Member IMC Group

Tungaloy

ACCELERATED MACHINING

# General Catalog

**2017 / 2018**

lungaloy

Member IMC Group
Tungaloy

In an accelerated world, a quick response to market needs is necessary. As a pioneer in innovation, **Tungaloy** leads the market in developing unique and powerful grades and geometries for this new era. TUNGFORCE, our newest line of products is designed for accelerated machining, bringing you the newest and greatest solutions for your machining needs.

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Tungaloy

2017 / 2018

# full product line

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## Grade A

Coated Grade CVD A002
Coated Grade PVD A003
Ceramic A005
Cermet A005
CBN (T-CBN) A006
PCD (T-DIA) A007
Uncoated Cemented Carbide A007

## TurnLine B

Insert B002
External Toolholder B180
Internal Toolholder B262
Miniature Machining B318
Threading B376

## GrooveLine C

Parting, Grooving, and Groove-Turn system C002

## MillLine D

High-Feed Milling D002
Shoulder Milling D036
Face Milling D130
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Profile Milling D222
Multi-Functional Milling D260
Milling Insert D351

## DrillLine E

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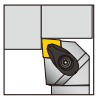
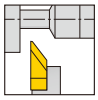
# Introduction

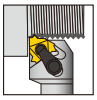
## Icons along the right/left side of the page

### Turning

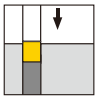

Ext. toolholder

Int. toolholder


Miniature tool


Threading tool

### Grooving, turning, and parting-off


Grooving, turning, and parting-off tool

Ext. grooving

Int. grooving

Face grooving

Parting-off

### Milling

High-feed milling

Shoulder milling

Face milling

Slot milling

Profile milling

Multi-functional milling

### Drilling

2-effective drill

Indexable drill

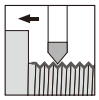
Deep hole drill

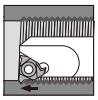
### Tooling system

Tooling system

## Icons in the chart section for each product

### Threading

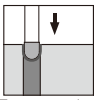

Ext. threading


Int. threading

### Grooving

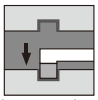
Ext. grooving

Ext. grooving and turning


Ext. grooving (full R)

Ext. grooving and turning (full R)

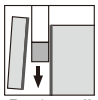
Forming


Int. grooving

Int. grooving and turning

Int. grooving and turning (full R)

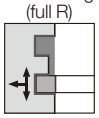
Int. grooving (full R)


Parting-off

Face grooving

Face grooving and turning

Int. face grooving


Int. face grooving and turning

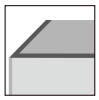
Face grooving for shaft

### Milling

Shoulder milling

Deep shoulder milling

Shoulder milling (with radius)

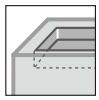

Face milling

Slotting

Slotting (with radius)

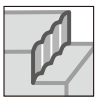
Side slotting

Side milling

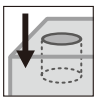

Pocketing

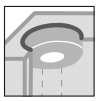
Ramping

Profiling


Plunging

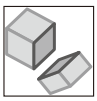
Hole enlarging


Holemaking

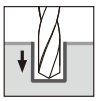

Counterboring

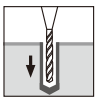
Hole chamfering

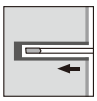
Chamfering


Cutting-off

### Drilling


Drilling


Small-diameter drilling


Deep-hole drilling

Hole chamfering

Tool kit

Oil hole

Oil hole for high-pressure

# Introduction

## Note in using this catalog:

★ This catalog provides the information of Tungaloy's cutting tools as of June 2017.

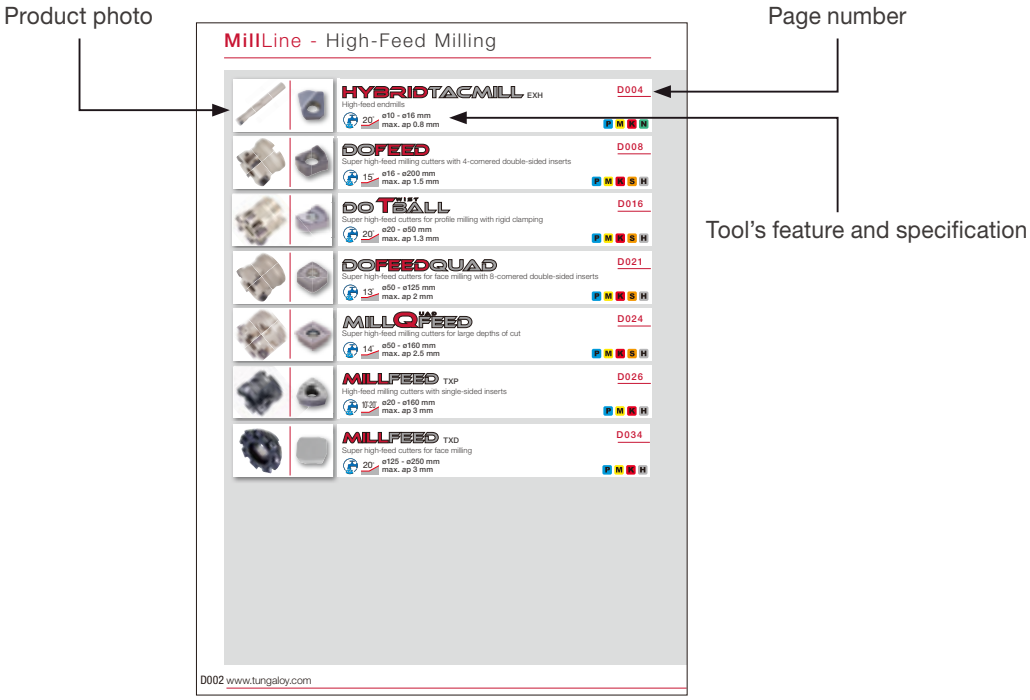
★ The specifications are subject to change without prior notice for product improvements. Also, the products may be discontinued in the future due to the development of new products.

★ The dimensions of all products are shown in millimeters (mm).

★ For indexable tools, such as toolholders, cutters, drill bodies, applicable inserts or heads need to be ordered separately.

## How to find a tool:

★ The catalog classifies the cutting tools into 5 lines – TurnLine (turning tools), GrooveLine (grooving tools), MillLine (milling tools), DrillLine (drilling tools), and ToolLine (tooling systems). The tools in each line are categorized by the applications.




Example: Contents of the cutters for high-feed milling in MillLine

★ Alphanumeric index in User's Guide helps you search a specific product.

## How to read the list for the standard items:

★ Designations for indexable tools – toolholders, cutters, drill bodies, etc.

· Orders are to be received for the tools with the designations in the catalog.

· For the tool with right- and left-hand options, the designation includes **R/L** as shown below.

Ex. 1: Designation: A16Q-STFP**R/L**13-D180

You can order both right- and left-hand tools. A16Q-STFP**R**13-D180 (a right-hand tool) and A16Q-STFP**L**13-D180 (a left-hand tool) will be available.

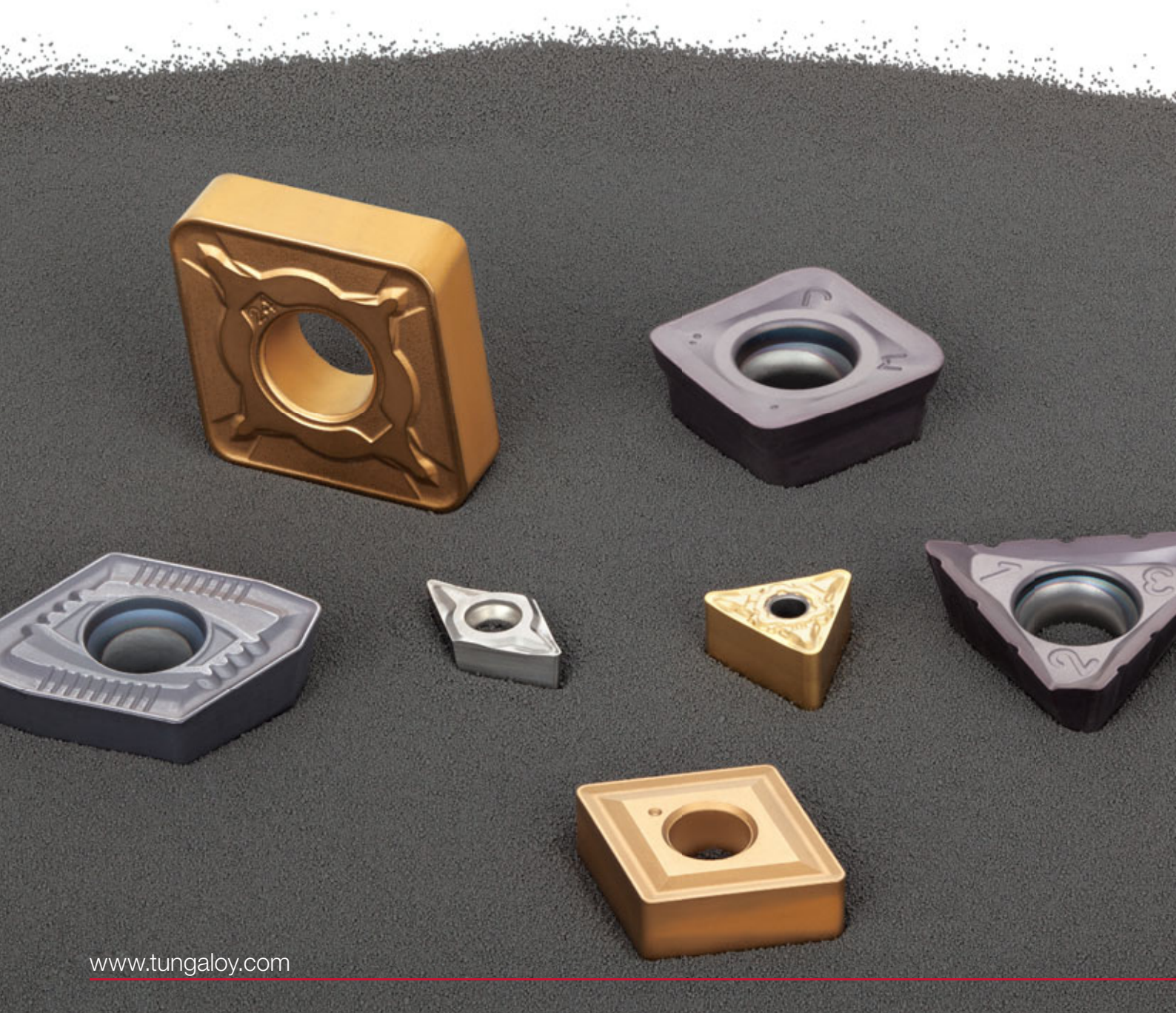
Ex. 2: Designation: A20R-STFP**R**13-D220

You can order only right-hand tools. Please contact us when you need left-hand tools.

★ Line up for inserts and solid tools

Blank : Please contact us regarding the product.

# Grade



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# GRADE


Coated Grade CVD A002

Coated Grade PVD A003

Ceramic A005

Cermet A005

CBN (T-CBN) A006

PCD (T-DIA) A007

Uncoated Cemented Carbide A007

# CVD - Coated Grade

| Grade | Coating | | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| | Main composition | Thickness / µm | | | | | | |
| **T9105**<br>P01 - P10<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | P K | - Good wear resistance<br>- Excellent performance in high-speed cutting | | | | |
| **T9115**<br>P10 - P20<br>K15 - K30 | TiCN-$Al_2O_3$ | 16 | P K | - Well-balanced between wear and chipping resistance<br>- Suitable for a wide range of turning applications | | | | |
| **T9125**<br>P20 - P30 | TiCN-$Al_2O_3$ | 16 | P | - High chipping resistance in light to medium interrupted cutting<br>- First choice for machining steel | | | | |
| **T9135**<br>P30 - P40 | TiCN-$Al_2O_3$ | 16 | P | - Excellent fracture resistance in heavy interrupted cutting | | | | |
| **T6120**<br>P10 - P20<br>M10 - M20 | TiCN | 6 | P M | - Good wear resistance in continuous cutting at high speed | | | | |
| **T6130**<br>P15 - P30<br>M15 - M30 | TiCN | 6 | P M | - High wear resistance in cutting at medium to high speed<br>- First choice for machining stainless steel | | | | |
| **T515**<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | K | - Good wear resistance even in high-speed machining<br>- First choice for roughing cast iron | | | | |
| **T5105**<br>K05 - K15 | TiCN-$Al_2O_3$ | 16 | K | - High resistance to wear and plastic deformation in continuous cutting at high speed | | | | |
| **T5115**<br>K10 - K20 | TiCN-$Al_2O_3$ | 16 | K | - Stable machining in a wide range of applications from continuous to interrupted cutting | | | | |
| **T5125**<br>K15 - K30 | TiCN-$Al_2O_3$ | 16 | K | - Strong resistance to sudden fracture<br>- Ideal for heavy interrupted machining | | | | |
| **T313V**<br>- | TiCN-$Al_2O_3$ | 3 | Threading | - Good resistance to plastic deformation<br>- Designed for threading | | | | |
| **T3225**<br>P20 - P35<br>M20 - M35 | TiCN-$Al_2O_3$ | 10 | P M | - High chipping and fracture resistance<br>- Suitable for machining steel and stainless steel | | | | |
| **T3130**<br>P20 - P40<br>M20 - M40 | TiCN-$Al_2O_3$ | 6 | P M | - Good balance between wear and chipping resistance<br>- Ideal for machining steel and stainless steel | | | | |
| **T1215**<br>K10 - K25 | TiCN-$Al_2O_3$ | 10 | K | - Good balance between wear and chipping resistance<br>- Designed for machining cast iron | | | | |
| **T1115**<br>K10 - K25 | TiCN-$Al_2O_3$ | 11 | K | - High wear resistance<br>- Ideal for machining cast iron | | | | |

# PVD - Coated Grade

| Grade | Coating: Main composition | Coating: Thickness / µm | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| **AH110**<br>P05 - P15<br>M05 - M15<br>K10 - K25<br>S05 - S15 | (Ti, Al)N | 3 | P M K S | - High wear resistance<br>- Suitable for finishing steel, cast iron, and high-hardened material | | | | |
| **AH120**<br>P15 - P25<br>M15 - M25<br>K15 - K30<br>S10 - S25 | (Ti, Al)N | 3 | P M K S | - Good balance between wear and fracture resistance<br>- Suitable for machining steel, stainless steel, and cast iron under general cutting conditions | | | | |
| **AH130**<br>P25 - P40<br>M25 - M40 | (Ti, Al)N | 3 | P M | - High chipping and fracture resistance<br>- Designed for machining austenitic stainless steel under general cutting conditions | | | | |
| **AH140**<br>M30 - M45 | (Ti, Al)N | 3 | M | - High fracture resistance<br>- Suitable for machining stainless steel | | | | |
| **AH170**<br>P20 - P35<br>M20 - M35<br>K15 - K30 | (Ti, Al)N | 3 | P M K | - High wear resistance<br>- Suitable for steel and cast iron drilling | | | | |
| **AH180**<br>P20 - P35<br>M20 - M35<br>K15 - K30 | (Ti, Al)N | 3 | P M K | - High wear resistance<br>- Suitable for steel and cast iron, stainless drilling | | | | |
| **AH330**<br>P15 - P30 | (Ti, Al)N | 3 | P | - Excellent wear resistance | | | | |
| **AH630**<br>P15 - P30<br>M15 - M30 | (Ti, Al)N | 5 | P M | - Good resistance to wear and fracture in machining stainless steel at low to medium cutting speed | | | | |
| **AH645**<br>P30 - P40<br>M30 - M40 | (Ti, Al)N | 5 | P M | - High fracture resistance in machining stainless steel | | | | |
| **AH710**<br>P05 - P15<br>K05 - K15<br>H05 - H15 | (Ti, Al)N | 3 | P K H | - High wear resistance<br>- Ideal for finishing cast iron and high-hardened material | | | | |
| **AH725**<br>P15 - P30<br>M15 - M30<br>K25 - K30<br>S15 - S25 | (Ti, Al)N | 2 | P M K S | - Good balance between wear and chipping resistance<br>- Suitable for machining steel and stainless steel under general cutting conditions | | | | |
| **AH7025**<br>P20 - P30<br>M20 - M30<br>S15 - S25 | (Ti, Al)N | 3.5 | P M S | - Excellent wear resistance and high rigidity<br>- First choice for grooving of various materials | | | | |
| **AH730**<br>P15 - P30 | (Ti, Al)N | 3 | P | - Well-balanced between wear and fracture resistance | | | | |
| **AH740**<br>P25 - P40 | (Ti, Al)N | 3 | P | - Excellent chipping resistance in machining steel | | | | |
| **AH750**<br>H15 - H30 | (Ti, Al)N | 3 | H | - High wear resistance<br>- Suitable for hard material machining | | | | |
| **AH8005**<br>M01 - M10<br>S01 - S10 | (Al,Ti)N | 3.5 | M S | - Good balance between wear and fracture resistance<br>- First choice for machining heat-resistant alloys under general cutting conditions | | | | |
| **AH8015**<br>M10 - M20<br>S10 - S20 | (Al,Ti)N | 3.5 | M S | - Strong resistance to wear and built-up edge | | | | |
| **AH905**<br>S01 - S10 | (Al, Ti)N | 1.5 | S | - Strong resistance to wear and built-up edge | | | | |

# PVD - Coated Grade

| Grade | Coating: Main composition | Coating: Thickness / µm | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| **AH3035**<br>P20 - P45<br>H20 - H30 | (Ti, Al)N | 5 | P H | - Good balance between wear and chipping resistance<br>- Suitable for machining high-hardened material at high feed | | | | |
| **AH3135**<br>P30 - P40<br>M30 - M40 | (Ti, Al)N | 4 | P M | - High fracture resistance<br>- Ideal for machining steel and stainless steel under general cutting conditions | | | | |
| **AH4035**<br>M30 - M45 | (Ti, Al)N | 5 | M | - Good balance for wear and fracture resistance<br>- Suitable for difficult stainless steel machining | | | | |
| **AH6030**<br>M25 - M35<br>S15 - S30 | (Ti, Al)N | 5 | M S | - High fracture resistance<br>- Ideal for drilling stainless steel and heat-resistant alloys under general cutting conditions | | | | |
| **AH9030**<br>P15 - 35<br>K10 - 25 | (Ti, Al)N | 5 | P K | - High wear resistance<br>- Designed for drilling steel and cast iron at high speed | | | | |
| **SH725**<br>P20 - P30<br>M20 - M30 | (Ti, Al)N | 2 | P M | - Excellent wear resistance<br>- Suitable for machining steel and stainless steel | | | | |
| **SH730**<br>P20 - P35<br>M20 - M35<br>S05 - S15 | (Ti, Al)N | 1 | P M S | - High wear resistance<br>- Suitable for machining steel, stainless steel, and difficult-to-cut materials | | | | |
| **GH110**<br>K10 - K25<br>N05 - N15 | Ti(C, N, O) | 3 | K N | - Good wear resistance | | | | |
| **GH130**<br>P25 - P40<br>M25 - M40<br>K25 - K40 | Ti(C, N, O) | 3 | P M K | - High chipping and fracture resistance<br>- Suitable for machining steel, stainless steel and cast iron | | | | |
| **GH330**<br>P15 - P30<br>M15 - M30<br>K05 - K30 | Ti(C, N, O) | 3 | P M K | - Strong resistance to wear and fracture<br>- Suitable for continuous to medium interrupted cutting | | | | |
| **GH730**<br>P20 - P35<br>M20 - M35<br>K20 - K30 | Ti(C, N, O) | 3 | P M K | - High wear resistance<br>- Ideal for turning and grooving at low speed | | | | |
| **J740**<br>- | TiN | 1 | For small lathes | - Ultra-fine-grain cemented carbide coated with TiN-based compound | | | | |
| **YH170**<br>P20 - P35<br>M20 - M35 | Ti(C, N) | 1.5 | P M | - Strong resistance to wear and fracture<br>- Suitable for steel and stainless drilling | | | | |
| **YH180**<br>P20 - P35<br>M20 - M35 | Ti(C, N) | 1.5 | P M | - High wear resistance<br>- Suitable for steel and stainless drilling | | | | |
| **JM10**<br>P20 - P35<br>M20 - M35 | TiN | 1 | P M | - High wear resistance<br>- Suitable for steel and stainless drilling | | | | |
| **DS1100**<br>N05 - N20 | DLC coating | Thin layer | N | - High wear resistance<br>- Designed for finishing aluminium | | | | |
| **DS1200**<br>N10 - N25 | DLC coating | Thin layer | N | - Good balance between wear and chipping resistance<br>- Ideal for semi-finishing to finishing of aluminium | | | | |

# Ceramic

| Grade | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|---|
| LX11 | 4.35 | 94.0 | 0.9 | H | - Alumina base<br>- Suitable for continuous cutting of high-hardened materials | | | | |
| LX21 | 4.24 | 94.0 | 0.8 | K | - Alumina base<br>- Excellent chipping resistance in continuous cutting of cast iron | | | | |
| FX105 | 3.24 | 93.0 | 1.3 | K | - Silicon nitride base<br>- Suitable for high-speed machining of cast iron | | | | |
| CX710 | 3.20 | 92.9 | 1.1 | K | - Silicon nitride base<br>- Excellent performance in high-speed machining of cast iron | | | | |

# Cermet

| Grade | Coating | | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| | Main composition | Thickness / µm | | | | | | |
| GT9530 | Ti(C, N, O) | 3 | P K | - High wear resistance<br>- Ideal for finishing with high surface quality | | | | |
| J9530 | TiN | 1 | For small lathes | - Suitable for small-part machining | | | | |
| NS9530 | Uncoated | - | P K | - High fracture resistance<br>- Suitable for finishing to medium cutting of steel | | | | |
| NS740 | Uncoated | - | P | - Good resistance to fracture and thermal crack<br>- Ideal for milling operations that require high rigidity | | | | |
| NS520 | Uncoated | - | P K | - Good wear resistance | | | | |
| GT720 | Ti(C, N, O) | 3 | P K | - Good wear resistance in high speed machining | | | | |
| X407 | Uncoated | - | P | - Good wear resistance for finish on dry machining | | | | |
| N308 | Uncoated | - | P | - Good wear resistance | | | | |

# CBN (T-CBN)

| Grade | Hardness (Hv) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| BXA20 | 3300 ~ 3500 | 1.30 ~ 1.50 | H | - Excellent performance in machining hardened steel | | | | |
| BXM10 | 2700 ~ 2900 | 0.80 ~ 0.90 | H | - Suitable for machining hardened steel with continuous cutting at high speed | | | | |
| BXM20 | 3500 ~ 3700 | 1.35 ~ 1.50 | H | - First choice for machining hardened steel in a wide range of applications | | | | |
| BXC50 | 3500 ~ 3700 | 1.15 ~ 1.30 | H | - High fracture resistance in continuous to interrupted machining | | | | |
| BX310 | 2700 ~ 2900 | 0.80 ~ 0.90 | H | - Good wear resistance<br>- Designed for continuous cutting of hardened steel at high speed | | | | |
| BX330 | 2800 ~ 3000 | 0.85 ~ 0.95 | H | - Excellent sharpness<br>- Designed for finishing hardened steel | | | | |
| BX360 | 3200 ~ 3400 | 1.00 ~ 1.10 | H | - Suitable for general-purpose machining of hardened steel | | | | |
| BX380 | 3500 ~ 3700 | 1.15 ~ 1.30 | H | - High fracture resistance<br>- Suitable for heavy interrupted cutting of hardened steel | | | | |
| BX530 | 2800 ~ 3000 | 0.85 ~ 0.95 | H | - Suitable for finishing hardened steel with high surface quality | | | | |
| BXC90 (BX90S) | 3900 ~ 4100 | 1.80 ~ 1.90 | K | - Suitable for machining cast iron at high speed | | | | |
| BX910 | 2600 ~ 2800 | 0.80 ~ 0.90 | K | - Excellent wear resistance in high-speed machining<br>- Ideal for machining centrifugally cast iron | | | | |
| BX930 | 3000 ~ 3200 | 0.95 ~ 1.20 | K | -Designed for machining ductile cast iron | | | | |
| BX950 | 3900 ~ 4100 | 1.80 ~ 1.90 | K S | - High fracture resistance<br>- Good performance in high-speed machining | | | | |
| BX850 | 3300 ~ 3500 | 0.75 ~ 0.85 | K H | - High fracture resistance in machining cast iron<br>- Suitable for hardened steel finish milling | | | | |
| BX870 | 3000 ~ 3200 | 0.95 ~ 1.20 | K | - High wear resistance<br>- Suitable for machining cylinder liners made of cast iron | | | | |
| BX470 | 4100 ~ 4300 | 1.90 ~ 2.10 | Sintered metal | - Excellent sharpness<br>- Suitable for machining ferrous sintered metal | | | | |
| BX480 | 4100 ~ 4300 | 1.90 ~ 2.10 | Sintered metal | - Hardest grade of all T-CBN grades<br>- Suitable for machining ferrous sintered metal | | | | |
| M714B | 3000 ~ 3200 | 1.00 ~ 1.10 | S | - High wear resistance and thermostability<br>- Good performance in high-speed machining of Inconel | | | | |

# PCD (T-DIA)

| Grades | Grain size (μm) | Hard-ness (Hv) | T.R.S. (GPa) | Application | Feature | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|---|
| DX110 | < 1 | 8500 | 1.8 | N | - Excellent sharpness for high surface quality<br>- Suitable for finishing non-ferrous metal and nonmetal | | | | |
| DX120 | 4.5 | 9000 | 1.8 | N | - Suitable for precision machining of non-ferrous metal and nonmetal | | | | |
| DX140 | 12.5 | 10000 | 1.7 | N | - High wear resistance<br>- Suitable for machining non-ferrous metal and nonmetal | | | | |
| DX160 | 28 | 11000 | 1.6 | N | - Designed for machining ceramic, cemented carbide, and nonmetal | | | | |
| DX180 | 45 | 12000 | 1.5 | N | - High wear resistance<br>- Designed for ceramic, cemented carbide, and nonmetal | | | | |

# Uncoated Cemented Carbide

| Grades | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| UX30<br>P30<br>M30 | 12.6 | 91.1 | 2.3 | P M | | | | |
| TH10<br>P10<br>M10<br>K10<br>N10 | 14.7 | 92.0 | 2.4 | P M<br>K N | | | | |
| KS05F<br>K05<br>S05<br>N05 | 15.0 | 93.0 | 2.9 | K S<br>N | | | | |
| KS15F<br>N15 | 14.4 | 91.5 | 3.0 | N | | | | |
| KS20<br>K20<br>N20<br>S20 | 14.5 | 90.8 | 2.8 | K S<br>N | | | | |
| TH03<br>P05<br>M05<br>K05<br>N05 | 13.8 | 93.8 | 1.9 | P M<br>K N | | | | |
| F | 14.9 | 93.4 | 2.5 | P K | | | | |
| EM10<br>P10 - P25<br>K10 - K25 | 14 | 91.5 | 3.4 | P K | | | | |

| Grades | Specific gravity | Hard-ness (HRA) | T.R.S. (GPa) | Application | Turning | Grooving | Milling | Drilling |
|---|---|---|---|---|---|---|---|---|
| UM<br>K10 - K25<br>N10 - N25 | 13.9 | 90.9 | 3.5 | K N | | | | |
| G2<br>K10 - K25<br>N10 - N25 | 15 | 90.8 | 2.7 | K N | | | | |
| G1F<br>P10 - P25<br>K10 - K25 | 15.1 | 92 | 2.6 | P K | | | | |
| MD10<br>P10 - P25<br>M10 - M25 | 15 | 92.8 | 3.4 | P M | | | | |
| MD20<br>P20 - P35<br>M20 - M35 | 14.4 | 91.5 | 3.9 | P M | | | | |

# TurnLine

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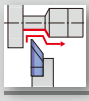
# TURNING

Insert B002

External Toolholder B180

Internal Toolholder B262


Miniature Machining B318

Threading B376

## Negative type

Coated grades CVD/PVD, Cermet, Uncoated cemented carbides, Ceramic

B050

## Posivite type

Coated grades CVD/PVD, Cermet, Uncoated cemented carbides, Ceramic

B104

## CBN/PCD Insert

CBN (T-CBN), PCD (T-DIA)

B158

08

# TurnLine - Designation system for Insert

● Conforms to “Indexable Inserts for Cutting Tools - Designation” (JIS B4120-1998, and ISO 1832 / AM1-1998)

## ❶ Shape

| Symbol | Shape | Nose angle (degree) | Figure |
|---|---|---|---|
| H | Hexagonal | 120° | |
| O | Octagonal | 135° | |
| P | Pentagonal | 108° | |
| S | Square | 90° | |
| T | Triangular | 60° | |
| C | Rhombic | 80° | |
| D | | 55° | |
| E | | 75° | |
| F | | 50° | |
| G | G-shape (Tungaloy's symbol) | 70° | |
| M | Rhombic | 86° | |
| V | | 35° | |
| Y | Y-shape (Tungaloy's symbol) | 25° | |
| W | Trigon | 80° | |
| L | Rectangular | 90° | |
| A | Parallelogram | 85° | |
| B | | 82° | |
| K | | 55° | |
| R | Round | - | |

Notes : With respect to the nose angles of rhombic and parallelogram shaped inserts, use the smaller angle respectively.

## ❷ Relief angle

| Symbol | Relief angle |
|---|---|
| A | 3° |
| B | 5° |
| C | 7° |
| D | 15° |
| E | 20° |
| F | 25° |
| G | 30° |
| N | 0° |
| P | 11° |
| O | Others |
| X | Special |

## ❸ Accuracy

| Symbol (class) | Tolerance (mm) | | |
|---|---|---|---|
| | Corner height (m) | Thickness (s) | I. C. dia. (ød) |
| A | ±0.005 | ±0.025 | ±0.025 |
| F | ±0.005 | ±0.025 | ±0.013 |
| C | ±0.013 | ±0.025 | ±0.025 |
| H | ±0.013 | ±0.025 | ±0.013 |
| E | ±0.025 | ±0.025 | ±0.025 |
| G | ±0.025 | ±0.13 | ±0.025 |
| J | ±0.005 | ±0.025 | ±0.005 ~ ±0.13 |
| K | ±0.013 | ±0.025 | ±0.05 ~ ±0.13 |
| L | ±0.025 | ±0.025 | ±0.05 ~ ±0.13 |
| M | ±0.08 ~ ±0.18 | ±0.13 | ±0.05 ~ ±0.13 |
| N | ±0.08 ~ ±0.18 | ±0.025 | ±0.05 ~ ±0.13 |
| U | ±0.13 ~ ±0.38 | ±0.13 | ±0.08 ~ ±0.25 |

| | ❶ | ❷ | ❸ | ❹ | ❺ |
|---|---|---|---|---|---|
| | T | N | M | G | 16 |
| [Example] | | | | | |
| [Example] | C | C | G | T | 09 |
| | ❶ | ❷ | ❸ | ❹ | ❺ |

## ❹ Groove and hole

| Symbol | Hole | Shape of hole | Chip-breaker | Shape |
|---|---|---|---|---|
| N | Without | - | Without | |
| R | | | Single-sided | |
| F | | | Double-sided | |
| A | With | Cylindrical hole | Without | |
| M | | | Single-sided | |
| G | | | Double-sided | |
| W | | Partly cylindrical hole, single-side 40° ~ 60° Counter sink | Without | |
| T | | | Single-sided | |
| Q | | Partly cylindrical hole, double-side 40° ~ 60° Counter sink | Without | |
| U | | | Double-sided | |
| B | | Partly cylindrical hole, single-side 70° ~ 90° Counter sink | Without | |
| H | | | Single-sided | |
| C | | Partly cylindrical hole, double-side 70° ~ 90° Counter sink | Without | |
| J | | | Double-sided | |
| X | - | - | - | |

## ❺ Cutting edge length

| * R | | S | | C | | W | | T | | D | | V | | K | | I. C.dia. (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | Symbol | Length | |
| | | 03 | 3.97 | 03 | 4.0 | | | 06 | 6.9 | 04 | 4.8 | | | | | 3.97 |
| | | 04 | 4.76 | 04 | 4.8 | | | 08 | 8.2 | 05 | 5.8 | 08 | 8.3 | | | 4.76 |
| *05 | 5 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 5 |
| | | 05 | 5.56 | 05 | 5.6 | 03 | 3.8 | 09 | 9.6 | 06 | 6.8 | | | | | 5.56 |
| *06 | 6 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 6 |
| | | 06 | 6.35 | 06 | 6.5 | 04 | 4.3 | 11 | 11 | 07 | 7.8 | 11 | 11.2 | | | 6.35 |
| | | 07 | 7.94 | 08 | 8.1 | 05 | 5.4 | 13 | 13.8 | 09 | 9.7 | | | | | 7.94 |
| *08 | 8 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 8 |
| 09 | 9.525 | 09 | 9.525 | 09 | 9.7 | 06 | 6.5 | 16 | 16.5 | 11 | 11.6 | 16 | 16.6 | 16 | 19.7 | 9.525 |
| *10 | 10 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 10 |
| *12 | 12 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 12 |
| 12 | 12.7 | 12 | 12.7 | 12 | 12.9 | 08 | 8.7 | 22 | 22 | 15 | 15.5 | 22 | 22.1 | | | 12.7 |
| 15 | 15.875 | 15 | 15.875 | 16 | 16.1 | 10 | 10.9 | 27 | 27.5 | 19 | 19.4 | | | | | 15.875 |
| *16 | 16 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 16 |
| 19 | 19.05 | 19 | 19.05 | 19 | 19.3 | 13 | 13 | 33 | 33 | 23 | 23.3 | | | | | 19.05 |
| *20 | 20 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 20 |
| | | 22 | 22.225 | 22 | 22.6 | | | 38 | 38.5 | 27 | 27.1 | | | | | 22.225 |
| *25 | 25 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 25 |
| 25 | 25.4 | 25 | 25.4 | 25 | 25.8 | | | 44 | 44 | 31 | 31 | | | | | 25.4 |
| 31 | 31.75 | 31 | 31.75 | 32 | 32.2 | | | 55 | 55 | 38 | 38.8 | | | | | 31.75 |
| *32 | 32 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 32 |

* When M0 is included in Designation, the inscribed-circle diameter is metric size.

● Detailed accuracy for J,K,L,M,N and U classes

For inserts with nose corner angles larger than 55°

Unit: mm

| Inscribed circle | Tolerance on inscribed circle dia. (ød) | | Tolerance on corner height (m) | | Insert shapes applied |
|---|---|---|---|---|---|
| | J,K,L,M,N (class) | U (class) | J,K,L,M,N (class) | U (class) | |
| 6.35 | ±0.05 | ±0.08 | ±0.08 | ±0.13 | H W O R P S T C,E,M |
| 9.525 | | | | | |
| 12.7 | ±0.08 | ±0.13 | ±0.13 | ±0.2 | |
| 15.875 | ±0.1 | ±0.18 | ±0.15 | ±0.27 | |
| 19.05 | | | | | |
| 25.4 | ±0.13 | ±0.25 | ±0.18 | ±0.38 | |
| 31.75 | ±0.15 | ±0.25 | ±0.2 | ±0.38 | |
| 32 | | | | | |

For M-type inserts with nose corner angles of 55° (Shape: D), 35° (Shape: V), 25° (Shape: Y)

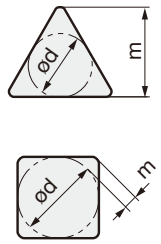
Unit: mm

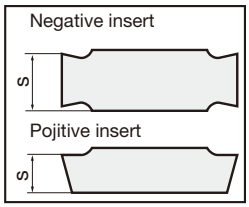
| Inscribed circle | Tolerance on inscribed circle dia. (ød) | Tolerance on corner height (m) | Insert shapes applied |
|---|---|---|---|
| 6.35 | ±0.05 | ±0.11 | D |
| 9.525 | | | |
| 12.7 | ±0.08 | ±0.15 | |
| 15.875 | ±0.1 | ±0.18 | |
| 19.05 | | | |
| 6.35 | ±0.05 | ±0.16 | V Y |
| 9.525 | | | |

Note on insert thickness

With regard to the insert thickness for chipbreaker inserts, the thickness (s) drawn in the outlined insert shapes on pages XX to XX is defined as "s" (height from the bottom face to the cutting edge) shown in the figure at right.

Inscribed circle (ød)
Corner height (m)




| Symbol | Thickness (mm) |
|---|---|
| X1 | 1.39 |
| 01 | 1.59 |
| T1 | 1.98(1.79) |
| 02 | 2.38 |
| T2 | 2.78 |
| 03 | 3.18 |
| T3 | 3.97 |
| 04 | 4.76 |
| 05 | 5.56 |
| 06 | 6.35 |
| 07 | 7.94 |
| 09 | 9.52 |

## ⑥ Thickness

[Example]

| ⑥ | ⑦ | | | | ⑩ |
|---|---|---|---|---|---|
| 04 | 08 | | | - | TM |
| T3 | 04 | F | N | - | JS |
| ⑥ | ⑦ | ⑧ | ⑨ | | ⑩ |

(Optional symbol) (Optional symbol) (Supplementary symbol)

## ⑦ Corner radius

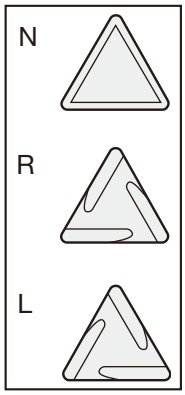
| Symbol | Corner radius $r_\varepsilon$ (mm) |
|---|---|
| 00 | 0.03 |
| 02 | 0.2 |
| 04 | 0.4 |
| 08 | 0.8 |
| 12 | 1.2 |
| 16 | 1.6 |
| 20 | 2.0 |
| 24 | 2.4 |
| 28 | 2.8 |
| 32 | 3.2 |

## ⑧ Symbols of major cutting edge

| Symbol | Condition of cutting edge | Shape |
|---|---|---|
| F | Sharp edge | |
| E | Honed rounded edge | |
| W.T | Honed chamfered edge | |
| S | Combination honed edge | |

## ⑨ Hand of insert

| Symbol | Hand |
|---|---|
| R | Right |
| L | Left |
| N | Neutral |




## ⑩ Chipbreakers

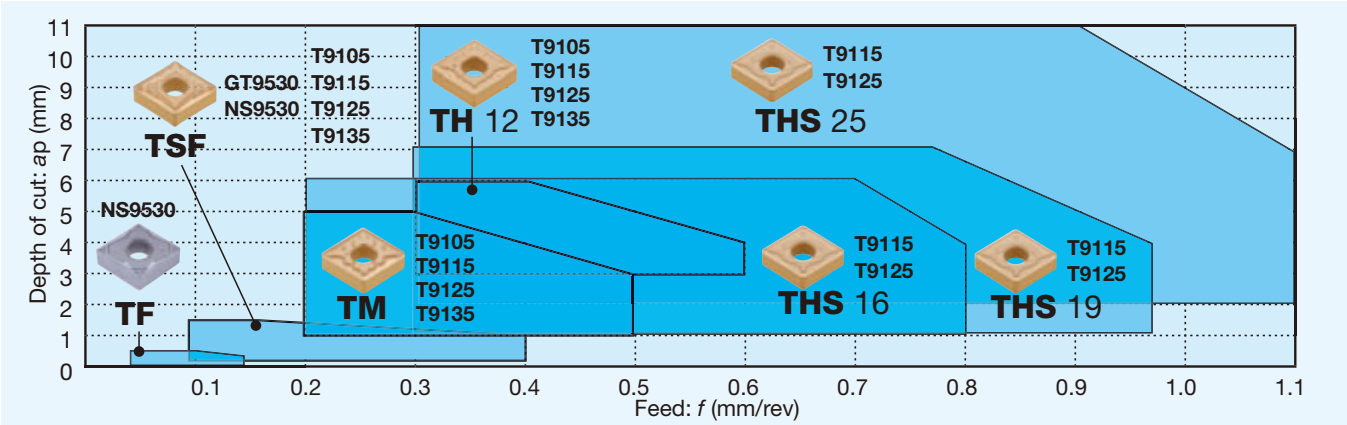
| Symbol | Applications | Symbol | Applications |
|---|---|---|---|
| 01(TF) | Precision finishing (Basic selection) | CB | Medium cutting |
| TS | Finishing (Basic selection) | CM | Medium cutting of cast irons |
| TSF | Finishing (Basic selection) | All-round | Medium cutting |
| TM | Medium cutting (Basic selection) | A | Finishing (Right and left hand) |
| THS | Medium to heavy cutting (Basic selection) | B | Finishing (Right and left hand) |
| TRS | Medium to heavy cutting | C | Finishing (Right and left hand) |
| TUS | Heavy cutting | D | Finishing (Right and left hand) |
| DM | Medium cutting | P | Finishing of Aluminium alloys |
| HRF | Finishing | W | Finishing (Angular type) |
| HRM | Finishing to medium cutting | PSF | Finishing (Positive type) |
| HMM | Medium cutting | PSS | Finishing to light cutting (Positive insert) |
| SF | Finishing of stainless steels | PS | Finishing to medium cutting (Positive type Basic selection) |
| SS | Finishing of stainless and mild steels | PM | Medium cutting (Positive type) |
| SM | Medium cutting of stainless steels | AL | Finishing to medium cutting of aluminium alloys |
| S | Medium cutting of stainless steels | RS | Medium cutting (For round inserts) |
| SH | Medium to heavy cutting of stainless steels | W□□ | Finishing (Angular type) |
| SA | For heat-resisting alloys and stainless steels | H□□ | Finishing (Parallel) |
| ZF | Finishing and copying | 11 | Finishing |
| ZM | Finishing to medium cutting and copying | 61 | Small depth of cut and high feed (For round inserts) |
| NS | Finishing and copying | S1 | Finishing (For KNMX type) |
| NM | Finish to medium cutting and copying | J08,J10 | For small lathes |
| AS | Small depth of cut and high feed | JS | For small lathes |
| AM | Small depth of cut and high feed | JRP | For small lathes |
| FW | Finishing (Wiper type) | JPP | For small lathes |
| SW | Finishing to medium cutting (Wiper type) | JSP | For small lathes |
| AFW | Small depth of cut and high feed (Wiper type Inserts) | | |
| ASW | Small depth of cut and high feed (Wiper type Inserts) | | |

# TurnLine - Chipbreaker Guide

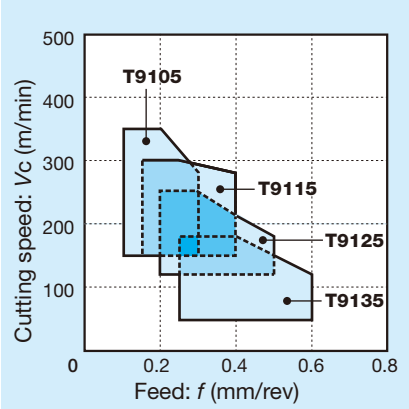
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## P Steel

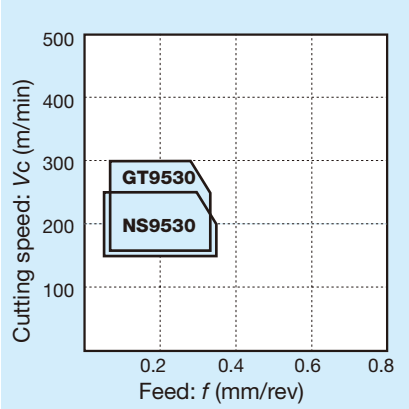
### Chipbreaker System for Turning (Negative Inserts)

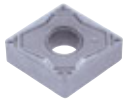



### CVD coated grades




### Coated cermets / Cermets




| Chipbreaker | Appearance | Features |
|---|---|---|
| TF |  | The sharp cutting edge and raised projection near corner contribute to excellent chip control at very small depths of cut and low feeds. Economical M-class tolerance and low cost. |
| TSF | | First choice chipbreaker for finishing steels. The dimple structure decreases the contact area between the insert surface and chips, resulting in significant reduction of heat occurrence. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| TM | | General purpose chipbreaker used for medium cutting. Unique chipbreaker geometry with sharp edges and large rake angle assures free cutting action in a wide range of cutting conditions. |
| TH | | Double-sided 3-dimensional chipbreaker with a wide land and broad groove used for medium to heavy cutting including interruption and unfavorable surface conditions. Also performs well in high feed machining. |
| THS | | Excellent chip control in a broad range of depth of cut. Strong cutting edge being suitable for interrupted and high feed operations. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Low carbon steels, Alloy steels | Medium carbon steels, Alloy steels | High carbon steels, Alloy steels |
|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | Continuous to light interrupted | TF | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 100 - 250 | 100 - 200 |
| | Finishing | Continuous to light interrupted | TSF | GT9530 | 0.2 - 1.5 | 0.08 - 0.4 | 150 - 300 | 80 - 250 | 80 - 200 |
| | | Heavy interrupted | TSF | T9125 | 0.2 - 1.5 | 0.08 - 0.4 | 120 - 250 | 80 - 200 | 80 - 150 |
| | Medium cutting | Continuous to heavy interrupted | TM | T9105 | 1.0 - 5.0 | 0.2 - 0.5 | 180 - 350 | 180 - 350 | 180 - 300 |
| | | | TM | T9115 | 1.0 - 5.0 | 0.2 - 0.5 | 150 - 300 | 150 - 300 | 120 - 250 |
| | | | TM | T9125 | 1.0 - 5.0 | 0.2 - 0.5 | 120 - 250 | 80 - 200 | 80 - 150 |
| | | | TM | T9135 | 1.0 - 5.0 | 0.2 - 0.5 | 50 - 180 | 50 - 150 | 50 - 120 |
| | Medium to heavy cutting | Continuous to heavy interrupted | TH | T9105 | 3.0 - 6.0 | 0.3 - 0.6 | 180 - 350 | 180 - 350 | 180 - 300 |
| | | | TH | T9115 | 3.0 - 6.0 | 0.3 - 0.6 | 150 - 300 | 150 - 300 | 120 - 250 |
| | | | TH | T9125 | 3.0 - 6.0 | 0.3 - 0.6 | 120 - 250 | 80 - 200 | 80 - 150 |
| | | | TH | T9135 | 3.0 - 6.0 | 0.3 - 0.6 | 50 - 180 | 50 - 150 | 50 - 120 |

Low carbon steels, Alloy steels: S10C、SCM415, SS400, SCr420H, etc. C10, 18CrMo4, E275A, 20Cr4, etc. Medium carbon steels, Alloy steels: S45C, SCM440, etc. C45, 42CrMo4, etc. High carbon steels, Alloy steels: SNCM439, etc. 41CrNiMo2, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: NEGATIVE INSERTS

## P Steel

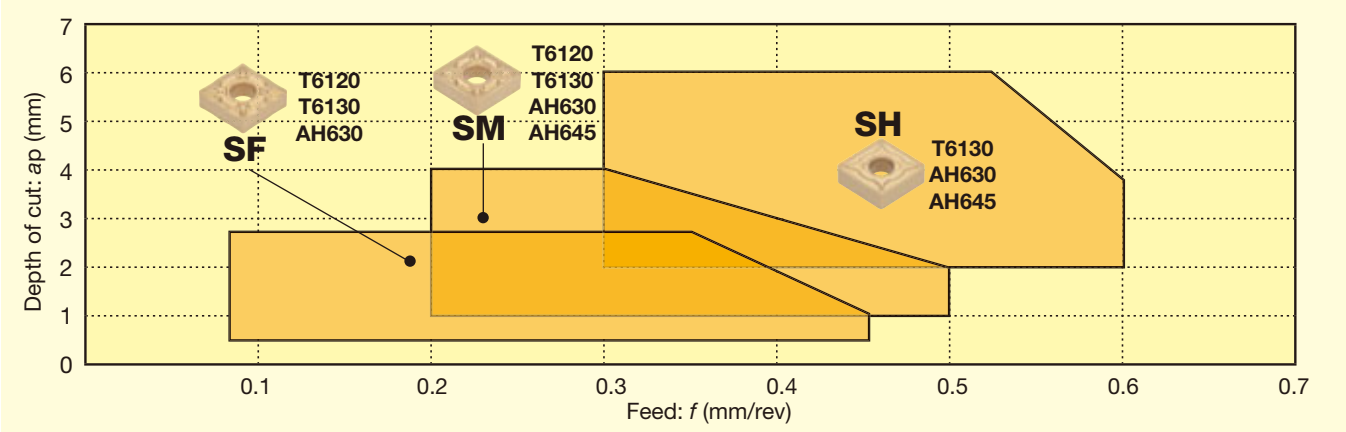
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: TF NS9530 → Wear: 01 GT9530 | Basic: TF NS9530 → Fracture: TSF GT9530 | |
| **Finishing** [ $a_p$ = 0.3 ~ 1.5 mm ] | Basic: TSF GT9530 → Chip control: ZF GT9530 | Basic: TSF GT9530 → Fracture: TSF T9115 | Basic: TSF T9125 → Fracture: TSF T9135 |
| **Medium cutting** [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic: TM T9115 → Wear: TM T9105; Chip control: ZM T9115 | Basic: TM T9125 → Fracture: TM T9135; Wear: TM T9115 | Basic: TM T9135 → Fracture: DM T9135 |
| **Medium to heavy cutting** [ $a_p$ = 3.0 ~ 6.0 mm ] | Basic: TH T9115 → Wear: TH T9105; Chip control: TM T9115 | Basic: TH T9125 → Fracture: TH T9135; Wear: TH T9115 | Basic: TH T9135 → Fracture: TUS T9135 |

# TurnLine - Chipbreaker Guide

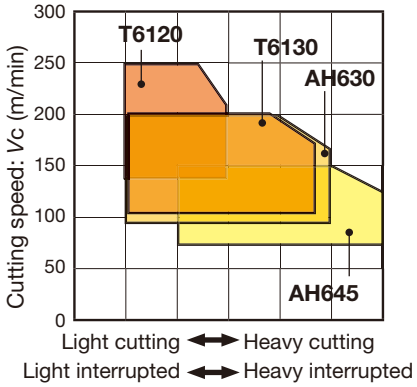
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## M Stainless Steel

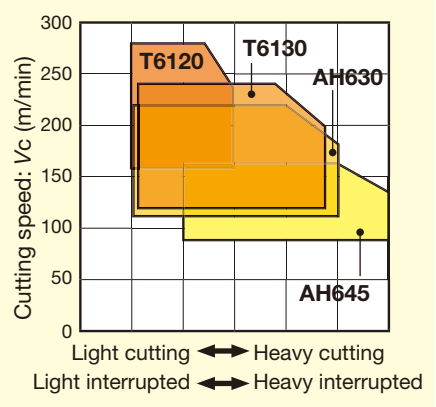
### Chipbreaker System for Turning



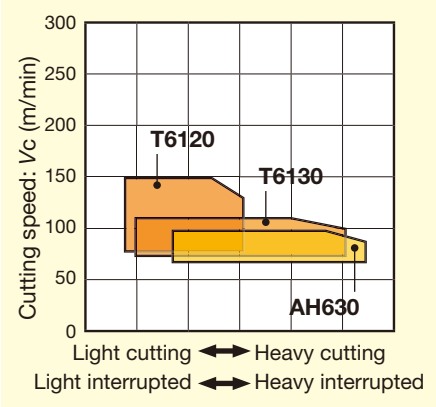

Austenitic stainless steel




Ferritic / martensite stainless steel




Precipitation hardened stainless steel




| Chipbreaker | Appearance | Features |
|---|---|---|
| SF | | Exellent chip control when finish cutting.<br>Outstanding chip control when high feed turning at small depth of cut. |
| SH | | Suitable for roughing operations and interrupted machining with tough cutting edges. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| SM | | Applicable to a wide range of cutting condition with sharp edge.<br>Recommended chipbreaker for stainless steel turning. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| M | Finishing | Continuous | SF | T6120 | 0.5 - 2.5 | 0.08 - 0.45 | 140 - 240 |
| | | Continuous to light interrupted | SF | T6130 | 0.5 - 2.5 | 0.08 - 0.45 | 100 - 200 |
| | | Heavy interrupted | SF | AH630 | 0.5 - 2.5 | 0.08 - 0.45 | 90 - 190 |
| | Medium cutting | Continuous | SM | T6120 | 1.0 - 4.0 | 0.2 - 0.5 | 140 - 240 |
| | | Continuous to light interrupted | SM | T6130 | 1.0 - 4.0 | 0.2 - 0.5 | 100 - 200 |
| | | Light interrupted | SM | AH630 | 1.0 - 4.0 | 0.2 - 0.5 | 90 - 190 |
| | | Heavy interrupted | SM | AH645 | 1.0 - 4.0 | 0.2 - 0.5 | 70 - 150 |
| | Medium to heavy cutting | Continuous to light interrupted | SH | T6130 | 2.0 - 6.0 | 0.3 - 0.6 | 100 - 200 |
| | | Light interrupted | SH | AH630 | 2.0 - 6.0 | 0.3 - 0.6 | 90 - 190 |
| | | Heavy interrupted | SH | AH645 | 2.0 - 6.0 | 0.3 - 0.6 | 70 - 150 |

Stainless steels: SUS304、SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: NEGATIVE INSERTS

## M Stainless Steel

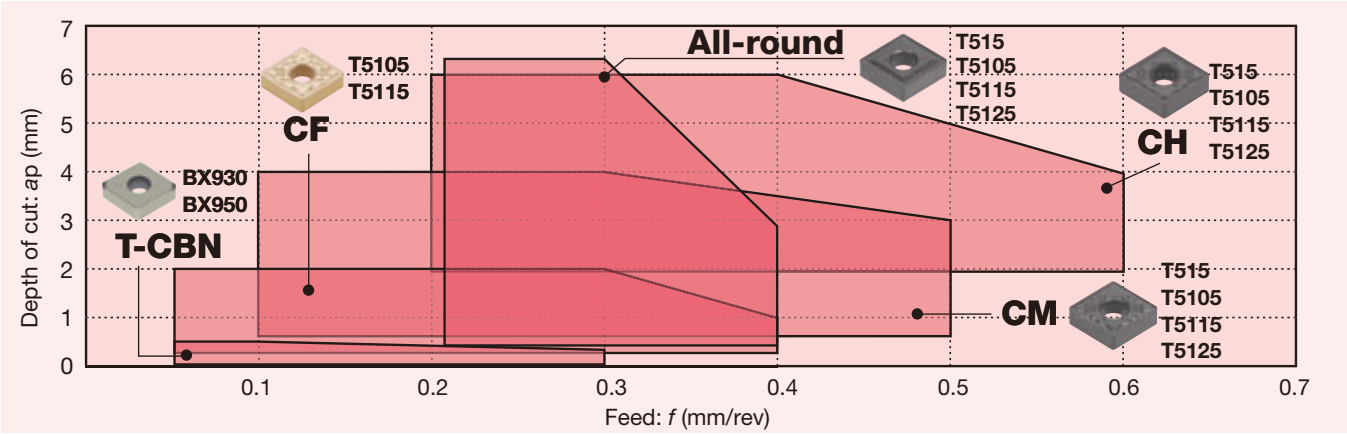
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Finishing** [ $a_p$ = 0.5 ~ 1.5 mm ] | Basic: **SF T6120**<br>Fracture → **SF T6130** | Basic: **SF T6130**<br>Fracture → **SF AH630**<br>Wear → **SF T6120** | Basic: **SF AH630**<br>Fracture → **SF AH645**<br>Wear → **SF T6130** |
| **Medium cutting** [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic: **SM T6130**<br>Wear → **SM T6120**<br>Chip control → **SF T6130** | Basic: **SM AH630**<br>Fracture → **SM AH645**<br>Wear → **SM T6130** | Basic: **SM AH645**<br>Fracture → **SH AH645** |
| **Medium to heavy cutting** [ $a_p$ = 2.0 ~ 6.0 mm ] | Basic: **SH T6130**<br>Fracture → **SH AH630**<br>Wear → **SH T6120**<br>Chip control → **SM T6130** | Basic: **SH AH630**<br>Fracture → **SH AH645**<br>Wear → **SH T6130** | Basic: **SH AH645**<br>Wear → **SH AH630** |

# TurnLine - Chipbreaker Guide

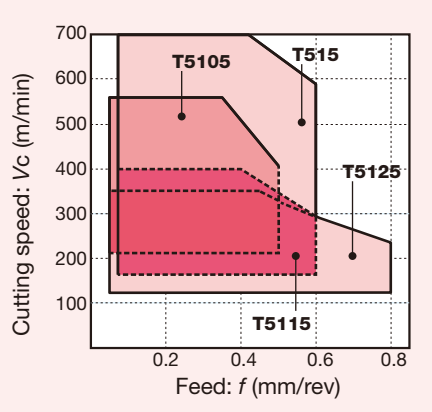
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## K Cast Iron

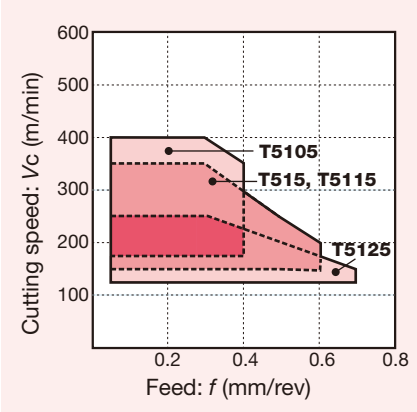
### Chipbreaker System for Turning (Negative Inserts)



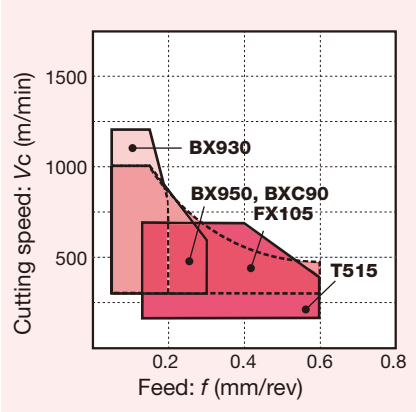

### Grey cast irons

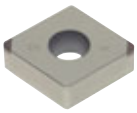
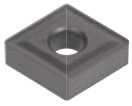


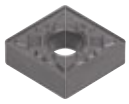
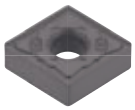

### Ductile cast irons




### High speed cutting: for grey cast irons




| Chip-breaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | T-CBN inserts. Performs well in high speed finishing of cast iron. |
| CF | | Low cutting force chipbreaker for cast iron. Combined with an arc-shaped concave and a high rake (substantially 20° rake angle), allows drastically reducing cutting forces and suppressing the deformation of thin walled components and burr occurrence. |
| All-round |  | Highly reliable chipbreaker for medium cutting under a wide range of conditions from continuous to interrupted cutting. |

| Chip-breaker | Appearance | Features |
|---|---|---|
| CM |  | First choice chipbreaker for cast iron. An all around chipbreaker, which is applicable for a wide range of cutting conditions from continuous to interrupted machining with the positive land and wide chip pocket |
| CH |  | Chipbreaker with reinforced cutting-edge for cast iron. Utilizing the land support and negative land design, features stable insert seating and high cutting edge strength even in heavy cutting. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Grey cast irons | Ductile cast irons |
| K | High speed cutting | Continuous | Without | BX930 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 1200 | 100 - 500 |
| | | Light interrupted | Without | BX950 | 0.05 - 0.5 | 0.05 - 0.3 | 300 - 1000 | 100 - 300 |
| | | Continuous | Without | BXC90 | 0.08 - 3.0 | 0.05 - 0.4 | 300 - 1000 | 100 - 300 |
| | Finishing | Continuous | CF | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Light interrupted | CF | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Continuous | CM | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | Medium cutting | Continuous | AR | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Light interrupted | CM | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Continuous | CH | T515 | 3.0 - 6.0 | 0.2 - 0.6 | 150 - 700 | 140 - 370 |
| | Heavy cutting | Continuous | CH | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Light interrupted | CH | T515 | 1.0 - 5.0 | 0.1 - 0.5 | 150 - 700 | 140 - 370 |
| | | Continuous | CH | T515 | 3.0 - 6.0 | 0.2 - 0.6 | 150 - 700 | 140 - 370 |

Grey cast irons: FC250, etc. 250, etc.  Ductile cast irons: FCD450, etc. 450-10S, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: NEGATIVE INSERTS

## K Cast Iron

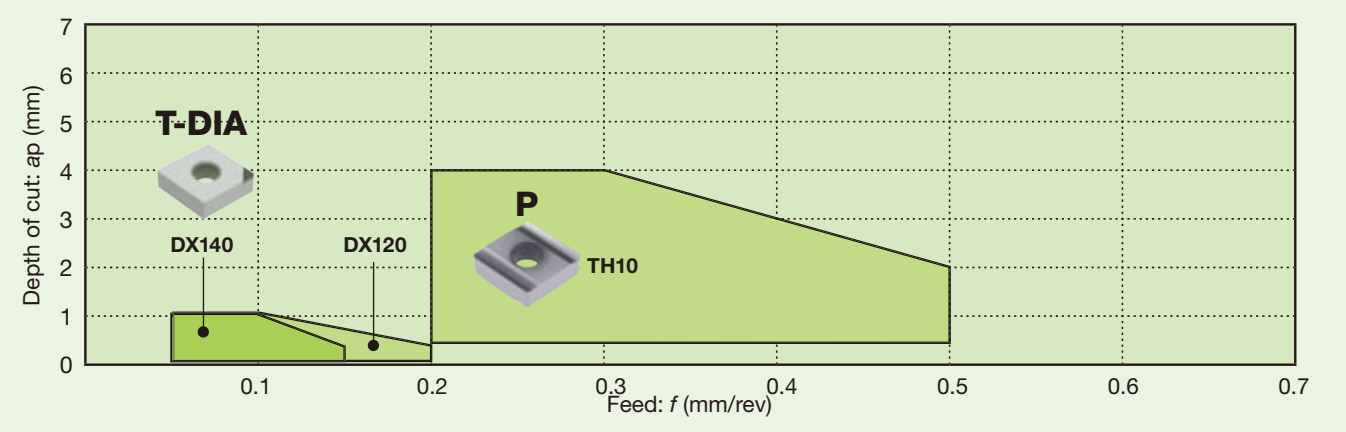
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Finishing** [ $a_p$ = 0.5 ~ 2.0 mm ] | Basic: All-round T515<br>Wear → All-round T5105<br>Burr occurrence → CF T5105 | Basic: All-round T515<br>Wear → All-round T5105<br>Fracture → CH T515<br>Burr occurrence → CF T5115 | Basic: CH T515<br>Wear → CH T5105<br>Fracture → CH T5125<br>Burr occurrence → All-round T515 |
| **Medium cutting** [ $a_p$ = 1.0 ~ 5.0 mm ] | Basic: All-round T515<br>Wear → All-round T5105<br>Burr occurrence → CF T5105 | Basic: All-round T515<br>Wear → All-round T5105<br>Fracture → CH T515<br>Burr occurrence → CF T5115 | Basic: CH T515<br>Wear → CH T5105<br>Fracture → CH T5125<br>Burr occurrence → All-round T515 |
| **Medium to heavy cutting** [ $a_p$ = 3.0 ~ 6.0 mm ] | Basic: All-round T515<br>Wear → All-round T5105<br>Burr occurrence → CF T5105 | Basic: All-round T515<br>Wear → All-round T5105<br>Fracture → CH T515<br>Burr occurrence → CF T5115 | Basic: CH T515<br>Wear → CH T5105<br>Fracture → CH T5125<br>Burr occurrence → All-round T515 |

# TurnLine - Chipbreaker Guide

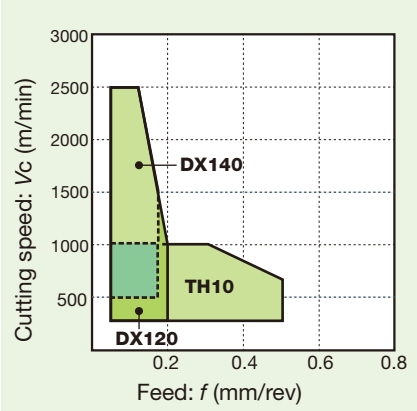
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## N Non-ferrous Metal

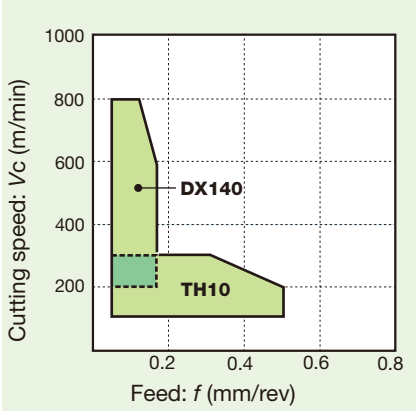
### Chipbreaker System for Turning (Negative Inserts)



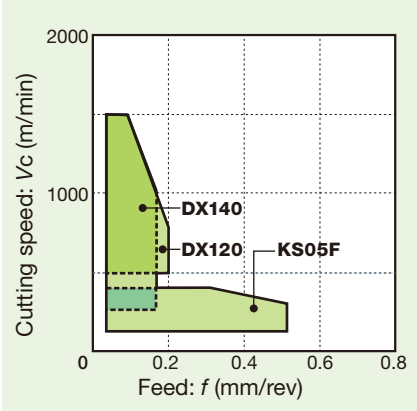

### Aluminium alloys (Si < 12%)

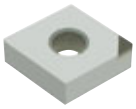
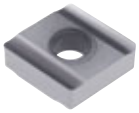



### Aluminium alloys (Si ≥ 12%)




### Copper alloys




| Chip-breaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-DIA) |  | Performs well in high speed finishing of non-ferrous materials. |
| P |  | Excels in sharpness of cutting edges and effectively used for machining non-ferrous metals such as aluminium alloys and copper alloys. |

| Chip-breaker | Appearance | Features |
|---|---|---|
| With chip-breaker (T-DIA) | | The wide chipbreaker width contributes to excellent chip control. |

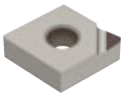
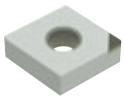
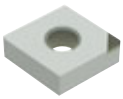
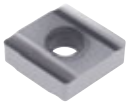
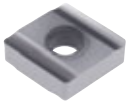
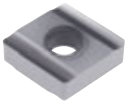
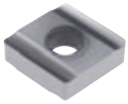
## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Aluminium alloys (Si < 12%) | Aluminium alloys (Si > 12%) | Copper alloys |
|---|---|---|---|---|---|---|---|---|---|
| N | Precision finishing | Continuous | With | DX120 | 0.05 - 0.5 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 0.5 | 0.05 - 0.20 | 300 - 2500 | - | 500 - 1500 |
| | Finishing | Continuous | Without | DX140 | 0.05 - 2.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 2.0 | 0.05 - 0.15 | 300 - 1800 | 400 - 600 | 400 - 1200 |
| | | Heavy interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 500 | 100 - 200 | 100 - 200 |
| | Medium cutting | Continuous | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 1000 | 100 - 300 | 100 - 300 |
| | | Light interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 800 | 100 - 200 | 100 - 200 |
| | | Heavy interrupted | P | TH10 | 0.5 - 4.0 | 0.2 - 0.5 | 100 - 500 | 100 - 200 | 100 - 200 |

# TurnLine - Selection System

## SELECTION SYSTEM: NEGATIVE INSERTS

## N Non-ferrous Metal

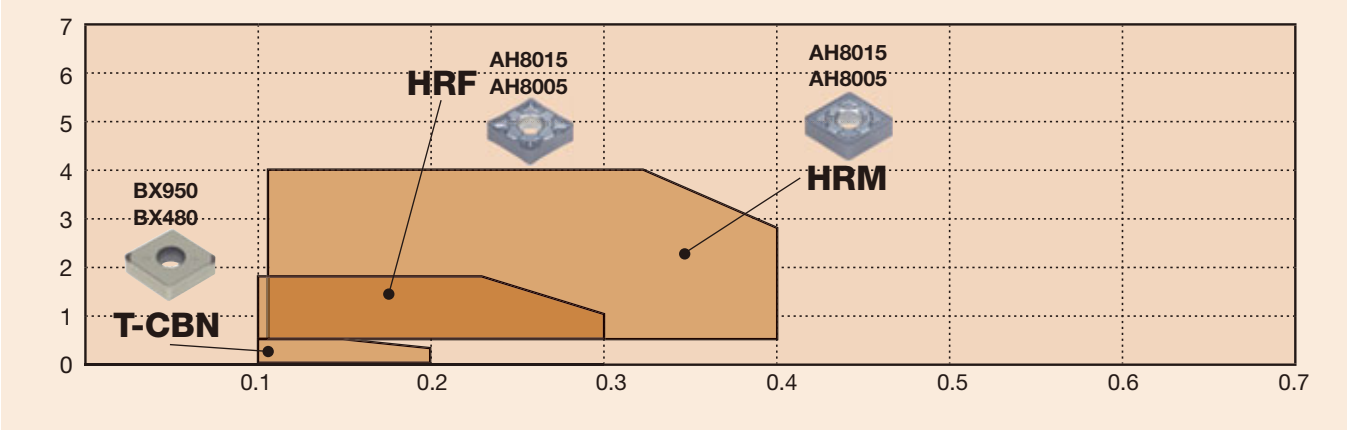
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic:  With chipbreaker **DX120** → Wear → **T-DIA DX140** | Basic: **T-DIA DX140** → Surface → With chipbreaker T-DIA **DX120**; Wear → **T-DIA DX160** | |
| **Finishing** [ $a_p$ = 0.5 ~2.0 mm ] | Basic:  **T-DIA DX140** → Surface → With chipbreaker T-DIA **DX120**; Wear → **T-DIA DX160** | Basic:  **T-DIA DX140** → Fracture → **P TH10**; Wear → **T-DIA DX160** | Basic:  **P TH10** |
| **Medium cutting** [ $a_p$ = 1.0 ~ 4.0 mm ] | Basic:  **P TH10** → Wear → **T-DIA DX140** | Basic:  **P TH10** → Wear → **T-DIA DX140** | Basic:  **P TH10** |

# TurnLine - Chipbreaker Guide

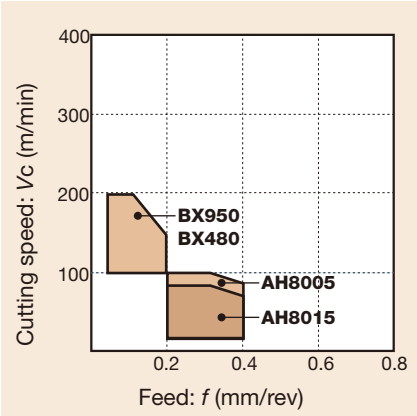
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## S Superalloys and titanium

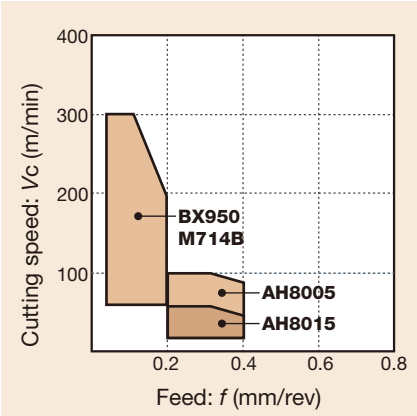
### Chipbreaker System for Turning (Negative Inserts)



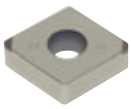

### Titanium alloys




### Ni-base alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| HRF | | Suitable for finishing operation of superalloys. Special protrusion provides excellent chip control in lower depth of cut. |
| HRM | | The 1st recommended chipbreaker for supperalloy turning. Optimized geometry provides stable chip control in various depth of cut. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | T-CBN inserts.<br>Performs well in finishing of heat-resistant or titanium alloys. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Titanium alloys | Ni-base alloys |
| S | Precision finishing | Continuous | Without | BX950 | 0.1 - 0.5 | 0.05 - 0.2 | 100 - 200 | 70 - 300 |
| | | | Without | M714B | 0.1 - 0.5 | 0.05 - 0.2 | - | 70 - 400 |
| | | Light interrupted | Without | BX480 | 0.1 - 0.5 | 0.05 - 0.2 | 100 - 200 | - |
| | Finishing to Medium cutting | Continuous | HRF | AH8005 | 0.5 - 1.5 | 0.05 - 0.25 | 20 - 100 | 20 - 100 |
| | | Light interrupted | HRF | AH8015 | 0.5 - 1.5 | 0.05 - 0.25 | 20 - 80 | 20 - 50 |
| | | Heavy interrupted | HRF | AH8015 | 0.5 - 1.5 | 0.05 - 0.25 | 10 - 60 | 10 - 40 |
| | Finishing | Continuous | HRM | AH8005 | 0.5 - 4.0 | 0.1 - 0.4 | 20 - 100 | 20 - 100 |
| | | Light interrupted | HRM | AH8015 | 0.5 - 4.0 | 0.1 - 0.4 | 20 - 80 | 20 - 50 |
| | | Heavy interrupted | HRM | AH8015 | 0.5 - 4.0 | 0.1 - 0.4 | 10 - 60 | 10 - 40 |

Ni-base alloys: INCONEL718, etc.
Titanium alloys: Ti-6Al-4V, etc

SELECTION SYSTEM: NEGATIVE INSERTS

# S Superalloys and titanium

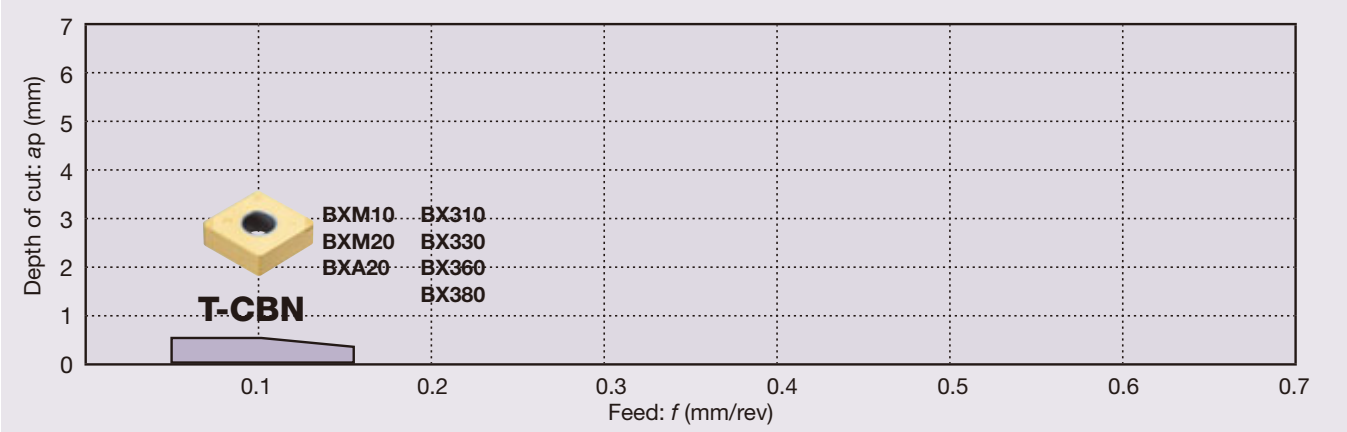
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: **T-CBN BX950** | Basic: **T-CBN BX480** → Fracture → No chipbreaker **TH10** | |
| **Finishing** [ $a_p$ = 0.5 ~ 1.5 mm ] | Basic: **HRF AH8005** → Fracture → **HRF AH8015** | Basic: **HRF AH8015** → Fracture → **HRM AH8015**; → Wear → **HRF AH8005** | Basic: **HRF AH8015** → Fracture → **HRM AH8015**; → Wear → **HRF AH8005** |
| **Medium cutting** [ $a_p$ = 0.5 ~ 4.0 mm ] | Basic: **HRM AH8005** → Fracture → **HRM AH8015**; → Chip control → **HRF AH8015** | Basic: **HRM AH8015** → Fracture → **SM AH630**; → Wear → **HRM AH8005** | Basic: **HRM AH8015** → Fracture → **SM AH630**; → Wear → **HRF AH8005** |

# TurnLine - Chipbreaker Guide

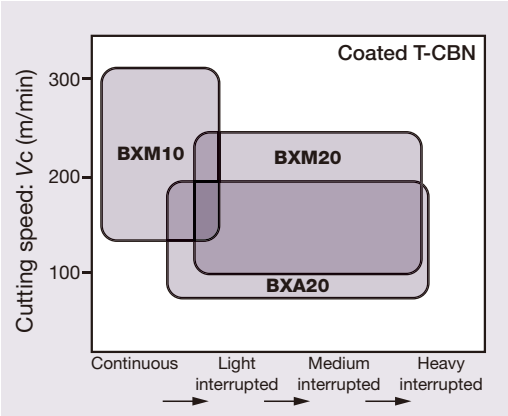
## BASIC CHIPBREAKERS: NEGATIVE INSERTS

## H Hard Materials

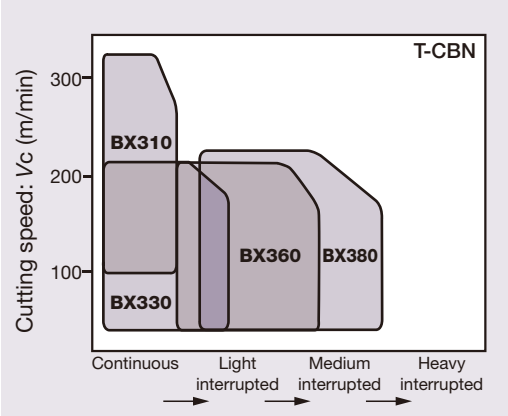
### Chipbreaker System for Turning (Negative Inserts)

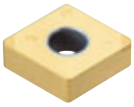


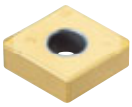
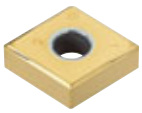

**Coated T-CBN**




**T-CBN**




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | Performs well in finishing of hardened steel. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| HF |  | When used in removing a carburized layer, excels in chip control at small depth of cut. |
| HM |  | When used in removing a carburized layer, excels in chip control at large depth of cut. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| H | Precision finishing | Continuous to light interrupted | Without | BXM10<br>BXA20 | 0.05 - 0.3 | 0.03 - 0.18 | 150 - 350 |
| | Finishing | Continuous to heavy interrupted | Without | BXM10<br>BXM20<br>BXA20 | 0.05 - 0.3 | 0.05 - 0.25 | 70 - 220 |
| | Removing of carburized layer | Continuous | HF | BXM20 | 0.2 - 0.75 | 0.05 - 0.2 | 70 - 200 |
| | | Continuous | HM | BXM20<br>BXA20 | 0.5 - 1.0 | 0.05 - 0.2 | 70 - 200 |

Hardened steels, Pre-hardened steels: SKD11, SKD61, etc. X153CrMoV12, X40CrMoV5-1, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: NEGATIVE INSERTS

## H Hard Materials

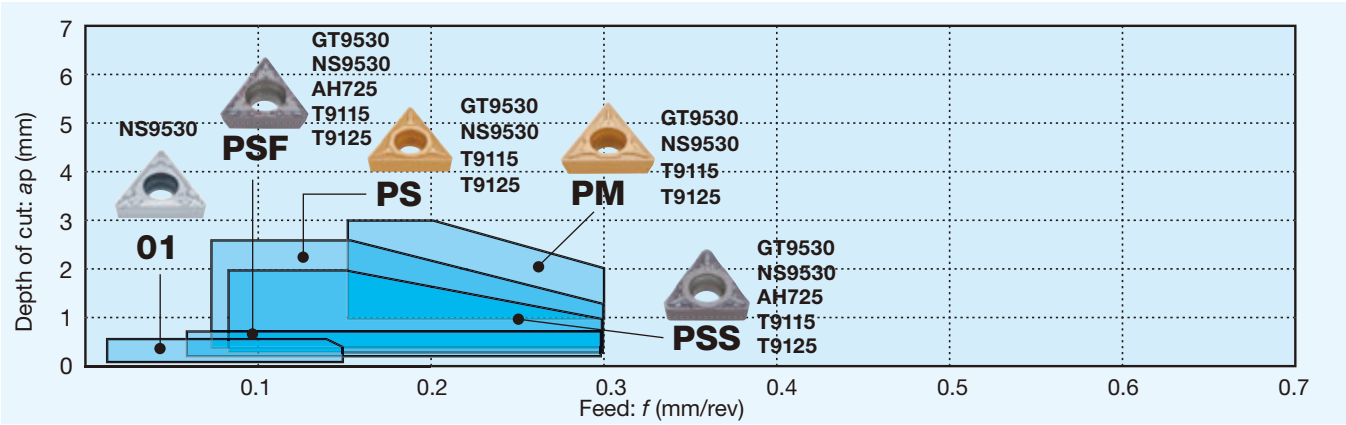
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.2 mm ] | Basic<br>T-CBN BXM10 | Basic<br>T-CBN BXA20<br>Fracture → -H BXM20<br>For high speed Wear → T-CBN BXM10 | |
| **Finishing** [ $a_p$ = ~ 0.5 mm ] | Basic<br>T-CBN BXM10 | Basic<br>T-CBN BXA20<br>Fracture → -H BXM20<br>For high speed Wear → T-CBN BXM10 | Basic<br>T-CBN BXM20<br>Fracture → -H BXM20 |

# TurnLine - Chipbreaker Guide

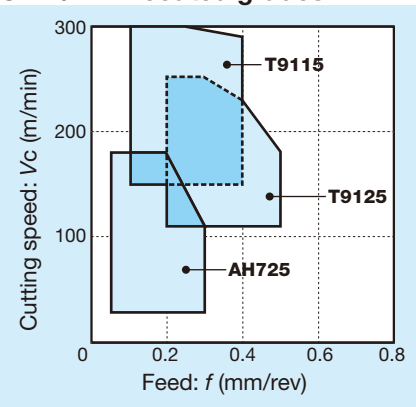
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## P Steel

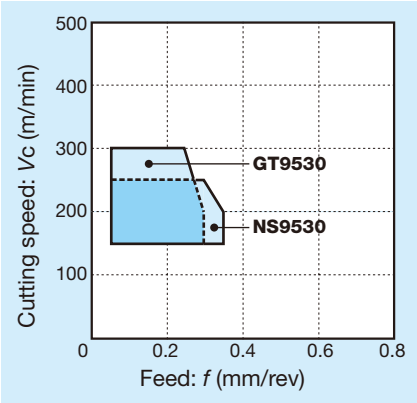
### Chipbreaker System for Turning (Positive Inserts)

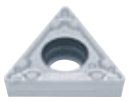
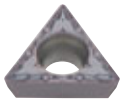
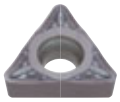



### CVD / PVD coated grades




### Coated cermets / Cermets




| Chipbreaker | Appearance | Features |
|---|---|---|
| 01 |  | The sharp cutting edge and raised projection near corner contribute to excellent chip control at very small depth of cut and low feed. |
| PSF |  | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PS | | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PM | | Developed chipbreaker for medium cutting. Excellent chip control due to wide, positive chip flow zone. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Low carbon steels, Alloy steels | Medium carbon steels, Alloy steels | High carbon steels, Alloy steels |
|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | Continuous | 01 | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | 01 | NS9530 | 0.05 - 0.5 | 0.03 - 0.15 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing | Continuous | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Heavy interrupted | PSS | NS9530 | 0.1 - 0.5 | 0.05 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing to light cutting | Continuous | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Light interrupted | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | | Heavy interrupted | PS | NS9530 | 0.3 - 2.0 | 0.08 - 0.3 | 150 - 250 | 80 - 220 | 80 - 180 |
| | Finishing to Medium cutting | Continuous to Heavy interrupted | PS | T9115 | 0.5 - 2.5 | 0.08 - 0.3 | 150 - 300 | 100 - 200 | 80 - 180 |
| | | | PS | T9125 | 0.5 - 2.5 | 0.08 - 0.3 | 120 - 250 | 80 - 180 | 80 - 120 |
| | Medium cutting | Continuous to Heavy interrupted | PM | T9115 | 1.0 - 3.0 | 0.15 - 0.3 | 150 - 300 | 100 - 200 | 80 - 180 |
| | | | PM | T9125 | 1.0 - 3.0 | 0.15 - 0.3 | 120 - 250 | 80 - 180 | 80 - 120 |

Low carbon steels, Alloy steels: S10C, SCM415, SS400, SCr420H, etc. C10, 18CrMo4, E275A, 20Cr4, etc. Medium carbon steels, Alloy steels: S45C, SCM440, etc. C45, 42CrMo4, etc. Hi carbon steels, Alloy steels: SNCM439, etc. 41CrNiMo2, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## P Steel

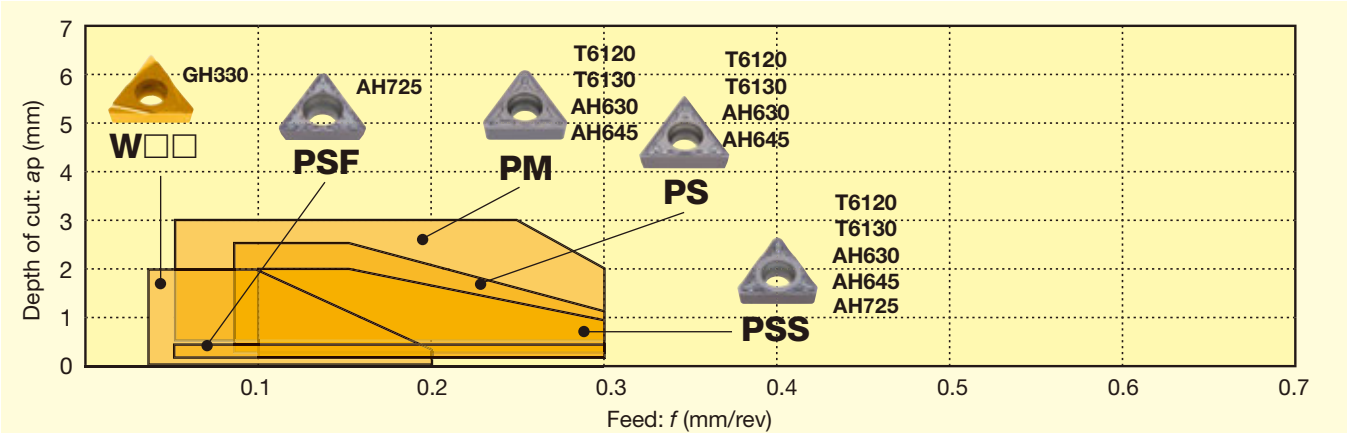
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: 01 NS9530 | Basic: 01 NS9530 → Fracture: PSF NS9530 | |
| **Finishing** [ $a_p$ = 0.1 ~ 0.5 mm ] | Basic: PSS NS9530 → Wear: PSS GT9530; Fracture: PS NS9530; Chip control: PSF NS9530 | Basic: PSS NS9530 → Wear: PSS GT9530; Fracture: PS NS9530; Chip control: PSF NS9530 | Basic: PSS NS9530 → Wear: PSS GT9530; Fracture: PS NS9530; Chip control: PSF NS9530 |
| **Finishing to Medium cutting** [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: PS T9115 → Fracture: PS T9125; Wear: PS NS9530 | Basic: PS T9115 → Fracture: PS T9125; Wear: PS NS9530 | Basic: PS T9125 → Fracture: PM T9125 |
| **Medium cutting** [ $a_p$ = 1.0 ~ 3.0 mm ] | Basic: PM T9115 → Wear: PM NS9530 | Basic: PM T9115 → Fracture: PM T9125 | Basic: PM T9125 |

# TurnLine - Chipbreaker Guide

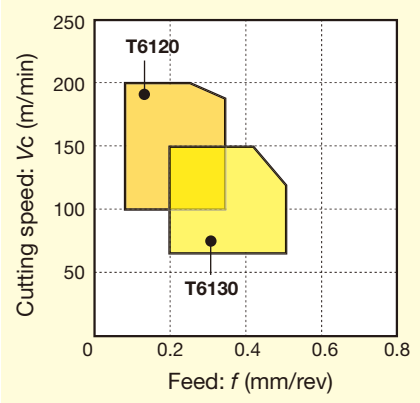
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## M Stainless Steel

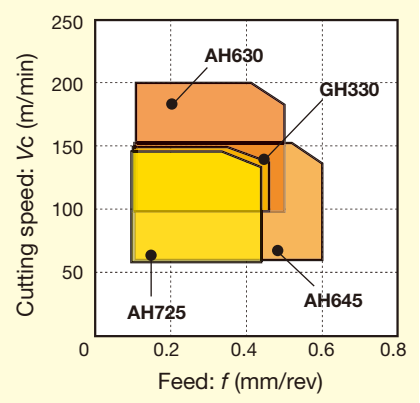
### Chipbreaker System for Turning (Positive Inserts)

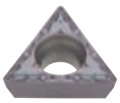


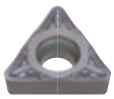
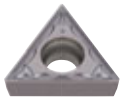
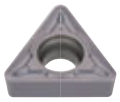

### CVD coated grades




### PVD coated grades




| Chipbreaker | Appearance | Features |
|---|---|---|
| W□□ | | Designed to control the direction of chip flow and used for precision finish boring. Provides excellent chip evacuation which is important to attain a highly accurate bore. |
| PSF |  | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |
| PM |  | Developed chipbreaker for medium cutting. Excellent chip control due to wide, positive chip flow zone. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| M | Precision finishing | Continuous | W□□ | GH330 | 0.05 - 2.0 | 0.03 - 0.2 | 100 - 150 |
| | Finishing | Continuous | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 150 |
| | | Light interrupted | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 150 |
| | | Heavy interrupted | PSF | AH725 | 0.1 - 0.5 | 0.05 - 0.3 | 50 - 120 |
| | Finishing to light cutting | Continuous | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | | Light interrupted | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PSS | AH630 | 0.3 - 2.0 | 0.08 - 0.3 | 90 - 190 |
| | Finishing to medium cutting | Continuous | PS | T6130 | 0.5 - 2.5 | 0.08 - 0.3 | 100 - 200 |
| | | Light interrupted | PS | AH630 | 0.5 - 2.5 | 0.08 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PS | AH630 | 0.5 - 2.5 | 0.08 - 0.3 | 90 - 190 |
| | Medium cutting | Continuous | PM | T6130 | 1.0 - 3.0* | 0.15 - 0.3 | 100 - 200 |
| | | Light interrupted | PM | AH630 | 1.0 - 3.0* | 0.15 - 0.3 | 90 - 190 |
| | | Heavy interrupted | PM | AH630 | 1.0 - 3.0* | 0.15 - 0.3 | 90 - 190 |

* For CCMT0602 and DCMT0702 type inserts, *ap* = 0.5 - 2.5
Stainless steels: SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## M Stainless Steel

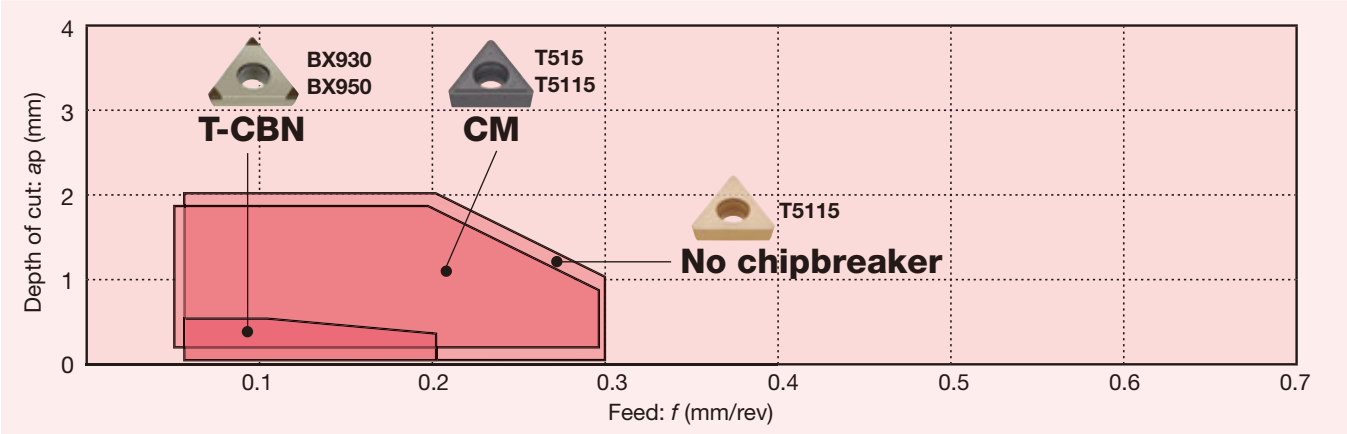
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: W□□ GH330 | Basic: W□□ GH330 | |
| **Finishing** [ $a_p$ = 0.3 ~ 1.5 mm ] | Basic: PSF AH725 → Wear: PSS T6130 | Basic: PSF AH725 → Fracture: PSS AH630; → Wear: PSS T6130 | Basic: PSF AH725 → Fracture: PSS AH630 |
| **Finishing to Medium cutting** [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: PSS AH630 → Wear: PS T6130 | Basic: PS AH630 → Fracture: PM AH645; → Wear: PS T6130 | Basic: PS AH630 → Fracture: PM AH645; → Wear: PS T6130 |
| **Medium cutting** [ $a_p$ = 1.0 ~ 3.0 mm ] | Basic: PM AH6130 | Basic: PM AH630 → Fracture: PM AH645; → Wear: PM T6130 | Basic: PM AH630 → Fracture: PM AH645 |

# TurnLine - Chipbreaker Guide

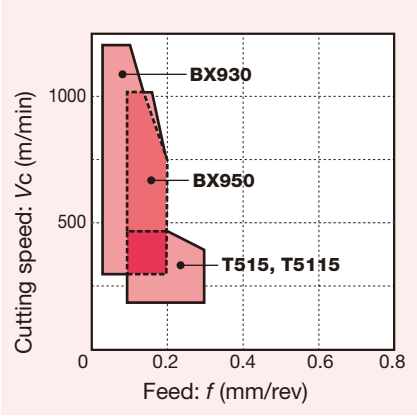
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## K Cast Iron

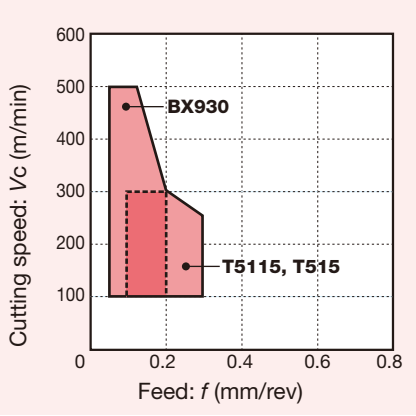
### Chipbreaker System for Turning (Positive Inserts)

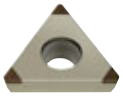



### Grey cast irons




### Ductile cast irons




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) |  | Performs well in high speed finishing of cast iron. |
| No chip-breaker | | Can cover a wide range of applications from finishing to roughing of cast irons. Excels in cutting edge strength. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| CM | | All-around chipbreaker for general purpose cutting, provides low cutting forces and excellent performance in finishing to medium cutting. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Grey cast irons | Ductile cast irons |
| K | Precision finishing | Continuous | Without | BX930 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 1200 | 100 - 500 |
| | | Light interrupted | Without | BX950 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 800 | 100 - 300 |
| | | | Without | BX470 | 0.05 - 0.5 | 0.05 - 0.2 | 300 - 800 | 100 - 300 |
| | Finishing | Continuous | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 150 - 700 | 150 - 300 |
| | | Heavy interrupted | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 100 - 200 | 100 - 200 |
| | Medium cutting | Light interrupted | CM | T515 | 0.05 - 2.0 | 0.05 - 0.3 | 100 - 300 | 100 - 250 |

Grey cast irons: FC250, etc. 250, etc.
Ductile cast irons: FCD450, etc. 450-10S, etc.

# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## K Cast Iron

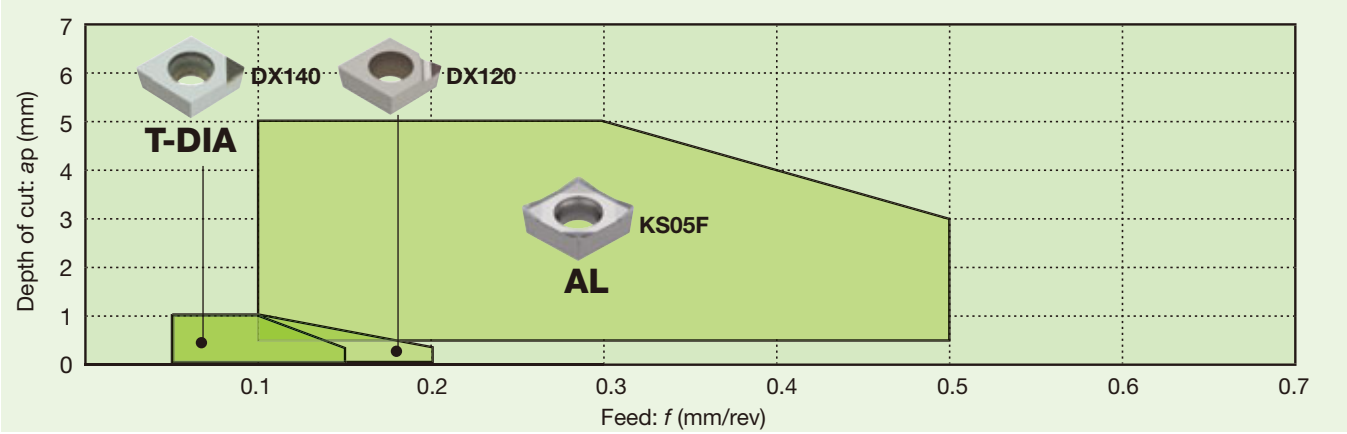
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Finishing to Medium cutting** [ $a_p$ = 0.5 ~ 3.0 mm ] | Basic: **CM T515** → Wear → **T-CBN BX930** | Basic: **CM T515** | Basic: **CM T515** |

# TurnLine - Chipbreaker Guide

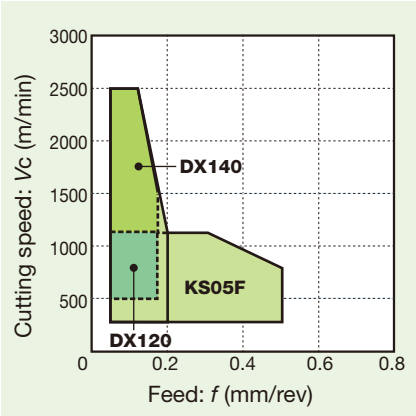
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## N Non-ferrous Metal

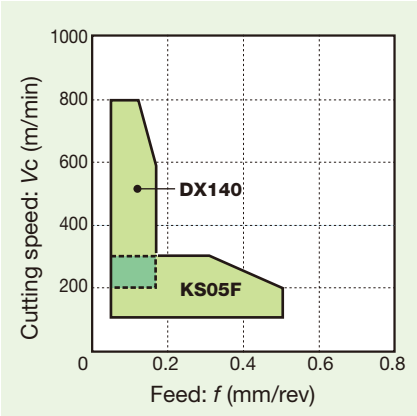
### Chipbreaker System for Turning (Positive Inserts)



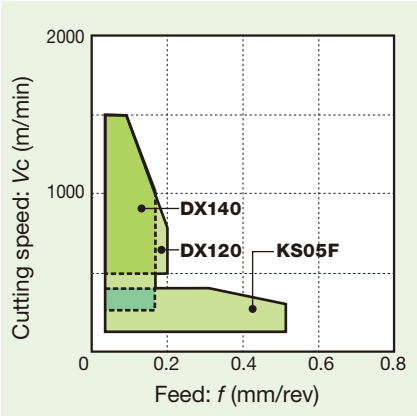

### Aluminium alloys (Si < 12%)

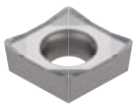



### Aluminium alloys (Si ≥ 12%)




### Copper alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| **No chip-breaker (T-DIA)** | | Performs well in high speed finishing of non-ferrous materials. |
| **AL** |  | Extremely sharp cutting edge. Polished surface. Excellent chip forming at high cutting feeds. Low power consumption. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| **With chip-breaker (T-DIA)** | | The wide chipbreaker width contributes to excellent chip control. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) Aluminium alloys (Si < 12%) | Aluminium alloys (Si > 12%) | Copper alloys |
|---|---|---|---|---|---|---|---|---|---|
| N | Precision finishing | Continuous | With | DX120 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.2 | 300 - 2500 | - | 500 - 1500 |
| | Finishing | Continuous | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 500 - 2500 | 400 - 800 | 500 - 1500 |
| | | Light interrupted | Without | DX140 | 0.05 - 1.0 | 0.05 - 0.15 | 300 - 1800 | 400 - 600 | 400 - 1200 |
| | | Heavy interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 600 | 100 - 200 | - |
| | Medium cutting | Continuous | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 1200 | 100 - 300 | 100 - 300 |
| | | Light interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 900 | 100 - 200 | 100 - 200 |
| | | Heavy interrupted | AL | KS05F | 0.5 - 5.0 | 0.1 - 0.5 | 100 - 600 | 100 - 200 | - |

# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## N Non-ferrous Metal

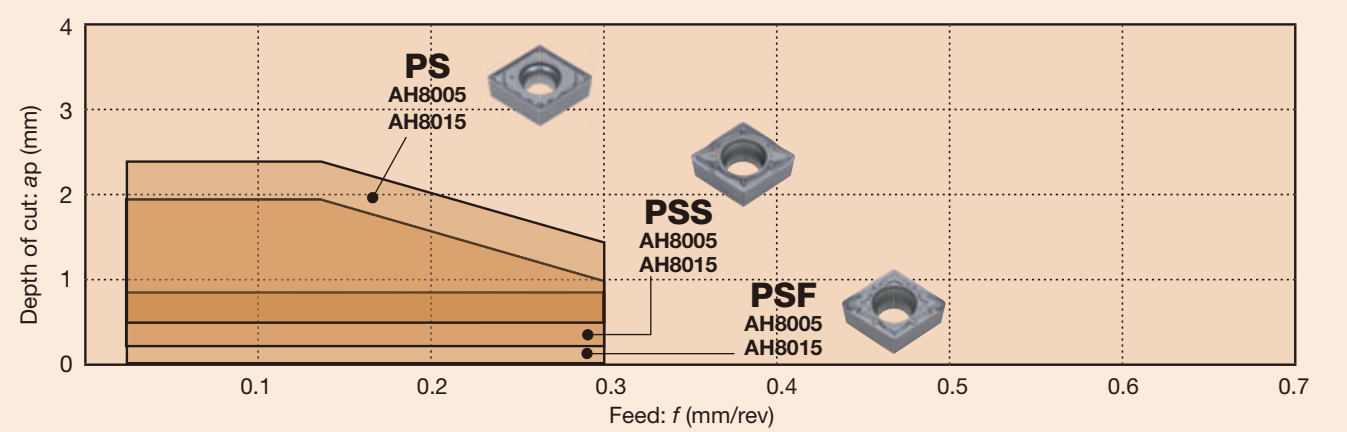
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: With chipbreaker **DX120** → Wear → **T-DIA DX140** | Basic: With chipbreaker **DX120** → Wear → **T-DIA DX140** | |
| **Finishing** [ $a_p$ = 0.5 ~ 2.0 mm ] | Basic: **T-DIA DX140** → Wear → **T-DIA DX160**; → Chip control → With chipbreaker T-DIA **DX120** | Basic: **T-DIA DX140** → Fracture → **AL KS05F**; → Wear → **T-DIA DX160** | Basic: **AL KS05F** |
| **Medium cutting** [ $a_p$ = 1.0 ~ 5.0 mm ] | Basic: **AL KS05F** → Wear → With chipbreaker T-DIA **DX120** | Basic: **AL KS05F** → Wear → **T-DIA DX140** | Basic: **AL KS05F** |

# TurnLine - Chipbreaker Guide

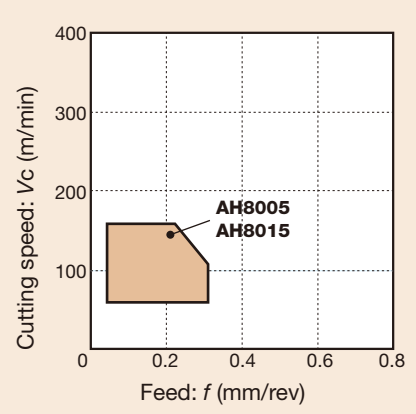
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## S Superalloys and titanium

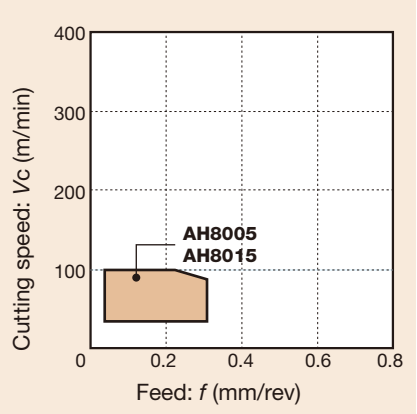
### Chipbreaker System for Turning (Positive Inserts)



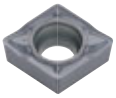

### Titanium alloys




### Ni-base alloys




| Chipbreaker | Appearance | Features |
|---|---|---|
| PS | | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

| Chipbreaker | Appearance | Features |
|---|---|---|
| PSF | | Developed chipbreaker for finishing at low cutting depths. Optimal chip control due to pre-positioned chipbreaker element. |
| PSS |  | 3-dimensional chipbreaker designed to have excellent chip control capability and low cutting force in finishing to medium cutting. Low cost, M-class positive insert used for high efficiency boring in a wide range of applications. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chip-breaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed: *Vc* (m/min) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Titanium alloys | Ni-base alloys |
| S | Finishing | Continuous | PSS | AH8015 | 0.3 - 2.0 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | | Light interrupted | PSS | AH8015 | 0.3 - 2.0 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | Finishing to medium cutting | Continuous | PS | AH8015 | 0.5 - 2.5 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |
| | | Light interrupted | PS | AH8015 | 0.5 - 2.5 | 0.02 - 0.3 | 20 - 150 | 20 - 100 |

Ni-base alloys: INCONEL718 etc.
Titanium alloys: Ti - 6Al - 4V etc.

SELECTION SYSTEM: POSITIVE INSERTS

# S Superalloys and titanium

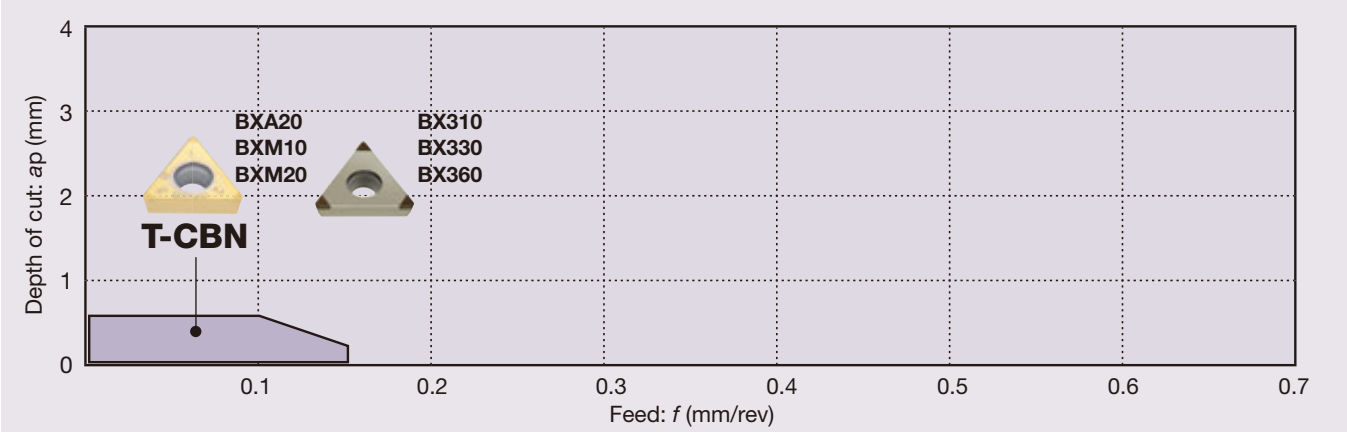
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Finishing** [ $a_p$ = 0.3 ~ 2.0 mm ] | Basic: **PSS AH8015** → Wear → **PSS AH8005** | Basic: **PSS AH8015** → Wear → **PSS AH8005**; → Fracture → **PS AH8015** | |
| **Finishing to medium cutting** [ $a_p$ = 0.5 ~ 2.5 mm ] | Basic: **PS AH8015** → Wear → **PSS AH8005** | Basic: **PS AH8015** → Fracture → **All-round AH8015** | Basic: **PS AH8015** → Fracture → **All-round AH8015** |

# TurnLine - Chipbreaker Guide

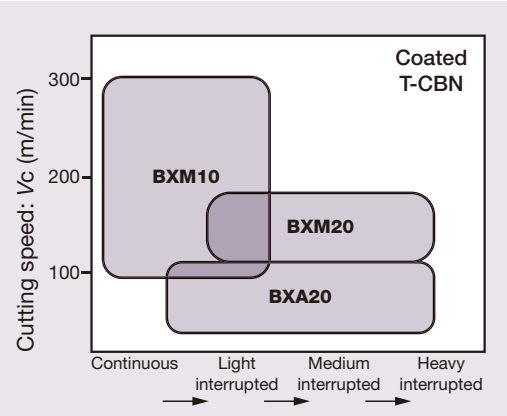
## BASIC CHIPBREAKERS: POSITIVE INSERTS

## H Hard Materials

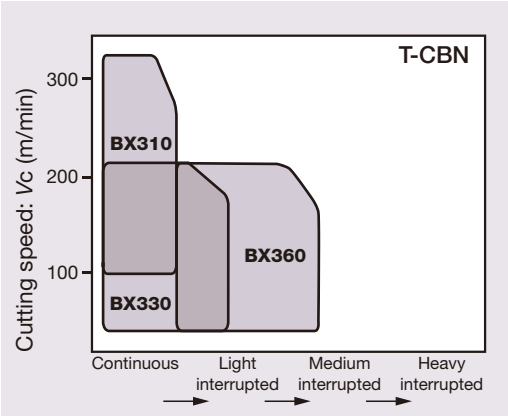
### Chipbreaker System for Turning (Positive Inserts)




**Coated T-CBN**




**T-CBN**




| Chipbreaker | Appearance | Features |
|---|---|---|
| No chip-breaker (T-CBN) | | Performs well in finishing of hardened steel. |

## STANDARD CUTTING CONDITIONS

| ISO | Operation | Work condition | Chipbreaker | Grade | Depth of cut *ap* (mm) | Feed *f* (mm/rev) | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|---|---|
| H | Precision finishing | Continuous | No chipbreaker (T-CBN) | BXM10 | 0.05 - 0.3 | 0.03 - 0.15 | 150 - 350 |
| | | Light interrupted | No chipbreaker (T-CBN) | BXM20<br>BXA20 | 0.05 - 0.3 | 0.03 - 0.15 | 70 - 220 |
| | Finishing | Continuous ~ interrupted | No chipbreaker (T-CBN) | BXM20<br>BXA20 | 0.07 - 0.5 | 0.05 - 0.3 | 70 - 220 |

Hardened steels, Pre-hardened steels: SKD11, SKD61, etc. X153CrMoV12, X40CrMoV5-1, etc.

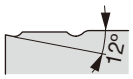
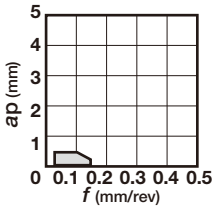
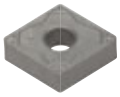
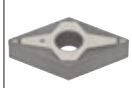
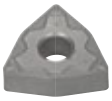
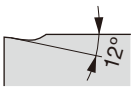
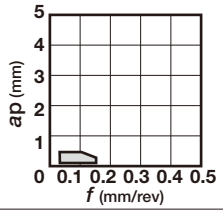
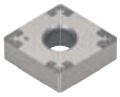
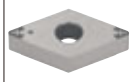
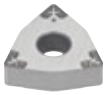
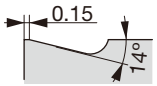
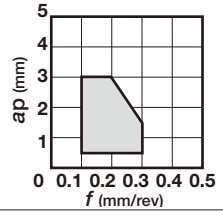
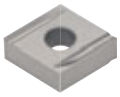
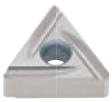
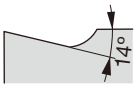
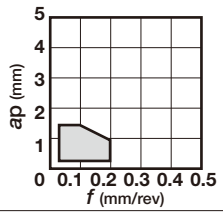
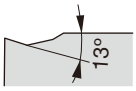
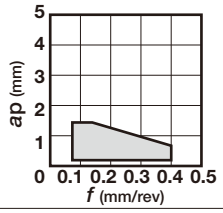
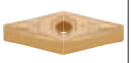
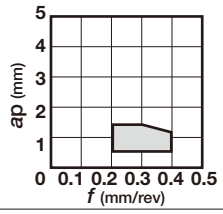
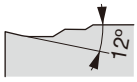
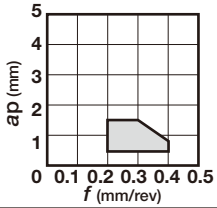
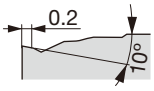
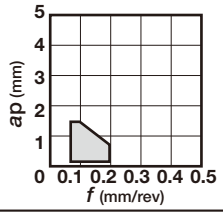
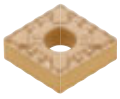
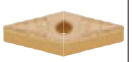
# TurnLine - Selection System

## SELECTION SYSTEM: POSITIVE INSERTS

## H Hard Materials

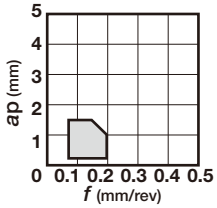
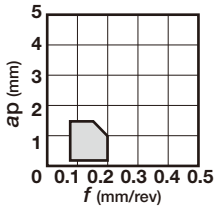
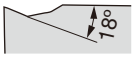
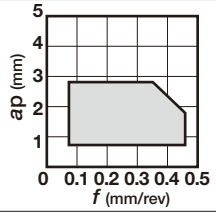
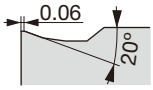
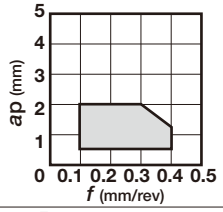
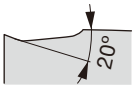
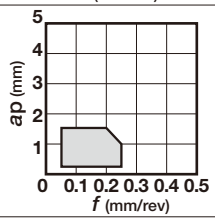
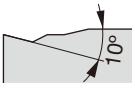
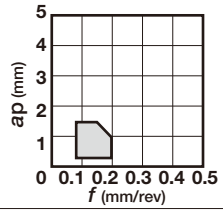
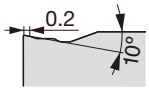
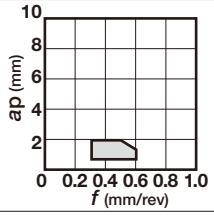
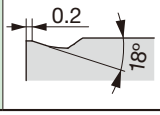
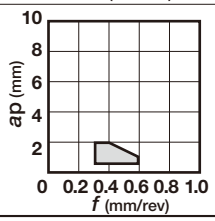
| | Continuous | Light interrupted | Heavy interrupted |
|---|---|---|---|
| **Precision finishing** [ $a_p$ = ~ 0.3 mm ] | Basic: **T-CBN BXM10** | Basic: **T-CBN BXM20** → Fracture: **T-CBN BXA20**; For high speed Wear: **T-CBN BXM10** | |
| **Finishing** [ $a_p$ = ~ 0.5 mm ] | Basic: **T-CBN BXM10** | Basic: **T-CBN BXM20** → Fracture: **T-CBN BXA20**; For high speed Wear: **T-CBN BXM10** | Basic: **T-CBN BXM20** → Fracture: **T-CBN BXA20** |

# TurnLine - Chipbreaker Overview

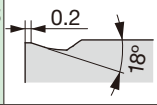
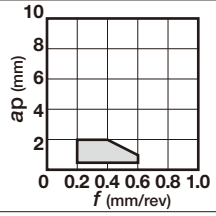
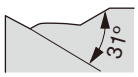
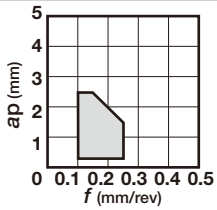
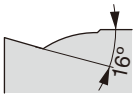
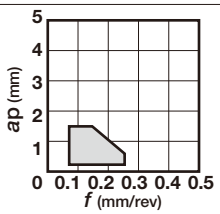
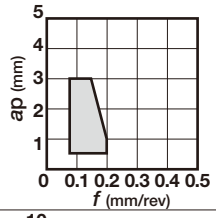
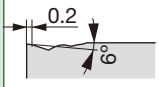
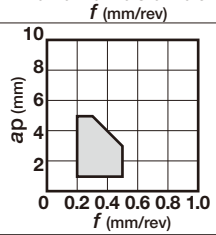
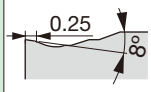
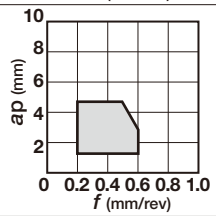
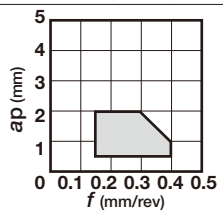
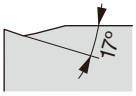
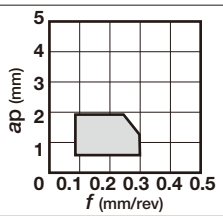
| Application | Negative type with hole | C | D | S | T | V | W | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 90° | 60° | 35° | 80° | 25° |
| Precision finishing | **TF**     |  B050 |  B061 | B071 | B080 | B091 |  B095 | |
| | **01**     |  B050 |  B061 | B071 | B080 | B091 |  B095 | |
| | **A~D**     |  B050 | | B071 |  B080, B081 | | | |
| | **W**     | | | | B081 | | | |
| Finishing | **TSF**     | B050 | B061 | B071 | B081 |  B091 | B095 | |
| Finishing (Wiper) | **FW**   | B050 | B061 | | B081 | | B095 | |
| | **AFW**     | B050 | | | | | B095 | |
| Finishing | **ZF**     |  B051 | B061 | | B081 |  B091 | B095 | B102 |

# TurnLine - Chipbreaker Overview



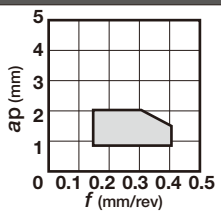
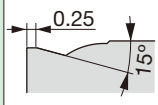
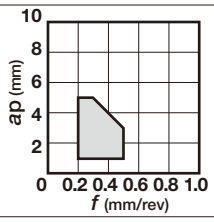
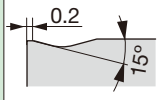
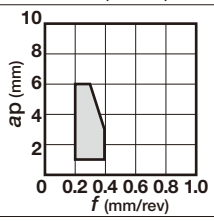
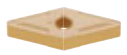
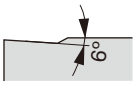
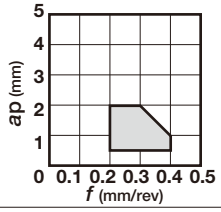
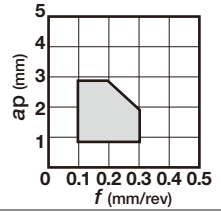
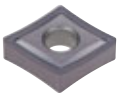
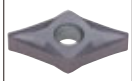
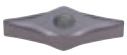
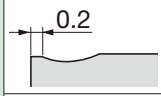
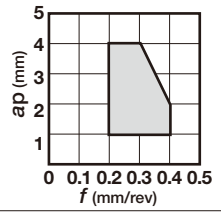
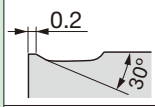
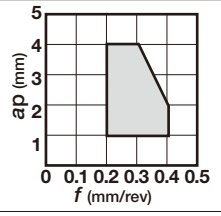
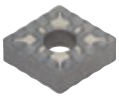
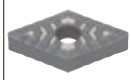
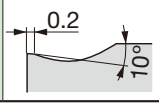
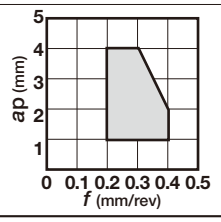
| Application | Negative type with hole | C | D | S | T | V | W | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 90° | 60° | 35° | 80° | 25° |
| Finishing | 11   | B051 | B062 | B072 | B082 | B091 | B096 | |
| Finishing of mild steels | 17   | B051 | B062 | B072 | B082 | | B096 | |
| Finishing | SF     | B051 | B062 | B072 | B082 | B091 | B096 | |
| | CF     | B051 | B062 | B072 | B082 | B092 | B096 | |
| | HRF     | B051 | B062 | B072 | B082 | B092 | B096 | |
| | TS     | B052 | B063 | B073 | B083 | B092 | B096 | |
| Finishing to medium cutting (Wiper) | SW     | B052 | B063 | | B083 | | B097 | |
| | ASW     | B052 | | | | | B097 | |

# TurnLine - Chipbreaker Overview

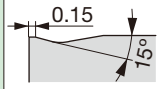
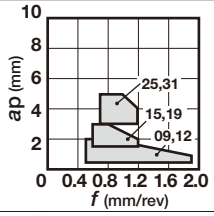
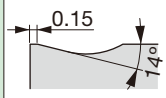
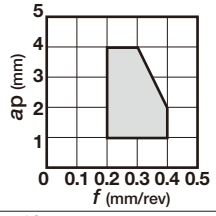
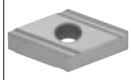
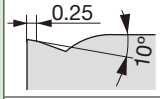
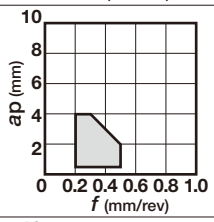
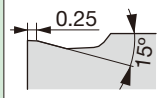
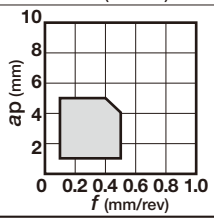
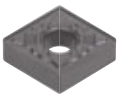
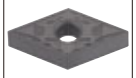
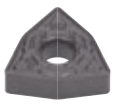
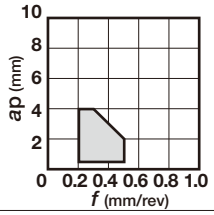
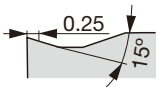
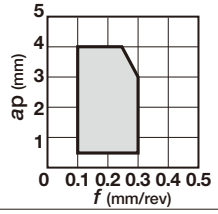
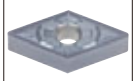
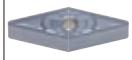
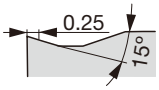
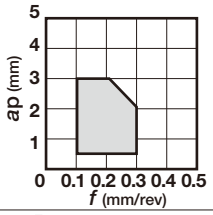
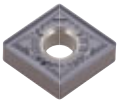
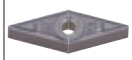
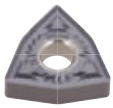
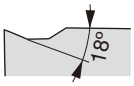
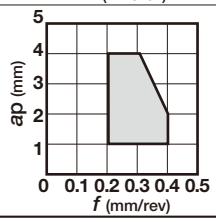
| Application | Negative type with hole | C | D | S | T | V | W | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 90° | 60° | 35° | 80° | 25° |
| High feed, small depth of cut | **AS**     | B052 | B063 | B073 | B083 | | B097 | |
| Boring (Double sided) | **CB**     | B052 | B063 | | B083 | | B097 | |
| Finishing | **NS**     | B053 | B063 | B073 | B083 | | B097 | |
| | **SS**   | B053 | B064 | B073 | B084 | B092 | B097 | |
| Medium cutting | **TM**     | B053 | B064 | B073 | B084 | B092 | B098 | |
| Finishing to medium cutting | **AM**     | B053 | B064 | | B084 | | B098 | |
| | **NM**   | B053 | B064 | | B084 | | B098 | |
| | **TQ**     | B054 | B065 | | B084 | B093 | B098 | |

# TurnLine - Chipbreaker Overview



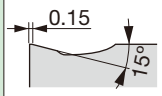
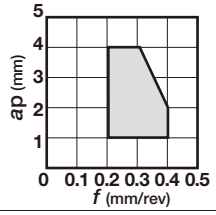
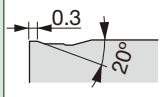
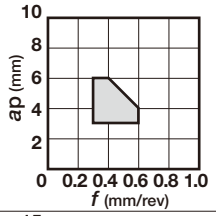
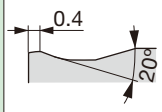
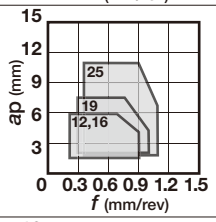
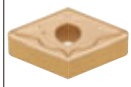
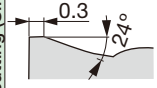
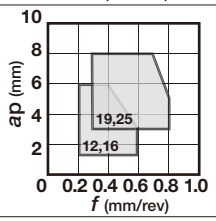
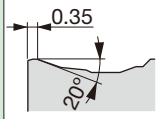
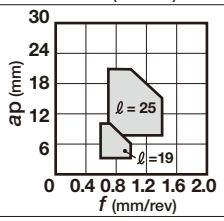
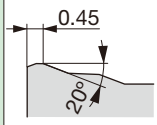
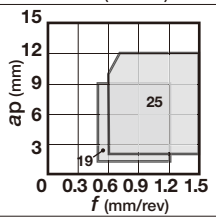
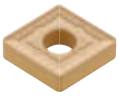
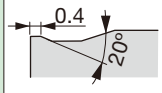
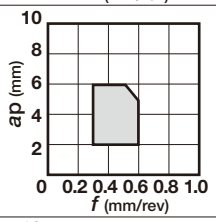
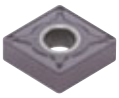
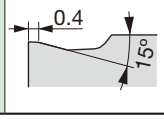
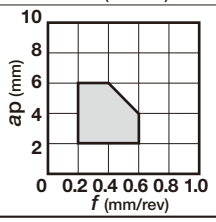
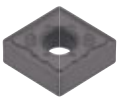
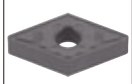
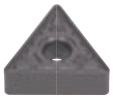
| Application | Negative type with hole | | C | D | S | T | V | W | Y |
|---|---|---|---|---|---|---|---|---|---|
| | | | 80° | 55° | 90° | 60° | 35° | 80° | 25° |
| Finishing to medium cutting | **ZM** |   | B054 | B065 | B074 | B085 | B093 | B098 | B102 |
| Medium cutting | **DM**   |   | B054 | B065 | B074 | B085 | B093 | B099 | |
| | **All-round**   |   | B054 | B065 | B074 | B085 |  B093 | B099 | |
| Finishing to medium cutting | **27**   |   | B055 | B065 | B074 | B085 | | B099 | |
| Medium cutting | **28** |   |  B055 |  B066 | | B086 |  B093 | | |
| | **33**   |   | B055 | B066 | | B086 | B093 | B099 | |
| | **37**   |   |  B055 |  B066 | B075 | B086 | | B099 | |
| | **38**   |   | B055 | B066 | | B086 | | | |

# TurnLine - Chipbreaker Overview

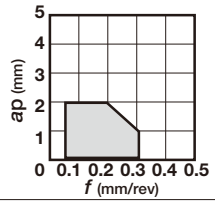
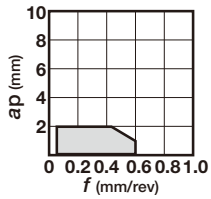
| Application | Negative type with hole | C | D | R | S | T | V | W |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | | 90° | 60° | 35° | 80° |
| Heavy cutting | **61**     | | | B070 | | | | |
| Medium cutting | **Parallel**     | |  B066 | | | | | |
| | **SM**     | B056 | B066 | | B075 | B086 | B094 | B100 |
| | **CM**     |  B056 |  B067 | | B075 | B086 | B094 |  B100 |
| | **P**   | B056 | B067 | | B075 | B087 | | |
| Finishing to medium cutting | **HRM**     | B056 |  B067 | | B075 | B087 |  B094 | B100 |
| Medium cutting | **HMM**     |  B056 | B067 | | B076 | B087 |  B094 |  B100 |
| | **SA**     | B057 | B067 | | B076 | B087 | | B100 |

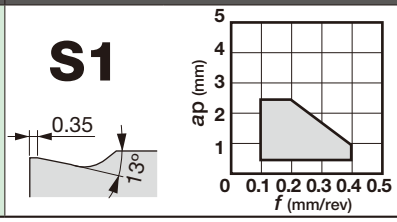
# TurnLine - Chipbreaker Overview



| Application | Negative type with hole | | C | D | R | S | T | V | W |
|---|---|---|---|---|---|---|---|---|---|
| | | | 80° | 55° | | 90° | 60° | 35° | 80° |
| Medium cutting | **S**   |   | B057 | B067 | | B076 | B088 | | |
| Medium to heavy cutting | **TH**   |   | B057 | B068 | | B076 | B088 | | B101 |
| | **THS**   |   | B057 |  B068 | | B076 | B088 | | B101 |
| Medium to heavy cutting (Single sided) | **TRS**   |   | B058 | | | B077 | | | |
| Heavy cutting (Single sided) | **TU**   |   | B058 | | | B077 | | | |
| | **TUS**   |   |  B058 | | | B077 | | | |
| Medium to heavy cutting | **SH**   |   |  B058 | B068 | | B077 | | | B101 |
| | **CH**   |   |  B058 |  B068 | | B077 |  B088 | | B101 |

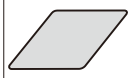
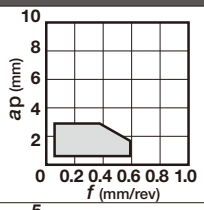
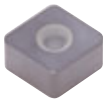
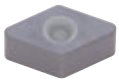
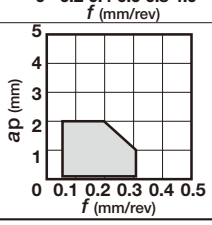
# TurnLine - Chipbreaker Overview

| Application | Negative type with hole | C | D | R | S | T | V | W |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | | 90° | 60° | 35° | 80° |
| Finishing to medium cutting | M,G-class  | B059 | B068 | B070 | B078 | B089 | B094 | B101 |
| Finishing to medium cutting | Wiper M-class  | B059 | | | | | | |

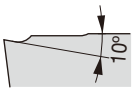
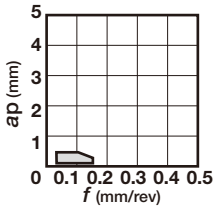
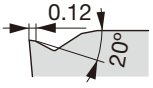
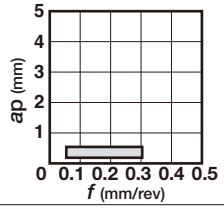
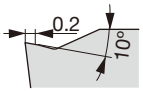
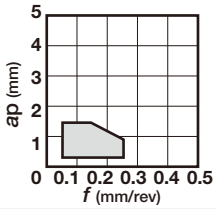
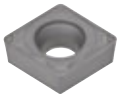
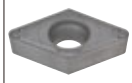
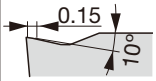
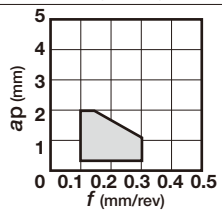
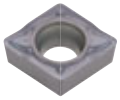
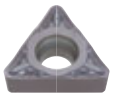
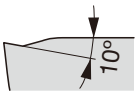
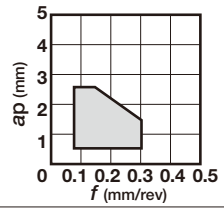
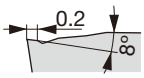
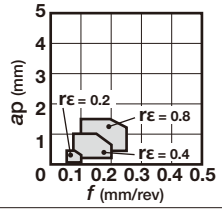
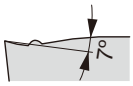
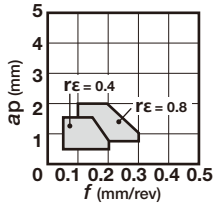
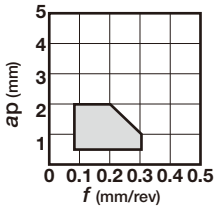
| Application | Negative type without hole | C | D | KNMX | LNGN | R | S | T |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | 55° | 90° | | 90° | 60° |
| Finishing | S1  | | | B103 | | | | |

# TurnLine - Chipbreaker Overview



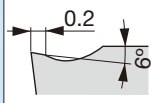
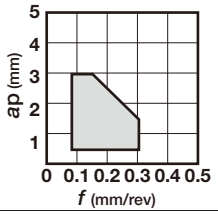
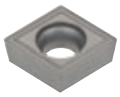
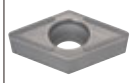
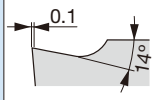
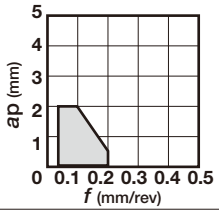
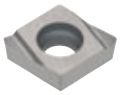
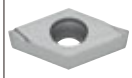
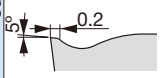
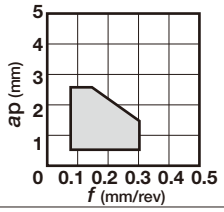
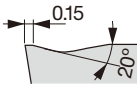
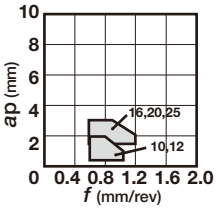
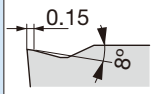
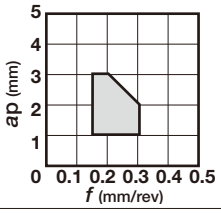
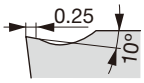
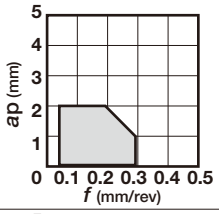
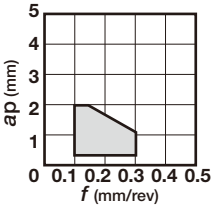
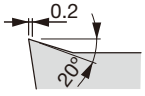
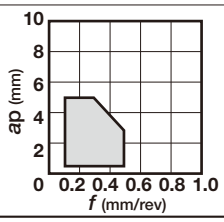
| Application | Negative type without hole | C | D | H | R | S | T | V |
|---|---|---|---|---|---|---|---|---|
| | | |  | | | | | |
| | | 80° | 55° | 120° | | 90° | 60° | 35° |
| Finishing to medium cutting | G-class   |  B060 |  B069 | B103 | | B079 | | B094 |
| | M,G-class   | B060 | B069 | | B070 | B079 | B090 | |

# TurnLine - Chipbreaker Overview

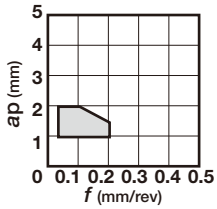
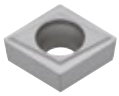
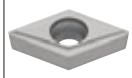
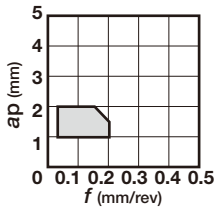
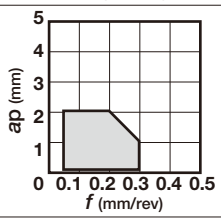
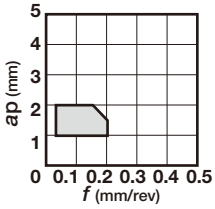
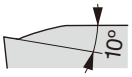
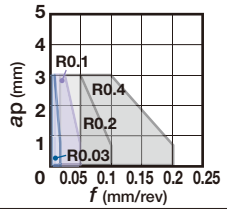
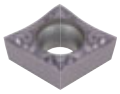
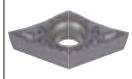
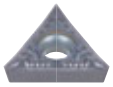
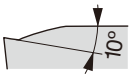
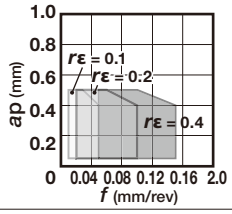
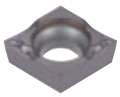
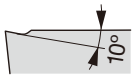
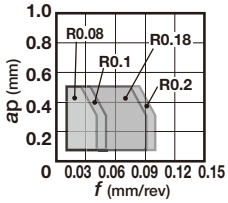
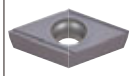
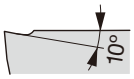
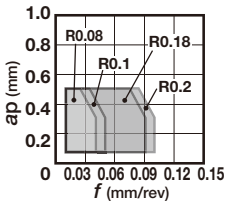
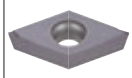
| Application | Positive 7° with hole | C | D | R | S | T | V | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | | 90° | 60° | 35° | 25° |
| Precision finishing | **01**     | B104 | B114 | | | B131 | | |
| Finishing | **PSF**     | B104 | B114 | | | B131 | B147 | |
| | **PF**     |  B104 |  B114 | | | | B147 | |
| Finishing to light cutting | **PSS**     |  B105 | B115 | | |  B131 | B147 | |
| Finishing to medium cutting | **PS**     | B105 | B115 | | B127 | B132 | B147 | |
| | **ZF**     | | | | | | | B153 |
| | **ZM**     | | | | | | | B153 |
| | **23**   | B105 | B115 | | B127 | B132 | | |

# TurnLine - Chipbreaker Overview



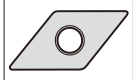
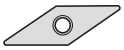
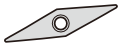
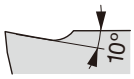
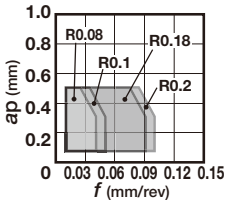
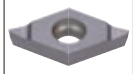
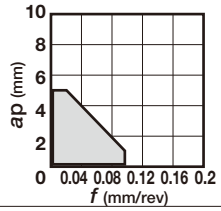
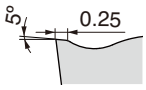
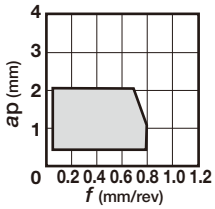
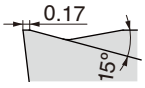
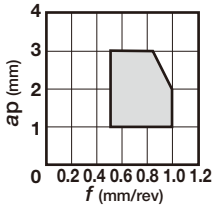
| Application | Positive 7° with hole | C | D | R | S | T | V | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | | 90° | 60° | 35° | 25° |
| Medium cutting | **24**     |  B105 |  B115 | | B127 | B132 | B148 | |
| Finishing | **W****     |  B106, B107 |  B116 | | | B132 | | |
| Finishing to medium cutting | **RS**     | | | B124 | | | | |
| Heavy cutting | **61**     | | | B125 | | | | |
| Medium cutting | **PM**     | B107 | B116 | | B127 | B133 | | |
| Finishing to medium cutting | **CM**     | B107 | B116 | B124 | B127 | B133 | B148 | |
| | **SS**   | | | | | B133 | | |
| | **AL**     | B108 | B117 | B124 | | B133 | B148 | |

# TurnLine - Chipbreaker Overview

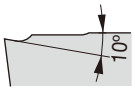
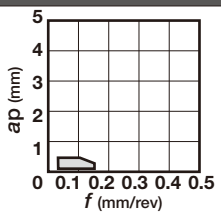
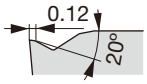
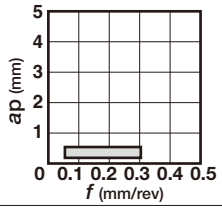
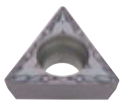
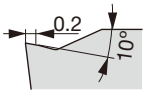
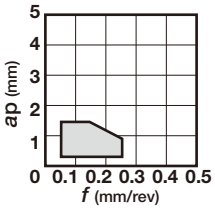
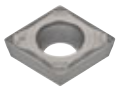
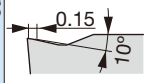
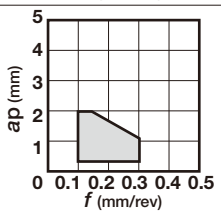
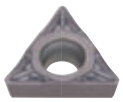
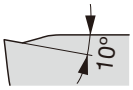
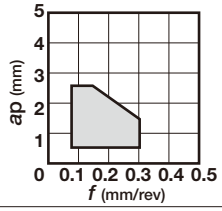
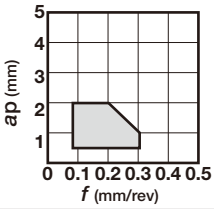
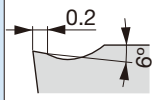
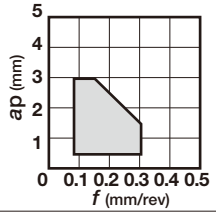
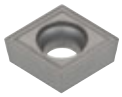
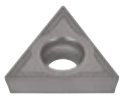
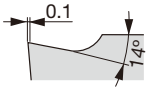
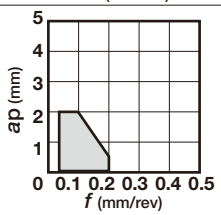
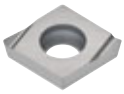
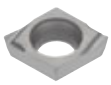
| Application | Positive 7° with hole | C | D | R | S | T | V | Y |
|---|---|---|---|---|---|---|---|---|
| | | 80° | 55° | | 90° | 60° | 35° | 25° |
| Finishing to medium cutting | **All-round**   |  B108 |  B117 | | | | B148 | |
| Finishing to medium cutting | **Angular**   | B108 | B117 | | | | | |
| Finishing to medium cutting | **—** M,G-class   | B108 | B117 | | | | | |
| Finishing | **—** (with hand)   | | | | | B134 | | |
| For external turning on small lathes (Sharp edge) | **JS**     |  B109 |  B118 | | |  B134 | | |
| For internal turning on small lathes (Sharp edge) | **JS**     |  B109 | | | | | | |
| For external turning on small lathes (Sharp edge) | **JPP**     | |  B118 | | | | | |
| For external turning on small lathes (Sharp edge) | **JRP**     | |  B119 | | | | | |

# TurnLine - Chipbreaker Overview



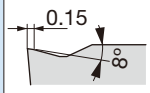
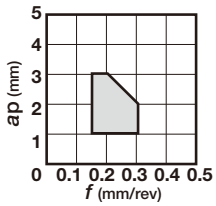
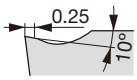
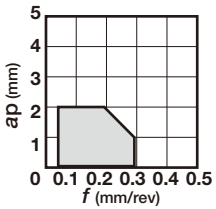
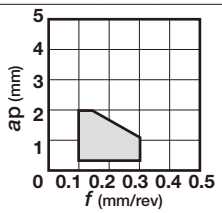
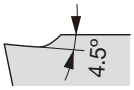
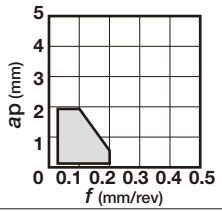
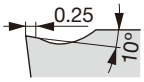
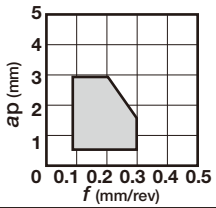
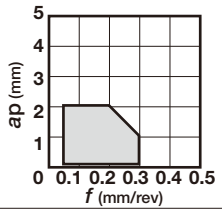
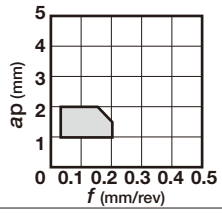
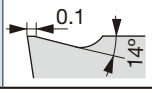
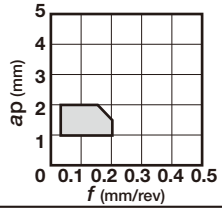
| Application | Positive 7° with hole | C | D | R | S | T | V | Y |
|---|---|---|---|---|---|---|---|---|
| | | |  | | | |  |  |
| | | 80° | 55° | | 90° | 60° | 35° | 25° |
| For external turning on small lathes (Sharp edge) | **JSP**     | |  B119 | | | | | |
| For external turning on small lathes (Sharp edge) | **J****   | B110 | B119 | | | B134, B135 | | |
| Low cutting force | **6RS**     | | | B253 | | | | |
| General use | **6RM**     | | | B253 | | | | |

# TurnLine - Chipbreaker Overview

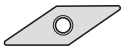
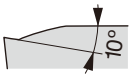
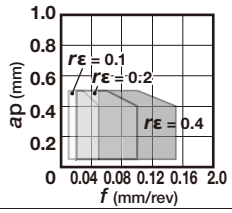
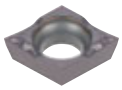
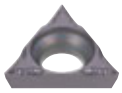
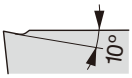
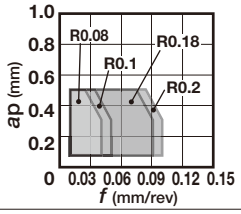
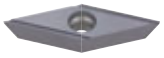
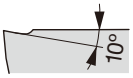
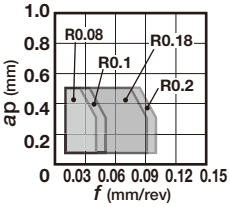
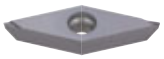
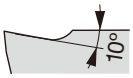
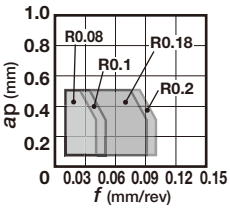
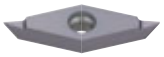
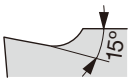
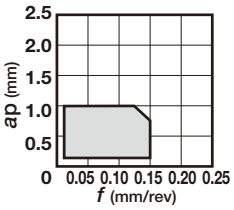
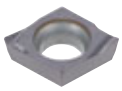
| Application | Positive 11° with hole | C | E | S | T | V |
|---|---|---|---|---|---|---|
| | | 80° | 75° | 90° | 60° | 35° |
| Precision finishing | **01**     | | | | B136 | |
| Finishing | **PSF**     | B111 | | |  B136 | |
| Finishing | **PF**     |  B111 | | | B136 | |
| Finishing to light cutting | **PSS**     | B111 | | |  B137 | |
| Finishing to medium cutting | **PS**     | B111 | | B128 | B137 | |
| Finishing to medium cutting | **23**   | | | B128 | B137 | |
| Medium cutting | **24**     |  B112 | | B128 |  B138 | |
| Finishing | **W****     |  B112 |  B122 | B128 | B138, B139 | |

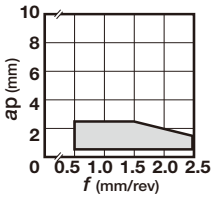
# TurnLine - Chipbreaker Overview



| Application | Positive 11° with hole | C | E | S | T | V |
|---|---|---|---|---|---|---|
| | | 80° | 75° | 90° | 60° | 35° |
| Medium cutting | **PM**     | B113 | | | B140 | |
| Finishing to medium cutting | **CM**     | B113 | | B129 | B140 | |
| | **SS**   | | | | B140 | |
| | **H****     | | | | B141 | |
| Medium cutting | **All-round**     | B113 | | | | |
| Finishing to medium cutting | **—** M,G-class   | B113 | | B129 | B141, B142 | |
| | **—** (with hand)   | | | Former Tungaloy-standard hole Not ISO B129 | | |
| | **—** (with hand)     | | | | Former Tungaloy-standard hole Not ISO B141 | |

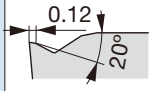
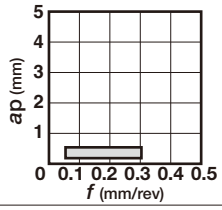
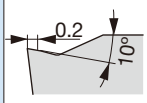
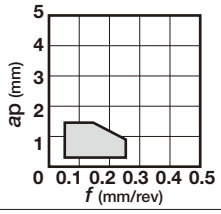
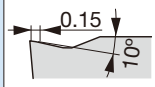
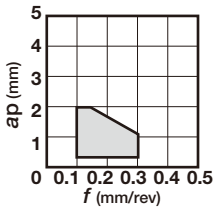
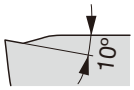
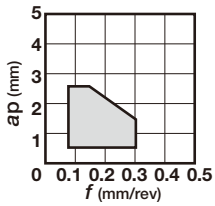
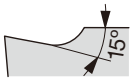
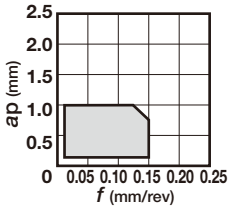
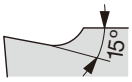
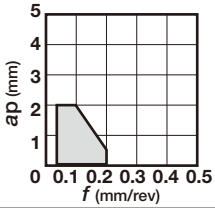
# TurnLine - Chipbreaker Overview

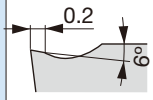
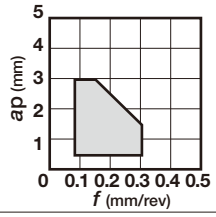
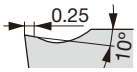
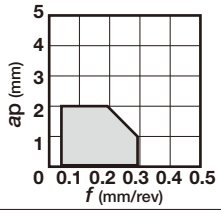
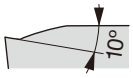
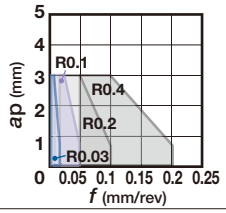
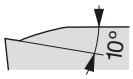
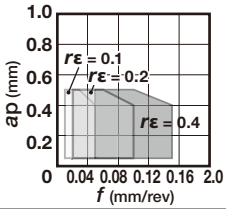
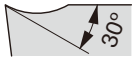
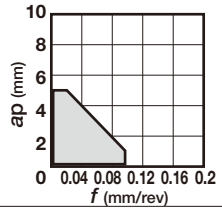
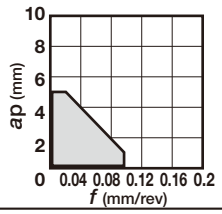
| Application | Positive 11° with hole | C | E | S | T | V |
|---|---|---|---|---|---|---|
| | | | | | |  |
| | | 80° | 75° | 90° | 60° | 35° |
| For internal turning on small lathes | **JS**     | |  B123 | |  B142 | |
| For external turning on small lathes (Sharp edge) | **JPP**     | | | | |  B149 |
| | **JRP**     | | | | |  B149 |
| | **JSP**     | | | | |  B149 |
| Finishing | **J08**     | |  B123 | | | |

| Application | Positive 11° with hole | W |
|---|---|---|
| | | |
| | | 80° |
| Heavy cutting | **ML**   | B150 |

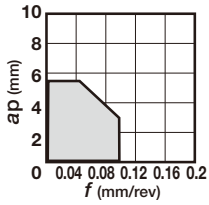
# TurnLine - Chipbreaker Overview

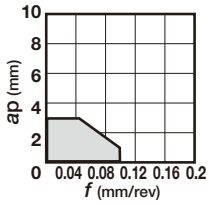


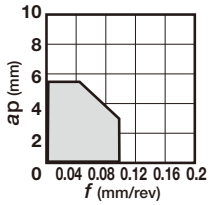
| Application | Positive 5° with hole | V 35° | W 80° |
|---|---|---|---|
| Finishing | **PSF**     | B145 | |
| Finishing | **PF**     | B145 | |
| Finishing to light cutting | **PSS**     | B145 | |
| Finishing to medium cutting | **PS**     | B145 | |
| Finishing | **W08**     | | B151 |
| Finishing | **W11**     | | B151 |

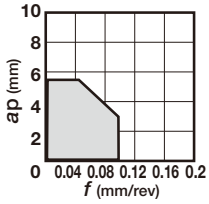
| Application | Positive 5° with hole | V 35° | W 80° |
|---|---|---|---|
| Medium cutting | **24**     | B145 | |
| Finishing to medium cutting | **CM**     | B145 | |
| For external turning on small lathes (Sharp edge) | **JS**     | B146 | |
| For internal turning on small lathes | **JS**     | | B151 |
| For external turning on small lathes (Sharp edge) | **J10**     | B146 | |
| For external turning on small lathes (Honed edge) | **J10**   | B146 | |

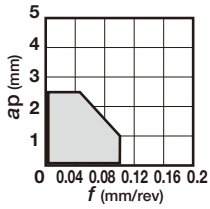
# TurnLine - Chipbreaker Overview

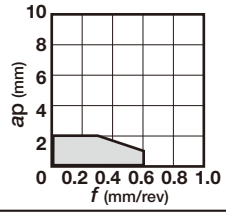
| Application | Positive with hole | JXF□ |
|---|---|---|
| Front-turning Insert | –   | B154 |

| Application | Positive with hole | J10E□ |
|---|---|---|
| Back-turning Insert | –   | B155, B156 |

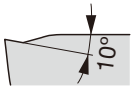
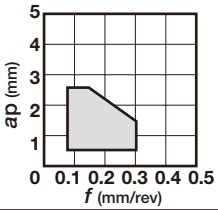
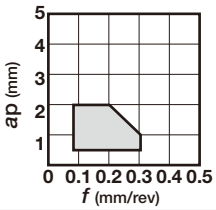
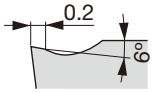
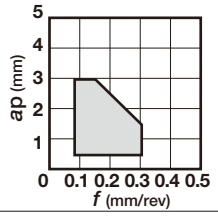
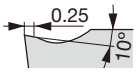
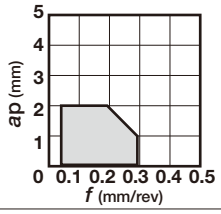
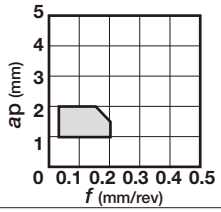
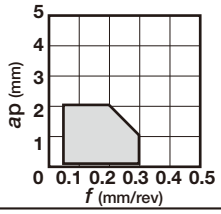
| Application | Positive with hole | JXB□ |
|---|---|---|
| Back-turning Insert | –   | B154 |

| Application | Positive with hole | JXR□ |
|---|---|---|
| Reverse-turning Insert | –   | B154 |

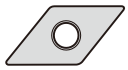
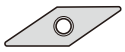
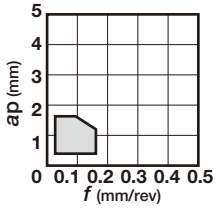
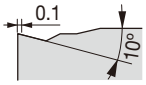
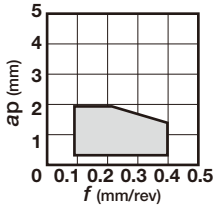
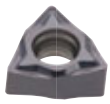
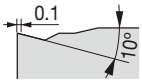
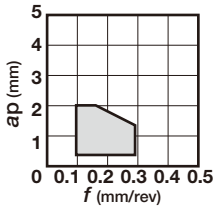
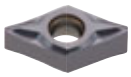
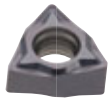
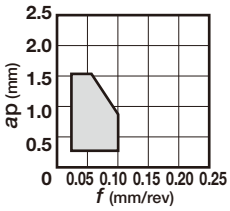
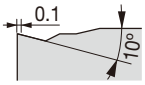
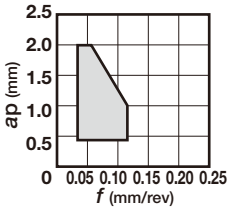
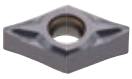
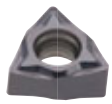
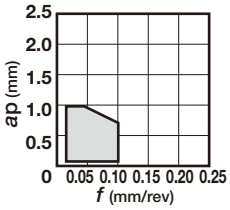
| Application | Positive with hole | JTB□ |
|---|---|---|
| Back-turning Insert | –   | B155 |

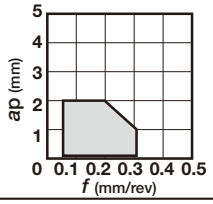
| Application | Positive without hole | RT□ |
|---|---|---|
| Medium cutting | –   | Special round insert B125 |

# TurnLine - Chipbreaker Overview

| Application | Positive 11° without hole | S | T |
|---|---|---|---|
| | | 90° | 60° |
| Finishing to medium cutting | **PS**     | | B143 |
| | **23**   | B130 | B143 |
| Medium cutting | **24**     | | B143 |
| Finishing to medium cutting | **CM**     | B130 | B143 |
| | — (with hand)   | B130 | B144 |
| | — M,G-class   | B130 | B144 |

# TurnLine - Chipbreaker Overview

| Application | Chipbreaker Positive, double-sided | | D | V | W |
|---|---|---|---|---|---|
| | | |  |  | |
| | | | 55° | 35° | 80° |
| Finishing (Low cutting force) | **SS** |   | B121 | | B152 |
| Finishing (Wiper) | **TSW**   |   | | |  B152 |
| Finishing to medium cutting | **TS**   |   |  B121 | |  B152 |
| Finishing (Low cutting force) (sharp edge) | **JSS** |   | B120, B121 | | B152 |
| Finishing to medium cutting (sharp edge) | **JTS**   |   |  B120 | |  B152 |
| Finishing (sharp edge) | **JRP** |   | B120 | B150 | |

| Application | Chipbreaker Positive, without hole | | RCGX□ |
|---|---|---|---|
| | | | |
| | | | Special round insert |
| Medium cutting | — |   | B126 |

MEMO

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✣ | ✣ | ●ⓒ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | | | ●ⓒ | ● | | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | ● |
| S | Superalloys | | | | | ●ⓒ | ● | | | | |
| H | Hard materials | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | Coated cermet | Cermet | | Uncoated |
| Precision finishing | TF | CNMG120404-TF | 0.4 | | | | | | | | ● | | ● |
| | | CNMG120408-TF | 0.8 | | | | | | | | ● | | |
| | 01 | CNGG090302-01 | 0.2 | | | | | | | | ● | | |
| | | CNGG090304-01 | 0.4 | | | | | | | | ● | | |
| | | CNGG090308-01 | 0.8 | | | | | | | | ● | | |
| | | CNGG120402-01 | 0.2 | | | | | | | | ● | ● | ● |
| | | CNGG120404-01 | 0.4 | | | | | | | | ● | ● | ● |
| | | CNGG120408-01 | 0.8 | | | | | | | | ● | ● | ● |
| | C | CNGG120404R-C | 0.4 | | | | | | ● | | ● | | |
| | | CNGG120404L-C | 0.4 | | | | | | | | ● | | |
| | | CNGG120408R-C | 0.8 | | | | | | | | ● | | |
| | | CNGG120408L-C | 0.8 | | | | | | | | ● | | |
| Finishing | TSF | CNMG090404E-TSF | 0.4 | | ● | ● | | | | ● | ● | | |
| | | CNMG090408E-TSF | 0.8 | | ● | ● | | | | ● | ● | | |
| | | CNMG120404-TSF | 0.4 | ● | ● | ● | | ● | | ● | ● | | |
| | | CNMG120408-TSF | 0.8 | ● | ● | ● | ● | ● | | ● | ● | | |
| | | CNMG120412-TSF | 1.2 | | ● | ● | | ● | | | | | |
| Finishing (Wiper) | FW | CNMG090404E-FW | 0.4 | ● | ● | ● | | | | ● | ● | | |
| | | CNMG090408E-FW | 0.8 | ● | ● | ● | | | | ● | ● | | |
| | | CNMG120404-FW | 0.4 | | ● | | | | | ● | ● | | |
| | | CNMG120408-FW | 0.8 | ● | ● | ● | | | | ● | ● | | |
| | AFW | CNMG120404-AFW | 0.4 | | ● | ● | | | | ● | ● | | |
| | | CNMG120408-AFW | 0.8 | ● | ● | ● | ● | | | ● | | | |

● : Line up

External toolholders → B198 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B274 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | GT720 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | | Cermet | Uncoated |
| P | Steel | ●⊂ | ⊂✠ | ✠ | ⊂ | ✠ | ⊂✠ | | | | | ●⊂ | ●⊂ | ●⊂ | ● |
| M | Stainless | | | | ● | ⊂ | ⊂ | | | ● | ⊂ | | | | ● |
| K | Cast iron | ●⊂ | | | | | | ● | ⊂ | | | ●⊂ | ●⊂ | ●⊂ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ● | ⊂ | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | GT720 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | ZF | CNMG090404E-ZF | 0.4 | ● | ● | | | | | | | | | | | | |
| | | CNMG120404-ZF | 0.4 | ● | ● | | | | | | | | | ● | | ● | |
| | | CNMG120408-ZF | 0.8 | ● | ● | ● | | | | | | | | ● | | ● | |
| | 11 | CNMG120404-11 | 0.4 | | | | | | | | | | | ● | | ● | ● |
| | | CNMG120408-11 | 0.8 | | | | | | | | | | | ● | ● | ● | ● |
| Finishing of mild steels | 17 | CNMG120404-17 | 0.4 | | | | | | | | | | | | | ● | |
| | | CNMG120408-17 | 0.8 | | | | | | | | | | | | | ● | |
| Finishing | SF | CNMG090304-SF | 0.4 | | | | ● | ● | ● | | | | | | | | |
| | | CNMG090308-SF | 0.8 | | | | ● | ● | ● | | | | | | | | |
| | | CNMG120404-SF | 0.4 | | | | ● | ● | ● | | | | | | | | |
| | | CNMG120408-SF | 0.8 | | | | ● | ● | ● | | | | | | | | |
| | | CNMG120412-SF | 1.2 | | | | ● | ● | ● | | | | | | | | |
| | CF | CNMG120404-CF | 0.4 | | | | | | | ● | ● | | | | | | |
| | | CNMG120408-CF | 0.8 | | | | | | | ● | ● | | | | | | |
| | | CNMG120412-CF | 1.2 | | | | | | | ● | ● | | | | | | |
| | HRF | CNMG120404-HRF | 0.4 | | | | | | | | | ● | ● | | | | |
| | | CNMG120408-HRF | 0.8 | | | | | | | | | ● | ● | | | | |
| | | CNMG120412-HRF | 1.2 | | | | | | | | | ● | ● | | | | |

● : Line up

| | | | |
|---|---|---|---|
| External toolholders | → B198 - | Internal toolholders | → B274 - |
| J series toolholders | → B342 | TungCap | → B215 -, B317, F066 - |
| PINZBOHR® | → F154 - F170 | Cartridges | → F171 - |

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5115 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | Coated cermet | Cermet | |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ✠ | | | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | ⓒ | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5115 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | TS | CNMG120404-TS | 0.4 | | ● | ● | ● | | | | ● | ● | ● |
| | | CNMG120408-TS | 0.8 | ● | ● | ● | ● | ● | | | ● | ● | ● |
| | | CNMG120412-TS | 1.2 | | ● | ● | ● | | | | | | |
| Finishing to medium cutting (Wiper) | SW | CNMG090408E-SW | 0.8 | ● | ● | ● | | | | ● | | | |
| | | CNMG090412E-SW | 1.2 | ● | ● | ● | | | | ● | | | |
| | | CNMG120408-SW | 0.8 | ● | ● | ● | | | ● | ● | | | |
| | | CNMG120412-SW | 1.2 | ● | ● | ● | | | ● | ● | | | |
| | ASW | CNMG120408-ASW | 0.8 | ● | ● | ● | | | | | | ● | |
| | | CNMG120412-ASW | 1.2 | ● | ● | ● | | | | | | | |
| High feed, small depth of cut | AS | CNMG120404-AS | 0.4 | ● | ● | ● | | | | | | ● | |
| | | CNMG120408-AS | 0.8 | ● | ● | ● | ● | | | | | ● | |
| | | CNMG120412-AS | 1.2 | | ● | ● | ● | | | | | | |
| Boring (Double sided) | CB | CNMG090304-CB | 0.4 | | | | | | | | | ● | |
| | | CNMG090308-CB | 0.8 | | | | | | | | | ● | |

● : Line up

External toolholders → B198 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B274 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | AH110 | AH120 | AH725 | AH8015 | GH330 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | | | | Cermet | | | | | | | |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | | ● | ●ⓒ | ⓒ | | ●ⓒ | | | | ●ⓒ | | | | | | | |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | | ● | ●ⓒ | ⓒ | ⓒ | ●ⓒ | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ●ⓒ | ● | ●ⓒ | ⓒ | | ●ⓒ | | | | ●ⓒ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | ● | ●ⓒ | ● | ⓒ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | AH110 | AH120 | AH725 | AH8015 | GH330 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | NS | CNMG120404-NS | 0.4 | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | CNMG120408-NS | 0.8 | | ● | ● | | | | | | | | | | | | | | | ● | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SS | CNMG090404E-SS | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | CNMG090408E-SS | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | CNMG120404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | |
| | | CNMG120408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | ● | | | | | | | | | | | |
| | | CNMG120412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | |
| Medium cutting | TM | CNMG090304-TM | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090308-TM | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG090404E-TM | 0.4 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | |
| | | CNMG090408E-TM | 0.8 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | |
| | | CNMG090412E-TM | 1.2 | | ● | ● | | ● | ● | ● | | ● | | ● | | ● | | | | | | | | | | | | |
| | | CNMG120404-TM | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | | | | | | |
| | | CNMG120408-TM | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | |
| | | CNMG120412-TM | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | |
| | | CNMG120416-TM | 1.6 | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | | | | | | | | | | |
| | | CNMG160612-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | |
| | | CNMG190608-TM | 0.8 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | |
| | | CNMG190612-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | |
| Finishing to medium cutting | AM | CNMG120408-AM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120412-AM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | CNMG120416-AM | 1.6 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | NM | CNMG120408-NM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | ● | | | | | | | |
| | | CNMG120412-NM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line up

| | | | |
|---|---|---|---|
| External toolholders | → B198 - | Internal toolholders | → B274 - |
| J series toolholders | → B342 | TungCap | → B215 -, B317, F066 - |
| PINZBOHR® | → F154 - F170 | Cartridges | → F171 - |

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | | Cermet | | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | | | | | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | | | | | | | ● | ●ⓒ | | | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | ⓒ | ✠ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ● | ●ⓒ | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | TQ | CNMG120404-TQ | 0.4 | | | | | | | | | | | ● | | ● | | |
| | | CNMG120408-TQ | 0.8 | | | | | | | | | | | ● | | ● | | |
| | | | | | | | | | | | | | | | | | | |
| | ZM | CNMG090408E-ZM | 0.8 | | ● | ● | | | | | | | | | | | | |
| | | CNMG120408-ZM | 0.8 | | ● | ● | ● | | | | | | | ● | | ● | | |
| | | CNMG120412-ZM | 1.2 | | ● | ● | ● | | | | | | | ● | | | | |
| | | CNMG120416-ZM | 1.6 | | ● | ● | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Medium cutting | DM | CNMG120404-DM | 0.4 | | ● | ● | | | | | | | | | | | | |
| | | CNMG120408-DM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | |
| | | CNMG120412-DM | 1.2 | ● | ● | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | All-round | CNMG090304 | 0.4 | | ● | ● | | | | | | | | | | ● | | |
| | | CNMG090308 | 0.8 | ● | ● | ● | ● | | | | | | | | ● | ● | | |
| | | CNMG120404 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | ● |
| | | CNMG120408 | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● |
| | | CNMG120412 | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● |
| | | CNMG120416 | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | CNMG160608 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | ● | | | | | |
| | | CNMG160612 | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | | CNMG160616 | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | CNMG190608 | 0.8 | | ● | ● | ● | | | | | | | | | | | |
| | | CNMG190612 | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | | CNMG190616 | 1.6 | | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B198 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B274 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9115 | T9125 | T9135 | AH110 | AH120 | AH725 | GH330 | | | | GT720 | | | | NS9530 | | | | TH10 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | | | | | |
| P | Steel | ●ⓒ | ⓒ✠ | ✠ | ● | ●ⓒ | ⓒ | ●ⓒ | | | | ●ⓒ | | | | ●ⓒ | | | | ● | | | | | | | |
| M | Stainless | | | | ● | ●ⓒ | ⓒ | ●ⓒ | | | | | | | | | | | | ● | | | | | | | |
| K | Cast iron | ●ⓒ | | | ● | ●ⓒ | ⓒ | ●ⓒ | | | | ●ⓒ | | | | ●ⓒ | | | | ● | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | | | | | | | |
| S | Superalloys | | | | ● | ●ⓒ | ● | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | AH110 | AH120 | AH725 | GH330 | GT720 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | 27 | CNMG120404-27 | 0.4 | ● | ● | | | | | | | ● | |
| | | CNMG120408-27 | 0.8 | ● | ● | ● | | | | | | ● | |
| Medium cutting | 28 | CNMG120404-28 | 0.4 | | ● | | ● | ● | | | | | |
| | | CNMG120408-28 | 0.8 | | | | ● | ● | | | | | |
| | 33 | CNMG120408-33 | 0.8 | | | | ● | | | | ● | | |
| | | CNMG120416-33 | 1.6 | ● | | | | | | | | | |
| | | CNMG160612-33 | 1.2 | ● | | | | | | | | | |
| | | CNMG190612-33 | 1.2 | ● | | | | | | | | | |
| | 37 | CNMG120404-37 | 0.4 | ● | | | | | | | | ● | |
| | | CNMG120408-37 | 0.8 | ● | | | | | | ● | | ● | ● |
| | | CNMG120412-37 | 1.2 | ● | | | | | | | | | |
| | 38 | CNMG120404-38 | 0.4 | | | | | | | ● | | | |
| | | CNMG120408-38 | 0.8 | ● | | | | | ● | ● | | | |

● : Line up

| | | | |
|---|---|---|---|
| External toolholders | → B204 - | Internal toolholders | → B292 - |
| J series toolholders | → B342 | TungCap | → B215 -, B317, F066 - |
| PINZBOHR® | → F154 - F170 | Cartridges | → F171 - |

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | AH905 | GH110 | | | | | NS9530 | | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ⊂ | ✠ | ⊂✠ | ✠ | | | | | ⊂ | | | | ● | | | | | ●⊂ | | | | ● | | | |
| M | Stainless | ● | ⊂ | ⊂ | ✠ | | | | | ⊂ | ● | ⊂ | | ● | | | | | | | | | ● | | | |
| K | Cast iron | | | | | ●⊂ | ● | ⊂ | ✠ | ⊂ | | | | ● | | | | | ●⊂ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | ● | ● | ⊂ | ⊂ | ● | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | AH905 | GH110 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | SM | CNMG090404E-SM | 0.4 | ● | ● | ● | | | | | | | | | | | | |
| | | CNMG090408E-SM | 0.8 | ● | ● | ● | | | | | | | | | | | | |
| | | CNMG090412E-SM | 1.2 | ● | ● | ● | | | | | | | | | | | | |
| | | CNMG120404-SM | 0.4 | ● | ● | ● | ● | | | | | ● | | | | | | |
| | | CNMG120408-SM | 0.8 | ● | ● | ● | ● | | | | | ● | | | ● | | | |
| | | CNMG120412-SM | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | | |
| | CM | CNMG120404-CM | 0.4 | | | | | | ● | ● | ● | | | | | | | |
| | | CNMG120408-CM | 0.8 | | | | | ● | ● | ● | ● | | | | | | | |
| | | CNMG120412-CM | 1.2 | | | | | ● | ● | ● | ● | | | | | | | |
| | | CNMG160608-CM | 0.8 | | | | | | ● | ● | ● | | | | | | | |
| | | CNMG160612-CM | 1.2 | | | | | | ● | ● | ● | | | | | | | |
| | P | CNGG120404R-P | 0.4 | | | | | | | | | | | | | ● | ● | ● |
| | | CNGG120404L-P | 0.4 | | | | | | | | | | | | | ● | ● | ● |
| | | CNGG120408R-P | 0.8 | | | | | | | | | | | | | ● | | ● |
| | | CNGG120408L-P | 0.8 | | | | | | | | | | | | | ● | | ● |
| Finishing to medium cutting | HRM | CNMG120404-HRM | 0.4 | | | | | | | | | | ● | ● | | | | |
| | | CNMG120408-HRM | 0.8 | | | | | | | | | | ● | ● | | | | |
| | | CNMG120412-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | CNMG160608-HRM | 0.8 | | | | | | | | | | ● | ● | | | | |
| | | CNMG160612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | CNMG190612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | CNMG190616-HRM | 1.6 | | | | | | | | | | ● | ● | | | | |
| Medium cutting | HMM | CNMG120404-HMM | 0.4 | | | | | | | | | | | | ● | | | |
| | | CNMG120408-HMM | 0.8 | | | | | | | | | | | | ● | | | |
| | | CNMG120412-HMM | 1.2 | | | | | | | | | | | | ● | | | |
| | | CNMG160608-HMM | 0.8 | | | | | | | | | | | | ● | | | |
| | | CNMG160612-HMM | 1.2 | | | | | | | | | | | | ● | | | |
| | | CNMG160616-HMM | 1.6 | | | | | | | | | | | | ● | | | |

● : Line up

External toolholders → B198 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B274 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT720 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | ● | ●ⓒ | ●ⓒ | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ⓒ✠ |
| N | Non-ferrous | | | | | | | | | | | | | | ⓒ✠ |
| S | Superalloys | | | | | | | | | ● | ●ⓒ | | | | ⓒ✠ |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT720 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | SA | CNMG120404-SA | 0.4 | | | | | ● | ● | ● | ● | | ● | | | | |
| | | CNMG120408-SA | 0.8 | | | | | ● | ● | ● | ● | ● | ● | | | | ● |
| | | CNMG120412-SA | 1.2 | | | | | ● | ● | ● | ● | | ● | | | | ● |
| | | CNMG190612-SA | 1.2 | | | | | | | | | | ● | | | | ● |
| | | CNMG190616-SA | 1.6 | | | | | | | | | | | | | | ● |
| Medium cutting | S | CNMG120404R-S | 0.4 | | | ● | ● | | ● | ● | ● | | | ● | ● | ● | |
| | | CNMG120404L-S | 0.4 | | | ● | ● | | ● | ● | ● | | | ● | | ● | |
| | | CNMG120408R-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | ● | ● | |
| | | CNMG120408L-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | | ● | |
| Medium to heavy cutting | TH | CNMG120408-TH | 0.8 | ● | ● | ● | ● | | ● | | | | ● | | | | |
| | | CNMG120412-TH | 1.2 | ● | ● | ● | ● | | ● | | | | ● | | | | |
| | | CNMG120416-TH | 1.6 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG160612-TH | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | CNMG160616-TH | 1.6 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | CNMG190612-TH | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | CNMG190616-TH | 1.6 | ● | ● | ● | ● | | | | | | ● | | | | |
| Medium to heavy cutting | THS | CNMG120408-THS | 0.8 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG120412-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG120416-THS | 1.6 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG160612-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG160616-THS | 1.6 | ● | ● | ● | ● | | | | | | | | | | |
| | | CNMG190612-THS | 1.2 | | ● | ● | ● | | | | | | | | | | |
| | | CNMG190616-THS | 1.6 | | ● | ● | ● | | | | | | | | | | |
| | | CNMG190624-THS | 2.4 | | ● | ● | ● | | | | | | | | | | |
| | | CNMG250924-THS | 2.4 | | ● | ● | ● | | | | | | | | | | |

● : Line up


External toolholders → B204 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B292 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●⊂ | ⊂✠ | ✠ | ✠ | ⊂✠ | ✠ | | | | |
| M | Stainless | | | | ⊂ | ⊂ | ✠ | | | | |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ● | ⊂ | ✠ |
| N | Non-ferrous | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | |
| Medium to heavy cutting (Single sided) | TRS | CNMM120408-TRS | 0.8 | ● | ● | ● | | | | | | | |
| | | CNMM120412-TRS | 1.2 | ● | ● | ● | | | | | | | |
| | | CNMM160612-TRS | 1.2 | ● | ● | ● | | | | | | | |
| | | CNMM160616-TRS | 1.6 | ● | ● | ● | | | | | | | |
| | | CNMM190616-TRS | 1.6 | ● | ● | ● | | | | | | | |
| | | CNMM190624-TRS | 2.4 | ● | ● | ● | | | | | | | |
| | | CNMM250924-TRS | 2.4 | ● | ● | ● | | | | | | | |
| Heavy cutting (Single sided) | TU | CNMM190612-TU | 1.2 | | ● | ● | | | | | | | |
| | | CNMM190616-TU | 1.6 | | ● | ● | | | | | | | |
| | | CNMM190624-TU | 2.4 | ● | ● | ● | | | | | | | |
| | | CNMM250924-TU | 2.4 | | ● | ● | | | | | | | |
| | TUS | CNMM190608-TUS | 0.8 | ● | ● | | | | | | | | |
| | | CNMM190612-TUS | 1.2 | ● | ● | ● | | | | | | | |
| | | CNMM190616-TUS | 1.6 | ● | ● | ● | | | | | | | |
| | | CNMM190624-TUS | 2.4 | ● | ● | ● | | | | | | | |
| | | CNMM190632-TUS | 3.2 | ● | ● | | | | | | | | |
| | | CNMM250916-TUS | 1.6 | ● | ● | ● | | | | | | | |
| | | CNMM250924-TUS | 2.4 | ● | ● | ● | | | | | | | |
| | | CNMM250932-TUS | 3.2 | ● | ● | | | | | | | | |
| Medium to heavy cutting | SH | CNMG120408-SH | 0.8 | | | | ● | ● | ● | | | | |
| | | CNMG120412-SH | 1.2 | | | | ● | ● | ● | | | | |
| | | CNMG120416-SH | 1.6 | | | | ● | ● | ● | | | | |
| | | CNMG160612-SH | 1.2 | | | | ● | ● | ● | | | | |
| | | CNMG160616-SH | 1.6 | | | | ● | ● | ● | | | | |
| | | CNMG190612-SH | 1.2 | | | | ● | ● | ● | | | | |
| | | CNMG190616-SH | 1.6 | | | | ● | ● | ● | | | | |
| | CH | CNMG120404-CH | 0.4 | | | | | | | | ● | ● | ● |
| | | CNMG120408-CH | 0.8 | | | | | | | ● | ● | ● | ● |
| | | CNMG120412-CH | 1.2 | | | | | | | ● | ● | ● | ● |
| | | CNMG160612-CH | 1.2 | | | | | | | | ● | ● | ● |
| | | CNMG160616-CH | 1.6 | | | | | | | | ● | ● | ● |
| | | CNMG190612-CH | 1.2 | | | | | | | | ● | ● | ● |
| | | CNMG190616-CH | 1.6 | | | | | | | | ● | ● | ● |

● : Line up

External toolholders → B204 -
J series toolholders → B342
PINZBOHR® → F154 - F170
Internal toolholders → B292 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° with hole**

| | | T9105 | T515 | T5105 | T5115 | T5125 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | Cermet | Uncoated | Ceramics | | |
| P | Steel | ● | | | | | ●◐ | ● | | | |
| M | Stainless | | | | | | | ● | | | |
| K | Cast iron | ●◐ | ●◐ | ● | ◐ | ✠ | ●◐ | ● | ●◐ | ● | |
| N | Non-ferrous | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T515 | T5105 | T5115 | T5125 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | CNMA120404 | 0.4 | | | ● | ● | ● | | ● | | | |
| | | CNMA120408 | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | | |
| | | CNMA120412 | 1.2 | ● | ● | ● | ● | ● | | ● | ● | | |
| | | CNMA120416 | 1.6 | ● | | ● | ● | ● | | ● | ● | | |
| | | CNMA160608 | 0.8 | | | ● | ● | ● | | | | | |
| | | CNMA160612 | 1.2 | | ● | ● | ● | ● | | | | | |
| | | CNMA160616 | 1.6 | | ● | ● | ● | ● | | | | | |
| | | CNMA190612 | 1.2 | | ● | ● | ● | ● | | | | | |
| | | CNMA190616 | 1.6 | | ● | ● | ● | ● | | | | | |
| | Wiper | CNMA120408W | 0.8 | | | | | | | | ● | | |
| | | CNMA120412W | 1.2 | | | | | | | | ● | | ● |
| | | CNMA120416W | 1.6 | | | | | | | | ● | | |
| | - | CNGA120404 | 0.4 | | | | | | | | | ● | ● |
| | | CNGA120408 | 0.8 | | | | | | ● | | ● | ● | ● |
| | | CNGA120412 | 1.2 | | | | | | | | ● | ● | ● |
| | | CNGA120416 | 1.6 | | | | | | | | ● | | ● |
| | | CNGA120420 | 2.0 | | | | | | | | | | ● |

● : Line up

| | | | |
|---|---|---|---|
| External toolholders | → B204 - | Internal toolholders | → B292 - |
| TungCap | → B215 -, B317, F066 - | PINZBOHR® | → F154 - F170 |
| Cartridges | → F171 - | | |

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 80° without hole**

| | | FX105 | LX21 | LX11 | CX710 |
|---|---|---|---|---|---|
| P | Steel | | | | |
| M | Stainless | | | | |
| K | Cast iron | ●◐ | ● | | ●◐ |
| N | Non-ferrous | | | | |
| S | Superalloys | | | | |
| H | Hard materials | | | ● | |

| Application | Chipbreaker | Designation | Corner radius | FX105 | LX21 | LX11 | CX710 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | **CNGD120712** | 1.2 | ● | | | |
| | | **CNGD120716** | 1.6 | ● | | | |
| | - | **CNMN120408** | 0.8 | ● | | | |
| | | **CNMN120412** | 1.2 | ● | | | |
| | - | **CNGN120404** | 0.4 | | | ● | |
| | | **CNGN120408** | 0.8 | ● | | ● | |
| | | **CNGN120412** | 1.2 | ● | | ● | |
| | | **CNGN120416** | 1.6 | ● | ● | ● | |
| | | **CNGN120420** | 2.0 | ● | | | |
| | | **CNGN120708** | 0.8 | ● | | ● | |
| | | **CNGN120712** | 1.2 | ● | | ● | |
| | | **CNGN120716** | 1.6 | ● | | ● | |
| | | **CNGN120720** | 2.0 | | | ● | |

● : Line up

CNGD... : External toolholders → **B254**

CNMN..., CNGN... : External toolholders → **B234**, Internal toolholders → **B311**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | Coated cermet | | Cermet | | Uncoated |
| P | Steel | ● | ◐ | ◐✣ | ✣ | ◐ | ● | ◐ | ◐ | ◐ | ◐ | ● |
| M | Stainless | | | | | ◐ | ● | | | | | ● |
| K | Cast iron | ◐ | ◐ | | | ◐ | ● | ◐ | ◐ | ◐ | ◐ | ● |
| N | Non-ferrous | | | | | | | | | | | ● |
| S | Superalloys | | | | | ◐ | ● | | | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | GH110 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | TF | DNMG150404-TF | 0.4 | | | | | | | | | ● | | ● |
| | | DNMG150408-TF | 0.8 | | | | | | | | | ● | | |
| | 01 | DNGG110402-01 | 0.2 | | | | | | | | | ● | | |
| | | DNGG110404-01 | 0.4 | | | | | | | | | ● | ● | |
| | | DNGG110408-01 | 0.8 | | | | | | | | ● | ● | | |
| | | DNGG150402-01 | 0.2 | | | | | | | | | ● | ● | ● |
| | | DNGG150404-01 | 0.4 | | | | | | ● | | | ● | ● | ● |
| | | DNGG150408-01 | 0.8 | | | | | | ● | | | ● | ● | ● |
| Finishing | TSF | DNMG110404E-TSF | 0.4 | | ● | ● | | | | ● | | ● | | |
| | | DNMG110408E-TSF | 0.8 | | ● | ● | | | | ● | | ● | | |
| | | DNMG110412E-TSF | 1.2 | | ● | ● | | | | ● | | ● | | |
| | | DNMG150404-TSF | 0.4 | ● | ● | ● | ● | ● | | ● | | ● | | |
| | | DNMG150408-TSF | 0.8 | ● | ● | ● | ● | ● | | ● | | ● | | |
| | | DNMG150412-TSF | 1.2 | ● | ● | ● | ● | ● | | | | | | |
| | | DNMG150604-TSF | 0.4 | | ● | ● | | | | ● | | ● | | |
| | | DNMG150608-TSF | 0.8 | ● | ● | ● | ● | | | ● | | ● | | |
| | | DNMG150612-TSF | 1.2 | ● | ● | ● | ● | | | | | | | |
| Finishing (Wiper) | FW | DNMG110404E-FW | 0.4 | | ● | | | | | | | | | |
| | | DNMG110408E-FW | 0.8 | | ● | | | | | | | | | |
| | | DNMG150404-FW | 0.4 | | ● | | | | | | | | | |
| | | DNMG150408-FW | 0.8 | | ● | | | | | | | | | |
| | | DNMG150604-FW | 0.4 | | ● | | | | | | | | | |
| | | DNMG150608-FW | 0.8 | | ● | | | | | | | | | |
| Finishing | ZF | DNMG110404E-ZF | 0.4 | | ● | ● | | | | | | | | |
| | | DNMG150404-ZF | 0.4 | | ● | ● | ● | | | ● | | ● | | |
| | | DNMG150408-ZF | 0.8 | | ● | ● | ● | | | ● | | ● | | |
| | | DNMG150412-ZF | 1.2 | | ● | ● | ● | | | | | | | |
| | | DNMG150604-ZF | 0.4 | | ● | ● | | | | | | | | |
| | | DNMG150608-ZF | 0.8 | | ● | ● | ● | | | | | | | |
| | | DNMG150612-ZF | 1.2 | | ● | ● | | | | | | | | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

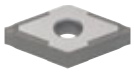
# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9115 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | Cermet | Uncoated |
| P | Steel | ●ⓒ | ⓒ | ✠ | ⓒ✠ | | | | | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | ● | ⓒ | ⓒ | | | ● | ⓒ | ●ⓒ | | ● |
| K | Cast iron | ●ⓒ | | | | ● | ⓒ | | | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | ● | ⓒ | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | 11 | DNMG110404-11 | 0.4 | | | | | | | | | | ● | |
| |  | DNMG110408-11 | 0.8 | | | | | | | | | | ● | |
| | | DNMG150404-11 | 0.4 | | | | | | | | | ● | ● | ● |
| | | DNMG150408-11 | 0.8 | ● | | | | | | | | | ● | |
| Finishing of mild steels | 17 | DNMG150404-17 | 0.4 | | | | | | | | | | ● | |
| | | DNMG150408-17 | 0.8 | | | | | | | | | | ● | |
| Finishing | SF | DNMG150404-SF | 0.4 | | ● | ● | ● | | | | | | | |
| | | DNMG150408-SF | 0.8 | | ● | ● | ● | | | | | | | |
| | | DNMG150604-SF | 0.4 | | ● | ● | ● | | | | | | | |
| | | DNMG150608-SF | 0.8 | | ● | ● | ● | | | | | | | |
| | CF | DNMG150404-CF | 0.4 | | | | | ● | ● | | | | | |
| | | DNMG150408-CF | 0.8 | | | | | ● | ● | | | | | |
| | | DNMG150412-CF | 1.2 | | | | | ● | ● | | | | | |
| | | DNMG150604-CF | 0.4 | | | | | ● | ● | | | | | |
| | | DNMG150608-CF | 0.8 | | | | | ● | ● | | | | | |
| | | DNMG150612-CF | 1.2 | | | | | ● | ● | | | | | |
| | HRF | DNMG150404-HRF | 0.4 | | | | | | | ● | ● | | | |
| | | DNMG150408-HRF | 0.8 | | | | | | | ● | ● | | | |
| | | DNMG150604-HRF | 0.4 | | | | | | | ● | ● | | | |
| | | DNMG150608-HRF | 0.8 | | | | | | | ● | ● | | | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9105 | T9115 | T9125 | T9135 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | |
| S | Superalloys | | | | | | | |
| H | Hard materials | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 (Coated) | T9115 (Coated) | T9125 (Coated) | T9135 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | NS520 (Cermet) |
|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | TS | DNMG150404-TS | 0.4 | | ● | ● | ● | ● | ● | ● |
| | | DNMG150408-TS | 0.8 | ● | ● | ● | ● | ● | ● | ● |
| | | DNMG150412-TS | 1.2 | ● | ● | ● | ● | | | |
| | | DNMG150604-TS | 0.4 | | | | | ● | ● | ● |
| | | DNMG150608-TS | 0.8 | | ● | ● | | ● | ● | ● |
| | | DNMG150612-TS | 1.2 | | ● | ● | | | | |
| Finishing to medium cutting (Wiper) | SW | DNMG110408E-SW | 0.8 | | ● | | | | | |
| | | DNMG110412E-SW | 1.2 | | ● | | | | | |
| | | DNMG150408-SW | 0.8 | | ● | | | | | |
| | | DNMG150412-SW | 1.2 | | ● | | | | | |
| | | DNMG150608-SW | 0.8 | | ● | | | | | |
| | | DNMG150612-SW | 1.2 | | ● | | | | | |
| High feed, small depth of cut | AS | DNMG150404-AS | 0.4 | | ● | | ● | | ● | |
| | | DNMG150408-AS | 0.8 | | ● | ● | ● | | ● | |
| | | DNMG150412-AS | 1.2 | | ● | ● | ● | | | |
| | | DNMG150604-AS | 0.4 | | ● | | | | | |
| | | DNMG150608-AS | 0.8 | | ● | ● | | | | |
| | | DNMG150612-AS | 1.2 | | ● | | | | | |
| Boring (Double sided) | CB | DNMG110404-CB | 0.4 | | | | | ● | ● | |
| | | DNMG110408-CB | 0.8 | | ● | | | ● | ● | |
| Finishing | NS | DNMG150404-NS | 0.4 | | | ● | | | ● | |
| | | DNMG150408-NS | 0.8 | ● | ● | ● | | | ● | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT9530 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ● | ●⊂ | ⊂✠ | ✠ | ⊂ | ✠ | ⊂✠ | ✠ | ● | ●⊂ | ●⊂ | ●⊂ | ●⊂ | |
| M | Stainless | | | | | ● | ⊂ | ⊂ | ✠ | ● | ●⊂ | ●⊂ | | | |
| K | Cast iron | ●⊂ | ●⊂ | | | | | | | ● | ●⊂ | ●⊂ | ●⊂ | ●⊂ | ⊂✠ |
| N | Non-ferrous | | | | | | | | | | | | | | ⊂✠ |
| S | Superalloys | | | | | | | | | ● | ●⊂ | | | | ⊂✠ |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT9530 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | SS | DNMG110404E-SS | 0.4 | | | | | | | ● | ● | | | | | | |
| | | DNMG110408E-SS | 0.8 | | | | | | | ● | ● | | | | | | |
| | | DNMG150404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | DNMG150408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | ● |
| | | DNMG150412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | |
| | | DNMG150604-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | DNMG150608-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | DNMG150612-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | |
| Medium cutting | TM | DNMG110404E-TM | 0.4 | | ● | ● | | | | | | | | | | | |
| | | DNMG110408E-TM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | DNMG110412E-TM | 1.2 | | ● | ● | | | | | | | | | | | |
| | | DNMG110404-TM | 0.4 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG110408-TM | 0.8 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150404-TM | 0.4 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | DNMG150408-TM | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | DNMG150412-TM | 1.2 | ● | ● | ● | ● | | | | | ● | ● | | | | |
| | | DNMG150416-TM | 1.6 | | ● | ● | | | | | | | | | | | |
| | | DNMG150604-TM | 0.4 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | DNMG150608-TM | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | DNMG150612-TM | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | DNMG150616-TM | 1.6 | ● | ● | ● | ● | | | | | | | | | | |
| Finishing to medium cutting | AM | DNMG150408-AM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | DNMG150412-AM | 1.2 | | ● | ● | | | | | | | | | | | |
| | | DNMG150416-AM | 1.6 | | ● | ● | | | | | | | | | | | |
| | | DNMG150608-AM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | DNMG150612-AM | 1.2 | | ● | ● | | | | | | | | | | | |
| | | DNMG150616-AM | 1.6 | | ● | ● | | | | | | | | | | | |
| | NM | DNMG150408-NM | 0.8 | | ● | ● | ● | | | | | | | | ● | ● | |
| | | DNMG150412-NM | 1.2 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150608-NM | 0.8 | | | | | | | | | | | | ● | ● | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | Cermet | | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | | | | | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | | | | | | | ● | ●ⓒ | | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | ⓒ | ✠ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ● | ●ⓒ | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | TQ | DNMG150404-TQ | 0.4 | | | | | | | | | | | ● | ● | | |
| | | DNMG150408-TQ | 0.8 | | | | | | | | | | | ● | ● | | |
| | | | | | | | | | | | | | | | | | |
| | ZM | DNMG110408E-ZM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | DNMG150408-ZM | 0.8 | | ● | ● | ● | | | | | | | ● | ● | | |
| | | DNMG150412-ZM | 1.2 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150608-ZM | 0.8 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150612-ZM | 1.2 | | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Medium cutting | DM | DNMG150408-DM | 0.8 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150412-DM | 1.2 | ● | ● | ● | ● | | | | | | | | | | |
| | | DNMG150604-DM | 0.4 | | ● | | | | | | | | | | | | |
| | | DNMG150608-DM | 0.8 | | ● | ● | ● | | | | | | | | | | |
| | | DNMG150612-DM | 1.2 | ● | ● | ● | ● | | | | | | | | | | |
| | | DNMG150616-DM | 1.6 | ● | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | All-round | DNMG110404 | 0.4 | | ● | ● | | | ● | ● | ● | | | ● | ● | | |
| | | DNMG110408 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | | ● | ● | | |
| | | DNMG150404 | 0.4 | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DNMG150408 | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | DNMG150412 | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● |
| | | DNMG150416 | 1.6 | | ● | ● | | | ● | ● | ● | | | | | | |
| | | DNMG150604 | 0.4 | | ● | ● | | | ● | ● | ● | | | | | | ● |
| | | DNMG150608 | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | ● |
| | | DNMG150612 | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | ● |
| | | DNMG150616 | 1.6 | | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | 27 | DNMG150404-27 | 0.4 | | | ● | | | | | | | | | ● | | |
| | | DNMG150408-27 | 0.8 | | ● | ● | | | | | | | | | ● | | |
| | | DNMG150412-27 | 1.2 | | | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

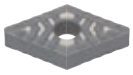
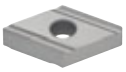
# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9115 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ●⊂ | ⊂ | ✠ | ⊂✠ | ✠ | ● | ●⊂ | ●⊂ | ●⊂ | ●⊂ | ●⊂ |
| M | Stainless | | ● | ⊂ | ⊂ | ✠ | ● | ●⊂ | ●⊂ | | | |
| K | Cast iron | ●⊂ | | | | | ● | ●⊂ | ●⊂ | ●⊂ | ●⊂ | ●⊂ |
| N | Non-ferrous | | | | | | | | | | | |
| S | Superalloys | | | | | | ● | ●⊂ | | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T6120 | T6130 | AH630 | AH645 | AH110 | AH120 | GH330 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | 28 | DNMG150404-28 | 0.4 | | | | | | | ● | | | | |
| | | DNMG150408-28 | 0.8 | | | | | | | ● | | | | |
| | | | | | | | | | | | | | | |
| | 33 | DNMG150404-33 | 0.4 | | | | | | ● | | | | | |
| | | DNMG150408-33 | 0.8 | | | | | | ● | | | | | ● |
| | | | | | | | | | | | | | | |
| | 37 | DNMG150404-37 | 0.4 | | | | | | | | | | ● | |
| | | DNMG150408-37 | 0.8 | | | | | | | | ● | | ● | |
| | |  | | | | | | | | | | | | |
| | 38 | DNMG150412-38 | 1.2 | ● | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | Parallel | DNGG150404R | 0.4 | | | | | | | | | ● | ● | |
| | | DNGG150404L | 0.4 | | | | | | | | | ● | ● | |
| | | DNGG150408R | 0.8 | | | | | | | | | | ● | |
| | | DNGG150408L | 0.8 | | | | | | | | | | ● | |
| | |  | | | | | | | | | | | | |
| | SM | DNMG110404E-SM | 0.4 | | ● | ● | ● | | | | | | | |
| | | DNMG110408E-SM | 0.8 | | ● | ● | ● | | | | | | | |
| | | DNMG150404-SM | 0.4 | | ● | ● | ● | ● | | | | | | |
| | | DNMG150408-SM | 0.8 | | ● | ● | ● | ● | | | | | | |
| | | DNMG150412-SM | 1.2 | | ● | ● | ● | ● | | | | | | |
| | | DNMG150604-SM | 0.4 | | ● | ● | ● | ● | | | | | | |
| | | DNMG150608-SM | 0.8 | | ● | ● | ● | ● | | | | | | |
| | | DNMG150612-SM | 1.2 | | ● | ● | ● | ● | | | | | | |
| | | | | | | | | | | | | | | |

● : Line up

External toolholders → B199 -
J series toolholders → B342
Internal toolholders → B276 -
TungCap → B215 -, B317, F068 -

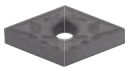
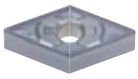
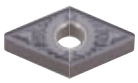
# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | | | NS9530 | | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ⊂✠ | ✠ | ✠ | ⊂✠ | ✠ | | | | | ●⊂ | | | | ● | ●⊂ | | | ●⊂ | | | | ● | | | |
| M | Stainless | | | ⊂ | ⊂ | ✠ | | | | | ●⊂ | ● | ⊂ | | ● | ●⊂ | | | | | | | ● | | | |
| K | Cast iron | | | | | | ●⊂ | ● | ⊂ | ✠ | ●⊂ | | | | ● | ●⊂ | | | ●⊂ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | ●⊂ | ● | ⊂ | ⊂ | ● | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | | | NS9530 | | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | CM | DNMG150404-CM | 0.4 | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | DNMG150408-CM | 0.8 | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | DNMG150412-CM | 1.2 | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| |  | DNMG150604-CM | 0.4 | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | DNMG150608-CM | 0.8 | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | DNMG150612-CM | 1.2 | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | P | DNGG150402R-P | 0.2 | | | | | | | | | | | | | | ● | | | | | | | | ● | | | |
| | | DNGG150402L-P | 0.2 | | | | | | | | | | | | | | ● | | | | | | | | ● | | | |
| | | DNGG150404R-P | 0.4 | | | | | | | | | | | | | | ● | | | | | | | | ● | | | |
| | | DNGG150404L-P | 0.4 | | | | | | | | | | | | | | ● | | | | | | | | ● | | | |
| | | DNGG150408R-P | 0.8 | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | DNGG150408L-P | 0.8 | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| Finishing to medium cutting | HRM | DNMG150404-HRM | 0.4 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | DNMG150408-HRM | 0.8 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | DNMG150412-HRM | 1.2 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| |  | DNMG150604-HRM | 0.4 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | DNMG150608-HRM | 0.8 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | DNMG150612-HRM | 1.2 | | | | | | | | | | | ● | ● | | | | | | | | | | | | | |
| Medium cutting | HMM | DNMG150404-HMM | 0.4 | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | | DNMG150408-HMM | 0.8 | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| |  | DNMG150412-HMM | 1.2 | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | SA | DNMG150404-SA | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150408-SA | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150604-SA | 0.4 | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | | DNMG150608-SA | 0.8 | | | | | | | | | | ● | | | | | | | | | | | | | | | |
| | S | DNMG150404R-S | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | ● | | | | | | | |
| | | DNMG150404L-S | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | ● | | | | | | | |
| | | DNMG150408R-S | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | ● | | | | | | | |
| | | DNMG150408L-S | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | ● | | | | | | | |
| | | DNMG150604R-S | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150604L-S | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | DNMG150608R-S | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | ● | | | | | | | | | | |
| | | DNMG150608L-S | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B205 -
J series toolholders → B342
Internal toolholders → B295 -
TungCap → B215 -, F068 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° with hole**

| | | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | GT720 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | Coated cermet | Cermet | Uncoated | Ceramics | | |
| P | Steel | ●ⓒ | ⓒ✠ | ✠ | ✠ | ⓒ✠ | ✠ | | | | | ●ⓒ | ●ⓒ | ●ⓒ | ● | | | |
| M | Stainless | | | | ⓒ | ⓒ | ✠ | | | | | ●ⓒ | | | ● | | | |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ● | ⓒ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | | ●ⓒ | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | GT720 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium to heavy cutting | TH | DNMG150408-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | |
| | | DNMG150412-TH | 1.2 | ● | ● | ● | | | | | | | | ● | | | | | | |
| | | DNMG150416-TH | 1.6 | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150608-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | |
| | | DNMG150612-TH | 1.2 | ● | ● | ● | | | | | | | | ● | | | | | | |
| | | DNMG150616-TH | 1.6 | ● | ● | ● | | | | | | | | | | | | | | |
| | THS | DNMG150408-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | |
| | | DNMG150412-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | |
| | | DNMG150416-THS | 1.6 | ● | ● | | | | | | | | | | | | | | | |
| | | DNMG150608-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | |
| | | DNMG150612-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | |
| | | DNMG150616-THS | 1.6 | ● | ● | | | | | | | | | | | | | | | |
| | SH | DNMG150408-SH | 0.8 | | | | ● | ● | ● | | | | | | | | | | | |
| | | DNMG150412-SH | 1.2 | | | | ● | ● | ● | | | | | | | | | | | |
| | | DNMG150416-SH | 1.6 | | | | ● | ● | ● | | | | | | | | | | | |
| | | DNMG150608-SH | 0.8 | | | | ● | ● | ● | | | | | | | | | | | |
| | | DNMG150612-SH | 1.2 | | | | ● | ● | ● | | | | | | | | | | | |
| | CH | DNMG150404-CH | 0.4 | | | | | | | | ● | ● | ● | | | | | | | |
| | | DNMG150408-CH | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | |
| | | DNMG150412-CH | 1.2 | | | | | | | ● | ● | ● | ● | | | | | | | |
| | | DNMG150604-CH | 0.4 | | | | | | | | ● | ● | ● | | | | | | | |
| | | DNMG150608-CH | 0.8 | | | | | | | | ● | ● | ● | | | | | | | |
| | | DNMG150612-CH | 1.2 | | | | | | | | ● | ● | ● | | | | | | | |
| Finishing to medium cutting | - | DNMA150404 | 0.4 | | | | | | | ● | ● | ● | ● | | ● | ● | ● | | | |
| | | DNMA150408 | 0.8 | | | | | | | ● | ● | ● | ● | | | | ● | | | |
| | | DNMA150412 | 1.2 | | | | | | | | ● | ● | ● | | | | | | | |
| | | DNMA150604 | 0.4 | | | | | | | ● | ● | ● | ● | | | | | | | |
| | | DNMA150608 | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | |
| | | DNMA150612 | 1.2 | | | | | | | | ● | ● | ● | | | | | | | |
| | - | DNGA150404 | 0.4 | | | | | | | | | | | | | ● | ● | | ● | ● |
| | | DNGA150408 | 0.8 | | | | | | | | | | | | | ● | ● | ● | ● | ● |
| | | DNGA150412 | 1.2 | | | | | | | | | | | | | | | ● | ● | ● |
| | | DNGA150416 | 1.6 | | | | | | | | | | | | | | | ● | | |
| | | DNGA150608 | 0.8 | | | | | | | | | | | | | | | | | ● |
| | | DNGA150612 | 1.2 | | | | | | | | | | | | | | | | | ● |
| | | DNGA150616 | 1.6 | | | | | | | | | | | | | | | | | ● |
| | | DNGA150620 | 2.0 | | | | | | | | | | | | | | | | | ● |

● : Line up

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 55° without hole**

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | ● |

| Application | Chipbreaker | Designation | Corner radius | Ceramics FX105 | Ceramics LX11 |
|---|---|---|---|---|---|
| Finishing to medium cutting | - | DNGD150708 | 0.8 | ● | |
| | | DNGD150712 | 1.2 | ● | |
| | | DNGD150716 | 1.6 | ● | |
| | - | DNGN150404 | 0.4 | | ● |
| | | DNGN150408 | 0.8 | | ● |
| | | DNGN150412 | 1.2 | ● | ● |
| | | DNGN150416 | 1.6 | ● | |
| | | DNGN150708 | 0.8 | | ● |
| | | DNGN150712 | 1.2 | | ● |
| | | DNGN150716 | 1.6 | | ● |

● : Line up

External toolholders → **B205 -**
J series toolholders → **B342**
Internal toolholders → **B295 -**
TungCap → **B215 -, F068 -**

DNGD... : External toolholders → **B254 -**

DNGN... : External toolholders → **B235**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Round, with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | Uncoated | Ceramics |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ● | |
| M | Stainless | | | | | ●ⓒ | ● | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | ● | |
| S | Superalloys | | | | | ●ⓒ | | |
| H | Hard materials | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|
| Heavy cutting | 61 | RNMG090300-61 | - | | ● | ● | | | | |
| | | RNMG120400-61 | - | ● | ● | ● | ● | ● | ● | |
| | | RNMG150600-61 | - | | ● | ● | | | | |
| | | RNMG190600-61 | - | | ● | ● | ● | | | |
| | | RNMG250900-61 | - | | ● | ● | | | | |
| Finishing to medium cutting | - | RNGA120400 | - | | | | | | | ● |

**Round, without hole**

| | | FX105 | LX11 |
|---|---|---|---|
| | | Ceramics | |
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | ●ⓒ | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | | ● |

| Application | Chipbreaker | Designation | Corner radius | FX105 | LX11 |
|---|---|---|---|---|---|
| Finishing to medium cutting | - | RNGN120400 | - | ● | ● |
| | | RNGN120700 | - | ● | ● |

● : Line up

RNMG..., RNGA... : External toolholders → **B211 -**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9115 | T9125 | GT9530 | NS9530 | NS520 | X407 |
|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ◐✠ | ●◐ | ●◐ | ●◐ | ● |
| M | Stainless | | | | | | |
| K | Cast iron | ●◐ | | ●◐ | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | |
| S | Superalloys | | | | | | |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 (Coated) | T9125 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | NS520 (Cermet) | X407 (Cermet) |
|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | TF | SNMG120404-TF | 0.4 | | | | ● | | |
| | | SNMG120408-TF | 0.8 | | | | ● | | |
| | 01 | SNGG090302-01 | 0.2 | | | | ● | ● | |
| | | SNGG090304-01 | 0.4 | | | | ● | | |
| | | SNGG090308-01 | 0.8 | | | | ● | ● | |
| | | SNGG120402-01 | 0.2 | | | | ● | | |
| | | SNGG120404-01 | 0.4 | | | | ● | | |
| | | SNGG120408-01 | 0.8 | | | | ● | ● | |
| | B ~ D | SNGG090304R-B | 0.4 | | | ● | ● | | ● |
| | | SNGG090304L-B | 0.4 | | | ● | ● | | ● |
| | | SNGG090308R-B | 0.8 | | | | ● | | ● |
| | | SNGG090308L-B | 0.8 | | | | ● | | ● |
| | | SNGG120404R-C | 0.4 | | | ● | ● | | |
| | | SNGG120404L-C | 0.4 | | | ● | ● | | ● |
| | | SNGG120408R-C | 0.8 | | | | ● | | |
| | | SNGG120408L-C | 0.8 | | | | ● | | ● |
| | | SNGG120408R-D | 0.8 | | | | ● | | |
| | | SNGG120408L-D | 0.8 | | | | ● | | |
| Finishing | TSF | SNMG120404-TSF | 0.4 | ● | ● | ● | ● | | |
| | | SNMG120408-TSF | 0.8 | ● | ● | ● | ● | | |
| | | SNMG120412-TSF | 1.2 | ● | ● | | | | |

● : Line up

External toolholders → B208 -
Cartridges → F171 -
Internal toolholders → B293 -

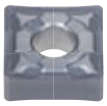
# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | Cermet | Uncoated |
| P | Steel | ◐ | ✣ | ◐✣ | | | | | ●◐ | ● |
| M | Stainless | ● | ◐ | ◐ | | | ● | ◐ | | ● |
| K | Cast iron | | | | ● | ◐ | | | ●◐ | ● |
| N | Non-ferrous | | | | | | | | | ● |
| S | Superalloys | | | | | | ● | ◐ | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | 11 | SNMG120404-11 | 0.4 | | | | | | | | ● | |
| | | SNMG120408-11 | 0.8 | | | | | | | | ● | ● |
| | | | | | | | | | | | | |
| Finishing of mild steels | 17 | SNMG120408-17 | 0.8 | | | | | | | | ● | |
| | | | | | | | | | | | | |
| Finishing | SF | SNMG120404-SF | 0.4 | ● | ● | ● | | | | | | |
| | | SNMG120408-SF | 0.8 | ● | ● | ● | | | | | | |
| | | | | | | | | | | | | |
| | CF | SNMG120408-CF | 0.8 | | | | ● | ● | | | | |
| | | SNMG120412-CF | 1.2 | | | | ● | ● | | | | |
| | | | | | | | | | | | | |
| | HRF | SNMG120408-HRF | 0.8 | | | | | | ● | ● | | |
| | | SNMG120412-HRF | 1.2 | | | | | | ● | ● | | |
| |  | | | | | | | | | | | |

● : Line up

External toolholders → B208 -
Cartridges → F171 -
Internal toolholders → B293 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | GH330 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | ●ⓒ | ●ⓒ | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●ⓒ | | | |
| H | Hard materials | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | GH330 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | Coated cermet | Cermet |
| Finishing | TS | SNMG120404-TS | 0.4 | | ● | ● | | | | | | | | ● | ● |
| | | SNMG120408-TS | 0.8 | ● | ● | ● | ● | | | | | | | ● | ● |
| | | SNMG120412-TS | 1.2 | | ● | ● | ● | | | | | | | | |
| High feed, small depth of cut | AS | SNMG120404-AS | 0.4 | | | | | | | | | | | | ● |
| | | SNMG120408-AS | 0.8 | ● | ● | | | | | | | | | | ● |
| Finishing | NS | SNMG120408-NS | 0.8 | | ● | ● | | | | | | | | | |
| | SS | SNMG120404-SS | 0.4 | | | | | ● | ● | ● | ● | | ● | | |
| | | SNMG120408-SS | 0.8 | | | | | ● | ● | ● | ● | | ● | | |
| | | SNMG120412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | |
| Medium cutting | TM | SNMG090304-TM | 0.4 | | ● | ● | ● | | | | | | | | |
| | | SNMG090308-TM | 0.8 | | ● | ● | ● | | | | | | | | |
| | | SNMG120404-TM | 0.4 | | ● | ● | | | | | | ● | | | |
| | | SNMG120408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | | | |
| | | SNMG120412-TM | 1.2 | ● | ● | ● | ● | | | | | ● | | | |
| | | SNMG120416-TM | 1.6 | | ● | ● | ● | | | | | | | | |
| | | SNMG150608-TM | 0.8 | | ● | | | | | | | | | | |
| | | SNMG150612-TM | 1.2 | | ● | | | | | | | ● | | | |
| | | SNMG190608-TM | 0.8 | | ● | | | | | | | | | | |
| | | SNMG190612-TM | 1.2 | | ● | | | | | | | ● | | | |

● : Line up

External toolholders → **B208 -** Internal toolholders → **B293 -**
Cartridges → **F171 -**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | | GT720 | | | | NS9530 | NS520 | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ✠ | | | | | ● | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | | ● | | | |
| M | Stainless | | | | | ⓒ | | | | | ● | ●ⓒ | | | | | | | | | | | ● | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | ●ⓒ | ● | ⓒ | ✠ | ● | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | ● | ●ⓒ | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6130 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | | GT720 | | | | NS9530 | NS520 | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | **ZM** | **SNMG120408-ZM** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG120412-ZM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **DM** | **SNMG120408-DM** | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | **SNMG120412-DM** | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | **All-round** | **SNMG090304** | 0.4 | | ● | ● | | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | **SNMG090308** | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | ● | | | | ● | | | |
| | | **SNMG120404** | 0.4 | | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | | | | ● | ● | | | ● | | | |
| | | **SNMG120408** | 0.8 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | ● | | | ● | | | |
| | | **SNMG120412** | 1.2 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | | ● | | | |
| | | **SNMG120416** | 1.6 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | **SNMG120420** | 2.0 | | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | | | | |
| | | **SNMG150612** | 1.2 | | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | **SNMG150616** | 1.6 | | ● | ● | | | ● | | | | | | | | | | | | | | | | | | | |
| | | **SNMG190612** | 1.2 | | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | |
| | | **SNMG190616** | 1.6 | | ● | ● | ● | | ● | ● | ● | ● | | ● | | | | | | | | | | | | | | |
| | | **SNMG250724** | 2.4 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | **27** | **SNMG120408-27** | 0.8 | | | ● | | | | | | | | | | | | | | | ● | | | | | | | |
| | | **SNMG120412-27** | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → **B208 -**
Cartridges → **F171 -**
Internal toolholders → **B293 -**

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9115 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | GH110 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Cermet | Uncoated |
| P | Steel | ●⊂ | ⊂ | ✠ | ⊂✠ | ✠ | | | | ⊂ | | | ● | ●⊂ | ●⊂ | ● |
| M | Stainless | | ● | ⊂ | ⊂ | ✠ | | | | ⊂ | ● | ⊂ | ● | ●⊂ | | ● |
| K | Cast iron | ●⊂ | | | | | ● | ⊂ | ✠ | ⊂ | | | ● | ●⊂ | ●⊂ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ● | ● | ⊂ | ● | | | |
| H | Hard materials | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH725 | AH8005 | AH8015 | GH110 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | 37 | SNMG120408-37 | 0.8 | ● | | | | | | | | | | | | ● | ● | |
| | SM | SNMG120408-SM | 0.8 | | ● | ● | ● | ● | | | | ● | | | | | | |
| | | SNMG120412-SM | 1.2 | | ● | ● | ● | ● | | | | | | | | | | |
| | CM | SNMG120408-CM | 0.8 | | | | | | ● | ● | ● | | | | | | | |
| | | SNMG120412-CM | 1.2 | | | | | | ● | ● | ● | | | | | | | |
| | P | SNGG090304R-P | 0.4 | | | | | | | | | | | | ● | | | ● |
| | | SNGG090304L-P | 0.4 | | | | | | | | | | | | ● | | | ● |
| | | SNGG090308R-P | 0.8 | | | | | | | | | | | | ● | ● | | ● |
| | | SNGG090308L-P | 0.8 | | | | | | | | | | | | | | | ● |
| | | SNGG120404R-P | 0.4 | | | | | | | | | | | | ● | | | ● |
| | | SNGG120404L-P | 0.4 | | | | | | | | | | | | ● | | | ● |
| | | SNGG120408R-P | 0.8 | | | | | | | | | | | | ● | | | ● |
| | | SNGG120408L-P | 0.8 | | | | | | | | | | | | ● | | | ● |
| Finishing to medium cutting | HRM | SNMG120408-HRM | 0.8 | | | | | | | | | | ● | ● | | | | |
| | | SNMG120412-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | SNMG150608-HRM | 0.8 | | | | | | | | | | ● | ● | | | | |
| | | SNMG150612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | SNMG190612-HRM | 1.2 | | | | | | | | | | ● | ● | | | | |
| | | SNMG190616-HRM | 1.6 | | | | | | | | | | ● | ● | | | | |

● : Line up

External toolholders → **B208 -**
Cartridges → **F171 -**
Internal toolholders → **B293 -**

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH905 | GH330 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | Cermet | Uncoated |
| P | Steel | ● | ●⊂ | ⊂✠ | ✠ | ⊂ | ✠ | ⊂✠ | ✠ | ●⊂ | | ●⊂ | ●⊂ | |
| M | Stainless | | | | | ● | ⊂ | ⊂ | ✠ | ●⊂ | | ●⊂ | | |
| K | Cast iron | ●⊂ | ●⊂ | | | | | | | ●⊂ | | ●⊂ | ●⊂ | ⊂✠ |
| N | Non-ferrous | | | | | | | | | | | | | ⊂✠ |
| S | Superalloys | | | | | | | | | ●⊂ | ⊂ | | | ⊂✠ |
| H | Hard materials | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH905 | GH330 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | HMM | SNMG120408-HMM | 0.8 | | | | | | | | | | ● | | | |
| | | SNMG120412-HMM | 1.2 | | | | | | | | | | ● | | | |
| | | | | | | | | | | | | | | | | |
| | SA | SNMG120404-SA | 0.4 | | | | | ● | ● | ● | ● | ● | | | | |
| | | SNMG120408-SA | 0.8 | | | | | ● | ● | ● | ● | ● | | | | ● |
| | | SNMG120412-SA | 1.2 | | | | | ● | ● | ● | ● | ● | | | | |
| | | SNMG190612-SA | 1.2 | | | | | | | | | | | | | ● |
| | | | | | | | | | | | | | | | | |
| | S | SNMG120404R-S | 0.4 | | | ● | ● | | ● | ● | ● | | | | ● | |
| | | SNMG120404L-S | 0.4 | | | ● | ● | | ● | ● | ● | | | | ● | |
| | | SNMG120408R-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | ● | |
| | | SNMG120408L-S | 0.8 | | | ● | ● | | ● | ● | ● | | | ● | ● | |
| | | | | | | | | | | | | | | | | |
| Medium to heavy cutting | TH | SNMG120408-TH | 0.8 | | ● | ● | ● | | | | | ● | | | | |
| | | SNMG120412-TH | 1.2 | | ● | ● | ● | | | | | ● | | | | |
| | | SNMG150612-TH | 1.2 | ● | ● | ● | | | | | | ● | | | | |
| | | SNMG150616-TH | 1.6 | ● | ● | ● | | | | | | ● | | | | |
| | | SNMG190612-TH | 1.2 | ● | ● | ● | ● | | | | | ● | | | | |
| | | SNMG190616-TH | 1.6 | ● | ● | ● | ● | | | | | ● | | | | |
| | | | | | | | | | | | | | | | | |
| | THS | SNMG120408-THS | 0.8 | | ● | ● | ● | | | | | | | | | |
| | | SNMG120412-THS | 1.2 | | ● | ● | ● | | | | | | | | | |
| | | SNMG150612-THS | 1.2 | | ● | ● | | | | | | | | | | |
| | | SNMG150616-THS | 1.6 | | ● | ● | | | | | | | | | | |
| | | SNMG190608-THS | 0.8 | | ● | ● | ● | | | | | | | | | |
| | | SNMG190612-THS | 1.2 | | ● | ● | ● | | | | | | | | | |
| | | SNMG190616-THS | 1.6 | | ● | ● | ● | | | | | | | | | |
| | | SNMG190624-THS | 2.4 | | ● | ● | ● | | | | | | | | | |
| | | SNMG250716-THS | 1.6 | | ● | ● | ● | | | | | | | | | |
| | | SNMG250724-THS | 2.4 | | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B208 -
Cartridges → F171 -
Internal toolholders → B293 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✠ | ✠ | ✠ | ⓒ✠ | ✠ | | | |
| M | Stainless | | | | ⓒ | ⓒ | ✠ | | | |
| K | Cast iron | ●ⓒ | | | | | | ● | ⓒ | ✠ |
| N | Non-ferrous | | | | | | | | | |
| S | Superalloys | | | | | | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | |
| Medium to heavy cutting (Single sided) | TRS | SNMM150612-TRS | 1.2 | ● | ● | ● | | | | | | |
| | | SNMM150616-TRS | 1.6 | ● | ● | ● | | | | | | |
| | | SNMM190616-TRS | 1.6 | ● | ● | ● | | | | | | |
| | | SNMM190624-TRS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250924-TRS | 2.4 | ● | ● | ● | | | | | | |
| Heavy cutting (Single sided) | TU | SNMM190616-TU | 1.6 | | | ● | | | | | | |
| | | SNMM190624-TU | 2.4 | | ● | ● | | | | | | |
| | | SNMM250724-TU | 2.4 | | ● | ● | | | | | | |
| | | SNMM250924-TU | 2.4 | ● | ● | | | | | | | |
| | TUS | SNMM190612-TUS | 1.2 | ● | ● | ● | | | | | | |
| | | SNMM190616-TUS | 1.6 | ● | ● | ● | | | | | | |
| | | SNMM190624-TUS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250724-TUS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250732-TUS | 3.2 | ● | ● | | | | | | | |
| | | SNMM250924-TUS | 2.4 | ● | ● | ● | | | | | | |
| | | SNMM250932-TUS | 3.2 | ● | ● | | | | | | | |
| Medium to heavy cutting | SH | SNMG120408-SH | 0.8 | | | | ● | ● | ● | | | |
| | | SNMG120412-SH | 1.2 | | | | ● | ● | ● | | | |
| | | SNMG150612-SH | 1.2 | | | | ● | ● | ● | | | |
| | | SNMG150616-SH | 1.6 | | | | ● | ● | ● | | | |
| | | SNMG190612-SH | 1.2 | | | | ● | ● | ● | | | |
| | | SNMG190616-SH | 1.6 | | | | ● | ● | ● | | | |
| | CH | SNMG120408-CH | 0.8 | | | | | | | ● | ● | ● |
| | | SNMG120412-CH | 1.2 | | | | | | | ● | ● | ● |
| | | SNMG120416-CH | 1.6 | | | | | | | ● | ● | ● |

● : Line up

External toolholders → B208 -
Cartridges → F171 -
Internal toolholders → B293 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° with hole**

| | | T515 | T5105 | T5115 | T5125 | GT720 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | ●◐ | ●◐ | ● | | | |
| M | Stainless | | | | | | | ● | | | |
| K | Cast iron | ●◐ | ● | ◐ | ✠ | ●◐ | ●◐ | ● | ●◐ | ● | |
| N | Non-ferrous | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T515 | T5105 | T5115 | T5125 | GT720 | NS520 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | Coated cermet | Cermet | Uncoated | Ceramics | | |
| Finishing to medium cutting | - | SNMA090308 | 0.8 | | ● | | | | | ● | | | |
| | | SNMA120404 | 0.4 | | ● | ● | ● | ● | | | | | |
| | | SNMA120408 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | | |
| | | SNMA120412 | 1.2 | ● | ● | ● | ● | | ● | ● | ● | | |
| | | SNMA120416 | 1.6 | | ● | ● | ● | | | | | | |
| | - | SNGA090304 | 0.4 | | | | | | | ● | | | |
| | | SNGA120404 | 0.4 | | | | | ● | | ● | | | ● |
| | | SNGA120408 | 0.8 | | | | | | ● | ● | ● | | ● |
| | | SNGA120412 | 1.2 | | | | | | | ● | ● | ● | ● |
| | | SNGA120416 | 1.6 | | | | | | | | ● | | ● |

● : Line up

External toolholders → **B208 -**
Cartridges → **F171 -**
Internal toolholders → **B293 -**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Square, 90° without hole**

| | | AH120 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ● | | | |
| M | Stainless | ●◐ | ● | | | |
| K | Cast iron | ●◐ | ● | ●◐ | ● | |
| N | Non-ferrous | | ● | | | |
| S | Superalloys | ●◐ | | | | |
| H | Hard materials | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | AH120 (Coated) | TH10 (Uncoated) | FX105 (Ceramics) | LX21 (Ceramics) | LX11 (Ceramics) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | SNGD120712 | 1.2 | | | ● | | |
| | | SNGD120716 | 1.6 | | | ● | | |
| | - | SNGN090308 | 0.8 | | | | ● | ● |
| | | SNGN120304 | 0.4 | | | | | ● |
| | | SNGN120312 | 1.2 | | | | | ● |
| | | SNGN120404 | 0.4 | | | | | ● |
| | | SNGN120408 | 0.8 | | ● | ● | ● | ● |
| | | SNGN120412 | 1.2 | | | ● | ● | ● |
| | | SNGN120416 | 1.6 | | | ● | ● | ● |
| | | SNGN120420 | 2.0 | | | ● | ● | |
| | | SNGN120424 | 2.4 | | | ● | | |
| | | SNGN120708 | 0.8 | | | | | ● |
| | | SNGN120712 | 1.2 | | | ● | | ● |
| | | SNGN120716 | 1.6 | | | ● | | ● |
| | | SNGN120720 | 2.0 | | | | | ● |
| | - | SNMN120408 | 0.8 | | ● | | | |
| | | SNMN120412 | 1.2 | ● | | | | |

● : Line up

SNGD... : External toolholders → **B255**

SNGN..., SNMN... : External toolholders → **B241**, Internal toolholders → **B312**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | GH110 | GH330 | SH725 | GT9530 | GT720 | NS9530 | NS520 | X407 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | Coated cermet | | Cermet | | | Uncoated |
| P | Steel | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ● |
| M | Stainless | ● | ●ⓒ | ●ⓒ | | | | | | ● |
| K | Cast iron | ● | ●ⓒ | | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ● |
| N | Non-ferrous | | | | | | | | | ● |
| S | Superalloys | ● | | | | | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 | GH330 | SH725 | GT9530 | GT720 | NS9530 | NS520 | X407 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | TF | TNMG160404-TF | 0.4 | | | | | | ● | ● | | ● |
| | | TNMG160408-TF | 0.8 | | | | | | ● | ● | | |
| | 01 | TNGG110302-01 | 0.2 | | | | | | ● | | | |
| | | TNGG110304-01 | 0.4 | | | | | | ● | | | |
| | | TNGG110308-01 | 0.8 | | | | | | ● | ● | | |
| | | TNGG160402-01 | 0.2 | ● | | | | | ● | ● | | ● |
| | | TNGG160404-01 | 0.4 | ● | | | | | ● | ● | | ● |
| | | TNGG160408-01 | 0.8 | ● | | | | | ● | ● | | |
| | | TNGG160412-01 | 1.2 | | | | | ● | ● | | | |
| Precision finishing (Sharp edge) | 01 | TNGG160402F-01 | 0.2 | | | ● | | | | | | |
| | | TNGG160404F-01 | 0.4 | | | ● | | | | | | |
| | | TNGG160408F-01 | 0.8 | | | ● | | | | | | |
| Precision finishing | A~C | TNGG110304R-A | 0.4 | | | | ● | | ● | | | |
| | | TNGG110304L-A | 0.4 | | | | ● | | ● | | | |
| | | TNGG110308R-A | 0.8 | | | | ● | | ● | | | |
| | | TNGG110308L-A | 0.8 | | | | ● | | ● | | | |
| | | TNGG160304R-C | 0.4 | | | | | | ● | | ● | |
| | | TNGG160304L-C | 0.4 | | | | | | ● | | | |
| | | TNGG160308R-C | 0.8 | | | | | | ● | | | |
| | | TNGG160308L-C | 0.8 | | | | | | ● | | | |
| | | TNGG160400R-C | 0.03 | | | | | | ● | | | |
| | | TNGG160400L-C | 0.03 | | | | | | ● | | | |
| | | TNGG160402R-C | 0.2 | | | | ● | | ● | | ● | ● |
| | | TNGG160402L-C | 0.2 | | | | ● | | ● | | | |
| | | TNGG160404R-C | 0.4 | ● | ● | | ● | | ● | ● | ● | ● |
| | | TNGG160404L-C | 0.4 | ● | ● | | ● | | ● | | ● | ● |
| | | TNGG160408R-C | 0.8 | ● | ● | | ● | | ● | ● | ● | ● |
| | | TNGG160408L-C | 0.8 | ● | ● | | ● | | ● | | ● | ● |

● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | SH725 | GT9530 | NS9530 | X407 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | Coated cermet | Cermet | | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ● |
| M | Stainless | | | | | ●ⓒ | ●ⓒ | | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | | ●ⓒ | ●ⓒ | | ● |
| N | Non-ferrous | | | | | | | | | | ● |
| S | Superalloys | | | | | ●ⓒ | | | | | |
| H | Hard materials | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | SH725 | GT9530 | NS9530 | X407 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | D | TNGG220404R-D | 0.4 | | | | | | | | ● | ● | |
| | | TNGG220404L-D | 0.4 | | | | | | | | ● | | |
| | | TNGG220408R-D | 0.8 | | | | | | | | ● | ● | |
| | | TNGG220408L-D | 0.8 | | | | | | | | ● | | |
| | W | TNGG160404R-W | 0.4 | | | | | | | | ● | | ● |
| | | TNGG160404L-W | 0.4 | | | | | | | | ● | | ● |
| | | TNGG160408R-W | 0.8 | | | | | | | | ● | | |
| | | TNGG160408L-W | 0.8 | | | | | | | | ● | | |
| Precision finishing (Sharp edge) | W | TNGG160402FR-W | 0.2 | | | | | | ● | | | | |
| | | TNGG160402FL-W | 0.2 | | | | | | ● | | | | |
| | | TNGG160404FR-W | 0.4 | | | | | | ● | | | | |
| | | TNGG160404FL-W | 0.4 | | | | | | ● | | | | |
| | | TNGG160408FR-W | 0.8 | | | | | | ● | | | | |
| | | TNGG160408FL-W | 0.8 | | | | | | ● | | | | |
| Finishing | TSF | TNMG110404E-TSF | 0.4 | | ● | ● | | | | ● | ● | | |
| | | TNMG110408E-TSF | 0.8 | | ● | ● | | | | ● | ● | | |
| | | TNMG160402-TSF | 0.2 | | | | | ● | | ● | ● | | |
| | | TNMG160404-TSF | 0.4 | | ● | ● | ● | ● | | ● | ● | | |
| | | TNMG160408-TSF | 0.8 | ● | ● | ● | ● | ● | | ● | ● | | |
| | | TNMG160412-TSF | 1.2 | | ● | ● | ● | | | ● | | | |
| Finishing (Wiper) | FW | TNMG110404E-FW | 0.4 | | ● | | | | | | | | |
| | | TNMG110408E-FW | 0.8 | | ● | | | | | | | | |
| | | TNMG160404-FW | 0.4 | | ● | | | | | | | | |
| | | TNMG160408-FW | 0.8 | | ● | | | | | | | | |
| Finishing | ZF | TNMG160404-ZF | 0.4 | | ● | ● | ● | | | ● | ● | | |
| | | TNMG160408-ZF | 0.8 | | ● | ● | ● | | | ● | ● | | |
| | | TNMG160412-ZF | 1.2 | | | ● | | | | | | | |

● : Line up

External toolholders → B201 -
J series toolholders → B343 -
Internal toolholders → B276 -
Cartridges → F171 -

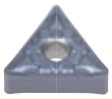
# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9125 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | Cermet | Uncoated |
| P | Steel | ◐✠ | ◐ | ✠ | ◐✠ | | | | | ●◐ | ●◐ | ● |
| M | Stainless | | ● | ◐ | ◐ | | | ● | ◐ | ●◐ | | ● |
| K | Cast iron | | | | | ● | ◐ | | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | ● | ◐ | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GH330 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | 11 | TNMG110304-11 | 0.4 | | | | | | | | | | ● | |
| | | TNMG110308-11 | 0.8 | | | | | | | | | | ● | |
| | | TNMG160402-11 | 0.2 | | | | | | | | | | ● | |
| | | TNMG160404-11 | 0.4 | | | | | | | | | ● | ● | ● |
| | | TNMG160408-11 | 0.8 | | | | | | | | | | ● | |
| | | TNMG220404-11 | 0.4 | | | | | | | | | | ● | |
| | | TNMG220408-11 | 0.8 | | | | | | | | | | ● | |
| Finishing of mild steels | 17 | TNMG160404-17 | 0.4 | ● | | | | | | | | ● | ● | |
| | | TNMG160408-17 | 0.8 | ● | | | | | | | | | ● | |
| Finishing | SF | TNMG160404-SF | 0.4 | | ● | ● | ● | | | | | | | |
| | | TNMG160408-SF | 0.8 | | ● | ● | ● | | | | | | | |
| | | TNMG160412-SF | 1.2 | | ● | ● | ● | | | | | | | |
| | CF | TNMG160404-CF | 0.4 | | | | | ● | ● | | | | | |
| | | TNMG160408-CF | 0.8 | | | | | ● | ● | | | | | |
| | HRF  | TNMG160404-HRF | 0.4 | | | | | | | ● | ● | | | |
| | | TNMG160408-HRF | 0.8 | | | | | | | ● | ● | | | |

● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9105 | T9115 | T9125 | T9135 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | |
| S | Superalloys | | | | | | | |
| H | Hard materials | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | Coated cermet | Cermet | |
| Finishing | TS | TNMG160404-TS | 0.4 | | ● | ● | ● | ● | ● | ● |
| | | TNMG160408-TS | 0.8 | ● | ● | ● | ● | ● | ● | ● |
| | | TNMG160412-TS | 1.2 | ● | ● | ● | ● | | | |
| Finishing to medium cutting (Wiper) | SW | TNMG110408E-SW | 0.8 | | ● | | | | | |
| | | TNMG110412E-SW | 1.2 | | ● | | | | | |
| | | TNMG160408-SW | 0.8 | | ● | | | | | |
| | | TNMG160412-SW | 1.2 | | ● | | | | | |
| High feed, small depth of cut | AS | TNMG160404-AS | 0.4 | | | ● | ● | | ● | |
| | | TNMG160408-AS | 0.8 | ● | ● | ● | ● | | ● | |
| | | TNMG160412-AS | 1.2 | ● | ● | ● | | | | |
| Boring (Double sided) | CB | TNMG110304-CB | 0.4 | | ● | | | | ● | |
| | | TNMG110308-CB | 0.8 | | ● | | | | ● | |
| Finishing | NS | TNMG160404-NS | 0.4 | | ● | ● | | | ● | |
| | | TNMG160408-NS | 0.8 | ● | ● | ● | | | ● | |

● : Line up

External toolholders → B201 -
J series toolholders → B343 -
Internal toolholders → B276 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH330 | GT9530 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | ●ⓒ | ⓒ | ●ⓒ | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ⓒ✠ |
| N | Non-ferrous | | | | | | | | | | | | | | ⓒ✠ |
| S | Superalloys | | | | | | | | | ●ⓒ | ● | | | | ⓒ✠ |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH330 | GT9530 | NS9530 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | SS | TNMG110404E-SS | 0.4 | | | | | | | ● | ● | | | | | | |
| | | TNMG110408E-SS | 0.8 | | | | | | | ● | ● | | | | | | |
| | | TNMG160404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | ● |
| | | TNMG160408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | ● |
| | | TNMG160412-SS | 1.2 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | TNMG220404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | TNMG220408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | | | |
| | | TNMG220412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | |
| Medium cutting | TM | TNMG110304-TM | 0.4 | | ● | ● | ● | | | | | | | | | | |
| | | TNMG110308-TM | 0.8 | | ● | ● | ● | | | | | | | | | | |
| | | TNMG110404E-TM | 0.4 | | ● | ● | | | | | | | | | | | |
| | | TNMG110408E-TM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | TNMG110412E-TM | 1.2 | | ● | ● | | | | | | | | | | | |
| | | TNMG160404-TM | 0.4 | | ● | ● | ● | | | | | ● | ● | | | | |
| | | TNMG160408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | ● | | | | |
| | | TNMG160412-TM | 1.2 | ● | ● | ● | ● | | | | | | | | | | |
| | | TNMG220404-TM | 0.4 | | | ● | | | | | | ● | | | | | |
| | | TNMG220408-TM | 0.8 | ● | ● | ● | ● | | | | | ● | | | | | |
| | | TNMG220412-TM | 1.2 | | ● | ● | ● | | | | | ● | | | | | |
| | | TNMG220416-TM | 1.6 | | ● | ● | | | | | | | | | | | |
| Finishing to medium cutting | AM | TNMG160408-AM | 0.8 | | ● | ● | | | | | | | | | | | |
| | | TNMG160412-AM | 1.2 | | ● | ● | | | | | | | | | | | |
| | NM | TNMG160408-NM | 0.8 | | | ● | | | | | | | | | | | |
| | | TNMG160412-NM | 1.2 | | ● | ● | | | | | | | | | | | |
| | TQ | TNMG160404-TQ | 0.4 | | | | | | | | | | | | ● | ● | |
| | | TNMG160408-TQ | 0.8 | | | | | | | | | | | | ● | ● | |

● : Line up

External toolholders → B201 -
J series toolholders → B343 -
Internal toolholders → B276 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH630 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | | GT9530 | GT720 | | | NS9530 | NS520 | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ● | ●◐ | ◐✣ | ✣ | ◐✣ | | | | | ● | ●◐ | | | ●◐ | ●◐ | | | ●◐ | ●◐ | | | ● | | | |
| M | Stainless | | | | | ◐ | | | | | ● | ●◐ | | | | | | | | | | | ● | | | |
| K | Cast iron | ●◐ | ●◐ | | | | ●◐ | ● | ◐ | ✣ | ● | ●◐ | | | ●◐ | ●◐ | | | ●◐ | ●◐ | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | ● | ●◐ | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH630 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | | | GT9530 | GT720 | | | NS9530 | NS520 | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | ZM | TNMG160404-ZM | 0.4 | | ● | ● | ● | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG160408-ZM | 0.8 | | ● | ● | ● | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG160412-ZM | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-ZM | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | DM | TNMG160408-DM | 0.8 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160412-DM | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | All-round | TNMG110304 | 0.4 | | ● | ● | | | | ● | ● | ● | | | | | | | | | ● | | | | ● | | | |
| | | TNMG110308 | 0.8 | | ● | ● | | | | ● | ● | ● | | | | | | | | | ● | | | | ● | | | |
| | | TNMG160304 | 0.4 | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | TNMG160308 | 0.8 | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | TNMG160404 | 0.4 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | ● | ● | | | ● | | | |
| | | TNMG160408 | 0.8 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | ● | | | ● | ● | | | ● | | | |
| | | TNMG160412 | 1.2 | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | | | | | | | | ● | | | |
| | | TNMG160416 | 1.6 | | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | ● | | | |
| | | TNMG160420 | 2.0 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220408 | 0.8 | ● | ● | ● | ● | | | ● | ● | ● | | | | | | | | | | | | | ● | | | |
| | | TNMG220412 | 1.2 | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | | | | | | | | | ● | | | |
| | | TNMG220416 | 1.6 | | ● | ● | | ● | | ● | ● | ● | | | | | | | | | | | | | ● | | | |
| | | TNMG270608 | 0.8 | | | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TNMG270612 | 1.2 | | | ● | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TNMG270616 | 1.6 | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| Finishing to medium cutting | 27 | TNMG160404-27 | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160408-27 | 0.8 | | ● | ● | | | | | | | | | | | | | | | ● | | | | | | | |
| | | TNMG160412-27 | 1.2 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220404-27 | 0.4 | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220408-27 | 0.8 | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-27 | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | GH330 | GT720 | | | | NS9530 | | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ●⊂ | ⊂✠ | ✠ | ⊂ | ✠ | ⊂✠ | ✠ | | | | | ●⊂ | ⊂ | ●⊂ | ●⊂ | | | | ●⊂ | | | | ● | | | |
| M | Stainless | | | | ● | ⊂ | ⊂ | ✠ | | | | | ●⊂ | ⊂ | ●⊂ | | | | | | | | | ● | | | |
| K | Cast iron | ●⊂ | | | | | | | ●⊂ | ● | ⊂ | ✠ | ●⊂ | ⊂ | ●⊂ | ●⊂ | | | | ●⊂ | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | | | | ●⊂ | ● | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | GH330 | GT720 | | | | NS9530 | | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | 28 | TNMG160404-28 | 0.4 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TNMG160408-28 | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TNMG220404-28 | 0.4 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | | TNMG220408-28 | 0.8 | | | | | | | | | | | | ● | | | | | | | | | | | | | | |
| | 33 | TNMG160404-33 | 0.4 | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | TNMG160408-33 | 0.8 | | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| | | TNMG160416-33 | 1.6 | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220404-33 | 0.4 | | ● | | | | | | | | | | | | | ● | | | | | | | | | | | |
| | | TNMG220412-33 | 1.2 | | | ● | | | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220416-33 | 1.6 | | ● | | | | | | | | | | | | | | | | | | | | | | | | |
| | 37 | TNMG160404-37 | 0.4 | ● | | | | | | | | | | | | | ● | | | | | ● | | | | | | | |
| | | TNMG160408-37 | 0.8 | ● | | | | | | | | | | | | | ● | | | | | ● | | | | | | | |
| | 38 | TNMG160404-38 | 0.4 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | | TNMG160408-38 | 0.8 | | | | | | | | | | | | | | ● | | | | | | | | | | | | |
| | SM | TNMG110404E-SM | 0.4 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMG110408E-SM | 0.8 | | | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | | TNMG160404-SM | 0.4 | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| | | TNMG160408-SM | 0.8 | | | | ● | ● | ● | ● | | | | | | ● | | | | | | | | | | | | | |
| | | TNMG160412-SM | 1.2 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TNMG220408-SM | 0.8 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-SM | 1.2 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | CM | TNMG160404-CM | 0.4 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG160408-CM | 0.8 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG160412-CM | 1.2 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG220408-CM | 0.8 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |
| | | TNMG220412-CM | 1.2 | | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B201 -
J series toolholders → B343 -
Internal toolholders → B276 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T6120 | T6130 | AH630 | AH645 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | SH725 | | | | NS9530 | | | | TH10 | KS20 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | |
| P | Steel | ⊂ | ✠ | ⊂✠ | ✠ | ●⊂ | | | | ● | ●⊂ | ●⊂ | | | | ●⊂ | | | | ● | | | | | | | |
| M | Stainless | ● | ⊂ | ⊂ | ✠ | ●⊂ | ● | ⊂ | | ● | ●⊂ | ●⊂ | | | | | | | | ● | | | | | | | |
| K | Cast iron | | | | | ●⊂ | | | | ● | ●⊂ | | | | | ●⊂ | | | | ● | ⊂✠ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | ● | ⊂✠ | | | | | | |
| S | Superalloys | | | | | ●⊂ | ● | ⊂ | ⊂ | ● | | | | | | | | | | | ⊂✠ | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T6120 | T6130 | AH630 | AH645 | AH120 | AH8005 | AH8015 | AH905 | GH110 | GH330 | SH725 | NS9530 | TH10 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | P | TNGG160402R-P | 0.2 | | | | | | | | | ● | ● | | ● | ● | |
| | | TNGG160402L-P | 0.2 | | | | | | | | | ● | ● | | ● | ● | |
| | | TNGG160404R-P | 0.4 | | | | | | | | | ● | ● | | ● | ● | |
| | | TNGG160404L-P | 0.4 | | | | | | | | | ● | ● | | ● | ● | |
| | | TNGG160408R-P | 0.8 | | | | | | | | | ● | ● | | ● | ● | |
| | | TNGG160408L-P | 0.8 | | | | | | | | | ● | ● | | ● | ● | |
| Medium cutting (Sharp edge) | P | TNGG160402FR-P | 0.2 | | | | | | | | | | | ● | | | |
| | | TNGG160402FL-P | 0.2 | | | | | | | | | | | ● | | | |
| | | TNGG160404FR-P | 0.4 | | | | | | | | | | | ● | | | |
| | | TNGG160404FL-P | 0.4 | | | | | | | | | | | ● | | | |
| | | TNGG160408FR-P | 0.8 | | | | | | | | | | | ● | | | |
| | | TNGG160408FL-P | 0.8 | | | | | | | | | | | ● | | | |
| Finishing to medium cutting | HRM | TNMG160404-HRM | 0.4 | | | | | | ● | ● | | | | | | | |
| | | TNMG160408-HRM | 0.8 | | | | | | ● | ● | | | | | | | |
| | | TNMG160412-HRM | 1.2 | | | | | | ● | ● | | | | | | | |
| Medium cutting | HMM | TNMG160404-HMM | 0.4 | | | | | | | | ● | | | | | | |
| | | TNMG160408-HMM | 0.8 | | | | | | | | ● | | | | | | |
| | | TNMG160412-HMM | 1.2 | | | | | | | | ● | | | | | | |
| | SA | TNMG160404-SA | 0.4 | ● | ● | ● | ● | ● | | | | | | | | | |
| | | TNMG160408-SA | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | ● |
| | | TNMG160412-SA | 1.2 | ● | ● | ● | ● | ● | | | | | | | | | ● |
| | | TNMG220408-SA | 0.8 | ● | ● | ● | ● | ● | | | | | | | | | ● |
| | | TNMG220412-SA | 1.2 | ● | ● | ● | ● | | | | | | | | | | |

● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ◐✠ | ✠ | ✠ | ◐✠ | ✠ | | | | | ●◐ | ◐ | ●◐ | | | | ●◐ | | | | | | | | | |
| M | Stainless | | | | ◐ | ◐ | ✠ | | | | | ●◐ | ◐ | ●◐ | | | | | | | | | | | | | |
| K | Cast iron | ●◐ | | | | | | ●◐ | ● | ◐ | ✠ | ●◐ | ◐ | ●◐ | | | | ●◐ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | ●◐ | ● | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | GH330 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | | | | | | | Cermet | | | | | | | |
| Medium cutting | S | TNMG160404R-S | 0.4 | ● | ● | ● | ● | ● | ● | | | | | | ● | ● | | | | ● | | | | | | | |
| | | TNMG160404L-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG160408R-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | ● | ● | | | | ● | | | | | | | |
| | | TNMG160408L-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG220404R-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG220404L-S | 0.4 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG220408R-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| | | TNMG220408L-S | 0.8 | | ● | ● | ● | ● | ● | | | | | | | ● | | | | ● | | | | | | | |
| Medium to heavy cutting | TH | TNMG220408-TH | 0.8 | ● | ● | ● | | | | | | | | ● | | | | | | | | | | | | | |
| | | TNMG220412-TH | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | THS | TNMG220408-THS | 0.8 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | | TNMG220412-THS | 1.2 | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| | CH | TNMG160404-CH | 0.4 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | | TNMG160408-CH | 0.8 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | | TNMG160412-CH | 1.2 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | | TNMG220408-CH | 0.8 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | |
| | | TNMG220412-CH | 1.2 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | |
| | | TNMG220416-CH | 1.6 | | | | | | | | ● | ● | ● | | | | | | | | | | | | | | |

● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

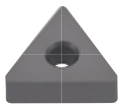
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° with hole**

| | | T515 | T5105 | T5115 | T5125 | GH110 | GT720 | NS520 | TH03 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | Coated cermet | Cermet | Uncoated | | Ceramics | | |
| P | Steel | | | | | ● | ●◐ | ●◐ | ● | ● | | | |
| M | Stainless | | | | | ● | | | ● | ● | | | |
| K | Cast iron | ●◐ | ● | ◐ | ✠ | ● | ●◐ | ●◐ | ● | ● | ●◐ | ● | |
| N | Non-ferrous | | | | | | | | ● | ● | | | |
| S | Superalloys | | | | | ● | | | | | | | |
| H | Hard materials | | | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T515 | T5105 | T5115 | T5125 | GH110 | GT720 | NS520 | TH03 | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | TNMA160404 | 0.4 | ● | ● | ● | ● | | | | | ● | | | |
| | | TNMA160408 | 0.8 | ● | ● | ● | ● | | ● | ● | | ● | ● | | |
| | | TNMA160412 | 1.2 | ● | ● | ● | ● | | | | | | ● | | |
| | | TNMA160416 | 1.6 | | ● | ● | ● | | | | | | | | |
| | | TNMA160420 | 2.0 | | ● | ● | ● | | | | | | | | |
| | | TNMA220404 | 0.4 | | ● | ● | ● | | | | | | | | |
| | | TNMA220408 | 0.8 | | ● | ● | ● | | | | | | | | |
| | | TNMA220412 | 1.2 | | ● | ● | ● | | | | | | | | |
| | | TNMA220416 | 1.6 | | ● | ● | ● | | | | | | | | |
| | - | TNGA110304 | 0.4 | | | | | | | | | ● | | | |
| | | TNGA110308 | 0.8 | | | | | | | | | ● | | | |
| | | TNGA160304 | 0.4 | | | | | | | | | ● | | | |
| | | TNGA160308 | 0.8 | | | | | | | | | ● | | | |
| | | TNGA160404 | 0.4 | | | | | ● | | ● | ● | ● | | ● | ● |
| | | TNGA160408 | 0.8 | | | | | ● | | ● | ● | ● | ● | ● | ● |
| | | TNGA160412 | 1.2 | | | | | | | ● | | ● | ● | ● | ● |
| | | TNGA160416 | 1.6 | | | | | | | | | ● | ● | | ● |
| | | TNGA220408 | 0.8 | | | | | | | | | ● | | | |



● : Line up

External toolholders → B206 -
J series toolholders → B343 -
Internal toolholders → B294 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Triangular, 60° without hole**

| | | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|
| | | Uncoated | Ceramics | | |
| P | Steel | ● | | | |
| M | Stainless | ● | | | |
| K | Cast iron | ● | ●◐ | ● | |
| N | Non-ferrous | ● | | | |
| S | Superalloys | | | | |
| H | Hard materials | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | TH10 | FX105 | LX21 | LX11 |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | **TNGN110308** | 0.8 | ● | | | |
| | | **TNGN160404** | 0.4 | | | ● | ● |
| | | **TNGN160408** | 0.8 | ● | | ● | ● |
| | | **TNGN160412** | 1.2 | ● | ● | ● | ● |
| | | **TNGN160416** | 1.6 | | ● | | ● |
| | | **TNGN160420** | 2.0 | | ● | | |
| | | **TNGN160708** | 0.8 | | | | ● |
| | | **TNGN160712** | 1.2 | | | | ● |

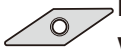
● : Line up

TNGN...: External toolholders → **B235 -, B241, B243,**
Internal toolholders → **B312**

# TurnLine - Insert

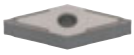
● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH120 | GH110 | GH330 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | | Cermet | | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ●ⓒ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ●ⓒ | ● | ●ⓒ | | | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | ●ⓒ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | ●ⓒ | ● | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH120 | GH110 | GH330 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | TF | VNMG160404-TF | 0.4 | | | | | | | | | | | | | ● | | |
| | | VNMG160408-TF | 0.8 | | | | | | | | | | | | ● | ● | | |
| | | | | | | | | | | | | | | | | | | |
| | 01 | VNGG160402-01 | 0.2 | | | | | | | | | ● | | | | ● | ● | ● |
| | | VNGG160404-01 | 0.4 | | | | | | | | | | | | | ● | ● | ● |
| | | VNGG160408-01 | 0.8 | | | | | | | | | | | | | ● | ● | |
| | | | | | | | | | | | | | | | | | | |
| Finishing | TSF | VNMG120402E-TSF | 0.2 | | ● | ● | | | | | | | | ● | | ● | | |
| | | VNMG120404E-TSF | 0.4 | | ● | ● | | | | | | | | ● | | ● | | |
| | | VNMG120408E-TSF | 0.8 | | ● | ● | | | | | | | | ● | | ● | | |
| | | VNMG160402-TSF | 0.2 | | | | | | | | ● | | | ● | | ● | | |
| | | VNMG160404-TSF | 0.4 | ● | ● | ● | ● | | | | ● | | | ● | | ● | | |
| | | VNMG160408-TSF | 0.8 | ● | ● | ● | ● | | | | ● | | | ● | | ● | | |
| | | VNMG160412-TSF | 1.2 | ● | ● | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | ZF | VNMG160404-ZF | 0.4 | | ● | ● | ● | | | | | | | ● | | ● | | |
| | | VNMG160408-ZF | 0.8 | | ● | ● | ● | | | | | | | ● | | ● | | |
| | | VNMG160412-ZF | 1.2 | | ● | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | 11 | VNMG160404-11 | 0.4 | | | | | | | | | | ● | | | ● | | ● |
| | | VNMG160408-11 | 0.8 | | | | | | | | | | | | | ● | | |
| |  | VNMG160412-11 | 1.2 | | | | | | | | | | | ● | | | | |
| | | | | | | | | | | | | | | | | | | |
| | SF | VNMG160404-SF | 0.4 | | | | | ● | ● | ● | | | | | | | | |
| | | VNMG160408-SF | 0.8 | | | | | ● | ● | ● | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

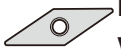
● : Line up

External toolholders → B202 - Internal toolholders → B277, B296, B299
TungCap → F069

# TurnLine - Insert

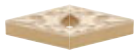
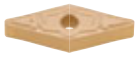
● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | AH110 | AH120 | AH8005 | AH8015 | GH330 | | | GT9530 | | | | NS9530 | NS520 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | | | ● | ●ⓒ | | | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | | | ● | ●ⓒ | ● | ⓒ | ●ⓒ | | | | | | | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ● | ⓒ | ● | ●ⓒ | | | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | ● | ●ⓒ | ● | ⓒ | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | AH110 | AH120 | AH8005 | AH8015 | GH330 | | | GT9530 | | | | NS9530 | NS520 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | CF | VNMG160404-CF | 0.4 | | | | | | | | | ● | ● | | | | | | | | | | | | | | | |
| | | VNMG160408-CF | 0.8 | | | | | | | | | ● | ● | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | HRF | VNMG160404-HRF | 0.4 | | | | | | | | | | | | | ● | ● | | | | | | | | | | | |
| | | VNMG160408-HRF | 0.8 | | | | | | | | | | | | | ● | ● | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TS | VNMG160404-TS | 0.4 | | ● | ● | ● | | | | | | | | | | | | | | ● | | | | ● | ● | | |
| | | VNMG160408-TS | 0.8 | | ● | ● | ● | | | | | | | | | | | | | | ● | | | | ● | ● | | |
| | | VNMG160412-TS | 1.2 | | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SS | VNMG120404E-SS | 0.4 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | VNMG120408E-SS | 0.8 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | | VNMG160404-SS | 0.4 | | | | | ● | ● | ● | ● | | | | ● | | | ● | | | | | | | | | | |
| | | VNMG160408-SS | 0.8 | | | | | ● | ● | ● | ● | | | | ● | | | ● | | | | | | | | | | |
| | | VNMG160412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medium cutting | TM | VNMG120404E-TM | 0.4 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | VNMG120408E-TM | 0.8 | | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | VNMG160404-TM | 0.4 | ● | ● | ● | ● | | ● | | | | | | ● | | | | | | | | | | | | | |
| | | VNMG160408-TM | 0.8 | ● | ● | ● | ● | | | | | | | ● | ● | | | | | | | | | | | | | |
| | | VNMG160412-TM | 1.2 | ● | ● | ● | ● | | | | | | | ● | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

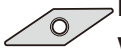
● : Line up

External toolholders → **B202 -** Internal toolholders → **B277, B296, B299**
TungCap → **F069**

# TurnLine - Insert

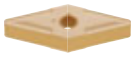
● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | | | | | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | | | | | | | ● | ●ⓒ | | | ● |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | ⓒ | ✠ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ● | ●ⓒ | | | |
| H | Hard materials | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | TQ | VNMG160404-TQ | 0.4 | | | | | | | | | | | ● | ● | |
| | | VNMG160408-TQ | 0.8 | | | | | | | | | | | ● | ● | |
| | | | | | | | | | | | | | | | | |
| | ZM | VNMG160408-ZM | 0.8 | | ● | ● | ● | | | | | | | | | |
| | | VNMG160412-ZM | 1.2 | | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| Medium cutting | DM | VNMG160408-DM | 0.8 | ● | ● | ● | ● | | | | | | | | | |
| | | VNMG160412-DM | 1.2 | | ● | ● | ● | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | All-round | VNMG160404 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● |
| | | VNMG160408 | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● |
| | | VNMG160412 | 1.2 | | ● | ● | | ● | ● | ● | ● | | | | ● | |
| |  | | | | | | | | | | | | | | | |
| | 28 | VNMG160404-28 | 0.4 | | | | | | | | | | ● | | | |
| | | VNMG160408-28 | 0.8 | | | | | | | | | | ● | | | |
| | | | | | | | | | | | | | | | | |
| | 33 | VNMG160404-33 | 0.4 | | | ● | | | | | | ● | | | | ● |
| | | VNMG160408-33 | 0.8 | | ● | ● | | | | | | | | | | ● |
| | | | | | | | | | | | | | | | | |

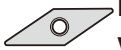
● : Line up

External toolholders → B206 - Internal toolholders → B296, B299
TungCap → F069

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE



**Rhombic, 35° with hole**

| | | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH8005 | AH8015 | AH905 | NS520 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Cermet | Uncoated | Ceramics |
| P | Steel | ◐ | ✠ | ◐✠ | ✠ | | | | | | | ●◐ | ● | |
| M | Stainless | ● | ◐ | ◐ | ✠ | | | | ● | ◐ | | | ● | |
| K | Cast iron | | | | | ● | ◐ | ✠ | | | | ●◐ | ● | |
| N | Non-ferrous | | | | | | | | | | | | ● | |
| S | Superalloys | | | | | | | | ● | ◐ | ◐ | | | |
| H | Hard materials | | | | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T6120 | T6130 | AH630 | AH645 | T5105 | T5115 | T5125 | AH8005 | AH8015 | AH905 | NS520 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | SM | VNMG120404E-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | |
| | | VNMG120408E-SM | 0.8 | ● | ● | ● | ● | | | | | | | | | |
| | | VNMG160404-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | |
| | | VNMG160408-SM | 0.8 | ● | ● | ● | ● | | | | | | | | | |
| | | VNMG160412-SM | 1.2 | ● | ● | ● | ● | | | | | | | | | |
| | CM | VNMG160408-CM | 0.8 | | | | | ● | ● | ● | | | | | | |
| | | VNMG160412-CM | 1.2 | | | | | ● | ● | ● | | | | | | |
| Finishing to medium cutting | HRM | VNMG160404-HRM | 0.4 | | | | | | | | ● | ● | | | | |
| | | VNMG160408-HRM | 0.8 | | | | | | | | ● | ● | | | | |
| | | VNMG160412-HRM | 1.2 | | | | | | | | ● | ● | | | | |
| Medium cutting | HMM | VNMG160404-HMM | 0.4 | | | | | | | | | | ● | | | |
| | | VNMG160408-HMM | 0.8 | | | | | | | | | | ● | | | |
| | | VNMG160412-HMM | 1.2 | | | | | | | | | | ● | | | |
| Finishing to medium cutting | - | VNMA160402 | 0.2 | | | | | | | | | | | | ● | |
| | | VNMA160404 | 0.4 | | | | | ● | ● | ● | | | | ● | ● | |
| | | VNMA160408 | 0.8 | | | | | ● | ● | ● | | | | ● | ● | |
| | | VNGA160404 | 0.4 | | | | | | | | | | | | | ● |
| | | VNGA160408 | 0.8 | | | | | | | | | | | | | ● |

**Rhombic, 35° without hole**

| | | FX105 |
|---|---|---|
| | | Ceramics |
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | FX105 |
|---|---|---|---|---|
| Finishing to medium cutting | - | VNGD160712 | 1.2 | ● |

● : Line up

External toolholders → **B202 -** Internal toolholders → **B277, B296, B299** TungCap → **F069**

VNGD...: External toolholders → **B255**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | GT9530 | GT720 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | ●ⓒ | | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | |
| S | Superalloys | | | | | ●ⓒ | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | GT9530 | GT720 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | Coated cermet | | Cermet | |
| Precision finishing | TF | WNMG080404-TF | 0.4 | | | | | | | | ● | |
| | | WNMG080408-TF | 0.8 | | | | | | | | ● | |
| | 01 | WNGG080402-01 | 0.2 | | | | | | | | ● | ● |
| | | WNGG080404-01 | 0.4 | | | | | | | ● | ● | ● |
| | | WNGG080408-01 | 0.8 | | | | | | | ● | ● | |
| Finishing | TSF | WNMG060404E-TSF | 0.4 | | ● | ● | | | ● | | ● | |
| | | WNMG060408E-TSF | 0.8 | | ● | ● | | | ● | | ● | |
| | | WNMG060412E-TSF | 1.2 | | ● | ● | | | ● | | ● | |
| | | WNMG060404-TSF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060408-TSF | 0.8 | | ● | ● | | | | | | |
| | | WNMG080404-TSF | 0.4 | | ● | ● | ● | ● | ● | | ● | |
| | | WNMG080408-TSF | 0.8 | | ● | ● | ● | ● | ● | | ● | |
| | | WNMG080412-TSF | 1.2 | ● | ● | ● | ● | ● | | | | |
| Finishing (Wiper) | FW | WNMG060404E-FW | 0.4 | ● | ● | ● | | | ● | | ● | |
| | | WNMG060408E-FW | 0.8 | ● | ● | ● | | | ● | | ● | |
| | | WNMG080404-FW | 0.4 | | ● | ● | | | ● | | ● | |
| | | WNMG080408-FW | 0.8 | ● | ● | ● | | | ● | | ● | |
| | AFW | WNMG060404-AFW | 0.4 | | ● | ● | | | | | ● | |
| | | WNMG060408-AFW | 0.8 | ● | ● | ● | ● | | | | ● | |
| | | WNMG080404-AFW | 0.4 | | ● | ● | | | | | ● | |
| | | WNMG080408-AFW | 0.8 | ● | ● | ● | ● | | | | ● | |
| Finishing | ZF | WNMG060404E-ZF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060404-ZF | 0.4 | | ● | ● | | | | | | |
| | | WNMG060408-ZF | 0.8 | | ● | ● | | | | | | |
| | | WNMG080404-ZF | 0.4 | | ● | ● | ● | | ● | | ● | |
| | | WNMG080408-ZF | 0.8 | | ● | ● | ● | | ● | | ● | |
| | | WNMG080412-ZF | 1.2 | | ● | | | | | | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069 -

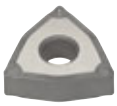
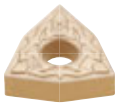
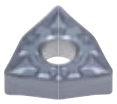
# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | Coated cermet | Cermet | |
| P | Steel | ●⊂ | ⊂✠ | ✠ | ⊂ | ✠ | ⊂✠ | | | | | ●⊂ | ●⊂ | ●⊂ |
| M | Stainless | | | | ● | ⊂ | ⊂ | | | ● | ⊂ | | | |
| K | Cast iron | ●⊂ | | | | | | ● | ⊂ | | | ●⊂ | ●⊂ | ●⊂ |
| N | Non-ferrous | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | ⊂ | | | |
| H | Hard materials | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | T5105 | T5115 | AH8005 | AH8015 | GT9530 | NS9530 | NS520 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | 11  | WNMG080404-11 | 0.4 | | | | | | | | | | | | ● | |
| | | WNMG080408-11 | 0.8 | | | | | | | | | | | | ● | |
| Finishing of mild steels | 17 | WNMG080404-17 | 0.4 | | | | | | | | | | | | ● | |
| | | WNMG080408-17 | 0.8 | | | | | | | | | | | | ● | |
| Finishing | SF | WNMG060404-SF | 0.4 | | | | ● | ● | ● | | | | | | | |
| | | WNMG060408-SF | 0.8 | | | | ● | ● | ● | | | | | | | |
| | | WNMG080404-SF | 0.4 | | | | ● | ● | ● | | | | | | | |
| | | WNMG080408-SF | 0.8 | | | | ● | ● | ● | | | | | | | |
| | CF  | WNMG080404-CF | 0.4 | | | | | | | ● | ● | | | | | |
| | | WNMG080408-CF | 0.8 | | | | | | | ● | ● | | | | | |
| | | WNMG080412-CF | 1.2 | | | | | | | ● | ● | | | | | |
| | HRF  | WNMG080404-HRF | 0.4 | | | | | | | | | ● | ● | | | |
| | | WNMG080408-HRF | 0.8 | | | | | | | | | ● | ● | | | |
| | TS | WNMG080404-TS | 0.4 | ● | ● | ● | | | | | | | | ● | ● | ● |
| | | WNMG080408-TS | 0.8 | ● | ● | ● | | | | | | | | ● | ● | ● |
| | | WNMG080412-TS | 1.2 | ● | ● | ● | | | | | | | | | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | GH330 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | | | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | ● | ⓒ | ⓒ | ✠ | | | ●ⓒ | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | GH330 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | | Cermet |
| Finishing to medium cutting (Wiper) | SW | WNMG060408E-SW | 0.8 | ● | ● | ● | | | | | | | ● | | |
| | | WNMG060412E-SW | 1.2 | ● | ● | ● | | | | | | | ● | | |
| | | WNMG080408-SW | 0.8 | ● | ● | ● | | | | | | ● | ● | | |
| | | WNMG080412-SW | 1.2 | | ● | ● | | | | | | ● | ● | | |
| | ASW | WNMG060408-ASW | 0.8 | ● | ● | ● | | | | | | | | | |
| | | WNMG060412-ASW | 1.2 | ● | ● | ● | ● | | | | | | | | |
| | | WNMG080408-ASW | 0.8 | ● | ● | ● | ● | | | | | | | | |
| | | WNMG080412-ASW | 1.2 | ● | ● | ● | ● | | | | | | | | |
| High feed, small depth of cut | AS | WNMG080404-AS | 0.4 | ● | | | | | | | | | | | ● |
| | | WNMG080408-AS | 0.8 | ● | ● | ● | ● | | | | | | | | ● |
| | | WNMG080412-AS | 1.2 | ● | ● | ● | ● | | | | | | | | |
| Boring (Double sided) | CB | WNMG060404-CB | 0.4 | | | ● | | | | | | | | | ● |
| | | WNMG060408-CB | 0.8 | | | ● | | | | | | | | | ● |
| Finishing | NS | WNMG080404-NS | 0.4 | | ● | ● | | | | | | | | | ● |
| | | WNMG080408-NS | 0.8 | | ● | ● | | | | | | | | | ● |
| | SS | WNMG060404E-SS | 0.4 | | | | | | | ● | ● | | | | |
| | | WNMG060408E-SS | 0.8 | | | | | | | ● | ● | | | | |
| | | WNMG060412E-SS | 1.2 | | | | | | | ● | ● | | | | |
| | | WNMG080404-SS | 0.4 | | | | | ● | ● | ● | ● | | | ● | |
| | | WNMG080408-SS | 0.8 | | | | | ● | ● | ● | ● | | | ● | |
| | | WNMG080412-SS | 1.2 | | | | | ● | ● | ● | ● | | | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | AH120 | AH725 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | | | ●ⓒ | ⓒ | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | |
| S | Superalloys | | | | | ●ⓒ | ● | | |
| H | Hard materials | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | AH120 | AH725 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | Coated cermet | Cermet |
| Medium cutting | TM | WNMG060404E-TM | 0.4 | | ● | ● | | | | | |
| | | WNMG060408E-TM | 0.8 | | ● | ● | | | | | |
| | | WNMG060412E-TM | 1.2 | | ● | ● | | | | | |
| | | WNMG060404-TM | 0.4 | | ● | ● | ● | | | | |
| | | WNMG060408-TM | 0.8 | ● | ● | ● | ● | ● | | | |
| | | WNMG080404-TM | 0.4 | ● | ● | ● | ● | ● | ● | | |
| | | WNMG080408-TM | 0.8 | ● | ● | ● | ● | ● | ● | | |
| | | WNMG080412-TM | 1.2 | ● | ● | ● | ● | ● | | | |
| | | WNMG080416-TM | 1.6 | ● | ● | ● | | ● | | | |
| Finishing to medium cutting | AM | WNMG080408-AM | 0.8 | | ● | ● | | | | | |
| | | WNMG080412-AM | 1.2 | | ● | ● | | | | | |
| | | WNMG080416-AM | 1.6 | | ● | ● | | | | | |
| | NM | WNMG060412E-NM | 1.2 | | | ● | | | | | |
| | | WNMG080408-NM | 0.8 | ● | ● | ● | | | | | |
| | | WNMG080412-NM | 1.2 | ● | ● | ● | ● | | | | |
| | TQ | WNMG080404-TQ | 0.4 | | | | | | | ● | ● |
| | | WNMG080408-TQ | 0.8 | | | | | | | ● | ● |
| | ZM | WNMG060408E-ZM | 0.8 | | ● | ● | | | | | |
| | | WNMG060408-ZM | 0.8 | | ● | ● | ● | | | | |
| | | WNMG060412-ZM | 1.2 | | ● | ● | ● | | | | |
| | | WNMG080408-ZM | 0.8 | | ● | ● | ● | | | ● | ● |
| | | WNMG080412-ZM | 1.2 | | ● | ● | ● | | | | |
| | | WNMG080416-ZM | 1.6 | | ● | ● | | | | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GH330 | | | GT720 | | | | NS9530 | NS520 | | | TH10 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | Uncoated | | | |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | | | | | ● | ●ⓒ | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | | ● | | | |
| M | Stainless | | | | | | | | | ● | ●ⓒ | ●ⓒ | | | | | | | | | | | ● | | | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | ●ⓒ | ● | ⓒ | ✠ | ● | ●ⓒ | ●ⓒ | | | ●ⓒ | | | | ●ⓒ | ●ⓒ | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | ● | | | |
| S | Superalloys | | | | | | | | | ● | ●ⓒ | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T515 | T5105 | T5115 | T5125 | AH110 | AH120 | GH330 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | **DM** | **WNMG080408-DM** | 0.8 | ● | ● | ● | ● | | | | | | | | | | | |
| | | **WNMG080412-DM** | 1.2 | ● | ● | ● | ● | | | | | | | | | | | |
| | **All-round** | **WNMG060404** | 0.4 | | ● | ● | | | ● | ● | ● | | | | | | | |
| | | **WNMG060408** | 0.8 | | ● | ● | | | ● | ● | ● | | | | | | | |
| | | **WNMG080404** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | ● |
| | | **WNMG080408** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | ● |
| | | **WNMG080412** | 1.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● |
| | | **WNMG080416** | 1.6 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| Finishing to medium cutting | **27** | **WNMG080408-27** | 0.8 | | | ● | | | | | | | | | | | | |
| Medium cutting | **33** | **WNMG080404-33** | 0.4 | | | | | | | | | | | | ● | | | |
| | | **WNMG080408-33** | 0.8 | ● | | | | | | | | | | | | | | ● |
| | **37** | **WNMG080404-37** | 0.4 | | | | | | | | | | | | | ● | | |
| | | **WNMG080408-37** | 0.8 | | ● | | | | | | | | | ● | | ● | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | AH8005 | AH8015 | AH905 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ⊂ | ✠ | ⊂✠ | ✠ | | | | | ●⊂ | ⊂ | | | | |
| M | Stainless | ● | ⊂ | ⊂ | ✠ | | | | | ●⊂ | ⊂ | ● | ⊂ | | |
| K | Cast iron | | | | | ●⊂ | ● | ⊂ | ✠ | ●⊂ | ⊂ | | | | ●✠ |
| N | Non-ferrous | | | | | | | | | | | | | | ●✠ |
| S | Superalloys | | | | | | | | | ●⊂ | ● | ● | ⊂ | ⊂ | ●✠ |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T6120 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | AH725 | AH8005 | AH8015 | AH905 | KS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | | | | Uncoated |
| Medium cutting | SM | WNMG060404E-SM | 0.4 | ● | ● | ● | | | | | | | | | | | |
| | | WNMG060408E-SM | 0.8 | ● | ● | ● | | | | | | | | | | | |
| | | WNMG060412E-SM | 1.2 | ● | ● | ● | | | | | | | | | | | |
| | | WNMG060408-SM | 0.8 | | | | | | | | | | ● | | | | |
| | | WNMG080404-SM | 0.4 | ● | ● | ● | ● | | | | | | | | | | |
| | | WNMG080408-SM | 0.8 | ● | ● | ● | ● | | | | | | ● | | | | |
| | | WNMG080412-SM | 1.2 | ● | ● | ● | ● | | | | | | ● | | | | |
| | CM | WNMG080404-CM | 0.4 | | | | | | | ● | | | | | | | |
| | | WNMG080408-CM | 0.8 | | | | | ● | ● | ● | ● | | | | | | |
| | | WNMG080412-CM | 1.2 | | | | | ● | ● | ● | ● | | | | | | |
| Finishing to medium cutting | HRM | WNMG080404-HRM | 0.4 | | | | | | | | | | | ● | ● | | |
| | | WNMG080408-HRM | 0.8 | | | | | | | | | | | ● | ● | | |
| | | WNMG080412-HRM | 1.2 | | | | | | | | | | | ● | ● | | |
| Medium cutting | HMM | WNMG080404-HMM | 0.4 | | | | | | | | | | | | | ● | |
| | | WNMG080408-HMM | 0.8 | | | | | | | | | | | | | ● | |
| | | WNMG080412-HMM | 1.2 | | | | | | | | | | | | | ● | |
| | SA | WNMG080408-SA | 0.8 | ● | ● | ● | ● | | | | | ● | ● | | | | ● |
| | | WNMG080412-SA | 1.2 | ● | ● | ● | ● | | | | | ● | | | | | |

● : Line up

External toolholders → B198 - Internal toolholders → B275 -
TungCap → B215, F069

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## NEGATIVE TYPE

**Trigon, 80° with hole**

| | | T9105 | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | NS520 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | Cermet | Uncoated | Ceramics |
| P | Steel | ● | ●ⓒ | ⓒ✠ | ✠ | ✠ | ⓒ✠ | ✠ | | | | | ●ⓒ | ●ⓒ | ● | |
| M | Stainless | | | | | ⓒ | ⓒ | ✠ | | | | | ●ⓒ | | ● | |
| K | Cast iron | ●ⓒ | ●ⓒ | | | | | | ●ⓒ | ● | ⓒ | ✠ | ●ⓒ | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | | | | | | | | | ● | |
| S | Superalloys | | | | | | | | | | | | ●ⓒ | | | |
| H | Hard materials | | | | | | | | | | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9115 | T9125 | T9135 | T6130 | AH630 | AH645 | T515 | T5105 | T5115 | T5125 | AH120 | NS520 | TH10 | LX11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium to heavy cutting | TH | WNMG080408-TH | 0.8 | ● | ● | ● | ● | ● | | | | | | | ● | | | |
| | | WNMG080412-TH | 1.2 | ● | ● | ● | ● | | | | | | | | ● | | | |
| | | WNMG080416-TH | 1.6 | ● | ● | ● | | | | | | | | | | | | |
| | | WNMG100612-TH | 1.2 | | ● | ● | | | | | | | | | | | | |
| | | WNMG100616-TH | 1.6 | | ● | ● | | | | | | | | | | | | |
| | THS | WNMG080408-THS | 0.8 | ● | ● | ● | ● | | | | | | | | | | | |
| | | WNMG080412-THS | 1.2 | ● | ● | ● | ● | | | | | | | | | | | |
| | | WNMG080416-THS | 1.6 | | ● | ● | | | | | | | | | | | | |
| | | WNMG100612-THS | 1.2 | | ● | ● | ● | | | | | | | | | | | |
| | | WNMG100616-THS | 1.6 | | ● | ● | ● | | | | | | | | | | | |
| | SH | WNMG080408-SH | 0.8 | | | | | ● | ● | ● | | | | | | | | |
| | | WNMG080412-SH | 1.2 | | | | | ● | ● | ● | | | | | | | | |
| | CH | WNMG080408-CH | 0.8 | | | | | | | | | ● | ● | ● | | | | |
| | | WNMG080412-CH | 1.2 | | | | | | | | | ● | ● | ● | | | | |
| Finishing to medium cutting | - | WNMA080404 | 0.4 | | | | | | | | | ● | ● | ● | | | ● | |
| | | WNMA080408 | 0.8 | | | | | | | | ● | ● | ● | ● | | ● | ● | |
| | | WNMA080412 | 1.2 | | | | | | | | ● | ● | ● | ● | | | | |
| | | WNMA080416 | 1.6 | | | | | | | | ● | ● | ● | ● | | | | |
| | | WNGA080408 | 0.8 | | | | | | | | | | | | | | | ● |

● : Line up

External toolholders → B205 - Internal toolholders → B293 -
TungCap → B215, F069

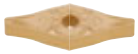
# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## NEGATIVE TYPE

**Rhombic, 25° with hole**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ◐✣ | ✣ | | | | | ●◐ | | | | ●◐ | | | | | | | | | | | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | ●◐ | | | | ●◐ | | | | | | | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coated | | | | | Coated cermet | | | | Cermet | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | T9135 | | | | GT9530 | | | | NS9530 | | | | | | | | | | | | | | | | | | | | | | |
| Finishing | ZF | YNMG160404-ZF | 0.4 | ● | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | YNMG160408-ZF | 0.8 | ● | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | ZM | YNMG160404-ZM | 0.4 | ● | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| | | YNMG160408-ZM | 0.8 | ● | ● | | | | ● | | | | ● | | | | | | | | | | | | | | | | | | | | | | |
| |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → **B206 -, B213 -** Internal toolholders → **B296, B299**

# TurnLine - Insert

## NEGATIVE TYPE

**Parallelogram, 55° without hole**

| | | |

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | T9115 | T9125 | T6130 | AH725 | AH8005 | AH8015 | GH730 | SH725 | J740 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✠ | ✠ | ⓒ | | | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | ⓒ | ⓒ | ● | ⓒ | ⓒ | ●ⓒ | ●ⓒ | | |
| K | Cast iron | ●ⓒ | | | ⓒ | | | ⓒ | | | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | |
| S | Superalloys | | | | ● | ● | ⓒ | | | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6130 | AH725 | AH8005 | AH8015 | GH730 | SH725 | J740 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | Coated cermet | Cermet |
| Precision finishing | 01 | CCGT060202-01 | 0.2 | | | | | | | | | ● | | |
| | | CCGT09T302-01 | 0.2 | | | | | | | | | ● | | |
| Precision finishing (Sharp edge) | 01 | CCGT060202F-01 | 0.2 | | | | | | | | ● | | | |
| | | CCGT060204F-01 | 0.4 | | | | | | | | ● | | | |
| | | CCGT09T302F-01 | 0.2 | | | | | | | | ● | | | |
| Finishing | PSF | CCMT060202-PSF | 0.2 | | | | ● | | | | | | ● | ● |
| | | CCMT060204-PSF | 0.4 | ● | ● | | ● | ● | ● | | | | ● | ● |
| | | CCMT09T302-PSF | 0.2 | | | | ● | | | | | | | ● |
| | | CCMT09T304-PSF | 0.4 | ● | ● | | ● | ● | ● | | | | ● | ● |
| | | CCMT09T308-PSF | 0.8 | ● | ● | | ● | | | | | | ● | ● |
| | PF | CCMT060202-PF | 0.2 | | | | | | | ● | | | ● | ● |
| | | CCMT060204-PF | 0.4 | | | ● | | | | ● | | | ● | ● |
| | | CCMT060208-PF | 0.8 | | | | | | | | | | ● | ● |
| | | CCMT09T302-PF | 0.2 | | | | | | | ● | | | | ● |
| | | CCMT09T304-PF | 0.4 | | | | | | | ● | | | ● | ● |
| | | CCMT09T308-PF | 0.8 | | ● | | | | | | | | ● | ● |

● : Line up

External toolholders → B246
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F154 - F170

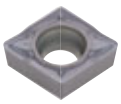
# TurnLine - Insert

● : Continuous cutting
ᑕ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | GH730 | | | | GT9530 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | |
| P | Steel | ●ᑕ | ᑕ✠ | ᑕ | ✠ | ᑕ✠ | ✠ | ●ᑕ | ᑕ | | | ᑕ | | | | ●ᑕ | | | | ●ᑕ | | | | | | | |
| M | Stainless | | | ● | ᑕ | ᑕ | ✠ | ●ᑕ | ᑕ | ● | ᑕ | ᑕ | | | | | | | | | | | | | | | |
| K | Cast iron | ●ᑕ | | | | | | ●ᑕ | ᑕ | | | ᑕ | | | | ●ᑕ | | | | ●ᑕ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ᑕ | ● | ● | ᑕ | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to light cutting | **PSS** | **CCMT060204-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● |
| | | **CCMT060208-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● |
| | | **CCMT09T304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● |
| |  | **CCMT09T308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● |
| | | **CCMT120404-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | | **CCMT120408-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | | **CCMT120412-PSS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| Finishing to medium cutting | **PS** | **CCMT060202-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | ● |
| | | **CCMT060204-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **CCMT060208-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **CCMT09T302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | ● |
| | | **CCMT09T304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **CCMT09T308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **CCMT120404-PS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | |
| | | **CCMT120408-PS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | |
| | | **CCMT120412-PS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | |
| | **23** | **CCMT060202-23** | 0.2 | | | | | | | | | | | | | ● |
| | | **CCMT060204-23** | 0.4 | | ● | | | | | | | | | | | ● |
| | | **CCMT060208-23** | 0.8 | | ● | | | | | | | | | | | |
| | | **CCMT09T304-23** | 0.4 | | ● | | | | | | | | | | | ● |
| | | **CCMT09T308-23** | 0.8 | | ● | | | | | | | | | | | ● |
| Medium cutting | **24** | **CCMT060202-24** | 0.2 | | ● | | | | | | | | | | | ● |
| | | **CCMT060204-24** | 0.4 | ● | ● | | | | | ● | | | | | | ● |
| | | **CCMT060208-24** | 0.8 | ● | ● | | ● | | | | | | | | | ● |
| | | **CCMT09T302-24** | 0.2 | | ● | | | | | | | | | | | ● |
| | | **CCMT09T304-24** | 0.4 | ● | ● | | | | | | | | | | | ● |
| | | **CCMT09T308-24** | 0.8 | ● | ● | | ● | | | | | | | | | ● |
| | | **CCMT120408-24** | 0.8 | ● | ● | | | | | ● | | | | | | ● |

● : Line up

External toolholders → B246
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F154 - F170

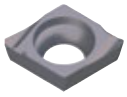
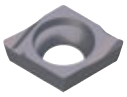
# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | SH725 | SH730 | TH10 |
|---|---|---|---|---|
| P | Steel | ●ⓒ | ●ⓒ | ● |
| M | Stainless | ●ⓒ | ●ⓒ | ● |
| K | Cast iron | | | ● |
| N | Non-ferrous | | | ● |
| S | Superalloys | | ●ⓒ | |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | SH725 (Coated) | SH730 (Coated) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|
| Finishing | W08 | CCGT03X100R-W08 | 0.03 | | ● | ● |
| | | CCGT03X100L-W08 | 0.03 | | ● | ● |
| | | CCGT03X101R-W08 | 0.1 | | ● | ● |
| | | CCGT03X101L-W08 | 0.1 | | ● | ● |
| | | CCGT03X102R-W08 | 0.2 | | ● | ● |
| | | CCGT03X102L-W08 | 0.2 | | ● | ● |
| | | CCGT03X104R-W08 | 0.4 | | ● | ● |
| | | CCGT03X104L-W08 | 0.4 | | ● | ● |
| |  | CCGT04T100R-W08 | 0.03 | | ● | ● |
| | | CCGT04T100L-W08 | 0.03 | | ● | ● |
| | | CCGT04T101R-W08 | 0.1 | | ● | ● |
| | | CCGT04T101L-W08 | 0.1 | | ● | ● |
| | | CCGT04T102R-W08 | 0.2 | | ● | ● |
| | | CCGT04T102L-W08 | 0.2 | | ● | ● |
| | | CCGT04T104R-W08 | 0.4 | | ● | ● |
| | | CCGT04T104L-W08 | 0.4 | | ● | ● |
| Finishing (Sharp edge) | W08 | CCGT03X100FL-W08 | 0.03 | ● | | |
| | | CCGT03X100FR-W08 | 0.03 | ● | | |
| | | CCGT03X101FL-W08 | 0.1 | ● | | |
| | | CCGT03X101FR-W08 | 0.1 | ● | | |
| | | CCGT03X102FL-W08 | 0.2 | ● | | |
| | | CCGT03X102FR-W08 | 0.2 | ● | | |
| | | CCGT03X104FL-W08 | 0.4 | ● | | |
| | | CCGT03X104FR-W08 | 0.4 | ● | | |
| |  | CCGT04T100FL-W08 | 0.03 | ● | | |
| | | CCGT04T100FR-W08 | 0.03 | ● | | |
| | | CCGT04T101FL-W08 | 0.1 | ● | | |
| | | CCGT04T101FR-W08 | 0.1 | ● | | |
| | | CCGT04T102FL-W08 | 0.2 | ● | | |
| | | CCGT04T102FR-W08 | 0.2 | ● | | |
| | | CCGT04T104FL-W08 | 0.4 | ● | | |
| | | CCGT04T104FR-W08 | 0.4 | ● | | |

● : Line up

Internal toolholders → B278
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH110 | GH330 | GH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Coated cermet | Cermet | Uncoated | |
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | | | ●ⓒ | ⓒ | ● | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ● | ⓒ |
| M | Stainless | | | ● | ⓒ | ⓒ | ✠ | | | ●ⓒ | ⓒ | ● | ●ⓒ | ⓒ | | | ● | ⓒ |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ⓒ | ●ⓒ | ⓒ | ● | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | | | | | | | | | | | ● | |
| S | Superalloys | | | | | | | | | ●ⓒ | ● | ● | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH110 | GH330 | GH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | W15 | CCGT060200R-W15 | 0.03 | | | | | | | | | | | | | | | | ● | |
| | | CCGT060200L-W15 | 0.03 | | | | | | | | | | | | | | | ● | ● | |
| | | CCGT060202R-W15 | 0.2 | | | | | | | | | | | | | | | ● | ● | |
| | | CCGT060202L-W15 | 0.2 | | | | | | | | | | | | | | ● | ● | ● | |
| | | CCGT060204R-W15 | 0.4 | | | | | | | | | | | | ● | | | ● | ● | |
| | | CCGT060204L-W15 | 0.4 | | | | | | | | | | | ● | ● | | ● | ● | ● | ● |
| | W20 | CCGT09T302R-W20 | 0.2 | | | | | | | | | | | | | | | ● | ● | |
| | | CCGT09T302L-W20 | 0.2 | | | | | | | | | | | | | | ● | ● | ● | |
| | | CCGT09T304R-W20 | 0.4 | | | | | | | | | | | | | | | ● | | |
| | | CCGT09T304L-W20 | 0.4 | | | | | | | | | | | ● | ● | | ● | ● | ● | |
| | | CCGT09T308R-W20 | 0.8 | | | | | | | | | | | | | | | ● | | |
| | | CCGT09T308L-W20 | 0.8 | | | | | | | | | | | | | | ● | ● | | |
| Medium cutting | PM | CCMT060204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | ● | ● | | |
| | | CCMT060208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | ● | ● | | |
| | | CCMT09T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | ● | ● | | |
| | | CCMT09T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | ● | ● | ● | | |
| | | CCMT09T312-PM | 1.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | | | | |
| | | CCMT120408-PM | 0.8 | | | ● | ● | ● | ● | | | | ● | | | | | | | |
| | | CCMT120412-PM | 1.2 | | | ● | ● | ● | ● | | | | ● | | | | | | | |
| Finishing to medium cutting | CM | CCMT060204-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | |
| | | CCMT060208-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | |
| | | CCMT09T304-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | |
| | | CCMT09T308-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | |
| | | CCMT09T312-CM | 1.2 | | | | | | | | ● | | | | | | | | | |
| | | CCMT120404-CM | 0.4 | | | | | | | | ● | | | | | | | | | |
| | | CCMT120408-CM | 0.8 | | | | | | | | ● | | | | | | | | | |

● : Line up

External toolholders → B246
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F154 - F170

# TurnLine - Insert

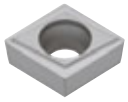
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | T5115 | GH110 | NS9530 | TH10 | KS05F |
|---|---|---|---|---|---|---|
| P | Steel | | ● | ●◐ | ● | |
| M | Stainless | | ● | | ● | |
| K | Cast iron | ◐ | ● | ●◐ | ● | ● |
| N | Non-ferrous | | | | ● | ● |
| S | Superalloys | | ● | | | ● |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T5115 (Coated) | GH110 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) | KS05F (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | AL | CCGT060202-AL | 0.2 | | | | | ● |
| | | CCGT060204-AL | 0.4 | | | | | ● |
| | | CCGT09T302-AL | 0.2 | | | | | ● |
| | | CCGT09T304-AL | 0.4 | | | | | ● |
| | | CCGT09T308-AL | 0.8 | | | | | ● |
| | | CCGT120402-AL | 0.2 | | | | | ● |
| | | CCGT120404-AL | 0.4 | | | | | ● |
| | | CCGT120408-AL | 0.8 | | | | | ● |
| | All-round | CCGT060202 | 0.2 | | | ● | | |
| | | CCGT060204 | 0.4 | | | ● | | |
| | | CCGT09T302 | 0.2 | | | ● | | |
| | | CCGT09T304 | 0.4 | | | ● | | |
| | | CCGT09T308 | 0.8 | | | ● | | |
| | Angular | CCGT060200R | 0.03 | | | | ● | |
| | | CCGT060202R | 0.2 | | | | ● | |
| | | CCGT060202L | 0.2 | | | | ● | |
| | | CCGT060204L | 0.4 | | | | ● | |
| | | CCGT09T302R | 0.2 | | | | ● | |
| | | CCGT09T302L | 0.2 | | | | ● | |
| | | CCGT09T304R | 0.4 | | | | ● | |
| | | CCGT09T304L | 0.4 | | | | ● | |
| | - | CCMW060204 | 0.4 | ● | | | | |
| | | CCMW060208 | 0.8 | ● | | | | |
| | | CCMW09T304 | 0.4 | ● | | | | |
| | | CCMW09T308 | 0.8 | ● | | | | |
| | - | CCGW060202 | 0.2 | | | | ● | |
| | | CCGW060204 | 0.4 | | | | ● | |
| | | CCGW09T304 | 0.4 | | ● | | ● | |



● : Line up

External toolholders → B246
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | AH725 | SH725 | SH730 |
|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ |
| M | Stainless | ◐ | ●◐ | ●◐ |
| K | Cast iron | ◐ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ● | | ●◐ |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) | SH730 (Coated) |
|---|---|---|---|---|---|---|
| For internal turning on small lathes | JS | CCGT03X101-JS | 0.1 | | | ● |
| | | CCGT03X102-JS | 0.2 | | | ● |
| | | CCGT03X104-JS | 0.4 | | | ● |
| | | CCGT04T101-JS | 0.1 | | | ● |
| | | CCGT04T102-JS | 0.2 | | | ● |
| | | CCGT04T104-JS | 0.4 | | | ● |
| For internal turning on small lathes (Sharp edge) | JS | CCGT03X101F-JS | 0.1 | | ● | |
| | | CCGT03X102F-JS | 0.2 | | ● | |
| | | CCGT03X104F-JS | 0.4 | | ● | |
| | | CCGT04T101F-JS | 0.1 | | ● | |
| | | CCGT04T102F-JS | 0.2 | | ● | |
| | | CCGT04T104F-JS | 0.4 | | ● | |
| For external turning on small lathes | JS | CCGT060201N-JS | 0.1 | ● | | |
| | | CCGT060202N-JS | 0.2 | ● | | |
| | | CCGT060204N-JS | 0.4 | ● | | |
| | | CCGT09T301N-JS | 0.1 | ● | | |
| | | CCGT09T302N-JS | 0.2 | ● | | |
| | | CCGT09T304N-JS | 0.4 | ● | | |
| For external turning on small lathes (Sharp edge) | JS | CCGT060200FN-JS | 0.03 | | ● | ● |
| | | CCGT060201FN-JS | 0.1 | | ● | ● |
| | | CCGT060202FN-JS | 0.2 | | ● | ● |
| | | CCGT060204FN-JS | 0.4 | | ● | ● |
| | | CCGT09T300FN-JS | 0.03 | | ● | ● |
| | | CCGT09T301FN-JS | 0.1 | | ● | ● |
| | | CCGT09T302FN-JS | 0.2 | | ● | ● |
| | | CCGT09T304FN-JS | 0.4 | | ● | ● |

● : Line up

External toolholders → B246
J series toolholders → B328 - B331
Internal toolholders → B278, B301
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 7°**

| | | SH725 | J740 | NS9530 | TH10 |
|---|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | ●◐ | ● |
| M | Stainless | ●◐ | ●◐ | | ● |
| K | Cast iron | | | ●◐ | ● |
| N | Non-ferrous | | | | ● |
| S | Superalloys | | | | |
| H | Hard materials | | | | |

| Application | Chipbreaker | Designation | Corner radius | SH725 (Coated) | J740 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | J10 | CCGT060200FR-J10 | 0.03 | ● | ● | | ● |
| | | CCGT060200FL-J10 | 0.03 | ● | ● | | ● |
| | | CCGT060201FR-J10 | 0.1 | ● | ● | ● | ● |
| | | CCGT060201FL-J10 | 0.1 | ● | ● | | ● |
| | | CCGT060202FR-J10 | 0.2 | ● | ● | ● | ● |
| | | CCGT060202FL-J10 | 0.2 | ● | ● | ● | ● |
| | | CCGT09T300FR-J10 | 0.03 | ● | ● | | ● |
| | | CCGT09T300FL-J10 | 0.03 | ● | ● | | ● |
| | | CCGT09T301FR-J10 | 0.1 | ● | ● | | ● |
| | | CCGT09T301FL-J10 | 0.1 | ● | ● | | ● |
| | | CCGT09T302FR-J10 | 0.2 | ● | ● | | ● |
| | | CCGT09T302FL-J10 | 0.2 | ● | ● | | ● |
| | | CCGT09T304FR-J10 | 0.4 | ● | | | |

● : Line up

External toolholders → B246
Internal toolholders → B278, B301
J series toolholders → B328 - B331
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 11°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | ●ⓒ | ⓒ | ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | ● | ⓒ | ⓒ | ✠ | ●ⓒ | ⓒ | ⓒ | | |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ⓒ | ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ⓒ | ● | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | Coated cermet | Cermet |
| Finishing | PSF | CPMT060202-PSF | 0.2 | | | | | | | | ● | | | |
| | | CPMT060204-PSF | 0.4 | ● | ● | | | | | | ● | | | |
| | | CPMT080202-PSF | 0.2 | | | | | | | | ● | | | |
| | | CPMT080204-PSF | 0.4 | ● | ● | | | | | | ● | | | |
| | | CPMT090302-PSF | 0.2 | | | | | | | | ● | | ● | ● |
| | | CPMT090304-PSF | 0.4 | ● | ● | | | | | | ● | | ● | ● |
| | | CPMT09T302-PSF | 0.2 | | | | | | | | ● | | | |
| | | CPMT09T304-PSF | 0.4 | ● | ● | | | | | | ● | | | |
| | PF | CPMT090302-PF | 0.2 | | | | | | | | | | ● | ● |
| | | CPMT090304-PF | 0.4 | | | | | | | | | | ● | ● |
| Finishing to light cutting | PSS | CPMT060204-PSS | 0.4 | ● | ● | | | | | | ● | | ● | ● |
| | | CPMT080204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT080208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT090304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT090308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT09T304-PSS | 0.4 | ● | ● | | | | | | ● | | | |
| | | CPMT09T308-PSS | 0.8 | ● | ● | | | | | | ● | | | |
| Finishing to medium cutting | PS | CPMT060202-PS | 0.2 | ● | ● | | | | | | ● | ● | | ● |
| | | CPMT060204-PS | 0.4 | ● | ● | | | | | ● | ● | ● | ● | ● |
| | | CPMT080202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT080204-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT080208-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT090304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT090308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | CPMT09T302-PS | 0.2 | ● | ● | | | | | | ● | | | |
| | | CPMT09T304-PS | 0.4 | ● | ● | | | | | | ● | | | ● |
| | | CPMT09T308-PS | 0.8 | ● | ● | | | | | ● | ● | | | |

● : Line up

Internal toolholders → B280, B301

# TurnLine - Insert

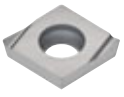
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 11°**

| | | T9125 | NS9530 | TH10 |
|---|---|---|---|---|
| P | Steel | ◐✣ | ●◐ | ● |
| M | Stainless | | | ● |
| K | Cast iron | | ●◐ | ● |
| N | Non-ferrous | | | ● |
| S | Superalloys | | | |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|
| Medium cutting | 24 | CPMT120408-24 | 0.8 | | ● | |
| | | CPMT160508-24 | 0.8 | ● | ● | |
| | | CPMT160512-24 | 1.2 | | ● | |
| Finishing | W15 | CPGT050202L-W15 | 0.2 | | ● | |
| | | CPGT050204L-W15 | 0.4 | | ● | |
| | | CPGT080202R-W15 | 0.2 | | | ● |
| | | CPGT080202L-W15 | 0.2 | | ● | ● |
| | | CPGT080204R-W15 | 0.4 | | | ● |
| | | CPGT080204L-W15 | 0.4 | | ● | ● |
| | W20 | CPGT090302R-W20 | 0.2 | | ● | ● |
| | | CPGT090302L-W20 | 0.2 | | ● | ● |
| | | CPGT090304R-W20 | 0.4 | | ● | ● |
| | | CPGT090304L-W15 | 0.4 | | ● | ● |



● : Line up

Internal toolholders → B280, B301 Cartridges → F174 -
Boring bar tools → F188 - F191

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 80° with hole Positive 11°**

| | | T9105 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | AH8005 | AH8015 | AH905 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | Cermet |
| P | Steel | ● | ⓒ | ✠ | ⓒ✠ | ✠ | | | | ⓒ | | | | ●ⓒ |
| M | Stainless | | ● | ⓒ | ⓒ | ✠ | | | | ⓒ | ● | ⓒ | | |
| K | Cast iron | ●ⓒ | | | | | ●ⓒ | ● | ⓒ | ⓒ | | | | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | ● | ⓒ | ⓒ | |
| H | Hard materials | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | AH8005 | AH8015 | AH905 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | **PM** | **CPMT060204-PM** | 0.4 | | | ● | ● | ● | ● | | | ● | | | | |
| | | **CPMT060208-PM** | 0.8 | | ● | ● | ● | ● | ● | | | ● | | | | |
| | | **CPMT090304-PM** | 0.4 | | ● | ● | ● | ● | ● | | | ● | | | | ● |
| | | **CPMT090308-PM** | 0.8 | | ● | ● | ● | ● | ● | | | ● | | | | ● |
| Finishing to medium cutting | **CM** | **CPMT060204-CM** | 0.4 | | | | | | | | ● | | | | | |
| | | **CPMT060208-CM** | 0.8 | | | | | | | | ● | | | | | |
| | | **CPMT080204-CM** | 0.4 | | | | | | | | ● | | | | | |
| | | **CPMT080208-CM** | 0.8 | | | | | | | | ● | | | | | |
| | | **CPMT090304-CM** | 0.4 | | | | | | | ● | ● | | | | | |
| | | **CPMT090308-CM** | 0.8 | | | | | | | ● | ● | | | | | |
| | | **CPMT09T304-CM** | 0.4 | | | | | | | ● | ● | | | | | |
| | | **CPMT09T308-CM** | 0.8 | | | | | | | ● | ● | | | | | |
| | | **CPMT09T312-CM** | 1.2 | | | | | | | | ● | | | | | |
| | | **CPMT120408-CM** | 0.8 | | | | | | | | ● | | | | | |
| | | **CPMT120412-CM** | 1.2 | | | | | | | | ● | | | | | |
| Medium cutting | **All-round** | **CPMT120408** | 0.8 | | | | | | | | | | ● | ● | ● | |
| | | | | | | | | | | | | | | | | |
| | **-** | **CPMW080204** | 0.4 | | | | | | | | ● | | | | | |
| | | **CPMW080208** | 0.8 | | | | | | | | ● | | | | | |
| | | **CPMW090304** | 0.4 | ● | | | | | | | ● | | | | | |
| | | **CPMW090308** | 0.8 | | | | | | | | ● | | | | | |

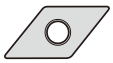
● : Line up

Internal toolholders → B280, B301
Boring bar tools → F188 - F191

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 55° with hole Positive 7°**

| | | T9115 | T9125 | AH725 | AH8005 | AH8015 | AH905 | GH730 | SH725 | J740 | GT9530 | J9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | Coated cermet | | Cermet |
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | | | | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ |
| M | Stainless | | | ⓒ | ● | ⓒ | | ⓒ | ●ⓒ | ●ⓒ | | | |
| K | Cast iron | ●ⓒ | | ⓒ | | | | ⓒ | | | ●ⓒ | ●ⓒ | ●ⓒ |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | | | ● | ● | ⓒ | ⓒ | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH725 | AH8005 | AH8015 | AH905 | GH730 | SH725 | J740 | GT9530 | J9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | 01 | DCGT070202-01 | 0.2 | | | | | | | | | ● | | ● | |
| | | DCGT11T302-01 | 0.2 | | | | | | | | | ● | | | |
| | | | | | | | | | | | | | | | |
| Precision finishing (Sharp edge) | 01 | DCGT070202F-01 | 0.2 | | | | | | | | ● | | | | |
| | | DCGT11T302F-01 | 0.2 | | | | | | | | ● | | | | |
| | | | | | | | | | | | | | | | |
| Finishing | PSF | DCMT070202-PSF | 0.2 | | | ● | | | | | | | ● | | ● |
| | | DCMT070204-PSF | 0.4 | ● | ● | ● | | | | | | | ● | | ● |
| | | DCMT11T302-PSF | 0.2 | | | ● | | | | | | | ● | | ● |
| | | DCMT11T304-PSF | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | | DCMT11T308-PSF | 0.8 | ● | ● | ● | ● | ● | ● | | | | | | |
| | | | | | | | | | | | | | | | |
| | PF | DCMT070202-PF | 0.2 | | | | | | | ● | | | ● | | ● |
| | | DCMT070204-PF | 0.4 | | | | | | | ● | | | ● | | ● |
| | | DCMT070208-PF | 0.8 | | | | | | | | | | ● | | ● |
| | | DCMT11T302-PF | 0.2 | | | | | | | ● | | | ● | | ● |
| | | DCMT11T304-PF | 0.4 | | | | | | | ● | | | ● | | ● |
| | | DCMT11T308-PF | 0.8 | | | | | | | | | | ● | | |
| | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B218 -
J series toolholders → B331 - 335
Internal toolholders → B287 -
PINZBOHR® → F154 - F170

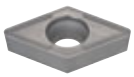
# TurnLine - Insert

● : Continuous cutting
ᶜ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 55° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | GH730 | | | | GT9530 | | | | NS9530 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | |
| P | Steel | ●ᶜ | ᶜ✣ | ᶜ | ✣ | ᶜ✣ | ✣ | ●ᶜ | ᶜ | | | | ᶜ | | | | ●ᶜ | | | | ●ᶜ | | | | | |
| M | Stainless | | | ● | ᶜ | ᶜ | ✣ | ●ᶜ | ᶜ | ● | ᶜ | | ᶜ | | | | | | | | | | | | | |
| K | Cast iron | ●ᶜ | | | | | | ●ᶜ | ᶜ | | | | ᶜ | | | | ●ᶜ | | | | ●ᶜ | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ᶜ | ● | ● | ᶜ | ᶜ | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | GH730 | | | | GT9530 | | | | NS9530 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to light cutting | **PSS** | **DCMT070204-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | ● | | | | ● | | | | | |
| | | **DCMT070208-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | | | ● | | | | ● | | | | | |
| | | **DCMT11T304-PSS** | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | ● | | | | ● | | | | | |
| | | **DCMT11T308-PSS** | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | ● | | | | ● | | | | | |
| | | **DCMT11T312-PSS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| Finishing to medium cutting | **PS** | **DCMT070202-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT070204-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT070208-PS** | 0.8 | ● | ● | | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT11T302-PS** | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT11T304-PS** | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT11T308-PS** | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | | |
| | | **DCMT11T312-PS** | 1.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | **23** | **DCMT070204-23** | 0.4 | | | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT11T304-23** | 0.4 | | | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT11T308-23** | 0.8 | | | | | | | | | | | | | | | | | | | | ● | | | | | |
| Medium cutting | **24** | **DCMT070202-24** | 0.2 | | | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT070204-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT070208-24** | 0.8 | | ● | | | | | | | | | | | | | | | | | | ● | | | | | |
| |  | **DCMT11T302-24** | 0.2 | | ● | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT11T304-24** | 0.4 | ● | ● | | | | | | | | | | | | | | | | | | ● | | | | | |
| | | **DCMT11T308-24** | 0.8 | ● | ● | | ● | | | | | | | | | | | | | | | | ● | | | | | |

● : Line up

External toolholders → **B218 -**
J series toolholders → **B331 - 335**
Internal toolholders → **B287 -**
PINZBOHR® → **F154 - F170**

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 55° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | | | ●ⓒ | ⓒ | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | ● | ⓒ | ⓒ | ✠ | | | ●ⓒ | ⓒ | ●ⓒ | ⓒ | | | ● |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ⓒ | ●ⓒ | ⓒ | ●ⓒ | ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | | | ●ⓒ | ● | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | W10 | DCGT070200R-W10 | 0.03 | | | | | | | | | | | | | | | ● |
| | | DCGT070200L-W10 | 0.03 | | | | | | | | | | | | | | | ● |
| | | DCGT070202R-W10 | 0.2 | | | | | | | | | | | | | | ● | ● |
| | | DCGT070202L-W10 | 0.2 | | | | | | | | | | | | | ● | ● | |
| | | DCGT070204R-W10 | 0.4 | | | | | | | | | | | ● | | | ● | ● |
| | | DCGT070204L-W10 | 0.4 | | | | | | | | | | | ● | | ● | ● | ● |
| | W15 | DCGT11T302R-W15 | 0.2 | | | | | | | | | | | | | | ● | ● |
| | | DCGT11T302L-W15 | 0.2 | | | | | | | | | | | | | ● | ● | |
| | | DCGT11T304R-W15 | 0.4 | | | | | | | | | | | | | | ● | |
| | | DCGT11T304L-W15 | 0.4 | | | | | | | | | | | ● | | ● | ● | ● |
| | | DCGT11T308R-W15 | 0.8 | | | | | | | | | | | | | | ● | ● |
| | | DCGT11T308L-W15 | 0.8 | | | | | | | | | | | | | | ● | ● |
| Medium cutting | PM | DCMT070204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | ● | |
| | | DCMT070208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | ● | |
| | | DCMT11T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | ● | |
| | | DCMT11T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | ● | ● | |
| | | DCMT11T312-PM | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | | | | |
| Finishing to medium cutting | CM | DCMT070204-CM | 0.4 | | | | | | | | ● | | | | | | | |
| | | DCMT070208-CM | 0.8 | | | | | | | | ● | | | | | | | |
| | | DCMT11T304-CM | 0.4 | | | | | | | ● | ● | | | | | | | |
| | | DCMT11T308-CM | 0.8 | | | | | | | ● | ● | | | | | | | |
| | | DCMT11T312-CM | 1.2 | | | | | | | | ● | | | | | | | |

● : Line up

External toolholders → B218 -
J series toolholders → B331 - 335
Internal toolholders → B287 -
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 55° with hole Positive 7°**

| | | T9105 | T5115 | GH110 | NS9530 | TH10 | KS05F |
|---|---|---|---|---|---|---|---|
| P | Steel | ● | | ● | ●◐ | ● | |
| M | Stainless | | | ● | | ● | |
| K | Cast iron | ●◐ | ◐ | ● | ●◐ | ● | ● |
| N | Non-ferrous | | | | | ● | ● |
| S | Superalloys | | | ● | | | ● |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9105 (Coated) | T5115 (Coated) | GH110 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) | KS05F (Uncoated) |
|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | AL | DCGT070202-AL | 0.2 | | | | | | ● |
| | | DCGT070204-AL | 0.4 | | | | | | ● |
| | | DCGT11T302-AL | 0.2 | | | | | | ● |
| | | DCGT11T304-AL | 0.4 | | | | | | ● |
| | | DCGT11T308-AL | 0.8 | | | | | | ● |
| | All-round | DCGT070202 | 0.2 | | | | ● | | |
| | | DCGT070204 | 0.4 | | | | ● | | |
| | | DCGT11T302 | 0.2 | | | | ● | | |
| | | DCGT11T304 | 0.4 | | | | ● | | |
| | | DCGT11T308 | 0.8 | | | | ● | | |
| | Angular | DCGT070202R | 0.2 | | | | | ● | |
| | | DCGT070202L | 0.2 | | | | | ● | |
| | | DCGT070204R | 0.4 | | | | | ● | |
| | | DCGT070204L | 0.4 | | | | | ● | |
| | | DCGT11T302R | 0.2 | | | | | ● | |
| | | DCGT11T302L | 0.2 | | | | | ● | |
| | | DCGT11T304R | 0.4 | | | | | ● | |
| | | DCGT11T304L | 0.4 | | | | | ● | |
| Medium cutting | - | DCMW070204 | 0.4 | ● | ● | | | | |
| | | DCMW070208 | 0.8 | | ● | | | | |
| | | DCMW11T304 | 0.4 | ● | ● | | | | |
| | | DCMW11T308 | 0.8 | | ● | | | | |
| | - | DCGW070202 | 0.2 | | | | | ● | |
| | | DCGW070204 | 0.4 | | | ● | | ● | |
| | | DCGW11T304 | 0.4 | | | | | ● | |
| | | DCGW11T308 | 0.8 | | | | | ● | |

● : Line up

External toolholders → B218 -
J series toolholders → B331 - 335
Internal toolholders → B287 -
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 55° with hole Positive 7°**

| | | |
|---|---|---|
| P | Steel | ⓒ ●ⓒ●ⓒ |
| M | Stainless | ⓒ ●ⓒ●ⓒ |
| K | Cast iron | ⓒ |
| N | Non-ferrous | |
| S | Superalloys | ● ●ⓒ |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coated AH725 | SH725 | SH730 |
|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JS | DCGT070200FN-JS | 0.03 | | ● | ● |
| | | DCGT070201FN-JS | 0.1 | | ● | ● |
| | | DCGT070202FN-JS | 0.2 | | ● | ● |
| | | DCGT11T300FN-JS | 0.03 | | ● | ● |
| | | DCGT11T301FN-JS | 0.1 | | ● | ● |
| | | DCGT11T302FN-JS | 0.2 | | ● | ● |
| | | DCGT11T304FN-JS | 0.4 | | ● | ● |
| For external turning on small lathes | JS | DCGT070201N-JS | 0.1 | ● | | |
| | | DCGT070202N-JS | 0.2 | ● | | |
| | | DCGT11T301N-JS | 0.1 | ● | | |
| | | DCGT11T302N-JS | 0.2 | ● | | |
| | | DCGT11T304N-JS | 0.4 | ● | | |
| For external turning on small lathes (Sharp edge) | JPP | DCET0702008MFR-JPP | <0.08* | | ● | ● |
| | | DCET0702008MFL-JPP | <0.08* | | ● | ● |
| | | DCET070201MFR-JPP | <0.1* | | ● | ● |
| | | DCET070201MFL-JPP | <0.1* | | ● | ● |
| | | DCET0702018MFR-JPP | <0.18* | | ● | ● |
| | | DCET0702018MFL-JPP | <0.18* | | ● | ● |
| | | DCET070202MFR-JPP | <0.2* | | ● | ● |
| | | DCET070202MFL-JPP | <0.2* | | ● | ● |
| | | DCET11T3008MFR-JPP | <0.08* | | ● | ● |
| | | DCET11T3008MFL-JPP | <0.08* | | ● | ● |
| | | DCET11T301MFR-JPP | <0.1* | | ● | ● |
| | | DCET11T301MFL-JPP | <0.1* | | ● | ● |
| | | DCET11T3018MFR-JPP | <0.18* | | ● | ● |
| | | DCET11T3018MFL-JPP | <0.18* | | ● | ● |
| | | DCET11T302MFR-JPP | <0.2* | | ● | ● |
| | | DCET11T302MFL-JPP | <0.2* | | ● | ● |

* Corner radius has minus tolerance.

● : Line up

External toolholders → B218 - J series toolholders → B331 - 335
Internal toolholders → B287 - PINZBOHR® → F154 - F170

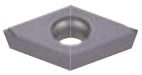
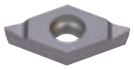
# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 55° with hole Positive 7°**

| | | SH725 | SH730 | J740 | J9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | ●◐ | ●◐ | ●◐ | ● |
| M | Stainless | ●◐ | ●◐ | ●◐ | | | ● |
| K | Cast iron | | | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | ● |
| S | Superalloys | | ●◐ | | | | |
| H | Hard materials | | | | | | |
| | | Coated | | | Coated cermet | Cermet | Uncoated |

| Application | Chipbreaker | Designation | Corner radius | SH725 | SH730 | J740 | J9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JRP | DCET0702008MFR-JRP | <0.08* | ● | ● | | | | |
| | | DCET0702008MFL-JRP | <0.08* | ● | ● | | | | |
| | | DCET070201MFR-JRP | <0.1* | ● | ● | | | | |
| | | DCET070201MFL-JRP | <0.1* | ● | ● | | | | |
| | | DCET0702018MFR-JRP | <0.18* | ● | ● | | | | |
| | | DCET0702018MFL-JRP | <0.18* | ● | ● | | | | |
| | | DCET070202MFR-JRP | <0.2* | ● | ● | | | | |
| | | DCET070202MFL-JRP | <0.2* | ● | ● | | | | |
| |  | DCET11T3008MFR-JRP | <0.08* | ● | ● | | | | |
| | | DCET11T3008MFL-JRP | <0.08* | ● | ● | | | | |
| | | DCET11T301MFR-JRP | <0.1* | ● | ● | | | | |
| | | DCET11T301MFL-JRP | <0.1* | ● | ● | | | | |
| | | DCET11T3018MFR-JRP | <0.18* | ● | ● | | | | |
| | | DCET11T3018MFL-JRP | <0.18* | ● | ● | | | | |
| | | DCET11T302MFR-JRP | <0.2* | ● | ● | | | | |
| | | DCET11T302MFL-JRP | <0.2* | ● | ● | | | | |
| | JSP | DCET0702008MFN-JSP | <0.08* | ● | ● | | | | |
| | | DCET070201MFN-JSP | <0.1* | ● | ● | | | | |
| | | DCET0702018MFN-JSP | <0.18* | ● | ● | | | | |
| | | DCET070202MFN-JSP | <0.2* | ● | ● | | | | |
| |  | DCET11T3008MFN-JSP | <0.08* | ● | ● | | | | |
| | | DCET11T301MFN-JSP | <0.1* | ● | ● | | | | |
| | | DCET11T3018MFN-JSP | <0.18* | ● | ● | | | | |
| | | DCET11T302MFN-JSP | <0.2* | ● | ● | | | | |
| | J10 | DCGT070200FR-J10 | 0.03 | ● | | ● | | | ● |
| | | DCGT070200FL-J10 | 0.03 | ● | | ● | | | ● |
| | | DCGT070201FR-J10 | 0.1 | ● | | ● | | ● | ● |
| | | DCGT070201FL-J10 | 0.1 | ● | | ● | | ● | ● |
| | | DCGT070202FR-J10 | 0.2 | ● | | ● | | ● | ● |
| | | DCGT070202FL-J10 | 0.2 | ● | | ● | | ● | ● |
| | | DCGT070204FR-J10 | 0.4 | ● | | | | | |
| | | DCGT070204FL-J10 | 0.4 | ● | | | | | |
| | | DCGT11T300FR-J10 | 0.03 | ● | | ● | | | ● |
| | | DCGT11T300FL-J10 | 0.03 | ● | | ● | | | ● |
| | | DCGT11T301FR-J10 | 0.1 | ● | | ● | | ● | ● |
| | | DCGT11T301FL-J10 | 0.1 | ● | | ● | | ● | ● |
| | | DCGT11T302FR-J10 | 0.2 | ● | | ● | | ● | ● |
| | | DCGT11T302FL-J10 | 0.2 | ● | | ● | | ● | ● |
| On small lathes (Honed edge) | J10 | DCGT070202R-J10 | 0.2 | | | | ● | | |
| | | DCGT11T302R-J10 | 0.2 | | | | ● | | |
| | | | | | | | | | |

* Corner radius has minus tolerance.

● : Line up

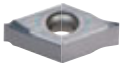
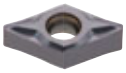
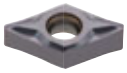
# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED

**Rhombic, 55° with hole**

| | | AH725 | SH725 |
|---|---|---|---|
| P | Steel | ◐ | ●◐ |
| M | Stainless | ◐ | ●◐ |
| K | Cast iron | ◐ | |
| N | Non-ferrous | | |
| S | Superalloys | ● | |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) |
|---|---|---|---|---|---|
| Finishing (Sharp edge) | JRP | DXGU070301MFRE-JRP | <0.1* | | ● |
| |  | DXGU070301MFLE-JRP | <0.1* | | ● |
| | | DXGU070302MFRE-JRP | <0.2* | | ● |
| | | DXGU070302MFLE-JRP | <0.2* | | ● |
| Finishing to medium cutting (Sharp edge) | JTS | DXGU070301MFR-JTS | <0.1* | | ● |
| |  | DXGU070301MFL-JTS | <0.1* | | ● |
| | | DXGU070302MFR-JTS | <0.2* | | ● |
| | | DXGU070302MFL-JTS | <0.2* | | ● |
| Finishing to medium cutting | JTS | DXGU070301MR-JTS | <0.1* | ● | |
| |  | DXGU070301ML-JTS | <0.1* | ● | |
| | | DXGU070302MR-JTS | <0.2* | ● | |
| | | DXGU070302ML-JTS | <0.2* | ● | |
| Finishing (Low cutting force) (Sharp edge) | JSS | DXGU070301MFR-JSS | <0.1* | | ● |
| | | DXGU070301MFL-JSS | <0.1* | | ● |
| | | DXGU070302MFR-JSS | <0.2* | | ● |
| | | DXGU070302MFL-JSS | <0.2* | | ● |

* Corner radius has minus tolerance.

● : Line up

External toolholders → B190 -
Internal toolholders → B268, B269

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED

**Rhombic, 55° with hole**

| | | AH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|
| | | Coated | Coated cermet | Cermet | Uncoated |
| P | Steel | ◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | | | |
| K | Cast iron | ◐ | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | ● |
| S | Superalloys | ● | | | ● |
| H | Hard materials | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|
| Finishing (Low cutting force) | JSS | DXGU070301MR-JSS | <0.1* | ● | | | |
| | | DXGU070301ML-JSS | <0.1* | ● | | | |
| | | DXGU070302MR-JSS | <0.2* | ● | | | |
| | | DXGU070302ML-JSS | <0.2* | ● | | | |
| Finishing to medium cutting | TS | DXGU070302R-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070302L-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070308R-TS | 0.8 | ● | ● | ● | ● |
| | | DXGU070308L-TS | 0.8 | ● | ● | ● | ● |
| Finishing (Low cutting force) | SS | DXGU070302R-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070302L-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-SS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-SS | 0.4 | ● | ● | ● | ● |

External toolholders → B190 -
Internal toolholders → B268, B269

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 75° with hole Positive 11°**

| | | GH110 | SH725 | SH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|
| | | Coated | | | Coated cermet | Cermet | Uncoated | |
| P | Steel | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ⓒ |
| M | Stainless | ● | ●ⓒ | ●ⓒ | | | ● | ⓒ |
| K | Cast iron | ● | | | ●ⓒ | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | ● | |
| S | Superalloys | ● | | ●ⓒ | | | | |
| H | Hard materials | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 | SH725 | SH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | W08 | EPGT03X100R-W08 | 0.03 | | | ● | | | ● | |
| | | EPGT03X100L-W08 | 0.03 | | | ● | | | ● | |
| | | EPGT03X101R-W08 | 0.1 | | | ● | | | ● | |
| | | EPGT03X101L-W08 | 0.1 | | | ● | | | ● | |
| | | EPGT03X102R-W08 | 0.2 | | | ● | | | ● | |
| | | EPGT03X102L-W08 | 0.2 | | | ● | | | ● | |
| | | EPGT03X104R-W08 | 0.4 | | | ● | | | ● | |
| | | EPGT03X104L-W08 | 0.4 | | | ● | | | ● | |
| | | EPGT040100R-W08 | 0.03 | | | ● | | | ● | |
| | | EPGT040100L-W08 | 0.03 | ● | | ● | | ● | ● | |
| | | EPGT040101R-W08 | 0.1 | | | ● | | | ● | |
| | | EPGT040101L-W08 | 0.1 | | | ● | | | ● | |
| | | EPGT040102R-W08 | 0.2 | ● | | ● | | ● | ● | |
| | | EPGT040102L-W08 | 0.2 | ● | | ● | ● | ● | ● | ● |
| | | EPGT040104R-W08 | 0.4 | ● | | ● | | ● | ● | |
| | | EPGT040104L-W08 | 0.4 | ● | | ● | ● | ● | ● | ● |
| Finishing (Sharp edge) | W08 | EPGT03X100FL-W08 | 0.03 | | ● | | | | | |
| | | EPGT03X100FR-W08 | 0.03 | | ● | | | | | |
| | | EPGT03X101FL-W08 | 0.1 | | ● | | | | | |
| | | EPGT03X101FR-W08 | 0.1 | | ● | | | | | |
| | | EPGT03X102FL-W08 | 0.2 | | ● | | | | | |
| | | EPGT03X102FR-W08 | 0.2 | | ● | | | | | |
| | | EPGT03X104FL-W08 | 0.4 | | ● | | | | | |
| | | EPGT03X104FR-W08 | 0.4 | | ● | | | | | |
| | | EPGT040100FL-W08 | 0.03 | | ● | | | | | |
| | | EPGT040100FR-W08 | 0.03 | | ● | | | | | |
| | | EPGT040101FL-W08 | 0.1 | | ● | | | | | |
| | | EPGT040101FR-W08 | 0.1 | | ● | | | | | |
| | | EPGT040102FL-W08 | 0.2 | | ● | | | | | |
| | | EPGT040102FR-W08 | 0.2 | | ● | | | | | |
| | | EPGT040104FL-W08 | 0.4 | | ● | | | | | |
| | | EPGT040104FR-W08 | 0.4 | | ● | | | | | |

● : Line up

Internal toolholders → B279 - Boring bar tools → F188 - F191
Top-borer tools → F192 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 75° with hole Positive 11°**

| | | SH725 | SH730 | J740 |
|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | ●◐ |
| M | Stainless | ●◐ | ●◐ | ●◐ |
| K | Cast iron | | | |
| N | Non-ferrous | | | |
| S | Superalloys | | ●◐ | |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | SH725 | SH730 | J740 |
|---|---|---|---|---|---|---|
| For internal turning on small lathes | JS | EPGT03X101-JS | 0.1 | | ● | |
| | | EPGT03X102-JS | 0.2 | | ● | |
| | | EPGT03X104-JS | 0.4 | | ● | |
| | | EPGT040101-JS | 0.1 | | ● | |
| | | EPGT040102-JS | 0.2 | | ● | |
| | | EPGT040104-JS | 0.4 | | ● | |
| For internal turning on small lathes (Sharp edge) | JS | EPGT03X101F-JS | 0.1 | ● | | |
| | | EPGT03X102F-JS | 0.2 | ● | | |
| | | EPGT03X104F-JS | 0.4 | ● | | |
| | | EPGT040101F-JS | 0.1 | ● | | |
| | | EPGT040102F-JS | 0.2 | ● | | |
| | | EPGT040104F-JS | 0.4 | ● | | |
| Finishing | J08 | EPGT040100L-J08 | 0.03 | | ● | ● |
| | | EPGT040102L-J08 | 0.2 | | ● | ● |
| | | EPGT040104L-J08 | 0.4 | | ● | ● |
| Finishing (Sharp edge) | J08 | EPGT040100FL-J08 | 0.03 | ● | | |
| | | EPGT040102FL-J08 | 0.2 | ● | | |
| | | EPGT040104FL-J08 | 0.4 | ● | | |

● : Line up

Internal toolholders → B279 - Boring bar tools → F188 - F191
Top-borer tools → F192 -

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Round, with hole Positive 7°**

| | | T9115 | T9125 | T5115 | AH120 | AH8005 | AH8015 | AH905 | KS05F |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●⊂ | ⊂✠ | | ●⊂ | | | | |
| M | Stainless | | | | ●⊂ | ● | ⊂ | | |
| K | Cast iron | ●⊂ | | ⊂ | ●⊂ | | | | ● |
| N | Non-ferrous | | | | | | | | ● |
| S | Superalloys | | | | ●⊂ | ● | ⊂ | ⊂ | ● |
| H | Hard materials | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T5115 | AH120 | AH8005 | AH8015 | AH905 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | Uncoated |
| Finishing to medium cutting | RS | RCMT10T3M0-RS | - | ● | ● | | | ● | ● | ● | |
| | | RCMT1204M0-RS | - | ● | ● | | | ● | ● | ● | |
| | | RCMT1606M0-RS | - | ● | ● | | ● | | | | |
| | | RCMT2006M0-RS | - | | ● | | | | | | |
| | | RCMT2507M0-RS | - | | ● | | | | | | |
| | CM | RCMT0502M0-CM | - | | | ● | | | | | |
| | | RCMT0602M0-CM | - | | | ● | | | | | |
| | | RCMT0803M0-CM | - | | | ● | | | | | |
| | AL | RCGT0602M0-AL | - | | | | | | | | ● |
| | | RCGT0803M0-AL | - | | | | | | | | ● |
| | | RCGT1003M0-AL | - | | | | | | | | ● |

● : Line up

External toolholders → **B233 -**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

Insert

Positive

## POSITIVE TYPE

**Round, with hole Positive 7°**

| | | T9115 | T9125 | AH8005 | AH8015 | AH905 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | Cermet | Uncoated |
| P | Steel | ●◐ | ◐✠ | | | | ●◐ | ● |
| M | Stainless | | | ● | ◐ | | | ● |
| K | Cast iron | ●◐ | | | | | ●◐ | ● |
| N | Non-ferrous | | | | | | | ● |
| S | Superalloys | | | ● | ◐ | ◐ | | |
| H | Hard materials | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH8005 | AH8015 | AH905 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Heavy cutting | 61 | RCMT0502M0-61 | - | ● | ● | | | | ● | ● |
| | | RCMT0602M0-61 | - | ● | ● | | | | ● | ● |
| | | RCMT0803M0-61 | - | ● | ● | | | | ● | ● |
| | 61 | RCMM1003M0-61 | - | ● | ● | ● | ● | ● | ● | ● |
| | | RCMM1204M0-61 | - | ● | ● | ● | ● | ● | ● | ● |
| | | RCMM1606M0-61 | - | ● | ● | | | | | ● |
| | | RCMM2006M0-61 | - | | ● | | | | | ● |
| | | RCMM2507M0-61 | - | | ● | | | | | |

| ød1 (mm) | Designation | 0502M0 | 0602M0 | 0803M0 | 1003M0 | 10T3M0 | 1204M0 | 1606M0 | 2006M0 | 2507M0 |
|---|---|---|---|---|---|---|---|---|---|---|
| | RC*T | 2.5 | 2.8 | 3.4 | 4.4 | 4.4 | 4.4 | 5.5 | 6.5 | 7.6 |
| | RCMM | - | - | - | 3.6 | - | 4.2 | 5.2 | 6.5 | 7.2 |

R

**Special Round Insert**

| | | TH10 | KS20 |
|---|---|---|---|
| | | Uncoated | |
| P | Steel | ● | |
| M | Stainless | ● | |
| K | Cast iron | ● | ◐✠ |
| N | Non-ferrous | ● | ◐✠ |
| S | Superalloys | | ◐✠ |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | TH10 | KS20 |
|---|---|---|---|---|---|
| Medium cutting | - | RT05 | - | ● | |
| | | RT06 | - | ● | ● |
| | | RT08 | - | ● | |

● : Line up

RC... : External toolholders → **B233 -**

RT... : External toolholders → **B252**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Round, without hole**
**Positive 7°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Ceramics LX11 |
|---|---|---|---|---|
| Medium cutting | - | RCGX090800 | - | ● |
| | | RCGX120800 | - | ● |

● : Line up

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Square, 90° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | | | ●⊂ | ⊂ | ●⊂ | ●⊂ |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | | | ●⊂ | ⊂ | | |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ⊂ | ●⊂ | ⊂ | ●⊂ | ●⊂ |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●⊂ | ● | | |
| H | Hard materials | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | Coated cermet | Cermet |
| Finishing to medium cutting | PS | SCMT09T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● |
| | | SCMT09T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● |
| | | SCMT120404-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | | SCMT120408-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | 23 | SCMT09T302-23 | 0.2 | | | | | | | | | | | | ● |
| | | SCMT09T308-23 | 0.8 | | ● | | | | | | | ● | | | |
| | | SCMT120408-23 | 0.8 | | ● | | | | | | | ● | ● | | |
| Medium cutting | 24 | SCMT070204-24 | 0.4 | | ● | | | | | | | | | | ● |
| | | SCMT09T302-24 | 0.2 | | | | | | | | | | | | ● |
| | | SCMT09T304-24 | 0.4 | | ● | | | | | | | | | | ● |
| | | SCMT09T308-24 | 0.8 | ● | ● | | | | | | | | | | ● |
| | | SCMT120404-24 | 0.4 | | ● | | | | | | | | | | ● |
| | | SCMT120408-24 | 0.8 | | ● | | | | | | | | | | ● |
| | PM | SCMT09T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | | SCMT09T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | | SCMT120408-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | ● |
| | | SCMT120412-PM | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | ● |
| Finishing to medium cutting | CM | SCMT09T304-CM | 0.4 | | | | | | | ● | ● | | | | |
| | | SCMT09T308-CM | 0.8 | | | | | | | ● | ● | | | | |
| | | SCMT09T312-CM | 1.2 | | | | | | | | ● | | | | |
| | | SCMT120404-CM | 0.4 | | | | | | | ● | ● | | | | |
| | | SCMT120408-CM | 0.8 | | | | | | | ● | ● | | | | |

● : Line up

External toolholders → B250

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Square, 90° with hole Positive 11°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | ●⊂ | ⊂ | ●⊂ | ●⊂ | ● |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | ●⊂ | ⊂ | | | ● |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ⊂ | ●⊂ | ●⊂ | ● |
| N | Non-ferrous | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | ●⊂ | ● | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | PS | SPMT090304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | |
| | | SPMT090308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | |
| | | SPMT120404-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | |
| | | SPMT120408-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | |
| | 23 | SPMT090304-23 | 0.4 | | ● | | | | | | | | ● | |
| | | SPMT090308-23 | 0.8 | | ● | | | | | | | | ● | |
| Medium cutting | 24 | SPMT090304-24 | 0.4 | | ● | | | | | | | | ● | |
| | | SPMT090308-24 | 0.8 | | ● | | | | | ● | | | ● | |
| | | SPMT120404-24 | 0.4 | | | | | | | | | | ● | |
| | | SPMT120408-24 | 0.8 | | | | | | | | | | ● | |
| Finishing | W15 | SPGT090302L-W15 | 0.2 | | | | | | | | | | ● | |
| | | SPGT090304L-W15 | 0.4 | | | | | | | | | | ● | ● |
| | | SPGT090308R-W15 | 0.8 | | | | | | | | | | | ● |
| | | SPGT090308L-W15 | 0.8 | | | | | | | | | | ● | ● |
| | W20 | SPGT120404L-W20 | 0.4 | | | | | | | | | | ● | |
| | | | | | | | | | | | | | | |

● : Line up

External toolholders → B243 - Internal toolholders → B282, B305
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Square, 90° with hole Positive 11°**

| | | T515 | T5115 | NS9530 | TH10 |
|---|---|---|---|---|---|
| P | Steel | | | ●◐ | ● |
| M | Stainless | | | | ● |
| K | Cast iron | ●◐ | ◐ | ●◐ | ● |
| N | Non-ferrous | | | | ● |
| S | Superalloys | | | | |
| H | Hard materials | | | | |

| Application | Chipbreaker | Designation | Corner radius | T515 (Coated) | T5115 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | CM | SPMT090304-CM | 0.4 | | ● | | |
| | | SPMT090308-CM | 0.8 | | ● | | |
| | | SPMT120404-CM | 0.4 | ● | ● | | |
| | | SPMT120408-CM | 0.8 | ● | ● | | |
| | - (Tungaloy's standard hole) | SPGM090304L | 0.4 | | | ● | |
| | | SPGM120304L | 0.4 | | | ● | |
| | | SPGM120308L | 0.8 | | | ● | |
| | - | SPMW090304 | 0.4 | | ● | | |
| | | SPMW090308 | 0.8 | | ● | | |
| | | SPMW120404 | 0.4 | | ● | | |
| | | SPMW120408 | 0.8 | | ● | | |
| | - | SPGW090302 | 0.2 | | | | ● |
| | | SPGW090304 | 0.4 | | | | ● |
| | | SPGW120404 | 0.4 | | | | ● |
| | - (Tungaloy's standard hole) | SPGA090304 | 0.4 | | | ● | |

● : Line up

External toolholders → B243 - Internal toolholders → B282, B305
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Square, 90° without hole Positive 11°**

| | | T9125 | T5115 | NS9530 | TH10 | UX30 | LX11 |
|---|---|---|---|---|---|---|---|
| P | Steel | ◐✣ | | ●◐ | ● | ● | |
| M | Stainless | | | | ● | ● | |
| K | Cast iron | | ◐ | ●◐ | ● | | |
| N | Non-ferrous | | | | ● | | |
| S | Superalloys | | | | | | |
| H | Hard materials | | | | | | ● |

| Application | Chipbreaker | Designation | Corner radius | T9125 | T5115 | NS9530 | TH10 | UX30 | LX11 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | Cermet | Uncoated | | Ceramics |
| Finishing to medium cutting | 23 | SPMR090304-23 | 0.4 | | | ● | | | |
| | | SPMR090308-23 | 0.8 | ● | | ● | | | |
| | | SPMR120304-23 | 0.4 | ● | | ● | | | |
| | | SPMR120308-23 | 0.8 | ● | | ● | | | |
| | CM | SPMR090304-CM | 0.4 | | ● | | | | |
| | | SPMR090308-CM | 0.8 | | ● | | | | |
| | | SPMR120304-CM | 0.4 | | ● | | | | |
| | | SPMR120308-CM | 0.8 | | ● | | | | |
| | | SPMR120312-CM | 1.2 | | ● | | | | |
| | - | SPGR090304L | 0.4 | | | ● | | | |
| | - | SPGN090304 | 0.4 | | | | ● | | ● |
| | | SPGN090308 | 0.8 | | | | ● | | ● |
| | | SPGN120304 | 0.4 | | | | ● | | ● |
| | | SPGN120308 | 0.8 | | | | ● | | ● |
| | | SPGN120312 | 1.2 | | | ● | | | ● |
| | | SPGN120408 | 0.8 | | | | ● | | |
| | - | SPMN090304 | 0.4 | | ● | | | | |
| | | SPMN090308 | 0.8 | | ● | | | | |
| | | SPMN120304 | 0.4 | | ● | | | | |
| | | SPMN120308 | 0.8 | | ● | ● | ● | ● | |
| | | SPMN120312 | 1.2 | | ● | | ● | | |
| | | SPMN120408 | 0.8 | | ● | | ● | | |
| | | SPMN120412 | 1.2 | | ● | | | | |

● : Line up

External toolholders → B243 - Internal toolholders → B282, B305
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 7°**

| | | T9115 | T9125 | AH725 | SH725 | J740 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | Coated cermet | Cermet | | Uncoated |
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | ⓒ | ●ⓒ | ●ⓒ | | | | ● |
| K | Cast iron | ●ⓒ | | ⓒ | | | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | ● |
| S | Superalloys | | | ● | | | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH725 | SH725 | J740 | GT9530 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Precision finishing | 01 | TCGT090204-01 | 0.4 | | | | | | | | ● | ● |
| | | TCGT110202-01 | 0.2 | | | | | ● | | | | |
| | | TCGT110204-01 | 0.4 | | | | | | ● | ● | ● | ● |
| | | TCGT110208-01 | 0.8 | | | | | | | ● | | |
| | | TCGT16T304-01 | 0.4 | | | | | | | | | ● |
| | | TCGT16T308-01 | 0.8 | | | | | | | | ● | ● |
| Precision finishing (Sharp edge) | 01 | TCGT110202F-01 | 0.2 | | | | ● | | | | | |
| Finishing | PSF | TCMT090202-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT090204-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110202-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT110204-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110302-PSF | 0.2 | | | ● | | | | | | |
| | | TCMT110304-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT16T304-PSF | 0.4 | ● | ● | ● | | | | | | |
| Finishing to light cutting | PSS | TCMT090204-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT090208-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT110204-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110208-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT110304-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT110308-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT16T304-PSS | 0.4 | ● | ● | ● | | | | | | |
| | | TCMT16T308-PSS | 0.8 | ● | ● | ● | | | | | | |
| | | TCMT16T312-PSS | 1.2 | ● | ● | ● | | | | | | |

● : Line up

External toolholders → B247 Internal toolholders → B283
J series toolholders → B336 PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH725 | GH730 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | ⊂ | ⊂ | ●⊂ | ●⊂ | ● |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | ⊂ | ⊂ | | | ● |
| K | Cast iron | ●⊂ | | | | | | ⊂ | ⊂ | ●⊂ | ●⊂ | ● |
| N | Non-ferrous | | | | | | | | | | | ● |
| S | Superalloys | | | | | | | ● | | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH725 | GH730 | GT9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | PS | TCMT090204-PS | 0.4 | | | | | | | ● | | | | |
| | | TCMT090208-PS | 0.8 | | | | | | | ● | | | | |
| | | TCMT110202-PS | 0.2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | TCMT110204-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | TCMT110208-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| | | TCMT110302-PS | 0.2 | ● | ● | ● | ● | ● | ● | | | | | |
| | | TCMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | | | |
| | | TCMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | | | |
| | | TCMT16T302-PS | 0.2 | ● | ● | ● | ● | ● | ● | ● | | | ● | |
| | | TCMT16T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | | | ● | |
| | | TCMT16T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | | | | |
| | 23 | TCMT090204-23 | 0.4 | | ● | | | | | | | | ● | |
| | | TCMT110204-23 | 0.4 | | | | | | | | | | ● | |
| | | TCMT16T304-23 | 0.4 | | | | | | | | | | ● | |
| | | TCMT16T308-23 | 0.8 | | ● | | | | | | | | | |
| Medium cutting | 24 | TCMT090202-24 | 0.2 | | | | | | | | | | ● | |
| | | TCMT090204-24 | 0.4 | ● | ● | | | | | | | | ● | |
| | | TCMT110202-24 | 0.2 | | | | | | | | | | ● | |
| | | TCMT110204-24 | 0.4 | ● | ● | | | | | | | | ● | |
| | | TCMT110208-24 | 0.8 | | ● | | | | | | | | | |
| | | TCMT16T304-24 | 0.4 | ● | ● | | | | | | | | | |
| | | TCMT16T308-24 | 0.8 | ● | ● | | | | | ● | | | | |
| Finishing | W15 | TCGT16T302L-W15 | 0.2 | | | | | | | | | | | ● |
| | | TCGT16T304L-W15 | 0.4 | | | | | | | | | | ● | ● |
| | | TCGT16T308L-W15 | 0.8 | | | | | | | | | | | ● |

● : Line up

External toolholders → B247
J series toolholders → B336
Internal toolholders → B283
PINZBOHR® → F154 - F170

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | | | | NS9530 | | | | KS05F | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | Cermet | | | | Uncoated | | | | | | | | |
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | | | ⊂ | | | | ●⊂ | | | | | | | | | | | | |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | | | ⊂ | | | | | | | | | | | | | | | | |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ⊂ | ⊂ | | | | ●⊂ | | | | ● | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | ● | | | | | | | | |
| S | Superalloys | | | | | | | | | ● | | | | | | | | ● | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH725 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | PM | TCMT110202-PM | 0.2 | | | ● | ● | ● | ● | | | ● | | |
| | | TCMT110204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | |
| | | TCMT110208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | |
| | | TCMT110302-PM | 0.2 | | | ● | ● | ● | ● | | | | | |
| | | TCMT110304-PM | 0.4 | | | ● | ● | ● | ● | | | | | |
| | | TCMT110308-PM | 0.8 | | | ● | ● | ● | ● | | | | | |
| | | TCMT16T304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | |
| | | TCMT16T308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | |
| | | TCMT16T312-PM | 1.2 | ● | ● | ● | ● | ● | ● | | | ● | | |
| Finishing to medium cutting | CM | TCMT090204-CM | 0.4 | | | | | | | | ● | | | |
| | | TCMT090208-CM | 0.8 | | | | | | | | ● | | | |
| | | TCMT110204-CM | 0.4 | | | | | | | | ● | | | |
| | | TCMT110208-CM | 0.8 | | | | | | | | ● | | | |
| | | TCMT110304-CM | 0.4 | | | | | | | | ● | | | |
| | | TCMT110308-CM | 0.8 | | | | | | | | ● | | | |
| | | TCMT16T304-CM | 0.4 | | | | | | | ● | ● | | | |
| | | TCMT16T308-CM | 0.8 | | | | | | | ● | ● | | | |
| | | TCMT16T312-CM | 1.2 | | | | | | | ● | ● | | | |
| | SS | TCGT110202-SS | 0.2 | | | | | | | | | | ● | |
| | | TCGT110204-SS | 0.4 | | | | | | | | | | ● | |
| | | TCGT110208-SS | 0.8 | | | | | | | | | | ● | |
| | | TCGT16T304-SS | 0.4 | | | | | | | | | | ● | |
| | AL | TCGT110202-AL | 0.2 | | | | | | | | | | | ● |
| | | TCGT110204-AL | 0.4 | | | | | | | | | | | ● |
| | | TCGT16T302-AL | 0.2 | | | | | | | | | | | ● |
| | | TCGT16T304-AL | 0.4 | | | | | | | | | | | ● |
| | | TCGT16T308-AL | 0.8 | | | | | | | | | | | ● |

● : Line up

External toolholders → B247 Internal toolholders → B283
J series toolholders → B336 PINZBOHR® → F154 - F170

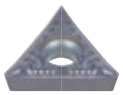
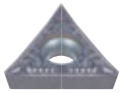
# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 7°**

| | | AH725 | SH725 | SH730 | J740 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|
| P | Steel | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | | ● |
| K | Cast iron | ⓒ | | | | ●ⓒ | ● |
| N | Non-ferrous | | | | | | ● |
| S | Superalloys | ● | | ●ⓒ | | | |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) | SH730 (Coated) | J740 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|---|---|---|
| Finishing | - | TCGT080102R | 0.2 | | | | | ● | ● |
| | | | | | | | | | |
| For external turning on small lathes (Sharp edge) | JS | TCGT110200FN-JS | 0.03 | | ● | ● | | | |
| | | TCGT110201FN-JS | 0.1 | | ● | ● | | | |
| | | TCGT110202FN-JS | 0.2 | | ● | ● | | | |
| | | TCGT110204FN-JS | 0.4 | | ● | ● | | | |
| | |  | | | | | | | |
| On small lathes (Honed edge) | JS | TCGT110201N-JS | 0.1 | ● | | | | | |
| | | TCGT110202N-JS | 0.2 | ● | | | | | |
| | | TCGT110204N-JS | 0.4 | ● | | | | | |
| | |  | | | | | | | |
| For external turning on small lathes (Sharp edge) | J08 | TCGT080200FR-J08 | 0.03 | | ● | | ● | | ● |
| | | TCGT080200FL-J08 | 0.03 | | ● | | ● | | ● |
| | | TCGT080201FR-J08 | 0.1 | | ● | | ● | | ● |
| | | TCGT080201FL-J08 | 0.1 | | ● | | ● | | ● |
| | | TCGT080202FR-J08 | 0.2 | | ● | | ● | | ● |
| | | TCGT080202FL-J08 | 0.2 | | ● | | ● | | ● |
| | | TCGT080204FR-J08 | 0.4 | | ● | | | | |
| | | | | | | | | | |

● : Line up

Internal toolholders → B283
J series toolholders → B336

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 7°**

| | | SH725 | J740 | J9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|
| P | Steel | ◐ | ◐ | ◐ | ◐ | ● |
| M | Stainless | ◐ | ◐ | | | ● |
| K | Cast iron | | | ◐ | ◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | | | | | |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | SH725 (Coated) | J740 (Coated) | J9530 (Coated cermet) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | J10 | TCGT110200FR-J10 | 0.03 | ● | ● | | | ● |
| | | TCGT110200FL-J10 | 0.03 | ● | ● | | | ● |
| | | TCGT110201FR-J10 | 0.1 | ● | ● | | | ● |
| | | TCGT110201FL-J10 | 0.1 | ● | ● | | | ● |
| | | TCGT110202FR-J10 | 0.2 | ● | ● | | ● | ● |
| | | TCGT110202FL-J10 | 0.2 | ● | ● | | ● | ● |
| | | TCGT110204FR-J10 | 0.4 | ● | | | | |
| | | TCGT110300FR-J10 | 0.03 | ● | ● | | | ● |
| | | TCGT110300FL-J10 | 0.03 | ● | ● | | | ● |
| | | TCGT110301FR-J10 | 0.1 | ● | ● | | | ● |
| | | TCGT110301FL-J10 | 0.1 | ● | ● | | | ● |
| | | TCGT110302FR-J10 | 0.2 | ● | ● | | ● | ● |
| | | TCGT110302FL-J10 | 0.2 | ● | ● | | ● | ● |
| On small lathes (Honed edge) | J10 | TCGT110302R-J10 | 0.2 | | | ● | | |
| | | TCGT110302L-J10 | 0.2 | | | ● | | |

● : Line up

Internal toolholders → B283
J series toolholders → B336

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | T9115 | T9125 | AH725 | GH730 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| M | Stainless | | | ⓒ | ⓒ | | | | | ● |
| K | Cast iron | ●ⓒ | | ⓒ | ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | ● |
| S | Superalloys | | | ● | | | | | | |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH725 | GH730 | GT9530 | GT720 | NS9530 | NS520 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | Coated cermet | | Cermet | | Uncoated |
| Precision finishing | 01 | TPGT090202-01 | 0.2 | | | | | ● | | ● | | |
| | | TPGT090204-01 | 0.4 | | | | | ● | | ● | ● | ● |
| | | TPGT110202-01 | 0.2 | | | | | ● | | ● | | |
| | | TPGT110204-01 | 0.4 | | | | | ● | | ● | ● | ● |
| | | TPGT110208-01 | 0.8 | | | | | | | ● | | |
| | | TPGT130302-01 | 0.2 | | | | | | ● | ● | | |
| | | TPGT130304-01 | 0.4 | | | | | ● | | ● | ● | ● |
| | | TPGT130308-01 | 0.8 | | | | | | | ● | ● | |
| | | TPGT16T304-01 | 0.4 | | | | | ● | | ● | ● | ● |
| | | TPGT16T308-01 | 0.8 | | | | | | ● | ● | ● | |
| Finishing | PSF | TPMT090202-PSF | 0.2 | | | ● | | | | ● | | |
| | | TPMT090204-PSF | 0.4 | ● | ● | ● | | ● | | ● | | |
| | | TPMT110202-PSF | 0.2 | | | ● | | ● | | ● | | |
| | | TPMT110204-PSF | 0.4 | ● | ● | ● | | ● | | ● | | |
| | | TPMT110302-PSF | 0.2 | | | ● | | | | ● | | |
| | | TPMT110304-PSF | 0.4 | ● | ● | ● | | ● | | ● | | |
| | | TPMT130304-PSF | 0.4 | ● | ● | ● | | | | | | |
| | | TPMT16T304-PSF | 0.4 | ● | ● | ● | | | | | | |
| | PF | TPMT110204-PF | 0.4 | | | | ● | ● | | ● | | |
| | | TPMT110208-PF | 0.8 | | | | | ● | | ● | | |
| | | TPMT110302-PF | 0.2 | | | | ● | | | ● | | |
| | | TPMT110304-PF | 0.4 | | | | ● | ● | | ● | | |
| | | TPMT130304-PF | 0.4 | | | | | ● | | ● | | |
| | | TPMT130308-PF | 0.8 | | | | | | | ● | | |
| | | TPMT16T304-PF | 0.4 | | | | | ● | | ● | | |

● : Line up

Mounting hole specifications → B141

External toolholders → B243 - B245
Internal toolholders → B284 -
Cartridges → F171 -
Boring bar tools → F188 - F191
Top-borer tools → F192 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | Coated cermet | Cermet |
| P | Steel | ●◐ | ◐✣ | ◐ | ✣ | ◐✣ | ✣ | ●◐ | ◐ | ◐ | ●◐ | ●◐ |
| M | Stainless | | | ● | ◐ | ◐ | ✣ | ●◐ | ◐ | ◐ | | |
| K | Cast iron | ●◐ | | | | | | ●◐ | ◐ | ◐ | ●◐ | ●◐ |
| N | Non-ferrous | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●◐ | ● | | | |
| H | Hard materials | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to light cutting | PSS | TPMT090204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT090208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT110204-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT110208-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT110304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | |
| | | TPMT110308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | |
| | | TPMT130304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | |
| | | TPMT130308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT16T304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT16T308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| Finishing to medium cutting | PS | TPMT090202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT090204-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT090208-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT110202-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT110204-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | TPMT110208-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| | | TPMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● |
| | | TPMT130302-PS | 0.2 | ● | ● | | | | | | ● | | ● | ● |
| | | TPMT130304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT130308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT16T304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | | TPMT16T308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | ● | ● |
| | 23 | TPMT090202-23 | 0.2 | | | | | | | | | | | ● |
| | | TPMT090204-23 | 0.4 | | ● | | | | | | | | | ● |
| | | TPMT110204-23 | 0.4 | | ● | | | | | | | | | ● |
| | | TPMT130304-23 | 0.4 | | ● | | | | | | | | | ● |
| | | TPMT130308-23 | 0.8 | | ● | | | | | | | | | ● |
| | | TPMT16T304-23 | 0.4 | | | | | | | | | | | ● |
| | | TPMT16T308-23 | 0.8 | | ● | | | | | | | | | ● |

● : Line up

Mounting hole specifications → B141

External toolholders → B243 - B245 Internal toolholders → B284 -
Cartridges → F171 -

# TurnLine - Insert

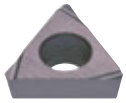
● : Continuous cutting
ⓒ : Light interrupted cutting
✣ : Heavy interrupted cutting

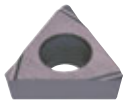
## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | T9125 | GH110 | SH725 | SH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | Coated cermet | Cermet | Uncoated | |
| P | Steel | ⓒ✣ | ● | ●ⓒ | ●ⓒ | ●ⓒ | ●ⓒ | ● | ⓒ |
| M | Stainless | | ● | ●ⓒ | ●ⓒ | | | ● | ⓒ |
| K | Cast iron | | ● | | | ●ⓒ | ●ⓒ | ● | |
| N | Non-ferrous | | | | | | | ● | |
| S | Superalloys | | ● | | ●ⓒ | | | | |
| H | Hard materials | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9125 | GH110 | SH725 | SH730 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | 24 | TPMT090204-24 | 0.4 | ● | | | | | ● | | |
| | | TPMT110204-24 | 0.4 | ● | | | | | ● | | |
| | | TPMT110208-24 | 0.8 | | | | | | ● | | |
| | | TPMT130304-24 | 0.4 | ● | | | | | ● | | |
| | | TPMT130308-24 | 0.8 | ● | | | | | ● | | |
| | | TPMT16T304-24 | 0.4 | ● | | | | | ● | | |
| | | TPMT16T308-24 | 0.8 | ● | | | | | ● | | |
| Finishing | W08 | TPGT070100R-W08 | 0.03 | | | | ● | | | ● | |
| | | TPGT070100L-W08 | 0.03 | | | | ● | | | ● | |
| | | TPGT070101R-W08 | 0.1 | | | | ● | | | ● | |
| | | TPGT070101L-W08 | 0.1 | | | | ● | | | ● | |
| | | TPGT070102R-W08 | 0.2 | | | | ● | | | ● | |
| | | TPGT070102L-W08 | 0.2 | | | | ● | | | ● | |
| | | TPGT070104R-W08 | 0.4 | | | | ● | | | ● | |
| | | TPGT070104L-W08 | 0.4 | | | | ● | | | ● | |
| | | TPGT080200L-W08 | 0.03 | | | | | ● | ● | | |
| | | TPGT080202L-W08 | 0.2 | | ● | | | ● | ● | ● | ● |
| | | TPGT080204L-W08 | 0.4 | | ● | | | ● | ● | ● | ● |
| Finishing (Sharp edge) | W08 | TPGT070100FL-W08 | 0.03 | | | ● | | | | | |
| | | TPGT070100FR-W08 | 0.03 | | | ● | | | | | |
| | | TPGT070101FL-W08 | 0.1 | | | ● | | | | | |
| | | TPGT070101FR-W08 | 0.1 | | | ● | | | | | |
| | | TPGT070102FL-W08 | 0.2 | | | ● | | | | | |
| | | TPGT070102FR-W08 | 0.2 | | | ● | | | | | |
| | | TPGT070104FL-W08 | 0.4 | | | ● | | | | | |
| | | TPGT070104FR-W08 | 0.4 | | | ● | | | | | |





● : Line up

Mounting hole specifications → B141

External toolholders → B243 - B245
Cartridges → F171 -
Internal toolholders → B284 -
Top-borer tools → F192 -

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | GH110 | GH330 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● | ⓒ |
| M | Stainless | ● | ●ⓒ | | | ● | ⓒ |
| K | Cast iron | ● | ●ⓒ | ●ⓒ | ●ⓒ | ● | |
| N | Non-ferrous | | | | | ● | |
| S | Superalloys | ● | | | | | |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 (Coated) | GH330 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | TH10 (Uncoated) | UX30 (Uncoated) |
|---|---|---|---|---|---|---|---|---|---|
| Finishing | W10 | TPGH080202L-W10 | 0.2 | | | ● | ● | | |
| | | TPGH080204L-W10 | 0.4 | | | ● | ● | | |
| | | TPGH090204L-W10 | 0.4 | | | ● | ● | | |
| | W13 | TPGH110204L-W13 | 0.4 | | | ● | ● | | |
| | | TPGH110302L-W13 | 0.2 | | | ● | ● | | |
| | | TPGH110304L-W13 | 0.4 | | | ● | ● | | |
| | W15 | TPGT090202R-W15 | 0.2 | | | | ● | | |
| | | TPGT090202L-W15 | 0.2 | | | ● | ● | ● | |
| | | TPGT090204R-W15 | 0.4 | | | | ● | | |
| | | TPGT090204L-W15 | 0.4 | ● | ● | ● | ● | ● | ● |
| | | TPGT110202R-W15 | 0.2 | | | | ● | | |
| | | TPGT110202L-W15 | 0.2 | | | ● | ● | ● | |
| | | TPGT110204L-W15 | 0.4 | ● | ● | ● | ● | ● | ● |
| | | TPGT110208R-W15 | 0.8 | | | | ● | | |
| | | TPGT110208L-W15 | 0.8 | | | | | | ● |
| | | TPGT110302L-W15 | 0.2 | | | | ● | | |
| | | TPGT110304R-W15 | 0.4 | | | | ● | | |
| | | TPGT110304L-W15 | 0.4 | | | | ● | | |
| | | TPGT110308L-W15 | 0.8 | | | | ● | | |
| | | TPGT130302R-W15 | 0.2 | | | | ● | | |
| | | TPGT130302L-W15 | 0.2 | | | ● | ● | ● | |
| | | TPGT130304R-W15 | 0.4 | ● | | | ● | | |
| | | TPGT130304L-W15 | 0.4 | ● | ● | ● | ● | ● | ● |
| | | TPGT130308L-W15 | 0.8 | | | | ● | ● | |
| | | TPGT16T302R-W15 | 0.2 | | | | ● | | |
| | | TPGT16T302L-W15 | 0.2 | | | ● | ● | ● | |
| | | TPGT16T304R-W15 | 0.4 | | | | ● | ● | |
| | | TPGT16T304L-W15 | 0.4 | ● | ● | ● | ● | ● | ● |
| | | TPGT16T308L-W15 | 0.8 | | | | ● | ● | ● |

● : Line up

Mounting hole specifications → **B141**

External toolholders → **B243 - B245** Internal toolholders → **B284 -**
Cartridges → **F171 -**

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | Coated cermet | Cermet |
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | | | ●⊂ | ⊂ | ●⊂ | ⊂ | ●⊂ | ●⊂ |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | | | ●⊂ | ⊂ | ●⊂ | ⊂ | | |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ⊂ | ●⊂ | ⊂ | ●⊂ | ⊂ | ●⊂ | ●⊂ |
| N | Non-ferrous | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●⊂ | ● | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | GH330 | GH730 | GT9530 | NS9530 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medium cutting | PM | TPMT090204-PM | 0.4 | | | ● | ● | ● | ● | | | | ● | | | | |
| | | TPMT090208-PM | 0.8 | | | ● | ● | ● | ● | | | | ● | | | | |
| | | TPMT110204-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | ● | ● |
| | | TPMT110208-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | ● | | |
| | | TPMT110304-PM | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | ● | ● |
| | | TPMT110308-PM | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | ● | | |
| | | TPMT130304-PM | 0.4 | | ● | ● | ● | ● | ● | | | | ● | | | | ● |
| | | TPMT130308-PM | 0.8 | | ● | ● | ● | ● | ● | | | | ● | | | ● | ● |
| | | TPMT16T304-PM | 0.4 | | ● | ● | ● | ● | ● | | | | ● | | | | ● |
| | | TPMT16T308-PM | 0.8 | | ● | ● | ● | ● | ● | | | | ● | | | | |
| | | TPMT16T312-PM | 1.2 | | ● | ● | ● | ● | ● | | | | ● | | | | |
| Finishing to medium cutting | CM | TPMT090204-CM | 0.4 | | | | | | | | ● | | | | | | |
| | | TPMT090208-CM | 0.8 | | | | | | | | ● | | | | | | |
| | | TPMT110204-CM | 0.4 | | | | | | | | ● | | | | | | |
| | | TPMT110208-CM | 0.8 | | | | | | | | ● | | | | | | |
| | | TPMT110304-CM | 0.4 | | | | | | | | ● | | | | | | |
| | | TPMT110308-CM | 0.8 | | | | | | | | ● | | | | | | |
| | | TPMT130304-CM | 0.4 | | | | | | | | ● | | | | | | |
| | | TPMT130308-CM | 0.8 | | | | | | | | ● | | | | | | |
| | | TPMT16T304-CM | 0.4 | | | | | | | ● | ● | | | | | | |
| | | TPMT16T308-CM | 0.8 | | | | | | | ● | ● | | | | | | |
| | | TPMT16T312-CM | 1.2 | | | | | | | ● | ● | | | | | | |
| | SS | TPGT110202-SS | 0.2 | | | | | | | | | | | | | | ● |
| | | TPGT110204-SS | 0.4 | | | | | | | | | | | ● | | | ● |
| | | TPGT130302-SS | 0.2 | | | | | | | | | | | | | | ● |
| | | TPGT130304-SS | 0.4 | | | | | | | | | | | ● | | | ● |
| | | TPGT16T304-SS | 0.4 | | | | | | | | | | | ● | | | ● |

● : Line up

Mounting hole specifications → B141

External toolholders → B243 - B245
Cartridges → F171 -
Top-borer tools → F192 -
Internal toolholders → B284 -
Boring bar tools → F188 - F191

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

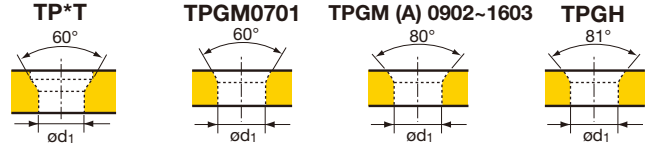
**Triangular, 60° with hole Positive 11°**

| | | T5115 | GT9530 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|
| P | Steel | | ●◐ | ●◐ | ● | ◐ |
| M | Stainless | | | | ● | ◐ |
| K | Cast iron | ◐ | ●◐ | ●◐ | ● | |
| N | Non-ferrous | | | | ● | |
| S | Superalloys | | | | | |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T5115 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | TH10 (Uncoated) | UX30 (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | H11 | TPGH110302L-H11 | 0.2 | | ● | ● | | |
| | | TPGH110304L-H11 | 0.4 | | ● | ● | | |
| | - | TPGM070102R | 0.2 | | | ● | | |
| | | TPGM070102L | 0.2 | | | ● | ● | |
| | | TPGM070104R | 0.4 | | | ● | | |
| | | TPGM070104L | 0.4 | | | ● | ● | |
| | | TPGM090202R | 0.2 | | | ● | | |
| | | TPGM090202L | 0.2 | | | ● | | |
| | | TPGM090204L | 0.4 | | | ● | | |
| | | TPGM110202R | 0.2 | | | ● | | |
| | Tungaloy-standard hole Not ISO | TPGM110202L | 0.2 | | | ● | | ● |
| | | TPGM110204R | 0.4 | | | ● | | |
| | | TPGM110204L | 0.4 | | | ● | | ● |
| | | TPGM110302R | 0.2 | | | ● | | |
| | | TPGM110302L | 0.2 | | | ● | | |
| | TPGM...R/L | TPGM110302L-2 | 0.2 | | | | ● | |
| | | TPGM110304R | 0.4 | | | ● | | |
| | | TPGM110304L | 0.4 | | | ● | | ● |
| | | TPGM110304L-2 | 0.4 | | | | ● | |
| | | TPGM160302L | 0.2 | | | ● | | |
| | | TPGM160304R | 0.4 | | | ● | | |
| | | TPGM160304L | 0.4 | | | ● | | ● |
| | | TPGM160304L-2 | 0.4 | | | | ● | |
| | - | TPMW110204 | 0.4 | ● | | | | |
| | | TPMW110208 | 0.8 | ● | | | | |
| | | TPMW130304 | 0.4 | ● | | | | |
| | | TPMW130308 | 0.8 | ● | | | | |
| | | TPMW16T304 | 0.4 | ● | | | | |
| | | TPMW16T308 | 0.8 | ● | | | | |

● : Line up

Mounting hole specifications




| ød1 (mm) | 0701** | 0802** | 0902** | 1102** | 1103** | 1303** | 1603** | 16T3** |
|---|---|---|---|---|---|---|---|---|
| TP*T(W) | - | 2.3 | 2.5 | 2.8 | 3.4 | 3.4 | - | 4.4 |
| TPGM(A) | 2.7 | - | 3.2 | 3.0 | 3.0 | - | 4.0 | - |
| TPGH | - | 2.3 | 3.0 | 3.4 | 3.4 | - | 4.5 | - |

External toolholders → B243 - B245 Internal toolholders → B284 -
Cartridges → F171 -

# TurnLine - Insert

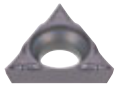
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° with hole Positive 11°**

| | | GH110 | SH725 | SH730 | NS9530 | TH10 |
|---|---|---|---|---|---|---|
| P | Steel | ● | | | ●◐ | ● |
| M | Stainless | ● | | | | ● |
| K | Cast iron | ● | | | ●◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | ● | | | | |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 (Coated) | SH725 (Coated) | SH730 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | TPGA090204 | 0.4 | | | | | ● |
| | | TPGA110202 | 0.2 | | | | ● | ● |
| | | TPGA110204 | 0.4 | | | | | ● |
| | | TPGA110302 | 0.2 | | | | ● | ● |
| | | TPGA110304 | 0.4 | | | | | ● |
| | | TPGA160304 | 0.4 | | | | ● | ● |
| | | TPGA160308 | 0.8 | | | | | ● |
| | - | TPGW090202 | 0.2 | | | | | ● |
| | | TPGW090204 | 0.4 | | | | | ● |
| | | TPGW110202 | 0.2 | | | | | ● |
| | | TPGW110204 | 0.4 | ● | | | | ● |
| | | TPGW110304 | 0.4 | | | | | ● |
| | | TPGW130304 | 0.4 | | | | | ● |
| | | TPGW16T304 | 0.4 | ● | | | | ● |
| | | TPGW16T308 | 0.8 | | | | | ● |
| For internal turning on small lathes | JS | TPGT070101-JS | 0.1 | | | ● | | |
| | | TPGT070102-JS | 0.2 | | | ● | | |
| | | TPGT070104-JS | 0.4 | | | ● | | |
| For internal turning on small lathes (Sharp edge) | JS | TPGT070101F-JS | 0.1 | | ● | | | |
| | | TPGT070102F-JS | 0.2 | | ● | | | |
| | | TPGT070104F-JS | 0.4 | | ● | | | |





● : Line up

External toolholders → B243 - B245 Internal toolholders → B284 -
Cartridges → F171 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° without hole Positive 11°**

| | | T9115 | T9125 | T5115 | AH725 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|
| | | Coated | | | | Cermet | Uncoated |
| P | Steel | ●◐ | ◐✠ | | ◐ | ●◐ | ● |
| M | Stainless | | | | ◐ | | ● |
| K | Cast iron | ●◐ | | ◐ | ◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | ● |
| S | Superalloys | | | | ● | | |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T5115 | AH725 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | PS | TPMR110304-PS | 0.4 | | ● | | | | |
| | | TPMR110308-PS | 0.8 | | ● | | | | |
| | | TPMR160304-PS | 0.4 | | ● | | | | |
| | | TPMR160308-PS | 0.8 | | ● | | | | |
| | 23 | TPMR110304-23 | 0.4 | ● | ● | | | ● | |
| | | TPMR110308-23 | 0.8 | | ● | | | ● | ● |
| | | TPMR160304-23 | 0.4 | ● | ● | | | ● | ● |
| | | TPMR160308-23 | 0.8 | | ● | | | ● | |
| Medium cutting | 24 | TPMR110304-24 | 0.4 | | ● | | | ● | |
| | | TPMR110308-24 | 0.8 | | ● | | | ● | |
| | | TPMR160304-24 | 0.4 | ● | ● | | ● | ● | |
| | | TPMR160308-24 | 0.8 | ● | ● | | | ● | |
| Finishing to medium cutting | CM | TPMR110304-CM | 0.4 | | | ● | | | |
| | | TPMR110308-CM | 0.8 | | | ● | | | |
| | | TPMR160304-CM | 0.4 | | | ● | | | |
| | | TPMR160308-CM | 0.8 | | | ● | | | |
| | | TPMR160312-CM | 1.2 | | | ● | | | |

● : Line up

External toolholders → B243 -
Cartridges → F171 -
Internal toolholders → B305

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Triangular, 60° without hole Positive 11°**

| | | Coated | | | | | Cermet | | | | Uncoated | | | | Ceramics | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ● | ●◐ | | | ●◐ | | | | ● | ◐ | | | | | | |
| M | Stainless | | ● | ●◐ | | | | | | | ● | ◐ | | | | | | |
| K | Cast iron | ◐ | ● | ●◐ | | | ●◐ | | | | ● | | | | ● | | | |
| N | Non-ferrous | | | | | | | | | | ● | | | | | | | |
| S | Superalloys | | ● | ●◐ | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | ● | | |

| Application | Chipbreaker | Designation | Corner radius | T5115 | GH110 | AH120 | | | NS9530 | | | | TH10 | UX30 | | | LX21 | LX11 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting | - | TPGR110302L | 0.2 | | | | | | ● | | | | | | | | | | | |
| | | TPGR110304L | 0.4 | | | | | | ● | | | | | | | | | | | |
| | | TPGR160304R | 0.4 | | | | | | ● | | | | | | | | | | | |
| | | TPGR160304L | 0.4 | | | | | | ● | | | | | | | | | | | |
| | | TPGR160308L | 0.8 | | | | | | ● | | | | | | | | | | | |
| | - | TPMN110304 | 0.4 | ● | | | | | | | | | ● | | | | | | | |
| | | TPMN110308 | 0.8 | ● | | | | | | | | | | | | | | | | |
| | | TPMN160304 | 0.4 | ● | | ● | | | | | | | ● | ● | | | | | | |
| | | TPMN160308 | 0.8 | ● | | ● | | | | | | | ● | ● | | | | | | |
| | | TPMN160312 | 1.2 | ● | | | | | | | | | | | | | | | | |
| | | TPMN220408 | 0.8 | | | | | | | | | | | ● | | | | | | |
| | | TPMN220412 | 1.2 | | | | | | | | | | | ● | | | | | | |
| | - | TPGN110302 | 0.2 | | | | | | | | | | ● | | | | | | | |
| | | TPGN110304 | 0.4 | | ● | | | | | | | | ● | | | | ● | ● | | |
| | | TPGN110308 | 0.8 | | | | | | | | | | ● | | | | | ● | | |
| | | TPGN160302 | 0.2 | | | | | | | | | | ● | | | | | | | |
| | | TPGN160304 | 0.4 | | ● | | | | ● | | | | ● | | | | | ● | | |
| | | TPGN160308 | 0.8 | | ● | | | | ● | | | | ● | | | | | ● | | |
| | | TPGN160312 | 1.2 | | | | | | | | | | | | | | | ● | | |
| | | TPGN220404 | 0.4 | | | | | | | | | | ● | | | | | | | |

● : Line up

External toolholders → B243 -
Cartridges → F171 -
Internal toolholders → B305

# TurnLine - Insert

● : Continuous cutting
⊂ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 35° with hole Positive 5°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | | | | GT9530 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●⊂ | ⊂✠ | ⊂ | ✠ | ⊂✠ | ✠ | | | ●⊂ | ⊂ | | | | ●⊂ | | | | ●⊂ | | | | | | | |
| M | Stainless | | | ● | ⊂ | ⊂ | ✠ | | | ●⊂ | ⊂ | | | | | | | | | | | | | | | |
| K | Cast iron | ●⊂ | | | | | | ●⊂ | ⊂ | ●⊂ | ⊂ | | | | ●⊂ | | | | ●⊂ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | ●⊂ | ● | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | T515 | T5115 | AH120 | AH725 | | | | GT9530 | | | | NS9530 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | | |
| Finishing | PSF | VBMT110302-PSF | 0.2 | | | | | | | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT110304-PSF | 0.4 | ● | ● | | | | | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160402-PSF | 0.2 | | | | | | | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160404-PSF | 0.4 | ● | ● | | | | | | | | ● | | | | ● | | | | ● | | | | | | | |
| | PF | VBMT110302-PF | 0.2 | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | VBMT110304-PF | 0.4 | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | VBMT110308-PF | 0.8 | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | VBMT160404-PF | 0.4 | | | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| | | VBMT160408-PF | 0.8 | | ● | | | | | | | | | | | | ● | | | | ● | | | | | | | |
| Finishing to light cutting | PSS | VBMT110304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT110308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160404-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160408-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160412-PSS | 1.2 | ● | ● | | | | | | | | ● | | | | | | | | | | | | | | | |
| Finishing to medium cutting | PS | VBMT110302-PS | 0.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160402-PS | 0.2 | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160404-PS | 0.4 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | ● | | | | ● | | | | | | | |
| | | VBMT160408-PS | 0.8 | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | ● | | | | ● | | | | | | | |
| Medium cutting | 24 | VBMT160404-24 | 0.4 | ● | ● | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | VBMT160408-24 | 0.8 | ● | ● | | | | | | | | | | | | | | | | ● | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Finishing to medium cutting | CM | VBMT110304-CM | 0.4 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | VBMT110308-CM | 0.8 | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| | | VBMT160404-CM | 0.4 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | VBMT160408-CM | 0.8 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |
| | | VBMT160412-CM | 1.2 | | | | | | | ● | ● | | | | | | | | | | | | | | | | | |

● : Line up

External toolholders → B219 Internal toolholders → B282 -
J series toolholders → B337 - B340

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 35° with hole Positive 5°**

| | | AH725 | SH725 | SH730 | J740 | J9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | Coated cermet | Cermet | Uncoated |
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | ●◐ | ●◐ | ● |
| M | Stainless | ◐ | ●◐ | ●◐ | ●◐ | | | ● |
| K | Cast iron | ◐ | | | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | | | ● |
| S | Superalloys | ● | | ●◐ | | | | |
| H | Hard materials | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 | SH725 | SH730 | J740 | J9530 | NS9530 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JS | VBGT110300FN-JS | 0.03 | | ● | ● | | | | |
| | | VBGT110301FN-JS | 0.1 | | ● | ● | | | | |
| | | VBGT110302FN-JS | 0.2 | | ● | ● | | | | |
| | | VBGT110304FN-JS | 0.4 | | ● | ● | | | | |
| For external turning on small lathes | JS | VBGT110301N-JS | 0.1 | ● | | | | | | |
| | | VBGT110302N-JS | 0.2 | ● | | | | | | |
| | | VBGT110304N-JS | 0.4 | ● | | | | | | |
| For external turning on small lathes (Sharp edge) | J10 | VBGT110300FR-J10 | 0.03 | | ● | | ● | | | ● |
| | | VBGT110300FL-J10 | 0.03 | | ● | | ● | | | ● |
| | | VBGT110301FR-J10 | 0.1 | | ● | | ● | | ● | ● |
| | | VBGT110301FL-J10 | 0.1 | | ● | | ● | | ● | ● |
| | | VBGT110302FR-J10 | 0.2 | | ● | | ● | | ● | ● |
| | | VBGT110302FL-J10 | 0.2 | | ● | | ● | | ● | ● |
| | | VBGT110304FR-J10 | 0.4 | | ● | | ● | | ● | ● |
| | | VBGT110304FL-J10 | 0.4 | | ● | | ● | | ● | ● |
| On small lathes (Honed edge) | J10 | VBGT110302R-J10 | 0.2 | | | | | ● | | |
| | | VBGT110302L-J10 | 0.2 | | | | | ● | | |
| | | VBGT110304R-J10 | 0.4 | | | | | ● | | |
| | | VBGT110304L-J10 | 0.4 | | | | | ● | | |

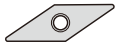
● : Line up

External toolholders → B219
Internal toolholders → B282 -
J series toolholders → B337 - B340

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 7°**

| | | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | | | GT9530 | | | | NS9530 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coated | | | | | | | | | | | | | Coated cermet | | | | Cermet | | | | | | |
| P | Steel | ●ⓒ | ⓒ✠ | ⓒ | ✠ | ⓒ✠ | ✠ | ●ⓒ | ⓒ | | | | | | ●ⓒ | | | | ●ⓒ | | | | | | |
| M | Stainless | | | ● | ⓒ | ⓒ | ✠ | ●ⓒ | ⓒ | ● | ⓒ | | | | | | | | | | | | | | |
| K | Cast iron | ●ⓒ | | | | | | ●ⓒ | ⓒ | | | | | | ●ⓒ | | | | ●ⓒ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | ●ⓒ | ● | ● | ⓒ | ⓒ | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T6120 | T6130 | AH630 | AH645 | AH120 | AH725 | AH8005 | AH8015 | AH905 | | | GT9530 | | | | NS9530 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Finishing | PSF | VCMT080202-PSF | 0.2 | | | | | | | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT080204-PSF | 0.4 | ● | ● | | | | | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT110302-PSF | 0.2 | | | | | | | | ● | | | | | | | | | | | | | | | | |
| | | VCMT110304-PSF | 0.4 | ● | ● | | | | | | ● | | | | | | | | | | | | | | | | |
| | | VCMT160404-PSF | 0.4 | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |
| | | VCMT160408-PSF | 0.8 | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |
| | PF | VCMT080202-PF | 0.2 | | | | | | | | | | | | | | ● | | | | ● | | | | | | |
| | | VCMT080204-PF | 0.4 | | | | | | | | | | | | | | ● | | | | ● | | | | | | |
| | | VCMT160404-PF | 0.4 | | | | | | | | | | | | | | ● | | | | ● | | | | | | |
| | | VCMT160408-PF | 0.8 | | | | | | | | | | | | | | ● | | | | ● | | | | | | |
| Finishing to light cutting | PSS | VCMT110304-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT110308-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT160404-PSS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |
| | | VCMT160408-PSS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |
| Finishing to medium cutting | PS | VCMT110302-PS | 0.2 | ● | ● | ● | ● | ● | ● | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT110304-PS | 0.4 | ● | ● | ● | ● | ● | ● | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT110308-PS | 0.8 | ● | ● | ● | ● | ● | ● | | ● | | | | | | ● | | | | ● | | | | | | |
| | | VCMT160404-PS | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |
| | | VCMT160408-PS | 0.8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | | | | | | |

● : Line up

External toolholders → B246 - Internal toolholders → B282 -
TungCap → F071

# TurnLine - Insert

● : Continuous cutting
ⓒ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 35° with hole Positive 7°**

| | | T9115 | T9125 | T515 | T5115 | AH8005 | AH8015 | AH905 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●ⓒ | ⓒ✠ | | | | | | ●ⓒ | |
| M | Stainless | | | | | ● | ⓒ | | | |
| K | Cast iron | ●ⓒ | | ●ⓒ | ⓒ | | | | ●ⓒ | ● |
| N | Non-ferrous | | | | | | | | | ● |
| S | Superalloys | | | | | ● | ⓒ | ⓒ | | ● |
| H | Hard materials | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | T515 | T5115 | AH8005 | AH8015 | AH905 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Coated | | | | | | | Cermet | Uncoated |
| Finishing to medium cutting | 24 | VCMT160404-24 | 0.4 | ● | ● | | | | | | ● | |
| | | VCMT160408-24 | 0.8 | ● | ● | | | | | | ● | |
| | | | | | | | | | | | | |
| | CM | VCMT080204-CM | 0.4 | | | | ● | | | | | |
| | | VCMT160404-CM | 0.4 | | | ● | ● | | | | | |
| | | VCMT160408-CM | 0.8 | | | ● | ● | | | | | |
| | | VCMT160412-CM | 1.2 | | | | ● | | | | | |
| | | | | | | | | | | | | |
| Medium cutting | All-round | VCMT160404 | 0.4 | | | | | ● | ● | ● | | |
| | | VCMT160408 | 0.8 | | | | | ● | ● | ● | | |
| | | VCMT160412 | 1.2 | | | | | ● | ● | ● | | |
| | | | | | | | | | | | | |
| Finishing to medium cutting | AL | VCGT160404-AL | 0.4 | | | | | | | | | ● |
| | | VCGT160408-AL | 0.8 | | | | | | | | | ● |
| | | VCGT160412-AL | 1.2 | | | | | | | | | ● |
| | | VCGT220520-AL | 2.0 | | | | | | | | | ● |
| | | VCGT220530-AL | 3.0 | | | | | | | | | ● |
| | | | | | | | | | | | | |

● : Line up

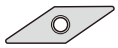
VC*T... : External toolholders → **B246 -**, Internal toolholders → **B282 -**

VPET... : J series toolholders → **B341**

# TurnLine - Insert

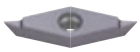
● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE



**Rhombic, 35° with hole Positive 11°**

| | | SH725 | SH730 |
|---|---|---|---|
| P | Steel | ●◐ | ●◐ |
| M | Stainless | ●◐ | ●◐ |
| K | Cast iron | | |
| N | Non-ferrous | | |
| S | Superalloys | | ●◐ |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | SH725 (Coated) | SH730 (Coated) |
|---|---|---|---|---|---|
| For external turning on small lathes (Sharp edge) | JPP | VPET0802008MFR-JPP | <0.08* | ● | ● |
| | | VPET0802008MFL-JPP | <0.08* | ● | ● |
| | | VPET080201MFR-JPP | <0.1* | ● | ● |
| | | VPET080201MFL-JPP | <0.1* | ● | ● |
| | | VPET0802018MFR-JPP | <0.18* | ● | ● |
| | | VPET0802018MFL-JPP | <0.18* | ● | ● |
| | | VPET080202MFR-JPP | <0.2* | ● | ● |
| | | VPET080202MFL-JPP | <0.2* | ● | ● |
| | | VPET1103008MFR-JPP | <0.08* | ● | ● |
| | | VPET1103008MFL-JPP | <0.08* | ● | ● |
| | | VPET110301MFR-JPP | <0.1* | ● | ● |
| | | VPET110301MFL-JPP | <0.1* | ● | ● |
| | | VPET1103018MFR-JPP | <0.18* | ● | ● |
| | | VPET1103018MFL-JPP | <0.18* | ● | ● |
| | | VPET110302MFR-JPP | <0.2* | ● | ● |
| | | VPET110302MFL-JPP | <0.2* | ● | ● |
| | JRP | VPET0802008MFR-JRP | <0.08* | ● | ● |
| | | VPET0802008MFL-JRP | <0.08* | ● | ● |
| | | VPET080201MFR-JRP | <0.1* | ● | ● |
| | | VPET080201MFL-JRP | <0.1* | ● | ● |
| | | VPET0802018MFR-JRP | <0.18* | ● | ● |
| | | VPET0802018MFL-JRP | <0.18* | ● | ● |
| | | VPET080202MFR-JRP | <0.2* | ● | ● |
| | | VPET080202MFL-JRP | <0.2* | ● | ● |
| | | VPET1103008MFR-JRP | <0.08* | ● | ● |
| | | VPET1103008MFL-JRP | <0.08* | ● | ● |
| | | VPET110301MFR-JRP | <0.1* | ● | ● |
| | | VPET110301MFL-JRP | <0.1* | ● | ● |
| | | VPET1103018MFR-JRP | <0.18* | ● | ● |
| | | VPET1103018MFL-JRP | <0.18* | ● | ● |
| | | VPET110302MFR-JRP | <0.2* | ● | ● |
| | | VPET110302MFL-JRP | <0.2* | ● | ● |
| For external turning on small lathes (Sharp edge) | JSP | VPET0802008MFN-JSP | <0.08* | ● | ● |
| | | VPET080201MFN-JSP | <0.1* | ● | ● |
| | | VPET0802018MFN-JSP | <0.18* | ● | ● |
| | | VPET080202MFN-JSP | <0.2* | ● | ● |
| |  | VPET1103008MFN-JSP | <0.08* | ● | ● |
| | | VPET110301MFN-JSP | <0.1* | ● | ● |
| | | VPET1103018MFN-JSP | <0.18* | ● | ● |
| | | VPET110302MFN-JSP | <0.2* | ● | ● |

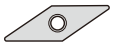
* Corner radius has minus tolerance.

● : Line up

# TurnLine - Insert

● : Continuous cutting
ᑕ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED



**Rhombic, 35° with hole**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coated SH725 |
|---|---|---|---|---|
| Finishing (Sharp edge) | JRP | VXGU09T201MFRE-JRP | <0.1* | ● |
| | | VXGU09T201MFLE-JRP | <0.1* | ● |
| | | VXGU09T202MFRE-JRP | <0.2* | ● |
| | | VXGU09T202MFLE-JRP | <0.2* | ● |

| | | | |
|---|---|---|---|
| P | Steel | ●ᑕ | |
| M | Stainless | ●ᑕ | |
| K | Cast iron | | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | | |

* Corner radius has minus tolerance.

● : Line up

## POSITIVE TYPE

**Trigon, 80° with hole Positive 11°**

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coated T9115 | Coated T9125 | Coated AH120 |
|---|---|---|---|---|---|---|
| Heavy cutting | ML | WPMT090725ZPR-ML | 2.5 | ● | ● | ● |
| | | WPMT090725ZPL-ML | 2.5 | ● | ● | ● |

| | | | |
|---|---|---|---|
| P | Steel | ●ᑕ | ᑕ✠ | ●ᑕ |
| M | Stainless | | | ●ᑕ |
| K | Cast iron | ●ᑕ | | ●ᑕ |
| N | Non-ferrous | | | |
| S | Superalloys | | | ●ᑕ |
| H | Hard materials | | | |

● : Line up



VXGU... : External toolholders → **B192 - B194, B218**

WPMT... : External toolholders → **B257**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## POSITIVE TYPE

**Trigon, 80° with hole Positive 5°**

| | | GH110 | SH725 | SH730 | NS9530 | TH10 | UX30 |
|---|---|---|---|---|---|---|---|
| P | Steel | ● | ●◐ | ●◐ | ●◐ | ● | ◐ |
| M | Stainless | ● | ●◐ | ●◐ | | ● | ◐ |
| K | Cast iron | ● | | | ●◐ | ● | |
| N | Non-ferrous | | | | | ● | |
| S | Superalloys | ● | | ●◐ | | | |
| H | Hard materials | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | GH110 (Coated) | SH725 (Coated) | SH730 (Coated) | NS9530 (Cermet) | TH10 (Uncoated) | UX30 (Uncoated) |
|---|---|---|---|---|---|---|---|---|---|
| Finishing | W08 | WBGT030100R-W08 | 0.03 | | | ● | | | |
| | | WBGT030100L-W08 | 0.03 | | | ● | ● | ● | ● |
| | | WBGT030101R-W08 | 0.1 | | | ● | | | |
| | | WBGT030101L-W08 | 0.1 | | | ● | | ● | |
| | | WBGT030102R-W08 | 0.2 | | | ● | | | |
| | | WBGT030102L-W08 | 0.2 | ● | | ● | ● | ● | ● |
| | | WBGT030104R-W08 | 0.4 | | | ● | | | |
| | | WBGT030104L-W08 | 0.4 | ● | | ● | ● | ● | ● |
| Finishing (Sharp edge) | W08 | WBGT030100FL-W08 | 0.03 | | ● | | | | |
| | | WBGT030100FR-W08 | 0.03 | | ● | | | | |
| | | WBGT030101FL-W08 | 0.1 | | ● | | | | |
| | | WBGT030101FR-W08 | 0.1 | | ● | | | | |
| | | WBGT030102FL-W08 | 0.2 | | ● | | | | |
| | | WBGT030102FR-W08 | 0.2 | | ● | | | | |
| | | WBGT030104FL-W08 | 0.4 | | ● | | | | |
| | | WBGT030104FR-W08 | 0.4 | | ● | | | | |
| | W11 | WBGT060102L-W11 | 0.2 | | | | ● | | |
| | | WBGT060104L-W11 | 0.4 | | | | ● | | |
| | | WBGT080202L-W11 | 0.2 | | | | ● | | |
| | | WBGT080204L-W11 | 0.4 | | | | ● | | |
| For internal turning on small lathes | JS | WBGT030101R-JS | 0.1 | | | ● | | | |
| | | WBGT030101L-JS | 0.1 | | | ● | | | |
| | | WBGT030102R-JS | 0.2 | | | ● | | | |
| | | WBGT030102L-JS | 0.2 | | | ● | | | |
| | | WBGT030104R-JS | 0.4 | | | ● | | | |
| | | WBGT030104L-JS | 0.4 | | | ● | | | |
| For internal turning on small lathes (Sharp edge) | JS | WBGT030101FL-JS | 0.1 | | ● | | | | |
| | | WBGT030101FR-JS | 0.1 | | ● | | | | |
| | | WBGT030102FL-JS | 0.2 | | ● | | | | |
| | | WBGT030102FR-JS | 0.2 | | ● | | | | |
| | | WBGT030104FL-JS | 0.4 | | ● | | | | |
| | | WBGT030104FR-JS | 0.4 | | ● | | | | |

● : Line up

Internal toolholders → B286 Top-borer tools → F192 -

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED

**Trigon, 80° with hole**

| | | AH725 | SH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | ●◐ | | | |
| K | Cast iron | ◐ | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | ● | | | | ● |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | KS05F (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting (Sharp edge) | JTS | WXGU040301MFR-JTS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JTS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JTS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JTS | <0.2* | | ● | | | |
| Finishing to medium cutting | JTS | WXGU040301MR-JTS | <0.1* | ● | | | | |
| | | WXGU040301ML-JTS | <0.1* | ● | | | | |
| | | WXGU040302MR-JTS | <0.2* | ● | | | | |
| | | WXGU040302ML-JTS | <0.2* | ● | | | | |
| Finishing (Low cutting force) (Sharp edge) | JSS | WXGU040301MFR-JSS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JSS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JSS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JSS | <0.2* | | ● | | | |
| Finishing (Low cutting force) | JSS | WXGU040301MR-JSS | <0.1* | ● | | | | |
| | | WXGU040301ML-JSS | <0.1* | ● | | | | |
| | | WXGU040302MR-JSS | <0.2* | ● | | | | |
| | | WXGU040302ML-JSS | <0.2* | ● | | | | |
| Finishing to medium cutting | TS | WXGU040302R-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040308R-TS | 0.8 | ● | | ● | ● | ● |
| | | WXGU040308L-TS | 0.8 | ● | | ● | ● | ● |
| Finishing (Wiper) | TSW | WXGU040304R-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040304L-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040308R-TSW | 0.8 | ● | | ● | ● | |
| | | WXGU040308L-TSW | 0.8 | ● | | ● | ● | |
| Finishing (Low cutting force) | SS | WXGU040302R-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-SS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-SS | 0.4 | ● | | ● | ● | ● |

* Corner radius has minus tolerance.

● : Line up

External toolholders → B188, B189, B217
Internal toolholders → B268

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Rhombic, 25° with hole Positive 7°**

| | | | |
|---|---|---|---|
| P | Steel | ◐✠ | ●◐ |
| M | Stainless | | |
| K | Cast iron | | ●◐ |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | Coated T9125 | Coated cermet GT9530 |
|---|---|---|---|---|---|
| Finishing to medium cutting | ZF | YWMT11T202-ZF | 0.2 | ● | ● |
| | | YWMT11T204-ZF | 0.4 | ● | ● |
| | | YWMT16T302-ZF | 0.2 | ● | ● |
| | | YWMT16T304-ZF | 0.4 | ● | ● |
| | | YWMT16T308-ZF | 0.8 | ● | ● |
| | ZM | YWMT11T204-ZM | 0.4 | ● | ● |
| | | YWMT16T304-ZM | 0.4 | ● | ● |
| | | YWMT16T308-ZM | 0.8 | ● | ● |

● : Line up

External toolholders → B220, B221
Internal toolholders → B300

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

### Front turning Insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coated J740 | Uncoated TH10 |
|---|---|---|---|---|---|
| Front turning | - | JXFR8000F | 0.03 | ● | ● |
| | | JXFR8010F | 0.1 | ● | ● |

### Reverse turning Insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coated J740 | Uncoated TH10 |
|---|---|---|---|---|---|
| Reverse turning | - | JXRR8000F | 0.03 | ● | ● |
| | | JXRR8010F | 0.1 | ● | ● |

### Back turning Insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Application | Chipbreaker | Designation | Corner radius | Coated J740 | Uncoated TH10 |
|---|---|---|---|---|---|
| Back turning | - | JXBR8000F | 0.03 | ● | ● |
| | | JXBL8000F | 0.03 | ● | ● |
| | | JXBR8005F | 0.05 | ● | ● |
| | | JXBL8005F | 0.05 | ● | ● |
| | | JXBR8005 | 0.05 | ● | |
| | | JXBL8005 | 0.05 | ● | |
| | | JXBR8010F | 0.1 | ● | ● |
| | | JXBL8010F | 0.1 | ● | ● |
| | | JXBR8010 | 0.1 | ● | |
| | | JXBL8010 | 0.1 | ● | |
| | | JXBR8015F | 0.15 | ● | ● |
| | | JXBL8015F | 0.15 | ● | ● |
| | | JXBR8015 | 0.15 | ● | |
| | | JXBL8015 | 0.15 | ● | |

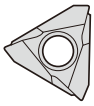
JXF..., JXR... : J series toolholders → B345, JXB... : J series toolholders → B346

● : Line up

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE



**Back turning Insert**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | | | | |
| M | Stainless | ●◐ | ●◐ | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coated | | | | | Coated cermet | | | | | Cermet | | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | J740 | | | | J9530 | | | | | NS9530 | | | | | TH10 | | | | |
| Back turning | - | JTBR3000F | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | JTBL3000F | 0.03 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | JTBR3005F | 0.05 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | JTBL3005F | 0.05 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | JTBR3005 | 0.05 | | ● | | | | ● | | | | | | | | | | | | | | |
| | | JTBL3005 | 0.05 | | ● | | | | | | | | | | | | | | | | | | |
| | | JTBR3010F | 0.1 | ● | ● | | | | | | | | | ● | | | | | ● | | | | |
| | | JTBL3010F | 0.1 | ● | ● | | | | | | | | | ● | | | | | ● | | | | |
| | | JTBR3010 | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | |
| | | JTBL3010 | 0.1 | | ● | | | | | | | | | | | | | | | | | | |
| | | JTBR3015F | 0.15 | ● | ● | | | | | | | | | | | | | | | | | | |
| | | JTBL3015F | 0.15 | ● | | | | | | | | | | | | | | | | | | | |

**Back turning Insert**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ●◐ | ●◐ | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | | | | |
| M | Stainless | ●◐ | ●◐ | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| K | Cast iron | | | | | | ●◐ | | | | ●◐ | | | | ● | | | | | | | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | | ● | | | | | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Application | Chipbreaker | Designation | Corner radius | Coated | | | | | Coated cermet | | | | | Cermet | | | | | Uncoated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SH725 | J740 | | | | J9530 | | | | | NS9530 | | | | | TH10 | | | | |
| Back turning | - | J10ER005BF | 0.05 | ● | ● | | | | | | | | | ● | | | | | ● | | | | |
| | | J10EL005BF | 0.05 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | J10ER005B | 0.05 | | ● | | | | ● | | | | | | | | | | | | | | |
| | | J10EL005B | 0.05 | | ● | | | | | | | | | | | | | | | | | | |
| | | J10ER010BF | 0.1 | ● | ● | | | | | | | | | ● | | | | | ● | | | | |
| | | J10EL010BF | 0.1 | ● | ● | | | | | | | | | | | | | | ● | | | | |
| | | J10ER010B | 0.1 | | ● | | | | ● | | | | | | | | | | | | | | |
| | | J10EL010B | 0.1 | | ● | | | | | | | | | | | | | | | | | | |
| | | J10EL015BF | 0.15 | ● | | | | | | | | | | | | | | | | | | | |
| | | J10ER015BF | 0.15 | ● | | | | | | | | | | | | | | | | | | | |

● : Line up

JTB... : J series toolholders → **B347**

J10E...: J series toolholders → **B349**

# TurnLine - Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE

**Back turning Insert**

| | | |
|---|---|---|
| P | Steel | ● |
| M | Stainless | ● |
| K | Cast iron | ● |
| N | Non-ferrous | ● |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Uncoated TH10 |
|---|---|---|---|---|
| Back turning | - | 10ER100B | 0.03 | ● |
| | | 10EL100B | 0.03 | ● |
| | | 10ER150B | 0.03 | ● |
| | | 10EL150B | 0.03 | ● |
| | | 10ER300 | - | ● |
| | | 10EL300 | - | ● |

● : Line up

J series toolholders → B349

MEMO

# TurnLine - Designation System for T-CBN (PCBN) Inserts

## Multi-Corner type

**2 QP - CNGA120404 -L**

① ② ③ ④

① Number of corners

② Type

| | |
|---|---|
| QP | CBN Inserts |

③ ISO symbol

④ Special feature & chipbreaker

| | |
|---|---|
| Without | Standard honing |
| -L | Light honing angle<br>Wear resistance priority |
| -H | Heavy honing angle<br>Impact resistance priority |
| W | Wiper type insert |
| W□ | Round wiper type insert |
| F | Sharp edge |
| -HF | With chipbreaker |
| -HM | With chipbreaker |

## Multi-Corner type (10 inserts packing)

**T 2 QP - CNGA120408**

①

① "T" shows 10 inserts packing.

## For general turning

**TNGA160402 - QBN**

① ②

① ISO symbol

② CBN inserts

## T-CBN (PCBN tipped) grooving Inserts

**XG R 63 10 S - QBN**

① ② ③ ④ ⑤

① For grooving tool GX-type

② Hand of Insert

| | |
|---|---|
| L | Left |
| R | Right |

③ Groove width (mm)

| | |
|---|---|
| 10 | 1.0 |
| 15 | 1.5 |

④ Corner radius: $r_\varepsilon$ (mm)

| | |
|---|---|
| S | 0.2 |

⑤ CBN inserts

## For TUNGCUT

**S G N 200 - 020**

① ② ③ ④ ⑤

① Number of edge

| | |
|---|---|
| S | Single corner |

② Application

| | |
|---|---|
| G | Grooving |

③ For use

| | |
|---|---|
| N | Non breaker |

④ Groove width (mm)

| | |
|---|---|
| 200 | 2.0 |

⑤ Corner radius: $r_\varepsilon$ (mm)

| | |
|---|---|
| 020 | 0.2 |

## TurnLine - Designation System for T-DIA (PCD) Inserts

Inserts for turning

**TPGW110204 - DIA**

❶ ISO symbol

❷ PCD inserts



## TurnLine - T-CBN Inserts GNGA type

GNGA

***Negative relief angle, G class, rhombic insert with 70° corner angle .***

### New shape CBN insert for general turning

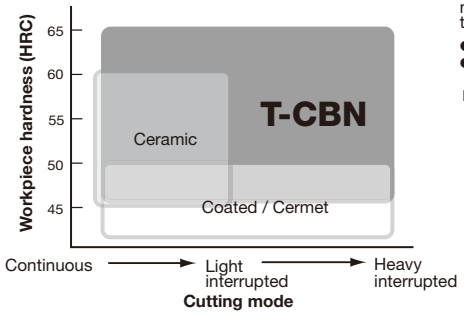
- 70° corner angle makes large clearance between insert and workpiece.
- Large clearance reduces the cutting force and wear on edge, and provides smooth chip flow to prevent scratches on machined surface by chips.

### High versatility

- Standard toolholder for ISO CN**1204 insert is available.
- No need offsets compared to CN**1204 insert, due to same geometry of cutting edge position.
- Double sided insert with 2 cutting edges.
- 4 types of CBN grades are available for machining of a wide range of materials.

# H T-CBN series for machining hardened steels and hard materials

## Application area



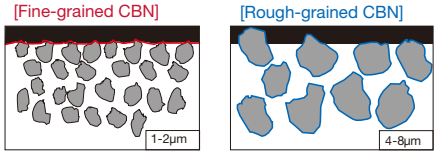

## Necessity of PCBN grades

The condition necessary to cut the work

Material is:
Hardness of tool ≥ Hardness of tool X 3

- Hardened steel (60HRC) → 700 Hv
- Cemented carbide → 1600 Hv
- PCBN (BX360) → 3300 Hv

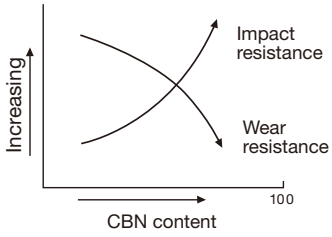
Effects of grain size of CBN on surface roughness and cutting speed




Fine grained PCBN provided with sharp cutting edge.
Good surface roughness

Rough grained PCBN. CBN particles are hold firmly.
Allows high speed machining

## Features of CBN grades for machining hardened steel and other hard materials




Fewer CBN content ⇨ Increasing wear resistance
Much CBN content ⇨ Increasing impact resistance

## Basic selection of T-CBN grades in machining of hardened steel and hard material

### Coated T-CBN grades

**BXM10** For high speeds cutting

**BXM20** For general purpose, more than *Vc* = 180 m/min

**BXA20** For general purpose, less than *Vc* = 180 m/min

### Uncoated T-CBN grades

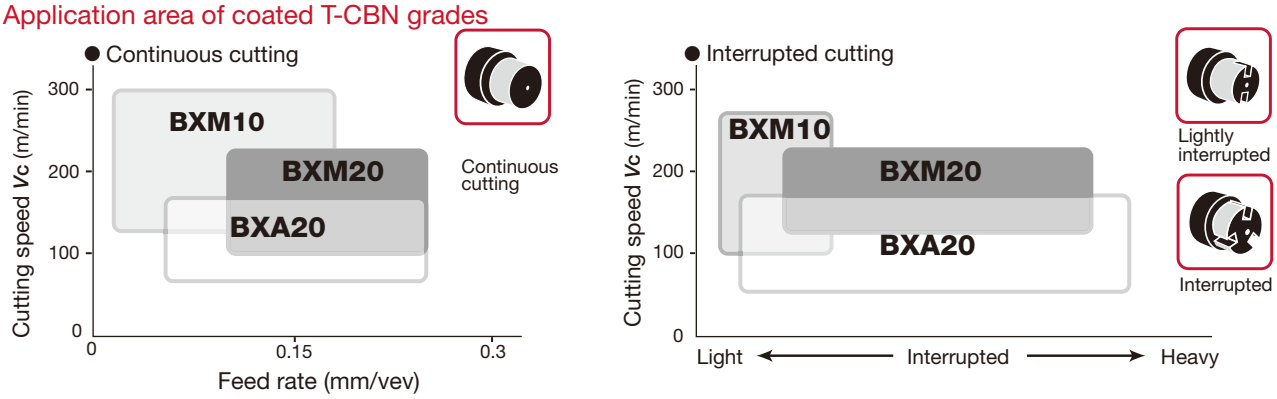
**BX310** For high speeds / Priority on wear resistance in continuous cutting

**BX330** For medium speeds / Priority on surface quality

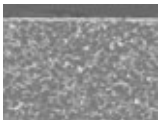
**BX360** For low to medium speeds / General purpose grade, excels in impact resistance

**BX380** For low to medium speeds / Priority on impact resistance in heavily interrupted cutting

## Application area of coated T-CBN grades




## Effects of Coated T-CBN grades

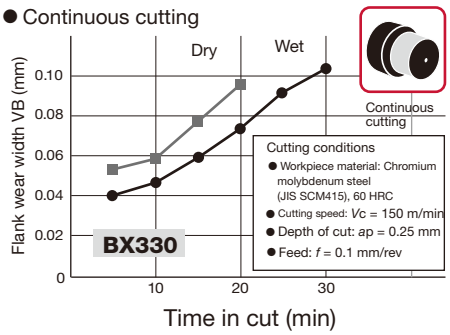


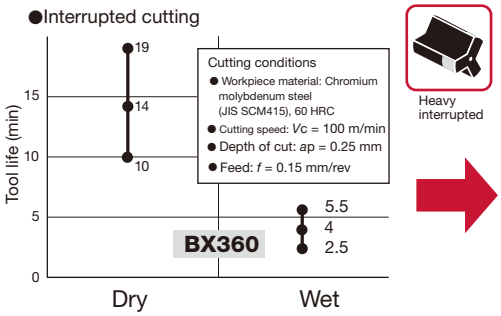
Coated on hard CBN
**Hardness:**
**CBN > Coating layer**

- **Protect CBN from oxidation wear**
  Since the coating layer intercepts air, oxidation wear of CBN can be prevented.
- **Peeling of coating layer can be protected**
  Hard and deformation resistant CBN is excellent substrate material.

→ **Improved resistance to flank wear**

## Effects of coolant in machining of hardened steel

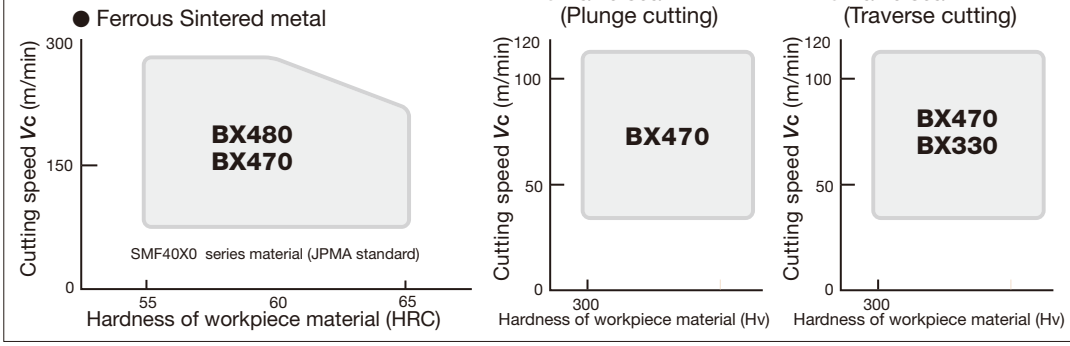



- In continuous cutting, wet cutting is superior to dry cutting in tool life for wear.
- In interrupted cutting, dry cutting is superior to wet cutting in tool life for fracture.

# T-CBN series for machining sintered metals

## Application area

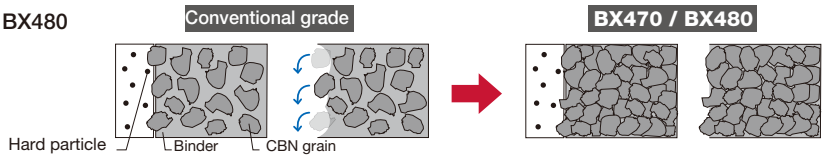



**BX470**
Priority on burr prevention and surface finish

**BX480**
Priority on wear resistance and versatility

## Features of BX470 and BX480

●Machining of Sintered metal including hard particles




Binder phase are selectively worn away by hard particles.
⇨ Wear proceeds with falling-out of CBN grains,

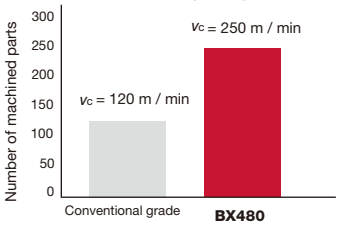
By increasing CBN content, wear of binder layer is suppressed.
⇨ Improved wear resistance

●Features of **BX470** and **BX480**

CBN content: 95 vol%
**Hv = 4100 ~ 4300**

The world highest CBN content as a commercially available material.

## ■ BX480 (Facing of gears)

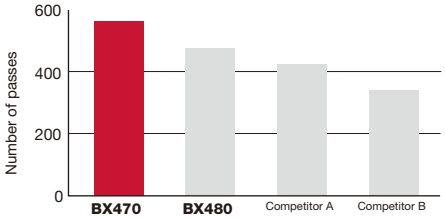



Cutting conditions
- Workpiece material: Sintered metal (> HRA60)
- Insert: DCMW11T308
- Depth of cut: ap = 0.2 ~ 0.5 mm
- Feed : f = 0.07 mm/rev
- Coolant : Water soluble type
- Interrupted cutting

## ■ BX470/BX480 Tool failure after machining Sintered metal

Cutting conditions
- Workpiece material: Sintered metal (> HRA60), Nitriding, Hard particles included
- Cutting speed: Vc = 110 m/min
- Depth of cut: ap = 0.15 mm
- Feed: f = 0.1 mm/rev
- Coolant : Water soluble type
- Interrupted cutting

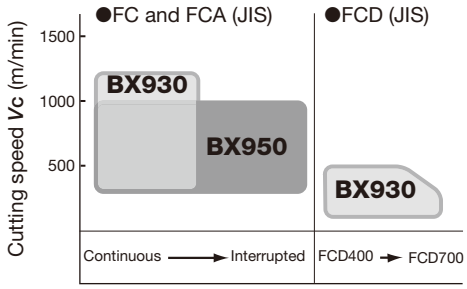
## ■ BX470 (Tool life criterion: Burr occurrence)




Cutting conditions
- Workpiece material: Ferrous Sintered metal
- Cutting speed: Vc = 100 m/min
- Depth of cut: ap = 0.15 ~ 0.3 mm
- Feed: f = 0.07 ~ 0.25 mm/rev
- Dry and interrupted cutting

# K T-CBN series for machining grey and ductile cast irons

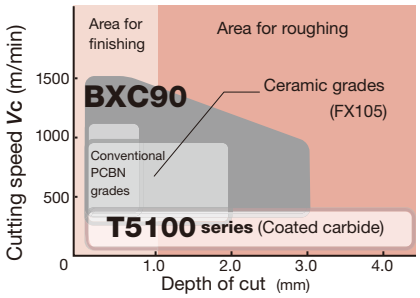
## Application area




**BX930**
- General purpose, first choice grade.
- Dedicated grade for machining ductile Cast iron

**BX950**
- Suitable for interrupted machining
- Excels in impact resistance

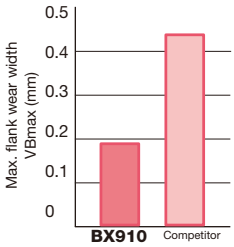
● Solid coated T-CBN grades




**BXC90**
- One-piece solid structure
- Applicable for small to large depths of cut

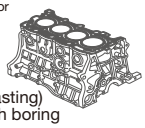
## ■ Machining of cylinder liners (Machining example of **BX910**)

●Wear width after machining 120 pcs.




●Tool failure after machining 120 pcs.

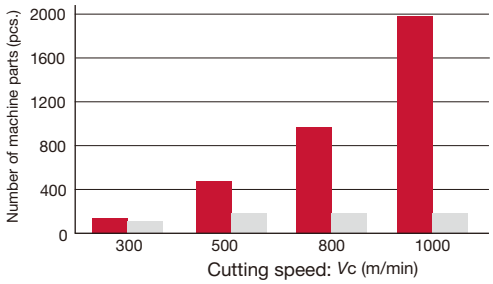
Cutting conditions



- Workpiece material: Cylinder liner (Spin casting) Machining type: Finish boring
- Cutting speed: Vc = 1,000 m/min
- Machine: Special purpose machine
- Coolant: Wet

**BX910** For machining cylinder liners

## ■ Tool life comparison in machining of disc brakes




BXC90
Ceramic

Cutting conditions
- Workpiece material: Disc rotor (JIS FC250)
- Insert: SNGN 120412 BXC90
- Depth of cut: ap = 0.7 mm
- Feed: f = 0.35 mm/rev
- Coolant: Dry
- Tool life criterion: Conditions of finished surface

# TurnLine - T-CBN Series

## Honing specifications

● T-CBN inserts with special honing specifications are made to order. Refer to the following description.

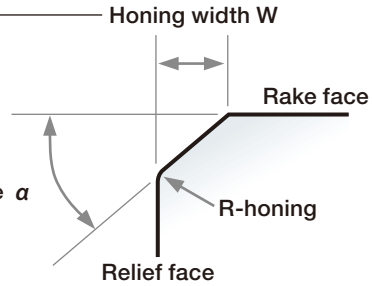
### Designation system for honing

Example:
Honing width: 0.15 mm
Honing angle: -30°
With R-honing

| S | 0 | 1 | 5 | 3 | 0 |
|---|---|---|---|---|---|

Shape — Honing width (W) — Honing angle (α)

T ··· Chamfered honing
S ··· Chamfered + R-honing
E ··· R-honing alone
F ··· Sharp edge




● Symbol

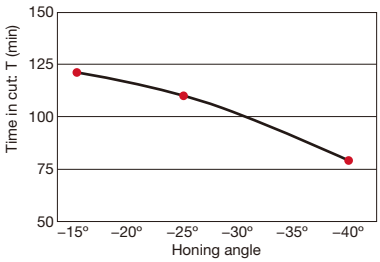
| W | Amount of honing (mm) |
|---|---|
| 005 | 0.05 |
| 010 | 0.10 |
| 013 | 0.13 |
| 015 | 0.15 |
| 020 | 0.20 |

| α | Honing angle |
|---|---|
| 10° | -10° |
| 15° | -15° |
| 20° | -20° |
| 25° | -25° |
| 30° | -30° |
| 35° | -35° |
| 40° | -40° |

● Honing specification can be selected in combination of items described here.
● Inserts with "R" honing alone are available.

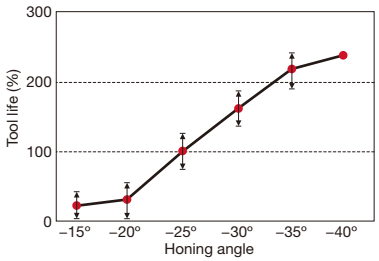
Honing specifications for machining hardened steels and other hard materials
Standard honing: -25° + R-honing
"-L" honing : -15° + R-honing
"-H" honing : -35° + R-honing

● Relationship between honing angle and tool life in continuous turning




**Cutting conditions**
Workpiece material:
Chromium molybdenum steel (JIS SCM415), 60 HRC
Insert: TNGN160404 BX360
Cutting speed: *Vc* = 100 m/min
Feed: *f* = 0.15 mm/rev
Depth of cut: *ap* = 0.25 mm
Coolant: Dry
Tool life criterion: VBmax = 0.15 mm
Honing: -□□°+ R-honing

● Relationship between honing angle and tool life in interrupted turning




**Cutting conditions**
Workpiece material:
Chromium molybdenum steel (JIS SCM415), 60 HRC
Insert: TNGN160404 BX360
Cutting speed: *Vc* = 100 m/min
Feed: *f* = 0.15 mm/rev
Depth of cut: *ap* = 0.25 mm
Coolant: Dry
Tool life criterion: Fracture
Honing: -□□°+ R-honing

● General rule
- For continuous cutting, small honing angle is favorable to minimize wear in general.
- For interrupted cutting, large honing angle is favorable to minimize fracture in general.

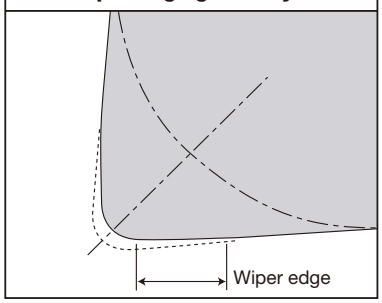
● Standard honing specifications

| Grades | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX910 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Negative insert | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | S01325 | T01315 | S01325 | S01315 | S01315 | S01325 |
| Positive insert | S01325 | S01325 | S01325 | – | S00515 | S00515 | S00515 | – | T01315 | – | S01315 | S00515 | S00515 |

## Wiper insert

● A finishing edge (wiper edge) is formed at the point of intersection between corner radius and straight cutting edge.

**Wiper edge geometry**

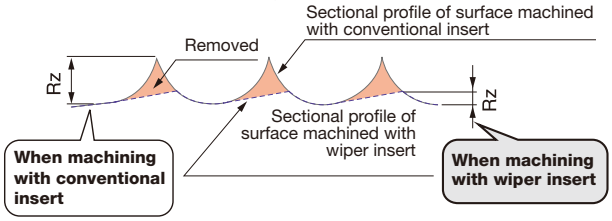



■ Effect of wiper edge

● Doubles the productivity → Reduced machining time
The wiper edge can double the feed rate and moreover does not deteriorate the surface roughness. (Note: Feed rate: *f* < 0.3 mm/rev)

● Superior surface roughness → By integrating roughing and finishing into one process, productivity can be increased.
Compared with conventional inserts only with corner radius, surface roughness can be improved with the wiper edge.

■ Profiles of surface roughness




■ Recommended toolholders for wiper-edged inserts

| | 2QP-CNGA1204**WL | 3QP-WNGA080408WL | 2QP-DNGA1504**WJ | 3QP-TNGA1604**WG |
|---|---|---|---|---|
| End cutting angle | 95° | | 93° | 91° |
| External toolholder | ACLNR/L**12-A | AWLNR/L**08-A | ADJNR/L**15-A | ATGNR/L**16-A<br>ATFNR/L**16-A |
| | DCLNR/L**12 | DWLNR/L**08 | DDJNR/L**15 | DTGNR/L**16<br>DTFNR/L**16 |
| Internal toolholder | A**-ACLNR/L12-D... | A**-AWLNR/L08-D... | A**-ADUNR/L15-D... | A**-ATFNR/L16-D... |

# TurnLine - CBN Insert

## Negative insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P Steel | | | | | | | | | | | | |
| M Stainless | | | | | | | | | | | | |
| K Cast iron | | | | | | | | | ●◐ | ✠ | ●◐ | ◐ |
| N Non-ferrous | | | | | | | | | | | | |
| S Superalloys | | | | | | | | | | | | ● |
| H Hard materials | ● | ●◐ | ●◐ | ✠ | ● | ●◐ | ●◐ | ✠ | | | | |
| Sintered metal | | | | | | | | | ●◐ | ◐✠ | | |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sharp edge | | 2QP-CNGA120404F | 0.4 | 2 | 2.3 | | | | | | | | | ● | | | |
| | | 2QP-CNGA120408F | 0.8 | 2 | 2.2 | | | | | | | | | ● | | | |
| General purpose | | 2QP-CNGA120404 | 0.4 | 2 | 2.3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-CNGA120408 | 0.8 | 2 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-CNGA120412 | 1.2 | 2 | 2.4 | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| Light honing | | 2QP-CNGA120404-L | 0.4 | 2 | 2.3 | ● | ● | | | | ● | | | | | | |
| | | 2QP-CNGA120408-L | 0.8 | 2 | 2.2 | ● | ● | | | | ● | | | | | | |
| | | 2QP-CNGA120412-L | 1.2 | 2 | 2.4 | ● | ● | | | | ● | | | | | | |
| Heavy honing | | 2QP-CNGA120404-H | 0.4 | 2 | 2.3 | | ● | | | | | ● | ● | | | | |
| | | 2QP-CNGA120408-H | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | ● | | | | |
| | | 2QP-CNGA120412-H | 1.2 | 2 | 2.4 | | ● | | | | | ● | ● | | | | |
| Wiper edge | | 2QP-CNGA120404WL | 0.4 | 2 | 2.3 | ● | ● | | | | | | | | | | |
| | | 2QP-CNGA120408WL | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | |
| | | 2QP-CNGA120412WL | 1.2 | 2 | 2.4 | ● | ● | | | | | | | | | | |
| | | 2QP-CNMA120404W | 0.4 | 2 | 2.3 | | | | | | ● | | | | | | |
| | | 2QP-CNMA120408W | 0.8 | 2 | 2.2 | | | | | | ● | | | | | | |
| | | 2QP-CNMA120412W | 1.2 | 2 | 2.4 | | | | | | ● | | | | | | |
| General purpose | | T2QP-CNGA120404 | 0.4 | 2 | 2.3 | | | | | | | ● | | | | | |
| | | T2QP-CNGA120408 | 0.8 | 2 | 2.2 | | | | | | | ● | | | | | |
| General purpose | | 4QP-CNGA120404 | 0.4 | 4 | 2.3 | | | | ● | | | | | | | | |
| | | 4QP-CNGA120408 | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| | | 4QP-CNGA120412 | 1.2 | 4 | 2.4 | | | | ● | | | | | | | | |
| Wiper edge | | 4QP-CNMA120404W | 0.4 | 4 | 2.3 | | | | ● | | | | | | | | |
| | | 4QP-CNMA120408W | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| | | 4QP-CNMA120412W | 1.2 | 4 | 2.4 | | | | ● | | | | | | | | |
| General purpose Nose angle 70° | | *2QP-GNGA120404 | 0.4 | 2 | 2.3 | | ● | ● | | | | ● | | | | | |
| | | *2QP-GNGA120408 | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | | ● | | ● | |
| | | *2QP-GNGA120412 | 1.2 | 2 | 2.4 | | ● | ● | | | | ● | | ● | | ● | |
| General purpose | | 2QP-DNGA150404 | 0.4 | 2 | 2.5 | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-DNGA150408 | 0.8 | 2 | 2.1 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 2QP-DNGA150412 | 1.2 | 2 | 2.0 | ● | ● | | | ● | ● | ● | ● | | ● | ● | ● |
| Light honing | | 2QP-DNGA150404-L | 0.4 | 2 | 2.5 | ● | ● | | | | ● | | | | | | |
| | | 2QP-DNGA150408-L | 0.8 | 2 | 2.1 | ● | ● | | | | ● | | | | | | |
| | | 2QP-DNGA150412-L | 1.2 | 2 | 2.0 | | ● | | | | ● | | | | | | |
| Heavy honing | | 2QP-DNGA150404-H | 0.4 | 2 | 2.5 | | ● | | | | | ● | ● | | | | |
| | | 2QP-DNGA150408-H | 0.8 | 2 | 2.1 | | ● | ● | | | | ● | ● | | | | |
| | | 2QP-DNGA150412-H | 1.2 | 2 | 2.0 | | ● | | | | | ● | ● | | | | |
| Wiper edge | | 2QP-DNGA150404WJ | 0.4 | 2 | 2.5 | ● | ● | ● | | | | | | | | | |
| | | 2QP-DNGA150408WJ | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | |
| General purpose | | 2QP-DNGA150604 | 0.4 | 2 | 2.5 | ● | ● | | | | | | | | | | |
| | | 2QP-DNGA150608 | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | |
| | | 2QP-DNGA150612 | 1.2 | 2 | 2.0 | ● | ● | | | | | | | | | | |

Note:
Letter "T" in the first position of designation shows that the standard packing quantity is 10 pieces.
Recommended toolholders for wiper inserts, W, WL, or WJ are shown on page **B162**

● : Line up

* Tungaloy's original shape

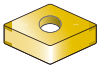

External toolholders → **B204 -**
J series toolholders → **B342 -**
PINZBOHR® → **F154 - F170**
Internal toolholders → **B292 -**
TungCap → **B215 -, B317, F066 -**
Cartridges → **F171 -**

# TurnLine - CBN Insert

## Negative insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX910 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | | |
| K | Cast iron | | | | | | | | | ●◐ | ✠ | ● | ●◐ | ◐ |
| N | Non-ferrous | | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | | ● |
| H | Hard materials | ● | ◐ | ◐ | ✠ | ● | ◐ | ◐ | ✠ | | | | | |
| | Sintered metal | | | | | | | | | ●◐ | ◐✠ | | | |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX910 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General purpose |  | 4QP-DNGA150404 | 0.4 | 4 | 2.5 | | | | ● | | | | | | | | | |
| | | 4QP-DNGA150408 | 0.8 | 4 | 2.1 | | | | ● | | | | | | | | | |
| | | 4QP-DNGA150412 | 1.2 | 4 | 2.0 | | | | ● | | | | | | | | | |
| General purpose | | 2QP-SNGA120404 | 0.4 | 2 | 2.4 | | ● | | | ● | ● | ● | ● | | ● | | ● | ● |
| | | 2QP-SNGA120408 | 0.8 | 2 | 2.4 | | ● | | | ● | ● | ● | ● | | ● | | ● | ● |
| | | 2QP-SNGA120412 | 1.2 | 2 | 2.4 | | ● | | | ● | ● | ● | ● | | ● | | ● | ● |
| Light honing | | 2QP-SNGA120404-L | 0.4 | 2 | 2.4 | | | | | | ● | | | | | | | |
| | | 2QP-SNGA120408-L | 0.8 | 2 | 2.4 | | ● | | | | ● | | | | | | | |
| | | 2QP-SNGA120412-L | 1.2 | 2 | 2.4 | | ● | | | | ● | | | | | | | |
| Heavy honing | | 2QP-SNGA120404-H | 0.4 | 2 | 2.4 | | | | | | | ● | ● | | | | | |
| | | 2QP-SNGA120408-H | 0.8 | 2 | 2.4 | | ● | | | | | ● | ● | | | | | |
| | | 2QP-SNGA120412-H | 1.2 | 2 | 2.4 | | ● | | | | | ● | ● | | | | | |
| General purpose | | 4QP-SNGA120404 | 0.4 | 4 | 2.4 | | | | ● | | | | | | | | | |
| | | 4QP-SNGA120408 | 0.8 | 4 | 2.4 | | | | ● | | | | | | | | | |
| | | 4QP-SNGA120412 | 1.2 | 4 | 2.4 | | | | ● | | | | | | | | | |
| General purpose | | 2QP-SNGN090308 | 0.8 | 2 | 2.4 | | | | | | | | | | | ● | | |
| | | 2QP-SNGN090312 | 1.2 | 2 | 2.4 | | | | | | | | | | | ● | | |
| Sharp edge | | 3QP-TNGA160404F | 0.4 | 3 | 2.2 | | | | | | | | | ● | | | | |
| | | 3QP-TNGA160408F | 0.8 | 3 | 1.9 | | | | | | | | | ● | | | | |
| General purpose | | 3QP-TNGA160404 | 0.4 | 3 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | ● |
| | | 3QP-TNGA160408 | 0.8 | 3 | 1.9 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | ● |
| | | 3QP-TNGA160412 | 1.2 | 3 | 2.4 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | ● | ● |
| Light honing | | 3QP-TNGA160404-L | 0.4 | 3 | 2.2 | ● | ● | | | | ● | | | | | | | |
| | | 3QP-TNGA160408-L | 0.8 | 3 | 1.9 | ● | ● | | | | ● | | | | | | | |
| | | 3QP-TNGA160412-L | 1.2 | 3 | 2.4 | ● | ● | | | | ● | | | | | | | |
| Heavy honing | | 3QP-TNGA160404-H | 0.4 | 3 | 2.2 | | ● | | | | | ● | ● | | | | | |
| | | 3QP-TNGA160408-H | 0.8 | 3 | 1.9 | | ● | ● | | | | ● | ● | | | | | |
| | | 3QP-TNGA160412-H | 1.2 | 3 | 2.4 | | ● | ● | | | | ● | ● | | | | | |
| Wiper edge | | 3QP-TNGA160404WG | 0.4 | 3 | 2.2 | | ● | ● | | | | | | | | | | |
| | | 3QP-TNGA160408WG | 0.8 | 3 | 1.9 | ● | ● | | | | | | | | | | | |
| General purpose | | T3QP-TNGA160404 | 0.4 | 3 | 2.2 | | | | | | | ● | | | | | | |
| | | T3QP-TNGA160408 | 0.8 | 3 | 1.9 | | | | | | | ● | | | | | | |
| General purpose | | 6QP-TNGA160404 | 0.4 | 6 | 2.2 | | | | ● | | | | | | | | | |
| | | 6QP-TNGA160408 | 0.8 | 6 | 1.9 | | | | ● | | | | | | | | | |
| | | 6QP-TNGA160412 | 1.2 | 6 | 2.4 | | | | ● | | | | | | | | | |

Note:
Letter "T" in the first position of designation shows that the standard packing quantity is 10 pieces.
Recommended toolholders for wiper inserts, WG are shown on page **B162**

● : Line up

External toolholders → **B205 -**
J series toolholders → **B342 -**
Cartridges → **F171 -**
Internal toolholders → **B293 -**
TungCap → **B215 -, F066 -**

# TurnLine - CBN Insert

## Negative insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | | | | | | | | | | | |
| M | Stainless | | | | | | | | | | | | |
| K | Cast iron | | | | | | | | | ●◐ | ✠ | ●◐ | ◐ |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | | | | | | | | | | | | ● |
| H | Hard materials | ● | ●◐ | ●◐ | ✠ | ● | ●◐ | ●◐ | ✠ | | | | |
| | Sintered metal | | | | | | | | | ●◐ | ◐✠ | | |

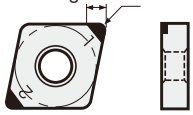
| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 | BXC50 | BX310 | BX330 | BX360 | BX380 | BX470 | BX480 | BX930 | BX950 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General purpose | | **2QP-VNGA160404** | 0.4 | 2 | 3.1 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **2QP-VNGA160408** | 0.8 | 2 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | **2QP-VNGA160412** | 1.2 | 2 | 3.0 | | ● | | | | | | | | | | |
| Light honing | | **2QP-VNGA160404-L** | 0.4 | 2 | 3.1 | ● | ● | | | | ● | | | | | | |
| | | **2QP-VNGA160408-L** | 0.8 | 2 | 2.2 | ● | ● | | | | ● | | | | | | |
| Heavy honing | | **2QP-VNGA160404-H** | 0.4 | 2 | 3.1 | | ● | ● | | | | ● | ● | | | | |
| | | **2QP-VNGA160408-H** | 0.8 | 2 | 2.2 | | ● | ● | | | | ● | ● | | | | |
| General purpose | | **4QP-VNGA160404** | 0.4 | 4 | 3.1 | | | | ● | | | | | | | | |
| | | **4QP-VNGA160408** | 0.8 | 4 | 2.2 | | | | ● | | | | | | | | |
| General purpose | | **3QP-WNGA080408** | 0.8 | 3 | 2.2 | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | ● |
| Wiper edge | | **3QP-WNGA080408WL** | 0.8 | 3 | 2.2 | ● | ● | | | | | | | | | | |
| General purpose | | **6QP-WNGA080408** | 0.8 | 6 | 2.2 | | | | ● | | | | | | | | |

Recommended toolholders for wiper inserts, WL are shown on page **B162**

● : Line up

Negative insert

CBN Length Corner radius



External toolholders → **B204 -** Internal toolholders → **B293 -**
TungCap → **B215 -, F066 -**

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## Negative insert · Multi-corner type Hard Breaker (T-CBN insert with chipbreaker)

| | | BXM20 | BXA20 |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | ●◐ | ●◐ |

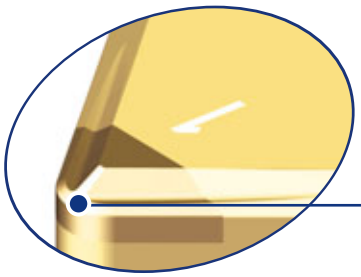
| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM20 | BXA20 |
|---|---|---|---|---|---|---|---|
| With chipbreaker | | 2QP-CNGM120408-HF | 0.8 | 2 | 2.2 | ● | |
| | | 2QP-CNGM120412-HF | 1.2 | 2 | 2.4 | ● | |
| | | 2QP-DNGM150408-HF | 0.8 | 2 | 2.1 | ● | |
| | | 2QP-DNGM150412-HF | 1.2 | 2 | 2.0 | ● | |
| | | 3QP-TNGM160408-HF | 0.8 | 3 | 1.9 | ● | |
| | | 3QP-TNGM160412-HF | 1.2 | 3 | 2.4 | ● | |
| | | 2QP-VNGM160408-HF | 0.8 | 2 | 2.2 | ● | |
| | | 2QP-CNGM120408-HM | 0.8 | 2 | 2.2 | ● | ● |
| | | 2QP-CNGM120412-HM | 1.2 | 2 | 2.4 | ● | ● |
| | | 2QP-DNGM150408-HM | 0.8 | 2 | 2.1 | ● | |
| | | 2QP-DNGM150412-HM | 1.2 | 2 | 2.0 | ● | |
| | | 3QP-TNGM160408-HM | 0.8 | 3 | 1.9 | ● | |
| | | 3QP-TNGM160412-HM | 1.2 | 3 | 2.2 | ● | |
| | | 2QP-VNGM160408-HM | 0.8 | 2 | 2.4 | ● | |

● : Line up

# "Hard Breakers" for removing the carburized layer

***Two types of chipbreaker provide excellent chip control in a wide application range !***

## HF type — For finishing

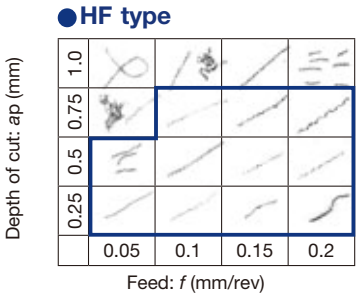


Single sided CBN insert provides higher stability in heavy machining.

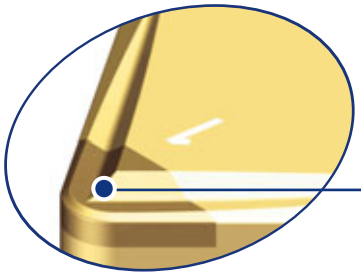
Excellent chip control in small DoC due to the high functional nose. Delivers exceptional surface finishes.

■ Example of chips

● HF type




## HM type — For medium cutting

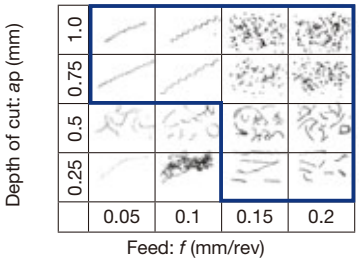


Single sided CBN insert provides higher stability in heavy machining.

Providing ideal chip control in large DoC by the well designed chipbreaker. Suitable for medium cutting or roughing.

■ Example of chips

● HM type

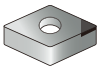


# TurnLine - CBN Insert

## Negative insert · One-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| | | | | | | ●◐ |
| General purpose | | CNGA120402-QBN | 0.2 | 1 | 4.1 | ● |
| | | CNGA120404-QBN | 0.4 | 1 | 4.0 | ● |
| | | CNGA120408-QBN | 0.8 | 1 | 3.9 | ● |
| | | CNGA120412-QBN | 1.2 | 1 | 3.9 | ● |
| |  | DNGA150402-QBN | 0.2 | 1 | 4.3 | ● |
| | | DNGA150404-QBN | 0.4 | 1 | 4.1 | ● |
| | | DNGA150408-QBN | 0.8 | 1 | 3.8 | ● |
| | | DNGA150412-QBN | 1.2 | 1 | 3.4 | ● |
| | | SNGA120402-QBN | 0.2 | 1 | 4.1 | ● |
| | | SNGA120404-QBN | 0.4 | 1 | 4.1 | ● |
| | | SNGA120408-QBN | 0.8 | 1 | 4.1 | ● |
| | | SNGA120412-QBN | 1.2 | 1 | 4.1 | ● |
| | | TNGA160402-QBN | 0.2 | 1 | 4.4 | ● |
| | | TNGA160404-QBN | 0.4 | 1 | 4.2 | ● |
| | | TNGA160408-QBN | 0.8 | 1 | 4.0 | ● |
| | | TNGA160412-QBN | 1.2 | 1 | 3.7 | ● |

● : Line up



External toolholders → B204 -
J series toolholders → B342 - B344
PINZBOHR® → F154 - F170
Internal toolholders → B292 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - CBN Insert

## Positive insert · Multi-corner type (G class)

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | P | Steel | | | | | | | | | | | | |
| | | | M | Stainless | | | | | | | | | | | | |
| | | | K | Cast iron | | | | ●◐ | ● | | | | | | | |
| | | | N | Non-ferrous | | | | | | | | | | | | |
| | | | S | Superalloys | | | | | | | | | | | | |
| | | | H | Hard materials | ● | ●◐ | ●◐ | | | | | | | | | |
| | | | | Sintered metal | | | | ●◐ | | | | | | | | |
| **Specification** | **Shape** | **Designation** | **Corner radius** | **No. of corner** | **CBN Length** | **BXM10** | **BXM20** | **BXA20** | **BX470** | **BX910** | | | | | | |
| General purpose | | **2QP-CCGW060202** | 0.2 | 2 | 2.3 | ● | ● | | | | | | | | | |
| | | **2QP-CCGW060204** | 0.4 | 2 | 2.3 | ● | ● | ● | ● | | | | | | | |
| | | **2QP-CCGW09T304** | 0.4 | 2 | 2.3 | ● | ● | ● | ● | | | | | | | |
| | | **2QP-CCGW09T308** | 0.8 | 2 | 2.2 | ● | ● | ● | ● | | | | | | | |
| General purpose | | **2QP-DCGW070202** | 0.2 | 2 | 2.7 | ● | ● | ● | | | | | | | | |
| | | **2QP-DCGW070204** | 0.4 | 2 | 2.5 | ● | ● | ● | ● | | | | | | | |
| | | **2QP-DCGW070208** | 0.8 | 2 | 2.5 | | | | ● | | | | | | | |
| Sharp edge | | **2QP-DCGW11T302F** | 0.2 | 2 | 2.7 | | | | ● | | | | | | | |
| | | **2QP-DCGW11T304F** | 0.4 | 2 | 2.5 | | | | ● | | | | | | | |
| General purpose | | **2QP-DCGW11T302** | 0.2 | 2 | 2.7 | ● | ● | | | | | | | | | |
| | | **2QP-DCGW11T304** | 0.4 | 2 | 2.5 | ● | ● | | ● | | | | | | | |
| | | **2QP-DCGW11T308** | 0.8 | 2 | 2.1 | ● | ● | ● | ● | | | | | | | |
| General purpose | | **2QP-SPGW09T308** | 0.8 | 2 | 2.4 | | | | | ● | | | | | | |
| | | **2QP-SPGW09T312** | 1.2 | 2 | 2.4 | | | | | ● | | | | | | |
| | | **2QP-SPGW120408** | 0.8 | 2 | 2.4 | | | | | ● | | | | | | |
| | | **2QP-SPGW120412** | 1.2 | 2 | 2.4 | | | | | ● | | | | | | |
| | | **2QP-SPGW120416** | 1.6 | 2 | 2.4 | | | | | ● | | | | | | |
| General purpose | | **2QP-SPGN090308** | 0.8 | 2 | 2.4 | | | | | ● | | | | | | |
| | | **2QP-SPGN090312** | 1.2 | 2 | 2.4 | | | | | ● | | | | | | |
| General purpose | | **3QP-TPGW080204** | 0.4 | 3 | 2.2 | ● | ● | | | | | | | | | |
| | | **3QP-TPGW090202** | 0.2 | 3 | 2.3 | | ● | | | | | | | | | |
| | | **3QP-TPGW090204** | 0.4 | 3 | 2.2 | ● | ● | | | | | | | | | |
| | | **3QP-TPGW110202** | 0.2 | 3 | 2.3 | | ● | | | | | | | | | |
| | | **3QP-TPGW110204** | 0.4 | 3 | 2.2 | ● | ● | | ● | | | | | | | |
| | | **3QP-TPGW110208** | 0.8 | 3 | 2.2 | | | | ● | | | | | | | |
| Sharp edge | | **3QP-TPGW110304F** | 0.4 | 3 | 2.2 | | | | ● | | | | | | | |
| | | **3QP-TPGW110308F** | 0.8 | 3 | 2.2 | | | | ● | | | | | | | |
| General purpose | | **3QP-TPGW110302** | 0.2 | 3 | 2.3 | | ● | | | | | | | | | |
| | | **3QP-TPGW110304** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPGW110308** | 0.8 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | |
| | | **3QP-TPGW130302** | 0.2 | 3 | 2.3 | | ● | | | | | | | | | |
| | | **3QP-TPGW130304** | 0.4 | 3 | 2.2 | ● | ● | | | | | | | | | |
| | | **3QP-TPGW16T304** | 0.4 | 3 | 2.2 | ● | ● | | | | | | | | | |
| | | **3QP-TPGW16T308** | 0.8 | 3 | 1.9 | ● | ● | | | | | | | | | |
| General purpose | | **3QP-TPGW160404** | 0.4 | 3 | 2.2 | ● | ● | | | | | | | | | |
| | | **3QP-TPGW160408** | 0.8 | 3 | 1.9 | | ● | | | | | | | | | |
| General purpose | | **3QP-TPGN110308** | 0.8 | 3 | 2.2 | | | | | ● | | | | | | |
| | | **3QP-TPGN110312** | 1.2 | 3 | 2.4 | | | | | ● | | | | | | |

● : Line up

External toolholders → B218 -
J series toolholders → B328 -
Cartridges → F171 -
Top-borer tools → F192 -
Internal toolholders → B278 -
PINZBOHR® → F154 - F170
Boring bar tools → F188 - F191

# TurnLine - CBN Insert

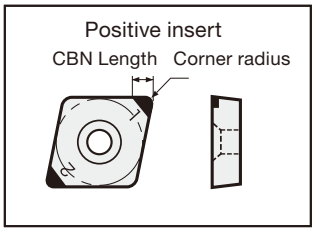
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## Positive insert · Multi-corner type (G class)

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BXM10 | BXM20 | BXA20 |
|---|---|---|---|---|---|---|---|---|
| General purpose | | **2QP-VBGW110304** | 0.4 | 2 | 3.1 | ● | ● | ● |
| | | **2QP-VBGW110308** | 0.8 | 2 | 2.2 | ● | ● | ● |
| | | **2QP-VBGW160404** | 0.4 | 2 | 3.1 | ● | ● | ● |
| | | **2QP-VBGW160408** | 0.8 | 2 | 2.2 | ● | ● | ● |
| General purpose | | **2QP-VCGW160404** | 0.4 | 2 | 3.1 | ● | ● | |

● : Line up

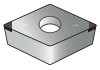



External toolholders → **B219 -**
J series toolholders → **B337 -**
Internal toolholders → **B282 -**
TungCap → **F071 -**

# TurnLine - CBN Insert

## Positive insert · Multi-corner type

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | P | Steel | | | | | | | | | | |
| | | | | | | M | Stainless | | | | | | | | | | |
| | | | | | | K | Cast iron | | | | ●◐ | ◐ | | | | | |
| | | | | | | N | Non-ferrous | | | | | | | | | | |
| | | | | | | S | Superalloys | | | | | ● | | | | | |
| | | | | | | H | Hard materials | ● | ●◐ | ●◐ | | | | | | | |
| **Specification** | **Shape** | **Designation** | **Corner radius** | **No. of corner** | **CBN Length** | **BX310** | **BX330** | **BX360** | **BX930** | **BX950** | | | | | | | |
| General purpose | | **2QP-CCMW060202** | 0.2 | 2 | 2.3 | ● | ● | ● | | | | | | | | | |
| | | **2QP-CCMW060204** | 0.4 | 2 | 2.3 | ● | ● | ● | ● | ● | | | | | | | |
| | | **2QP-CCMW09T304** | 0.4 | 2 | 2.3 | ● | ● | ● | ● | ● | | | | | | | |
| | | **2QP-CCMW09T308** | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | |
| General purpose |  | **2QP-DCMW070202** | 0.2 | 2 | 2.7 | ● | ● | ● | | | | | | | | | |
| | | **2QP-DCMW070204** | 0.4 | 2 | 2.5 | ● | ● | ● | ● | ● | | | | | | | |
| | | **2QP-DCMW11T302** | 0.2 | 2 | 2.7 | ● | ● | ● | | | | | | | | | |
| | | **2QP-DCMW11T304** | 0.4 | 2 | 2.5 | ● | ● | ● | ● | ● | | | | | | | |
| | | **2QP-DCMW11T308** | 0.8 | 2 | 2.1 | ● | ● | ● | | | | | | | | | |
| General purpose | | **2QP-SPMN090304** | 0.4 | 2 | 2.4 | | ● | ● | ● | | | | | | | | |
| | | **2QP-SPMN090308** | 0.8 | 2 | 2.4 | | ● | ● | ● | | | | | | | | |
| General purpose | | **3QP-TPMW080204** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW090202** | 0.2 | 3 | 2.3 | | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW090204** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW110202** | 0.2 | 3 | 2.3 | ● | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW110204** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW110302** | 0.2 | 3 | 2.3 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW110304** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW110308** | 0.8 | 3 | 1.9 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW130302** | 0.2 | 3 | 2.4 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW130304** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW16T304** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMW16T308** | 0.8 | 3 | 1.9 | ● | | | | | | | | | | | |
| | | **3QP-TPMW160404** | 0.4 | 3 | 2.2 | ● | ● | ● | ● | | | | | | | | |
| | | **3QP-TPMW160408** | 0.8 | 3 | 1.9 | ● | ● | ● | ● | | | | | | | | |
| General purpose | | **3QP-TPMN110302** | 0.2 | 3 | 2.3 | | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMN110304** | 0.4 | 3 | 2.2 | | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMN110308** | 0.8 | 3 | 1.9 | | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMN160304** | 0.4 | 3 | 2.2 | | ● | ● | ● | ● | | | | | | | |
| | | **3QP-TPMN160308** | 0.8 | 3 | 1.9 | | ● | ● | ● | ● | | | | | | | |
| General purpose | | **2QP-VBMW110304** | 0.4 | 2 | 3.1 | ● | ● | ● | ● | | | | | | | | |
| | | **2QP-VBMW110308** | 0.8 | 2 | 2.2 | ● | ● | ● | ● | | | | | | | | |
| | | **2QP-VBMW160404** | 0.4 | 2 | 3.1 | ● | ● | ● | | | | | | | | | |
| | | **2QP-VBMW160408** | 0.8 | 2 | 2.2 | ● | ● | ● | | | | | | | | | |
| General purpose | | **2QP-VCMW160404** | 0.4 | 2 | 3.1 | | ● | ● | ● | | | | | | | | |

● : Line up

External toolholders → B218 -
J series toolholders → B328 -
PINZBOHR® → F154 - F170
Boring bar tools → F188 - F191
Internal toolholders → B278 -
TungCap → F071 -
Cartridges → F171 -

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✣ : Heavy interrupted cutting

## Positive insert · One-corner type

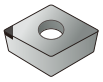
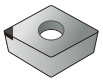
| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX330 |
|---|---|---|---|---|---|---|
| | | | | | | H: ●◐ |
| General purpose | | Q-CCMW060204 | 0.4 | 1 | 2.5 | ● |
| | | Q-CCMW09T304 | 0.4 | 1 | 2.5 | ● |
| General purpose | | Q-DCMW070204 | 0.4 | 1 | 2.1 | ● |
| | | Q-DCMW11T304 | 0.4 | 1 | 2.1 | ● |
| General purpose | | Q-SPGN090304 | 0.4 | 1 | 2.8 | ● |
| | | Q-SPGN090308 | 0.8 | 1 | 2.8 | ● |
| General purpose | | Q-TPMW080204 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPMW090202 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW090204 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW110202 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW110204 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPMW110304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW110308 | 0.8 | 1 | 2.2 | ● |
| | | Q-TPMW130302 | 0.2 | 1 | 2.4 | ● |
| | | Q-TPMW130304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW16T304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW160404 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPMW160408 | 0.8 | 1 | 1.9 | ● |
| General purpose | | Q-TPGN110304 | 0.4 | 1 | 2.2 | ● |
| | | Q-TPGN110308 | 0.8 | 1 | 2.2 | ● |
| | | Q-TPGN160304 | 0.4 | 1 | 2.3 | ● |
| | | Q-TPGN160308 | 0.8 | 1 | 1.9 | ● |

Note: Packing Qty : 2 pcs.

## Positive insert · Mini

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |
| | Sintered metal |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX310 | BX470 |
|---|---|---|---|---|---|---|---|
| | | | | | | H: ● | K: ●◐<br>S: ●◐<br>Sintered metal: ●◐ |
| General purpose |  | 1QP-CCGW03X102 | 0.2 | 1 | 1.4 | ● | ● |
| | | 1QP-CCGW03X104 | 0.4 | 1 | 1.3 | ● | ● |
| | | 1QP-CCGW04T102 | 0.2 | 1 | 1.9 | ● | ● |
| | | 1QP-CCGW04T104 | 0.4 | 1 | 1.8 | ● | ● |
| General purpose |  | 1QP-EPGW03X102 | 0.2 | 1 | 1.4 | ● | ● |
| | | 1QP-EPGW03X104 | 0.4 | 1 | 1.3 | ● | ● |
| | | 1QP-EPGW040102 | 0.2 | 1 | 1.7 | ● | ● |
| | | 1QP-EPGW040104 | 0.4 | 1 | 1.6 | ● | ● |

● : Line up

External toolholders → B218 -
J series toolholders → B328 -
PINZBOHR® → F154 - F170
Boring bar tools → F188 - F191
Internal toolholders → B278 -
Cartridges → F171 -
Top-borer tools → F192 -

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## Positive insert · One-corner type

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| | | | | | | ●◐ |
| General purpose | | SPGN090304-QBN | 0.4 | 1 | 4.1 | ● |
| | | SPGN090308-QBN | 0.8 | 1 | 4.1 | ● |
| | | SPGN090312-QBN | 1.2 | 1 | 4.1 | ● |
| | | SPGN120308-QBN | 0.8 | 1 | 4.1 | ● |
| | | SPGN120312-QBN | 1.2 | 1 | 4.1 | ● |
| General purpose | | TPGW090202-QBN | 0.2 | 1 | 3.3 | ● |
| | | TPGW090204-QBN | 0.4 | 1 | 3.2 | ● |
| | | TPGW110202-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGW110204-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGW130302-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGW130304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGW16T302-QBN | 0.2 | 1 | 4.4 | ● |
| | | TPGW16T304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGW16T308-QBN | 0.8 | 1 | 4.0 | ● |
| General purpose | | TPGN110304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGN110308-QBN | 0.8 | 1 | 3.5 | ● |
| | | TPGN160304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGN160308-QBN | 0.8 | 1 | 4.0 | ● |
| General purpose | | CPGA090204-QBN | 0.4 | 1 | 4.0 | ● |
| | | CPGA090208-QBN | 0.8 | 1 | 3.8 | ● |
| General purpose | | TPGA090202-QBN | 0.2 | 1 | 3.1 | ● |
| | | TPGA090204-QBN | 0.4 | 1 | 2.9 | ● |
| | | TPGA110202-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGA110204-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGA110302-QBN | 0.2 | 1 | 3.9 | ● |
| | | TPGA110304-QBN | 0.4 | 1 | 3.7 | ● |
| | | TPGA160302-QBN | 0.2 | 1 | 4.4 | ● |
| | | TPGA160304-QBN | 0.4 | 1 | 4.2 | ● |
| | | TPGA160308-QBN | 0.8 | 1 | 4.0 | ● |

## Positive insert · Full-face type

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | CBN Length | BX360 |
|---|---|---|---|---|---|---|
| | | | | | | ●◐ |
| General purpose | | TBGN060104-15-QBN | 0.4 | 3 | - | ● |
| | | TBGN060108-15-QBN | 0.8 | 3 | - | ● |

● : Line up

External toolholders → B243 - Internal toolholders → B282 -
Cartridges → F171 - Boring bar tools → F188 - F191

# TurnLine - CBN Insert

## Coated Solid CBN (BXC90)

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ●◐ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Specification | Shape | Designation | Corner radius | No. of corner | BXC90 |
|---|---|---|---|---|---|
| General purpose | | **S-CNGN090308** | 0.8 | 4 | ● |
| | | **S-CNGN090312** | 1.2 | 4 | ● |
| | | **S-CNGN120408** | 0.8 | 4 | ● |
| | | **S-CNGN120412** | 1.2 | 4 | ● |
| General purpose | | **S-RNGN090300** | - | - | ● |
| | | **S-RNGN120400** | - | - | ● |
| General purpose | | **S-SNGN090308** | 0.8 | 8 | ● |
| | | **S-SNGN090312** | 1.2 | 8 | ● |
| | | **S-SNGN120308** | 0.8 | 8 | ● |
| | | **S-SNGN120312** | 1.2 | 8 | ● |
| | | **S-SNGN120408** | 0.8 | 8 | ● |
| | | **S-SNGN120412** | 1.2 | 8 | ● |
| General purpose | | **S-TNGN110308** | 0.8 | 6 | ● |
| | | **S-TNGN110312** | 1.2 | 6 | ● |
| | | **S-TNGN160408** | 0.8 | 6 | ● |
| | | **S-TNGN160412** | 1.2 | 6 | ● |

● : Line up

# TurnLine - CBN Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## T-CBN (PCBN tipped) grooving Insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | Grooving width ±0.05 | BX360 |
|---|---|---|---|---|---|---|
| Grooving | | XGR6310S-QBN | 0.2 | 1 | 1.0 | |
| | | XGR6315S-QBN | 0.2 | 1 | 1.5 | ● |
| | | XGR6320S-QBN | 0.2 | 1 | 2.0 | ● |
| | | XGR6325S-QBN | 0.2 | 1 | 2.5 | ● |
| | | XGR6330S-QBN | 0.2 | 1 | 3.0 | ● |
| | | XGR6335S-QBN | 0.2 | 1 | 3.5 | ● |
| | | XGR6340S-QBN | 0.2 | 1 | 4.0 | ● |
| | | XGR6345S-QBN | 0.2 | 1 | 4.5 | ● |

## TungCut CBN insert for hardened steels

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | Grooving width ±0.025 | BX360 |
|---|---|---|---|---|---|---|
| Grooving | | SGN200-020 | 0.2 | 1 | 2.0 | ● |
| | | SGN300-020 | 0.2 | 1 | 3.0 | ● |
| | | SGN400-020 | 0.2 | 1 | 4.0 | ● |

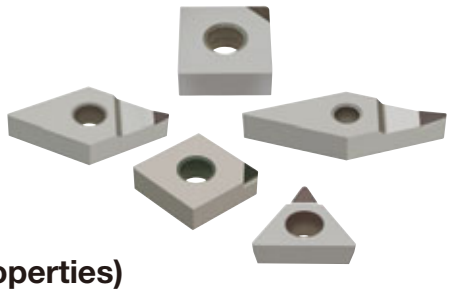
● : Line up

XGR... : Toolholders → **C030**

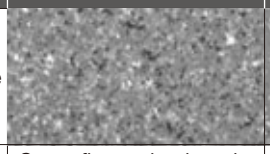
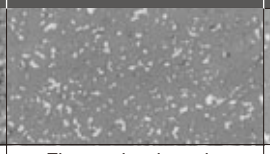
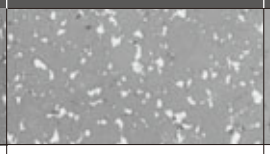
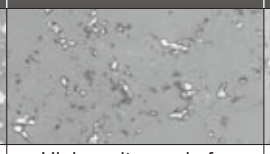
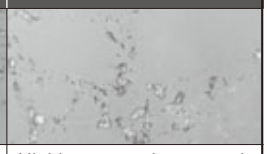
SGN... : Toolholders → **C054 -**

# TurnLine - PCD grade, T-DIA series

Expanded product line allows T-DIA tools to be applied to wider workpiece materials and cutting conditions.



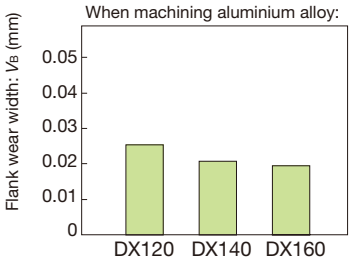
## Features and applications (Physical and mechanical properties)

| | DX110 | DX120 | DX140 | DX160 | DX180 |
|---|---|---|---|---|---|
| Grade |  |  |  |  |  |
| Property | Super fine grained grade. Excels in surface finish. | Fine grained grade. Excels in surface finish. | General purpose grade | High purity grade for hard materials | Highly wear resistant grade for special applications |
| Approx. grain size of diamond (μm) | < 1 | 5 | 13 | 28 | 45 |
| Hardness (Hv) | 8500 → | | | | 12000 (Harder) |
| Wear resistance | → | | | | Higher |
| Grindability (Cutting edge sharpness) | Better ← | | | | |

Note: T-DIA grades are not suitable for ferrous materials (such as hardened steel, chilled Cast iron), and Ni- or Co-base Superalloys.

## Cutting performance (Wear resistance)

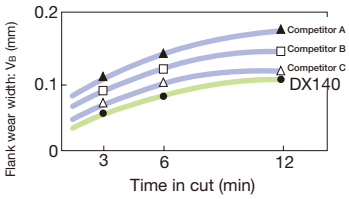
When machining aluminium alloy:




**Continuous external turning**

- Workpiece material: 10 % Si, aluminium alloy
- Insert: SPGN120308-DIA
- Toolholder: CSBPR2525M4
- Cutting speed: $v_c$ = 500 m/min
- Feed: $f$ = 0.1 mm/rev
- Depth of cut: $a_p$ = 0.5 mm
- Coolant: Dry cutting
- Time in cut: 30 min

When machining FRP:




**Face milling**

- Workpiece material: Fiber reinforced plastics (FRP)
- Insert: SPCN42ZFR-DIA
- Milling cutter: TPG4208R-A
- Cutting speed: $v_c$ = 942 m/min
- Feed: $f$ = 0.1 mm/rev
- Depth of cut: $a_p$ = 1.5 mm
- Coolant: Dry cutting

## Grade selection guide

**DX140** Basic selection (General purpose grade)

- For precision machining
- When good surface finish is required.
- When interrupted cutting is involved.

→ **DX120** Excels in cutting-edge sharpness and impact resistance. → **DX110** Super fine grained grade

- When machining hard materials such as high silicon aluminium alloys (Si > 12 %)
- Simultaneous machining of aluminium alloy and Cast iron.
- When high wear resistance is required.

→ **DX160** Superior wear resistance → **DX180** Special purpose grade

- When requiring higher wear resistance than DX160 (such as when machining high silicon materials, cemented carbides, semi-sintered ceramics, etc.)

## STANDARD CUTTING CONDITIONS FOR TURNING

| ISO | Workpiece material | Grade applicability DX110 | DX120 | DX140 | DX160 | DX180 | Cutting speed $v_c$ (m/min) | Depth of cut $a_p$ (mm) | Feed $f$ (mm/rev) |
|---|---|---|---|---|---|---|---|---|---|
| N | Aluminium alloys (Si < 12 %) | ○ | ○ | ◎ | | | 1000 - 2500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Aluminium alloys (Si > 12 %) | | | ○ | ◎ | | 400 - 800 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Copper, brass | ○ | ○ | ◎ | | | 500 - 1500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Phosphor bronze | ○ | ○ | ◎ | | | 300 - 500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | Carbon, graphite | | | ◎ | | | 300 - 500 | 0.05 - 2.0 | 0.05 - 0.2 |
| | FRP | ○ | ◎ | ○ | | | 500 - 1000 | 0.05 - 0.5 | 0.03 - 0.1 |
| | Plastics | ○ | ◎ | ○ | | | 500 - 1000 | 0.05 - 0.5 | 0.01 - 0.05 |
| | Cemented carbides (D40 ~ D60) | | | | ○ | ◎ | 10 - 20 | 0.05 - 0.2 | 0.01 - 0.05 |
| | Semi-sintered ceramics | | | | ○ | ◎ | 100 - 150 | 0.05 - 2.0 | 0.03 - 0.1 |

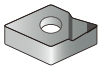
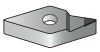
(Note) ◎ : First choice ○ : Second choice

# TurnLine - PCD Insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

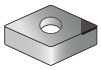
## Negative insert (with rake angle)

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | PCB Length | DX120 |
|---|---|---|---|---|---|---|
| | | | | | | N ●◐ |
| Low cutting force | | CNMM120402-DIA | 0.2 | 1 | 3.5 | ● |
| | | CNMM120404-DIA | 0.4 | 1 | 3.5 | ● |
| Low cutting force |  | DNMM150402-DIA | 0.2 | 1 | 3.3 | ● |
| | | DNMM150404-DIA | 0.4 | 1 | 3.1 | ● |
| Low cutting force | | TNMM160402-DIA | 0.2 | 1 | 3.3 | ● |
| | | TNMM160404-DIA | 0.4 | 1 | 3.2 | ● |
| Low cutting force |  | VNMM160402-DIA | 0.2 | 1 | 4.8 | ● |
| | | VNMM160404-DIA | 0.4 | 1 | 4.4 | ● |
| | | VNMM160408-DIA | 0.8 | 1 | 3.6 | ● |

## Negative insert

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

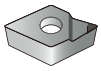
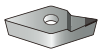
| Specification | Shape | Designation | Corner radius | No. of corner | PCB Length | DX140 | DX160 |
|---|---|---|---|---|---|---|---|
| | | | | | | N ●◐ | N ●◐ |
| General purpose | | CNGA120404-DIA | 0.4 | 1 | 3.5 | ● | |
| General purpose |  | DNGA150404-DIA | 0.4 | 1 | 3.1 | ● | ● |
| | | DNGA150408-DIA | 0.8 | 1 | 2.8 | ● | |
| General purpose | | SNGA120404-DIA | 0.4 | 1 | 3.6 | ● | |
| | | SNGA120408-DIA | 0.8 | 1 | 3.6 | ● | |
| General purpose | | SNGN120408-DIA | 0.8 | 1 | 3.6 | ● | |
| General purpose | | TNGA160404-DIA | 0.4 | 1 | 3.2 | ● | ● |
| | | TNGA160408-DIA | 0.8 | 1 | 2.9 | ● | ● |

● : Line up

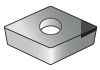
External toolholders → B204 -
J series toolholders → B342 - B344
PINZBOHR® → F154 - F170
Internal toolholders → B292 -
TungCap → B215 -, B317, F066 -
Cartridges → F171 -

# TurnLine - PCD Insert

## Positive insert (with rake angle)

| | | | | | | | DX120 |
|---|---|---|---|---|---|---|---|
| | | | | | | P Steel | |
| | | | | | | M Stainless | |
| | | | | | | K Cast iron | |
| | | | | | | N Non-ferrous | ●◐ |
| | | | | | | S Superalloys | |
| | | | | | | H Hard materials | |
| **Specification** | **Shape** | **Designation** | **Corner radius** | **No. of corner** | **Relief angle** | **PCB Length** | |
| Low cutting force | | **CCMT060202-DIA** | 0.2 | 1 | 7° | 2.4 | ● |
| | | **CCMT060204-DIA** | 0.4 | 1 | 7° | 2.4 | ● |
| | | **CCMT09T302-DIA** | 0.2 | 1 | 7° | 3.5 | ● |
| | | **CCMT09T304-DIA** | 0.4 | 1 | 7° | 3.5 | ● |
| Low cutting force |  | **DCMT070202-DIA** | 0.2 | 1 | 7° | 2.3 | ● |
| | | **DCMT070204-DIA** | 0.4 | 1 | 7° | 2.1 | ● |
| | | **DCMT11T302-DIA** | 0.2 | 1 | 7° | 3.2 | ● |
| | | **DCMT11T304-DIA** | 0.4 | 1 | 7° | 3.0 | ● |
| Low cutting force | | **TCMT080202-DIA** | 0.2 | 1 | 7° | 2.4 | ● |
| | | **TCMT080204-DIA** | 0.4 | 1 | 7° | 2.3 | ● |
| | | **TCMT110202-DIA** | 0.2 | 1 | 7° | 2.4 | ● |
| | | **TCMT110204-DIA** | 0.4 | 1 | 7° | 2.2 | ● |
| | | **TCMT110302-DIA** | 0.2 | 1 | 7° | 2.4 | ● |
| | | **TCMT110304-DIA** | 0.4 | 1 | 7° | 2.2 | ● |
| Low cutting force |  | **VCMT160402-DIA** | 0.2 | 1 | 7° | 4.8 | ● |
| | | **VCMT160404-DIA** | 0.4 | 1 | 7° | 4.4 | ● |

## Positive insert

| | | | | | | | DX120 | DX140 | DX160 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | P Steel | | | |
| | | | | | | M Stainless | | | |
| | | | | | | K Cast iron | | | |
| | | | | | | N Non-ferrous | ●◐ | ●◐ | ●◐ |
| | | | | | | S Superalloys | | | |
| | | | | | | H Hard materials | | | |
| **Specification** | **Shape** | **Designation** | **Corner radius** | **No. of corner** | **Relief angle** | **PCB Length** | | | |
| General purpose | | **CCGW060200-DIA** | 0.05 | 1 | 7° | 2.4 | | ● | |
| | | **CCGW060202-DIA** | 0.2 | 1 | 7° | 2.4 | | ● | |
| | | **CCGW060204-DIA** | 0.4 | 1 | 7° | 2.4 | | ● | |
| | | **CCGW09T302-DIA** | 0.2 | 1 | 7° | 3.5 | | ● | |
| | | **CCGW09T304-DIA** | 0.4 | 1 | 7° | 3.5 | | ● | ● |
| | | **CCGW09T308-DIA** | 0.8 | 1 | 7° | 3.4 | | ● | |
| General purpose |  | **DCGW070200-DIA** | 0.05 | 1 | 7° | 2.4 | | ● | |
| | | **DCGW070202-DIA** | 0.2 | 1 | 7° | 2.3 | ● | ● | |
| | | **DCGW070204-DIA** | 0.4 | 1 | 7° | 2.1 | | ● | |
| | | **DCGW11T302-DIA** | 0.2 | 1 | 7° | 3.2 | | ● | |
| | | **DCGW11T304-DIA** | 0.4 | 1 | 7° | 3.0 | | ● | |
| | | **DCGW11T308-DIA** | 0.8 | 1 | 7° | 2.7 | | ● | |
| General purpose | | **SPGN090308-DIA** | 0.8 | 1 | 11° | 3.6 | | ● | |
| | | **SPGN120302-DIA** | 0.2 | 1 | 11° | 3.6 | | ● | |
| | | **SPGN120304-DIA** | 0.4 | 1 | 11° | 3.6 | | ● | |
| | | **SPGN120308-DIA** | 0.8 | 1 | 11° | 3.6 | | ● | ● |

● : Line up

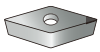
External toolholders → **B218 -**
J series toolholders → **B328 -**
PINZBOHR® → **F154 - F170**
Internal toolholders → **B278 -**
TungCap → **F071 -**
Cartridges → **F171 -**

# TurnLine - PCD Insert

## Positive insert

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

| | |
|---|---|
| P | Steel |
| M | Stainless |
| K | Cast iron |
| N | Non-ferrous |
| S | Superalloys |
| H | Hard materials |

| Specification | Shape | Designation | Corner radius | No. of corner | Relief angle | PCB Length | DX120 | DX140 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | N | N |
| General purpose | | **CPGA090202-DIA** | 0.2 | 1 | 11° | 3.5 | | ● |
| | | **CPGA090204-DIA** | 0.4 | 1 | 11° | 3.5 | | ● |
| General purpose | | **EPGW040102-DIA** | 0.2 | 1 | 11° | 2.0 | | ● |
| | | **EPGW040104-DIA** | 0.4 | 1 | 11° | 1.9 | | ● |
| General purpose | | **TPGA090202-DIA** | 0.2 | 1 | 11° | 2.4 | | ● |
| | | **TPGA090204-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGA110202-DIA** | 0.2 | 1 | 11° | 2.4 | | ● |
| | | **TPGA110204-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGA110302-DIA** | 0.2 | 1 | 11° | 2.4 | | ● |
| | | **TPGA110304-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGA110308-DIA** | 0.8 | 1 | 11° | 2.9 | | ● |
| | | **TPGA160302-DIA** | 0.2 | 1 | 11° | 3.3 | | ● |
| | | **TPGA160304-DIA** | 0.4 | 1 | 11° | 3.2 | | ● |
| | | **TPGA160308-DIA** | 0.8 | 1 | 11° | 2.9 | | ● |
| General purpose | | **TPGN090204-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGN110304-DIA** | 0.4 | 1 | 11° | 3.2 | ● | ● |
| | | **TPGN110308-DIA** | 0.8 | 1 | 11° | 2.9 | | ● |
| | | **TPGN160302-DIA** | 0.2 | 1 | 11° | 3.3 | | ● |
| | | **TPGN160304-DIA** | 0.4 | 1 | 11° | 3.2 | ● | ● |
| | | **TPGN160308-DIA** | 0.8 | 1 | 11° | 2.9 | | ● |
| General purpose | | **TPGW080202-DIA** | 0.2 | 1 | 11° | 2.4 | | ● |
| | | **TPGW080204-DIA** | 0.4 | 1 | 11° | 2.3 | | ● |
| | | **TPGW090202-DIA** | 0.2 | 1 | 11° | 2.4 | ● | ● |
| | | **TPGW090204-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGW110202-DIA** | 0.2 | 1 | 11° | 2.4 | ● | ● |
| | | **TPGW110204-DIA** | 0.4 | 1 | 11° | 2.2 | | ● |
| | | **TPGW130302-DIA** | 0.2 | 1 | 11° | 3.3 | ● | ● |
| | | **TPGW130304-DIA** | 0.4 | 1 | 11° | 3.2 | | ● |
| | | **TPGW16T302-DIA** | 0.2 | 1 | 11° | 3.3 | | ● |
| | | **TPGW16T304-DIA** | 0.4 | 1 | 11° | 3.2 | | ● |
| | | **TPGW16T308-DIA** | 0.8 | 1 | 11° | 2.9 | | ● |
| General purpose |  | **VCGW160402-DIA** | 0.2 | 1 | 7° | 4.8 | | ● |
| | | **VCGW160404-DIA** | 0.4 | 1 | 7° | 4.4 | | ● |

● : Line up

External toolholders → **B243 -**
Internal toolholders → **B279 -**
Cartridges → **F171 -**
Boring bar tools → **F188 - F191**
Top-borer tools → **F192 -**

MEMO

# TurnLine - External Toolholder

## MINIFORCETURN
Economical double-sided inserts with excellent sharpness

B188

## ISOECOTURN
Small-sized “Eco” insert series for maximized profits

B198

## TURNINGA
Highly rigid clamping system with excellent repeatability

B204

## TUNGTURNJET
Toolholders for high pressure coolant supply

B212

## Y-PRO SERIES
Inserts with 25° corner angle for profiling

B220

## ISO-Turn External
Toolholders for general external turning
D-type, H-type, M-type, P-type, S-type, T-type

B221

## FIXRTURN
Highly productive round insert with 6 indexes

B253

## DIMPLEFX
Ceramic insert with dimple for highly efficient cast iron machining

B254

## TURNFEED
Tool series for high-feed cutting

B257

## TURNTEC
Inserts and toolholders for roughing large depths of cut with high productivity

B258

ISO-EcoTurn

# External Toolholder (Negative insert) - Quick Guide

| | Turning / Facing | | External profiling | | | | | Turning | |
|---|---|---|---|---|---|---|---|---|---|
| | L 95º | | J 93º | | N 63º | V 72.5º | P 62.5º | A 91º | G 91º |
| **Turning A** Double clamping | 80º CN□□<br>ACLNR/L<br>□0904-A □12-A<br>□16-A □19-A<br>B198, B204<br>80º WN□□<br>AWLNR/L<br>□06-A □08-A<br>B198, B205 | 70º GN□□<br>ACLNR/L<br>□12-A<br>B204 | 55º DN□□<br>ADJNR/L<br>□1104-A □15-A<br>□1506-A<br>B199, B205<br>60º TN□□<br>ATJNR/L<br>□16-A<br>B206 | 35º VN□□<br>AVJNR/L<br>□16-A □1204-A<br>B203, B206<br>25º YNMG<br>AVJNR/L<br>□16-A<br>B206 | | 35º VN□□<br>AVVNN<br>□16-A □1204-A<br>B204, B206<br>25º YNMG<br>AVVNN<br>□16-A<br>B206 | 55º DN□□<br>ADPNN<br>□15-A<br>B207 | | 60º TN□□<br>ATGNR/L<br>□16-A □22-A<br>B207 |
| **D** One-Double | 80º CN□□<br>DCLNR/L<br>□12 □16 □19<br>B221<br>80º WN□□<br>DWLNR/L<br>□06 □08<br>B222 | 70º GN□□<br>DCLNR/L<br>□12<br>B221 | 55º DN□□<br>DDJNR/L<br>□15 □1506<br>B222 | | | | | | 60º TN□□<br>DTGNR/L<br>□16 □22<br>B223 |
| **C** Double clamping for dimple ceramic insert | 80º CN□□<br>CCLNR/L<br>□1207-RD<br>B254 | | 55º DN□□<br>CDJNR/L<br>□1507-RD<br>B254 | | 55º DNGD<br>CDNNN<br>□1507-RD<br>B255 | 35º VNGD<br>CVVNN<br>□1607-RD<br>B255 | | | |
| **P** Lever lock | 80º CN□□<br>PCLNR/L<br>□0904 □09 □12<br>□16 □19<br>B198,<br>B199 TungTurn-Jet,<br>B212 TungTurn-Jet,<br>B215 TungTurn-Jet,<br>B226, B342<br>80º CN□□<br>PCMNN<br>□12<br>B216 TungTurn-Jet<br>80º CN□□<br>PCL2NR<br>□12<br>B342<br>80º WN□□<br>PWLNR/L<br>□0604 □08<br>B199,<br>B214 TungTurn-Jet,<br>B215 TungTurn-Jet | 70º GN□□<br>PCLNR/L<br>□12<br>B212 TungTurn-Jet,<br>B215 TungTurn-Jet,<br>B226, B342<br>70º GN□□<br>PCMNN<br>□12<br>B216 TungTurn-Jet<br>70º GN□□<br>PCL2NR<br>□12<br>B342<br>60º TN□□<br>PTL2NR/L<br>□16<br>B226, B344 | 55º DN□□<br>PDJNR/L<br>□11 □1104 □15<br>□1506<br>B200 TungTurn-Jet,<br>B212 TungTurn-Jet,<br>B215 TungTurn-Jet,<br>B227, B342<br>35º VN□□<br>PVJNR/L<br>□16 □1204<br>B201,<br>B213 TungTurn-Jet,<br>B216 TungTurn-Jet<br>25º YNMG<br>PVJNR/L<br>□16<br>B213 TungTurn-Jet,<br>B216 TungTurn-Jet | 60º TN□□<br>PTJNR/L<br>□1104<br>B201 | | | 55º DN□□<br>PDPNN<br>□15 □1506<br>B227<br>55º DN□□<br>PDMNL<br>□1104<br>B217 TungTurn-Jet | 35º VN□□<br>PVVNN<br>□1204<br>B202 | 60º TN□□<br>PTGNR/L<br>□1104 □16 □22<br>B201,<br>B213 TungTurn-Jet,<br>B228 |
| **M** Multi clamping | 80º CN□□<br>MCLNR/L<br>□12<br>B234<br>80º CN□□<br>MCLNR/L<br>□12<br>B234 | 70º GN□□<br>MCLNR/L<br>□12<br>B234<br>80º WN□□<br>MWLNR/L<br>□08<br>B234 | 35º VN□□<br>MVJNR/L<br>□16<br>B234<br>25º YNMG<br>MVJNR/L<br>□16<br>B234<br>60º TN□□<br>MTJNR/L<br>□16<br>B235 | 55º DN□□<br>MDJNR/L<br>□15<br>B235<br>55º DN□□<br>MDJNR<br>□15<br>B235<br>60º TN□□<br>MTJNR/L<br>□16<br>B235 | | 35º VN□□<br>MVVNN<br>□16<br>B235<br>25º YNMG<br>MVVNN<br>□16<br>B235 | 55º DN□□<br>MDPNN<br>□15<br>B236<br>55º DN□□<br>MDPNN<br>□15<br>B236 | | |
| **C** Clamp-on | | | 55º KNMX<br>CKJNR/L<br>□16<br>B241 | | | | | | 60º TN□□<br>CTGNR/L<br>□16<br>B241 |
| **H** Retract-pin | | | | | | | | | |
| **JT** Back clamping | 60º TN□□<br>JTTLNR/L<br>□16<br>B343 | | | | | | | 60º TN□□<br>JTTANR/L<br>□16<br>B343 | |

| | Turning | Turning chamfering | | Turning/Facing chamfering | Facing | | Profiling | | External profiling |
|---|---|---|---|---|---|---|---|---|---|
| | B·R 75º | E 60º | D 45º | S 45º | K 75º | F 91º | Q*1 · H*1 45º | | Special |
| | 90º SN□□<br>ASBNR/L<br>□12-A □15-A<br>□19-A<br>B208 | | 90º SN□□<br>ASDNN<br>□12-A<br>B208 | 90º SN□□<br>ASSNR/L<br>□12-A □15-A<br>□19-A<br>B209 | 90º SN□□<br>ASKNR/L<br>□12-A<br>B209 | 60º TN□□<br>ATFNR/L<br>□16-A □22-A<br>B210 | 55º DN□□<br>ADQNR/L<br>□1104-A □15-A<br>□1506-A<br>B203, B210<br>60º TN□□<br>ATQNR/L<br>□16-A<br>B210 | 35º VN□□<br>AVQNR/L<br>□16-A □1204-A<br>B203, B211<br>25º YNMG<br>AVQNR/L<br>□16-A<br>B211 | - RN□□<br>ARGNR/L<br>□12-A<br>B211 |
| | 90º SN□□<br>DSBNR/L<br>□12 □15 □19<br>B223 | | 90º SN□□<br>DSDNN<br>□12<br>B223 | 90º SN□□<br>DSSNR/L<br>□12<br>B224 | 90º SN□□<br>DSKNR/L<br>□12<br>B224 | 60º TN□□<br>DTFNR/L<br>□16 □22<br>B224 | 55º DN□□<br>DDQNR/L<br>□15 □1506<br>B225 | | - RN□□<br>DRGNR/L<br>□12<br>B225 |
| | | | | 90º SNGD<br>CSSNR/L<br>□1207-RD<br>B255<br>90º HNGD<br>CHSNR/L<br>□0507-RD<br>B256 | | | | | |
| | 90º SN□□<br>PSBNR/L<br>□09 □12 □19<br>B229<br>100º CN□□<br>PCBNR/L<br>□12<br>B228 | | 90º SN□□<br>PSDNN<br>□09 □12<br>B229 | 90º SN□□<br>PSSNR/L<br>□09 □12 □19<br>B230 | 90º SN□□<br>PSKNR/L<br>□09 □12 □19<br>B230 | 60º TN□□<br>PTFNR/L<br>□1104 □16 □22<br>B201, B231<br>80º CN□□<br>PCFNR/L<br>□12<br>B231 | 55º DN□□<br>PDQNR/L<br>□15<br>B232<br>35º VN□□<br>PVQNR/L<br>□16 □1204<br>B202, B214 | | - RNMG<br>PRGNR/L<br>□09 □12<br>B232 |
| | | 60º TN□□<br>MTENN<br>□16<br>B236 | | | | | 35º VN□□<br>MVQNR/L<br>□16<br>B237<br>25º YNMG<br>MVQNR/L<br>□16<br>B237 | 60º TN□□<br>MTQNR/L<br>□16<br>B236<br>60º TN□□<br>MTQNR/L<br>□16<br>B236 | |
| | 90º SN□□<br>CSBNR/L<br>□12<br>B241 | | 90º SN□□<br>CSDNN<br>□12<br>B242 | 90º SN□□<br>CSSNR/L<br>□12<br>B242 | 90º SN□□<br>CSKNR/L<br>□12<br>B242 | 60º TN□□<br>CTFNR/L<br>□16<br>B243 | | | |
| | 90º SNMM<br>HSRNR/L<br>□31<br>B245 | | | | | | | | |

Note:*1 marked Q and H style are Tungaloy Standard.

# External Toolholder (Positive insert) - Quick Guide

| | Turning Facing | External profiling | | | | Turning | | | Turning Facing |
|---|---|---|---|---|---|---|---|---|---|
| | L 95° | J 93° | | V 72.5° | N 62.5° | A 91° | G 91° | B·R 75° | X 20° |
| **X** Double clamping screw-on/clamping | | | | | | | | | 80° WPMT<br>XWXPR/L<br>□09<br>**B257** |
| **P** Lever lock | 80° WXGU<br>JPWL2XR/L<br>□04<br>**B188** | 55° DXGU<br>JPDJ2XR/L<br>□07<br>**B190** | 35° VXGU<br>JPVJ2XR/L<br>□09<br>**B192** | | | | | | |
| **C** Clamp-on | | | | | | | 60° TP□□<br>CTGPR/L<br>□16<br>**B243** | 90° SP□□<br>CSBPR/L<br>□09 □12<br>**B243** | |
| **J** Screw-on | 80° CC□□<br>JSCLCR/L<br>□06 □09<br>**B329**<br><br>80° CC□□<br>JSCL2CR/L*2<br>□06 □09<br>**B328**<br><br>35° VP□□<br>JSVL2PR/L<br>□08 □11<br>**B341**<br><br>80° WXGU<br>JSWLXR □04<br>**B189**<br>JSWL2XR/L □04<br>**B188, B189**<br>**B217** TungTurn-Jet | 55° DC□□<br>JSDJCR/L<br>□07 □11<br>**B332, B333**<br><br>55° DC□□<br>JSDJ2CR/L*2<br>□07 □11<br>**B218** TungTurn-Jet,<br>**B331, B333**<br><br>35° VB□□<br>JSVJBR/L<br>□11<br>**B337, B339**<br><br>35° VB□□<br>JSVJ2BR/L<br>□11<br>**B219** TungTurn-Jet<br>**B337**<br>**B338** TungTurn-Jet | 55° DXGU<br>JSDJXR □07<br>**B191**<br>JSDJ2XR/L □07<br>**B190, B191**<br>**B217** TungTurn-Jet<br><br>35° VXGU<br>JSVJXR □09<br>**B193**<br>JSVJ2XR/L □09<br>**B192, B193,**<br>**B218** TungTurn-Jet | 35° VB□□<br>JSVNBN<br>□11<br>**B340** | 55° DC□□<br>JSDNCN<br>□07 □11<br>**B334**<br><br>55° DC□□<br>JSDN3CR/L*3<br>□07 □11<br>**B334** | 80° CC□□<br>JSCACL<br>□06 □09<br>**B330**<br><br>60° TC□□<br>JSTACR/L<br>□08 □11<br>**B336**<br><br>35° VB□□<br>JSVABR/L<br>□11<br>**B338** | 80° CC□□<br>JSCGCR/L<br>□06 □09<br>**B331** | | |
| **S** Screw-on | 80° CC□□<br>SCLCR/L<br>□09 □12<br>**B246** | 55° DC□□<br>SDJCR/L<br>□11<br>**B246**<br><br>35° VC□□<br>SVJCR/L<br>□16<br>**B246**<br><br>25° YWMT<br>SYJBR/L<br>□16<br>**B220** | | 35° VC□□<br>SVVCN<br>□16<br>**B247** | 55° DC□□<br>SDNCN<br>□11<br>**B247** | 60° TC□□<br>STACR/L<br>□16<br>**B247** | | | |
| **JT** Back clamping | 80° CC□□<br>JTCL2CR/L<br>□06 □09<br>**B328** | 55° DC□□<br>JTDJ2CR/L<br>□07 □11<br>**B332** | | | | 60° TC□□<br>JTTACR/L<br>□08 □11<br>**B336** | | | |
| **T** Taper-lock | | | | | | | | | |

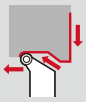
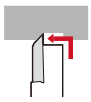
*2: L2 and J2: without offset

*3 63°

| | Turning Chamfering | Turning / Facing Chamfering | Facing | | Profiling | | | |
|---|---|---|---|---|---|---|---|---|
| | D 45° | S 45° | F 91° | C 90° | Q*1 45° · H*1 17.5° | H 100° | I 76.5° | P 117.5° |
| | | | | | | | | |
| | | | | | | | | |
| | 90° □ SP□□<br>CSDPN<br>□09 □12<br>B244 | 90° □ SP□□<br>CSSPR/L<br>□09 □12<br>B244 | 60° △ TP□□<br>CTFPR/L<br>□16<br>B244 | 60° △ TP□□<br>CTCPR/L<br>□16<br>B245 | | | | |
| | | | 55° DC□□<br>JSDFCR/L<br>□07 □11<br>B335 | | | | | 35° VP□□<br>JSVP2PR/L<br>□08 □11<br>B341 |
| | 90° SC□□<br>SSDCN<br>□07 □09<br>B250<br><br>90° SP□□<br>SSDPN Tungaloy standard<br>□07 □09<br>B250 | | | | 35° VC□□<br>SVQCR/L<br>□16<br>B251<br><br>55° DC□□<br>SDQCR/L<br>□11<br>B251<br><br>35° VCG□<br>SVHCR/L<br>□22<br>B251<br><br>25° YWMT<br>SYQBR/L<br>□16<br>B220 | 25° YWMT<br>SYHBR/L<br>□16<br>B220 | 25° YWMT<br>SYIBN<br>□16<br>B221 | |
| | | | | | | | | |
| | | | | | | | | |

Note:*1 marked Q and H style are Tungaloy Standard.

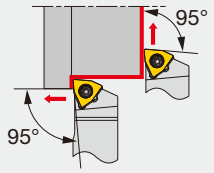
# External Toolholder (Positive insert) - Quick Guide

| | External profiling | Back turning | Front turning / Revese turning |
|---|---|---|---|
| | Special  |  | |
| **X** Double clamping screw-on/clamping | | | |
| **P** Lever lock | - RCM□<br>PRGCR/L<br>□10 □12 □16<br>□20<br>**B233**<br>- RCM□<br>PRDCN<br>□10 □12 □16<br>□20 □25<br>**B233** | | |
| **C** Clamp-on | | | |
| **J** Screw-on | | JXB<br>JSXBR/L<br>□08<br>**B346**<br>JTB<br>JSTBR/L<br>□03<br>**B347**<br>JS□□K-TBL3<br>□3<br>**B347**<br>J10E<br>JSEGR/L<br>□10<br>**B349** | JX□□<br>JSXGR/L<br>□08<br>**B345, B362**<br>55° DC□□<br>JS□□K-SDUCL<br>□07 □11<br>**B335**<br>55° DXGU<br>JS□□□-SDUXL<br>□07<br>**B194**<br>35° VXGU<br>JS□□□-SVUXL<br>□09<br>**B194** |
| **S** Screw-on | - RCMT<br>SRACR/L<br>□05 □06 □08<br>**B248**<br>- RCMT<br>SRGCR/L<br>□05 □06 □08<br>□10 □12<br>**B249, B253** FixRTurn<br>- RCMT<br>SRDCN<br>□06 □08 □10<br>□12<br>**B250, B253** FixRTurn | Note:<br>JSXBR/L type is also used for JXT-type threading inserts. | Note:<br>JSXGR/L type is also used for JXG-type grooving inserts. |
| **JT** Back clamping | | | |
| **T** Taper-lock | - RT□□<br>TRACN<br>□05 □06 □08<br>**B252**<br>- RT□□<br>TRDCN<br>□05 □06<br>**B252** | | |

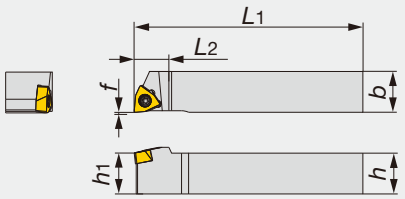
MEMO

# MINIFORCE TURN
## JSWL2XR/L

Screw-on toolholder without offset with 95° approach angle, for WXGU inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1010X04 | 10 | 10 | 120 | 11 | 10 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1212F04 | 12 | 12 | 85 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1212X04 | 12 | 12 | 120 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L1616X04 | 16 | 16 | 120 | 13 | 16 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JSWL2XR/L2020H04 | 20 | 20 | 100 | 13 | 20 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |

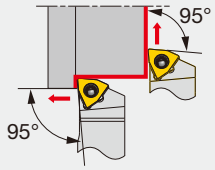
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

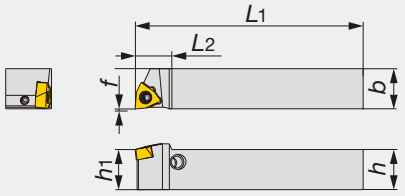
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSWL2XR/L... | SR34-514 | T-7F |

# MINIFORCE TURN
## JPWL2XR/L

Lever lock type toolholder without offset with 95° approach angle, for WXGU inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPWL2XR/L1010X04 | 10 | 10 | 120 | 11 | 10 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1212F04 | 12 | 12 | 85 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1212X04 | 12 | 12 | 120 | 11 | 12 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |
| JPWL2XR/L1616X04 | 16 | 16 | 120 | 13 | 16 | 0 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

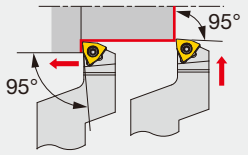
| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPWL2XR/L... | SLLV-2 | SL-PI-2 | SR10400611 | HW2.0/5RED |

JSWL2XR/L, JPWL2XR/L: Inserts → **B195 -**, Standard cutting conditions → **B197**

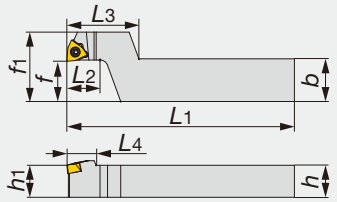
MINIFORCE TURN

## JSWLXR-F

Screw-on stepped-head toolholder with 95° approach angle, for WXGU inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | L3 | L4 | h1 | f | f1 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSWLXR1016X04-F15 | 10 | 16 | 120 | 12 | 27 | 11 | 10 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1216F04-F15 | 12 | 16 | 85 | 12 | 27 | 11 | 12 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1216X04-F15 | 12 | 16 | 120 | 12 | 27 | 11 | 12 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |
| JSWLXR1620X04-F15 | 16 | 20 | 120 | 12 | 27 | 11 | 16 | 15 | 26 | 0.2 | WXGU0403**L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

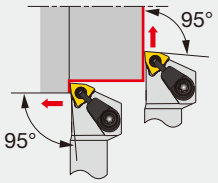
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSWLXR**-F15 | SR34-514 | T-7F |

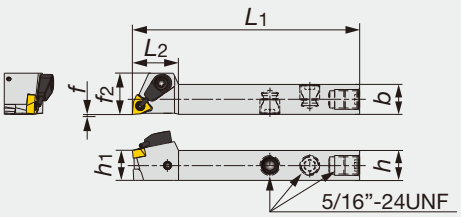
MINIFORCE TURN

## JSWL2XR/L-CHP

Screw-on toolholder without offset with 95° approach angle, for WXGU inserts,with channels for high pressure coolant




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1212F04-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 16.5 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

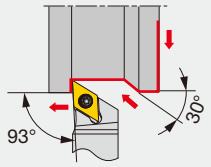
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSWL2XR/L1212F04-CHP | SR34-514 | S-CU-CHP | T-7F |

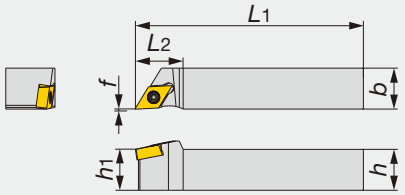
JSWLXR-F, JSWL2XR/L-CHP: Inserts → **B195**, Standard cutting conditions → **B197**

# MINIFORCE TURN
## JSDJ2XR/L

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L1616X07 | 16 | 16 | 120 | 18 | 16 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JSDJ2XR/L2020H07 | 20 | 20 | 100 | 18 | 20 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |

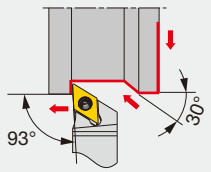
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

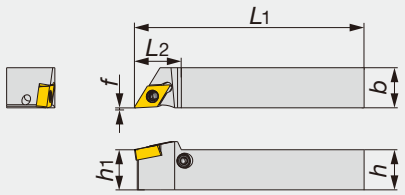
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJ2XR/L... | SR34-514 | T-7F |

# MINIFORCE TURN
## JPDJ2XR/L

Lever lock type toolholder without offset with 93° approach angle, for DXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPDJ2XR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |
| JPDJ2XR/L1616X07 | 16 | 16 | 120 | 18 | 16 | 0 | 0.2 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

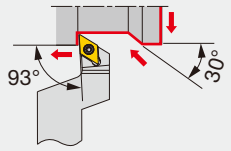
| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPDJ2XR/L... | SLLV-2 | SL-PI-2 | SR10400611 | HW2.0/5RED |

JSDJ2XR/L, JPDJ2XR/L: Inserts → **B196 -**, Standard cutting conditions → **B197**

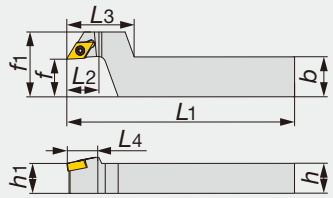
MINIFORCE TURN

## JSDJXR-F

Screw-on stepped-head toolholder with 93° approach angle, for DXGU inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | L3 | L4 | h1 | f | f1 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSDJXR1016X07-F15 | 10 | 16 | 120 | 12 | 27 | 14 | 10 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1216F07-F15 | 12 | 16 | 85 | 12 | 27 | 14 | 12 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1216X07-F15 | 12 | 16 | 120 | 12 | 27 | 14 | 12 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |
| JSDJXR1620X07-F15 | 16 | 20 | 120 | 12 | 27 | 14 | 16 | 15 | 26 | 0.2 | DXGU0703**L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

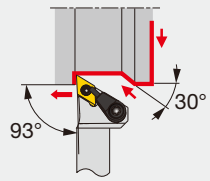
**SPARE PARTS**

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJXR**-F15 | SR34-514 | T-7F |

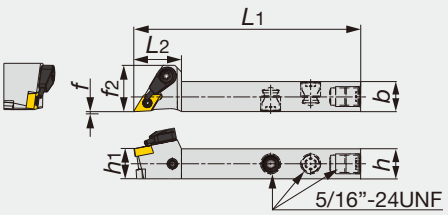
MINIFORCE TURN

## JSDJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 18.5 | 0.2 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

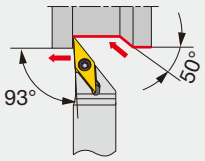
**SPARE PARTS**

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | SR34-514 | S-CU-CHP | T-7F |

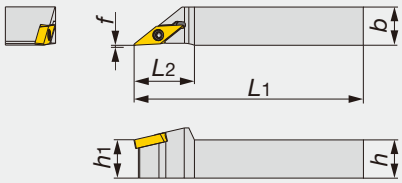
JSDJXR-F, JSDJ2XR/L-CHP: Inserts → **B196 -**, Standard cutting conditions → **B197**

# MINIFORCE TURN
## JSVJ2XR/L

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1010X09 | 10 | 10 | 120 | 17 | 10 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1212F09 | 12 | 12 | 85 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1212X09 | 12 | 12 | 120 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L1616X09 | 16 | 16 | 120 | 19 | 16 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JSVJ2XR/L2020H09 | 20 | 20 | 100 | 19 | 20 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |

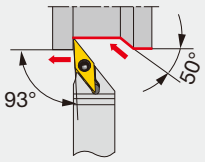
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

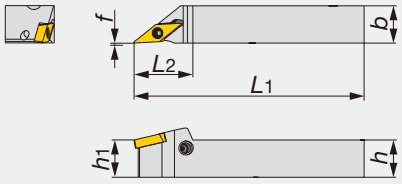
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJ2XR/L... | SR34-508 | T-7F |

# MINIFORCE TURN
## JPVJ2XR/L

Lever lock type toolholder without offset with 93° approach angle, for VXGU inserts




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JPVJ2XR/L1010X09 | 10 | 10 | 120 | 19 | 10 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1212F09 | 12 | 12 | 85 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1212X09 | 12 | 12 | 120 | 19 | 12 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |
| JPVJ2XR/L1616X09 | 16 | 16 | 120 | 19 | 16 | 0 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

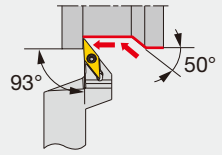
### SPARE PARTS

| Designation | Lever | Pin | Clamping screw | Wrench |
|---|---|---|---|---|
| JPVJ2XR/L... | SLLV-1 | SL-PI-2 | SR10400611 | HW2.0/5RED |

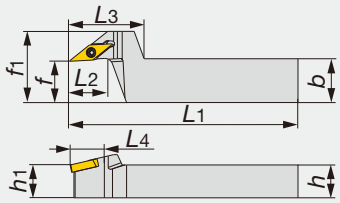
JSVJ2XR/L, JPVJ2XR/L: Inserts → **B197**, Standard cutting conditions → **B197**

# MINIFORCE TURN
## JSVJXR-F

Screw-on stepped-head toolholder with 93° approach angle, for VXGU inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | L3 | L4 | h1 | f | f1 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSVJXR1016X09-F15 | 10 | 16 | 120 | 12 | 27 | 19 | 10 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1216F09-F15 | 12 | 16 | 85 | 12 | 27 | 19 | 12 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1216X09-F15 | 12 | 16 | 120 | 12 | 27 | 19 | 12 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |
| JSVJXR1620X09-F15 | 16 | 20 | 120 | 12 | 27 | 19 | 16 | 15 | 26 | 0.2 | VXGU09T2**L... | 0.9 |

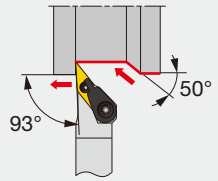
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L).

### SPARE PARTS

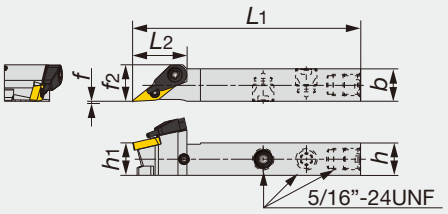
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJXR**-F15 | SR34-508 | T-7F |

# MINIFORCE TURN
## JSVJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts, with coolant nozle for high pressure




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | 12 | 12 | 85 | 20 | 12 | 0 | 13.5 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

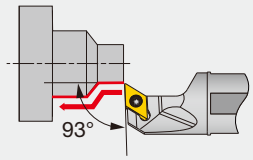
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | SR34-508 | S-CU-CHP | T-7F |

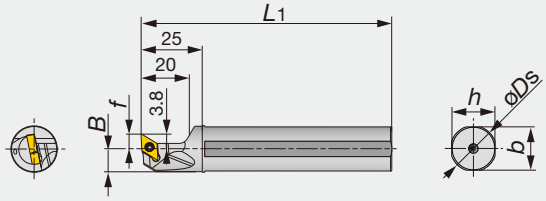
JSVJXR-F, JSVJ2XR/L-CHP: Inserts → **B197**, Standard cutting conditions → **B197**

# MINIFORCE TURN
## JS-SDUXL

Screw-on toolholder with 93° approach angle, for DXGU inserts




Cutting edge style **U**




Left hand (L) shown.

| Designation | øDs | f | L1 | h | b | B | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS14H-SDUXL07 | 14 | 6 | 100 | 13 | 13 | 6.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS159F-SDUXL07 | 15.875 | 6 | 85 | 15 | 15 | 7.687 | 0.2 | DXGU0703**L... | 0.9 |
| JS16F-SDUXL07 | 16 | 6 | 85 | 15 | 15 | 7.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS19G-SDUXL07 | 19.05 | 6 | 90 | 18 | 18 | 9.275 | 0.2 | DXGU0703**L... | 0.9 |
| JS19X-SDUXL07 | 19.05 | 6 | 120 | 18 | 18 | 9.275 | 0.2 | DXGU0703**L... | 0.9 |
| JS20G-SDUXL07 | 20 | 6 | 90 | 19 | 19 | 9.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS20X-SDUXL07 | 20 | 6 | 120 | 19 | 19 | 9.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS22X-SDUXL07 | 22 | 10 | 120 | 21 | 21 | 10.75 | 0.2 | DXGU0703**L... | 0.9 |
| JS25H-SDUXL07 | 25 | 10 | 100 | 24 | 24 | 12.25 | 0.2 | DXGU0703**L... | 0.9 |
| JS254X-SDUXL07 | 25.4 | 10 | 120 | 24 | 24 | 12.45 | 0.2 | DXGU0703**L... | 0.9 |

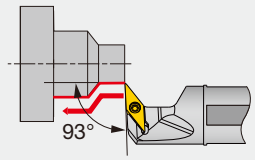
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Left-hand toolholders (L) are used with left-hand inserts (L).

### SPARE PARTS

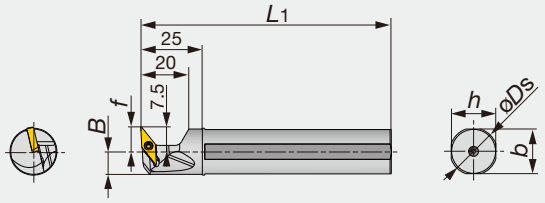
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-SDUXL07 | SR34-514 | T-7F |

# MINIFORCE TURN
## JS-SVUXL

Screw-on toolholder with 93° approach angle, for VXGU inserts




Cutting edge style **U**




Left hand (L) shown.

| Designation | øDs | f | L1 | h | b | B | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS159F-SVUXL09 | 15.875 | 10 | 85 | 15 | 15 | 7.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS16F-SVUXL09 | 16 | 10 | 85 | 15 | 15 | 7.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS19G-SVUXL09 | 19.05 | 10 | 90 | 18 | 18 | 9.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS19X-SVUXL09 | 19.05 | 10 | 120 | 18 | 18 | 9.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS20G-SVUXL09 | 20 | 10 | 90 | 19 | 19 | 9.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS20X-SVUXL09 | 20 | 10 | 120 | 19 | 19 | 9.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS22X-SVUXL09 | 22 | 10 | 120 | 21 | 21 | 10.7 | 0.2 | VXGU09T2**L... | 0.9 |
| JS25H-SVUXL09 | 25 | 10 | 100 | 24 | 24 | 12.2 | 0.2 | VXGU09T2**L... | 0.9 |
| JS254X-SVUXL09 | 25.4 | 10 | 120 | 24 | 24 | 12.4 | 0.2 | VXGU09T2**L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Left-hand toolholders (L) are used with left-hand inserts (L).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-SVUXL09 | SR34-508 | T-7F |

JS-SDUXL: Inserts → **B196 -**, Standard cutting conditions → **B197**

JS-SVUXL: Inserts → **B197**, Standard cutting conditions → **B197**

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT

### POSITIVE TYPE DOUBLE-SIDED

**Trigon, 80° with hole**

| | | AH725 | SH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | ●◐ | | | |
| K | Cast iron | ◐ | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | ● | | | | ● |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | KS05F (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting(Sharp edge) | JTS | WXGU040301MFR-JTS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JTS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JTS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JTS | <0.2* | | ● | | | |
| Finishing to medium cutting | JTS | WXGU040301MR-JTS | <0.1* | ● | | | | |
| | | WXGU040301ML-JTS | <0.1* | ● | | | | |
| | | WXGU040302MR-JTS | <0.2* | ● | | | | |
| | | WXGU040302ML-JTS | <0.2* | ● | | | | |
| Finishing (Low cutting force) (Sharp edge) | JSS | WXGU040301MFR-JSS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JSS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JSS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JSS | <0.2* | | ● | | | |
| Finishing (Low cutting force) | JSS | WXGU040301MR-JSS | <0.1* | ● | | | | |
| | | WXGU040301ML-JSS | <0.1* | ● | | | | |
| | | WXGU040302MR-JSS | <0.2* | ● | | | | |
| | | WXGU040302ML-JSS | <0.2* | ● | | | | |
| Finishing to medium cutting | TS | WXGU040302R-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040308R-TS | 0.8 | ● | | ● | ● | ● |
| | | WXGU040308L-TS | 0.8 | ● | | ● | ● | ● |
| Finishing (Wiper) | TSW | WXGU040304R-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040304L-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040308R-TSW | 0.8 | ● | | ● | ● | |
| | | WXGU040308L-TSW | 0.8 | ● | | ● | ● | |
| Finishing (Low cutting force) | SS | WXGU040302R-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-SS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-SS | 0.4 | ● | | ● | ● | ● |

* Corner radius has minus tolerance

● : Line up

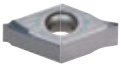
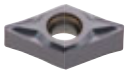
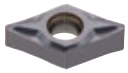
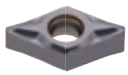
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT

### POSITIVE TYPE DOUBLE-SIDED

**Rhombic, 55° with hole**

| | | AH725 | SH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | ●◐ | | | |
| K | Cast iron | ◐ | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | ● | | | | ● |
| H | Hard materials | | | | | |
| | | Coated | | Coated cermet | Cermet | Uncoated |

| Application | Chipbreaker | Designation | Corner radius | AH725 | SH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|---|
| Finishing (sharp edge) | JRP  | DXGU070301MFRE-JRP | <0.1* | | ● | | | |
| | | DXGU070301MFLE-JRP | <0.1* | | ● | | | |
| | | DXGU070302MFRE-JRP | <0.2* | | ● | | | |
| | | DXGU070302MFLE-JRP | <0.2* | | ● | | | |
| Finishing to medium cutting(sharp edge) | JTS  | DXGU070301MFR-JTS | <0.1* | | ● | | | |
| | | DXGU070301MFL-JTS | <0.1* | | ● | | | |
| | | DXGU070302MFR-JTS | <0.2* | | ● | | | |
| | | DXGU070302MFL-JTS | <0.2* | | ● | | | |
| Finishing to medium cutting | JTS  | DXGU070301MR-JTS | <0.1* | ● | | | | |
| | | DXGU070301ML-JTS | <0.1* | ● | | | | |
| | | DXGU070302MR-JTS | <0.2* | ● | | | | |
| | | DXGU070302ML-JTS | <0.2* | ● | | | | |
| Finishing (Low cutting force) (sharp edge) | JSS | DXGU070301MFR-JSS | <0.1* | | ● | | | |
| | | DXGU070301MFL-JSS | <0.1* | | ● | | | |
| | | DXGU070302MFR-JSS | <0.2* | | ● | | | |
| | | DXGU070302MFL-JSS | <0.2* | | ● | | | |
| Finishing (Low cutting force) | JSS | DXGU070301MR-JSS | <0.1* | ● | | | | |
| | | DXGU070301ML-JSS | <0.1* | ● | | | | |
| | | DXGU070302MR-JSS | <0.2* | ● | | | | |
| | | DXGU070302ML-JSS | <0.2* | ● | | | | |
| Finishing to medium cutting | TS  | DXGU070302R-TS | 0.2 | ● | | ● | ● | ● |
| | | DXGU070302L-TS | 0.2 | ● | | ● | ● | ● |
| | | DXGU070304R-TS | 0.4 | ● | | ● | ● | ● |
| | | DXGU070304L-TS | 0.4 | ● | | ● | ● | ● |
| | | DXGU070308R-TS | 0.8 | ● | | ● | ● | ● |
| | | DXGU070308L-TS | 0.8 | ● | | ● | ● | ● |
| Finishing (Low cutting force) | SS | DXGU070302R-SS | 0.2 | ● | | ● | ● | ● |
| | | DXGU070302L-SS | 0.2 | ● | | ● | ● | ● |
| | | DXGU070304R-SS | 0.4 | ● | | ● | ● | ● |
| | | DXGU070304L-SS | 0.4 | ● | | ● | ● | ● |

* Corner radius has minus tolerance

● : Line up

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## POSITIVE TYPE DOUBLE-SIDED

**Rhombic, 35° with hole**

| | | |
|---|---|---|
| P | Steel | ●◐ |
| M | Stainless | ●◐ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | Coated SH725 |
|---|---|---|---|---|
| Finishing (sharp edge) | JRP | VXGU09T201MFRE-JRP | <0.1* | ● |
| | | VXGU09T201MFLE-JRP | <0.1* | ● |
| | | VXGU09T202MFRE-JRP | <0.2* | ● |
| | | VXGU09T202MFLE-JRP | <0.2* | ● |

* Corner radius has minus tolerance

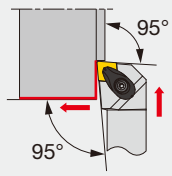
● : Line up

## STANDARD CUTTING CONDITIONS
### FOR EXTERNAL TURNING

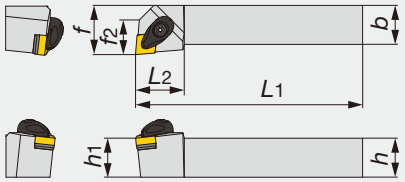
| Applications | ISO | Workpiece material | Priority | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|---|---|
| For swiss type automatic lathes | P | Low carbon steel<br>SS400, etc. E275A, etc.<br>Carbon steel S45C, etc. C45, etc.<br>Low alloy steel SCM415, etc. 18CrMo4, etc.<br>Alloy steel SCM440, etc. 42CrMo4, etc. | With high sharpness | JSS | SH725 | 50 - 180 | 0.1 - 1.5 | 0.03 - 0.1 |
| | | | First choice | JTS | AH725 | 50 - 180 | 0.1 - 2 | 0.03 - 0.1 |
| | M | Stainless steel (Austenitic)<br>SUS304, etc. X5CrNi18-9, etc.<br>Stainless steel (Martensitic and ferritic)<br>SUS430, etc. X6Cr17, etc.<br>Stainless steel (Precipitation hardened)<br>SUS630, etc. X5CrNiCuNb16-4, etc. | First choice | JSS | SH725 | 50 - 180 | 0.1 - 1.5 | 0.03 - 0.1 |
| | | | For impact resistance | JTS | AH725 | 50 - 180 | 0.1 - 2 | 0.03 - 0.1 |
| For small size CNC lathes | P | Low carbon steel<br>SS400E, etc. 275A, etc.<br>Carbon steel S45C, etc. C45, etc.<br>Low alloy steel SCM415, etc. 18CrMo4, etc.<br>Alloy steel SCM440, etc. 42CrMo4, etc. | First choice | SS | AH725 | 50 - 180 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | AH725 | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | | For improved surface finish | SS | NS9530 | 80 - 200 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | NS9530 | 80 - 200 | 0.3 - 2 | 0.08 - 0.3 |
| | | | For wear resistance | SS | GT9530 | 80 - 250 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | | TS | GT9530 | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | M | Stainless steel (Austenitic)<br>SUS304, etc. X5CrNi18-9, etc.<br>Stainless steel (Martensitic and ferritic)<br>SUS430, etc. X6Cr17, etc.<br>Stainless steel (Precipitation hardened)<br>SUS630, etc. X5CrNiCuNb16-4, etc. | First choice | SS | AH725 | 50 - 150 | 0.15 - 1.5 | 0.05 - 0.2 |
| | | | For impact resistance | TS | AH725 | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |

# ISOECOTURN
## ACLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ACLNR/L2020K0904-A | 20 | 20 | 125 | 25 | 20 | 25 | 18 | 0.8 | CN**0904... | 3 |
| ACLNR/L2525M0904-A | 25 | 25 | 150 | 25 | 25 | 32 | 18 | 0.8 | CN**0904... | 3 |

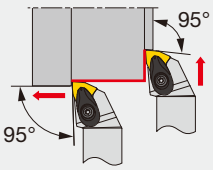
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

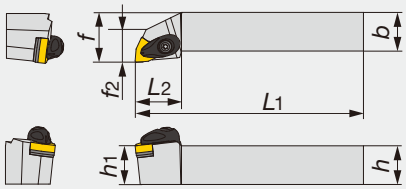
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ACLNR/L**0904-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASC322 | CSTB-3.5 | T-15F |

# ISOECOTURN
## AWLNR/L-Eco

Double-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| AWLNR/L2020K0604-A | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | WN**0604... | 3 |
| AWLNR/L2525M0604-A | 25 | 25 | 150 | 27 | 25 | 32 | 23 | 0.8 | WN**0604... | 3 |

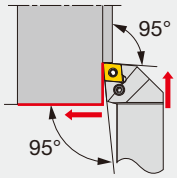
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

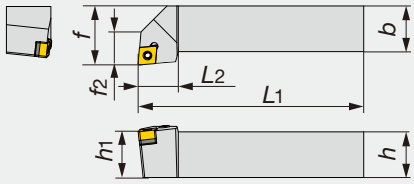
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AWLNR/L**0604-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |

# ISOECOTURN
## PCLNR/L-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2020K0904 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | CN**0904... | 2 |
| PCLNR/L2525M0904 | 25 | 25 | 150 | 25 | 25 | 32 | 18 | 0.8 | CN**0904... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

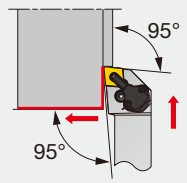
**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L**0904 | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |

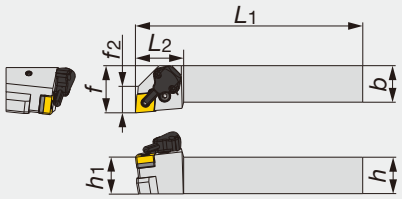
ACLNR/L-Eco, PCLNR/L-Eco: Inserts → **B050 -**, AWLNR/L-Eco: Inserts → **B095 -**

## ISOETURN PCLNR/L-CHP-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts with channels for high pressure coolant




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | 25 | 25 | 150 | 33 | 25 | 32 | 18 | 0.8 | CN**0904... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

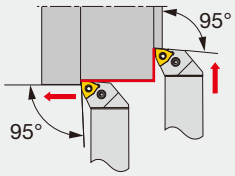
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |

**SPARE PARTS**

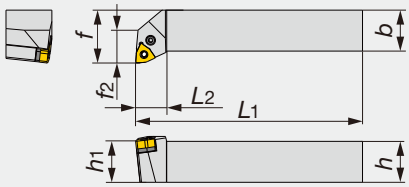
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PCLNR/L2525M0904-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

## ISOETURN PWLNR/L-Eco

Lever lock type toolholder with 95° approach angle, for negative 80° trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PWLNR/L2020K0604 | 20 | 20 | 125 | 15 | 20 | 25 | 18 | 0.8 | WN**0604... | 2 |
| PWLNR/L2525M0604 | 25 | 25 | 150 | 19 | 25 | 32 | 20 | 0.8 | WN**0604... | 2 |

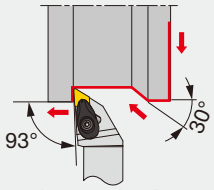
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

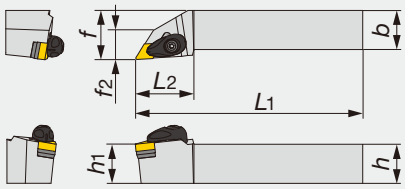
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PWLNR/L**0604 | LSW312 | LCS3 | P-2.5 | LSP3 | LCL3 |

## ISOETURN ADJNR/L-Eco

Double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJNR/L2020K1104-A | 20 | 20 | 125 | 30 | 20 | 25 | 16 | 0.8 | DN**1104... | 3 |
| ADJNR/L2525M1104-A | 25 | 25 | 150 | 30 | 25 | 32 | 19 | 0.8 | DN**1104... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

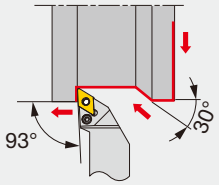
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADJNR/L**1104-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

PCLNR/L-CHP-Eco: Inserts → **B050 -**, PWLNR/L-Eco: Inserts → **B095 -**, ADJNR/L-Eco: Inserts → **B061 -**

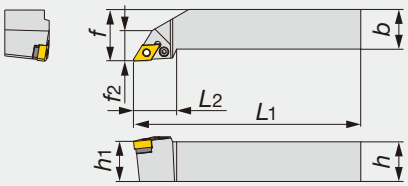
# ISOETURN Eco

## PDJNR/L-Eco

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L1616H1104 | 16 | 16 | 100 | 27 | 16 | 20 | 16 | 0.8 | DN**1104... | 2 |
| PDJNR/L2020K1104 | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | DN**1104... | 2 |
| PDJNR/L2525M1104 | 25 | 25 | 150 | 27 | 25 | 32 | 19 | 0.8 | DN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

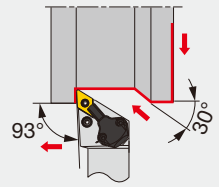
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L**1104 | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

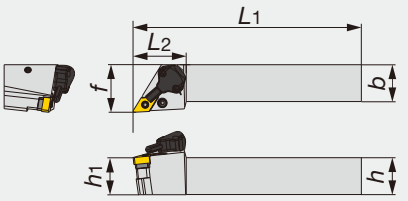
# ISOETURN Eco

## PDJNR/L-CHP-Eco

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | 25 | 25 | 150 | 36 | 25 | 32 | 0.8 | DN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

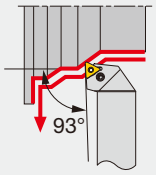
### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PDJNR/L2525M1104-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

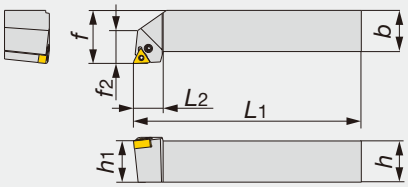
PDJNR/L-Eco, PDJNR/L-CHP-Eco: Inserts → **B061 -**

## PTJNR/L-Eco

Lever lock type toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTJNR/L2525M1104 | 25 | 25 | 150 | 18 | 25 | 32 | 20 | 0.8 | TN**1104... | 2 |

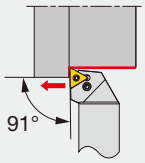
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

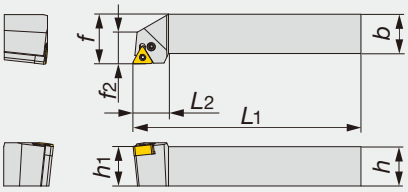
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTJNR/L2525M1104 | LCS23A | P-2.5 | LCL23 |

## PTGNR/L-Eco

Lever lock type toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L2020K1104 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | TN**1104... | 2 |
| PTGNR/L2525M1104 | 25 | 25 | 150 | 20 | 25 | 32 | 22.5 | 0.8 | TN**1104... | 2 |

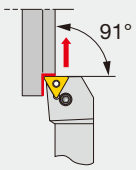
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

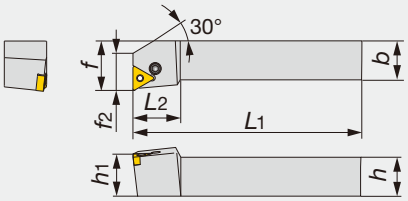
| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTGNR/L**1104 | LCS23A | P-2.5 | LCL23 |

## PTFNR/L-Eco

Lever lock type toolholder for facing with 91° approach angle, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L2020K1104 | 20 | 20 | 125 | 16 | 20 | 25 | 16 | 0.8 | TN**1104... | 2 |
| PTFNR/L2525M1104 | 25 | 25 | 150 | 22 | 25 | 32 | 20 | 0.8 | TN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

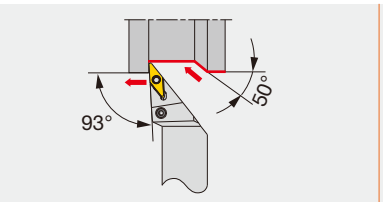
**SPARE PARTS**

| Designation | Clamping screw | Wrench | Lever |
|---|---|---|---|
| PTFNR/L**1104 | LCS23A | P-2.5 | LCL23 |

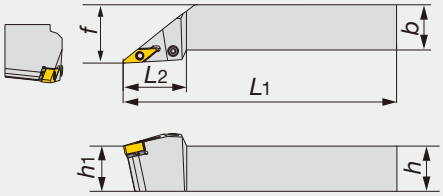
PTJNR/L-Eco, PTGNR/L-Eco, PTFNR/L-Eco: Inserts → **B080 -**

# ISOECOTURN
## PVJNR/L-Eco

Lever lock type toolholders – 93° approach angle. For negative 35° rhombic insert.




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PVJNR/L2020K1204 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | VN**1204... | 2 |
| PVJNR/L2525M1204 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | VN**1204... | 2 |

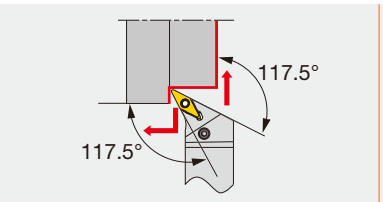
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

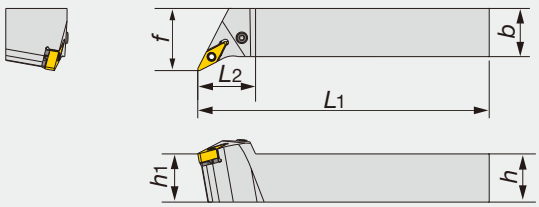
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PVJNR/L**1204 | LSV212 | LCS3V | P-2.5 | LSP3 | LCL3V |

# ISOECOTURN
## PVQNR/L-Eco

Lever lock type toolholder – 117.5° approach angle. For negative 35° rhombic insert.




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PVQNR/L2020K1204 | 20 | 20 | 125 | 30 | 20 | 25 | 0.8 | VN**1204... | 2 |
| PVQNR/L2525M1204 | 25 | 25 | 150 | 30 | 25 | 32 | 0.8 | VN**1204... | 2 |

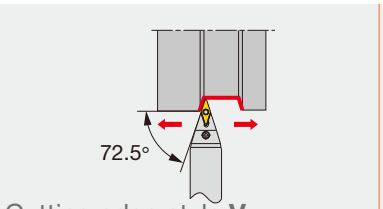
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

**SPARE PARTS**

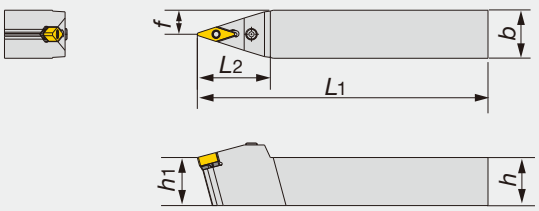
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PVQNR/L**1204 | LSV212 | LCS3V | P-2.5 | LSP3 | LCL3V |

# ISOECOTURN
## PVVNN-Eco

Lever lock type toolholders – 72.5° approach angle. For negative 35° rhombic insert.




Cutting edge style **V**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PVVNN2020K1204 | 20 | 20 | 125 | 38 | 20 | 10 | 0.8 | VN**1204... | 2 |
| PVVNN2525M1204 | 25 | 25 | 150 | 38 | 25 | 12.5 | 0.8 | VN**1204... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

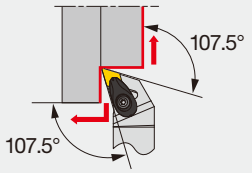
**SPARE PARTS**

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PVVNN**1204 | LSV212 | LCS3V | P-2.5 | LSP3 | LCL3V |

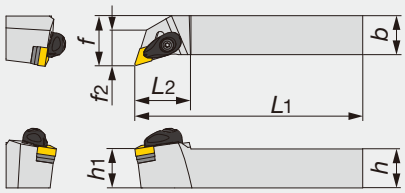
PVJNR/L-Eco, PVQNR/L-Eco, PVVNN-Eco: Inserts → **B091 -**

## ISOECOTURN ADQNR/L-Eco

Double-clamp toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADQNR/L2020K1104-A | 20 | 20 | 125 | 30 | 20 | 25 | 18 | 0.8 | DN**1104... | 3 |
| ADQNR/L2525M1104-A | 25 | 25 | 150 | 30 | 25 | 32 | 20 | 0.8 | DN**1104... | 3 |

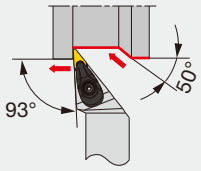
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

### SPARE PARTS

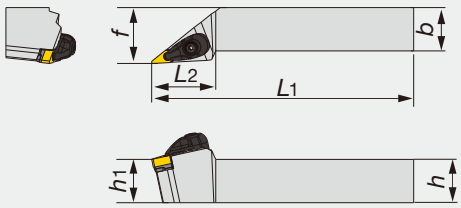
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADQNR/L**1104-A | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

## ISOECOTURN AVJNR/L-Eco

Double-clamp toolholders – 93° approach angle. For negative 35° rhombic insert.




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVJNR/L2020K1204-A | 20 | 20 | 125 | 37 | 20 | 25 | 0.8 | VN**1204... | 3 |
| AVJNR/L2525M1204-A | 25 | 25 | 150 | 37 | 25 | 32 | 0.8 | VN**1204... | 3 |

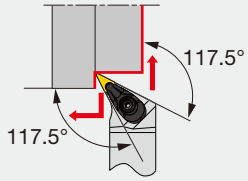
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

### SPARE PARTS

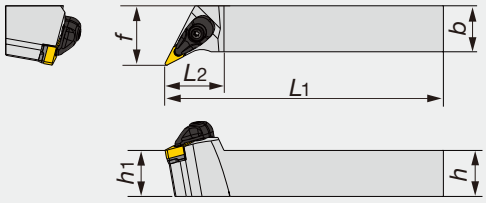
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVJNR/L**-A | ACP3L-E | ACS-5W | BP-7 | SP-2.5 | ASV222 | CSTB-3.0 | T-15F |

## ISOECOTURN AVQNR/L-Eco

Double-clamp toolholders – 117.5° approach angle. For negative 35° rhombic insert.




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVQNR/L2020K1204-A | 20 | 20 | 125 | 32 | 20 | 25 | 0.8 | VN**1204... | 3 |
| AVQNR/L2525M1204-A | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | VN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVQNR/L**-A | ACP3L-E | ACS-5W | BP-7 | SP-2.5 | ASV222 | CSTB-3.0 | T-15F |

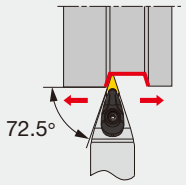
ADQNR/L-Eco: Inserts → **B061 -**

AVJNR/L-Eco, AVQNR/L-Eco: Inserts → **B091 -**

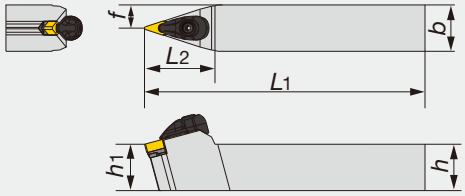
# ISOECOTURN

## AVVNN-Eco

Double-clamp toolholders – 72.5° approach angle. For negative 35° rhombic insert.




Cutting edge style **V**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVVNN2020K1204-A | 20 | 20 | 125 | 38 | 20 | 10 | 0.8 | VN**1204... | 3 |
| AVVNN2525K1204-A | 25 | 25 | 150 | 38 | 25 | 13 | 0.8 | VN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius

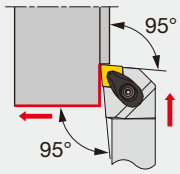
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVVNN**-A | ACP3L-E | ACS-5W | BP-7 | SP-2.5 | ASV222 | CSTB-3.0 | T-15F |

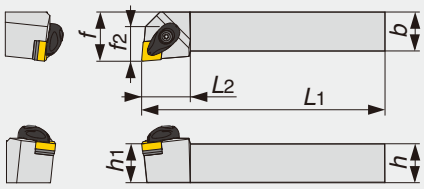
# TURNINGA

## ACLNR/L

Double-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ACLNR/L2020K12-A | 20 | 20 | 125 | 26 | 20 | 25 | 19 | 0.8 | CN**1204... | 3 |
| ACLNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 32 | 21 | 0.8 | CN**1204... | 3 |
| ACLNR/L3225P12-A | 32 | 25 | 170 | 30 | 32 | 32 | 21 | 0.8 | CN**1204... | 3 |
| ACLNR/L2525M16-A | 25 | 25 | 150 | 31 | 25 | 32 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3225P16-A | 32 | 25 | 170 | 31 | 32 | 32 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3232P16-A | 32 | 32 | 170 | 31 | 32 | 40 | 22 | 1.2 | CN**1606... | 6.4 |
| ACLNR/L3232P19-A | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... | 6.4 |
| ACLNR/L4040S19-A | 40 | 40 | 250 | 40 | 40 | 50 | 25 | 1.2 | CN**1906... | 6.4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

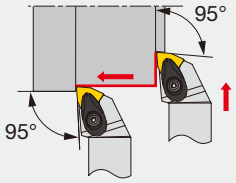
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ACLNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASC422 | CSTB-3.5 | T-15F | - |
| ACLNR/L**16-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASC533 | CSTB-5 | - | KEYV-T20 |
| ACLNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASC634 | CSTB-5 | - | KEYV-T20 |

AVVNN-Eco: Inserts → **B091 -**

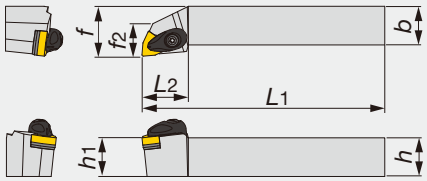
ACLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

# TURNING
## AWLNR/L

Double-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| AWLNR/L2020K06-A | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | WN**0604... | 3 |
| AWLNR/L2020K08-A | 20 | 20 | 125 | 30 | 20 | 25 | 19 | 0.8 | WN**0804... | 3 |
| AWLNR/L2525M06-A | 25 | 25 | 150 | 27 | 25 | 32 | 23 | 0.8 | WN**0604... | 3 |
| AWLNR/L2525M08-A | 25 | 25 | 150 | 30 | 25 | 32 | 21 | 0.8 | WN**0804... | 3 |
| AWLNR/L3225P08-A | 32 | 25 | 170 | 30 | 32 | 32 | 21 | 0.8 | WN**0804... | 3 |

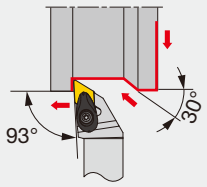
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

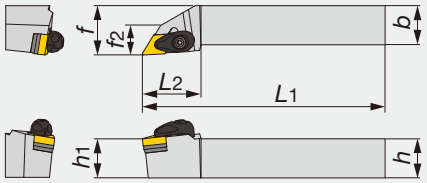
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AWLNR/L**06-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |
| AWLNR/L**08-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASW422 | CSTB-3.5 | T-15F |

# TURNING
## ADJNR/L

Double-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJNR/L2020K15-A | 20 | 20 | 125 | 36 | 20 | 25 | 17 | 0.8 | DN**1504... | 3 |
| ADJNR/L2020K1506-A | 20 | 20 | 125 | 36 | 20 | 25 | 17 | 0.8 | DN**1506... | 3 |
| ADJNR/L2525M15-A | 25 | 25 | 150 | 36 | 25 | 32 | 18 | 0.8 | DN**1504... | 3 |
| ADJNR/L2525M1506-A | 25 | 25 | 150 | 36 | 25 | 32 | 18 | 0.8 | DN**1506... | 3 |
| ADJNR/L3225P15-A | 32 | 25 | 170 | 36 | 32 | 32 | 18 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADJNR/L**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| ADJNR/L**1506-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

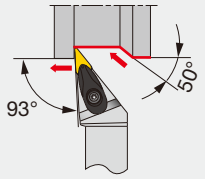
AWLNR/L: Inserts → **B095 -**, CBN → **B165**

ADJNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

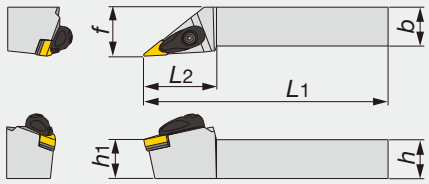
# TURNING

## AVJNR/L

Double-clamp toolholder with 93° approach angle, for negative 35° and 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVJNR/L2020K16-A | 20 | 20 | 125 | 43 | 20 | 25 | 0.8 | V/YN**1604... | 3 |
| AVJNR/L2525M16-A | 25 | 25 | 150 | 46 | 25 | 32 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

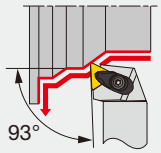
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVJNR/L**16-A | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

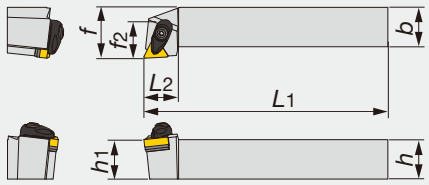
# TURNING

## ATJNR/L

Double-clamp toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATJNR/L2020K16-A | 20 | 20 | 125 | 22 | 20 | 25 | 23 | 0.8 | TN**1604... | 3 |
| ATJNR/L2525M16-A | 25 | 25 | 150 | 22 | 25 | 32 | 25 | 0.8 | TN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

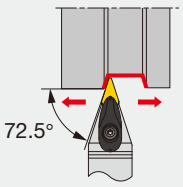
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATJNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

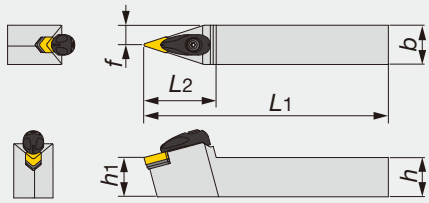
# TURNING

## AVVNN

Double-clamp toolholder with 72.5° approach angle, for negative 35° and 25° rhombic inserts




Cutting edge style **V**




| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVVNN2020K16-A | 20 | 20 | 125 | 46 | 20 | 10 | 0.8 | V/YN**1604... | 3 |
| AVVNN2525M16-A | 25 | 25 | 150 | 46 | 25 | 12.5 | 0.8 | V/YN**1604... | 3 |

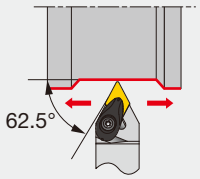
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

**SPARE PARTS**

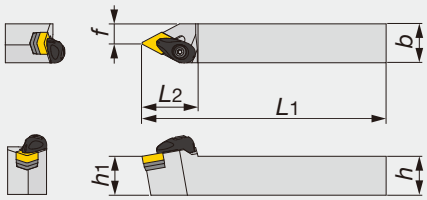
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVVNN**16-A | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

# TURNING
## ADPNN

Double-clamp toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ADPNN2020K15-A | 20 | 20 | 125 | 36 | 20 | 7.5 | 0.8 | DN**1504... | 3 |
| ADPNN2525M15-A | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1504... | 3 |

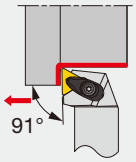
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

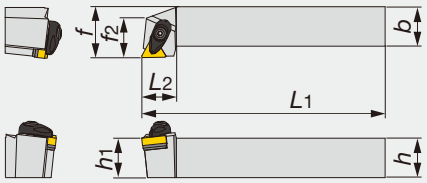
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADPNN**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |

# TURNING
## ATGNR/L

Double-clamp toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATGNR/L2020K16-A | 20 | 20 | 125 | 22 | 20 | 25 | 22 | 0.8 | TN**1604... | 3 |
| ATGNR/L2525M16-A | 25 | 25 | 150 | 22 | 25 | 32 | 25 | 0.8 | TN**1604... | 3 |
| ATGNR/L2525M22-A | 25 | 25 | 150 | 26 | 25 | 32 | 26 | 0.8 | TN**2204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATGNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |
| ATGNR/L**22-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | AST422 | CSTB-3.5 | T-15F |

AVJNR/L, AVVNN: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

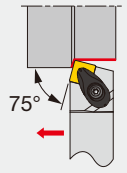
ATJNR/L, ATGNR/L: Inserts → **B080 -**, CBN → **B164**, PCD → **B176**

ADPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

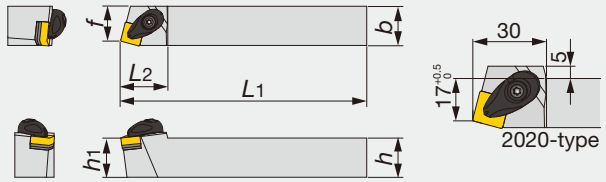
# TURNING

## ASBNR/L

Double-clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ASBNR/L2020K12-A | 20 | 20 | 125 | 30 | 20 | 17 | 0.8 | SN**1204... | 3 |
| ASBNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 22 | 0.8 | SN**1204... | 3 |
| ASBNR/L2525M15-A | 25 | 25 | 150 | 42.5 | 25 | 22 | 1.2 | SN**1506... | 6.4 |
| ASBNR/L3232P15-A | 32 | 32 | 170 | 42.5 | 32 | 27 | 1.2 | SN**1506... | 6.4 |
| ASBNR/L3232P19-A | 32 | 32 | 170 | 47.5 | 32 | 27 | 1.2 | SN**1906... | 6.4 |
| ASBNR/L4040S19-A | 40 | 40 | 250 | 47.5 | 40 | 35 | 1.2 | SN**1906... | 6.4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

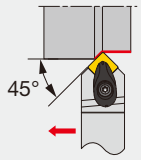
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ASBNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F | - |
| ASBNR/L**15-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASS533 | CSTB-5 | - | KEYV-T20 |
| ASBNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASS634 | CSTB-5 | - | KEYV-T20 |

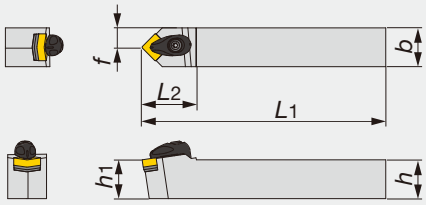
# TURNING

## ASDNN

Double-clamp toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| ASDNN2020K12-A | 20 | 20 | 125 | 35 | 20 | 10 | 0.8 | SN**1204... | 3 |
| ASDNN2525M12-A | 25 | 25 | 150 | 35 | 25 | 12.5 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

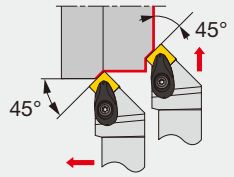
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ASDNN**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

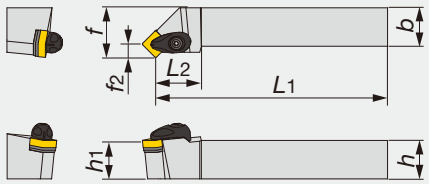
ASBNR/L, ASDNN: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

# TURNING
## ASSNR/L

Double-clamp toolholder with 45° approach angle (S-style), for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ASSNR/L2020K12-A | 20 | 20 | 125 | 30 | 20 | 25 | 8.3 | 0.8 | SN**1204... | 3 |
| ASSNR/L2525M12-A | 25 | 25 | 150 | 30 | 25 | 32 | 8.3 | 0.8 | SN**1204... | 3 |
| ASSNR/L2525M15-A | 25 | 25 | 150 | 25 | 25 | 32 | 10.3 | 1.2 | SN**1506... | 6.4 |
| ASSNR/L3232P15-A | 32 | 32 | 170 | 25 | 32 | 40 | 10.3 | 1.2 | SN**1506... | 6.4 |
| ASSNR/L3232P19-A | 32 | 32 | 170 | 27.5 | 32 | 40 | 12.5 | 1.2 | SN**1906... | 6.4 |
| ASSNR/L4040S19-A | 40 | 40 | 250 | 27.5 | 40 | 50 | 12.5 | 1.2 | SN**1906... | 6.4 |

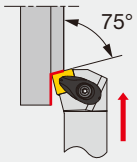
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

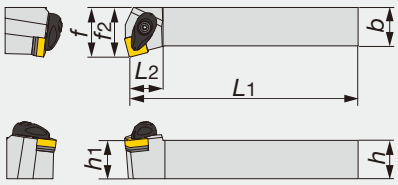
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| ASSNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F | - |
| ASSNR/L**15-A | ACP5S | ACS-6W | BP-8.8 | SP-2.5 | ASS533 | CSTB-5 | - | KEYV-T20 |
| ASSNR/L**19-A | ACP6S | ACS-6W | BP-8.8 | SP-2.5 | ASS634 | CSTB-5 | - | KEYV-T20 |

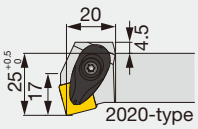
# TURNING
## ASKNR/L

Double-clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ASKNR/L2020K12-A | 20 | 20 | 125 | 20 | 20 | 25 | 17 | 0.8 | SN**1204... | 3 |
| ASKNR/L2525M12-A | 25 | 25 | 150 | 22 | 25 | 32 | 21 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

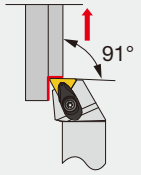
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ASKNR/L**12-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

ASSNR/L, ASKNR/L: Inserts → **B071 -**, CBN → **B164**, PCD → **B176**

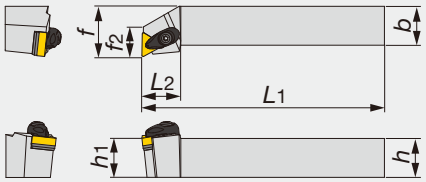
# TURNING

## ATFNR/L

Double-clamp toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATFNR/L2020K16-A | 20 | 20 | 125 | 25 | 20 | 25 | 18 | 0.8 | TN**1604... | 3 |
| ATFNR/L2525M16-A | 25 | 25 | 150 | 25 | 25 | 32 | 19 | 0.8 | TN**1604... | 3 |
| ATFNR/L2525M22-A | 25 | 25 | 150 | 29 | 25 | 32 | 23 | 0.8 | TN**2204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

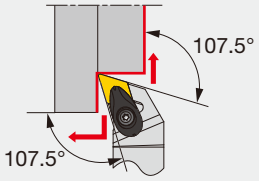
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATFNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |
| ATFNR/L**22-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | AST422 | CSTB-3.5 | T-15F |

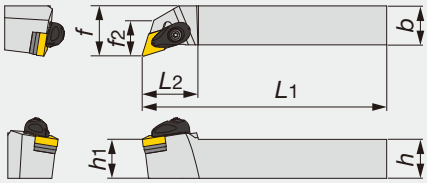
# TURNING

## ADQNR/L

Double-clamp toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ADQNR/L2020K15-A | 20 | 20 | 125 | 32 | 20 | 25 | 21 | 0.8 | DN**1504... | 3 |
| ADQNR/L2020K1506-A | 20 | 20 | 125 | 32 | 20 | 25 | 21 | 0.8 | DN**1506... | 3 |
| ADQNR/L2525M15-A | 25 | 25 | 150 | 36 | 25 | 32 | 23 | 0.8 | DN**1504... | 3 |
| ADQNR/L2525M1506-A | 25 | 25 | 150 | 36 | 25 | 32 | 23 | 0.8 | DN**1506... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

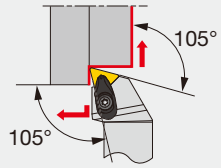
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ADQNR/L**15-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| ADQNR/L**1506-A | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

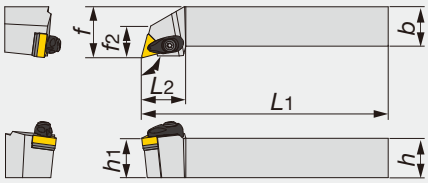
# TURNING

## ATQNR/L

Double-clamp toolholder with 105° approach angle, for negative triangle inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ATQNR/L2020K16-A | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | TN**1604... | 3 |
| ATQNR/L2525M16-A | 25 | 25 | 150 | 28 | 25 | 32 | 20 | 0.8 | TN**1604... | 3 |

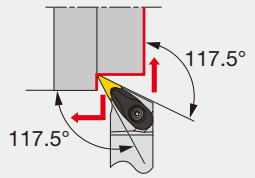
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

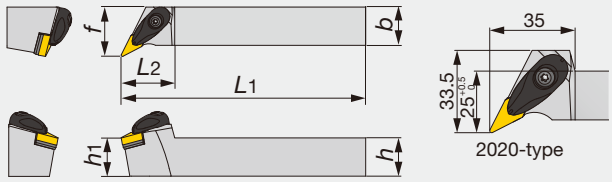
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ATQNR/L**16-A | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

# TURNING
## AVQNR/L

Double-clamp toolholder with 117.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| AVQNR/L2020K16-A | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | V/YN**1604... | 3 |
| AVQNR/L2525M16-A | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | V/YN**1604... | 3 |

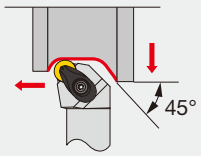
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

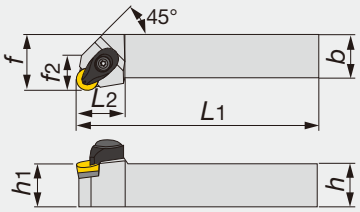
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| AVQNR/L... | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

# TURNING
## ARGNR/L

Double-clamp toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| ARGNR/L2525M12-A | 25 | 25 | 150 | 28 | 25 | 32 | 20 | 6.35 | RN**120400 | 3 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| ARGNR/L... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASR420 | CSTB-3.5 | T-15F |


ATFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

ADQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

ATQNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

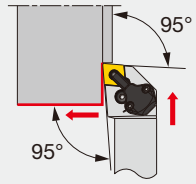
AVQNR/L: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

ARGNR/L: Inserts → **B070**

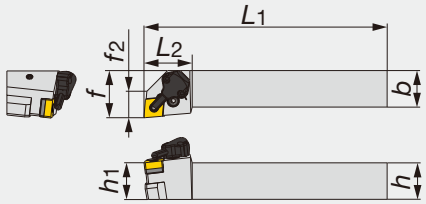
TUNGTURN JET

## PCLNR/L-CHP

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts, with channels for high pressure coolant




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | 25 | 25 | 150 | 33 | 25 | 32 | 18 | 0.8 | CN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |

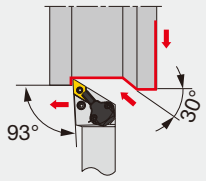
### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PCLNR/L2525M12-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

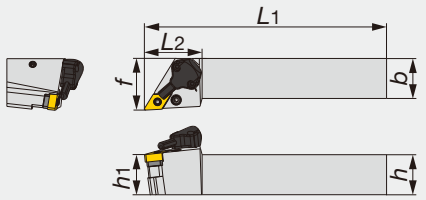
TUNGTURN JET

## PDJNR/L-CHP

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | 25 | 25 | 150 | 36 | 25 | 32 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | LSD43A | LCS4 | P-3 | LSP4 | LCL4 |

### SPARE PARTS

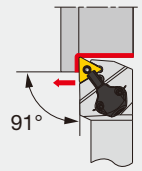
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PDJNR/L2525M15-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

PCLNR/L-CHP: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

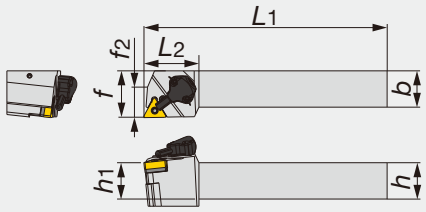
PDJNR/L-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## PTGNR/L-CHP

Lever lock type toolholders with 91° approach angle. For negative triangle insert. High-pressure coolant capability.




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L2020K1104-CHP | 20 | 20 | 125 | 38 | 20 | 32 | 21 | 0.8 | TN**1104... | 2 |
| PTGNR/L2020K16-CHP | 20 | 20 | 125 | 38 | 20 | 32 | 21 | 0.8 | TN**1604... | 2 |
| PTGNR/L2525M1104-CHP | 25 | 25 | 150 | 38 | 25 | 32 | 21 | 0.8 | TN**1104... | 2 |
| PTGNR/L2525M16-CHP | 25 | 25 | 150 | 38 | 25 | 32 | 21 | 0.8 | TN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

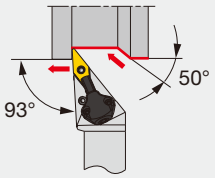
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PTGNR/L**1104-CHP | - | LCS23A | P-2.5 | LSP3 | LCL23 |
| PTGNR/L16**-CHP | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |

### SPARE PARTS

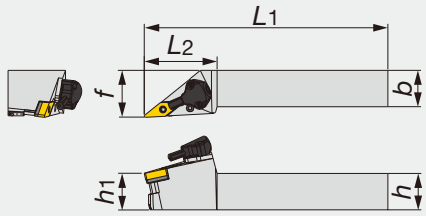
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PTGNR/L**1104-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |
| PTGNR/L16**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

## PVJNR/L-CHP

Lever lock type toolholders with 93° approach angle. For negative 35° or 25° rhombic insert. High-pressure coolant capability.




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PVJNR/L2020K1204-CHP | 20 | 20 | 125 | 50 | 25 | 32 | 0.8 | VN**1204... | 2 |
| PVJNR/L2525M1204-CHP | 25 | 25 | 150 | 50 | 25 | 32 | 0.8 | VN**1204... | 2 |
| PVJNR/L2020K16-CHP | 20 | 20 | 125 | 50 | 20 | 32 | 0.8 | V/YN**1604... | 2 |
| PVJNR/L2525M16-CHP | 25 | 25 | 150 | 50 | 25 | 32 | 0.8 | V/YN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PVJNR/L**-CHP | LSV317 | LCS3V | P-2.5 | LSP3 | LCL3V |

### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PVJNR/L**-CHP | CU-V-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

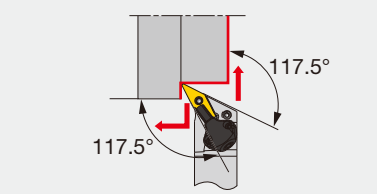
PTGNR/L-CHP: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

PVJNR/L-CHP: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

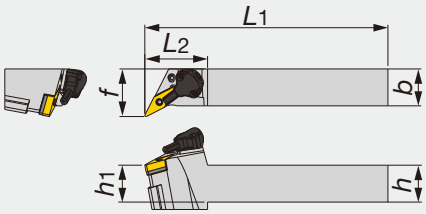
TUNGTURN JET

## PVQNR/L-CHP

Lever lock type toolholders with 117.5° approach angle. For negative 35° or 25° rhombic insert. High-pressure coolant capability.




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PVQNR/L2020K16-CHP | 20 | 20 | 125 | 42.5 | 20 | 32 | 0.8 | V/YN**1604... | 2 |
| PVQNR/L2525M16-CHP | 25 | 25 | 150 | 42.5 | 25 | 32 | 0.8 | V/YN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PVQNR/L**-CHP | LSV317 | LCS3V | P-2.5 | LSP3 | LCL3V |

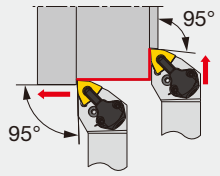
### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PVQNR/L**-CHP | CU-V-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

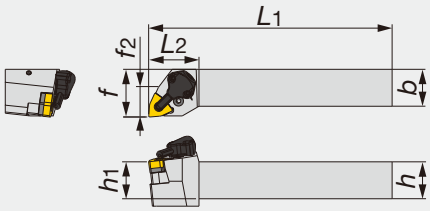
TUNGTURN JET

## PWLNR/L-CHP

Lever lock type toolholders with 95° approach angle. For negative 80° trigon insert. High-pressure coolant capability.




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PWLNR/L2020K0604-CHP | 20 | 20 | 125 | 34 | 20 | 32 | 20 | 0.8 | WN**0604... | 2 |
| PWLNR/L2020K08-CHP | 20 | 20 | 125 | 34 | 20 | 32 | 20 | 0.8 | WN**0804... | 3 |
| PWLNR/L2525M0604-CHP | 25 | 25 | 150 | 34 | 25 | 32 | 20 | 0.8 | WN**0604... | 2 |
| PWLNR/L2525M08-CHP | 25 | 25 | 150 | 34 | 25 | 32 | 20 | 0.8 | WN**0804... | 3 |

*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| PWLNR/L**0604-CHP | LSW312 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PWLNR/L**08-CHP | LSW42 | LCS4 | P-2.5 | LSP4 | LCL4 |

### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring | Coolant screw | Wrench 3 |
|---|---|---|---|---|---|---|
| PWLNR/L**0604-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |
| PWLNR/L**08-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N | SRM4X4TL360 | P-2 |

PVQNR/L-CHP: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

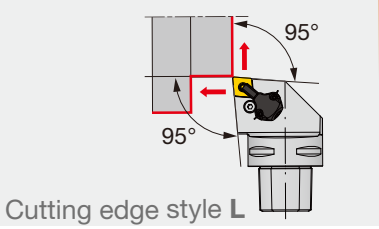
PWLNR/L-CHP, C-PWLN-CHP: Inserts → **B095 -**, CBN → **B165**

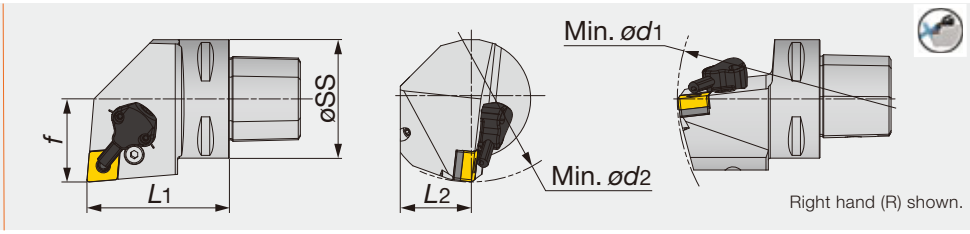
C-PCLN-CHP: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

C-PDJN-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## TUNGTURN JET
### C-PCLN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, C 80° rhombic with channels for high pressure coolant



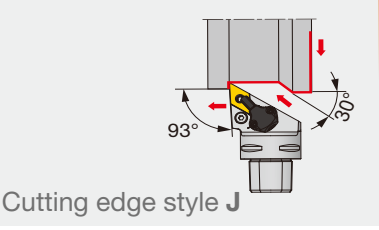



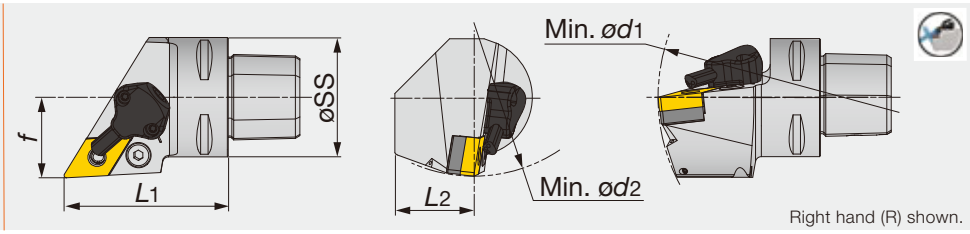

| Designation | øSS | $L_1$ | $L_2$ | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L27050-0904-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**0904... |
| C4PCLNR/L27050-12-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5PCLNR/L35060-12-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-0904-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**0904... |
| C6PCLNR/L45065-12-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

**$r_\varepsilon$: Standard corner radius

## TUNGTURN JET
### C-PDJN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, D 55° rhombic with channels for high pressure coolant



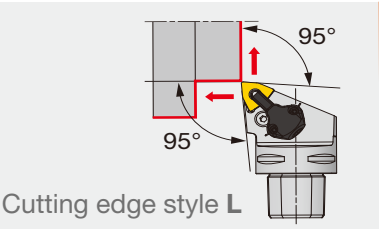



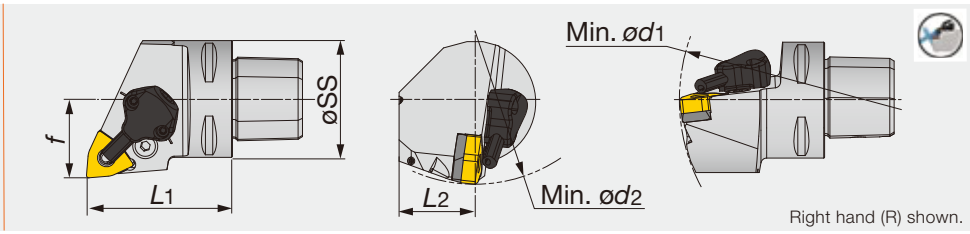

| Designation | øSS | $L_1$ | $L_2$ | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDJNR/L27050-1104-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1104... |
| C4PDJNR/L27050-15-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1504(06)... |
| C5PDJNR/L35060-15-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**1504(06)... |
| C6PDJNR/L45065-1104-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1104... |
| C6PDJNR/L45065-15-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1504(06)... |

**$r_\varepsilon$: Standard corner radius

## TUNGTURN JET
### C-PWLN-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, W 80° trigon with channels for high pressure coolant




| Designation | øSS | $L_1$ | $L_2$ | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PWLNR/L27050-0604-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0604... |
| C4PWLNR/L27050-08-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0804... |
| C6PWLNR/L45065-08-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | WN**0804... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS FOR P-TYPE

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C*PCLNR/L**-12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| C*PWLNR/L**-08-CHP | LSW42BR/L | LCS4 | P-3 | LSP4 | LCL4 |
| C*PDJNR/L**-15-CHP | LSD43A | LCS4 | P-3 | LSP4 | LCL4 |
| C*PCLNR/L**0904-CHP | LSC317 | LCS3 | P-2.5 | LSP3 | LCL33 |
| C*PWLNR/L**0604-CHP | LSW312BR/L | LCS3 | P-2.5 | LSP3 | LCL3 |
| C*PDJNR/L**1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

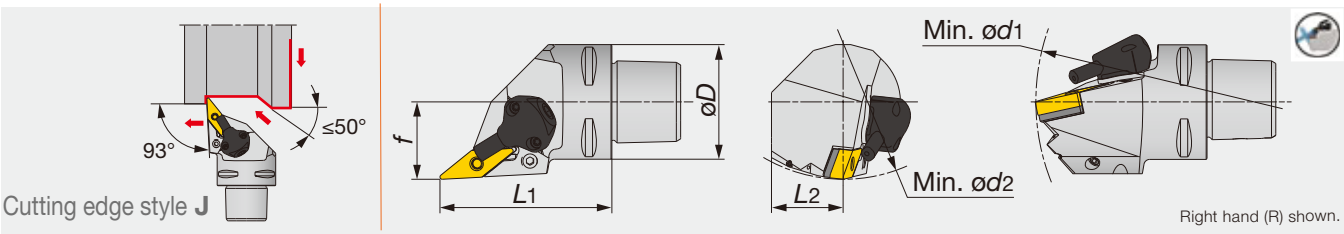
### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PCLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |
| C*PWLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |
| C*PDJLNR/L**-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N |

TUNGTURN

## C-PVJNR/L-CHP

Lever lock toolholders with TungCap connection – 93° approach angle. For negative 35° or 25° rhombic insert. High-pressure coolant capability.




| Designation | øD | $L_1$ | $L_2$ | f | ød1 | ød2 | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PVJNR/L27060-1204-CHP | 40 | 60 | 20 | 27 | 140 | 90 | 0.8 | VN**1204... |
| C4PVJNR/L27060-16-CHP | 40 | 60 | - | 27 | 140 | 110 | 0.8 | V/YN**1604... |
| C6PVJNR/L45065-1204-CHP | 63 | 65 | 31.5 | 45 | 190 | 81 | 0.8 | VN**1204... |
| C6PVJNR/L45065-16-CHP | 63 | 65 | - | 45 | 190 | 81 | 0.8 | V/YN**1604... |

Applicable for 14 MPa pressure coolant
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|---|
| C*PVJNR/L**-1204-CHP | LSV212 | LCS3V | P-2.5 | P-3 | LSP3 | LCL3V |
| C*PVJNR/L**-16-CHP | LSV317 | LCS3V | P-2.5 | - | LSP3 | LCL3V |

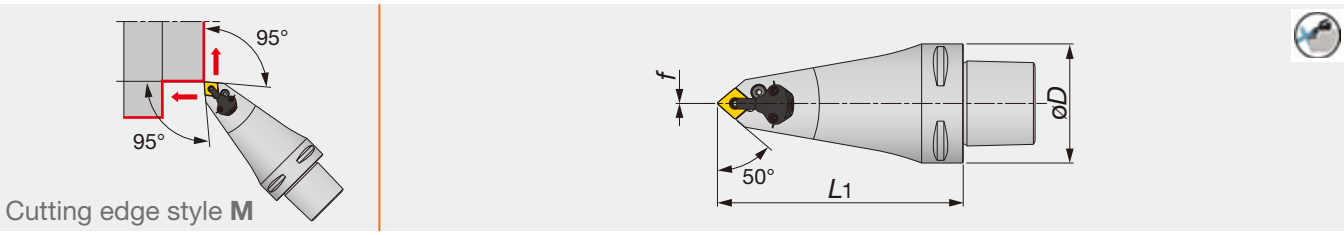
### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PVJNR/L**-CHP | CU-V-CHP | SRM3 | T-8F | OR6.4X0.9N |

TUNGTURN

## C-PCMNN-CHP

Lever lock toolholder with TungCap connection. For negative 80° rhombic insert. High-pressure coolant capability.




| Designation | h | b | $L_1$ | $L_2$ | Insert |
|---|---|---|---|---|---|
| C6PCMNN00130-12-CHP | 63 | 115 | 0 | 0.8 | CN**1204... |

Applicable for 14 MPa pressure coolant
**$r_\varepsilon$: Standard corner radius

For external turning only.

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C6PCMNN00130-12-CHP | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |

### SPARE PARTS

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C6PCMNN00130-12-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |

C-PVJNR/L-CHP: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

C-PCMNN-CHP: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

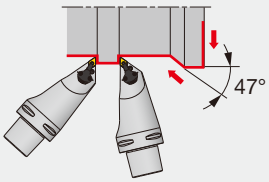
C-PDMNL-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

JSDJ2XR/L-CHP: Inserts → **B120 -**

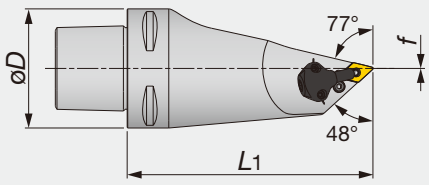
JSWL2XR/L-CHP: Inserts → **B152**

## C-PDMNL-CHP

Lever lock toolholder with TungCap connection. For negative 55° rhombic insert. High-pressure coolant capability.




Cutting edge style **M**




Left hand (L) shown.

| Designation | øD | L1 | f | rε** | Insert |
|---|---|---|---|---|---|
| C6PDMNL00130-1104-CHP | 63 | 130 | 0 | 0.8 | DN**1104... |

Applicable for 14 MPa pressure coolant
**rε: Standard corner radius

For external turning only.

### SPARE PARTS

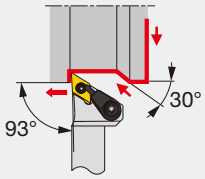
| Designation | Shim | Clamping screw | Wrench 1 | Spring pin | Lever |
|---|---|---|---|---|---|
| C6PDMNL00130-1104-CHP | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |

### SPARE PARTS

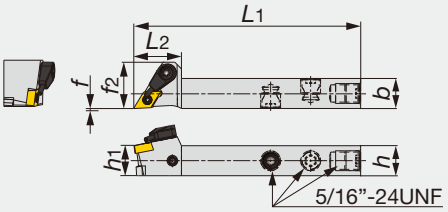
| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C6PDMNL00130-1104-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N |

## JSDJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for DXGU inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 18.5 | 0.2 | DXGU0703**L/R... | 0.9 |

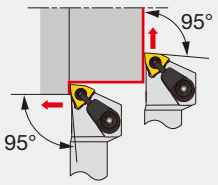
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

### SPARE PARTS

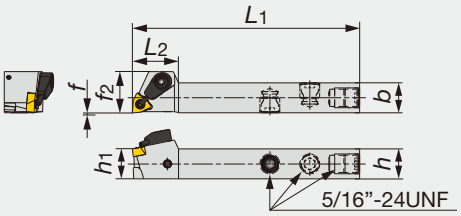
| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2XR/L1212F07-CHP | SR34-514 | S-CU-CHP | T-7F |

## JSWL2XR/L-CHP

Screw-on toolholder offset with 95° approach angle, for WXGU inserts, with channels for high pressure coolant




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSWL2XR/L1212F04-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 16.5 | 0.2 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

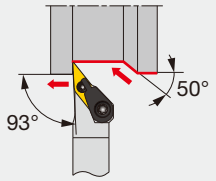
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSWL2XR/L1212F04-CHP | SR34-514 | S-CU-CHP | T-7F |

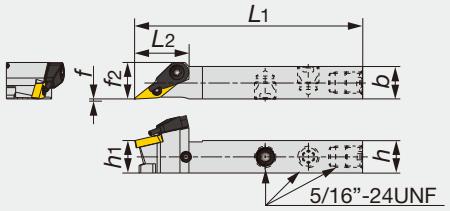
TUNGTURN JET

## JSVJ2XR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for VXGU inserts, with coolant nozzle for high pressure




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | 12 | 12 | 85 | 20 | 12 | 0 | 13.5 | 0.2 | VXGU09T2**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right-hand toolholders (R) are used with left-hand inserts (L). Left-hand toolholders (L) are used with right-hand inserts (R).

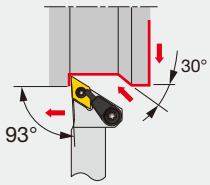
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2XR/L1212F09-CHP | SR34-508 | S-CU-CHP | T-7F |

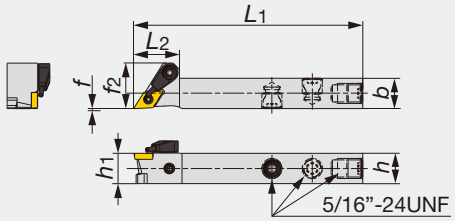
TUNGTURN JET

## JSDJ2CR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for positive 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | 12 | 12 | 85 | 18 | 12 | 0 | 18 | 0.2 | DC**0702... | 0.9 |
| JSDJ2CR/L1212F11-CHP | 12 | 12 | 85 | 19 | 12 | 0 | 20.5 | 0.2 | DC**11T3... | 0.9 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | CSTB-2.5 | S-CU-CHP | T-8F |
| JSDJ2CR/L1212F11-CHP | CSTB-4SD | S-CU-CHP | T-8F |

JSVJ2XR/L-CHP: Inserts → **B150**

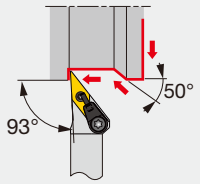
JSDJ2CR/L-CHP: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

JSVJ2BR/L-CHP: Inserts → **B145 -**, CBN → **B169 -**

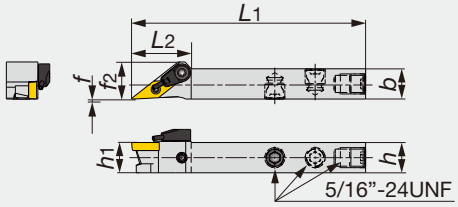
TUNGTURN JET

# JSVJ2BR/L-CHP

Screw-on toolholder without offset with 93° approach angle, for positive 35° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | 12 | 12 | 85 | 23.6 | 12 | 0 | 14.7 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | CSTB-2.5 | S-CU-CHP | T-8F |

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

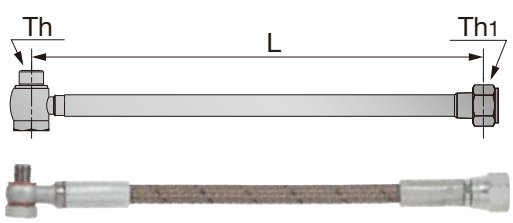
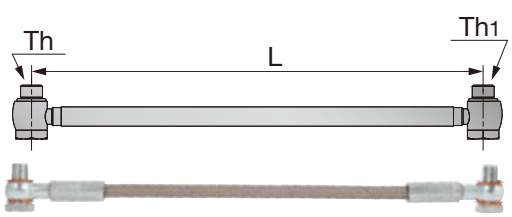
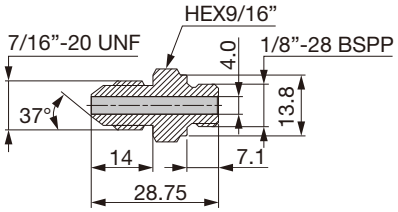



Fig. 2



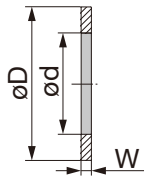

| Designation | L | Th | Th1 | Max. pressure (Mpa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16”-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16”-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

### Connector



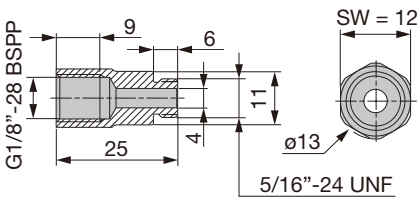
| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

### Seal washer



| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

### Connector for small lathe with seal washer

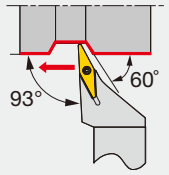


| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

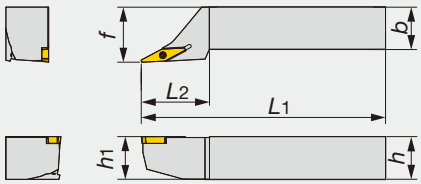
# Y-PRO SERIES

## SYJBR/L

Screw-on clamp toolholder with 93° approach angle, for positive 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYJBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | YWMT16T3... |
| SYJBR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | YWMT16T3... |

**rε: Standard corner radius

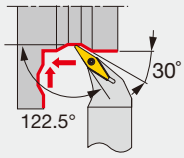
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SYJBR/L... | CSTB-2.5L080 | T-8F |

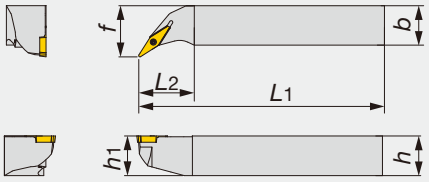
# Y-PRO SERIES

## SYQBR/L

Screw-on clamp toolholder with 122.5° approach angle, for positive 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYQBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | YWMT16T3... |
| SYQBR/L2525M16 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | YWMT16T3... |

**rε: Standard corner radius

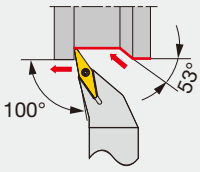
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SYQBR/L... | CSTB-2.5L080 | T-8F |

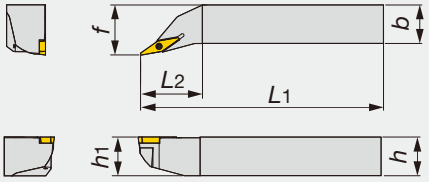
# Y-PRO SERIES

## SYHBR/L

Screw-on clamp toolholder with 100° approach angle, for positive 25° rhombic inserts




Cutting edge style **H**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYHBR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | YWMT16T3... |
| SYHBR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | YWMT16T3... |

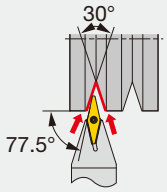
**rε: Standard corner radius

### SPARE PARTS

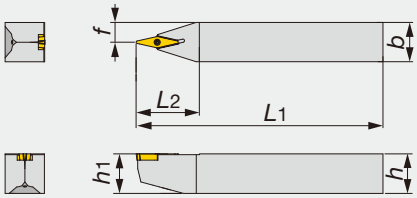
| Designation | Clamping screw | Wrench |
|---|---|---|
| SYHBR/L... | CSTB-2.5L080 | T-8F |

## SYIBN

Screw-on clamp toolholder with 77.5° approach angle, for positive 25° rhombic inserts




Cutting edge style **I**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SYIBN2020K16 | 20 | 20 | 125 | 32 | 20 | 10 | 0.8 | YWMT16T3... |
| SYIBN2525M16 | 25 | 25 | 150 | 40 | 25 | 12.5 | 0.8 | YWMT16T3... |

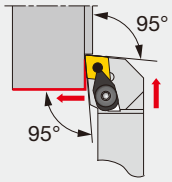
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

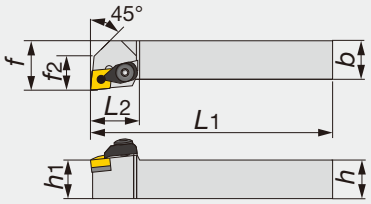
| Designation | Clamping screw | Wrench |
|---|---|---|
| SYIBN... | CSTB-2.5L080 | T-8F |

## DCLNR/L

"One-Double" toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DCLNR/L2020K12 | 20 | 20 | 125 | 30 | 20 | 25 | 18 | 0.8 | CN**1204... |
| DCLNR/L2525M12 | 25 | 25 | 150 | 30 | 25 | 32 | 18 | 0.8 | CN**1204... |
| DCLNR/L3225P12 | 32 | 25 | 170 | 30 | 32 | 32 | 18 | 0.8 | CN**1204... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

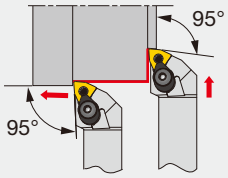
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DCLNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSC42 | BP-10 | LSP4 | P-3 | P-4 |

SYJBR/L, SYQBR/L, SYHBR/L, SYIBN: Inserts → **B153**

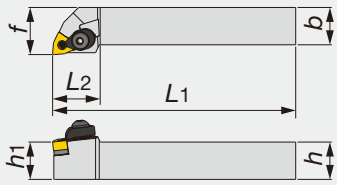
DCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

## DWLNR/L

"One-Double" toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DWLNR/L2020K06 | 20 | 20 | 125 | 25.5 | 20 | 25 | 0.8 | WN**0604... |
| DWLNR/L2020K08 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | WN**0804... |
| DWLNR/L2525M06 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | WN**0604... |
| DWLNR/L2525M08 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | WN**0804... |
| DWLNR/L3225P08 | 32 | 25 | 170 | 30 | 32 | 32 | 0.8 | WN**0804... |

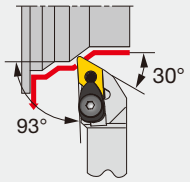
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

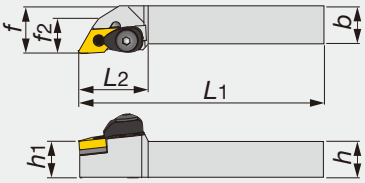
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DWLNR/L**06 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LSW312 | BP-9 | LSP3 | P-2.5 | P-3 |
| DWLNR/L**08 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSW42 | BP-10 | LSP4 | P-3 | P-4 |

## DDJNR/L

"One-Double" toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DDJNR/L2020K15 | 20 | 20 | 125 | 38 | 20 | 25 | 19 | 0.8 | DN**1504... |
| DDJNR/L2020K1506 | 20 | 20 | 125 | 38 | 20 | 25 | 19 | 0.8 | DN**1506... |
| DDJNR/L2525M15 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**1504... |
| DDJNR/L2525M1506 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**1506... |
| DDJNR/L3225P15 | 32 | 25 | 170 | 38 | 32 | 32 | 19 | 0.8 | DN**1504... |
| DDJNR/L3225P1506 | 32 | 25 | 170 | 38 | 32 | 32 | 19 | 0.8 | DN**1506... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

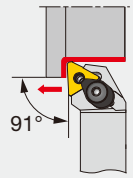
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DDJNR/L**15 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |
| DDJNR/L**1506 | DCPM-43 | DLCL43 | DPIS44 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |

DWLNR/L: Inserts → **B095 -**, CBN → **B165**

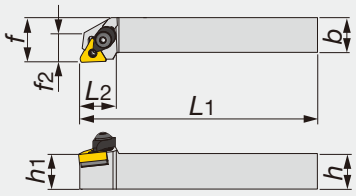
DDJNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## DTGNR/L

"One-Double" toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DTGNR/L2020K16 | 20 | 20 | 125 | 21 | 20 | 25 | 16 | 0.8 | TN**1604... |
| DTGNR/L2525M16 | 25 | 25 | 150 | 21 | 25 | 32 | 21 | 0.8 | TN**1604... |
| DTGNR/L2525M22 | 25 | 25 | 150 | 28 | 25 | 32 | 25 | 0.8 | TN**2204... |

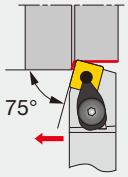
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

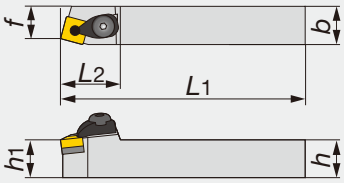
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DTGNR/L**16 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LST317 | BP-9 | LSP3 | P-2.5 | P-3 |
| DTGNR/L**22 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LST42 | BP-10 | LSP4 | P-3 | P-4 |

## DSBNR/L

"One-Double" toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| DSBNR/L2020K12 | 20 | 20 | 125 | 35 | 20 | 17 | 0.8 | SN**1204... |
| DSBNR/L2525M12 | 25 | 25 | 150 | 35 | 25 | 22 | 0.8 | SN**1204... |

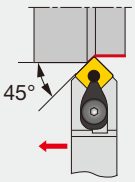
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

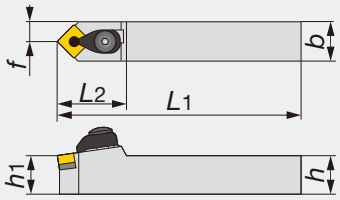
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSBNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DSDNN

"One-Double" toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| DSDNN2020K12 | 20 | 20 | 125 | 36 | 20 | 10 | 0.8 | SN**1204... |
| DSDNN2525M12 | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | SN**1204... |

Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

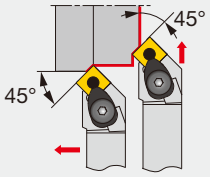
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSDNN... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

DTGNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

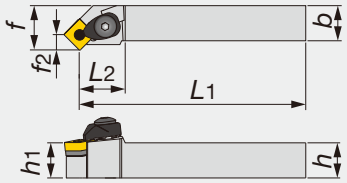
DSBNR/L, DSDNN: Inserts → **B071 -**, CBN → **B164**, PCD → **B176**

## DSSNR/L

"One-Double" toolholder with 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DSSNR/L2020K12 | 20 | 20 | 125 | 34.3 | 20 | 25 | 8.3 | 0.8 | SN**1204... |
| DSSNR/L2525M12 | 25 | 25 | 150 | 34.3 | 25 | 32 | 8.3 | 0.8 | SN**1204... |

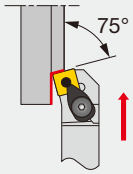
Note: Except for 57-type chipbreaker inserts
**rε: Standard corner radius

**SPARE PARTS**

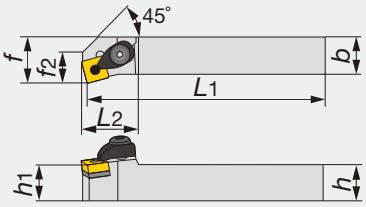
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSSNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DSKNR/L

"One-Double" toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DSKNR/L2020K12 | 20 | 20 | 125 | 31 | 20 | 25 | 17 | 0.8 | SN**1204... |
| DSKNR/L2525M12 | 25 | 25 | 150 | 31 | 25 | 32 | 17 | 0.8 | SN**1204... |

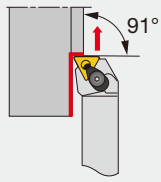
Note: Except for 57-type chipbreaker inserts
**rε: Standard corner radius

**SPARE PARTS**

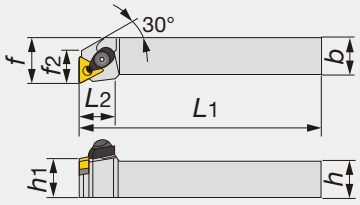
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DSKNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSS42 | BP-10 | LSP4 | P-3 | P-4 |

## DTFNR/L

"One-Double" toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DTFNR/L2020K16 | 20 | 20 | 125 | 23 | 20 | 25 | 18.5 | 0.8 | TN**1604... |
| DTFNR/L2525M16 | 25 | 25 | 150 | 23 | 25 | 32 | 20 | 0.8 | TN**1604... |
| DTFNR/L2525M22 | 25 | 25 | 150 | 31 | 25 | 32 | 24 | 0.8 | TN**2204... |

Note: Except for 57-type chipbreaker inserts
**rε: Standard corner radius

**SPARE PARTS**

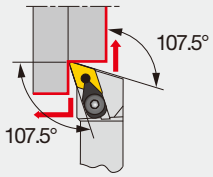
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DTFNR/L**16 | DCPM-33 | LCL33 | DPIS33 | DLCS33 | LST317 | BP-9 | LSP3 | P-2.5 | P-3 |
| DTFNR/L**22 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LST42 | BP-10 | LSP4 | P-3 | P-4 |

DSSNR/L, DSKNR/L: Inserts → **B071 -**, CBN → **B164**, PCD → **B176**

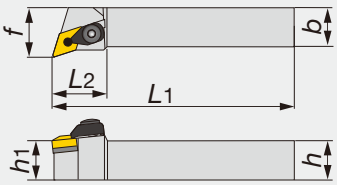
DTFNR/L: Inserts → **B080 -**, CBN → **B164**, PCD → **B176**

## DDQNR/L

"One-Double" toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| DDQNR/L2020K15 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | DN**1504... |
| DDQNR/L2020K1506 | 20 | 20 | 125 | 35 | 20 | 25 | 0.8 | DN**1506... |
| DDQNR/L2525M15 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | DN**1504... |
| DDQNR/L2525M1506 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | DN**1506... |
| DDQNR/L3225P15 | 32 | 25 | 170 | 35 | 32 | 32 | 0.8 | DN**1504... |
| DDQNR/L3225P1506 | 32 | 25 | 170 | 35 | 32 | 32 | 0.8 | DN**1506... |

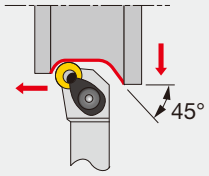
Note: Except for 57-type chipbreaker inserts
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

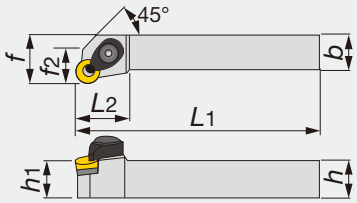
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DDQNR/L**15 | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |
| DDQNR/L**1506 | DCPM-43 | DLCL43 | DPIS44 | DLCS43 | LSD42 | BP-10 | LSP4 | P-3 | P-4 |

## DRGNR/L

"One-Double" toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| DRGNR/L2525M12 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 6.35 | RN**120400 |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

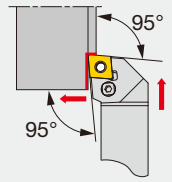
| Designation | Clamp | Lever | Piston | Clamp screw | Shim | Spring | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| DRGNR/L... | DCPM-43 | DLCL43 | DPIS43 | DLCS43 | LSR42 | BP-10 | LSP4 | P-3 | P-4 |

DDQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

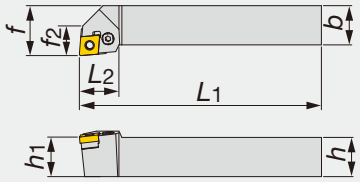
DRGNR/L: Inserts → **B070**

## PCLNR/L

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L1616H09 | 16 | 16 | 100 | 20 | 16 | 20 | 15 | 0.8 | CN**0903... |
| PCLNR/L2020K09 | 20 | 20 | 125 | 20 | 20 | 25 | 15 | 0.8 | CN**0903... |
| PCLNR/L2525M09 | 25 | 25 | 150 | 20 | 25 | 32 | 15 | 0.8 | CN**0903... |
| PCLNR/L1616 | 16 | 16 | 100 | 26 | 16 | 20 | – | 0.8 | CN**1204... |
| PCLNR/L2020 | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3232 | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... |
| PCLNR/L1616H12E | 16 | 16 | 100 | 26 | 16 | 20 | – | 0.8 | CN**1204... |
| PCLNR/L2020K12E | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M12E | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L3225P12E | 32 | 25 | 170 | 28 | 32 | 32 | 18 | 0.8 | CN**1204... |
| PCLNR/L2525M16E | 25 | 25 | 150 | 31 | 25 | 25 | – | 1.2 | CN**1606... |
| PCLNR/L3225P16E | 32 | 25 | 150 | 31 | 32 | 32 | – | 1.2 | CN**1606... |
| PCLNR3232P16E | 32 | 32 | 170 | 31 | 32 | 40 | – | 1.2 | CN**1606... |
| PCLNR/L3232P19E | 32 | 32 | 170 | 40 | 32 | 40 | 25 | 1.2 | CN**1906... |

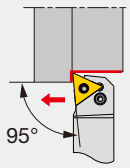
**rε: Standard corner radius

### SPARE PARTS

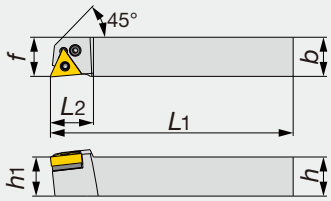
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCLNR/L1616H09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L2020K09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L2525M09 | ELSC32 | LCS3 | P-2.5 | LSP3L | LCL33 |
| PCLNR/L1616 | LSC42 | LCS4CA | P-3 | LSP4 | LCL4 |
| PCLNR/L2020 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L2525M4 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L3225P4 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |
| PCLNR/L3232 | LSC63 | LCS6 | P-4 | LSP6 | LCL6 |
| PCLNR/L1616H12E | ELSC42 | LCS4CA | P-3 | LSP4 | LCL4 |
| PCLNR/L2020K12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L2525M12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L3225P12E | ELSC42 | LCS4 | P-3 | LSP4S | LCL43M |
| PCLNR/L2525M16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3225P16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3232P16E | ELSC53 | LCS5 | P-3 | LSP6C | LCL5 |
| PCLNR/L3232P19E | ELSC63 | LCS6 | P-4 | LSP6 | LCL6 |

## PTL2NR/L

No-offset Lever-lock clamp toolholder with 95° approach approach angle, for negative 60° triangular inserts




Cutting edge style **L2**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PTL2NR/L2020H16 | 20 | 20 | 100 | 22 | 20 | 20 | 0.4 | TN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

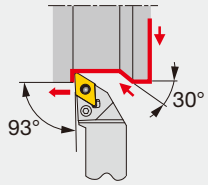
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTL2NR/L... | LST317 D30 | LCS3 | P-2.5 | LSP3 | LCL3 |

PCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176 -**

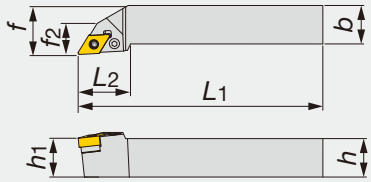
PTL2NR/L: Inserts → **B080 -**, CBN → **B164**, PCD → **B176**

## PDJNR/L

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PDJNR/L1616H11 | 16 | 16 | 100 | 27 | 16 | 20 | 16 | 0.8 | DN**1104... |
| PDJNR/L2020K11 | 20 | 20 | 125 | 27 | 20 | 25 | 16 | 0.8 | DN**1104... |
| PDJNR/L2020 | 20 | 20 | 125 | 34 | 20 | 25 | 19 | 0.8 | DN**1504... |
| PDJNR2020K15E | 20 | 20 | 125 | 36 | 20 | 25 | - | 0.8 | DN**1506... |
| PDJNR/L2520 | 25 | 20 | 150 | 34 | 25 | 25 | 19 | 0.8 | DN**1504... |
| PDJNR/L2525M11 | 25 | 25 | 150 | 27 | 25 | 32 | 19 | 0.8 | DN**1104... |
| PDJNR/L2525 | 25 | 25 | 150 | 34 | 25 | 32 | 19 | 0.8 | DN**1504... |
| PDJNR/L2525M15E | 25 | 25 | 150 | 36 | 25 | 32 | - | 0.8 | DN**1506... |
| PDJNR/L3225 | 32 | 25 | 170 | 32 | 32 | 32 | 19 | 0.8 | DN**1504... |
| PDJNR3225P15E | 32 | 25 | 170 | 36 | 32 | 34 | - | 0.8 | DN**1506... |

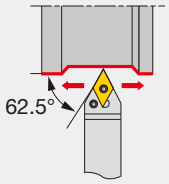
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

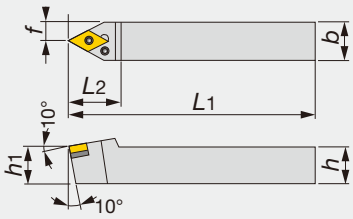
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDJNR/L1616H11, 2020K11 | ELSD32 | LCS3 | P-2.5 | LSP3 | LCL33L |
| PDJNR/L2020 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR2020K15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |
| PDJNR/L2520 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR/L2525 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR/L2525M15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |
| PDJNR/L3225 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDJNR3225P15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |

## PDPNN

Lever lock type toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PDPNN2525 | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1504... |
| PDPNN2525M15E | 25 | 25 | 150 | 36 | 25 | 12.5 | 0.8 | DN**1506... |

**$r_\varepsilon$: Standard corner radius

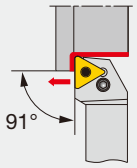
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDPNN2525 | LSD42 | LCS4 | P-3 | LSP4 | LCL4 |
| PDPNN2525M15E | ELSD42 | ELCS4 | P-3 | LSP4S | LCL44 |

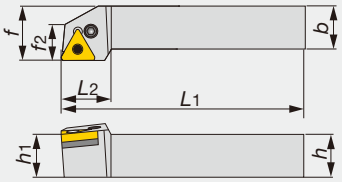
PDJNR/L, PDPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## PTGNR/L

Lever lock type toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_2$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L1616 | 16 | 16 | 100 | 22 | 16 | 20 | 16 | 0.8 | TN**1604... |
| PTGNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 16 | 0.8 | TN**1604... |
| PTGNR/L2525M3 | 25 | 25 | 150 | 22 | 25 | 32 | 21 | 0.8 | TN**1604... |
| PTGNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 24 | 0.8 | TN**2204... |
| PTGNR3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 24 | 0.8 | TN**2204... |

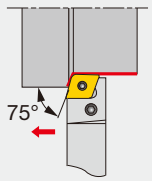
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

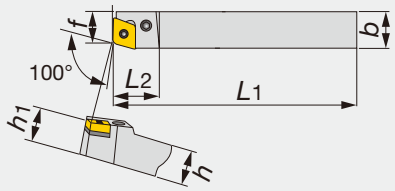
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTGNR/L1616, 2020 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTGNR/L2525M3 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTGNR/L2525M4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |
| PTGNR3225P4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |

## PCBNR/L

Lever lock type toolholder with 75° approach angle, for negative 80° rhombic inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PCBNR/L2525 | 25 | 25 | 150 | 28 | 25 | 22 | 0.8 | CN**1204... |

Note: 100° corners are used
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

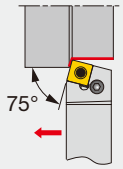
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCBNR/L2525 | LSC42 | LCS4 | P-3 | LSP4 | LCL4 |

PTGNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

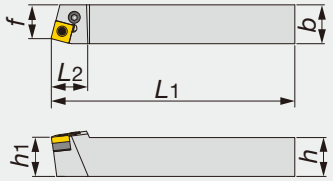
PCBNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

## PSBNR/L

Lever lock type toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert |
|---|---|---|---|---|---|---|---|---|
| PSBNR/L1616 | 16 | 16 | 100 | 22 | 16 | 13 | 0.8 | SN**0903... |
| PSBNR/L2020 | 20 | 20 | 125 | 28 | 20 | 17 | 0.8 | SN**1204... |
| PSBNR/L2525 | 25 | 25 | 150 | 24 | 25 | 22 | 0.8 | SN**1204... |
| PSBNR/L3232 | 32 | 32 | 170 | 40 | 32 | 27 | 1.2 | SN**1906... |

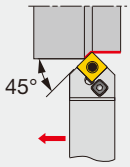
***rε*: Standard corner radius

### SPARE PARTS

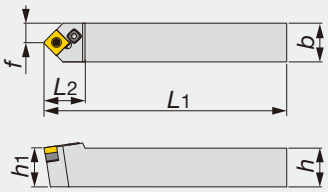
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSBNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSBNR/L2*2* | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSBNR/L3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |

## PSDNN

Lever lock type toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert |
|---|---|---|---|---|---|---|---|---|
| PSDNN1616 | 16 | 16 | 100 | 22 | 16 | 8 | 0.8 | SN**0903... |
| PSDNN2020 | 20 | 20 | 125 | 30 | 20 | 10.3 | 0.8 | SN**1204... |
| PSDNN2525 | 25 | 25 | 150 | 30 | 25 | 12.8 | 0.8 | SN**1204... |

***rε*: Standard corner radius

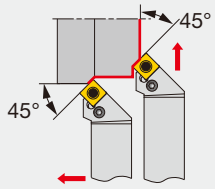
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSDNN1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSDNN2020 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSDNN2525 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |

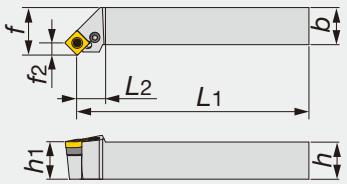
PSBNR/L, PSDNN: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

## PSSNR/L

Lever lock type toolholder with 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PSSNR/L1616 | 16 | 16 | 94 | 16 | 16 | 20 | 6.1 | 0.8 | SN**0903... |
| PSSNR/L2020 | 20 | 20 | 116 | 21 | 20 | 25 | 8.3 | 0.8 | SN**1204... |
| PSSNR/L2525 | 25 | 25 | 141 | 21 | 25 | 32 | 8.3 | 0.8 | SN**1204... |
| PSSNR3225 | 32 | 25 | 161 | 21 | 32 | 32 | 8.3 | 0.8 | SN**1204... |
| PSSNR/L3232 | 32 | 32 | 157.5 | 27.5 | 32 | 40 | 12.5 | 1.2 | SN**1906... |

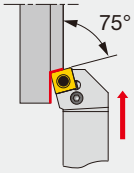
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

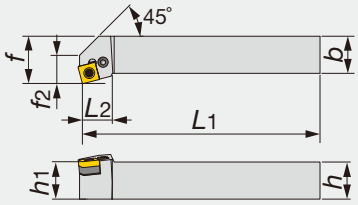
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSSNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSSNR/L2020 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSSNR/L**25 | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSSNR/L3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |

## PSKNR/L

Lever lock type toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PSKNR/L1616 | 16 | 16 | 100 | 17 | 16 | 25 | 15 | 0.8 | SN**0903... |
| PSKNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 17 | 0.8 | SN**1204... |
| PSKNR/L2525 | 25 | 25 | 150 | 22 | 25 | 32 | 17 | 0.8 | SN**1204... |
| PSKNR3232 | 32 | 32 | 170 | 40 | 32 | 40 | 27 | 1.2 | SN**1906... |

**$r_\varepsilon$: Standard corner radius

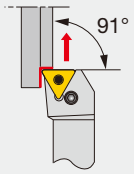
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PSKNR/L1616 | LSS33 | LCS3 | P-2.5 | LSP3L | LCL3 |
| PSKNR/L2*2* | LSS42 | LCS4 | P-3 | LSP4 | LCL4 |
| PSKNR3232 | LSS63 | LCS6 | P-4 | LSP6 | LCL6 |

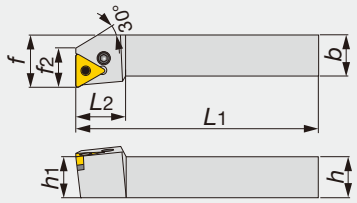
PSSNR/L, PSKNR/L: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

## PTFNR/L

Lever lock type toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L1616 | 16 | 16 | 100 | 22 | 16 | 20 | 16 | 0.8 | TN**1604... |
| PTFNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 16 | 0.8 | TN**1604... |
| PTFNR/L2525M3 | 25 | 25 | 150 | 22 | 25 | 32 | 20 | 0.8 | TN**1604... |
| PTFNR/L2525M4 | 25 | 25 | 150 | 28 | 25 | 32 | 24 | 0.8 | TN**2204... |
| PTFNR/L3225P4 | 32 | 25 | 170 | 28 | 32 | 32 | 24 | 0.8 | TN**2204... |

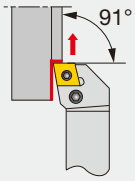
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

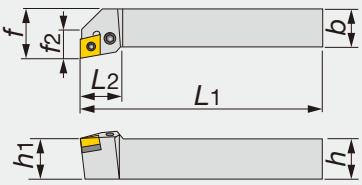
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PTFNR/L1616, 2020 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTFNR/L2525M3 | LST317 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PTFNR/L**25*4 | LST42 | LCS4 | P-3 | LSP4 | LCL4 |

## PCFNR/L

Lever lock type toolholder for facing with 91° approach angle, negative 80° rhombic inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| PCFNR/L2020 | 20 | 20 | 125 | 28 | 20 | 25 | 18 | 0.8 | CN**1204... |
| PCFNR/L2525 | 25 | 25 | 150 | 28 | 25 | 32 | 18 | 0.8 | CN**1204... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

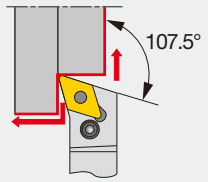
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PCFNR/L... | LSC42 D30 | LCS4 | P-3 | LSP4 | LCL4 |

PTFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

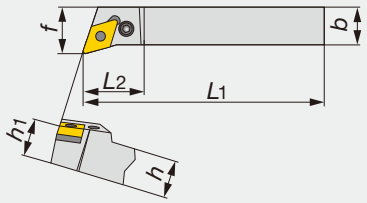
PCFNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

## PDQNR/L

Lever lock type toolholder with 107.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PDQNR/L2525 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | DN**1504... |

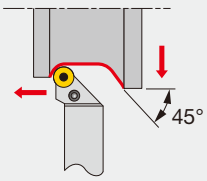
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

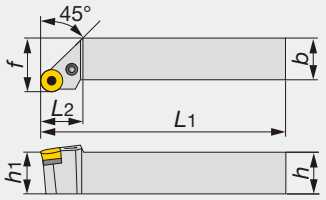
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PDQNR/L... | LSD42 D30 | LCS4 | P-3 | LSP4 | LCL4 |

## PRGNR/L

Lever lock type toolholder with 91° approach angle, for negative round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| PRGNR/L2020 | 20 | 20 | 125 | 19 | 20 | 25 | 4.76 | RNMG090300-61 |
| PRGNR/L2525M4 | 25 | 25 | 150 | 25 | 25 | 32 | 6.35 | RN**120400 |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

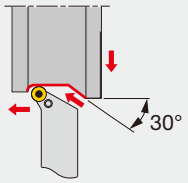
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRGNR/L2020 | LSR32 | LCS3 | P-2.5 | LSP3 | LCL3 |
| PRGNR/L2525M4 | LSR42 | LCS4 | P-3 | LSP4 | LCL4 |

PDQNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

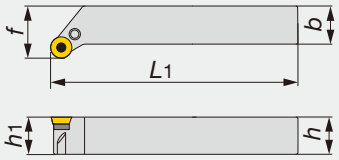
PRGNR/L: Inserts → **B070**

## PRGCR/L

Lever lock type toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

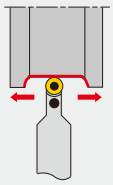
| Designation | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|
| PRGCR/L2020K10 | 20 | 20 | 125 | 20 | 25 | RCMM1003... |
| PRGCR/L2525M12 | 25 | 25 | 150 | 25 | 32 | RCM*1204... |
| PRGCR/L3225P16 | 32 | 25 | 170 | 32 | 32 | RCM*1606... |
| PRGCR/L3232P20 | 32 | 32 | 170 | 32 | 40 | RCM*2006... |

### SPARE PARTS

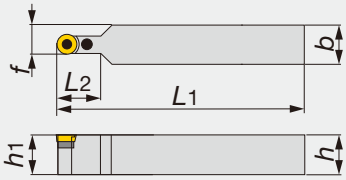
| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRGCR/L2020K10 | LSR32C | LCS2 | P-2 | LSP3 | LCL3C |
| PRGCR/L2525M12 | LSR42C | LCS3 | P-2.5 | LSP3 | LCL4C |
| PRGCR/L3225P16 | LSR53C | LCS5 | P-3 | LSP4 | LCL5C |
| PRGCR/L3232P20 | LSR63C | LCS5 | P-3 | LSP6C | LCL6C |

## PRDCN

Lever lock type toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| PRDCN2020K10 | 20 | 20 | 125 | 22 | 20 | 15 | RCMM1003... |
| PRDCN2525M12 | 25 | 25 | 150 | 24 | 25 | 18.5 | RCM*1204... |
| PRDCN3225P12 | 32 | 25 | 170 | 24 | 32 | 18.5 | RCM*1204... |
| PRDCN3225P16 | 32 | 25 | 170 | 28 | 32 | 20.5 | RCM*1606... |
| PRDCN3232P20 | 32 | 32 | 170 | 32 | 32 | 26 | RCM*2006... |
| PRDCN4040R25 | 40 | 40 | 200 | 42 | 40 | 32.5 | RCM*2507... |

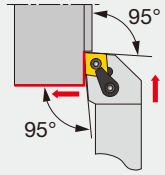
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|
| PRDCN2020K10 | LSR32C | LCS2 | P-2 | LSP3 | LCL3C |
| PRDCN**25*12 | LSR42C | LCS3 | P-2.5 | LSP3 | LCL4C |
| PRDCN3225P16 | LSR53C | LCS5 | P-3 | LSP4 | LCL5C |
| PRDCN3232P20 | LSR63C | LCS5 | P-3 | LSP6C | LCL6C |
| PRDCN4040R25 | LSR84C | LCS8C | P-4 | LSP6 | LCL8C |

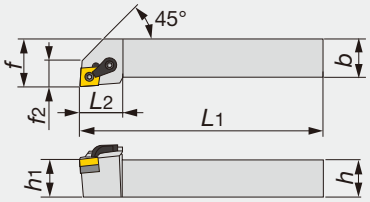
PRGCR/L, PRDCN: Inserts → **B124 -**

## MCLNR/L

Multi-clamp toolholder with 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| MCLNR/L2525M12 | 25 | 25 | 150 | 32 | 25 | 32 | 18 | 0.8 | CN**1204... |

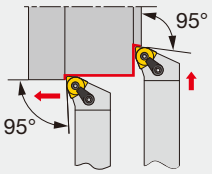
**rε: Standard corner radius

**SPARE PARTS**

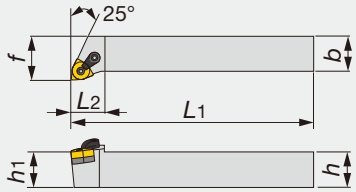
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MCLNR/L... | MCPM-21 | MLP46 | MCS625-3 | MSC-432 | P-3 | P-2.5F |

## MWLNR/L

Multi-clamp toolholder with 95° approach angle, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MWLNR2020K08 | 20 | 20 | 125 | 25 | 20 | 25 | 0.8 | WN**0804... |
| MWLNR/L2525M08 | 25 | 25 | 150. | 25 | 25 | 32 | 0.8 | WN**0804... |

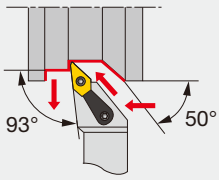
**rε: Standard corner radius

**SPARE PARTS**

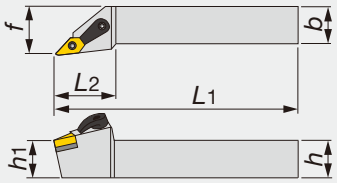
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench |
|---|---|---|---|---|---|
| MWLNR/L... | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432 | P-2.5 |

## MVJNR/L

Multi-clamp toolholder with 93° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVJNR/L2020K16 | 20 | 20 | 125 | 42 | 20 | 25 | 0.8 | V/YN**1604... |
| MVJNR/L2525M16 | 25 | 25 | 150 | 42 | 25 | 32 | 0.8 | V/YN**1604... |
| MVJNR/L3225P16 | 32 | 25 | 170 | 42 | 32 | 32 | 0.8 | V/YN**1604... |
| MVJNR/L3232P16 | 32 | 32 | 170 | 42 | 32 | 40 | 0.8 | V/YN**1604... |

**rε: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVJNR/L... | MCPM-22 | MLP34L | MCS625-3 | MSV-322 | P-3 | P-2F |

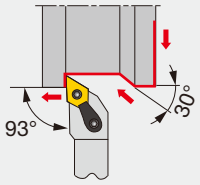
MCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

MWLNR/L: Inserts → **B095 -**, CBN → **B165**

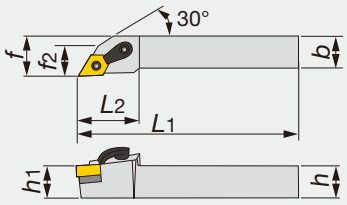
MVJNR/L: Inserts → **B091 -**, **B102 -**, CBN → **B165 -**, PCD → **B176**

## MDJNR

Multi-clamp toolholder with 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| MDJNR2525M15 | 25 | 25 | 150 | 38 | 25 | 32 | 19 | 0.8 | DN**15... |

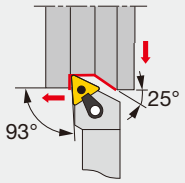
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

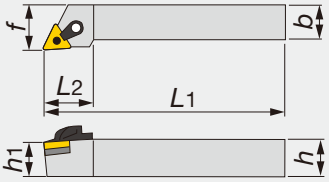
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MDJNR2525M15 | MCPM-22 | MLP46L | MCS625-3 | MSD-432 | P-3 | P-2.5F |

## MTJNR

Multi-clamp toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTJNR2525M16 | 25 | 25 | 150 | 28 | 25 | 32 | 0.8 | TN**16... |

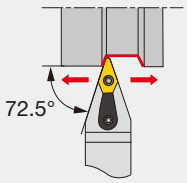
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

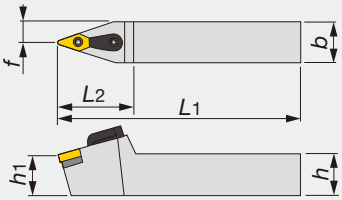
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTJNR2525M16 | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

## MVVNN

Multi-clamp toolholder with 72.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVVNN2020K16 | 20 | 20 | 125 | 48 | 20 | 10 | 0.8 | V/YN**1604... |
| MVVNN2525M16 | 25 | 25 | 150 | 48 | 25 | 12.5 | 0.8 | V/YN**1604... |
| MVVNN3225P16 | 32 | 25 | 170 | 48 | 32 | 12.5 | 0.8 | V/YN**1604... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVVNN... | MCPM-30 | MLP34L | MCS828-4 | MSV-322 | P-4 | P-2F |

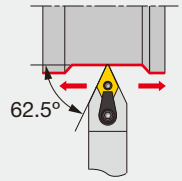
MDJNR: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

MTJNR: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

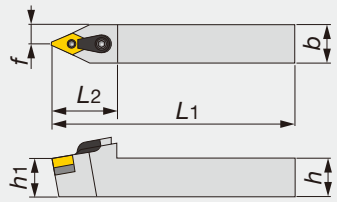
MVVNN: Inserts → **B091 -**, **B102 -**, CBN → **B165 -**, PCD → **B176**

## MDPNN

Multi-clamp toolholder with 62.5° approach angle, for negative 55° rhombic inserts




Cutting edge style **P**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| MDPNN2525M15 | 25 | 25 | 150 | 42 | 25 | 12.5 | 0.8 | DN**15... |

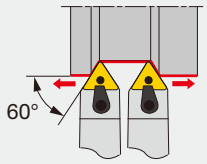
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

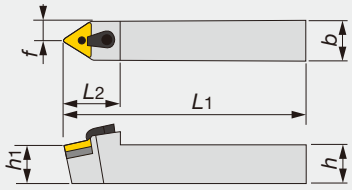
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MDPNN2525M15 | MCPM-22 | MLP46L | MCS625-3 | MSD-432 | P-3 | P-2.5F |

## MTENN

Multi-clamp toolholder with 60° approach angle, for negative triangle inserts




Cutting edge style **E**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTENN2525M16 | 25 | 25 | 150 | 35 | 25 | 12.5 | 0.8 | TN**16... |

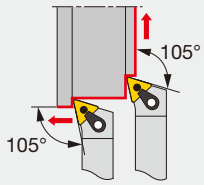
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

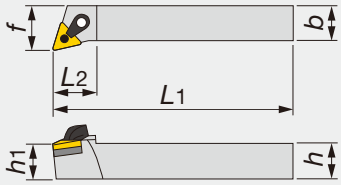
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTENN2525M16 | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

## MTQNR

Multi-clamp toolholder with 105° approach angle, for negative triangle inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| MTQNR2020K16 | 20 | 20 | 125 | 26 | 20 | 25 | 0.8 | TN**16... |
| MTQNR2525M16 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | TN**16... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

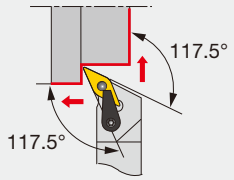
| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MTQNR... | MCPM-21 | MLP34L | MCS625-3 | MST-322 | P-3 | P-2F |

MDPNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

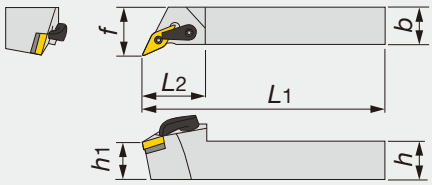
MTENN, MTQNR: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## MVQNR/L

Multi-clamp toolholder with 117.5° approach angle, for negative 35° or 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| MVQNR/L2020K16 | 20 | 20 | 125 | 40 | 20 | 25 | 0.8 | V/YN**1604... |
| MVQNR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | V/YN**1604... |
| MVQNR/L3232P16 | 32 | 32 | 170 | 40 | 32 | 40 | 0.8 | V/YN**1604... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Pin | Right-left screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| MVQNR/L... | MCPM-22 | MLP34L | MCS625-3 | MSV-322 | P-3 | P-2F |

## Replacement Parts for M-type Toolholders

- When using the inserts shown in the shaded cells, the optional parts shown in the shaded cells are needed. You may purchase them separately.
- 1) Used for 1616H16. ● 2) Used for MSDNN. ● 3) Used for MDJNR/L ● 4) Used for MVVNN

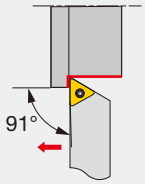
| Toolholder Designation | | Designation | Shape | Shim | Lock pin | Shim screw | Clamp | Clamping screw | Chipbreaker piece | Lock pin Wrench | Wrench |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Applicable inserts | | | | | | | | | |
| MTJNR/L<br>MTQNR/L<br>MTENN | 2020K16<br>2525M16 | TN**1604** | | MST-322 | MLP34L | - | MCPM-20 1)<br>MCPM-21 | MCS620-3 1)<br>MCS625-3 | CBT-3M | P-2F | |
| | | TN**1604** | | | - | MSP-5 | | | | | |
| | | TN**1603** | | MST-332 | MLP34L | - | MCPM-20 1)<br>MCPM-21 | MCS620-3 1)<br>MCS625-3 | CBT-3M | P-2F | P-3 |
| | | TN**1603** | | | - | MSP-5 | | | | | |
| MCLNR/L | 2525M12 | CN**1204** | | MSC-432 | MLP46 | - | MCPM-21 | MCS625-3 | CBC-4MN | P-2.5F | P-3 |
| | | CN**1204** | | | - | MSP-6.3 | | | | | |
| MDJNR/L<br>MDPNR/L | 2525M15 | DN**1506** | | MSD-432 | MLP46L | - | MCPM-22 | MCS625-3 | CBD-4MR/L 3)<br>CBD-4MN | P-2.5F | P-3 |
| | | DN**1504** | | MSD-442 | | - | | | | | |
| | | DN**1504** | | MSD-442 | - | MSP-6.3 | | | | | |
| MVJNR/L<br>MVVNN<br>MVQNR/L | 2020K16<br>2525M16<br>3225P16<br>3232P16 | VN**1604** | | MSV-322 | MLP34L | - | MCPM-22<br>MCPM-30 4) | MCS625-3<br>MCS828-4 4) | - | P-2F | P-3<br>P-4 4) |
| MWLNR/L | 2020K08<br>2525M08 | WN**0804** | | MSW-432 | MLP46 | - | MCPM-6 | MCS520-2.5 | - | P-2.5 | P-2.5 |

Note : The shims are made of Tungaloy grade D30, and the chipbreaker pieces are of TX30.

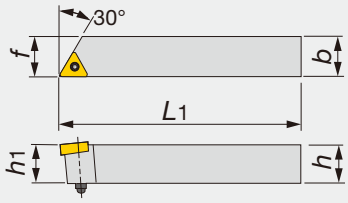
MVQNR/L: Inserts → **B091 -**, **B102 -**, CBN → **B165 -**, PCD → **B176**

## ETANR

Pin-lock toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ETANR1616H33 | 16 | 16 | 100 | 15.5 | 16 | 0.8 | TN**1604... |
| ETANR2020K33 | 20 | 20 | 125 | 19.5 | 20 | 0.8 | TN**1604... |

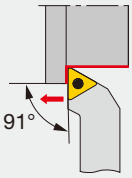
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

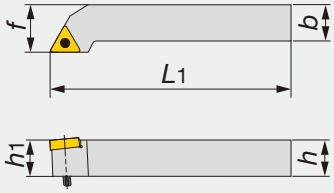
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ETANR1616H33 | ER3 | P332US | KY40 |
| ETANR2020K33 | ER3 | P333US | KY40 |

## ETGNR/L

Pin-lock toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ETGNR/L1212 | 12 | 12 | 80 | 11.5 | 16 | 0.4 | TN**1103... |
| ETGNR/L1616H33 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | TN**1604... |
| ETGNR/L2020K33 | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |
| ETGNR/L2020K33W | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |
| ETGNR2525M33 | 25 | 25 | 150 | 24.5 | 32 | 0.8 | TN**1604... |
| ETGNR/L2525M33W | 25 | 25 | 150 | 24.5 | 32 | 0.8 | TN**1604... |

**$r_\varepsilon$: Standard corner radius

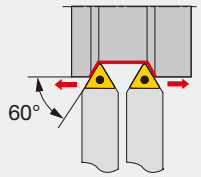
### SPARE PARTS

| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ETGNR/L1212 | ER2 | P221US | - | KY25 |
| ETGNR/L1616H33 | ER3 | P332US | - | KY40 |
| ETGNR/L2020K33 | ER3 | P333US | - | KY40 |
| ETGNR/L2020K33W | ER3 | P333WS | EST32 | KY40 |
| ETGNR2525M33 | ER3 | P334US | - | KY40 |
| ETGNR/L2525M33W | ER3 | P334WS | EST32 | KY40 |

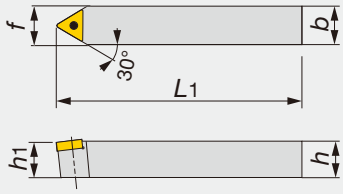
ETANR, ETGNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## ETENN

Pin-lock toolholder with 60° approach angle, for negative triangle inserts




Cutting edge style **E**




| Designation | *h* | *b* | $L_1$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ETENN1212 | 12 | 12 | 80 | 11.5 | 6 | 0.4 | TN**1103... |
| ETENN1616H33 | 16 | 16 | 100 | 15.5 | 8 | 0.8 | TN**1604... |
| ETENN2020K33 | 20 | 20 | 125 | 19.5 | 10 | 0.8 | TN**1604... |
| ETENN2020K33W | 20 | 20 | 125 | 19.5 | 10 | 0.8 | TN**1604... |
| ETENN2525M33W | 25 | 25 | 150 | 24.5 | 12.5 | 0.8 | TN**1604... |

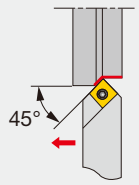
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

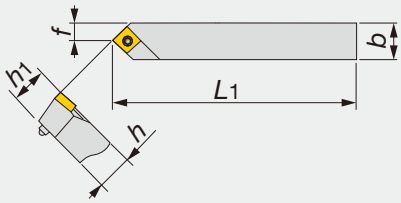
| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ETENN1212 | ER2 | P221US | - | KY25 |
| ETENN1616H33 | ER3 | P332US | - | KY40 |
| ETENN2020K33 | ER3 | P333US | - | KY40 |
| ETENN2020K33W | ER3 | P333WS | EST32 | KY40 |
| ETENN2525M33W | ER3 | P334WS | EST32 | KY40 |

## ESDNR/L

Pin-lock toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| ESDNR1212 | 12 | 12 | 80 | 11.5 | 6 | 0.8 | SN**0903... |
| ESDNR1616H32 | 16 | 16 | 100 | 15.5 | 8 | 0.8 | SN**0903... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

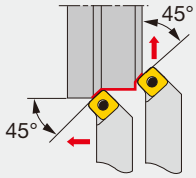
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ESDNR1212 | ER3 | P321US | KY40 |
| ESDNR1616H32 | ER3 | P322US | KY40 |

ETENN: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

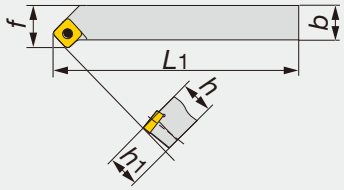
ESDNR/L: Inserts → **B071 -**

## ESSNR/L

Pin-lock toolholder with 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|
| ESSNR1616H32 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | SN**0903... |
| ESSNR2020W | 20 | 20 | 125 | 19.5 | 25 | 0.8 | SN**1204... |

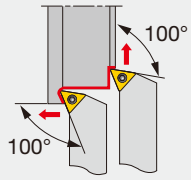
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

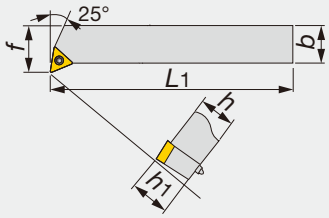
| Designation | E-ring | Pin | Shim | Wrench |
|---|---|---|---|---|
| ESSNR1616H32 | ER3 | P322US | - | KY40 |
| ESSNR2020W | ER3 | P433W | ESS42 | KY40 |

## ETXNR/L

Pin-lock toolholder with 100° approach angle, for negative triangle inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|
| ETXNL1616H33 | 16 | 16 | 100 | 15.5 | 20 | 0.8 | TN**1604... |
| ETXNR2020K33 | 20 | 20 | 125 | 19.5 | 25 | 0.8 | TN**1604... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

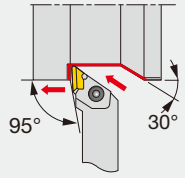
| Designation | E-ring | Pin | Wrench |
|---|---|---|---|
| ETXNL1616H33 | ER3 | P332US | KY40 |
| ETXNR2020K33 | ER3 | P333US | KY40 |

ESSNR/L: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

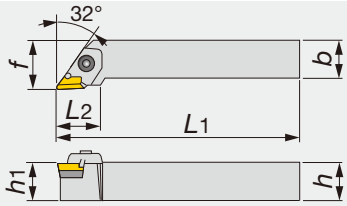
ETXNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## CKJNR/L

Clamp-on toolholder with 93° approach angle, for negative 55° parallelogram inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CKJNR/L2525 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | KNMX1604... |

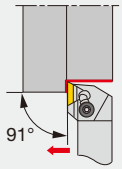
**rε: Standard corner radius

### SPARE PARTS

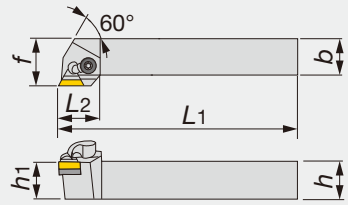
| Designation | Clamp | Pin | Clamping screw | Shim screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|---|---|
| CKJNR2525 | CPK5R | BP-490 | CTS-M6 | SM3X0.5X10 | CSK54R | SP913 | P-4 |
| CKJNL2525 | CPK5L | BP-490 | CTS-M6 | SM3X0.5X10 | CSK54L | SP913 | P-4 |

## CTGNR/L

Clamp-on toolholder with 91° approach angle, for negative triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTGNR/L2020 | 20 | 20 | 125 | 28.5 | 20 | 25 | 0.8 | TN**1604... |
| CTGNR/L2525 | 25 | 25 | 150 | 28.5 | 25 | 32 | 0.8 | TN**1604... |

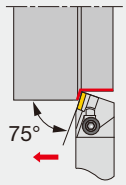
**rε: Standard corner radius

### SPARE PARTS

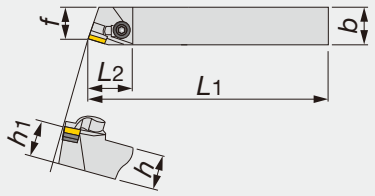
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CTGNR/L... | NCT-2M | NF-84A | NDS-8A | SM3X0.5X8 | NAT-32 | P-4 |

## CSBNR/L

Clamp-on toolholder with 75° approach angle, for negative square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSBNR2020 | 20 | 20 | 125 | 31 | 20 | 17 | 0.8 | SN**1204... |
| CSBNR/L2525 | 25 | 25 | 150 | 31 | 25 | 22 | 0.8 | SN**1204... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSBNR/L... | NCS-3M | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

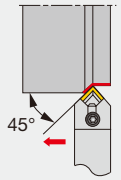
CKJNR/L: Inserts → **B103**

CTGNR/L: Inserts → **B090**, CBN → **B173**

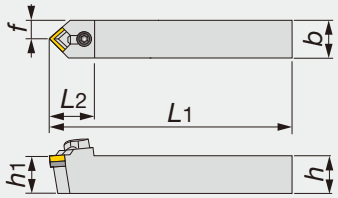
CSBNR/L: Inserts → **B079**, CBN → **B173**, PCD → **B176**

## CSDNN

Clamp-on toolholder with 45° approach angle, for negative square inserts




Cutting edge style **D**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSDNN2020 | 20 | 20 | 125 | 32 | 20 | 10 | 0.8 | SN**1204... |
| CSDNN2525 | 25 | 25 | 150 | 32 | 25 | 12.5 | 0.8 | SN**1204... |

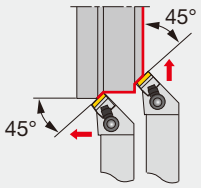
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

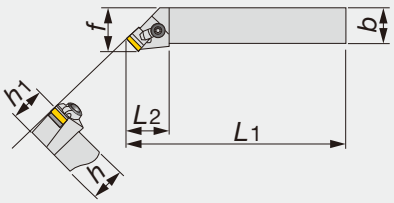
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSDNN... | NCS-3MN | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

## CSSNR/L

Clamp-on toolholder with 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSSNR/L2020 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | SN**1204... |
| CSSNR/L2525 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | SN**1204... |

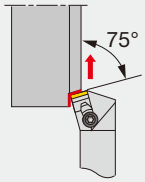
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

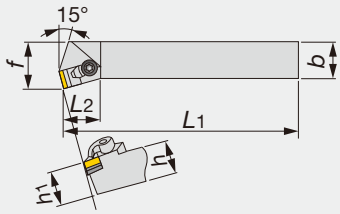
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSSNR/L... | NCS-3M | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

## CSKNR/L

Clamp-on toolholder with 75° approach angle, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSKNR/L2525 | 25 | 25 | 150 | 25 | 25 | 32 | 0.8 | SN**1204... |

**$r_\varepsilon$: Standard corner radius

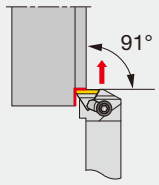
**SPARE PARTS**

| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CSKNR/L2525 | NCS-3MN | NF-84A | NDS-8A | SM3X0.5X8 | NAS-42 | P-4 |

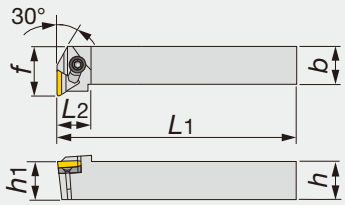
CSDNN, CSSNR/L, CSKNR/L: Inserts → **B079**, CBN → **B173**, PCD → **B176**

## CTFNR/L

Clamp-on toolholder for facing with 91° approach angle, negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTFNR/L2020 | 20 | 20 | 125 | 22 | 20 | 25 | 0.8 | TN**1604... |
| CTFNR/L2525 | 25 | 25 | 150 | 22 | 25 | 32 | 0.8 | TN**1604... |

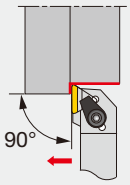
**rε: Standard corner radius

### SPARE PARTS

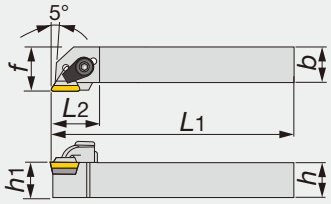
| Designation | Chipbreaker piece | Clamp | Clamping screw | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|---|
| CTFNR/L... | NCT-2M | NF-84A | NDS-8A | SM3X0.5X8 | NAT-32 | P-4 |

## CTGPR/L

Clamp-on toolholder with 90° approach angle, for positive triangle inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTGPR/L1616H3 | 16 | 16 | 100 | 23 | 16 | 20 | 0.8 | TP**1603... |
| CTGPR/L2020K3 | 20 | 20 | 125 | 27 | 20 | 25 | 0.8 | TP**1603... |
| CTGPR/L2525M3 | 25 | 25 | 150 | 27 | 25 | 32 | 0.8 | TP**1603... |

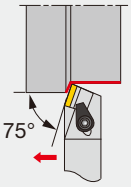
**rε: Standard corner radius

### SPARE PARTS

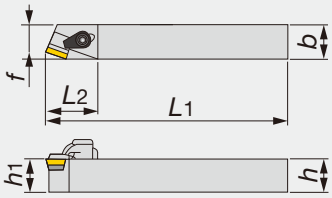
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTGPR/L1616H3 | CBT-3M | CSG-6L | SM3X0.5X8 | PAT-32 | P-3 |
| CTGPR/L2*2**3 | CBT-3M | CSG-8 | SM3X0.5X8 | PAT-32 | P-4 |

## CSBPR/L

Clamp-on toolholder with 75° approach angle, for positive square inserts




Cutting edge style **B**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSBPR/L1616H3 | 16 | 16 | 100 | 25 | 16 | 13 | 0.4 | SP**0903... |
| CSBPR/L2020K4 | 20 | 20 | 125 | 32 | 20 | 17 | 0.8 | SP**1203... |
| CSBPR/L2525M4 | 25 | 25 | 150 | 32 | 25 | 22 | 0.8 | SP**1203... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSBPR/L1616H3 | CBS-3M | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSBPR/L2*2**4 | CBS-4M | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

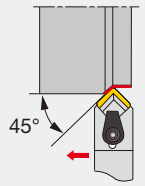
CTFNR/L: Inserts → **B090**, CBN → **B173**

CTGPR/L: Inserts → **B136 -**, CBN → **B170 -**, PCD → **B178**

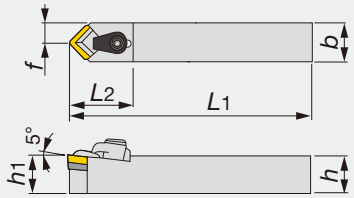
CSBPR/L: Inserts → **B130**, CBN → **B168 -**, PCD → **B177**

## CSDPN

Clamp-on toolholder with 45° approach angle, for positive square inserts




Cutting edge style **D**




| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSDPN1616H3 | 16 | 16 | 100 | 26 | 16 | 8 | 0.8 | SP**0903... |
| CSDPN2020K4 | 20 | 20 | 125 | 34 | 20 | 10 | 0.8 | SP**1203... |
| CSDPN2525M4 | 25 | 25 | 150 | 34 | 25 | 12.5 | 0.8 | SP**1203... |

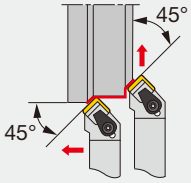
**rε: Standard corner radius

### SPARE PARTS

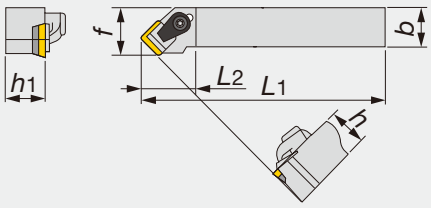
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSDPN1616H3 | CBS-3MN | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSDPN2*2**4 | CBS-4MN | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

## CSSPR

Clamp-on toolholder with 45° approach angle, for positive square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CSSPR1616H3 | 16 | 16 | 105.5 | 23 | 16 | 20 | 0.8 | SP**0903... |
| CSSPR2020K4 | 20 | 20 | 133 | 28 | 20 | 25 | 0.8 | SP**1203... |
| CSSPR2525M4 | 25 | 25 | 158 | 28. | 25 | 32 | 0.8 | SP**1203... |

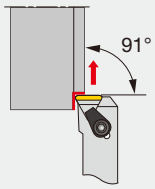
**rε: Standard corner radius

### SPARE PARTS

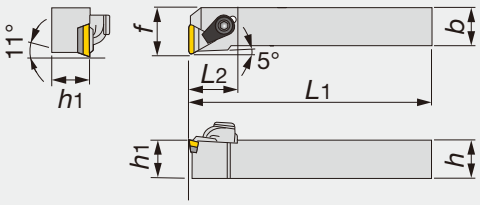
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CSSPR1616H3 | CBS-3M | CSG-6L | SM2.5X0.45X8 | PAS-32 | P-3 |
| CSSPR2*2**4 | CBS-4M | CSG-8 | SM3X0.5X8 | PAS-42 | P-4 |

## CTFPR/L

Clamp-on toolholder for facing with 91° approach angle, positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTFPR/L1616H3 | 16 | 16 | 100 | 23 | 16 | 20 | 0.8 | TP**1603... |
| CTFPR/L2020K3 | 20 | 20 | 125 | 26 | 20 | 25 | 0.8 | TP**1603... |
| CTFPR/L2525M3 | 25 | 25 | 150 | 26 | 25 | 32 | 0.8 | TP**1603... |

**rε: Standard corner radius

### SPARE PARTS

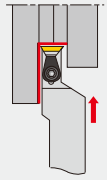
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTFPR/L1616H3 | CBT-3M | CSG-6L | SM3X0.5X8 | PAT-32 | P-3 |
| CTFPR/L2*2**3 | CBT-3M | CSG-8 | SM3X0.5X8 | PAT-32 | P-4 |

CSDPN, CSSPR: Inserts → **B130**, CBN → **B168 -**, PCD → **B177**

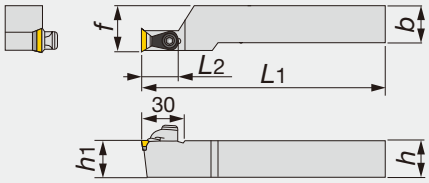
CTFPR/L: Inserts → **B143 -**, CBN → **B170 -**, PCD → **B178**

## CTCPR/L

Clamp-on toolholder for facing with 90° approach angle, positive triangle inserts



Cutting edge style **C**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| CTCPR/L2525M3 | 25 | 25 | 150 | 32 | 25 | 32 | 0.8 | TP**1603... |

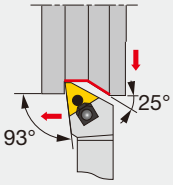
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

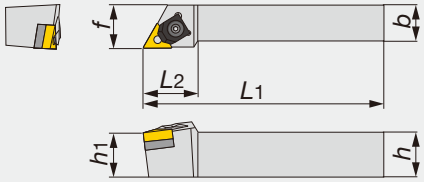
| Designation | Chipbreaker piece | Clamp set | Shim screw | Shim | Wrench |
|---|---|---|---|---|---|
| CTCPR/L2525M3 | CBT-3M | CSW-2 | SM3X0.5X8 | PAT-32 | P-4 |

## WTJNR/L

Wedge-on toolholder with 93° approach angle, for negative triangle inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| WTJNR2020 | 20 | 20 | 125 | 31 | 20 | 25 | 0.8 | TN**1604... |
| WTJNR/L2525M3 | 25 | 25 | 150 | 31 | 25 | 32 | 0.8 | TN**1604... |

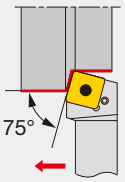
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

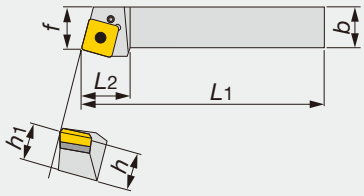
| Designation | Clamp | E-ring | Nut | Pin | Clamping screw | Shim | Wrench |
|---|---|---|---|---|---|---|---|
| WTJNR2020 | WCW3 | 5103-25 | WCN3S | WCP3S | WCS3 | WST33 | P-3 |
| WTJNR/L2525M3 | WCW3 | 5103-25 | WCN3 | WCP3S | WCS3 | WST33 | P-3 |

## HSRNR/L

Retract-pin clamp toolholder with 75° approach angle, for negative square inserts




Cutting edge style **R**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert |
|---|---|---|---|---|---|---|---|---|
| HSRNR/L4040R | 40 | 40 | 200 | 50 | 40 | 43 | 1.6 | SNMM3109... |
| HSRNR/L5050S | 50 | 50 | 250 | 60 | 50 | 53 | 1.6 | SNMM3109... |

**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

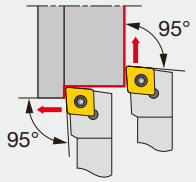
| Designation | Pin | Clamping screw | Shim | Wrench |
|---|---|---|---|---|
| HSRNR/L... | SW99 | LS-8 | NAS-04 | P-4 |

CTCPR/L: Inserts → **B143 -**, CBN → **B170 -**, PCD → **B178**

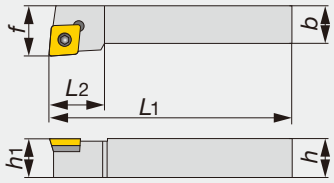
WTJNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## SCLCR/L

Screw-on clamp toolholder with 95° approach angle, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SCLCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... |
| SCLCR/L2020K12 | 20 | 20 | 125 | 20 | 20 | 25 | 0.8 | CC**1204... |

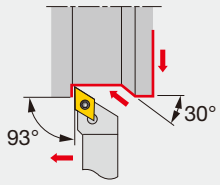
**rε: Standard corner radius

### SPARE PARTS

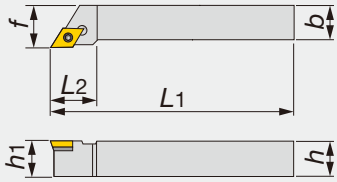
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCLCR/L1616H09 | CSTB-3.5L | DTS5-3.5 | SSC32 | P-3.5 | T-15F |
| SCLCR/L2020K12 | CSTB-4F | DTS6-4 | SSC4T3 | P-4 | T-15F |

## SDJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDJCR1616H11 | 16 | 16 | 100 | 20 | 16 | 20 | 0.8 | DC**11T3... |
| SDJCR/L2020K11 | 20 | 20 | 125 | 20.5 | 20 | 25 | 0.8 | DC**11T3... |
| SDJCR/L2525M11 | 25 | 25 | 150 | 21.5 | 25 | 32 | 0.8 | DC**11T3... |

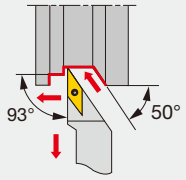
**rε: Standard corner radius

### SPARE PARTS

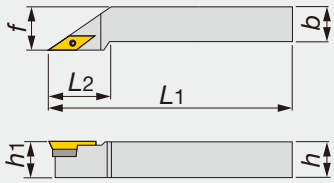
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDJCR/L... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVJCR/L1616H16 | 16 | 16 | 100 | 32 | 16 | 20 | 0.8 | VC**1604... |
| SVJCR/L2020K16 | 20 | 20 | 125 | 32 | 20 | 25 | 0.8 | VC**1604... |
| SVJCR/L2525M16 | 25 | 25 | 150 | 40 | 25 | 32 | 0.8 | VC**1604... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVJCR/L... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

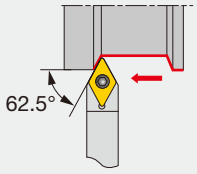
SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

SDJCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

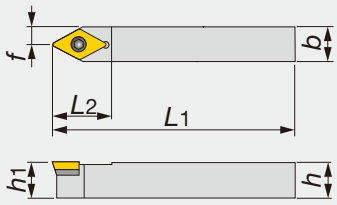
SVJCR/L: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

## SDNCN

Screw-on clamp toolholder with 62.5° approach angle, for positive 55° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDNCN1616H11 | 16 | 16 | 100 | 21 | 16 | 8 | 0.8 | DC**11T3... |
| SDNCN2020K11 | 20 | 20 | 125 | 21 | 20 | 10 | 0.8 | DC**11T3... |
| SDNCN2525M11 | 25 | 25 | 150 | 21 | 25 | 12.5 | 0.8 | DC**11T3... |

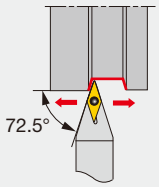
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

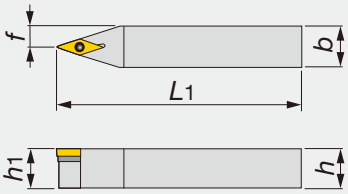
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDNCN... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVVCN

Screw-on clamp toolholder with 72.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **V**




| Designation | *h* | *b* | $L_1$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|
| SVVCN2020K16 | 20 | 20 | 125 | 20 | 10 | 0.8 | VC**1604... |
| SVVCN2525M16 | 25 | 25 | 150 | 25 | 12.5 | 0.8 | VC**1604... |

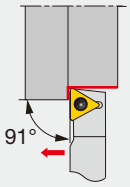
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

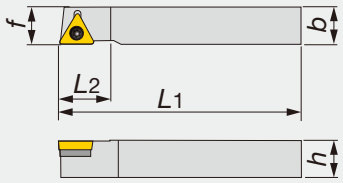
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVVCN... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

## STACR/L

Screw-on toolholder with 91° approach angle, for positive triangle inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| STACR/L1616H16 | 16 | 16. | 100 | 22.5 | 16 | 16 | 0.8 | TC**16T3... |

**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| STACR/L... | CSTB-3.5L | DTS5-3.5 | SST32 | P-3.5 | T-15F |

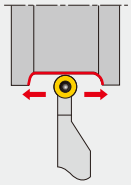
SDNCN: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

SVVCN: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

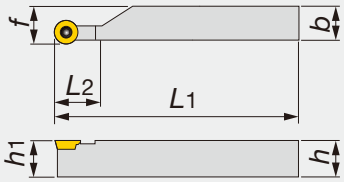
STACR/L: Inserts → **B131 -**

## SRACR/L

Screw-on toolholder with 91° approach angle, for positive round inserts



Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| SRACR1010H05 | 10 | 10 | 100 | 10 | 10 | 10.3 | RCMT0502... |
| SRACR/L1212H05 | 12 | 12 | 100 | 10 | 12 | 12.3 | RCMT0502... |
| SRACR/L1212H06 | 12 | 12 | 100 | 12 | 12 | 12.4 | RC*T0602... |
| SRACR1616H05 | 16 | 16 | 100 | 10 | 16 | 16.3 | RCMT0502... |
| SRACR/L1616H06 | 16 | 16 | 100 | 12 | 16 | 16.4 | RC*T0602... |
| SRACR/L1616H08 | 16 | 16 | 100 | 16 | 16 | 16.5 | RC*T0803... |
| SRACR/L2020K05 | 20 | 20 | 125 | 10 | 20 | 20.3 | RCMT0502... |
| SRACR/L2020K06 | 20 | 20 | 125 | 12 | 20 | 20.4 | RC*T0602... |
| SRACR/L2020K08 | 20 | 20 | 125 | 16 | 20 | 20.5 | RC*T0803... |
| SRACR/L2525M05 | 25 | 25 | 150 | 10 | 25 | 25.3 | RCMT0502... |
| SRACR/L2525M06 | 25 | 25 | 150 | 12 | 25 | 25.4 | RC*T0602... |
| SRACR/L2525M08 | 25 | 25 | 150 | 16 | 25 | 25.5 | RC*T0803... |

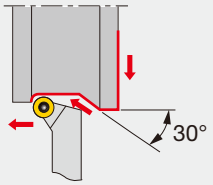
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SRACR/L1*1*H05 | CSTB-2.2R | T-7F |
| SRACR/L1212H06 | CSTB-2.5 | T-8F |
| SRACR1616H05 | CSTB-2.2R | T-7F |
| SRACR/L1616H06 | CSTB-2.5 | T-8F |
| SRACR/L1616H08 | CSTB-3 | T-9F |
| SRACR/L2020K05 | CSTB-2.2R | T-7F |
| SRACR/L2020K06 | CSTB-2.5 | T-8F |
| SRACR/L2020K08 | CSTB-3 | T-9F |
| SRACR/L2525M05 | CSTB-2.2R | T-7F |
| SRACR/L2525M06 | CSTB-2.5 | T-8F |
| SRACR/L2525M08 | CSTB-3 | T-9F |

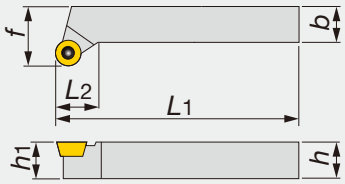
SRACR/L: Inserts → **B124 -**

## SRGCR/L

Screw-on toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| SRGCR1212H05 | 12 | 12 | 100 | 9.5 | 12 | 16 | RCMT0502... |
| SRGCR/L1212H06 | 12 | 12 | 100 | 10 | 12 | 16 | RC*T0602... |
| SRGCR/L1616H05 | 16 | 16 | 100 | 9.5 | 16 | 20 | RCMT0502... |
| SRGCR/L1616H06 | 16 | 16 | 100 | 10 | 16 | 20 | RC*T0602... |
| SRGCR/L1616H08 | 16 | 16 | 100 | 11 | 16 | 20 | RC*T0803... |
| SRGCR/L2020K05 | 20 | 20 | 125 | 11.2 | 20 | 25 | RCMT0502... |
| SRGCR/L2020K06 | 20 | 20 | 125 | 12 | 20 | 25 | RC*T0602... |
| SRGCR/L2020K08 | 20 | 20 | 125 | 12.7 | 20 | 25 | RC*T0803... |
| SRGCR/L2020K10 | 20 | 20 | 125 | 14 | 25 | 25 | RC*T1003... |
| SRGCR/L2525M05 | 25 | 25 | 150 | 14.7 | 25 | 32 | RCMT0502... |
| SRGCR/L2525M06 | 25 | 25 | 150 | 15 | 25 | 32 | RC*T0602... |
| SRGCR/L2525M08 | 25 | 25 | 150 | 16.2 | 25 | 32 | RC*T0803... |
| SRGCR/L2525M10 | 25 | 25 | 150 | 17.5 | 25 | 32 | RC*T1003... |

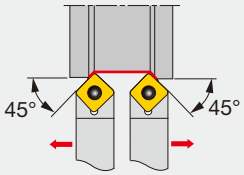
### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SRGCR1212H05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L1212H06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L1616H05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L1616H06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L1616H08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2020K05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L2020K06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L2020K08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2020K10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |
| SRGCR/L2525M05 | CSTB-2.2R | - | - | - | T-7F |
| SRGCR/L2525M06 | CSTB-2.5 | - | - | - | T-8F |
| SRGCR/L2525M08 | CSTB-3 | - | - | - | T-9F |
| SRGCR/L2525M10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |

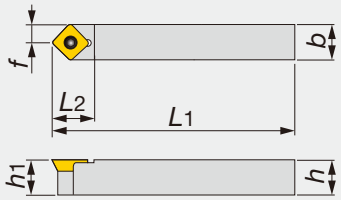
SRGCR/L: Inserts → **B124 -**

## SSDC/PN

Screw-on clamp toolholder with 45° approach angle, for positive square inserts




Cutting edge style **D**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|
| SSDCN1010K07 | 10 | 10 | 125 | 12 | 10 | 5 | 0.4 | SC**0702... |
| SSDPN1010H | 10 | 10 | 100 | 12 | 10 | 5 | 0.4 | SP*P042... |
| SSDCN1212K09 | 12 | 12 | 125 | 15 | 12 | 6 | 0.8 | SC**09T3... |
| SSDPN1212H | 12 | 12 | 100 | 12 | 12 | 6 | 0.4 | SP*P042... |
| SSDCN1616H09 | 16 | 16 | 100 | 15 | 16 | 8 | 0.8 | SC**09T3... |
| SSDPN1616H | 16 | 16 | 100 | 14 | 16 | 8 | 0.8 | SP*M322... |

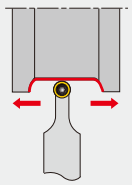
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

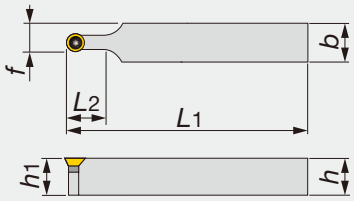
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSDCN1010K07 | CSTB-3 | - | - | - | T-9F |
| SSDPN1010H | CSTA-NO3 | - | - | - | T-9F |
| SSDCN1212K09 | CSTB-4 | - | - | - | T-15F |
| SSDPN1212H | CSTA-NO3 | - | - | - | T-9F |
| SSDCN1616H09 | CSTB-3.5L | DTS5-3.5 | SSS32 | P-3.5 | T-15F |
| SSDPN1616H | CSTA-NO5 | - | - | - | T-9F |

## SRDCN

Screw-on toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| SRDCN2020K06 | 20 | 20 | 125 | 12 | 20 | 13 | RC*T0602... |
| SRDCN2020K08 | 20 | 20 | 125 | 16 | 20 | 14 | RC*T0803... |
| SRDCN2020K10 | 20 | 20 | 125 | 20.3 | 25 | 15 | RC*T1003... |
| SRDCN2525M06 | 25 | 25 | 150 | 12 | 25 | 15.5 | RC*T0602... |
| SRDCN2525M08 | 25 | 25 | 150 | 16 | 25 | 16.5 | RC*T0803... |
| SRDCN2525M10 | 25 | 25 | 150 | 20.3 | 25 | 17.5 | RC*T1003... |

### SPARE PARTS

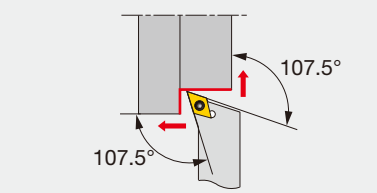
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SRDCN2020K06 | CSTB-2.5 | - | - | - | T-8F |
| SRDCN2020K08 | CSTB-3 | - | - | - | T-9F |
| SRDCN2020K10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |
| SRDCN2525M06 | CSTB-2.5 | - | - | - | T-8F |
| SRDCN2525M08 | CSTB-3 | - | - | - | T-9F |
| SRDCN2525M10 | CSTB-3.5L | DTS5-3.5 | SSR32 | P-3.5 | T-15F |

SSDC/PN: Inserts → **B127, E100**

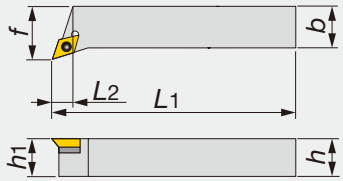
SRDCN: Inserts → **B124 -**

## SDQCR/L

Screw-on clamp toolholder with 107.5° approach angle, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SDQCR/L2020K11 | 20 | 20 | 125 | 20.5 | 20 | 25 | 0.8 | DC**11T3... |
| SDQCR2525M11 | 25 | 25 | 150 | 21.5 | 25 | 32 | 0.8 | DC**11T3... |

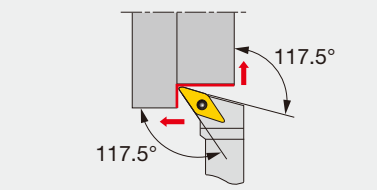
**rε: Standard corner radius

### SPARE PARTS

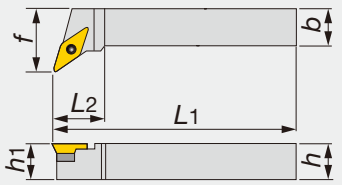
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SDQCR/L... | CSTB-3.5L | DTS5-3.5 | SSD32 | P-3.5 | T-15F |

## SVQCR/L

Screw-on clamp toolholder with 117.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVQCR/L2020K16 | 20 | 20 | 125 | 35 | 20 | 27 | 0.8 | VC**1604... |
| SVQCR/L2525M16 | 25 | 25 | 150 | 35 | 25 | 32 | 0.8 | VC**1604... |

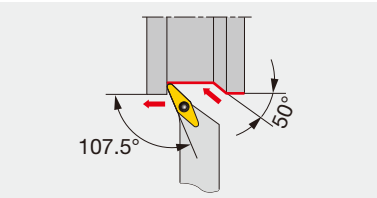
**rε: Standard corner radius

### SPARE PARTS

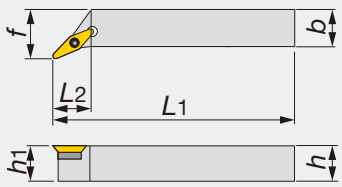
| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVQCR/L... | CSTB-3.5L | DTS5-3.5 | SSV32 | P-3.5 | T-15F |

## SVHCR/L

Screw-on clamp toolholder with 107.5° approach angle, for positive 35° rhombic inserts




Cutting edge style **H**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| SVHCR/L2525M22 | 25 | 25 | 150 | 33.8 | 25 | 32 | 0.8 | VCG*2205... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SVHCR/L2525M22 | CSTB-4.5L110P | DTS6-4.5 | SSV42 | P-4.5 | T-15F |

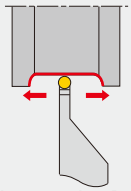
SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

SVQCR/L: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

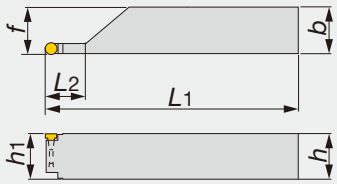
SVHCR/L: Inserts → **B148**

## TRACN

Taper-lock toolholder with 91° approach angle, for RT type tapered round inserts



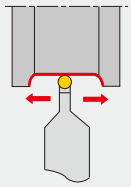
Cutting edge style **A**



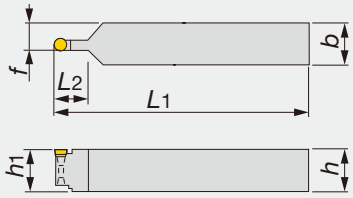

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TRACN2020K05 | 20 | 20 | 125 | 20 | 20 | 20.3 | RT05 |
| TRACN2020K06 | 20 | 20 | 125 | 22 | 20 | 20.4 | RT06 |
| TRACN2525M05 | 25 | 25 | 150 | 20 | 25 | 25.3 | RT05 |
| TRACN2525M06 | 25 | 25 | 150 | 22 | 25 | 25.4 | RT06 |
| TRACN2525M08 | 25 | 25 | 150 | 25 | 25 | 25.5 | RT08 |

## TRDCN

Taper-lock toolholder with 45° approach angle, for RT type tapered round inserts



Cutting edge style **D**

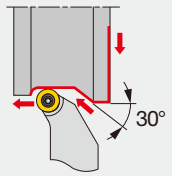



| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TRDCN2020K05 | 20 | 20 | 125 | 20 | 20 | 12.5 | RT05 |
| TRDCN2525M05 | 25 | 25 | 150 | 20 | 25 | 15 | RT05 |
| TRDCN2525M06 | 25 | 25 | 150 | 22 | 25 | 15.5 | RT06 |

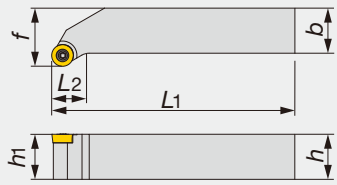
TRACN, TRDCN: Inserts → **B125**

# FIXRTURN
## SRGCR/L

Screw-on toolholder with 91° approach angle, for positive round inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|
| SRGCR/L2525M12-6F | 25 | 25 | 150 | 18.6 | 25 | 32 | RCMT1204M0-6RS/-6RM | 3 |

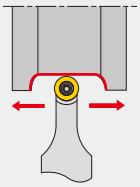
*Torque: Recommended torque (N·m) for clamping

### SPARE PARTS

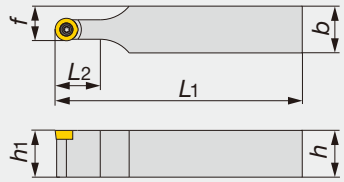
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| SRGCR/L2525M12-6F | CSTB-4 | M-1000 | T-15F |

# FIXRTURN
## SRDCN

Screw-on toolholder with 45° approach angle, for positive round inserts



Cutting edge style **D**




| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|
| SRDCN2525M12-6F | 25 | 25 | 150 | 24.1 | 25 | 18.5 | RCMT1204M0-6RS/-6RM | 3 |

*Torque: Recommended torque (N·m) for clamping

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| SRDCN2525M12-6F | CSTB-4 | M-1000 | T-15F |

## INSERT

### RCMT

6RS

6RM

| Designation | Coated | | Cermet | *ød* | s | *ød*1 |
|---|---|---|---|---|---|---|
| | T9115 | T9125 | NS9530 | | | |
| RCMT1204M0-6RS | ● | ● | ● | 12 | 4.76 | 5.16 |
| RCMT1204M0-6RM | ● | ● | ● | 12 | 4.76 | 5.16 |

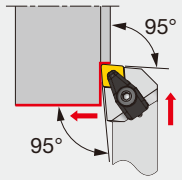
● : Line up

## STANDARD CUTTING CONDITIONS

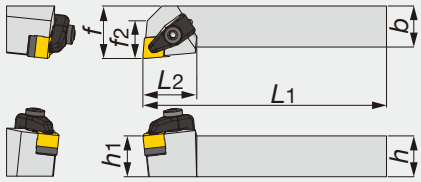
| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|
| P | Steels<br>S45C, SCM415, etc.<br>C45, 18CrMo4, etc. | 6RS | T9115 | 150 - 300 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RS | T9125 | 120 - 250 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RS | NS9530 | 150 - 250 | 0.5 - 2.0 | 0.5 - 1.0 |
| | | 6RM | T9115 | 150 - 300 | 1.0 - 3.0 | 0.5 - 1.0 |
| | | 6RM | T9125 | 120 - 250 | 1.0 - 3.0 | 0.5 - 1.0 |
| | | 6RM | NS9530 | 150 - 250 | 1.0 - 3.0 | 0.5 - 1.0 |

# DIMPLEFX
## CCLNR/L-RD

Double clamp toolholder for ceramic insert with dimple, 95° approach angle, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| CCLNR/L2525M1207-RD | 25 | 25 | 150 | 33 | 25 | 32 | 23 | 1.2 | CN*D1207... | 4 |
| CCLNR3225P1207-RD | 32 | 25 | 170 | 33 | 32 | 32 | 23 | 1.2 | CN*D1207... | 4 |

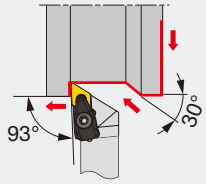
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

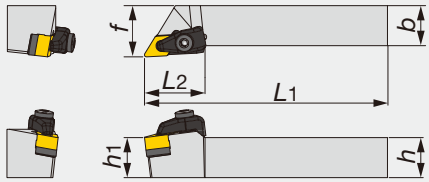
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CCLNR/L**-RD | CCP4-A | CCS4-A | CC44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

# DIMPLEFX
## CDJNR/L-RD

Double clamp toolholder for ceramic insert with dimple, 93° approach angle, for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CDJNR/L2525M1507-RD | 25 | 25 | 150 | 38 | 25 | 32 | 1.2 | DN*D1507... | 4 |
| CDJNR3225P1507-RD | 32 | 25 | 170 | 38 | 32 | 32 | 1.2 | DN*D1507... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

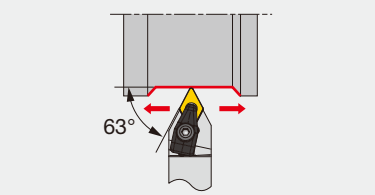
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CDJNR/L**-RD | CCP4-A | CCS4-A | CD44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

CCLNR/L-RD: Inserts → **B060**, Standard cutting conditions → **B256**

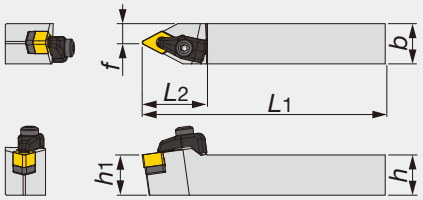
CDJNR/L-RD: Inserts → **B069**, Standard cutting conditions → **B256**

## DIMPLEFX
### CDNNN-RD

Double clamp toolholder for ceramic insert with dimple, 63° approach angle, for negative 55° rhombic inserts




Cutting edge style **N**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CDNNN2525M1507-RD | 25 | 25 | 150 | 40 | 25 | 12.5 | 1.2 | DN*D1507... | 4 |

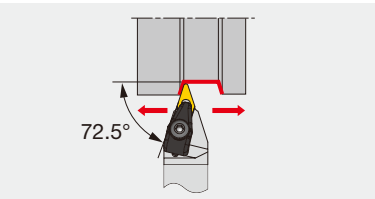
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

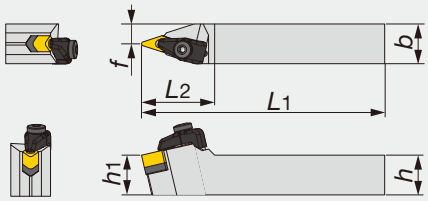
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CDNNN2525M1507-RD | CCP4-A | CCS4-A | CD44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

## DIMPLEFX
### CVVNN-RD

Double clamp toolholder for ceramic insert with dimple, 72.5° approach angle, for negative 35° rhombic inserts




Cutting edge style **V**




| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CVVNN2525M1607-RD | 25 | 25 | 150 | 46 | 25 | 12.5 | 1.2 | VN*D160712 | 4 |

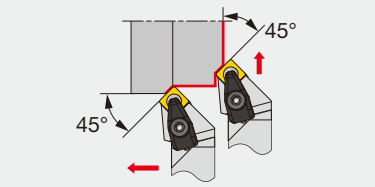
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

**SPARE PARTS**

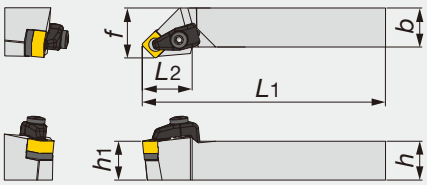
| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CVVNN2525M1607-RD | CCP4-A | CCS4-A | CV34-A | BH-4-10-A | BP-5-A | P-3 | P-4 |

## DIMPLEFX
### CSSNR/L-RD

Double clamp toolholder for ceramic insert with dimple, 45° approach angle, for negative square inserts




Cutting edge style **S**




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CSSNR/L2525M1207-RD | 25 | 25 | 150 | 32 | 25 | 32 | 1.2 | SN*D1207... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

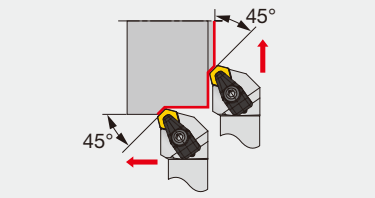
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CSSNR/L2525M1207-RD | CCP4-A | CCS4-A | CS44-A | BH5-10-A | BP-5-A | P-3 | P-4 |

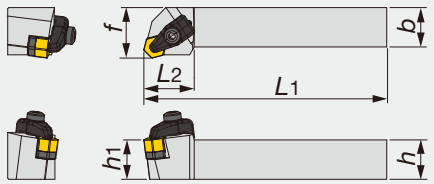
CDNNN-RD: Inserts → **B069**, CVVNN-RD: Inserts → **B094**, CSSNR/L-RD: Inserts → **B079**
Standard cutting conditions → **B256**

# DIMPLEFX
## CHSNR-RD

Double clamp toolholder for ceramic insert with dimple, 45° approach angle, for negative hexagonal inserts




Cutting edge style **S**




Right hand (R) shown.

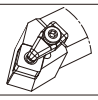
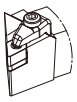
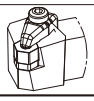
| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| CHSNR2525M0507-RD | 25 | 25 | 150 | 32 | 25 | 32 | 1.2 | HN*D0507... | 4 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

SPARE PARTS

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| CHSNR2525M0507-RD | CCP4-A | CCS4-A | CH44-A | BH-40050-A | BP-5-A | P-3 | P-4 |

## Parts for C-type

| Toolholders Designation | Applicable Insert Designation | | Clamp | Clamp screw | Shim | Shim screw | Spring | Wrench |
|---|---|---|---|---|---|---|---|---|
| CCLNR2525M1207-RD | CNGD1207□□ | | CCP4-A | CCS4-A | CC44-A | BH5-10-A | BP-5-A | P-4 P-3 |
| CCLNL2525M1207-RD | | | | | | | | |
| CCLNR3225P1207-RD | | | | | | | | |
| CSSNR2525M1207-RD | SNGD1207□□ |  | | | CS44-A | | | |
| CSSNL2525M1207-RD | | | | | | | | |
| CDJNR2525M1507-RD | DNGD1507□□ |  | | | CD44-A | | | |
| CDJNL2525M1507-RD | | | | | | | | |
| CDJNR3225P1507-RD | | | | | | | | |
| CDNNN2525M1507-RD | DNGD1507□□ | | | | | | | |
| CVVNN2525M1607-RD | VNGD160712 | | | | CV34-A | BH-4-10-A | | |
| CHSNR2525M0507-RD | HNGD0507□□ |  | | | CH44-A | BH-40050-A | | |

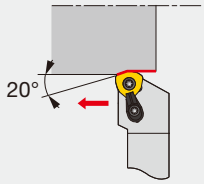
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| K | Grey cast irons | FX105 | 700 (300 - 1000) | 1 (0.05 - 3) | 0.3 (0.05 - 0.6) |
| | Ductile cast irons | FX105 | 200 (100 - 300) | 1 (0.05 - 3) | 0.2 (0.05 - 0.4) |

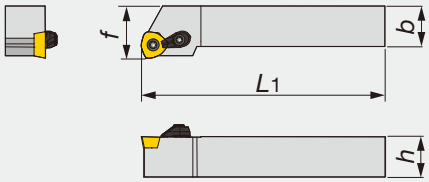
CHSNR-RD: Inserts → **B103**

# TURNFEED
## XWXPR/L

Double clamping toolholder with 20° approach angle for roughing operation with positive trigon inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *f* | Insert |
|---|---|---|---|---|---|
| XWXPR/L2525M09 | 25 | 25 | 150 | 32 | WPMT090725ZPR/L-ML |
| XWXPR/L3232P09 | 32 | 32 | 170 | 40 | WPMT090725ZPR/L-ML |
| XWXPR/L4040S09 | 40 | 40 | 250 | 50 | WPMT090725ZPR/L-ML |

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| XWXPR/L... | CSY-20 | CSPB-5 | IP-20T |

Note: Care should be taken not to confuse the hand of inserts to be used.

## INSERT

### WPMT09-ML

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

**Trigon, 80° with hole Positive 11°**

| | | Coated | | |
|---|---|---|---|---|
| | | T9115 | T9125 | AH120 |
| P | Steel | ●◐ | ◐✠ | ●◐ |
| M | Stainless | | | ●◐ |
| K | Cast iron | ●◐ | | ●◐ |
| N | Non-ferrous | | | |
| S | Superalloys | | | ●◐ |
| H | Hard materials | | | |

| Application | Chipbreaker | Designation | Corner radius | T9115 | T9125 | AH120 |
|---|---|---|---|---|---|---|
| Heavy | ML | WPMT090725ZPR-ML | 2.5 | ● | ● | ● |
| | | WPMT090725ZPL-ML | 2.5 | ● | ● | ● |

● : Line up

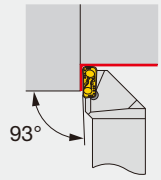
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Chipbreaker | Cutting speed: *Vc* (m/min) | Depth of cut: *ap* (mm) | Feed: *f* (mm/rev) |
|---|---|---|---|---|---|---|
| P | Mild and low carbon steels<br>SS400, S25C, etc.<br>E275A, C15E4, etc. < 180 HB | T9125 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| | Carbon and alloy steels<br>S50C, SCM440, etc.<br>C55, 42CrMo4, etc. < 300HB | T9115 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. < 250 HB | T9125 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |
| K | Grey and ductile cast irons<br>FC250, FCD400, etc.<br>250, 400-15S, etc. | AH120 | ML | 150 (100 - 250) | 0.5 - 2.5 | 1.5 (0.5 - 2.5) |

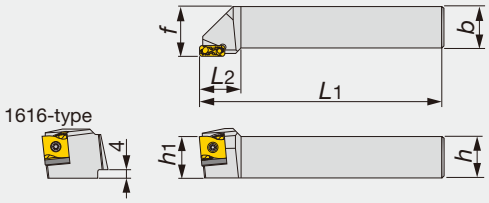
Note: When the side cutting edge is used for facing, the maximum feed is limited to within 1.0 mm/rev.

# TURNTEC
## TLANR/L

Screw-on clamp toolholder for roughing operation with 93° approach angle, for negative tangential inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLANR/L1616H12 | 16 | 16 | 100 | 20 | 16 | 20 | LNMX1204**R/L... |
| TLANR/L1616M12S | 16 | 16 | 150 | 20 | 16 | 20 | LNMX1204**R/L... |
| TLANR/L2020K12 | 20 | 20 | 125 | 20 | 20 | 25 | LNMX1204**R/L... |
| TLANR/L2020K16 | 20 | 20 | 125 | 25 | 20 | 25 | LNMX1606**R/L... |
| TLANR/L2525M12 | 25 | 25 | 150 | 20 | 25 | 30 | LNMX1204**R/L... |
| TLANR/L2525M16 | 25 | 25 | 150 | 25 | 25 | 30 | LNMX1606**R/L... |
| TLANR/L3232P16 | 32 | 32 | 170 | 35 | 32 | 37 | LNMX1606**R/L... |
| TLANR/L3232P24 | 32 | 32 | 170 | 35 | 32 | 38 | LNMX2410**R/L... |
| TLANR/L4040R16 | 40 | 40 | 200 | 35 | 40 | 47 | LNMX1606**R/L... |
| TLANR/L4040R24 | 40 | 40 | 200 | 40 | 40 | 47 | LNMX2410**R/L... |
| TLANR/L5050S24 | 50 | 50 | 250 | 40 | 50 | 57 | LNMX2410**R/L... |

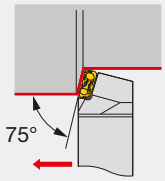
## SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Spring | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| TLANR1616H12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL1616H12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR1616M12S | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL1616M12S | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2020K12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL2020K12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2020K16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL2020K16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR2525M12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12R | - | KEYV-T10 | T-6F-S |
| TLANL2525M12 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L | - | KEYV-T10 | T-6F-S |
| TLANR2525M16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL2525M16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR3232P16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL3232P16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR3232P24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL3232P24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |
| TLANR4040R16 | CSTB-4L115-S | - | TSL16R | PSP-16 | KEYV-T15 | - |
| TLANL4040R16 | CSTB-4L115-S | - | TSL16L | PSP-16 | KEYV-T15 | - |
| TLANR4040R24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL4040R24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |
| TLANR5050S24 | CSTB-5L163-S | - | TSL24R | SP 16-L14 | KEYV-T20 | - |
| TLANL5050S24 | CSTB-5L163-S | - | TSL24L | SP 16-L14 | KEYV-T20 | - |

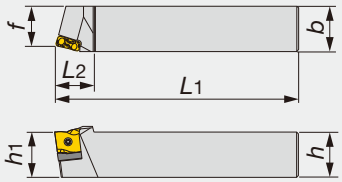
TLANR/L: Inserts → **B260**, Standard cutting conditions → **B261**

# TURNTEC
## TLBNR/L

Screw-on clamp toolholder for roughing operation with 75° approach angle, for negative tangential inserts




Cutting edge style **B**




Right hand (R) shown.

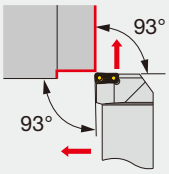
| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLBNR/L4040R24 | 40 | 40 | 200 | 35 | 40 | 35 | LNMX2410**R/L... |

### SPARE PARTS

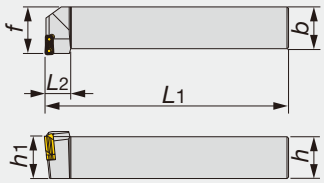
| Designation | Clamping screw | Shim | Spring pin | Wrench |
|---|---|---|---|---|
| TLBNR4040R24 | CSTB-5L163-S | TSL24R | PSP-16 | KEYV-T20 |
| TLBNL4040R24 | CSTB-5L163-S | TSL24L | PSP-16 | KEYV-T20 |

# TURNTEC
## TLFNR/L

Screw-on clamp toolholder for roughing operation with 93° approach angle, for negative tangential inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | Insert |
|---|---|---|---|---|---|---|---|
| TLFNR/L2525M16 | 25 | 25 | 150 | 20 | 25 | 30 | LNMX1606**L/R... |
| TLFNR/L3232P16 | 32 | 32 | 170 | 20 | 32 | 37 | LNMX1606**L/R... |

Note: The right hand insert (R) is used for the left hand toolholders (TLFNL** type), and the left hand insert (L) is used for the right hand toolholders (TLFNR** type).

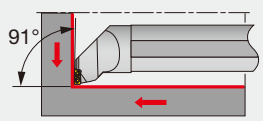
### SPARE PARTS

| Designation | Clamping screw | Shim | Spring pin | Wrench |
|---|---|---|---|---|
| TLFNR2525M16 | CSTB-4L115-S | TSL16L | PSP-16 | KEYV-T15 |
| TLFNL2525M16 | CSTB-4L115-S | TSL16R | PSP-16 | KEYV-T15 |
| TLFNR3232P16 | CSTB-4L115-S | TSL16L | PSP-16 | KEYV-T15 |
| TLFNL3232P16 | CSTB-4L115-S | TSL16R | PSP-16 | KEYV-T15 |

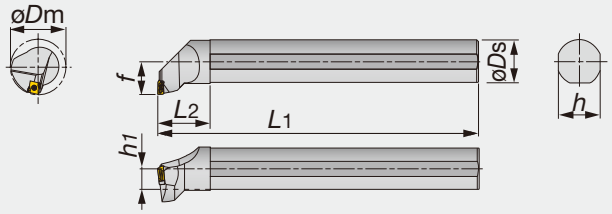
TLBNR/L, TLFNR/L: Inserts → **B260**, Standard cutting conditions → **B261**

# TURNTEC
## S-TLANR/L

Screw-on clamp toolholder for roughing operation with 91° approach angle, for negative tangential inserts




Cutting edge style **A**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | h1 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S25T-TLANR/L12-D530 | Steel | 53 | 25 | 17 | 300 | 40 | 23 | 11.5 | LNMX1204**L/R... |
| S32U-TLANR/L12-D530 | Steel | 53 | 32 | 22 | 350 | 45 | 30 | 15 | LNMX1204**L/R... |
| S40V-TLANR/L12-D530 | Steel | 53 | 40 | 27 | 400 | 53 | 37 | 18.5 | LNMX1204**L/R... |
| S50U-TLANR/L16-D850 | Steel | 85 | 50 | 37 | 350 | 63 | 47 | 23.5 | LNMX1606**L/R... |

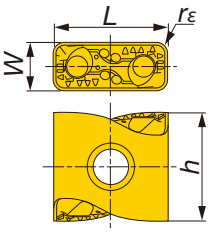
Note: The right hand insert (R) is used for the left hand toolholders (TLANL** type), and the left hand insert (L) is used for the right hand toolholders (TLANR** type).

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Spring pin | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| S**-TLANR/L12-D530 | CSTB-3.5L115-S | CSTF-2L055-S | TSL12L/RI | - | KEYV-T10 | T-6F-S |
| S50U-TLANR16-D850 | CSTB-4L115-S | - | TSL16LI | PSP-16 | KEYV-T15 | - |
| S50U-TLANL16-D850 | CSTB-4L115-S | - | TSL16RI | PSP-16 | KEYV-T15 | - |

## INSERT

### LNMX12/16/24




| Designation | rε | Coated T9115 R | Coated T9115 L | Coated T9125 R | Coated T9125 L | Coated AH725 R | Coated AH725 L | W | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| LNMX120408R/L-TDR | 0.8 | ● | ● | ● | ● | | | 4.8 | 12 | 11.6 |
| LNMX120412R/L-TDR | 1.2 | ● | ● | ● | ● | | | 4.8 | 12 | 11.6 |
| LNMX160608R/L-TDR | 0.8 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-TDR | 1.2 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160616R/L-TDR | 1.6 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX241016R/L-TDR | 1.6 | ● | ● | ● | ● | | | 9.4 | 24 | 20.5 |
| LNMX241024R/L-TDR | 2.4 | ● | ● | ● | ● | | | 9.4 | 24 | 20.5 |
| LNMX160608R/L-MDR | 0.8 | ● | ● | | | ● | ● | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-MDR | 1.2 | ● | ● | | | ● | ● | 6.4 | 16.2 | 13.5 |
| LNMX160608R/L-TWR | 0.8 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |
| LNMX160612R/L-TWR | 1.2 | ● | ● | ● | ● | | | 6.4 | 16.2 | 13.5 |

● : Line up

Standard cutting conditions → **B261**

# STANDARD CUTTING CONDITIONS

## LNMX1204

*** Values in red shows the condition for facing**

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 |
| P | Steels<br>S45C, SCM415, etc.<br>C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9,<br>X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 2.2 | 0.8 - 5<br>0.8 - 2.2 | 0.15 - 0.6 | 0.25 - 0.8 |

## LNMX1606

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 0.8 | $r_\varepsilon$ : 1.2 | $r_\varepsilon$ : 1.6 |
| P | Steels<br>S45C, SCM415, etc.<br>C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TWR | T9115 | 120 - 250 | 1 - 8<br>1 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| | | TWR | T9125 | 80 - 180 | 1 - 8<br>1 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9,<br>X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | TDR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | 1 - 8<br>1 - 3.2 | 0.15 - 0.6 | 0.25 - 0.8 | 0.3 - 1 |
| | | MDR | T9115 | 100 - 150 | 1.5 - 6<br>0.5 - 3.2 | 1.5 - 7<br>0.8 - 3.2 | - | 0.1 - 0.5 | 0.15 - 0.7 | - |
| | | MDR | AH725 | 50 - 150 | 1.5 - 6<br>0.5 - 3.2 | 1.5 - 7<br>0.8 - 3.2 | - | 0.1 - 0.5 | 0.15 - 0.7 | - |
| | | TWR | T9115 | 100 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |
| | | TWR | T9125 | 80 - 180 | 0.5 - 5<br>0.5 - 3.2 | 0.8 - 6<br>0.8 - 3.2 | - | 0.15 - 0.6 | 0.25 - 0.8 | - |

## LNMX2410

| ISO | Workpiece material | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Depth of cut: *ap* (mm) | | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 2.4 | $r_\varepsilon$ : 1.6 | $r_\varepsilon$ : 2.4 |
| P | Steels<br>S45C, SCM415, etc.<br>C45, 18CrMo4, etc. | TDR | T9115 | 120 - 250 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| | | TDR | T9125 | 80 - 150 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9,<br>X5CrNiMo17-12-2, etc. | TDR | T9115 | 100 - 180 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |
| | | TDR | T9125 | 80 - 150 | 4 - 15<br>1 - 4.5 | 5 - 15<br>1 - 4.5 | 0.3 - 1 | 0.3 - 1.1 |

# TurnLine - Internal Toolholder

## MINIFORCE TURN

B268

Economical double-sided inserts with excellent sharpness

Shank ø10 - 20 mm

## ISOECO TURN

B274

Small-sized “Eco” insert series for maximized profits

Shank ø16 - 32 mm

## STREAMJETBAR

B278

Highly rigid toolholders providing good chip evacuation

Shank ø4 - 50 mm

## TURNINGA

B297

Highly rigid clamping system with excellent repeatability

Shank ø25 - 50 mm

## Y-PRO SERIES

B300

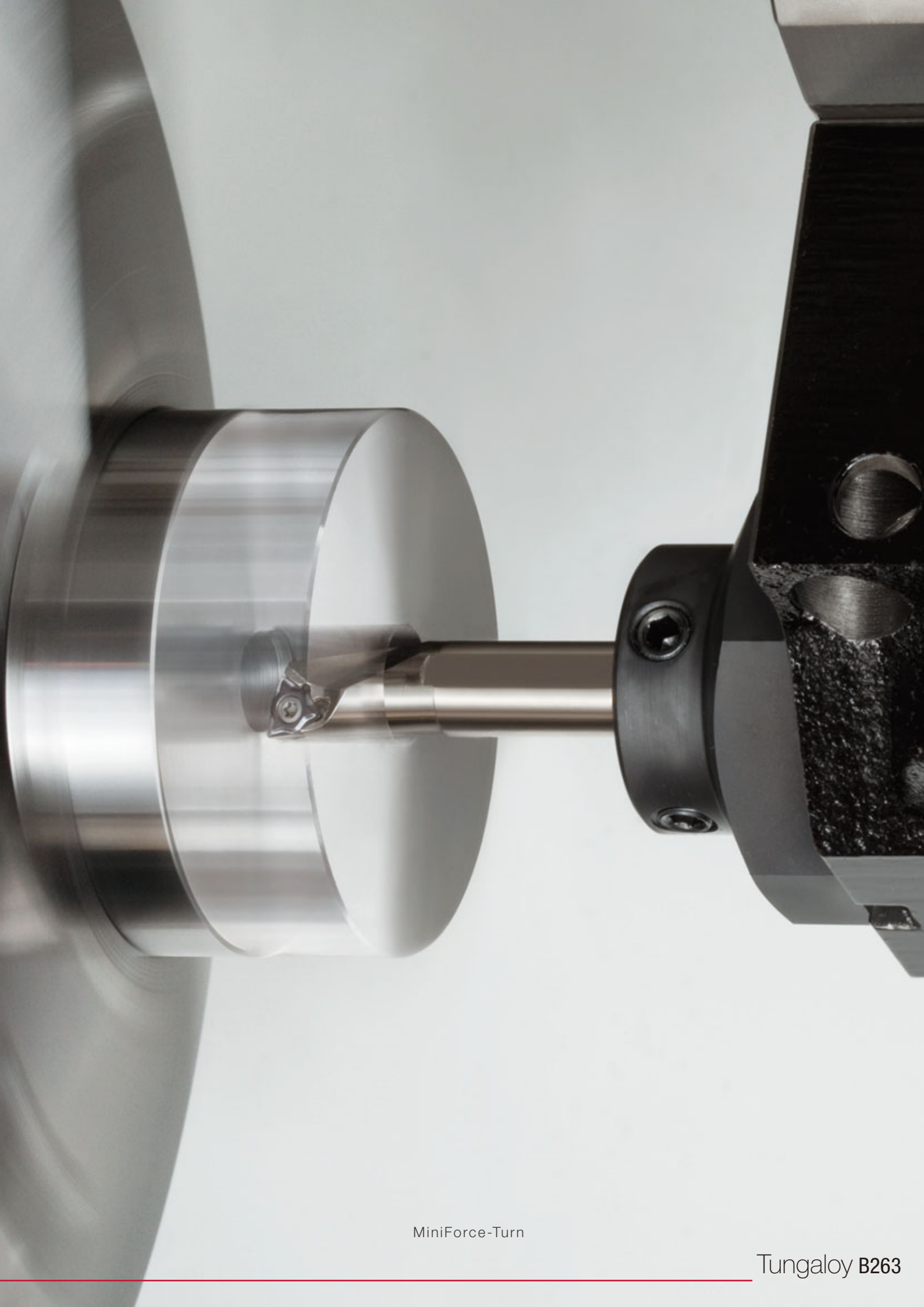
Inserts with 25° corner angle for profiling

Shank ø12 - 16 mm

## ISO-Turn Internal

B301

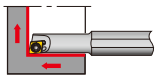
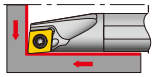
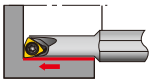
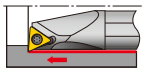
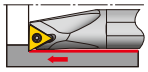
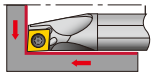
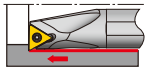
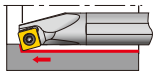
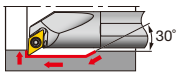
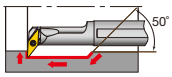
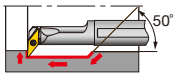
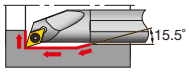
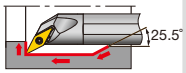
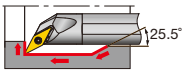
Toolholders for general internal turning

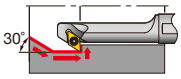
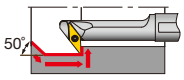
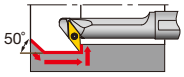
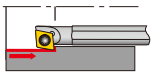
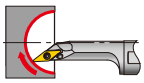
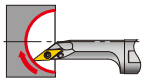
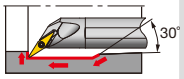
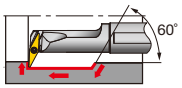


MiniForce-Turn

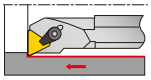
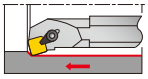
# Internal Toolholder - Quick Guide

## Positive type

| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|---|
|  | **SEXPR/L**<br>Boring & internal facing<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø8<br>ø4 - ø8 | ø4.5 – ø7<br>ø4.5 – ø7 | B279<br>B281 |
|  | **SCLCR/L**<br>Boring & internal facing<br>Insert type: CC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø4 - ø25<br>ø4 - ø25<br>ø12 - ø25 | ø5 – ø27<br>ø5 – ø27<br>ø16 – ø32 | B278<br>B301 |
|  | **SWUBR/L**<br>Boring<br>Insert type: WB□□ | ✓ | | Steel<br>Carbide | ø5 - ø8<br>ø5 - ø8 | ø6 – ø8<br>ø6 – ø8 | B286 |
|  | **STUPR/L**<br>Boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø7 - ø32<br>ø7 - ø25<br>ø12 - ø25 | ø8 – ø34<br>ø8 – ø27<br>ø14 – ø31 | B285<br>B302 |
|  | **STFPR/L**<br>Blind hole boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø20 | ø10 – ø27<br>ø10 – ø22 | B284 |
|  | **SCLPR/L**<br>Boring & internal facing<br>Insert type: CP□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø8 - ø25<br>ø8 - ø16<br>ø12 - ø25 | ø10 – ø27<br>ø10 – ø20<br>ø14 – ø32 | B280<br>B301 |
|  | **STFCR/L**<br>Blind hole boring<br>Insert type: TC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø12 – ø18<br>ø12 – ø18 | B283 |
|  | **SSKPR/L**<br>Through boring<br>Insert type: SP□□ | ✓ | | Steel | ø16 - ø25 | ø20 – ø31 | B282 |
|   | **SDUCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 – ø32<br>ø13 – ø27 | B287 |
|   | **SVUCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø12 - ø25<br>ø12 - ø25<br>ø25 | ø16 – ø32<br>ø18 – ø32<br>ø32 | B288<br>B303 |
|   | **SVUBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø16 - ø25<br>ø16 - ø25<br>ø20 | ø20 – ø32<br>ø24.5 – ø34<br>ø25 | B287<br>B303 |
|   | **SDQCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø10 - ø25<br>ø10 - ø20<br>ø16 - ø25 | ø13 – ø30<br>ø13 – ø25<br>ø20 – ø32 | B288<br>B303 |
|   | **SVQCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø10 - ø16<br>ø10 - ø16<br>ø25 | ø13.5 – ø21.5<br>ø13.5 – ø21.5<br>ø32 | B289<br>B304 |
|   | **SVQBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide<br>Reinforced | ø12 - ø25<br>ø12 - ø25<br>ø20 | ø17 – ø30.5<br>ø17 – ø30.5<br>ø25 | B289<br>B304 |

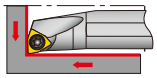
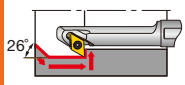
| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|---|
|  | **SDZCR/L**<br>Internal retracting<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø16 | ø14 – ø25<br>ø18 – ø22 | B290 |
|  | **SVZCR/L**<br>Internal retracting<br>Insert type: VC□□ | ✓ | | Steel | ø12 | ø16 | B291 |
|  | **SVZBR/L**<br>Internal retracting<br>Insert type: VB□□ | ✓ | | Steel | ø16 - ø32 | ø20 – ø40 | B291 |
|  | **SEZPR/L**<br>Internal retracting<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø5<br>ø4 - ø5 | ø5.5 – ø6.5<br>ø5.5 – ø6.5 | B292 |
|  | **SVJCR/L**<br>Internal sphere cutting<br>Insert type: VC□□ | ✓ | | Steel | ø12 - ø16 | ø16 – ø20 | B282 |
|  | **SVJBR/L**<br>Internal sphere cutting<br>Insert type: VB□□ | ✓ | | Steel | ø20 - ø25 | ø25 – ø30 | B282 |
|  | **SYQBR/L**<br>Internal undercut & profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø12 - ø16<br>ø12 - ø16 | ø17 – ø21.5<br>ø17 – ø21.5 | B300 |
|  | **SYUBR/L**<br>Boring & internal profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø16<br>ø12 - ø16 | ø20<br>ø20 – ø24.5 | B300 |

## Clamp-on

| Style | Description & Aplication | ISO insert | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|
|  | **CTFPR/L**<br>Blind hole boring<br>Insert type: TP□□ (Without hole) | ✓ | Steel<br>Carbide | ø12 - ø32<br>ø12 - ø16 | ø16 – ø40<br>ø16 – ø20 | B305 |
|  | **CSKPR/L**<br>Through boring<br>Insert type: SP□□ (Without hole) | ✓ | Steel | ø16 - ø25 | ø20 – ø32 | B305 |

# Internal Toolholder - Quick Guide

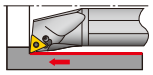
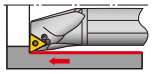
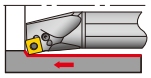
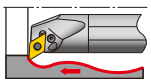
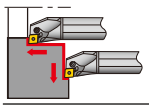
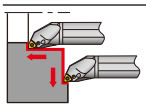
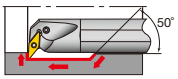
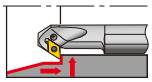
## MiniForce-Turn - Double-sided insert with positive cutting edges

| Style | MiniForce-Turn Description & Application | MiniForce -Turn | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|
|  | **SWLXR/L**<br>Boring & facing<br>Insert type: WXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø12 – ø22<br>ø12 – ø22 | B268 |
| | **SDXXR/L**<br>Internal profiling<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø13 – ø24<br>ø13 – ø24 | B268 |
|   | **SDZXR/L**<br>Internal retracting<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø12 - ø20<br>ø12 - ø16 | ø14 – ø20<br>ø18 – ø22 | B269 |

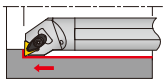
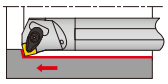
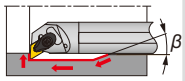
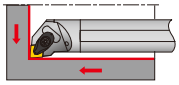
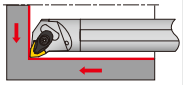
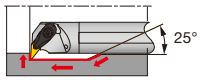
# Internal Toolholder - Quick Guide

## Negative type

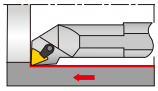
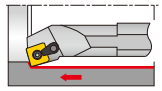
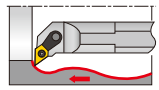
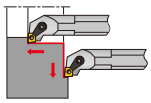
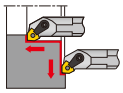
### Lever-lock

| Style | StreamJet-Bar Description & Application | ISO insert | ISO-EcoTurn | Shank Type | Shank Ø | Min. bore diameter (mm) (20 30 40 50 60 70) | |
|---|---|---|---|---|---|---|---|
|  | **PTUNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | ✓ | Steel<br>Reinforced | ø16 - ø32<br>ø16 - ø50 | ø20 – ø40<br>ø20 – ø63 | B277<br>B295<br>B309<br>B310 |
|  | **PTFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 – ø63 | B276<br>B294<br>B308 |
|  | **PSKNR/L**<br>Through boring<br>Insert type: SN□□ | ✓ | | Steel | ø32 - ø50 | ø40 – ø63 | B293<br>B307 |
|  | **PDUNR/L**<br>Internal profiling<br>Insert type: DN□□ | ✓ | ✓ | Steel<br>Reinforced | ø20 - ø50<br>ø32 - ø50 | ø25 – ø63<br>ø40 – ø63 | B276<br>B295<br>B308<br>B309<br>B317 |
|  | **PCLNR/L**<br>Boring & internal facing<br>Insert type: CN□□, GN□□ | ✓ | ✓ | Steel<br>Reinforced | ø16 - ø50<br>ø16 - ø50 | ø20 – ø63<br>ø20 – ø63 | B274<br>B292<br>B306<br>B317 |
|  | **PWLNR/L**<br>Boring & facing<br>Insert type: WN□□ | ✓ | ✓ | Steel | ø16 - ø40 | ø20 – ø50 | B275<br>B293<br>B307 |
|   | **PVUNR/L**<br>Boring & internal profiling<br>Insert type: VN□□ | ✓ | ✓ | Steel | ø25 - ø40 | ø32 – ø50 | B277<br>B296 |
|  | **PDZNR/L**<br>Internal retracting<br>Insert type: DN□□ | ✓ | | Steel | ø32 - ø50 | ø40 – ø63 | B296<br>B310 |

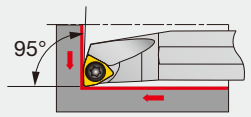
## Double-clamp

| Style | Turning A<br>Description & Application | ISO insert | ISO-EcoTurn | Shank Type | Shank Ø | Min. bore diameter (mm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | 20 30 40 50 60 70 | |
|  | **ATFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | | Steel | ø25 - ø32 | ø32 ø40 | B298 |
|  | **ASKNR/L**<br>Boring<br>Insert type: SN□□ | ✓ | | Steel | ø25 - ø32 | ø32 ø40 | B298 |
|  | **ADUNR/L**<br>Boring & internal profiling<br>Insert type: DN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B276<br>B299 |
|  | **ACLNR/L**<br>Boring & internal facing<br>Insert type: CN□□, GN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B274<br>B297 |
|  | **AWLNR/L**<br>Boring & internal facing<br>Insert type: WN□□ | ✓ | ✓ | Steel | ø25 - ø50 | ø32 ø63 | B275<br>B297 |
|  | **AVUNR/L**<br>Boring & internal profiling<br>Insert type: VN□□ | ✓ | | Steel | ø32 - ø40 | ø40 ø50 | B299 |

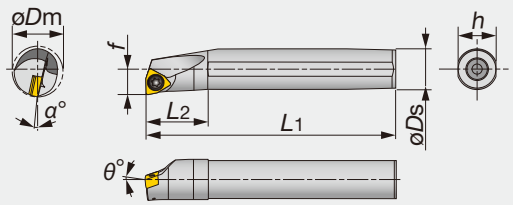
## Multi-clamp

| Style | Description & Application | ISO insert | Shank Type | Shank Ø | Min. bore diameter (mm) | |
|---|---|---|---|---|---|---|
| | | | | | 20 30 40 50 60 70 | |
|  | **MTFNR/L**<br>Boring<br>Insert type: TN□□ | ✓ | Steel | ø25 | ø32 | B312 |
|  | **MSKNR/L**<br>Through boring<br>Insert type: SN□□ | ✓ | Steel | ø25 | ø32 | B312 |
|  | **MDUNR/L**<br>Boring & internal profiling<br>Insert type: DN□□ | ✓ | Steel | ø25 | ø32 | B313 |
|  | **MCLNR/L**<br>Boring & internal facing<br>Insert type: CN□□, GN□□ | ✓ | Steel | ø25 | ø32 | B311 |
|  | **MWLNR/L**<br>Boring & internal facing<br>Insert type: WN□□ | ✓ | Steel | ø25 - ø50 | ø32 ø70 | B311 |

# MINIFORCE TURN
## A/E-SWLXR/L
For trigon insert with 6 edges




Cutting edge style **L**




Right hand (R) shown.

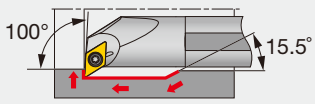
| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SWLXR/L04-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | -10 | -16 | 0.4 | WXGU0403**L/R... | 0.9 |
| A12M-SWLXR/L04-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | -10 | -14 | 0.4 | WXGU0403**L/R... | 0.9 |
| A16Q-SWLXR/L04-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | -10 | -11 | 0.4 | WXGU0403**L/R... | 0.9 |
| A20R-SWLXR/L04-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | -10 | -10 | 0.4 | WXGU0403**L/R... | 0.9 |
| E10M-SWLXR/L04-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | -10 | -16 | 0.4 | WXGU0403**L/R... | 0.9 |
| E12Q-SWLXR/L04-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | -10 | -14 | 0.4 | WXGU0403**L/R... | 0.9 |
| E16R-SWLXR/L04-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | -10 | -11 | 0.4 | WXGU0403**L/R... | 0.9 |
| E20S-SWLXR/L04-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | -10 | -10 | 0.4 | WXGU0403**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with left hand inserts (L) Left hand toolholders (L) are used with right hand inserts (R)

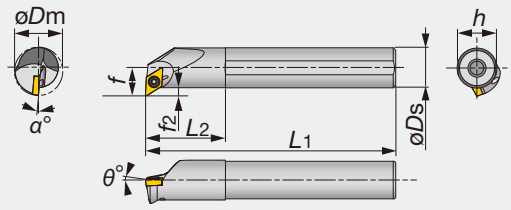
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SWLXR/L... | SR34-514 | T-7F |

# MINIFORCE TURN
## A/E-SDXXR/L
For 55° rhombic insert with 4 edges




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDXXR/L07-D130 | STEEL | 13 | 10 | 7.6 | 125 | 20 | 9 | 2.6 | -14 | -16 | 0.4 | DXGU0703**L/R... | 0.9 |
| A12M-SDXXR/L07-D160 | STEEL | 16 | 12 | 8.6 | 150 | 24 | 11 | 2.6 | -14 | -14 | 0.4 | DXGU0703**L/R... | 0.9 |
| A16Q-SDXXR/L07-D200 | STEEL | 20 | 16 | 10.6 | 180 | 32 | 15 | 2.6 | -13 | -13 | 0.4 | DXGU0703**L/R... | 0.9 |
| A20R-SDXXR/L07-D240 | STEEL | 24 | 20 | 12.6 | 200 | 36 | 18 | 2.6 | -13 | -12 | 0.4 | DXGU0703**L/R... | 0.9 |
| E10M-SDXXR/L07-D130 | CARBIDE | 13 | 10 | 7.6 | 150 | 25 | 9 | 2.6 | -14 | -16 | 0.4 | DXGU0703**L/R... | 0.9 |
| E12Q-SDXXR/L07-D160 | CARBIDE | 16 | 12 | 8.6 | 180 | 27 | 11 | 2.6 | -14 | -14 | 0.4 | DXGU0703**L/R... | 0.9 |
| E16R-SDXXR/L07-D200 | CARBIDE | 20 | 16 | 10.6 | 200 | 32 | 15 | 2.6 | -13 | -13 | 0.4 | DXGU0703**L/R... | 0.9 |
| E20S-SDXXR/L07-D240 | CARBIDE | 24 | 20 | 12.6 | 250 | 36 | 18 | 2.6 | -13 | -12 | 0.4 | DXGU0703**L/R... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with left hand inserts (L) Left hand toolholders (L) are used with right hand inserts (R)

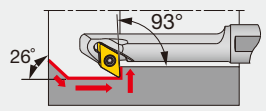
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SDXXR/L... | SR34-514 | T-7F |

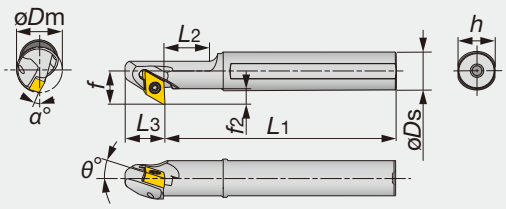
A/E-SWLXR/L: Inserts → **B270**, Standard cutting conditions → **B273**
A/E-SDXXR/L: Inserts → **B271 -**, Standard cutting conditions → **B273**

# A/E-SDZXR/L

For 55° rhombic insert with 4 edges




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SDZXR/L07-D140 | STEEL | 14 | 12 | 10.5 | 150 | 30 | 13 | 11 | 4.5 | -10 | -14 | 0.4 | DXGU0703**R/L... | 0.9 |
| A16Q-SDZXR/L07-D160 | STEEL | 16 | 16 | 12.5 | 180 | 35 | 13 | 15 | 4.5 | -10 | -12.5 | 0.4 | DXGU0703**R/L... | 0.9 |
| A20R-SDZXR/L07-D200 | STEEL | 20 | 20 | 14.5 | 200 | 40 | 13 | 18 | 4.5 | -10 | -10.5 | 0.4 | DXGU0703**R/L... | 0.9 |
| E12Q-SDZXR/L07-D180 | CARBIDE | 18 | 12 | 10.5 | 180 | - | 13 | 11 | 4.5 | -11 | -11 | 0.4 | DXGU0703**R/L... | 0.9 |
| E16R-SDZXR/L07-D220 | CARBIDE | 22 | 16 | 12.5 | 200 | - | 13 | 15 | 4.5 | -11 | -9 | 0.4 | DXGU0703**R/L... | 0.9 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: Right hand toolholders (R) are used with right hand inserts (R) Left hand toolholders (L) are used with left hand inserts (L)

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SDZXR/L... | SR34-514 | T-7F |

A/E-SDZXR/L: Inserts → **B271 -**, Standard cutting conditions → **B273**

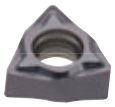
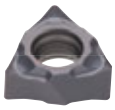
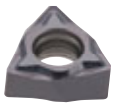
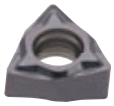
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT

### POSITIVE TYPE DOUBLE-SIDED

**Trigon, 80° with hole**

| | | AH725 | SH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | ●◐ | | | |
| K | Cast iron | ◐ | | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | | ● |
| S | Superalloys | ● | | | | ● |
| H | Hard materials | | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | KS05F (Uncoated) |
|---|---|---|---|---|---|---|---|---|
| Finishing to medium cutting (Sharp edge) | JTS  | WXGU040301MFR-JTS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JTS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JTS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JTS | <0.2* | | ● | | | |
| Finishing to medium cutting | JTS | WXGU040301MR-JTS | <0.1* | ● | | | | |
| | | WXGU040301ML-JTS | <0.1* | ● | | | | |
| | | WXGU040302MR-JTS | <0.2* | ● | | | | |
| | | WXGU040302ML-JTS | <0.2* | ● | | | | |
| Finishing (Low cutting force) (Sharp edge) | JSS  | WXGU040301MFR-JSS | <0.1* | | ● | | | |
| | | WXGU040301MFL-JSS | <0.1* | | ● | | | |
| | | WXGU040302MFR-JSS | <0.2* | | ● | | | |
| | | WXGU040302MFL-JSS | <0.2* | | ● | | | |
| Finishing (Low cutting force) | JSS | WXGU040301MR-JSS | <0.1* | ● | | | | |
| | | WXGU040301ML-JSS | <0.1* | ● | | | | |
| | | WXGU040302MR-JSS | <0.2* | ● | | | | |
| | | WXGU040302ML-JSS | <0.2* | ● | | | | |
| Finishing to medium cutting | TS  | WXGU040302R-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-TS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-TS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040308R-TS | 0.8 | ● | | ● | ● | ● |
| | | WXGU040308L-TS | 0.8 | ● | | ● | ● | ● |
| Finishing (Wiper) | TSW  | WXGU040304R-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040304L-TSW | 0.4 | ● | | ● | ● | |
| | | WXGU040308R-TSW | 0.8 | ● | | ● | ● | |
| | | WXGU040308L-TSW | 0.8 | ● | | ● | ● | |
| Finishing (Low cutting force) | SS | WXGU040302R-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040302L-SS | 0.2 | ● | | ● | ● | ● |
| | | WXGU040304R-SS | 0.4 | ● | | ● | ● | ● |
| | | WXGU040304L-SS | 0.4 | ● | | ● | ● | ● |

* Corner radius has minus tolerance

● : Line up

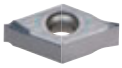
● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

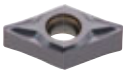
## POSITIVE TYPE DOUBLE-SIDED

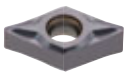
**Rhombic, 55° with hole**

| | | AH725 | SH725 |
|---|---|---|---|
| P | Steel | ◐ | ●◐ |
| M | Stainless | ◐ | ●◐ |
| K | Cast iron | ◐ | |
| N | Non-ferrous | | |
| S | Superalloys | ● | |
| H | Hard materials | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 (Coated) | SH725 (Coated) |
|---|---|---|---|---|---|
| Finishing (sharp edge) | JRP | DXGU070301MFRE-JRP | <0.1* | | ● |
| | | DXGU070301MFLE-JRP | <0.1* | | ● |
| | | DXGU070302MFRE-JRP | <0.2* | | ● |
| | | DXGU070302MFLE-JRP | <0.2* | | ● |
| Finishing to medium cutting(sharp edge) | JTS | DXGU070301MFR-JTS | <0.1* | | ● |
| | | DXGU070301MFL-JTS | <0.1* | | ● |
| | | DXGU070302MFR-JTS | <0.2* | | ● |
| | | DXGU070302MFL-JTS | <0.2* | | ● |
| Finishing to medium cutting | JTS | DXGU070301MR-JTS | <0.1* | ● | |
| | | DXGU070301ML-JTS | <0.1* | ● | |
| | | DXGU070302MR-JTS | <0.2* | ● | |
| | | DXGU070302ML-JTS | <0.2* | ● | |
| Finishing (Low cutting force)(sharp edge) | JSS | DXGU070301MFR-JSS | <0.1* | | ● |
| | | DXGU070301MFL-JSS | <0.1* | | ● |
| | | DXGU070302MFR-JSS | <0.2* | | ● |
| | | DXGU070302MFL-JSS | <0.2* | | ● |







* Corner radius has minus tolerance

● : Line up

● : Continuous cutting
◐ : Light interrupted cutting
✠ : Heavy interrupted cutting

## INSERT

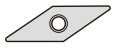
### POSITIVE TYPE DOUBLE-SIDED

**Rhombic, 55° with hole**

| | | AH725 (Coated) | GT9530 (Coated cermet) | NS9530 (Cermet) | KS05F (Uncoated) |
|---|---|---|---|---|---|
| P | Steel | ◐ | ●◐ | ●◐ | |
| M | Stainless | ◐ | | | |
| K | Cast iron | ◐ | ●◐ | ●◐ | ● |
| N | Non-ferrous | | | | ● |
| S | Superalloys | ● | | | ● |
| H | Hard materials | | | | |

| Application | Chipbreaker | Designation | Corner radius | AH725 | GT9530 | NS9530 | KS05F |
|---|---|---|---|---|---|---|---|
| Finishing (Low cutting force) | JSS | DXGU070301MR-JSS | <0.1* | ● | | | |
| | | DXGU070301ML-JSS | <0.1* | ● | | | |
| | | DXGU070302MR-JSS | <0.2* | ● | | | |
| | | DXGU070302ML-JSS | <0.2* | ● | | | |
| Finishing to medium cutting | TS | DXGU070302R-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070302L-TS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-TS | 0.4 | ● | ● | ● | ● |
| | | DXGU070308R-TS | 0.8 | ● | ● | ● | ● |
| | | DXGU070308L-TS | 0.8 | ● | ● | ● | ● |
| Finishing (Low cutting force) | SS | DXGU070302R-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070302L-SS | 0.2 | ● | ● | ● | ● |
| | | DXGU070304R-SS | 0.4 | ● | ● | ● | ● |
| | | DXGU070304L-SS | 0.4 | ● | ● | ● | ● |

### POSITIVE TYPE DOUBLE-SIDED



**Rhombic, 35° with hole**

| | | SH725 (Coated) |
|---|---|---|
| P | Steel | ●◐ |
| M | Stainless | ●◐ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

| Application | Chipbreaker | Designation | Corner radius | SH725 |
|---|---|---|---|---|
| Finishing (sharp edge) | JRP | VXGU09T201MFRE-JRP | <0.1* | ● |
| | | VXGU09T201MFLE-JRP | <0.1* | ● |
| | | VXGU09T202MFRE-JRP | <0.2* | ● |
| | | VXGU09T202MFLE-JRP | <0.2* | ● |

* Corner radius has minus tolerance

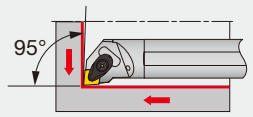
● : Line up

## STANDARD CUTTING CONDITIONS
### FOR INTERNAL TURNING

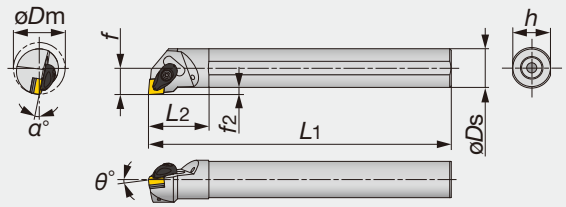
| ISO | Workpiece material | Grade: First Choice | Grade: For surface finish | Grade: For wear resistance (High speed) | Cutting speed *Vc* (m/min) | Depth of cut *ap* (mm) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel<br>SS400, S25C, etc.<br>E275A, C25, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Carbon steel<br>S45C, S55C, etc.<br>C45, C55, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Low alloy steel<br>SCM415, etc.<br>18CrMo4, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Alloy steel<br>SCM440, SCr420, etc.<br>42CrMo4, 20Cr4, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| M | Stainless steel (Austenitic)<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | Stainless steel (Martensitic and ferritic)<br>SUS430, SUS416, etc.<br>X6Cr17, X20Cr13, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | Stainless steel (Precipitation hardening)<br>SUS630, etc.<br>X5CrNiCuNb16-4, etc. | AH725 | - | - | 50 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| K | Grey cast iron<br>FC250, etc.<br>250, etc. | AH725 | - | - | 50 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 250 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Ductile cast iron<br>FCD700, etc.<br>600-3, etc. | AH725 | - | - | 50 - 120 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | NS9530 | - | 80 - 150 | 0.3 - 2 | 0.08 - 0.3 |
| | | - | - | GT9530 | 80 - 180 | 0.3 - 2 | 0.08 - 0.3 |
| N | Non ferrous Metal<br>Aluminum alloy, etc. | KS05F | - | - | 100 - 300 | 0.3 - 2 | 0.08 - 0.3 |
| | Non ferrous Metal<br>Copper Alloy, etc. | KS05F | - | - | 100 - 300 | 0.3 - 2 | 0.08 - 0.3 |

# ISOECOTURN
## A-ACLNR/L-Eco

Double-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ACLNR/L0904-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4 | -6 | -13 | 0.8 | CN**0904... | 3 |
| A32S-ACLNR/L0904-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | CN**0904... | 3 |

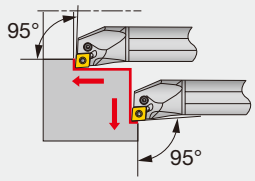
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

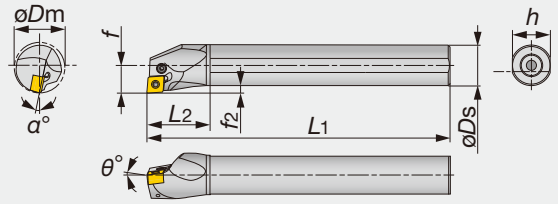
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ACLNR/L0904... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASC322 | CSTB-3.5 | T-15F |

# ISOECOTURN
## A-PCLNR/L-Eco

Lever clamp boring bars, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PCLNR/L0904-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -6 | -16 | 0.8 | CN**0904... | 1.7 |
| A20Q-PCLNR/L0904-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -12 | 0.8 | CN**0904... | 1.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

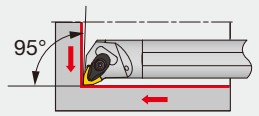
| Designation | Clamping screw | Wrench | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|
| A16M-PCLNR/L0904-D200 | LCS33 | P-2F | LCL33N | - | SSHM3-4 |
| A20Q-PCLNR/L0904-D250 | LCS33 | P-2F | LCL33N | EA20 | SSHM3-4 |

* Optional

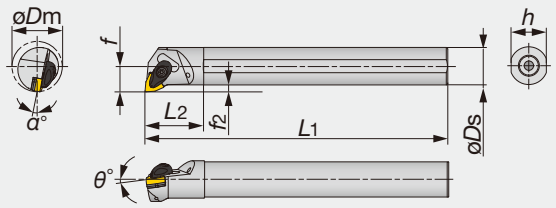
A-ACLNR/L-Eco, A-PCLNR/L-Eco: Inserts → **B050 -**

# ISOECOTURN
## A-AWLNR/L-Eco

Double-clamp boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | a° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-AWLNR/L0604-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0604... | 3 |
| A32S-AWLNR/L0604-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0604... | 3 |

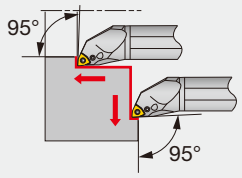
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

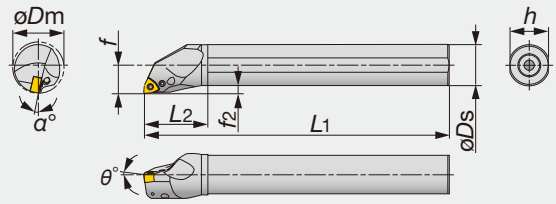
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AWLNR/L... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |

# ISOECOTURN
## A-PWLNR/L-Eco

Lever clamp boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | a° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L0604-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -8 | -17 | 0.8 | WN**0604... | 1.7 |
| A20Q-PWLNR/L0604-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | WN**0604... | 1.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

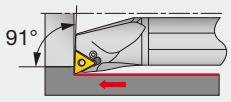
| Designation | Clamping screw | Wrench | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|
| A16M-PWLNR/L0604-D200 | LCS33 | P-2F | LCL33N | - | SSHM3-4 |
| A20Q-PWLNR/L0604-D250 | LCS33 | P-2F | LCL33N | EA-20 | SSHM3-4 |

* Optional

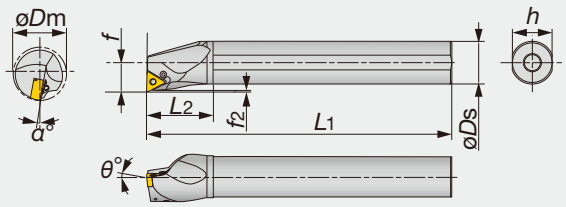
A-AWLNR/L-Eco, A-PWLNR/L-Eco: Inserts → **B095 -**

# ISOETURN
## A-PTFNR/L-Eco

Lever clamp boring bars, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.31 | -6 | -12 | 0.8 | TN**1104... | 2 |
| A32S-PTFNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.25 | -6 | -10 | 0.8 | TN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

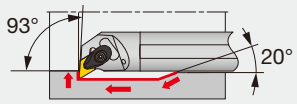
### SPARE PARTS

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|
| A25R-PTFNR/L... | LCS23A | P-2.5 | LCL23 | EA-25 | SSHM4-5 |
| A32S-PTFNR/L... | LCS23A | P-2.5 | LCL23 | EA-32 | SSHM4-5 |

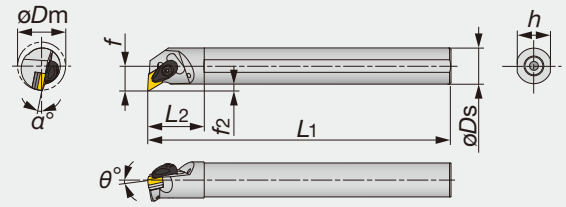
* Optional

# ISOETURN
## A-ADUNR/L-Eco

Double-clamp boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ADUNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | DN**1104... | 3 |
| A32S-ADUNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | DN**1104... | 3 |

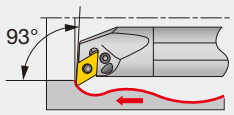
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

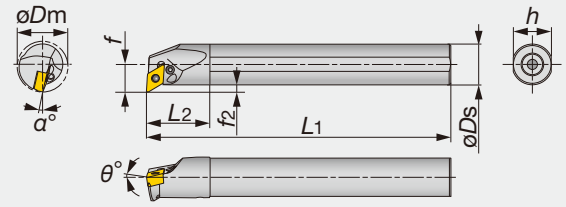
| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ADUNR/L... | ACP3S-E | ACS-5W | BP-7 | SP-2.5 | ASD322 | CSTB-3.5 | T-15F |

# ISOETURN
## A-PDUNR/L-Eco

Lever clamp boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L1104-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | DN**1104... | 1.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PDUNL ** type), and the left hand insert (L) is used for the right hand toolholders (PDUNR ** type).

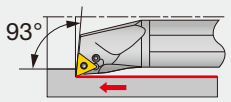
### SPARE PARTS

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|
| A20Q-PDUNR/L1104-D250 | LCS22A | P-2F | LCL33NL | EA-20 | SSHM2.5-3 |

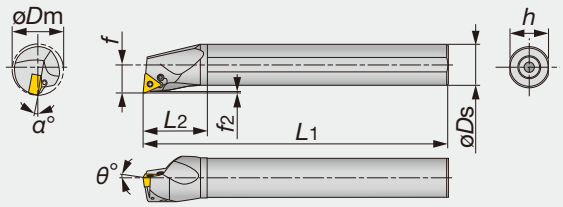
* Optional

# ISOECOTURN
## A-PTUNR/L-Eco

Lever clamp boring bars, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTUNR/L1104-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.22 | -6 | -12 | 0.8 | TN**1104... | 2 |
| A32S-PTUNR/L1104-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.16 | -6 | -10 | 0.8 | TN**1104... | 2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

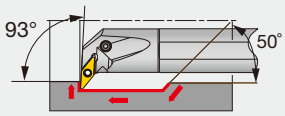
### SPARE PARTS

| Designation | Clamping screw | Wrench | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|
| A25R-PTUNR/L1104-D320 | LCS23A | P-2.5 | LCL23 | EA-25 | SSHM4-5 |
| A32S-PTUNR/L1104-D400 | LCS23A | P-2.5 | LCL23 | EA-32 | SSHM4-5 |

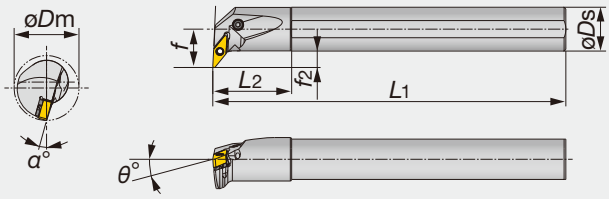
* Optional

# ISOECOTURN
## A-PVUNR/L-Eco

Lever lock type boring bars. For negative 35° rhombic insert.




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L1204-D320 | STEEL | 32 | 25 | 18 | 200 | 45 | 23 | 5.0 | -5 | -15 | 0.8 | VN**1204... | 3 |
| A25R-PVUNR/L1204-D370 | STEEL | 37 | 25 | 22 | 200 | 45 | 23 | 8.0 | -4 | -15 | 0.8 | VN**1204... | 3 |
| A32S-PVUNR/L1204-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 5.5 | -6 | -12 | 0.8 | VN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench | Lever | Shim | Spring pin | Oil supply attachment | Coolant screw |
|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L1204-D... | LCS3V | P-2.5 | LCL3V | LSV212 | LSP3 | EA-25 | SSHM4-5 |
| A32S-PVUNR/L1204-D400 | LCS3V | P-2.5 | LCL3V | LSV212 | LSP3 | EA-32 | SSHM4-5 |

A-PTFNR/L-Eco, A-PTUNR/L-Eco: Inserts →**B080 -**

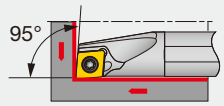
A-ADUNR/L-Eco, A-PDUNR/L-Eco: Inserts → **B061 -**

A-PVUNR/L-Eco: Inserts →**B091 -**

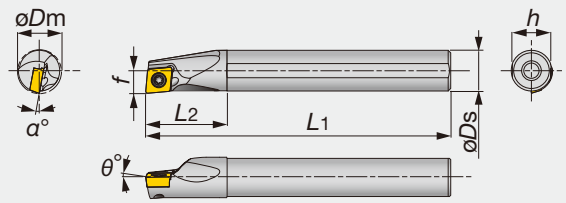
# A/E-SCLCR/L

## Screw-on boring bars, for positive 80° rhombic inserts






Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SCLCR/L03-D050 | STEEL | 5 | 4 | 2.5 | 80 | 8 | 3.8 | 0 | -15 | 0.2 | CC**03X1... | 0.6 |
| A05F-SCLCR/L03-D060 | STEEL | 6 | 5 | 3 | 80 | 9 | 4.8 | 0 | -13 | 0.2 | CC**03X1... | 0.6 |
| A06G-SCLCR/L04-D070 | STEEL | 7 | 6 | 3.5 | 90 | 11 | 5.75 | 0 | -13 | 0.2 | CC**04T1... | 0.6 |
| A07G-SCLCR/L04-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0 | -11 | 0.2 | CC**04T1... | 0.6 |
| A08H-SCLCR/L06-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| A10F-SCLCR06-D120 | STEEL | 12 | 10 | 6 | 80 | 20 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| A10K-SCLCR/L06-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| A12H-SCLCR06-D140 | STEEL | 14 | 12 | 7 | 100 | 24 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| A12M-SCLCR/L06-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| A12H-SCLCR06-D160 | STEEL | 16 | 12 | 9 | 100 | 24 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| A12M-SCLCR/L06-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| A16K-SCLCR09-D180 | STEEL | 18 | 16 | 9 | 125 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A16Q-SCLCR/L09-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| A16K-SCLCR09-D200 | STEEL | 20 | 16 | 11 | 125 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A16Q-SCLCR/L09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| A20R-SCLCR/L09-D220 | STEEL | 22 | 20 | 11 | 200 | 32 | 18 | 0 | -8 | 0.8 | CC**09T3... | 3 |
| A25S-SCLCR/L09-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0 | -6 | 0.8 | CC**09T3... | 3 |
| E04G-SCLCR/L03-D050 | CARBIDE | 5 | 4 | 2.5 | 90 | 9 | 3.8 | 0 | -15 | 0.2 | CC**03X1... | 0.6 |
| E05G-SCLCR/L03-D060 | CARBIDE | 6 | 5 | 3 | 90 | 10 | 4.8 | 0 | -13 | 0.2 | CC**03X1... | 0.6 |
| E06H-SCLCR/L04-D070 | CARBIDE | 7 | 6 | 3.5 | 100 | 12 | 5.75 | 0 | -13 | 0.2 | CC**04T1... | 0.6 |
| E07H-SCLCR/L04-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0 | -11 | 0.2 | CC**04T1... | 0.6 |
| E08G-SCLCR06-D100 | CARBIDE | 10 | 8 | 5.5 | 90 | 22 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| E08K-SCLCR/L06-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 0 | -13 | 0.4 | CC**0602... | 1.2 |
| E10F-SCLCR06-D120 | CARBIDE | 12 | 10 | 6 | 80 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E10H-SCLCR06-D120 | CARBIDE | 12 | 10 | 6 | 100 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E10M-SCLCR/L06-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 0 | -10 | 0.4 | CC**0602... | 1.2 |
| E12G-SCLCR06-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12J-SCLCR06-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12Q-SCLCR/L06-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0 | -8 | 0.4 | CC**0602... | 1.2 |
| E12G-SCLCR06-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E12J-SCLCR06-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E12Q-SCLCR/L06-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 0 | -7 | 0.4 | CC**0602... | 1.2 |
| E16H-SCLCR09-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16L-SCLCR09-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16R-SCLCR/L09-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0 | -10 | 0.8 | CC**09T3... | 3 |
| E16H-SCLCR09-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E16L-SCLCR09-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E16R-SCLCR/L09-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 0 | -9 | 0.8 | CC**09T3... | 3 |
| E20S-SCLCR09-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0 | -8 | 0.8 | CC**09T3... | 3 |
| E25T-SCLCR09-D270 | CARBIDE | 27 | 25 | 13.5 | 300 | 45 | 23 | 0 | -6 | 0.8 | CC**09T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLCL** type), and the left hand insert (L) is used for the right hand toolholders (SCLCR** type).

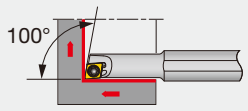
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SCLCR/L03-D... | CSTA-1.6 | T-6F |
| A**-SCLCR/L04-D... | CSTB-2 | T-6F |
| A**-SCLCR/L06-D... | CSTB-2.5S | T-8F |
| A**-SCLCR/L09-D... | CSTB-4S | T-15F |
| E**-SCLCR/L03-D... | CSTA-1.6 | T-6F |
| E**-SCLCR/L04-D... | CSTB-2 | T-6F |
| E**-SCLCR/L06-D... | CSTB-2.5S | T-8F |
| E16*-SCLCR/L09-D... | CSTB-4L060 | T-15F |
| E2**-SCLCR/L09-D... | CSTB-4S | T-15F |

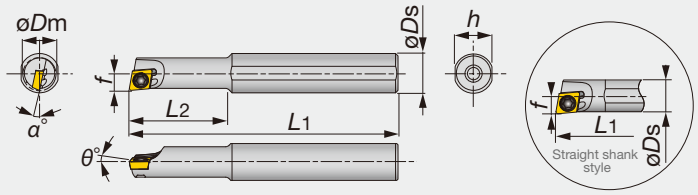
# STREAMJETBAR

## A/E-SEXPR/L

Screw-on boring bars, for positive 75° rhombic inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SEXPR/L03-D045 | STEEL | 4.5 | 4 | 2.3 | 80 | 8 | 3.8 | 0 | -15 | 0.2 | EP**03X1... | 0.6 |
| A04F-SEXPR/L03-D050 | STEEL | 5 | 4 | 2.5 | 80 | 8 | 3.8 | 0 | -13 | 0.2 | EP**03X1... | 0.6 |
| A05F-SEXPR/L04-D055 | STEEL | 5.5 | 5 | 2.75 | 80 | 9 | 4.8 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A06G-SEXPR/L04-D070 | STEEL | 7 | 6 | 3.6 | 90 | 11 | 5.75 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A08H-SEXPR/L04-D055 | STEEL | 5.5 | 8 | 2.75 | 100 | 16 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| A08H-SEXPR/L04-D070 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E04G-SEXPR/L03-D045 | CARBIDE | 4.5 | 4 | 2.3 | 90 | 9 | 3.8 | 0 | -15 | 0.2 | EP**03X1... | 0.6 |
| E04G-SEXPR/L03-D050 | CARBIDE | 5 | 4 | 2.5 | 90 | 9 | 3.8 | 0 | -13 | 0.2 | EP**03X1... | 0.6 |
| E05G-SEXPR/L04-D055 | CARBIDE | 5.5 | 5 | 2.75 | 90 | 10 | 4.8 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E06H-SEXPR/L04-D070 | CARBIDE | 7 | 6 | 3.6 | 100 | 12 | 5.75 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E08K-SEXPR/L04-D055 | CARBIDE | 5.5 | 8 | 2.75 | 125 | 28 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |
| E08K-SEXPR/L04-D070 | CARBIDE | 7 | 8 | 3.6 | 125 | 40 | 7.5 | 0 | -12 | 0.4 | EP**0401... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SEXPL** type), and the left hand insert (L) is used for the right hand toolholders (SEXPR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SEXPR/L03-D... | CSTA-1.6 | T-6F |
| A**-SEXPR/L04-D... | CSTB-2 | T-6F |
| E**-SEXPR/L03-D... | CSTA-1.6 | T-6F |
| E**-SEXPR/L04-D... | CSTB-2 | T-6F |

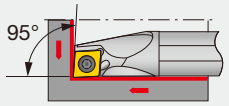

A/E-SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

A/E-SEXPR/L: Inserts → **B122 -**, CBN → **B171**, PCD → **B178**

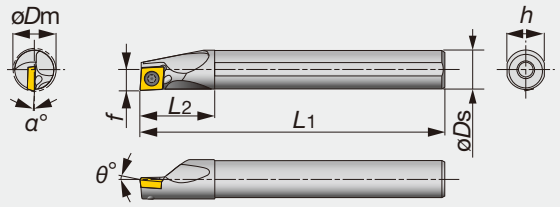
# A/E-SCLPR/L

## Screw-on boring bars, for positive 80° rhombic inserts






Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A08H-SCLPR/L06-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 5 | -8 | 0.4 | CP**0602... | 1.2 |
| A10K-SCLPR/L06-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 5 | -5 | 0.4 | CP**0602... | 1.2 |
| A10K-SCLPR/L08-D120 | STEEL | 12 | 10 | 6 | 125 | 20 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| A12M-SCLPR/L06-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 5 | -4 | 0.4 | CP**0602... | 1.2 |
| A12M-SCLPR/L08-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| A12M-SCLPR/L08-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| A16Q-SCLPR/L09-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| A16Q-SCLPR/L09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| A20R-SCLPR/L09-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 5 | -2 | 0.8 | CP**0903... | 3 |
| A25S-SCLPR/L09-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 5 | -1 | 0.8 | CP**0903... | 3 |
| E08K-SCLPR/L06-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 5 | -8 | 0.4 | CP**0602... | 1.2 |
| E10M-SCLPR/L06-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 5 | -5 | 0.4 | CP**0602... | 1.2 |
| E10H-SCLPR08-D120 | CARBIDE | 12 | 10 | 6 | 100 | 25 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| E10M-SCLPR/L08-D120 | CARBIDE | 12 | 10 | 6 | 150 | 25 | 9 | 5 | -5 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L06-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 5 | -4 | 0.4 | CP**0602... | 1.2 |
| E12G-SCLPR08-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12J-SCLPR08-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L08-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 5 | -4 | 0.4 | CP**0802... | 1.4 |
| E12G-SCLPR08-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E12J-SCLPR08-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E12Q-SCLPR/L08-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 5 | -3 | 0.4 | CP**0802... | 1.4 |
| E16H-SCLPR09-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16L-SCLPR09-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16R-SCLPL09-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 5 | -3.5 | 0.8 | CP**0903... | 3 |
| E16H-SCLPR09-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| E16L-SCLPR09-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |
| E16R-SCLPL09-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 5 | -3 | 0.8 | CP**0903... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLPL** type), and the left hand insert (L) is used for the right hand toolholders (SCLPR** type).

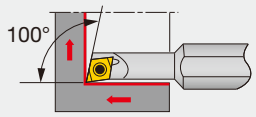
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SCLPR/L06-D... | CSTB-2.5S | T-8F |
| A10K-SCLPR/L08-D120 | CSTB-3L042 | T-9F |
| A12M-SCLPR/L08-D... | CSTB-3L050 | T-9F |
| A**-SCLPR/L09-D... | CSTB-4L060 | T-15F |
| E**-SCLPR/L06-D... | CSTB-2.5S | T-8F |
| E10*-SCLPR/L08-D... | CSTB-3L042 | T-9F |
| E12*-SCLPR/L08-D... | CSTB-3L050 | T-9F |
| E16*-SCLPR/L09-D... | CSTB-4L060 | T-15F |

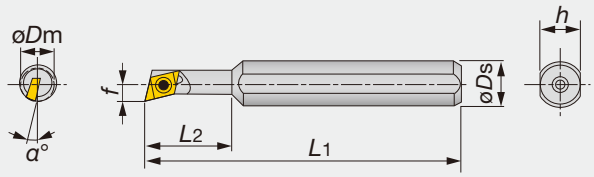
A/E-SCLPR/L: Inserts → **B111 -**

# JS-SEXPR/L

Screw-on boring bar, for positive 75° rhombic inserts




Cutting edge style **X**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JS08H-SEXPR045 | STEEL | 5.5 | 8 | 2.7 | 100 | 16 | 7 | 12 | 0.4 | EP**0401... | 0.6 |
| JS08H-SEXPR047 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7 | 12 | 0.4 | EP**0401... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SEXPL** type), and the left hand insert (L) is used for the right hand toolholders (SEXPR** type).

## SPARE PARTS

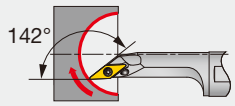
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS08H-SEXPR04... | CSTB-2 | T-6F |

JS-SEXPR/L: Inserts → **B122**, CBN → **B171**, PCD → **B178**

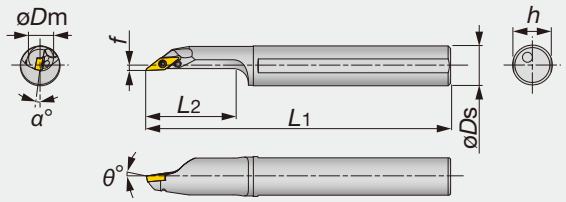
# STREAMJETBAR

## A-SVJBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20R-SVJBR/L11-D250 | STEEL | 25 | 20 | 2 | 200 | 40 | 18 | -5 | -5 | 0.4 | VB**1103... | 1.2 |
| A25S-SVJBR/L11-D300 | STEEL | 30 | 25 | 3.5 | 250 | 50 | 23 | -5 | -5 | 0.4 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVJBL** type), and the left hand insert (L) is used for the right hand toolholders (SVJBR** type).

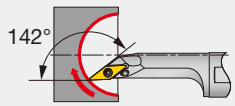
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVJB*11-D... | CSTB-2.5 | T-8F |

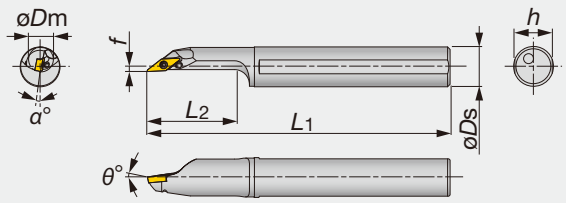
# STREAMJETBAR

## A-SVJCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVJCR/L08-D160 | STEEL | 16 | 12 | 2 | 150 | 28 | 11 | -5 | -5 | 0.4 | VC**0802... | 0.6 |
| A16Q-SVJCR/L08-D200 | STEEL | 20 | 16 | 2 | 180 | 35 | 15 | -5 | -5 | 0.4 | VC**0802... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVJCL** type), and the left hand insert (L) is used for the right hand toolholders (SVJCR** type).

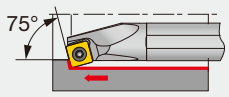
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVJC*08-D... | CSTB-2L | T-6F |

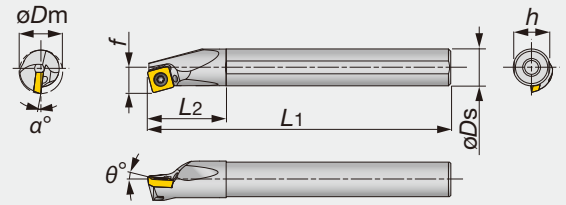
# STREAMJETBAR

## A-SSKPR

Screw-on boring bars, for positive square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SSKPR09-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 5 | -6 | 0.8 | SP**0903... | 3 |
| A20R-SSKPR09-D240 | STEEL | 24 | 20 | 13 | 200 | 36 | 18 | 5 | -2 | 0.8 | SP**0903... | 3 |
| A25S-SSKPR12-D310 | STEEL | 31 | 25 | 17 | 250 | 45 | 23 | 5 | -2 | 0.8 | SP**1204... | 6 |

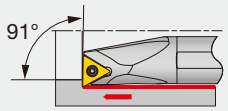
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SSKPL** type), and the left hand insert (L) is used for the right hand toolholders (SSKPR** type).

### SPARE PARTS

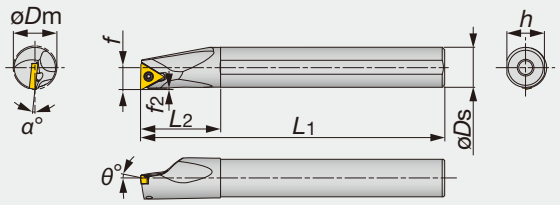
| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SSKPR09-D2*0 | CSTB-4L060 | T-15F |
| A25S-SSKPR12-D310 | CSTB-5S | T-20F |

# A/E-STFCR/L

## Screw-on boring bars, for positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-STFCR/L1103-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.6 | 0 | -13 | 0.4 | TC**1103... | 1.2 |
| A12M-STFCR/L1103-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.5 | 0 | -10 | 0.4 | TC**1103... | 1.2 |
| A16Q-STFCR/L1103-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.5 | 0 | -7 | 0.4 | TC**1103... | 1.2 |
| E10M-STFCR/L1103-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 0 | -13 | 0.4 | TC**1103... | 1.2 |
| E12Q-STFCR/L1103-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.5 | 0 | -10 | 0.4 | TC**1103... | 1.2 |
| E16R-STFCR/L1103-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.5 | 0 | -7 | 0.4 | TC**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STFCL** type), and the left hand insert (L) is used for the right hand toolholders (STFCR** type).

### SPARE PARTS

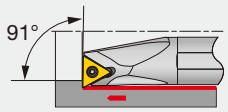
| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-STFCR/L1103-D... | CSTB-2.5 | T-8F |
| E**-STFCR/L1103-D... | CSTB-2.5 | T-8F |

A-SVJBR/L: Inserts → **B145 -**, CBN → **B169 -**
A-SVJCR/L: Inserts → **B147 -**
A-SSKPR: Inserts → **B128 -**, CBN → **B168**
A/E-STFCR/L: Inserts → **B131 -**, PCD → **B177**

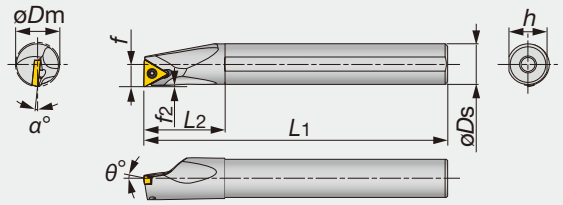
# A/E-STFPR/L

## Screw-on boring bars, for positive triangle inserts






Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A08H-STFPR/L09-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0.7 | 5 | -8 | 0.4 | TP**0902... | 0.9 |
| A10K-STFPR/L1102-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102... | 1.2 |
| A12M-STFPR/L1102-D140 | STEEL | 14 | 12 | 7.0 | 150 | 24 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| A16Q-STFPR/L13-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.7 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| A20R-STFPR13-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.8 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| A25S-STFPR16-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0.6 | 5 | -1 | 0.4 | TP**16T3... | 3 |
| E08K-STFPR/L09-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7.5 | 0.7 | 5 | -8 | 0.4 | TP**0902... | 0.9 |
| E10M-STFPR/L1102-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102... | 1.2 |
| E12Q-STFPR/L1102-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| E16R-STFPR13-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.7 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| E20S-STFPR13-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.8 | 5 | -2 | 0.4 | TP**1303... | 1.4 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STFPL ** type), and the left hand insert (L) is used for the right hand toolholders (STFPR ** type).
(1) Inserts of TPGH, TPGM and TPGA are not applicable.

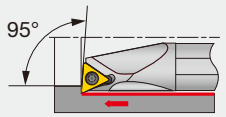
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A08H-STFPR/L09-D100 | CSTB-2.2S | T-7F |
| A10K-STFPR/L1102-D120 | CSTB-2.5B | T-8F |
| A12M-STFPR/L1102-D140 | CSTB-2.5 | T-8F |
| A16Q-STFPR/L13-D180 | CSTB-3S | T-9F |
| A20R-STFPR13-D220 | CSTB-3 | T-9F |
| A25S-STFPR16-D270 | CSTB-4M | T-15F |
| E08K-STFPR/L09-D100 | CSTB-2.2S | T-7F |
| E10M-STFPR/L1102-D120 | CSTB-2.5B | T-8F |
| E12Q-STFPR/L1102-D140 | CSTB-2.5 | T-8F |
| E16R-STFPR13-D180 | CSTB-3S | T-9F |
| E20S-STFPR13-D220 | CSTB-3 | T-9F |

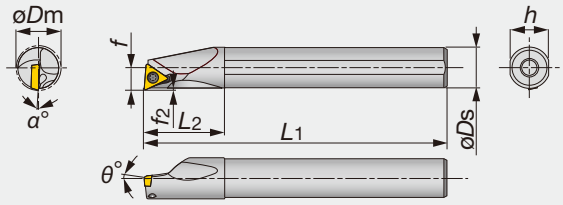
A/E-STFPR/L: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

# A/E-STUPR/L

## Screw-on boring bars, for positive triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A07G-STUPR/L07-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0.4 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| A08H-STUPR/L07-D080 | STEEL | 8 | 8 | 4 | 100 | 19.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| A08H-STUPR/L09-D100 | STEEL | 10 | 8 | 5.5 | 100 | 16 | 7.5 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| A10F-STUPR1102-D120 | STEEL | 12 | 10 | 6.5 | 80 | 20 | 9 | 1.4 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| A10K-STUPR/L1102-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.7 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| A10K-STUPR/L1103-D120 | STEEL | 12 | 10 | 6.5 | 125 | 20 | 9 | 0.6 | 5 | -10 | 0.4 | TP**1103...(1) | 1.4 |
| A12H-STUPR1102-D140 | STEEL | 14 | 12 | 7 | 100 | 24 | 11 | 0.9 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1102-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.7 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1103-D140 | STEEL | 14 | 12 | 7 | 150 | 24 | 11 | 0.6 | 5 | -6 | 0.4 | TP**1103...(1) | 1.4 |
| A12H-STUPR1102-D160 | STEEL | 16 | 12 | 9 | 100 | 24 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| A12M-STUPR/L1102-D160 | STEEL | 16 | 12 | 9 | 150 | 24 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| A16K-STUPR13-D180 | STEEL | 18 | 16 | 9 | 125 | 32 | 15 | 0.9 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16Q-STUPR/L1103-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.8 | 5 | -4 | 0.4 | TP**1103...(1) | 1.4 |
| A16Q-STUPR/L13-D180 | STEEL | 18 | 16 | 9 | 180 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16K-STUPR13-D200 | STEEL | 20 | 16 | 11 | 125 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A16Q-STUPR/L13-D200 | STEEL | 20 | 16 | 11 | 180 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| A20R-STUPR/L1103-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1103...(1) | 1.4 |
| A20R-STUPR/L13-D220 | STEEL | 22 | 20 | 11 | 200 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1303...(1) | 1.4 |
| A25S-STUPR/L16-D270 | STEEL | 27 | 25 | 13.5 | 250 | 45 | 23 | 0.5 | 5 | -1 | 0.8 | TP**16T3...(1) | 3 |
| A32T-STUPR/L16-D340 | STEEL | 34 | 32 | 17 | 300 | 50 | 30 | 0.7 | 5 | 0 | 0.8 | TP**16T3... | 3 |
| E07H-STUPR/L07-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0.3 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08G-STUPR07-D080 | CARBIDE | 8 | 8 | 4 | 90 | 44.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08K-STUPR/L07-D080 | CARBIDE | 8 | 8 | 4 | 125 | 44.5 | 7.5 | 0.5 | 5 | -10 | 0.4 | TP**0701... | 0.9 |
| E08G-STUPR09-D100 | CARBIDE | 10 | 8 | 5.5 | 90 | 22 | 7 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| E08K-STUPR/L09-D100 | CARBIDE | 10 | 8 | 5.5 | 125 | 22 | 7 | 0.6 | 5 | -8 | 0.4 | TP**0902...(1) | 0.9 |
| E10F-STUPR1102-D120 | CARBIDE | 12 | 10 | 6.5 | 80 | 25 | 9 | 0.5 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10H-STUPR1102-D120 | CARBIDE | 12 | 10 | 6.5 | 100 | 25 | 9 | 0.6 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10M-STUPR/L1102-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.6 | 5 | -6 | 0.4 | TP**1102...(1) | 1.2 |
| E10M-STUPR/L1103-D120 | CARBIDE | 12 | 10 | 6.5 | 150 | 25 | 9 | 0.7 | 5 | -10 | 0.4 | TP**1103...(1) | 1.4 |
| E12G-STUPR1102-D140 | CARBIDE | 14 | 12 | 7 | 90 | 27 | 11 | 0.9 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12J-STUPR1102-D140 | CARBIDE | 14 | 12 | 7 | 110 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1102-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.6 | 5 | -4 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1103-D140 | CARBIDE | 14 | 12 | 7 | 180 | 27 | 11 | 0.7 | 5 | -6 | 0.4 | TP**1103...(1) | 1.4 |
| E12G-STUPR1102-D160 | CARBIDE | 16 | 12 | 9 | 90 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E12J-STUPR1102-D160 | CARBIDE | 16 | 12 | 9 | 110 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E12Q-STUPR/L1102-D160 | CARBIDE | 16 | 12 | 9 | 180 | 27 | 11 | 0.6 | 5 | -3 | 0.4 | TP**1102...(1) | 1.2 |
| E16H-STUPR13-D180 | CARBIDE | 18 | 16 | 9 | 100 | 32 | 15 | 0.9 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPR/L1103-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.8 | 5 | -3 | 0.4 | TP**1103...(1) | 1.4 |
| E16L-STUPR13-D180 | CARBIDE | 18 | 16 | 9 | 130 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPR/L13-D180 | CARBIDE | 18 | 16 | 9 | 200 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16H-STUPR13-D200 | CARBIDE | 20 | 16 | 11 | 100 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16L-STUPR13-D200 | CARBIDE | 20 | 16 | 11 | 130 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E16R-STUPL13-D200 | CARBIDE | 20 | 16 | 11 | 200 | 32 | 15 | 0.6 | 5 | -3 | 0.4 | TP**1303...(1) | 1.4 |
| E20S-STUPR1103-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.7 | 5 | -2 | 0.4 | TP**1103...(1) | 1.4 |
| E20S-STUPR13-D220 | CARBIDE | 22 | 20 | 11 | 250 | 36 | 18 | 0.6 | 5 | -2 | 0.4 | TP**1303...(1) | 1.4 |
| E25T-STUPR16-D270 | CARBIDE | 27 | 25 | 13.5 | 300 | 45 | 23 | 0.5 | 5 | -1 | 0.8 | TP**16T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius

Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STUPL ** type), and the left hand insert (L) is used for the right hand toolholders (STUPR ** type).

(1) Inserts of TPGH, TPGM and TPGA are not applicable.

A/E-STUPR/L: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

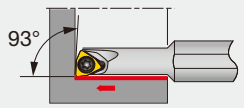
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A07/08-STUPR/L07/09-D... | CSTB-2.2L038 | T-7F |
| A10*-STUPR/L1102-D120 | CSTB-2.5S | T-8F |
| A12*-STUPR/L1102-D... | CSTB-2.5B | T-8F |
| A12M-STUPR/L1103-D140 | CSTB-3L050 | T-9F |
| A16*-STUPR/L13-D... | CSTB-3S | T-9F |
| A20R-STUPR/L13-D220 | CSTB-3 | T-9F |
| A**-STUPR/L16-D... | CSTB-4M | T-15F |
| E07/08-STUPR/L07/09-D... | CSTB-2.2L038 | T-7F |
| E10*-STUPR/L1102-D120 | CSTB-2.5S | T-8F |
| E12*-STUPR/L1102-D... | CSTB-2.5B | T-8F |
| E**-STUPR/L1103-D... | CSTB-3L050 | T-9F |
| E16*-STUPR/L13-D... | CSTB-3S | T-9F |
| E20S-STUPR13-D220 | CSTB-3 | T-9F |
| E25T-STUPR16-D270 | CSTB-4M | T-15F |

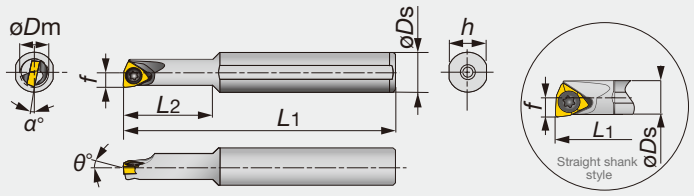
# STREAMJETBAR

## A/E-SWUBR/L

Screw-on boring bars, for positive trigon inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A05F-SWUBR/L03-D060 | STEEL | 6 | 5 | 3 | 80 | 9 | 4.8 | 0 | -13 | 0.4 | WB**0301... | 0.6 |
| A06G-SWUBR/L03-D070 | STEEL | 7 | 6 | 3.5 | 90 | 11 | 5.75 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| A07G-SWUBR/L03-D080 | STEEL | 8 | 7 | 4 | 90 | 12 | 6.75 | 0 | -11 | 0.4 | WB**0301... | 0.6 |
| A08H-SWUBR03-D060 | STEEL | 6 | 8 | 3.1 | 100 | 18 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| A08H-SWUBR03-D070 | STEEL | 7 | 8 | 3.6 | 100 | 20 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E05G-SWUBR/L03-D060 | CARBIDE | 6 | 5 | 3 | 90 | 10 | 4.8 | 0 | -13 | 0.4 | WB**0301... | 0.6 |
| E06H-SWUBR/L03-D070 | CARBIDE | 7 | 6 | 3.5 | 100 | 12 | 5.75 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E07H-SWUBR/L03-D080 | CARBIDE | 8 | 7 | 4 | 100 | 14 | 6.75 | 0 | -11 | 0.4 | WB**0301... | 0.6 |
| E08K-SWUBR03-D060 | CARBIDE | 6 | 8 | 3.1 | 125 | 30 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |
| E08K-SWUBR03-D070 | CARBIDE | 7 | 8 | 3.6 | 125 | 40 | 7.5 | 0 | -12 | 0.4 | WB**0301... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SWUBL** type), and the left hand insert (L) is used for the right hand toolholders (SWUBR** type).

## SPARE PARTS

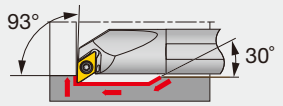
| Designation | Clamping screw | Wrench |
|---|---|---|
| A/E**-SWUBR/L... | CSTB-2 | T-6F |

A/E-SWUBR/L: Inserts → **B151**

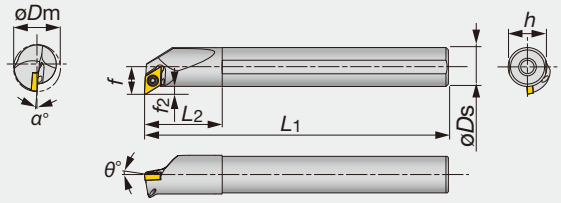
# STREAMJETBAR

## A/E-SDUCR/L

Screw-on boring bars, for positive 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDUCR/L07-D130 | STEEL | 13 | 10 | 7 | 125 | 20 | 9 | 2 | 0 | -10 | 0.4 | DC**0702... | 1.2 |
| A12M-SDUCR/L07-D160 | STEEL | 16 | 12 | 9.3 | 150 | 24 | 11 | 3.3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDUCR/L07-D200 | STEEL | 20 | 16 | 11.3 | 180 | 32 | 15 | 3.3 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| A20R-SDUCR/L11-D270 | STEEL | 27 | 20 | 16.1 | 200 | 36 | 18 | 6.1 | 0 | -5 | 0.8 | DC**11T3... | 3 |
| A25S-SDUCR/L11-D320 | STEEL | 32 | 25 | 18.6 | 250 | 45 | 23 | 6.1 | 0 | -4 | 0.8 | DC**11T3... | 3 |
| E10H-SDUCR07-D130 | CARBIDE | 13 | 10 | 7 | 100 | 25 | 9 | 1.9 | 5 | -3.5 | 0.4 | DC**0702... | 1.2 |
| E10M-SDUCR/L07-D130 | CARBIDE | 13 | 10 | 7 | 150 | 25 | 9 | 2 | 0 | -10 | 0.4 | DC**0702... | 1.2 |
| E12J-SDUCR07-D160 | CARBIDE | 16 | 12 | 9.3 | 110 | 27 | 11 | 3.2 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E12Q-SDUCR/L07-D160 | CARBIDE | 16 | 12 | 9.3 | 180 | 27 | 11 | 3.3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E16L-SDUCR07-D200 | CARBIDE | 20 | 16 | 11.3 | 130 | 32 | 15 | 3.2 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E16R-SDUCR/L07-D200 | CARBIDE | 20 | 16 | 11.3 | 200 | 32 | 15 | 3.3 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E20S-SDUCR11-D270 | CARBIDE | 27 | 20 | 16.1 | 250 | 36 | 18 | 6.1 | 0 | -5 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SDUCL** type), and the left hand insert (L) is used for the right hand toolholders (SDUCR** type).

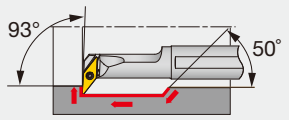
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDUCR/L07-D1*0 | CSTB-2.5S | T-8F |
| A16Q-SDUCR/L07-D200 | CSTB-2.5 | T-8F |
| A2**-SDUCR/L11-D**0 | CSTB-4S | T-15F |
| E1**-SDUCR/L07-D1*0 | CSTB-2.5S | T-8F |
| E16*-SDUCR/L07-D200 | CSTB-2.5 | T-8F |
| E20S-SDUCR11-D270 | CSTB-4S | T-15F |

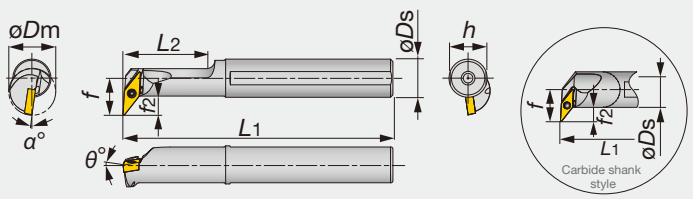
# STREAMJETBAR

## A/E-SVUBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SVUBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVUBR/L11-D250 | STEEL | 25 | 20 | 17.5 | 200 | 40 | 19 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| A25S-SVUBR/L16-D320 | STEEL | 32 | 25 | 20.5 | 250 | 50 | 23 | 8.5 | 0 | -6 | 0.8 | VB**1604... | 3 |
| E16R-SVUBR/L11-D245 | CARBIDE | 24.5 | 16 | 16 | 200 | - | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| E20S-SVUBR/L11-D285 | CARBIDE | 28.5 | 20 | 18 | 250 | - | 19 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| E25T-SVUBR/L16-D340 | CARBIDE | 34 | 25 | 21 | 300 | - | 23 | 8.5 | 0 | -6 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUBL** type), and the left hand insert (L) is used for the right hand toolholders (SVUBR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVUBR/L11-D2*0 | CSTB-2.5 | T-8F |
| A25S-SVUBR/L16-D320 | CSTB-3.5 | T-15F |
| E**-SVUBR/L11-D2*5 | CSTB-2.5 | T-8F |
| E25T-SVUBR/L16-D340 | CSTB-3.5 | T-15F |

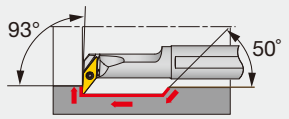
A/E-SDUCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

A/E-SVUBR/L: Inserts → **B145 -**, CBN → **B169 -**

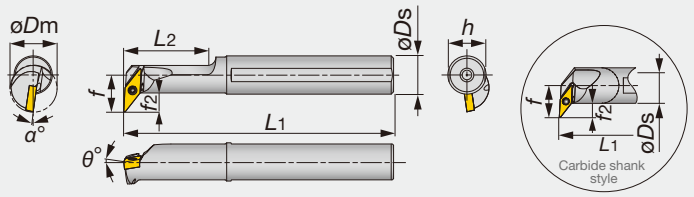
# STREAMJETBAR

## A/E-SVUCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVUCR/L08-D160 | STEEL | 16 | 12 | 11 | 150 | 30 | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |
| A25S-SVUCR/L16-D320 | STEEL | 32 | 25 | 19 | 250 | 45 | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |
| E12Q-SVUCR/L08-D180 | CARBIDE | 18 | 12 | 11.5 | 180 | - | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |
| E25T-SVUCR/L16-D320 | CARBIDE | 32 | 25 | 19 | 300 | - | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUCL** type), and the left hand insert (L) is used for the right hand toolholders (SVUCR** type).

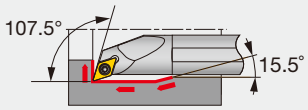
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A12M-SVUCR/L08-D160 | CSTB-2L | T-6F |
| A25S-SVUCR/L16-D320 | CSTB-3.5 | T-15F |
| E12Q-SVUCR/L08-D180 | CSTB-2L | T-6F |
| E25T-SVUCR/L16-D320 | CSTB-3.5 | T-15F |

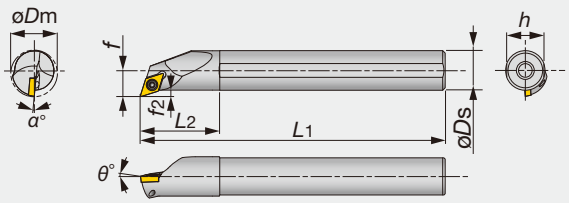
# STREAMJETBAR

## A/E-SDQCR/L

Screw-on boring bars, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SDQCR/L07-D130 | STEEL | 13 | 10 | 7.6 | 125 | 20 | 9 | 2.6 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| A12M-SDQCR/L07-D160 | STEEL | 16 | 12 | 8.6 | 150 | 24 | 11 | 2.6 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDQCR/L07-D200 | STEEL | 20 | 16 | 10.6 | 180 | 32 | 15 | 2.6 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| A20R-SDQCR/L11-D250 | STEEL | 25 | 20 | 13.7 | 200 | 36 | 18 | 3.7 | 0 | -7 | 0.8 | DC**11T3... | 3 |
| A25S-SDQCR/L11-D300 | STEEL | 30 | 25 | 16.2 | 250 | 45 | 23 | 3.7 | 0 | -4 | 0.8 | DC**11T3... | 3 |
| E10H-SDQCR07-D130 | CARBIDE | 13 | 10 | 7.6 | 100 | 25 | 9 | 2.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E10M-SDQCR/L07-D130 | CARBIDE | 13 | 10 | 7.6 | 150 | 25 | 9 | 2.6 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E12J-SDQCR07-D160 | CARBIDE | 16 | 12 | 8.6 | 110 | 27 | 11 | 2.5 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E12Q-SDQCR/L07-D160 | CARBIDE | 16 | 12 | 8.6 | 180 | 27 | 11 | 2.6 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| E16L-SDQCR07-D200 | CARBIDE | 20 | 16 | 10.6 | 130 | 32 | 15 | 2.5 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E16R-SDQCR/L07-D200 | CARBIDE | 20 | 16 | 10.6 | 200 | 32 | 15 | 2.6 | 0 | -5 | 0.4 | DC**0702... | 1.2 |
| E20S-SDQCR/L11-D250 | CARBIDE | 25 | 20 | 13.7 | 250 | 36 | 18 | 3.7 | 0 | -7 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SDQCL** type), and the left hand insert (L) is used for the right hand toolholders (SDQCR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDQCR/L07-D**0 | CSTB-2.5S | T-8F |
| A2**-SDQCR/L11-D**0 | CSTB-4S | T-15F |
| E1**-SDQCR/L07-D**0 | CSTB-2.5S | T-8F |
| E20S-SDQCR/L11-D250 | CSTB-4S | T-15F |

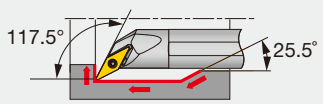
A/E-SVUCR/L: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

A/E-SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

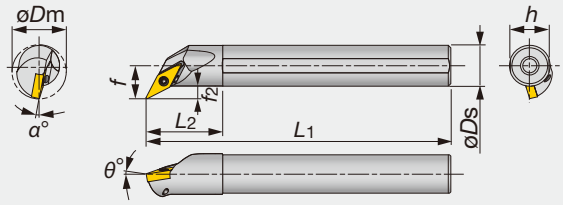
# STREAMJETBAR

## A/E-SVQBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVQBR/L11-D170 | STEEL | 17 | 12 | 10.5 | 150 | 24 | 11 | 4.5 | -5 | -10 | 0.4 | VB**1103... | 1.2 |
| A16Q-SVQBR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 5 | -5 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVQBR/L11-D255 | STEEL | 25.5 | 20 | 15 | 200 | 36 | 18 | 5 | -5 | -6 | 0.4 | VB**1103... | 1.2 |
| A25S-SVQBR/L16-D305 | STEEL | 30.5 | 25 | 17.5 | 250 | 45 | 23 | 5 | -5 | -8 | 0.8 | VB**1604... | 3 |
| E12Q-SVQBR/L11-D170 | CARBIDE | 17 | 12 | 10.5 | 180 | 27 | 11 | 4.5 | -5 | -10 | 0.4 | VB**1103... | 1.2 |
| E16R-SVQBR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 5 | -5 | -8 | 0.4 | VB**1103... | 1.2 |
| E20S-SVQBR/L11-D255 | CARBIDE | 25.5 | 20 | 15 | 250 | 36 | 18 | 5 | -5 | -6 | 0.4 | VB**1103... | 1.2 |
| E25T-SVQBR/L16-D305 | CARBIDE | 30.5 | 25 | 17.5 | 300 | 45 | 23 | 5 | -5 | -8 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVQBL type), and the left hand insert (L) is used for the right hand toolholders (SVQBR type).

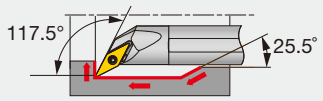
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVQBR/L11-D... | CSTB-2.5 | T-8F |
| A25S-SVQBR/L16-D305 | CSTB-3.5 | T-15F |
| E**-SVQBR/L11-D... | CSTB-2.5 | T-8F |
| E25T-SVQBR/L16-D305 | CSTB-3.5 | T-15F |

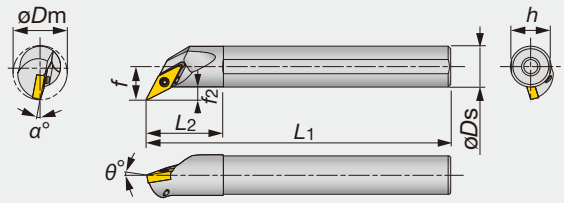
# STREAMJETBAR

## A/E-SVQCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A10K-SVQCR/L08-D135 | STEEL | 13.5 | 10 | 8 | 125 | 20 | 9 | 3 | -5 | -8 | 0.4 | VC**0802... | 0.6 |
| A16Q-SVQCR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 4.9 | -5 | -8 | 0.4 | VC**1103... | 1.2 |
| E10M-SVQCR/L08-D135 | CARBIDE | 13.5 | 10 | 8 | 150 | 25 | 9 | 3 | -5 | -8 | 0.4 | VC**0802... | 0.6 |
| E16R-SVQCR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 4.9 | -5 | -8 | 0.4 | VC**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVQCL ** type), and the left hand insert (L) is used for the right hand toolholders (SVQCR ** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A10K-SVQCR/L08-D135 | CSTB-2L | T-6F |
| A16Q-SVQCR/L11-D215 | CSTB-2.5 | T-8F |
| E10M-SVQCR/L08-D135 | CSTB-2L | T-6F |
| E16R-SVQCR/L11-D215 | CSTB-2.5 | T-8F |

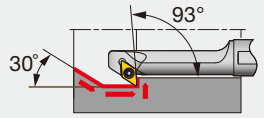
A/E-SVQBR/L: Inserts → **B145 -**, CBN → **B169 -**

A/E-SVQCR/L: Inserts → **B147 -**

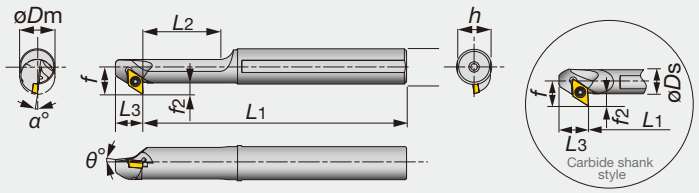
# A/E-SDZCR/L

## Screw-on boring bars, for positive 55° rhombic inserts






Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SDZCR/L07-D140 | STEEL | 14 | 12 | 10.5 | 150 | 30 | 12.5 | 11 | 4.5 | 0 | -9 | 0.4 | DC**0702... | 1.2 |
| A16Q-SDZCR/L07-D160 | STEEL | 16 | 16 | 12.5 | 180 | 35 | 12.5 | 15 | 4.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| A20R-SDZCR/L11-D200 | STEEL | 20 | 20 | 15.5 | 200 | 40 | 15.0 | 18 | 5.5 | 0 | -8 | 0.8 | DC**11T3... | 3 |
| A25S-SDZCR/L11-D250 | STEEL | 25 | 25 | 18 | 250 | 50 | 15 | 23 | 5.5 | 0 | -6 | 0.8 | DC**11T3... | 3 |
| E12Q-SDZCR/L07-D180 | CARBIDE | 18 | 12 | 10.5 | 180 | - | 12.5 | 11 | 4.5 | 0 | -8 | 0.4 | DC**0702... | 1.2 |
| E16R-SDZCR/L07-D220 | CARBIDE | 22 | 16 | 12.5 | 200 | - | 12.5 | 15 | 4.5 | 0 | -6 | 0.4 | DC**0702... | 1.2 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SDZCR ** type), and the left hand insert (L) is used for the left hand toolholders (SDZCL ** type).

### SPARE PARTS

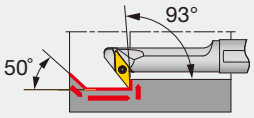
| Designation | Clamping screw | Wrench |
|---|---|---|
| A1**-SDZCR/L07-D1*0 | CSTB-2.5 | T-8F |
| A2**-SDZCR/L11-D2*0 | CSTB-4S | T-15F |
| E1**-SDZCR/L07-D**0 | CSTB-2.5 | T-8F |

A/E-SDZCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

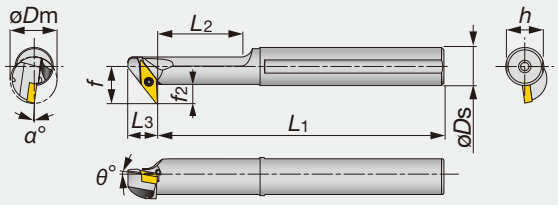
# STREAMJETBAR

## A-SVZBR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SVZBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 12.5 | 15 | 8 | 0 | -8 | 0.4 | VB**1103... | 1.2 |
| A20R-SVZBR/L11-D250 | STEEL | 25 | 20 | 17.5 | 200 | 40 | 12.5 | 18 | 8 | 0 | -7 | 0.4 | VB**1103... | 1.2 |
| A25S-SVZBR/L16-D320 | STEEL | 32 | 25 | 24 | 250 | 50 | 17.5 | 23 | 12 | 0 | -6 | 0.8 | VB**1604... | 3 |
| A32T-SVZBR/L16-D400 | STEEL | 40 | 32 | 27.5 | 300 | 72 | 17.5 | 30 | 12 | 0 | -5 | 0.8 | VB**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SVZBR type), and the left hand insert (L) is used for the left hand toolholders (SVZBL type).

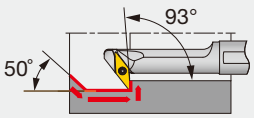
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SVZBR/L11-D2*0 | CSTB-2.5 | T-8F |
| A25S-SVZBR/L16-D320 | CSTB-3.5 | T-15F |
| A32T-SVZBR/L16-D400 | CSTB-3.5L | T-15F |

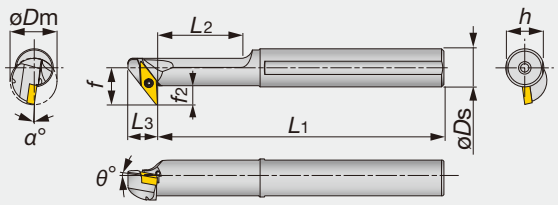
# STREAMJETBAR

## A-SVZCR/L

Screw-on boring bars, for positive 35° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SVZCR/L08-D160 | STEEL | 16 | 12 | 11 | 150 | 30 | 10 | 11 | 5.5 | 0 | -8 | 0.4 | VC**0802... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SVZCR ** type), and the left hand insert (L) is used for the left hand toolholders (SVZCL ** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A12M-SVZCR/L08-D160 | CSTB-2L | T-6F |

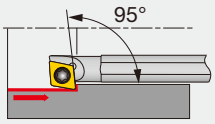
A-SVZBR/L: Inserts → **B145 -**, CBN → **B169 -**

A-SVZCR/L: Inserts → **B147 -**

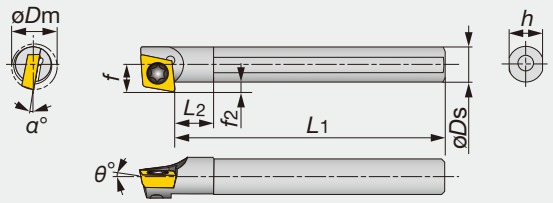
# STREAMJETBAR

## A/E-SEZPR/L

Screw-on boring bars, for positive 75° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A04F-SEZPR/L03-D055 | STEEL | 5.5 | 4 | 3.2 | 80 | 4 | 3.8 | 1.2 | 0 | -8 | 0.2 | EP**03X1... | 0.6 |
| A05F-SEZPR/L03-D065 | STEEL | 6.5 | 5 | 3.7 | 80 | 5 | 4.8 | 1.2 | 0 | -6 | 0.2 | EP**03X1... | 0.6 |
| E04G-SEZPR/L03-D055 | CARBIDE | 5.5 | 4 | 3.2 | 90 | 5 | 3.8 | 1.2 | 0 | -8 | 0.2 | EP**03X1... | 0.6 |
| E05G-SEZPR/L03-D065 | CARBIDE | 6.5 | 5 | 3.7 | 90 | 6 | 4.8 | 1.2 | 0 | -6 | 0.2 | EP**03X1... | 0.6 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (SEZPR ** type), and the left hand insert (L) is used for the left hand toolholders (SEZPL ** type).

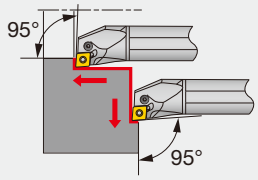
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SEZPR/L03-D... | CSTA-1.6 | T-6F |
| E**-SEZPR/L03-D... | CSTA-1.6 | T-6F |

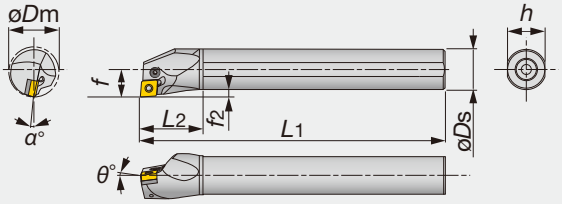
# STREAMJETBAR

## A-PCLNR/L

Lever-lock boring bars, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PCLNR/L09-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| A20Q-PCLNR/L09-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| A25R-PCLNR/L09-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| A25R-PCLNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | CN**1204... | 2.7 |
| A32S-PCLNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| A40T-PCLNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| A50U-PCLNR/L12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PCLNL ** type), and the left hand insert (L) is used for the right hand toolholders (PCLNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|---|---|
| A**-PCLNR/L09-D**0 | - | LCS22A | - | P-2F | - | - | LCL32N | EA-25 | SSHM5-6 |
| A25R-PCLNR/L12-D320 | - | LCS43 | - | - | P-2.5 | - | LCL43N | EA-32 | SSHM5-6 |
| A32S-PCLNR12-D400 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 | EA-32 | SSHM5-6 |
| A32S-PCLNL12-D400 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A40T-PCLNR12-D500 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A40T-PCLNL12-D500 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PCLNR12-D630 | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PCLNL12-D630 | LSC42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |

* Optional

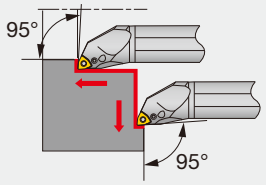
A/E-SEZPR/L: Inserts → **B122 -**, CBN → **B171**

A-PCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

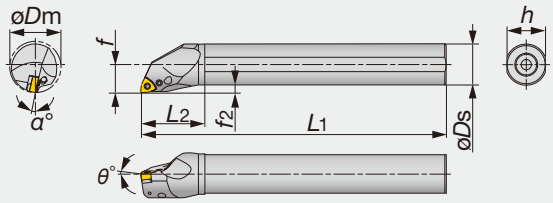
# STREAMJETBAR

## A-PWLNR/L

Lever-lock boring bars, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L06-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 3 | -8 | -17 | 0.8 | WN**0604... | 1.7 |
| A20Q-PWLNR/L06-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | WN**0604... | 1.7 |
| A25R-PWLNR/L06-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -12 | 0.8 | WN**0604... | 2.7 |
| A32S-PWLNR/L06-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | WN**0604... | 2.7 |
| A25R-PWLNR/L08-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0804... | 2.7 |
| A32S-PWLNR/L08-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 0.8 | WN**0804... | 4.8 |
| A40T-PWLNR/L08-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | WN**0804... | 4.8 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

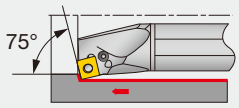
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|---|---|
| A16M-PWLNR/L06-D200 | - | LCS33 | - | P-2F | - | - | LCL33N | - | SSHM3-4 |
| A20Q-PWLNR/L06-D250 | - | LCS33 | - | P-2F | - | - | LCL33N | EA-20 | SSHM3-4 |
| A25R-PWLNR/L06-D320 | LSW312BR/L | - | LCS3B | - | P-2.5 | LSP3 | LCL3 | EA-25 | SSHM4-5 |
| A32S-PWLNR/L06-D400 | LSW312BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 | SSHM4-5 |
| A25R-PWLNR/L08-D320 | - | LCS43 | - | - | P-2.5 | - | LCL43N | EA-25 | SSHM4-5 |
| A32S-PWLNR/L08-D400 | LSW42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PWLNR/L08-D500 | LSW42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM4-5 |

* Optional

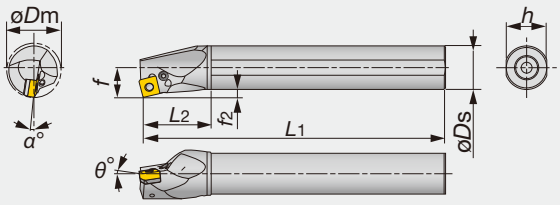
# STREAMJETBAR

## A-PSKNR/L

Lever-lock boring bars, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-PSKNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | SN**1204... | 4.8 |
| A40T-PSKNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | SN**1204... | 4.8 |
| A50U-PSKNR/L12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | SN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PSKNL ** type), and the left hand insert (L) is used for the right hand toolholders (PSKNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|
| A32S-PSKNR/L12-D400 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PSKNR/L12-D500 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PSKNR/L12-D630 | LSS42BR/L | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |

* Optional

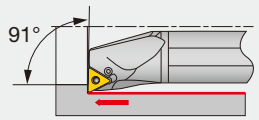
A-PWLNR/L: Inserts → **B095 -**, CBN → **B165**

A-PSKNR/L: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

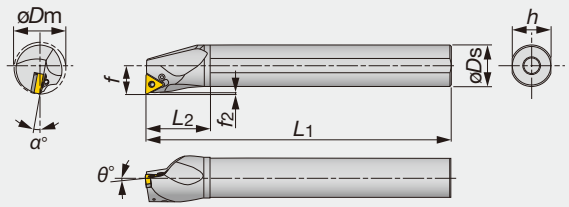
# A-PTFNR/L

## Lever-lock boring bars, for negative triangle inserts






Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.2 | -6 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTFNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.1 | -6 | -10 | 0.8 | TN**1604... | 2.7 |
| A40T-PTFNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 1.1 | -6 | -10 | 0.8 | TN**1604... | 2.7 |
| A50U-PTFNR/L16-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 1.1 | -6 | -8 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PTFNL ** type), and the left hand insert (L) is used for the right hand toolholders (PTFNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|
| A25R-PTFNR/L16-D320 | ELST317BR/L | LCS3 | P-2.5 | LSP3 | LCL33 | EA-25 | SSHM4-5 |
| A32S-PTFNR/L16-D400 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | EA-32 | SSHM4-5 |
| A40T-PTFNR/L16-D500 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | - | SSHM6-6 |
| A50U-PTFNR/L16-D630 | LST317BR/L | LCS3 | P-2.5 | LSP3 | LCL3 | - | SSHM6-6 |

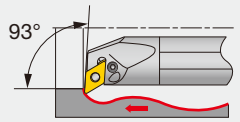
* Optional

A-PTFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

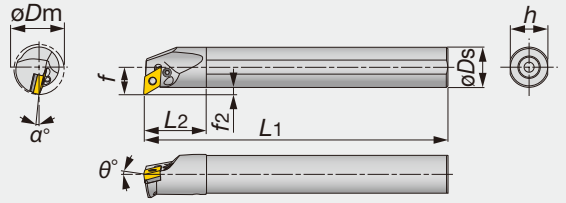
# STREAMJETBAR

## A-PDUNR/L

Lever-lock boring bars, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L11-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 3 | -6 | -14 | 0.8 | DN**1104... | 1.7 |
| A25R-PDUNR/L11-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -12 | 0.8 | DN**1104... | 2.7 |
| A32S-PDUNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -13 | 0.8 | DN**1504... | 4.8 |
| A40T-PDUNR/L15-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -10 | 0.8 | DN**1504... | 4.8 |
| A50U-PDUNR/L15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -8 | 0.8 | DN**1504... | 4.8 |
| A32S-PDUNR/L1506-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -13 | 0.8 | DN**1506... | 4.8 |
| A40T-PDUNR/L1506-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -6 | -11 | 0.8 | DN**1506... | 4.8 |
| A50U-PDUNR/L1506-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -10 | 0.8 | DN**1506... | 4.8 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

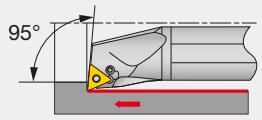
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|---|---|
| A20Q-PDUNR/L11-D250 | - | LCS22A | - | P-2F | - | - | LCL33NL | EA-20 | SSHM2.5-3 |
| A25R-PDUNR/L11-D320 | ELSD317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL33L | EA-25 | SSHM3-4 |
| A32S-PDUNR/L15-D400 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | EA-32 | SSHM5-6 |
| A40T-PDUNR/L15-D500 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PDUNR/L15-D630 | LSD42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A32S-PDUNR/L1506-D400 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | EA-20 | SSHM5-6 |
| A40T-PDUNR/L1506-D500 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | - | SSHM6-6 |
| A50U-PDUNR/L1506-D630 | ELSD42 | - | ELCS4 | - | P-3 | LSP4S | LCL44 | - | SSHM6-6 |

* Optional

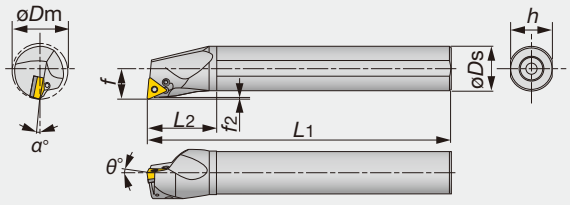
# STREAMJETBAR

## A-PTUNR/L

Lever-lock boring bars, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16M-PTUNR/L11-D200 | STEEL | 20 | 16 | 11 | 150 | 32 | 15 | 1 | -6 | -14 | 0.4 | TN**1103... | 1.7 |
| A20Q-PTUNR/L11-D250 | STEEL | 25 | 20 | 13 | 180 | 36 | 18 | 1 | -6 | -12 | 0.4 | TN**1103... | 1.7 |
| A25R-PTUNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 1.4 | -6 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 1.3 | -6 | -10 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The insert hole conforms to the ISO standard.
Tool holder length may be different to the ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (PTUNL ** type), and the left hand insert (L) is used for the right hand toolholders (PTUNR ** type).

### SPARE PARTS

| Designation | Shim | Clamping screw1 | Clamping screw2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|---|---|
| A16M-PTUNR/L11-D200 | - | LCS22A | - | P-2F | - | - | LCL22N | - | SSHM3-4 |
| A20Q-PTUNR/L11-D250 | - | LCS22A | - | P-2F | - | - | LCL22N | EA-20 | SSHM3-4 |
| A25R-PTUNR/L16-D320 | ELST317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | EA-25 | SSHM4-5 |
| A32S-PTUNR/L16-D400 | LST317BR/L | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 | SSHM4-5 |

* Optional

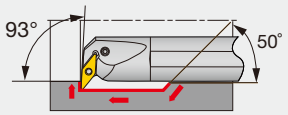
A-PDUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

A-PTUNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

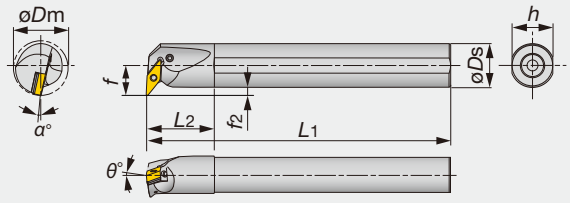
# STREAMJETBAR

## A-PVUNR/L

Lever-lock boring bars, for negative 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L16-D370 | STEEL | 37 | 25 | 22 | 200 | 45 | 23 | 9.5 | -5 | -14 | 0.8 | V/YN**1604... | 2.7 |
| A32S-PVUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -5 | -12 | 0.8 | V/YN**1604... | 2.7 |
| A40T-PVUNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 7 | -5 | -10 | 0.8 | V/YN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

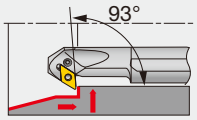
| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|
| A25R-PVUNR/L16-D370 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | EA-25 | SSHM4-5 |
| A32S-PVUNR/L16-D400 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | EA-32 | SSHM4-5 |
| A40T-PVUNR/L16-D500 | LSV317BR/L | LCS3V | P-2.5 | LSP3 | LCL3V | - | SSHM5-6 |

* Optional

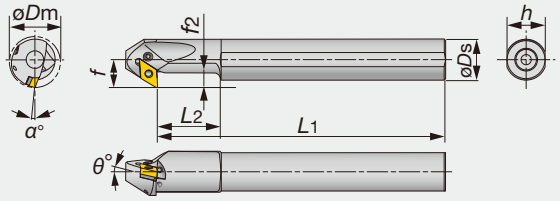
# STREAMJETBAR

## A-PDZNR/L

Lever-lock boring bars, for negative 55° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-PDZNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 11.5 | -6 | -13 | 0.8 | DN**1504... | 4.8 |
| A40T-PDZNR/L15-D500 | STEEL | 50 | 40 | 27 | 300 | 60 | 37 | 14.5 | -6 | -10 | 0.8 | DN**1504... | 4.8 |
| A50U-PDZNR/L15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 14.5 | -6 | -8 | 0.8 | DN**1504... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the right hand toolholders (PDZNR** type), and the left hand insert (L) is used for the left hand toolholders (PDZNL** type).

### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever | Oil supply attachment* | Screw for oil hole* |
|---|---|---|---|---|---|---|---|
| A32S-PDZNR15-D400 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A32S-PDZNL15-D400 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | EA-32 | SSHM4-5 |
| A40T-PDZNR15-D500 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM5-6 |
| A40T-PDZNL15-D500 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM5-6 |
| A50U-PDZNR15-D630 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |
| A50U-PDZNL15-D630 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 | - | SSHM6-6 |

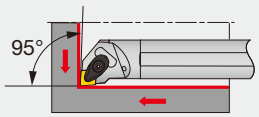
* Optional

A-PVUNR/L: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**
A-PDZNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

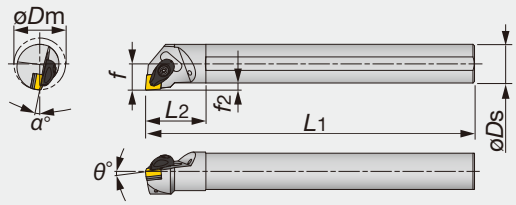
# TURNING

## A-ACLNR/L

Double-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ACLNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | CN**1204... | 3 |
| A32S-ACLNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | CN**1204... | 3 |
| A40T-ACLNR/L12-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | CN**1204... | 3 |
| A50U-ACLNR12-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 0.8 | CN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

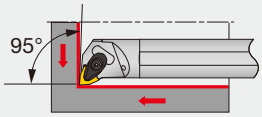
**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ACLNR/L12-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASC422 | CSTB-3.5 | T-15F |

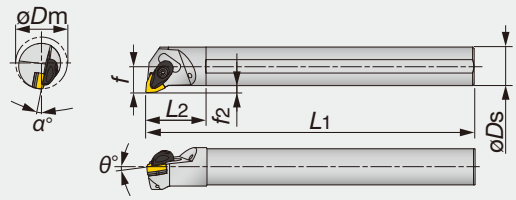
# TURNING

## A-AWLNR/L

Double-clamp boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-AWLNR/L06-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0604... | 3 |
| A32S-AWLNR/L06-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0604... | 3 |
| A25R-AWLNR/L08-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | WN**0804... | 3 |
| A32S-AWLNR/L08-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | WN**0804... | 3 |
| A40T-AWLNR/L08-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | WN**0804... | 3 |
| A50U-AWLNR/L08-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 0.8 | WN**0804... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

**SPARE PARTS**

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AWLNR/L06-D... | ACP3S | ACS-5W | BP-7 | SP-2.5 | ASW322 | CSTB-3.5 | T-15F |
| A**-AWLNR/L08-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASW422 | CSTB-3.5 | T-15F |

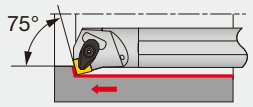
A-ACLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

A-AWLNR/L: Inserts → **B095 -**, CBN → **B165**

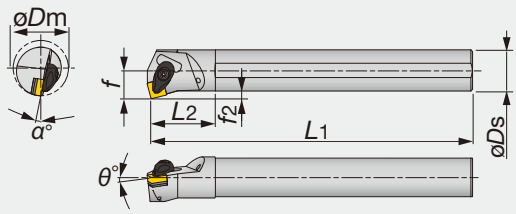
# TURNING

## A-ASKNR/L

Double-clamp boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ASKNR/L12-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | SN**1204... | 3 |
| A32S-ASKNR/L12-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | SN**1204... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

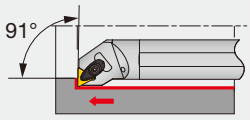
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ASKN*12-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASS422 | CSTB-3.5 | T-15F |

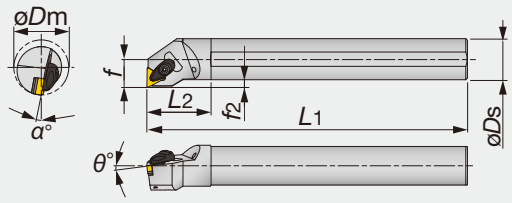
# TURNING

## A-ATFNR/L

Double-clamp boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ATFNR/L16-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 0.8 | TN**1604... | 3 |
| A32S-ATFNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | TN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ATFNR/L16-D... | ACP3S | ACS-5W | BP-7 | SP-2.5 | AST322 | CSTB-3.5 | T-15F |

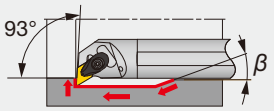
A-ASKNR/L: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

A-ATFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

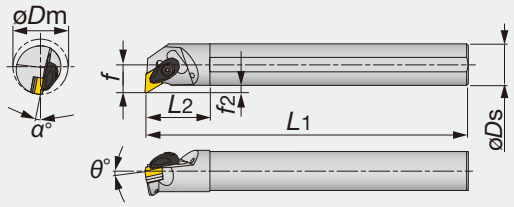
# TURNING

## A-ADUNR/L

Double-clamp boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | β | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A25R-ADUNR/L15-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 30 | 0.8 | DN**1504... | 3 |
| A32S-ADUNR/L15-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 20 | 0.8 | DN**1504... | 3 |
| A40T-ADUNR15-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 15 | 0.8 | DN**1504... | 3 |
| A50U-ADUNR15-D630 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 10 | -6 | -7 | 15 | 0.8 | DN**1504... | 3 |
| A25R-ADUNR/L1506-D320 | STEEL | 32 | 25 | 17 | 200 | 45 | 23 | 4.5 | -6 | -13 | 15 | 0.8 | DN**1506... | 3 |
| A32S-ADUNR/L1506-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -11 | 20 | 0.8 | DN**1506... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

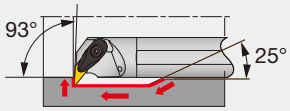
### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-ADUNR/L15-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD432 | CSTB-3.5 | T-15F |
| A**-ADUNR/L1506-D... | ACP4S | ACS-5W | BP-7 | SP-2.5 | ASD423 | CSTB-3.5 | T-15F |

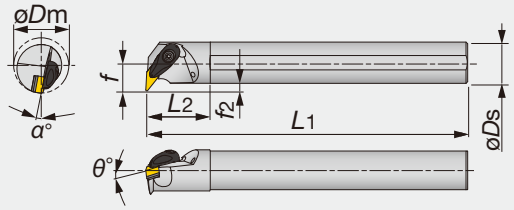
# TURNING

## A-AVUNR/L

Double-clamp boring bar, for negative 35° or 25° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A32S-AVUNR/L16-D400 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 6 | -6 | -10 | 0.8 | V/YN**1604... | 3 |
| A40T-AVUNR/L16-D500 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 7 | -6 | -8 | 0.8 | V/YN**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamp | Clamp screw | Spring | Spring pin | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|---|---|
| A**-AVUNR/L16-D... | ACP3L | ACS-5W | BP-7 | SP-2.5 | ASV322 | CSTB-3.5 | T-15F |

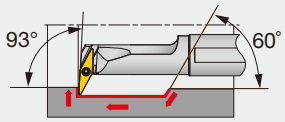

A-ADUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

A-AVUNR/L: Inserts → **B091 -**, **B102**, CBN → **B165 -**, PCD → **B176**

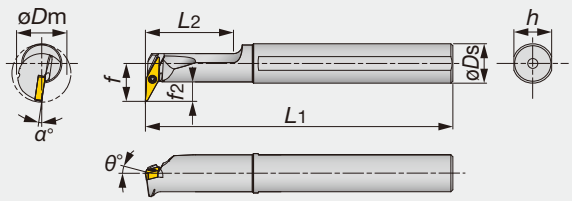
# Y-PRO SERIES

## A/E-SYUBR/L

Screw-on boring bars, for positive 25° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A16Q-SYUBR/L11-D200 | STEEL | 20 | 16 | 15.5 | 180 | 35 | 15 | 8 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |
| E12Q-SYUBR/L11-D200 | CARBIDE | 20 | 12 | 13.5 | 180 | 27 | 11 | 7.5 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |
| E16R-SYUBR/L11-D245 | CARBIDE | 24.5 | 16 | 16 | 200 | 32 | 15 | 8 | 0 | -8 | 0.4 | YW**11T2... | 0.6 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

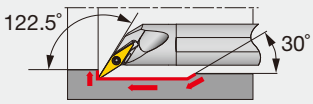
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A16Q-SYUBR/L11-D200 | CSTB-2L | T-6F |
| E**-SYUBR/L11-D... | CSTB-2L | T-6F |

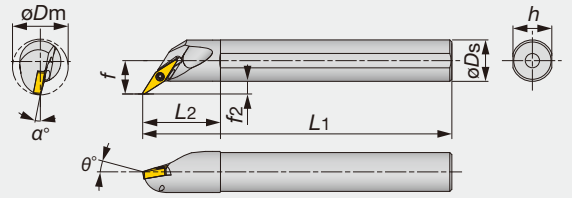
# Y-PRO SERIES

## A/E-SYQBR/L

Screw-on boring bars, for positive 25° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A12M-SYQBR/L11-D170 | STEEL | 17 | 12 | 10.5 | 150 | 24 | 11 | 4.5 | -5 | -10 | 0.4 | YW**11T2... | 0.6 |
| A16Q-SYQBR/L11-D215 | STEEL | 21.5 | 16 | 13 | 180 | 30 | 15 | 5 | -5 | -8 | 0.4 | YW**11T2... | 0.6 |
| E12Q-SYQBR/L11-D170 | CARBIDE | 17 | 12 | 10.5 | 180 | 27 | 11 | 4.5 | -5 | -10 | 0.4 | YW**11T2... | 0.6 |
| E16R-SYQBR/L11-D215 | CARBIDE | 21.5 | 16 | 13 | 200 | 32 | 15 | 5 | -5 | -8 | 0.4 | YW**11T2... | 0.6 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

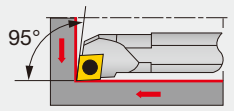
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| A**-SYQBR/L11-D... | CSTB-2L | T-6F |
| E**-SYQBR/L11-D... | CSTB-2L | T-6F |

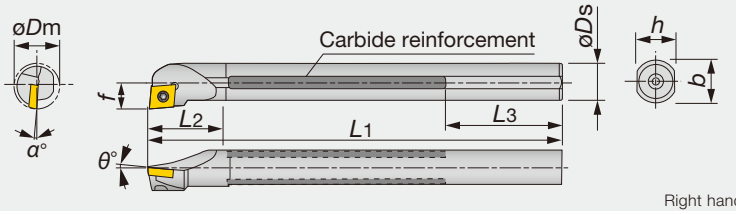
A/E-SYUBR/L, A/E-SYQBR/L: Inserts → **B153**

## T-SCLCR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | b | α° | θ° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-SCLCR/L06 | TSUPPARI | 16 | – | 12 | 9 | 150 | 22 | 59 | 11 | – | -10 | 0 | 0.4 | CC**0602... | 1.2 |
| T16Q-SCLCR/L09 | TSUPPARI | 20 | – | 16 | 11 | 180 | 27 | 59 | 15 | – | -10 | 0 | 0.8 | CC**09T3... | 3 |
| T20R-SCLCR/L09C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | – | -8 | 0 | 0.8 | CC**09T3... | 3 |
| T25S-SCLCR/L09C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | – | -6 | 0 | 0.8 | CC**09T3... | 3 |

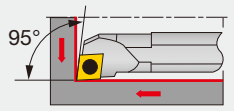
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLCL** type), and the left hand insert (L) is used for the right hand toolholders (SCLCR** type).

### SPARE PARTS

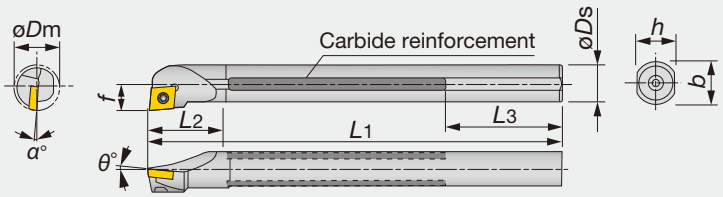
| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-SCLCR/L06 | CSTB-2.5 | T-8F |
| T16Q-SCLCR/L09 | CSTB-4S | T-15F |
| T20R-SCLCR/L09C | CSTB-4S | T-15F |
| T25S-SCLCR/L09C | CSTB-4S | T-15F |

## T-SCLPR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | α° | θ° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-SCLPR08-D14 | TSUPPARI | 14 | - | 12 | 7 | 150 | 22 | 59 | 11 | -4 | 5 | 0.4 | CP**0802... | 1.4 |
| T12M-SCLPR/L08 | TSUPPARI | 16 | - | 12 | 9 | 150 | 25 | 59 | 11 | -3 | 5 | 0.4 | CP**0802... | 1.4 |
| T16Q-SCLPR09-D18 | TSUPPARI | 18 | - | 16 | 9 | 180 | 27 | 59 | 15 | -3.5 | 5 | 0.8 | CP**0903... | 3 |
| T16Q-SCLPR/L09 | TSUPPARI | 20 | - | 16 | 11 | 180 | 30 | 59 | 15 | -4 | 5 | 0.8 | CP**0903... | 3 |
| T20R-SCLPR09C-D22 | TSUPPARI | 22 | Rc1/4 | 20 | 11 | 200 | 35 | 49 | 18 | -2 | 5 | 0.8 | CP**0903... | 3 |
| T20R-SCLPR/L09 | TSUPPARI | 25 | - | 20 | 13 | 200 | 35 | 49 | 18 | -2 | 5 | 0.8 | CP**0903... | 3 |
| T25S-SCLPR09C-D27 | TSUPPARI | 27 | Rc1/4 | 25 | 13.5 | 250 | 40 | 64 | 23 | -1 | 5 | 0.8 | CP**0903... | 3 |
| T25S-SCLPR/L09 | TSUPPARI | 32 | - | 25 | 17 | 250 | 40 | 64 | 23 | 0 | 5 | 0.8 | CP**0903... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SCLPL** type), and the left hand insert (L) is used for the right hand toolholders (SCLPR** type).

### SPARE PARTS

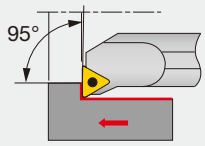
| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-SCLPR/L08... | CSTB-3L050 | T-9F |
| T16Q-SCLPR09-D18 | CSTB-4L060 | T-15F |
| T16Q-SCLPR/L09 | CSTB-4S | T-15F |
| T20R-SCLPR09C-D22 | CSTB-4L060 | T-15F |
| T20R-SCLPR/L09 | CSTB-4S | T-15F |
| T25S-SCLPR09C-D27 | CSTB-4L060 | T-15F |
| T25S-SCLPR/L09 | CSTB-4S | T-15F |

T-SCLCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

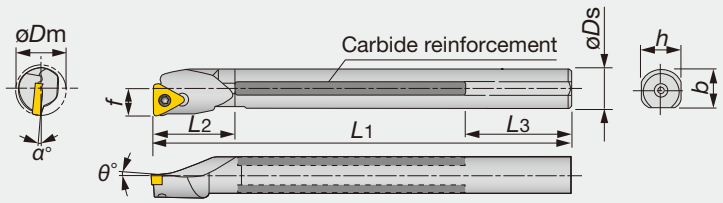
T-SCLPR/L: Inserts → **B111 -**

## T-STUPR/L

Tsuppari-Ichiban boring bar, for positive triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T12M-STUPR11-D14 | TSUPPARI | 14 | - | 12 | 7 | 150 | 24 | 59 | 11 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| T12M-STUPR/L11 | TSUPPARI | 16 | - | 12 | 9 | 150 | 25 | 58 | 11 | 5 | -4 | 0.4 | TP**1102... | 1.2 |
| T16Q-STUPR13-D18 | TSUPPARI | 18 | - | 16 | 9 | 180 | 30 | 59 | 15 | 5 | -3.5 | 0.4 | TP**1303... | 1.4 |
| T16Q-STUPR/L13 | TSUPPARI | 20 | - | 16 | 11 | 180 | 30 | 59 | 15 | 5 | -3 | 0.4 | TP**1303... | 1.4 |
| T20R-STUPR13C-D22 | TSUPPARI | 22 | Rc1/4 | 20 | 11 | 200 | 35 | 49 | 18 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| T20R-STUPR/L13 | TSUPPARI | 24 | - | 20 | 13 | 200 | 40 | 49 | 18 | 5 | -2 | 0.4 | TP**1303... | 1.4 |
| T25S-STUPR16C-D27 | TSUPPARI | 27 | Rc1/4 | 25 | 13.5 | 250 | 40 | 64 | 23 | 5 | -1 | 0.8 | TP**16T3... | 3 |
| T25S-STUPR/L16 | TSUPPARI | 31 | - | 25 | 17 | 250 | 45 | 64 | 23 | 5 | 0 | 0.8 | TP**16T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (STUPL** type), and the left hand insert (L) is used for the right hand toolholders (STUPR** type).

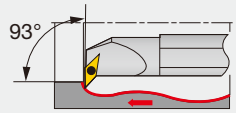
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| T12M-STUPR11-D14 | CSTB-2.5B | T-8F |
| T12M-STUPR/L11 | CSTB-2.5 | T-8F |
| T16Q-STUPR13-D18 | CSTB-3S | T-9F |
| T16Q-STUPR/L13 | CSTB-3 | T-9F |
| T20R-STUPR13C-D22 | CSTB-3S | T-9F |
| T20R-STUPR/L13 | CSTB-3 | T-9F |
| T25S-STUPR/L16... | CSTB-4S | T-15F |

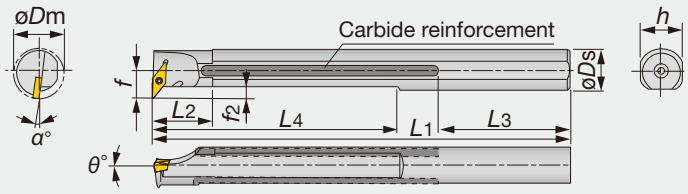
T-STUPR/L: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

## T-SVUBR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | L4 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T20R-SVUBR11C | TSUPPARI | 25 | Rc1/4 | 20 | 14 | 200 | 30 | 59 | 121 | 18 | 4 | 0 | -8 | 0.4 | VB**1103... | 1.2 |

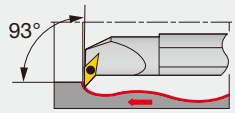
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (SVUBL** type), and the left hand insert (L) is used for the right hand toolholders (SVUBR** type).

### SPARE PARTS

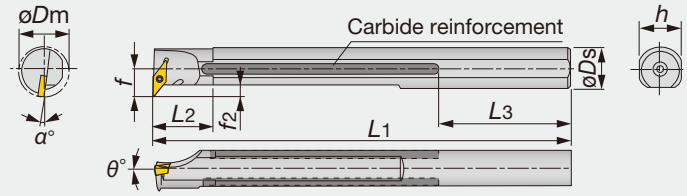
| Designation | Clamping screw | Wrench |
|---|---|---|
| T20R-SVUBR11C | CSTB-2.5 | T-8F |

## T-SVUCR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T25S-SVUCR16C | TSUPPARI | 32 | Rc1/4 | 25 | 19 | 250 | 40 | 64 | 23 | 6.5 | 0 | -5 | 0.8 | VC**1604... | 3 |

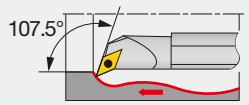
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

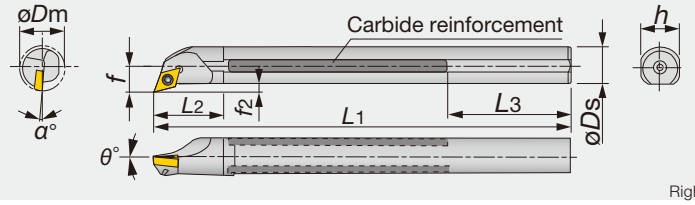
| Designation | Clamping screw | Wrench |
|---|---|---|
| T25S-SVUCR16C | CSTB-3.5L | T-15F |

## T-SDQCR/L

Tsuppari-Ichiban, Screw-on boring bar, for positive 55° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-SDQCR/L07 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | 3 | 0 | -6 | 0.4 | DC**0702... | 1.2 |
| T20R-SDQCR/L11C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | 3 | 0 | -6 | 0.8 | DC**11T3... | 3 |
| T25S-SDQCR/L11C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | 4.5 | 0 | -4 | 0.8 | DC**11T3... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| T16Q-SDQCR/L07 | CSTB-2.5 | T-8F |
| T20R-SDQCR/L11C | CSTB-4M | T-15F |
| T25S-SDQCR/L11C | CSTB-4 | T-15F |

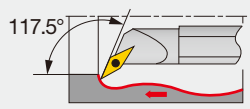

T-SVUBR: Inserts → **B145 -**, CBN → **B169 -**

T-SVUCR: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

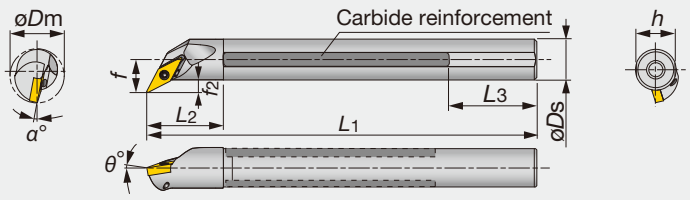
T-SDQCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

## T-SVQBR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T20R-SVQBR11C | TSUPPARI | 25 | Rc1/4 | 20 | 14 | 200 | 30 | 59 | 18 | 4 | -5 | -7 | 0.4 | VB**1103... | 1.2 |

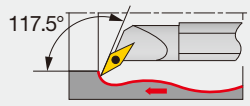
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard. When using a right or left hand insert, the right hand instert (R) is used for the left hand toolholders (L), and the left hand insert (L) is used for the right hand toolholders (R).

### SPARE PARTS

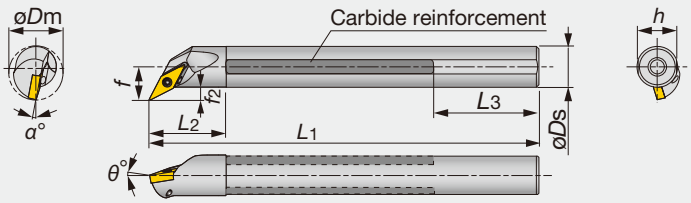
| Designation | Clamping screw | Wrench |
|---|---|---|
| T20R-SVQBR11C | CSTB-2.5 | T-8F |

## T-SVQCR

Tsuppari-Ichiban, Screw-on boring bar, for positive 35° rhombic inserts




Cutting edge style **Q**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T25S-SVQCR16C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | 8 | 0 | -5 | 0.8 | VC**1604... | 3 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard. When using a right or left hand insert, the right hand instert (R) is used for the left hand toolholders (L), and the left hand insert (L) is used for the right hand toolholders (R).

### SPARE PARTS

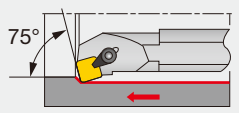
| Designation | Clamping screw | Wrench |
|---|---|---|
| T25S-SVQCR16C | CSTB-3.5L | T-15F |

T-SVQBR: Inserts → **B145 -**, CBN → **B169 -**

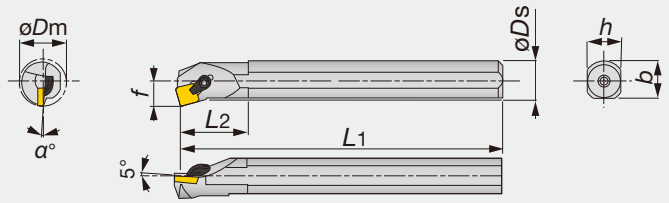
T-SVQCR: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

## S-CSKPR/L

Clamp-on boring bar, for positive square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S16Q-CSKPR09 | STEEL | 20 | 16 | 11 | 180 | 30 | 15 | 15 | -4 | 0.8 | SP**0903... |
| S20R-CSKPR/L09 | STEEL | 25 | 20 | 13 | 200 | 40 | 18 | 18.5 | -2 | 0.8 | SP**0903... |
| S25S-CSKPR12 | STEEL | 32 | 25 | 17 | 250 | 45 | 23 | 22.5 | 0 | 0.8 | SP**1203... |

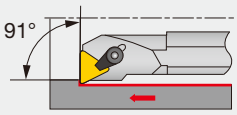
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

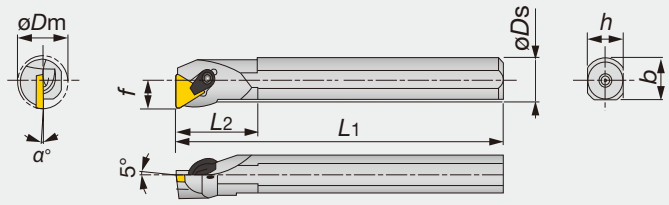
| Designation | Clamp set | Wrench |
|---|---|---|
| S16Q-CSKPR09 | CSG-5S | P-2.5 |
| S20R-CSKPR/L09 | CSG-5 | P-2.5 |
| S25S-CSKPR12 | CSG-6 | P-3 |

## S/C-CTFPR/L

Clamp-on style boring bar, for positive triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S12M-CTFPR/L11 | STEEL | 16 | 12 | 9 | 150 | 25 | 11 | 11.5 | -6 | 0.4 | TP**1103... |
| S16Q-CTFPR/L11 | STEEL | 20 | 16 | 11 | 180 | 30 | 15 | 15 | -4 | 0.4 | TP**1103... |
| S20R-CTFPR/L16 | STEEL | 25 | 20 | 13 | 200 | 40 | 18 | 18.5 | -2 | 0.8 | TP**1603... |
| S25S-CTFPR/L16 | STEEL | 32 | 25 | 17 | 250 | 45 | 23 | 22.5 | 0 | 0.8 | TP**1603... |
| S32T-CTFPR/L16 | STEEL | 40 | 32 | 22 | 300 | 50 | 30 | 29.5 | 0 | 0.8 | TP**1603... |
| C12Q-CTFPR/L11 | CARBIDE | 16 | 12 | 9 | 180 | - | 11 | - | -6 | 0.4 | TP**1103... |
| C16R-CTFPR/L11 | CARBIDE | 20 | 16 | 11 | 200 | - | 15 | - | -4 | 0.4 | TP**1103... |

**rε: Standard corner radius
Note: The hole of inserts conforms to ISO standard.
When using a right or left hand insert, the right hand insert (R) is used for left hand toolholders (L) and the left hand insert (L) is used for right hand toolholders (R).

### SPARE PARTS

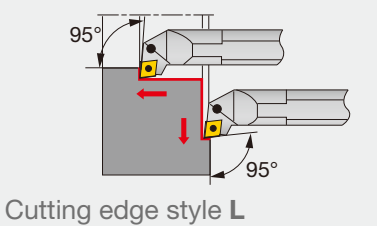
| Designation | Clamp set | Wrench |
|---|---|---|
| S12M-CTFPR/L11 | CSW-00 | P-2.5 |
| S16Q-CTFPR/L11 | CSG-5S | P-2.5 |
| S20R-CTFPR/L16 | CSG-6S | P-3 |
| S**-CTFPR/L16 | CSG-6 | P-3 |
| C12Q-CTFPR/L11 | CSW-00 | P-2.5 |
| C16R-CTFPR/L11 | CSG-5S | P-2.5 |

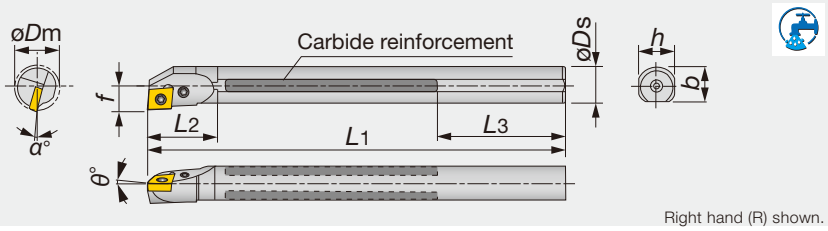
S-CSKPR/L: Inserts → **B130**, CBN → **B168**, PCD → **B177**

S/C-CTFPR/L: Inserts → **B143 -**, CBN → **B168 -**, PCD → **B178**

## T-PCLNR

Lever-lock boring bar, for negative 80° rhombic inserts




| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-PCLNR09 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| T20R-PCLNR09C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| T25S-PCLNR09C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| T32U-PCLNR12C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| T40V-PCLNR12C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| T50W-PCLNR12C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

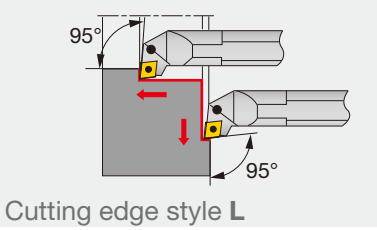
*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

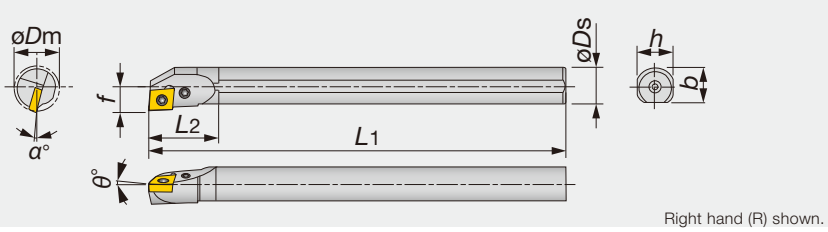
### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| T**-PCLNR09... | - | LCS22A | - | P-2F | - | - | LCL32N |
| T**-PCLNR12C | LSC42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |

## S-PCLNR/L

Lever-lock boring bar, for negative 80° rhombic inserts




| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | θ° | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PCLNR/L09 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -6 | -14 | 0.8 | CN**0903... | 1.7 |
| S20Q-PCLNR/L09 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -6 | -12 | 0.8 | CN**0903... | 1.7 |
| S25R-PCLNR/L09 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -6 | -11 | 0.8 | CN**0903... | 1.7 |
| S32S-PCLNR/L12 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -6 | -11 | 0.8 | CN**1204... | 4.8 |
| S40T-PCLNR/L12 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -6 | -10 | 0.8 | CN**1204... | 4.8 |
| S50U-PCLNR/L12 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -6 | -8 | 0.8 | CN**1204... | 4.8 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

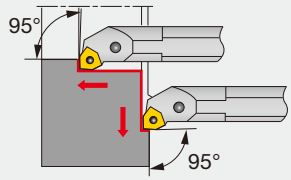
### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S**-PCLNR/L09 | - | LCS22A | - | P-2F | - | - | LCL32N |
| S32S-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PCLNR/L12 | LSC42BR/L | - | LCS4 | - | P-3 | LSP4 | LCL4 |

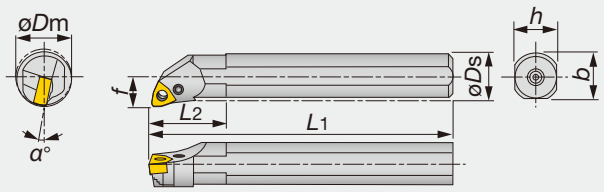
T-PCLNR, S-PCLNR/L: Inserts → **B050 -**, CBN → **B163**, PCD → **B176**

## S-PWLNR/L

Lever-lock boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PWLNR/L06 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -17 | 0.8 | WN**0604... |
| S20Q-PWLNR/L06 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -14 | 0.8 | WN**0604... |
| S25R-PWLNR/L06 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | WN**0604... |

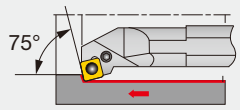
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

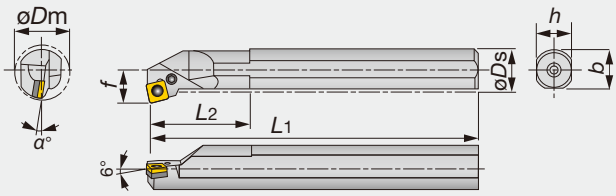
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S**-PWLNR/L06 | - | LCS33 | - | P-2F | - | - | LCL33N |
| S25R-PWLNR06 | LSW312BR | - | LCS3B | - | P-2.5 | LSP3 | LCL3 |
| S25R-PWLNL06 | LSW312BL | - | LCS3B | - | P-2.5 | LSP3 | LCL3 |

## S-PSKNR

Lever-lock boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PSKNR12 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | SN**1204... |
| S40T-PSKNR12 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | SN**1204... |
| S50U-PSKNR12 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | SN**1204... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

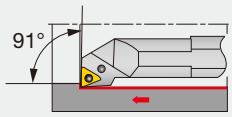
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S**-PSKNR12 | LSS42BR | LCS4 | P-3 | LSP4 | LCL4 |

S-PWLNR/L: Inserts → **B095 -**, CBN → **B165**

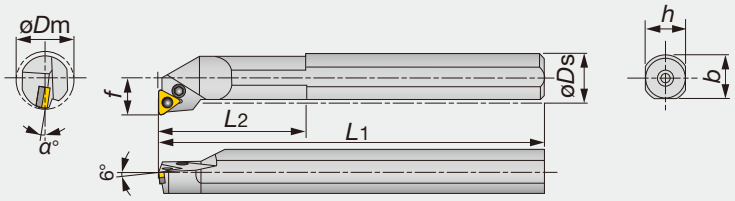
S-PSKNR: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

## S-PTFNR/L

Lever lock type boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PTFNR/L16 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | TN**1604... | 2.7 |
| S40T-PTFNR/L16 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | TN**1604... | 2.7 |
| S50U-PTFNR16 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | TN**1604... | 2.7 |

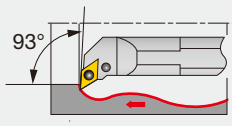
*Torque: Recommended torque (N·m) for clamping **$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

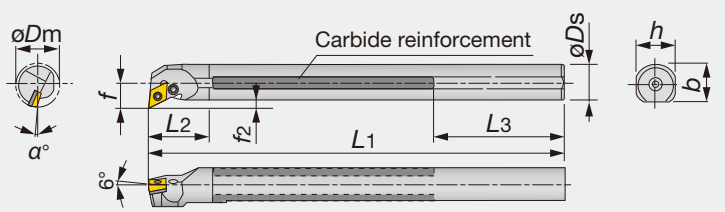
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S32S-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |
| S32S-PTFNL16 | LST317BL | LCS3 | P-2.5 | LSP3 | LCL3 |
| S40T-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |
| S40T-PTFNL16 | LST317BL | LCS3 | P-2.5 | LSP3 | LCL3 |
| S50U-PTFNR16 | LST317BR | LCS3 | P-2.5 | LSP3 | LCL3 |

## T-PDUNR

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | f2 | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T32U-PDUNR15C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | 6 | -13 | 0.8 | DN**1504... |
| T40V-PDUNR15C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | 7 | -10 | 0.8 | DN**1504... |
| T50W-PDUNR15C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | 10 | -8 | 0.8 | DN**1504... |

**$r_\varepsilon$: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

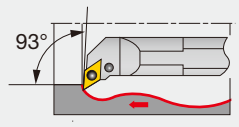
| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| T**-PDUNR15C | LSD42BR | LCS4 | P-3 | LSP4 | LCL4 |

S-PTFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

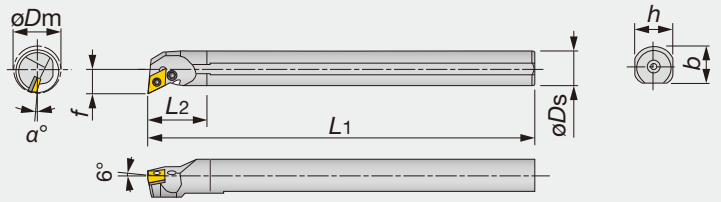
T-PDUNR: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## S-PDUNR/L

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S20Q-PDUNR/L11 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -14 | 0.8 | DN**1104... |
| S25R-PDUNR/L11 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | DN**1104... |
| S32S-PDUNR/L15 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -13 | 0.8 | DN**1504... |
| S40T-PDUNR/L15 | STEEL | 50 | 40 | 27 | 300 | 55 | 37 | 37.5 | -10 | 0.8 | DN**1504... |
| S50U-PDUNR/L15 | STEEL | 63 | 50 | 35 | 350 | 65 | 47 | 47.5 | -8 | 0.8 | DN**1504... |

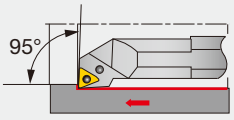
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

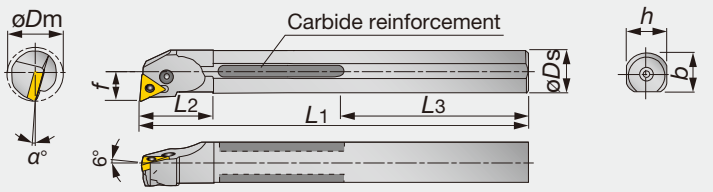
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| S20Q-PDUNR/L11 | - | LCS22A | - | P-2F | - | - | LCL33NL |
| S25R-PDUNR11 | ELSD317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33L |
| S25R-PDUNL11 | ELSD317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL33L |
| S32S-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S32S-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S40T-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PDUNR15 | LSD42BR | - | LCS4 | - | P-3 | LSP4 | LCL4 |
| S50U-PDUNL15 | LSD42BL | - | LCS4 | - | P-3 | LSP4 | LCL4 |

## T-PTUNR

Lever-lock boring bar, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | Oil hole | øDs | f | L1 | L2 | L3 | h | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T16Q-PTUNR11 | TSUPPARI | 20 | - | 16 | 11 | 180 | 27 | 59 | 15 | -14 | 0.4 | TN**1103... | 1.7 |
| T20R-PTUNR11C | TSUPPARI | 25 | Rc1/4 | 20 | 13 | 200 | 35 | 49 | 18 | -12 | 0.4 | TN**1103... | 1.7 |
| T25S-PTUNR16C | TSUPPARI | 32 | Rc1/4 | 25 | 17 | 250 | 40 | 64 | 23 | -12 | 0.8 | TN**1604... | 2.7 |
| T32U-PTUNR16C | TSUPPARI | 40 | Rc1/2 | 32 | 22 | 350 | 50 | 103 | 30 | -10 | 0.8 | TN**1604... | 2.7 |
| T40V-PTUNR16C | TSUPPARI | 50 | Rc1/2 | 40 | 27 | 400 | 55 | 88 | 37 | -10 | 0.8 | TN**1604... | 2.7 |
| T50W-PTUNR16C | TSUPPARI | 63 | Rc1/2 | 50 | 35 | 450 | 65 | 63 | 47 | -8 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: • The hole of inserts conforms to ISO standard.
• Toolholder lengths do not always conform to ISO.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

### SPARE PARTS

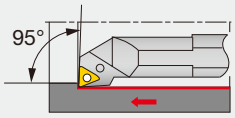
| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever |
|---|---|---|---|---|---|---|---|
| T**-PTUNR11... | - | LCS22A | - | P-2F | - | - | LCL22N |
| T25S-PTUNR16C | ELST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33 |
| T**-PTUNR16C | LST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL3 |

S-PDUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

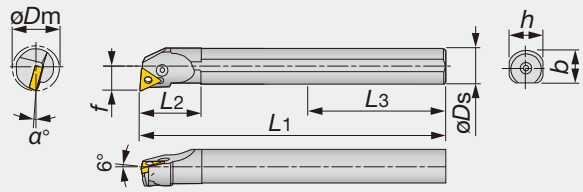
T-PTUNR: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## A/S-PTUNR/L

Lever lock type boring bar, for negative triangle inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S16M-PTUNR/L11 | STEEL | 20 | 16 | 11 | 150 | 30 | 15 | 15.5 | -14 | 0.4 | TN**1103... | 1.7 |
| S20Q-PTUNR/L11 | STEEL | 25 | 20 | 13 | 180 | 35 | 18 | 19 | -12 | 0.4 | TN**1103... | 1.7 |
| S25R-PTUNR/L16 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 24 | -12 | 0.8 | TN**1604... | 2.7 |
| A32S-PTUNR/L16 | STEEL | 40 | 32 | 22 | 250 | 50 | 30 | 29.5 | -12 | 0.8 | TN**1604... | 2.7 |

*Torque: Recommended torque (N·m) for clamping **rε: Standard corner radius
Note: • The hole of inserts conforms to ISO standard.
• Toolholder lengths do not always conform to ISO.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.

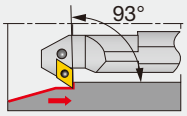
### SPARE PARTS

| Designation | Shim | Clamping screw 1 | Clamping screw 2 | Wrench 1 | Wrench 2 | Spring | Lever | Oil supply attachment* |
|---|---|---|---|---|---|---|---|---|
| S**-PTUNR/L11 | - | LCS22A | - | P-2F | - | - | LCL22N | - |
| S25R-PTUNR16 | ELST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | - |
| S25R-PTUNL16 | ELST317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL33 | - |
| A32S-PTUNR16 | LST317BR | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 |
| A32S-PTUNL16 | LST317BL | - | LCS3 | - | P-2.5 | LSP3 | LCL3 | EA-32 |

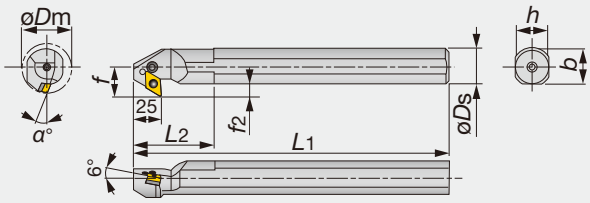
* Optional

## S-PDZNR/L

Lever-lock boring bar, for negative 55° rhombic inserts




Cutting edge style **Z**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | f2 | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S32S-PDZNR/L15 | STEEL | 40 | 32 | 22 | 275 | 55 | 30 | 6 | 29.5 | -13 | 0.8 | DN**1504... |
| S40T-PDZNR15 | STEEL | 50 | 40 | 27 | 325 | 60 | 37 | 7 | 37.5 | -10 | 0.8 | DN**1504... |
| S50U-PDZNR15 | STEEL | 60 | 50 | 35 | 375 | 65 | 47 | 10 | 47.5 | -8 | 0.8 | DN**1504... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert is used for right hand toolholders and the left hand insert is used for left hand toolholders.

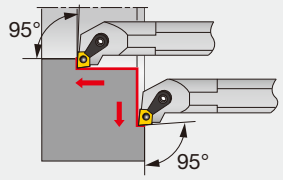
### SPARE PARTS

| Designation | Shim | Clamping screw | Wrench | Spring | Lever |
|---|---|---|---|---|---|
| S32S-PDZNR15 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 |
| S32S-PDZNL15 | LSZ42BL | LCS4 | P-3 | LSP4 | LCL4 |
| S*0*-PDZNR15 | LSZ42BR | LCS4 | P-3 | LSP4 | LCL4 |

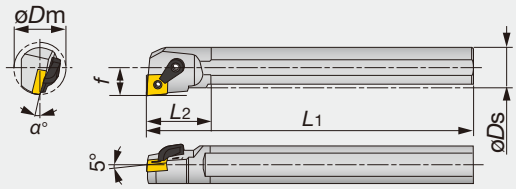
A/S-PTUNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**
S-PDZNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

## S-MCLNR/L

Multi-clamp boring bar, for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MCLNR/L12 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | CN**1204... |

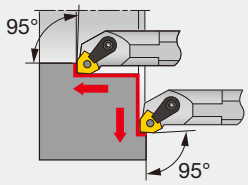
**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MCLNL** type), and the left hand insert (L) is used for the right hand toolholders (MCLNR** type).

### SPARE PARTS

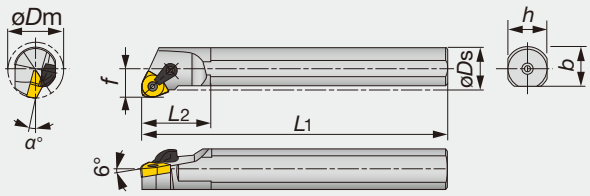
| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MCLNR/L12 | MCPM-21 | MLP44 | MCS620-3 | P-3 | P-2.5F |

## S-MWLNR/L

Multi-clamp boring bar, for negative trigon inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MWLNR/L08 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | WN**0804... |
| S32S-MWLNR/L08 | STEEL | 44 | 32 | 22 | 250 | 50 | 30 | 29.5 | -10 | 0.8 | WN**0804... |
| S40T-MWLNR/L08 | STEEL | 54 | 40 | 27 | 300 | 60 | 37 | 37.5 | -10 | 0.8 | WN**0804... |
| S50U-MWLNR/L08 | STEEL | 70 | 50 | 35 | 350 | 75 | 47 | 47.5 | -10 | 0.8 | WN**0804... |

**rε: Standard corner radius

### SPARE PARTS

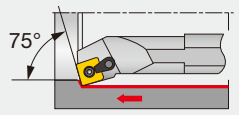
| Designation | Clamp | Pin | Clamping screw | Shim | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| S25R-MWLNR/L08 | MCPM-6 | MLP44 | MCS520-2.5 | - | P-2.5 | P-2.5F |
| S32S-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |
| S40T-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |
| S50U-MWLNR/L08 | MCPM-6 | MLP46 | MCS520-2.5 | MSW-432BR/L | P-2.5 | P-2.5F |

S-MCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

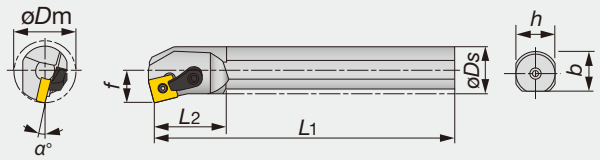
S-MWLNR/L: Inserts → **B095 -**, CBN → **B165**

## S-MSKNR/L

Multi-clamp boring bar, for negative square inserts




Cutting edge style **K**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MSKNR/L12 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | SN**1204... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MSKNL** type), and the left hand insert (L) is used for the right hand toolholders (MSKNR** type).

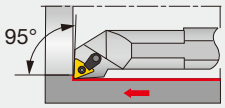
### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MSKNR/L12 | MCPM-21<br>MCL-6* | MLP44 | MCS620-3 | P-3 | P-2.5F |

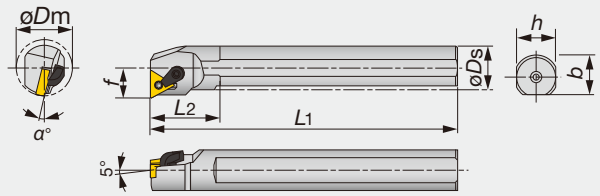
Note: * marked parts type No. in former type No.

## S-MTFNR/L

Multi-clamp boring bar, for negative triangle inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MTFNR/L16 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | TN**1604... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MTFNL** type), and the left hand insert (L) is used for the right hand toolholders (MTFNR** type).

### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MTFNR/L16 | MCPM-6<br>MCL-5M* | MLP33L | MCS520-2.5 | P-2.5 | P-2F |

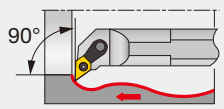
Note: * marked parts type No. in former type No.

S-MSKNR/L: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

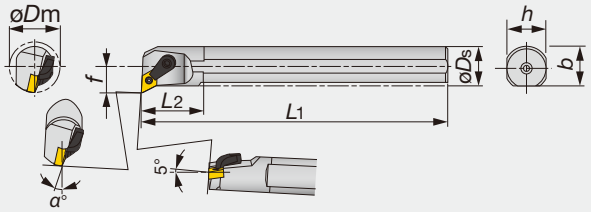
S-MTFNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## S-MDUNR/L

Multi-clamp boring bar, for negative 55° rhombic inserts




Cutting edge style **U**




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | b | α° | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S25R-MDUNR/L11 | STEEL | 32 | 25 | 17 | 200 | 40 | 23 | 22.5 | -12 | 0.8 | DN**1104... |

**rε: Standard corner radius
Note: When using a right or left hand insert, the right hand insert (R) is used for the left hand toolholders (MDUNL** type), and the left hand insert (L) is used for the right hand toolholders (MDUNR** type).

### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| S25R-MDUNR/L11 | MCPM-21<br>MCL-6* | MLP33L | MCS620-3 | P-3 | P-2F |

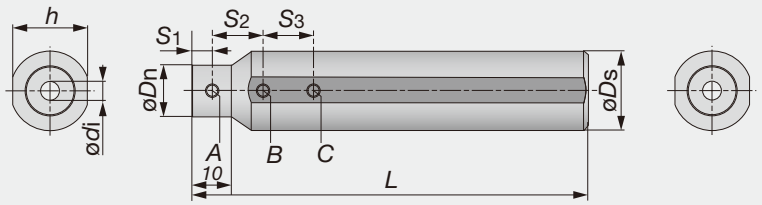
Note: * marked parts type No. in former type No.

S-MDUNR/L: Inserts → **B061 -**

## BLM sleeves

Standard Sleeves for SJB-Mini series with round shank






| Designation | øDs | ødi | øDn | L | h | S1 | S2 | S3 |
|---|---|---|---|---|---|---|---|---|
| BLM159-04 | 15.875 | 4 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM159-05 | 15.875 | 5 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM159-06 | 15.875 | 6 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM159-07 | 15.875 | 7 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM16-04 | 16 | 4 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM16-05 | 16 | 5 | 15 | 100 | 15 | 5 | 15 | 15 |
| BLM16-06 | 16 | 6 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM16-07 | 16 | 7 | 15 | 100 | 15 | 5 | 20 | 20 |
| BLM19-04 | 19.05 | 4 | 18 | 100 | 18 | 5 | 15 | 15 |
| BLM19-05 | 19.05 | 5 | 18 | 100 | 18 | 5 | 15 | 15 |
| BLM19-06 | 19.05 | 6 | 18 | 100 | 18 | 5 | 20 | 20 |
| BLM19-07 | 19.05 | 7 | 18 | 100 | 18 | 5 | 20 | 20 |
| BLM20-04 | 20 | 4 | 13 | 100 | 19 | 5 | 15 | 15 |
| BLM20-05 | 20 | 5 | 14 | 100 | 19 | 5 | 15 | 15 |
| BLM20-06 | 20 | 6 | 15 | 100 | 19 | 5 | 20 | 20 |
| BLM20-07 | 20 | 7 | 16 | 100 | 19 | 5 | 20 | 20 |
| BLM22-04 | 22 | 4 | 13 | 125 | 21 | 5 | 15 | 15 |
| BLM22-05 | 22 | 5 | 14 | 125 | 21 | 5 | 15 | 15 |
| BLM22-06 | 22 | 6 | 15 | 125 | 21 | 5 | 20 | 20 |
| BLM22-07 | 22 | 7 | 16 | 125 | 21 | 5 | 20 | 20 |
| BLM25-04 | 25 | 4 | 13 | 125 | 24 | 5 | 15 | 15 |
| BLM25-05 | 25 | 5 | 14 | 125 | 24 | 5 | 15 | 15 |
| BLM25-06 | 25 | 6 | 15 | 125 | 24 | 5 | 20 | 20 |
| BLM25-07 | 25 | 7 | 16 | 125 | 24 | 5 | 20 | 20 |
| BLM254-04 | 25.4 | 4 | 13 | 125 | 24 | 5 | 15 | 15 |
| BLM254-05 | 25.4 | 5 | 14 | 125 | 24 | 5 | 15 | 15 |
| BLM254-06 | 25.4 | 6 | 15 | 125 | 24 | 5 | 20 | 20 |
| BLM254-07 | 25.4 | 7 | 16 | 125 | 24 | 5 | 20 | 20 |

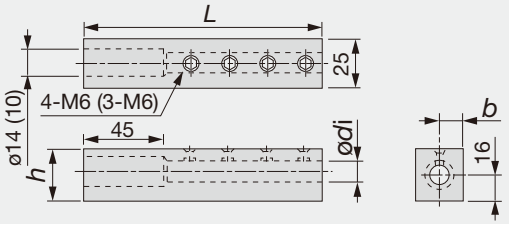
### SPARE PARTS

| Designation | Clamping screw *A* | Clamping screw *B*, *C* | Wrench | Seal cap*(inner screw) |
|---|---|---|---|---|
| BLM159, 16... | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM19-04 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM19-05, 06, 07 | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM20-04, 05 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM20-06, 07 | SSHM4-4 | SSHM4-4 | P-2 | CA-16(M6) |
| BLM22-... | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM25-04, 05 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM25-06 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM25-07 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |
| BLM254-04, 05, 06 | SSHM4-4 | SSHM4-8 | P-2 | CA-16(M6) |
| BLM254-07 | SSHM4-4 | SSHM4-6 | P-2 | CA-16(M6) |

*Optional

## BLS sleeves

Sleeves for boring bars with square shank (regular length)



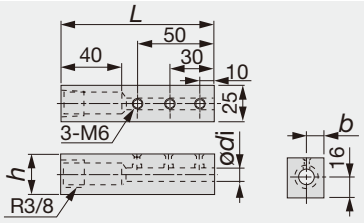

| Designation | ødi | L | h | b |
|---|---|---|---|---|
| BLS16-08 | 8 | 125 | 28 | 12.5 |
| BLS16-10 | 10 | 125 | 28 | 12.5 |
| BLS16-12 | 12 | 125 | 28 | 12.5 |

### SPARE PARTS

| Designation | Wrench |
|---|---|
| BLS16-... | P-3 |

## BLS-C sleeves

Sleeves for boring bars with square shank (short type)



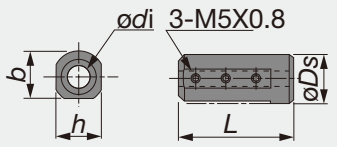

| Designation | ødi | L | h | b |
|---|---|---|---|---|
| BLS16-08C | 8 | 100 | 28 | 12.5 |
| BLS16-10C | 10 | 100 | 28 | 12.5 |
| BLS16-12C | 12 | 100 | 28 | 12.5 |

### SPARE PARTS

| Designation | Wrench |
|---|---|
| BLS16-**C | P-3 |

## BLM sleeves

Sleeves for boring bars with round shank



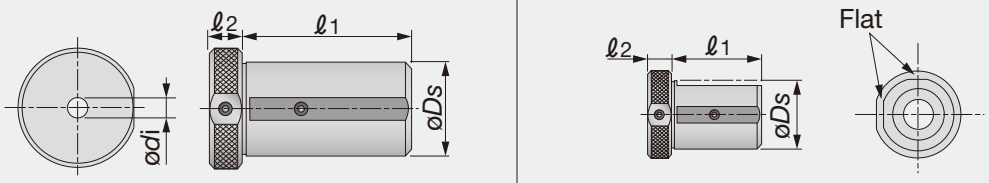

| Designation | ødi | øDs | L | h | b |
|---|---|---|---|---|---|
| BLM19-08 | 8 | 19.05 | 100 | 18 | 18 |
| BLM20-08 | 8 | 20 | 100 | 19 | 18 |
| BLM22-08 | 8 | 22 | 125 | 21 | 21 |
| BLM254-08 | 8 | 25.4 | 125 | 24 | 24 |
| BLM25-08C | 8 | 25 | 55 | 24 | 23 |
| BLM25-10C | 10 | 25 | 55 | 24 | 23 |
| BLM25-12C | 12 | 25 | 55 | 24 | 23 |

### SPARE PARTS

| Designation | Wrench |
|---|---|
| BLM... | P-2.5 |

## BLC sleeves

Standard Sleeves for boring bars with round shank



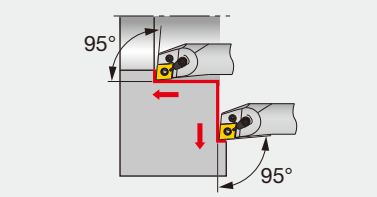

| Designation | ødi | ℓ1 | ℓ2 | øDs |
|---|---|---|---|---|
| BLC40-8 | 8 | 73 | 13 | 40 |
| BLC40-10 | 10 | 73 | 13. | 40 |
| BLC40-12 | 12 | 73 | 13 | 40 |
| BLC40-16 | 16 | 73 | 13 | 40 |
| BLC32-8C | 8 | 45 | 20 | 32 |
| BLC32-10C | 10 | 45 | 20 | 32 |
| BLC32-12C | 12 | 45 | 20 | 32 |
| BLC40-8C | 8 | 55 | 13 | 40 |
| BLC40-10C | 10 | 55 | 13 | 40 |
| BLC40-12C | 12 | 55 | 13 | 40 |
| BLC40-16C | 16 | 55 | 13 | 40 |

### SPARE PARTS

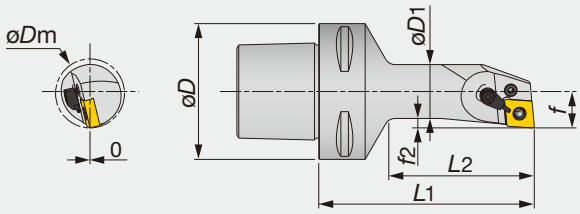
| Designation | Wrench |
|---|---|
| BLC40-8 | P-3 |
| BLC40-1... | P-4 |
| BLC32-8C | P-3 |
| BLC32-1*C | P-4 |
| BLC40-8C | P-3 |
| BLC40-1*C | P-4 |

## C-PCLNL-CHP

Lever lock type internal toolholder with TungCap connection with 95° approach angle. For negative 80° rhombic insert. High-pressure coolant capability.




Cutting edge style **L**




| Designation | øDm | øD | øD1 | L1 | L2 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| C6PCLNL17100-12-CHP | 32 | 63 | 25 | 100 | 67.5 | 17 | 4.5 | 0.8 | CN**1204... |

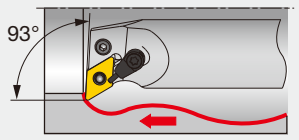
Applicable for 14 MPa pressure coolant
**rε: Standard corner radius

### SPARE PARTS

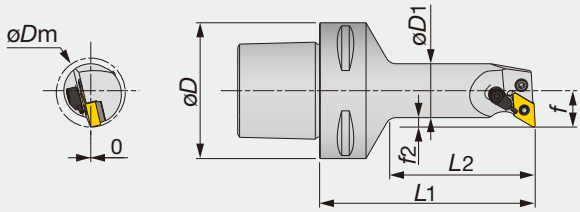
| Designation | Clamping screw | Coolant unit | Wrench | Lever |
|---|---|---|---|---|
| C6PCLNL17100-12-CHP | LCS43 | S-CU-CHP | P-2.5F | LCL43N |

## C-PDUNL-CHP

Lever lock type internal toolholder with TungCap connection with 93° approach angle. For negative 55° rhombic insert. High-pressure coolant capability.




Cutting edge style **U**




Left hand (L) shown.

| Designation | øDm | øD | øD1 | L1 | L2 | f | f2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| C6PDUNL17100-1104-CHP | 32 | 63 | 25 | 100 | 67.5 | 17 | 4.5 | 0.8 | DN**1104... |

Applicable for 14 MPa pressure coolant
**rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Coolant unit | Wrench | Spring pin | Lever |
|---|---|---|---|---|---|---|
| C6PDUNL17100-1104-CHP | ELSD317BL | LCS43 | S-CU-CHP | P-2.5 | LSP3 | LCL33L |

C-PCLNL-CHP: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

C-PDUNL-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

# TurnLine - Miniature Machining

## MINIFORCETURN

B188, B268

Economical double-sided inserts with excellent sharpness

## TETRAMINICUT

C049

Unique insert geometry for highly precise grooving

*W* = 0.33 - 3.0 mm

## TETRAFORCECUT

C041

4-cornered inserts with good clamping rigidity for highly precise grooving and parting

*W* = 0.5 - 3.18 mm

## DUOJUSTCUT

C009

Innovative clamping system for stable parting operations

*W* = 1.0 - 2.0 mm

## TUNGCUT

C053

Multi-functional tool series for various grooving operations

*W* = 1.4 - 8.0 mm

## TUNGHEAVYGROOVE

C123

Highly rigid clamping system for wide grooving and profiling in one pass

*W* = 10 - 25 mm

## J-SERIES

B328

Toolholders for small-part machining

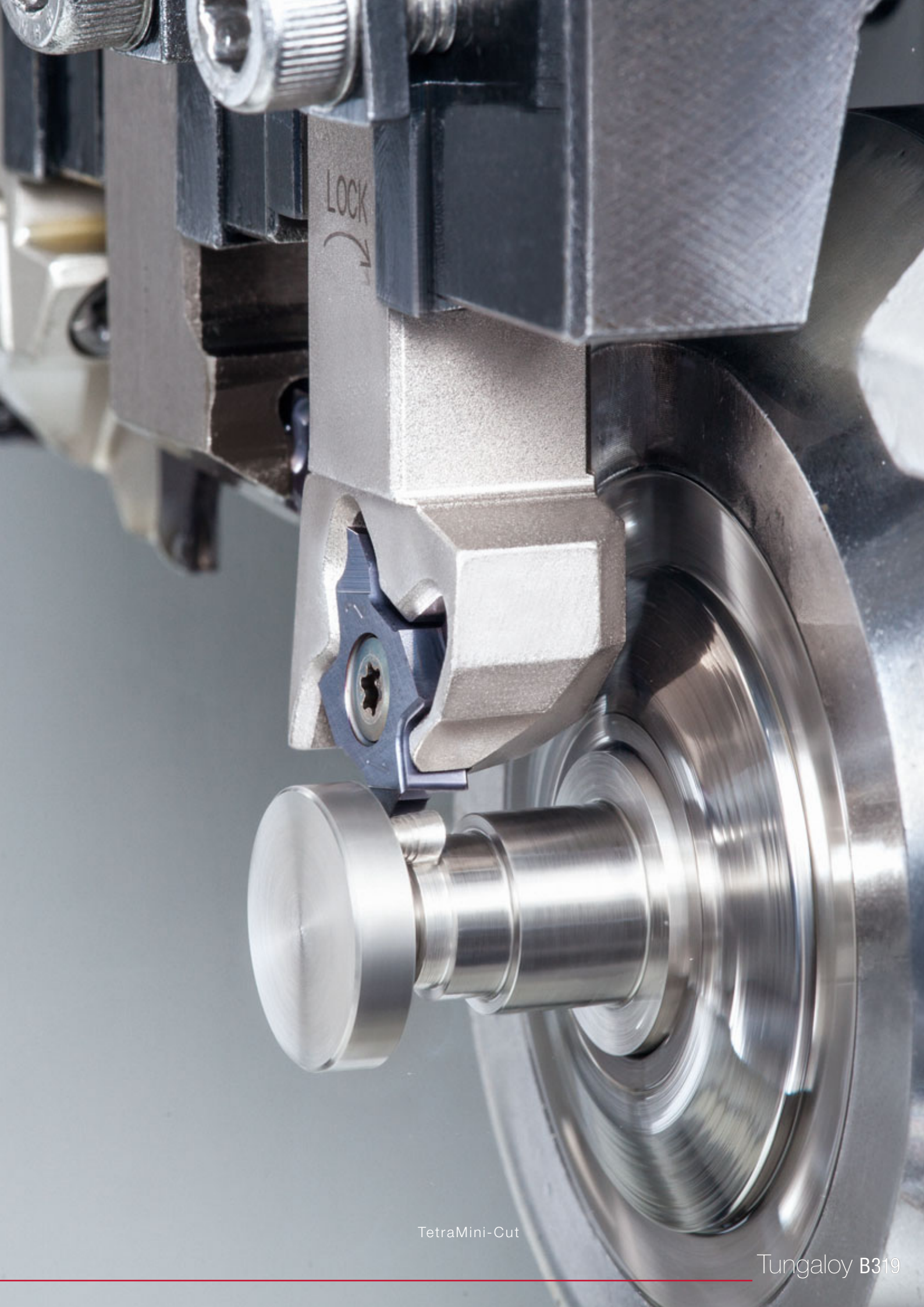
## TINYMINITURN

B352

Solid boring bars for turning small diameters with high precision

## Other Tool for Miniature Machining

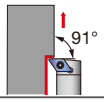
B375



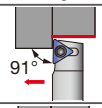
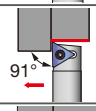
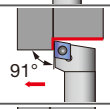
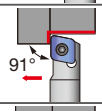
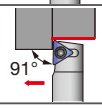

TetraMini-Cut

# Miniature External Turning - Quick Guide

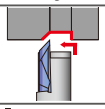
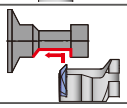
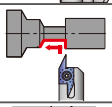
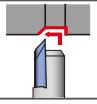
## Facing

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JSDFCR/L**<br>Cutting edge angle 91°<br>Insert type: DC□□ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B335 |

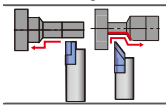
## External Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JTTACR/L**<br>Cutting edge angle 91°<br>Insert type: TC□□ | ✓ | | 8 - 16 mm | Back side clamping without offset | B336 |
|   | **JSTACR/L**<br>Cutting edge angle 91°<br>Insert type: TC□□ | ✓ | | 8 - 16 mm | Screw-on clamping without offset | B336 |
|   | **JSCGCR/L**<br>Cutting edge angle 91°<br>Insert type: CC□□ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B331 |
|   | **JSCACL**<br>Cutting edge angle 91°<br>Insert type: CC□□ | ✓ | | 10 - 12 mm | Screw-on clamping without offset | B330 |
|   | **JTTANR/L**<br>Cutting edge angle 91°<br>Insert type: TN□□ | | ✓ | 12 - 16 mm | Back side clamping without offset | B343 |

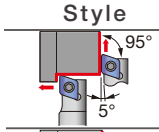
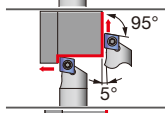
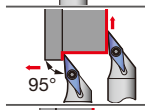
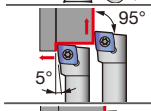
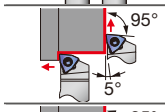
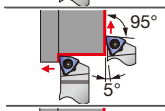
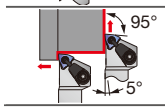
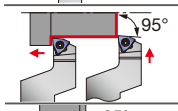
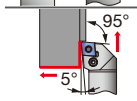
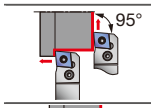
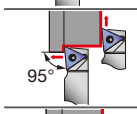
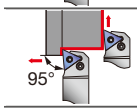
## Back Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JSTBR/L**<br>Insert type: JTBR/L3□□ | ✓ | | 10 - 16 mm | Screw-on clamping | B347 |
|  | **JS-TBL3**<br>Insert type: JTBR3□□ | ✓ | | ø19.05 - 25.4 mm | Screw-on clamping | B347 |
|  | **JSEGR/L**<br>Insert type: J10ER/L□□ | ✓ | | 10 - 16 mm | Screw-on clamping | B349 |
|  | **JSXBR/L**<br>Insert type: JXBR/L8□□ | ✓ | | 10 - 25 mm | Screw-on clamping | B346 |

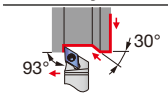
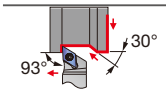
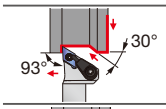
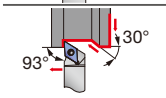
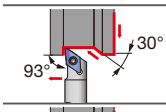
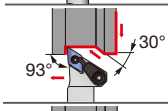
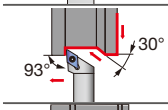
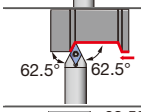
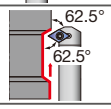
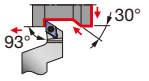
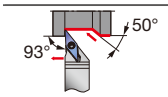
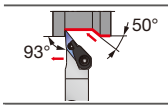
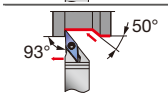
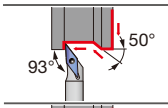
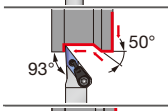
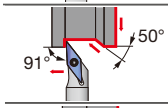
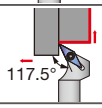
## Front & Reverse Turning

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|  | **JSXGR/L**<br>Insert type: JXFR/L8<br>JXRR/L8 | ✓ | | 10 - 25 mm | Screw-on clamping | B345 |

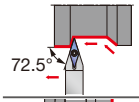
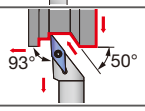
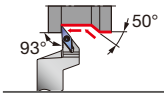
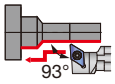
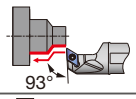
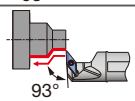
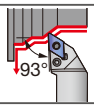
## External Turning & Facing

| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JTCL2CR/L**<br>Cutting edge angle 95°<br>Insert type: CC□□ | ✓ | | 8 - 16 mm | Back side clamping without offset | B328 |
|   | **JSCL2CR/L**<br>Cutting edge angle 95°<br>Insert type: CC□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B328 |
|   | **JSVL2PR/L**<br>Cutting edge angle 95°<br>Insert type: VP□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B341 |
|   | **JSCLCR/L**<br>Cutting edge angle 95°<br>Insert type: CC□□ | ✓ | | 8 - 16 mm | Screw-on clamping with offset | B329 |
|   | **JPWL2XR/L**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B188 |
|   | **JSWL2XR/L**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B188 |
|   | **JSWL2XR/L-CHP**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 12 mm | Screw-on clamping without offset | B189 |
|   | **JSWLXR-F**<br>Cutting edge angle 95°<br>Insert type: WXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B189 |
|   | **PCLNR**<br>Cutting edge angle 95°<br>Insert type: CN□□ | | ✓ | 20 mm | Lever-lock clamping with offset | B342 |
|   | **PCL2NR**<br>Cutting edge angle 95°<br>Insert type: CN□□ | | ✓ | 20 mm | Lever-lock clamping without offset | B342 |
|   | **JTTLNR/L**<br>Cutting edge angle 95°<br>Insert type: TN□□ | | ✓ | 12 - 16 mm | Back side clamping without offset | B343 |
|   | **PTL2NR/L**<br>Cutting edge angle 95°<br>Insert type: TN□□ | | ✓ | 20 mm | Lever-lock clamping without offset | B344 |

## External Turning & Profiling

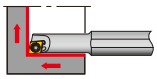
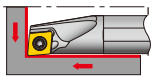
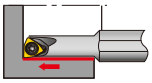
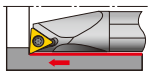
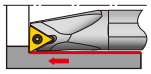
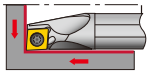
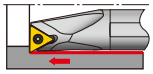
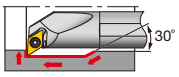
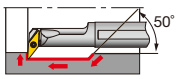
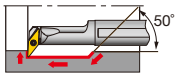
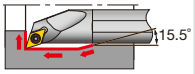
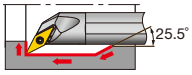
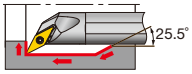
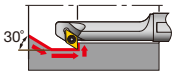
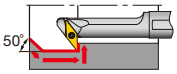
| Style | Description | Type of insert: Positive | Type of insert: Negative | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
|   | **JPDJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B190 |
|   | **JSDJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B190 |
|   | **JSDJ2XR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 12 mm | Screw-on clamping without offset | B191 |
|   | **JTDJ2CR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 10 - 16 mm | Back side clamping without offset | B332 |
|   | **JSDJ2CR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 8 - 16 mm | Screw-on clamping without offset | B331 |
|   | **JSDJ2CR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 12 mm | Screw-on clamping without offset | B333 |
|   | **JSDJCR/L**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | 8 - 16 mm | Screw-on clamping with offset | B333 |
|   | **JSDNCN**<br>Cutting edge angle 62.5°<br>Insert type: DC□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B334 |
|   | **JSDN3CR/L**<br>Cutting edge angle 62.5°<br>Insert type: DC□□ | ✓ | | 12 - 16 mm | Screw-on clamping with offset | B334 |
|   | **JSDJXR-F**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B191 |
|   | **JPVJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 16 mm | Side clamping without offset | B192 |
|   | **JSVJ2XR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 12 mm | Screw-on clamping without offset | B193 |
|   | **JSVJ2XR/L**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 20 mm | Screw-on clamping without offset | B192 |
|   | **JSVJ2BR/L**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B337 |
|   | **JSVJ2BR/L-CHP**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 12 mm | Screw-on clamping without offset | B338 |
|   | **JSVABR/L**<br>Cutting edge angle 91°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B338 |
|   | **JSVP2PR/L**<br>Cutting edge angle 117.5°<br>Insert type: VP□□ | ✓ | | 10 - 16 mm | Screw-on clamping without offset | B341 |

## External Turning & Profiling

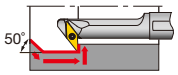
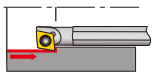
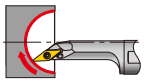
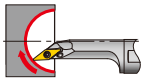
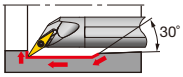
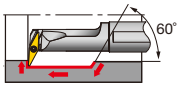
| Style | Description | Type of insert | | Shank Size | Clamping style | |
|---|---|---|---|---|---|---|
| | | Positive | Negative | | | |
|   | **JSVNBN**<br>Cutting edge angle 72.5°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B340 |
|   | **JSVJBR/L**<br>Cutting edge angle 93°<br>Insert type: VB□□ | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B337 |
|   | **JSVJXR-F**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | 10 - 16 mm | Screw-on clamping with offset | B193 |
|   | **JS-SDUCL**<br>Cutting edge angle 93°<br>Insert type: DC□□ | ✓ | | ø19.05 - 25.4 mm | Screw-on clamping with offset | B335 |
|   | **JS-SDUXL**<br>Cutting edge angle 93°<br>Insert type: DXGU | ✓ | | ø14 - 25.4 mm | Screw-on clamping with offset | B194 |
|   | **JS-SVUXL**<br>Cutting edge angle 93°<br>Insert type: VXGU | ✓ | | ø15.875 - 25.4 mm | Screw-on clamping with offset | B194 |
|   | **PDJNR**<br>Cutting edge angle 93°<br>Insert type: DN□□ | | ✓ | 20 mm | Lever-lock clamping with offset | B342 |

# Miniature Internal Turning - Quick Guide

## Positive type

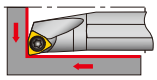
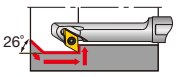
| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|---|
|  | **SEXPR/L**<br>Boring & Internal facing<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø8<br>ø4 - ø8 | ø4.5 – ø7<br>ø4.5 – ø7 | B279 |
|  | **SCLCR/L**<br>Boring & internal facing<br>Insert type: CC□□ | ✓ | | Steel<br>Carbide | ø4 - ø25<br>ø4 - ø25 | ø5 – ø27<br>ø5 – ø27 | B278 |
|  | **SWUBR/L**<br>Boring<br>Insert type: WB□□ | ✓ | | Steel<br>Carbide | ø5 - ø8<br>ø5 - ø8 | ø6 – ø8<br>ø6 – ø8 | B286 |
|  | **STUPR/L**<br>Boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø7 - ø32<br>ø7 - ø25 | ø8 – ø34<br>ø8 – ø27 | B285 |
|  | **STFPR/L**<br>Blind hole boring<br>Insert type: TP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø20 | ø10 – ø27<br>ø10 – ø22 | B284 |
|  | **SCLPR/L**<br>Boring & internal facing<br>Insert type: CP□□ | ✓ | | Steel<br>Carbide | ø8 - ø25<br>ø8 - ø16 | ø10 – ø27<br>ø10 – ø20 | B280 |
|  | **STFCR/L**<br>Blind hole boring<br>Insert type: TC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø12 – ø18<br>ø12 – ø18 | B283 |
|   | **SDUCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 – ø32<br>ø13 – ø27 | B287 |
|   | **SVUCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø25 | ø16 – ø32<br>ø18 – ø32 | B288 |
|   | **SVUBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide | ø16 - ø25<br>ø16 - ø25 | ø20 – ø32<br>ø24.5 – ø34 | B287 |
|   | **SDQCR/L**<br>Boring & internal profiling<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø10 - ø25<br>ø10 - ø20 | ø13 – ø30<br>ø13 – ø25 | B288 |
|   | **SVQCR/L**<br>Boring & internal profiling<br>Insert type: VC□□ | ✓ | | Steel<br>Carbide | ø10 - ø16<br>ø10 - ø16 | ø13.5 – ø21.5<br>ø13.5 – ø21.5 | B289 |
|   | **SVQBR/L**<br>Boring & internal profiling<br>Insert type: VB□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø25 | ø17 – ø30.5<br>ø17 – ø30.5 | B289 |
|   | **SDZCR/L**<br>Internal retracting<br>Insert type: DC□□ | ✓ | | Steel<br>Carbide | ø12 - ø25<br>ø12 - ø16 | ø14 – ø25<br>ø18 – ø22 | B290 |
|   | **SVZCR/L**<br>Internal retracting<br>Insert type: VC□□ | ✓ | | Steel | ø12 | ø16 | B291 |

Miniature Tool

| Style | StreamJet-Bar Description & Application | ISO Insert | Y-Pro | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|---|
|  | **SVZBR/L**<br>Internal retracting<br>Insert type: VB□□ | ✓ | | Steel | ø16 - ø32 | ø20 – ø40 | B291 |
|  | **SEZPR/L**<br>Internal retracting<br>Insert type: EP□□ | ✓ | | Steel<br>Carbide | ø4 - ø5<br>ø4 - ø5 | ø5.5 – ø6.5<br>ø5.5 – ø6.5 | B292 |
|  | **SVJCR/L**<br>Internal sphere cutting<br>Insert type: VC□□ | ✓ | | Steel | ø12 - ø16 | ø16 – ø20 | B282 |
|  | **SVJBR/L**<br>Internal sphere cutting<br>Insert type: VB□□ | ✓ | | Steel | ø20 - ø25 | ø25 – ø30 | B282 |
|  | **SYQBR/L**<br>Internal undercut & profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø12 - ø16<br>ø12 - ø16 | ø17 – ø21.5<br>ø17 – ø21.5 | B300 |
|  | **SYUBR/L**<br>Boring & internal profiling<br>Insert type: YW□□ | | ✓ | Steel<br>Carbide | ø16<br>ø12 - ø16 | ø20<br>ø20 – ø24.5 | B300 |

# Miniature Internal Turning - Quick Guide

## Double-sided insert with positive cutting edges

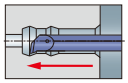
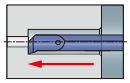
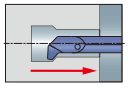
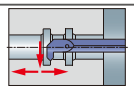
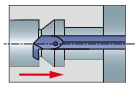
| Style | MiniForce-Turn Description & Application | MiniForce -Turn | Shank Type | Shank Ø | Min. bore diameter (mm) (0 10 20 30 40 50) | |
|---|---|---|---|---|---|---|
|  | **SWLXR/L**<br>Boring & facing<br>Insert type: WXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø12 – ø22<br>ø12 – ø22 | B268 |
| | **SDXXR/L**<br>Internal profiling<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø10 - ø20<br>ø10 - ø20 | ø13 – ø24<br>ø13 – ø24 | B268 |
|  | **SDZXR/L**<br>Internal retracting<br>Insert type: DXGU | ✓ | Steel<br>Carbide | ø12 - ø20<br>ø12 - ø16 | ø14 – ø20<br>ø18 – ø22 | B269 |

Miniature Tool

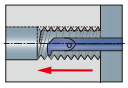
# Miniature Internal Turning - Quick Guide

**TinyMini-Turn -** Solid carbide tools for small diameters turning

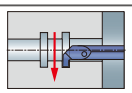
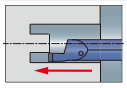
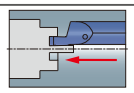
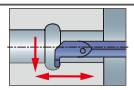
## Boring, profiling, chamfering

| Style | TinyMini-Turn Description & Application | Shank øDs | Min. bore diameter øDm (mm) (0 – 2 – 4 – 6 – 8 – 10) | |
|---|---|---|---|---|
|  | **JBT** Boring, profiling, & chamfering | ø4 & ø7 | ø0.6 – ø7 | B352 |
|  | **JBP** Boring & chamfering | ø4 & ø7 | ø2.8 – ø5 | B353 |
|  | **JBU** Back boring & chamfering | ø7 | ø5 | B353 |
|  | **JBC** Boring & 45° chamfering | ø7 | ø5 – ø6.8 | B353 |
|  | **JBB** Back boring | ø4 & ø7 | ø3 – ø7 | B354 |

## Threading

| Style | TinyMini-Turn Description & Application | Shank øDs | Min. bore diameter øDm (mm) (0 – 2 – 4 – 6 – 8 – 10) | |
|---|---|---|---|---|
|  | **JBI** Threading (Metric thread) | ø4 & ø7 | ø4 – ø7 | B354 |

## Grooving

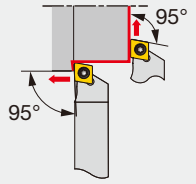
| Style | TinyMini-Turn Description & Application | Shank øDs | Groove width | Min. bore diameter øDm (mm) (0 – 2 – 4 – 6 – 8 – 10 – 12 – 14 – 15) | |
|---|---|---|---|---|---|
|  | **JBG** Grooving | ø4 & ø7 | 0.5 - 2 | ø2 – ø6.8 | B355 |
|  | **JBF** Face grooving | ø7 | 1 - 3 | ø6 – ø15 | B356 |
|  | **JBS** Face grooving (for shaft) | ø7 | 2 | ø6 | B356 |
|  | **JBR** Boring & profiling (full radius type) | ø7 | 1 | ø5 – ø6.8 | B357 |

Miniature Tool

MEMO

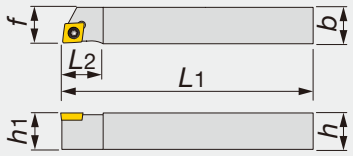
## JSCL2CR/L

Screw-on toolholder without offset with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCL2CR/L1010X06 | 10 | 10 | 120 | 12 | 10 | 10 | 0.2 | CC**0602... | 1.2 |
| JSCL2CR/L1212F06 | 12 | 12 | 85 | 12 | 12 | 12 | 0.2 | CC**0602... | 1.2 |
| JSCL2CR/L1212X06 | 12 | 12 | 120 | 12 | 12 | 12 | 0.2 | CC**0602... | 1.2 |
| JSCL2CL1212K06 | 12 | 12 | 125 | 12 | 12 | 12 | 0.4 | CC**0602... | 1.2 |
| JSCL2CR/L1212F09 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JSCL2CR/L1212X09 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JSCL2CR/L1616X09 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

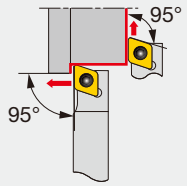
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCL2CR/L**06 | CSTB-2.5 | T-8F |
| JSCL2CR/L**09 | CSTB-4SD | T-8F |



J-SERIES

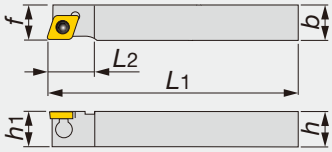
## JTCL2CR/L

Back clamp toolholder without offset with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTCL2CL0810K06 | 8 | 10 | 125 | 12 | 8 | 10 | 0.4 | CC**0602... | 0.9 |
| JTCL2CR/L1010X06 | 10 | 10 | 120 | 12 | 10 | 10 | 0.2 | CC**0602... | 0.9 |
| JTCL2CR/L1212F09 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR/L1212X09 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR/L1616X09 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | CC**09T3... | 1.2 |
| JTCL2CR1616M09 | 16 | 16 | 150 | 16 | 16 | 16 | 0.8 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

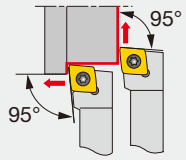
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTCL2CR/L**06 | JCP-2 | JDS-3525 | P-2F |
| JTCL2CR/L**09 | JCP-3 | JDS-5040 | P-2.5F |

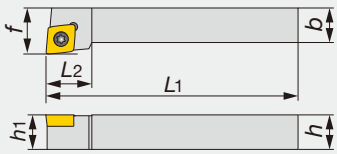
JSCL2CR/L, JTCL2CR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSCLCR/L

Screw-on toolholder with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCLCR/L0808H06 | 8 | 8 | 100 | 12 | 8 | 10 | 0.4 | CC**0602... | 1.2 |
| JSCLCR/L1010H06 | 10 | 10 | 100 | 12 | 10 | 12 | 0.4 | CC**0602... | 1.2 |
| JSCLCR/L1212H09 | 12 | 12 | 100 | 16 | 12 | 16 | 0.8 | CC**09T3... | 1.2 |
| JSCLCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... | 1.2 |

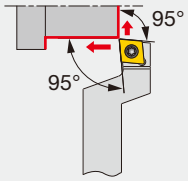
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

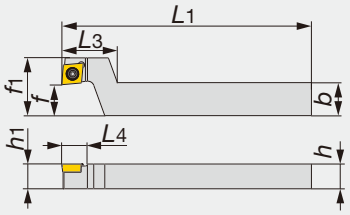
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCLCR/L**H06 | CSTB-2.5 | T-8F |
| JSCLCR/L**H09 | CSTB-4SD | T-8F |

# J-SERIES
## JSCLCR-F

Screw-on stepped-head toolholder with 95° approach angle for positive 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $h_1$ | *f* | $f_1$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSCLCR1216F09-F15 | 12 | 16 | 85 | 12 | 27 | 12.5 | 12 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |
| JSCLCR1216X09-F15 | 12 | 16 | 120 | 12 | 27 | 12.5 | 12 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |
| JSCLCR1620X09-F15 | 16 | 20 | 120 | 12 | 27 | 12.5 | 16 | 15 | 28 | 0.2 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

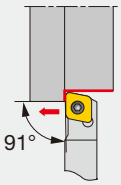
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCLCR**F15 | CSTB-4SD | T-8F |



JSCLCR/L, JSCLCR-F: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

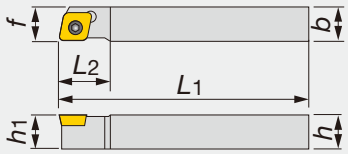
# JSCACL

Screw-on toolholder without offset with 91° approach angle for positive 80° rhombic inserts




Cutting edge style **A**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCACL1010H06 | 10 | 10 | 100 | 12 | 10 | 10 | 0.4 | CC**0602... | 1.2 |
| JSCACL1212H09 | 12 | 12 | 100 | 16 | 12 | 12 | 0.8 | CC**09T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

## SPARE PARTS

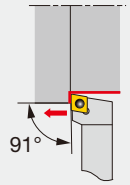
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCACL1010H06 | CSTB-2.5 | T-8F |
| JSCACL1212H09 | CSTB-4SD | T-8F |



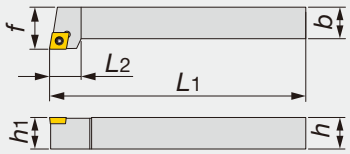
JSCACL: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSCGCR/L

Screw-on toolholder with 91° approach angle for positive 80° rhombic inserts




Cutting edge style **G**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSCGCR/L1212H06 | 12 | 12 | 100 | 12 | 12 | 16 | 0.4 | CC**0602... | 1.2 |
| JSCGCR/L1616H09 | 16 | 16 | 100 | 16 | 16 | 20 | 0.8 | CC**09T3... | 1.2 |

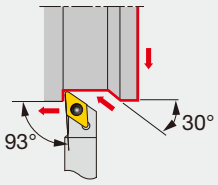
*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

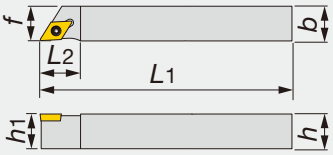
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSCGCR/L1212H06 | CSTB-2.5 | T-8F |
| JSCGCR/L1616H09 | CSTB-4SD | T-8F |

# J-SERIES
## JSDJ2CR/L

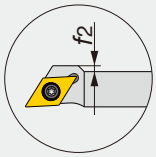
Screw-on toolholder without offset with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J2**




Without offset




JSDJ2CR/L1010X11
JSDJ2CR/L1212F11
JSDJ2CR/L1212X11

Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L0808F07 | 8 | 8 | 85 | 14 | 8 | 8 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 10 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1010X11 | 10 | 10 | 120 | 20 | 10 | 10 | 4 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1212F11 | 12 | 12 | 85 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 1.2 |
| JSDJ2CL1212K07 | 12 | 12 | 125 | 14 | 12 | 12 | - | 0.4 | DC**0702... | 1.2 |
| JSDJ2CR/L1212X11 | 12 | 12 | 120 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JSDJ2CR/L1616X11 | 16 | 16 | 120 | 20 | 16 | 16 | - | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJ2CR/L**07 | CSTB-2.5 | T-8F |
| JSDJ2CR/L**11 | CSTB-4SD | T-8F |



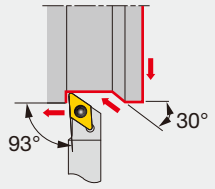
JSCGCR/L: Inserts → **B104 -**, CBN → **B168 -**, PCD → **B177**

JSDJ2CR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

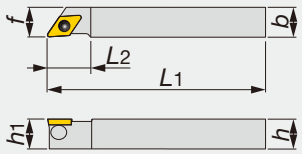
# J-SERIES

## JTDJ2CR/L

Back clamp toolholder without offset with 93° approach angle for positive 55° rhombic inserts

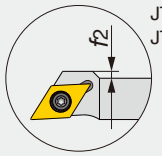



Cutting edge style **J2**




Without offset

JTDJ2CR/L1212F11
JTDJ2CR/L1212X11




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JTDJ2CR/L1010X07 | 10 | 10 | 120 | 14 | 10 | 10 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212F07 | 12 | 12 | 85 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212X07 | 12 | 12 | 120 | 14 | 12 | 12 | - | 0.2 | DC**0702... | 0.9 |
| JTDJ2CR/L1212F11 | 12 | 12 | 85 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JTDJ2CR/L1212X11 | 12 | 12 | 120 | 20 | 12 | 12 | 2 | 0.2 | DC**11T3... | 1.2 |
| JTDJ2CL1212M11 | 12 | 12 | 150 | 20 | 12 | 12 | - | 0.8 | DC**11T3... | 1.2 |
| JTDJ2CR/L1616X11 | 16 | 16 | 120 | 20 | 16 | 16 | - | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

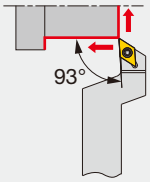
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTDJ2CR/L**07 | JCP-2 | JDS-3525 | P-2F |
| JTDJ2CR/L**11 | JCP-3 | JDS-5040 | P-2.5F |

Miniature Tool

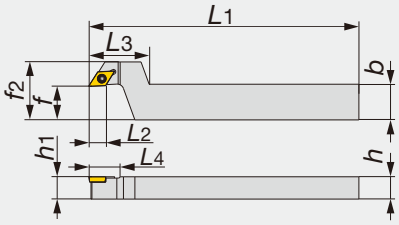
# J-SERIES

## JSDJCR-F

Screw-on stepped-head toolholder with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $h_1$ | *f* | $f_2$ | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSDJCR1016X07-F15 | 10 | 16 | 120 | 12.5 | 27 | 14 | 10 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216F07-F15 | 12 | 16 | 85 | 12.5 | 27 | 14 | 12 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216X07-F15 | 12 | 16 | 120 | 12.5 | 27 | 14 | 12 | 15 | 26 | 0.2 | DC**0702... | 1.2 |
| JSDJCR1216F11-F15 | 12 | 16 | 85 | 12.5 | 27 | 20 | 12 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |
| JSDJCR1216X11-F15 | 12 | 16 | 120 | 12.5 | 27 | 20 | 12 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |
| JSDJCR1620X11-F15 | 16 | 20 | 120 | 12.5 | 27 | 20 | 16 | 15 | 28 | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

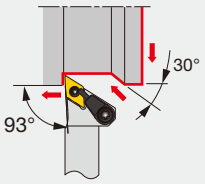
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJCR**07-F15 | CSTB-2.5 | T-8F |
| JSDJCR**11-F15 | CSTB-4SD | T-8F |

JTDJ2CR/L, JSDJCR-F: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

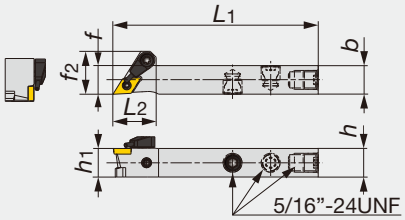
# J-SERIES

## JSDJ2CR/L-CHP

Screw-on toolholder without offset with 93° approach angle for positive 55° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | 12 | 12 | 85 | 18 | 12 | 12 | 18 | 0.2 | DC**0702... | 1.2 |
| JSDJ2CR/L1212F11-CHP | 12 | 12 | 85 | 19 | 12 | 12 | 20.5 | 0.2 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

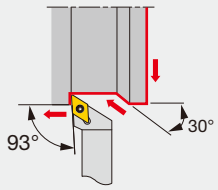
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSDJ2CR/L1212F07-CHP | CSTB-2.5 | S-CU-CHP | T-8F |
| JSDJ2CR/L1212F11-CHP | CSTB-4SD | S-CU-CHP | T-8F |

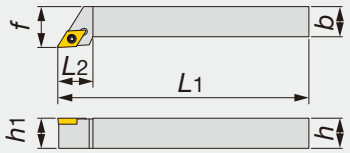
# J-SERIES

## JSDJCR/L

Screw-on toolholder with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDJCR/L0808H07 | 8 | 8 | 100 | 14 | 8 | 10 | 0.4 | DC**0702... | 1.2 |
| JSDJCR/L1010H11 | 10 | 10 | 100 | 18 | 10 | 12 | 0.8 | DC**11T3... | 1.2 |
| JSDJCR/L1212H07 | 12 | 12 | 100 | 14 | 12 | 16 | 0.4 | DC**0702... | 1.2 |
| JSDJCR/L1212H11 | 12 | 12 | 100 | 18 | 12 | 16 | 0.8 | DC**11T3... | 1.2 |
| JSDJCR/L1616H11 | 16 | 16 | 100 | 18 | 16 | 20 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

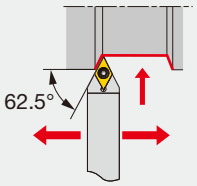
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDJC**H07 | CSTB-2.5 | T-8F |
| JSDJC**H11 | CSTB-4SD | T-8F |



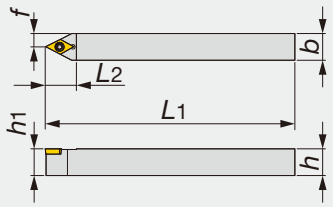
JSDJ2CR/L-CHP, JSDJCR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSDNCN

Screw-on toolholder with 62.5° approach angle for positive 55° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDNCN1010X07 | 10 | 10 | 120 | 15 | 10 | 5 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1010X11 | 10 | 10 | 120 | 21 | 10 | 5 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1212F07 | 12 | 12 | 85 | 15 | 12 | 6 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1212X07 | 12 | 12 | 120 | 15 | 12 | 6 | 0.2 | DC**0702... | 1.2 |
| JSDNCN1212F11 | 12 | 12 | 85 | 21 | 12 | 6 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1212H11 | 12 | 12 | 100 | 21 | 12 | 6 | 0.8 | DC**11T3... | 1.2 |
| JSDNCN1212X11 | 12 | 12 | 120 | 21 | 12 | 6 | 0.2 | DC**11T3... | 1.2 |
| JSDNCN1616X11 | 16 | 16 | 120 | 21 | 16 | 8 | 0.2 | DC**11T3... | 1.2 |

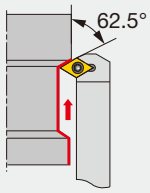
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

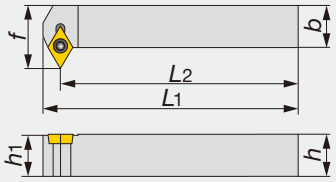
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDNCN**07 | CSTB-2.5 | T-8F |
| JSDNCN**11 | CSTB-4SD | T-8F |

# J-SERIES
## JSDN3CR/L

Screw-on toolholder with 62.5° approach angle (N3-style) for positive 55° rhombic inserts




Cutting edge style **N3**




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDN3CR1212H07 | 12 | 12 | 105 | 100 | 12 | 18 | 0.4 | DC**0702... | 1.2 |
| JSDN3CR1616H11 | 16 | 16 | 107 | 100 | 16 | 25 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

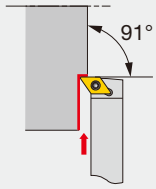
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDN3CR1212H07 | CSTB-2.5 | T-8F |
| JSDN3CR1616H11 | CSTB-4SD | T-8F |

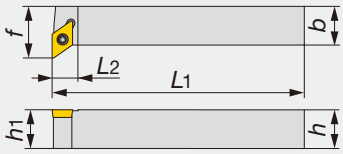
JSDNCN, JSDN3CR/L: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSDFCR/L

Screw-on toolholder for facing with 91° approach angle for positive 55° rhombic inserts




Cutting edge style **F**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSDFCR/L1212H07 | 12 | 12 | 100 | 8 | 12 | 16 | 0.4 | DC**0702... | 1.2 |
| JSDFCR/L1616H11 | 16 | 16 | 100 | 10.5 | 16 | 22 | 0.8 | DC**11T3... | 1.2 |

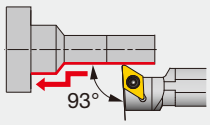
*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

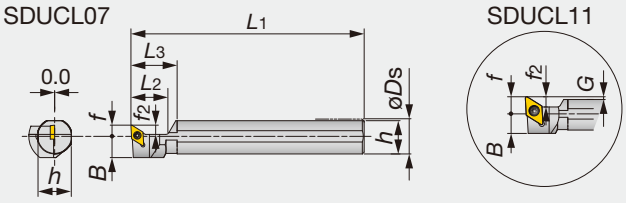
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSDFCR/L1212H07 | CSTB-2.5 | T-8F |
| JSDFCR/L1616H11 | CSTB-4SD | T-8F |

# J-SERIES
## JS-SDUCL

Screw-on toolholder with 93° approach angle for positive 55° rhombic inserts




Cutting edge style **U**




Left hand (L) shown.

| Designation | *øDs* | *f* | *f*2 | *L*1 | *L*2 | *L*3 | *h* | B | G | *rε*** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JS19K-SDUCL07 | 19.05 | 6 | 5 | 125 | 20 | 25 | 18 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS20K-SDUCL07 | 20 | 6 | 5 | 125 | 20 | 25 | 19 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS22K-SDUCL07 | 22 | 6 | 5 | 125 | 20 | 25 | 21 | 11.5 | - | 0.4 | DC**0702... | 1.2 |
| JS19K-SDUCL11 | 19.05 | 10 | 6 | 125 | 20 | 25 | 18 | 11.5 | 1.525 | 0.8 | DC**11T3... | 1.2 |
| JS20K-SDUCL11 | 20 | 10 | 6 | 125 | 20 | 25 | 19 | 11.5 | 1 | 0.8 | DC**11T3... | 1.2 |
| JS22K-SDUCL11 | 22 | 11 | 6 | 125 | 20 | 25 | 21 | 11.5 | 1 | 0.8 | DC**11T3... | 1.2 |
| JS25K-SDUCL11 | 25.4 | 12 | 6 | 125 | 20 | 25 | 24 | 12.7 | 0.7 | 0.8 | DC**11T3... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
***rε*: Standard corner radius

### SPARE PARTS

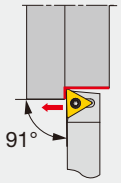
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**K-SDUCL07 | CSTB-2.5 | T-8F |
| JS**K-SDUCL11 | CSTB-4SD | T-8F |



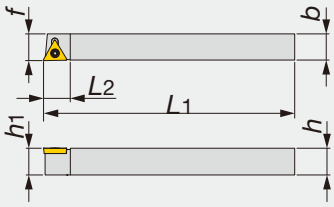
JSDFCR/L, JS-SDUCL: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

# J-SERIES
## JSTACR/L

Screw-on toolholder without offset with 91° approach angle for positive 60° triangle inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSTACR/L0808K08 | 8 | 8 | 125 | 10 | 8 | 8 | 0.2 | TC**0802... | 0.6 |
| JSTACR/L1010K08 | 10 | 10 | 125 | 10 | 10 | 10 | 0.2 | TC**0802... | 0.6 |
| JSTACR/L1212K11 | 12 | 12 | 125 | 12 | 12 | 12 | 0.4 | TC**1102... | 1.2 |
| JSTACR/L1616H11 | 16 | 16 | 100 | 12 | 16 | 16 | 0.4 | TC**1102... | 1.2 |

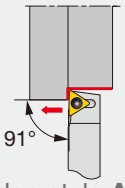
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

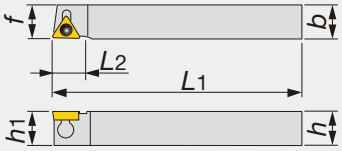
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTACR/L**K08 | CSTB-2L | T-6F |
| JSTACR/L**11 | CSTB-2.5 | T-8F |

# J-SERIES
## JTTACR/L

Back clamp toolholder without offset with 91° approach angle for positive 60° triangle inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTACL0810K08 | 8 | 10 | 125 | 10 | 8 | 10 | 0.2 | TC**0802... | 0.9 |
| JTTACR/L1212M11 | 12 | 12 | 150 | 12 | 12 | 12 | 0.4 | TC**1102... | 0.9 |
| JTTACR/L1616M11 | 16 | 16 | 150 | 12 | 16 | 16 | 0.4 | TC**1102... | 0.9 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

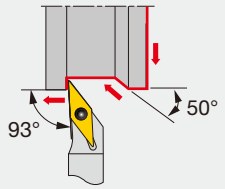
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTACL0810K08 | JCP-1 | JDS-3525 | P-2F |
| JTTACR/L**M11 | JCP-2 | JDS-3525 | P-2F |

JSTACR/L, JTTACR/L: Inserts → **B131 -**, PCD → **B177**

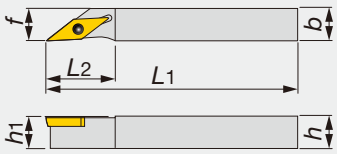
# J-SERIES
## JSVJ2BR/L

Screw-on toolholder without offset with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1010X11 | 10 | 10 | 120 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BL1010K11 | 10 | 10 | 125 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1212F11 | 12 | 12 | 85 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1212X11 | 12 | 12 | 120 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR1212K11 | 12 | 12 | 125 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVJ2BR/L1616X11 | 16 | 16 | 120 | 21 | 16 | 16 | 0.2 | VB**1103... | 1.2 |

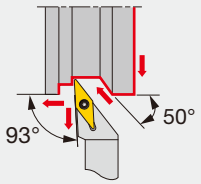
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

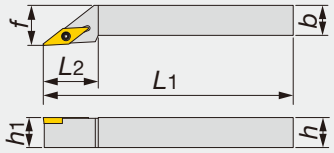
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJ2BR/L... | CSTB-2.5 | T-8F |

# J-SERIES
## JSVJBR/L

Screw-on toolholder with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVJBR/L1010H11 | 10 | 10 | 100 | 20 | 10 | 12 | 0.4 | VB**1103... | 1.2 |
| JSVJBR/L1212H11 | 12 | 12 | 100 | 22 | 12 | 16 | 0.4 | VB**1103... | 1.2 |
| JSVJBR/L1616H11 | 16 | 16 | 100 | 22 | 16 | 20 | 0.4 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJBR/L... | CSTB-2.5 | T-8F |

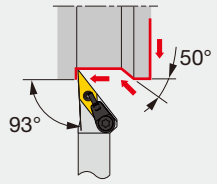


JSVJ2BR/L, JSVJBR/L: Inserts → **B145 -**, CBN → **B169 -**

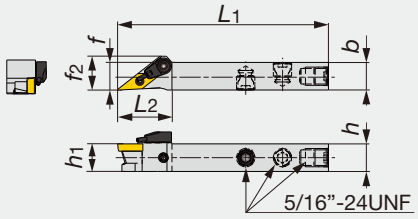
# J-SERIES

## JSVJ2BR/L-CHP

Screw-on toolholder without offset with 93° approach angle for positive 35° rhombic inserts, with channels for high pressure coolant




Cutting edge style **J2**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | 12 | 12 | 85 | 23.6 | 12 | 12 | 14.7 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

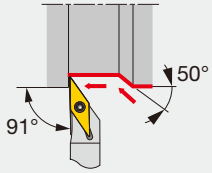
### SPARE PARTS

| Designation | Clamping screw | Coolant unit | Wrench |
|---|---|---|---|
| JSVJ2BR/L1212F11-CHP | CSTB-2.5 | S-CU-CHP | T-8F |

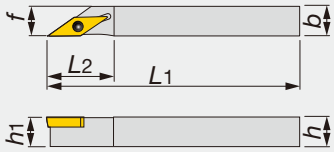
# J-SERIES

## JSVABR/L

Screw-on toolholder without offset with 91° approach angle for positive 35° rhombic inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVABR/L1010K11 | 10 | 10 | 125 | 21 | 10 | 10 | 0.2 | VB**1103... | 1.2 |
| JSVABL1212K11 | 12 | 12 | 125 | 21 | 12 | 12 | 0.2 | VB**1103... | 1.2 |
| JSVABL1616K11 | 16 | 16 | 125 | 21 | 16 | 16 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

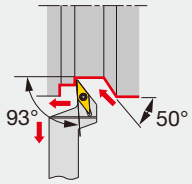
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVABR/L... | CSTB-2.5 | T-8F |

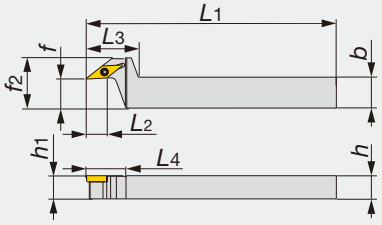
JSVJ2BR/L-CHP, JSVABR/L: Inserts → **B145 -**, CBN → **B169 -**

# JSVJBR-F

Screw-on stepped-head toolholder with 93° approach angle for positive 35° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *L*3 | *L*4 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JSVJBR1216F11-F15 | 12 | 16 | 85 | 12.6 | 27 | 21 | 12 | 15 | 26 | 0.2 | VB**1103... | 1.2 |
| JSVJBR1216X11-F15 | 12 | 16 | 120 | 12.6 | 27 | 21 | 12 | 15 | 26 | 0.2 | VB**1103... | 1.2 |
| JSVJBR1620X11-F15 | 16 | 20 | 120 | 12.6 | 27 | 21 | 16 | 15 | 26 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
***r*ε: Standard corner radius

## SPARE PARTS

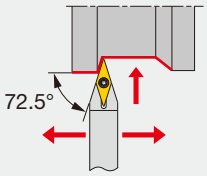
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVJBR**-F15 | CSTB-2.5 | T-8F |



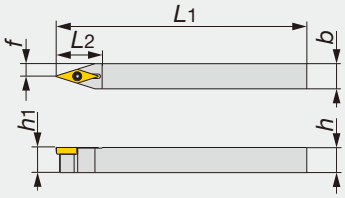
JSVJBR-F: Inserts → **B145 -**, CBN → **B169 -**

# JSVNBN

Screw-on toolholder with 72.5° approach angle for positive 35° rhombic inserts




Cutting edge style **N**




| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVNBN1010X11 | 10 | 10 | 120 | 22 | 10 | 5 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1212F11 | 12 | 12 | 85 | 22 | 12 | 6 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1212X11 | 12 | 12 | 120 | 22 | 12 | 6 | 0.2 | VB**1103... | 1.2 |
| JSVNBN1616X11 | 16 | 16 | 120 | 22 | 16 | 8 | 0.2 | VB**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

## SPARE PARTS

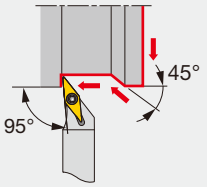
| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVNBN... | CSTB-2.5 | T-8F |



JSVNBN: Inserts → **B145 -**, CBN → **B169 -**

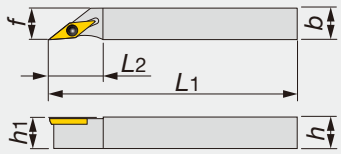
# J-SERIES
## JSVL2PR/L

Screw-on toolholder without offset with 95° approach angle for positive 35° rhombic inserts




Cutting edge style **L2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSVL2PR/L1010X08 | 10 | 10 | 120 | 16 | 10 | 10 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1010K08 | 10 | 10 | 125 | 16 | 10 | 10 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212F08 | 12 | 12 | 85 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212F11 | 12 | 12 | 85 | 21 | 12 | 12 | 0.2 | VP**1103... | 1.2 |
| JSVL2PR/L1212X08 | 12 | 12 | 120 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1212X11 | 12 | 12 | 120 | 21 | 12 | 12 | 0.2 | VP**1103... | 1.2 |
| JSVL2PR/L1212K08 | 12 | 12 | 125 | 16 | 12 | 12 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1616X08 | 16 | 16 | 120 | 16 | 16 | 16 | 0.2 | VP**0802... | 0.6 |
| JSVL2PL1616K08 | 16 | 16 | 125 | 16 | 16 | 16 | 0.2 | VP**0802... | 0.6 |
| JSVL2PR/L1616X11 | 16 | 16 | 120 | 21 | 16 | 16 | 0.2 | VP**1103... | 1.2 |

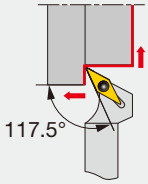
*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVL2PR/L**08 | CSTB-2L | T-6F |
| JSVL2PR/L**11 | CSTB-2.5 | T-8F |

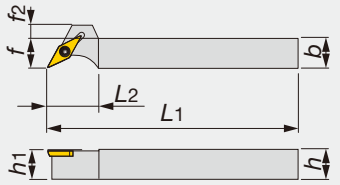
# J-SERIES
## JSVP2PR/L

Screw-on toolholder without offset with 117.5° approach angle for positive 35° rhombic inserts




Cutting edge style **P2**

Without offset




Right hand (R) shown.

| Designation | *h* | *b* | *L*1 | *L*2 | *h*1 | *f* | *f*2 | *r*ε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSVP2PR/L1010K08 | 10 | 10 | 125 | 16 | 10 | 10 | 4 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1010K11 | 10 | 10 | 125 | 20 | 10 | 10 | 8 | 0.2 | VP**1103... | 1.2 |
| JSVP2PR/L1212K08 | 12 | 12 | 125 | 16 | 12 | 12 | 2 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1212K11 | 12 | 12 | 125 | 20 | 12 | 12 | 6 | 0.2 | VP**1103... | 1.2 |
| JSVP2PR/L1616K08 | 16 | 16 | 125 | 16 | 16 | 16 | 2 | 0.2 | VP**0802... | 0.6 |
| JSVP2PR/L1616K11 | 16 | 16 | 125 | 20 | 16 | 16 | 6 | 0.2 | VP**1103... | 1.2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

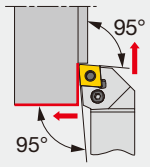
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVP2PR/L**08 | CSTB-2L | T-6F |
| JSVP2PR/L**11 | CSTB-2.5 | T-8F |

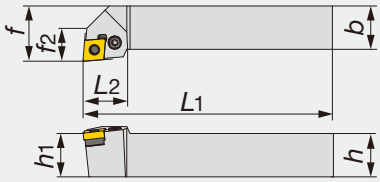
JSVL2PR/L, JSVP2PR/L: Inserts → **B149**

## PCLNR

Lever lock type toolholder with 95° approach angle for negative 80° rhombic inserts




Cutting edge style **L**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR2020H12 | 20 | 20 | 100 | 26 | 20 | 25 | 18 | 0.8 | CN**1204... | 3 |

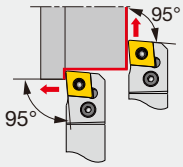
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

**SPARE PARTS**

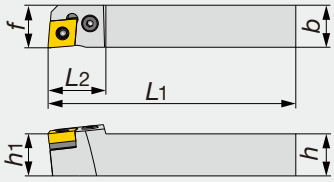
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PCLNR2020H12 | LSC42 | LCS4 | LCL4 | LSP4 | P-3 |

## PCL2NR

Lever lock type toolholder without offset with 95° approach angle for negative 80° rhombic inserts




Cutting edge style **L2**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PCL2NR2020H12 | 20 | 20 | 100 | 26 | 20 | 20 | 0.8 | CN**1204... | 3 |

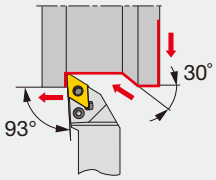
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

**SPARE PARTS**

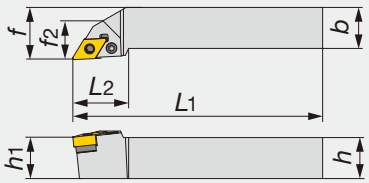
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PCL2NR2020H12 | LSC42 | LCS4 | LCL4 | LSP4 | P-3 |

## PDJNR

Lever lock type toolholder with 93° approach angle for negative 55° rhombic inserts




Cutting edge style **J**




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | f2 | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR2020H15 | 20 | 20 | 100 | 32 | 20 | 25 | 20 | 0.8 | DN**1504... | 3 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

**SPARE PARTS**

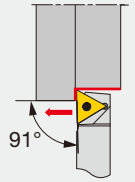
| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PDJNR2020H15 | LSD42 | LCS4 | LCL4 | LSP4 | P-3 |

PCLNR, PCL2NR: Inserts → **B050 -**, CBN → **B163**

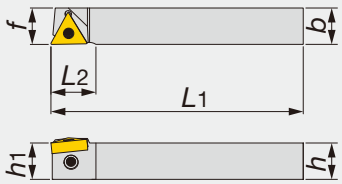
PDJNR: Inserts → **B061 -**, CBN → **B163**

# J-SERIES
## JTTANR/L

Back clamp toolholder without offset with 91° approach angle for negative 60° triangular inserts




Cutting edge style **A**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTANR/L1216K16 | 12 | 16 | 125 | 19.8 | 12 | 16 | 0.4 | TN**1604... | 1.2 |
| JTTANR/L1616K16 | 16 | 16 | 125 | 19.8 | 16 | 16 | 0.4 | TN**1604... | 1.2 |

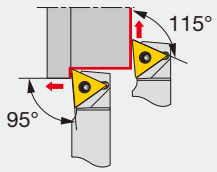
*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

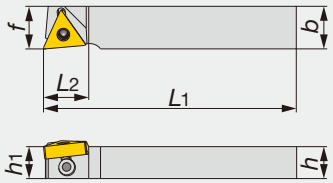
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTANR/L... | JCP-3N | JDS-5040 | P-2.5F |

# J-SERIES
## JTTLNR/L

Back clamp toolholder without offset with 95° approach angle for negative 60° triangular inserts




Cutting edge style **L**




Without offset

Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | rε** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JTTLNR/L1216F16 | 12 | 16 | 85 | 17 | 12 | 16 | 0.4 | TN**1604... | 1 |
| JTTLNR/L1216X16 | 12 | 16 | 120 | 17 | 12 | 16 | 0.4 | TN**1604... | 1 |
| JTTLNR/L1616X16 | 16 | 16 | 120 | 17 | 16 | 16 | 0.4 | TN**1604... | 1 |

*Torque: Recommended torque (N·m) for clamping
**rε: Standard corner radius

### SPARE PARTS

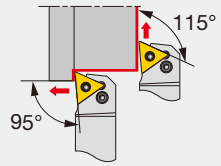
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| JTTLNR/L... | JCP-3N | JDS-5040 | P-2.5F |



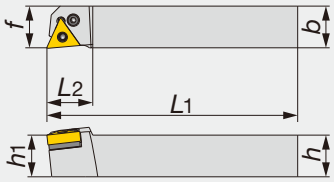
JTTANR/L, JTTLNR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176 -**

## PTL2NR/L

Lever lock type toolholder without offset with 95° approach angle for negative 60° triangular inserts




Cutting edge style **L2**




Without offset

Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | $h_1$ | *f* | $r_\varepsilon$** | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| PTL2NR/L2020H16 | 20 | 20 | 100 | 22 | 20 | 20 | 0.4 | TN**1604... | 2 |

*Torque: Recommended torque (N·m) for clamping
**$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Shim | Clamping screw | Lever | Spring pin | Wrench |
|---|---|---|---|---|---|
| PTL2NR/L2020H16 | LST317 | LCS3 | LCL3 | LSP3 | P-2.5 |

Miniature Tool

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

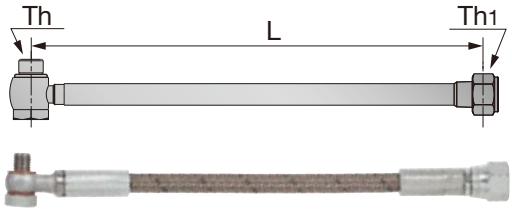
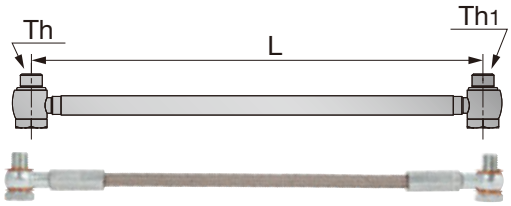
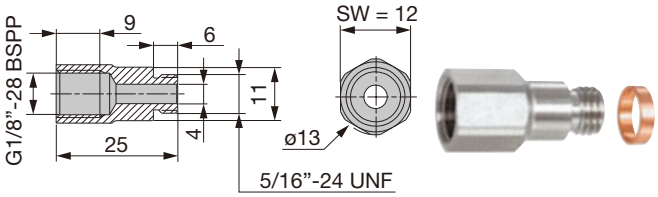



Fig. 2



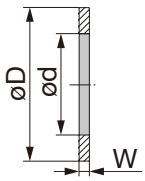

| Designation | L | Th | Th1 | Max. pressure (Mpa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16”-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16”-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

### Connector for small lathe with seal washer




| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

### Seal washer

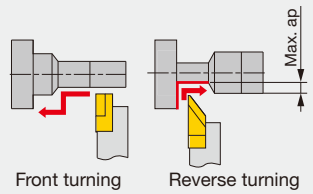


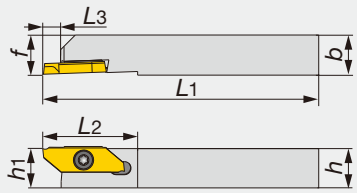
| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

PTL2NR/L: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176 -**

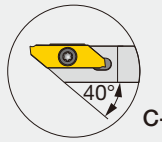
# JSXGR/L

Screw-on toolholder without offset for front / reverse turning & external grooving




Without offset




C-type

Right hand (R) shown.

| Designation | h | b | L1 | L2 | L3 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 10 | 10 | 125 | 29 | 6.7 | 10 | 10 | JXFR/L8..., JXRR/L8... |
| JSXGR/L1212K8-C | 12 | 12 | 125 | 29 | 6.7 | 12 | 12 | JXFR/L8..., JXRR/L8... |
| JSXGR/L1616K8 | 16 | 16 | 125 | 29 | 6.5 | 16 | 16 | JXFR/L8..., JXRR/L8... |
| JSXGR/L2020K8 | 20 | 20 | 125 | 29 | 6.5 | 20 | 20 | JXFR/L8..., JXRR/L8... |
| JSXGR/L2525K8 | 25 | 25 | 125 | 29 | 6.5 | 25 | 25 | JXFR/L8..., JXRR/L8... |

- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXF insert (front-turning), JXR insert (reverse-turning), JXG insert (grooving)

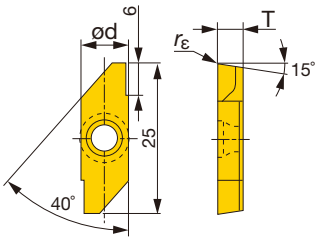
## SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXGR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXF (front turning, sharp edge)

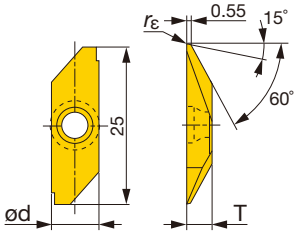



Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXFR/L8000F | 0.03 | ● | | ● | | 8 | 3.97 | 5.5 |
| JXFR/L8010F | 0.1 | ● | | ● | | 8 | 3.97 | 5.5 |

● : Line up

### JXR (reverse turning, sharp edge)



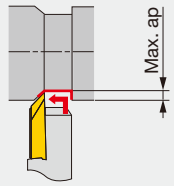

Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXRR/L8000F | 0.03 | ● | | ● | | 8 | 3.97 | 5.5 |
| JXRR/L8010F | 0.1 | ● | | ● | | 8 | 3.97 | 5.5 |

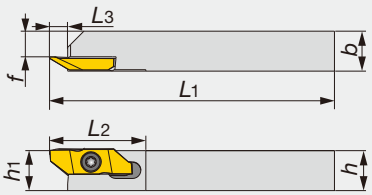
● : Line up

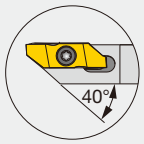
# JSXBR/L

Screw-on toolholder for back turning and threading




Max. ap = 5.5 mm




C-type

Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $L_3$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR/L1010K8-C | 10 | 10 | 125 | 29 | 6.7 | 10 | 5.7 | JXBR/L8..., JXT*R... |
| JSXBR/L1212K8-C | 12 | 12 | 125 | 29 | 6.7 | 12 | 7.7 | JXBR/L8..., JXT*R... |
| JSXBR/L1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXBR/L8..., JXT*R... |
| JSXBR/L2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXBR/L8..., JXT*R... |
| JSXBR/L2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXBR/L8..., JXT*R... |

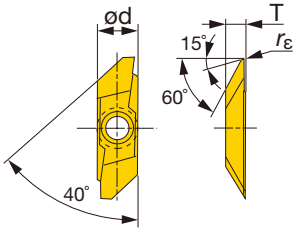
- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXB insert (back-turning), JXT insert (threading)

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXBR/L... | CSTB-4SD | T-8F |

## INSERT

### JXB (sharp edge)

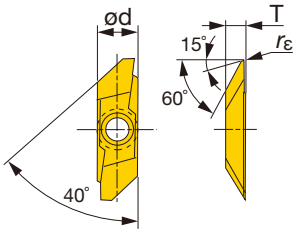



Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| JXBR/L8000F | 0.03 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8005F | 0.05 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8010F | 0.1 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8015F | 0.15 | ● | ● | ● | ● | 8 | 3.97 | 5.5 |

● : Line up

### JXB (with horning)

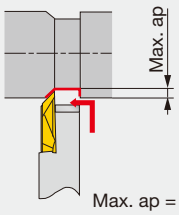


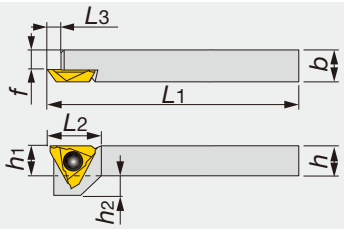

Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|
| JXBR/L8005 | 0.05 | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8010 | 0.1 | ● | ● | 8 | 3.97 | 5.5 |
| JXBR/L8015 | 0.15 | ● | ● | 8 | 3.97 | 5.5 |

● : Line up

# J-SERIES
## JSTBR/L
Screw-on toolholder for back turning




Right hand (R) shown.

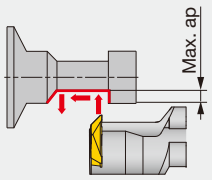
| Designation | h | b | L1 | L2 | L3 | h1 | f | h2 | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| JSTBR/L1010X3 | 10 | 10 | 120 | 15 | 5 | 10 | 6 | 5 | JTBR/L3... | 1.2 |
| JSTBL1010K3 | 10 | 10 | 125 | 15 | 5 | 10 | 6 | 5 | JTBR/L3... | 1.2 |
| JSTBR/L1212F3 | 12 | 12 | 85 | 15 | 5 | 12 | 8 | 3 | JTBR/L3... | 1.2 |
| JSTBR/L1212X3 | 12 | 12 | 120 | 15 | 5 | 12 | 8 | 3 | JTBR/L3... | 1.2 |
| JSTBR/L1616X3 | 16 | 16 | 120 | 15 | 5 | 16 | 12 | - | JTBR/L3... | 1.2 |

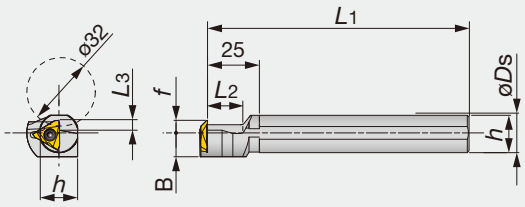
*Torque: Recommended torque (N·m) for clamping

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTBR/L... | CSTB-4SD | T-8F |

# J-SERIES
## JS-TBL3
Screw-on toolholder for back turning




| Designation | øDs | f | L1 | L2 | L3 | h | B | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JS19K-TBL3 | 19.05 | 6 | 125 | 17 | 4.5 | 18 | 11.5 | JTBR3... | 3 |
| JS20K-TBL3 | 20 | 6 | 125 | 17 | 4.5 | 19 | 11.5 | JTBR3... | 3 |
| JS22K-TBL3 | 22 | 6 | 125 | 17 | 4.5 | 21 | 11.5 | JTBR3... | 3 |
| JS25K-TBL3 | 25.4 | 10 | 125 | 17 | 4.5 | 24 | 12.7 | JTBR3... | 3 |

*Torque: Recommended torque (N·m) for clamping

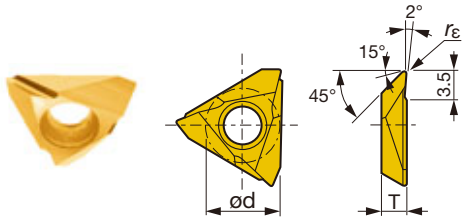
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TBL3 | CSTB-4S | T-15F |

JSTBR/L, JS-TBL3: Inserts → **B348**, Standard cutting conditions → **B348**

## INSERT

### JTB (sharp edge)

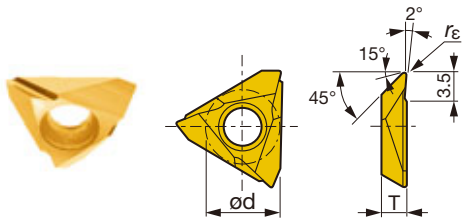



Right hand (R) shown.

| Designation | rε | Coated | | | | Cermet | | Uncoated | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | J740 | | SH725 | | NS9530 | | TH10 | | | | |
| | | R | L | R | L | R | L | R | L | | | |
| JTBR/L3000F | 0.03 | ● | ● | ● | ● | | | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3005F | 0.05 | ● | ● | ● | ● | | | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3010F | 0.1 | ● | ● | ● | ● | ● | ● | ● | ● | 9.438 | 3.18 | 2.5 |
| JTBR/L3015F | 0.15 | ● | | ● | ● | | | | | 9.438 | 3.18 | 2.5 |

● : Line up

### JTB (with horning)




Right hand (R) shown.

| Designation | rε | Coated | | Coated cermet | | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| | | J740 | | J9530 | | | | |
| | | R | L | R | L | | | |
| JTBR/L3005 | 0.05 | ● | ● | ● | | 9.438 | 3.18 | 2.5 |
| JTBR/L3010 | 0.1 | ● | ● | ● | | 9.438 | 3.18 | 2.5 |

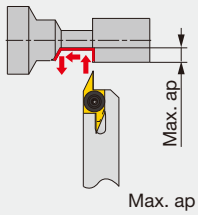
● : Line up

## STANDARD CUTTING CONDITIONS (JTB type insert)

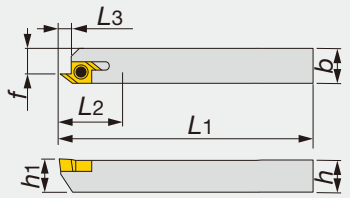
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel S45C, etc. C45, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel SUM22, etc. 11SMn28, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel SUS303, etc. X10CrNiS18-9, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass Si < 12% C3604B, etc. CW614N, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |

# JSEGR/L

Screw-on toolholder for back turning




Max. ap = 3 mm




| Designation | h | b | L1 | L2 | L3 | h1 | f | Insert | Torque* |
|---|---|---|---|---|---|---|---|---|---|
| JSEGR/L1010K10 | 10 | 10 | 125 | - | 3.3 | 10 | 7.5 | J10ER/L... | 1.2 |
| JSEGR/L1212K10 | 12 | 12 | 125 | - | 3.3 | 12 | 9.5 | J10ER/L... | 1.2 |
| JSEGR/L1616K10 | 16 | 16 | 125 | - | 3.3 | 16 | 13.5 | J10ER/L... | 1.2 |

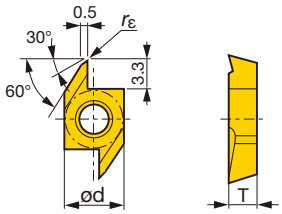
*Torque: Recommended torque (N·m) for clamping

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSEGR/L... | CSTB-2.5 | T-8F |

## INSERT

### J10E (sharp edge)

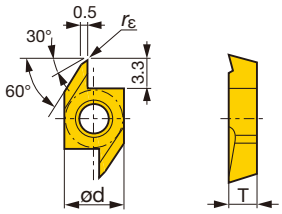



Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | Coated SH725 R | Coated SH725 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J10ER/L005BF | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 6.35 | 3.18 | 3 |
| J10ER/L010BF | 0.1 | ● | ● | ● | ● | ● | | ● | ● | 6.35 | 3.18 | 3 |
| J10ER/L015BF | 0.15 | | | ● | ● | | | | | 6.35 | 3.18 | 3 |

● : Line up

### J10E (with horning)




Right hand (R) shown.

| Designation | rε | Coated J740 R | Coated J740 L | Coated cermet J9530 R | Coated cermet J9530 L | ød | T | Max. depth of cut |
|---|---|---|---|---|---|---|---|---|
| J10ER/L005B | 0.05 | ● | ● | ● | | 6.35 | 3.18 | 3 |
| J10ER/L010B | 0.1 | ● | ● | ● | | 6.35 | 3.18 | 3 |

● : Line up

JSEGR/L: Inserts → **B349 -**, Standard cutting conditions → **B350**

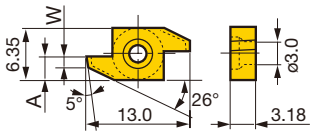
## STANDARD CUTTING CONDITIONS (J10E type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel S45C, etc. C45, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel SUM22, etc. 11SMn28, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel SUS303, etc. X10CrNiS18-9, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass Si < 12% C3604B, etc. CW614N, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys (Ti-6Al-4V, etc.) | TH10 | 10 - 30 | 0.01 - 0.1 |

Miniature Tool

## INSERT

### 10E (Insert blank)



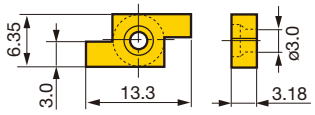

Right hand (R) shown.

| Designation | Uncoated TH10 R | Uncoated TH10 L | W | A |
|---|---|---|---|---|
| 10ER/L100B | ● | ● | 1 | 2.5 |
| 10ER/L150B | ● | ● | 1.5 | 3 |

● : Line up

Note: Right hand holder (JSEGR...) use right hand insert (10ER...) and left hand holder (JSEGL...) use left hand insert (10EL...).

### 10E (Insert blank)



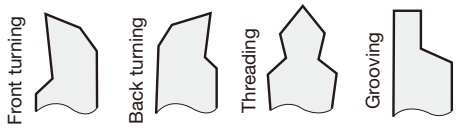

Right hand (R) shown.

| Designation | Uncoated TH10 R | Uncoated TH10 L |
|---|---|---|
| 10ER/L300 | ● | ● |

● : Line up

Note: Right hand holder (JSEGR...) use right hand insert (10ER...) and left hand holder (JSEGL...) use left hand insert (10EL...).

## Formed examples of insert blanks



Notes:
- Front relief angle, side relief angle, edge width can be ground depending on the application.
- Insert blanks can be formed to a profiling tool which has a width up to 3 mm.

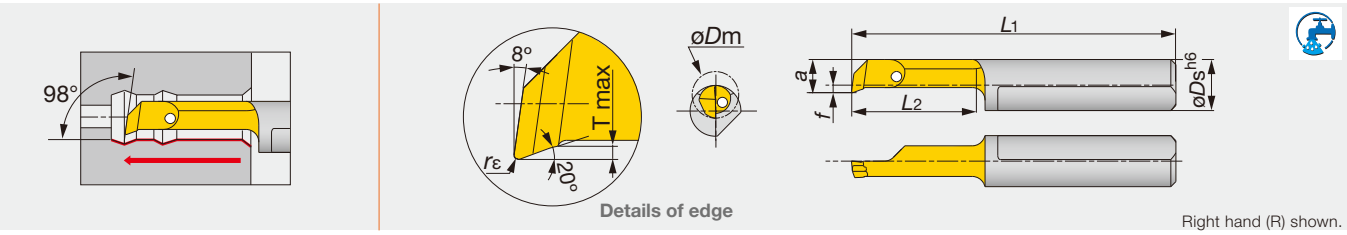
## Standard cutting conditions

| Operations | Workpiece material | | Carbon steels | Stainless steels | Brass |
|---|---|---|---|---|---|
| Lateral feed (external turning) | Cutting speed (m/min) | | ~ 100 | ~ 50 | ~ 200 |
| | Feed (mm/rev) | Roughing | ~ 0.06 | ~ 0.03 | ~ 0.1 |
| | | Medium | ~ 0.03 | ~ 0.025 | ~ 0.06 |
| | | Finishing | ~ 0.02 | ~ 0.015 | ~ 0.04 |
| Parting-off Grooving Forming | Cutting speed (m/min) | | ~ 80 | ~ 30 | ~ 150 |
| | Feed (mm/rev) | Roughing | ~ 0.02 | ~ 0.015 | ~ 0.05 |
| | | Medium | ~ 0.015 | ~ 0.01 | ~ 0.03 |
| | | Finishing | ~ 0.01 | ~ 0.008 | ~ 0.015 |

MEMO

# JBT R/L

## Solid boring bars for boring, profiling & chamfering




| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | $r_\varepsilon{}^{+0.05}_{0}$ |
|---|---|---|---|---|---|---|---|---|---|
| JBTR04020004-D006 | ● | 0.6 | 4 | - | 0.5 | 18.5 | 2 | 0.08 | 0.04 |
| JBTR04030004-D006 | ● | 0.6 | 4 | - | 0.5 | 19.5 | 3 | 0.08 | 0.04 |
| JBTR04045005-D010 | ● | 1 | 4 | - | 0.9 | 21 | 4.5 | 0.1 | 0.05 |
| JBTR04065005-D010 | ● | 1 | 4 | - | 0.9 | 23 | 6.5 | 0.1 | 0.05 |
| JBTR04040005-D020 | ● | 2 | 4 | - | 1.7 | 20.5 | 4 | 0.1 | 0.05 |
| JBTR04090005-D020 | ● | 2 | 4 | - | 1.7 | 25.5 | 9 | 0.1 | 0.05 |
| JBTR04140005-D020 | ● | 2 | 4 | - | 1.7 | 30.5 | 14 | 0.1 | 0.05 |
| JBTR/L04090010-D028 | ● | 3.5 | 4 | 0.6 | 2.6 | 25.5 | 9 | 0.2 | 0.1 |
| JBTR/L04150010-D028 | ● | 3.5 | 4 | 0.6 | 2.6 | 31.5 | 15 | 0.2 | 0.1 |
| JBTR/L04190010-D028 | ● | 3.5 | 4 | 0.6 | 2.6 | 35.5 | 19 | 0.2 | 0.1 |
| JBTR/L04090010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.3 | 0.1 |
| JBTR/L04150010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.3 | 0.1 |
| JBTR/L04190010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 35.5 | 19 | 0.3 | 0.1 |
| JBTR04230010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 39.5 | 23 | 0.3 | 0.1 |
| JBTR04270010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 43.5 | 27 | 0.3 | 0.1 |
| JBTR/L07090015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 0.5 | 0.15 |
| JBTR/L07140015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.5 | 0.15 |
| JBTR/L07190015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.5 | 0.15 |
| JBTR/L07240015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 40 | 24 | 0.5 | 0.15 |
| JBTR/L07290015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 45 | 29 | 0.5 | 0.15 |
| JBTR07340015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 50 | 34 | 0.5 | 0.15 |
| JBTR/L07140015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 0.5 | 0.15 |
| JBTR/L07210015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 0.5 | 0.15 |
| JBTR/L07240015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 0.5 | 0.15 |
| JBTR/L07290015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 0.5 | 0.15 |
| JBTR07340015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 50 | 34 | 0.5 | 0.15 |
| JBTR07410015-D060 | ● | 6 | 7 | 1.8 | 5.3 | 57 | 41 | 0.5 | 0.15 |
| JBTR/L07190015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 35 | 19 | 0.6 | 0.15 |
| JBTR07240015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 40 | 24 | 0.6 | 0.15 |
| JBTR/L07290015-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 45 | 29 | 0.6 | 0.15 |
| JBTR/L07340015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 50 | 34 | 0.6 | 0.15 |
| JBTR07390015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 55 | 39 | 0.6 | 0.15 |
| JBTR07440015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 60 | 44 | 0.6 | 0.15 |
| JBTR07490015-D070 | ● | 7 | 7 | 2.8 | 6.3 | 65 | 49 | 0.6 | 0.15 |

● : Line up

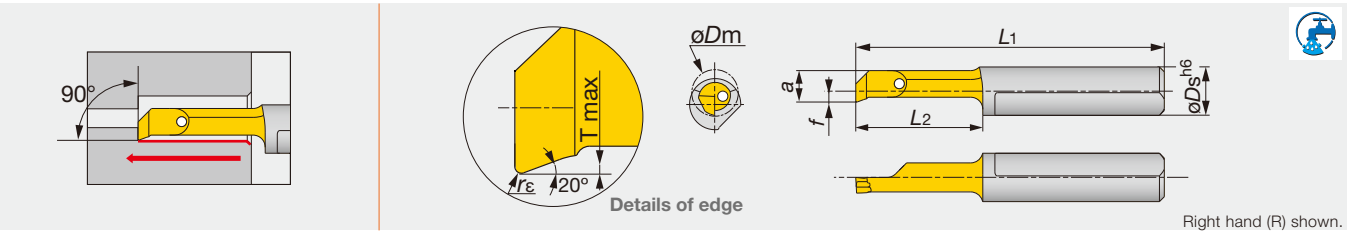


Standard cutting conditions → **B359**

TINYMINITURN

## JBP R

Solid boring bars for boring & chamfering




Right hand (R) shown.

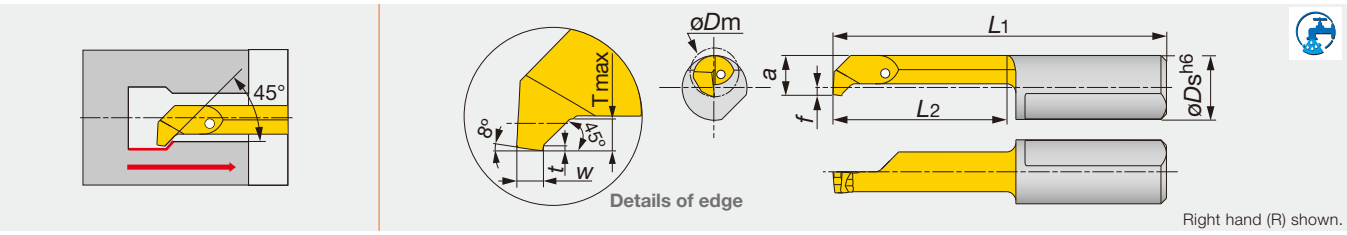
| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | $r_\varepsilon^{+0.05}_{0}$ |
|---|---|---|---|---|---|---|---|---|---|
| JBPR04090010-D028 | ● | 3.5 | 4 | 0.9 | 2.6 | 25.5 | 9 | 0.2 | 0.1 |
| JBPR04150010-D028 | ● | 3.5 | 4 | 0.9 | 2.6 | 31.5 | 15 | 0.2 | 0.1 |
| JBPR04090010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.3 | 0.1 |
| JBPR04150010-D040 | ● | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.3 | 0.1 |
| JBPR07140015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.5 | 0.15 |
| JBPR07190015-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.5 | 0.15 |

● : Line up

TINYMINITURN

## JBU R

Solid boring bars for back boring & chamfering




Right hand (R) shown.

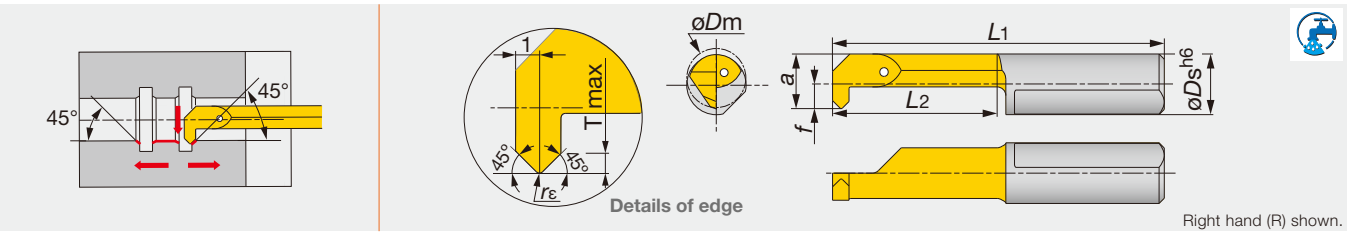
| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | t | T max | $W^{+0.05}_{0}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| JBUR07140010-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.2 | 1 | 1 |
| JBUR07190010-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.2 | 1 | 1 |

● : Line up

TINYMINITURN

## JBC R

Solid boring bars for Boring & 45° chamfering




Right hand (R) shown.

| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | $r_\varepsilon^{\pm0.05}$ |
|---|---|---|---|---|---|---|---|---|---|
| JBCR07140020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 0.7 | 0.2 |
| JBCR07190020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 0.7 | 0.2 |
| JBCR07190020-D068 | ● | 6.8 | 7 | 2.8 | 6.3 | 35 | 19 | 0.7 | 0.2 |

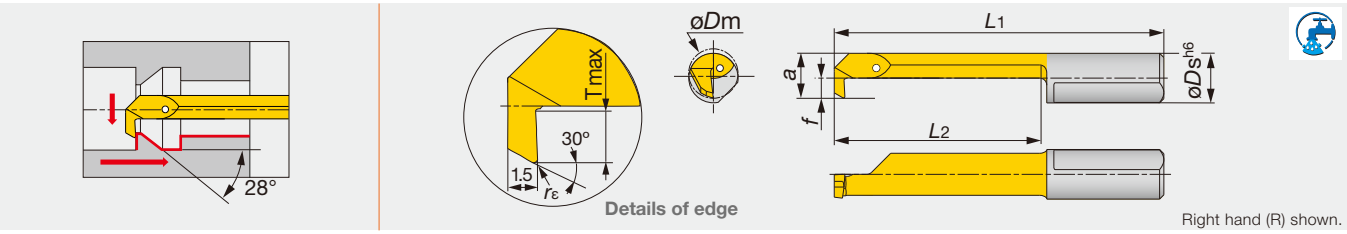
● : Line up

Standard cutting conditions → **B359**

TINYMINITURN

## JBB R

Solid boring bars for back boring



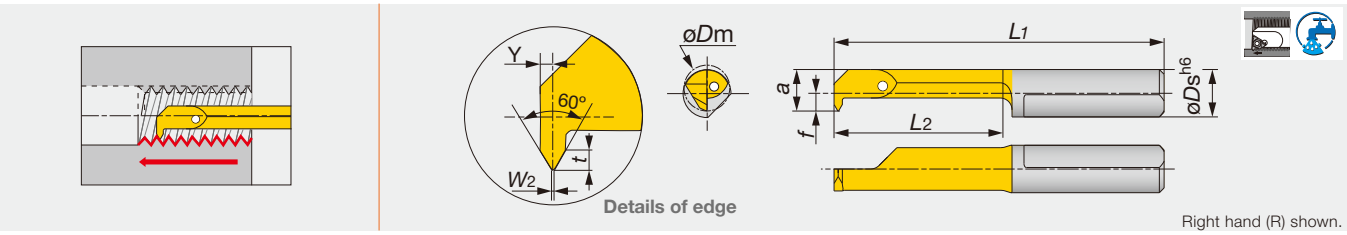

| Designation | SH730 | øDm | øDs | f | a | L1 | L2 | T max | rε +0.05 |
|---|---|---|---|---|---|---|---|---|---|
| JBBR04140020-D030 | ● | 3 | 4 | 0.6 | 2.6 | 30 | 14 | 0.5 | 0.2 |
| JBBR04190020-D030 | ● | 3 | 4 | 0.6 | 2.6 | 35 | 19 | 0.5 | 0.2 |
| JBBR04140015-D040 | ● | 4 | 4 | 1.5 | 3.5 | 30 | 14 | 0.8 | 0.15 |
| JBBR04240015-D040 | ● | 4 | 4 | 1.5 | 3.5 | 40 | 24 | 0.8 | 0.15 |
| JBBR07190020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 | 0.2 |
| JBBR07290020-D050 | ● | 5 | 7 | 0.9 | 4.4 | 45 | 29 | 1 | 0.2 |
| JBBR07190020-D060 | ● | 6 | 7 | 1.8 | 5.3 | 35 | 19 | 1.8 | 0.2 |
| JBBR07290020-D060 | ● | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 | 0.2 |
| JBBR07190020-D070 | ● | 7 | 7 | 2.8 | 6.3 | 35 | 19 | 2.5 | 0.2 |
| JBBR07290020-D070 | ● | 7 | 7 | 2.8 | 6.3 | 45 | 29 | 2.5 | 0.2 |

● : Line up

TINYMINITURN

## JBI R

Solid boring bars for threading (metric)



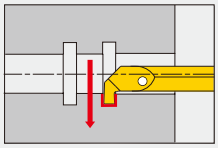

| Designation | SH730 | Pitch | øDm | W2 -0 0.02 | øDs | f | a | L1 | L2 | t | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JBIR04140050-D040 | ● | 0.5 | 4 | 0.06 | 4 | 1.5 | 3.5 | 30 | 14 | 0.3 | 0.35 |
| JBIR07140050-D050 | ● | 0.5 | 5 | 0.06 | 7 | 0.9 | 4.4 | 30 | 14 | 0.3 | 0.35 |
| JBIR07140075-D050 | ● | 0.75 | 5 | 0.09 | 7 | 0.9 | 4.4 | 30 | 14 | 0.4 | 0.45 |
| JBIR07140100-D048 | ● | 1 | 4.8 | 0.12 | 7 | 0.9 | 4.4 | 30 | 14 | 0.6 | 0.55 |
| JBIR07140100-D060 | ● | 1 | 6 | 0.12 | 7 | 1.8 | 5.3 | 30 | 14 | 0.6 | 0.55 |
| JBIR07140125-D060 | ● | 1.25 | 6 | 0.15 | 7 | 1.8 | 5.3 | 30 | 14 | 0.7 | 0.65 |
| JBIR07140150-D060 | ● | 1.5 | 6 | 0.18 | 7 | 1.8 | 5.3 | 30 | 14 | 0.8 | 0.75 |
| JBIR07140150-D070 | ● | 1.5 | 7 | 0.18 | 7 | 2.8 | 6.3 | 30 | 14 | 0.8 | 0.75 |

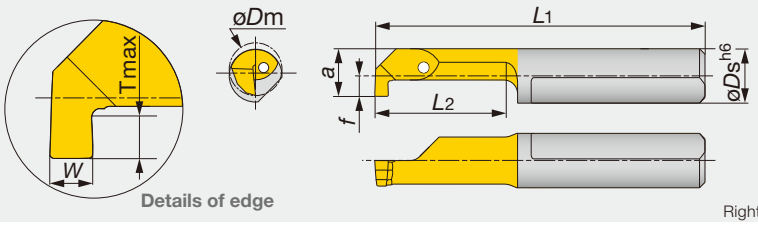
● : Line up

Standard cutting conditions → **B359**

# JBG R/L

## Solid boring bars for internal grooving






Right hand (R) shown.

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | f | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|---|
| JBGR04050050-D020 | ● | 0.5 | 2 | 4 | 0.2 | 1.8 | 21 | 5 | 0.4 |
| JBGR04100050-D020 | ● | 0.5 | 2 | 4 | 0.2 | 1.8 | 26 | 10 | 0.4 |
| JBGR04050070-D030 | ● | 0.7 | 3 | 4 | 0.7 | 2.7 | 21 | 5 | 0.6 |
| JBGR04100070-D030 | ● | 0.7 | 3 | 4 | 0.7 | 2.7 | 26 | 10 | 0.6 |
| JBGR04090100-D040 | ● | 1 | 4 | 4 | 1.5 | 3.5 | 25.5 | 9 | 0.8 |
| JBGR04150100-D040 | ● | 1 | 4 | 4 | 1.5 | 3.5 | 31.5 | 15 | 0.8 |
| JBGR07090100-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07140100-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 1 |
| JBGR07090150-D050 | ● | 1.5 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07140150-D050 | ● | 1.5 | 5 | 7 | 0.9 | 4.4 | 30 | 14 | 1 |
| JBGR07090200-D050 | ● | 2 | 5 | 7 | 0.9 | 4.4 | 25 | 9 | 1 |
| JBGR07190200-D050 | ● | 2 | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 |
| JBGR/L07090100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07290100-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR/L07090150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07240150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 |
| JBGR07290150-D060 | ● | 1.5 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR07090200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 25 | 9 | 1.8 |
| JBGR07140200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 30 | 14 | 1.8 |
| JBGR07210200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 37 | 21 | 1.8 |
| JBGR07240200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 |
| JBGR07290200-D060 | ● | 2 | 6 | 7 | 1.8 | 5.3 | 45 | 29 | 1.8 |
| JBGR07090100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR07140100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210100-D068 | ● | 1 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07090150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR07140150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07290150-D068 | ● | 1.5 | 6.8 | 7 | 2.7 | 6.2 | 45 | 29 | 2.5 |
| JBGR07090200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 25 | 9 | 2.5 |
| JBGR/L07140200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 30 | 14 | 2.5 |
| JBGR07210200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 37 | 21 | 2.5 |
| JBGR07250200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 40 | 25 | 2.5 |
| JBGR07290200-D068 | ● | 2 | 6.8 | 7 | 2.7 | 6.2 | 45 | 29 | 2.5 |

* Corner radius : less than 0.1 mm.

● : Line up

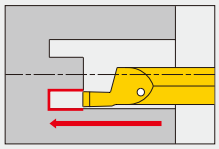


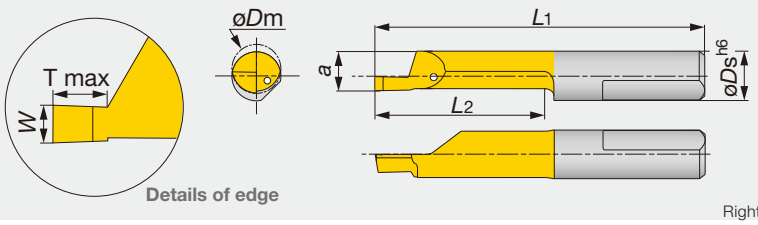
Standard cutting conditions → **B360**

TINYMTURN

## JBF R/L

Solid boring bars for face grooving






Right hand (R) shown.

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|
| JBFR07110100-D060 | ● | 1 | 6 | 7 | 5.2 | 26 | 10 | 1.5 |
| JBFR07110150-D060 | ● | 1.5 | 6 | 7 | 5.2 | 26 | 10 | 2 |
| JBFR07110200-D060 | ● | 2 | 6 | 7 | 5.2 | 26 | 10 | 3 |
| JBFR07110100-D080 | ● | 1 | 8 | 7 | 5.9 | 27 | 11 | 1.5 |
| JBFR07110150-D080 | ● | 1.5 | 8 | 7 | 5.9 | 27 | 11 | 2.5 |
| JBFR07110200-D080 | ● | 2 | 8 | 7 | 5.9 | 27 | 11 | 3 |
| JBFR07110250-D080 | ● | 2.5 | 8 | 7 | 5.9 | 27 | 11 | 3.5 |
| JBFR07110300-D080 | ● | 3 | 8 | 7 | 5.9 | 27 | 11 | 3.5 |
| JBFR/L07210150-D080 | ● | 1.5 | 8 | 7 | 5.9 | 36 | 21 | 2.5 |
| JBFR07210200-D080 | ● | 2 | 8 | 7 | 5.9 | 36 | 21 | 3 |
| JBFR07210250-D080 | ● | 2.5 | 8 | 7 | 5.9 | 36 | 21 | 3.5 |
| JBFR07210300-D080 | ● | 3 | 8 | 7 | 5.9 | 36 | 21 | 3.5 |
| JBFR/L07300200-D080 | ● | 2 | 8 | 7 | 5.9 | 46 | 30 | 3 |
| JBFR07300300-D080 | ● | 3 | 8 | 7 | 5.9 | 46 | 30 | 3.5 |
| JBFR07200200-D080 | ● | 2 | 8 | 7 | 5.9 | 36 | 20 | 3 |
| JBFR07200250-D150 | ● | 2.5 | 15 | 7 | 5.9 | 36 | 20 | 20 |
| JBFR07200300-D150 | ● | 3 | 15 | 7 | 5.9 | 36 | 20 | 20 |
| JBFR07300300-D150 | ● | 3 | 15 | 7 | 5.9 | 46 | 30 | 30 |

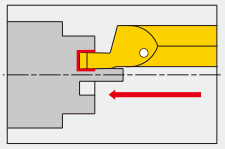
* Corner radius : less than 0.1 mm.

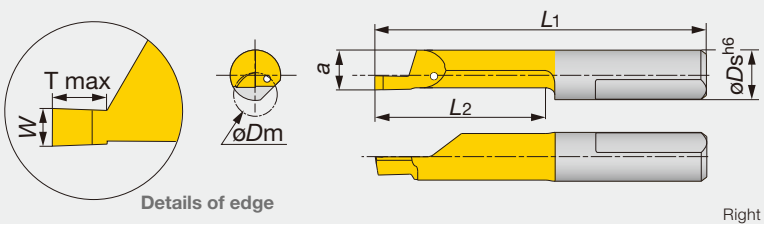
● : Line up

TINYMTURN

## JBS R

Solid boring bars for face grooving (for shaft machining)






Right hand (R) shown.

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | a | L1 | L2 | T max |
|---|---|---|---|---|---|---|---|---|
| JBSR07200200-D060 | ● | 2 | 6 | 7 | 5.2 | 36 | 20 | 4 |

* Corner radius : less than 0.1 mm.

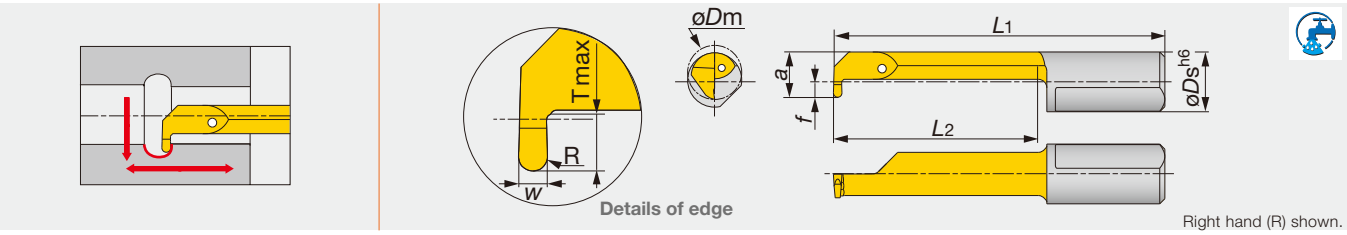
● : Line up

Standard cutting conditions → **B360**

TINYMTURN

## JBR R

Solid boring bars for Boring & profiling (full radius type)



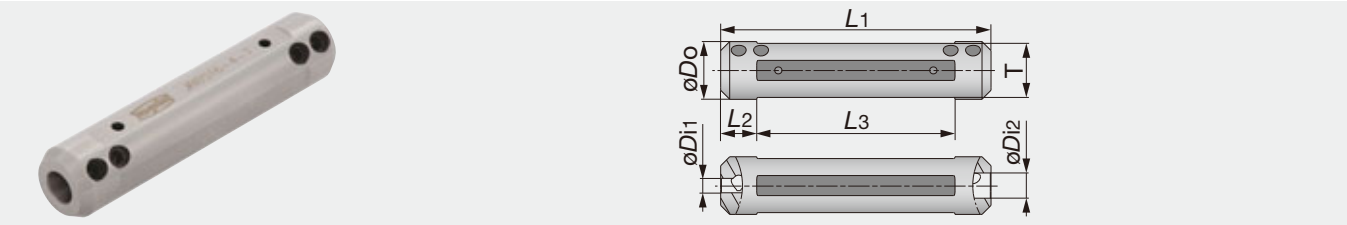

| Designation | SH730 | $W^{+0.05}_{0}$ | øDm | øDs | f | a | L1 | L2 | T max | R |
|---|---|---|---|---|---|---|---|---|---|---|
| JBRR07190050-D050 | ● | 1 | 5 | 7 | 0.9 | 4.4 | 35 | 19 | 1 | 0.5 |
| JBRR07240050-D060 | ● | 1 | 6 | 7 | 1.8 | 5.3 | 40 | 24 | 1.8 | 0.5 |
| JBRR07290050-D068 | ● | 1 | 6.8 | 7 | 2.8 | 6.3 | 45 | 29 | 2.5 | 0.5 |

● : Line up

TINYMTURN

## JBBS

Sleeve for external coolant supply




| Designation | øDo | øDi1 | øDi2 | L1 | L2 | L3 | T |
|---|---|---|---|---|---|---|---|
| JBBS12-4-4 | 12 | 4 | 4 | 75 | 10 | 55 | 10.3 |
| JBBS127-4-4 | 12.7 | 4 | 4 | 76.2 | 10 | 56.2 | 11.6 |
| JBBS14-4-4 | 14 | 4 | 4 | 75 | 10 | 55 | 12 |
| JBBS159-4-7 | 15.875 | 4 | 7 | 76.2 | 10 | 56.2 | 14 |
| JBBS16-4-7 | 16 | 4 | 7 | 75 | 10 | 55 | 15 |
| JBBS19-4-7 | 19.05 | 4 | 7 | 89 | 10 | 69 | 17.2 |
| JBBS20-4-7 | 20 | 4 | 7 | 90 | 10 | 70 | 18 |
| JBBS22-4-7 | 22 | 4 | 7 | 90 | 10 | 70 | 20 |
| JBBS25-4-7 | 25 | 4 | 7 | 100 | 10 | 80 | 23 |
| JBBS254-4-7 | 25.4 | 4 | 7 | 90 | 10 | 70 | 23.4 |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JBBS12-4-4 | SSHM5-4PF-S | P-2.5 |
| JBBS127-4-4 | SSHM5-6PF-S | P-2.5 |
| JBBS14-4-4 | SSHM5-4PF-S | P-2.5 |
| JBBS**-4-7 | SSHM5-6PF-S | P-2.5 |

Standard cutting conditions → **B359**

# JBBS-C

## Sleeve for internal coolant supply

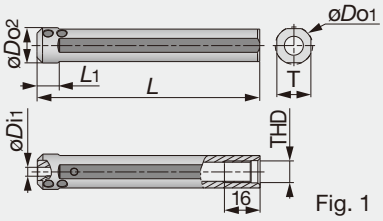



Fig. 1

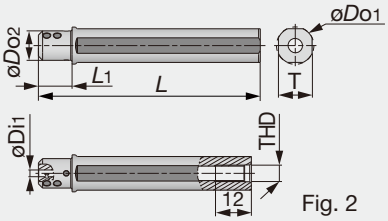


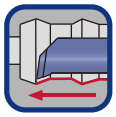

Fig. 2

| Designation | øDo1 | øDo2 | øDi1 | L | L1 | T | THD | Fig. |
|---|---|---|---|---|---|---|---|---|
| JBBS159-4-L100C | 15.875 | 15.875 | 4 | 100 | 10 | 14.58 | R1/8 | 1 |
| JBBS159-7-L100C | 15.875 | 15.875 | 7 | 100 | 10 | 14.58 | R1/8 | 1 |
| JBBS16-4-L100C | 16 | 16 | 4 | 100 | 10 | 15 | R1/8 | 1 |
| JBBS16-7-L100C | 16 | 16 | 7 | 100 | 10 | 15 | R1/8 | 1 |
| JBBS19-4-L100C | 19.05 | 17.5 | 4 | 100 | 20 | 17.2 | R1/8 | 2 |
| JBBS19-7-L100C | 19.05 | 17.5 | 7 | 100 | 20 | 17.2 | R1/8 | 2 |
| JBBS20-4-L100C | 20 | 17.5 | 4 | 100 | 20 | 18 | R1/8 | 2 |
| JBBS20-7-L100C | 20 | 17.5 | 7 | 100 | 20 | 18 | R1/8 | 2 |
| JBBS22-4-L100C | 22 | 17.5 | 4 | 100 | 20 | 20 | R1/8 | 2 |
| JBBS22-7-L100C | 22 | 17.5 | 7 | 100 | 20 | 20 | R1/8 | 2 |
| JBBS25-4-L100C | 25 | 18 | 4 | 100 | 23 | 23 | R1/8 | 2 |
| JBBS25-7-L100C | 25 | 18 | 7 | 100 | 23 | 23 | R1/8 | 2 |
| JBBS254-4-L100C | 25.4 | 18 | 4 | 100 | 23 | 23.4 | R1/8 | 2 |
| JBBS254-7-L100C | 25.4 | 18 | 7 | 100 | 23 | 23.4 | R1/8 | 2 |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JBBS**-4-L100C | SSHM5-6PF-S | P-2.5 |
| JBBS**-7-L100C | SSHM5-4PF-S | P-2.5 |

## STANDARD CUTTING CONDITIONS

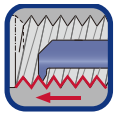


### Boring, profiling, chamfering, back boring

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S25C, etc.<br>C15, C25, etc. | SH730 | 40 - 140 | 0.01 - 0.08 * |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc.<br>C55, 42CrMoS4, etc. | SH730 | 40 - 140 | 0.01 - 0.08 * |
| | Prehardened steels<br>NAK80, PX5, etc. | SH730 | 40 - 140 | 0.01 - 0.08 * |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 40 - 140 | 0.01 - 0.08 * |
| K | Grey cast irons<br>FC250, FCD300, etc.<br>250, 300, etc. | SH730 | 30 - 100 | 0.01 - 0.08 * |
| | Ductile cast irons<br>FC450, FCD600, etc.<br>400-15, 600-3, etc. | SH730 | 30 - 100 | 0.01 - 0.08 * |
| N | Aluminium alloys, copper alloys<br>Si < 12% | SH730 | 90 - 200 | 0.01 - 0.08 * |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | SH730 | 30 - 100 | 0.01 - 0.08 * |
| | Superalloys<br>Inconel718, etc. | SH730 | 30 - 100 | 0.01 - 0.08 * |

* JBTR/L04020004-D006,
JBTR/L04030004-D006

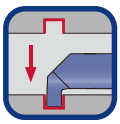
Max. *f* = 0.01 mm/rev



### Threading (metric thread)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Number of passes<br>Pitch (mm)<br>0.5 | 0.75 | 1 | 1.25 | 1.5 |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S25C, etc.<br>C15, C25, etc. | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc.<br>C55, 42CrMoS4, etc. | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| | Prehardened steels<br>NAK80, PX5, etc. | SH730 | 40 - 140 | 6 - 8 | 8 - 10 | 10 - 12 | 12 - 15 | 15 - 18 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 40 - 140 | 8 | 10 | 12 | 15 | 18 |
| K | Grey cast irons<br>FC250, FCD300, etc.<br>250, 300, etc. | SH730 | 30 - 100 | 7 | 9 | 12 | 14 | 17 |
| | Ductile cast irons<br>FC450, FCD600, etc.<br>400-15, 600-3, etc. | SH730 | 30 - 100 | 7 | 9 | 12 | 14 | 17 |
| N | Aluminium alloys, copper alloys<br>Si < 12% | SH730 | 90 - 200 | 6 | 8 | 10 | 12 | 15 |

## STANDARD CUTTING CONDITIONS



### Internal grooving

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S25C, etc.<br>C15, C25, etc. | SH730 | 40 - 140 | 0.01 - 0.03 |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc.<br>C55, 42CrMoS4, etc. | SH730 | 40 - 140 | 0.01 - 0.03 |
| | Prehardened steels<br>NAK80, PX5, etc. | SH730 | 40 - 140 | 0.01 - 0.03 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 40 - 140 | 0.01 - 0.03 |
| K | Grey cast irons<br>FC250, FCD300, etc.<br>250, 300, etc. | SH730 | 30 - 100 | 0.01 - 0.03 |
| | Ductile cast irons<br>FC450, FCD600, etc.<br>400-15, 600-3, etc. | SH730 | 30 - 100 | 0.01 - 0.03 |
| N | Aluminium alloys, copper alloys<br>Si < 12% | SH730 | 90 - 200 | 0.01 - 0.03 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | SH730 | 30 - 100 | 0.01 - 0.03 |
| | Superalloys<br>Inconel718, etc. | SH730 | 30 - 100 | 0.01 - 0.03 |

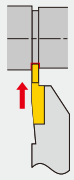
### Face grooving

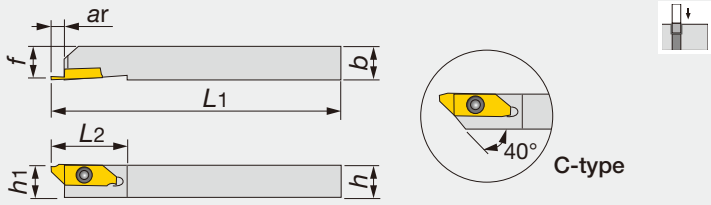
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S25C, etc.<br>C15, C25, etc. | SH730 | 40 - 140 | 0.01 - 0.05 |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc.<br>C55, 42CrMoS4, etc. | SH730 | 40 - 140 | 0.01 - 0.05 |
| | Prehardened steels<br>NAK80, PX5, etc. | SH730 | 40 - 140 | 0.01 - 0.05 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 40 - 140 | 0.01 - 0.05 |
| K | Grey cast irons<br>FC250, FCD300, etc.<br>250, 300, etc. | SH730 | 30 - 100 | 0.01 - 0.05 |
| | Ductile cast irons<br>FC450, FCD600, etc.<br>400-15, 600-3, etc. | SH730 | 30 - 100 | 0.01 - 0.05 |
| N | Aluminium alloys, copper alloys<br>Si < 12% | SH730 | 90 - 200 | 0.01 - 0.05 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | SH730 | 30 - 100 | 0.01 - 0.05 |
| | Superalloys<br>Inconel718, etc. | SH730 | 30 - 100 | 0.01 - 0.05 |

MEMO

# JSXGR/L

Screw-on toolholder without offset for front / reverse turning & external grooving






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 0.7 - 2 | 6.7 | 10 | 10 | 125 | 29 | 10 | 10 | JX*R/L8... |
| JSXGR/L1212K8-C | 0.7 - 2 | 6.7 | 12 | 12 | 125 | 29 | 12 | 12 | JX*R/L8... |
| JSXGR/L1616K8 | 0.7 - 2 | 6.5 | 16 | 16 | 125 | 29 | 16 | 16 | JX*R/L8... |
| JSXGR/L2020K8 | 0.7 - 2 | 6.5 | 20 | 20 | 125 | 29 | 20 | 20 | JX*R/L8... |
| JSXGR/L2525K8 | 0.7 - 2 | 6.5 | 25 | 25 | 125 | 29 | 25 | 25 | JX*R/L8... |

- Can be wrenched also from the back with a double-head screw.
- This toolholders can be used for JXG insert (grooving), JXF insert (front-turning), JXK insert (reverse-turning).

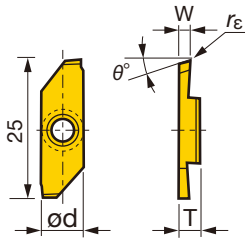
## SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXGR/L | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXG (handed insert with sharp edge)




Right hand (R) shown.

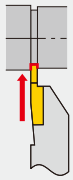
| Designation | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | $W^{+0.05}_{0}$ | θ° | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|
| JXGR/L8070FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 0.7 | 15 | 4.5 |
| JXGR/L8070FA-005 | 0.05 | ● | | | | 8 | 3.97 | 0.7 | 15 | 4.5 |
| JXGR/L8100FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 1 | 15 | 6 |
| JXGR/L8100FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1 | 15 | 6 |
| JXGR/L8100FA45 | 0 | ● | | ● | | 8 | 3.97 | 1 | 15 | 4.5 |
| JXGR/L8100FA45-005 | 0.05 | ● | | | | 8 | 3.97 | 1 | 15 | 4.5 |
| JXGR/L8150FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 1.5 | 15 | 6 |
| JXGR/L8150FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1.5 | 15 | 6 |
| JXGR/L8150FA50 | 0 | ● | | ● | | 8 | 3.97 | 1.5 | 15 | 5 |
| JXGR/L8150FA50-005 | 0.05 | ● | | | | 8 | 3.97 | 1.5 | 15 | 5 |
| JXGR/L8180FA | 0 | ● | | ● | | 8 | 3.97 | 1.8 | 15 | 6 |
| JXGR/L8180FA-005 | 0.05 | ● | | | | 8 | 3.97 | 1.8 | 15 | 6 |
| JXGR/L8200FA | 0 | ● | ● | ● | ● | 8 | 3.97 | 2 | 15 | 6 |
| JXGR/L8200FA-005 | 0.05 | ● | | | | 8 | 3.97 | 2 | 15 | 6 |
| JXGR/L8200FN | 0 | ● | ● | ● | ● | 8 | 3.97 | 2 | 0 | 6 |
| JXGR/L8200FN-005 | 0.05 | ● | | | | 8 | 3.97 | 2 | 0 | 6 |

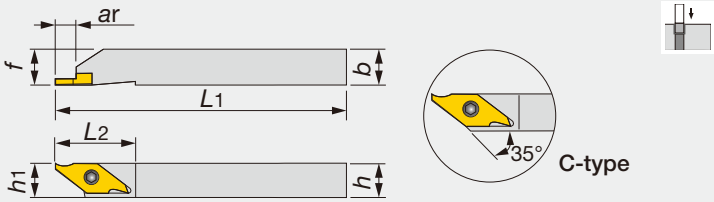
● : Line up

Standard cutting conditions → B364

# JSVGR/L

## External grooving toolholders






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSVGR/L1010K-C | 0.33 - 2 | 6.2 | 10 | 10 | 125 | 23 | 10 | 10 | JVGR/L... |
| JSVGR/L1212K-C | 0.33 - 2 | 6.2 | 12 | 12 | 125 | 23 | 12 | 12 | JVGR/L... |
| JSVGR/L1616K | 0.33 - 2 | 6.2 | 16 | 16 | 125 | 23 | 16 | 16 | JVGR/L... |

• Recommend clamping torque: 2.3 N·m

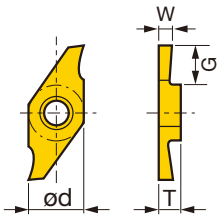
### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSVGR/L | CSTB-3S | T-9F | (T-8L) |

*Optional

## INSERT

### JVG (handed insert with sharp edge)




Right hand (R) shown.

| Designation | Coated | | | | Cermet | | Uncoated | | ød | T | $W^{+0.05}_{0}$ | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SH725 | | J740 | | NS9530 | | TH10 | | | | | | |
| | R | L | R | L | R | L | R | L | | | | | |
| JVGR/L033F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.33 | 0.8 | 0.7 |
| JVGR/L050F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.5 | 1.2 | 1.1 |
| JVGR/L075F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.75 | 2 | 1.9 |
| JVGR/L095F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 0.95 | 2 | 1.9 |
| JVGR/L100F | ● | ● | ● | | ● | ● | ● | ● | 7.94 | 3.18 | 1 | 6 | 5.5 |
| JVGR/L125F | ● | ● | ● | | | | ● | | 7.94 | 3.18 | 1.25 | 5.5 | 5 |
| JVGR/L150F | ● | ● | ● | | ● | ● | ● | ● | 7.94 | 3.18 | 1.5 | 6 | 5.5 |
| JVGR/L200F | ● | ● | ● | | ● | | ● | | 7.94 | 3.18 | 2 | 6 | 5.5 |

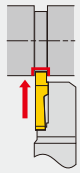
● : Line up

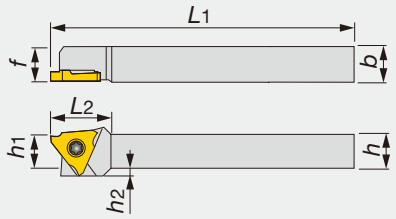
Standard cutting conditions → B364

## STANDARD CUTTING CONDITIONS (JXG type, JVG type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steel<br>S45C, etc.<br>C45, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel<br>SUM22, etc.<br>11SMn28, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel<br>SUS303, etc.<br>X10CrNiS18-9, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass<br>Si < 12%<br>C3604B, etc. CW614N, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material,<br>Titanium alloys<br>Ti-6Al-4V, etc. | TH10 | 10 - 30 | 0.01 - 0.1 |

# J-SERIES
## JSTGR/L
External grooving toolholders






Right hand (R) shown.

| Designation | W | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSTGR/L1010X3 | 0.33 - 3 | 10 | 10 | 120 | 18.5 | 10 | 10 | 2 | JTGR/L3... |
| JSTGR/L1212F3 | 0.33 - 3 | 12 | 12 | 85 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1212X3 | 0.33 - 3 | 12 | 12 | 120 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1616X3 | 0.33 - 3 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | JTGR/L3... |
| JSTGL1616K3 | 0.33 - 3 | 16 | 16 | 125 | 18.5 | 16 | 16 | - | JTGR/L3... |

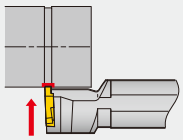
• Recommend clamping torque: 1.2 N·m

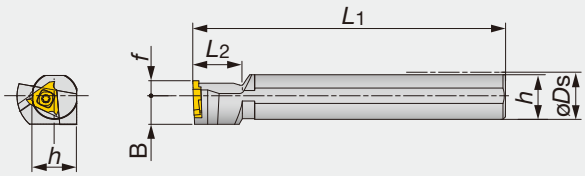
### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSTGR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

# J-SERIES
## JS-TGL3
External grooving toolholders






Left hand (L) shown.

| Designation | W | øDs | f | L1 | L2 | h | B | Insert |
|---|---|---|---|---|---|---|---|---|
| JS19K-TGL3 | 0.33 - 3 | 19.05 | 6 | 125 | 20 | 18 | 11.5 | JTGR3... |
| JS20K-TGL3 | 0.33 - 3 | 20 | 6 | 125 | 20 | 19 | 11.5 | JTGR3... |
| JS22K-TGL3 | 0.33 - 3 | 22 | 6 | 125 | 20 | 21 | 11.5 | JTGR3... |
| JS25K-TGL3 | 0.33 - 3 | 25.4 | 10 | 125 | 20 | 24 | 12.7 | JTGR3... |

• Left hand toolholders (TGL3) are used with right hand inserts (JTGR3). • Recommend clamping torque: 3.0 N·m

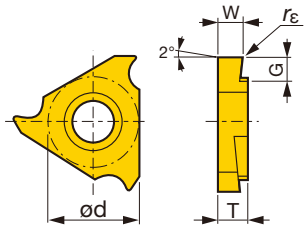
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TGL3 | CSTB-4S | T-15F |



JSTGR/L, JS-TGL3: Inserts → **B366 -**, Standard cutting conditions → **B367**

## JTG (sharp edge)

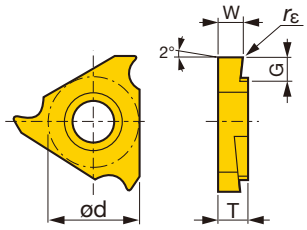



Right hand (R) shown.

| Designation | $W^{+0.05}_{0}$ | rε | Coated SH725 R | Coated SH725 L | Coated J740 R | Coated J740 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JTGR/L3033F | 0.33 | 0.03 | ● | | ● | ● | | | ● | ● | 9.525 | 3.18 | 0.8 | 0.7 |
| JTGR/L3033F-005 | 0.33 | 0.05 | ● | | | | | | | | 9.525 | 3.18 | 0.8 | 0.7 |
| JTGR/L3043F | 0.43 | 0.03 | | | ● | | | | | | 9.525 | 3.18 | 1.2 | 1.1 |
| JTGR/L3050F | 0.5 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.2 | 1.1 |
| JTGR/L3050F-005 | 0.5 | 0.05 | ● | ● | | | | | | | 9.525 | 3.18 | 1.2 | 1.1 |
| JTGR/L3065F | 0.65 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3065F-010 | 0.65 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3075F | 0.75 | 0.03 | ● | ● | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3075F-010 | 0.75 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3080F | 0.8 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3080F-010 | 0.8 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3085F | 0.85 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3095F | 0.95 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3095F-010 | 0.95 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2 | 1.9 |
| JTGR/L3100F | 1 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3100F-010 | 1 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3110F | 1.1 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3120F | 1.2 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3120F-010 | 1.2 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3125F | 1.25 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3125F-010 | 1.25 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3130F | 1.3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3140F | 1.4 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3140F-010 | 1.4 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3145F | 1.45 | 0.05 | ● | | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3145F-010 | 1.45 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3150F | 1.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3150F-010 | 1.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3175F | 1.75 | 0.05 | ● | | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3175F-010 | 1.75 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3180F | 1.8 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.2 | 2.1 |
| JTGR/L3200F | 2 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3200F-010 | 2 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3225F | 2.25 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3250F | 2.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3250F-010 | 2.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3275F | 2.75 | 0.05 | | | ● | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3300F | 3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |
| JTGR/L3300F-010 | 3 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.7 | 2.6 |

● : Line up

## JTG (with horning)



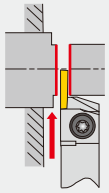

Right hand (R) shown.

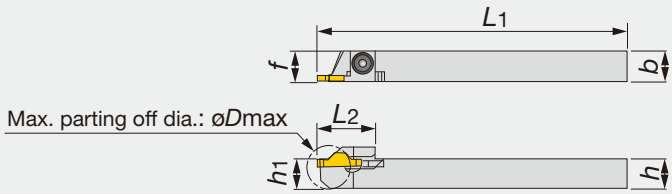
| Designation | rε | Coated cermet J9530 R | Coated cermet J9530 L | ød | T | $W^{+0.05}_{0}$ | G | Max. groove depth |
|---|---|---|---|---|---|---|---|---|
| JTGR/L3100 | 0.05 | ● | | 9.525 | 3.18 | 1 | 2.2 | 2.1 |
| JTGR/L3125 | 0.05 | ● | | 9.525 | 3.18 | 1.25 | 2.2 | 2.1 |
| JTGR/L3150 | 0.05 | ● | | 9.525 | 3.18 | 1.5 | 2.2 | 2.1 |
| JTGR/L3200 | 0.05 | ● | | 9.525 | 3.18 | 2 | 2.7 | 2.6 |

● : Line up

## STANDARD CUTTING CONDITIONS (JTG type insert)

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|
| P | General steel S45C, etc. C45, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| | Free-cutting steel SUM22, etc. 11SMn28, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel SUS303, etc. X10CrNiS18-9, etc. | SH725 | 50 - 200 | 0.01 - 0.1 |
| | | J740 | 10 - 100 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass Si < 12% C3604B, etc. CW614N, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material, Titanium alloys Ti-6Al-4V, etc. | TH10 | 10 - 30 | 0.01 - 0.1 |






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCCWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10 | JCC*200F... |
| JCCWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 19 | 12 | 12 | JCC*200F... |
| JCCWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 19 | 16 | 16 | JCC*200F... |
| JCCWSR/L2020K2 | 2 | 20 | 20 | 20 | 125 | 19 | 20 | 20 | JCC*200F... |
| JCCWSR/L2525K2 | 2 | 20 | 25 | 25 | 125 | 19 | 25 | 25 | JCC*200F... |

## SPARE PARTS

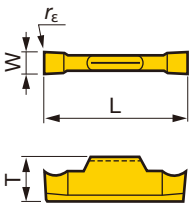
| Designation | Clamping screw | Wrench | Wrench1 |
|---|---|---|---|
| JCCWSR/L... | CSTB-4S | T-15F | (T-15L) |

*Optional

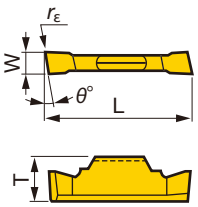
## INSERT

### JCC (sharp edge)

Neutral (JCCN200F)




Handed insert (JCCR/L200F)




Right hand (R) shown.

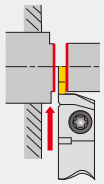
| Designation | rε | Coated J740 R | Coated J740 N | Coated J740 L | Uncoated TH10 R | Uncoated TH10 N | Uncoated TH10 L | T | W | L | θ° |
|---|---|---|---|---|---|---|---|---|---|---|---|
| JCCN200F | 0 | | ● | | | ● | | 4.8 | 2 | 15 | - |
| JCCN200F-005 | 0.05 | | ● | | | | | 4.8 | 2 | 15 | - |
| JCCR/L200F | 0 | ● | | ● | ● | | ● | 4.8 | 2 | 15 | 15 |
| JCCR/L200F-005 | 0.05 | ● | | ● | | | | 4.8 | 2 | 15 | 15 |

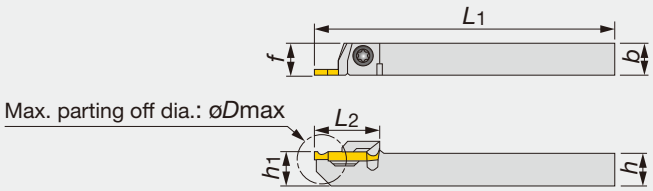
● : Line up

Standard cutting conditions → B369

# JCGWSR/L

External grooving & parting-off toolholders






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 20 | 10 | 10 | JCGN200F... |
| JCGWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 20 | 12 | 12 | JCGN200F... |
| JCGWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 20 | 16 | 16 | JCGN200F... |

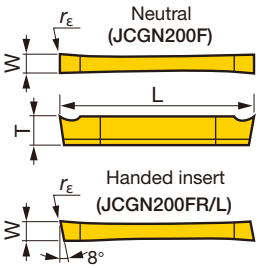
## SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JCGWSR/L... | CSTB-4S | T-15F | (T-15L) |

*Optional

## INSERT

### JCG (sharp edge)



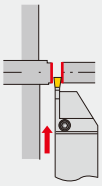

Right hand (R) shown.

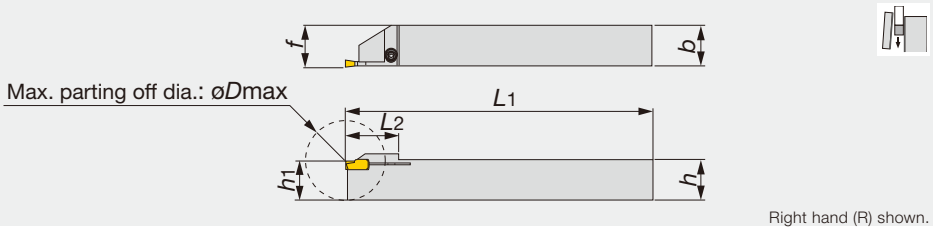
| Designation | rε | Coated J740 R | Coated J740 N | Coated J740 L | Uncoated TH10 R | Uncoated TH10 N | Uncoated TH10 L | T | W | L |
|---|---|---|---|---|---|---|---|---|---|---|
| JCGN200F | 0.05 | | ● | | | ● | | 3 | 2 | 20 |
| JCGN200FR/L | 0.05 | ● | | ● | ● | | ● | 3 | 2 | 20 |

● : Line up

## STANDARD CUTTING CONDITIONS (JCC type, JCG type insert)

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|
| P | General steel<br>S45C, etc.<br>C45, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| P | Free-cutting steel<br>SUM22, etc.<br>11SMn28, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| M | Stainless steel<br>SUS303, etc.<br>X10CrNiS18-9, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| N | Aluminium alloys, Brass<br>Si < 12%<br>C3604B, etc. CW614N, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-machine material,<br>Titanium alloys<br>Ti-6Al-4V, etc. | TH10 | 10 - 30 | 0.01 - 0.1 |






| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGSSR/L1010-20 | 2 | 20 | 10 | 10 | 125 | 15 | 10 | 10.2 | GE20... |
| JCGSSR/L1212-20 | 2 | 25 | 12 | 12 | 125 | 19 | 12 | 12.2 | GE20... |
| JCGSSR/L1616-20 | 2 | 32 | 16 | 16 | 125 | 22.5 | 16 | 16.2 | GE20... |

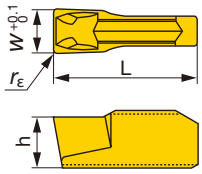
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGSSR/L... | CSTB-3 | T-9F |

Miniature Tool

## INSERT

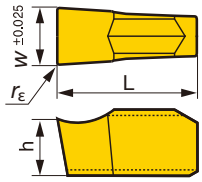
### GE20




| Designation | rε | Coated GH730 | Cermet NS9530 | W | L | h |
|---|---|---|---|---|---|---|
| GE20 | 0.2 | ● | ● | 2 | 10 | 3.5 |

● : Line up

For aluminium and non-ferrous metals




| Designation | rε | Uncoated KS05F | W | L | h |
|---|---|---|---|---|---|
| GE20-AL | 0.2 | ● | 2 | 10 | 3.5 |

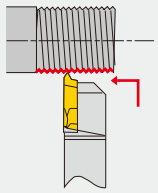
● : Line up

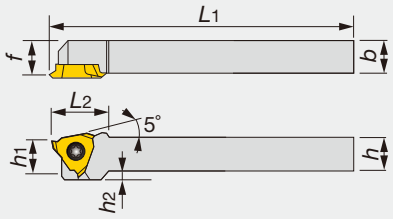
Standard cutting conditions → **B371**

## STANDARD CUTTING CONDITIONS (GE type insert)

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>Alloy steels<br>( ~ 150HB) | NS9530 | 100 ~ 200 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 180 | 0.05 - 0.14 |
| | Medium carbon steels<br>Alloy steels<br>(150 ~ 250HB) | NS9530 | 80 ~ 180 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 150 | 0.05 - 0.14 |
| | High carbon steels<br>Alloy steels<br>(250HB ~ ) | NS9530 | 80 ~ 150 | 0.05 - 0.14 |
| | | GH730 | 50 ~ 120 | 0.05 - 0.14 |
| M | Stainless steels | GH730 | 50 ~ 120 | 0.05 - 0.14 |
| K | Gray and<br>ductile cast irons | GH730 | 50 ~ 180 | 0.05 - 0.14 |
| N | Aluminium alloys<br>Non-ferrous metals | KS05F | 200 ~ 300 | 0.03 - 0.1 |

# J-SERIES
## JSTTR/L
External threading toolholders






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSTTR/L1010X3 | 10 | 10 | 120 | 18.5 | 10 | 9.5 | 2 | JTTR/L3... |
| JSTTR/L1212F3 | 12 | 12 | 85 | 18.5 | 12 | 11.5 | - | JTTR/L3... |
| JSTTR/L1212X3 | 12 | 12 | 120 | 18.5 | 12 | 11.5 | - | JTTR/L3... |
| JSTTR/L1616X3 | 16 | 16 | 120 | 18.5 | 16 | 15.5 | - | JTTR/L3... |

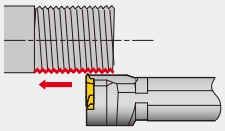
• Recommend clamping torque: 1.2 N·m

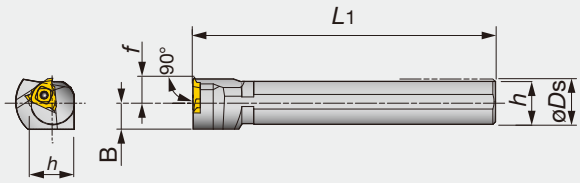
### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSTTR/L... | CSTB-4SD | T-8F | (T-8L) |

*Optional

# J-SERIES
## JS-TTL3
External threading toolholders






Left hand (L) shown.

| Designation | øDs | f | L1 | h | B | Insert |
|---|---|---|---|---|---|---|
| JS19K-TTL3 | 19.05 | 10 | 125 | 18 | 11.5 | JTTR30... |
| JS20K-TTL3 | 20 | 10 | 125 | 19 | 11.5 | JTTR30... |
| JS22K-TTL3 | 22 | 10 | 125 | 21 | 11.5 | JTTR30... |
| JS25K-TTL3 | 25.4 | 10 | 125 | 24 | 12.7 | JTTR30... |

• Recommend clamping torque: 3.5 N·m

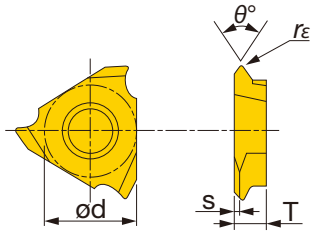
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TTL3 | CSTB-4S | T-15F |

JSTTR/L, JS-TTL3: Inserts → **B373**

## INSERT

### JTT (sharp edge)

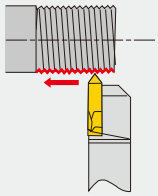


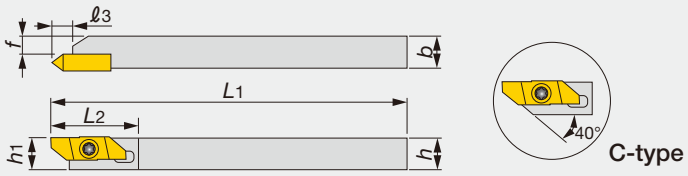

Right hand (R) shown.

| Designation | rε | Coated | | | | Cermet | | Uncoated | | θ° | ød | T | s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SH725 | | J740 | | NS9530 | | TH10 | | | | | |
| | | R | L | R | L | R | L | R | L | | | | |
| JTTR/L3005F-55 | 0.05 | ● | | ● | | | | | | 55 | 9.525 | 3.18 | 0.6 |
| JTTR/L3005F | 0.05 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |
| JTTR/L3010F | 0.1 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |

Machinable pitch range: 0.5 to 1 mm

● : Line up






Right hand (R) shown.

| Designation | h | b | L1 | L2 | ℓ3 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR1010K8-C | 10 | 10 | 125 | 29 | 6.4 | 10 | 5.7 | JXT*R... |
| JSXBR1212K8-C | 12 | 12 | 125 | 29 | 6.4 | 12 | 7.7 | JXT*R... |
| JSXBR1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXT*R... |
| JSXBR2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXT*R... |
| JSXBR2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXT*R... |

- Can be wrenched from back side with both end torx screw.
- This toolholder is compatible with JXB-type inserts and JXT-type inserts.

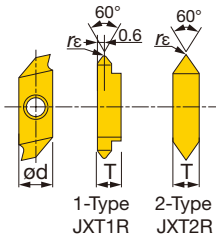
## SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| JSXBR... | CSTB-4SD | T-8F | (T-8L) |

*Optional

## INSERT

### JXT (sharp edge)

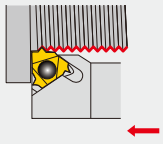


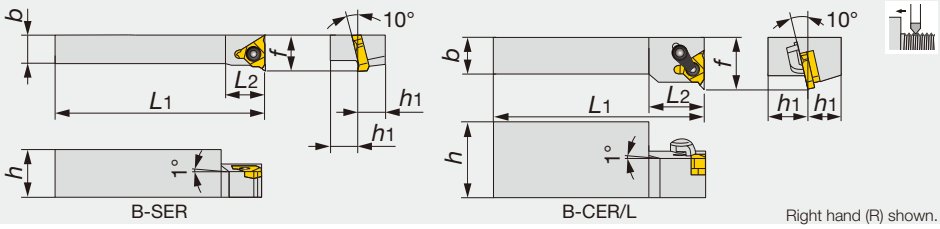

| Designation | rε | Coated J740 | Uncoated TH10 | θ° | ød | T |
|---|---|---|---|---|---|---|
| JXT1R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |
| JXT2R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |

Machinable pitch range: 0.5 to 1 mm

● : Line up

# TUNGTHREAD
## B-S/CER/L
External threading toolholders



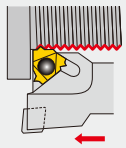


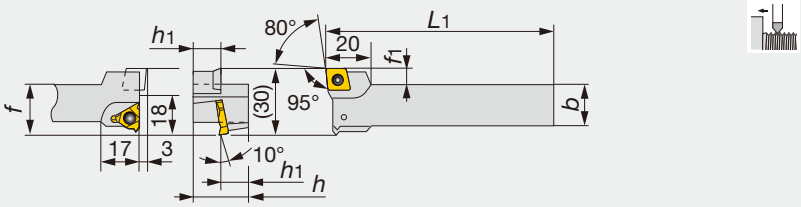

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-SER10H16 | 20 | 10 | 100 | 15 | 10 | 16 | 16ER/L... |
| B-SER12K16 | 24 | 12 | 125 | 18 | 12 | 18 | 16ER/L... |
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | 16ER/L... |

### SPARE PARTS

| Designation | Clamp set | Shim set | Clamping screw | Wrench |
|---|---|---|---|---|
| B-SER**16 | - | - | CSTB-3.5 | T-15F |
| B-CER/L16M16 | CSP16 | A16-1 | - | T-15F |

# TUNGTHREAD
## BC-SER/L
External threading toolholders



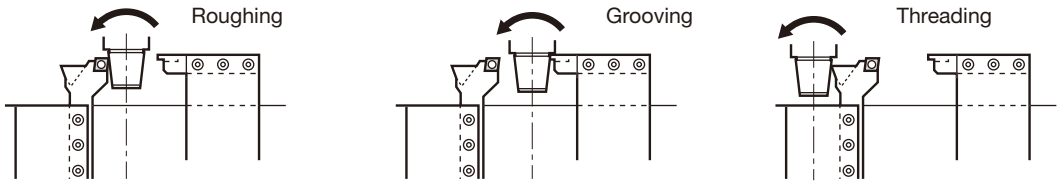



| Designation | h | b | L1 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|
| BC-SER12K16 | 24 | 16 | 125 | 12 | 23 | 7 | 16ER/L..., CC*T09T3... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| BC-SER**16 | CSTB-3.5 | T-15F |

● Tooling examples using BC-type toolholders




B-S/CER/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

BC-SER/L: Inserts → **B104 -** (CC*T09T3...), **B384 -** (16ER/L...),
PCD → **B177**, Standard cutting conditions → **B382**

## TUNGTHREAD

Inserts and toolholders for threading

B384

## Threading Tool for Oil and Gas

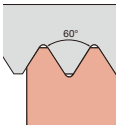
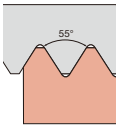
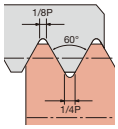
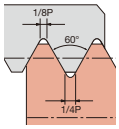
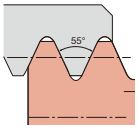
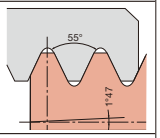
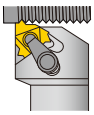
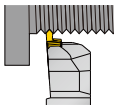
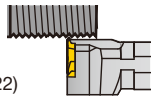
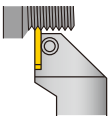
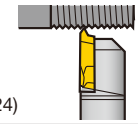
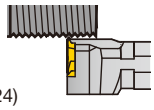
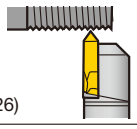
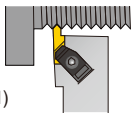
Tool series for threading oil well goods

B427

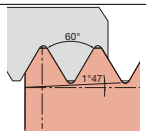
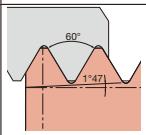
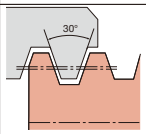
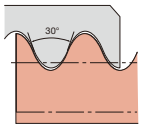
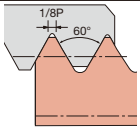
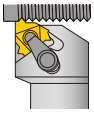
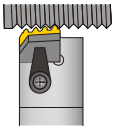
TungThread

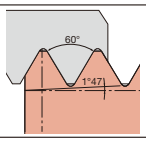
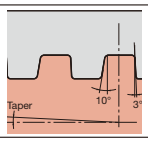
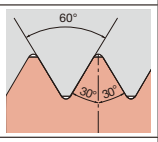
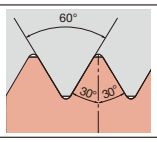
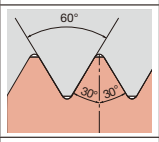
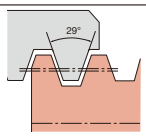
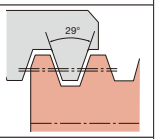
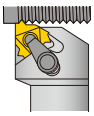
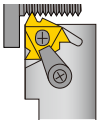
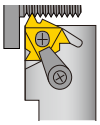
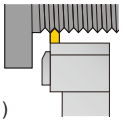
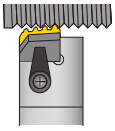
Tungaloy **B377**

# Applicable tool for each external thread type

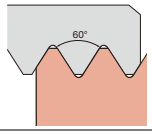
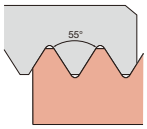
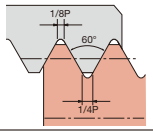
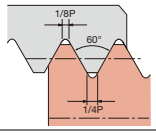
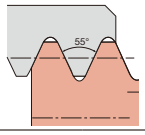
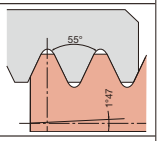
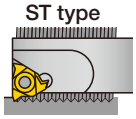
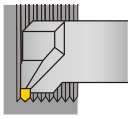
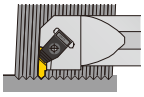
| Thread type | Partial profile | | Full profile | | | | |
|---|---|---|---|---|---|---|---|
| | 60° | 55° | ISO metric | Unified | Whitworth | Parallel pipe thread | Taper pipe thread |
| | - | - | M | UNC, UNF UNEF | BSW, BSF W | G BSP, PF | R, PT, BSPT |
| Thread form / Tool type |  |  |  |  |  | |  |
| ST type  (B398) | 0.5 ~ 6 mm 48 ~ 4TPI (B384) | 0.5 ~ 5 mm 48 ~ 5TPI (B385) | 0.5 ~ 6 mm (B386) | 32 ~ 5TPI (B388) | 28 ~ 5TPI (B390) | | 28 ~ 11TPI (B391) |
| TETRAMCUT STCR/L-18  (B421) | 0.8 ~ 3 mm 32 ~ 8TPI (B423) | — | — | — | — | | — |
| TETRAMCUT JS-STCL18  (B422) | 0.8 ~ 3 mm 32 ~ 8TPI (B423) | — | — | — | — | | — |
| TT-R/L  (B420) | ~ 3 mm ~ 8TPI (B419) | ~ 3 mm ~ 8TPI (B419) | — | — | — | | — |
| JSTTR/L  (B424) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | — | — | — | | — |
| JS-TTL3  (B424) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | 0.5 ~ 1 mm 48 ~ 25TPI (B425) | — | — | — | | — |
| JSXBR/L  (B426) | 0.5 ~ 1 mm 48 ~ 25TPI (B426) | — | — | — | — | | — |
| TUNGT-CLAMP  (C021) | 1.27 ~ 4.23 mm 20 ~ 6TPI (C023) | — | — | — | — | | — |

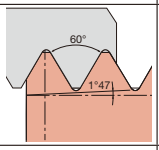
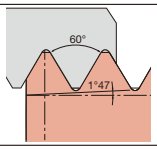
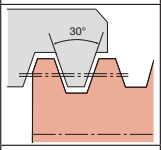
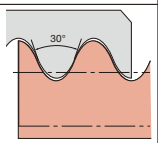
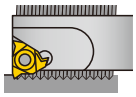
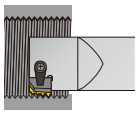
Threading Tool

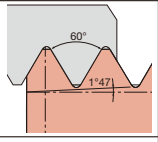
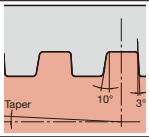
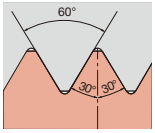
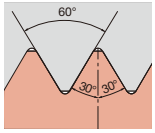
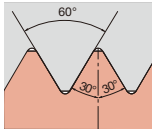
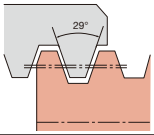
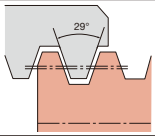
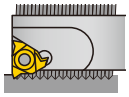
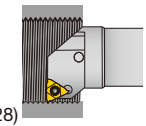
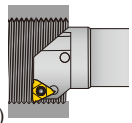
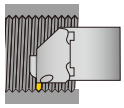
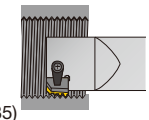
| Thread type | Full profile | | | | | |
|---|---|---|---|---|---|---|
| | National taper pipe | | 30° Trapezoidal | DIN 405 Round | UNJ | |
| | NPT | NPTF | TR | Rd | UNJC,UNJF | |
| Thread form / Tool type |  |  |  |  |  | |
| ST type  (B398) | 27 ~ 8TPI (B392) | 27 ~ 8TPI (B393) | 1.5 ~ 6 mm (B394) | 8TPI, 6TPI (B396) | 32 ~ 8TPI (B396) | |
| Chaser  (B434) | 11.5TPI, 8TPI (B434) | —— | —— | —— | —— | |

| Thread type | Full profile | | | | | | |
|---|---|---|---|---|---|---|---|
| | API Tubing & Casing | | API Rotary Shoulder Connection | | | ACME | STUB ACME |
| | Round | Buttress | V-0.038R | V-0.040 | V-0.050 | | |
| Thread form / Tool type |  |  |  |  |  |  |  |
| ST type  (B398) | 10TPI, 8TPI (B395) | 5TPI (0.75TPF) (B395) | —— | —— | —— | 12 ~ 5TPI (B394) | —— |
| Lay down (Single side)  (B427) | —— | 5TPI (0.75TPF) 5TPI (1TPF) (B428) | —— | —— | —— | —— | —— |
| Lay down (Double side)  (B429) | —— | —— | 4TPI (2TPF) 4TPI (3TPF) (B430) | 5TPI (3TPF) (B430) | 4TPI (2TPF) 4TPI (3TPF) (B430) | —— | —— |
| On edge  (B431) | 10TPI, 8TPI (B433) | 5TPI (0.75TPF) 5TPI (1TPF) (B433) | —— | —— | —— | 16 ~ 3TPI (B433) | 16 ~ 3TPI (B433) |
| Chaser  (B434) | 10TPI, 8TPI (B434) | 5TPI (0.75TPF) (B434) | —— | —— | —— | —— | —— |

# Applicable tool for each internal thread type

| Thread type | Partial profile | | Full profile | | | | |
|---|---|---|---|---|---|---|---|
| | 60° | 55° | ISO metric | Unified | Whitworth | Parallel pipe thread | Taper pipe thread |
| | - | - | M | UNC, UNF UNEF | BSW, BSF W | G, Rp BSP, PF, PS | Rc, PT, BSPT |
| Thread form / Tool type |  |  |  |  |  | |  |
| ST type  (B399) | 0.5 ~ 6 mm 48 ~ 4TPI (B384) | 0.5 ~ 5 mm 48 ~ 5TPI (B385) | 0.5 ~ 6 mm (B386) | 32 ~ 5TPI (B388) | 28 ~ 5TPI (B390) | | 19 ~ 11TPI (B391) |
| TT-R/L  (B420) | ~ 3 mm ~ 8TPI (B419) | ~ 3 mm ~ 8TPI (B419) | —— | —— | —— | | —— |
| TUNGT-CLAMP  (C022) | 2.11 ~ 5.08 mm 12 ~ 5TPI (C023) | —— | —— | —— | —— | | —— |

| Thread type | Full profile | | | | |
|---|---|---|---|---|---|
| | National taper pipe | | 30° Trapezoidal | DIN 405 Round | |
| | NPT | NPTF | TR | Rd | |
| Thread form / Tool type |  |  |  |  | |
| ST type  (B399) | 27 ~ 8TPI (B392) | 14 ~ 8TPI (B393) | 1.5 ~ 5 mm (B394) | 6TPI (B396) | |
| Chaser  (B435) | 11.5TPI, 8TPI (B435) | —— | —— | —— | |

| Thread type | Full profile | | | | | | |
|---|---|---|---|---|---|---|---|
| | API Tubing & Casing | | API Rotary Shoulder Connection | | | ACME | STUB ACME |
| | Round | Buttress | V-0.038R | V-0.040 | V-0.050 | | |
| Thread form / Tool type |   |   |   |   |   |   |   |
| ST type  (B399) | 10TPI, 8TPI (B395) | 5TPI (0.75TPF) (B395) | —— | —— | —— | 12 ~ 5TPI (B394) | —— |
| Lay down (Single side)  (B428) | —— | 5TPI (0.75TPF) 5TPI (1TPF) (B428) | —— | —— | —— | —— | —— |
| Lay down (Double side)  (B430) | —— | —— | 4TPI (2TPF) 4TPI (3TPF) (B430) | 5TPI (3TPF) (B430) | 4TPI (2TPF) 4TPI (3TPF) (B430) | —— | —— |
| On edge  (B432) | 10TPI, 8TPI (B433) | 5TPI (0.75TPF) 5TPI (1TPF) (B433) | —— | —— | —— | —— | —— |
| Chaser  (B435) | 10TPI, 8TPI (B435) | 5TPI (0.75TPF) (B435) | —— | —— | —— | —— | —— |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Cutting speed: *Vc* (m/min) | | | |
|---|---|---|---|---|---|---|
| | | | AH725 | T313V | NS9530 | TH10 |
| P | Carbon steels | < 200HB | 80 - 180 | 100 - 200 | 150 - 200 | - |
| | | > 200HB | 60 - 160 | 100 - 150 | 100 - 170 | - |
| M | Stainless steels | - | 50 - 130 | 70 - 130 | - | - |
| K | Cast irons | - | - | 70 - 150 | - | 70 - 90 |
| N | Non-ferrous metals | - | - | - | - | 100 - 500 |
| S | Heat-resisting alloys | - | - | - | - | 10 - 40 |
| H | Hard materials | 50 ~ 60HRC | - | - | - | 10 - 30 |

## DESIGNATION SYSTEM FOR TAC INSERTS

**16 I R 175 ISO - B**

① ② ③ ④ ⑤ ⑥

**① Insert size**

| Symbol | I. C. dia (mm) |
|---|---|
| 06 | - |
| 11 | 6.35 |
| 16 | 9.525 |
| 22 | 12.7 |
| 27 | 15.875 |

**② External or Internal**

| | |
|---|---|
| E | External |
| I | Internal |

**③ Hand of insert**

| | |
|---|---|
| R | Right hand |
| L | Left hand |

**④ Pitch (TPI)**

| | |
|---|---|
| **Partial-profile inserts** | |
| A | Pitch: 0.5 ~ 1.5 mm<br>TPI: 48 ~ 16 |
| AG | Pitch: 0.5 ~ 3 mm<br>TPI: 48 ~ 8 |
| G | Pitch: 1.75 ~ 3 mm<br>TPI: 14 ~ 8 |
| N | Pitch: 3.5 ~ 5 mm<br>TPI: 7 ~ 5 |
| Z | Pitch: 4 ~ 6 mm<br>TPI: 6 ~ 4 |
| **Full-profile inserts** | |
| pitch (mm)×10 or 100<br>TPI (Thread Per Inch)<br>(Examples)<br>05: 0.5 mm pitch×10<br>175: 1.75 mm pitch×100<br>14: 14 TPI | |

**⑤ Thread type**

| | |
|---|---|
| **Partial-profile inserts** | |
| 60° | 60° thread angle |
| 55° | 55° thread angle |
| TR | 30° trapezoidal |
| ACME | 29° trapezoidal |
| **Full-profile inserts** | |
| ISO | Metric |
| UN | Unified |
| W | Whitworth |
| PT | Taper pipe |
| NPT | National taper pipe |
| NPTF | National taper pipe |
| RAPI | API round |
| RD | API round |
| BAPI | API buttress |
| RD | Round (DIN405) |
| UNJ | UNJ |

**⑥ Chipbreaker**

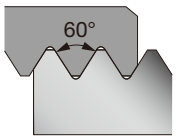
| | |
|---|---|
| B | With (Basic selection) |
| M | With |
| CB | With |
| - | Without |

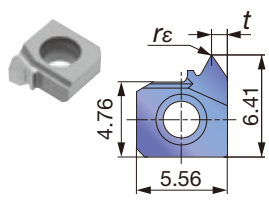
Note: Please identify new designation system for internal inserts.
-i.e."N"→"I"
(Example) Conventional: 16NR15ISO
New: 16IR15ISO

Threading Tool

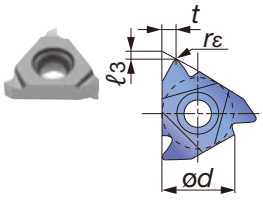
MEMO

# 60° thread angle




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | CNR/L**27... |

## Partial-profile insert

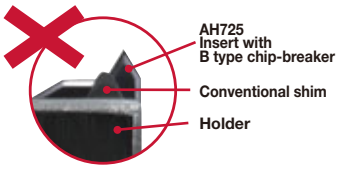
| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Un-coated | | | | | | Coated | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | 0.5~1.5 | 48~16 | R | | | | | | | | | 6IRA60 | ● | | ● | - | 0.9 | - | 0.04 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | | 11IRA60 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 11 | 0.5~1.5 | 48~16 | L | | | | | | | | | 11ILA60 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16IRA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | L | 16ELA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16ILA60 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.06 | 16IRAG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IRG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.12 |
| 16 | 1.75~3 | 14~8 | L | 16ELG60 | ● | ● | | 9.525 | 1.6 | 1.2 | 0.22 | 16ILG60 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.12 |
| 22 | 3.5~5 | 7~5 | R | 22ERN60 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.44 | 22IRN60 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | 3.5~5 | 7~5 | L | 22ELN60 | ● | ● | | 12.7 | 2.5 | 1.7 | 0.44 | 22ILN60 | ● | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 27 | 4~6 | 6~4 | R | 27ERZ60 | ● | ● | | 15.875 | 3.2 | 2.2 | 0.5 | 27IRZ60 | ● | ● | | 15.875 | 3.2 | 2.2 | 0.28 |

## Partial-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | ℓ3 | rε | Designation | Grade | | ød | t | ℓ3 | rε |
| | | | | | Coated | Cermet | | | | | | Coated | Cermet | | | | |
| | | | | | AH725 | NS9530 | | | | | | AH725 | NS9530 | | | | |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | 11IRA60-B | ● | | 6.35 | 0.9 | 0.7 | 0.04 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | 11IRA60-M | | ● | 6.35 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60-B | ●* | | 9.525 | 0.9 | 0.8 | 0.05 | 16IRA60-B | ●* | | 9.525 | 0.9 | 0.8 | 0.05 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA60-M | | ● | 9.525 | 0.9 | 0.7 | 0.06 | 16IRA60-M | | ● | 9.525 | 0.9 | 0.7 | 0.04 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.06 | 16IRAG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.05 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG60-M | ● | ● | 9.525 | 1.6 | 1.2 | 0.06 | 16IRAG60-M | ● | ● | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.17 | 16IRG60-B | ●* | | 9.525 | 1.7 | 1.2 | 0.1 |
| 16 | 1.75~3 | 14~8 | R | 16ERG60-M | | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IRG60-M | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 22 | 3.5~5 | 7~5 | R | 22ERN60-B | ● | | 12.7 | 2.5 | 1.7 | 0.32 | 22IRN60-B | ● | | 12.7 | 2.5 | 1.7 | 0.19 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

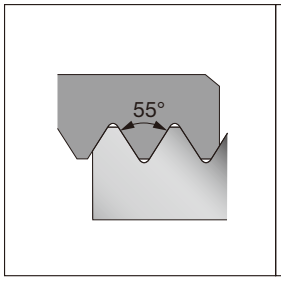
**Please check the items used and replace shims if necessary (see page B397).**

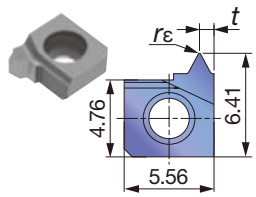



Inappropriate Examples

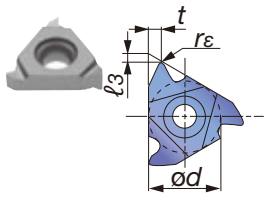
● : Line up / Packing Quantity = 5 pcs.

# 55° thread angle




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Partial-profile insert

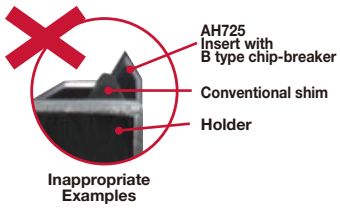
| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Un-coated | | | | | | Coated | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | 0.5~1.5 | 48~16 | R | | | | | | | | | 6IRA55 | ● | | ● | - | 0.9 | - | 0.07 |
| 11 | 0.5~1.5 | 48~16 | R | | | | | | | | | 11IRA55 | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.07 |
| 16 | 0.5~1.5 | 48~16 | R | 16ERA55 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 | 16IRA55 | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 0.5~3 | 48~8 | R | 16ERAG55 | ● | | | 9.525 | 1.7 | 1.2 | 0.07 | 16IRAG55 | ● | | | 9.525 | 1.7 | 1.2 | 0.07 |
| 16 | 1.75~3 | 14~8 | R | 16ERG55 | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IRG55 | ● | ● | ● | 9.525 | 1.7 | 1.2 | 0.25 |
| 22 | 3.5~5 | 7~5 | R | 22ERN55 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.5 | 22IRN55 | ● | ● | ● | 12.7 | 2.5 | 1.7 | 0.5 |

## Partial-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | rε | Designation | Grade | ød | t | ℓ3 | rε |
| | | | | | Coated | | | | | | Coated | | | | |
| | | | | | AH725 | | | | | | AH725 | | | | |
| 16 | 0.5~3 | 48~16 | R | 16ERAG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.07 | 16IRAG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.05 |
| 16 | 1.75~3 | 14~8 | R | 16ERG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.23 | 16IRG55-B | ●* | 9.525 | 1.7 | 1.2 | 0.2 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

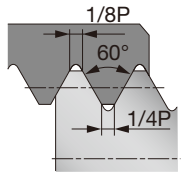
**Please check the items used and replace shims if necessary (see page B397).**

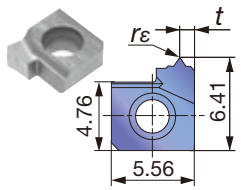



Threading Tool

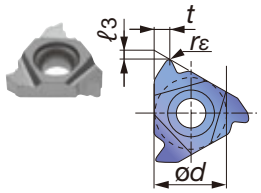
● : Line up / Packing Quantity = 5 pcs.

# ISO metric




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | CNR/L**27... |

## Full-profile insert

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Un-coated | | | | | | Coated | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | 0.75 | | R | | | | | | | | | 6IR075ISO | ● | | ● | - | 0.5 | - | 0.05 |
| 6 | 1 | | R | | | | | | | | | 6IR10ISO | ● | | ● | - | 0.9 | - | 0.07 |
| 6 | 1.25 | | R | | | | | | | | | 6IR125ISO | ● | | ● | - | 0.9 | - | 0.09 |
| 6 | 1.5 | | R | | | | | | | | | 6IR15ISO | ● | | ● | - | 0.9 | - | 0.11 |
| 6 | 1.75 | | R | | | | | | | | | 6IR175ISO | ● | | ● | - | 0.9 | - | 0.12 |
| 6 | 2 | | R | | | | | | | | | 6IR20ISO | ● | | ● | - | 0.9 | - | 0.14 |
| 11 | 0.5 | | R | | | | | | | | | 11IR05ISO | ● | | ● | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.75 | | R | | | | | | | | | 11IR075ISO | ● | | | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 1 | | R | | | | | | | | | 11IR10ISO | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | 1 | | L | | | | | | | | | 11IL10ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | 1.25 | | R | | | | | | | | | 11IR125ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | 1.25 | | L | | | | | | | | | 11IL125ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | 1.5 | | R | | | | | | | | | 11IR15ISO | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | 1.5 | | L | | | | | | | | | 11IL15ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | 1.75 | | R | | | | | | | | | 11IR175ISO | ● | ● | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | L | | | | | | | | | 11IL175ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 2 | | R | | | | | | | | | 11IR20ISO | ● | ● | | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | 2 | | L | | | | | | | | | 11IL20ISO | ● | | | 6.35 | 0.9 | 0.7 | 0.14 |
| 16 | 0.5 | | R | 16ER05ISO | ● | | ● | 9.525 | 0.5 | 1.2 | 0.06 | 16IR05ISO | ● | | | 9.525 | 0.5 | 1.2 | 0.04 |
| 16 | 0.75 | | R | 16ER075ISO | ● | ● | ● | 9.525 | 0.5 | 1.2 | 0.09 | 16IR075ISO | ● | | | 9.525 | 0.5 | 1.2 | 0.05 |
| 16 | 1 | | R | 16ER10ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.13 | 16IR10ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 1 | | L | 16EL10ISO | | | | 9.525 | 0.9 | 0.7 | 0.13 | 16IL10ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | 1.25 | | R | 16ER125ISO | ● | ● | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR125ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | 1.25 | | L | 16EL125ISO | | | | 9.525 | 0.9 | 0.7 | 0.16 | 16IL125ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | 1.5 | | R | 16ER15ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.19 | 16IR15ISO | ● | ● | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | 1.5 | | L | 16EL15ISO | | | | 9.525 | 0.9 | 0.7 | 0.19 | 16IL15ISO | ● | | | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | 1.75 | | R | 16ER175ISO | ● | ● | | 9.525 | 1.6 | 1.2 | 0.22 | 16IR175ISO | ● | ● | | 9.525 | 1.6 | 1.2 | 0.12 |
| 16 | 2 | | R | 16ER20ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR20ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2 | | L | 16EL20ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.25 | 16IL20ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.31 | 16IR25ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | 3 | | R | 16ER30ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.21 |
| 16 | 3 | | L | 16EL30ISO | | | | 9.525 | 1.6 | 1.2 | 0.38 | 16IL30ISO | ● | | | 9.525 | 1.6 | 1.2 | 0.21 |

● : Line up / Packing Quantity = 5 pcs.

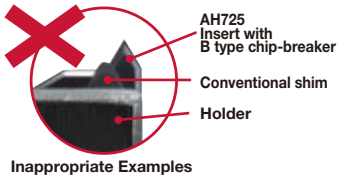
| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Un-coated | | | | | | Coated | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 22 | 3.5 | | R | 22ER35ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.44 | 22IR35ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | 4 | | R | 22ER40ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.5 | 22IR40ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.28 |
| 22 | 4.5 | | R | 22ER45ISO | ● | | | 12.7 | 2.5 | 1.7 | 0.56 | 22IR45ISO | ● | | | 12.7 | 2.5 | 1.7 | 0.32 |
| 22 | 5 | | R | 22ER50ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.63 | 22IR50ISO | ● | ● | | 12.7 | 2.5 | 1.7 | 0.35 |
| 27 | 6 | | R | 27ER60ISO | ● | ● | | 15.875 | 3.2 | 2.2 | 0.75 | 27IR60ISO | ● | ● | | 15.875 | 3.2 | 2.2 | 0.42 |

## Full-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Cermet | | | | | | Coated | | Cermet | | | | |
| | | | | | AH725 | | NS9530 | | | | | | AH725 | | NS9530 | | | | |
| 11 | 0.5 | | R | | | | | | | | | 11IR05ISO-B | ● | | | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.5 | | R | | | | | | | | | 11IR05ISO-M | | | ● | 6.35 | 0.5 | 1.2 | 0.04 |
| 11 | 0.75 | | R | | | | | | | | | 11IR075ISO-B | ● | | | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 0.75 | | R | | | | | | | | | 11IR075ISO-M | | | ● | 6.35 | 0.5 | 1.2 | 0.05 |
| 11 | 1 | | R | | | | | | | | | 11IR10ISO-B | ● | | | 6.35 | 0.9 | 0.7 | 0.08 |
| 11 | 1 | | R | | | | | | | | | 11IR10ISO-M | | | ● | 6.35 | 0.9 | 0.7 | 0.08 |
| 11 | 1.25 | | R | | | | | | | | | 11IR125ISO-B | ● | | | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | 1.25 | | R | | | | | | | | | 11IR125ISO-M | | | ● | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | 1.5 | | R | | | | | | | | | 11IR15ISO-B | ● | | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.5 | | R | | | | | | | | | 11IR15ISO-M | | | ● | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | R | | | | | | | | | 11IR175ISO-B | ● | | | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 1.75 | | R | | | | | | | | | 11IR175ISO-M | | | ● | 6.35 | 0.9 | 0.7 | 0.12 |
| 11 | 2 | | R | | | | | | | | | 11IR20ISO-B | ● | | | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | 2 | | R | | | | | | | | | 11IR20ISO-M | | | ● | 6.35 | 0.9 | 0.7 | 0.14 |
| 16 | 0.5 | | R | 16ER05ISO-M | | | ● | 9.525 | 0.5 | 1.2 | 0.06 | | | | | | | | |
| 16 | 0.75 | | R | 16ER075ISO-B | ●* | | | 9.525 | 0.6 | 0.6 | 0.08 | | | | | | | | |
| 16 | 0.75 | | R | 16ER075ISO-M | | | ● | 9.525 | 0.5 | 1.2 | 0.09 | | | | | | | | |
| 16 | 1 | | R | 16ER10ISO-B | ●* | | | 9.525 | 0.7 | 0.7 | 0.11 | 16IR10ISO-B | ●* | | | 9.525 | 0.7 | 0.6 | 0.05 |
| 16 | 1 | | R | 16ER10ISO-M | ● | | ● | 9.525 | 0.9 | 0.7 | 0.13 | 16IR10ISO-M | | | ● | 9.525 | 0.9 | 0.7 | 0.08 |
| 16 | 1.25 | | R | 16ER125ISO-B | ●* | | | 9.525 | 0.9 | 0.8 | 0.14 | 16IR125ISO-B | ●* | | | 9.525 | 0.9 | 0.8 | 0.07 |
| 16 | 1.25 | | R | 16ER125ISO-M | | | ● | 9.525 | 0.9 | 0.7 | 0.16 | 16IR125ISO-M | | | ● | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | 1.5 | | R | 16ER15ISO-B | ●* | | | 9.525 | 1 | 0.8 | 0.19 | 16IR15ISO-B | ●* | | | 9.525 | 1 | 0.8 | 0.08 |
| 16 | 1.5 | | R | 16ER15ISO-M | ● | | ● | 9.525 | 0.9 | 0.7 | 0.19 | 16IR15ISO-M | ● | | ● | 9.525 | 0.9 | 0.7 | 0.12 |
| 16 | 1.75 | | R | 16ER175ISO-B | ●* | | | 9.525 | 1.2 | 0.9 | 0.2 | 16IR175ISO-B | ●* | | | 9.525 | 1.2 | 0.9 | 0.10 |
| 16 | 1.75 | | R | 16ER175ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.22 | 16IR175ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2 | | R | 16ER20ISO-B | ●* | | | 9.525 | 1.3 | 1 | 0.24 | 16IR20ISO-B | ●* | | | 9.525 | 1.3 | 1 | 0.11 |
| 16 | 2 | | R | 16ER20ISO-M | ● | | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR20ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO-B | ●* | | | 9.525 | 1.5 | 1.1 | 0.3 | 16IR25ISO-B | ●* | | | 9.525 | 1.5 | 1.1 | 0.14 |
| 16 | 2.5 | | R | 16ER25ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.31 | 16IR25ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | 3 | | R | 16ER30ISO-B | ●* | | | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO-B | ●* | | | 9.525 | 1.5 | 1.1 | 0.18 |
| 16 | 3 | | R | 16ER30ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.38 | 16IR30ISO-M | | | ● | 9.525 | 1.6 | 1.2 | 0.21 |
| 22 | 3.5 | | R | 22ER35ISO-B | ● | | | 12.7 | 2.3 | 1.6 | 0.48 | | | | | | | | |
| 22 | 4 | | R | 22ER40ISO-B | ● | | | 12.7 | 2.3 | 1.6 | 0.52 | | | | | | | | |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

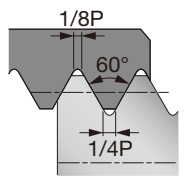
**Please check the items used and replace shims if necessary(see page B397).**

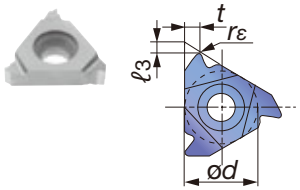


Inappropriate Examples

● : Line up / Packing Quantity = 5 pcs.

# Unified




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coated: AH725 | Grade: Coated: T313V | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coated: AH725 | Grade: Coated: T313V | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | (0.794) | 32 | R | | | | | | | | 11IR32UN | ● | | 6.35 | 0.5 | 1.2 | 0.06 |
| 11 | (0.907) | 28 | R | | | | | | | | 11IR28UN | ● | | 6.35 | 0.5 | 1.2 | 0.06 |
| 11 | (1.058) | 24 | R | | | | | | | | 11IR24UN | ● | | 6.35 | 0.9 | 0.7 | 0.07 |
| 11 | (1.27) | 20 | R | | | | | | | | 11IR20UN | ● | | 6.35 | 0.9 | 0.7 | 0.09 |
| 11 | (1.411) | 18 | R | | | | | | | | 11IR18UN | ● | | 6.35 | 0.9 | 0.7 | 0.1 |
| 11 | (1.588) | 16 | R | | | | | | | | 11IR16UN | ● | | 6.35 | 0.9 | 0.7 | 0.11 |
| 11 | (1.814) | 14 | R | | | | | | | | 11IR14UN | ● | | 6.35 | 0.9 | 0.7 | 0.13 |
| 16 | (0.794) | 32 | R | 16ER32UN | ● | | 9.525 | 0.5 | 1.2 | 0.1 | 16IR32UN | ● | | 9.525 | 0.5 | 1.2 | 0.06 |
| 16 | (0.907) | 28 | R | 16ER28UN | ● | | 9.525 | 0.5 | 1.2 | 0.11 | 16IR28UN | ● | | 9.525 | 0.5 | 1.2 | 0.06 |
| 16 | (1.058) | 24 | R | 16ER24UN | ● | | 9.525 | 0.9 | 0.7 | 0.13 | 16IR24UN | ● | | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | (1.27) | 20 | R | 16ER20UN | ● | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR20UN | ● | | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | (1.411) | 18 | R | 16ER18UN | ● | | 9.525 | 0.9 | 0.7 | 0.18 | 16IR18UN | ● | | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | (1.588) | 16 | R | 16ER16UN | ● | ● | 9.525 | 0.9 | 0.7 | 0.2 | 16IR16UN | ● | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | (1.814) | 14 | R | 16ER14UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.13 |
| 16 | (1.954) | 13 | R | 16ER13UN | ● | | 9.525 | 1.6 | 1.2 | 0.24 | 16IR13UN | ● | | 9.525 | 1.6 | 1.2 | 0.14 |
| 16 | (2.117) | 12 | R | 16ER12UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.27 | 16IR12UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.15 |
| 16 | (2.309) | 11 | R | 16ER11UN | ● | | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11UN | ● | | 9.525 | 1.6 | 1.2 | 0.16 |
| 16 | (2.54) | 10 | R | 16ER10UN | ● | | 9.525 | 1.6 | 1.2 | 0.32 | 16IR10UN | ● | | 9.525 | 1.6 | 1.2 | 0.18 |
| 16 | (2.822) | 9 | R | 16ER9UN | ● | | 9.525 | 1.6 | 1.2 | 0.35 | 16IR9UN | ● | | 9.525 | 1.6 | 1.2 | 0.2 |
| 16 | (3.175) | 8 | R | 16ER8UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.4 | 16IR8UN | ● | ● | 9.525 | 1.6 | 1.2 | 0.22 |
| 22 | (3.629) | 7 | R | 22ER7UN | ● | | 12.7 | 2.5 | 1.7 | 0.45 | 22IR7UN | ● | | 12.7 | 2.5 | 1.7 | 0.25 |
| 22 | (4.233) | 6 | R | 22ER6UN | ● | | 12.7 | 2.5 | 1.7 | 0.53 | 22IR6UN | ● | | 12.7 | 2.5 | 1.7 | 0.3 |
| 22 | (5.08) | 5 | R | 22ER5UN | ● | | 12.7 | 2.5 | 1.7 | 0.64 | 22IR5UN | ● | | 12.7 | 2.5 | 1.7 | 0.36 |

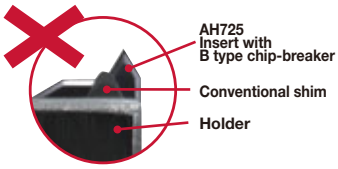
● : Line up / Packing Quantity = 5 pcs.

## Full-profile insert with chipbreaker

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | | Internal insert | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | $\ell_3$ | rε | Designation | Grade | | ød | t | $\ell_3$ | rε |
| | | | | | Coated | Cermet | | | | | | Coated | Cermet | | | | |
| | | | | | AH725 | NS9530 | | | | | | AH725 | NS9530 | | | | |
| 16 | | 24 | R | **16ER24UN-B** | ●* | | 9.525 | 0.8 | 0.7 | 0.11 | | | | | | | |
| 16 | | 24 | R | **16ER24UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.13 | | | | | | | |
| 16 | | 20 | R | **16ER20UN-B** | ●* | | 9.525 | 0.9 | 0.8 | 0.14 | **16IR20UN-B** | ●* | | 9.525 | 0.9 | 0.8 | 0.06 |
| 16 | | 20 | R | **16ER20UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.16 | **16IR20UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.09 |
| 16 | | 18 | R | **16ER18UN-B** | ●* | | 9.525 | 1 | 0.8 | 0.15 | **16IR18UN-B** | ●* | | 9.525 | 1 | 0.8 | 0.08 |
| 16 | | 18 | R | **16ER18UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.18 | **16IR18UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.1 |
| 16 | | 16 | R | **16ER16UN-B** | ●* | | 9.525 | 1.1 | 0.9 | 0.19 | **16IR16UN-B** | ●* | | 9.525 | 1.1 | 0.9 | 0.09 |
| 16 | | 16 | R | **16ER16UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.2 | **16IR16UN-M** | | ● | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | | 14 | R | **16ER14UN-B** | ●* | | 9.525 | 1.2 | 1 | 0.22 | **16IR14UN-B** | ●* | | 9.525 | 1.2 | 0.9 | 0.11 |
| 16 | | 14 | R | **16ER14UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.23 | **16IR14UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.13 |
| 16 | | 13 | R | **16ER13UN-B** | ●* | | 9.525 | 1.3 | 1 | 0.24 | | | | | | | |
| 16 | | 12 | R | **16ER12UN-B** | ●* | | 9.525 | 1.4 | 1.1 | 0.25 | **16IR12UN-B** | ●* | | 9.525 | 1.4 | 1.1 | 0.12 |
| 16 | | 12 | R | **16ER12UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.27 | **16IR12UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.15 |
| 16 | | 8 | R | **16ER8UN-B** | ●* | | 9.525 | 1.6 | 1.2 | 0.41 | **16IR8UN-B** | ●* | | 9.525 | 1.5 | 1.1 | 0.19 |
| 16 | | 8 | R | **16ER8UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.4 | **16IR8UN-M** | | ● | 9.525 | 1.6 | 1.2 | 0.22 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "$\ell_3$".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

**Please check the items used and replace shims if necessary (see page B397).**

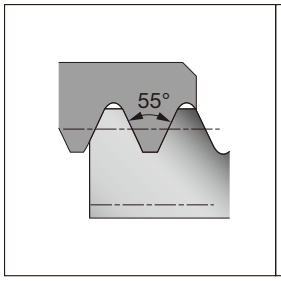


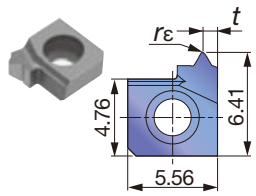
Inappropriate Examples



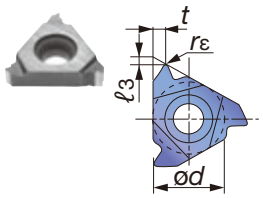
● : Line up / Packing Quantity = 5 pcs.

# Whitworth




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

## Full-profile insert

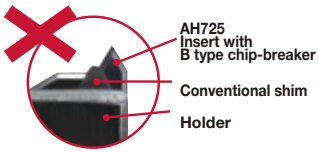
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coated AH725 | Coated T313V | Un-coated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coated AH725 | Coated T313V | Un-coated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | (1.337) | 19 | R | | | | | | | | | 6IR19W | ● | | ● | - | 0.9 | - | 0.17 |
| 11 | (1.337) | 19 | R | | | | | | | | | 11IR19W | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.17 |
| 11 | (1.814) | 14 | R | | | | | | | | | 11IR14W | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.23 |
| 16 | (0.907) | 28 | R | 16ER28W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.11 | 16IR28W | ● | | | 9.525 | 0.9 | 0.7 | 0.11 |
| 16 | (0.97) | 26 | R | 16ER26W | ● | | | 9.525 | 0.9 | 0.7 | 0.12 | 16IR26W | ● | | | 9.525 | 0.9 | 0.7 | 0.12 |
| 16 | (1.27) | 20 | R | 16ER20W | ● | | | 9.525 | 0.9 | 0.7 | 0.16 | 16IR20W | ● | | | 9.525 | 0.9 | 0.7 | 0.16 |
| 16 | (1.337) | 19 | R | 16ER19W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.17 | 16IR19W | ● | | | 9.525 | 0.9 | 0.7 | 0.17 |
| 16 | (1.411) | 18 | R | 16ER18W | ● | | | 9.525 | 0.9 | 0.7 | 0.18 | 16IR18W | ● | | | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | (1.588) | 16 | R | 16ER16W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.2 | 16IR16W | ● | ● | | 9.525 | 0.9 | 0.7 | 0.2 |
| 16 | (1.814) | 14 | R | 16ER14W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.23 |
| 16 | (1.814) | 14 | L | 16EL14W | ● | | | 9.525 | 1.6 | 1.2 | 0.23 | | | | | | | | |
| 16 | (2.117) | 12 | R | 16ER12W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.27 | 16IR12W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.27 |
| 16 | (2.309) | 11 | R | 16ER11W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11W | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.29 |
| 16 | (2.54) | 10 | R | 16ER10W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.32 | 16IR10W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.32 |
| 16 | (2.822) | 9 | R | 16ER9W | ● | | | 9.525 | 1.6 | 1.2 | 0.35 | 16IR9W | ● | | | 9.525 | 1.6 | 1.2 | 0.35 |
| 16 | (3.175) | 8 | R | 16ER8W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.4 | 16IR8W | ● | ● | | 9.525 | 1.6 | 1.2 | 0.4 |
| 22 | (3.629) | 7 | R | 22ER7W | ● | | | 12.7 | 2.5 | 1.7 | 0.45 | 22IR7W | ● | | | 12.7 | 2.5 | 1.7 | 0.45 |
| 22 | (4.233) | 6 | R | 22ER6W | ● | | | 12.7 | 2.5 | 1.7 | 0.53 | 22IR6W | ● | | | 12.7 | 2.5 | 1.7 | 0.53 |
| 22 | (5.08) | 5 | R | 22ER5W | ● | | | 12.7 | 2.5 | 1.7 | 0.64 | 22IR5W | ● | | | 12.7 | 2.5 | 1.7 | 0.64 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coated AH725 | Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coated AH725 | Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (1.337) | 19 | R | 16ER19W-B | ●* | | 9.525 | 1 | 0.8 | 0.16 | | | | | | | |
| 16 | (1.337) | 19 | R | 16ER19W-M | | ● | 9.525 | 0.9 | 0.7 | 0.17 | 16IR19W-M | | ● | 9.525 | 0.9 | 0.7 | 0.17 |
| 16 | (1.588) | 16 | R | 16ER16W-B | ●* | | 9.525 | 1.1 | 0.9 | 0.2 | 16IR16W-B | ●* | | 9.525 | 1.1 | 0.9 | 0.18 |
| 16 | (1.814) | 14 | R | 16ER14W-B | ●* | | 9.525 | 1.2 | 1 | 0.24 | 16IR14W-B | ●* | | 9.525 | 1.2 | 1 | 0.21 |
| 16 | (1.814) | 14 | R | 16ER14W-M | | ● | 9.525 | 1.6 | 1.2 | 0.23 | 16IR14W-M | | ● | 9.525 | 1.6 | 1.2 | 0.23 |
| 16 | (2.309) | 11 | R | 16ER11W-B | ●* | | 9.525 | 1.5 | 1.1 | 0.27 | 16IR11W-B | ●* | | 9.525 | 1.5 | 1.1 | 0.27 |
| 16 | (2.309) | 11 | R | 16ER11W-M | | ● | 9.525 | 1.6 | 1.2 | 0.29 | 16IR11W-M | | ● | 9.525 | 1.6 | 1.2 | 0.29 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

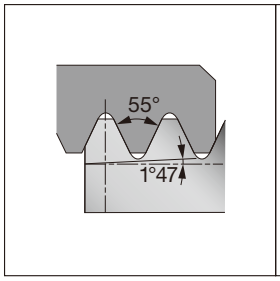
**Please check the items used and replace shims if necessary (see page B397).**

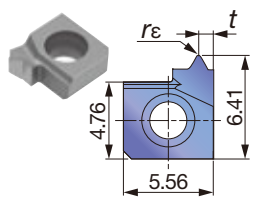



Inappropriate Examples

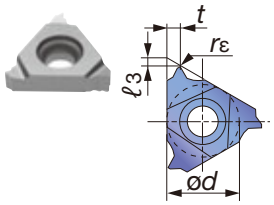
● : Line up / Packing Quantity = 5 pcs.

# Taper pipe




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 11 | | SNR/L**11... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

## Full-profile insert

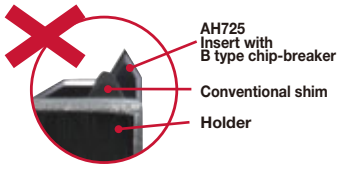
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coated AH725 | Grade: Coated T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coated AH725 | Grade: Coated T313V | Grade: Un-coated TH10 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | (1.337) | 19 | R | | | | | | | | | 6IR19PT | ● | | ● | - | 0.9 | - | 0.14 |
| 11 | (1.337) | 19 | R | | | | | | | | | 11IR19PT | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.14 |
| 11 | (1.814) | 14 | R | | | | | | | | | 11IR14PT | ● | ● | ● | 6.35 | 0.9 | 0.7 | 0.16 |
| 16 | (0.907) | 28 | R | 16ER28PT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.09 | | | | | | | | |
| 16 | (1.337) | 19 | R | 16ER19PT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.14 | 16IR19PT | ● | | | 9.525 | 0.9 | 0.7 | 0.14 |
| 16 | (1.814) | 14 | R | 16ER14PT | ● | ● | | 9.525 | 1.6 | 1.2 | 0.16 | 16IR14PT | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.16 |
| 16 | (2.309) | 11 | R | 16ER11PT | ● | ● | | 9.525 | 1.6 | 1.2 | 0.26 | 16IR11PT | ● | ● | ● | 9.525 | 1.6 | 1.2 | 0.26 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert: Designation | Grade: Coated AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε | Internal insert: Designation | Grade: Coated AH725 | Grade: Cermet NS9530 | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | (1.337) | 19 | R | 16ER19PT-M | | ● | 9.525 | 0.9 | 0.7 | 0.18 | 16IR19PT-M | | ● | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | (1.814) | 14 | R | 16ER14PT-B | ●* | | 9.525 | 1.2 | 1 | 0.21 | 16IR14PT-B | ●* | | 9.525 | 1 | 1.2 | 0.21 |
| 16 | (1.814) | 14 | R | 16ER14PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.25 | 16IR14PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.25 |
| 16 | (2.309) | 11 | R | 16ER11PT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.28 | 16IR11PT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.28 |
| 16 | (2.309) | 11 | R | 16ER11PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.32 | 16IR11PT-M | | ● | 9.525 | 1.6 | 1.2 | 0.32 |

Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

**Please check the items used and replace shims if necessary (see page B397).**

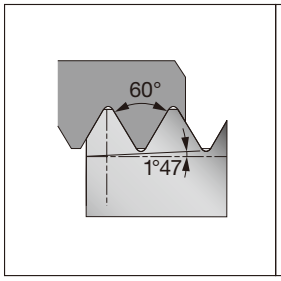


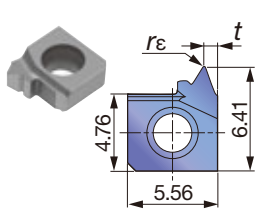

Inappropriate Examples

Threading Tool

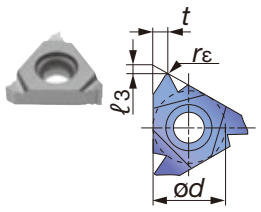
● : Line up / Packing Quantity = 5 pcs.

# NPT




Right hand insert
for internal threading shown.




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 6 | | SNR/L000*K06SC...<br>SNR/L000*H06... |
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

## Full-profile insert

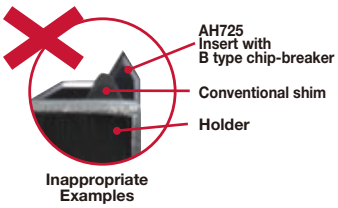
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | | | Internal insert | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | ød | t | ℓ3 | rε | Designation | Grade | | | ød | t | ℓ3 | rε |
| | | | | | Coated | | Un-coated | | | | | | Coated | | Un-coated | | | | |
| | | | | | AH725 | T313V | TH10 | | | | | | AH725 | T313V | TH10 | | | | |
| 6 | (1.411) | 18 | R | | | | | | | | | 6IR18NPT | ● | | ● | - | 0.9 | - | 0.03 |
| 16 | (0.941) | 27 | R | 16ER27NPT | ● | | | 9.525 | 0.5 | 1.2 | 0.02 | 16IR27NPT | ● | | | 9.525 | 0.5 | 1.2 | 0.02 |
| 16 | (1.411) | 18 | R | 16ER18NPT | ● | ● | | 9.525 | 0.9 | 0.7 | 0.03 | 16IR18NPT | ● | | | 9.525 | 0.9 | 0.7 | 0.03 |
| 16 | (1.814) | 14 | R | 16ER14NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.04 | 16IR14NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.04 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.05 | 16IR115NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.05 |
| 16 | (3.175) | 8 | R | 16ER8NPT | ● | | | 9.525 | 1.6 | 1.2 | 0.07 | 16IR8NPT | ● | | ● | 9.525 | 1.6 | 1.2 | 0.07 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | ød | t | ℓ3 | rε | Internal insert | | | ød | t | ℓ3 | rε |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | | | | | Designation | Grade | | | | | |
| | | | | | Coated | Cermet | | | | | | Coated | Cermet | | | | |
| | | | | | AH725 | NS9530 | | | | | | AH725 | NS9530 | | | | |
| 16 | (1.411) | 18 | R | 16ER18NPT-B | ●* | | 9.525 | 1 | 0.8 | 0.05 | | | | | | | |
| 16 | (1.411) | 18 | R | 16ER18NPT-M | | ● | 9.525 | 0.9 | 0.7 | 0.07 | 16IR18NPT-M | | ● | 9.525 | 0.9 | 0.7 | 0.07 |
| 16 | (1.814) | 14 | R | 16ER14NPT-B | ●* | | 9.525 | 1.2 | 0.9 | 0.05 | 16IR14NPT-B | ●* | | 9.525 | 1.2 | 0.9 | 0.05 |
| 16 | (1.814) | 14 | R | 16ER14NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.08 | 16IR14NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.08 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.09 | 16IR115NPT-B | ●* | | 9.525 | 1.5 | 1.1 | 0.09 |
| 16 | (2.209) | 11.5 | R | 16ER115NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.09 | 16IR115NPT-M | | ● | 9.525 | 1.6 | 1.2 | 0.09 |
| 16 | (3.175) | 8 | R | 16ER8NPT-B | ●* | | 9.525 | 1.8 | 1.3 | 0.12 | 16IR8NPT-B | ●* | | 9.525 | 1.8 | 1.3 | 0.12 |

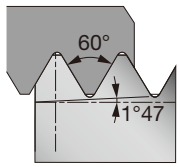
Note: ●* Please be aware of the different dimensions regarding "*t*" & "ℓ3".
Required to modify the position of the cutting edge.
Colored product needs to change the shim.

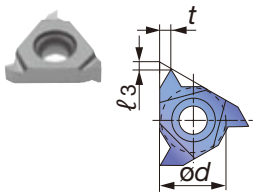
**Please check the items used and replace shims if necessary (see page B397).**




● : Line up / Packing Quantity = 5 pcs.

# NPTF




Right hand insert
for external threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16... | TSNR/L**16 |
| | B-SER/L**16 | SNR/L**16... |
| | B-CER/L**16 | TCNR/L**16... |
| | BC-SER/L**16 | CNR/L**16... |

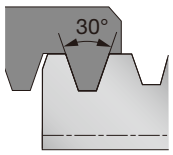
## Full-profile insert

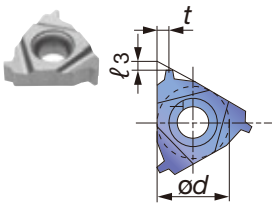
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade / Coated / AH725 | ød | t | ℓ3 | rε | Designation | Grade / Coated / AH725 | ød | t | ℓ3 | rε |
| 16 | (0.941) | 27 | R | **16ER27NPTF** | ● | 9.525 | 0.5 | 1.2 | - | | | | | | |
| 16 | (1.411) | 18 | R | **16ER18NPTF** | ● | 9.525 | 0.9 | 0.7 | - | | | | | | |
| 16 | (1.814) | 14 | R | **16ER14NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR14NPTF** | ● | 9.525 | 1.6 | 1.2 | - |
| 16 | (2.209) | 11.5 | R | **16ER115NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR115NPTF** | ● | 9.525 | 1.6 | 1.2 | - |
| 16 | (3.175) | 8 | R | **16ER8NPTF** | ● | 9.525 | 1.6 | 1.2 | - | **16IR8NPTF** | ● | 9.525 | 1.6 | 1.2 | - |



● : Line up / Packing Quantity = 5 pcs.

# 30° Trapezoidal (DIN103)




Right hand insert
for external threading shown.

## Applicable toolholders

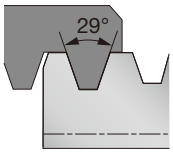
| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |
| 27 | CER/L**27... | |

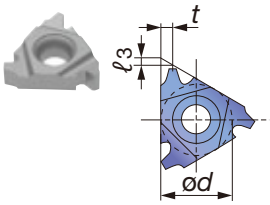
## Special full-profile insert (see page B403)

| Insert size | Pitch | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | ℓ3 | Designation | Grade | | ød | t | ℓ3 |
| | | | | | Coated | | | | | | Coated | | | | |
| | | | | | AH725 | T313V | | | | | AH725 | T313V | | | |
| 16 | 1.5 | | R | **16ER15TR** | ● | | 9.525 | 0.9 | 0.7 | **16IR15TR** | ● | | 9.525 | 0.9 | 0.7 |
| 16 | 2 | | R | **16ER20TR** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR20TR** | ● | ● | 9.525 | 1.6 | 1.3 |
| 16 | 3 | | R | **16ER30TR** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR30TR** | ● | ● | 9.525 | 1.6 | 1.3 |
| 22 | 4 | | R | **22ER40TR** | ● | ● | 12.7 | 2.5 | 2 | **22IR40TR** | ● | ● | 12.7 | 2.5 | 2 |
| 22 | 5 | | R | **22ER50TR** | ● | ● | 12.7 | 2.5 | 2 | **22IR50TR** | ● | ● | 12.7 | 2.5 | 2 |
| 27 | 6 | | R | **27ER60TR** | ● | ● | 15.875 | 3.2 | 2.5 | | | | | | |



# 29° Trapezoidal (ACME)




Right hand insert
for external threading shown.

## Applicable toolholders

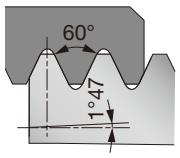
| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

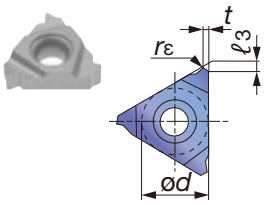
## Special full-profile insert (see page B403)

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | ℓ3 | Designation | Grade | | ød | t | ℓ3 |
| | | | | | Coated | | | | | | Coated | | | | |
| | | | | | AH725 | T313V | | | | | AH725 | T313V | | | |
| 16 | (2.117) | 12 | R | **16ER12ACME** | ● | | 9.525 | 1.6 | 1.3 | **16IR12ACME** | ● | | 9.525 | 1.6 | 1.3 |
| 16 | (2.540) | 10 | R | **16ER10ACME** | ● | | 9.525 | 1.6 | 1.3 | **16IR10ACME** | ● | | 9.525 | 1.6 | 1.3 |
| 16 | (3.175) | 8 | R | **16ER8ACME** | ● | ● | 9.525 | 1.6 | 1.3 | **16IR8ACME** | ● | ● | 9.525 | 1.6 | 1.3 |
| 22 | (4.233) | 6 | R | **22ER6ACME** | ● | ● | 12.7 | 2.5 | 2 | **22IR6ACME** | ● | ● | 12.7 | 2.5 | 2 |
| 22 | (5.080) | 5 | R | **22ER5ACME** | ● | ● | 12.7 | 2.5 | 2 | **22IR5ACME** | ● | ● | 12.7 | 2.5 | 2 |

● : Line up / Packing Quantity = 5 pcs.

# API Round




Right hand insert
for internal threading shown.

## Applicable toolholders

| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

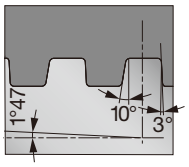
## Full-profile insert

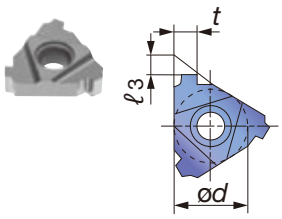
| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | | Internal insert | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | | ød | t | ℓ3 | rε | Designation | Grade | | ød | t | ℓ3 | rε |
| | | | | | Coated | | | | | | | Coated | | | | | |
| | | | | | AH725 | T313V | | | | | | AH725 | T313V | | | | |
| 16 | (2.54) | 10 | R | **16ER10RAPI** | ● | | 9.525 | 1.6 | 1.2 | 0.36 | **16IR10RAPI** | ● | ● | 9.525 | 1.6 | 1.2 | 0.36 |
| 16 | (3.175) | 8 | R | **16ER8RAPI** | ● | | 9.525 | 1.6 | 1.2 | 0.43 | **16IR8RAPI** | ● | ● | 9.525 | 1.6 | 1.2 | 0.43 |

## Full-profile insert with chipbreaker

| Insert size | Pitch (Reference) | Number of threads | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | rε | Designation | Grade | ød | t | ℓ3 | rε |
| | | | | | Coated | | | | | | Coated | | | | |
| | | | | | AH725 | | | | | | AH725 | | | | |
| 16 | (2.54) | 10 | R | **16ER10RD-CB** | ● | 9.525 | 1.2 | 1.5 | 0.36 | **16IR10RD-CB** | ● | 9.525 | 1.2 | 1.5 | 0.36 |
| 16 | (3.175) | 8 | R | **16ER8RD-CB** | ● | 9.525 | 1.3 | 1.5 | 0.43 | **16IR8RD-CB** | ● | 9.525 | 1.3 | 1.5 | 0.43 |

# API Buttress




Right hand insert
for external threading shown.

## Applicable toolholders

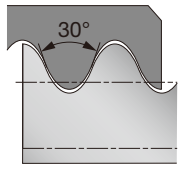
| Insert size | External | Internal |
|---|---|---|
| 22 | CER/L**22... | TSNR/L**22<br>SNR/L**22...<br>TCNR/L**22...<br>CNR/L**22... |

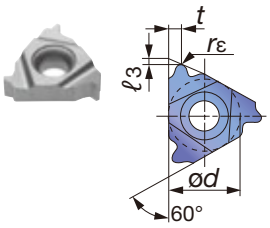
## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | Internal insert | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | Designation | Grade | ød | t | ℓ3 |
| | | | | | Coated | | | | | Coated | | | |
| | | | | | AH725 | | | | | AH725 | | | |
| 22 | (5.08) | 5 | R | **22ER5BAPI** | ● | 12.7 | 3.72 | 2.2 | **22IR5BAPI** | ● | 12.7 | 3.45 | 2.2 |

● : Line up / Packing Quantity = 5 pcs.

# Round (DIN405)




Right hand insert
for external threading shown.

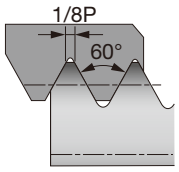
## Applicable toolholders

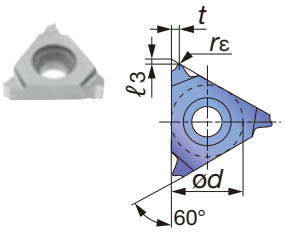
| Insert size | External | Internal |
|---|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 | TSNR/L**16<br>SNR/L**16...<br>TCNR/L**16...<br>CNR/L**16... |

## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | | Internal insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | rε | Designation | Grade | ød | t | ℓ3 | rε |
| | | | | | Coated | | | | | | Coated | | | | |
| | | | | | AH725 | | | | | | AH725 | | | | |
| 16 | | 8 | R | **16ER8RD-B** | ● | 9.525 | 1.3 | 1.4 | - | | | | | | |
| 16 | | 6 | R | **16ER6RD-B** | ● | 9.525 | 1.7 | 1.5 | - | **16IR6RD-B** | ● | 9.525 | 1.5 | 1.4 | - |

# UNJ (Aerospace)




Right hand (R) shown.

## Applicable toolholders

| Insert size | External |
|---|---|
| 16 | CER/L**16...<br>B-SER/L**16<br>B-CER/L**16<br>BC-SER/L**16 |

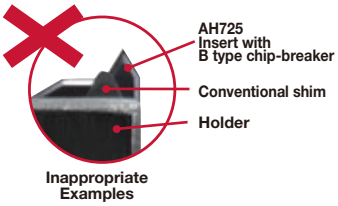
## Full-profile insert

| Insert size | Pitch (Reference) | TPI | Hand of cut | External insert | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Designation | Grade | ød | t | ℓ3 | rε |
| | | | | | Coated | | | | |
| | | | | | AH725 | | | | |
| 16 | | 32 | R | **16ER32UNJ** | ● | 9.525 | 0.5 | 1.2 | 0.13 |
| 16 | | 28 | R | **16ER28UNJ** | ● | 9.525 | 0.5 | 1.2 | 0.15 |
| 16 | | 24 | R | **16ER24UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.18 |
| 16 | | 20 | R | **16ER20UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.21 |
| 16 | | 18 | R | **16ER18UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.24 |
| 16 | | 16 | R | **16ER16UNJ** | ● | 9.525 | 0.9 | 0.7 | 0.26 |
| 16 | | 14 | R | **16ER14UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.3 |
| 16 | | 12 | R | **16ER12UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.35 |
| 16 | | 10 | R | **16ER10UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.42 |
| 16 | | 8 | R | **16ER8UNJ** | ● | 9.525 | 1.6 | 1.2 | 0.53 |

● : Line up / Packing Quantity = 5 pcs.

## IMPORTANT NOTICE - Replacement of shim sheet

**Please check the items used and replace shims if necessary (see the following list).**




### List of interchangeable Shims (Size 16 · Insert).

| Holder type | Lead Angle | External designation | | Internal designation | |
|---|---|---|---|---|---|
| | | ① Conventional | ❶ Standard (New) | ② Conventional | ❷ Standard (New) |
| Dual clamping methods of screw-on and clamp-on | 4° | GXE16-4DT | AE16-4DT | GXN16-4DT | AN16-4DT |
| | 3° | GXE16-3DT | AE16-3DT | GXN16-3DT | AN16-3DT |
| | 2° | GXE16-2DT | AE16-2DT | GXN16-2DT | AN16-2DT |
| | 1° (Standard) | GX16-1DT | A16-1DT | GX16-1DT | A16-1DT |
| | 0° | GXE16-0DT | AE16-0DT | GXN16-0DT | AN16-0DT |
| | -1° | GXE16-99DT | AE16-99DT | GXN16-99DT | AN16-99DT |
| | -2° | GXE16-98DT | AE16-98DT | GXN16-98DT | AN16-98DT |
| Clamp-on | 4° | GXE16-4 | AE16-4 | GXN16-4 | AN16-4 |
| | 3° | GXE16-3 | AE16-3 | GXN16-3 | AN16-3 |
| | 2° | GXE16-2 | AE16-2 | GXN16-2 | AN16-2 |
| | 1° (Standard) | GXE16-1 | A16-1 | GXN16-1 | A16-1 |
| | 0° | GXE16-0 | AE16-0 | GXN16-0 | AN16-0 |
| | -1° | GXE16-99 | AE16-99 | GXN16-99 | AN16-99 |
| | -2° | GXE16-98 | AE16-98 | GXN16-98 | AN16-98 |

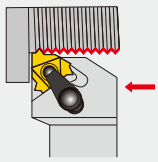
### Target items for the replacement of shims (Size 16 · Insert).

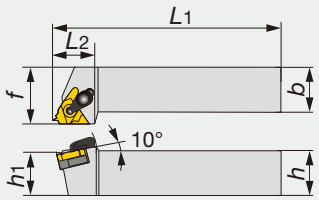
| Thread type | External | | | Internal | | |
|---|---|---|---|---|---|---|
| | Designation | Grade | Replacement | Designation | Grade | Replacement |
| ISO | | | ① Conventional → ❶ Standard (New) | 16IR15ISO-B | AH725 | ② Conventional → ❷ Standard (New) |
| | | | | 16IR175ISO-B | AH725 | |
| | | | | 16IR20ISO-B | AH725 | |
| 55° | 16ERAG55-B | AH725 | | 16IRAG55-B | AH725 | |
| | | | | 16IRG55-B | AH725 | |
| 60° | 16ERA60-B | AH725 | | 16IRAG60-B | AH725 | |
| | | | | 16IRA60-B | AH725 | |
| | | | | 16IRG60-B | AH725 | |
| UN | | | | 16IR18UN-B | AH725 | |
| | | | | 16IR16UN-B | AH725 | |
| | | | | 16IR14UN-B | AH725 | |
| W | | | | 16IR16W-B | AH725 | |
| | | | | 16IR14W-B | AH725 | |
| PT | | | | 16IR14PT-B | AH725 | |
| NPT | 16ER8NPT-B | AH725 | | 16IR14NPT-B | AH725 | |
| | | | | 16IR115NPT-B | AH725 | |

# TUNGTHREAD

## CER/L

External threading toolholders, Altanative clamping of screw-on or clamp-on (DT type only)






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| CER/L1212H16DT | 12 | 12 | 100 | 24 | 12 | 16 | 16ER/L... |
| CER/L1616H16DT | 16 | 16 | 100 | 24 | 16 | 20 | 16ER/L... |
| CER/L2020K16DT | 20 | 20 | 125 | 24 | 20 | 25 | 16ER/L... |
| CER/L2525M16DT | 25 | 25 | 150 | 28 | 25 | 32 | 16ER/L... |
| CER/L2525M22DT | 25 | 25 | 150 | 31.3 | 25 | 32 | 22ER/L... |
| CER3232P16T | 32 | 32 | 170 | 32 | 32 | 40 | 16ER... |
| CER3232P22T | 32 | 32 | 170 | 32 | 32 | 40 | 22ER... |
| CER2525M27T | 25 | 25 | 150 | 34 | 25 | 32 | 27ER... |
| CER3232P27T | 32 | 32 | 170 | 34 | 32 | 40 | 27ER... |

Note: A clamp set for CER/L type consists of a clamp and a clamping screw. A shim set for CER/L type consists of a shim and a shim screw. Standard shims for CER/L type can be used for both left hand and right hand toolholders. Use either of the sides depending on the hand.

### SPARE PARTS

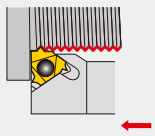
| Designation | Clamp set | Clamping screw | Screw | Shim | Shim set | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|
| CER/L**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | A16-1DT | - | P-3.5 | T-15F | - |
| CER/L2525M22DT | CSP22 | CSTB-4ST | DTS6-4 | GX22-1DT | - | P-4 | T-15F | T-20F |
| CER3232P16T | CSP16 | - | - | - | A16-1 | - | T-15F | - |
| CER3232P22T | CSP22 | - | - | - | NXE22-1 | - | T-20F | - |
| CER**27T | CSP27 | - | - | - | NXE27-1 | P-4 | - | - |

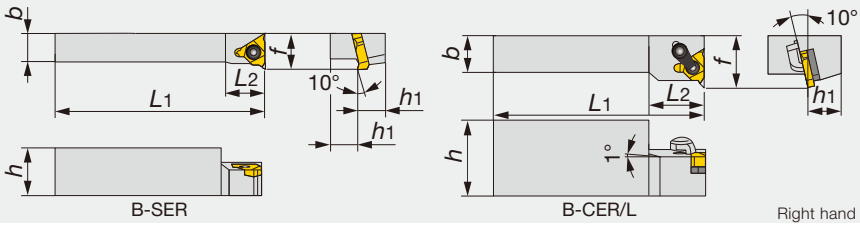


# TUNGTHREAD

## B-S/CER/L

External threading toolholders for small lathe






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-SER10H16 | 20 | 10 | 100 | 15 | 10 | 16 | 16ER... |
| B-SER12K16 | 24 | 12 | 125 | 18 | 12 | 18 | 16ER... |
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | 16ER/L... |

### SPARE PARTS

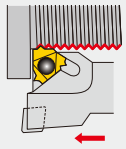
| Designation | Clamp set | Shim set | Clamping screw | Wrench |
|---|---|---|---|---|
| B-SER**16 | - | - | CSTB-3.5 | T-15F |
| B-CER/L16M16 | CSP16 | A16-1 | - | T-15F |

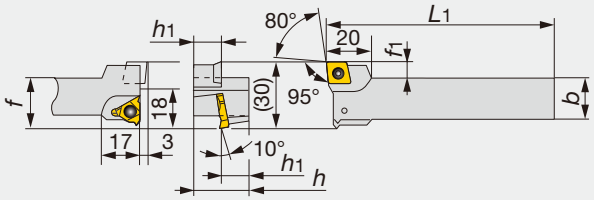
CER/L, B-S/CER/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

# TUNGTHREAD

## BC-SER/L

Multi functional external threading toolholders for small lathe






Right hand (R) shown.

| Designation | h | b | L1 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|
| BC-SER12K16 | 24 | 16 | 125 | 12 | 23 | 7 | 16ER..., CC*T09T3... |

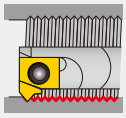
### SPARE PARTS

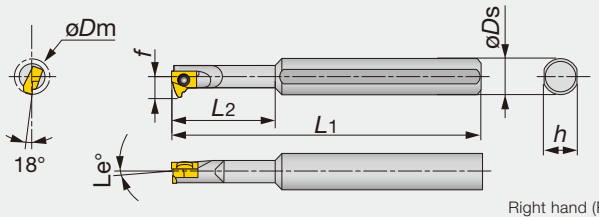
| Designation | Clamping screw | Wrench |
|---|---|---|
| BC-SER12K16 | CSTB-3.5 | T-15F |

# TUNGTHREAD

## SNR/L-2/3

Small bars for internal threading, Screw-on clamp






Right hand (R) ,carbide shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | h | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|
| SNR0006H06-2 | STEEL | 8 | 8 | 4.7 | 100 | 18 | 7 | 2 | 6IR... |
| SNR0006H06-3 | STEEL | 8 | 8 | 4.7 | 100 | 18 | 7 | 3 | 6IR... |
| SNR0008H06-2 | STEEL | 10 | 8 | 5.7 | 100 | 18 | 7 | 2 | 6IR... |
| SNR0008H06-3 | STEEL | 10 | 8 | 5.7 | 100 | 18 | 7 | 3 | 6IR... |
| SNR0006K06SC-2 | CARBIDE | 8 | 8 | 4.7 | 125 | 30 | 7 | 2 | 6IR... |
| SNR0006K06SC-3 | CARBIDE | 8 | 8 | 4.7 | 125 | 30 | 7 | 3 | 6IR... |
| SNR0008K06SC-2 | CARBIDE | 10 | 8 | 5.7 | 125 | 18 | 7 | 2 | 6IR... |
| SNR0008K06SC-3 | CARBIDE | 10 | 8 | 5.7 | 125 | 18 | 7 | 3 | 6IR... |

Note: When using the right hand insert (6IR** type), is used for the right hand toolholders (SNR** type).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SNR0006H06... | CSTB-2L040 | T-6F |
| SNR0008H06... | CSTB-2L | T-6F |
| SNR0006K06SC... | CSTB-2L040 | T-6F |
| SNR0008K06SC... | CSTB-2L | T-6F |

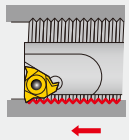


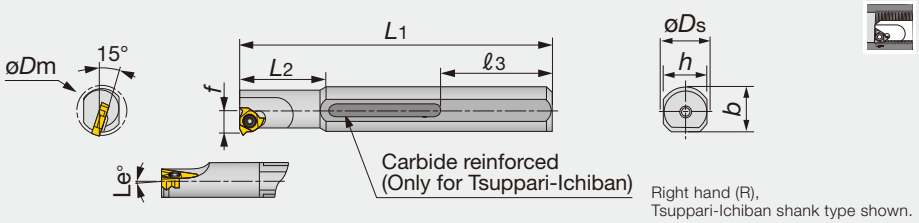
BC-SER/L: Inserts → **B104 -** (CC*T09T3...), **B384 -** (16ER...),
Standard cutting conditions → **B382**

SNR/L-2/3: Inserts → **B384 -**, Standard cutting conditions → **B382**

# SNR/L

## Internal threading bars, Screw-on clamp






Right hand (R),
Tsuppari-Ichiban shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TSNR0016Q16 | TSUPPARI | 19 | 16 | 10.6 | 180 | 40 | 59 | 15 | - | 1 | 16IR... |
| TSNR0020R22 | TSUPPARI | 24 | 20 | 13.9 | 200 | 50 | 49 | 18 | - | 1 | 22IR... |
| SNR/L0010K11 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 1 | 11IR/L... |
| SNR0010K11-2 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 2 | 11IR... |
| SNR0010K11-3 | STEEL | 12 | 16 | 6.6 | 125 | 25 | - | 15 | 15.5 | 3 | 11IR... |
| SNR/L0013L11 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 1 | 11IR/L... |
| SNR0013L11-2 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 2 | 11IR... |
| SNR0013L11-3 | STEEL | 15 | 16 | 8.2 | 140 | 32.5 | - | 15 | 15.5 | 3 | 11IR... |
| SNR/L0016M16 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 1 | 16IR/L... |
| SNR0016M16-2 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 2 | 16IR... |
| SNR0016M16-3 | STEEL | 19 | 16 | 10.6 | 150 | 40 | - | 15 | 15.5 | 3 | 16IR... |
| SNR/L0020Q22 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 1 | 22IR/L... |
| SNR0020Q22-2 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 2 | 22IR... |
| SNR0020Q22-3 | STEEL | 24 | 20 | 13.9 | 180 | 50 | - | 18 | 19 | 3 | 22IR... |
| SNR0010M11SC | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 1 | 11IR... |
| SNR0010M11SC-2 | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 2 | 11IR... |
| SNR0010M11SC-3 | CARBIDE | 13 | 10 | 7.4 | 150 | 24 | - | 9 | - | 3 | 11IR... |
| SNR0012P11SC | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 1 | 11IR... |
| SNR0012P11SC-2 | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 2 | 11IR... |
| SNR0012P11SC-3 | CARBIDE | 15 | 12 | 8.5 | 170 | 28 | - | 11 | - | 3 | 11IR... |
| SNR/L0016R16SC | CARBIDE | 20 | 16 | 11.9 | 200 | 35 | - | 15 | - | 1 | 16IR/L... |
| SNR0016R16SC-2 | CARBIDE | 20 | 16 | 11.9 | 200 | 35 | - | 15 | - | 2 | 16IR... |

Note: When using a right or left hand insert, the right hand insert (**IR...type) is used for the right hand toolholders (SNR...type) and left hand insert (**IL...type) is used for the left hand toolholders (SNL...type).

### SPARE PARTS

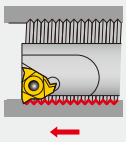
| Designation | Clamping screw | Wrench |
|---|---|---|
| TSNR0016Q16 | CSTB-3.5 | T-15F |
| TSNR0020R22 | CSTB-4 | T-15F |
| SNR/L00**11... | CSTB-2.5 | T-8F |
| SNR/L0016M16... | CSTB-3.5 | T-15F |
| SNR/L0020Q22... | CSTB-4 | T-15F |
| SNR00**11SC... | CSTB-2.5 | T-8F |
| SNR/L0016R16SC... | CSTB-3.5 | T-15F |

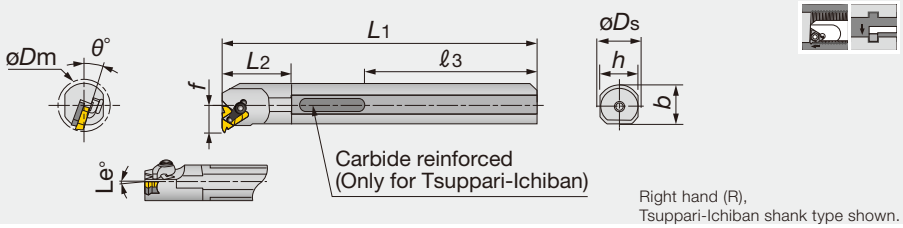


SNR/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

# CNR/L

Internal threading bars, Alternative clamping of screw-on or clamp-on(DT type only)






Right hand (R),
Tsuppari-Ichiban shank type shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | θ° | Le° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCNR0020R16DT | TSUPPARI | 24 | 20 | 14 | 200 | 30 | 49 | 18 | - | 15 | 1 | 16IR... |
| TCNR0025S16DT | TSUPPARI | 29 | 25 | 16.5 | 250 | 38 | 64 | 23 | - | 15 | 1 | 16IR... |
| TCNR0025S22DT | TSUPPARI | 30 | 25 | 18.2 | 250 | 38 | 64 | 23 | - | 15 | 1 | 22IR... |
| CNR/L0020P16 | STEEL | 24 | 20 | 14 | 170 | 30 | - | 18 | 19 | 15 | 1 | 16IR/L... |
| CNR/L0025R16 | STEEL | 29 | 25 | 16.5 | 200 | 38 | - | 23 | 24 | 15 | 1 | 16IR/L... |
| CNR/L0032S16 | STEEL | 37 | 32 | 20.1 | 250 | 48 | - | 30 | 31 | 15 | 1 | 16IR/L... |
| CNR/L0025R22 | STEEL | 30 | 25 | 18.2 | 200 | 38 | - | 23 | 24 | 15 | 1 | 22IR/L... |
| CNR/L0032S22 | STEEL | 38 | 32 | 21.9 | 250 | 48 | - | 30 | 31 | 15 | 1 | 22IR/L... |
| CNR0040T27 | STEEL | 46 | 40 | 26.9 | 300 | 60 | - | 37 | 38.5 | 10 | 1 | 27IR... |

Note: A clamp set for CNR/L type toolholders consists of a clamp and a clamping screw. A shim set for CNR/L type toolholders consists of a shim and a shim fixing screw. Standard shims for CNR/L type toolholders are commonly used for right and left hand toolholders. The right hand insert (IR) is used for the right hand toolholder (CNR...) and left hand insert (IL) is used for left hand toolholder (CNL...).

## SPARE PARTS

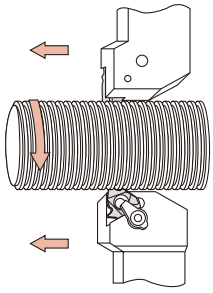
| Designation | Clamp set | Clamping screw | Screw | Shim | Shim set R | Shim set L | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|---|---|
| TCNR002**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | A16-1DT | - | - | P-3.5 | T-15F | - |
| TCNR0025S22DT | CSP22 | CSTB-4ST | DTS6-4 | GX22-1DT | - | - | P-4 | T-15F | T-20F |
| CNR/L**16 | CSP16 | - | - | - | A16-1 | A16-1 | - | T-15F | - |
| CNR/L**22 | CSP22 | - | - | - | NXN22-1 | NXE22-1 | - | T-20F | - |
| CNR0040T27 | CSP27 | - | - | - | NXN27-1 | NXE27-1 | P-4 | - | - |



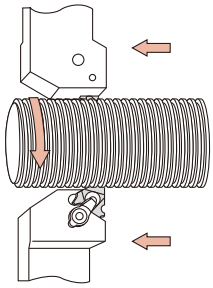
CNR/L: Inserts → **B384 -**, Standard cutting conditions → **B382**

## External threading

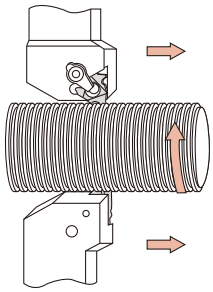
### Right hand thread



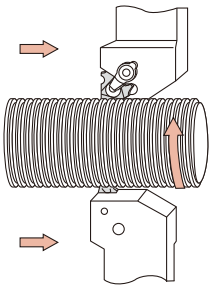
| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ① |



| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ④ |

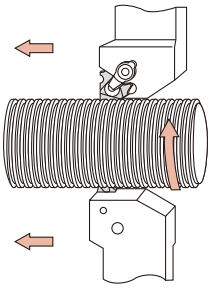


| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ① |

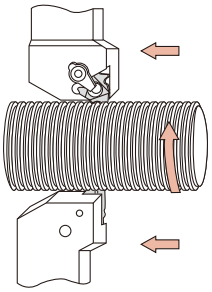


| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ④ |

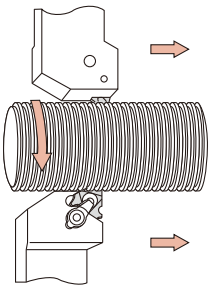
### Left hand thread



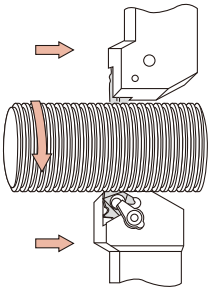
| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ② |



| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ③ |



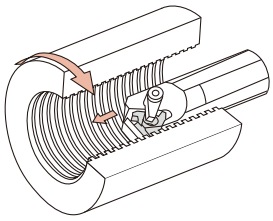
| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ② |



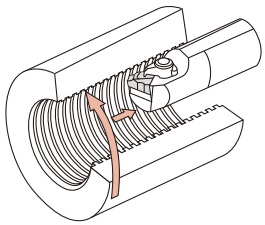
| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ③ |

## Internal threading

### Right hand thread

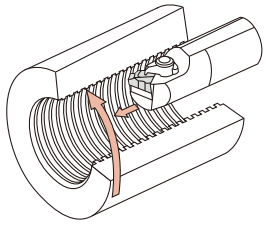


| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Push |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ② |

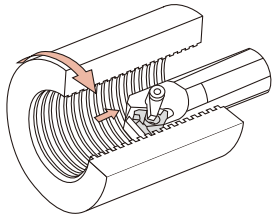


| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Pull |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ③ |

### Left hand thread



| | |
|---|---|
| Work rotation | Reverse |
| Feed direction | Push |
| Hand of toolholder | Left |
| Hand of insert | Left |
| Standard shim | ① |



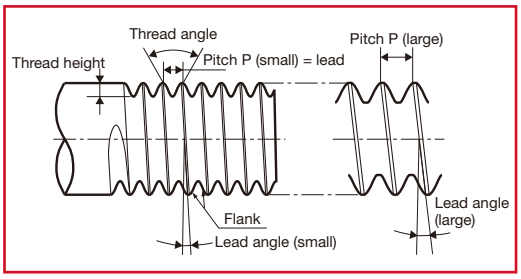
| | |
|---|---|
| Work rotation | Regular |
| Feed direction | Pull |
| Hand of toolholder | Right |
| Hand of insert | Right |
| Standard shim | ④ |

## Standard shim

| No. | New | No. | New |
|---|---|---|---|
| ① | A16-1DT | ② | A16-1DT |
| | A16-1 | | A16-1 |
| | GX22-1DT | | GX22-1DT |
| | NXE22-1 | | NXN22-1 |
| | NXE27-1 | | NXN27-1 |
| ③ | AE16-99DT | ④ | AN16-99DT |
| | AE16-99 | | AN16-99 |
| | GXE22-99DT | | GXN22-99DT |
| | NXE22-99 | | NXN22-99 |
| | NXE27-99 | | NXN27-99 |

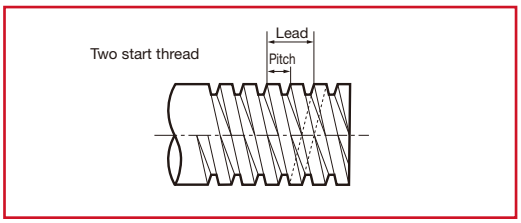
## Relationship between lead, lead angle and pitch

1. Lead is the axial distance a screw advances in one rotation. In single start screw, the lead is equal to the pitch.
2. The inclination angle of a threaded groove is called lead angle. In screws of the same diameter, the lead angle increases as the pitch increases.
3. The side face of a completed thread groove is called flank. The distance between the crest and the root is called thread height.




## Single and multi start thread

1. The single start thread has a single groove. Two start thread or three start thread has two grooves or three grooves respectively.
2. The pitch of multi start thread is the distance of adjoining groove.
3. When viewing the section of the multi start thread, the pitch is same as that of the single start thread. The lead of the two or three start thread is twice or three times the pitch. The multi start thread is mainly used for trapezoidal threads.




## Tolerance class of threads

Tolerance classes of screw threads are expressed as follows:

Metric coarse external thread: 6h, 6g Metric coarse internal thread: 5H, 6H

These classes are ranked with tolerances of thread diameter, pitch, thread angle, etc. For fastening applications, 6H- and 6g-class (former JIS second class) threads, manufactured by cutting or rolling, are generally used. 5H- and 4h-class threads (former JIS first class) are generally finished by grinding.

For example, M8-6g means metric coarse external thread of 6g tolerance class.

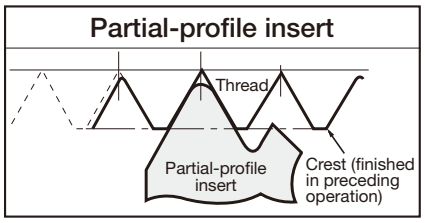
# TAC threading insert

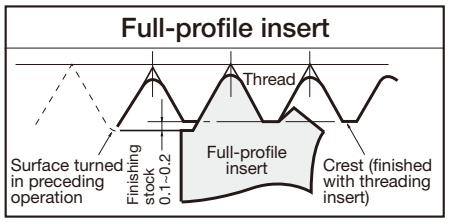
## Difference between full-profile and partial-profile insert

### Full-profile insert

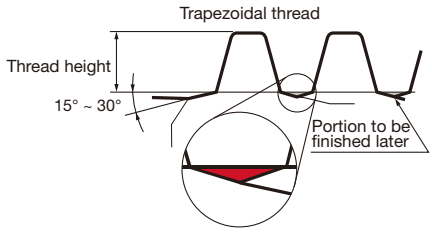
In the full-profile insert, the major diameter of the thread is finished by the profiled finishing edge as shown in Figure below. Therefore, about 0.1 mm of finishing stock must be left on the outer surface of the workpiece before threading. In trapezoidal threads, since slants of 15° to 30° are left on the crest of the thread as shown in Figure below, these portions must be finished by another tool later.

Full-profile insert could produce no burr and good thread by the profiled finishing edge.




When machining trapezoidal threads:




### Partial-profile insert

Partial-profile inserts can not be used for finishing of the crest, but can be applied to a wide range of pitches.

For example

| Designation | Pitch (mm) | TPI | Insert radius $r_\varepsilon$ (mm) |
|---|---|---|---|
| 16ERA60 | 0.5 ~ 1.5 | 48 ~ 16 | 0.06 |
| 16ERG60 | 1.75 ~ 3 | 14 ~ 8 | 0.22 |

Corner radii of inserts are fitted to the thread of the smallest pitch.

## Difference between external and internal use inserts

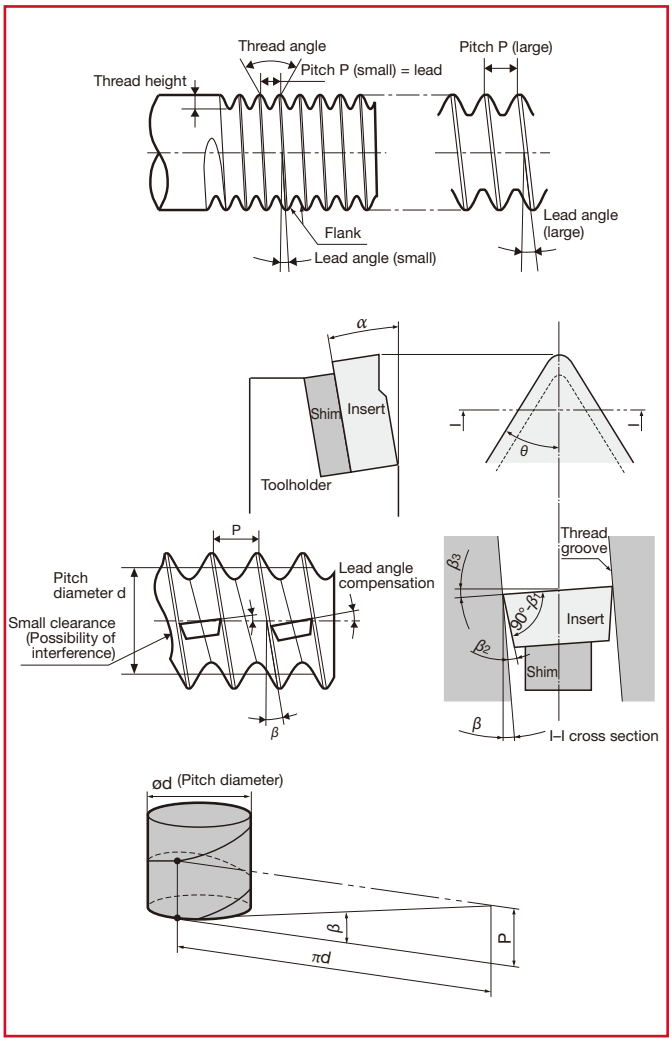
In full-profile inserts for metric and unified threads, the corner radius and thread height differ from those for the external and internal use insert respectively. Therefore, the right hand insert for external use and the left hand insert for internal use are not the same tool.
Since the rake angles of toolholders are -10° for external toolholders and -15° for internal toolholders, the external / internal toolholders can not be used for machining internal / external thread.
In Whitworth thread, though the external thread and internal thread have the same thread form, the external and internal toolholders are incompatible because of the different rake angle.

**For example**

| Designation | Applicable inserts | Insert radius $r_\varepsilon$ (mm) | Thread hight h (mm) | Rake angle of holders |
|---|---|---|---|---|
| 16ER20ISO | External | 0.25 | 1.52 | -10° |
| 16IL20ISO | Internal | 0.14 | 1.3 | -15° |

# Compensation for the lead angle and tool relief angle

When the pitch is large or the screw diameter is small, the lead angle becomes large and the effective relief angle on the advance flank side $\beta_2$ becomes small. In particular, this will cause shorter life of the insert in the case of trapezoidal screw with small flank angle. It is ideal without any interference for the thread cutting insert to have an equal relief angle on both right and left. Replace the shim so that the rake face of insert faces the thread groove direction (that is, $\beta = \beta_3$).




## Calculating the lead angle

The lead angle is calculated as follows:

$$\beta = \tan^{-1}(\ell / \pi d) = \tan^{-1}(nP/\pi d)$$

$\beta$ : Lead angle
$\ell$ : Lead
$n$ : No. of threads
$P$ : Pitch
$d$ : Pitch diameter

## Calculating the relief angle

The relief angle $\beta_1$ is calculated as follows:

$$\beta_1 = \tan^{-1}(\tan\theta \cdot \tan\alpha)$$

The $\alpha$ of a standard toolholder is 10° for external threading and 15° for internal threading.

| Included angle $2\theta$ | $\theta$ | $\beta_1$ | |
|---|---|---|---|
| | | External threading tool | Internal threading tool |
| 60° | 30° | 5.8° | 8.8° |
| 55° | 27.5° | 5.2° | 7.9° |
| 30° | 15° | 2.7° | 4.1° |
| 29° | 14.5° | 2.6° | 4° |

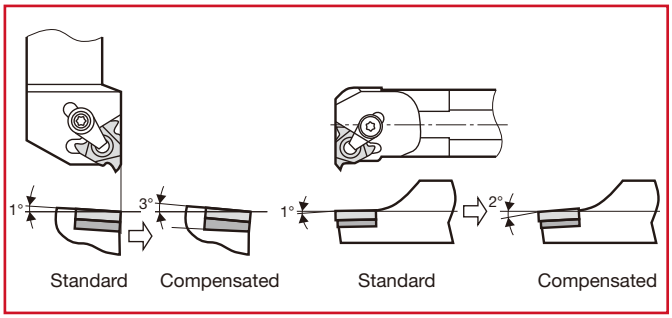
Accordingly, the effective relief angle is calculated as follows:

$$\beta_2 = \beta_1 + \beta_3 - \beta$$

$\beta$ : Lead angle
$\beta_2$ : Effective relief angle
$\beta_3$ : Lead angle compensation value

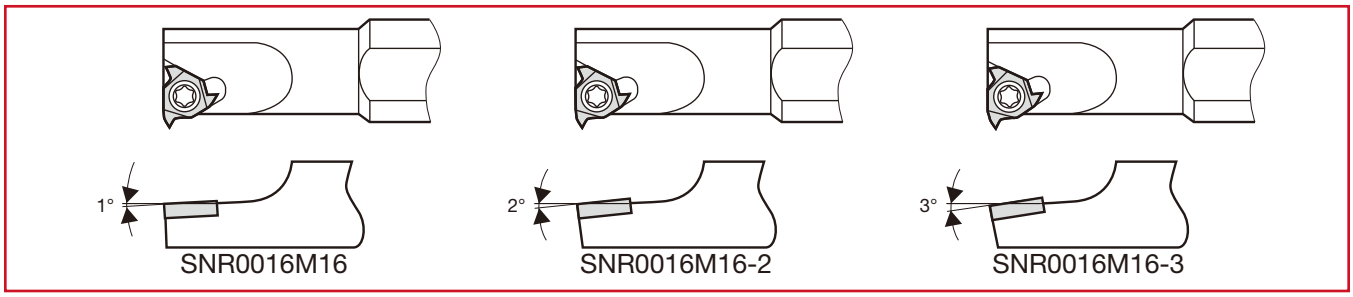
In other words, $\beta_1 = \beta_2$ when the thread lead angle is equal to the compensation value. Namely, the relief angle of the tool itself is equal to the effective relief angle. If the wrong compensation value is used, $\beta_1 > \beta_2$. The effective relief angle becomes smaller and cause the interference between the frank side of insert and the thread groove. Therefore, carry out com-pensation of the lead angle so that the following range is obtained:

**±1° when the thread angle is 60° and 55°**
**±30° when the thread angle is 30° and 29°**




## Compensation of lead angle for shim less internal toolholders

When using internal threading toolholders without shim, the above-mentioned method can not be applied for lead angle compensation. Therefore, special toolholders for large lead angles are available as shown below. The final figure of the designation (-2 or -3) indicates 2° or 3° lead angle to be used respectively. The toolholders without these figures are for 1° lead angle.



## Type of shim and the compensation value of lead angle

The designation of the shim and compensated lead angles are shown in the table.

| Compensated lead angles | -2° | -1° | 0° | 1° | 2° | 3° | 4° |
|---|---|---|---|---|---|---|---|
| Shim | □□□-98 | □□□-99 | □□□-0 | □□□-1 | □□□-2 | □□□-3 | □□□-4 |

Note: The last numeral of the shim designation is the compensated lead angle.

### ■ Toolholders and applicable shims

Screw-on / clamp-on dual toolholders

| Toolholder designation | Shim | |
|---|---|---|
| | R | L |
| **CER/L□□□□□16DT** | AE16-□DT | AN16-□DT |
| **CER/L□□□□□22DT** | GXE22-□DT | GXN22-□DT |
| **TCNR/L□□□□□16DT** | AN16-□DT | AE16-□DT |
| **TCNR/L□□□□□22DT** | GXN22-□DT | GXE22-□DT |

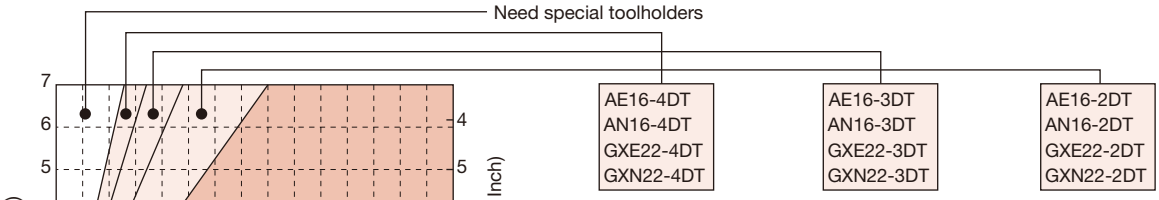
Note: Standard shim is AE16-1DT or GX22-1DT. Other types are optional.

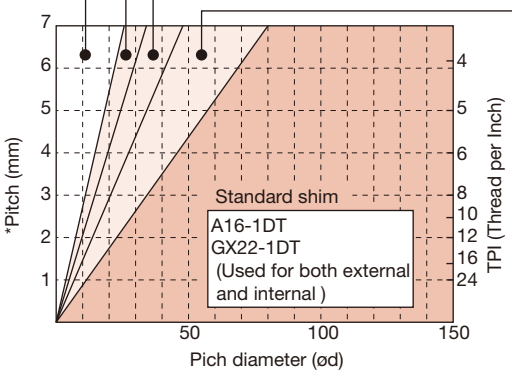
Clamp-on type toolholders

| Toolholder designation | Shim | |
|---|---|---|
| | R | L |
| **CER/L□□□□□16-T** | AE16-□ | AN16-□ |
| **CER/L□□□□□22-T** | NXE22-□ | NXN22-□ |
| **CER/L□□□□□27-T** | NXE27-□ | NXN27-□ |
| **CNR/L□□□□□16** | AN16-□ | AE16-□ |
| **CNR/L□□□□□22** | NXN22-□ | NXE22-□ |
| **CNR/L□□□□□27** | NXN27-□ | NXE27-□ |
| **B-CER/L□□□16** | AE16-□ | AN16-□ |

Note: Standard shim is □□□□□-1. Other types are optional.

## Shim selection guide for screw-on / clamp-on dual ST-type tools



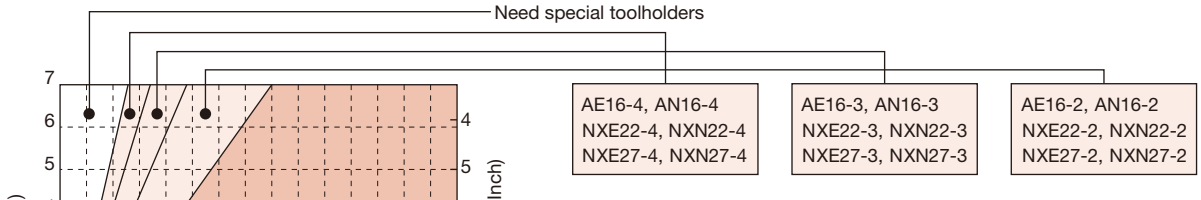



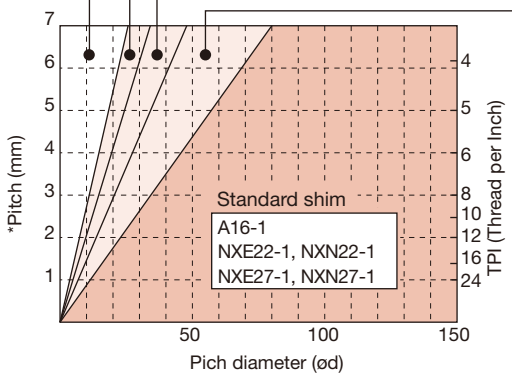

* For the multi start thread lead (multiplied by the pitch and No. of threads)

● List of exchangeable shims

| | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 |
|---|---|---|---|---|---|---|---|---|
| β3 = 4° | **AE16-4DT** | ● | **AN16-4DT** | ● | **GXE22-4DT** | ● | **GXN22-4DT** | ● |
| β3 = 3° | **AE16-3DT** | ● | **AN16-3DT** | ● | **GXE22-3DT** | ● | **GXN22-3DT** | ● |
| β3 = 2° | **AE16-2DT** | ● | **AN16-2DT** | ● | **GXE22-2DT** | ● | **GXN22-2DT** | ● |
| β3 = 1° Standard shim | **A16-1DT** | ● | **A16-1DT** | ● | **GX22-1DT** | ● | **GX22-1DT** | ● |
| β3 = 0° | **AE16-0DT** | ● | **AN16-0DT** | ● | **GXE22-0DT** | ● | **GXN22-0DT** | ● |
| β3 = -1° | **AE16-99DT** | ● | **AN16-99DT** | ● | **GXE22-99DT** | ● | **GXN22-99DT** | ● |
| β3 = -2° | **AE16-98DT** | ● | **AN16-98DT** | ● | **GXE22-98DT** | ● | **GXN22-98DT** | ● |
| Applicable toolholders | CER--16DT<br>TCNL--16DT | | CEL--16DT<br>TCNR--16DT | | CER--22DT<br>TCNL--22DT | | CEL--22DT<br>TCNR--22DT | |

## Shim selection guide for clamp-on type ST-tools




* For the multi start thread lead (multiplied by the pitch and No. of threads)

● List of exchangeable shims

| | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 | Designation | D30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| β3 = 4° | **AE16-4** | ● | **AN16-4** | ● | **NXE22-4** | ● | **NXN22-4** | ● | **NXE27-4** | | **NXN27-4** | |
| β3 = 3° | **AE16-3** | ● | **AN16-3** | ● | **NXE22-3** | ● | **NXN22-3** | ● | **NXE27-3** | | **NXN27-3** | |
| β3 = 2° | **AE16-2** | ● | **AN16-2** | ● | **NXE22-2** | ● | **NXN22-2** | ● | **NXE27-2** | | **NXN27-2** | |
| β3 = 1° Standard shim | **A16-1** | ● | **A16-1** | ● | **NXE22-1** | ● | **NXN22-1** | ● | **NXE27-1** | ● | **NXN27-1** | ● |
| β3 = 0° | **AE16-0** | ● | **AN16-0** | ● | **NXE22-0** | ● | **NXN22-0** | ● | **NXE27-0** | | **NXN27-0** | |
| β3 = -1° | **AE16-99** | ● | **AN16-99** | ● | **NXE22-99** | ● | **NXN22-99** | ● | **NXE27-99** | | **NXN27-99** | |
| β3 = -2° | **AE16-98** | ● | **AN16-98** | ● | **NXE22-98** | ● | **NXN22-98** | ● | **NXE27-98** | | **NXN27-98** | |
| Applicable toolholders | CER--16T<br>CNL--16<br>B-CER--16 | | CEL--16T<br>CNR--16<br>B-CEL--16 | | CER--22T<br>CNL--22 | | CEL--22T<br>CNR--22 | | CER--27T<br>CNL--27 | | CEL--27T<br>CNR--27 | |

● : Line up

# Selection of internal threading toolholders

## Relation between internal toolholders and machinable threads

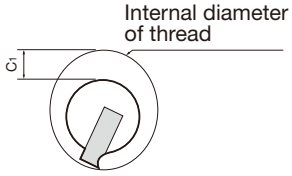
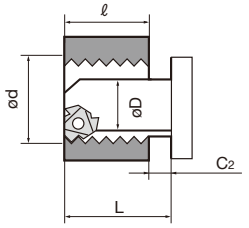
In the tables starting from next page, the relationships between toolholders, inserts, threads to be machined, and shims to be replaced are shown. In these tables, the criteria are set as follows.

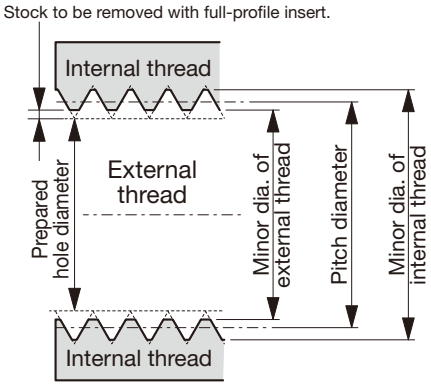
- **The minimum machining diameter.**
- **The L/D ratio of the toolholder.**
- **The lead angle of the thread.**
- **Cutting conditions**

Especially when machining near the minimum machining diameter, the compensation for the lead angle should be done carefully.
Moreover, in threading, because chips generally can not be broken into small pieces, the shank size should be selected in consideration of adequate clearance ($C_1$).

**Symbols**

- ◯ Recommended
- • Usable
- 2 Needs replacing of the shim. "2" indicates "Change to the shim for 2° lead angle".
- Unusable

| | | | |
|---|---|---|---|
| Clearance $C_1$ |   | $C_1 \geq 3$ mm<br>( 1 mm for 6IR insert holders) | |
| Overhang ratio L/D |   | Steel shank | L/D ≤ 2→◯ |
| | | Carbide shank | L/D ≤ 3→◯ |




## How to use the tables

①Firstly, find the nominal thread diameter. Example: M35 X 1.5
②The table indicates that the lead angle is 0°48′.
③The Cat. No. of the insert to be used corresponds with IR15ISO.
④By following the row to the right, • and ◯ marks are found. The ◯ mark indicates the optimum toolholder type. The toolholders of • mark are usable, but less rigid because the shank diameter against the threading diameter is smaller than those of ◯ marked toolholder. In this example, CNR0025R16 and TCNR0020R16DT are the optimum toolholders. The insert Cat.No. is 16IR15ISO.
⑤In the case of M33 X 3 thread, the lead angle is 1°46′. By following the row to the right. 2 mark is found. This indicates that the shim should be replaced to 2° type. For calculation of the lead angle, refer to page B405.

## Metric fine screw thread (ISO)

(For full size of this table, see page B409.)

| Nominal size | Pitch | Effective diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | 22IR | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT |
| M33×1.5 | 1.5 | 32.03 | 0°51′ | IR15ISO | | | | | • | | • | | • | | ◯ | | | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M33×2 | 2 | 31.7 | 1°09′ | IR20ISO | • | | • | | • | | • | | • | | • | ◯ | | | | | • | | • | | • | | • | | • | | • | ◯ | | | | |
| M33×3 | 3 | 31.05 | 1°46′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | • | 2 | | | | |
| M35×1.5 | 1.5 | 34.03 | 0°48′ | IR15ISO | | | | | • | | • | | • | | • | ◯ | | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M36×1.5 | 1.5 | 35.03 | 0°47′ | IR15ISO | | | | | • | | • | | • | | • | ◯ | | | | | | | | | • | | • | | • | | • | ◯ | | | | |
| M36×2 | 2 | 34.7 | 1°03′ | IR20ISO | | | | | | | | | | | • | ◯ | | | | | • | | • | | • | | • | | • | | • | ◯ | | | | |
| M36×3 | 3 | 34.05 | 1°36′ | | | | | | | | | | | | | | | | | | | | | | | | | | | | • | 2 | | | | |
| M38×1.5 | 1.5 | 37 | | | | | | | | | | | | | | | | | | | | | | | • | | • | | • | | • | • | ◯ | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | • | | • | | • | | • | • | | | | |

# Selection of Internal Toolholders—Relationship between thread sizes, toolholders, and inserts—Part 1

## Metric coarse screw thread (ISO)

| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | 22IR | | | | | 27IR | | 6IR | | | | 11IR | | 16IR | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16-2 | SNR0016M16-3 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | CNR0040T27 | (CNR0050U27) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0016R16SC-2 | (SNR0016R16SC-3) | TCNR0025S22DT | (TCNR0032T22DT) |
| M10 | 1.5 | 9.03 | 3°02′ | IR15ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M11 | 1.5 | 10.03 | 2°44′ | IR15ISO | | ○ | | | | | | | | | | | | | | | | | ○ | | | | | | | | |
| M12 | 1.75 | 10.86 | 2°56′ | IR175ISO | | ○ | | | | | | | | | | | | | | | | | ○ | | | | | | | | |
| M14 | 2 | 12.7 | 2°52′ | IR20ISO | | • | | ○ | | | | | | | | | | | | | | | • | | ○ | | | | | | |
| M16 | 2 | 14.7 | 2°29′ | IR20ISO | • | | ○ | | | | | | | | | | | | | | | • | | ○ | | | | | | | |
| M18 | 2.5 | 16.38 | 2°47′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M20 | 2.5 | 18.38 | 2°29′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M22 | 2.5 | 20.38 | 2°14′ | IR25ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M24 | 3 | 22.05 | 2°29′ | IR30ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M27 | 3 | 25.05 | 2°11′ | IR30ISO | | | | | | | | | ○ | | | | | | | | | | | | | | | ○ | | | |
| M30 | 3.5 | 27.73 | 2°18′ | IR35ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M33 | 3.5 | 30.73 | 2°05′ | IR35ISO | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | |
| M36 | 4 | 33.4 | 2°11′ | IR40ISO | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | |
| M39 | 4 | 36.4 | 2°00′ | IR40ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | | 2 | |
| M42 | 4.5 | 39.08 | 2°06′ | IR45ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | | 2 | |
| M45 | 4.5 | 42.08 | 1°57′ | IR45ISO | | | | | | | | | | | • | | 2 | | | | | | | | | | | | | 2 | |
| M48 | 5 | 44.75 | 2°02′ | IR50ISO | | | | | | | | | | | • | | 2 | 2 | | | | | | | | | | | | 2 | 2 |
| M52 | 5 | 48.75 | 1°52′ | IR50ISO | | | | | | | | | | | • | | 2 | 2 | | | | | | | | | | | | 2 | 2 |
| M56 | 5.5 | 52.43 | 1°55′ | IR55ISO | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M60 | 5.5 | 56.43 | 1°47′ | IR55ISO | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | |
| M64 | 6 | 60.1 | 1°49′ | IR60ISO | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | |
| M68 | 6 | 64.1 | 1°42′ | IR60ISO | | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | |

2 : Change the shim to NXN22-2

2 : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

## Metric fine screw thread (ISO)

1/4

| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | Carbide shank | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | | | 6IR | | | | 11IR | | | | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 |
| M9×0.75 | 0.75 | 8.51 | 1°36′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M9×1 | 1 | 8.32 | 2°11′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M10×0.75 | 0.75 | 9.51 | 1°26′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M10×1 | 1 | 9.35 | 1°57′ | IR10ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M10×1.25 | 1.25 | 9.19 | 2°29′ | IR125ISO | | | | | | | | | | | | | | | | | | | | |
| M11×0.75 | 0.75 | 10.51 | 1°18′ | IR075ISO | | | | | | | | | | | | | | | | | | | | |
| M11×1 | 1 | 10.35 | 1°46′ | IR10ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M12×1 | 1 | 11.35 | 1°36′ | IR10ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M12×1.25 | 1.25 | 11.19 | 2°02′ | IR125ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M12×1.5 | 1.5 | 11.03 | 2°29′ | IR15ISO | ○ | | | | | | | | | | ○ | | | | | | | | | |
| M14×1 | 1 | 13.35 | 1°22′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M14×1.25 | 1.25 | 13.19 | 1°44′ | IR125ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M14×1.5 | 1.5 | 13.03 | 2°06′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M15×1 | 1 | 14.35 | 1°16′ | IR10ISO | | | | | | | | | | | | | | | | | | | | |
| M15×1.5 | 1.5 | 14.03 | 1°57′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M16×1 | 1 | 15.35 | 1°11′ | IR10ISO | | | | | ○ | | | | | | | | | | | | | | | |
| M16×1.5 | 1.5 | 15.03 | 1°49′ | IR15ISO | • | | ○ | | | | | | | | • | | ○ | | | | | | | |
| M17×1 | 1 | 16.35 | 1°07′ | IR10ISO | | | | | ○ | | | | | | | | | | ○ | | | | | |
| M17×1.5 | 1.5 | 16.03 | 1°42′ | IR15ISO | • | | • | | | ○ | | | | | • | | ○ | | | | | | | |
| M18×1 | 1 | 17.35 | 1°03′ | IR10ISO | | | | | ○ | | | | | | | | | | ○ | | | | | |
| M18×1.5 | 1.5 | 17.03 | 1°36′ | IR15ISO | • | | • | | | ○ | | | | | • | | • | | | ○ | | | | |
| M18×2 | 2 | 16.7 | 2°11′ | IR20ISO | • | | • | | | ○ | | | | | • | | • | | | ○ | | | | |
| M20×1 | 1 | 19.35 | 0°57′ | IR10ISO | | | | | • | | | ○ | | | | | | | • | | | ○ | | |
| M20×1.5 | 1.5 | 19.03 | 1°26′ | IR15ISO | | | | | • | | | ○ | | | | | | | • | | | ○ | | |
| M20×2 | 2 | 18.7 | 1°57′ | IR20ISO | • | | • | | | ○ | | | | | • | | • | | | • | | | ○ | |

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | | | | | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | | 16IR | | | | 6IR | | | | 11IR | | | | | 16IR | | | | | 16IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| M22×1 | 1 | 21.35 | 0°51′ | IR10ISO | | | | | • | | ○ | | | | | | | | | | | • | | | ○ | | | | | | • | | |
| M22×1.5 | 1.5 | 21.03 | 1°18′ | IR15ISO | • | | • | | • | | ○ | | | | | | | • | | • | | • | | | ○ | | | | | | | | |
| M22×2 | 2 | 20.7 | 1°46′ | IR20ISO | • | | • | | | • | | ○ | | | | | | • | | • | | | • | | | ○ | | | | | | | |
| M24×1 | 1 | 23.35 | 0°47′ | IR10ISO | | | | | | | ○ | | | • | | | | | | | | • | | | ○ | | | | | • | | | |
| M24×1.5 | 1.5 | 23.03 | 1°11′ | IR15ISO | • | | • | | | | ○ | | | • | | | | • | | • | | • | | | ○ | | | | | • | | | |
| M24×2 | 2 | 22.07 | 1°39′ | IR20ISO | • | | • | | | • | | ○ | | | | | | • | | • | | | • | | | ○ | | | | | | | |
| M25×1 | 1 | 24.35 | 0°45′ | IR10ISO | | | | | • | | ○ | | | • | | | | | | | | | | | ○ | | | • | | • | | | |
| M25×1.5 | 1.5 | 24.03 | 1°08 | IR15ISO | • | | • | | • | | ○ | | | • | | | | • | | • | | | | | ○ | | | • | | • | | | |
| M25×2 | 2 | 23.7 | 1°32′ | IR20ISO | • | | • | | | • | | ○ | | | • | | | • | | • | | | • | | | ○ | | | | | | | |
| M26×1.5 | 1.5 | 25.03 | 1°06′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M27×1 | 1 | 26.35 | 0°42′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ | | |
| M27×1.5 | 1.5 | 26.03 | 1°03′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M27×2 | 2 | 25.7 | 1°25′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M28×1 | 1 | 27.35 | 0°40′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ | | |
| M28×1.5 | 1.5 | 27.03 | 1°01′ | IR15ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M28×2 | 2 | 26.7 | 1°22′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M30×1 | 1 | 29.35 | 0°37′ | IR10ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ | | |
| M30×1.5 | 1.5 | 29.03 | 0°57′ | IR15ISO | | | | | • | | • | | | ○ | | | | | | | | • | | | • | | | • | | | ○ | | |
| M30×2 | 2 | 28.7 | 1°16′ | IR20ISO | • | | • | | • | | • | | | ○ | | | | • | | • | | • | | | • | | | • | | | ○ | | |
| M30×3 | 3 | 28.05 | 1°57′ | IR30ISO | | | | | | | | | | | ○ | | | | | | | | | | | | | | ○ | | | | |
| M32×1.5 | 1.5 | 31.03 | 0°53′ | IR15ISO | | | | | • | | • | | | ○ | | | ○ | | | | | • | | | • | | | • | | | • | ○ | |
| M32×2 | 2 | 30.07 | 1°11′ | IR20ISO | • | | • | | • | | • | | | ○ | | | ○ | • | | • | | • | | | • | | | • | | | • | ○ | |

## Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | Carbide shank | | | | | | | | | | "Tsuppari-Ichiban" | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | 22IR | | | 6IR | | | | 11IR | | | 16IR | | 16IR | | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT |
| M33×1.5 | 1.5 | 32.03 | 0°51′ | IR15ISO | | | | | • | | • | | • | | ○ | | | | | | | | | • | | • | | • | | • | ○ | | | | |
| M33×2 | 2 | 31.7 | 1°09′ | IR20ISO | • | | • | | • | | • | | • | | • | ○ | | | | | | • | | • | | • | | • | | • | ○ | | | | |
| M33×3 | 3 | 31.05 | 1°46′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | • | 2 | | | | |
| M35×1.5 | 1.5 | 34.03 | 0°48′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | ○ | | | | |
| M36×1.5 | 1.5 | 35.03 | 0°47′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | ○ | | | | |
| M36×2 | 2 | 34.7 | 1°03′ | IR20ISO | • | | • | | • | | • | | | | • | ○ | | | | | | • | | • | | • | | • | | • | ○ | | | | |
| M36×3 | 3 | 34.05 | 1°36′ | IR30ISO | | | | | | | | | | | 2 | | | | | | | | | | | | | | | • | 2 | | | | |
| M38×1.5 | 1.5 | 37.03 | 0°44′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M39×1.5 | 1.5 | 38.03 | 0°43′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M39×2 | 2 | 38.7 | 0°58′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M39×3 | 3 | 37.05 | 1°29′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | • | | • | • | ○ | | | |
| M40×1.5 | 1.5 | 39.03 | 0°42′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M40×2 | 2 | 37.8 | 0°57′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M40×3 | 3 | 38.05 | 1°26′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | • | | • | • | ○ | | | |
| M42×1.5 | 1.5 | 41.03 | 0°40′ | IR15ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M42×2 | 2 | 40.7 | 0°54′ | IR20ISO | | | | | • | | • | | • | | • | ○ | | | | | | | | • | | • | | • | | • | • | ○ | | | |
| M42×3 | 3 | 40.05 | 1°22′ | IR30ISO | | | | | | | | | • | | • | ○ | | | | | | | | | | | | • | | • | • | ○ | | | |
| M42×4 | 4 | 39.4 | 1°51′ | IR40ISO | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | • | 2 |
| M45×1.5 | 1.5 | 44.03 | 0°37′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | • | | • | | • | | • | • | ○ | ○ | | |
| M45×2 | 2 | 43.7 | 0°50′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | • | | • | | • | | • | • | ○ | ○ | | |
| M45×3 | 3 | 43.05 | 1°16′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | • | | • | | • | | • | | • | • | ○ | ○ | | |
| M45×4 | 4 | 42.4 | 1°43′ | IR40ISO | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | • | 2 |
| M48×1.5 | 1.5 | 47.03 | 0°35′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | • | | • | | • | | • | • | ○ | ○ | | |
| M48×2 | 2 | 46.7 | 0°47′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | • | | • | | • | | • | • | ○ | ○ | | |
| M48×3 | 3 | 46.05 | 1°11′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | | | | | | | • | | • | • | ○ | ○ | | |
| M48×4 | 4 | 45.4 | 1°36′ | IR40ISO | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | • | 2 |

2 : Change the shim to AN16-2

2 : Change the shim to NXN22-2

2 : Change the shim to AN16-2DT

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

# Metric fine screw thread (ISO)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | "Tsuppari-Ichiban" | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | | | 22IR | | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0020Q22 | SNR0020Q22-2 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| M50×1.5 | 1.5 | 49.03 | 0°33′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | • | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M50×2 | 2 | 48.7 | 0°45′ | IR20ISO | | | | | • | | • | | • | | • | • | ○ | | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M50×3 | 3 | 48.05 | 1°08′ | IR30ISO | | | | | | | | | • | | • | • | ○ | | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M52×1.5 | 1.5 | 51.03 | 0°32′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M52×2 | 2 | 50.7 | 0°43′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M52×3 | 3 | 50.05 | 1°06′ | IR30ISO | | | | | | | | | • | | • | • | ○ | • | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M52×4 | 4 | 49.4 | 1°29′ | IR40ISO | | | | | | | | | | | | | | | | • | • | • | • | | | | | | | | | | | | | | | • | • | ○ |
| M55×1.5 | 1.5 | 54.03 | 0°30′ | IR15ISO | | | | | • | | • | | • | | • | • | ○ | • | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M55×2 | 2 | 53.7 | 0°41′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M55×3 | 3 | 53.05 | 1°02′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M55×4 | 4 | 52.4 | 1°24′ | IR40ISO | | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ |
| M56×1.5 | 1.5 | 55.03 | 0°30′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M56×2 | 2 | 54.7 | 0°40′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M56×3 | 3 | 54.05 | 1°01′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M56×4 | 4 | 53.4 | 1°22′ | IR40ISO | | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ |
| M58×1.5 | 1.5 | 57.03 | 0°29′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M58×2 | 2 | 56.7 | 0°39′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M58×3 | 3 | 56.05 | 0°59′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M58×4 | 4 | 55.4 | 1°19′ | IR40ISO | | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ |
| M60×1.5 | 1.5 | 59.03 | 0°28′ | IR15ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M60×2 | 2 | 58.7 | 0°37′ | IR20ISO | | | | | • | | • | | • | | • | • | • | ○ | | | | | | | | | | • | | • | | • | | • | • | ○ | ○ | | | |
| M60×3 | 3 | 58.05 | 0°57′ | IR30ISO | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | | | | | | • | | • | • | ○ | ○ | | | |
| M60×4 | 4 | 57.4 | 1°16′ | IR40ISO | | | | | | | | | | | | | | | | • | • | • | • | ○ | | | | | | | | | | | | | | • | • | ○ |

# Unified coarse screw thread (UNC)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 11IR | | | | | | 16IR | | | 22IR | | | | | | 27IR | | | 11IR | | | | | | 16IR | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0010K11 | SNR0010K11-2 | SNR0010K11-3 | SNR0013L11 | SNR0013L11-2 | SNR0013L11-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | CNR0040T27 | (CNR0050U27) | (CNR0063V27) | SNR0010M11SC | SNR0010M11SC-2 | SNR0010M11SC-3 | SNR0012P11SC | SNR0012P11SC-2 | SNR0012P11SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TCNR0025S22DT | (TCNR0032T22DT) |
| 7/16-14UNC | 14 | 9.93 | 3°20′ | (IR14UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2-13UNC | 13 | 11.43 | 3°07′ | (IR13UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9/16-12UNC | 12 | 12.91 | 2°59′ | IR12UN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5/8-11UNC | 11 | 14.38 | 2°56′ | (IR11UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4-10UNC | 10 | 17.4 | 2°40′ | (IR10UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7/8-9UNC | 9 | 20.39 | 2°31′ | IR9UN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-8UNC | 8 | 23.34 | 2°29′ | IR8UN | | | | | | | | ○ | | | | | | | | | | | | | | | | | | | | | | |
| 1 1/8-7UNC | 7 | 26.22 | 2°31′ | (IR7UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 1/4-7UNC | 7 | 29.39 | 2°15′ | (IR7UN) | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | | | | |
| 1 3/8-6UNC | 6 | 32.17 | 2°24′ | (IR6UN) | | | | | | | | | | | ○ | | | | | | | | | | | | | | | | | | | |
| 1 1/2-6UNC | 6 | 35.35 | 2°11′ | (IR6UN) | | | | | | | | | | | ○ | | 2 | | | | | | | | | | | | | | | 2 | | |
| 1 3/4-5UNC | 5 | 41.15 | 2°15′ | (IR5UN) | | | | | | | | | | | ○ | | 2 | | | | | | | | | | | | | | | 2 | | |
| 2-4 1/2UNC | 4.5 | 47.14 | 2°11′ | (IR45UN) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 1/4-4 1/2UNC | 4.5 | 53.49 | 1°55′ | (IR45UN) | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| 2 1/2-4UNC | 4 | 59.38 | 1°57′ | (IR4UN) | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | |
| 2 3/4-4UNC | 4 | 65.73 | 1°46′ | (IR4UN) | | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | | |
| 3-4UNC | 4 | 72.08 | 1°36′ | (IR4UN) | | | | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | | |
| 3 1/4-4UNC | 4 | 78.43 | 1°29′ | (IR4UN) | | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 3 1/2-4UNC | 4 | 84.78 | 1°22′ | (IR4UN) | | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 3 3/4-4UNC | 4 | 91.13 | 1°16′ | (IR4UN) | | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |
| 4-4UNC | 4 | 97.48 | 1°11′ | (IR4UN) | | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | | | |

2 : Change the shim to NXN22-2

2 : Change the shim to NXN27-2

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Unified fine screw thread (UNF)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | Carbide shank | | | | | | | | | | "Tsuppari-Ichiban" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 11IR | | 16IR | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11-2 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| 3/8-24UNF | 24 | 8.84 | 2°11′ | (IR24UN) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | | | | | | | | | | | | | | | | | | | | | | | |
| 7/16-20UNF | 20 | 10.29 | 2°15′ | (IR20UN) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | ○ | | | | | | | | | | ○ | | | | | | | | | | | | |
| 1/2-20UNF | 20 | 11.87 | 1°57′ | (IR20UN) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | | | |
| 9/16-18UNF | 18 | 13.37 | 1°55′ | (IR18UN) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | | | |
| 5/8-18UNF | 18 | 14.96 | 1°43′ | (IR18UN) | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | IRA60 | • | | ○ | | | | | | | | • | | ○ | | | | | | | | | | |
| 3/4-16UNF | 16 | 18.02 | 1°36′ | IR16UN | | | | | ○ | | | | | | | | | | | ○ | | | | | | | |
| 7/8-14UNF | 14 | 21.05 | 1°34′ | IR14UN | | | | | • | ○ | | | | | | | | | | • | | ○ | | | | | |
| 1-12UNF | 12 | 24.03 | 1°36′ | IR12UN | | | | | | | | ○ | | | | | | | | | | | | ○ | | | |
| 1 1/8-12UNF | 12 | 27.2 | 1°25′ | IR12UN | | | | | | | ○ | | | | | | | | | | | | ○ | | ○ | | |
| 1 1/4-12UNF | 12 | 30.38 | 1°16′ | IR12UN | | | | | | | • | | ○ | | | | | | | | | | ○ | | • | ○ | |
| 1 3/8-12UNF | 12 | 33.55 | 1°09′ | IR12UN | | | | | | | • | | • | ○ | | | | | | | | | ○ | | • | • | ○ |
| 1 1/2-12UNF | 12 | 36.73 | 1°03′ | IR12UN | | | | | | | • | | • | ○ | | | | | | | | | ○ | | • | • | ○ |

## Unified extra fine screw thread (UNEF)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | 11IR | | | | 16IR | | | | | 6IR | | 11IR | | | | 16IR | | | 16IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0008H06-2 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0006H06SC-2 | SNR0008H06SC-2 | SNR0010K11 | SNR0010K11-2 | SNR0012L11 | SNR0012L11-2 | SNR0016M16 | SNR0016M16-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT |
| 3/8 | 32 | 9.01 | 1°61′ | IR32UN | | | | | | | | | | | | | | | | | | | | | | | |
| 7/16 | 28 | 10.52 | 1°57′ | IR28UN | ○ | | | | | | | | | | | ○ | | | | | | | | | | | |
| 1/2 | 28 | 12.11 | 1°37′ | IR28UN | | | | | | | | | | | | | | | | | | | | | | | |
| 9/16 | 24 | 13.6 | 1°42′ | IR24UN | | | | | | | | | | | | | | | | | | | | | | | |
| 5/8 | 24 | 15.19 | 1°27′ | IR24UN | | | | | | | | | | | | | | | | | | | | | | | |
| 11/16 | 24 | 16.77 | 1°15′ | IR24UN | | | ○ | | | | | | | | | | | ○ | | | | | | | | | |
| 3/4 | 20 | 18.22 | 1°27′ | IR20UN | | | ○ | | | | | | | | | | | ○ | | | | | | | | | |
| 13/16 | 20 | 19.81 | 1°17′ | IR20UN | | | • | | ○ | | | | | | | | | • | | ○ | | | | | | | |
| 7/8 | 20 | 21.4 | 1°08′ | IR20UN | | | • | | ○ | | | | | | | | | • | | ○ | | | | | | | |
| 15/16 | 20 | 22.99 | 1°01′ | IR20UN | | | • | | • | | ○ | | | | | | | • | | ○ | | | | ○ | | | |
| 1 | 20 | 24.57 | 0°94′ | IR20UN | | | • | | • | | ○ | | | | | | | • | | • | | ○ | | ○ | | | |
| 1 1/16 | 18 | 26.07 | 0°99′ | IR18UN | | | • | | • | | ○ | | | | | | | • | | • | | ○ | | ○ | | | |
| 1 1/8 | 18 | 27.66 | 0°93′ | IR18UN | | | • | | • | | ○ | | | | | | | • | | • | | ○ | | ○ | | | |
| 1 3/16 | 18 | 29.25 | 0°88′ | IR18UN | | | • | | • | | • | | ○ | | | | | • | | • | | ○ | | • | ○ | | |
| 1 1/4 | 18 | 30.83 | 0°84′ | IR18UN | | | • | | • | | • | | ○ | | | | | • | | • | | ○ | | • | ○ | | |
| 1 5/16 | 18 | 32.42 | 0°79′ | IR18UN | | | • | | • | | • | | ○ | | | | | • | | • | | ○ | | • | ○ | | |
| 1 3/8 | 18 | 34.01 | 0°76′ | IR18UN | | | • | | • | | • | | • | ○ | | | | • | | • | | ○ | | • | • | ○ | |
| 1 7/16 | 18 | 35.6 | 0°72′ | IR18UN | | | • | | • | | • | | • | ○ | | | | • | | • | | ○ | | • | • | ○ | |
| 1 1/2 | 18 | 37.18 | 0°69′ | IR18UN | | | • | | • | | • | | • | ○ | | | | • | | • | | ○ | | • | • | ○ | |
| 1 9/16 | 18 | 38.77 | 0°66′ | IR18UN | | | • | | • | | • | | • | ○ | | | | • | | • | | ○ | | • | • | ○ | |
| 1 5/8 | 18 | 40.36 | 0°64′ | IR18UN | | | • | | • | | • | | • | • | ○ | | | • | | • | | ○ | | • | • | ○ | |
| 1 11/16 | 18 | 41.95 | 0°61′ | IR18UN | | | • | | • | | • | | • | • | ○ | | | • | | • | | ○ | | • | • | ○ | |

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Whitworth British Standard (BSW)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | Carbide shank | | "Tsuppari-Ichiban" | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 16IR | | | | | | 22IR | | | | | 16IR | | 16IR | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | SNR0016M16 | SNR0016M16-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | TSNR0020R22 | TCNR0025S22DT |
| 7/16 | 14 | 9.95 | 3°32′ | IR14W | | | | | | | | | | | | | | | | | | |
| 1/2 | 12 | 11.34 | 3°40′ | IR12W | | | | | | | | | | | | | | | | | | |
| 9/16 | 12 | 12.93 | 2°98′ | IR12W | | | | | | | | | | | | | | | | | | |
| 5/8 | 11 | 14.4 | 2°92′ | IR11W | | | | | | | | | | | | | | | | | | |
| 11/16 | 11 | 15.98 | 2°63′ | IR11W | | | | | | | | | | | | | | | | | | |
| 3/4 | 10 | 17.42 | 2°66′ | IR10W | | | | | | | | | | | | | | | | | | |
| 7/8 | 9 | 20.42 | 2°52′ | IR9W | | | | | | | | | | | | | | | | | | |
| 1 | 8 | 23.37 | 2°48′ | IR8W | | | | | | | | | | | | | | | | | | |
| 1 1/8 | 7 | 26.25 | 2°52′ | IR7W | | | | | | | | | | | | | | | | | | |
| 1 1/4 | 7 | 29.43 | 2°25′ | IR7W | | | | | | | | ○ | | | | | | | | | | |
| 1 1/2 | 6 | 35.39 | 2°18′ | IR6W | | | | | | | | ○ | | | | | | | | | | |
| 1 3/4 | 5 | 41.2 | 2°25′ | IR5W | | | | | | | | • | | 2 | | | | | | | | 2 |

2 : Change the shim to NXN22-2

2 : Change the shim to GXN22-2DT

## Whitworth British Standard Fine (BSF)

| Nominal size | TPI | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | | "Tsuppari-Ichiban" | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | 11IR | | 16IR | | | | | 22IR | | | | 6IR | | 16IR | | 16IR | | | 22IR | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0008H06-2 | SNR0010K11 | SNR0010K11-2 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | SNR0006H06SC-2 | SNR0008H06SC-2 | SNR0016M16 | SNR0016M16-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | TSNR0020R22 | TCNR0025S22DT |
| 7/16 | 18 | 10.21 | 2°52′ | IR18W | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | 16 | 11.68 | 2°48′ | IR16W | ○ | | | | | | | | | | | | | ○ | | | | | | | | |
| 9/16 | 16 | 13.27 | 2°18′ | IR16W | • | ○ | | | | | | | | | | | | • | ○ | | | | | | | |
| 5/8 | 14 | 14.71 | 2°25′ | IR14W | | | | | | | | | | | | | | | | | | | | | | |
| 11/16 | 14 | 16.3 | 2°03′ | IR14W | | | | ○ | | | | | | | | | | | | | | | | | | |
| 3/4 | 12 | 17.69 | 2°18′ | IR12W | | | | | | | | | | | | | | | | | | | | | | |
| 7/8 | 11 | 20.75 | 2°03′ | IR11W | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 10 | 23.77 | 1°95′ | IR10W | | | | | | ○ | | | | | | | | | | | | | | | | |
| 1 1/8 | 9 | 26.77 | 1°92′ | IR9W | | | | | | ○ | | | | | | | | | | | ○ | | | | | |
| 1 1/4 | 9 | 29.94 | 1°72′ | IR9W | | | | | | • | | 2 | | | | | | | | | ○ | | 2 | | | |
| 1 3/8 | 8 | 32.89 | 1°76′ | IR8W | | | | | | • | | 2 | | | | | | | | | ○ | | 2 | | | |
| 1 1/2 | 8 | 36.07 | 1°61′ | IR8W | | | | | | • | | • | 2 | | | | | | | | ○ | | • | 2 | | |
| 1 5/8 | 8 | 39.24 | 1°48′ | IR8W | | | | | • | | | • | ○ | | | | | | | ○ | | • | • | ○ | | |
| 1 3/4 | 7 | 42.13 | 1°57′ | IR7W | | | | | | | | | | | ○ | | 2 | | | | | | | | | 2 |
| 2 | 7 | 48.48 | 1°37′ | IR7W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |
| 2 1/4 | 6 | 54.44 | 1°42′ | IR6W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |
| 2 1/2 | 6 | 60.79 | 1°27′ | IR6W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |
| 2 3/4 | 6 | 67.14 | 1°15′ | IR6W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |
| 3 | 5 | 72.95 | 1°27′ | IR5W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |
| 3 1/4 | 5 | 79.3 | 1°17′ | IR5W | | | | | | | | | | • | | | • | ○ | | | | | | | • | ○ |

2 : Change the shim to AN16-2

2 : Change the shim to NXN22-2

2 : Change the shim to AN16-2DT

2 : Change the shim to GXN22-2DT

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## 30° trapezoidal thread (TR)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 16IR | | | | | | | | 22IR | | | | | 27IR | | 16IR | | | 16IR | | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | CNR0040T16 | CNR0050U16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | CNR0040T27 | (CNR0050U27) | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| TR22×3 | 3 | 20.5 | 2°40′ | IR30TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR24×5 | 5 | 21.5 | 4°14′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR24×3 | 3 | 22.5 | 2°26′ | IR30TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR26×5 | 5 | 23.5 | 3°52′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR26×3 | 3 | 24.5 | 2°14′ | IR30TR | | ○ | | | | | | | | | | | | | | | | | | | | | | | |
| TR28×5 | 5 | 25.5 | 3°34′ | IR50TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR28×3 | 3 | 26.5 | 2°04′ | IR30TR | | • | | | | | | | | | | | | | | | ○ | | | | | | | | |
| TR30×6 | 6 | 27 | 4°03′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR30×3 | 3 | 28.5 | 1°55′ | IR30TR | | • | | | | | | | | | | | | | | | ○ | | | | | | | | |
| TR32×6 | 6 | 29 | 3°46′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR32×3 | 3 | 30.5 | 1°48′ | IR30TR | | • | | 2 | | | | | | | | | | | | | • | | | 2 | | | | | |
| TR34×6 | 6 | 31 | 3°32′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR34×3 | 3 | 32.5 | 1°41′ | IR30TR | | • | | 2 | | | | | | | | | | | | | • | | | 2 | | | | | |
| TR36×6 | 6 | 33 | 3°19′ | IR60TR | | | | | | | | | | | | | | | | | | | | | | | | | |
| TR36×3 | 3 | 34.5 | 1°35′ | IR30TR | | • | | 2 | 2 | | | | | | | | | | | | • | | | 2 | 2 | | | | |
| TR38×3 | 3 | 36.5 | 1°30′ | IR30TR | | • | | 2 | 2 | | | | | | | | | | | | • | | | 2 | 2 | | | | |
| TR40×3 | 3 | 38.5 | 1°25′ | IR30TR | • | | | • | ○ | | | | | | | | | | | ○ | | | | • | ○ | | | | |
| TR42×3 | 3 | 40.5 | 1°21′ | IR30TR | • | | | • | ○ | | | | | | | | | | | ○ | | | | • | ○ | | | | |
| TR44×3 | 3 | 42.5 | 1°17′ | IR30TR | • | | | • | • | ○ | | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR46×3 | 3 | 44.5 | 1°14′ | IR30TR | • | | | • | • | ○ | | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR48×3 | 3 | 46.5 | 1°11′ | IR30TR | • | | | • | • | ○ | | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR50×3 | 3 | 48.5 | 1°08′ | IR30TR | • | | | • | • | ○ | | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR52×3 | 3 | 50.5 | 1°05′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR55×3 | 3 | 53.5 | 1°01′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |
| TR60×3 | 3 | 58.5 | 0°56′ | IR30TR | • | | | • | • | • | ○ | | | | | | | | | ○ | | | | • | • | ○ | | | |

2 : Change the shim to AN16-2

2 : Change the shim to AN16-2DT

## 30° trapezoidal thread (TR)



| Nominal size | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 16IR | | | | | | 22IR | | | | | | | | 27IR | | | | 16IR | | | 16IR | | | | 22IR | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | (CNR0040T22) | (CNR0050U22) | (CNR0063V22) | CNR0040T27 | (CNR0050U27) | (CNR0063V27) | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) | TSNR0020R22 | TCNR0025S22DT | (TCNR0032T22DT) |
| TR65×4 | 4 | 63 | 1°09′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | | | • | • | ○ |
| TR70×4 | 4 | 68 | 1°04′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | | | • | • | ○ |
| TR75×4 | 4 | 73 | 1°00′ | IR40TR | | | | | | | • | | | • | • | • | ○ | | | | | | | | | | | | • | • | ○ |
| TR80×4 | 4 | 78 | 0°56′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR85×4 | 4 | 83 | 0°53′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR90×4 | 4 | 88 | 0°50′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR95×4 | 4 | 93 | 0°47′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR100×4 | 4 | 98 | 0°45′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR105×4 | 4 | 103 | 0°42′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR110×4 | 4 | 108 | 0°41′ | IR40TR | | | | | | | • | | | • | • | • | • | ○ | | | | | | | | | | | • | • | ○ |
| TR115×6 | 6 | 112 | 0°59′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR120×6 | 6 | 117 | 0°56′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR125×6 | 6 | 122 | 0°54′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR130×6 | 6 | 127 | 0°52′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR135×6 | 6 | 132 | 0°50′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR140×6 | 6 | 137 | 0°48′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR145×6 | 6 | 142 | 0°46′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR150×6 | 6 | 147 | 0°45′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR155×6 | 6 | 152 | 0°43′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR160×6 | 6 | 157 | 0°42′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR165×6 | 6 | 162 | 0°41′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |
| TR170×6 | 6 | 167 | 0°39′ | IR60TR | | | | | | | | | | | | | | | • | • | ○ | | | | | | | | | | |

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## Parallel pipe thread (G) This table is also applied to PF, Rp, and PS type threads.

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 6IR | | 11IR | | | | 16IR | | | | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0008H06-2 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| G1/4 | 19 | 1.34 | 12.30 | 1°59′ | IR19W | • | ○ | | | | | | | | | | | | • | | ○ | | | | | | | | | | | |
| G3/8 | 19 | 1.34 | 15.81 | 1°33′ | IR19W | • | • | | ○ | | | | | | | | | | • | | ○ | | | | | | | | | | | |
| G1/2 | 14 | 1.81 | 19.79 | 1°40′ | IR14W | | | | • | | ○ | | | | | | | | | | | | | • | | ○ | | | | | | |
| G5/8 | 14 | 1.81 | 21.75 | 1°31′ | IR14W | | | | • | | ○ | | | | | | | | | | | | | • | | ○ | | | | | | |
| G3/4 | 14 | 1.81 | 25.28 | 1°18′ | IR14W | | | • | | • | | ○ | | | | | | | | | | | • | | • | | ○ | | ○ | | | |
| G7/8 | 14 | 1.81 | 29.04 | 1°08′ | IR14W | | | • | | • | | • | | ○ | | | | | | | | | • | | • | | ○ | | • | ○ | | |
| G1 | 11 | 2.31 | 31.77 | 1°20′ | IR11W | | | | | | | • | | ○ | | | | | | | | | | | | | ○ | | • | ○ | | |
| G1-1/8 | 11 | 2.31 | 36.42 | 1°09′ | IR11W | | | | | | | • | | • | ○ | | | | | | | | | | | | ○ | | • | • | ○ | |
| G1-1/4 | 11 | 2.31 | 40.43 | 1°02′ | IR11W | | | | | | | • | | • | ○ | | | | | | | | | | | | ○ | | • | • | ○ | |
| G1-1/2 | 11 | 2.31 | 46.32 | 0°55′ | IR11W | | | | | | | • | | • | • | ○ | | | | | | | | | | | ○ | | • | • | • | ○ |
| G1-3/4 | 11 | 2.31 | 52.27 | 0°48′ | IR11W | | | | | | | • | | • | • | • | ○ | | | | | | | | | | ○ | | • | • | • | ○ |
| G2 | 11 | 2.31 | 58.14 | 0°43′ | IR11W | | | | | | | • | | • | • | • | ○ | | | | | | | | | | ○ | | • | • | • | ○ |
| G2-1/4 | 11 | 2.31 | 64.23 | 0°39′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| G2-1/2 | 11 | 2.31 | 73.71 | 0°34′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| G2-3/4 | 11 | 2.31 | 80.06 | 0°32′ | IR11W | | | | | | | • | | • | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| G3 | 11 | 2.31 | 86.41 | 0°29′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |
| G3-1/2 | 11 | 2.31 | 98.85 | 0°26′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |
| G4 | 11 | 2.31 | 111.55 | 0°23′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |
| G4-1/2 | 11 | 2.31 | 124.25 | 0°20′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |
| G5 | 11 | 2.31 | 136.95 | 0°18′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |
| G6 | 11 | 2.31 | 162.35 | 0°16′ | IR11W | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0 ← (CNR0020P16 – (CNR0050U16))

0 : Change the shim to AN16-0DT ← (TCNR0020R16DT – (TCNR0032T16DT))

Threading Tool

## Taper pipe thread (PT) This table is also applied to Rc type pipe thread.

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | | Carbide shank | | | | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 6IR | | | | 11IR | | | | 16IR | | | | | | 6IR | | | | 11IR | | | | 16IR | | 16IR | | | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0010K11 | SNR0010K11-2 | SNR0013L11 | SNR0013L11-2 | SNR0016M16 | SNR0016M16-2 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0010M11SC | SNR0010M11SC-2 | SNR0012P11SC | SNR0012P11SC-2 | SNR0016R16SC | SNR0016R16SC-2 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| PT1/4 | 19 | 1.34 | 12.30 | 1°59′ | IR19PT | ○ | | | | | | | | | | | | | | ○ | | | | | | | | | | | | | |
| PT3/8 | 19 | 1.34 | 15.81 | 1°33′ | IR19PT | • | | ○ | | | | | | | | | | | | • | | ○ | | | | | | | | | | | |
| PT1/2 | 14 | 1.81 | 19.79 | 1°40′ | IR14PT | | | | | | ○ | | | | | | | | | | | | | | • | | ○ | | | | | | |
| PT3/4 | 14 | 1.81 | 25.28 | 1°19′ | IR14PT | | | | | | | | | ○ | | | | | | | | | | • | | • | | ○ | | ○ | | | |
| PT1 | 11 | 2.31 | 31.77 | 1°20′ | IR11PT | | | | | | | | | • | | ○ | | | | | | | | | | | | ○ | | • | ○ | | |
| PT1 1/4 | 11 | 2.31 | 40.43 | 1°02′ | IR11PT | | | | | | | | | • | | • | ○ | | | | | | | | | | | ○ | | • | • | ○ | |
| PT1 1/2 | 11 | 2.31 | 46.32 | 0°55′ | IR11PT | | | | | | | | | • | | • | • | ○ | | | | | | | | | | ○ | | • | • | • | ○ |
| PT2 | 11 | 2.31 | 58.14 | 0°43′ | IR11PT | | | | | | | | | • | | • | • | • | ○ | | | | | | | | | ○ | | • | • | • | ○ |
| PT2 1/2 | 11 | 2.31 | 73.71 | 0°34′ | IR11PT | | | | | | | | | • | | • | • | • | • | ○ | | | | | | | | ○ | | • | • | • | ○ |
| PT3 | 11 | 2.31 | 86.41 | 0°29′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT3 1/2 | 11 | 2.31 | 98.85 | 0°26′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT4 | 11 | 2.31 | 111.55 | 0°23′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT5 | 11 | 2.31 | 136.95 | 0°18′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT6 | 11 | 2.31 | 162.35 | 0°16′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT7 | 11 | 2.31 | 187.75 | 0°13′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT8 | 11 | 2.31 | 213.15 | 0°12′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT9 | 11 | 2.31 | 238.55 | 0°11′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT10 | 11 | 2.31 | 263.95 | 0°10′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |
| PT12 | 11 | 2.31 | 314.75 | 0°08′ | IR11PT | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0 ← (CNR0020P16 – (CNR0050U16))

0 : Change the shim to AN16-0DT ← (TCNR0020R16DT – (TCNR0032T16DT))

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

## National taper pipe thread (NPT)

| Nominal size | TPI | Pitch | Lead angle | Shank material | Steel shank | | | | | | | | | | | | Carbide shank | | | | | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Insert size | 6IR | | | | 16IR | | | | | | | | 6IR | | | | 16IR | | | 16IR | | | |
| | | | | Holder Cat. No. / Insert Cat. No. | SNR0006H06-2 | SNR0006H06-3 | SNR0008H06-2 | SNR0008H06-3 | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | (CNR0040T16) | (CNR0050U16) | SNR0006K06SC-2 | SNR0006K06SC-3 | SNR0008K06SC-2 | SNR0008K06SC-3 | SNR0016R16SC | SNR0016R16SC-2 | (SNR0016R16SC-3) | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S16DT | (TCNR0032T16DT) |
| 3/8NPT | 18 | 1.41 | 1°37′ | IR18NPT | • | | ○ | | | | | | | | | | • | | ○ | | | | | | | | |
| 1/2NPT | 14 | 1.81 | 1°40′ | IR14NPT | | | | | | | | | | | | | | | | | | | | | | | |
| 3/4NPT | 14 | 1.81 | 1°19′ | IR14NPT | | | | | ○ | | | | | | | | | | | | ○ | | | ○ | | | |
| 1NPT | 11.5 | 2.21 | 1°17′ | IR115NPT | | | | | ○ | | | ○ | | | | | | | | | ○ | | | • | ○ | | |
| 1 1/4NPT | 11.5 | 2.21 | 1°00′ | IR115NPT | | | | | ○ | | | • | • | ○ | | | | | | | ○ | | | • | • | • | ○ |
| 1 1/2NPT | 11.5 | 2.21 | 0°52′ | IR115NPT | | | | | ○ | | | • | • | ○ | | | | | | | ○ | | | • | • | • | ○ |
| 2NPT | 11.5 | 2.21 | 0°41′ | IR115NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 2 1/2NPT | 8 | 3.175 | 0°50′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 3NPT | 8 | 3.175 | 0°40′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 3 1/2NPT | 8 | 3.175 | 0°35′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 4NPT | 8 | 3.175 | 0°31′ | IR8NPT | | | | | ○ | | | • | • | • | • | ○ | | | | | ○ | | | • | • | • | ○ |
| 5NPT | 8 | 3.175 | 0°25′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 6NPT | 8 | 3.175 | 0°21′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 8NPT | 8 | 3.175 | 0°16′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 10NPT | 8 | 3.175 | 0°13′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 12NPT | 8 | 3.175 | 0°11′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 14NPT | 8 | 3.175 | 0°10′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 16NPT | 8 | 3.175 | 0°09′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 18NPT | 8 | 3.175 | 0°08′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 20NPT | 8 | 3.175 | 0°07′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |
| 24NPT | 8 | 3.175 | 0°06′ | IR8NPT | | | | | | | | 0 | 0 | 0 | 0 | 0 | | | | | | | | | 0 | 0 | 0 |

0 : Change the shim to AN16-0

0 : Change the shim to AN16-0DT

## 29° trapezoidal thread (ACME)

| Nominal size | TPI | Pitch | Pitch diameter | Lead angle | Shank material | Steel shank | | | | | | | | | | | | | Carbide shank | | | "Tsuppari-Ichiban" | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Insert size | 16IR | | | | | | 22IR | | | | | 27IR | | 16IR | | | 16IR | | 22IR | |
| | | | | | Holder Cat. No. / Insert Cat. No. | SNR0016M16 | SNR0016M16-2 | SNR0016M16-3 | CNR0020P16 | CNR0025R16 | CNR0032S16 | SNR0020Q22 | SNR0020Q22-2 | SNR0020Q22-3 | CNR0025R22 | CNR0032S22 | CNR0040T27 | (CNR0050U27) | SNR0016R16SC | SNR0016R16SC-2 | SNR0016R16SC-3 | TSNR0016Q16 | TCNR0020R16DT | TCNR0025S22DT | (TCNR0032T22DT) |
| 3/8 | 12 | 2.12 | 8.465 | 4°33′ | IR12ACME | | | | | | | | | | | | | | | | | | | | |
| 7/16 | 12 | 2.12 | 10.053 | 3°50′ | IR12ACME | | | | | | | | | | | | | | | | | | | | |
| 1/2 | 10 | 2.54 | 11.43 | 4°03′ | IR10ACME | | | | | | | | | | | | | | | | | | | | |
| 5/8 | 8 | 3.18 | 14.274 | 4°03′ | IR8ACME | | | | | | | | | | | | | | | | | | | | |
| 3/4 | 6 | 4.23 | 16.934 | 4°33′ | IR6ACME | | | | | | | | | | | | | | | | | | | | |
| 7/8 | 6 | 4.23 | 20.109 | 3°50′ | IR6ACME | | | | | | | | | | | | | | | | | | | | |
| 1 | 5 | 5.08 | 22.86 | 4°03′ | IR5ACME | | | | | | | | | | | | | | | | | | | | |
| 1-1/8 | 5 | 5.08 | 26.035 | 3°33′ | IR5ACME | | | | | | | | | | | | | | | | | | | | |
| 1-1/4 | 5 | 5.08 | 29.21 | 3°10′ | IR5ACME | | | | | | | | | | | | | | | | | | | | |
| 1-3/8 | 4 | 6.35 | 31.75 | 3°39′ | IR4ACME | | | | | | | | | | | | | | | | | | | | |
| 1-1/2 | 4 | 6.35 | 34.925 | 3°19′ | IR4ACME | | | | | | | | | | | | | | | | | | | | |
| 1-3/4 | 4 | 6.35 | 41.275 | 2°48′ | IR4ACME | | | | | | | | | | | | | | | | | | | | |
| 2 | 4 | 6.35 | 47.625 | 2°26′ | IR4ACME | | | | | | | | | | | | | | | | | | | | |

Because this thread standard is characterized with large pitch and small diameter, (that is a large lead angle) the standard inserts and toolholders can not be used for machining this thread type. The application is limited to outside of the standard.

Note : The above tables show correspondence of internal toolholders at the time of setting clearance between thread and toolholder to 3 mm (1 mm in case of SN type) and the finishing stock to 0.1 mm.

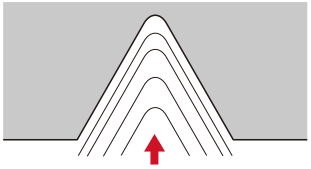
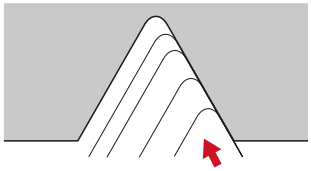
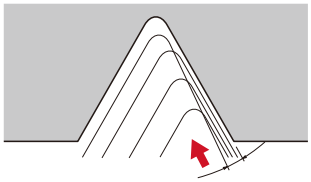
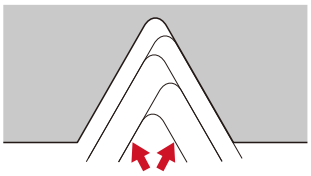
## Threading guidelines

Determine the infeed per pass and number of threads whilst referring to the table and description below.

| Pitch | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 ~ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | 48 | 32 | 24 | 20 | 16 | 14 | 12 | 10 | 8 | 7 | 6 | 5.5 | 5 ~ |
| No. of passes | 4 ~ 6 | 4 ~ 7 | 4 ~ 8 | 5 ~ 9 | 6 ~ 10 | 7 ~ 12 | 7 ~ 12 | 8 ~ 14 | 10 ~ 16 | 11 ~ 18 | 11 ~ 18 | 11 ~ 19 | 12 ~ 24 |

Note:
- When using the full-profile insert, set the total infeed amount by taking the finish stock of 0.1mm into account.
- Set the first infeed to 150 ~ 200% of nose R and do not allow it to exceed 0.5 mm.
- The infeed amount during the final pass must be a minimum of 0.05 mm. No zero cuts should be made. (Extra small infeed or zero cutting of work hardened surfaces will reduce tool life.)
- The partial-profile insert or inside diameter insert has small nose R. Reduce the infeed per pass and increase the no. of passes.
- Regarding standard infeed per passes and no. of passes, please refer to our catalogue.

## Infeed methods for threading tools

| Infeed method | Features |
|---|---|
|  Straight infeed (radial infeed) | • Most simple and usual method<br>Suitable for relatively small pitch threads of easily machinable material.<br>• Chip contact length on right and left is longer, causing chattering, with increased load on the nose end.<br>• When the half included angle is not symmetrical to the right and left, infeeding in the direction of 1/2 of the included angle will ensure equal machining with right and left cutting edges. |
|  Single edge infeed (flank infeed) | • Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering.<br>• Chips are discharged in one direction only. Satisfactory chip control.<br>• Edge on the right (with zero infeed) tends to be worn heavily. |
|  Modified single-edge infeed (flank infeed) | • Suitable for large pitch threads or easy to tear materials. Effectively prevents chattering.<br>• Chips are discharged in one direction only. Satisfactory chip control.<br>• Edge on the right performs some cutting, therefore wear of this edge can thus be suppressed. |
|  Alternating flank infeed | • Suitable for large pitch threads or easy to tear material. Effectively prevents chattering.<br>• Chips are discharged alternately in right and left directions, resulting possibly in entanglement.<br>• Right and left edges are used alternately, ensuring uniform wear and extending tool life. |

## ISO metric full-profile inserts (for external)

| Pitch | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Height of thread | 0.32 | 0.47 | 0.63 | 0.79 | 0.95 | 1.11 | 1.27 | 1.58 | 1.9 | 2.21 | 2.53 | 2.85 | 3.16 | 3.48 | 3.8 |
| Total depth of cut | 0.42 | 0.57 | 0.73 | 0.89 | 1.05 | 1.21 | 1.37 | 1.68 | 2 | 2.31 | 2.63 | 2.95 | 3.26 | 3.58 | 3.9 |
| Number of passes 1 | 0.15 | 0.18 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.3 | 0.35 | 0.35 | 0.4 | 0.4 | 0.45 | 0.5 | 0.5 |
| 2 | 0.12 | 0.12 | 0.2 | 0.2 | 0.25 | 0.25 | 0.25 | 0.25 | 0.3 | 0.3 | 0.35 | 0.35 | 0.35 | 0.35 | 0.4 |
| 3 | 0.1 | 0.12 | 0.13 | 0.15 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 4 | 0.05 | 0.1 | 0.1 | 0.14 | 0.15 | 0.16 | 0.2 | 0.23 | 0.2 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| 5 | | 0.05 | 0.05 | 0.1 | 0.1 | 0.15 | 0.15 | 0.2 | 0.2 | 0.21 | 0.2 | 0.2 | 0.25 | 0.23 | 0.25 |
| 6 | | | | 0.05 | 0.05 | 0.1 | 0.12 | 0.15 | 0.15 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 7 | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.2 | 0.2 | 0.2 | 0.2 |
| 8 | | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.18 | 0.15 | 0.15 |
| 9 | | | | | | | | 0.05 | 0.1 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 10 | | | | | | | | | 0.1 | 0.1 | 0.13 | 0.15 | 0.15 | 0.15 | 0.15 |
| 11 | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.15 | 0.13 | 0.15 | 0.15 |
| 12 | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 | 0.15 | 0.15 |
| 13 | | | | | | | | | | | 0.1 | 0.1 | 0.1 | 0.15 | 0.15 |
| 14 | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 | 0.15 |
| 15 | | | | | | | | | | | | 0.1 | 0.1 | 0.1 | 0.1 |
| 16 | | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 |
| 17 | | | | | | | | | | | | | 0.1 | 0.1 | 0.1 |
| 18 | | | | | | | | | | | | | 0.05 | 0.1 | 0.1 |
| 19 | | | | | | | | | | | | | | 0.1 | 0.1 |
| 20 | | | | | | | | | | | | | | 0.05 | 0.1 |
| 21 | | | | | | | | | | | | | | | 0.1 |
| 22 | | | | | | | | | | | | | | | 0.05 |
| 23 | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | |

## ISO metric full-profile inserts (for internal)

| Pitch | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Height of thread | 0.29 | 0.43 | 0.58 | 0.72 | 0.87 | 1.01 | 1.16 | 1.45 | 1.74 | 2.03 | 2.32 | 2.61 | 2.9 | 3.19 | 3.48 |
| Total depth of cut | 0.39 | 0.53 | 0.68 | 0.82 | 0.97 | 1.11 | 1.26 | 1.55 | 1.84 | 2.13 | 2.42 | 2.71 | 3 | 3.29 | 3.58 |
| Number of passes 1 | 0.08 | 0.1 | 0.14 | 0.15 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 | 0.35 | 0.35 | 0.4 | 0.4 |
| 2 | 0.07 | 0.09 | 0.13 | 0.13 | 0.16 | 0.18 | 0.18 | 0.22 | 0.22 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| 3 | 0.07 | 0.08 | 0.11 | 0.12 | 0.14 | 0.16 | 0.17 | 0.2 | 0.2 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| 4 | 0.06 | 0.08 | 0.1 | 0.11 | 0.12 | 0.14 | 0.16 | 0.18 | 0.18 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| 5 | 0.06 | 0.07 | 0.08 | 0.1 | 0.12 | 0.12 | 0.14 | 0.16 | 0.16 | 0.18 | 0.18 | 0.18 | 0.2 | 0.2 | 0.19 |
| 6 | 0.05 | 0.06 | 0.07 | 0.09 | 0.1 | 0.1 | 0.12 | 0.15 | 0.15 | 0.16 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| 7 | | 0.05 | 0.05 | 0.07 | 0.08 | 0.09 | 0.1 | 0.1 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.16 | 0.17 |
| 8 | | | | 0.05 | 0.05 | 0.07 | 0.08 | 0.1 | 0.13 | 0.13 | 0.14 | 0.14 | 0.14 | 0.14 | 0.16 |
| 9 | | | | | | 0.05 | 0.06 | 0.08 | 0.12 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 | 0.15 |
| 10 | | | | | | | 0.05 | 0.06 | 0.1 | 0.11 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 |
| 11 | | | | | | | | 0.05 | 0.08 | 0.1 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 |
| 12 | | | | | | | | | 0.06 | 0.1 | 0.1 | 0.12 | 0.12 | 0.13 | 0.13 |
| 13 | | | | | | | | | 0.05 | 0.07 | 0.1 | 0.11 | 0.12 | 0.12 | 0.13 |
| 14 | | | | | | | | | | 0.05 | 0.09 | 0.1 | 0.12 | 0.12 | 0.13 |
| 15 | | | | | | | | | | | 0.07 | 0.1 | 0.11 | 0.12 | 0.12 |
| 16 | | | | | | | | | | | 0.05 | 0.09 | 0.1 | 0.12 | 0.12 |
| 17 | | | | | | | | | | | | 0.08 | 0.1 | 0.1 | 0.12 |
| 18 | | | | | | | | | | | | 0.05 | 0.1 | 0.1 | 0.1 |
| 19 | | | | | | | | | | | | | 0.08 | 0.1 | 0.1 |
| 20 | | | | | | | | | | | | | 0.05 | 0.1 | 0.1 |
| 21 | | | | | | | | | | | | | | 0.08 | 0.1 |
| 22 | | | | | | | | | | | | | | 0.05 | 0.1 |
| 23 | | | | | | | | | | | | | | | 0.08 |
| 24 | | | | | | | | | | | | | | | 0.05 |

## Unified full-profile inserts

| | For external | | | | | | | For internal | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | 24 | 20 | 18 | 16 | 14 | 12 | 8 | 24 | 20 | 18 | 16 | 14 | 12 | 8 |
| Height of thread | 0.67 | 0.8 | 0.89 | 1.01 | 1.15 | 1.34 | 2.01 | 0.61 | 0.74 | 0.82 | 0.92 | 1.05 | 1.23 | 1.84 |
| Total depth of cut | 0.77 | 0.9 | 0.99 | 1.11 | 1.25 | 1.44 | 2.11 | 0.71 | 0.84 | 0.92 | 1.02 | 1.15 | 1.33 | 1.94 |
| Number of passes 1 | 0.25 | 0.25 | 0.28 | 0.3 | 0.3 | 0.3 | 0.35 | 0.2 | 0.2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 |
| 2 | 0.22 | 0.2 | 0.23 | 0.25 | 0.25 | 0.25 | 0.3 | 0.16 | 0.16 | 0.18 | 0.18 | 0.2 | 0.2 | 0.25 |
| 3 | 0.15 | 0.16 | 0.18 | 0.18 | 0.23 | 0.21 | 0.25 | 0.12 | 0.13 | 0.15 | 0.16 | 0.18 | 0.18 | 0.22 |
| 4 | 0.1 | 0.14 | 0.15 | 0.15 | 0.18 | 0.18 | 0.22 | 0.1 | 0.12 | 0.14 | 0.14 | 0.16 | 0.16 | 0.2 |
| 5 | 0.05 | 0.1 | 0.1 | 0.1 | 0.14 | 0.15 | 0.2 | 0.08 | 0.1 | 0.1 | 0.11 | 0.13 | 0.13 | 0.18 |
| 6 | | 0.05 | 0.05 | 0.08 | 0.1 | 0.12 | 0.2 | 0.05 | 0.08 | 0.1 | 0.1 | 0.1 | 0.1 | 0.16 |
| 7 | | | | 0.05 | 0.05 | 0.1 | 0.16 | | 0.05 | 0.05 | 0.08 | 0.08 | 0.1 | 0.14 |
| 8 | | | | | | 0.08 | 0.16 | | | | 0.05 | 0.05 | 0.08 | 0.12 |
| 9 | | | | | | 0.05 | 0.12 | | | | | | 0.08 | 0.12 |
| 10 | | | | | | | 0.1 | | | | | | 0.05 | 0.1 |
| 11 | | | | | | | 0.05 | | | | | | | 0.1 |
| 12 | | | | | | | | | | | | | | 0.05 |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | |

## Whitworth full-profile inserts

| | For external | | | | | | | | | For internal | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPI | 20 | 19 | 18 | 16 | 14 | 12 | 11 | 10 | 8 | 20 | 19 | 18 | 16 | 14 | 12 | 11 | 10 | 8 |
| Height of thread | 0.83 | 0.88 | 0.92 | 1.04 | 1.19 | 1.39 | 1.51 | 1.66 | 2.08 | 0.83 | 0.88 | 0.92 | 1.04 | 1.19 | 1.39 | 1.51 | 1.66 | 2.08 |
| Total depth of cut | 0.93 | 0.98 | 1.02 | 1.14 | 1.29 | 1.49 | 1.61 | 1.76 | 2.18 | 0.93 | 0.98 | 1.02 | 1.14 | 1.29 | 1.49 | 1.61 | 1.76 | 2.18 |
| Number of passes 1 | 0.25 | 0.28 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.35 | 0.35 | 0.2 | 0.2 | 0.22 | 0.22 | 0.25 | 0.25 | 0.25 | 0.3 | 0.35 |
| 2 | 0.2 | 0.22 | 0.24 | 0.25 | 0.25 | 0.25 | 0.25 | 0.3 | 0.3 | 0.18 | 0.18 | 0.18 | 0.18 | 0.21 | 0.21 | 0.21 | 0.25 | 0.3 |
| 3 | 0.18 | 0.18 | 0.18 | 0.18 | 0.23 | 0.2 | 0.2 | 0.23 | 0.25 | 0.16 | 0.16 | 0.17 | 0.17 | 0.2 | 0.2 | 0.2 | 0.22 | 0.25 |
| 4 | 0.15 | 0.15 | 0.15 | 0.14 | 0.2 | 0.18 | 0.18 | 0.2 | 0.23 | 0.14 | 0.16 | 0.16 | 0.16 | 0.18 | 0.18 | 0.18 | 0.2 | 0.22 |
| 5 | 0.1 | 0.1 | 0.1 | 0.12 | 0.16 | 0.15 | 0.15 | 0.15 | 0.22 | 0.12 | 0.13 | 0.14 | 0.14 | 0.16 | 0.16 | 0.16 | 0.16 | 0.2 |
| 6 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.14 | 0.14 | 0.14 | 0.2 | 0.08 | 0.1 | 0.1 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 | 0.18 |
| 7 | | | | 0.05 | 0.05 | 0.12 | 0.12 | 0.12 | 0.18 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.12 | 0.12 | 0.16 |
| 8 | | | | | | 0.1 | 0.12 | 0.12 | 0.16 | | | | 0.05 | 0.05 | 0.1 | 0.1 | 0.12 | 0.14 |
| 9 | | | | | | 0.05 | 0.1 | 0.1 | 0.14 | | | | | | 0.1 | 0.1 | 0.1 | 0.12 |
| 10 | | | | | | | 0.05 | 0.05 | 0.1 | | | | | | 0.05 | 0.1 | 0.1 | 0.11 |
| 11 | | | | | | | | | 0.05 | | | | | | | 0.05 | 0.05 | 0.1 |
| 12 | | | | | | | | | | | | | | | | | | 0.05 |
| 13 | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | |

## 30° Trapezoidal (TR) inserts

| | For external | | | | | For internal | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pitch | 2 | 3 | 4 | 5 | 6 | 2 | 3 | 4 | 5 | 6 |
| Height of thread | 1.25 | 1.75 | 2.25 | 2.75 | 3.5 | 1.25 | 1.75 | 2.25 | 2.75 | 3.5 |
| Total depth of cut | 1.35 | 1.85 | 2.35 | 2.85 | 3.6 | 1.35 | 1.85 | 2.35 | 2.85 | 3.6 |
| Number of passes 1 | 0.25 | 0.25 | 0.3 | 0.3 | 0.3 | 0.2 | 0.22 | 0.25 | 0.25 | 0.25 |
| 2 | 0.2 | 0.22 | 0.25 | 0.25 | 0.25 | 0.18 | 0.2 | 0.22 | 0.22 | 0.22 |
| 3 | 0.2 | 0.2 | 0.22 | 0.2 | 0.23 | 0.18 | 0.18 | 0.2 | 0.2 | 0.21 |
| 4 | 0.18 | 0.18 | 0.2 | 0.2 | 0.2 | 0.16 | 0.16 | 0.2 | 0.18 | 0.2 |
| 5 | 0.15 | 0.17 | 0.18 | 0.18 | 0.18 | 0.15 | 0.16 | 0.17 | 0.18 | 0.18 |
| 6 | 0.12 | 0.16 | 0.16 | 0.16 | 0.18 | 0.13 | 0.16 | 0.16 | 0.16 | 0.18 |
| 7 | 0.1 | 0.14 | 0.15 | 0.16 | 0.16 | 0.1 | 0.14 | 0.16 | 0.16 | 0.16 |
| 8 | 0.1 | 0.14 | 0.14 | 0.15 | 0.16 | 0.1 | 0.14 | 0.14 | 0.15 | 0.16 |
| 9 | 0.05 | 0.12 | 0.14 | 0.14 | 0.16 | 0.1 | 0.12 | 0.14 | 0.14 | 0.16 |
| 10 | | 0.12 | 0.12 | 0.14 | 0.16 | 0.05 | 0.12 | 0.12 | 0.14 | 0.16 |
| 11 | | 0.1 | 0.12 | 0.14 | 0.16 | | 0.1 | 0.12 | 0.14 | 0.16 |
| 12 | | 0.05 | 0.12 | 0.12 | 0.15 | | 0.1 | 0.12 | 0.12 | 0.15 |
| 13 | | | 0.1 | 0.12 | 0.15 | | 0.05 | 0.1 | 0.12 | 0.15 |
| 14 | | | 0.1 | 0.12 | 0.15 | | | 0.1 | 0.12 | 0.15 |
| 15 | | | 0.05 | 0.12 | 0.14 | | | 0.1 | 0.12 | 0.14 |
| 16 | | | | 0.1 | 0.14 | | | 0.05 | 0.1 | 0.14 |
| 17 | | | | 0.1 | 0.12 | | | | 0.1 | 0.12 |
| 18 | | | | 0.1 | 0.12 | | | | 0.1 | 0.12 |
| 19 | | | | 0.05 | 0.12 | | | | 0.1 | 0.12 |
| 20 | | | | | 0.12 | | | | 0.05 | 0.12 |
| 21 | | | | | 0.1 | | | | | 0.1 |
| 22 | | | | | 0.1 | | | | | 0.1 |
| 23 | | | | | 0.05 | | | | | 0.1 |
| 24 | | | | | | | | | | 0.05 |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |

## 29° Trapezoidal (TR) inserts

| | For external | | | For internal | | |
|---|---|---|---|---|---|---|
| TPI | 8 | 6 | 5 | 8 | 6 | 5 |
| Height of thread | 1.88 | 2.41 | 2.92 | 1.88 | 2.41 | 2.92 |
| Total depth of cut | 1.98 | 2.51 | 3.02 | 1.98 | 2.51 | 3.02 |
| Number of passes 1 | 0.25 | 0.25 | 0.25 | 0.22 | 0.22 | 0.22 |
| 2 | 0.22 | 0.22 | 0.22 | 0.2 | 0.2 | 0.2 |
| 3 | 0.2 | 0.2 | 0.2 | 0.18 | 0.18 | 0.18 |
| 4 | 0.18 | 0.18 | 0.18 | 0.16 | 0.18 | 0.18 |
| 5 | 0.16 | 0.17 | 0.18 | 0.16 | 0.16 | 0.16 |
| 6 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.16 |
| 7 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 |
| 8 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 9 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| 10 | 0.12 | 0.14 | 0.14 | 0.12 | 0.14 | 0.14 |
| 11 | 0.1 | 0.14 | 0.14 | 0.1 | 0.14 | 0.14 |
| 12 | 0.1 | 0.12 | 0.14 | 0.1 | 0.12 | 0.14 |
| 13 | 0.05 | 0.12 | 0.12 | 0.1 | 0.12 | 0.12 |
| 14 | | 0.12 | 0.12 | 0.05 | 0.12 | 0.12 |
| 15 | | 0.1 | 0.12 | | 0.1 | 0.12 |
| 16 | | 0.1 | 0.12 | | 0.1 | 0.12 |
| 17 | | 0.05 | 0.12 | | 0.1 | 0.12 |
| 18 | | | 0.12 | | 0.05 | 0.12 |
| 19 | | | 0.1 | | | 0.1 |
| 20 | | | 0.1 | | | 0.1 |
| 21 | | | 0.05 | | | 0.1 |
| 22 | | | | | | 0.05 |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |

## PT full-profile inserts

| | For external | | | | For internal | | |
|---|---|---|---|---|---|---|---|
| TPI | 28 | 19 | 14 | 11 | 19 | 14 | 11 |
| Height of thread | 0.6 | 0.86 | 1.16 | 1.48 | 0.86 | 1.16 | 1.48 |
| Total depth of cut | 0.7 | 0.96 | 1.26 | 1.58 | 0.96 | 1.26 | 1.58 |
| Number of passes 1 | 0.25 | 0.28 | 0.3 | 0.3 | 0.22 | 0.25 | 0.25 |
| 2 | 0.2 | 0.2 | 0.25 | 0.25 | 0.2 | 0.22 | 0.22 |
| 3 | 0.1 | 0.18 | 0.2 | 0.22 | 0.18 | 0.18 | 0.18 |
| 4 | 0.1 | 0.15 | 0.15 | 0.18 | 0.16 | 0.14 | 0.18 |
| 5 | 0.05 | 0.1 | 0.11 | 0.15 | 0.1 | 0.12 | 0.15 |
| 6 | | 0.05 | 0.1 | 0.12 | 0.05 | 0.1 | 0.13 |
| 7 | | | 0.1 | 0.11 | 0.05 | 0.1 | 0.12 |
| 8 | | | 0.05 | 0.1 | | 0.1 | 0.1 |
| 9 | | | | 0.1 | | 0.05 | 0.1 |
| 10 | | | | 0.05 | | | 0.1 |
| 11 | | | | | | | 0.05 |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |
| 26 | | | | | | | |

## NPT full-profile inserts

| | For external | | | | For internal | | |
|---|---|---|---|---|---|---|---|
| TPI | 18 | 14 | 11.5 | 8 | 14 | 11.5 | 8 |
| Height of thread | 1.14 | 1.47 | 1.79 | 2.58 | 1.47 | 1.79 | 2.58 |
| Total depth of cut | 1.24 | 1.57 | 1.89 | 2.68 | 1.57 | 1.89 | 2.68 |
| Number of passes 1 | 0.2 | 0.25 | 0.25 | 0.3 | 0.22 | 0.22 | 0.25 |
| 2 | 0.18 | 0.22 | 0.22 | 0.25 | 0.2 | 0.2 | 0.2 |
| 3 | 0.17 | 0.2 | 0.2 | 0.2 | 0.18 | 0.18 | 0.2 |
| 4 | 0.16 | 0.18 | 0.18 | 0.2 | 0.18 | 0.18 | 0.2 |
| 5 | 0.14 | 0.17 | 0.18 | 0.2 | 0.16 | 0.16 | 0.2 |
| 6 | 0.12 | 0.16 | 0.17 | 0.2 | 0.14 | 0.16 | 0.2 |
| 7 | 0.12 | 0.12 | 0.16 | 0.18 | 0.12 | 0.16 | 0.18 |
| 8 | 0.1 | 0.12 | 0.14 | 0.18 | 0.12 | 0.14 | 0.18 |
| 9 | 0.05 | 0.1 | 0.12 | 0.16 | 0.1 | 0.12 | 0.16 |
| 10 | | 0.05 | 0.12 | 0.16 | 0.1 | 0.12 | 0.16 |
| 11 | | | 0.1 | 0.14 | 0.05 | 0.1 | 0.14 |
| 12 | | | 0.05 | 0.14 | | 0.1 | 0.14 |
| 13 | | | | 0.12 | | 0.05 | 0.12 |
| 14 | | | | 0.1 | | | 0.1 |
| 15 | | | | 0.1 | | | 0.1 |
| 16 | | | | 0.05 | | | 0.1 |
| 17 | | | | | | | 0.05 |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |
| 26 | | | | | | | |

## Designation System for TAC Threading Tools (TT-type)

### Insert

| TT | R | 42 | M | -005 |
|---|---|---|---|---|
| | ① | ② | ③ | ④ |

| ① Hand | |
|---|---|
| R | Right |
| L | Left |

| ② Insert size (mm) | |
|---|---|
| Inscribed circle | 12.7 |
| Thickness | 3.2 |

| ③ Thread type | |
|---|---|
| M | 60° thread angle |
| W | 55° thread angle |

| ④ Corner radius (mm) | |
|---|---|
| Blank | 0 |
| -005 | 0.05 |

### Toolholder

| TT- | 20 | 20 | R | E |
|---|---|---|---|---|
| | ① | ② | ③ | ④ |

| ① Shank height (mm) |
|---|

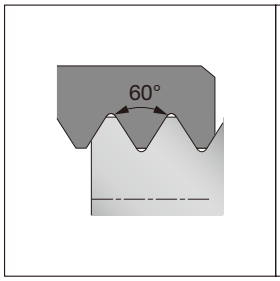
| ② Shank width (mm) |
|---|

| ③ Hand | |
|---|---|
| R | Right |
| L | Left |

| ④ External or Internal | |
|---|---|
| E | External |
| I | Internal |

TT-type Insert

## 60° thread angle

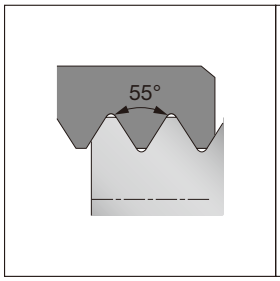



### Partial-profile insert for external and internal threads

| Pitch | TPI | Hand of cut | Designation | Grade | | ød | s | θ° | Applicable toolholders |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cermet NS9530 | Uncoated TH10 | | | | |
| ≤ 3 | ≥ 8 | R | **TTR42M-005** | ● | ● | 12.7 | 3.2 | 60 | TT-****RE/LI |
| ≤ 3 | ≥ 8 | L | **TTL42M-005** | ● | ● | 12.7 | 3.2 | 60 | TT-****LE/RI |

TT-type Insert

## 55° thread angle



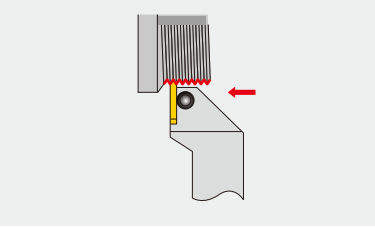

### Partial-profile insert for external and internal threads

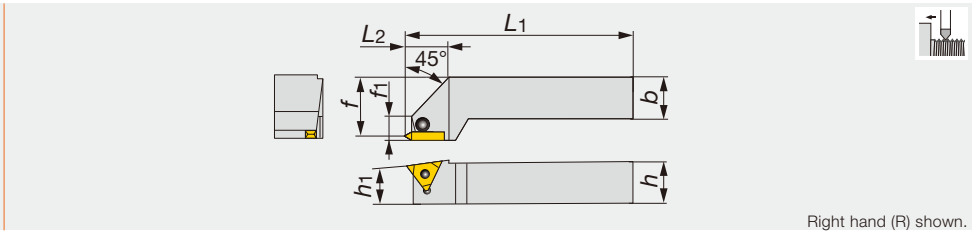
| Pitch | TPI | Hand of cut | Designation | Grade | | ød | s | θ° | Applicable toolholders |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cermet NS9530 | Uncoated TH10 | | | | |
| ≤ 3 | ≥ 8 | R | **TTR42W-005** | ● | ● | 12.7 | 3.2 | 55 | TT-****RE/LI |
| ≤ 3 | ≥ 8 | L | **TTL42W-005** | ● | ● | 12.7 | 3.2 | 55 | TT-****LE/RI |

● : Line up / Packing Quantity = 5 pcs.

## TT-R/LE

"TT type"External threading toolholders, pin lock






| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | f | $f_1$ | Insert |
|---|---|---|---|---|---|---|---|---|
| TT-2525R/LE | 25 | 25 | 150 | 25 | 25 | 32. | 15 | TTR/L42... |

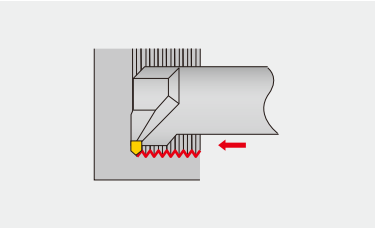
### SPARE PARTS

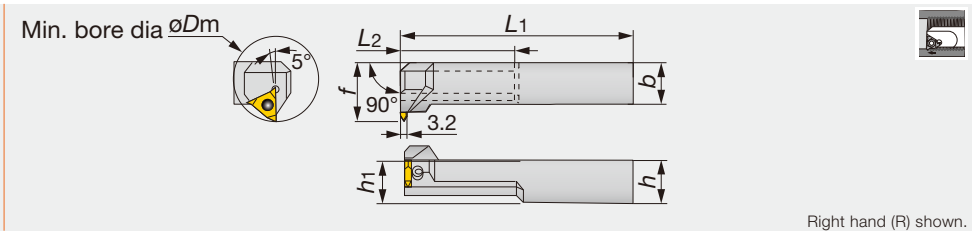
| Designation | Clamp | Right-left screw | Wrench |
|---|---|---|---|
| TT-2525R/LE | CP91 | DS-6 | P-3 |

TUNGTHREAD

## TT-R/LI

"TT type"Internal threading toolholders, pin lock





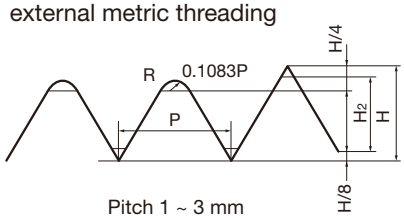

| Designation | øDm | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| TT-2525RI | 50 | 25 | 25 | 200 | 70 | 25 | 35 | TTL42... |

Notes : The left hand insert is used for right hand toolholders.

### SPARE PARTS

| Designation | Clamp | Right-left screw | Wrench |
|---|---|---|---|
| TT-2525RI | CP91 | DS-6 | P-3 |

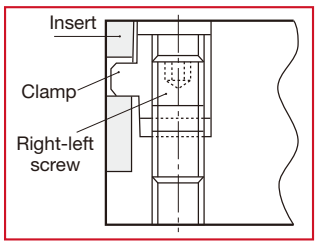
- Relationship between pitch, depth of cut and number of passes for external metric threading




Note: Maximum machinable pitch is 3 mm.

| | P | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.5 | 3 |
|---|---|---|---|---|---|---|---|---|
| | $H_2$ | 0.6 | 0.76 | 0.92 | 1.09 | 1.25 | 1.57 | 1.9 |
| | H | 0.866 | 1.083 | 1.299 | 1.516 | 1.732 | 2.165 | 2.598 |
| Number of passes | 1 | 0.25 | 0.3 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| | 2 | 0.15 | 0.2 | 0.25 | 0.25 | 0.25 | 0.3 | 0.35 |
| | 3 | 0.1 | 0.1 | 0.15 | 0.2 | 0.2 | 0.25 | 0.28 |
| | 4 | 0.05 | 0.06 | 0.1 | 0.1 | 0.16 | 0.2 | 0.2 |
| | 5 | 0.05 | 0.06 | 0.05 | 0.1 | 0.1 | 0.15 | 0.2 |
| | 6 | | 0.06 | 0.05 | 0.07 | 0.07 | 0.1 | 0.13 |
| | 7 | | | 0.02 | 0.05 | 0.05 | 0.07 | 0.1 |
| | 8 | | | | 0.02 | 0.02 | 0.05 | 0.1 |
| | 9 | | | | | 0.02 | 0.03 | 0.05 |
| | 10 | | | | | | 0.02 | 0.05 |
| | 11 | | | | | | | 0.02 |
| | 12 | | | | | | | 0.02 |

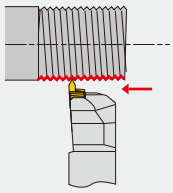
## ● Part assembly

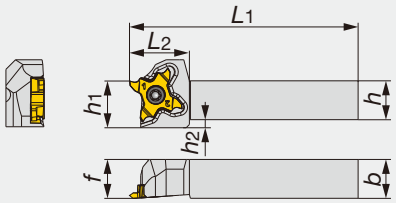



TT-R/LE, TT-R/LI: Inserts → **B419**

# STCR/L-18

Precision threading tools with uniquely shaped insert for swiss type machine, automatic and general lathes






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| STCR/L1010X18 | 10 | 10 | 120 | 18.5 | 10 | 10 | 4.5 | TC*18... |
| STCR/L1212F18 | 12 | 12 | 85 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1212X18 | 12 | 12 | 120 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1616X18 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | TC*18... |
| STCR/L2020H18 | 20 | 20 | 100 | 18.5 | 20 | 20 | - | TC*18... |
| STCR/L2020X18 | 20 | 20 | 120 | 23 | 20 | 25 | - | TC*18... |
| STCR/L2525Z18 | 25 | 25 | 135 | 23 | 25 | 30 | - | TC*18... |

- The right hand insert (TCT18R...) is used for the right hand toolholders (STCR...), and the left hand insert (TCL18...) is used for the left hand toolholders (STCL...).

## SPARE PARTS

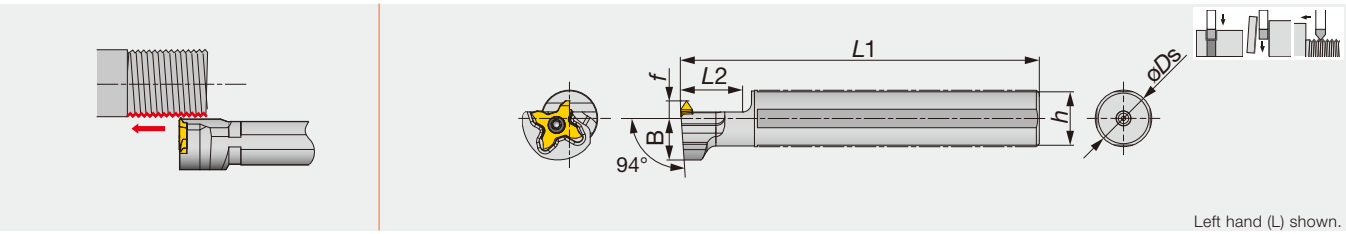
| Designation | Clamping screw | Wrench |
|---|---|---|
| STCR... | CSTC-4L100DL | T-1008/5 |
| STCL... | CSTC-4L100DR | T-1008/5 |



STCR/L-18: Inserts, Standard cutting conditions → **B423**

# JS-STCL18

Precision threading tools with uniquely shaped insert for swiss type machine,automatic and general lathes




Left hand (L) shown.

| Designation | øDs | L1 | L2 | h | B | f | Insert |
|---|---|---|---|---|---|---|---|
| JS14H-STCL18 | 14 | 100 | 20 | 13 | 14 | 6 | TC*18R... |
| JS159F-STCL18 | 15.875 | 85 | 20 | 15 | 14 | 6 | TC*18R... |
| JS16F-STCL18 | 16 | 85 | 20 | 15 | 14 | 6 | TC*18R... |
| JS19G-STCL18 | 19.05 | 90 | 20 | 18 | 14 | 6 | TC*18R... |
| JS19X-STCL18 | 19.05 | 120 | 20 | 18 | 14 | 6 | TC*18R... |
| JS20G-STCL18 | 20 | 90 | 20 | 19 | 14 | 6 | TC*18R... |
| JS20X-STCL18 | 20 | 120 | 20 | 19 | 14 | 6 | TC*18R... |
| JS22X-STCL18 | 22 | 120 | 20 | 21 | 12.25 | 10 | TC*18R... |
| JS25H-STCL18 | 25 | 100 | 20 | 24 | 12.25 | 10 | TC*18R... |
| JS254X-STCL18 | 25.4 | 120 | 20 | 24 | 12.25 | 10 | TC*18R... |

- The right hand insert (TCT18R...) is used for the left hand toolholders (STCL...)

## SPARE PARTS

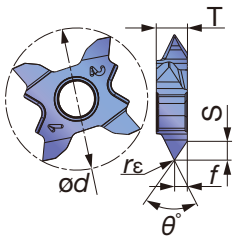
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**STCL18 | CSTC-4L100DL | T-1008/5 |



JS-STCL18: Inserts, Standard cutting conditions → **B423**

## INSERT

### TCT18R/L(For Threading)



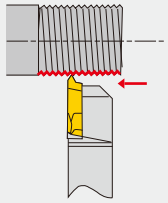

| Designation | Coated AH725 R | Coated AH725 L | Pitch min | Pitch max | *f* | S | *rε* | *θ°* | T | *ød* |
|---|---|---|---|---|---|---|---|---|---|---|
| TCT18R/L-60N-010 | ● | ● | 0.8 | 3 | 1.6 | 2.67 | 0.1 | 60 | 4 | 18 |
| TCT18R/L-60N-020 | ● | ● | 1.5 | 3 | 1.6 | 2.57 | 0.2 | 60 | 4 | 18 |

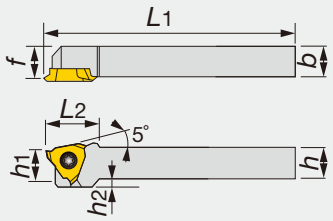
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Pitch (mm) | TPI |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S20C, etc. C15, C20, etc. | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc. C55, 42CrMoS4, etc. | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| | Prehardened steels<br>NAK80, PX5, etc. | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| M | Stainless steels<br>SUS303, SUS316,etc. X5CrNi18-9, X5CrNiMo17-12-2, etc | AH725 | 50 - 80 | 0.8 - 3 | 32 - 8 |
| K | Grey cast irons<br>250, 300, etc. | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| | Ductile cast irons<br>400-15, 600-3, etc. | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |
| | Superalloys<br>Inconel718, etc. | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |

# J-SERIES
## JSTTR/L
External threading toolholders for small lathe






Right hand (R) shown.

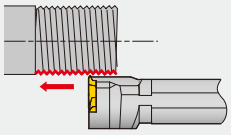
| Designation | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSTTR/L1010X3 | 10 | 10 | 120 | 18.5 | 10 | 9.5 | 2 | JTTR/L30... |
| JSTTR/L1212F3 | 12 | 12 | 85 | 18.5 | 12 | 11.5 | - | JTTR/L30... |
| JSTTR/L1212X3 | 12 | 12 | 120 | 18.5 | 12 | 11.5 | - | JTTR/L30... |
| JSTTR/L1616X3 | 16 | 16 | 120 | 16.5 | 16 | 15.5 | - | JTTR/L30... |

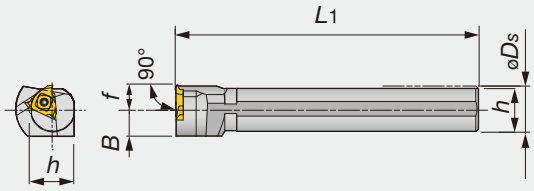
Recommend clamping torque: 1.2 N·m

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTTR/L... | CSTB-4SD | T-8F |

# J-SERIES
## JS-TTL3
External threading toolholders for small lathe






Left hand (L) shown.

| Designation | øDs | f | L1 | h | B | Insert |
|---|---|---|---|---|---|---|
| JS19K-TTL3 | 19.05 | 10 | 125 | 18 | 11.5 | JTTR30... |
| JS20K-TTL3 | 20 | 10 | 125 | 19 | 11.5 | JTTR30... |
| JS22K-TTL3 | 22 | 10 | 125 | 21 | 11.5 | JTTR30... |
| JS25K-TTL3 | 25.4 | 10 | 125 | 24 | 12.7 | JTTR30... |

Recommend clamping torque: 3.5 N·m

### SPARE PARTS

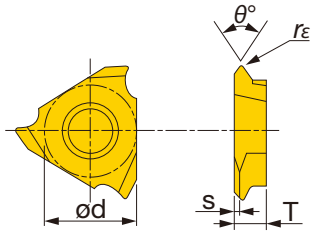
| Designation | Clamping screw | Wrench |
|---|---|---|
| JS**-TTL3 | CSTB-4S | T-15F |



JSTTR/L, JS-TTL3: Inserts → **B425**

## INSERT

### JTT (sharp edge)

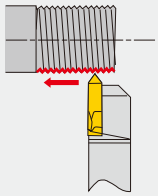


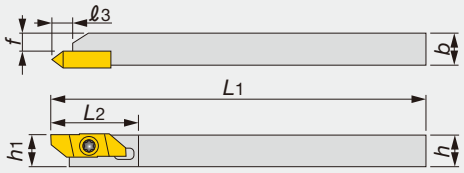

Right hand (R) shown.

| Designation | rε | Coated | | | | Cermet | | Uncoated | | θ° | ød | T | s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SH725 | | J740 | | NS9530 | | TH10 | | | | | |
| | | R | L | R | L | R | L | R | L | | | | |
| JTTR/L3005F-55 | 0.05 | ● | | ● | | | | | | 55 | 9.525 | 3.18 | 0.6 |
| JTTR/L3005F | 0.05 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |
| JTTR/L3010F | 0.1 | ● | ● | ● | | ● | | ● | | 60 | 9.525 | 3.18 | 0.9 |

Machinable pitch range: 0.5 to 1 mm.

● : Line up





C-type

Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $\ell_3$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXBR1010K8-C | 10 | 10 | 125 | 29 | 6.4 | 10 | 5.7 | JXT*R... |
| JSXBR1212K8-C | 12 | 12 | 125 | 29 | 6.4 | 12 | 7.7 | JXT*R... |
| JSXBR1616K8 | 16 | 16 | 125 | 29 | 6.4 | 16 | 11.7 | JXT*R... |
| JSXBR2020K8 | 20 | 20 | 125 | 29 | 6.4 | 20 | 15.7 | JXT*R... |
| JSXBR2525K8 | 25 | 25 | 125 | 29 | 6.4 | 25 | 20.7 | JXT*R... |

- Can be wrenched from back side with both end torx screw.
- This toolholder is also compatible with JSXB-type insert for back turning.

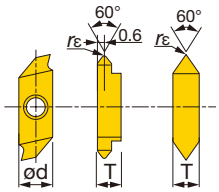
## SPARE PARTS

| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| JSXBR... | CSTB-4SD | T-8F | (T-8L) |

T-8L is option part.

## INSERT

### JXT (sharp edge)




1-Type JXT1R  2-Type JXT2R

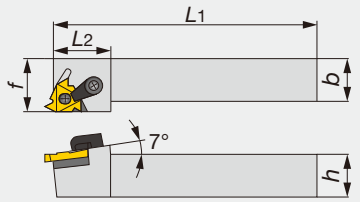
| Designation | rε | Coated J740 | Uncoated TH10 | θ° | ød | T |
|---|---|---|---|---|---|---|
| JXT1R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |
| JXT2R6000F | 0.03 | ● | ● | 60 | 8 | 3.97 |

Machinable pitch range: 0.5 to 1 mm

● : Line up

# MTVNR/L-5

"TungThread"External threading toolholders for laydown inserts




Right hand (R) shown.

| Designation | b | h | $L_1$ | $L_2$ | f | Insert |
|---|---|---|---|---|---|---|
| MTVNR-2525M5 | 25 | 25 | 152 | 39 | 31.8 | L53 5B**EXT-FC |
| MTVNR-3232M5 | 32 | 32 | 178 | 39 | 38.1 | L53 5B**EXT-FC |

## SPARE PARTS

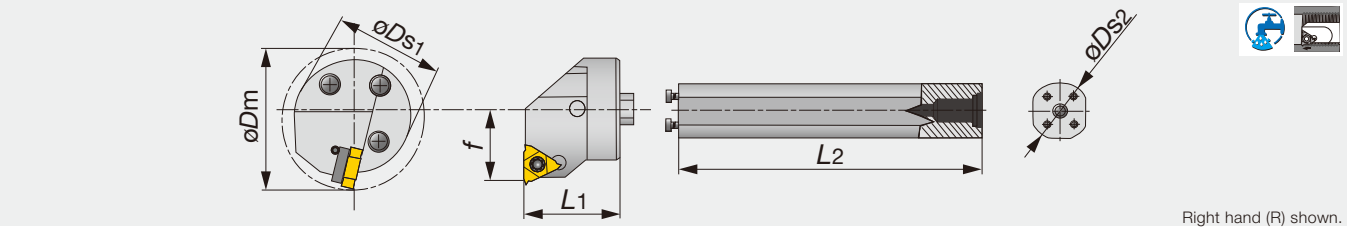
| Designation | Shim | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|---|
| MTVNR... | LS53NOFORMEXT | NL-58 | TC-250 | STC-11 | 1/8HEX |

Threading Tool

MTVNR/L-5: Inserts → **B428**

# HS-LNFR/L-53

Exchangeable internal threading heads for laydown inserts




Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-LNFR-53 | 50 | 40 | 28.7 | 41.3 | L53 5B**INT-FC |
| HS50-LNFR-53 | 63 | 50 | 32.7 | 41.3 | L53 5B**INT-FC |

## SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS**-LNFR-53 | NL-56 | TC-250 | STC-11 | 1/8HEX |

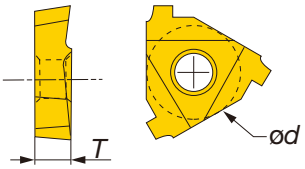
## Shank

| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

## Full-profile insert (Single-sided)

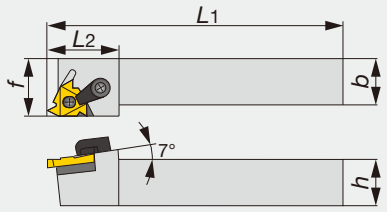



| Connection | TPI | Taper | | External insert | | | | Internal insert | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | Designation | Grade Coated AH725 | ød | T | Designation | Grade Coated AH725 | ød | T |
| API Buttress | 5 | 1/16 | 0.75 | **L53 5B75 EXT-FC** | ● | 15.875 | 4.8 | **L53 5B75 INT-FC** | ● | 15.875 | 4.8 |
| | 5 | 1/12 | 1 | **L53 5B1 EXT-FC** | ● | 15.875 | 4.8 | **L53 5B1 INT-FC** | ● | 15.875 | 4.8 |

● : Line up

# MTVNR/L-54

External threading toolholder for laydown double-side inserts




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | *f* | Insert |
|---|---|---|---|---|---|---|
| MTVNR-3232M54 | 32 | 32 | 178 | 39 | 38.1 | LDS 54**FT-CB#... |

## SPARE PARTS

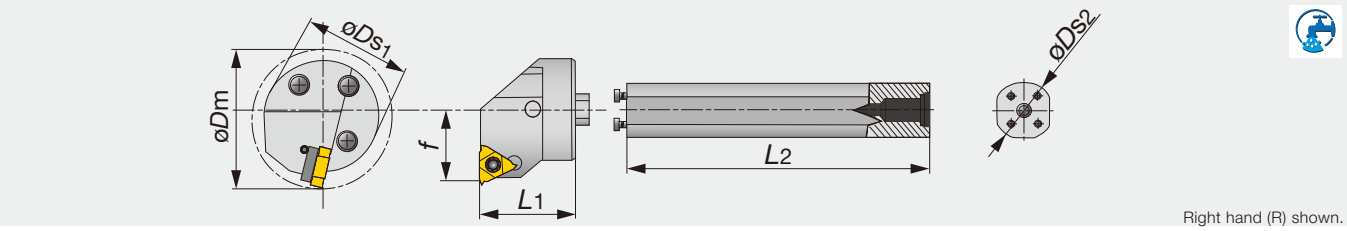
| Designation | Shim | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|---|
| MTVNR-3232M54 | LS53NOFORMEXT | NL-58 | TC-250 | STC-11 | 1/8HEX |



MTVNR/L-54: Inserts → **B430**

# HS-LNFR/L-54API

Exchangeable internal threading heads for laydown double-side inserts




Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-LNFR-54API | 50 | 40 | 27 | 32 | LDS 54**FT-CB#... |
| HS50-LNFR-54API | 63 | 50 | 35 | 40 | LDS 54**FT-CB#... |

## SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS40-LNFR-54API | H410-1 | TC-250 | STC-11 | 1/8HEX |
| HS50-LNFR-54API | NL-56 | TC-250 | STC-11 | 1/8HEX |

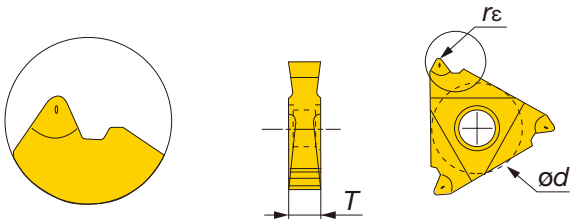
## Shank

| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

## Full-profile insert (Double-sided)

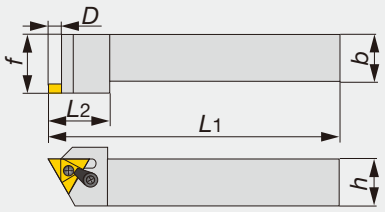



| Connection | TPI | Thread form | Taper mm/mm | Taper TPF | Designation | Grade Coated AH725 | ød | T | rε |
|---|---|---|---|---|---|---|---|---|---|
| API Rotary shoulder connection | 5 | V-0.040 | 1/4 | 3 | **LDS 54 530 FT-CB #5** | ● | 15.875 | 6.4 | 0.51 |
| | 4 | V-0.038R | 1/6 | 2 | **LDS 54 428 FT-CB #1** | ● | 15.875 | 6.4 | 0.97 |
| | 4 | V-0.038R | 1/4 | 3 | **LDS 54 438 FT-CB #2** | ● | 15.875 | 6.4 | 0.97 |
| | 4 | V-0.050 | 1/6 | 2 | **LDS 54 425 FT-CB #3** | ● | 15.875 | 6.4 | 0.64 |
| | 4 | V-0.050 | 1/4 | 3 | **LDS 54 435 FT-CB #4** | ● | 15.875 | 6.4 | 0.64 |

● : Line up

# MTVOR/L

## External multi-clamp toolholders for on edge inserts




Right hand (R) shown.

| Designation | *h* | *b* | $L_1$ | $L_2$ | *f* | D | Insert |
|---|---|---|---|---|---|---|---|
| MTVOR-2525M4 | 25 | 25 | 152 | 31 | 31.7 | 5.8 | TNM*43... |
| MTVOR-3232M4 | 32 | 32 | 178 | 31 | 38.1 | 5.8 | TNM*43... |
| MTVOR-2525M5 | 25 | 25 | 152 | 36 | 31.7 | 7.3 | TNM*54... |
| MTVOR-3232M5 | 32 | 32 | 178 | 36 | 38.1 | 7.3 | TNM*54... |

Note: For TNMC inserts, STVOR/L toolholder is recommended. Also, M-Type toolholder is available.

### SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| MTVOR-**M4 | NL-44 | TC-190 | STC-5 | 3/32HEX |
| MTVOR-**M5 | NL-56 | TC-250 | STC-11 | 1/8HEX |

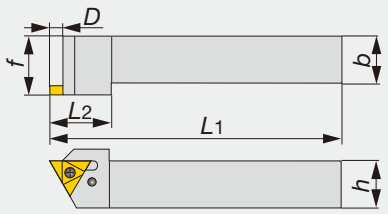


MTVOR/L: Inserts → **B433**

# TUNGTHREAD

## STVOR/L

External screw-on toolholders for on edge inserts




Right hand (R) shown.

| Designation | h | b | L1 | L2 | f | D | Insert |
|---|---|---|---|---|---|---|---|
| STVOR-2525M4 | 25 | 25 | 152 | 31 | 31.7 | 5.8 | TNMC43... |
| STVOR-3232M4 | 32 | 32 | 178 | 31 | 38.1 | 5.8 | TNMC43... |
| STVOR-2525M5 | 25 | 25 | 152 | 36 | 31.7 | 7.3 | TNMC54... |
| STVOR-3232M5 | 32 | 32 | 178 | 36 | 38.1 | 7.3 | TNMC54... |

### SPARE PARTS

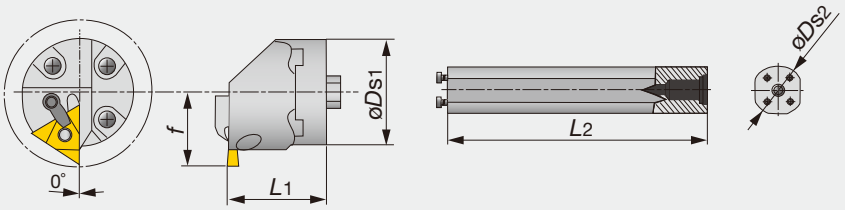
| Designation | Clamping screw | Clamp | Clamping screw | Wrench | |
|---|---|---|---|---|---|
| STVOR-**M4 | SD2 | (TC-190) | (STC-9) | T-20TORX | 3/32HEX |
| STVOR-**M5 | SD3 | (TC-250) | (STC-11) | T-20TORX | 1/8HEX |

Clamp and clamping screw are option parts.

# TUNGTHREAD

## HS-MTHOR/L

Exchangeable internal threading heads, for on edge insert, applicable on S-570 shanks




Right hand (R) shown.

| Designation | øDm | øDs1 | f | L1 | Insert |
|---|---|---|---|---|---|
| HS40-MTHOR-4 | 66.7 | 40 | 25.9 | 32 | TNM*43... |
| HS50-MTHOR-4 | 73 | 50 | 35.9 | 40 | TNM*43... |
| HS40-MTHOR-5 | 81.3 | 40 | 30.6 | 32 | TNM*54... |
| HS50-MTHOR-5 | 82.6 | 50 | 35.9 | 40 | TNM*54... |

### SPARE PARTS

| Designation | Lock pin | Clamp | Clamping screw | Wrench |
|---|---|---|---|---|
| HS**-MTHOR-4 | NL-44 | TC-190 | STC-5 | 3/32HEX |
| HS**-MTHOR-5 | NL-56 | TC-250 | STC-11 | 1/8HEX |

### Shank

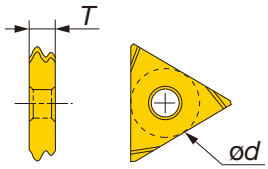
| Designation | øDs2 | L2 |
|---|---|---|
| S-570-40M-40 | 40 | 273 |
| S-570-50M-50 | 50 | 366 |

### SPARE PARTS

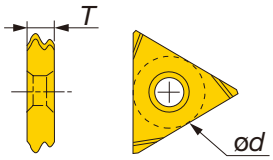
| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4EX |

STVOR/L, HS-MTHOR/L: Inserts → **B433**

## Full profile insert and partial topping insert




TNMA



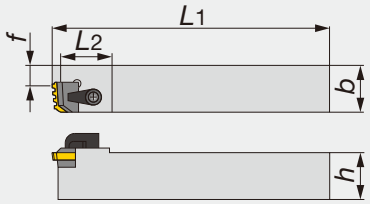

TNMC

| Connection | TPI | Taper | | External insert | | | | Internal insert | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | Designation | Grade Coated AH725 | ød | T | Designation | Grade Coated AH725 | ød | T |
| API Round | 10 | 1/16 | 0.75 | **TNMA 43 10RD EXT** | ● | 12.7 | 4.8 | **TNMA 43 10RD INT** | ● | 12.7 | 4.8 |
| | 8 | 1/16 | 0.75 | **TNMA 43 8RD EXT** | ● | 12.7 | 4.8 | **TNMA 43 8RD INT** | ● | 12.7 | 4.8 |
| API Buttress | 5 | 1/12 | 1 | **TNMA 54 5B1 EXT-FC** | ● | 15.875 | 6.4 | **TNMA 54 5B1 INT-FC** | ● | 15.875 | 6.4 |
| | 5 | 1/16 | 0.75 | **TNMA 54 5B75 EXT-FC** | ● | 15.875 | 6.4 | **TNMA 54 5B75 INT-FC** | ● | 15.875 | 6.4 |
| ACME (29° Trapezoid) | 16 | - | - | **TNMA43NT16PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMA43NT14PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMA43NT12PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMA43NT10PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMA43NT8PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMA43NT6PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMA54NT5PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMA54NT4PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMA54NT3PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| STUB ACME (29° Trapezoid) | 16 | - | - | **TNMA43NT16PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMA43NT14PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMA43NT12PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMA43NT10PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMA43NT8PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMA43NT6PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMA54NT5PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMA54NT4PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMA54NT3PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| API Round | 10 | 1/16 | 0.75 | **TNMC 43 10RD EXT** | ● | 12.7 | 4.8 | **TNMC 43 10RD INT** | ● | 12.7 | 4.8 |
| | 8 | 1/16 | 0.75 | **TNMC 43 8RD EXT** | ● | 12.7 | 4.8 | **TNMC 43 8RD INT** | ● | 12.7 | 4.8 |
| API Buttress | 5 | 1/12 | 1 | **TNMC 54 5B1 EXT-FC** | ● | 15.875 | 6.4 | **TNMC 54 5B1 INT-FC** | ● | 15.875 | 6.4 |
| | 5 | 1/16 | 0.75 | **TNMC 54 5B75 EXT-FC** | ● | 15.875 | 6.4 | **TNMC 54 5B75 INT-FC** | ● | 15.875 | 6.4 |
| ACME (29° Trapezoid) | 16 | - | - | **TNMC43NT16PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMC43NT14PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMC43NT12PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMC43NT10PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMC43NT8PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMC43NT6PEXT-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMC54NT5PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMC54NT4PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMC54NT3PEXT-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| STUB ACME (29° Trapezoid) | 16 | - | - | **TNMC43NT16PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 14 | - | - | **TNMC43NT14PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 12 | - | - | **TNMC43NT12PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 10 | - | - | **TNMC43NT10PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 8 | - | - | **TNMC43NT8PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 6 | - | - | **TNMC43NT6PSTUBE-PT** | ● | 12.7 | 4.8 | - | - | - | - |
| | 5 | - | - | **TNMC54NT5PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 4 | - | - | **TNMC54NT4PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |
| | 3 | - | - | **TNMC54NT3PSTUBE-PT** | ● | 15.875 | 6.4 | - | - | - | - |

• For ACME and STUB-ACME inserts can cut crest radius. Crest flat of ACME and STUB-ACME have to cut by another tool.

● : Line up

# TUNGTHREAD
## CLVOR
External toolholders for the chaser inserts



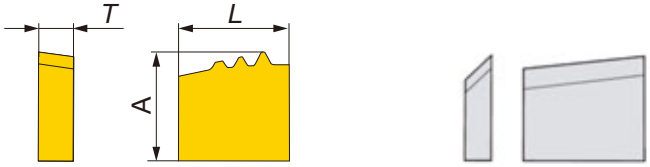

Right-hand (R) shown.

| Designation | f | L1 | L2 | h | b | Insert |
|---|---|---|---|---|---|---|
| CLVOR-25M6 | 16.1 | 177.8 | 32 | 25 | 25 | CR-8R/10R/11.5NPT/8NPT-3E/4E |
| CLVOR-32M6 | 16.1 | 177.8 | 32 | 32 | 32 | CR-8R/10R/11.5NPT/8NPT-3E/4E |
| CLVOR-40M8 | 29.8 | 179.1 | 32 | 40 | 40 | CR-5B75-4E |

### SPARE PARTS

| Designation | Shim | Shim screw | Clamp | Clamping screw | Wrench | | |
|---|---|---|---|---|---|---|---|
| CLVOR-25M6 | TF1207 | SF80 | TC-311 | STC-4 | T-25TORX | - | 5/32HEX |
| CLVOR-32M6 | TF1207 | SF85 | TC-311 | STC-4 | T-25TORX | - | 5/32HEX |
| CLVOR-40M8 | TF8132-E | SF60 | TC-311 | STC-4 | - | T-20TORX | 5/32HEX |

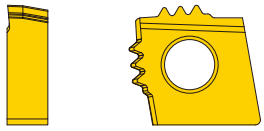
### Full profile insert (chaser)




| Connection | TPI | Taper mm/mm | Taper TPF | Designation | AH725 | L | A | T | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3E** | ● | 16 | 15 | 5.2 | CR-8R / 10R-3E / 4E-CB |
| | 10 | 1/16 | 0.75 | **CR-10R-3E** | ● | 16 | 15.9 | 5.2 | CR-8R / 10R-3E / 4E-CB |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-4E** | ● | 20.4 | 15.9 | 5.1 | CR-5B75 / 5B1-4E-CB |
| NPT | 11.5 | 1/16 | 0.75 | **CR-11.5NPT-4E** | ● | 15.9 | 15.7 | 4.76 | CR-8R / 10R-3E / 4E-CB |
| | 8 | 1/16 | 0.75 | **CR-8NPT-4E** | ● | 15.9 | 15.7 | 5.2 | CR-8R / 10R-3E / 4E-CB |

# TUNGTHREAD
## CNGA-3E
API Round & buttress chaser insert with 2 corners for turning

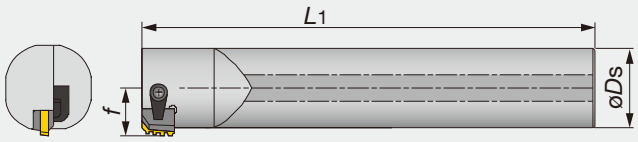
### Full profile insert (chaser)



| Connection | TPI | Taper mm/mm | Taper TPF | Designation | AH725 |
|---|---|---|---|---|---|
| API Round | 10 | 1/16 | 0.75 | **CNGA-10R-3E** | ● |
| | 8 | 1/16 | 0.75 | **CNGA-8R-3E** | ● |
| API Buttress | 5 | 1/16 | 0.75 | **CNGA-5B75-3E** | ● |

Note: Toolholder should be designed and ordered individualy.

● : Line up



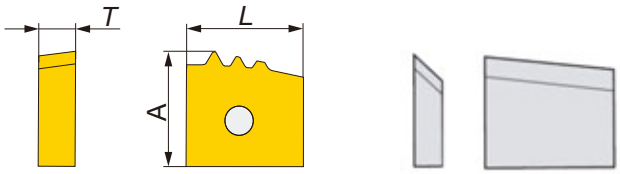

Right-hand (R) shown.

| Designation | øDm | øDs | f | L1 | Insert |
|---|---|---|---|---|---|
| SI-CLHOR-40M6 | 50.8 | 40 | 23.16 | 400 | CR-**I |

## SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| SI-CLHOR-40M6 | TC-311 | STC-8 | 5/32HEX |

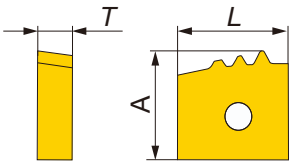
## Full profile insert (chaser)



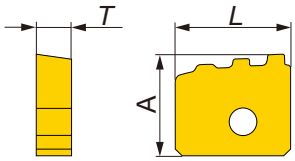

| Connection | TPI | Taper mm/mm | Taper TPF | Designation | AH725 | L | A | T | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3I** | ● | 16 | 15 | 5.1 | CR-8R / 10R-3I / 4I-CB |
| | 10 | 1/16 | 0.75 | **CR-10R-3I** | ● | 16 | 15.9 | 5.1 | CR-8R / 10R-3I / 4I-CB |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-3I** | ● | 16 | 14.7 | 5.2 | CR-8R / 10R-3I / 4I-CB |
| NPT | 11.5 | 1/16 | 0.75 | **CR-11.5NPT-4I** | ● | 15.9 | 15.7 | 4.76 | CR-8R / 10R-3I / 4I-CB |
| | 8 | 1/16 | 0.75 | **CR-8NPT-4I** | ● | 15.9 | 15.7 | 5.2 | CR-8R / 10R-3I / 4I-CB |



● : Line up




API Round




API Buttress

| Connection | TPI | Taper | | Designation | AH725 | *L* | A | *T* | Breakerpiece |
|---|---|---|---|---|---|---|---|---|---|
| | | mm/mm | TPF | | | | | | |
| API Round | 8 | 1/16 | 0.75 | **CR-8R-3E #1** | ● | 16 | 14.7 | 5.2 | TD39318R-1-CBW/CAVITY |
| | 8 | 1/16 | 0.75 | **CR-8R-3E #2** | ● | 16 | 14.9 | 5.2 | TD39328R-2-CBW/CAVITY |
| | 8 | 1/16 | 0.75 | **CR-8R-3E #3** | ● | 16 | 15 | 5.2 | TD39338R-3-CBW/CAVITY |
| API Buttress | 5 | 1/16 | 0.75 | **CR-5B75-3E #1** | ● | 17 | 14.6 | 5.2 | TD46015B75-1-CBW/CAVITY |
| | 5 | 1/16 | 0.75 | **CR-5B75-3E #2** | ● | 17 | 14.8 | 5.2 | TD46025B75-2-CBW/CAVITY |
| | 5 | 1/16 | 0.75 | **CR-5B75-3E #3** | ● | 17 | 15 | 5.2 | TD46035B75-3-CBW/CAVITY |



● : Line up

MEMO

# GrooveLine

CT-110
EFPL-4-045055 8293738
CTBU25-045-4/5 8296043
STCR 2525-27
LOCK
STCL1212X18
5962299 JSXXL1212X09

# PARTING, GROOVING & GROOVE-TURN SYSTEM

## Parting, Grooving & Groove-Turn System

C002

# GrooveLine - Parting, Grooving & Groove-Turn System

## TETRAFORCECUT

C041

4-cornered inserts with good clamping rigidity for highly precise grooving and parting

*W* = 0.5 - 3.18 mm

## TETRAMINICUT

C049

Unique insert geometry for highly precise grooving

*W* = 0.33 - 3.0 mm

## DUOJUSTCUT

C009

Innovative clamping system for stable parting operations

*W* = 1.0 - 2.0 mm

## EASYMULTICUT

C111

Multi-functional tool series for parting, grooving, and turning

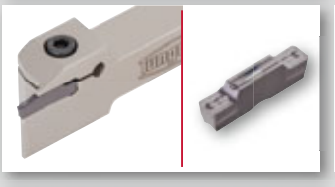
*W* = 4.0 - 6.0 mm

## TUNGHEAVYGROOVE

C123

Highly rigid clamping system for wide grooving and profiling in one pass

*W* = 10 - 25 mm



## TUNGCUT

C053

Multi-functional tool series for various grooving operations

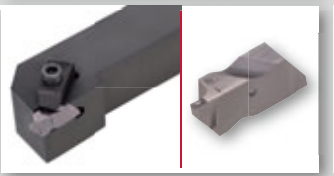
*W* = 1.4 - 8.0 mm

## MY-T SERIES

C086

Variety tool series for a wide range of grooving and parting operations

*W* = 2.0 - 8.0 mm

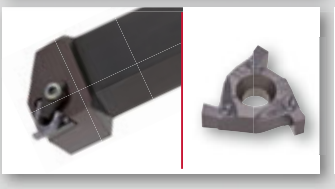


## TUNGT-CLAMP

C021

G-class inserts with precisely designed chipbreaker for grooving

*W* = 1.0 - 3.0 mm



## GTGNTYPE

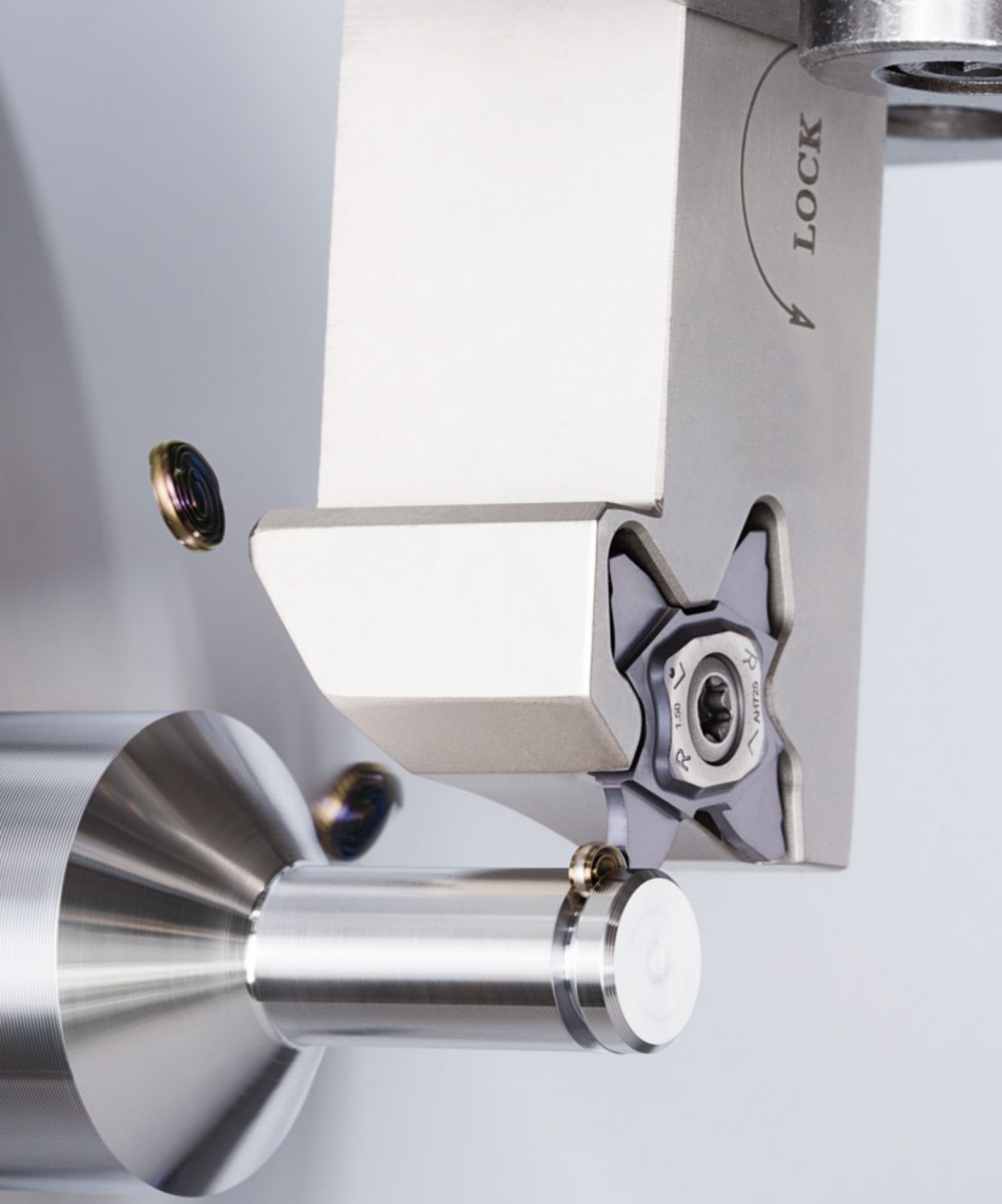
C038

3-cornered inserts for grooving

*W* = 1.0 - 2.25 mm

## Other Grooving & Parting Tool

C014



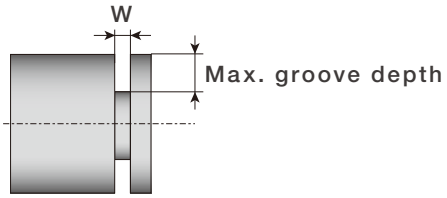

TetraForce-Cut

# External Grooving - Quick Guide

## Max. groove depth: 6.4 mm

| Series | W (mm) | Max. groove depth (mm) | |
|---|---|---|---|
| TetraMini-Cut | 0.33 | 0.8 | C049 |
| | 0.43 - 0.5 | 1.2 | |
| | 0.75 - 1.75 | 2 | |
| | 2 - 3 | 2.5 | |
| JTGR/L | 0.33 | 0.7 | C018 |
| | 0.43 - 0.5 | 1.1 | |
| | 0.65 - 0.95 | 1.9 | |
| | 1 - 1.8 | 2.1 | |
| | 2 - 3 | 2.6 | |
| GBR/L32 | 0.33 | 0.8 | C033 |
| | 0.5 | 1.2 | |
| | 0.75 - 1.5 | 2 | |
| | 2 - 2.5 | 2.5 | |
| GBR/L43 | 1.25 - 1.45 | 2 | C033 |
| | 1.5 - 2.3 | 3.5 | |
| | 2.5 - 4.5 | 5 | |
| GX-R/LE | 1 | 1.5 | C030 |
| | 1.5 | 2.3 | |
| | 2 | 3 | |
| | 2.5 | 3.8 | |
| | 3 | 4.5 | |
| | 3.5 | 5.3 | |
| | 4 - 4.5 | 6 | |
| TetraForce-Cut | 0.5 - 0.75 | 2.5 | C041 |
| | 0.8 | 1.6 | |
| | 1 - 1.25 | 3.5 | |
| | 1.4 | 2 | |
| | 1.47 | 2.5 | |
| | 1.5 | 5.7 | |
| | 1.57 - 1.96 | 3 | |
| | 2 | 6.4 | |
| | 2.22 - 2.3 | 3.5 | |
| | 2.39 - 2.5 | 5.7 | |
| | 2.7 - 2.87 | 6.2 | |
| | 3 - 3.18 | 6.4 | |

First choice
Available

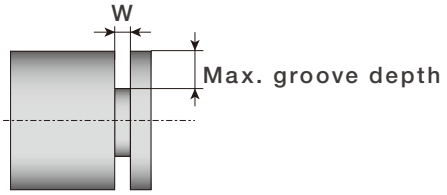


# External Grooving - Quick Guide

## Max. groove depth: 50 mm

| Series | W (mm) | Max. groove depth (mm) | |
|---|---|---|---|
| MY-T FLEX | 3 | 10 | C104 |
| | 4 | 12 | |
| | 5 | 14 | |
| CTD | 3 - 4 | 14 | C106 |
| | 5 | 20 | |
| MY-T CGD | 2 | 16 | C102 |
| | 3 - 8 | 21.6 | |
| MY-T G series | 2 | 16 | C086 |
| | 3 | 22 | |
| | 4 - 5 | 25 | |
| TungCut | 1.4 | 16 | C053 |
| | 2 | 17 | |
| | 3 - 4 | 25 | |
| | 5 - 6 | 25 / 32 | |
| | 8 | 35 | |
| EasyMulti-Cut | 4 | 25 / 30 | C111 |
| | 5 | 25 / 32 | |
| | 6 | 25 / 35 | |
| TungHeavy Groove | 10 | 36 | C123 |
| | 15 | 40 | |
| | 20 | 40 | |
| | 25 | 50 | |

First choice
Available

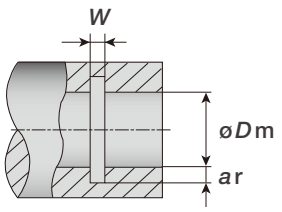


# Internal Grooving - Quick Guide

| Series | W (mm) | ar (mm) | øDm (mm) | |
|---|---|---|---|---|
| SNG | 1 - 2 | 1.5 | 8 – 25 | C025 |
| | 1.5 - 3.5 | 2 | 14 – 25 | |
| | 1.5 - 3.5 | 3 | 20 – 25 | |
| EasyMulti-Cut | 4 | 6 | 20 – 25 | C111 |
| | | 9 | 25 | |
| | | 11 | 32 | |
| | 5 | 11 | 40 | |
| | 6 | 11 | 40 | |
| TungCut | 2 | 6 | 25 | C053 |
| | | 8 | 25 | |
| | 3 | 6 | 25 | |
| | | 5.1 | 25 | |
| | | 8 | 32 | |
| | | 10 | 40 | |
| | 4 | 6 | 25 | |
| | | 8 | 32 | |
| | | 4 | 31 | |
| | | 10 | 40 | |
| | 5 | 5 | 31 | |
| | | 10 | 40 | |
| | 6 | 4 | 31 | |
| | | 10 | 40 | |
| | 8 | 5 | 37 | |
| | | 5.8 | 42 | |
| MY-T G series | 3 | 3.5 | 25 | C086 |
| | | 5 | 32 | |
| | 4 | 5 | 32 | |
| | | 6 | 40 | |
| | 5 | 5 | 32 | |
| | | 6 | 40 | |
| GBR/L32 | 0.33 | 0.8 | 32 | C034 |
| | 0.5 | 1.2 | 32 | |
| | 0.75-2.5 | 2 | 32 | |



First choice
Available

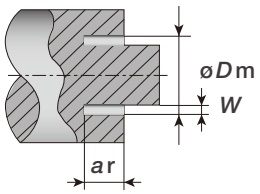


# Face Grooving - Quick Guide



| Series | W (mm) | ar (mm) | øD (mm) 50 | 100 | 150 | 200 | 250 | 300 | 400 | 500 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FGC | 3 | 10 | 30 | 120 | | | | | | | C128 |
| | 4 | 10 | 30 | 120 | | | | | | | |
| | | 20 | 30 | 120 | | | | | | | |
| | 5 | 12 | 30 | 120 | | | | | | | |
| | | 22 | 30 | 120 | | | | | | | |
| | 6 | 14 | 40 | 120 | | | | | | | |
| | 8 | 16 | 60 | 120 | | | | | | | |
| TungCut | 3 | 10 | 30 | 50 | | | | | | | C053 |
| | | 12 | 46 | 200 | | | | | | | |
| | | 15 | 50 | 100 | | | | | | | |
| | 4 | 10 | 30 | 36 | | | | | | | |
| | | 12 | 30 | 40 | | | | | | | |
| | | 16 | 58 | 250 | | | | | | | |
| | | 20 | 36 | 200 | | | | | | | |
| | 5 | 20 | 60 | ∞ | | | | | | | |
| | | 25 | 60 | 200 | | | | | | | |
| | 6 | 20 | 60 | 250 | | | | | | | |
| | | 25 | 60 | 400 | | | | | | | |
| MY-T G series | 3 | 10 | 30 | 500 | | | | | | | C086 |
| | | 14 | 30 | 500 | | | | | | | |
| | 4 | 14 | 35 | 500 | | | | | | | |
| | | 22 | 35 | 500 | | | | | | | |
| | 5 | 14 | 35 | 500 | | | | | | | |
| | | 22 | 35 | 500 | | | | | | | |
| EasyMulti-Cut | 4 | 50 | 30 | 75 | | | | | | | C111 |
| | | 65 | 75 | 500 | | | | | | | |
| | 5 | 50 | 35 | 75 | | | | | | | |
| | | 65 | 75 | 500 | | | | | | | |
| | 6 | 50 | 45 | 75 | | | | | | | |
| | | 65 | 75 | 500 | | | | | | | |
| GX-F | 1 | 1.5 | 55 | ∞ | | | | | | | C032 |
| | 1.5 | 2.3 | 55 | ∞ | | | | | | | |
| | 2 | 3 | 55 | ∞ | | | | | | | |
| | 2.5 | 3.8 | 55 | ∞ | | | | | | | |
| | 3 | 4.5 | 55 | ∞ | | | | | | | |
| | 3.5 | 5.3 | 55 | ∞ | | | | | | | |
| | 4 - 4.5 | 6 | 55 | ∞ | | | | | | | |

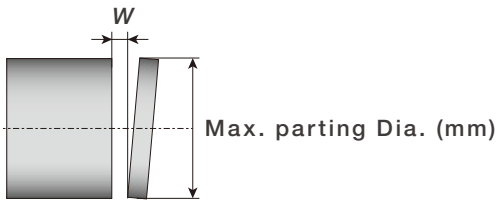
First choice
Available



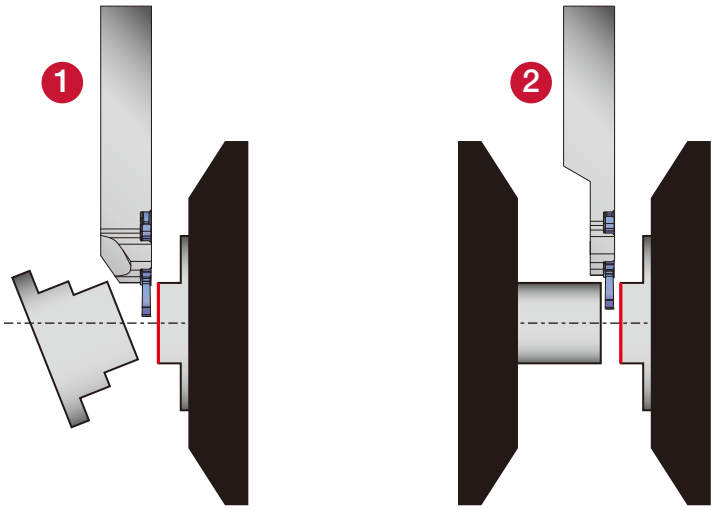
# Parting off - Quick Guide

| Series | W (mm) | Max. parting Dia. (mm) (10 / 20 / 40 / 60 / 80 / 100 / 200) | |
|---|---|---|---|
| TetraForce-Cut | 0.5 - 0.75 | 5 | C041 |
| | 0.8 | 3.2 | |
| | 1 - 1.25 | 5 | |
| | 1.4 | 4 | |
| | 1.47 | 5 | |
| | 1.5 | 11.4 | |
| | 1.57 - 1.96 | 6 | |
| | 2 | 12.8 | |
| | 2.2 - 2.3 | 7 | |
| | 2.39 - 2.5 | 11.4 | |
| | 2.7 - 2.87 | 12.4 | |
| | 3 - 3.18 | 12.8 | |
| DuoJust-Cut | 1 | 6 | C009 |
| | 1.5 | 16 | |
| | 2 | 16 | |
| MY-T | 2 | 50 | C086 |
| | 3 | 100 | |
| | 4 | 100 | |
| | 5 | 120 | |
| TungCut | 1.4 | 29 | C053 |
| | 2 | 12.8 / 50 | |
| | 3 | 12.8 / 100 | |
| | 4 | 50 / 120 | |
| | 5 | 50 / 120 | |
| | 6 | 50 / 120 | |
| | 8 | 80 | |
| EasyMulti-Cut | 4 | 50 / 100 | C111 |
| | 5 | 50 / 120 | |
| | 6 | 50 / 120 | |

First choice
Available



# Great cutting performance in **various parting-off operations**




**1 JSXXR/L**
*W* = 1 - 2 mm
Max. parting Dia.:
16 mm
Shank size:
10 - 20 mm
C010

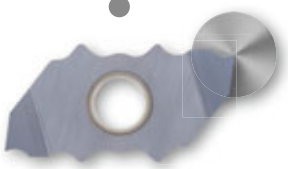
**2 JSXXR/L - S**
*W* = 1 - 2 mm
Max. parting Dia.:
16 mm
Shank size:
10 - 12 mm
C010

**3 types of inserts** are available for different parting-off diameters can be mounted **in the same pocket of all the toolholders.**

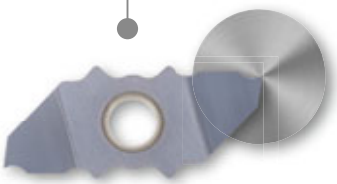
- Optimized overhang length for **stable machining**

Regular-type toolholder

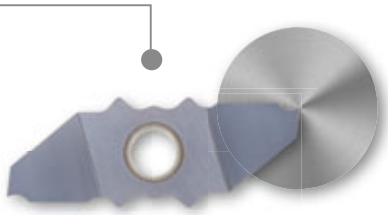
Toolholder for sub-spindle



**JXPG06**
Max. parting-off dia.
**ø6 mm**
C011



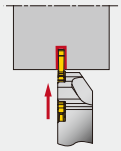
**JXPG12**
Max. parting-off dia.
**ø12 mm**
C011

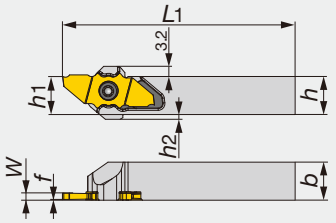


**JXPG16**
Max. parting-off dia.
**ø16 mm**
C011

# JSXXR/L

## Parting off tool for swiss lathes






Right hand (R) shown.

| Designation | W | h | b | f | L1* | h1 | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| JSXXR/L1010X09 | 1 - 2 | 10 | 10 | 0.2 | ≤120 | 10 | 3 | JXPG06...,12...,16... |
| JSXXR/L1212F09 | 1 - 2 | 12 | 12 | 0.2 | ≤85 | 12 | 1.5 | JXPG06...,12...,16... |
| JSXXR/L1212X09 | 1 - 2 | 12 | 12 | 0.2 | ≤120 | 12 | 1.5 | JXPG06...,12...,16... |
| JSXXR/L1616X09 | 1 - 2 | 16 | 16 | 0.2 | ≤120 | 16 | - | JXPG06...,12...,16... |
| JSXXR/L2020H09 | 1 - 2 | 20 | 20 | 0.2 | ≤100 | 20 | - | JXPG06...,12...,16... |

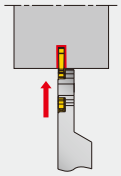
* "*L*1" is calculated with JXPG16*** insert. When JXPG12*** insert is used, "*L*1" is shorter 2 mm.
When JXPG06*** insert is used, "*L*1" is shorter 4 mm.
Note: The right hand insert (JXPG**R***) is used for the right hand toolholders (JSXXR***), and the left hand insert (JXPG**L***) is used for the left hand toolholders (JSXXL***).

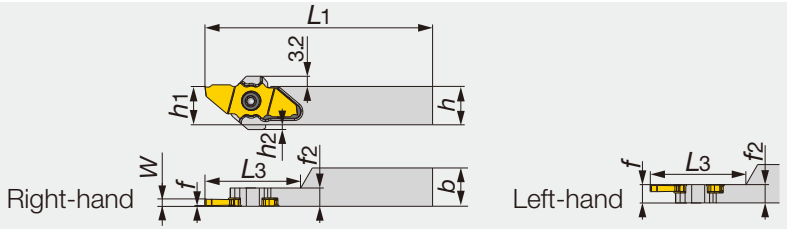
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXXR... | CSTC-4L100DL | T-1008/5 |
| JSXXL... | CSTC-4L100DR | T-1008/5 |

# JSXXR/L-S

## Parting off tool for sub spindle in swiss lathes






| Designation | W | h | b | f | L1* | L3* | h1 | h2 | f2 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| JSXXR/L1010X09-S | 1 - 2 | 10 | 10 | 0.2/5.5 | ≤120 | ≤26 | 10 | 3 | 5.7 | JXPG06...,12...,16... |
| JSXXR/L1212F09-S | 1 - 2 | 12 | 12 | 0.2/5.5 | ≤85 | ≤26 | 12 | 1.5 | 5.7 | JXPG06...,12...,16... |
| JSXXR/L1212X09-S | 1 - 2 | 12 | 12 | 0.2/5.5 | ≤120 | ≤30 | 12 | 1.5 | 5.7 | JXPG06...,12...,16... |

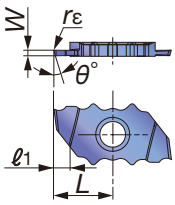
* "*L*1" and "*L*3" are calculated with JXPG16*** insert. When JXPG12*** insert is used, "*L*1" and "*L*3" are 2 mm shorter.
When JXPG06*** insert is used, "*L*1" and "*L*3" are 4 mm shorter.
Note: The right-hand insert (JXPG**R***) is used for the right-hand toolholder (JSXXR***), and the left-hand insert (JXPG**L***) is used for the left-hand toolholder (JSXXL***).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXXR*****09-S | CSTC-4L055DL | T-1008/5 |
| JSXXL*****09-S | CSTC-4L055DR | T-1008/5 |

# INSERT

## JXPG06R/L-F (sharp edge)

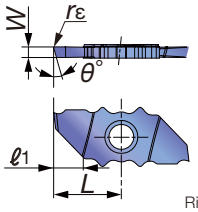



Right hand (R) shown.

| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG06R/L10F | 1 | 0.05 | ● | ● | 6 | 10.5 | 0 | 2.65 |
| JXPG06R/L15F | 1.5 | 0.05 | ● | ● | 6 | 10.5 | 0 | 2.65 |
| JXPG06R/L10F-15 | 1 | 0.05 | ● | ● | 6 | 10.5 | 15 | 2.65 |
| JXPG06R/L15F-15 | 1.5 | 0.05 | ● | ● | 6 | 10.5 | 15 | 2.65 |

● : Line up
*D*max: Max. parting off dia

## JXPG12R/L-F (sharp edge)

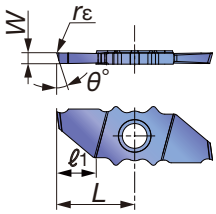



Right hand (R) shown.

| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG12R/L15F | 1.5 | 0.05 | ● | ● | 12 | 12.5 | 0 | 5.23 |
| JXPG12R/L20F | 2 | 0.05 | ● | ● | 12 | 12.5 | 0 | 5.23 |
| JXPG12R/L15F-15 | 1.5 | 0.05 | ● | ● | 12 | 12.5 | 15 | 5.23 |
| JXPG12R/L20F-15 | 2 | 0.05 | ● | ● | 12 | 12.5 | 15 | 5.23 |

● : Line up
*D*max: Max. parting off dia

## JXPG16R/L-F (sharp edge)




Right hand (R) shown.

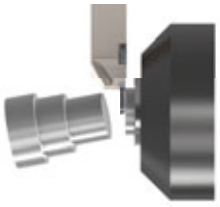
| Designation | W±0.025 | rε | SH725 R | SH725 L | Dmax | L | θ° | ℓ1 |
|---|---|---|---|---|---|---|---|---|
| JXPG16R/L15F | 1.5 | 0.05 | ● | ● | 16 | 14.5 | 0 | 6.96 |
| JXPG16R/L20F | 2 | 0.05 | ● | ● | 16 | 14.5 | 0 | 6.96 |
| JXPG16R/L15F-15 | 1.5 | 0.05 | ● | ● | 16 | 14.5 | 15 | 6.96 |
| JXPG16R/L20F-15 | 2 | 0.05 | ● | ● | 16 | 14.5 | 15 | 6.96 |

● : Line up
*D*max: Max. parting off dia

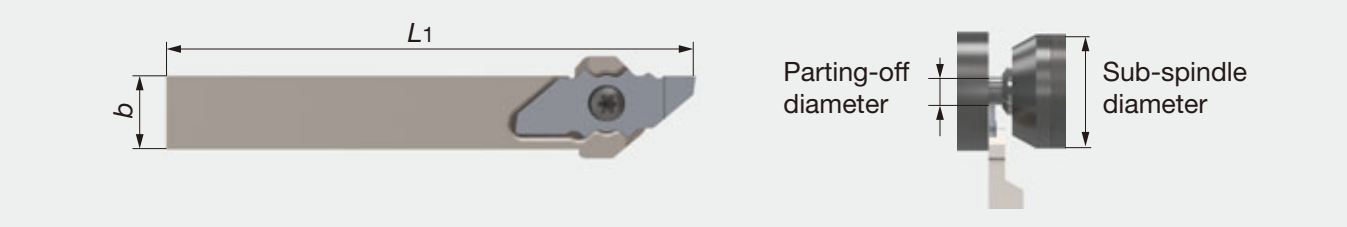
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Low carbon steels<br>C15, C20, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| | Carbon steels, Alloy steels<br>C55, 42CrMoS4, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| | Free cutting steels<br>SUH22, SUH23, X50CrSi8 2, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH725 | 50 - 200 | 0.01 - 0.05 |
| N | Aluminium alloys<br>A5056, A6061, etc. | SH725 | 150 - 200 | 0.01 - 0.05 |
| | Copper alloy<br>C2600, C280C, etc. | SH725 | 100 - 200 | 0.01 - 0.05 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | SH725 | 30 - 80 | 0.01 - 0.05 |
| | Superalloys<br>Inconel718, etc. | SH725 | 30 - 80 | 0.01 - 0.05 |

## HOW TO SELECT TOOLS

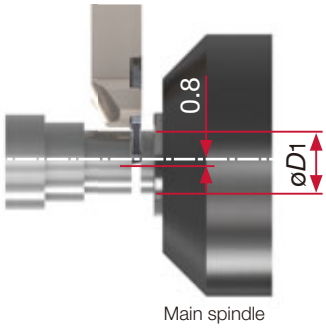
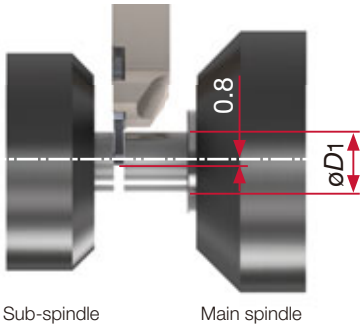
| | Large-diameter machining of workpiece with rigidity | | Small-diameter machining of workpiece with short overhang | |
|---|---|---|---|---|
| | | | Sub-spindle tooling | |
| | Main-spindle tooling | Sub-spindle tooling | Workpiece with long overhang at the side of sub-spindle for the process after parting-off | Short workpiece with low rigitity |
| Application |  <br>Main spindle<br>Position of parting-off is at the side of the main spindle | <br>Sub-spindle Main spindle<br>Position of parting-off is at the side of the sub-spindle | <br>Sub-spindle Main spindle<br>Position of parting-off is at the side of the main spindle | <br>Sub-spindle Main spindle<br>Position of parting-off is at the side of the sub-spindle |
| **Toolholder** | R-hand (JSXXR type) | L-hand (JSXXL type) | R-hand (JSXXR-S type) | L-hand (JSXXL-S type) |
| **Insert** | Right-hand insert with lead angle to remove center core (JXPG**R***-15 type) | Left-hand insert (JXPG**L*** type) | Right-hand insert (JXPG**R*** type) | Left-hand insert (JXPG**L*** type) |

## HOW TO SELECT TOOLHOLDERS FOR SUB-SPINDLE




| Sub-spindle dia. | Max parting-off dia. | Shank size b | Tool length $L_1$ | Insert | Toolholder |
|---|---|---|---|---|---|
| ø40 | ~ ø6 | 10 | 116 | JXPG06... | JSXXR/L1010X09-S |
| ø40 | ~ ø6 | 12 | 81 | JXPG06... | JSXXR/L1212F09-S |
| ø40 | ~ ø12 | 10 | 118 | JXPG12... | JSXXR/L1010X09-S |
| ø40 | ~ ø12 | 12 | 83 | JXPG12... | JSXXR/L1212F09-S |
| ø40 | ~ ø16 | 10 | 120 | JXPG16... | JSXXR/L1010X09-S |
| ø40 | ~ ø16 | 12 | 85 | JXPG16... | JSXXR/L1212F09-S |
| ø50 | ~ ø6 | 12 | 116 | JXPG06... | JSXXR/L1212X09-S |
| ø50 | ~ ø12 | 12 | 118 | JXPG12... | JSXXR/L1212X09-S |
| ø50 | ~ ø16 | 12 | 85 | JXPG16... | JSXXR/L1212F09-S |
| ø50 | ~ ø16 | 12 | 120 | JXPG16... | JSXXR/L1212X09-S |

## MAX. PARTING-OFF DIA. & DEPTH

| Main-spindle tooling | Sub-spindle tooling |
|---|---|
|  |  |

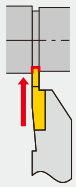


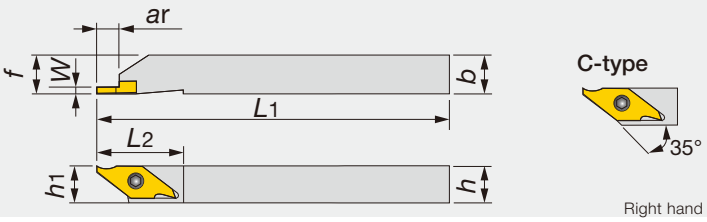
The cutting edge reaches 0.8 mm beyond the center line in parting-off.
$øD_1$ = Max. parting-off dia.

# J-SERIES

## JSVGR/L

External grooving toolholders for swiss lathes






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSVGR/L1010K-C | 0.33 - 2 | 0.7 - 5.5 | 10 | 10 | 125 | 23 | 10 | 10 | JVGR/L... |
| JSVGR/L1212K-C | 0.33 - 2 | 0.7 - 5.5 | 12 | 12 | 125 | 23 | 12 | 12 | JVGR/L... |
| JSVGR/L1616K | 0.33 - 2 | 0.7 - 5.5 | 16 | 16 | 125 | 23 | 16 | 16 | JVGR/L... |

• Recommend clamping torque: 2.3 N•m.

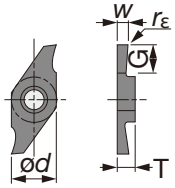
| Designation | Applicable insert |
|---|---|
| JSVGR/L1010K-C | JVGR/L... |
| JSVGR/L1212K-C | JVGR/L... |
| JSVGR/L1616K | JVGR/L... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSVGR/L... | CSTB-3S | T-9F(Optional T-9L) |

## APPLICABLE INSERT

### JVG-type (sharp edge)




Right hand (R) shown.

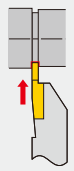
| Designation | $W^{+0.05}_{0}$ | rε | Coated J740 R | Coated J740 L | Coated SH725 R | Coated SH725 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JVGR/L033F | 0.33 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 0.7 |
| JVGR/L050F | 0.5 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.1 |
| JVGR/L075F | 0.75 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.9 |
| JVGR/L095F | 0.95 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 1.9 |
| JVGR/L100F | 1 | 0 | ● | | ● | ● | ● | ● | ● | ● | 7.94 | 3.18 | 5.5 |
| JVGR/L125F | 1.25 | 0 | ● | | ● | ● | | | ● | | 7.94 | 3.18 | 5 |
| JVGR/L150F | 1.5 | 0 | ● | | ● | ● | ● | ● | ● | ● | 7.94 | 3.18 | 5.5 |
| JVGR/L200F | 2 | 0 | ● | | ● | ● | ● | | ● | | 7.94 | 3.18 | 5.5 |

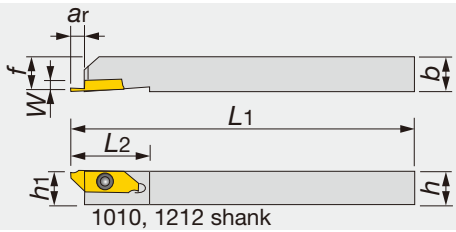
● : Line up

# JSXGR/L

No-offset screw-on toolholder for front & reverse turning & external grooving








without offset
C-type

Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JSXGR/L1010K8-C | 0.7 - 2 | 4.5 - 6 | 10 | 10 | 125 | 29 | 10 | 9.9 | JXG... |
| JSXGR/L1212K8-C | 0.7 - 2 | 4.5 - 6 | 12 | 12 | 125 | 29 | 12 | 11.9 | JXG... |
| JSXGR/L1616K8 | 0.7 - 2 | 4.5 - 6 | 16 | 16 | 125 | 29 | 16 | 15.9 | JXG... |
| JSXGR/L2020K8 | 0.7 - 2 | 4.5 - 6 | 20 | 20 | 125 | 29 | 20 | 19.9 | JXG... |
| JSXGR/L2525K8 | 0.7 - 2 | 4.5 - 6 | 25 | 25 | 125 | 29 | 25 | 24.9 | JXG... |

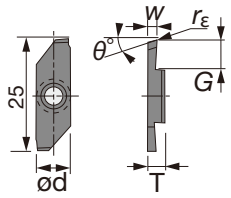
• Can be wrenched from back side with double socket torx screw. •JSXGR/L-type toolholders are used for JXG-type grooving inserts, JXF-type front-turning inserts and JXR-type reverse-turning inserts.

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSXGR/L... | CSTB-4SD | T-8F |

## APPLICABLE INSERT

### JXG-type (with hand and sharp edge)




Right hand (R) shown.

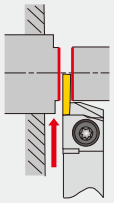
| Designation | W±0.025 | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | ød | T | θ° | G |
|---|---|---|---|---|---|---|---|---|---|---|
| JXGR/L8070FA | 0.7 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8070FA-005 | 0.7 | 0.05 | ● | | | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8100FA | 1 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8100FA-005 | 1 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8100FA45 | 1 | 0 | ● | | ● | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8100FA45-005 | 1 | 0.05 | ● | | | | 8 | 3.97 | 15 | 4.5 |
| JXGR/L8150FA | 1.5 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8150FA-005 | 1.5 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8150FA50 | 1.5 | 0 | ● | | ● | | 8 | 3.97 | 15 | 5 |
| JXGR/L8150FA50-005 | 1.5 | 0.05 | ● | | | | 8 | 3.97 | 15 | 5 |
| JXGR/L8180FA | 1.8 | 0 | ● | | ● | | 8 | 3.97 | 15 | 6 |
| JXGR/L8180FA-005 | 1.8 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FA | 2 | 0 | ● | ● | ● | ● | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FA-005 | 2 | 0.05 | ● | | | | 8 | 3.97 | 15 | 6 |
| JXGR/L8200FN | 2 | 0 | ● | ● | ● | ● | 8 | 3.97 | 0 | 6 |
| JXGR/L8200FN-005 | 2 | 0.05 | ● | | | | 8 | 3.97 | 0 | 6 |

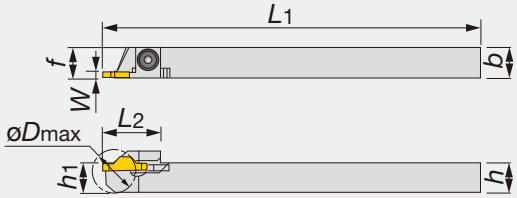
● : Line up

# J-SERIES

## JCCWSR/L

External grooving & parting toolholders for swiss lathes






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCCWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10 | JCC*200... |
| JCCWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 19 | 12 | 12 | JCC*200... |
| JCCWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 19 | 16 | 16 | JCC*200... |
| JCCWSR/L2020K2 | 2 | 20 | 20 | 20 | 125 | 19 | 20 | 20 | JCC*200... |
| JCCWSR/L2525K2 | 2 | 20 | 25 | 25 | 125 | 19 | 25 | 25 | JCC*200... |

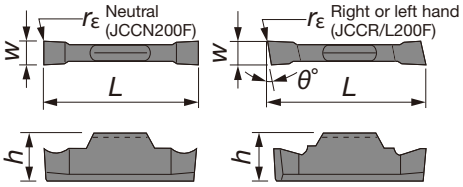
øDmax: Max. parting off dia.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCCWSR/L... | CSTB-4S | T-15F |

## APPLICABLE INSERT

### JCC-type (sharp edge)




Right hand (R) shown.

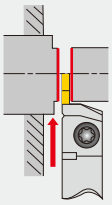
| Designation | W±0.025 | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | h | L | θ° |
|---|---|---|---|---|---|---|---|---|---|
| JCCN200F | 2 | 0 | ● | | ● | | 4.8 | 15 | 0 |
| JCCN200F-005 | 2 | 0.05 | ● | | | | 4.8 | 15 | 0 |
| JCCR/L200F | 2 | 0 | ● | ● | ● | ● | 4.8 | 15 | 15 |
| JCCR/L200F-005 | 2 | 0.05 | ● | ● | | | 4.8 | 15 | 15 |

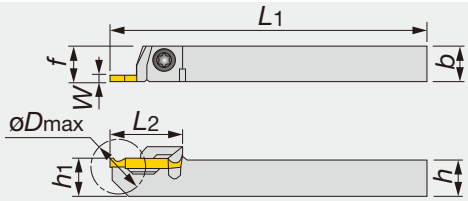
● : Line up

# JCGWSR/L

External grooving & parting toolholders for swiss lathes








Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGWSR/L1010K2 | 2 | 20 | 10 | 10 | 125 | 20 | 10 | 10 | JCGN200F... |
| JCGWSR/L1212K2 | 2 | 20 | 12 | 12 | 125 | 20 | 12 | 12 | JCGN200F... |
| JCGWSR/L1616K2 | 2 | 20 | 16 | 16 | 125 | 20 | 16 | 16 | JCGN200F... |

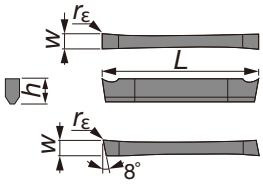
øDmax: Max. parting off dia.

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGWSR/L... | CSTB-4S | T-15F |

## APPLICABLE INSERT

### JCG-type (sharp edge)

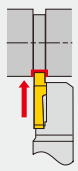



Right hand (R) shown.

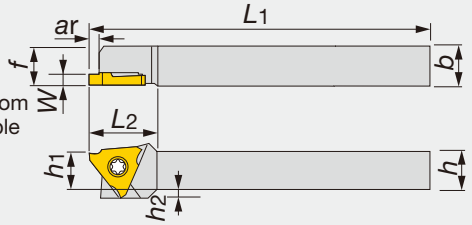
| Designation | W±0.025 | rε | Coated J740 R | Coated J740 L | Uncoated TH10 R | Uncoated TH10 L | h | L |
|---|---|---|---|---|---|---|---|---|
| JCGN200F | 2 | 0.05 | ● | | ● | | 3 | 20 |
| JCGN200FR/L | 2 | 0.05 | ● | ● | ● | ● | 3 | 20 |

● : Line up

# J-SERIES
## JSTGR/L
External grooving toolholders for swiss lathes



Can be wrenched from back side with double socket torx screw.




Right hand (R) shown.

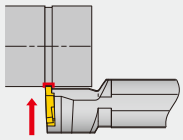
| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f | $h_2$ | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| JSTGR/L1010X3 | 0.33 - 3 | 0.7 - 2.6 | 10 | 10 | 120 | 18.5 | 10 | 10 | 2 | JTGR/L3... |
| JSTGR/L1212F3 | 0.33 - 3 | 0.7 - 2.6 | 12 | 12 | 85 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1212X3 | 0.33 - 3 | 0.7 - 2.6 | 12 | 12 | 120 | 18.5 | 12 | 12 | - | JTGR/L3... |
| JSTGR/L1616X3 | 0.33 - 3 | 0.7 - 2.6 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | JTGR/L3... |
| JSTGL1616K3 | 0.33 - 3 | 0.7 - 2.6 | 16 | 16 | 125 | 18.5 | 16 | 16 | - | JTGR/L3... |

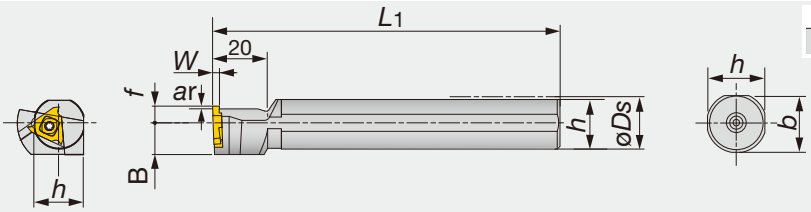
• Recommend clamping torque: 1.2 N·m.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JSTGR/L... | CSTB-4SD | T-8F |

# J-SERIES
## JS-TGL3
External grooving toolholders for swiss lathe, perpendicularly mounted inserts






Left hand (L) shown.

| Designation | W | ar | øDs | f | $L_1$ | h | b | B | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JS19K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 19.05 | 6 | 125 | 18 | 18 | 11.5 | JTGR3... |
| JS20K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 20 | 6 | 125 | 19 | 19 | 11.5 | JTGR3... |
| JS22K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 22 | 6 | 125 | 21 | 21 | 11.5 | JTGR3... |
| JS25K-TGL3 | 0.33 - 3 | 0.7 - 2.6 | 25.4 | 10 | 125 | 24 | 24 | 12.7 | JTGR3... |

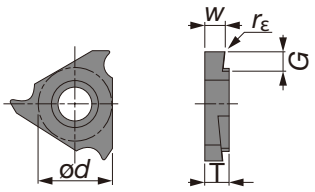
• Left hand toolholders (TGL3) are used with right hand inserts (JTGR3). • Recommend clamping torque: 3.0 Nm-ft.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS***-TGL3 | CSTB-4S | T-15F |

## APPLICABLE INSERT

### JTG-type (sharp edge)



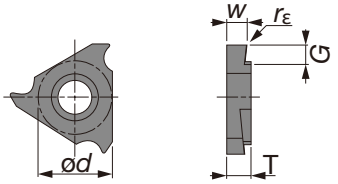

Right hand (R) shown.

| Designation | $W^{+0.05}_{0}$ | rε | Coated | | | | Cermet | | Uncoated | | ød | T | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SH725 | | J740 | | NS9530 | | TH10 | | | | |
| | | | R | L | R | L | R | L | R | L | | | |
| JTGR/L3033F | 0.33 | 0.03 | ● | | ● | ● | | | ● | ● | 9.525 | 3.18 | 0.7 |
| JTGR/L3033F-005 | 0.33 | 0.05 | ● | | | | | | | | 9.525 | 3.18 | 0.7 |
| JTGR/L3043F | 0.43 | 0.03 | | | ● | | | | | | 9.525 | 3.18 | 1.1 |
| JTGR/L3050F | 0.5 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.1 |
| JTGR/L3050F-005 | 0.5 | 0.05 | ● | ● | | | | | | | 9.525 | 3.18 | 1.1 |
| JTGR/L3065F | 0.65 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3065F-010 | 0.65 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3075F | 0.75 | 0.03 | ● | ● | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 1.9 |
| JTGR/L3075F-010 | 0.75 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3080F | 0.8 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3080F-010 | 0.8 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3085F | 0.85 | 0.03 | ● | | ● | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3095F | 0.95 | 0.03 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 1.9 |
| JTGR/L3095F-010 | 0.95 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 1.9 |
| JTGR/L3100F | 1 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3100F-010 | 1 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3110F | 1.1 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3120F | 1.2 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3120F-010 | 1.2 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3125F | 1.25 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3125F-010 | 1.25 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3130F | 1.3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3140F | 1.4 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3140F-010 | 1.4 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3145F | 1.45 | 0.05 | ● | | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3145F-010 | 1.45 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3150F | 1.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3150F-010 | 1.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3175F | 1.75 | 0.05 | ● | | ● | ● | ● | ● | ● | ● | 9.525 | 3.18 | 2.1 |
| JTGR/L3175F-010 | 1.75 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3180F | 1.8 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.1 |
| JTGR/L3200F | 2 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.6 |
| JTGR/L3200F-010 | 2 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3225F | 2.25 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3250F | 2.5 | 0.05 | ● | ● | ● | ● | ● | | ● | ● | 9.525 | 3.18 | 2.6 |
| JTGR/L3250F-010 | 2.5 | 0.1 | ● | ● | | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3275F | 2.75 | 0.05 | | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3300F | 3 | 0.05 | ● | | ● | | | | | | 9.525 | 3.18 | 2.6 |
| JTGR/L3300F-010 | 3 | 0.1 | ● | | | | | | | | 9.525 | 3.18 | 2.6 |

● : Line up

## APPLICABLE INSERT

### JTG-type (with honed edge)




Right hand (R) shown.

| Designation | $W^{+0.05}_{0}$ | rε | J9530 R | J9530 L | ød | T | G |
|---|---|---|---|---|---|---|---|
| JTGR/L3100 | 1 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3125 | 1.25 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3150 | 1.5 | 0.05 | ● | | 9.525 | 3.18 | 2.1 |
| JTGR/L3200 | 2 | 0.05 | ● | | 9.525 | 3.18 | 2.6 |

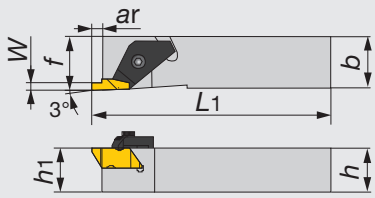
● : Line up

## STANDARD CUTTING CONDITIONS FOR J SERIES GROOVING TOOLS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | General steels, Free-cutting steels, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| | | SH725 | 50 - 150 | 0.01 - 0.1 |
| | | NS9530 | 50 - 150 | 0.01 - 0.1 |
| | | J9530 | 50 - 150 | 0.01 - 0.1 |
| M | Stainless steels, etc. | J740 | 10 - 100 | 0.01 - 0.1 |
| | | SH725 | 50 - 150 | 0.01 - 0.1 |
| N | Aluminium alloys, copper alloys, etc. | TH10 | 10 - 200 | 0.01 - 0.1 |
| S | Difficult-to-cut materials, titanium alloys, etc. | TH10 | 10 - 30 | 0.01 - 0.1 |

# TUNGT-CLAMP
## FLASR/L

External grooving & threading toolholders for swiss lathes




Right hand (R) shown.

| Designation | W | ar | h1 | h | b | L1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| FLASR/L-1616M3 | 1 - 3 | 5.31 | 16 | 16 | 16 | 125 | 16 | FL*-3**R/L... |

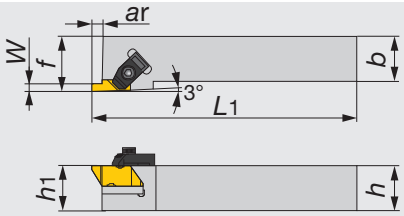
Note: The right hand toolholders use right hand inserts, and the left hand toolholders use left hand inserts.

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| FLASR-1616M3 | TF-184 | S-412 | 5/32HEX |
| FLASL-1616M3 | TF-185 | S-412 | 5/32HEX |

# TUNGT-CLAMP
## FLSR/L

External toolholders for grooving & threading




Right hand (R) shown.

| Designation | W | ar | h1 | h | b | L1 | f | Insert |
|---|---|---|---|---|---|---|---|---|
| FLSR/L-2020M3 | 1 - 3 | 4.5 | 20 | 20 | 20 | 125 | 32 | FL*-3**R/L... |
| FLSR/L-2525M3 | 1 - 3 | 4.5 | 25 | 25 | 25 | 150 | 32 | FL*-3**R/L... |

Note: The right hand toolholders use right hand inserts, and the left hand toolholders use left hand inserts.

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| FLSR-****M3 | TF-72 | S-412 | 5/32HEX |
| FLSL-****M3 | TF-73 | S-412 | 5/32HEX |



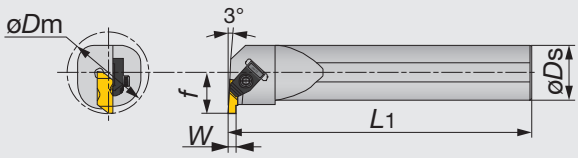

Reference pages

Inserts → **C023,** Standard cutting conditions → **C024**

# TUNGT-CLAMP

## A_M-FLER/L

Internal toolholders for grooving & threading




Right hand (R) shown.

| Designation | W | øDm | øDs | L1 | f | Insert |
|---|---|---|---|---|---|---|
| A25M-FLER/L3 | 1 - 3 | 34.9 | 25 | 300 | 17.7 | FL*-3**L/R... |
| A32M-FLER/L3 | 1 - 3 | 44.45 | 32 | 350 | 22.1 | FL*-3**L/R... |
| A40M-FLER3 | 1 - 3 | 50.8 | 40 | 350 | 24.5 | FL*-3**L... |

Note: The right hand toolholders use left hand inserts, and the left hand toolholders use right hand inserts.

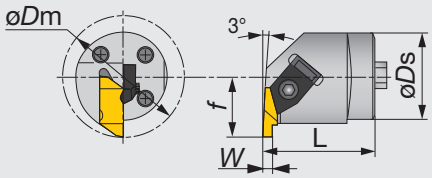
### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| A**M-FLER3 | TF-73 | S-412 | 5/32HEX |
| A**M-FLEL3 | TF-72 | S-412 | 5/32HEX |

# TUNGT-CLAMP

## HS-FLER/L

Exchangeable heads for internal grooving & threading, applicable on S-570 shanks




Right hand (R) shown.

| Designation | W | øDm | øDs | L | f | Insert |
|---|---|---|---|---|---|---|
| HS40-FLER3W | 1 - 3 | 56.1 | 40 | 40.1 | 28 | FL*-3**L... |
| HS50-FLER3W | 1 - 3 | 70.1 | 50 | 41.9 | 35 | FL*-3**L... |

Note: The right hand toolholders use right hand inserts, and the left hand toolholders use left hand inserts.

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| HS40-FLER3W | TF-73 | S-412 | 5/32HEX |
| HS50-FLER3W | TF-73 | S-412 | 5/32HEX |



Reference pages

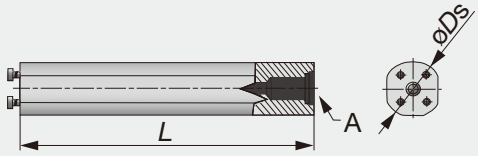
Inserts → **C023,** Standard cutting conditions → **C024**

# TUNGT-CLAMP

S-570

Steel shanks for exchangeable head





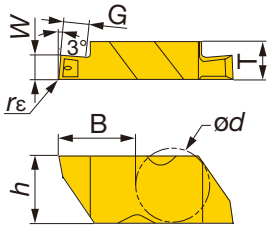

| Designation | øDs | L | A |
|---|---|---|---|
| S-570-40M-40 | 40 | 273 | 1/2-14NPT |
| S-570-50M-50 | 50 | 366 | 1/2-14NPT |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S-570-40M-40 | SS100 | 5/32HEX |
| S-570-50M-50 | SS94 | 1/4HEX |

## INSERT

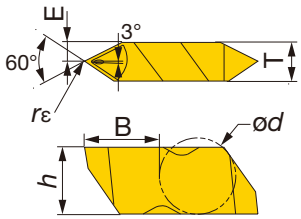
### FLG-CB (For grooving)




| Designation | W±0.025 | rε | AH110 R | AH110 L | G | ød | T | h | B |
|---|---|---|---|---|---|---|---|---|---|
| FLG-3M100R/L-CB | 1 | 0.13 - 0.25 | ● | ● | 1.4 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M150R/L-CB | 1.5 | 0.13 - 0.25 | ● | ● | 2.55 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M200R/L-CB | 2 | 0.13 - 0.25 | ● | ● | 2.55 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M250R/L-CB | 2.5 | 0.13 - 0.25 | ● | ● | 4.07 | 9.525 | 4.95 | 8.74 | 10.29 |
| FLG-3M300R/L-CB | 3 | 0.13 - 0.25 | ● | ● | 4.07 | 9.525 | 4.95 | 8.74 | 10.29 |

● : Line up

### FLT-CB (For threading)




| Designation | rε | AH725 R | AH725 L | Pitch Internal | Pitch External | ød | E | T | h | B |
|---|---|---|---|---|---|---|---|---|---|---|
| FLT-3R/L-HCB | 0.13 - 0.2 | ● | ● | 2.11 - 5.08 | 1.27 - 4.23 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |
| FLT-3R/LC-HCB | 0.31 - 0.38 | ● | ● | 4.23 - 5.08 | 2.31 - 4.23 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |
| FLT-3R/L-CB | 0.13 - 0.2 | ● | ● | 2.11 - 3.175 | 1.27 - 3.175 | 9.525 | 2.49 | 4.95 | 8.74 | 10.16 |

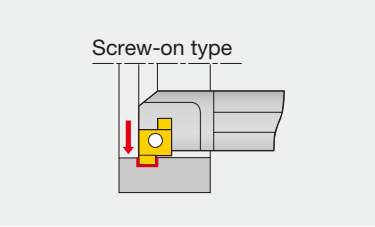
● : Line up

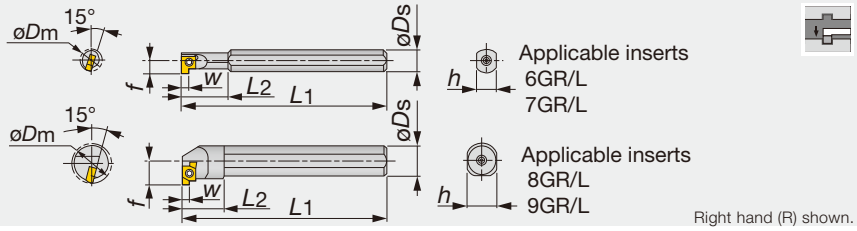
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Application | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| P | High carbon steel S45C / C45, etc. | AH110 | Grooving | 100 - 200 | 0.12 - 0.35 |
| | | AH725 | Threading | 80 - 180 | - |
| | Alloy steel SCM435 / 34CrMo4, etc. | AH110 | Grooving | 50 - 80 | 0.12 - 0.3 |
| | | AH725 | Threading | 60 - 160 | - |
| M | Stainless steel SUS304 / X5CrNi18-9, etc. | AH110 | Grooving | 50 - 150 | 0.1 - 0.2 |
| | | AH725 | Threading | 50 - 130 | - |
| K | Gray cast iron FC250 / 250 / GG25, etc. | AH110 | Grooving | 50 - 180 | 0.1 - 0.25 |
| | | AH725 | Threading | - | - |
| | Ductile cast iron FCD400 / 40-15 / GGG400, etc. | AH110 | Grooving | 50 - 120 | 0.1 - 0.25 |
| | | AH725 | Threading | - | - |

## SNGR/L

Toolholders for internal grooving




| Designation | Material | W | øDm | øDs | f | L1 | L2 | h | Max. groove depth | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| SNGR/L08H06 | STEEL | 1 - 2 | 8 | 8 | 4.7 | 100 | 18 | 7 | 1.5 | 6GR/L... |
| SNGR/L08H07 | STEEL | 1 - 2 | 10 | 8 | 5.8 | 100 | 23 | 7 | 1.5 | 7GR/L... |
| SNGR/L10K07 | STEEL | 1 - 2 | 12 | 10 | 6.8 | 125 | 29 | 9 | 1.5 | 7GR/L... |
| SNGR/L10K08 | STEEL | 1.5 - 3.5 | 14 | 10 | 7.6 | 125 | 15 | 9 | 2 | 8GR/L... |
| SNGR/L12M08 | STEEL | 1.5 - 3.5 | 16 | 12 | 8.6 | 150 | 18 | 11 | 2 | 8GR/L... |
| SNGR/L16Q09 | STEEL | 1.5 - 3.5 | 20 | 16 | 11.6 | 180 | 20 | 15 | 3 | 9GR/L... |
| SNGR/L20R09 | STEEL | 1.5 - 3.5 | 24 | 20 | 13.6 | 200 | 25 | 18 | 3 | 9GR/L... |
| SNGR/L08K06SC | CARBIDE | 1.5 - 3.5 | 8 | 8 | 4.7 | 125 | 28 | 7 | 1.5 | 6GR/L... |
| SNGR/L08K07SC | CARBIDE | 1.5 - 3.5 | 10 | 8 | 5.8 | 125 | 35 | 7 | 1.5 | 7GR/L... |
| SNGR/L10M07SC | CARBIDE | 1.5 - 3.5 | 12 | 10 | 6.8 | 150 | 45 | 9 | 1.5 | 7GR/L... |
| SNGR/L10M08SC | CARBIDE | 1.5 - 3.5 | 14 | 10 | 7.6 | 150 | 45 | 9 | 2 | 8GR/L... |
| SNGR/L12Q08SC | CARBIDE | 1.5 - 3.5 | 16 | 12 | 8.6 | 180 | - | 11 | 2 | 8GR/L... |
| SNGR/L16R09SC | CARBIDE | 1.5 - 3.5 | 20 | 16 | 11.6 | 200 | - | 15 | 3 | 9GR/L... |

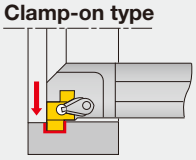
### SPARE PARTS

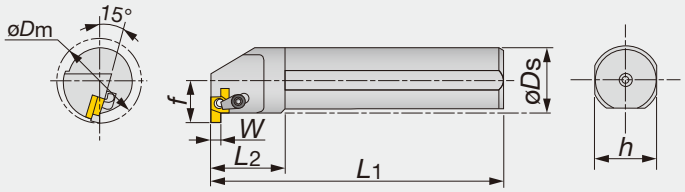
| Designation | Clamping screw | Wrench |
|---|---|---|
| SNGR/L***06 | CSTB-2L040 | T-6F |
| SNGR/L***07 | CSTB-2.2S | T-7F |
| SNGR/L***08 | CSTB-2.2 | T-7F |
| SNGR/L***09 | CSTB-2.5L080 | T-8F |
| SNGR/L***06SC | CSTB-2L040 | T-6F |
| SNGR/L***07SC | CSTB-2.2S | T-7F |
| SNGR/L***08SC | CSTB-2.2 | T-7F |
| SNGR/L***09SC | CSTB-2.5L080 | T-8F |

# CNGR/L

## Toolholders for internal grooving

**Clamp-on type**






Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CNGR/L25S15 | 2 - 5 | 32 | 5 | 25 | 18.1 | 250 | 30 | 23 | 15GR/L... |
| CNGR/L32T15 | 2 - 5 | 40 | 5 | 32 | 22.1 | 300 | 35 | 30 | 15GR/L... |
| CNGR/L40U15 | 2 - 5 | 48 | 5 | 40 | 26.1 | 350 | 45 | 38 | 15GR/L... |

### SPARE PARTS

| Designation | Clamp set | Screw | Shim | Wrench |
|---|---|---|---|---|
| CNGR... | CSP22 | DTS5-3.5 | SGSR151 | T-20F |
| CNGL... | CSP22 | DTS5-3.5 | SGSL151 | T-20F |

### Optional parts for CNG type toolholders

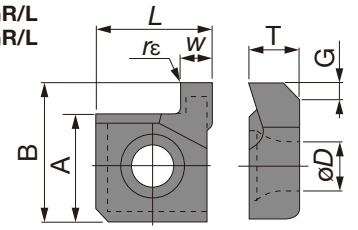
When using as a screw-on type, use the following parts.

| Designation | Clamping screw | Wrench |
|---|---|---|
| CNGR/L... | CSTB-3.5L | T-15F |

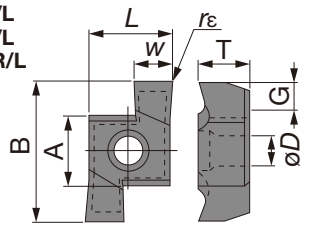
## INSERT

### **GR/L

6GR/L
7GR/L




8GR/L
9GR/L
15GR/L




Right hand (R) shown.

| Designation | W±0.025 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | Uncoated UX30 R | Uncoated UX30 L | A | B | T | øD | L | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6GR/L100 | 1 | 0.2 | ● | | ● | | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 6GR/L150 | 1.5 | 0.2 | ● | | ● | ● | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 6GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | ● | 4.76 | 6.44 | 2.34 | 2.3 | 5.56 | 1.5 |
| 7GR/L100 | 1 | 0.2 | ● | | ● | | ● | | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 7GR/L150 | 1.5 | 0.2 | ● | | ● | | ● | | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 7GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 7.36 | 3.08 | 2.58 | 5.56 | 1.5 |
| 8GR/L150 | 1.5 | 0.2 | ● | | ● | | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L200 | 2 | 0.2 | ● | | ● | ● | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L250 | 2.5 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L300 | 3 | 0.2 | ● | | ● | ● | ● | ● | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 8GR/L350 | 3.5 | 0.2 | | | ● | | ● | | 5.56 | 10.16 | 3.87 | 2.58 | 6.15 | 2 |
| 9GR/L150 | 1.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 2 |
| 9GR/L200 | 2 | 0.2 | ● | ● | ● | ● | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L250 | 2.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L300 | 3 | 0.2 | ● | ● | ● | ● | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 9GR/L350 | 3.5 | 0.2 | ● | ● | ● | | ● | ● | 6.35 | 12.95 | 4.66 | 2.86 | 7.74 | 3 |
| 15GR/L200 | 2 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L250 | 2.5 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L300 | 3 | 0.2 | ● | | ● | | ● | ● | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L350 | 3.5 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 3 |
| 15GR/L400 | 4 | 0.2 | ● | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 4 |
| 15GR/L450 | 4.5 | 0.2 | | | ● | ● | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 4 |
| 15GR/L500 | 5 | 0.2 | | | ● | | ● | | 9.2 | 20.8 | 5.1 | 4.8 | 10.8 | 5 |

Note:
When using a right or left hand insert, the right hand insert is used with right hand toolholder and the left hand insert is used with left hand toolholder.

● : Line up

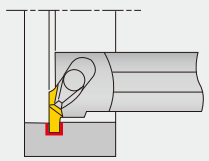
## STANDARD CUTTING CONDITIONS

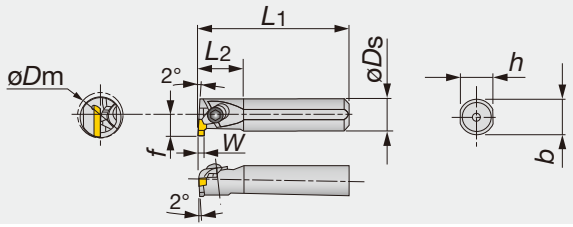
| ISO | Workpiece material | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|
| P | Medium carbon steels | 40 - 150 | 0.05 - 0.15 |
| K | Cast irons, Light alloys | 60 - 200 | 0.05 - 0.15 |

Notes:
- Cutting conditions shown above are a guideline only.
- When grooving close to the minimum bore diameter or with long reach conditions, reduce the conditions shown above by approximately 50%.
- To help chip evacuation, use water-soluble cutting fluid. The fluid should be applied sufficiently to the cutting point.
- When using without cutting fluid, reduce both the cutting speeds and feeds shown on the above by 50% at least.

# CGXR/L

## Toolholders for internal grooving






Right hand (R) shown.

| Designation | Material | W | øDm | øDs | f | L1 | L2 | h | b | Max. groove depth | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGXR/L0016 | STEEL | 1 - 3 | 20 | 16 | 11.3 | 150 | 24 | 15 | 15.5 | 3 | GIR/L52... |
| CGXR/L0020 | STEEL | 1 - 3 | 24 | 20 | 13.3 | 180 | 30 | 18 | 19 | 3 | GIR/L52... |
| CGXR/L0025 | STEEL | 1 - 5 | 32 | 25 | 18 | 200 | 38 | 23 | 24 | 5.3 | GIR/L63... |
| CGXR/L0032 | STEEL | 1 - 5 | 40 | 32 | 23 | 250 | 48 | 30 | 31 | 5.3 | GIR/L63... |
| CGXR/L0040 | STEEL | 1 - 5 | 48 | 40 | 27 | 300 | 60 | 37 | 38.5 | 5.3 | GIR/L63... |
| CGXR/L16SC | CARBIDE | 1 - 3 | 20 | 16 | 11.3 | 200 | 24 | 15 | - | 3 | GIR/L52... |

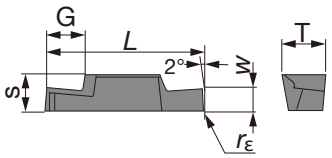
• When using a right or left hand insert, the right hand insert (GIR) is used for the right hand toolholders (CGXR) , and the left hand insert (GIL) is used for the left hand toolholders (CGXL).

### SPARE PARTS

| Designation | Clamp set | Wrench 1 | Wrench 2 |
|---|---|---|---|
| CGXR/L0016/20 | CSW-0 | - | P-2.5T |
| CGXR/L0025/32/40 | CSW-2 | P-4 | - |
| CGXR/L16SC | CSW-0 | - | P-2.5T |

## INSERT

### GIR/L




Right hand (R) shown.

| Designation | W±0.05 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | S | T | L | G |
|---|---|---|---|---|---|---|---|---|---|---|
| GIR/L5210-02 | 1 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 1.5 |
| GIR/L5215-02 | 1.5 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 2.3 |
| GIR/L5220-02 | 2 | 0.2 | ● | ● | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L5225-02 | 2.5 | 0.2 | ● | | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L5230-02 | 3 | 0.2 | ● | | ● | ● | 3.5 | 4.4 | 15 | 3 |
| GIR/L6310-02 | 1 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 1.5 |
| GIR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 2.3 |
| GIR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 3 |
| GIR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 3.8 |
| GIR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 4.5 |
| GIR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6340-02 | 4.0 | 0.2 | ● | ● | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6345-02 | 4.5 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 5.3 |
| GIR/L6350-02 | 5 | 0.2 | ● | | ● | ● | 5.5 | 6.4 | 24 | 5.3 |

● : Line up

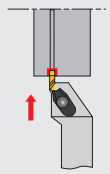
Note:
When using a right or left hand insert, the right hand insert is used with right hand toolholder and the left hand insert is used with left hand toolholder.

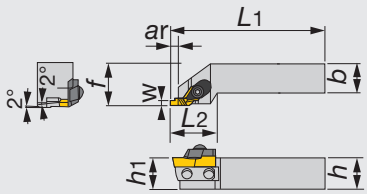
## STANDARD CUTTING CONDITIONS (EXTERNAL & INTERNAL GROOVING)

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) W < 2 mm | W = 2 ~ 4 mm | W > 4 mm |
|---|---|---|---|---|---|---|
| P | Carbon steels | NS9530 | 80 - 150 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.2 |
| K | Cast irons, Light alloys | TH10 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.2 |

## GX-R/LE

External toolholders for grooving, with double-ended inserts






Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| GX-2020R/LE | 1 - 4.5 | 1.5 - 6 | 20 | 20 | 125 | 35 | 20 | 25 | XGR/L63... |
| GX-2525R/LE | 1 - 4.5 | 1.5 - 6 | 25 | 25 | 150 | 35 | 25 | 32 | XGR/L63... |

• When using a right or left hand insert, the right hand insert (XGR) is used for the right hand toolholders (GX-****RE) , and the left hand insert (XGL) is used for the left hand toolholders (GX-****LE).

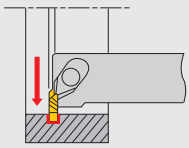
### SPARE PARTS

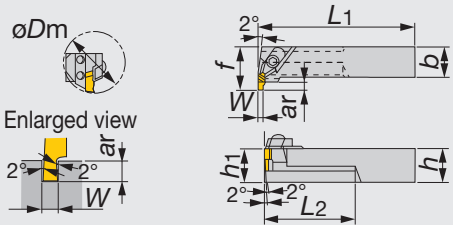
| Designation | Clamp set | Clamp screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2020RE | CP81A | RT-1 | SL-6R | BHM4-8 | P-4 |
| GX-2020LE | CP81A | RT-1 | SL-6L | BHM4-8 | P-4 |
| GX-2525RE | CP81A | RT-1 | SL-1R | BHM4-8 | P-4 |
| GX-2525LE | CP81A | RT-1 | SL-1L | BHM4-8 | P-4 |

Note:
Max.groove width and max. groove depth shown in the above table are the values when the insert having the largest cutting edge width is used.

## GX-R/LI

Toolholders for internal grooving






Right hand (R) shown.

| Designation | W | øDm | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| GX-2525R/LI | 1 - 4.5 | 55 | 1.5 - 6 | 25 | 25 | 200 | 70 | 25 | 35 | XGL/R63... |

• When using a right or left hand insert, the right hand insert (XGR) is used for the left hand toolholders (GX-****LI) , and the left hand insert (XGL) is used for the right hand toolholders (GX-****RI).

### SPARE PARTS

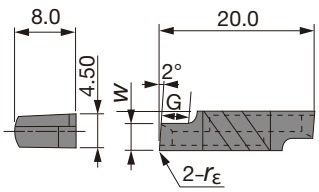
| Designation | Clamp set | Clamp screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2525RI | CP81B | RT-1 | SL-2R | BHM3-8 | P-4 |
| GX-2525LI | CP81B | RT-1 | SL-2L | BHM3-8 | P-4 |



Reference pages
Inserts, Standard cutting conditions → **C031**

# INSERT

## XGR/L



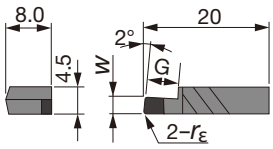

Right hand (R) shown.

| Designation | W±0.05 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | Uncoated UX30 R | Uncoated UX30 L | G |
|---|---|---|---|---|---|---|---|---|---|
| XGR/L6310-02 | 1 | 0.2 | ● | ● | ● | ● | ● | ● | 1.5 |
| XGR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | ● | ● | 2.3 |
| XGR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | ● | ● | 3 |
| XGR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | ● | ● | 3.8 |
| XGR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | ● | ● | 4.5 |
| XGR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | ● | ● | 5.3 |
| XGR/L6340-02 | 4 | 0.2 | ● | ● | ● | ● | ● | ● | 6 |
| XGR/L6345-02 | 4.5 | 0.2 | ● | ● | ● | ● | ● | ● | 6 |

● : Line up

Note;
For internal machining, use right-hand toolholder (GX-****RI) with left-hand insert (XGL****), and use left-hand toolholder (GX-****LI) with right-hand insert (XGR****).
For external machining, use right-hand toolholder (GX-****RE) with right-hand insert (XGR****), and use left-hand toolholder (GX-****LE) with left-hand insert (XGL****).

## XGR/L-QBN




Right hand (R) shown.

| Designation | W±0.05 | rε | T-CBN BX360 R | T-CBN BX360 L | G |
|---|---|---|---|---|---|
| XGR/L6315S-QBN | 1.5 | 0.2 | ● | | 2.3 |
| XGR/L6320S-QBN | 2 | 0.2 | ● | | 3 |
| XGR/L6325S-QBN | 2.5 | 0.2 | ● | | 3.8 |
| XGR/L6330S-QBN | 3 | 0.2 | ● | | 4.5 |
| XGR/L6335S-QBN | 3.5 | 0.2 | ● | | 5.3 |
| XGR/L6340S-QBN | 4 | 0.2 | ● | | 6 |
| XGR/L6345S-QBN | 4.5 | 0.2 | ● | | 6 |

● : Line up

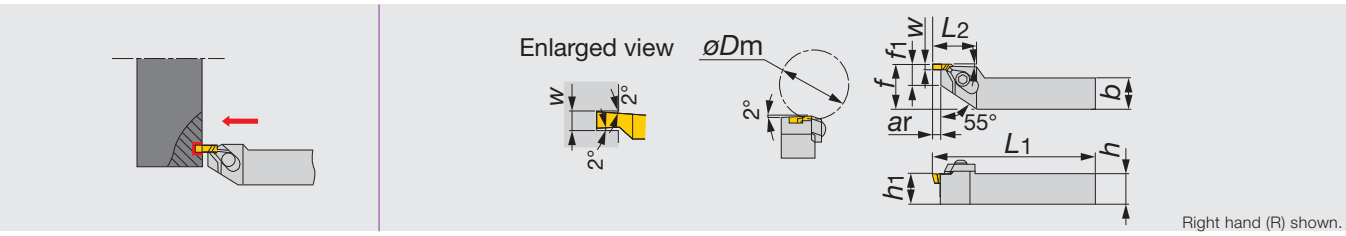
Note;
For internal machining, use right-hand toolholder (GX-****RI) with left-hand insert (XGL****), and use left-hand toolholder (GX-****LI) with right-hand insert (XGR****).
For external machining, use right-hand toolholder (GX-****RE) with right-hand insert (XGR****), and use left-hand toolholder (GX-****LE) with left-hand insert (XGL****).

# STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed $v_c$ (m/min) | Feed f (mm/rev) W < 2 mm | W = 2 ~ 4 mm | W > 4 mm |
|---|---|---|---|---|---|---|
| P | Carbon steels | NS9530 | 80 - 200 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | TX10S | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | UX30 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| K | Cast irons , Light alloys | TH10 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| H | Hardened steels | BX360 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.15 |

## GX-R/LF

Toolholders for face grooving




Right hand (R) shown.

| Designation | W | øDm | ar | h | b | L1 | L2 | h1 | f | f1 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GX-2525R/LF | 1 - 4.5 | 55 | 1.5 - 6 | 25 | 25 | 150 | 35 | 25 | 32 | 15 | XNL/R63... |

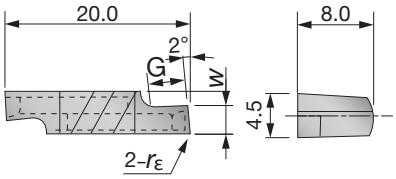
• When using a right or left hand insert, the right hand insert (XNR) is used for the left hand toolholders (GX-...LF) , and the left hand insert (XNL) is used for the right hand toolholders (GX-...RF).

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Shim | Shim screw | Wrench |
|---|---|---|---|---|---|
| GX-2525RF | CP81A | RT-1 | SL-3R | BHM4-8 | P-4 |
| GX-2525LF | CP81A | RT-1 | SL-3L | BHM4-8 | P-4 |

## INSERT

### XNR/L



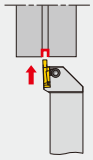

Left hand (L) shown.

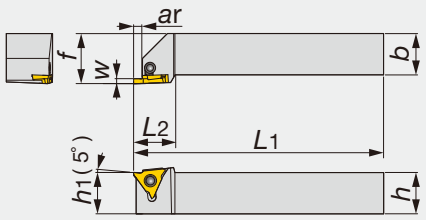
| Designation | W±0.05 | rε | Cermet NS9530 R | Cermet NS9530 L | Uncoated TH10 R | Uncoated TH10 L | G |
|---|---|---|---|---|---|---|---|
| XNR/L6310-02 | 1 | 0.2 | ● | ● | ● | ● | 1.5 |
| XNR/L6315-02 | 1.5 | 0.2 | ● | ● | ● | ● | 2.3 |
| XNR/L6320-02 | 2 | 0.2 | ● | ● | ● | ● | 3 |
| XNR/L6325-02 | 2.5 | 0.2 | ● | ● | ● | ● | 3.8 |
| XNR/L6330-02 | 3 | 0.2 | ● | ● | ● | ● | 4.5 |
| XNR/L6335-02 | 3.5 | 0.2 | ● | ● | ● | ● | 5.3 |
| XNR/L6340-02 | 4 | 0.2 | ● | ● | ● | ● | 6 |
| XNR/L6345-02 | 4.5 | 0.2 | ● | ● | ● | ● | 6 |

● : Line up

## TGTSR/L

External toolholders for grooving, with triple corner insert






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f |
|---|---|---|---|---|---|---|---|---|
| TGTSR/L2020K16 | 0.33 - 2.5 | 2.5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2525M16 | 0.33 - 2.5 | 2.5 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2020K22-1 | 1 - 1.45 | 2 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2020K22-2 | 1.5 - 2.3 | 3.5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2020K22-3 | 2.5 - 4.5 | 5 | 20 | 20 | 125 | 25 | 20 | 25 |
| TGTSR/L2525M22-1 | 1 - 1.45 | 2 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2525M22-2 | 1.5 - 2.3 | 3.5 | 25 | 25 | 150 | 25 | 25 | 30 |
| TGTSR/L2525M22-3 | 2.5 - 4.5 | 5 | 25 | 25 | 150 | 25 | 25 | 30 |

- See below applicable insert table. (C035-C036)
- The right hand insert (GBR) is used for the right hand toolholders (TGTSR), and the left hand insert (GBL) is used for the left hand toolholders (TGTSL).

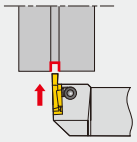
| Designation | Applicable insert |
|---|---|
| TGTSR/L2020K16 | GBR/L32... |
| TGTSR/L2525M16 | GBR/L32... |
| TGTSR/L2020K22-1 | GBR/L43125 ~ 145 GBR/L43050R |
| TGTSR/L2020K22-2 | GBR/L43150 ~ 230 GBR/L43075R ~ 100R |
| TGTSR/L2020K22-3 | GBR/L43250 ~ 450 GBR/L43125R ~ 200R |
| TGTSR/L2525M22-1 | GBR/L43125 ~ 145 GBR/L43050R |
| TGTSR/L2525M22-2 | GBR/L43150 ~ 230 GBR/L43075R ~ 100R |
| TGTSR/L2525M22-3 | GBR/L43250 ~ 450 GBR/L43125R ~ 200R |

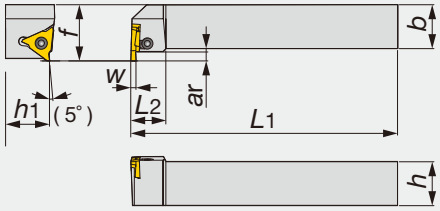
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| TGTSR/L*****16 | CP900 | MCS520-2.5 | P-2.5 |
| TGTSR/L*****22... | CP910 | MCS520-2.5 | P-2.5 |

## TGTTR/L

Perpendicular toolholders for external grooving, with triple corner inserts






Right hand (R) shown.

| Designation | W | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f |
|---|---|---|---|---|---|---|---|---|
| TGTTR/L2020K16 | 0.33 - 2.5 | 2.5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2525M16 | 0.33 - 2.5 | 2.5 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2020K22-1 | 1 - 1.45 | 2 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2020K22-2 | 1.5 - 2.3 | 3.5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2020K22-3 | 2.5 - 4.5 | 5 | 20 | 20 | 125 | 20 | 20 | 27 |
| TGTTR/L2525M22-1 | 1 - 2.3 | 2 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2525M22-2 | 1.5 - 2.3 | 3.5 | 25 | 25 | 150 | 20 | 25 | 32 |
| TGTTR/L2525M22-3 | 2.5 - 4.5 | 5 | 25 | 25 | 150 | 20 | 25 | 32 |

- See below applicable insert table. (C035-C036)
- The left hand insert (GBL) is used for the right hand toolholders (TGTTR), and the right hand insert (GBR) is used for the left hand toolholders (TGTTL).

| Designation | Applicable insert |
|---|---|
| TGTTR/L2020K16 | GBL/R32... |
| TGTTR/L2525M16 | GBL/R32... |
| TGTTR/L2020K22-1 | GBL/R43125 ~ 145 GBL/R43050R |
| TGTTR/L2020K22-2 | GBL/R43150 ~ 230 GBL/R43075R ~ 100R |
| TGTTR/L2020K22-3 | GBL/R43250 ~ 450 GBL/R43125R ~ 200R |
| TGTTR/L2525M22-1 | GBL/R43125 ~ 145 GBL/R43050R |
| TGTTR/L2525M22-2 | GBL/R43150 ~ 230 GBL/R43075R ~ 100R |
| TGTTR/L2525M22-3 | GBL/R43250 ~ 450 GBL/R43125R ~ 200R |

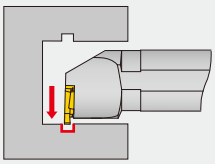
### SPARE PARTS

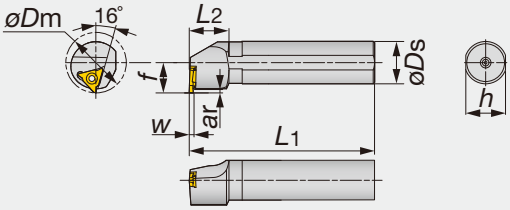
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| TGTTR/L*****16 | CP900 | MCS520-2.5 | P-2.5 |
| TGTTR/L*****22... | CP910 | MCS520-2.5 | P-2.5 |



## S-SGTR/L

Toolholders for internal grooving






Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | $L_1$ | $L_2$ | h | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S25R-SGTR/L16 | 0.33 - 2.5 | 35 | 2 | 25 | 17.5 | 200 | 30 | 23 | GBL/R32... |
| S32S-SGTR/L22 | 1.25 - 4.5 | 40 | 2.5 | 32 | 23 | 250 | 30 | 30 | GBL/R43... |

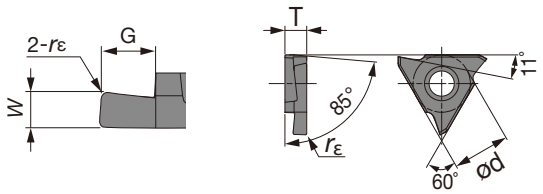
- When using a right or left hand insert, the right hand insert (GBR) is used for the left hand toolholders (SGTL) , and the left hand insert (GBL) is used for the right hand toolholders (SGTR).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S25R-SGTR/L16 | CSTB-4S | T-15F |
| S32S-SGTR/L22 | CSTB-5S | T-20F |

# APPLICABLE INSERT

## GBR/L32

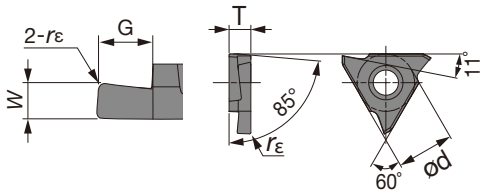



Right hand (R) shown.

| Designation | W±0.025 | rε | Coated AH710 R | Coated AH710 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated KS05F R | Uncoated KS05F L | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBR/L32033 | 0.33 | 0.03 | ● | ● | ● | | ● | | 0.8 | 9.525 | 3.18 |
| GBR/L32050 | 0.5 | 0.05 | ● | ● | ● | | ● | | 1.2 | 9.525 | 3.18 |
| GBR/L32075 | 0.75 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32095 | 0.95 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32100 | 1 | 0.05 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32125 | 1.25 | 0.2 | ● | ● | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GBR/L32145 | 1.45 | 0.2 | ● | ● | ● | | ● | | 2 | 9.525 | 3.18 |
| GBR/L32150 | 1.5 | 0.2 | ● | ● | ● | | ● | | 2 | 9.525 | 3.18 |
| GBR/L32200 | 2 | 0.2 | ● | ● | ● | | ● | | 2.5 | 9.525 | 3.18 |
| GBR/L32250 | 2.5 | 0.2 | ● | ● | ● | | ● | | 2.5 | 9.525 | 3.18 |

● : Line up

## GBR/L43



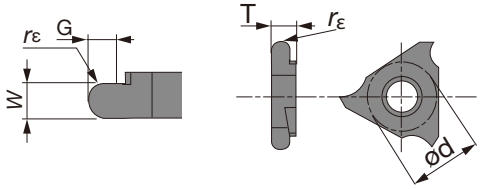

Right hand (R) shown.

| Designation | W±0.025 | rε | Coated AH710 R | Coated AH710 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated KS05F R | Uncoated KS05F L | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBR/L43125 | 1.25 | 0.2 | ● | ● | ● | | ● | | 2 | 12.7 | 4.76 |
| GBR/L43145 | 1.45 | 0.2 | ● | ● | ● | | ● | | 2 | 12.7 | 4.76 |
| GBR/L43150 | 1.5 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43175 | 1.75 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43185 | 1.85 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43200 | 2 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43230 | 2.3 | 0.2 | ● | ● | ● | ● | ● | | 3.5 | 12.7 | 4.76 |
| GBR/L43250 | 2.5 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43265 | 2.65 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43280 | 2.8 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43300 | 3 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43330 | 3.3 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43350 | 3.5 | 0.3 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43400 | 4 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43430 | 4.3 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |
| GBR/L43450 | 4.5 | 0.4 | ● | ● | ● | | ● | | 5 | 12.7 | 4.76 |

● : Line up

## APPLICABLE INSERT

### GBR/L43-R (Radius)




Right hand (R) shown.

| Designation | W±0.025 | rε | Coated AH710 R | Coated AH710 L | Cermet NS9530 R | Cermet NS9530 L | Uncoated KS05F R | Uncoated KS05F L | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GBR/L43050R | 1 | 0.5 | ● | ● | ● | | ● | ● | 2 | 12.7 | 4.76 |
| GBR/L43075R | 1.5 | 0.75 | ● | ● | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GBR/L43100R | 2 | 1 | ● | ● | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GBR/L43125R | 2.5 | 1.25 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |
| GBR/L43150R | 3 | 1.5 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |
| GBR/L43200R | 4 | 2 | ● | ● | ● | | ● | ● | 5 | 12.7 | 4.76 |

● : Line up

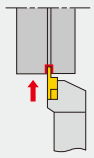
## STANDARD CUTTING CONDITIONS

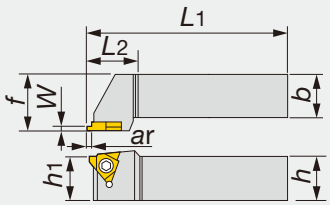
| ISO | Workpiece material | Hardness | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|
| P | Carbon steels, Alloy steels S45C / C45, SCM415, 18CrMo4, etc. | 150 - 240HB | NS9530 | 100 - 200 | 0.02 - 0.25 |
| | | 150 - 240HB | AH710 | 60 - 150 | 0.05 - 0.25 |
| M | Stainless steels SUS304 / X5CrNi18-9, etc. | ≤ 240HB | AH710 | 60 - 150 | 0.05 - 0.15 |
| K | Cast irons FC250 / 250, etc. | Tensile strength ≤ 350 N/mm$^2$ | AH710 | 60 - 150 | 0.05 - 0.15 |
| N | Non-ferrous metals Aluminium, etc. | - | KS05F | 200 - 300 | 0.05 - 0.15 |



## SGTR/L

External toolholders for grooving, with triple corner inserts






Right hand (R) shown.

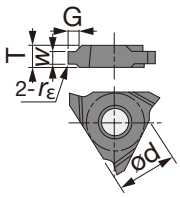
| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| SGTR1616-3 | 1.15 - 2.7 | 1.5 - 3 | 16 | 16 | 100 | 20 | 16 | 20 | GLR/L3... |
| SGTR/L2020-3 | 1.15 - 2.7 | 1.5 - 3 | 20 | 20 | 125 | 20 | 20 | 25 | GLR/L3... |
| SGTR/L2525-3 | 1.15 - 2.7 | 1.5 - 3 | 25 | 25 | 150 | 20 | 25 | 32 | GLR/L3... |
| SGTR/L2020-4 | 1.15 - 4.2 | 1.5 - 4 | 20 | 20 | 125 | 30 | 20 | 25 | GLR/L4...,GOR/L4... |
| SGTR/L2525-4 | 1.15 - 4.2 | 1.5 - 4 | 25 | 25 | 150 | 30 | 25 | 32 | GLR/L4...,GOR/L4... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SGTR/L****-3 | CSTB-4 | T-15F |
| SGTR/L****-4 | CSTB-5 | T-20F |

## APPLICABLE INSERT

### GOR/L (O-ring)

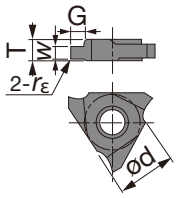



Right hand (R) shown.

| Designation | $W^{+0.1}_{+0.05}$ | rε | Cermet NS9530 | | Uncoated UX30 | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | | | |
| GOR/L4190 | 2.5 | 0.4 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GOR/L4240 | 3.2 | 0.4 | ● | | ● | | 2 | 12.7 | 4.76 |
| GOR/L4310 | 4.1 | 0.7 | ● | | ● | | 2.5 | 12.7 | 4.76 |

● : Line up

### GLR/L (Lock-ring)




Right hand (R) shown.

| Designation | $W^{+0.1}_{+0.05}$ | rε | Cermet NS9530 | | Uncoated UX30 | | G | ød | T |
|---|---|---|---|---|---|---|---|---|---|
| | | | R | L | R | L | | | |
| GLR/L3115 | 1.15 | 0.1 | ● | ● | ● | ● | 1.5 | 9.525 | 3.18 |
| GLR/L3135 | 1.35 | 0.1 | ● | ● | ● | | 1.5 | 9.525 | 3.18 |
| GLR/L3165 | 1.65 | 0.1 | ● | ● | ● | | 2 | 9.525 | 3.18 |
| GLR/L3175 | 1.75 | 0.1 | ● | ● | ● | ● | 2 | 9.525 | 3.18 |
| GLR/L3195 | 1.95 | 0.1 | ● | ● | ● | ● | 2.5 | 9.525 | 3.18 |
| GLR/L3220 | 2.2 | 0.1 | ● | | ● | ● | 3 | 9.525 | 3.18 |
| GLR/L3270 | 2.7 | 0.1 | ● | | ● | ● | 3 | 9.525 | 3.18 |
| GLR/L4115 | 1.15 | 0.1 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GLR/L4135 | 1.35 | 0.1 | ● | | ● | | 1.5 | 12.7 | 4.76 |
| GLR/L4165 | 1.65 | 0.1 | ● | | ● | | 2 | 12.7 | 4.76 |
| GLR/L4175 | 1.75 | 0.1 | ● | | ● | | 2 | 12.7 | 4.76 |
| GLR/L4190 | 1.9 | 0.1 | ● | | | | 2.5 | 12.7 | 4.76 |
| GLR/L4195 | 1.95 | 0.1 | ● | | ● | | 2.5 | 12.7 | 4.76 |
| GLR/L4220 | 2.2 | 0.1 | ● | | ● | ● | 3.5 | 12.7 | 4.76 |
| GLR/L4270 | 2.7 | 0.1 | ● | | ● | | 3.5 | 12.7 | 4.76 |
| GLR/L4320 | 3.2 | 0.1 | ● | | ● | ● | 4 | 12.7 | 4.76 |
| GLR/L4420 | 4.2 | 0.1 | ● | | ● | ● | 4 | 12.7 | 4.76 |

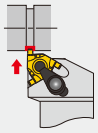
● : Line up

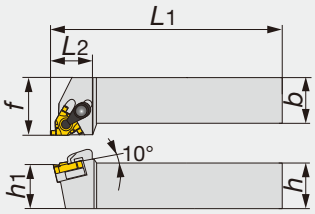
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) | | |
|---|---|---|---|---|---|---|
| | | | | W < 2 mm | W = 2 ~ 4 mm | W > 4 mm |
| P | Carbon steels | NS9530 | 80 - 200 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |
| | | UX30 | 60 - 150 | 0.05 - 0.1 | 0.08 - 0.2 | 0.08 - 0.25 |

## CER/L

External grooving toolholders, alternative clamping of screw-on or clamp-on(DT type only)






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| CER/L1212H16DT | 12 | 12 | 100 | 24 | 12 | 16 | GTGN16... |
| CER/L1616H16DT | 16 | 16 | 100 | 24 | 16 | 20 | GTGN16... |
| CER/L2020K16DT | 20 | 20 | 125 | 24 | 20 | 25 | GTGN16... |
| CER/L2525M16DT | 25 | 25 | 150 | 28 | 25 | 32 | GTGN16... |
| CER3232P16T | 32 | 32 | 170 | 32 | 32 | 40 | GTGN16... |

- A clamp set for CER/L type consists of a clamp and a clamping screw.
- A shim set for CER/L type consists of a shim and a shim screw.
- Standard shims for CER/L type can be used for both left hand and right hand toolholders. Use either of the sides depending on the hand.
- When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

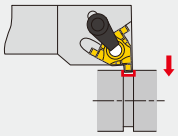
### SPARE PARTS

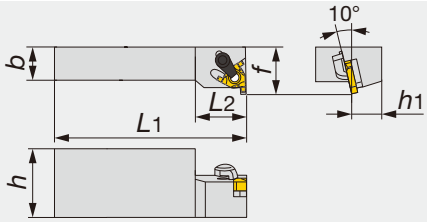
| Designation | Clamp set | Clamping screw | Shim screw | Shim * | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| CER*****16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16ER/IL-DT | P-3.5 | T-15F |
| CEL*****16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16EL/IR-DT | P-3.5 | T-15F |
| CER3232P16T | CSP16 | - | - | G16ER/IR-S | - | T-15F |

* Option: Shim for Grooving

## B-S/CER/L

External threading toolholders for swiss lathes






Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|
| B-CER/L16M16 | 32 | 16 | 150 | 24 | 16 | 22 | GTGN16... |

- When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

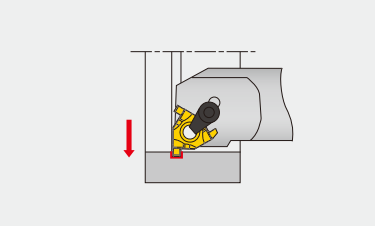
### SPARE PARTS

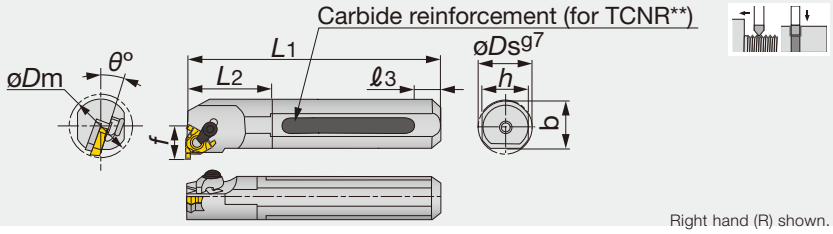
| Designation | Clamp set | Clamping screw | Wrench | Shim * |
|---|---|---|---|---|
| B-CER16M16 | CSP16 | - | T-15F | G16ER/IL-S |
| B-CEL16M16 | CSP16 | - | T-15F | G16EL/IR-S |

* Option: Shim for Grooving

## CNR/L

Internal grooving bars, alternative clamping of screw-on or clamp-on (DT type only)






Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ3 | h | b | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TCNR0020R16DT | TSUPPARI | 24 | 20 | 14 | 200 | 30 | 49 | 18 | - | 15 | GTGN-16... |
| TCNR0025S16DT | TSUPPARI | 29 | 25 | 16.5 | 250 | 38 | 64 | 23 | - | 15 | GTGN-16... |
| CNR/L0020P16 | STEEL | 24 | 20 | 14 | 170 | 30 | - | 18 | 19 | 15 | GTGN-16... |
| CNR/L0025R16 | STEEL | 29 | 25 | 16.5 | 200 | 38 | - | 23 | 24 | 15 | GTGN-16... |
| CNR/L0032S16 | STEEL | 37 | 32 | 20.1 | 250 | 48 | - | 30 | 31 | 15 | GTGN-16... |

- Shim is used for both right and left hand toolholders.
- A clamp set for CNR/L type toolholders consists of a clamp and a clamping screw. • A shim set for CNR/L type toolholders consists of a shim and a shim fixing screw.
- Standard shims for CNR/L type toolholders are commonly used for right and left hand toolholders.
- When using the GTGN insert, the exclusive shim must be used. Exclusive shim should be ordered separately.

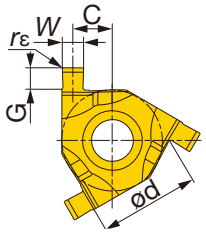
### SPARE PARTS

| Designation | Clamp set | Clamping screw | Shim screw | Shim * | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| TCNR002**16DT | CSP16 | CSTB-3.5ST | DTS5-3.5 | G16EL/IR-DT | P-3.5 | T-15F |
| CNR00***16 | CSP16 | - | - | G16EL/IR-S | - | T-15F |
| CNL00***16 | CSP16 | - | - | G16ER/IL-S | - | T-15F |

* Option: Shim for Grooving

## INSERT

### GTGN16




Right hand (R) shown.

| Designation | W±0.03 | rε | SH730 | Insert size | ød | G | C | Shim: Dual method clamp type; Screw-on/ Clamp-on | Shim: Clamp-on type |
|---|---|---|---|---|---|---|---|---|---|
| GTGN-16ER/IL100 | 1 | 0.1 | ● | 16 | 9.525 | 1.25 | 4.22 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL120 | 1.2 | 0.1 | ● | 16 | 9.525 | 1.3 | 4.12 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL140 | 1.4 | 0.1 | ● | 16 | 9.525 | 1.5 | 4.02 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL170 | 1.7 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.87 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL195 | 1.95 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.75 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16ER/IL225 | 2.25 | 0.1 | ● | 16 | 9.525 | 1.8 | 3.6 | G16ER/IL-DT | G16ER/IL-S |
| GTGN-16EL/IR100 | 1 | 0.1 | ● | 16 | 9.525 | 1.25 | 4.22 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR120 | 1.2 | 0.1 | ● | 16 | 9.525 | 1.3 | 4.12 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR140 | 1.4 | 0.1 | ● | 16 | 9.525 | 1.5 | 4.02 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR170 | 1.7 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.87 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR195 | 1.95 | 0.1 | ● | 16 | 9.525 | 1.7 | 3.75 | G16EL/IR-DT | G16EL/IR-S |
| GTGN-16EL/IR225 | 2.25 | 0.1 | ● | 16 | 9.525 | 1.8 | 3.6 | G16EL/IR-DT | G16EL/IR-S |

Package quantity = 10 pcs

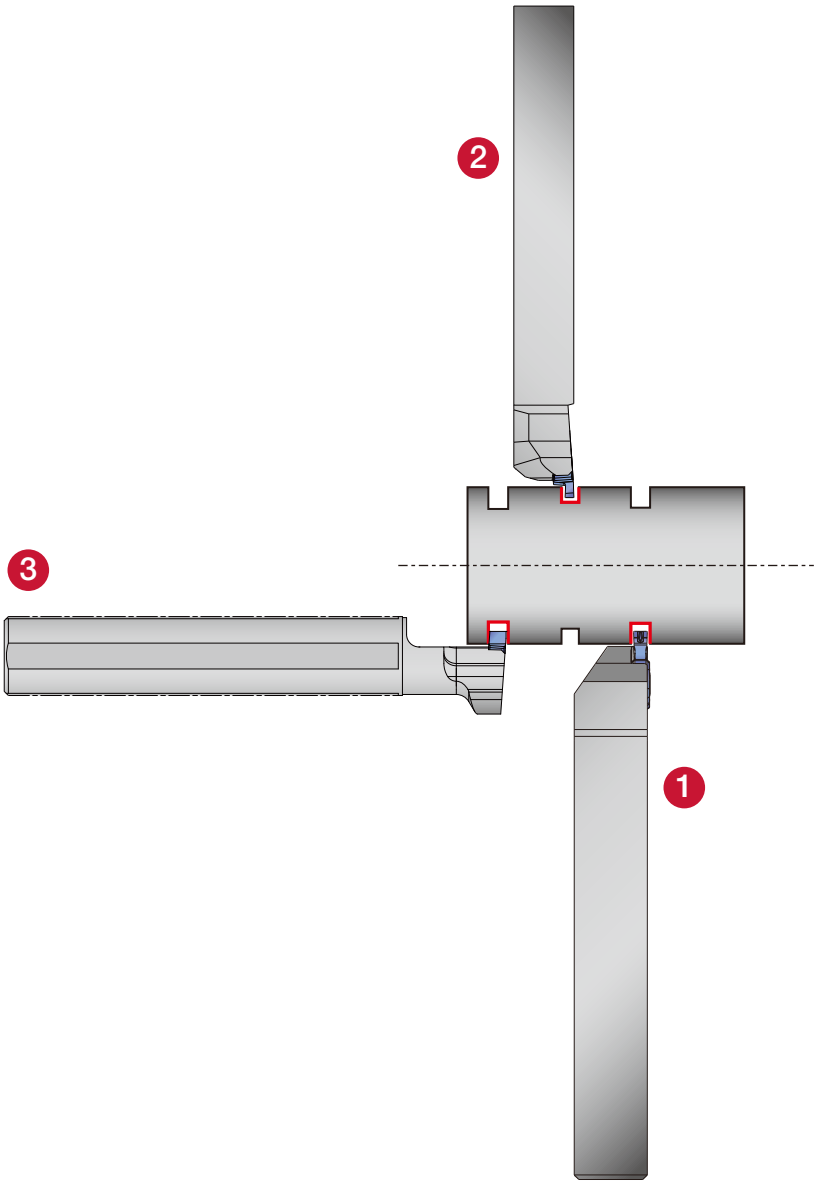
Note:
GTGN insert is applicable for both external and internal grooving, but the hand of tool is opposite in external and internal machining.
Shim for GTGN is exclusive to each type of toolholders

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|
| P | Steels<br>C45, 42CrMo4, etc. | SH730 | 50 - 150 | 0.05 - 0.1 |
| M | Stainless steels<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | SH730 | 30 - 150 | 0.05 - 0.1 |
| S | Heat-resistant alloys, Titanium alloys etc.<br>Ti-6Al-4V, etc. | SH730 | 30 - 100 | 0.05 - 0.1 |

# **Multi-purpose grooving** line with economical insert containing **4 cutting edges**






**1 STCR/L -27**
*W* = 0.5 - 3.18 mm
*ar* = 1.6 - 6.4 mm
Shank size:
10 - 25 mm
C042

**2 STCR/L -18**
*W* = 0.33 - 3 mm
*ar* = 0.8 - 2.5 mm
Shank size:
10 - 25 mm
C049

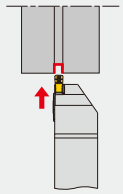
**3 JS-STCL18**
*W* = 0.33 - 3 mm
*ar* = 0.8 - 2.5 mm
Shank size:
ø14 - ø25.4 mm
C050

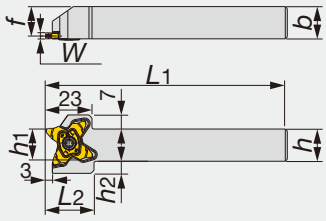
**STCR/L -27-CHP**
*W* = 0.5 - 3.18 mm
*ar* = 1.6 - 6.4 mm
Shank size:
25 mm
C042

TETRAFORCE CUT

## STCR/L-27

Precision external grooving tools with uniquely shaped insert with 4 cutting edges






Right hand (R) shown.

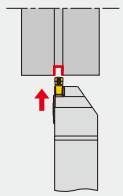
| Designation | W | $h_1$ | b | h | $L_1$ | f | $h_2$ | $L_2$ | Insert |
|---|---|---|---|---|---|---|---|---|---|
| STCR/L1010-27 | 0.5 - 3.18 | 10 | 10 | 10 | 120 | 8.5 | 9.5 | 24 | TC*27... |
| STCR/L1212-27 | 0.5 - 3.18 | 12 | 12 | 12 | 120 | 10.5 | 8 | 24 | TC*27... |
| STCR/L1616-27 | 0.5 - 3.18 | 16 | 16 | 16 | 120 | 14.5 | 6 | 24 | TC*27... |
| STCR/L2020-27 | 0.5 - 3.18 | 20 | 20 | 20 | 120 | 18.5 | 2 | 24 | TC*27... |
| STCR/L2525-27 | 0.5 - 3.18 | 25 | 25 | 25 | 135 | 23.5 | - | - | TC*27... |

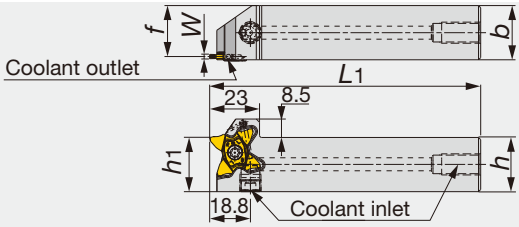
### SPARE PARTS

| Designation | Screw | Wrench |
|---|---|---|
| STCR****-27 | SR16-212-01397L | T-2010/5 |
| STCL****-27 | SR16-212-01397 | T-2010/5 |

## STCR/L-CHP

Precision external grooving tools with uniquely shaped insert, with channels for high pressure coolant.






Right hand (R) shown.

| Designation | W | $h_1$ | b | h | $L_1$ | f | Insert |
|---|---|---|---|---|---|---|---|
| STCR/L2525-27-CHP | 0.5 - 3.18 | 25 | 25 | 25 | 125 | 23.5 | TC*27... |

### SPARE PARTS

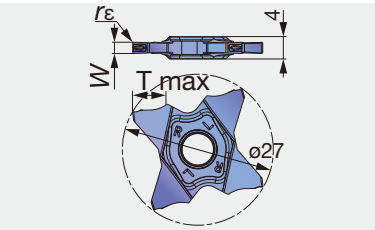
| Designation | Screw | Wrench |
|---|---|---|
| STCR****-27-CHP | SR16-212-01397L | T-2010/5 |
| STCL****-27-CHP | SR16-212-01397 | T-2010/5 |

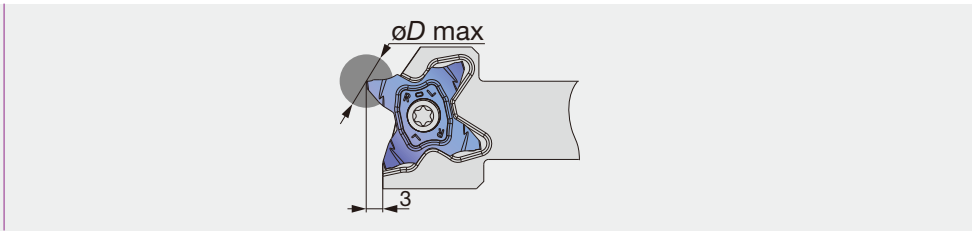
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed: f (mm/rev) Grooving, parting off TCS | Grooving, parting off TCM | Parting off (with hand) TCS | Profiling (with full radius insert) TCS | Profiling (with full radius insert) TCM | Depth of cut for profiling (with full radius insert) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel S45C / C45, etc. | AH725 | 100 - 200 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| P | Alloy steel SCM435 / 34CrMo4, etc. | AH725 | 50 -180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| M | Stainless steel SUS304 / X5CrNi18-9, etc. | AH725 | 100 - 150 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Grey cast iron FC250 / 250 / GG25, etc. | AH725 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Ductile cast iron FCD400 / 400-15 / GGG400, etc. | AH725 | 50 - 120 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | AH725 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.1 | 0.5 |

# INSERT - FOR GROOVING AND PARTING OFF

## TCS27



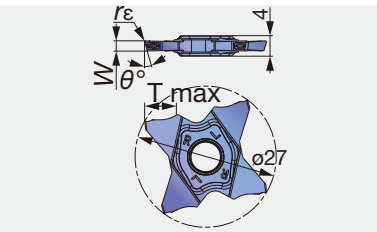



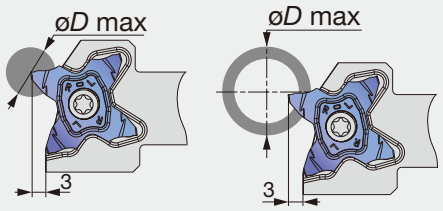

| Designation | W ± 0.02 | rε | AH725 | T max | øD max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCS27-050-000 | 0.5 | 0 | ● | 1 | 2 | ∞ | - | - | - | - | - | - | - | - | - | - | - |
| TCS27-050-004 | 0.5 | 0.04 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-075-010 | 0.75 | 0.1 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-080-000 | 0.8 | 0 | ● | 1.6 | 3.2 | ∞ | - | - | - | - | - | - | - | - | - | - | - |
| TCS27-100-006 | 1 | 0.06 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-100-010 | 1 | 0.1 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-104-000 | 1.04 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-120-000 | 1.2 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-125-010 | 1.25 | 0.1 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-125-020 | 1.25 | 0.2 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-140-000 | 1.4 | 0 | ● | 2 | 4 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-147-000 | 1.47 | 0 | ● | 2.5 | 5 | ∞ | ∞ | - | - | - | - | - | - | - | - | - | - |
| TCS27-150-010 | 1.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-150-020 | 1.5 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-157-015 | 1.57 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-170-010 | 1.7 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-175-010 | 1.75 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-175-020 | 1.75 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-178-018 | 1.78 | 0.18 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-185-020 | 1.85 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-196-015 | 1.96 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-200-010 | 2 | 0.1 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCS27-200-020 | 2 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCS27-222-015 | 2.22 | 0.15 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-230-020 | 2.3 | 0.2 | ● | 3.5 | 7. | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCS27-239-015 | 2.39 | 0.15 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-247-020 | 2.47 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-250-010 | 2.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-250-030 | 2.5 | 0.3 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-270-010 | 2.7 | 0.1 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCS27-287-020 | 2.87 | 0.2 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCS27-300-000 | 3 | 0 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-020 | 3 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-030 | 3 | 0.3 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-300-040 | 3 | 0.4 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCS27-315-015 | 3.15 | 0.15 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |
| TCS27-318-020 | 3.18 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |

Package Quantity = 5 pcs.
● : Line up

# INSERT - FOR PARTING OFF

## TCS27-R/L




Right hand (R) shown.

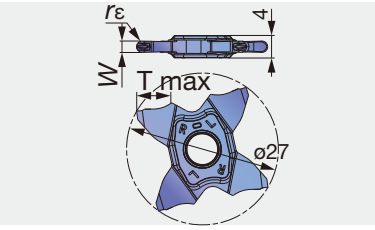
| Designation | W ± 0.02 | rε | AH725 | | T max | θ° | Max. parting off dia. øD max | |
|---|---|---|---|---|---|---|---|---|
| | | | R | L | | | Solid bar | Tube |
| TCS27-100-15R/L | 1 | 0.06 | ● | ● | 3.5 | 15 | 7 | 600 |
| TCS27-150-6R/L | 1.5 | 0.06 | ● | ● | 5.7 | 6 | 11.4 | 35 |
| TCS27-150-15R/L | 1.5 | 0.06 | ● | ● | 5.7 | 15 | 11.4 | 35 |
| TCS27-200-6R/L | 2 | 0.1 | ● | ● | 6.4 | 6 | 12.8 | 30 |
| TCS27-200-15R/L | 2 | 0.1 | ● | ● | 6.4 | 15 | 12.8 | 30 |

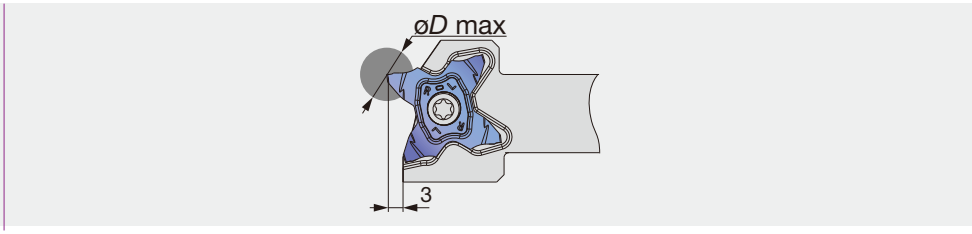
Package Quantity = 5 pcs.

● : Line up

# INSERT - FOR GROOVING AND PROFILING

## TCS27-Full R



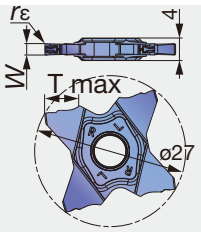

| Designation | *W* ± 0.02 | *rε* | AH725 | T max | Relation of groove depth (T) and Max. diameter (ø*D* max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCS27-157-079 | 1.57 | 0.79 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-200-100 | 2 | 1 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCS27-239-120 | 2.39 | 1.2 | ● | 5.7 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCS27-300-150 | 3 | 1.5 | ● | 6.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |

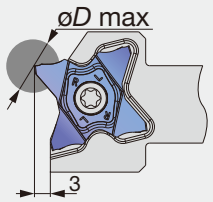
Package Quantity = 5 pcs.

● : Line up

# INSERT - FOR GROOVING AND PARTING OFF

## TCM27



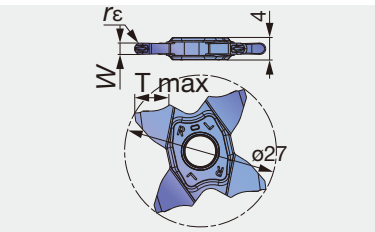

| Designation | W ± 0.02 | rε | AH725 | T max | øD max | Relation of groove depth (T) and Max. diameter (øD max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCM27-150-010 | 1.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-150-020 | 1.5 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-157-015 | 1.57 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-170-010 | 1.7 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-175-010 | 1.75 | 0.1 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-175-020 | 1.75 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-178-018 | 1.78 | 0.18 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-185-020 | 1.85 | 0.2 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-196-015 | 1.96 | 0.15 | ● | 3 | 6 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-200-010 | 2 | 0.1 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCM27-200-020 | 2 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 105 | 85 | 60 | 50 | 30 |
| TCM27-222-015 | 2.22 | 0.15 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-230-020 | 2.3 | 0.2 | ● | 3.5 | 7 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-239-015 | 2.39 | 0.15 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-247-020 | 2.47 | 0.2 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-250-010 | 2.5 | 0.1 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-250-030 | 2.5 | 0.3 | ● | 5.7 | 11.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-270-010 | 2.7 | 0.1 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCM27-287-020 | 2.87 | 0.2 | ● | 6.2 | 12.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | - |
| TCM27-300-000 | 3 | 0 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-020 | 3 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-030 | 3 | 0.3 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-300-040 | 3 | 0.4 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |
| TCM27-315-015 | 3.15 | 0.15 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |
| TCM27-318-020 | 3.18 | 0.2 | ● | 6.4 | 12.8 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 68 |

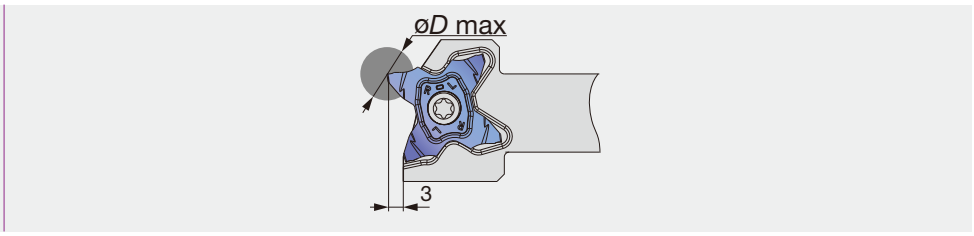
Package Quantity = 5 pcs.

● : Line up

## INSERT - FOR GROOVING AND PROFILING

### TCM27-Full R



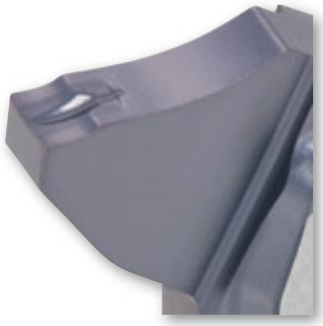




| Designation | *W* ± 0.02 | *r*ε | AH725 | T max | Relation of groove depth (T) and Max. diameter (ø*D* max) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | T≤1 | T≤2 | T≤3 | T≤3.5 | T≤4 | T≤4.5 | T≤5 | T≤5.5 | T≤5.7 | T≤6 | T≤6.2 | T≤6.4 |
| TCM27-157-079 | 1.57 | 0.79 | ● | 3 | ∞ | ∞ | ∞ | - | - | - | - | - | - | - | - | - |
| TCM27-200-100 | 2 | 1 | ● | 3.5 | ∞ | ∞ | ∞ | 600 | - | - | - | - | - | - | - | - |
| TCM27-239-120 | 2.39 | 1.2 | ● | 5.7 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 130 | 50 | 35 | - | - | - |
| TCM27-300-150 | 3 | 1.5 | ● | 6.4 | ∞ | ∞ | ∞ | 600 | 280 | 180 | 135 | 105 | 95 | 85 | 78 | 55 |

Package Quantity = 5 pcs.
● : Line up

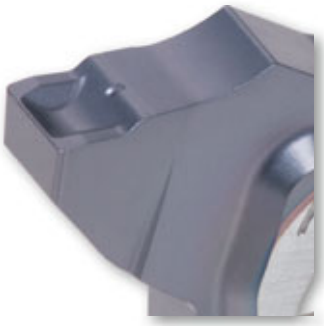
## CHIPBREAKER

### TCS27



*W* = 0.5 mm – 3.18 mm
For general machining
Lower cutting force and superior sharpness

### TCM27



*W* = 1.5 mm – 3.18 mm
For high feed machining
Well-designed edge with high strength

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) Grooving, parting-off TCS | Grooving, parting-off TCM | Parting-off (with hand) TCS | Profiling (with full radius insert) TCS | Profiling (with full radius insert) TCM | Depth of cut for profiling (with full radius insert) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel S45C / C45, etc. | AH725 | 100 - 200 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| P | Alloy steel SCM435 / 34CrMo4, etc. | AH725 | 50 -180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| M | Stainless steel SUS304 / X5CrNi18-9, etc. | AH725 | 100 - 150 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Grey cast iron FC250 / 250 / GG25, etc. | AH725 | 50 - 180 | 0.05 - 0.15 | 0.05 - 0.25 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| K | Ductile cast iron FCD400 / 400-15 / GGG400, etc. | AH725 | 50 - 120 | 0.05 - 0.15 | 0.05 - 0.2 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.15 | 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | AH725 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.04 - 0.12 | 0.05 - 0.1 | 0.05 - 0.1 | 0.5 |

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

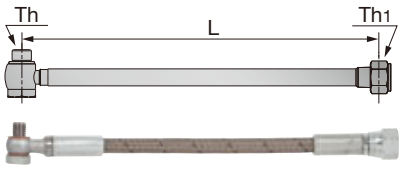
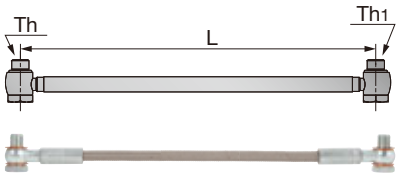
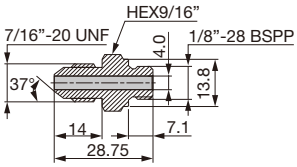



Fig. 2



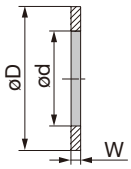

| Designation | Length L | Threading size Th | Threading size Th1 | Max. pressure (MPa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

### Connector



| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

### Seal washer

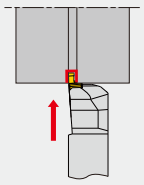


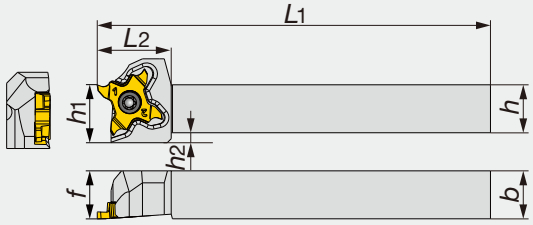
| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |

# STCR/L-18

Precision external grooving and threading tools with uniquely shaped insert for swiss lathes








Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | f | h2 | Insert |
|---|---|---|---|---|---|---|---|---|
| STCR/L1010X18 | 10 | 10 | 120 | 18.5 | 10 | 10 | 4.5 | TC*18... |
| STCR/L1212F18 | 12 | 12 | 85 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1212X18 | 12 | 12 | 120 | 18.5 | 12 | 12 | 2.5 | TC*18... |
| STCR/L1616X18 | 16 | 16 | 120 | 18.5 | 16 | 16 | - | TC*18... |
| STCR/L2020H18 | 20 | 20 | 100 | 18.5 | 20 | 20 | - | TC*18... |
| STCR/L2020X18 | 20 | 20 | 120 | 23 | 20 | 25 | - | TC*18... |
| STCR/L2525Z18 | 25 | 25 | 135 | 23 | 25 | 30 | - | TC*18... |

• The right hand insert (TC*18R***) is used for the right hand toolholders (STCR***), and the left hand insert (TC*18L***) is used for the left hand toolholders (STCL***).

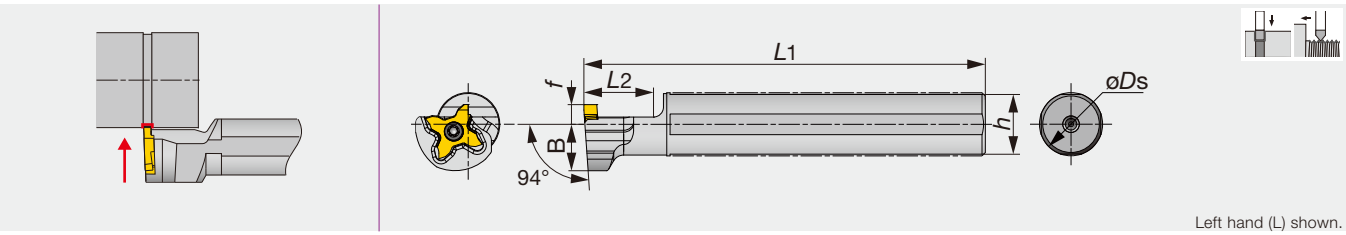
## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| STCR*****18 | CSTC-4L100DL | T-1008/5 |
| STCL*****18 | CSTC-4L100DR | T-1008/5 |

# TETRAMINI CUT

## JS-STCL18

Precision grooving tools with uniquely shaped insert for swiss lathes




Left hand (L) shown.

| Designation | øDs | L1 | L2 | h | B | f | Insert |
|---|---|---|---|---|---|---|---|
| JS14H-STCL18 | 14 | 100 | 20 | 13 | 14 | 6 | TC*18... |
| JS159F-STCL18 | 15.875 | 85 | 20 | 15 | 14 | 6 | TC*18... |
| JS16F-STCL18 | 16 | 85 | 20 | 15 | 14 | 6 | TC*18... |
| JS19G-STCL18 | 19.05 | 90 | 20 | 18 | 14 | 6 | TC*18... |
| JS19X-STCL18 | 19.05 | 120 | 20 | 18 | 14 | 6 | TC*18... |
| JS20G-STCL18 | 20 | 90 | 20 | 19 | 14 | 6 | TC*18... |
| JS20X-STCL18 | 20 | 120 | 20 | 19 | 14 | 6 | TC*18... |
| JS22X-STCL18 | 22 | 120 | 20 | 21 | 12.25 | 10 | TC*18... |
| JS25H-STCL18 | 25 | 100 | 20 | 24 | 12.25 | 10 | TC*18... |
| JS254X-STCL18 | 25.4 | 120 | 20 | 24 | 12.25 | 10 | TC*18... |

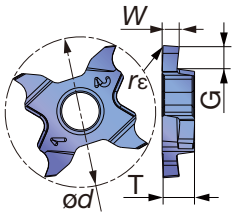
• The right hand insert (TC*18R***) is used for the left hand toolholders (STCL***).

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JS****-STCL18 | CSTC-4L100DL | T-1008/5 |

## INSERT

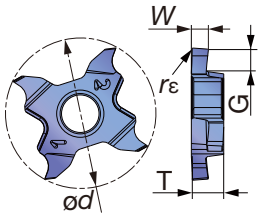
### TCP18R/L-F (sharp edge)




| Designation | W±0.02 | rε | SH725 R | SH725 L | G | T | ød |
|---|---|---|---|---|---|---|---|
| TCP18R/L033F-005 | 0.33 | 0.05 | ● | ● | 0.8 | 4 | 18 |
| TCP18R/L043F-005 | 0.43 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L050F-005 | 0.5 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L075F-005 | 0.75 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L095F-005 | 0.95 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L100F-010 | 1 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L120F-010 | 1.2 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L125F-010 | 1.25 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L145F-010 | 1.45 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L150F-010 | 1.5 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L175F-010 | 1.75 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L200F-010 | 2 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L250F-010 | 2.5 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L300F-010 | 3 | 0.1 | ● | ● | 2.5 | 4 | 18 |

● : Line up

## TCP18R/L(honed edge)




| Designation | W±0.02 | rε | AH725 | | | | |
|---|---|---|---|---|---|---|---|
| | | | R | L | G | T | ød |
| TCP18R/L033-005 | 0.33 | 0.05 | ● | ● | 0.8 | 4 | 18 |
| TCP18R/L043-005 | 0.43 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L050-005 | 0.5 | 0.05 | ● | ● | 1.2 | 4 | 18 |
| TCP18R/L075-005 | 0.75 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L095-005 | 0.95 | 0.05 | ● | ● | 2 | 4 | 18 |
| TCP18R/L100-010 | 1 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L120-010 | 1.2 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L125-010 | 1.25 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L145-010 | 1.45 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L150-010 | 1.5 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L175-010 | 1.75 | 0.1 | ● | ● | 2 | 4 | 18 |
| TCP18R/L200-010 | 2 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L250-010 | 2.5 | 0.1 | ● | ● | 2.5 | 4 | 18 |
| TCP18R/L300-010 | 3 | 0.1 | ● | ● | 2.5 | 4 | 18 |

● : Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Priority | Grade | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels (C15, C20 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| | Prehardened steels (NAK80, PX5 etc.) | First choice | SH725 | 80 - 180 | 0.03 - 0.1 |
| | | Toughness | AH725 | 80 - 180 | 0.03 - 0.1 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2 etc) | First choice | SH725 | 50 - 120 | 0.03 - 0.1 |
| | | Toughness | AH725 | 50 - 120 | 0.03 - 0.1 |
| K | Grey cast irons (250, 300 etc.) | First choice | AH725 | 50 - 180 | 0.03 - 0.1 |
| | | Sharpness | SH725 | 50 - 180 | 0.03 - 0.1 |
| | Ductile cast irons (400-15, 600-3 etc.) | First choice | AH725 | 50 - 180 | 0.03 - 0.1 |
| | | Sharpness | SH725 | 50 - 180 | 0.03 - 0.1 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | First choice | SH725 | 20 - 80 | 0.03 - 0.1 |
| | | Toughness | AH725 | 20 - 80 | 0.03 - 0.1 |
| | Superalloys (Inconel718, etc.) | First choice | SH725 | 20 - 80 | 0.03 - 0.1 |
| | | Toughness | AH725 | 20 - 80 | 0.03 - 0.1 |

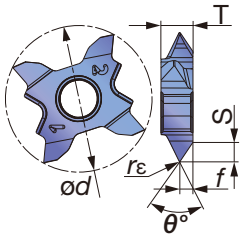
## CHIPBREAKER

# TCP18

*W* = 0.33 mm – 3 mm
Suitable for small parts on swiss lathe
Low cutting force with large rake angle

## INSERT

### TCT18R/L (For Threading)




| Designation | rε | AH725 | | pitch min | pitch max | f | S | θ° | T | ød |
|---|---|---|---|---|---|---|---|---|---|---|
| | | R | L | | | | | | | |
| TCT18R/L-60N-010 | 0.1 | ● | ● | 0.8 | 3 | 1.6 | 2.67 | 60 | 4 | 18 |
| TCT18R/L-60N-020 | 0.2 | ● | ● | 1.5 | 3 | 1.6 | 2.57 | 60 | 4 | 18 |

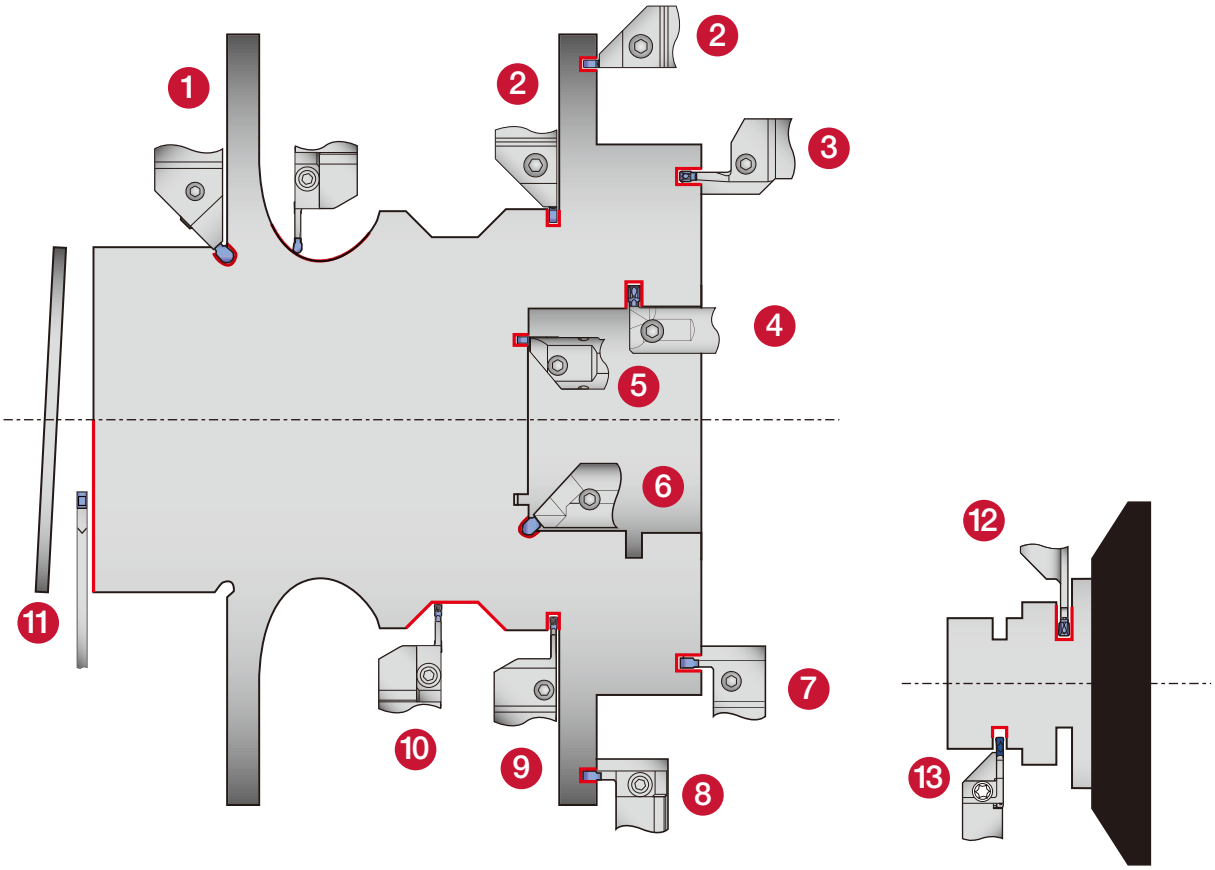
● : Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Pitch (mm) | TPI |
|---|---|---|---|---|---|
| P | Low carbon steels (C15, C20 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| | Carbon steels, Alloy steels (C55, 42CrMoS4 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| | Prehardened steels (NAK80, PX5 etc.) | AH725 | 60 - 150 | 0.8 - 3 | 32 - 8 |
| M | Stainless steels (X5CrNi18-9, X5CrNiMo17-12-2, etc.) | AH725 | 50 - 80 | 0.8 - 3 | 32 - 8 |
| K | Grey cast irons (250, 300 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| | Ductile cast irons (400-15, 600-3 etc.) | AH725 | 50 - 100 | 0.8 - 3 | 32 - 8 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |
| | Superalloys (Inconel718, etc.) | AH725 | 30 - 100 | 0.8 - 3 | 32 - 8 |

# Multi-functional tool reduces tool cost and shortens set-up time






**1 CGEUR/L**
Monoblock type
*W* = 3 - 6 mm
*ar* = 2.8 - 3.4 mm
Shank size:
16 - 25 mm
C063

**2 CTEFR/L**
Monoblock type
*W* = 2 - 6 mm
*ar* = 4.8 mm
Shank size:
20 - 25 mm
C057

**3 CTFR/L**
Monoblock type
*W* = 3 - 6 mm
*ar* = 10 - 25 mm
Shank size:
25 mm
C066

**4 CTIR/L**
Monoblock type
*W* = 2 - 8 mm
*ar* = 4 - 10 mm
Shank size:
ø16 - ø40 mm
C064

**5 CTIFR/L**
Monoblock type
*W* = 3 - 6 mm
*ar* = 5.5 mm
Shank size:
ø25 - ø32 mm
C071

**6 CGIUR/L**
Monoblock type
*W* = 3 - 6 mm
*ar* = 2.8 mm
Shank size:
ø20 - ø25 mm
C065

**7 CTFVR/L**
Monoblock type
*W* = 3 - 6 mm
*ar* = 10 - 20 mm
Shank size:
25 mm
C067

**8 CAFR/L**
Adaptor type
*W* = 3 - 6 mm
*ar* = 12 - 25 mm
Shank size:
20 - 32 mm
C068

**9 CTER/L**
Monoblock type
*W* = 2 - 8 mm
*ar* = 8 - 36 mm
Shank size:
16 - 32 mm
C054

**10 CAER/L**
Adaptor type
*W* = 3 - 6 mm
*ar* = 16 - 20 mm
Shank size:
20 - 32 mm
C058

**11 CGP**
Blade type
*W* = 1.4 - 8 mm
Max. parting Dia.:
ø120 mm
Shank size:
ø20 - ø25 mm
C061

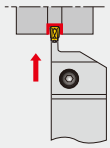
**12 CGER/L**
Monoblock type
*W* = 1.4 - 4 mm
*ar* = 10 - 16 mm
Shank size:
12 - 20 mm
C057

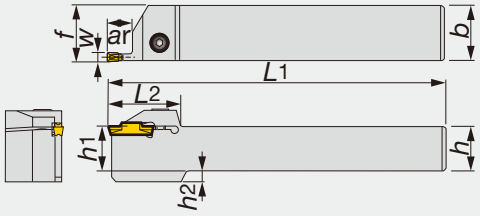
**13 JCTER/L**
Monoblock type
*W* = 1.4 - 3 mm
*ar* = 10 - 16 mm
Shank size:
10 - 20 mm
C056

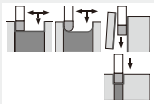
# TUNGCUT

## CTER/L

External toolholders for grooving, parting & turning





Insert:
DGM, SGM, DGS, SGS, DGG, DTX, DTE, DTR, DTA, SGN

Right hand (R) shown.

| Designation | W | Seat size | ar | h | b | $L_1$ | $L_2$ | $h_1$ | f (1) | $h_2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| CTER/L1616-2T08 | 2 | 2 | 8 | 16 | 16 | 110 | 33 | 16 | 16.1 | 4 |
| CTER/L2020-2T08 | 2 | 2 | 8 | 20 | 20 | 125 | 33 | 20 | 20.1 | - |
| CTER/L2525-2T08 | 2 | 2 | 8 | 25 | 25 | 150 | 33 | 25 | 25.1 | - |
| CTER/L1616-2T12 | 2 | 2 | 12 | 16 | 16 | 110 | 32 | 16 | 16.1 | 4 |
| CTER/L2020-2T12 | 2 | 2 | 12 | 20 | 20 | 125 | 32 | 20 | 20.1 | - |
| CTER/L2525-2T12 | 2 | 2 | 12 | 25 | 25 | 150 | 32 | 25 | 25.1 | - |
| CTER/L1616-2T17 | 2 | 2 | 17 | 16 | 16 | 110 | 37 | 16 | 16.1 | 4 |
| CTER/L2020-2T17 | 2 | 2 | 17 | 20 | 20 | 125 | 37 | 20 | 20.1 | - |
| CTER/L2525-2T17 | 2 | 2 | 17 | 25 | 25 | 150 | 37 | 25 | 25.1 | - |
| CTER/L1616-3T09 | 3 | 3 | 9 | 16 | 16 | 110 | 32 | 16 | 16.3 | 4 |
| CTER/L2020-3T09 | 3 | 3 | 9 | 20 | 20 | 125 | 32 | 20 | 20.3 | - |
| CTER/L2525-3T09 | 3 | 3 | 9 | 25 | 25 | 150 | 32 | 25 | 25.3 | - |
| CTER/L2020-3T12 | 3 | 3 | 12 | 20 | 20 | 125 | 32 | 20 | 20.3 | - |
| CTER/L2525-3T12 | 3 | 3 | 12 | 25 | 25 | 150 | 32 | 25 | 25.3 | - |
| CTER/L1616-3T20 | 3 | 3 | 20 | 16 | 16 | 110 | 38.5 | 16 | 16.3 | 4 |
| CTER/L2020-3T20 | 3 | 3 | 20 | 20 | 20 | 125 | 38.5 | 20 | 20.3 | - |
| CTER/L2525-3T20 | 3 | 3 | 20 | 25 | 25 | 150 | 38.5 | 25 | 25.3 | - |
| CTER/L2525-3T25 | 3 | 3 | 25 | 25 | 25 | 150 | 44.5 | 25 | 25.3 | - |
| CTER/L1616-4T10 | 4 | 4 | 10 | 16 | 16 | 110 | 32 | 16 | 16.5 | 4 |
| CTER/L2020-4T10 | 4 | 4 | 10 | 20 | 20 | 125 | 32 | 20 | 20.5 | - |
| CTER/L2525-4T10 | 4 | 4 | 10 | 25 | 25 | 150 | 32 | 25 | 25.5 | - |
| CTER/L2020-4T15 | 4 | 4 | 15 | 20 | 20 | 125 | 33 | 20 | 20.5 | - |
| CTER/L2525-4T15 | 4 | 4 | 15 | 25 | 25 | 150 | 33 | 25 | 25.5 | - |
| CTER/L1616-4T25 | 4 | 4 | 25 | 16 | 16 | 110 | 45 | 16 | 16.5 | 4 |
| CTER/L2020-4T25 | 4 | 4 | 25 | 20 | 20 | 125 | 45 | 20 | 20.5 | - |
| CTER/L2525-4T25 | 4 | 4 | 25 | 25 | 25 | 150 | 45 | 25 | 25.5 | - |
| CTER/L3232-4T25 | 4 | 4 | 25 | 32 | 32 | 170 | 45 | 32 | 32.5 | - |
| CTER/L2020-5T12 | 5 | 5 | 12 | 20 | 20 | 125 | 37 | 20 | 20.6 | - |
| CTER/L2525-5T12 | 5 | 5 | 12 | 25 | 25 | 150 | 37 | 25 | 25.6 | - |
| CTER/L2525-5T20 | 5 | 5 | 20 | 25 | 25 | 150 | 37 | 25 | 25.6 | - |
| CTER/L2525-5T32 | 5 | 5 | 32 | 25 | 25 | 150 | 56 | 25 | 25.6 | - |
| CTER/L3232-5T32 | 5 | 5 | 32 | 32 | 32 | 170 | 56 | 32 | 32.6 | - |
| CTER/L2020-6T12 | 6 | 6 | 12 | 20 | 20 | 125 | 37 | 20 | 20.6 | - |
| CTER/L2525-6T12 | 6 | 6 | 12 | 25 | 25 | 150 | 37 | 25 | 25.6 | 7 |
| CTER/L2525-6T20 | 6 | 6 | 20 | 25 | 25 | 150 | 41 | 25 | 25.6 | - |
| CTER/L2525-6T32 | 6 | 6 | 32 | 25 | 25 | 150 | 56 | 25 | 25.6 | 7 |
| CTER/L3232-6T32 | 6 | 6 | 32 | 32 | 32 | 170 | 56 | 32 | 32.6 | - |
| CTER/L2525-8T16 | 8 | 8 | 16 | 25 | 25 | 150 | 47 | 25 | 26.1 | 7 |
| CTER/L2525-8T25 | 8 | 8 | 25 | 25 | 25 | 150 | 47 | 25 | 26.1 | 7 |
| CTER/L3232-8T25 | 8 | 8 | 25 | 32 | 32 | 170 | 47 | 32 | 33.1 | - |
| CTER/L2525-8T36 | 8 | 8 | 36 | 25 | 25 | 150 | 60 | 25 | 26.1 | 7 |
| CTER/L3232-8T36 | 8 | 8 | 36 | 32 | 32 | 170 | 60 | 32 | 33.1 | - |

• When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• For Applicable insert, see page C073 - C085.

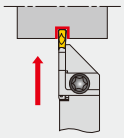
## SPARE PARTS

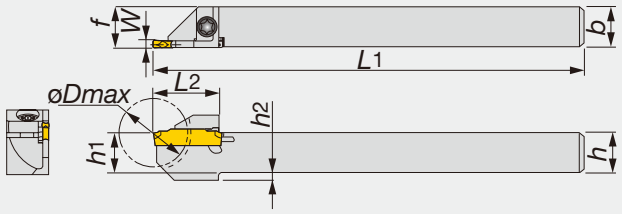
| Designation | Clamping screw | Wrench |
|---|---|---|
| CTER/L1616-2T08 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T08 | CM5X0.8X20-A | P-4 |
| CTELR/L2525-2T08 | CM5X0.8X25-A | P-4 |
| CTER/L1616-2T12 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T12 | CM5X0.8X20-A | P-4 |
| CTER/L2525-2T12 | CM5X0.8X25-A | P-4 |
| CTER/L1616-2T17 | CM5X0.8X16-A | P-4 |
| CTER/L2020-2T17 | CM5X0.8X20-A | P-4 |
| CTER/L2525-2T17 | CM5X0.8X25-A | P-4 |
| CTER/L1616-3T09 | CM5X0.8X16-A | P-4 |
| CTER/L2020-3T09 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T09 | CM5X0.8X25-A | P-4 |
| CTER/L2020-3T12 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T12 | CM5X0.8X25-A | P-4 |
| CTER/L1616-3T20 | CM5X0.8X16-A | P-4 |
| CTER/L2020-3T20 | CM5X0.8X20-A | P-4 |
| CTER/L2525-3T20.25 | CM5X0.8X25-A | P-4 |
| CTER/L1616-4T10 | CM6X1X16-A | P-5 |
| CTER/L2020-4T10 | CM6X1X20-A | P-5 |
| CTER/L2525-4T10 | CM6X1X25-A | P-5 |
| CTER/L2020-4T15 | CM6X1X20-A | P-5 |
| CTER/L2525-4T15 | CM6X1X25-A | P-5 |
| CTER/L1616-4T25 | CM6X1X16-A | P-5 |
| CTER/L2020-4T25 | CM6X1X20-A | P-5 |
| CTER/L2525-4T25 | CM6X1X25-A | P-5 |
| CTER/L3232-4T25 | CM6X1X25-A | P-5 |
| CTER/L2020-5T12 | CM6X1X20-A | P-5 |
| CTER/L2525-5T20 | CM6X1X25-A | P-5 |
| CTER/L2525, 3232-5T32 | CM6X1X25-A | P-5 |
| CTER/L2020-6T12 | CM8X1.25X20-A | P-6 |
| CTER/L2525-6T12 | CM8X1.25X25-A | P-6 |
| CTER/L2525-6T20 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-6T32 | CM8X1.25X25-A | P-6 |
| CTER/L2525-8T16 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-8T25 | CM8X1.25X25-A | P-6 |
| CTER/L2525, 3232-8T36 | CM8X1.25X25-A | P-6 |

# TUNGCUT

## JCTER/L

External grooving & parting toolholders for swiss lathes





Insert:
Seat size 1 = DGS1.4-016
Seat size 2, 3, = DGM, SGM, DGS, SGS, DGE, DTE, DGG

Right hand (R) shown.

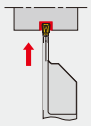
| Designation | W | Seat size | øDmax | h | b | L1 | L2 | h1 | f(1) | h2 |
|---|---|---|---|---|---|---|---|---|---|---|
| JCTER/L1010X1.4T10 | 1.4 | 1 | 20 | 10 | 10 | 120 | 18 | 10 | 10.2 | - |
| JCTER/L1010-1.4T10 | 1.4 | 1 | 20 | 10 | 10 | 125 | 18 | 10 | 10.2 | - |
| JCTER/L1212F1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 85 | 19.5 | 12 | 12.2 | - |
| JCTER/L1212X1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 120 | 19.5 | 12 | 12.2 | - |
| JCTER/L1212-1.4T12 | 1.4 | 1 | 24 | 12 | 12 | 125 | 19.5 | 12 | 12.2 | - |
| JCTER/L1414-1.4T12 | 1.4 | 1 | 24 | 14 | 14 | 125 | 19.5 | 14 | 14.2 | - |
| JCTER/L1616X1.4T16 | 1.4 | 1 | 32 | 16 | 16 | 120 | 24 | 16 | 16.2 | - |
| JCTER/L1616-1.4T16 | 1.4 | 1 | 32 | 16 | 16 | 125 | 24 | 16. | 16.2 | - |
| JCTER/L1010X2T10 | 2 | 2 | 20 | 10 | 10 | 120 | 19 | 10 | 10.1 | 2 |
| JCTER/L1010-2T10 | 2 | 2 | 20 | 10 | 10 | 125 | 19 | 10 | 10.1 | 2 |
| JCTER/L1212F2T12 | 2 | 2 | 24 | 12 | 12 | 85 | 19 | 12 | 12.1 | 2 |
| JCTER/L1212X2T12 | 2 | 2 | 24 | 12 | 12 | 120 | 19 | 12 | 12.1 | 2 |
| JCTER/L1212-2T12 | 2 | 2 | 24 | 12 | 12 | 125 | 19 | 12 | 12.1 | 2 |
| JCTER/L1414-2T12 | 2 | 2 | 24 | 14 | 14 | 125 | 19 | 14 | 14.1 | - |
| JCTER/L1616X2T16 | 2 | 2 | 32 | 16 | 16 | 120 | 24 | 16 | 16.1 | - |
| JCTER/L1616-2T16 | 2 | 2 | 32 | 16 | 16 | 125 | 24 | 16 | 16.1 | - |
| JCTER/L1212F3T12 | 3 | 3 | 24 | 12 | 12 | 85 | 19 | 12 | 12.3 | 2 |
| JCTER/L1212X3T12 | 3 | 3 | 24 | 12 | 12 | 120 | 19 | 12 | 12.3 | 2 |
| JCTER/L1212-3T12 | 3 | 3 | 24 | 12 | 12 | 125 | 19 | 12 | 12.3 | 2 |
| JCTER/L1616X3T16 | 3 | 3 | 32 | 16 | 16 | 120 | 24 | 16 | 16.3 | - |
| JCTER/L1616-3T16 | 3 | 3 | 32 | 16 | 16 | 125 | 24 | 16 | 16.3 | - |
| JCTER/L2020H3T16 | 3 | 3 | 32 | 20 | 20 | 100 | 24 | 20 | 20.3 | - |
| JCTER/L2020-3T16 | 3 | 3 | 32 | 20 | 20 | 125 | 24 | 20 | 20.3 | - |

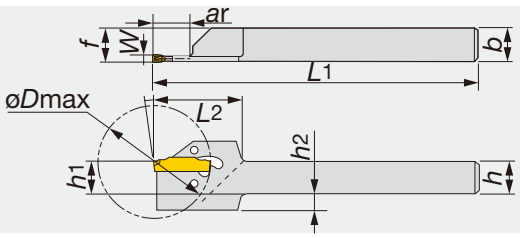
(1) "*f*" value is calculated with groove width "*W*" shown in the table. • *ø*Dmax: Max. parting off dia.
• For Applicable insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| JCTER/L... | CSHB-4-A | T-15F |

# TUNGCUT
## CGER/L
External deep grooving & parting toolholders for swiss lathes





Insert:
Seat size 1 = DGS1.4-016
Seat size 2, 3, 4, = DGM, SGM, DGS, SGS, SGN, DGG

Right hand (R) shown.

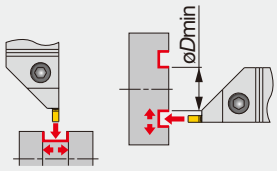
| Designation | W | Seat size | øDmax(1) | ar | h | b | L1 | L2 | h1 | f(2) | h2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGER/L2020-1.4T14 | 1.4 | 1 | 29/29 | 9.7 | 20 | 20 | 125 | 31 | 20 | 20.2 | - |
| CGER/L1212-2T17 | 2 | 2 | 35/35 | 11.8 | 12 | 12 | 150 | 31 | 12 | 12.1 | 6 |
| CGER/L1616-2T17 | 2 | 2 | 35/35 | 11.8 | 16 | 16 | 150 | 31 | 16 | 16.1 | 2 |
| CGER/L2020-2T17 | 2 | 2 | 35/35 | 9.8 | 20 | 20 | 125 | 31 | 20 | 20.1 | - |
| CGER/L1212-3T19 | 3 | 3 | 38/40 | 12 | 12 | 12 | 150 | 31 | 12 | 12.3 | 6 |
| CGER/L1616-3T19 | 3 | 3 | 38/45 | 14.9 | 16 | 16 | 150 | 31 | 16 | 16.3 | 2 |
| CGER/L2020-3T19 | 3 | 3 | 38/45 | 13.2 | 20 | 20 | 125 | 31 | 20 | 20.3 | - |
| CGER/L2020-4T19 | 4 | 4 | 38/55 | 20.3 | 20 | 20 | 125 | 33 | 20 | 20.4 | - |

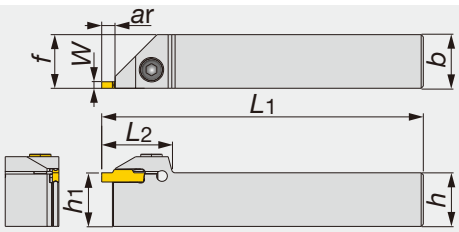
• Wrench, CRW**, should be ordered separately. Insert is clamped by the elastic deformation of upper jaw. (1) DG*/SG* Maximum diameter of parting off Dmax, can be increased by using SG* insert for some toolholders. (2) "*f*" value is calculated with groove width "*W*" shown in the table. • *øD*max: Max. parting off dia. • For Applicable insert, see page C073 - C085.

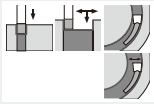
### SPARE PARTS

| Designation | Wrench |
|---|---|
| CGER/L2020-1.4T14 | CRW23 |
| CGER/L****-2T17 - 4T19 | CRW33 |

# TUNGCUT
## CTEFR/L
Toolholders for External / Face grooving & turning



Insert:
DGM, SGM, DGS, SGS, DTE, DGG, DTX, DTR, DTF, SGN

Right hand (R) shown.

| Designation | W | Seat size | ar | h1 | b | h | L1 | f | L2 |
|---|---|---|---|---|---|---|---|---|---|
| CTEFR/L2020-4T04 | 4 | 2, 3, 4 | 4.8 | 20 | 20 | 20 | 125 | 20.5 | 33 |
| CTEFR/L2525-4T04 | 4 | 2, 3, 4 | 4.8 | 25 | 25 | 25 | 150 | 25.5 | 33 |
| CTEFR/L2020-6T04 | 6 | 5, 6 | 4.8 | 20 | 20 | 20 | 125 | 20.6 | 37 |
| CTEFR/L2525-6T04 | 6 | 5, 6 | 4.8 | 25 | 25 | 25 | 150 | 25.6 | 37 |

(1) "*f*" value is calculated with groove width "*W*" shown in the table. • For Applicable insert, see page C073 - C085.

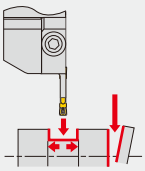
### SPARE PARTS

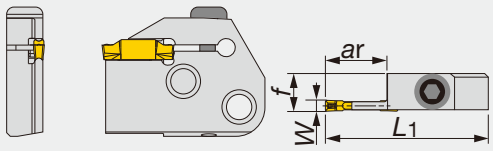
| Designation | Clamping screw | Wrench |
|---|---|---|
| CTEFR/L2020-4T04 | CM6X1X20-A | P-5 |
| CTEFR/L2525-4T04 | CM6X1X25-A | P-5 |
| CTEFR/L2020-6T04 | CM6X1X20-A | P-5 |
| CTEFR/L2525-6T04 | CM6X1X25-A | P-5 |

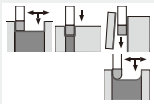
| Insert | Groove width W | Min. dia. for face grooving øDmin |
|---|---|---|
| DGM / DGS / SGN | 2 | 295 |
| DGM / DGS / SGN | 3 | 92 |
| DGM / DGS / SGN | 4 | 37 |
| DGM / DGS | 5 | 60 |
| DGM / DGS | 6 | 57 |
| DTE / DGG | 3 | 62 |
| DTE / DGG | 4 | 42 |
| DTE / DGG | 5 | 64 |
| DTE / DGG | 6 | 61 |

| Insert | Groove width W | Min. dia. for face grooving øDmin |
|---|---|---|
| DTR | 3 | 44 |
| DTR | 4 | 32 |
| DTR | 5 | 48 |
| DTR | 6 | 48 |
| DTX | 3 | 19 |
| DTX | 4 | 20 |
| DTX | 5 | 20 |
| DTX | 6 | 23 |
| DTF | 3 | 19 |
| DTF | 4 | 20 |

# TUNGCUT
## CAER/L
Blades for external grooving & parting & turning





Insert:
DGS, SGS, DGM, SGM, DTX, DTE, DGG, DTR, SGN

Right hand (R) shown.

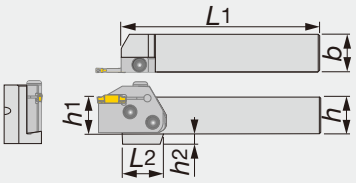
| Designation | W | Seat size | ar | $L_1$ | f | Shank |
|---|---|---|---|---|---|---|
| CAER/L-3T16 | 3 | 3 | 16 | 45 | 10.4 | CHFVL/R...,CHSR/L... |
| CAER/L-4T16 | 4 | 4 | 16 | 45 | 10.5 | CHFVL/R...,CHSR/L... |
| CAER/L-5T20 | 5 | 5 | 20 | 49 | 10.5 | CHFVL/R...,CHSR/L... |
| CAER/L-6T20 | 6 | 6 | 20 | 49 | 10.5 | CHFVL/R...,CHSR/L... |

• For Applicable insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CAER/L... | BHM6-20-A | P-4 |

# TUNGCUT
## CHSR/L
Shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | $h_2$ | Blade* |
|---|---|---|---|---|---|---|---|
| CHSR/L2020 | 20 | 20 | 133 | 35 | 20 | 12 | CAER/L...,CAFL/R... |
| CHSR/L2525 | 25 | 25 | 133 | 28 | 25 | 7 | CAER/L...,CAFL/R... |
| CHSR/L3232 | 32 | 32 | 153 | 28 | 32 | - | CAER/L...,CAFL/R... |

* Blade sold separately.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHSR/L... | CSHB-6-A | P-4 |

### Combination of blade and toolholder

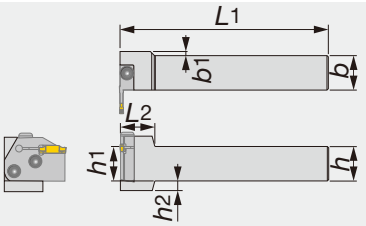
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |

● : Corresponding

# CHFVR/L

## Shank of perpendicular toolholders for CAER/L & CAFR/L blades






Right hand (R) shown.

| Designation | h | b | $L_1$ | $L_2$ | $h_1$ | $h_2$ | $b_1$ | Blade |
|---|---|---|---|---|---|---|---|---|
| CHFVR/L2020 | 20 | 20 | 150 | 25 | 20 | 12 | 8 | CAEL/R...,CAFR/L... |
| CHFVR/L2525 | 25 | 25 | 150 | 25 | 25 | 7 | 3 | CAEL/R...,CAFR/L... |
| CHFVR/L3232 | 32 | 32 | 170 | 25 | 32 | - | - | CAEL/R...,CAFR/L... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHFVR/L... | CSHB-6-A | P-4 |

### Combination of blade and toolholder

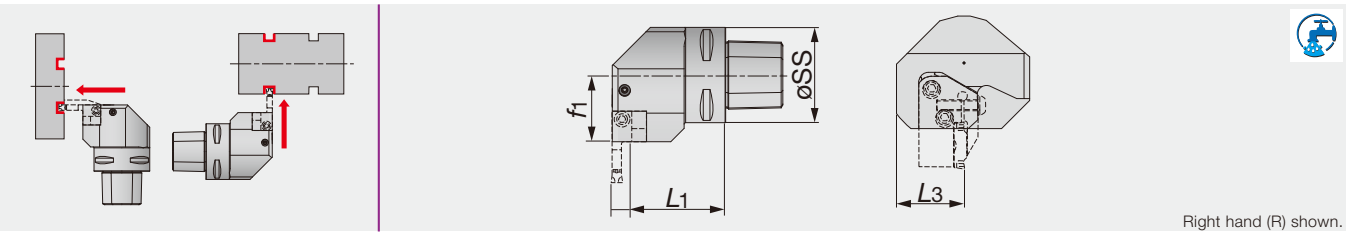
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

● : Corresponding

TUNGCUT

## C-CHFVR/L

TungCut shank of perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_3$ | $f_1$ |
|---|---|---|---|---|
| C4CHFVR/L27050N | 40 | 42.5 | 36 | 27 |
| C5CHFVR/L35060N | 50 | 49.5 | 36 | 35 |
| C6CHFVR/L45065 | 63 | 54.5 | 41 | 45 |
| C6CHFVR/L45065N | 63 | 54.5 | 41 | 45 |

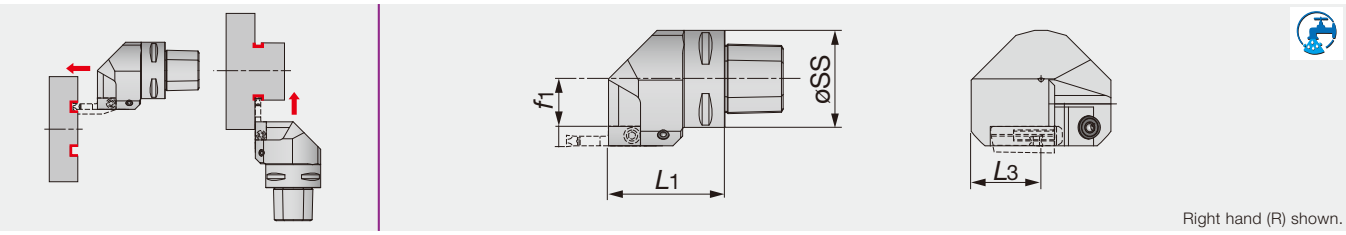
• The last character of designation is "N": Capable for 7 Mpa coolant pressure.

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Plug | Clamping screw | Wrench |
|---|---|---|---|---|---|
| C4CHFVR/L27050N | SATZ-M8X1-M3 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C5CHFVR/L35060N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C6CHFVR/L45065 | CNZ125 | PNZ5 | - | CSHB-6-A | P-4 |
| C6CHFVR/L45065N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |

## C-CHSR/L

TungCut shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_3$ | $f_1$ |
|---|---|---|---|---|
| C4CHSR/L27050N | 40 | 50 | 36 | 16.5 |
| C5CHSR/L35060 | 50 | 60 | 36 | 24.5 |
| C5CHSR/L35060N | 50 | 60 | 36 | 24.5 |
| C6CHSR/L45065N | 63 | 65 | 41 | 34.5 |

• The last character of designation is "N": Capable for 7 Mpa coolant pressure.

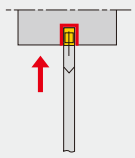
### SPARE PARTS

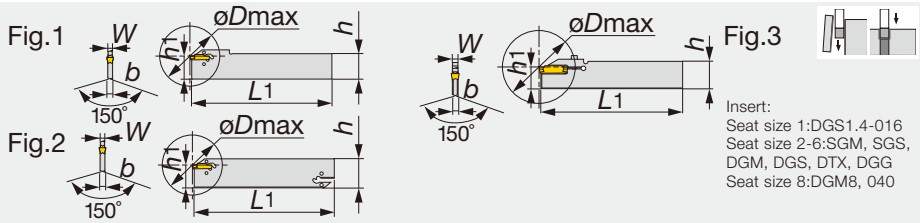
| Designation | Coolant parts | Coolant parts 1 | Plug | Clamping screw | Wrench |
|---|---|---|---|---|---|
| C4CHSR/L27050N | SATZ-M8X1-M3 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C5CHSR/L35060 | CNZ125 | PNZ5 | - | CSHB-6-A | P-4 |
| C5CHSR/L35060N | SATZ-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |
| C6CHSR/L45065N | SATE-M10X1-M5 | - | SSHM4-4 | CSHB-6-A | P-4 |

## Combination of blade and toolholder

| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| C*CHFVR... | | ● | ● | |
| C*CHFVL... | ● | | | ● |
| C*CHSR... | ● | | | ● |
| C*CHSL... | | ● | ● | |

● : Corresponding






| Designation | W | Seat size | øDmax | h1 | b | h | L1 | Fig |
|---|---|---|---|---|---|---|---|---|
| CGP26-1.4S | 1.4 | 1 | 26 | 21.4 | 1 | 26 | 150 | 1 |
| CGP32-1.4D | 1.4 | 1 | 26 | 24.8 | 1 | 32 | 150 | 2 |
| CGP26-2S | 2 | 2 | 40 | 21.4 | 1.8 | 26 | 150 | 1 |
| CGP32-2D | 2 | 2 | 50 | 24.8 | 1.8 | 32 | 150 | 2 |
| CGP26-3S | 3 | 3 | 50 | 21.4 | 2.4 | 26 | 150 | 1 |
| CGP32-3D | 3 | 3 | 100 | 24.8 | 2.4 | 32 | 150 | 2 |
| CGP26-4S | 4 | 4 | 80 | 21.4 | 3.2 | 26 | 150 | 1 |
| CGP32-4D | 4 | 4 | 100 | 24.9 | 3.2 | 32 | 150 | 2 |
| CGP45-4D | 4 | 4 | 120 | 38.1 | 3.2 | 45 | 150 | 2 |
| CGP32-5D | 5 | 5 | 120 | 24.9 | 4 | 32 | 150 | 2 |
| CGP32-6D | 6 | 6 | 120 | 24.9 | 5.2 | 32 | 150 | 2 |
| CGP32-8S-CL | 8 | 8 | 80 | 24.9 | 6.2 | 32 | 150 | 3 |

- When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended. • Wrench (CRW**) should be ordered separately.
- Max groove depth is 28.5 mm.
- øDmax: Max. parting off dia.
- For Applicable insert, see page C073 - C085.

## SPARE PARTS

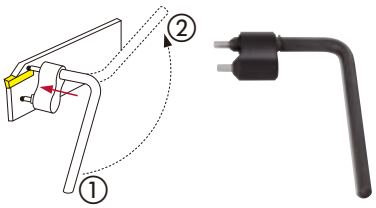
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGP**-1.4* | - | CRW23 |
| CGP**-2/3/4/5/6 | - | CRW33 |
| CGP32-8S-CL | CM4X0.7X20-M0-A | P-3 |



## Caution

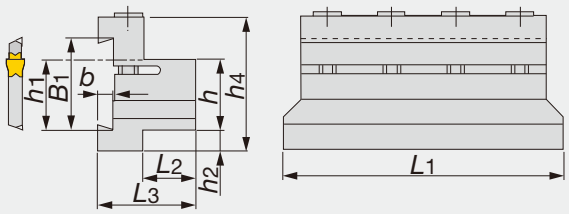
### Newly developed wrench

Insert is clamped by the elastic deformation of upper jaw.
Low clamping stress increases the stability and tool life.




①→②: unclamp
②→①: clamp

# TUNGCUT
## CTBF
Tool block for CGP blades(fixed clamp)




Right hand (R) shown.

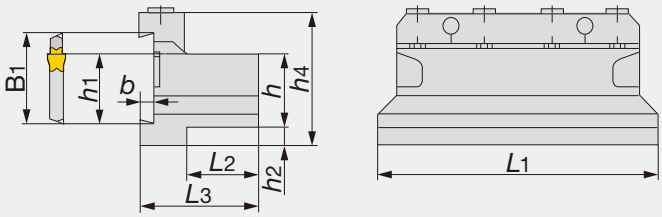
| Designation | h | B1 | L2 | L1 | b | h1 | h2 | h4 | L3 | Blade* |
|---|---|---|---|---|---|---|---|---|---|---|
| CTBF25-45 | 25 | 45 | 22 | 110 | 5.5 | 38.1 | 25 | 66 | 40 | CGP45... |
| CTBF32-45 | 32 | 45 | 28 | 120 | 5.5 | 38.1 | 18 | 66 | 45 | CGP45... |

* Blade sold separately.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTBF... | CM6X1.0X40-A | P-5 |

# TUNGCUT
## CTBU
Tool block for CGP and EGP blades




Right hand (R) shown.

| Designation | h1 | b | B1 | L1 | h | h2 | h4 | L2 | L3 | Blade* |
|---|---|---|---|---|---|---|---|---|---|---|
| CTBU20-26 | 21.4 | 4 | 26 | 86 | 20 | 9 | 43 | 21 | 38 | CGP26... |
| CTBU25-26 | 21.4 | 4 | 26 | 110 | 25 | 5 | 45 | 23 | 42 | CGP26... |
| CTBU20-32 | 24.8 | 5.3 | 32 | 100 | 20 | 13 | 50 | 19 | 38 | CGP32... |
| CTBU25-32 | 24.8 | 5.3 | 32 | 110 | 25 | 8 | 50 | 23 | 42 | CGP32... |
| CTBU32-32 | 24.8 | 5.3 | 32 | 110 | 32 | 5 | 54 | 29 | 48 | CGP32... |

* Blade sold separately.

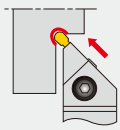
### SPARE PARTS

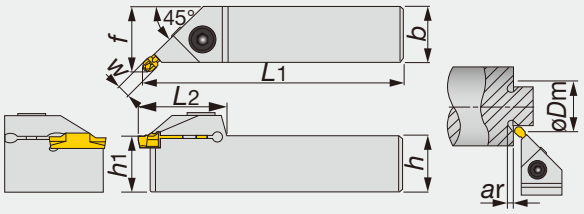
| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU20-26 | CT-86 | CM6X30-S | P-5 |
| CTBU25-26 | CT-105 | CM6X30-S | P-5 |
| CTBU20-32 | CT-100 | CM6X30-S | P-5 |
| CTBU25-32 | CT-110 | CM6X30-S | P-5 |
| CTBU32-32 | CT-110 | CM6X30-S | P-5 |

# CGEUR/L

## External 45° toolholders for undercutting








Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | h | b | L1 | L2 | h1 | f (1) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGEUR/L1616-3T02 | 3 | 32 | 3 | 2.8 | 16 | 16 | 110 | 30 | 16 | 19.3 | DTIU... |
| CGEUR/L2020-3T02 | 3 | 32 | 3 | 2.8 | 20 | 20 | 125 | 30 | 20 | 23.3 | DTIU... |
| CGEUR/L2525-3T02 | 3 | 32 | 3 | 2.8 | 25 | 25 | 150 | 30 | 25 | 28.3 | DTIU... |
| CGEUR/L1616-4T02 | 4 | 32 | 4 | 2.8 | 16 | 16 | 110 | 31 | 16 | 19.5 | DTIU... |
| CGEUR/L2020-4T02 | 4 | 32 | 4 | 2.8 | 20 | 20 | 125 | 31 | 20 | 23.5 | DTIU... |
| CGEUR/L2525-4T02 | 4 | 32 | 4 | 2.8 | 25 | 25 | 150 | 31 | 25 | 28.5 | DTIU... |
| CGEUR/L2525-6T03 | 6 | 34 | 5, 6 | 3.4 | 25 | 25 | 150 | 35 | 25 | 28.9 | DTIU... |

(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• For Applicable insert, see page C073 - C085.

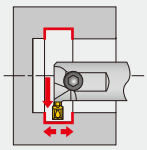
### SPARE PARTS

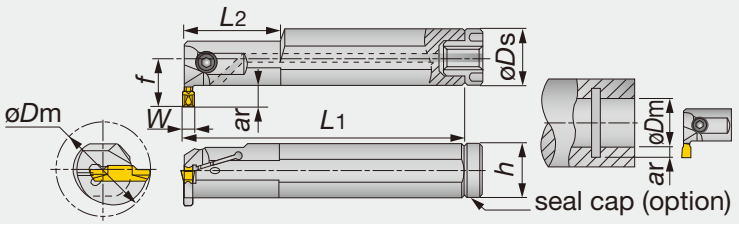
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGEUR/L****-3T02 | CM5X0.8X16-A | P-4 |
| CGEUR/L1616-4T02 | CM6X1X16-A | P-5 |
| CGEUR/L2020-4T02 | CM6X1X20-A | P-5 |
| CGEUR/L2525-4T02/6T03 | CM6X1X25-A | P-5 |

# TUNGCUT

## CTIR/L

Boring bars for Internal grooving & turning






Insert:
Seat size 2:DGIM, DGIS
Seat size 3-8:DTI, DTX

Right hand (R) shown.

| Designation | *W* | *øDm* | Seat size | *ar* | *øDs* | *f* | *L1* | *L2* | *h* | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CTIR/L16-2T08-D250 | 2 | 25 | 2 | 8 | 16 | 16.5 | 125 | - | 14 | DGIM..., DGIS... |
| CTIR/L20-2T06-D250 | 2 | 25 | 2 | 6 | 20 | 15.8 | 160 | 40 | 18 | DGIM..., DGIS... |
| CTIR/L20-3T06-D250 | 3 | 25 | 3 | 6 | 20 | 15.8 | 160 | 40 | 18 | DTI..., DTX... |
| CTIR/L25-3T05-D250 | 3 | 25 | 3 | 5.1 | 25 | 17.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L25-3T08-D320 | 3 | 32 | 3 | 8 | 25 | 21.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L32-3T10-D400 | 3 | 40 | 3 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L20-4T06-D250 | 4 | 25 | 4 | 6 | 20 | 15.8 | 160 | 40 | 18 | DTI..., DTX... |
| CTIR/L25-4T08-D320 | 4 | 32 | 4 | 8 | 25 | 21.5 | 200 | 40 | 23 | DTI..., DTX... |
| CTIR/L32-4T04-D310 | 4 | 31 | 4 | 4 | 32 | 20.8 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-4T10-D400 | 4 | 40 | 4 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L25-5T05-D310 | 5 | 31 | 5 | 5 | 25 | 17.3 | 200 | 60 | 23 | DTI..., DTX... |
| CTIR/L32-5T10-D400 | 5 | 40 | 5 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-6T04-D310 | 6 | 31 | 6 | 4 | 32 | 20.8 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-6T10-D400 | 6 | 40 | 6 | 10 | 32 | 27 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L32-8T05-D370 | 8 | 37 | 8 | 5 | 32 | 21.3 | 250 | 60 | 30 | DTI..., DTX... |
| CTIR/L40-8T05-D420 | 8 | 42 | 8 | 5.8 | 40 | 25.8 | 300 | 65 | 38 | DTI..., DTX... |

(1) "*L*1" value is calculated with groove width "*W*" shown in the table.
• For applicable Insert, see page C073 - C085.

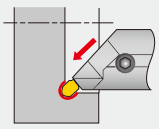
### SPARE PARTS

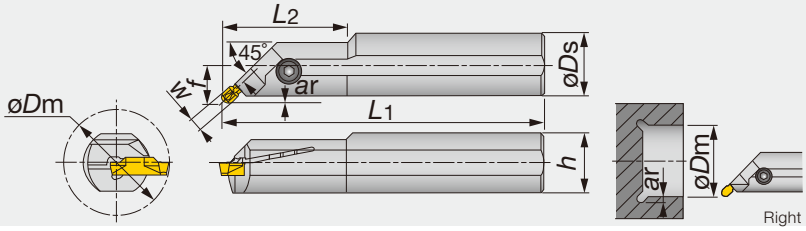
| Designation | Clamping screw | Wrench | Seal cap | Thread type tor connection |
|---|---|---|---|---|
| CTIR/L16-2T08-D250 | CM5X0.8X10-A | P-4 | CA-16 | M6 |
| CTIR/L20-2T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L20-3T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L25-3T05-D250 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L25-3T08-D320 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L32-3T10-D400 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L20-4T06-D250 | CM5X0.8X12-A | P-4 | CA-20 | M6 |
| CTIR/L25-4T08-D320 | CM5X0.8X16-A | P-4 | CA-25 | R1/8" |
| CTIR/L32-4T04-D310 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L32-4T10-D400 | CM5X0.8X16-A | P-4 | CA-32 | R1/8" |
| CTIR/L25-5T05-D310 | CM6X1X16-A | P-5 | CA-25 | R1/8" |
| CTIR/L32-5T10-D400 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-6T04-D310 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-6T10-D400 | CM6X1X20-A | P-5 | CA-32 | R1/8" |
| CTIR/L32-8T05-D370 | CM6X1X25-A | P-5 | CA-32 | R1/8" |
| CTIR/L40-8T05-D420 | CM6X1X25-A | P-5 | CA-40 | R1/8" |

# CGIUR/L

## Boring bars for internal undercutting








Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | øDs | f (1) | L1 | L2 | h | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CGIUR/L20-3T02-D380 | 3 | 38 | 3 | 2.8 | 20 | 12.8 | 160 | - | 19 | DTIU... |
| CGIUR/L25-3T02-D380 | 3 | 38 | 3 | 2.8 | 25 | 14.8 | 200 | 40 | 23 | DTIU... |
| CGIUR/L20-4T02-D380 | 4 | 38 | 4 | 2.8 | 20 | 12.9 | 160 | - | 19 | DTIU... |
| CGIUR/L25-4T02-D460 | 4 | 46 | 4 | 2.8 | 25 | 14.9 | 200 | 40 | 23 | DTIU... |
| CGIUR/L25-6T02-D460 | 6 | 46 | 5, 6 | 2.8 | 25 | 15.2 | 200 | - | 23 | DTIU... |

(1) "*f*" value is calculated with groove width "*W*" shown in the table.
• For applicable Insert, see page C073 - C085.

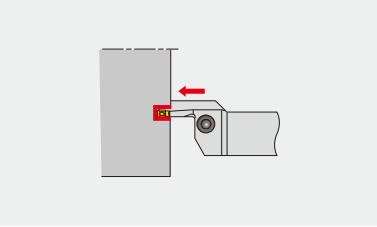
### SPARE PARTS

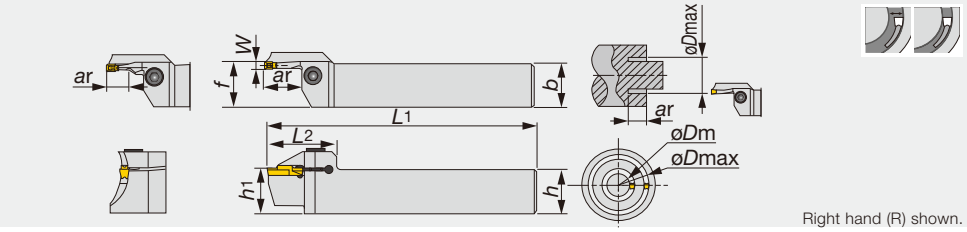
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGIUR/L20-3T02-D380 | CM5X0.8X12-A | P-4 |
| CGIUR/L25-3T02-D380 | CM5X0.8X16-A | P-4 |
| CGIUR/L**-4T02-D... | CM5X0.8X16-A | P-4 |
| CGIUR/L25-6T02-D460 | CM6X1X25-A | P-5 |

# TUNGCUT

## CTFR/L

Toolholders for face grooving & turning






Right hand (R) shown.

| Designation | W | øDm | øDmax | Seat size | ar | h | b | L1 | L2 | h1 | f (1) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFR/L2525-3T10-024035 | 3 | 24 | 35 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T10-029040 | 3 | 29 | 40 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T10-034050 | 3 | 34 | 50 | 3 | 10 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T15-044070 | 3 | 44 | 70 | 3 | 15 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-3T15-064100 | 3 | 64 | 100 | 3 | 15 | 25 | 25 | 150 | 38 | 25 | 25.5 |
| CTFR/L2525-4T10-022036 | 4 | 22 | 36 | 4 | 10 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-028042 | 4 | 28 | 42 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-034050 | 4 | 34 | 50 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-042070 | 4 | 42 | 70 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-062120 | 4 | 62 | 120 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-4T20-112200 | 4 | 112 | 200 | 4 | 20 | 25 | 25 | 150 | 39 | 25 | 25.6 |
| CTFR/L2525-5T25-050080 | 5 | 50 | 80 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-070110 | 5 | 70 | 110 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-100150 | 5 | 100 | 150 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-5T25-140200 | 5 | 140 | 200 | 5 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-048070 | 6 | 48 | 70 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-058100 | 6 | 58 | 100 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-088180 | 6 | 88 | 180 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |
| CTFR/L2525-6T25-168400 | 6 | 168 | 400 | 6 | 25 | 25 | 25 | 150 | 49 | 25 | 25.6 |

- When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.

(1) "*f*" value is calculated with groove width "*W*" shown in the table.

- When DTF insert is installed, Max "ar" should be 15 mm.
- For applicable Insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTFR/L2525-3T - 4T... | CM6X1X25-A | P-5 |
| CTFR/L2525-5T - 6T... | CM8X1.25X25-A | P-6 |

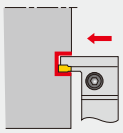
### INSERT

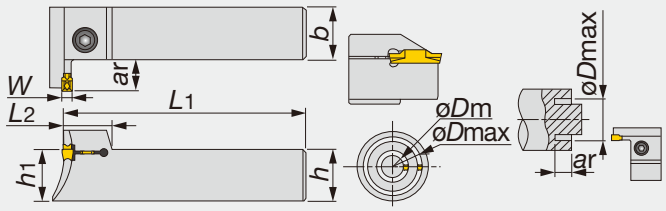
| Designation | Insert seat size | Insert |
|---|---|---|
| CTFR/L2525-3T10-024035 | 3 | DTF, DTX |
| CTFR/L2525-3T10-029040 | 3 | DTF, DTX |
| CTFR/L2525-3T10-034050 | 3 | DTF, DTX |
| CTFR/L2525-3T15-044070 | 3 | DTF, DTX, DTE, DTR |
| CTFR/L2525-3T15-064100 | 3 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T10-022036 | 4 | DTF, DTX |
| CTFR/L2525-4T20-028042 | 4 | DTF, DTX |
| CTFR/L2525-4T20-034050 | 4 | DTF, DTX |
| CTFR/L2525-4T20-042070 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T20-062120 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-4T20-112200 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-5T25-... | 5 | DTX, DTE, DGG, DGM, DGS, DTR |
| CTFR/L2525-6T25-... | 6 | DTX, DTE, DGG, DGM, DGS, DTR |

# CTFVR/L

## Perpendicular toolholders for face grooving and turning








Right hand (R) shown.

| Designation | W | øDm | øDmax | Seat size | ar | h | b | L1 | L2 | h1 |
|---|---|---|---|---|---|---|---|---|---|---|
| CTFVR/L2525-3T10-024035 | 3 | 24 | 35 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T10-029040 | 3 | 29 | 40 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T10-034050 | 3 | 34 | 50 | 3 | 10 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T15-044060 | 3 | 44 | 60 | 3 | 15 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-3T15-054085 | 3 | 54 | 85 | 3 | 15 | 25 | 25 | 150 | 18 | 25 |
| CTFVR/L2525-4T12-022040 | 4 | 22 | 40 | 4 | 12 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-032050 | 4 | 32 | 50 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-042060 | 4 | 42 | 60 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-4T15-052085 | 4 | 52 | 85 | 4 | 15 | 25 | 25 | 150 | 18.5 | 25 |
| CTFVR/L2525-5T20-050080 | 5 | 50 | 80 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-070110 | 5 | 70 | 110 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-100150 | 5 | 100 | 150 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-5T20-140200 | 5 | 140 | 200 | 5 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-048085 | 6 | 48 | 85 | 6 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-073150 | 6 | 73 | 150 | 6 | 20 | 25 | 25 | 150 | 22 | 25 |
| CTFVR/L2525-6T20-138250 | 6 | 138 | 250 | 6 | 20 | 25 | 25 | 150 | 22 | 25 |

- When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
- For applicable Insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTFVR/L2525-3T... | CM5X0.8X25-A | P-4 |
| CTFVR/L2525-4T... | CM6X1X25-A | P-5 |
| CTFVR/L2525-5T..., 6T... | CM8X1.25X25-A | P-6 |

### INSERT

| Designation | Insert seat size | Insert |
|---|---|---|
| CTFVR/L2525-3T10-024035 | 3 | DTF, DTX |
| CTFVR/L2525-3T10-029040 | 3 | DTF, DTX |
| CTFVR/L2525-3T10-034050 | 3 | DTF, DTX, DTR |
| CTFVR/L2525-3T15-044060 | 3 | DTF, DTX, DTE, DTR |
| CTFVR/L2525-3T15-054085 | 3 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-4T12-022040 | 4 | DTF, DTX |
| CTFVR/L2525-4T15-032050 | 4 | DTF, DTX |
| CTFVR/L2525-4T15-042060 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-4T15-052085 | 4 | DTF, DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-5T20-... | 5 | DTX, DTE, DGG, DGM, DGS, DTR |
| CTFVR/L2525-6T20-... | 6 | DTX, DTE, DGG, DGM, DGS, DTR |

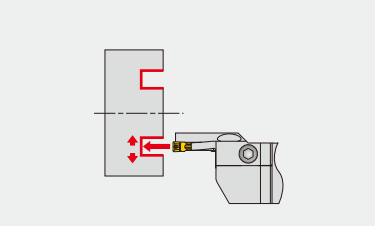
(1) Min. diameter øDm of DTE, DGS and DGM insert

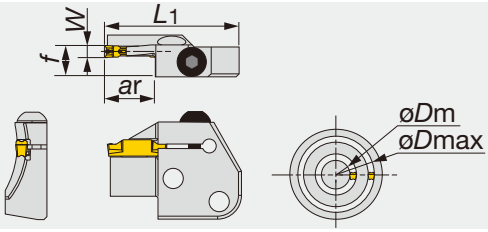
| Insert | øDm | Note |
|---|---|---|
| DTE3 / DGS3 / DGM3 | ø92 | When diameter is smaller than øDm, DTF or DTX type insert is recommended. |
| DTE4 / DGS4 / DGM4 | ø42 | |

# TUNGCUT

## CAFR/L

Blades for face grooving & turning





Insert:
CAFR/L-3T12-040055:DTF
Seat size 3(2)-6:DTF(3), DTE, DGG, DTX, DGS, DGM, DTR, DTM, SGN
Shank:
CHFVR/L, CHSR/L
Right hand (R) shown.

| Designation | *W* | ø*D*m | ø*D*max | Seat size | *ar* | *L*1 | *f* (1) |
|---|---|---|---|---|---|---|---|
| CAFR/L-3T12-040055 | 3 | 40 | 55 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-055075 | 3 | 55 | 75 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-075100 | 3 | 75 | 100 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-100140 | 3 | 100 | 140 | 3 | 12 | 45 | 10.4 |
| CAFR/L-3T12-140200 | 3 | 140 | 200 | 3 | 12 | 45 | 10.4 |
| CAFR/L-4T16-050070 | 4 | 50 | 70 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-070100 | 4 | 70 | 100 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-100150 | 4 | 100 | 150 | 4 | 16 | 45 | 10.5 |
| CAFR/L-4T16-150250 | 4 | 150 | 250 | 4 | 16 | 45 | 10.5 |
| CAFR/L-5T20-055080 | 5 | 55 | 80 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-080120 | 5 | 80 | 120 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-120180 | 5 | 120 | 180 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-180300 | 5 | 180 | 300 | 5 | 20 | 49 | 10.5 |
| CAFR/L-5T20-300000 | 5 | 300 | ∞ | 5 | 20 | 49 | 10.5 |
| CAFR/L-6T25-060090 | 6 | 60 | 90 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-090150 | 6 | 90 | 150 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-150250 | 6 | 150 | 250 | 6 | 25 | 55 | 10.5 |
| CAFR/L-6T25-250400 | 6 | 250 | 400 | 6 | 25 | 55 | 10.5 |

• When depth is deeper than (insert length - 1.5 mm), 1 corner type is recommended.
(1) "*f*" value is calculated with groove width "*W*" shown in the table.
(2) Not applicable for CAFR/L-3T12-040055
(3) Seat sizes of DTF are Only 3 and 4
• For applicable Insert, see page C073 - C085.

### SPARE PARTS

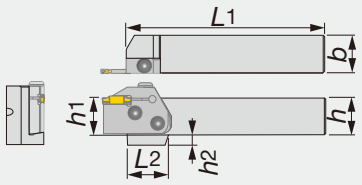
| Designation | Clamping screw | Wrench |
|---|---|---|
| CAFR/L... | BHM6-20-A | P-4 |

### Min. diameter ø*D*m of DTE, DGS and DGM insert

| Insert | ø*D*m | Note |
|---|---|---|
| DTE 3 / DGS 3 / DGM 3 | ø92 | When diameter is smaller than ø*D*m, DTF or DTX type insert is recommended. |
| DTE 4 / DGS 4 / DGM 4 | ø42 | |
| DTE 5 / DGS 5 / DGM 5 | ø64 | |
| DTE 6 / DGS 6 / DGM 6 | ø61 | |

# TUNGCUT
## CHSR/L

Shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

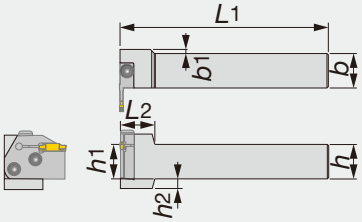
| Designation | h | b | L1 | L2 | h1 | h2 | Blade |
|---|---|---|---|---|---|---|---|
| CHSR/L2020 | 20 | 20 | 133 | 35 | 20 | 12 | CAER/L...,CAFL/R... |
| CHSR/L2525 | 25 | 25 | 133 | 28 | 25 | 7 | CAER/L...,CAFL/R... |
| CHSR/L3232 | 32 | 32 | 153 | 28 | 32 | - | CAER/L...,CAFL/R... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHSR/L... | CSHB-6-A | P-4 |

# TUNGCUT
## CHFVR/L

Shank of perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | h | b | L1 | L2 | h1 | h2 | b1 | Blade |
|---|---|---|---|---|---|---|---|---|
| CHFVR/L2020 | 20 | 20 | 150 | 25 | 20 | 12 | 8 | CAEL/R...,CAFR/L... |
| CHFVR/L2525 | 25 | 25 | 150 | 25 | 25 | 7 | 3 | CAEL/R...,CAFR/L... |
| CHFVR/L3232 | 32 | 32 | 170 | 25 | 32 | - | - | CAEL/R...,CAFR/L... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CHFVR/L... | CSHB-6-A | P-4 |

## Combination of blade and toolholder

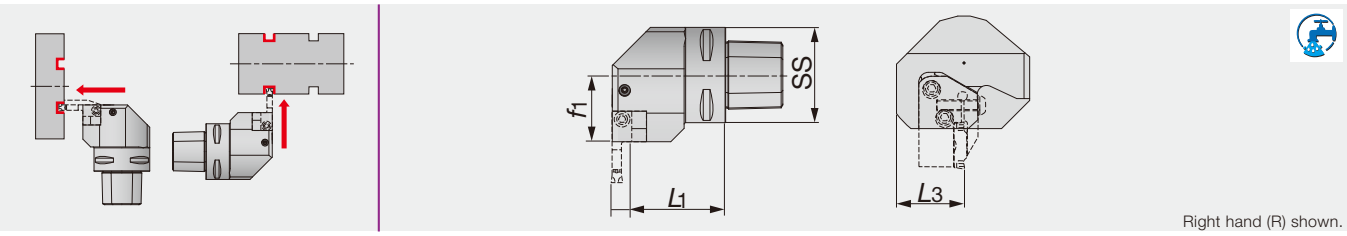
| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

● : Correspondence

TUNGCUT

## C-CHFVR/L

TungCut shank of perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | Blade |
|---|---|---|---|---|---|
| C4CHFVR/L27050N | 40 | 42.5 | 36 | 27 | CAEL/R..., CAFR/L... |
| C5CHFVR/L35060N | 50 | 49.5 | 36 | 35 | CAEL/R..., CAFR/L... |
| C6CHFVR/L45065 | 63 | 54.5 | 41 | 45 | CAEL/R..., CAFR/L... |
| C6CHFVR/L45065N | 63 | 54.5 | 41 | 45 | CAEL/R..., CAFR/L... |

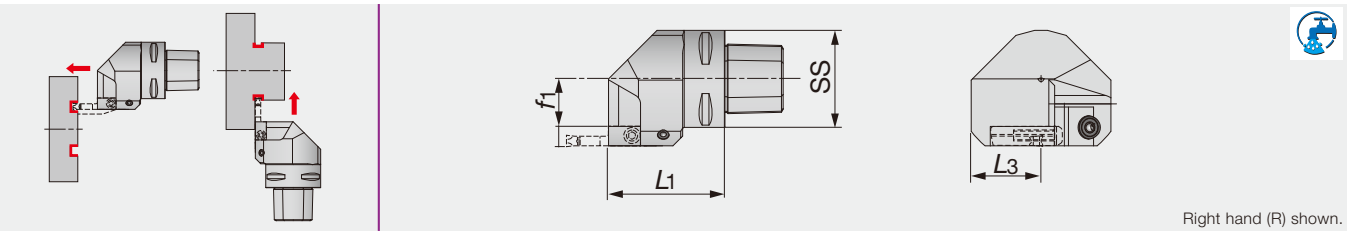
• The last character of designation is "N":Capable for 7Mpa, coolant pressure.

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHFVR/L27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHFVR/L35060N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHFVR/L45065 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C6CHFVR/L45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

## C-CHSR/L

TungCut shank of toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | SS | $L_1$ | $L_3$ | $f_1$ | Blade |
|---|---|---|---|---|---|
| C4CHSR/L27050N | 40 | 50 | 36 | 16.5 | CAER/L..., CAFL/R... |
| C5CHSR/L35060 | 50 | 60 | 36 | 24.5 | CAER/L..., CAFL/R... |
| C5CHSR/L35060N | 50 | 60 | 36 | 24.5 | CAER/L..., CAFL/R... |
| C6CHSR/L45065N | 63 | 65 | 41 | 34.5 | CAER/L..., CAFL/R... |

• The last character of designation is "N":Capable for 7Mpa, coolant pressure.

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHSR/L27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHSR/L35060 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C5CHSR/L35060N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHSR/L45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

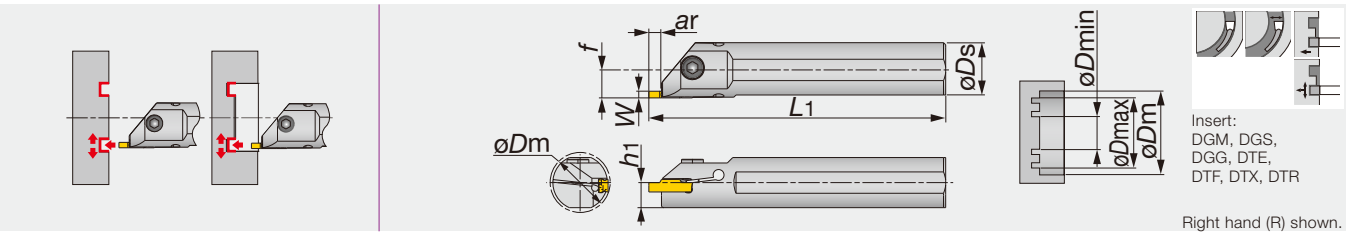
### Combination of blade and toolholder

| Toolholders | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| C*CHFVR... | ● | | | ● |
| C*CHFVL... | | ● | ● | |
| C*CHSR... | | ● | ● | |
| C*CHSL... | ● | | | ● |

● : Correspondence

## CTIFR/L

Toolholders for face / internal face grooving & turning




| Designation | W | Seat size | ar | øDs | h1 | L1(1) | f |
|---|---|---|---|---|---|---|---|
| CTIFR/L25-4T05-D270 | 4 | 3, 4 | 5.5 | 25 | 11.5 | 200 | 13.3 |
| CTIFR/L32-4T05-D340 | 4 | 3, 4 | 5.5 | 32 | 15 | 250 | 16.8 |
| CTIFR/L25-5T05-D270 | 6 | 5, 6 | 5.5 | 25 | 11.5 | 200 | 13.3 |
| CTIFR/L32-5T05-D340 | 6 | 5, 6 | 5.5 | 32 | 15 | 250 | 16.8 |

(1) "f" value is calculated with groove width "W" shown in the table.**
• For applicable Insert, see page C073 - C085.

### SPARE PARTS

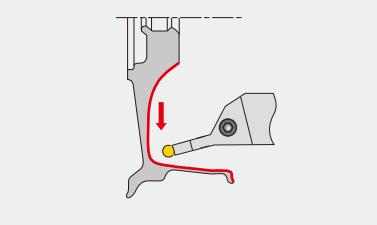
| Designation | Clamping screw | Wrench |
|---|---|---|
| CTIFR/L25-4T05-D270 | CM6X1X16-A | P-5 |
| CTIFR/L32-4T05-D340 | CM6X1X20-A | P-5 |
| CTIFR/L25-5T05-D270 | CM6X1X16-A | P-5 |
| CTIFR/L32-5T05-D340 | CM6X1X20-A | P-5 |

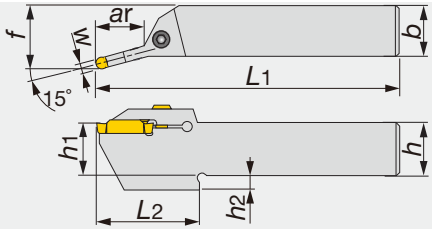
| Insert seat size | Min. bore dia. øDm | |
|---|---|---|
| | øDs = 25 mm | øDs = 32 mm |
| 3 | 26.3 | 33.3 |
| 4 | 26.8 | 33.8 |
| 5 | 26.3 | 33.3 |
| 6 | 26.8 | 33.8 |

| Insert seat size | øDmin | | | | øDmax |
|---|---|---|---|---|---|
| | DGM, DGS, DGG | DTE | DTF / DTX | DTR | |
| 3 | 92 | 62 | 19 | 44 | ∞ |
| 4 | 37 | 42 | 20 | 32 | ∞ |
| 5 | 60 | 64 | 20 | 48 | ∞ |
| 6 | 57 | 61 | 23 | 48 | ∞ |

# TUNGCUT
## CTER/L-15A

Toolholders for machining aluminum wheel, square shank






Right hand (R) shown.

| Designation | W | Seat size | ar | h | b | L1 | f | L2 | h1 | h2 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CTER/L2525-6T25-15A | 6 | 6 | 25 | 25 | 25 | 150 | 32.2 | 50.5 | 25 | 7 | DTA... |
| CTER/L2525-8T30-15A | 8 | 8 | 30 | 25 | 25 | 150 | 32.9 | 55 | 25 | 7 | DTA... |

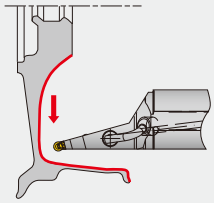
• For applicable Insert, see page C073 - C085.

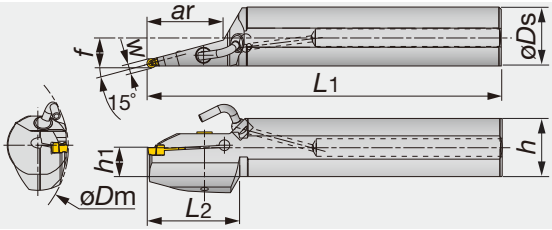
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CTER/L2525-****-15A | CM6X1X25-A | P-5 |

# TUNGCUT
## CGIUR/L-15A

Boring bars for machining aluminum wheel






Right hand (R) shown.

| Designation | W | øDm | Seat size | ar | øDs | f | L1 | L2 | h | h1 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGIUR/L40-6T50-D160-15A | 6 | 160 | 6 | 50 | 40 | 19.7 | 320 | 60 | 38.5 | 19 | DTA... |
| CGIUR/L40-8T83-D160-15A | 8 | 160 | 8 | 83 | 40 | 20.5 | 320 | 85 | 38.5 | 19 | DTA... |
| CGIUR/L50-6T85-D200-15A | 6 | 200 | 6 | 85 | 50 | 25.2 | 350 | 85 | 48.5 | 23.5 | DTA... |
| CGIUR/L50-8T85-D200-15A | 8 | 200 | 8 | 85 | 50 | 25.9 | 350 | 85 | 48.5 | 23.5 | DTA... |

• For applicable Insert, see page C073 - C085.

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| CGIUR/L**-15A | CM6X1X25-A | P-5 |

### Nozzle parts

| Coolant pipe | Coolant nozzle |
|---|---|
| PNZ5 | CNZ125 |

## External grooving and parting

### DGM type (2 corners)
### SGM type (1 corner)

C077

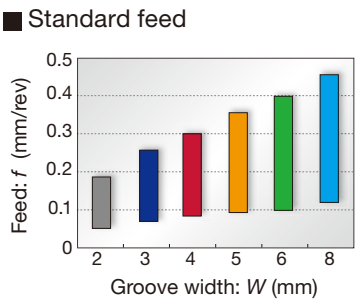
**1st choice for external grooving and parting off**

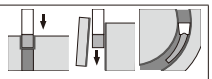
Smooth chip evacuation

Well-designed edge with high strength

Handed insert available

*W* = 2 - 8 mm



### DGS type (2 corners)
### SGS type (1 corner)

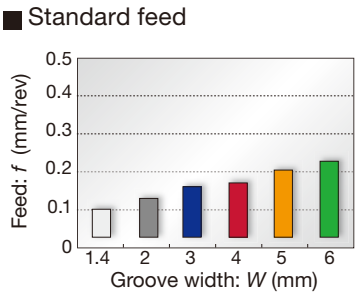
C078, C079

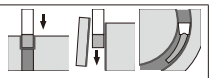
**Lower cutting force and superior sharpness**

Unique-designed edge and chipbreaker

Handed insert available

*W* = 1.4 - 6 mm



## External and face grooving, and turning

### DTE type (2 corners)

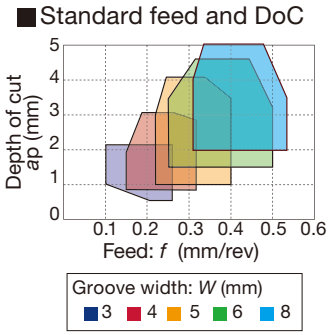
C080, C081

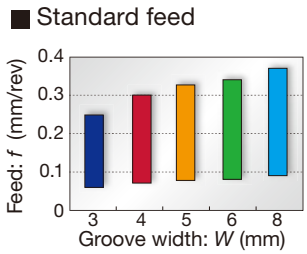
**For general purpose**

Unique chipbreaker makes chips shorter

Molded and ground insert available

*W* = 3 - 8 mm






## External and face grooving

### DGG type (2 corners)

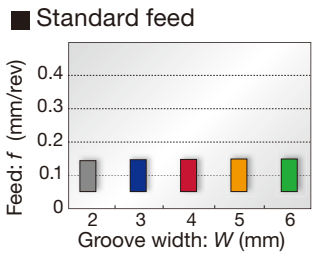
C081

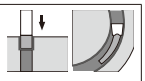
**For non-ferrous materials and titanium**

Chipbreaker with low cutting force

Sharp cutting edge that prevents vibration and delivers fine surface finish

*W* = 2 - 6 mm



# TUNGCUT - Chipbreaker Guide

## External, internal and face grooving, and turning

### DTX type (2 corners)

C081

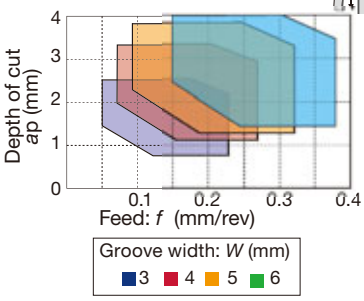
**Multi-functional type**

Well balanced sharpness and strength

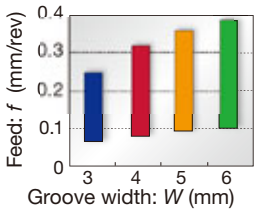
Multi functional insert

*W* = 3 - 6 mm

■ Standard feed and DoC

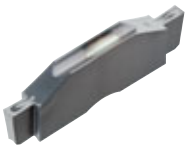



■ Standard feed




## External grooving

### DGE type (2 corners)



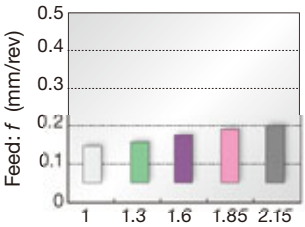
C080

**For high accurate and shallow groove**

Excellent chip control

*W* = 1 - 2.15 mm

■ Standard feed




## Profiling and undercutting

### DTR type (2 corners)

Molded

Ground

C083, C084

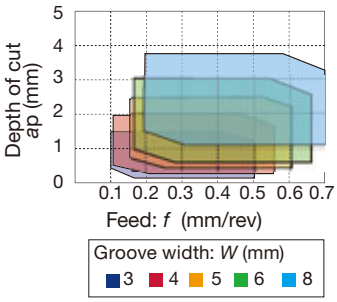
**Full radius type**

Excellent chip control

Molded and ground insert available

*W* = 3 - 8 mm

■ Standard feed and DoC




### DTIU type (2 corners)

C084

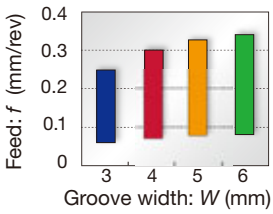
**Full radius type**

Excellent chip control

For undercutting

*W* = 3 - 6 mm

■ Standard feed and DoC



## Internal grooving and turning

### DTI type (2 corners)

C082

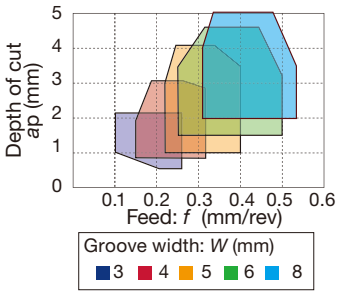
**1st choice for internal grooving**

Unique chipbreaker makes chips shorter

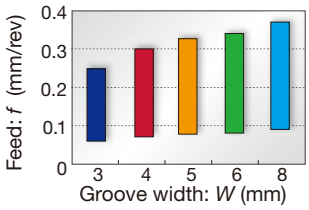
Molded and ground insert available

*W* = 3 - 8 mm

■ Standard feed and DoC



■ Standard feed




## Small diameter internal grooving

### DGIM type (2 corners)

C083

**2 mm insert width only** (For general purpose)

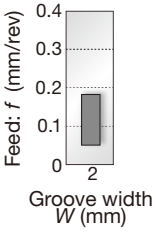
Unique chipbreaker for excellent chip control

Excellent fracture resistance due to optimum land on the cutting edge

For general applications on steels & stainless steels

*W* = 2 mm

■ Standard feed



### DGIS type (2 corners)

C083

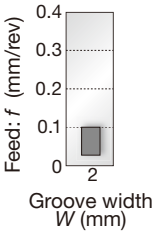
**2 mm insert width only** (Lower cutting force)

Low cutting force due to a unique land geometry

Applicable for low carbon steels & stainless steels

*W* = 2 mm

■ Standard feed



## Face grooving and turning

### DTF type (2 corners)

C082

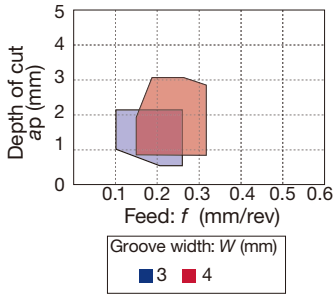
**1st choice for face grooving**

Unique chipbreaker makes chips shorter

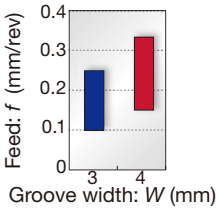
Handed insert

*W* = 3 - 4 mm

■ Standard feed and DoC



■ Standard feed



# TUNGCUT - Chipbreaker Guide

## Aluminium wheel machining

**DTA type (2 corners)**

C084

**Full radius type**

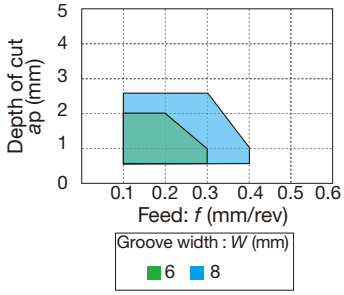
Excellent chip control

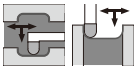
For aluminium wheel profiling

Ground insert

W = 6 - 8 mm

■ Standard feed and DoC



## External grooving of hardened steels

**SGN-CBN type (1 corner)**

C085

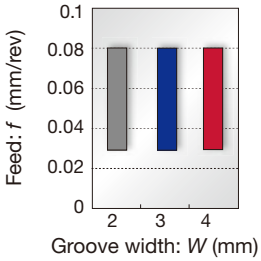
**For hardened steel cutting**

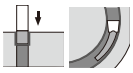
Optimum cutting edge shape for grooving of hardened steels

High tolerance width for finishing (*W* = ±0.025 mm)

*W* = 2 - 4 mm

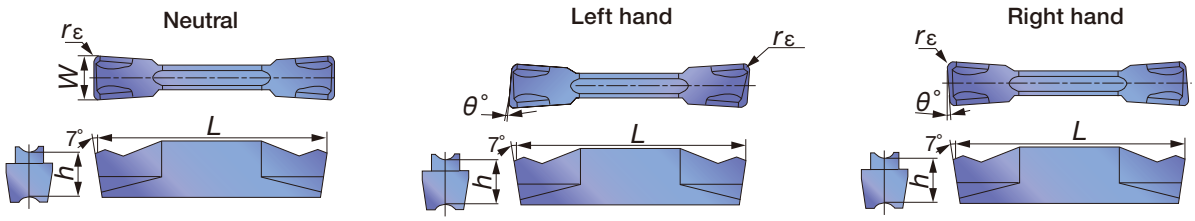
■ Standard feed



## DGM

External grooving and parting off, 2 corner

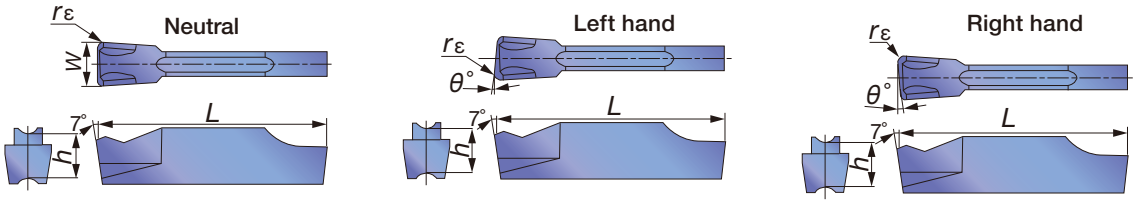



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | | | | | | | Cermet | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH7025 | | AH725 | | AH905 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | R | L | R | L | | | |
| DGM2-020 | 2 | 2 | 0.2 | ● | | ● | | ● | | | | ● | | ● | | 20 | 5 | 0 |
| DGM2-020-6R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 6 |
| DGM2-020-8R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 8 |
| DGM2-020-15R/L | 2 | 2 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 15 |
| DGM2-002-15R/L | 2 | 2 | 0.02 | | | | | ● | ● | | | ● | ● | | | 19.35 | 5 | 15 |
| DGM3-020 | 3 | 3 | 0.2 | ● | | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGM3-020-6R/L | 3 | 3 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.9 | 5 | 6 |
| DGM3-002-6R/L | 3 | 3 | 0.02 | | | | | ● | ● | | | ● | ● | | | 19.45 | 5 | 6 |
| DGM3-020-15R/L | 3 | 3 | 0.2 | | | | | ● | ● | | | ● | ● | | | 19.9 | 5 | 15 |
| DGM4-030 | 4 | 4 | 0.3 | ● | | ● | | ● | | ● | | ● | | ● | | 20 | 5 | 0 |
| DGM4-030-4R/L | 4 | 4 | 0.3 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 4 |
| DGM4-030-15R/L | 4 | 4 | 0.3 | | | | | ● | ● | | | ● | ● | | | 19.8 | 5 | 15 |
| DGM5-030 | 5 | 5 | 0.3 | ● | | ● | | ● | | ● | | ● | | ● | | 25 | 5.5 | 0 |
| DGM5-030-4R | 5 | 5 | 0.3 | | | | | ● | | | | ● | | | | 24.9 | 5.5 | 4 |
| DGM6-030 | 6 | 6 | 0.3 | ● | | ● | | ● | | ● | | ● | | | | 25 | 5.5 | 0 |
| DGM8-040 | 8 | 8 | 0.4 | ● | | | | ● | | | | ● | | | | 30 | 6.7 | 0 |

● : Line up

## SGM

External deep grooving and parting off, 1 corner

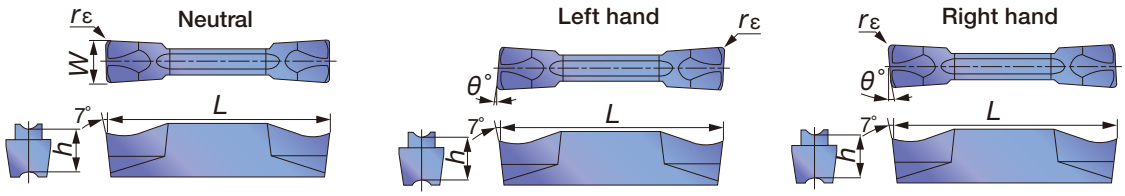



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | | GH130 | | | | |
| | | | | R | L | R | L | | | |
| SGM2-020 | 2 | 2 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGM2-020-6R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGM3-020 | 3 | 3 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGM3-020-6R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.6 | 5 | 6 |
| SGM3-020-15R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.6 | 5 | 15 |
| SGM4-030 | 4 | 4 | 0.3 | | ● | | ● | 20 | 5 | 0 |
| SGM4-030-4R/L | 4 | 4 | 0.3 | ● | ● | ● | ● | 19.65 | 5 | 4 |
| SGM5-030 | 5 | 5 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |
| SGM6-030 | 6 | 6 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |

● : Line up

## DGS

External grooving and parting off, 2 corner



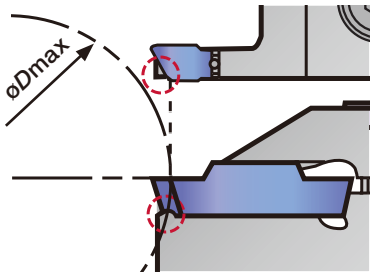

| Designation | Insert seat size | W±0.05 | rε | Coated | | | | | | | | Cermet | | L | h | θ° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH7025 | | AH725 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | R | L | | | |
| DGS1.4-016 | 1 | 1.4 | 0.16 | | | | | | ● | | ● | | | 16 | 4.3 | 0 |
| DGS2-020 | 2 | 2 | 0.2 | ● | | ● | | | ● | | ● | | ● | 20 | 5 | 0 |
| DGS2-020-6R/L | 2 | 2 | 0.2 | | | | | ● | ● | ● | ● | | | 19.95 | 5 | 6 |
| DGS2-002-6R/L | 2 | 2 | 0.02 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 6 |
| DGS2-020-15R/L | 2 | 2 | 0.2 | | | | | ● | ● | ● | ● | | | 19.95 | 5 | 15 |
| DGS2-002-15R/L | 2 | 2 | 0.02 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 15 |
| DGS3-020 | 3 | 3 | 0.2 | ● | | ● | | | ● | | ● | | ● | 20 | 5 | 0 |
| DGS3-020-6R/L | 3 | 3 | 0.2 | | | | | ● | ● | ● | ● | | | 19.9 | 5 | 6 |
| DGS3-002-6R/L | 3 | 3 | 0.02 | | | | | ● | ● | ● | ● | | | 19.6 | 5 | 6 |
| DGS3-020-15R/L | 3 | 3 | 0.2 | | | | | ● | ● | ● | ● | | | 19.9 | 5 | 15 |
| DGS3-002-15R/L | 3 | 3 | 0.02 | | | | | ● | ● | ● | ● | | | 19.45 | 5 | 15 |
| DGS4-030 | 4 | 4 | 0.3 | ● | | ● | | | ● | | ● | | ● | 20 | 5 | 0 |
| DGS4-030-4R/L | 4 | 4 | 0.3 | | | | | ● | ● | ● | ● | | | 19.8 | 5 | 4 |
| DGS5-030 | 5 | 5 | 0.3 | ● | | | | | ● | | ● | | ● | 25 | 5.5 | 0 |
| DGS6-030 | 6 | 6 | 0.3 | ● | | | | | ● | | ● | | | 25 | 5.5 | 0 |

● : Line up

## Caution

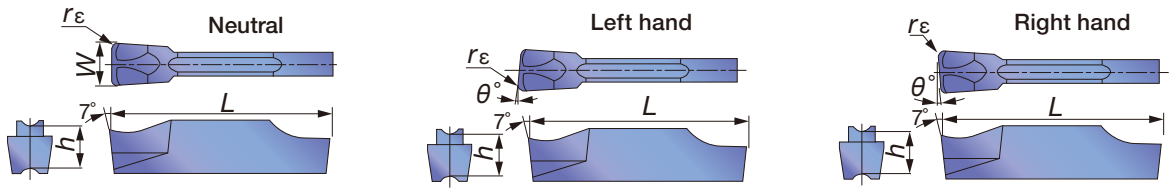
| Designation | øDmax (mm) | Designation | øDmax (mm) |
|---|---|---|---|
| DGM2-002-15R/L | 28 | DGS2-002-15R/L | 28 |
| DGM3-002-15R/L | 29 | DGS3-002-15R/L | 29 |
| DGM4-030-15R/L | 30 | SGS3-020-15R/L | 103 |
| SGM3-020-15R/L | 103 | SGS3-002-15R/L | 34 |

The tool will interfere with the workpiece when grooving larger diameter than øDmax.



## SGS

External deep grooving and parting off, 1 corner

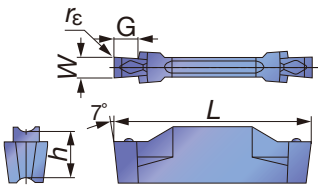



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | | GH130 | | | | |
| | | | | R | L | R | L | L | h | θ° |
| SGS2-020 | 2 | 2 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGS2-020-6R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGS2-020-15R/L | 2 | 2 | 0.2 | ● | ● | ● | ● | 19.8 | 5 | 15 |
| SGS3-020 | 3 | 3 | 0.2 | | ● | | ● | 20 | 5 | 0 |
| SGS3-020-6R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.64 | 5 | 6 |
| SGS3-002-6R/L | 3 | 3 | 0.02 | ● | ● | ● | ● | 19.8 | 5 | 6 |
| SGS3-020-15R/L | 3 | 3 | 0.2 | ● | ● | ● | ● | 19.64 | 5 | 15 |
| SGS3-002-15R/L | 3 | 3 | 0.02 | ● | ● | ● | ● | 19.8 | 5 | 15 |
| SGS4-030 | 4 | 4 | 0.3 | | ● | | ● | 20 | 5 | 0 |
| SGS5-030 | 5 | 5 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |
| SGS6-030 | 6 | 6 | 0.3 | | ● | | ● | 25 | 5.5 | 0 |

● : Line up

## DGE

External grooving (for high-precision machining)




| Designation | Insert seat size | W±0.02 | rε | Coated | | Cermet | G | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AH725 | GH130 | NS9530 | | | |
| DGE100-000 | 2 | 1 | 0 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE130-000 | 2 | 1.3 | 0 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE160-010 | 2 | 1.6 | 0.1 | ● | ● | ● | 2.5 | 20 | 5 |
| DGE185-010 | 2 | 1.85 | 0.1 | ● | ● | ● | 3.5 | 20 | 5 |
| DGE215-015 | 2 | 2.15 | 0.15 | ● | ● | ● | 3.5 | 20 | 5 |

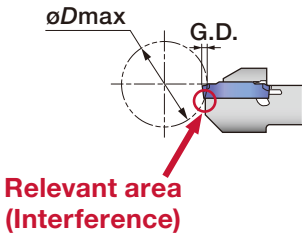
● : Line up

### Caution

øDmax is limited as shown in the picture to the right according to the groove depth, G.D. Please refer to the following table.

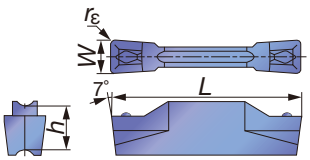
G.D = Groove depth

| Designation | Max. groove depth (mm) | øDmax (mm) | | | | |
|---|---|---|---|---|---|---|
| | | G.D. = 1 | G.D. = 1.5 | G.D. = 2 | G.D. = 2.5 | G.D. = 3 |
| DGE100-000 | 2 | ∞ | 18.6 | 11.5 | - | - |
| DGE130-000 | | | | | | |
| DGE160-010 | | | | | | |
| DGE185-010 | 3 | | | | 8.8 | 7 |
| DGE215-015 | | | | | | |




## DTE

External, grooving and turning (for high-precision machining)

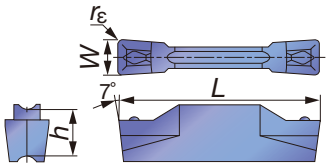



| Designation | Insert seat size | W±0.02 | rε | Coated | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTE265-015 | 3 | 2.65 | 0.15 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE300-020 | 3 | 3 | 0.2 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE300-040 | 3 | 3 | 0.4 | ● | | ● | ● | ● | 20 | 5 |
| DTE315-015 | 3 | 3.15 | 0.15 | ● | | ● | ● | ● | 20 | 5 |
| DTE400-040 | 4 | 4 | 0.4 | ● | | ● | ● | ● | 20 | 5 |
| DTE400-080 | 4 | 4 | 0.8 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE415-015 | 4 | 4.15 | 0.15 | ● | | ● | ● | ● | 20 | 5 |
| DTE478-055 | 5 | 4.78 | 0.55 | ● | | ● | ● | ● | 25 | 5.5 |
| DTE500-040 | 5 | 5 | 0.4 | ● | | ● | ● | ● | 25 | 5.5 |
| DTE500-080 | 5 | 5 | 0.8 | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTE515-015 | 5 | 5.15 | 0.15 | ● | | ● | ● | | 25 | 5.5 |
| DTE600-080 | 6 | 6 | 0.8 | ● | ● | ● | ● | | 25 | 5.5 |
| DTE600-120 | 6 | 6 | 1.2 | ● | | ● | ● | | 25 | 5.5 |
| DTE800-080 | 8 | 8 | 0.8 | ● | | ● | ● | | 30 | 6.7 |
| DTE800-120 | 8 | 8 | 1.2 | ● | | ● | ● | | 30 | 6.7 |

● : Line up

## DTE

External, grooving and turning

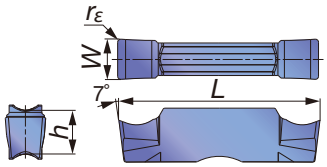



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTE3-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTE4-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |

● : Line up

## DGG

External and face grooving (for high-precision machining)

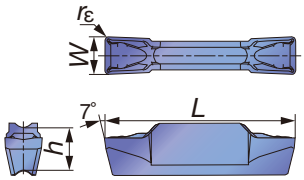



| Designation | Insert seat size | W±0.02 | rε | Cermet | Uncoated | L | h |
|---|---|---|---|---|---|---|---|
| | | | | NS9530 | KS05F | | |
| DGG200-020 | 2 | 2 | 0.2 | ● | ● | 20 | 5 |
| DGG300-020 | 3 | 3 | 0.2 | ● | ● | 20 | 5 |
| DGG400-040 | 4 | 4 | 0.4 | ● | ● | 20 | 5 |
| DGG500-040 | 5 | 5 | 0.4 | ● | ● | 25 | 5.5 |
| DGG600-040 | 6 | 6 | 0.4 | ● | ● | 25 | 5.5 |

● : Line up

## DTX

External, internal, face grooving and turning

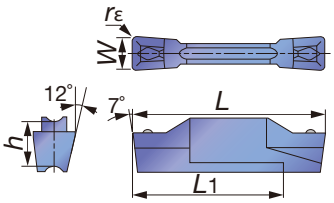



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTX3-030 | 3 | 3 | 0.3 | ● | ● | ● | ● | ● | 20 | 5 |
| DTX4-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTX5-040 | 5 | 5 | 0.4 | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTX6-080 | 6 | 6 | 0.8 | | | ● | ● | | 25 | 5.5 |

● : Line up

## DTF

Face grooving and turning

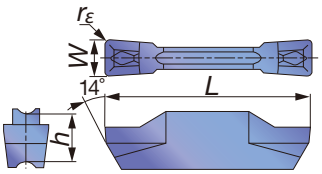



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | | | Cermet | | L | h | L1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | | AH725 | | GH130 | | NS9530 | | | | |
| | | | | R | L | R | L | R | L | R | L | | | |
| DTF3-040-R/L | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | 20 | 5 | 16 |
| DTF4-040-R/L | 4 | 4 | 0.4 | ● | ● | ● | ● | ● | ● | ● | ● | 20 | 5 | 16 |

● : Line up

## DTI

Internal grooving and turning (for high-precision machining)

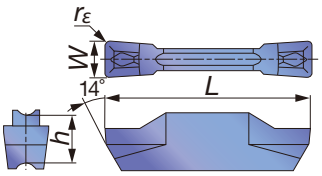



| Designation | Insert seat size | W±0.02 | rε | Coated | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DTI300-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | 20 | 5 |
| DTI400-040 | 4 | 4 | 0.4 | ● | ● | ● | ● | 20 | 5 |
| DTI400-080 | 4 | 4 | 0.8 | ● | ● | ● | ● | 20 | 5 |
| DTI500-040 | 5 | 5 | 0.4 | ● | ● | ● | ● | 25 | 5.5 |
| DTI500-080 | 5 | 5 | 0.8 | ● | ● | ● | ● | 25 | 5.5 |
| DTI600-080 | 6 | 6 | 0.8 | ● | ● | ● | | 25 | 5.5 |
| DTI600-120 | 6 | 6 | 1.2 | ● | ● | ● | | 25 | 5.5 |
| DTI800-080 | 8 | 8 | 0.8 | ● | ● | ● | | 30 | 6.7 |
| DTI800-120 | 8 | 8 | 1.2 | ● | ● | ● | | 30 | 6.7 |

● : Line up

## DTI

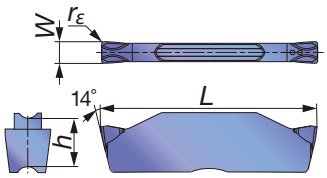
Internal grooving and turning




| Designation | Insert seat size | W±0.05 | rε | Coated | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | GH130 | NS9530 | | |
| DTI3-040 | 3 | 3 | 0.4 | ● | ● | ● | ● | ● | 20 | 5 |
| DTI4-040 | 4 | 4 | 0.4 | ● | | ● | ● | ● | 20 | 5 |

● : Line up

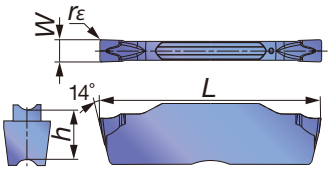
## DGIM
Small diameter internal grooving




| Designation | Insert seat size | W±0.05 | rε | Coated | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DGIM2-020 | 2 | 2 | 0.2 | ● | ● | ● | ● | 20 | 5 |

● : Line up

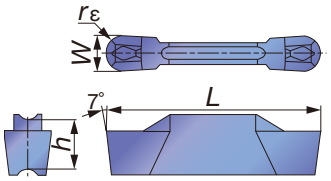
## DGIS
Small diameter internal grooving




| Designation | Insert seat size | W±0.05 | rε | Coated | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DGIS2-020 | 2 | 2 | 0.2 | ● | ● | ● | ● | 20 | 5 |

● : Line up

## DTR
Profiling and undercutting (for high-precision machining)

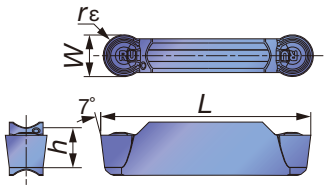



| Designation | Insert seat size | W±0.02 | rε | Coated | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH725 | GH130 | NS9530 | | |
| DTR300-150 | 3 | 3 | 1.5 | ● | ● | ● | ● | 20 | 5 |
| DTR400-200 | 4 | 4 | 2 | ● | ● | ● | ● | 20 | 5 |
| DTR478-239 | 5 | 4.78 | 2.39 | ● | ● | ● | ● | 25 | 5.5 |
| DTR500-250 | 5 | 5 | 2.5 | ● | ● | ● | ● | 25 | 5.5 |
| DTR600-300 | 6 | 6 | 3 | ● | ● | ● | | 25 | 5.5 |

● : Line up

## DTR

Profiling and undercutting

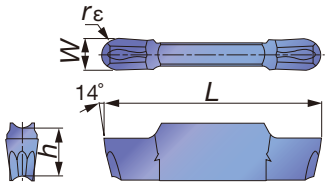



| Designation | Insert seat size | W±0.05 | rε | Coated | | | | | Cermet | L | h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | T9125 | AH7025 | AH725 | AH905 | GH130 | NS9530 | | |
| DTR3-150 | 3 | 3 | 1.5 | ● | ● | ● | ● | ● | ● | 20 | 5 |
| DTR4-200 | 4 | 4 | 2 | ● | ● | ● | ● | ● | ● | 20 | 5 |
| DTR5-250 | 5 | 5 | 2.5 | ● | ● | ● | ● | ● | ● | 25 | 5.5 |
| DTR6-300 | 6 | 6 | 3 | ● | ● | ● | | ● | | 25 | 5.5 |
| DTR8-400 | 8 | 8 | 4 | ● | | ● | | ● | | 30 | 6.7 |

● : Line up

## DTIU

Profiling and undercutting (for high-precision machining)

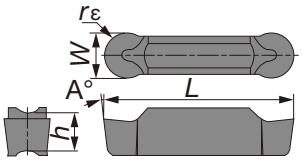



| Designation | Insert seat size | W±0.02 | rε | Coated | | L | h |
|---|---|---|---|---|---|---|---|
| | | | | AH725 | GH130 | | |
| DTIU300-150 | 3 | 3 | 1.5 | ● | ● | 20 | 5 |
| DTIU400-200 | 4 | 4 | 2 | ● | ● | 20 | 5 |
| DTIU500-250 | 5 | 5 | 2.5 | ● | ● | 25 | 5.5 |
| DTIU600-300 | 6 | 6 | 3 | ● | ● | 25 | 5.5 |

● : Line up

## DTA

Aluminium wheel machining (for high-precision machining)

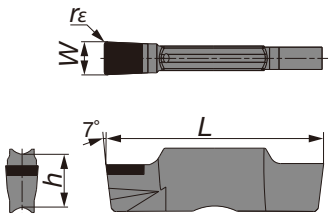



| Designation | Insert seat size | W±0.02 | rε | Uncoated | L | h | A° |
|---|---|---|---|---|---|---|---|
| | | | | TH10 | | | |
| DTA600-300 | 6 | 6 | 3 | ● | 25 | 5.5 | 7 |
| DTA800-400 | 8 | 8 | 4 | ● | 30 | 6.7 | 10 |

● : Line up

## SGN

External grooving of hardened steels




| Designation | Insert seat size | W±0.025 | rε | CBN BX360 | L | h |
|---|---|---|---|---|---|---|
| SGN200-020 | 2 | 2 | 0.2 | ● | 20 | 5 |
| SGN300-020 | 3 | 3 | 0.2 | ● | 20 | 5 |
| SGN400-020 | 4 | 4 | 0.2 | ● | 20 | 5 |

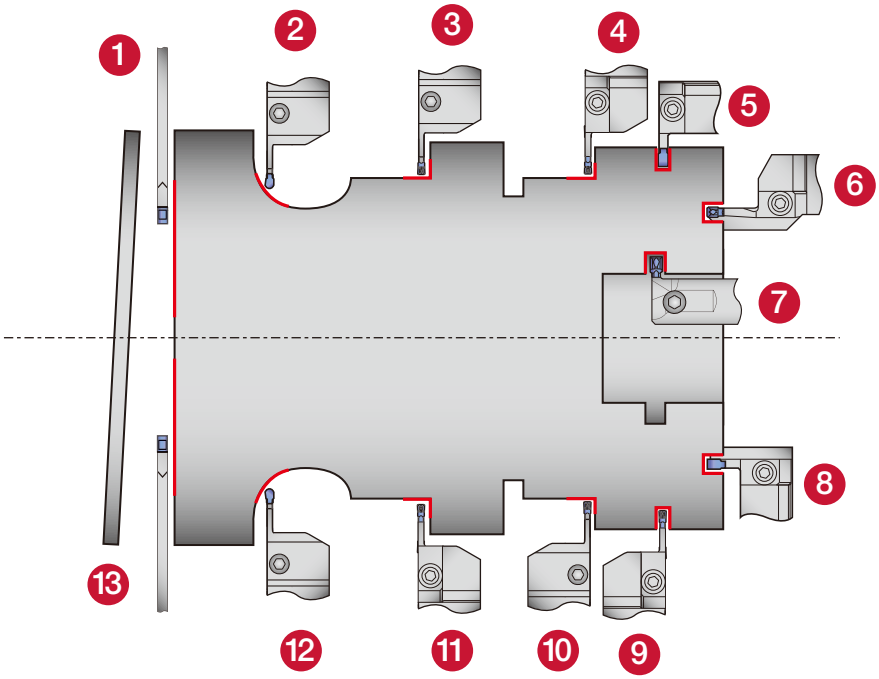
● : Line up

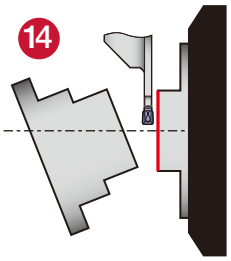
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed Vc (m/min) |
|---|---|---|---|---|---|
| P | Steels (S45C / C45, SCM435 / 34CrMo4, etc.) | < 300 HB | First choice | AH7025, AH725 | 50 - 180 |
| | | < 300 HB | Priority for wear resistance | T9125 | 80 - 200 |
| | | < 300 HB | Priority for impact resistance | GH130 | 50 - 120 |
| | | < 300 HB | Priority for surface finish | NS9530 | 80 - 220 |
| M | Stainless steels (SUS303 / X10CrNiS18-9, etc.) | < 200 HB | First choice | AH7025, AH725 | 50 - 120 |
| | | < 200 HB | Priority for impact resistance | GH130 | 50 - 120 |
| K | Grey cast irons (FC250, GG25, 250, etc.) | - | First choice | GH130 | 50 - 180 |
| | Ductile cast irons (FCD450, GGG45, 450-10S, etc.) | - | First choice | GH130 | 50 - 120 |
| N | Aluminium alloys (Si < 12%) | - | First choice | TH10 | 100 - 500 |
| S | Titanium alloys (Ti-6Al-4V, etc.) | < HRC 40 | First choice | AH905 | 20 - 80 |
| | | < HRC 40 | Priority for impact resistance | AH7025, AH725 | 20 - 80 |
| H | Hardened steels (SCM435, SUJ2, 34CrMo4, etc.) | > HRC 50 | First choice | BX360 | 80 - 150 |

# MY-T SERIES - Quick Guide

## Wide variety of tools dramatically reduce set up time






### 1 CCH
1 corner
*W* = 3 - 5 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm
C094

### 2 CGSSR/L-D
1 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 22 - 25 mm
Shank size:
16 - 25 mm
C093

### 3 CGSSR/L
1 corner
Monoblock type
*W* = 2 - 5 mm
*ar* = 12 - 16 mm
Shank size:
16 - 25 mm
C093

### 4 CGWSR/L-G
1 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 12 mm
Shank size:
20 - 25 mm
C092

### 5 CGWTR/L-G
1 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 12 mm
Shank size:
20 - 25 mm
C092

### 6 CGWSR/L *S/D*L/R
1 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 10 - 22 mm
Shank size:
20 - 25 mm
C095

### 7 CGTR/L
1 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 3.5 - 6 mm
Shank size:
ø25 - ø40 mm
C097

### 8 CGWTR/L *S/D*L/R
1 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 10 - 22 mm
Shank size:
20 - 25 mm
C096

### 9 CGWSR/L-WG
2 corner
Adaptor type
*W* = 3 - 5 mm
*ar* = 12 - 13 mm
Shank size:
20 - 25 mm
C088

### 10 CGWSR/L-W
2 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 12 - 13 mm
Shank size:
16 - 25 mm
C087

### 11 CGWSR/L -WG-L
2 corner
Adaptor type
*W* = 2 - 5 mm
*ar* = 15 - 21.5 mm
Shank size:
20 - 25 mm
C088

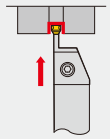
### 12 CGWSR/L -W-L
2 corner
Monoblock type
*W* = 3 - 5 mm
*ar* = 15 - 21.5 mm
Shank size:
16 - 25 mm
C087

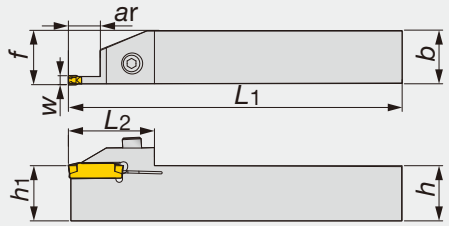
### 13 CCH-W
2 corner
*W* = 2 - 5 mm
Max. parting Dia.:
42 mm
Shank size:
20 - 32 mm
C089

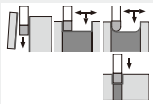
### 14 JCGSSR/L
1 corner
For swiss type machine
*W* = 2 mm
Max. parting Dia.:
32 mm
Shank size:
10 - 16 mm
C094

# MY-T SERIES
## CGWSR/L-W

External toolholders for grooving & parting & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L1616-W30 | 3 | 12 | 16 | 16 | 125 | 34 | 16 | 16.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W30 | 3 | 12 | 20 | 20 | 150 | 34 | 20 | 20.4 | WG*30, WGE30R/L |
| CGWSR/L2525-W30 | 3 | 12 | 25 | 25 | 150 | 34 | 25 | 25.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W40 | 4 | 13 | 20 | 20 | 150 | 39 | 20 | 20.4 | WG*40, WGE40R/L |
| CGWSR/L2525-W40 | 4 | 13 | 25 | 25 | 150 | 39 | 25 | 25.4 | WG*40, WGE40R/L |
| CGWSR/L2020-W50 | 5 | 13 | 20 | 20 | 150 | 39 | 20 | 20.4 | WG*50, WGE50R/L |
| CGWSR/L2525-W50 | 5 | 13 | 25 | 25 | 150 | 39 | 25 | 25.4 | WG*50, WGE50R/L |

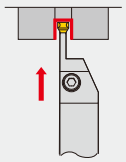
• For applicable Insert, see page C090 - C091.

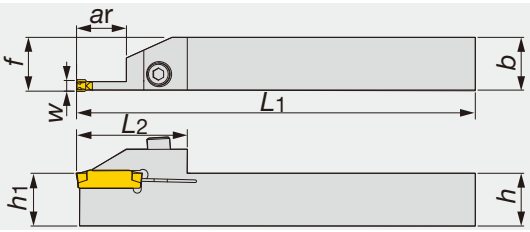
### SPARE PARTS

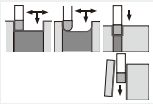
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGWSR/L****-W... | CHHM5-18 | P-4 |

# MY-T SERIES
## CGWSR/L-W-L

External toolholders for deep grooving & parting & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L1616-W20-L | 2 | 15 | 16 | 16 | 125 | 37 | 16 | 16.2 | WGE20, WGE20R/L |
| CGWSR/L2020-W20-L | 2 | 15 | 20 | 20 | 150 | 37 | 20 | 20.2 | WGE20, WGE20R/L |
| CGWSR/L2525-W20-L | 2 | 15 | 25 | 25 | 150 | 37 | 25 | 25.2 | WGE20, WGE20R/L |
| CGWSR/L1616-W30-L | 3 | 16.5, 17.5 | 16 | 16 | 125 | 37 | 16 | 16.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W30-L | 3 | 16.5, 17.5 | 20 | 20 | 150 | 37 | 20 | 20.4 | WG*30, WGE30R/L |
| CGWSR/L2525-W30-L | 3 | 16.5, 17.5 | 25 | 25 | 150 | 37 | 25 | 25.4 | WG*30, WGE30R/L |
| CGWSR/L2020-W40-L | 4 | 21, 21.5 | 20 | 20 | 150 | 42 | 20 | 20.4 | WG*40, WGE40R/L |
| CGWSR/L2525-W40-L | 4 | 21, 21.5 | 25 | 25 | 150 | 42 | 25 | 25.4 | WG*40, WGE40R/L |
| CGWSR/L2020-W50-L | 5 | 21 | 20 | 20 | 150 | 42 | 20 | 20.4 | WG*50, WGE50R/L |
| CGWSR/L2525-W50-L | 5 | 21 | 25 | 25 | 150 | 42 | 25 | 25.4 | WG*50, WGE50R/L |

• For applicable Insert, see page C090 - C091.

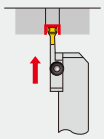
### SPARE PARTS

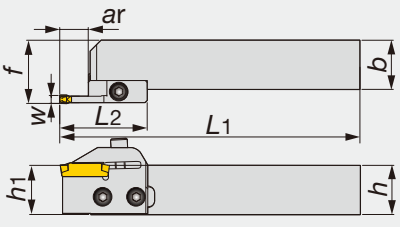
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGWSR/L****-W**-L | CHHM5-18 | P-4 |

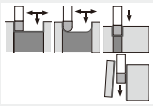
# MY-T SERIES

## CGWSR/L-WG

External toolholders for grooving & parting & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-W30GR/L | 3 | 12 | 20 | 20 | 150.5 | 43.5 | 20 | 26.9 | WG*30, WGE30R/L | CGWSR/L2020 | W30GR/L |
| CGWSR/L2525-W30GR/L | 3 | 12 | 25 | 25 | 150.5 | 43.5 | 25 | 31.9 | WG*30, WGE30R/L | CGWSR/L2525 | W30GR/L |
| CGWSR/L2020-W40GR/L | 4 | 13 | 20 | 20 | 151.5 | 44.5 | 20 | 26.9 | WG*40, WGE40R/L | CGWSR/L2020 | W40GR/L |
| CGWSR/L2525-W40GR/L | 4 | 13 | 25 | 25 | 151.5 | 44.5 | 25 | 31.9 | WG*40, WGE40R/L | CGWSR/L2525 | W40GR/L |
| CGWSR/L2020-W50GR/L | 5 | 13 | 20 | 20 | 151.5 | 44.5 | 20 | 26.9 | WG*50, WGE50R/L | CGWSR/L2020 | W50GR/L |
| CGWSR/L2525-W50GR/L | 5 | 13 | 25 | 25 | 151.5 | 44.5 | 25 | 31.9 | WG*50, WGE50R/L | CGWSR/L2525 | W50GR/L |

- When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
- For Applicable insert, see page C090 - C091.

### SPARE PARTS

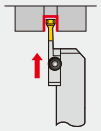
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-W**GR/L | CHHM5-18 | CSHB-6 | P-4 |

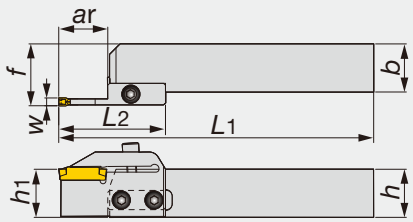
# MY-T SERIES

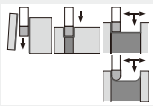
## CGWSR/L-WG-L

External toolholders for deep grooving & parting & turning







Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-W20GR/L-L | 2 | 15 | 20 | 20 | 153.5 | 46.5 | 20 | 26.7 | WGE20, WGE20R/L | CGWSR/L2020 | W20GR/L-L |
| CGWSR/L2525-W20GR/L-L | 2 | 15 | 25 | 25 | 153.5 | 46.5 | 25 | 31.7 | WGE20, WGE20R/L | CGWSR/L2525 | W20GR/L-L |
| CGWSR/L2020-W30GR/L-L | 3 | 16.5 - 17.5 | 20 | 20 | 157.5 | 50.5 | 20 | 26.9 | WG*30, WGE30R/L | CGWSR/L2020 | W30GR/L-L |
| CGWSR/L2525-W30GR/L-L | 3 | 16.5 - 17.5 | 25 | 25 | 157.5 | 50.5 | 25 | 31.9 | WG*30, WGE30R/L | CGWSR/L2525 | W30GR/L-L |
| CGWSR/L2020-W40GR/L-L | 4 | 21 - 21.5 | 20 | 20 | 162.5 | 55.5 | 20 | 26.9 | WG*40, WGE40R/L | CGWSR/L2020 | W40GR/L-L |
| CGWSR/L2525-W40GR/L-L | 4 | 21 - 21.5 | 25 | 25 | 162.5 | 55.5 | 25 | 31.9 | WG*40, WGE40R/L | CGWSR/L2525 | W40GR/L-L |
| CGWSR/L2020-W50GR/L-L | 5 | 21 | 20 | 20 | 162.5 | 55.5 | 20 | 26.9 | WG*50, WGE50R/L | CGWSR/L2020 | W50GR/L-L |
| CGWSR/L2525-W50GR/L-L | 5 | 21 | 25 | 25 | 162.5 | 55.5 | 25 | 31.9 | WG*50, WGE50R/L | CGWSR/L2525 | W50GR/L-L |

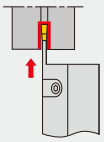
- When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
- For Applicable insert, see page C090 - C091.

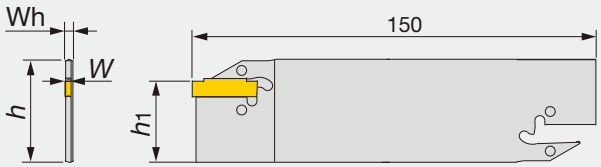
### SPARE PARTS

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-W**GR/L-L | CHHM5-18 | CSHB-6 | P-4 |

## CCH-W

Blades for external grooving & parting off (2 corner)



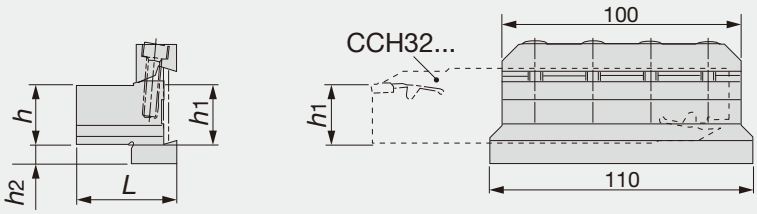



| Designation | W | Applicable insert | Max. parting off dia. | Wh | h1 | h |
|---|---|---|---|---|---|---|
| CCH32-W20 | 2 | WGE20, WGE20R/L | 33 | 1.6 | 24.6 | (32) |
| CCH32-W30 | 3 | WG*30, WGE30R/L | 33 | 2.2 | 24.6 | (32) |
| CCH32-W40 | 4 | WG*40, WGE40R/L | 42 | 3.2 | 24.5 | (32) |
| CCH32-W50 | 5 | WG*50, WGE50R/L | 42 | 4.2 | 24.3 | (32) |

• For Applicable insert, see page C090 - C091.

## CCBS-32

Tool block for CCH blades




| Designation | h | h1 | h2 | L | Blade |
|---|---|---|---|---|---|
| CCBS20-32 | 20 | 20 | 13 | 38 | CCH32... |
| CCBS25-32 | 25 | 25 | 8 | 42 | CCH32... |
| CCBS32-32 | 32 | 32 | 5 | 42 | CCH32... |

### SPARE PARTS

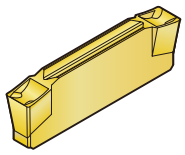
| Designation | Clamp | Screw | Wrench |
|---|---|---|---|
| CCBS**-32 | CC-32 | CM6X25 | P-5 |

# MY-T SERIES - Chipbreaker Guide

## 2 corner inserts

### External grooving and parting off

**WGE**

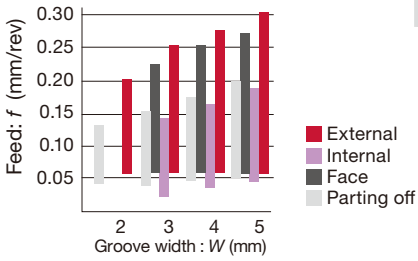


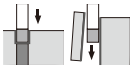
C091

1st choice for external grooving and parting

Excellent chip control for grooving

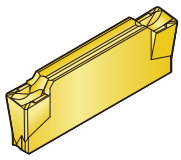
W = 2 - 5 mm



### Parting off

**WGE R/L**

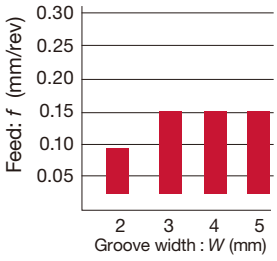


C091

Handed insert

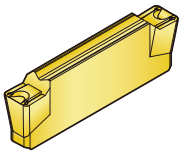
Minimize burr generation when workpiece is cut off

W = 2 - 5 mm



### External grooving and traversing

**WGT**

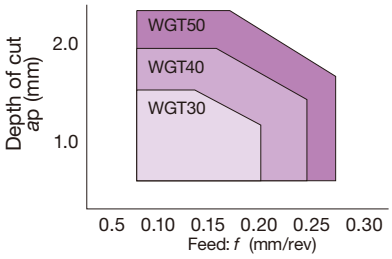


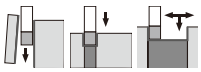
C091

1st choice for traversing

Low cutting force and good chip control for traversing

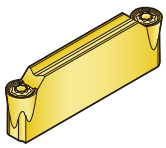
W = 3 - 5 mm



### Profiling

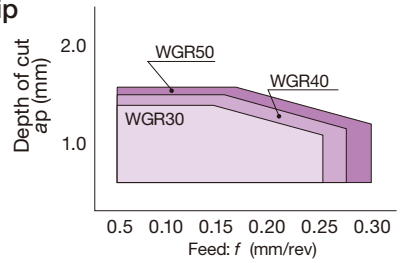
**WGR**

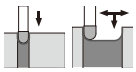


C091

Low cutting force and good chip control for profiling

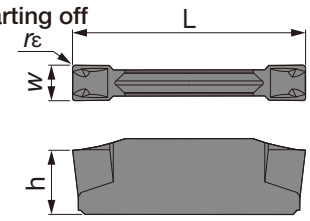
W = 3 - 5 mm



## WGE

For general parting off and grooving

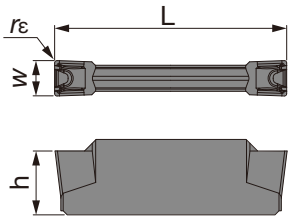



| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGE20 | 2 | 0.2 | ● | ● | ● | 20 | 4.7 |
| WGE30 | 3 | 0.2 | ● | ● | ● | 20 | 5.5 |
| WGE40 | 4 | 0.2 | ● | ● | ● | 25 | 5.7 |
| WGE50 | 5 | 0.2 | ● | ● | ● | 25 | 5.9 |

● : Line up

## WGT

For traversing

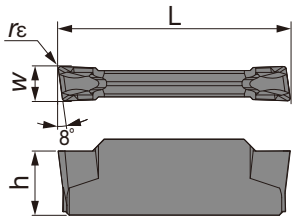



| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGT30 | 3 | 0.4 | ● | ● | ● | 20 | 5.5 |
| WGT40 | 4 | 0.4 | ● | ● | ● | 25 | 5.7 |
| WGT50 | 5 | 0.4 | ● | ● | ● | 25 | 5.9 |

● : Line up

## WGER/L

For parting off (with hand)



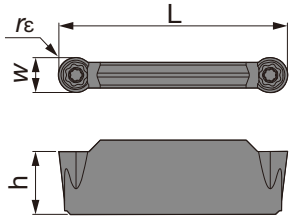

Right hand (R) shown.

| Designation | $W^{+0.1}_{0}$ | rε | Coated | | L | h |
|---|---|---|---|---|---|---|
| | | | GH730 | | | |
| | | | R | L | | |
| WGE20R/L | 2 | 0.2 | ● | ● | 20 | 4.7 |
| WGE30R/L | 3 | 0.2 | ● | ● | 20 | 5.5 |
| WGE40R/L | 4 | 0.2 | ● | ● | 25 | 5.7 |
| WGE50R/L | 5 | 0.2 | ● | ● | 25 | 5.9 |

● : Line up

## WGR

For profiling




| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| WGR30 | 3 | 1.5 | ● | ● | ● | 20 | 5.5 |
| WGR40 | 4 | 2 | ● | ● | ● | 25 | 5.7 |
| WGR50 | 5 | 2.5 | | ● | ● | 25 | 5.9 |

● : Line up

## STANDARD CUTTING CONDITIONS

| Workpiece material | Recommended grade | Cutting speed $v_C$ (m/min) |
|---|---|---|
| Low carbon steels<br>Alloy steels<br>( ~ HB150) | T9125 | 80 ~ 200 |
| | NS9530 | 100 ~ 200 |
| | GH730 | 50 ~ 180 |
| Medium carbon steels<br>Alloy steels<br>(HB150 ~ 250) | T9125 | 80 ~ 180 |
| | NS9530 | 80 ~ 180 |
| | GH730 | 50 ~ 150 |
| High carbon steels<br>Alloy steels<br>(HB250 ~ ) | T9125 | 80 ~ 150 |
| | NS9530 | 80 ~ 150 |
| | GH730 | 50 ~ 120 |
| Stainless steels | T9125 | 80 ~ 150 |
| | GH730 | 50 ~ 120 |
| Grey and ductile cast irons | T9125 | 80 ~ 200 |
| | GH730 | 50 ~ 180 |

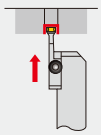
| Operation | Feed: *f* (mm/rev) | | | |
|---|---|---|---|---|
| | Groove width: *W* (mm) | | | |
| | 2 | 3 | 4 | 5 |
| Grooving (WGE□□) | 0.06 ~ 0.20 | 0.06 ~ 0.25 | 0.07 ~ 0.27 | 0.07 ~ 0.30 |
| Parting off (WGE□□R/L) | 0.04 ~ 0.10 | 0.04 ~ 0.14 | 0.04 ~ 0.14 | 0.04 ~ 0.14 |
| Traversing (WGT□□) | - | *ap* = 0.5 ~ 1.5<br>*f* = 0.06 ~ 0.2 | *ap* = 0.5 ~ 2.0<br>*f* = 0.06 ~ 0.25 | *ap* = 0.5 ~ 2.5<br>*f* = 0.06 ~ 0.27 |
| Profiling (WGR□□) | - | *ap* = 0.5 ~ 1.4<br>*f* = 0.05 ~ 0.25 | *ap* = 0.5 ~ 1.5<br>*f* = 0.05 ~ 0.26 | *ap* = 0.5 ~ 1.6<br>*f* = 0.05 ~ 0.3 |

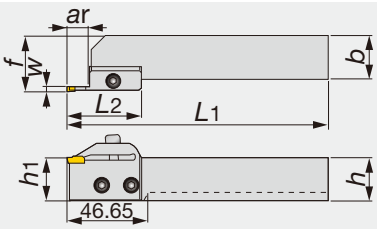
Note: For diameter compensation values in traversing, see page **C104**.

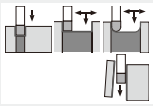
# MY-T SERIES

## CGWSR/L-G

External toolholders for grooving & parting & turning





Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-20GR/L | 2 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 26.8 | GE20, GE20-AL | CGWSR/L2020 | 20GR/L |
| CGWSR/L2525-20GR/L | 2 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 31.8 | GE20, GE20-AL | CGWSR/L2525 | 20GR/L |
| CGWSR/L2020-30GR/L | 3 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27 | G*30,GE30R/L,GE30-AL | CGWSR/L2020 | 30GR/L |
| CGWSR/L2525-30GR/L | 3 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 32 | G*30,GE30R/L,GE30-AL | CGWSR/L2525 | 30GR/L |
| CGWSR/L2020-40GR/L | 4 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27.1 | G*40,GE40R/L,GE40-AL | CGWSR/L2020 | 40GR/L |
| CGWSR/L2525-40GR/L | 4 | 12 | 25 | 25 | 150.2 | 43.15 | 25 | 32.1 | G*40,GE40R/L,GE40-AL | CGWSR/L2525 | 40GR/L |
| CGWSR/L2020-50GR/L | 5 | 12 | 20 | 20 | 150.2 | 43.15 | 20 | 27.2 | G*50,GE50R | CGWSR/L2020 | 50GR |

Note: For diameter compensation values in traversing, see page C104.
When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.
For Applicable insert, see page C098 - C101.

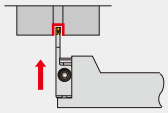
### SPARE PARTS

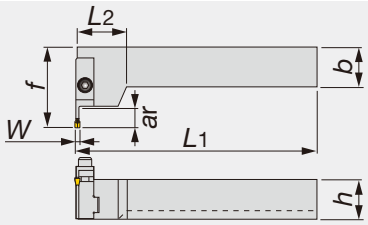
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-**GR/L | CHHM5-18 | CSHB-6 | P-4 |

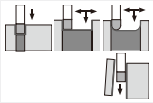
# MY-T SERIES

## CGWTR/L-G

External toolholders for grooving & parting & turning





Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | ar | h | b | L1 | L2 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWTR/L2020-30GL/R | 3 | 12 | 20 | 20 | 150 | 12.9 | 49.9 | G*30,GE30R/L,GE30-AL | CGWTR/L2020 | 30GL/R |
| CGWTR/L2525-30GL/R | 3 | 12 | 25 | 25 | 150 | 12.9 | 49.9 | G*30,GE30R/L,GE30-AL | CGWTR/L2525 | 30GL/R |
| CGWTR/L2020-40GL/R | 4 | 12 | 20 | 20 | 150.1 | 12.9 | 49.9 | G*40,GE40R/L,GE40-AL | CGWTR/L2020 | 40GL/R |
| CGWTR/L2525-40GL/R | 4 | 12 | 25 | 25 | 150.1 | 12.9 | 49.9 | G*40,GE40R/L,GE40-AL | CGWTR/L2525 | 40GL/R |
| CGWTR/L2020-50GL/R | 5 | 12 | 20 | 20 | 150.2 | 12.9 | 49.9 | G*50,GE50R/L,GE50-AL | CGWTR/L2020 | 50GL/R |
| CGWTR/L2525-50GL/R | 5 | 12 | 25 | 25 | 150.2 | 12.9 | 49.9 | G*50,GE50R/L,GE50-AL | CGWTR/L2525 | 50GL/R |

Note: For diameter compensation values in traversing, see page C104.
When using a right or left hand blade set, the right hand blade set is used with left hand shank and the left hand blade set is used with right hand shank.
For Applicable insert, see page C098 - C101.

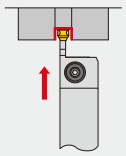
### SPARE PARTS

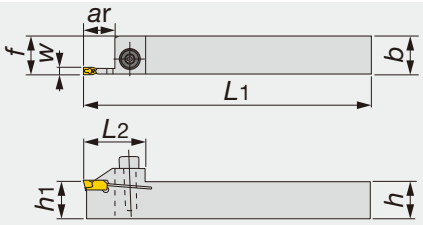
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWTR/L****-**GL/R | CHHM5-18 | CSHB-6 | P-4 |

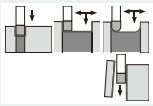
# MY-T SERIES

## CGSSR/L

External toolholders for grooving & parting & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGSSR/L1616-20 | 2 | 16 | 16 | 16 | 125 | 27 | 16 | 16.2 | GE20, GE20-AL |
| CGSSR/L2020-20 | 2 | 16 | 20 | 20 | 150 | 27 | 20 | 20.2 | GE20, GE20-AL |
| CGSSR/L2525-20 | 2 | 16 | 25 | 25 | 150 | 27 | 25 | 25.2 | GE20, GE20-AL |
| CGSSR/L1616-30 | 3 | 12 | 16 | 16 | 125 | 27 | 16 | 16.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-30 | 3 | 12 | 20 | 20 | 150 | 27 | 20 | 20.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2525-30 | 3 | 12 | 25 | 25 | 150 | 27 | 25 | 25.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-40 | 4 | 12 | 20 | 20 | 150 | 27 | 20 | 20.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2525-40 | 4 | 12 | 25 | 25 | 150 | 27 | 25 | 25.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2020-50 | 5 | 12 | 20 | 20 | 150 | 27 | 20 | 20.7 | G*50,GE50R/L,GE50-AL |
| CGSSR/L2525-50 | 5 | 12 | 25 | 25 | 150 | 27 | 25 | 25.7 | G*50,GE50R/L,GE50-AL |

Note: For Applicable insert, see page C098 - C101.

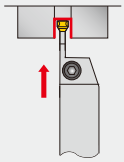
### SPARE PARTS

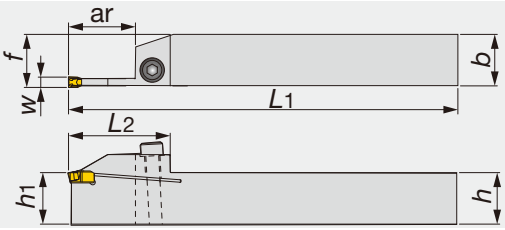
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGSSR/L... | CHHM5-18 | P-4 |

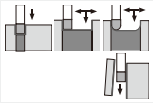
# MY-T SERIES

## CGSSR/L-D

External toolholders for deep grooving & parting & turning





Right hand (R) shown.

| Designation | W | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| CGSSR/L1616-30D | 3 | 22 | 16 | 16 | 125 | 36.2 | 16 | 16.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-30D | 3 | 22 | 20 | 20 | 150 | 36.2 | 20 | 20.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2525-30D | 3 | 22 | 25 | 25 | 150 | 36.2 | 25 | 25.5 | G*30,GE30R/L,GE30-AL |
| CGSSR/L2020-40D | 4 | 25 | 20 | 20 | 150 | 39.5 | 20 | 20.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2525-40D | 4 | 25 | 25 | 25 | 150 | 39.5 | 25 | 25.6 | G*40,GE40R/L,GE40-AL |
| CGSSR/L2020-50D | 5 | 25 | 20 | 20 | 150 | 39.5 | 20 | 20.7 | G*50,GE50R/L |
| CGSSR/L2525-50D | 5 | 25 | 25 | 25 | 150 | 39.5 | 25 | 25.7 | G*50,GE50R/L |

Note: For Applicable insert, see page C098 - C101.

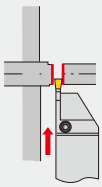
### SPARE PARTS

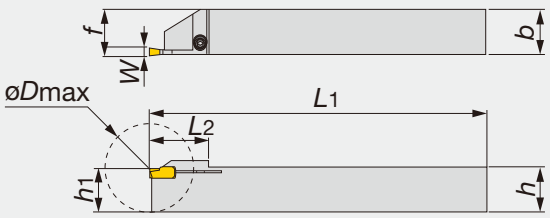
| Designation | Clamping screw | Wrench |
|---|---|---|
| CGSSR/L****-**D | CHHM5-18 | P-4 |

# MY-T SERIES

## JCGSSR/L

External grooving toolholders for swiss lathe






Right hand (R) shown.

| Designation | W | øDmax | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|
| JCGSSR/L1010-20 | 2 | 20 | 10 | 10 | 125 | 15 | 10 | 10.2 | GE20, GE20-AL |
| JCGSSR/L1212-20 | 2 | 25 | 12 | 12 | 125 | 19 | 12 | 12.2 | GE20, GE20-AL |
| JCGSSR/L1616-20 | 2 | 32 | 16 | 16 | 125 | 22.5 | 16 | 16.2 | GE20, GE20-AL |

• øDmax: Max. parting off diameter • For Applicable insert, see page C098 - C101.

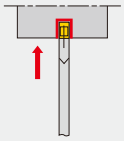
### SPARE PARTS

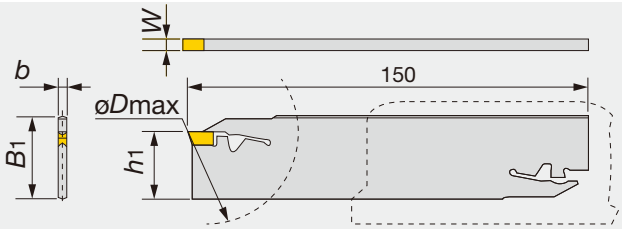
| Designation | Clamping screw | Wrench |
|---|---|---|
| JCGSSR/L... | CSTB-3 | T-9F |

# MY-T SERIES

## CCH

Blades for external grooving & parting off (for 1 corner insert)






External

| Designation | W | øDmax | b | h1 | B1 | Insert |
|---|---|---|---|---|---|---|
| CCH32-30 | 3 | 100 | 2.2 | 24.6 | 31.31 | GE30,GE30R/L,GE30-AL |
| CCH32-40 | 4 | 100 | 3.2 | 24.5 | 31.04 | GE40,GE40R/L,GE40-AL |
| CCH32-50 | 5 | 120 | 4.2 | 24.3 | 30.77 | GE50,GE50R/L,GE50-AL |

• øDmax: Max. parting off diameter • For Applicable insert, see page C098 - C101.

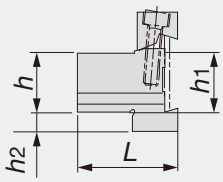
### SPARE PARTS

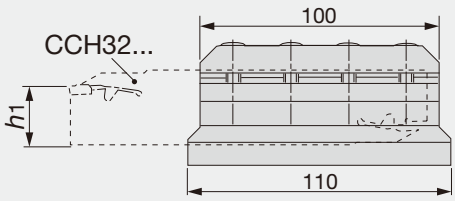
| Designation | Wrench |
|---|---|
| CCH... | CTL-2 |

Parting-off

## CCBS-32

Tool block for CCH blades




| Designation | h | h1 | h2 | L | Blade |
|---|---|---|---|---|---|
| CCBS20-32 | 20 | 20 | 13 | 38 | CCH32... |
| CCBS25-32 | 25 | 25 | 8 | 42 | CCH32... |
| CCBS32-32 | 32 | 32 | 5 | 42 | CCH32... |

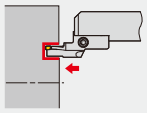
### SPARE PARTS

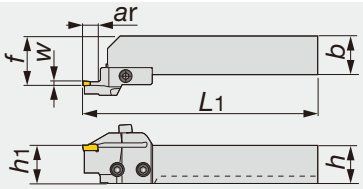
| Designation | Clamp | Screw | Wrench |
|---|---|---|---|
| CCBS**-32 | CC-32 | CM6X25 | P-5 |

# MY-T SERIES

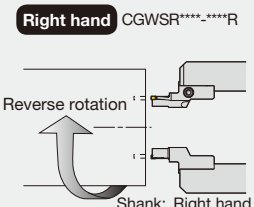
## #S/D##R/L+CGWSR/L

Blades of "My-T" toolholders CGWSR/L-#S/D & CGWTR/L-#S/D for face grooving & turning

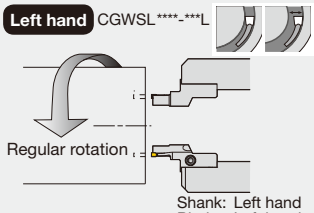





Right hand (R) shown.
The dashed line shows 20 mm square shank tools.




Shank: Right hand
Blade: Right hand




Shank: Left hand
Blade: Left hand

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30S3040R/L | 3 | 30 | 40 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S4050R/L | 3 | 40 | 50 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S5065R/L | 3 | 50 | 65 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S6590R/L | 3 | 65 | 90 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S90150R/L | 3 | 90 | 150 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 30S150500R/L | 3 | 150 | 500 | 10 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*30, GE30-AL | CGWSR/L... |
| 40S3545R/L | 4 | 35 | 45 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S4555R/L | 4 | 45 | 55 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S5580R/L | 4 | 55 | 80 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S80140R/L | 4 | 80 | 140 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40S140500R/L | 4 | 140 | 500 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D3545R/L | 4 | 35 | 45 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D4555R/L | 4 | 45 | 55 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D5580R/L | 4 | 55 | 80 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D80140R/L | 4 | 80 | 140 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 40D140500R/L | 4 | 140 | 500 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*40, GE40-AL | CGWSR/L... |
| 50S3545R/L | 5 | 35 | 45 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S4555R/L | 5 | 45 | 55 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S5575R/L | 5 | 55 | 75 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S75130R/L | 5 | 75 | 130 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50S130500R/L | 5 | 130 | 500 | 14 | 20/25 | 20/25 | 152.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D3545R/L | 5 | 35 | 45 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D4555R/L | 5 | 45 | 55 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D5575R/L | 5 | 55 | 75 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D75130R/L | 5 | 75 | 130 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |
| 50D130500R/L | 5 | 130 | 500 | 22 | 20/25 | 20/25 | 160.5 | 20/25 | 27/32 | G*50 | CGWSR/L... |

- There are 2 shank type of CGWSR/L and CGWTR/L.
- CGWSR/L Shank : The right hand blade set(...R) is used with right hand shank(CGWSR...) and the left hand blade set(...L) is used with left hand shank(CGWSL...).
- CGWTR/L Shank : The left hand blade set(...L)is used with right hand shank(CGWTR...) and the right hand blade set(...R)is used with left hand shank(CGWTL...).
- For Applicable insert, see page C098 - C101.

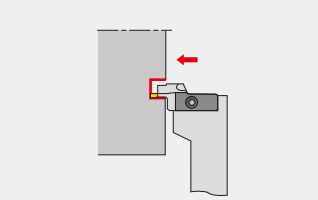
### SPARE PARTS

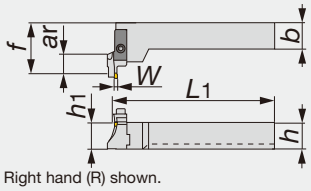
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| 30S... | CHHM5-18 | CSHB-6 | P-4 |
| 40D... | CM5X0.8X16 | CSHB-6 | P-4 |
| 50S... | CHHM5-18 | CSHB-6 | P-4 |
| 50D... | CM5X0.8X16 | CSHB-6 | P-4 |

# MY-T SERIES

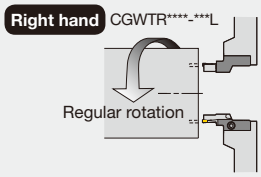
## #S/D##R/L+CGWTR/L

Blades of "My-T" toolholders CGWSR/L-#S/D & CGWTR/L-#S/D for face grooving & turning

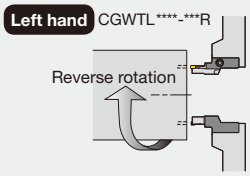





Right hand (R) shown.
The dashed line shows 20 mm square shank tools.




Shank: Right hand
Blade: Left hand




Shank: Left hand
Blade: Right hand

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30S3040R/L | 3 | 30 | 40 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S4050R/L | 3 | 40 | 50 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S5065R/L | 3 | 50 | 65 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S6590R/L | 3 | 65 | 90 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S90150R/L | 3 | 90 | 150 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 30S150500R/L | 3 | 150 | 500 | 10 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*30, GE30-AL | CGWTL/R... |
| 40S3545R/L | 4 | 35 | 45 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S4555R/L | 4 | 45 | 55 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S5580R/L | 4 | 55 | 80 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S80140R/L | 4 | 80 | 140 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40S140500R/L | 4 | 140 | 500 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*40, GE40-AL | CGWTL/R... |
| 40D3545R/L | 4 | 35 | 45 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D4555R/L | 4 | 45 | 55 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D5580R/L | 4 | 55 | 80 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D80140R/L | 4 | 80 | 140 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 40D140500R/L | 4 | 140 | 500 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*40, GE40-AL | CGWTL/R... |
| 50S3545R/L | 5 | 35 | 45 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S4555R/L | 5 | 45 | 55 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S5575R/L | 5 | 55 | 75 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S75130R/L | 5 | 75 | 130 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50S130500R/L | 5 | 130 | 500 | 14 | 20/25 | 20/25 | 150 | 20/25 | 52.25 | G*50 | CGWTL/R... |
| 50D3545R/L | 5 | 35 | 45 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D4555R/L | 5 | 45 | 55 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D5575R/L | 5 | 55 | 75 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D75130R/L | 5 | 75 | 130 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |
| 50D130500R/L | 5 | 130 | 500 | 22 | 20/25 | 20/25 | 150 | 20/25 | 60.25 | G*50 | CGWTL/R... |

- There are 2 shank type of CGWSR/L and CGWTR/L.
- CGWSR/L Shank : The right hand blade set(...R) is used with right hand shank(CGWSR...) and the left hand blade set(...L) is used with left hand shank(CGWSL...).
- CGWTR/L Shank : The left hand blade set(...L)is used with right hand shank(CGWTR...) and the right hand blade set(...R)is used with left hand shank(CGWTL...).
- For Applicable insert, see page C098 - C101.

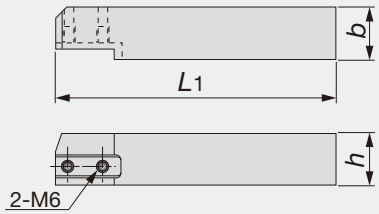


### SPARE PARTS

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| 30S... | CHHM5-18 | CSHB-6 | P-4 |
| 40D... | CM5X0.8X16 | CSHB-6 | P-4 |
| 50S... | CHHM5-18 | CSHB-6 | P-4 |
| 50D... | CM5X0.8X16 | CSHB-6 | P-4 |

# MY-T SERIES
## CGWSR/L

Shank of toolholders CGWSR/L-WG, -WG-L, -G, -CGD, -FL-G/TP & -#S/D




Right hand (R) shown.

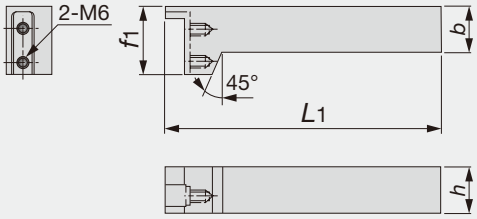
| Designation | h | b | L1 |
|---|---|---|---|
| CGWSR/L2020 | 20 | 20 | 137 |
| CGWSR/L2525 | 25 | 25 | 137 |

### SPARE PARTS

| Designation | Blade screw |
|---|---|
| CGWSR/L... | CSHB-6 |

# MY-T SERIES
## CGWTR/L

Shank of perpendicular toolholders CGWTR/L-G, -CGD, -FL & -#S/D




Right hand (R) shown.

| Designation | h | b | L1 | f1 |
|---|---|---|---|---|
| CGWTR/L2020 | 20 | 20 | 150 | 37 |
| CGWTR/L2525 | 25 | 25 | 150 | 37 |

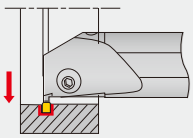
### SPARE PARTS

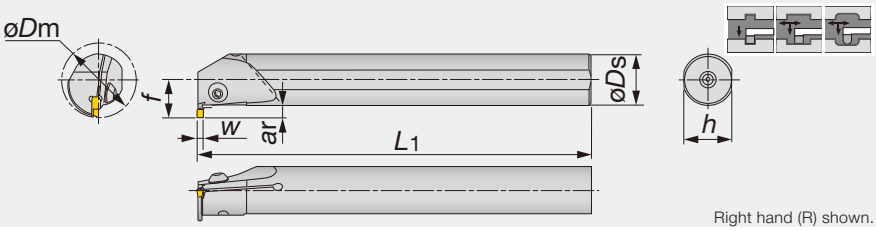
| Designation | Blade screw |
|---|---|
| CGWTR/L... | CSHB-6 |



# MY-T SERIES
## CGTR/L

Toolholders for internal grooving






Right hand (R) shown.

| Designation | W | øDm | ar | øDs | f | L1 | h | Insert |
|---|---|---|---|---|---|---|---|---|
| S20Q-CGTR/L30 | 3 | 25 | 3.5 | 20 | 14.5 | 180 | 18 | G*30, GE30-AL |
| S25R-CGTR/L30 | 3 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*30, GE30-AL |
| S25R-CGTR/L40 | 4 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*40, GE40-AL |
| S32S-CGTR/L40 | 4 | 40 | 6 | 32 | 23 | 250 | 30 | G*40, GE40-AL |
| S25R-CGTR/L50 | 5 | 32 | 5 | 25 | 18.5 | 200 | 23 | G*50 |
| S32S-CGTR/L50 | 5 | 40 | 6 | 32 | 23 | 250 | 30 | G*50 |

• For Applicable insert, see page C098 - C101.

### SPARE PARTS

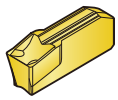
| Designation | Clamping screw | Wrench |
|---|---|---|
| S***-CGTR/L... | BHM5-14 | P-3 |

# MY-T SERIES - Chipbreaker Guide

## 1 corner inserts

### External grooving and parting off

**GE**

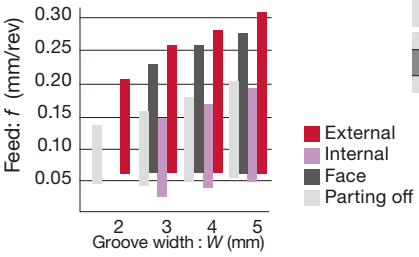


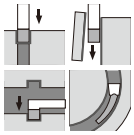
C100

1st choice for external grooving and parting

Excellent chip control for grooving

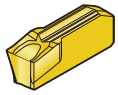
W = 2 - 5 mm



### Parting off

**GE R/L**

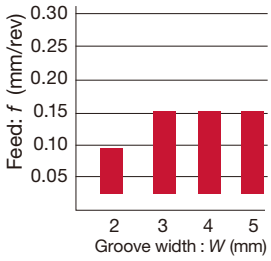


C100

Handed insert

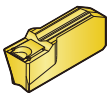
Minimize burr generation when workpiece is cut off

W = 3 - 5 mm



### Grooving and traversing

**GT**

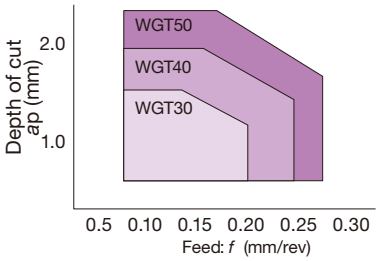


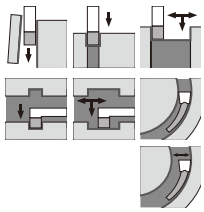
C100

1st choice for traversing

Low cutting force and good chip control for traversing

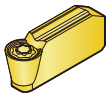
W = 3 - 5 mm



### Profiling

**GR**

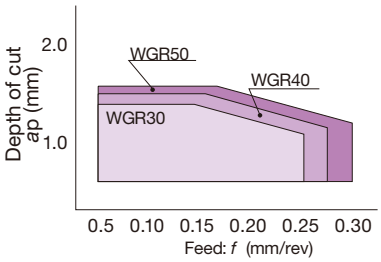


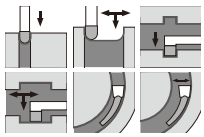
C100

Full radius type

Low cutting force and good chip control for profiling

W = 3 - 5 mm

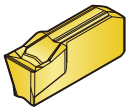


# 1 corner inserts

## Face grooving

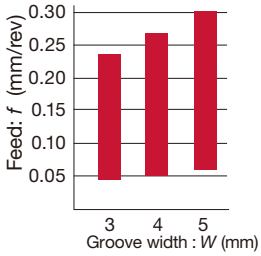
**GF**

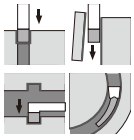


C100

1st choice for face grooving

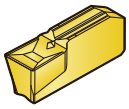
Low cutting force and good chip control for face grooving
W = 3 - 5 mm



## Internal grooving

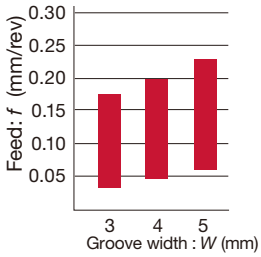
**GN**

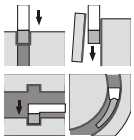


C100

1st choice for internal grooving

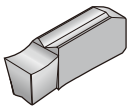
Low cutting force and good chip control for internal grooving
W = 3 - 5 mm



## For non-ferrous materials

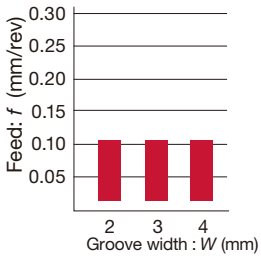
**GE-AL**

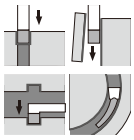


C100

Reduce cutting force and welding due to sharp chipbreaker

W = 2 - 4 mm

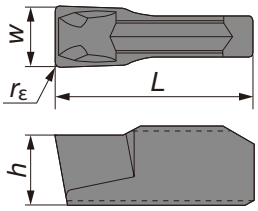


# INSERT

## GE

For general grooving

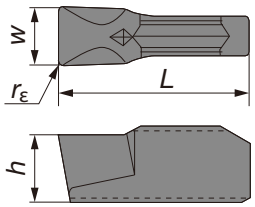



| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GE20 | 2 | 0.2 | | ● | ● | 10 | 3.5 |
| GE30 | 3 | 0.2 | ● | ● | ● | 10 | 3.5 |
| GE40 | 4 | 0.2 | ● | ● | ● | 10 | 4 |
| GE50 | 5 | 0.2 | ● | ● | ● | 12 | 4.5 |

● : Line up

## GN

For internal grooving

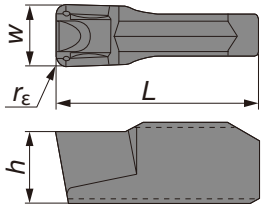



| Designation | $W^{+0.1}_{0}$ | rε | Coated | L | h |
|---|---|---|---|---|---|
| | | | GH730 | | |
| GN30 | 3 | 0.2 | ● | 10 | 3.5 |
| GN40 | 4 | 0.2 | ● | 10 | 4 |
| GN50 | 5 | 0.2 | ● | 12 | 4.5 |

● : Line up

## GT

For traversing

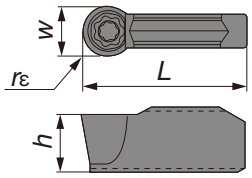



| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GT30 | 3 | 0.4 | | ● | ● | 10 | 3.5 |
| GT40 | 4 | 0.4 | | ● | ● | 10 | 4 |
| GT50 | 5 | 0.4 | ● | ● | ● | 12 | 4.5 |

● : Line up

## GR

For profiling

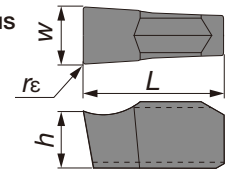



| Designation | $W^{+0.1}_{0}$ | rε | Coated | | Cermet | L | h |
|---|---|---|---|---|---|---|---|
| | | | T9125 | GH730 | NS9530 | | |
| GR30 | 3 | 1.5 | | ● | ● | 10 | 3.5 |
| GR40 | 4 | 2.0 | ● | ● | ● | 10 | 4 |
| GR50 | 5 | 2.5 | ● | ● | ● | 12 | 4.5 |

● : Line up

## GE-AL

For aluminium and non-ferrous metals

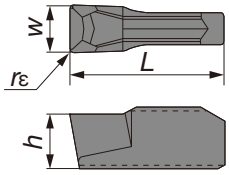



| Designation | $W^{\pm0.025}$ | rε | Uncoated | L | h |
|---|---|---|---|---|---|
| | | | KS05F | | |
| GE20-AL | 2 | 0.2 | ● | 10 | 3.5 |
| GE30-AL | 3 | 0.2 | ● | 10 | 3.5 |
| GE40-AL | 4 | 0.2 | ● | 10 | 4 |

● : Line up

## GF

For face grooving (Improved chip control)

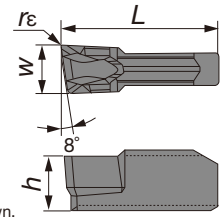



| Designation | $W^{+0.1}_{0}$ | rε | Coated | Cermet | L | h |
|---|---|---|---|---|---|---|
| | | | GH730 | NS9530 | | |
| GF30 | 3 | 0.2 | ● | ● | 10 | 3.5 |
| GF40 | 4 | 0.2 | ● | ● | 10 | 4 |
| GF50 | 5 | 0.2 | ● | ● | 12 | 4.5 |

● : Line up

## GE-R/L

For parting off (handed insert)




Right hand (R) shown.

| Designation | $W^{+0.1}_{0}$ | rε | Coated | L | h |
|---|---|---|---|---|---|
| | | | GH730 | | |
| GE30R/L | 3 | 0.2 | ● | 10 | 3.5 |
| GE40R/L | 4 | 0.2 | ● | 10 | 4 |
| GE50R/L | 5 | 0.2 | ● | 12 | 4.5 |

● : Line up

## STANDARD CUTTING CONDITIONS

| Workpiece material | Recommended grade | Cutting speed $v_c$ (m/min) |
|---|---|---|
| Low carbon steels<br>Alloy steels ( ~ HB150) | T9125 | 80 - 200 |
| | NS9530 | 100 - 200 |
| | GH730 | 50 - 180 |
| Medium carbon steels<br>Alloy steels (HB150 ~ 250) | T9125 | 80 - 180 |
| | NS9530 | 80 - 180 |
| | GH730 | 50 - 150 |
| High carbon steels<br>Alloy steels (HB250 ~ ) | T9125 | 80 - 150 |
| | NS9530 | 80 - 150 |
| | GH730 | 50 - 120 |
| Stainless steels | T9125 | 80 - 150 |
| | GH730 | 50 - 120 |
| Grey and ductile cast irons | T9125 | 80 - 200 |
| | GH730 | 50 - 180 |
| Aluminium alloys, Non-ferrous metals | KS05F | 200 - 300 |

### For External

| Operation | Feed: *f* (mm/rev) | | | |
|---|---|---|---|---|
| | Groove width: *W* (mm) | | | |
| | 2 | 3 | 4 | 5 |
| Grooving<br>(GE**) | 0.06 - 0.2 | 0.06 - 0.25 | 0.07 - 0.27 | 0.07 - 0.3 |
| Parting off<br>(GE**R/L) | 0.04 - 0.1 | 0.04 - 0.14 | 0.04 - 0.14 | 0.04 - 0.14 |
| Traversing<br>(GT**) | - | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | Depth of cut<br>*ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | Depth of cut<br>*ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Profi ling<br>(GR**) | - | Depth of cut<br>*ap* = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | Depth of cut<br>*ap* = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Grooving for Aluminium alloys<br>(GE**-AL) | 0.03 - 0.1 | 0.03 - 0.1 | 0.03 - 0.1 | - |

Note: For diameter compensation values in traversing, see page **C104**.

### For Face

| Operation | Feed: *f* (mm/rev) | | |
|---|---|---|---|
| | Groove width: *W* (mm) | | |
| | 3 | 4 | 5 |
| Face grooving<br>(GE**) | 0.06 - 0.22 | 0.06 - 0.24 | 0.07 - 0.26 |
| Face grooving<br>(GF**) | 0.04 - 0.25 | 0.05 ~ 0.26 | 0.05 - 0.30 |
| Face traversing<br>(GT**) | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | Depth of cut<br>*ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | Depth of cut<br>*ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Face traversing<br>(GR**) | Depth of cut<br>*ap* = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | Depth of cut<br>*ap* = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | Depth of cut<br>*ap* = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Face grooving for aluminium alloys<br>(GE**-AL) | 0.03 - 0.1 | 0.03 - 0.1 | - |

Notes:
- For diameter compensation values in traversing, see page **C104**.
- For occurrence of vibrations in face traversing, set the feed to the lower side of the values show in the above table.

### For Internal

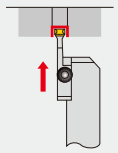
| Operation | Feed: *f* (mm/rev) | | |
|---|---|---|---|
| | Groove width: *W* (mm) | | |
| | 3 | 4 | 5 |
| Face grooving<br>(GE**) | 0.04 - 0.14 | 0.05 - 0.15 | 0.05 - 0.16 |
| Face grooving<br>(GN**) | 0.04 - 0.16 | 0.05 - 0.18 | 0.05 - 0.2 |
| Face traversing<br>(GT**) | *ap* = 0.5 - 1.5<br>*f* = 0.06 - 0.2 | *ap* = 0.5 - 2<br>*f* = 0.06 - 0.25 | *ap* = 0.5 - 2.5<br>*f* = 0.06 - 0.27 |
| Face traversing<br>(GR**) | *ap* = 0.5 - 1.4<br>*f* = 0.05 - 0.25 | *ap* = 0.5 - 1.5<br>*f* = 0.05 - 0.26 | *ap* = 0.5 - 1.6<br>*f* = 0.05 - 0.3 |
| Face grooving for aluminium alloys<br>(GE**-AL) | 0.03 ~ 0.1 | 0.03 ~ 0.1 | - |

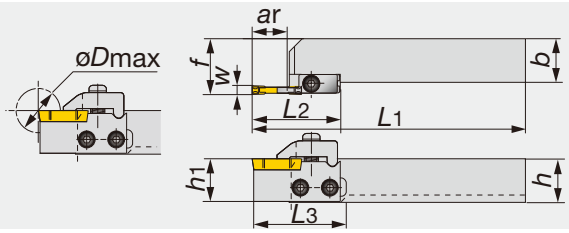
Notes:
- For diameter compensation values in traversing, see page **C104**.
- For occurrence of vibrations in face traversing, set the feed to the lower side of the values show in the above table.

# MY-T SERIES

## CGWSR/L-CGD

External toolholders for grooving & parting






Right hand (R) shown.
The dashed line shows
20 mm-square shank tools.

| Designation | W | øDmax | ar | h | b | L1 | L2 | L3 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-CGDR/L2 | 2 | 35 | 16 | 20 | 20 | 152 | 45 | 48.5 | 20 | 26.45 | CGD200 | CGWSR/L2020 | CGDR/L2 |
| CGWSR/L2525-CGDR/L2 | 2 | 35 | 16 | 25 | 25 | 152 | 45 | - | 25 | 31.45 | CGD200 | CGWSR/L2525 | CGDR/L2 |
| CGWSR/L2020-CGDR/L3 | 3 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.45 | CGD300 | CGWSR/L2020 | CGDR/L3 |
| CGWSR/L2525-CGDR/L3 | 3 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 31.45 | CGD300 | CGWSR/L2525 | CGDR/L3 |
| CGWSR/L2020-CGDR/L4 | 4 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.65 | CGD400 | CGWSR/L2020 | CGDR/L4 |
| CGWSR/L2525-CGDR/L4 | 4 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 31.65 | CGD400 | CGWSR/L2525 | CGDR/L4 |
| CGWSR/L2020-CGDR/L5 | 5 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 26.95 | CGD500 | CGWSR/L2020 | CGDR/L5 |
| CGWSR/L2525-CGDR/L5 | 5 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 31.95 | CGD500 | CGWSR/L2525 | CGDR/L5 |
| CGWSR/L2020-CGDR/L6 | 6 | 46 | 21.6 | 20 | 20 | 157.6 | 50.6 | 54.1 | 20 | 27.1 | CGD600 | CGWSR/L2020 | CGDR/L6 |
| CGWSR/L2525-CGDR/L6 | 6 | 46 | 21.6 | 25 | 25 | 157.6 | 50.6 | - | 25 | 32.1 | CGD600 | CGWSR/L2525 | CGDR/L6 |
| CGWSR2525-8 | 7 / 8 | 50 | 21.6 | 25 | 25 | 150 | - | - | 25 | 26.35 | CGD700, CGD800 | - | - |
| CGWSR3232-8 | 7 / 8 | 50 | 21.6 | 32 | 32 | 170 | - | - | 32 | 33.35 | CGD700, CGD800 | - | - |

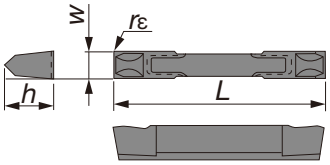
When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

## SPARE PARTS

| Designation | Blade | Clamp | Clamping screw | Blade screw | Spring pin | Spring | Wrench |
|---|---|---|---|---|---|---|---|
| CGWSR****-CGDR2 | TCR2 | CCR2 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL2 | TCL2 | CCL2 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR3 | TCR3 | CCR3 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL3 | TCL3 | CCL3 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR4 | TCR4 | CCR4 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL4 | TCL4 | CCL4 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR5 | TCR5 | CCR5 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSL****-CGDL5 | TCL5 | CCL5 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDR6 | TCR6 | CCR6 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-CGDL6 | TCL6 | CCL6 | RT-1 | CSHB-6 | - | BP-9 | P-4 |
| CGWSR****-8 | - | CCR/L-8 | CHHM6-20 | - | 5X14AW | BP-9 | P-5 |

## INSERT

### CGD




| Designation | W±0.025 | rε | Coated GH330 | Cermet NS9530 | Uncoated UX30 | L | h |
|---|---|---|---|---|---|---|---|
| CGD200 | 2 | 0.2 | ● | ● | ● | 20 | 3.25 |
| CGD300 | 3 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD400 | 4 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD500 | 5 | 0.2 | ● | ● | ● | 28.6 | 6.3 |
| CGD600 | 6 | 0.2 | ● | ● | ● | 28.6 | 8.5 |
| CGD700 | 7 | 0.2 | ● | | ● | 28.6 | 8.5 |
| CGD800 | 8 | 0.2 | ● | | ● | 28.6 | 8.5 |

● : Line up

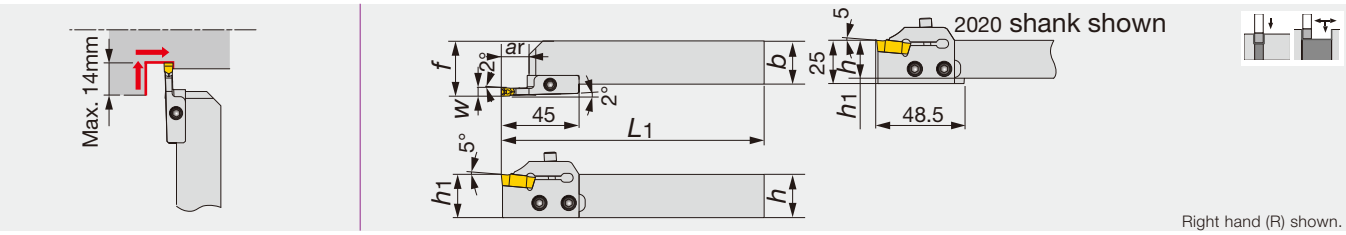
## STANDARD CUTTING CONDITIONS

| Operation | Cutting speed $v_c$ (m/min) | Groove width: *W* (mm) Feed: *f* (mm/rev) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Grooving: Low carbon steels | 100 ~ 200 | 0.08 ~ 0.20 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 |
| Grooving: Medium carbon steels | | | | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 | 0.08 ~ 0.30 |
| Parting off | 100 ~ 150 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 | 0.08 ~ 0.15 |

# MY-T SERIES

## CGWSR/L-FLR/L#GP

External toolholders for grooving & turning




| Designation | W | ar | h | b | L1 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-FLR/L3GP | 3 | 10 | 20 | 20 | 152 | 20 | 27 | FLEX30R/L | CGWSR/L2020 | FLR/L3GP |
| CGWSR/L2525-FLR/L3GP | 3 | 10 | 25 | 25 | 152 | 25 | 32 | FLEX30R/L | CGWSR/L2525 | FLR/L3GP |
| CGWSR/L2020-FLR/L4GP | 4 | 12 | 20 | 20 | 152 | 20 | 27 | FLEX40R/L | CGWSR/L2020 | FLR/L4GP |
| CGWSR/L2525-FLR/L4GP | 4 | 12 | 25 | 25 | 152 | 25 | 32 | FLEX40R/L | CGWSR/L2525 | FLR/L4GP |
| CGWSR/L2020-FLR/L5GP | 5 | 14 | 20 | 20 | 152 | 20 | 27 | FLEX50R/L | CGWSR/L2020 | FLR/L5GP |
| CGWSR/L2525-FLR/L5GP | 5 | 14 | 25 | 25 | 152 | 25 | 32 | FLEX50R/L | CGWSR/L2525 | FLR/L5GP |

- When ordering, shank and blade assembly Designation or shank and blade-set are required.
- When using a right or left hand blade-set, the right hand blade-set is used with right hand shank and the left hand blade-set is used with left hand shank.

### SPARE PARTS

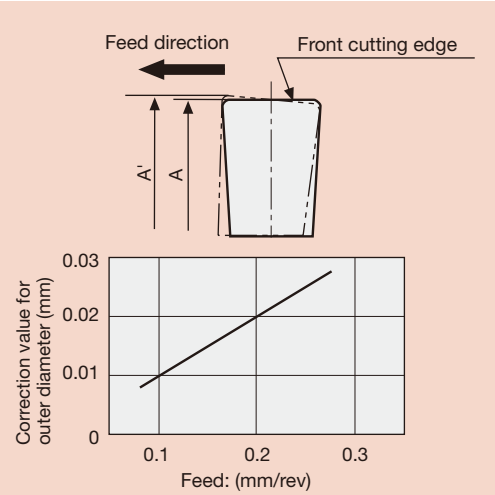
| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-FLR/L*GP | CHHM5-18 | CSHB-6 | P-4 |



## Cautionary Notes

When performing OD machining, the tool point must be set at a right angle to the axial direction of the work.

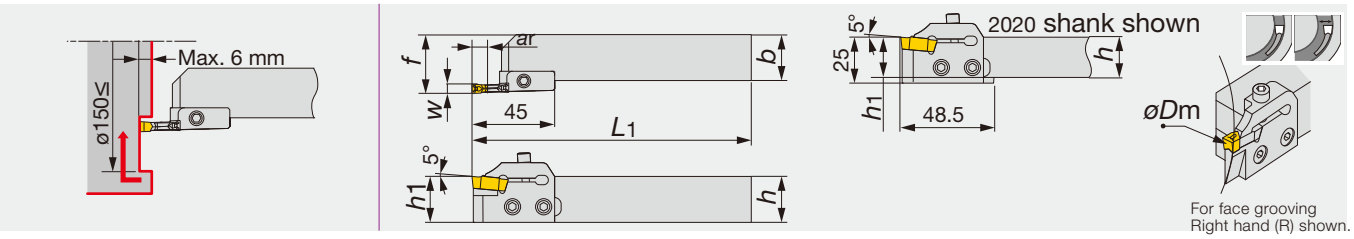
- When replacing an insert, the replacement should be made only after completely removing any chips or other foreign matter from the tool clamping area on the holder by using compressed air, etc.
- Never tighten the insert mounting screws when an insert has not been installed since doing so can deform the screws and prevent the future installation of an insert.
- Flex-Tool has mechanism in which the end cutting edge angle is formed by accepting a cutting force. In external grooving, there is a possibility that if the cutting conditions (feed and depth of cut) are set too high, the programmed diameter will not be achieved. To prevent this problem, it is necessary to perform a compensation in the program by an amount that is equal to the amount A'-A that is shown in the drawing on the right. The values of compensation corresponding to the feeds are also shown in the graph.




Correction value for outer diameter (Reference)

The length of blade for 5mm width is shortened 2mm compared from the old type blade. Please notice and read the instruction manual packaged in the box.

# MY-T SERIES
## CGWSR/L-FLR/L5TP
Toolholders for face grooving & turning



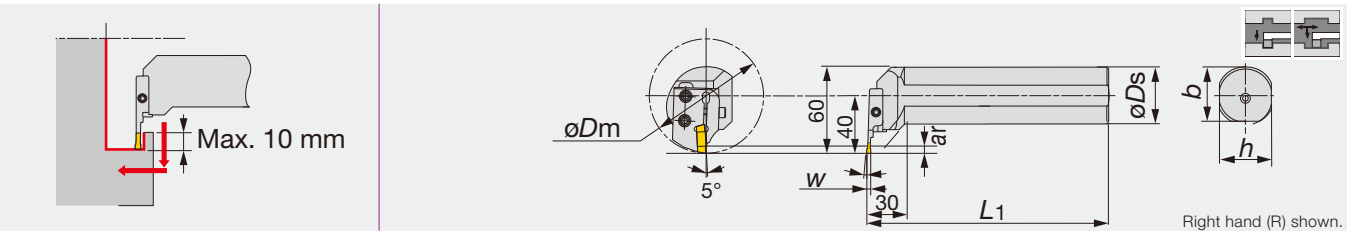

| Designation | W | øDm | ar | h | b | L1 | h1 | f | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CGWSR/L2020-FLR/L5TP | 5 | 150 | 6 | 20 | 20 | 152 | 20 | 27 | FLEX50R/L | CGWSR/L2020 | FLR/L5TP |
| CGWSR/L2525-FLR/L5TP | 5 | 150 | 6 | 25 | 25 | 152 | 25 | 32 | FLEX50R/L | CGWSR/L2525 | FLR/L5TP |

- When ordering, shank and blade assembly Designation or shank and blade set are required.
- When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

### SPARE PARTS

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWSR/L****-FLR/L5TP | CHHM5-18 | CSHB-6 | P-4 |

# MY-T SERIES
## CGWTR/L0040-FLL/R3NP
Toolholders for internal grooving & turning



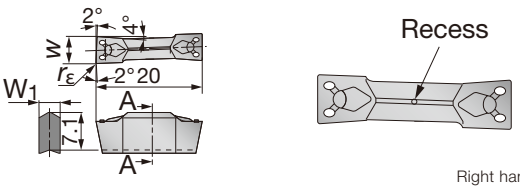

| Designation | W | øDm | ar | øDs | L1 | h | b | Insert | Shank | Blade |
|---|---|---|---|---|---|---|---|---|---|---|
| CGWTR/L0040-FLL/R3NP | 3 | 80 | 10 | 40 | 180 | 37.5 | 37 | FLEX30L/R | CGWTR/L0040 | FLL/R3NP |

- When ordering, shank and blade assembly Designation or shank and blade set are required.
- When using a right or left hand blade set, the right hand blade set is used with left hand shank and the left hand blade set is used with right hand shank.

### SPARE PARTS

| Designation | Clamping screw | Blade screw | Wrench |
|---|---|---|---|
| CGWTR/L0040-FLL/R3NP | CHHM5-18 | CSHB-6 | P-4 |

## APPLICABLE INSERT
### FLEX(R/L)



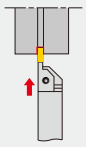

Right hand (R) shown.

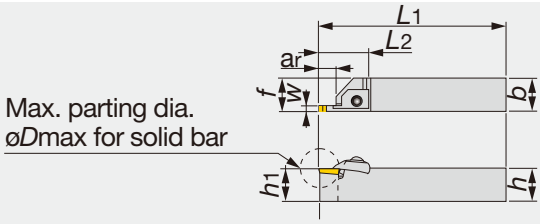
| Designation | W±0.05 | rε | Coated T9125 | Cermet NS9530 | Uncoated UX30 | W1 |
|---|---|---|---|---|---|---|
| FLEX30R/L | 3 | 0.4 | | ● | | 2.15 |
| FLEX40R/L | 4 | 0.4 | | ● | | 3.1 |
| FLEX50R/L | 5 | 0.4 | ● | ● | ● | 4 |

● : Line up

## CTWR/L

External toolholders for grooving & parting, with double-ended inserts






Right hand (R) shown.

| Designation | W | øDmax | ar | h | b | L1 | L2 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CTWR/L2020-3 | 3 | 32 | 14 | 20 | 20 | 150 | 41 | 20 | 20.25 | CTD3 |
| CTWR/L2525-3 | 3 | 32 | 14 | 25 | 25 | 150 | 41 | 25 | 25.25 | CTD3 |
| CTWR/L2020-4 | 4 | 32 | 14 | 20 | 20 | 150 | 41 | 20 | 20.25 | CTD4 |
| CTWR/L2525-4 | 4 | 32 | 14 | 25 | 25 | 150 | 41 | 25 | 25.25 | CTD4 |
| CTWR/L2525-5 | 5 | 42 | 20 | 25 | 25 | 150 | 46 | 25 | 25.25 | CTD5 |

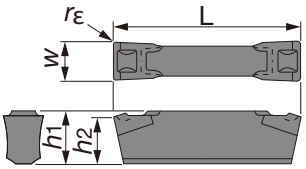
### SPARE PARTS

| Designation | Clamp | Pin | Clamping screw | Washer | Wrench |
|---|---|---|---|---|---|
| CTWR2020-3 | CTC-3R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2020-3 | CTC-3L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-3 | CTC-3R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-3 | CTC-3L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2020-4 | CTC-4R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2020-4 | CTC-4L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-4 | CTC-4R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-4 | CTC-4L | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWR2525-5 | CTC-5R | BP-360 | CTS-M6 | CDW6 | P-4 |
| CTWL2525-5 | CTC-5L | BP-360 | CTS-M6 | CDW6 | P-4 |

## APPLICABLE INSERT

External

### CTD




Parting-off

| Designation | W±0.1 | rε | AH725 | L | h1 | h2 |
|---|---|---|---|---|---|---|
| CTD3 | 3 | 0.2 | ● | 20 | 4.3 | 4 |
| CTD4 | 4 | 0.2 | ● | 20 | 5.3 | 5 |
| CTD5 | 5 | 0.2 | ● | 25 | 6.3 | 6 |

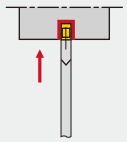
● : Line up

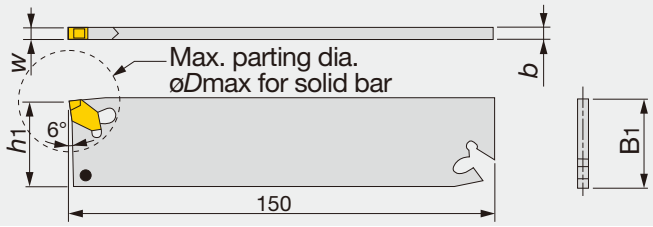
## STANDARD CUTTING CONDITIONS

| Operation (Workpiece material) | | Cutting speed $v_c$ (m/min) | Feed: f (mm/rev) | | |
|---|---|---|---|---|---|
| | | | CTD3 | CTD4 | CTD5 |
| Grooving | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 |
| | Medium carbon steels | | 0.08 ~ 0.25 | 0.08 ~ 0.3 | 0.08 ~ 0.3 |
| Parting off | | 100 ~ 150 | 0.08 ~ 0.15 | | |

## CTH

Blades for external grooving & parting






| Designation | W | øDmax | b | h1 | B1 | Insert |
|---|---|---|---|---|---|---|
| CTH32-3 | 3 | 100 | 2.2 | 30.27 | 32.24 | CT*3... |
| CTH32-4 | 4 | 100 | 3.2 | 30.13 | 31.97 | CT*4... |
| CTH32-5 | 5 | 100 | 4.2 | 30 | 31.7 | CT*5... |
| CTH32-6 | 6 | 100 | 5.2 | 29.87 | 31.44 | CT*6... |

• For Applicable insert, see page C110.

### SPARE PARTS

| Designation | Wrench |
|---|---|
| CTH... | CTL-2 |

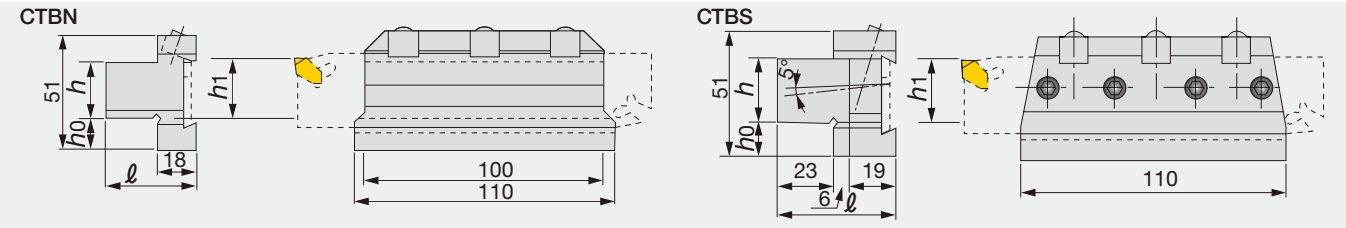
## STANDARD CUTTING CONDITIONS FOR CTH, CTS

| Operation / Workpiece material | | Cutting speed $v_c$ (m/min) | Feed: $f$ (mm/rev) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | CTN3 | CTN4 | CTN5 | CTN6 | CTR/L□ | CT□□K |
| Grooving | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.25 | 0.08 ~ 0.3 | - | - |
| | Medium carbon steels | | | 0.08 ~ 0.3 | 0.08 ~ 0.3 | | | |
| | Cast irons, Light alloys | 100 ~ 200 | - | - | - | - | | 0.1 ~ 0.3 |
| Parting off | Low carbon steels | 100 ~ 150 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.2 | 0.08 ~ 0.15 | - |
| | Medium carbon steels | | | | | | | |
| | Cast irons, Light alloys | 100 ~ 200 | - | - | - | - | - | 0.1 ~ 0.3 |

Note: When using CTS type (blade type) toolholders, reduce the values given in the table by 80 %.

## CTBN/S-32

Tool block for CTH blades



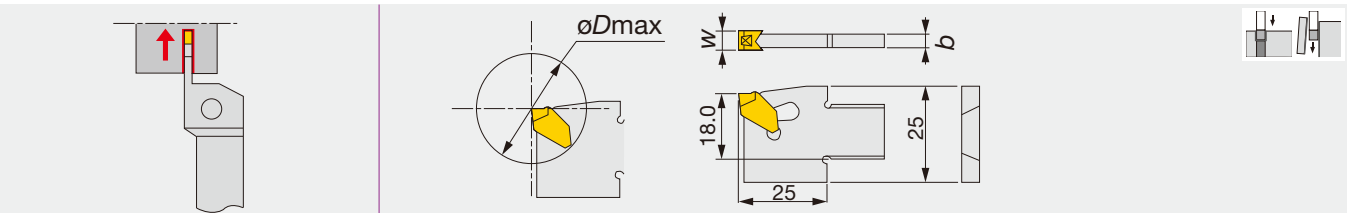

| Designation | *h* | *h*1 | *h*0 | *ℓ* | Blade |
|---|---|---|---|---|---|
| CTBN20-32 | 20 | 20.2 | 19.6 | 38 | CTH32... |
| CTBN25-32 | 25 | 25.2 | 14.6 | 38 | CTH32... |
| CTBN32-32 | 32 | 32.2 | 7.6 | 43 | CTH32... |
| CTBS20-32 | 20 | 20.2 | 19.4 | 48 | CTH32... |
| CTBS25-32 | 25 | 25.2 | 14.4 | 48 | CTH32... |
| CTBS32-32 | 32 | 32.2 | 7.4 | 48 | CTH32... |

### SPARE PARTS

| Designation | Wedge clamping screw | Wedge | Wrench |
|---|---|---|---|
| CTBN**-32 | NDS-8S | CTW-2 | P-4 |
| CTBS**-32 | DS-8 | CTW-2 | P-4 |

## CTSR/L

Blades for external grooving & parting




Right hand (R) shown.

| Designation | W | øDmax | b | Insert |
|---|---|---|---|---|
| CTSR/L25-3 | 3 | 50 | 2.2 | CT*3... |
| CTSR/L25-4 | 4 | 50 | 3.2 | CT*4... |
| CTSR25-5 | 5 | 50 | 4.2 | CT*5... |
| CTSR25-6 | 6 | 50 | 5.2 | CT*6... |

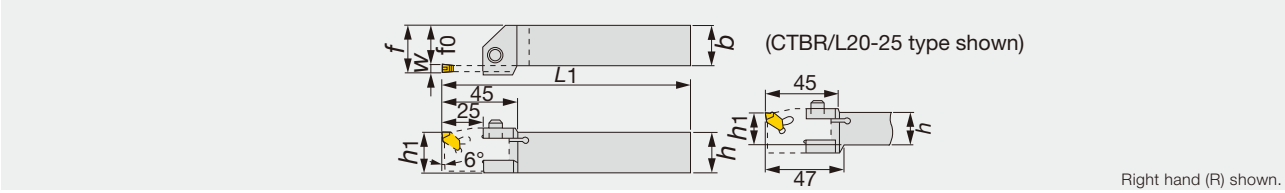
- Refer to the assembly drawing of "CTBR/L" regarding the dimensions.
- For Applicable insert, see page C110.

### SPARE PARTS

| Designation | Wrench |
|---|---|
| CTSR/L... | CTL-2 |

# TOOLHOLDER

## CTBR/L




Right hand (R) shown.

| W | Designation | Blade | ar | h1 | h | b | L1 | f0 | f |
|---|---|---|---|---|---|---|---|---|---|
| 3,4 | CTBR/L20-25 | CTSR/L25-3/4 | Max.25Max.cut off dia.ø50 | 20.2 | 20 | 25 | 150 | 19.6 | 22.6/23.6 |
| 3,4,5,6 | CTBR/L25-25 | CTSR/L25-3/4/5/6 | Max.25Max.cut off dia.ø50 | 25.2 | 25 | 25 | 150 | 24.6 | 27.6/28.6/29.6/30.6 |

When using a right or left hand blade set, the right hand blade set is used with right hand shank and the left hand blade set is used with left hand shank.

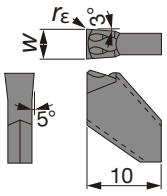
### SPARE PARTS

| Designation | Clamping Screw | Wrench |
|---|---|---|
| CTBR/L... | M6×20 | P-5 |

# INSERT for CTH, CTS TYPE PARTING OFF TOOLHOLDER

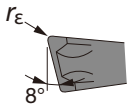
## CTN/CTR/CTL

**CTN**



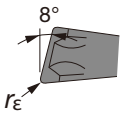

Neutral (N) shown

**CTR**




Right hand (R)

**CTL**

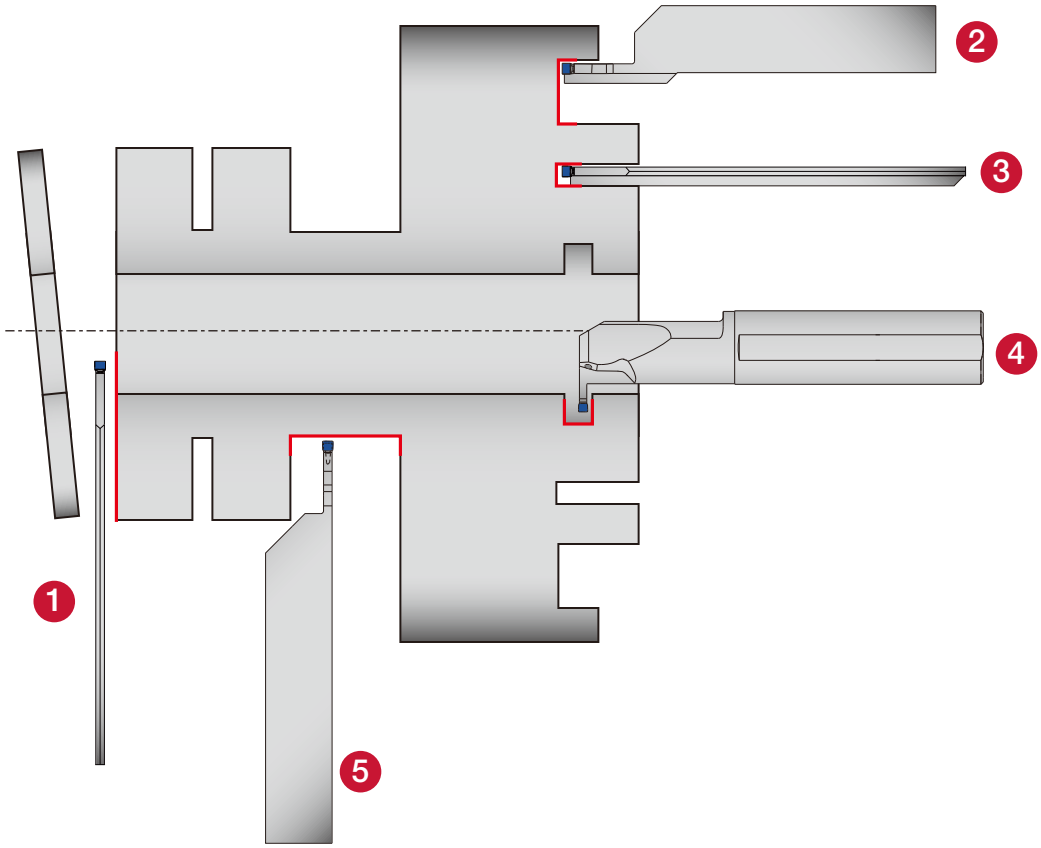



Left hand (L)

| Designation | W±0.2 | rε | Coated | | | Uncoated | | |
|---|---|---|---|---|---|---|---|---|
| | | | T313W | | | TH10 | | |
| | | | N | R | L | N | R | L |
| CTN3 | 3 | 0.2 | ● | | | | | |
| CTR/L3 | 3 | 0.2 | | ● | ● | | | |
| CTN3K | 3 | 0.2 | | | | ● | | |
| CTR/L3K | 3 | 0.2 | | | | | ● | ● |
| CTN4 | 4 | 0.2 | ● | | | | | |
| CTR/L4 | 4 | 0.2 | | ● | ● | | | |
| CTN4K | 4 | 0.2 | | | | ● | | |
| CTR/L4K | 4 | 0.2 | | | | | ● | ● |
| CTN5 | 5 | 0.3 | ● | | | | | |
| CTR/L5 | 5 | 0.3 | | ● | | | | |
| CTN5K | 5 | 0.3 | | | | ● | | |
| CTR/L5K | 5 | 0.3 | | | | | ● | |
| CTN6 | 6 | 0.3 | ● | | | | | |
| CTN6K | 6 | 0.3 | | | | ● | | |

● : Line up

# The insert's secure & unique clamping guarantees reliable machining in grooving and turning




## 1 EGP

Blade type
*W* = 4 - 6 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm

C113

## EGP-CHP

Blade type
*W* = 4 - 6 mm
Max. parting Dia.:
120 mm
Shank size:
20 - 32 mm

C114

## 2 ETFR/L

*W* = 4 - 6 mm
*ar* = 15 - 32 mm
Shank size:
20 - 25 mm

C116

## ETFR-CHP

*W* = 4 mm
*ar* = 15 - 32 mm
Shank size:
25 mm

C117

## 3 EFPR/L

Blade type
*W* = 4 - 6 mm
*ar* = Max. 65 mm
Shank size:
25 mm

C118

## 4 ETIR/L

*W* = 4 - 6 mm
*ar* = 6 - 11 mm
Shank size:
ø16 - ø32 mm

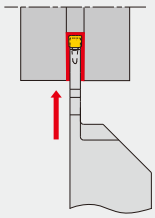
C115

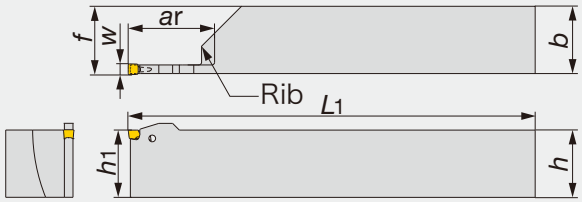
## 5 ETER/L

*W* = 4 - 6 mm
*ar* = 25 - 35 mm
Shank size:
20 - 32 mm

C112

# EASYMULTICUT
## ETER/L
External toolholders for grooving & parting & turning






Right hand (R) shown.

| Designation | W | ar | h1 | b | h | L1 | f | Insert | Rib |
|---|---|---|---|---|---|---|---|---|---|
| ETER/L2020-4T25 | 4 | 25 | 20 | 20 | 20 | 125 | 20.4 | E**4... | Without |
| ETER/L2525-4T25 | 4 | 25 | 25 | 25 | 25 | 150 | 25.4 | E**4... | Without |
| ETER/L3232-4T30 | 4 | 30 | 32 | 32 | 32 | 170 | 32.4 | E**4... | Without |
| ETER/L2020-5T25 | 5 | 25 | 20 | 20 | 20 | 125 | 20.4 | ETX5... | Without |
| ETER/L2525-5T32 | 5 | 32 | 25 | 25 | 25 | 150 | 25.4 | ETX5... | Without |
| ETER/L3232-5T32 | 5 | 32 | 32 | 32 | 32 | 170 | 32.4 | ETX5... | Without |
| ETER/L2525-6T35 | 6 | 35* | 25 | 25 | 25 | 150 | 25.4 | ETX6... | With |
| ETER/L3232-6T35 | 6 | 35** | 32 | 32 | 32 | 170 | 32.4 | ETX6... | With |

* Max. ø170
**Max. ø340

• For Applicable insert, see page C120 - C121.

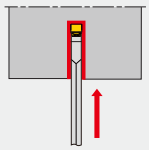
### SPARE PARTS

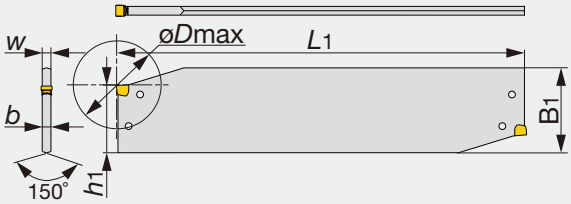
| Designation | Wrench* |
|---|---|
| ETER/L2020-4T25 | ECW-456EF |
| ETER/L2525-4T25 | ECW-456EF |
| ETER/L3232-4T30 | ECW-456EF |
| ETER/L2020-5T25 | ECW-456EF |
| ETER/L2525-5T32 | ECW-456EF |
| ETER/L3232-5T32 | ECW-456EF |
| ETER/L2525-6T35 | ECW-456EF |
| ETER/L3232-6T35 | ECW-456EF |

*Optional parts

# EGP

## Blades for external deep grooving & parting






| Designation | W | øDmax | h1 | b | B1 | L1 | Insert |
|---|---|---|---|---|---|---|---|
| EGP26-4D | 4 | 80 | 21.4 | 3.2 | 26 | 150 | E**4... |
| EGP32-4D | 4 | 100 | 24.9 | 3.2 | 32 | 150 | E**4... |
| EGP32-5D | 5 | 120 | 24.9 | 4.0 | 32 | 150 | ETX5... |
| EGP32-6D | 6 | 120 | 24.9 | 5.2 | 32 | 150 | ETX6... |

- *øD*max: Max. parting off diameter
- For Applicable insert, see page C120 - C121.

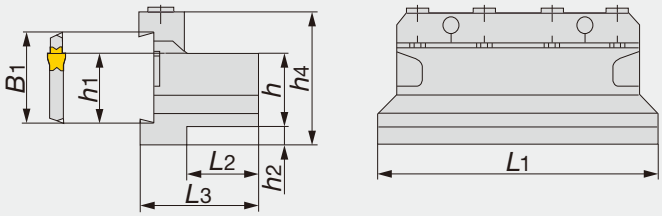
### SPARE PARTS

| Designation | Wrench* |
|---|---|
| EGP26-4D | ECW-456EF |
| EGP32-*D | ECW-456EF |

*Optional parts

# CTBU

## Tool block for CGP and EGP blades



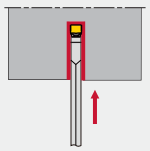

| Designation | h1 | B1 | L1 | h | h2 | h4 | L2 | L3 | Blade |
|---|---|---|---|---|---|---|---|---|---|
| CTBU20-26 | 21.4 | 26 | 86 | 20 | 9 | 43 | 21 | 38 | EGP26... |
| CTBU25-26 | 21.4 | 26 | 110 | 25 | 5 | 45 | 23 | 42 | EGP26... |
| CTBU20-32 | 24.8 | 32 | 100 | 20 | 13 | 50 | 19 | 38 | EGP32... |
| CTBU25-32 | 24.8 | 32 | 110 | 25 | 8 | 50 | 23 | 42 | EGP32... |
| CTBU32-32 | 24.8 | 32 | 110 | 32 | 5 | 54 | 29 | 48 | EGP32... |

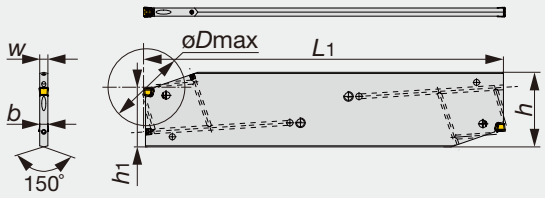
### SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU20-26 | CT-86 | CM6X30-S | P-5 |
| CTBU25-26 | CT-105 | CM6X30-S | P-5 |
| CTBU20-32 | CT-100 | CM6X30-S | P-5 |
| CTBU25, 32-32 | CT-110 | CM6X30-S | P-5 |

## EGP-CHP

Blades for external deep grooving & parting, with channels for high pressure coolant.






| Designation | W | øDmax | ar | h | b | L1 | h1 | Insert |
|---|---|---|---|---|---|---|---|---|
| EGP32-4D-CHP | 4 | 100 | 50 | 32 | 3.4 | 150 | 24.9 | E**4... |
| EGP32-5D-CHP | 5 | 120 | 60 | 32 | 4.2 | 160 | 24.9 | ETX5... |
| EGP32-6D-CHP | 6 | 120 | 60 | 32 | 5.2 | 160 | 24.9 | ETX6... |

- øDmax: Max. parting off diameter
- For Applicable insert, see page C120 - C121.

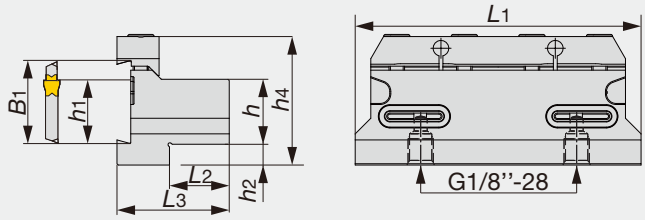
### SPARE PARTS

| Designation | Sealing screw | Wrench* |
|---|---|---|
| EGP32-*D-CHP | SGC340 | ECW-456EF |

*Optional parts

## CTBU-CHP

Tool blocks for external deep parting and grooving blades with channels for high pressure coolant




| Designation | h | B1 | L2 | L1 | h1 | h2 | h4 | L3 | Blade |
|---|---|---|---|---|---|---|---|---|---|
| CTBU25-32-CHP | 25 | 32 | 23 | 110 | 24.8 | 8 | 49.4 | 43.2 | EGP32-*D-CHP |

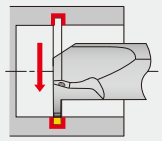
### SPARE PARTS

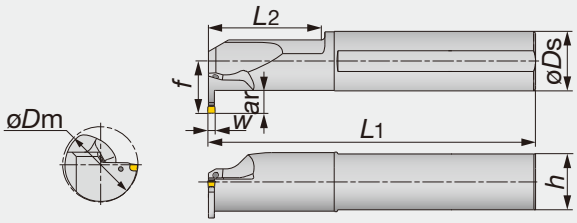
| Designation | Sealing screw | Clamp | Wrench | O-ring |
|---|---|---|---|---|
| CTBU25-32-CHP | SRM6X16DIN912-12.9 | CT-110 | P-5 | OR14X2.5NN |

# ETIR/L

## Internal toolholders for grooving & turning








Right hand (R) shown.

| Designation | W | øDm | ar | øDs | h | L1 | f | L2 | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ETIR/L16-4T06-D200 | 4 | 20 | 6 | 16 | 15 | 160 | 15 | 40 | E**4... |
| ETIR/L20-4T06-D250 | 4 | 25 | 6 | 20 | 18 | 160 | 17 | 40 | E**4... |
| ETIR/L25-4T09-D320 | 4 | 32 | 9 | 25 | 23 | 200 | 22.5 | 40 | E**4... |
| ETIR/L32-4T11-D400 | 4 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | E**4... |
| ETIR/L32-5T11-D400 | 5 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | ETX5... |
| ETIR/L32-6T11-D400 | 6 | 40 | 11 | 32 | 30 | 250 | 28 | 60 | ETX6... |

- Wrench should be ordered separately.
- For Applicable insert, see page C120 - C121.

### SPARE PARTS

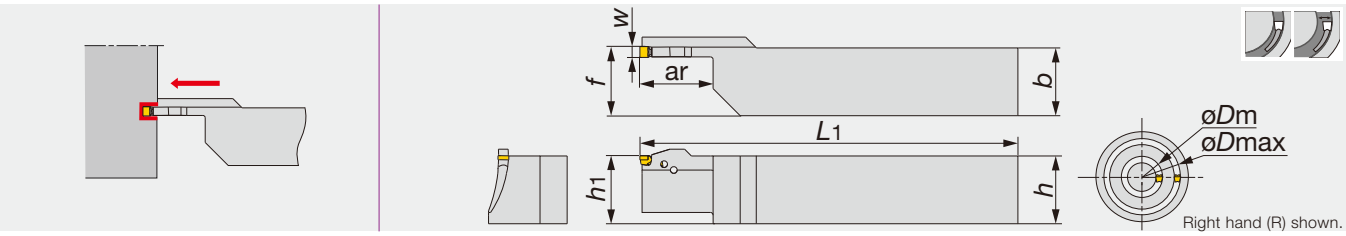
| Designation | Seal cap (internal screw) | Wrench* |
|---|---|---|
| ETIR/L16-4T06-D200 | CA-16(M6) | ECW-456I |
| ETIR/L20-4T06-D250 | CA-20(M6) | ECW-456I |
| ETIR/L25-4T09-D320 | CA-25(R1/8") | ECW-456EF |
| ETIR/L32... | CA-32(R1/8") | ECW-456EF |

*Optional parts

# EASYMULTICUT

## ETFR/L

Toolholders for face grooving & turning




| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ETFR/L2020-4T15-030035 | 4 | 30 | 35 | 15 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T15-030035 | 4 | 30 | 35 | 15 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T22-035045 | 4 | 35 | 45 | 22 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T22-035045 | 4 | 35 | 45 | 22 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-045055 | 4 | 45 | 55 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-045055 | 4 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-055075 | 4 | 55 | 75 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-055075 | 4 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2020-4T25-075120 | 4 | 75 | 120 | 25 | 20 | 20 | 125 | 20 | 20.5 | E**4... |
| ETFR/L2525-4T25-075120 | 4 | 75 | 120 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-4T25-120200 | 4 | 120 | 200 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-4T25-200500 | 4 | 200 | 500 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR/L2525-5T25-035045 | 5 | 35 | 45 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T25-045055 | 5 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T25-055075 | 5 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-075120 | 5 | 75 | 120 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-120200 | 5 | 120 | 200 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-5T32-200500 | 5 | 200 | 500 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX5... |
| ETFR/L2525-6T25-040055 | 6 | 40 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T25-055075 | 6 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-075120 | 6 | 75 | 120 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-120200 | 6 | 120 | 200 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |
| ETFR/L2525-6T32-200500 | 6 | 200 | 500 | 32 | 25 | 25 | 150 | 25 | 25.5 | ETX6... |

• For Applicable insert, see page C120 - C121.

### SPARE PARTS

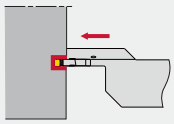
| Designation | Wrench* |
|---|---|
| ETFR/L... | ECW-456EF |

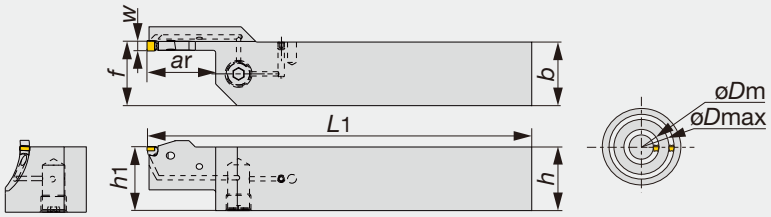
*Optional parts

# ETFR-CHP

Toolholders for face grooving & turning, with channels for high pressure coolant.








Right hand (R) shown.

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ETFR2525-4T15-030035-CHP | 4 | 30 | 35 | 15 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T22-035045-CHP | 4 | 35 | 45 | 22 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-045055-CHP | 4 | 45 | 55 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-055075-CHP | 4 | 55 | 75 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-075120-CHP | 4 | 75 | 120 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-120200-CHP | 4 | 120 | 200 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |
| ETFR2525-4T25-200500-CHP | 4 | 200 | 500 | 25 | 25 | 25 | 150 | 25 | 25.5 | E**4... |

• For Applicable insert, see page C120 - C121.

## SPARE PARTS

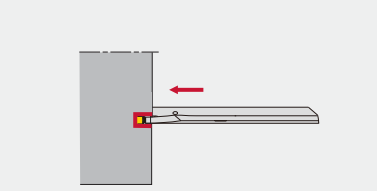
| Designation | Wrench* |
|---|---|
| ETFR****-CHP | ECW-456EF |

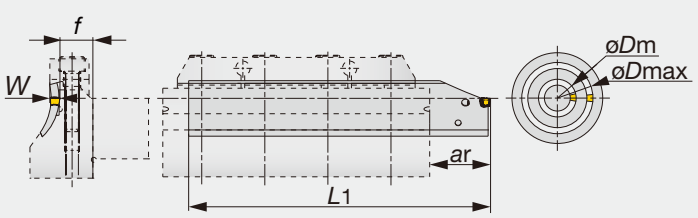
*Optional parts

EASYMULTICUT

# EFPR/L

## Face grooving blade






Right hand (R) shown

| Designation | W | øDm | øDmax | f | L1 | min ar | max ar | Insert |
|---|---|---|---|---|---|---|---|---|
| EFPR/L-4-030035 | 4 | 30 | 35 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-035045 | 4 | 35 | 45 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-045055 | 4 | 45 | 55 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-055075 | 4 | 55 | 75 | 13.6 | 125 | 18 | 50 | E**4... |
| EFPR-4-075120 | 4 | 75 | 120 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-4-120200 | 4 | 120 | 200 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-4-200500 | 4 | 200 | 500 | 13.6 | 140 | 18 | 65 | E**4... |
| EFPR-5-035045 | 5 | 35 | 45 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-045055 | 5 | 45 | 55 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-055075 | 5 | 55 | 75 | 13.6 | 125 | 19 | 50 | ETX5... |
| EFPR-5-075120 | 5 | 75 | 120 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-5-120200 | 5 | 120 | 200 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-5-200500 | 5 | 200 | 500 | 13.6 | 140 | 19 | 65 | ETX5... |
| EFPR-6-045055 | 6 | 45 | 55 | 13.6 | 125 | 20 | 50 | ETX6... |
| EFPR-6-055075 | 6 | 55 | 75 | 13.6 | 125 | 20 | 50 | ETX6... |
| EFPR-6-075120 | 6 | 75. | 120 | 13.6 | 140 | 20 | 65 | ETX6... |
| EFPR-6-120200 | 6 | 120 | 200 | 13.6 | 140 | 20 | 65 | ETX6... |
| EFPR/L-6-200500 | 6 | 200 | 500 | 13.6 | 140 | 20 | 65 | ETX6... |

• For Applicable insert, see page C120 - C121.

### SPARE PARTS

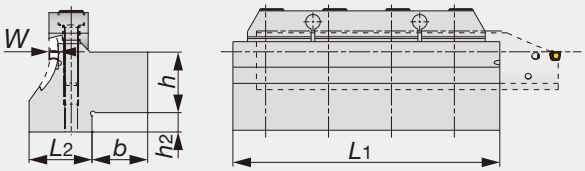
| Designation | Wrench* |
|---|---|
| EFPR/L... | ECW-456I |

*Optional parts

# CTBU-CHP for EFPR/L

Tool block for EFP blades, with channels for high pressure coolant.






| Designation | W | øDm | h | b | h2 | L2 | L1 | Blade |
|---|---|---|---|---|---|---|---|---|
| CTBU25-030-4-CHP | 4 | 30 | 25 | 23 | 8 | 26 | 110 | EFPR/L-4-030035 |
| CTBU25-035-4/5-CHP | 4, 5 | 35 | 25 | 23 | 8 | 26 | 110 | EFPR-4/5-035045 |
| CTBU25-045-4/5-CHP | 4, 5 | 45 | 25 | 23 | 8 | 26 | 110 | EFPR-4/5-045055 |
| CTBU25-055-4/5-CHP | 4, 5 | 55 | 25 | 23 | 8 | 24 | 110 | EFPR-4/5-055075 |
| CTBU25-075-4/5-CHP | 4, 5 | 75 | 25 | 23 | 8 | 22 | 110 | EFPR-4/5-075120 |
| CTBU25-120-4/5-CHP | 4, 5 | 120 | 25 | 23 | 8 | 21 | 110 | EFPR-4/5-120200 |
| CTBU25-200-4/5-CHP | 4, 5 | 200 | 25 | 23 | 8 | 18.5 | 110 | EFPR-4/5-200500 |
| CTBU25-045-6-CHP | 6 | 45 | 25 | 23 | 8 | 28 | 110 | EFPR-6-045055 |
| CTBU25-055-6-CHP | 6 | 55 | 25 | 23 | 8 | 26 | 110 | EFPR-6-055075 |
| CTBU25-075-6-CHP | 6 | 75 | 25 | 23 | 8 | 24 | 110 | EFPR-6-075120 |
| CTBU25-120-6-CHP | 6 | 120 | 25 | 23 | 8 | 23 | 110 | EFPR-6-120200 |
| CTBU25-200-6-CHP | 6 | 200 | 25 | 23 | 8 | 20.5 | 110 | EFPR/L-6-200500 |

## SPARE PARTS

| Designation | Clamp | Clamping screw | Wrench |
|---|---|---|---|
| CTBU25-***-*-CHP | CT-110 | CM6X30-S | P-5 |

# EASYMULTICUT - Chipbreaker Guide

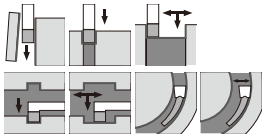
## ETX type

C121

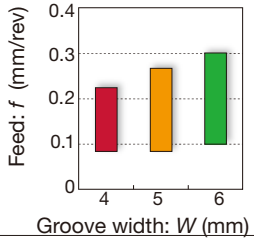
**Multi-functional insert**

**Well-balanced sharpness and strength**

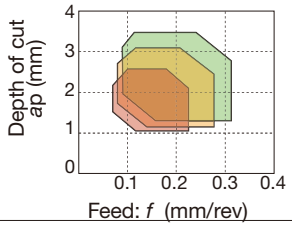
*W* = 4 - 6 mm



■ Standard feed for grooving




■ Standard feed and depth of cut for turning



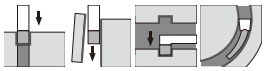

## EGM type

C121

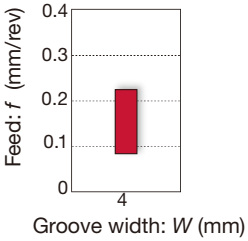
**First choice for parting off**

**Well-designed edge with high strength**

*W* = 4 mm

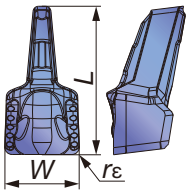


■ Standard feed for grooving



## INSERT

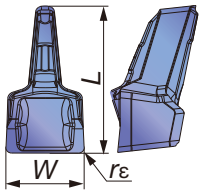
### ETX




| Designation | W±0.05 | rε | AH725 | L |
|---|---|---|---|---|
| ETX4-040 | 4 | 0.4 | ● | 8 |
| ETX5-040 | 5 | 0.4 | ● | 10 |
| ETX6-040 | 6 | 0.4 | ● | 12 |

● : Line up

### EGM




| Designation | W±0.05 | rε | AH725 | L |
|---|---|---|---|---|
| EGM4-030 | 4 | 0.3 | ● | 8 |

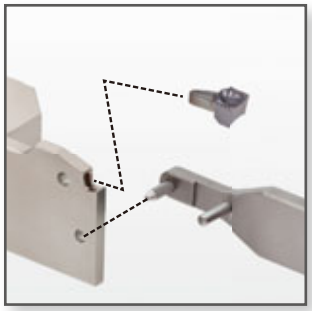
● : Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Grades | Chip-breaker | Cutting speed Vc (m/min) |
|---|---|---|---|---|---|
| P | Low carbon steel (S45C, C15, C20, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| | Carbon steel, Alloy steel (SCM440, C55, 42CrMoS4, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| | Prehardened steel (NAK80, PX5, etc.) | - 300 HB | AH725 | ETX | 80 - 180 |
| | | - 300 HB | AH725 | EGM | 80 - 180 |
| M | Stainless steel (SUS303, X5CrNi18-9, X5CrNiMo17-12-2, etc) | - | AH725 | ETX | 50 - 120 |
| | | - | AH725 | EGM | 50 - 120 |

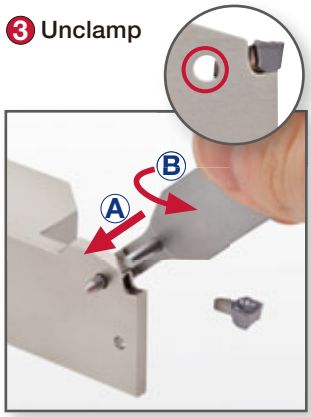
## PROCEDURE TO CLAMP AND UNCLAMP INSERT

1 Put the insert in the pocket



2 Turn the wrench and push the insert into the pocket to clamp

3 Unclamp




A Twist the wrench

B Push out the insert from the pocket to unclamp

## PARTS FOR COOLANT HOSE

### Connecting hose

Fig. 1

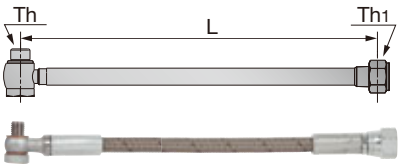
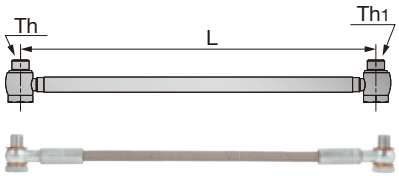
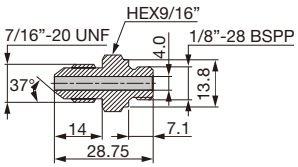



Fig. 2



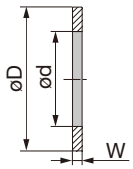

| Designation | Length L | Threading size Th | Threading size Th1 | Max. pressure (MPa) | Fig. |
|---|---|---|---|---|---|
| CHP-HOSE-G1/8-7/16-200BS | 200 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-G1/8-7/16-250BS | 250 | G1/8"-28 BSPP | 7/16"-20 UNF | 26 | 1 |
| CHP-HOSE-5/16-7/16-200BS | 200 | 5/16"-24UNF | 7/16"-20 UNF | 20 | 1 |
| CHP-HOSE-5/16-G1/8-200BS | 200 | 5/16"-24UNF | G1/8"-28 BSPP | 20 | 1 |
| CHP-HOSE-G1/8-G1/8-200BB | 200 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |
| CHP-HOSE-G1/8-G1/8-250BB | 250 | G1/8"-28 BSPP | G1/8"-28 BSPP | 26 | 2 |

### Connector



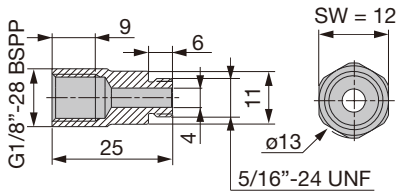
| Designation |
|---|
| CHP-NIPPLE-G1/8-7/16UNF |

### Seal washer



| Designation | øD | ød | W |
|---|---|---|---|
| CHP-COPPER-SEAL1/8 | 15 | 10 | 1 |
| CHP-COPPER-SEAL5/16 | 11 | 8 | 1 |
| CHP-COPPER-SEAL5/16-2.5 | 11 | 8 | 2.5 |

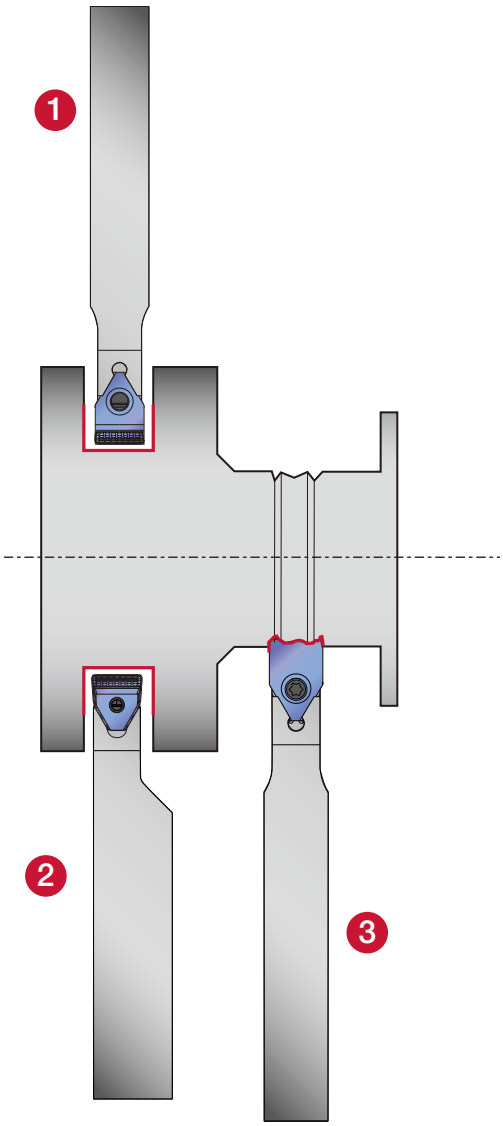
### Connector for small lathe with seal washer



| Designation |
|---|
| CHP-CONECTOR/5/16-G1/8 |

# Efficiently **reduces machining time** of wide width grooving and forming!

Effectively reduces the number of passes or machining time of complex profiles!








## 1 FPGN

Lever lock type
W = 10 - 25 mm
ar = 20 - 36 mm
Shank size:
12 - 25 mm

C125

## 2 FPGR

Lever lock type
W = 10 - 25 mm
ar = 20 - 50 mm
Shank size:
25 - 40 mm

C124

## 3 SPGN

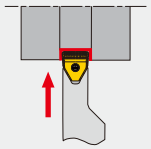
Screw clamp type
W = 10 - 25 mm
ar = 20 - 36 mm
Shank size:
12 - 25 mm

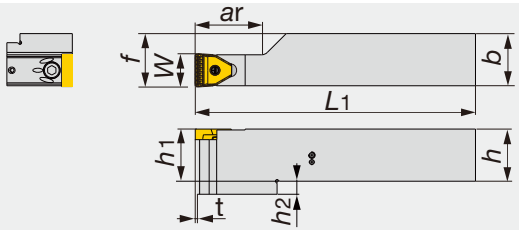
C125

# TUNGHEAVY GROOVE

## FPGR/L

Lever lock type for external wide grooving and profiling






| Designation | W | ar PSGB | ar PSGM | h1 | b | h | L1 PSGB | L1 PSGM | f | h2 | t PSGB | t PSGM | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FPGR2525M-10T20 | 10 | 25 | 20 | 25 | 25 | 25 | 155 | 150 | 25.5 | - | 5.5 | 0.5 | PSG*10... |
| FPGR3232P-10T36 | 10 | 41 | 36 | 32 | 32 | 32 | 175 | 170 | 32.5 | - | 5.5 | 0.5 | PSG*10... |
| FPGR2525M-15T20 | 15 | 25 | 20 | 25 | 25 | 25 | 155 | 150 | 25.5 | - | 5.5 | 0.5 | PSG*15... |
| FPGR3232P-15T40 | 15 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | - | 5.5 | 0.4 | PSG*15... |
| FPGR3232P-20T40 | 20 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | 8 | 5.5 | 0.4 | PSG*20... |
| FPGR4040R-20T50 | 20 | 55 | 50 | 40 | 40 | 40 | 205 | 200 | 40.5 | 8 | 5.5 | 0.4 | PSG*20... |
| FPGR3232P-25T40 | 25 | 45 | 40 | 32 | 32 | 32 | 175 | 170 | 32.5 | 8 | 5.5 | 0.4 | PSG*25... |
| FPGR4040R-25T50 | 25 | 55 | 50 | 40 | 40 | 40 | 205 | 200 | 40.5 | 8 | 5.5 | 0.4 | PSG*25... |

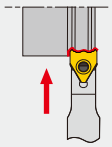
(1) Can be used with both wide grooving and profile grooving inserts

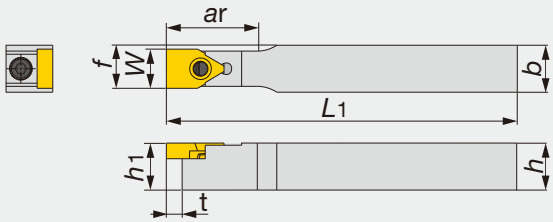
### SPARE PARTS

| Designation | Lever | Clamping screw | Spring | Wrench |
|---|---|---|---|---|
| FPGR*****-10T..., 15T... | FCL4 | FCS3 | BP-5 | P-2.5 |
| FPGR*****-20T..., 25T... | FCL8 | FCS6 | BP-9 | P-5 |

## FPGN

Lever lock type for external wide grooving and profiling






| Designation | W | ar PSGB | ar PSGM | h1 | b | h | L1 PSGB | L1 PSGM | f | t PSGB | t PSGM | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FPGN1212X-10T20 | 10 | 25 | 20 | 12 | 12 | 12 | 125 | 120 | 11 | 5.5 | 0.5 | PSG*10... |
| FPGN1616X-10T20 | 10 | 25 | 20 | 16 | 16 | 16 | 125 | 120 | 13 | 5.5 | 0.5 | PSG*10... |
| FPGN2020K-10T20 | 10 | 25 | 20 | 20 | 20 | 20 | 130 | 125 | 15 | 5.5 | 0.5 | PSG*10... |
| FPGN1616X-15T25 | 15 | 30 | 25 | 16 | 16 | 16 | 125 | 120 | 15.5 | 5.5 | 0.4 | PSG*15... |
| FPGN2020K-15T25 | 15 | 30 | 25 | 20 | 20 | 20 | 130 | 125 | 17.5 | 5.5 | 0.4 | PSG*15... |
| FPGN2020K-20T32 | 20 | 37 | 32 | 20 | 20 | 20 | 130 | 125 | 20 | 5.5 | 0.4 | PSG*20... |
| FPGN2525M-20T32 | 20 | 37 | 32 | 25 | 25 | 25 | 155 | 150 | 22.5 | 5.5 | 0.4 | PSG*20... |
| FPGN2525M-25T36 | 25 | 41 | 36 | 25 | 25 | 25 | 155 | 150 | 25 | 5.5 | 0.4 | PSG*25... |

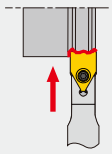
• We can make special shape with forming insert (PSGB type) responding to customer's request.(1) Can be used with both wide grooving and profile grooving inserts

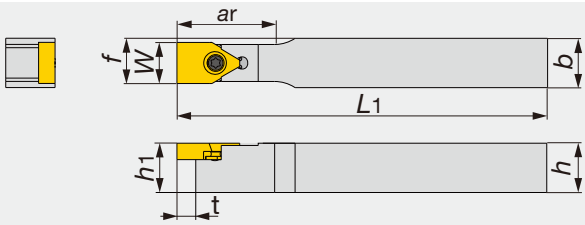
### SPARE PARTS

| Designation | Lever | Clamping screw | Spring | Wrench |
|---|---|---|---|---|
| FPGN*****-10T..., 15T... | FCL4 | FCS3 | BP-5 | P-2.5 |
| FPGN*****-20T..., 25T... | FCL8 | FCS6 | BP-9 | P-5 |

## SPGN

Screw-on type, for external wide grooving and profiling






| Designation | W | ar | h1 | b | h | L1 | f | t | Insert(1) |
|---|---|---|---|---|---|---|---|---|---|
| SPGN1212X-10T20 | 10 | 25 | 12 | 12 | 12 | 125 | 11 | 5.5 | PSGB10 |
| SPGN1616X-10T20 | 10 | 25 | 16 | 16 | 16 | 125 | 13 | 5.5 | PSGB10 |
| SPGN2020K-10T20 | 10 | 25 | 20 | 20 | 20 | 130 | 15 | 5.5 | PSGB10 |
| SPGN1616X-15T25 | 15 | 30 | 16 | 16 | 16 | 125 | 15.5 | 5.5 | PSGB15 |
| SPGN2020K-15T25 | 15 | 30 | 20 | 20 | 20 | 130 | 17.5 | 5.5 | PSGB15 |
| SPGN2020K-20T32 | 20 | 37 | 20 | 20 | 20 | 130 | 20 | 5.5 | PSGB20 |
| SPGN2525M-20T32 | 20 | 37 | 25 | 25 | 25 | 155 | 22.5 | 5.5 | PSGB20 |
| SPGN2525M-25T36 | 25 | 41 | 25 | 25 | 25 | 155 | 25 | 5.5 | PSGB25 |

• We can make special shape with forming insert (PSGB type) responding to customer's request.(1) Can be used with profile grooving inserts, only

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| SPGN*****-10T20 | CSTB-3L081 | T-8F |
| SPGN*****-15T25 | CSTB-4 | T-15F |
| SPGN*****-20T..., 25T... | CSTB-5 | T-20F |

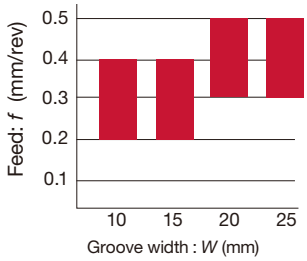
# TUNGHEAVY GROOVE - Chipbreaker Guide

## PSGM

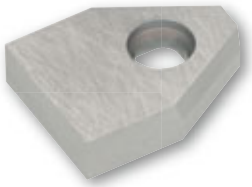
C127

For wide grooving
Excellent chip control

*W* = 10 - 25 mm



## PSGB



C127

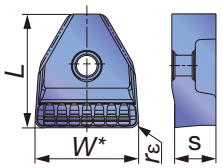
Blank for profiling shape

*W* = 10 - 25 mm

Specially tailored profile inserts

## INSERT

### For wide grooving

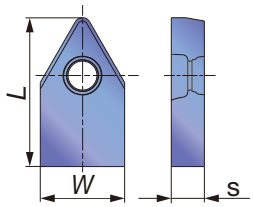



| Designation | W* | rε | Coated AH725 | L | s |
|---|---|---|---|---|---|
| PSGM10-08 | 10 | 0.8 | ● | 11 | 4 |
| PSGM15-15 | 15 | 1.5 | ● | 15 | 5 |
| PSGM20-20 | 20 | 2 | ● | 22 | 6.5 |
| PSGM25-20 | 25 | 2 | ● | 22 | 6.5 |

*: Tolerance *W* ± 0.08 (*W* = 10 mm), ± 0.1 (*W* ≥ 15 mm)

● : Line up

### Blanks for wide profile grooving*

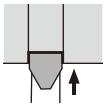



| Designation | W ± 0.025 | Uncoated UX30 | Uncoated TH10 | L | s |
|---|---|---|---|---|---|
| PSGB10 | 10.2 | ● | ● | 18 | 4 |
| PSGB15 | 15.2 | ● | ● | 20 | 5 |
| PSGB20 | 20.2 | ● | ● | 27 | 6.5 |
| PSGB25 | 25.2 | ● | ● | 27 | 6.5 |

● : Line up

*Stocked products are blanks (semi-finished) for formed inserts

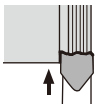
## STANDARD CUTTING CONDITIONS



### Wide grooving

| ISO | Workpiece material | Hardness (HB) | Grade | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|
| P | Alloy steel SCM440 / 42CrMo4, etc. | < 300 | AH725 | 50 - 180 |
| | Alloy steel SCM440 / 42CrMo4, etc. | < 300 | UX30 | 50 - 120 |

| PSGM type insert | Groove width: *W* (mm) 10 | 15 | 20 | 25 |
|---|---|---|---|---|
| Feed: *f* (mm/rev) | 0.2 - 0.4 | 0.2 - 0.4 | 0.3 - 0.5 | 0.3 - 0.5 |

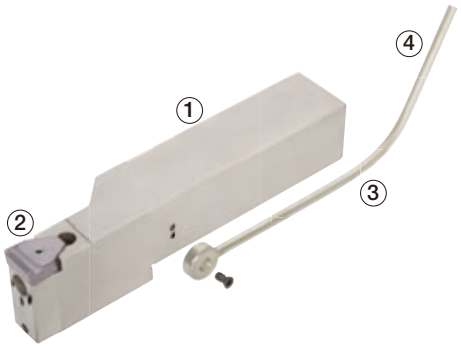


### Forming

| ISO | Workpiece material | Hardness (HB) | Grade | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|
| P | Steel S45C / C45, etc. | < 200 | UX30 | 50 - 150 |
| | Alloy steel SCM440 / 42CrMo4, etc. | < 300 | UX30 | 50 - 120 |
| M | Stainless steel SUS303 / X10CrNiS18-9, etc. | < 200 | UX30 | 50 - 120 |
| K | Grey cast iron FC250 / 250, etc. | - | TH10 | 50 - 150 |
| | Ductile cast iron FCD450 / 450-10S, etc. | - | TH10 | 50 - 120 |
| N | Aluminium alloy Si < 12%, etc. | - | TH10 | 100 - 500 |

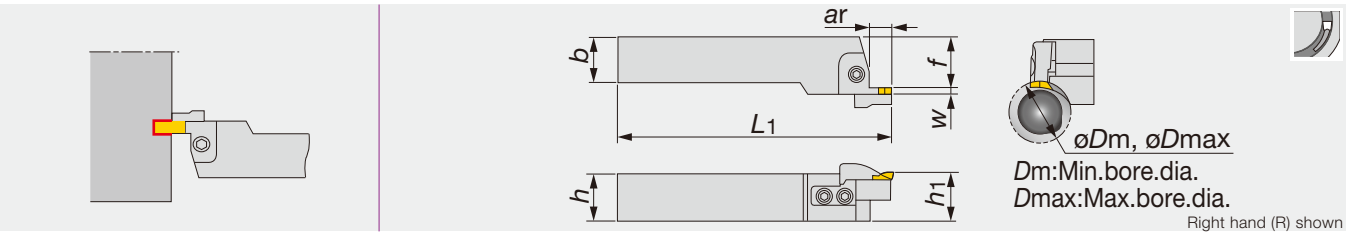
## ■ Spare parts for internal coolant supply attachment (Order separately)

| No. | Parts name | Designation | Note |
|---|---|---|---|
| ① | Body | FPGR... | - |
| ② | Insert | PSGM... | - |
| ③ | Coolant supply attachment | SGCU-341 | - |
| ④ | Connector | Commercial items can be used | G 1/8 thread |
| | | | NPT 1/8 thread |



## CFGSR/L-#S/D

Toolholders for face grooving




| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CFGSR/L2020-3SA | 3 | 30 | 40 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SB | 3 | 40 | 50 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SC | 3 | 50 | 60 | 10 | 20 | 20 | 125 | 21 | 22 | FGC3 |
| CFGSR/L2020-3SD | 3 | 60 | 80 | 10 | 20 | 20 | 125 | 20.5 | 22 | FGC3 |
| CFGSR/L2020-3SE | 3 | 80 | 120 | 10 | 20 | 20 | 125 | 20.5 | 22 | FGC3 |
| CFGSR/L2525-3SA | 3 | 30 | 40 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SB | 3 | 40 | 50 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SC | 3 | 50 | 60 | 10 | 25 | 25 | 150 | 26 | 29 | FGC3 |
| CFGSR/L2525-3SD | 3 | 60 | 80 | 10 | 25 | 25 | 150 | 25.5 | 29 | FGC3 |
| CFGSR/L2525-3SE | 3 | 80 | 120 | 10 | 25 | 25 | 150 | 25.5 | 29 | FGC3 |
| CFGSR/L2020-4SA | 4 | 30 | 40 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SB | 4 | 40 | 50 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SC | 4 | 50 | 60 | 10 | 20 | 20 | 125 | 21 | 21 | FGC4 |
| CFGSR/L2020-4SD | 4 | 60 | 80 | 10 | 20 | 20 | 125 | 20.5 | 21 | FGC4 |
| CFGSR/L2020-4SE | 4 | 80 | 120 | 10 | 20 | 20 | 125 | 20.5 | 21 | FGC4 |
| CFGSR/L2525-4SA | 4 | 30 | 40 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SB | 4 | 40 | 50 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SC | 4 | 50 | 60 | 10 | 25 | 25 | 150 | 26 | 28 | FGC4 |
| CFGSR/L2525-4SD | 4 | 60 | 80 | 10 | 25 | 25 | 150 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4SE | 4 | 80 | 120 | 10 | 25 | 25 | 150 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4DA | 4 | 30 | 40 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DB | 4 | 40 | 50 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DC | 4 | 50 | 60 | 20 | 25 | 25 | 160 | 26 | 28 | FGC4 |
| CFGSR/L2525-4DD | 4 | 60 | 80 | 20 | 25 | 25 | 160 | 25.5 | 28 | FGC4 |
| CFGSR/L2525-4DE | 4 | 80 | 120 | 20 | 25 | 25 | 160 | 25.5 | 28 | FGC4 |
| CFGSR/L2020-5SA | 5 | 30 | 40 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SB | 5 | 40 | 50 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SC | 5 | 50 | 60 | 12 | 20 | 20 | 127 | 21 | 20 | FGC5 |
| CFGSR/L2020-5SD | 5 | 60 | 80 | 12 | 20 | 20 | 127 | 20.5 | 20 | FGC5 |
| CFGSR/L2020-5SE | 5 | 80 | 120 | 12 | 20 | 20 | 127 | 20.5 | 20 | FGC5 |
| CFGSR/L2525-5SA | 5 | 30 | 40 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SB | 5 | 40 | 50 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SC | 5 | 50 | 60 | 12 | 25 | 25 | 152 | 26 | 27 | FGC5 |
| CFGSR/L2525-5SD | 5 | 60 | 80 | 12 | 25 | 25 | 152 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5SE | 5 | 80 | 120 | 12 | 25 | 25 | 152 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5DA | 5 | 30 | 40 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DB | 5 | 40 | 50 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DC | 5 | 50 | 60 | 22 | 25 | 25 | 162 | 26 | 27 | FGC5 |
| CFGSR/L2525-5DD | 5 | 60 | 80 | 22 | 25 | 25 | 162 | 25.5 | 27 | FGC5 |
| CFGSR/L2525-5DE | 5 | 80 | 120 | 22 | 25 | 25 | 162 | 25.5 | 27 | FGC5 |
| CFGSR2525-6SB | 6 | 40 | 50 | 14 | 25 | 25 | 154 | 26 | 26 | FGC6 |
| CFGSR/L2525-6SC | 6 | 50 | 60 | 14 | 25 | 25 | 154 | 26 | 26 | FGC6 |
| CFGSR/L2525-6SD | 6 | 60 | 80 | 14 | 25 | 25 | 154 | 25.5 | 26 | FGC6 |
| CFGSR/L2525-6SE | 6 | 80 | 120 | 14 | 25 | 25 | 154 | 25.5 | 26 | FGC6 |
| CFGSR/L3232-8SD | 8 | 60 | 80 | 16 | 32 | 32 | 170 | 32.5 | 24.5 | FGC8 |
| CFGSR/L3232-8SE | 8 | 80 | 120 | 16 | 32 | 32 | 170 | 32.5 | 24.5 | FGC8 |

- Right hand toolholders are used in regular rotation. Left hand toolholders are used in reverse rotation.
- Each toolholder set includes all components.
- The right hand blade and clamp are used with the right hand shank, the left hand blade and clamp are used with the left hand shank.

| Designation | Shank | Blade | Clamp |
|---|---|---|---|
| CFGSR/L2020-3SA | CFGSR/L2020 | FBR/L25-3SA | CFG-3SR/L |
| CFGSR/L2020-3SB | CFGSR/L2020 | FBR/L25-3SB | CFG-3SR/L |
| CFGSR/L2020-3SC | CFGSR/L2020 | FBR/L25-3SC | CFG-3SR/L |
| CFGSR/L2020-3SD | CFGSR/L2020 | FBR/L25-3SD | CFG-3SR/L |
| CFGSR/L2020-3SE | CFGSR/L2020 | FBR/L25-3SE | CFG-3SR/L |
| CFGSR/L2525-3SA | CFGSR/L2525 | FBR/L25-3SA | CFG-3SR/L |
| CFGSR/L2525-3SB | CFGSR/L2525 | FBR/L25-3SB | CFG-3SR/L |
| CFGSR/L2525-3SC | CFGSR/L2525 | FBR/L25-3SC | CFG-3SR/L |
| CFGSR/L2525-3SD | CFGSR/L2525 | FBR/L25-3SD | CFG-3SR/L |
| CFGSR/L2525-3SE | CFGSR/L2525 | FBR/L25-3SE | CFG-3SR/L |
| CFGSR/L2020-4SA | CFGSR/L2020 | FBR/L25-4SA | CFG-4SR/L |
| CFGSR/L2020-4SB | CFGSR/L2020 | FBR/L25-4SB | CFG-4SR/L |
| CFGSR/L2020-4SC | CFGSR/L2020 | FBR/L25-4SC | CFG-4SR/L |
| CFGSR/L2020-4SD | CFGSR/L2020 | FBR/L25-4SD | CFG-4SR/L |
| CFGSR/L2020-4SE | CFGSR/L2020 | FBR/L25-4SE | CFG-4SR/L |
| CFGSR/L2525-4SA | CFGSR/L2525 | FBR/L25-4SA | CFG-4SR/L |
| CFGSR/L2525-4SB | CFGSR/L2525 | FBR/L25-4SB | CFG-4SR/L |
| CFGSR/L2525-4SC | CFGSR/L2525 | FBR/L25-4SC | CFG-4SR/L |
| CFGSR/L2525-4SD | CFGSR/L2525 | FBR/L25-4SD | CFG-4SR/L |
| CFGSR/L2525-4SE | CFGSR/L2525 | FBR/L25-4SE | CFG-4SR/L |
| CFGSR/L2525-4DA | CFGSR/L2525 | FBR/L25-4DA | CFG-4DR/L |
| CFGSR/L2525-4DB | CFGSR/L2525 | FBR/L25-4DB | CFG-4DR/L |
| CFGSR/L2525-4DC | CFGSR/L2525 | FBR/L25-4DC | CFG-4DR/L |
| CFGSR/L2525-4DD | CFGSR/L2525 | FBR/L25-4DD | CFG-4DR/L |
| CFGSR/L2525-4DE | CFGSR/L2525 | FBR/L25-4DE | CFG-4DR/L |
| CFGSR/L2020-5SA | CFGSR/L2020 | FBR/L25-5SA | CFG-5SR/L |
| CFGSR/L2020-5SB | CFGSR/L2020 | FBR/L25-5SB | CFG-5SR/L |
| CFGSR/L2020-5SC | CFGSR/L2020 | FBR/L25-5SC | CFG-5SR/L |
| CFGSR/L2020-5SD | CFGSR/L2020 | FBR/L25-5SD | CFG-5SR/L |
| CFGSR/L2020-5SE | CFGSR/L2020 | FBR/L25-5SE | CFG-5SR/L |
| CFGSR/L2525-5SA | CFGSR/L2525 | FBR/L25-5SA | CFG-5SR/L |
| CFGSR/L2525-5SB | CFGSR/L2525 | FBR/L25-5SB | CFG-5SR/L |
| CFGSR/L2525-5SC | CFGSR/L2525 | FBR/L25-5SC | CFG-5SR/L |
| CFGSR/L2525-5SD | CFGSR/L2525 | FBR/L25-5SD | CFG-5SR/L |
| CFGSR/L2525-5SE | CFGSR/L2525 | FBR/L25-5SE | CFG-5SR/L |
| CFGSR/L2525-5DA | CFGSR/L2525 | FBR/L25-5DA | CFG-5DR/L |
| CFGSR/L2525-5DB | CFGSR/L2525 | FBR/L25-5DB | CFG-5DR/L |
| CFGSR/L2525-5DC | CFGSR/L2525 | FBR/L25-5DC | CFG-5DR/L |
| CFGSR/L2525-5DD | CFGSR/L2525 | FBR/L25-5DD | CFG-5DR/L |
| CFGSR/L2525-5DE | CFGSR/L2525 | FBR/L25-5DE | CFG-5DR/L |
| CFGSR2525-6SB | CFGSR2525 | FBR25-6SB | CFG-6SR |
| CFGSR/L2525-6SC | CFGSR/L2525 | FBR/L25-6SC | CFG-6SR/L |
| CFGSR/L2525-6SD | CFGSR/L2525 | FBR/L25-6SD | CFG-6SR/L |
| CFGSR/L2525-6SE | CFGSR/L2525 | FBR/L25-6SE | CFG-6SR/L |
| CFGSR/L3232-8SD | CFGSR/L3232 | FBR/L32-8SD | CFG-8SR/L |
| CFGSR/L3232-8SE | CFGSR/L3232 | FBR/L32-8SE | CFG-8SR/L |

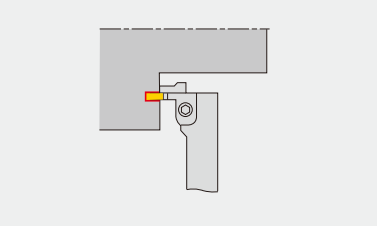
## SPARE PARTS

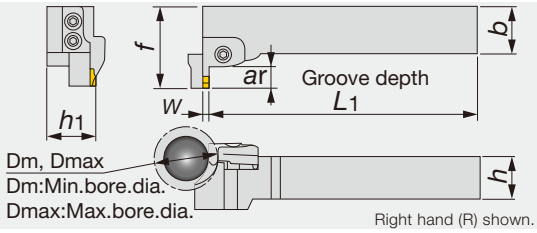
| Designation | Clamp | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|---|
| CFGSR/L2020-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DA | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DB | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DC | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DD | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-4DE | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2020-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DA | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DB | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DC | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DD | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-5DE | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SB | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SC | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SD | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L2525-6SE | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L3232-8SD | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGSR/L3232-8SE | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

MEMO

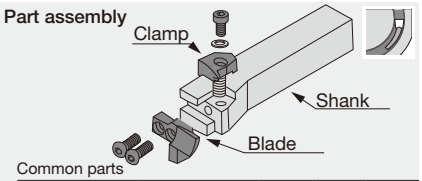
## CFGTR/L-#S/D

Perpendicular toolholders for face grooving






Right hand (R) shown.




Common parts

| Blade fixing screw | Clamping screw | Spring | Wrench | Washer |
|---|---|---|---|---|
| CSHB-6 | CHHM5-18 | BP-7 | P-4 | CPW5 |

| Designation | W | øDm | øDmax | ar | h | b | L1 | h1 | f | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| CFGTR/L2020-3SA | 3 | 30 | 40 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SB | 3 | 40 | 50 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SC | 3 | 50 | 60 | 10 | 20 | 20 | 122 | 21 | 44 | FGC3 |
| CFGTR/L2020-3SD | 3 | 60 | 80 | 10 | 20 | 20 | 122 | 20.5 | 44 | FGC3 |
| CFGTR/L2020-3SE | 3 | 80 | 120 | 10 | 20 | 20 | 122 | 20.5 | 44 | FGC3 |
| CFGTR/L2525-3SA | 3 | 30 | 40 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SB | 3 | 40 | 50 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SC | 3 | 50 | 60 | 10 | 25 | 25 | 147 | 26 | 44 | FGC3 |
| CFGTR/L2525-3SD | 3 | 60 | 80 | 10 | 25 | 25 | 147 | 25.5 | 44 | FGC3 |
| CFGTR/L2525-3SE | 3 | 80 | 120 | 10 | 25 | 25 | 147 | 25.5 | 44 | FGC3 |
| CFGTR/L2020-4SA | 4 | 30 | 40 | 10 | 20 | 20 | 121 | 21 | 44. | FGC4 |
| CFGTR/L2020-4SB | 4 | 40 | 50 | 10 | 20 | 20 | 121 | 21 | 44 | FGC4 |
| CFGTR/L2020-4SC | 4 | 50 | 60 | 10 | 20 | 20 | 121 | 21 | 44 | FGC4 |
| CFGTR/L2020-4SD | 4 | 60 | 80 | 10 | 20 | 20 | 121 | 20.5 | 44 | FGC4 |
| CFGTR/L2020-4SE | 4 | 80 | 120 | 10 | 20 | 20 | 121 | 20.5 | 44. | FGC4 |
| CFGTR/L2525-4SA | 4 | 30 | 40 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SB | 4 | 40 | 50 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SC | 4 | 50 | 60 | 10 | 25 | 25 | 146 | 26 | 44 | FGC4 |
| CFGTR/L2525-4SD | 4 | 60 | 80 | 10 | 25 | 25 | 146 | 25.5 | 44 | FGC4 |
| CFGTR/L2525-4SE | 4 | 80 | 120 | 10 | 25 | 25 | 146 | 25.5 | 44 | FGC4 |
| CFGTR/L2525-4DA | 4 | 30 | 40 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DB | 4 | 40 | 50 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DC | 4 | 50 | 60 | 20 | 25 | 25 | 146 | 26 | 54 | FGC4 |
| CFGTR/L2525-4DD | 4 | 60 | 80 | 20 | 25 | 25 | 146 | 25.5 | 54 | FGC4 |
| CFGTR/L2525-4DE | 4 | 80 | 120 | 20 | 25 | 25 | 146 | 25.5 | 54 | FGC4 |
| CFGTR/L2020-5SA | 5 | 30 | 40 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SB | 5 | 40 | 50 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SC | 5 | 50 | 60 | 12 | 20 | 20 | 120 | 21 | 46 | FGC5 |
| CFGTR/L2020-5SD | 5 | 60 | 80 | 12 | 20 | 20 | 120 | 20.5 | 46 | FGC5 |
| CFGTR/L2020-5SE | 5 | 80 | 120 | 12 | 20 | 20 | 120 | 20.5 | 46 | FGC5 |
| CFGTR/L2525-5SA | 5 | 30 | 40 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SB | 5 | 40 | 50 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SC | 5 | 50 | 60 | 12 | 25 | 25 | 145 | 26 | 46 | FGC5 |
| CFGTR/L2525-5SD | 5 | 60 | 80 | 12 | 25 | 25 | 145 | 25.5 | 46 | FGC5 |
| CFGTR/L2525-5SE | 5 | 80 | 120 | 12 | 25 | 25 | 145 | 25.5 | 46 | FGC5 |
| CFGTR/L2525-5DA | 5 | 30 | 40 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DB | 5 | 40 | 50 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DC | 5 | 50 | 60 | 22 | 25 | 25 | 145 | 26 | 56 | FGC5 |
| CFGTR/L2525-5DD | 5 | 60 | 80 | 22 | 25 | 25 | 145 | 25.5 | 56 | FGC5 |
| CFGTR/L2525-5DE | 5 | 80 | 120 | 22 | 25 | 25 | 145 | 25.5 | 56 | FGC5 |
| CFGTR/L2525-6SB | 6 | 40 | 50 | 14 | 25 | 25 | 144 | 26 | 48 | FGC6 |
| CFGTR2525-6SC | 6 | 50 | 60 | 14 | 25 | 25 | 144 | 26 | 48 | FGC6 |
| CFGTR2525-6SD | 6 | 60 | 80 | 14 | 25 | 25 | 144 | 25.5 | 48 | FGC6 |
| CFGTR/L2525-6SE | 6 | 80 | 120 | 14 | 25 | 25 | 144 | 25.5 | 48 | FGC6 |
| CFGTR3232-8SD | 8 | 60 | 80 | 16 | 32 | 32 | 162 | 32.5 | 50 | FGC8 |
| CFGTR/L3232-8SE | 8 | 80 | 120 | 16 | 32 | 32 | 162 | 32.5 | 50 | FGC8 |

- When using these face grooving toolholders, right hand ones use a right hand bladeset and left hand ones are left hand bladeset.
- Each toolholder set includes all components.
- The right hand blade and clamp are used with the right hand shank, the left hand blade and clamp are used with the left hand shank.

| Designation | Shank | Blade | Clamp |
|---|---|---|---|
| CFGTR/L2020-3SA | CFGTR/L2020 | FBR/L25-3SA | CFG-3SR/L |
| CFGTR/L2020-3SB | CFGTR/L2020 | FBR/L25-3SB | CFG-3SR/L |
| CFGTR/L2020-3SC | CFGTR/L2020 | FBR/L25-3SC | CFG-3SR/L |
| CFGTR/L2020-3SD | CFGTR/L2020 | FBR/L25-3SD | CFG-3SR/L |
| CFGTR/L2020-3SE | CFGTR/L2020 | FBR/L25-3SE | CFG-3SR/L |
| CFGTR/L2525-3SA | CFGTR/L2525 | FBR/L25-3SA | CFG-3SR/L |
| CFGTR/L2525-3SB | CFGTR/L2525 | FBR/L25-3SB | CFG-3SR/L |
| CFGTR/L2525-3SC | CFGTR/L2525 | FBR/L25-3SC | CFG-3SR/L |
| CFGTR/L2525-3SD | CFGTR/L2525 | FBR/L25-3SD | CFG-3SR/L |
| CFGTR/L2525-3SE | CFGTR/L2525 | FBR/L25-3SE | CFG-3SR/L |
| CFGTR/L2020-4SA | CFGTR/L2020 | FBR/L25-4SA | CFG-4SR/L |
| CFGTR/L2020-4SB | CFGTR/L2020 | FBR/L25-4SB | CFG-4SR/L |
| CFGTR/L2020-4SC | CFGTR/L2020 | FBR/L25-4SC | CFG-4SR/L |
| CFGTR/L2020-4SD | CFGTR/L2020 | FBR/L25-4SD | CFG-4SR/L |
| CFGTR/L2020-4SE | CFGTR/L2020 | FBR/L25-4SE | CFG-4SR/L |
| CFGTR/L2525-4SA | CFGTR/L2525 | FBR/L25-4SA | CFG-4SR/L |
| CFGTR/L2525-4SB | CFGTR/L2525 | FBR/L25-4SB | CFG-4SR/L |
| CFGTR/L2525-4SC | CFGTR/L2525 | FBR/L25-4SC | CFG-4SR/L |
| CFGTR/L2525-4SD | CFGTR/L2525 | FBR/L25-4SD | CFG-4SR/L |
| CFGTR/L2525-4SE | CFGTR/L2525 | FBR/L25-4SE | CFG-4SR/L |
| CFGTR/L2525-4DA | CFGTR/L2525 | FBR/L25-4DA | CFG-4DR/L |
| CFGTR/L2525-4DB | CFGTR/L2525 | FBR/L25-4DB | CFG-4DR/L |
| CFGTR/L2525-4DC | CFGTR/L2525 | FBR/L25-4DC | CFG-4DR/L |
| CFGTR/L2525-4DD | CFGTR/L2525 | FBR/L25-4DD | CFG-4DR/L |
| CFGTR/L2525-4DE | CFGTR/L2525 | FBR/L25-4DE | CFG-4DR/L |
| CFGTR/L2020-5SA | CFGTR/L2020 | FBR/L25-5SA | CFG-5SR/L |
| CFGTR/L2020-5SB | CFGTR/L2020 | FBR/L25-5SB | CFG-5SR/L |
| CFGTR/L2020-5SC | CFGTR/L2020 | FBR/L25-5SC | CFG-5SR/L |
| CFGTR/L2020-5SD | CFGTR/L2020 | FBR/L25-5SD | CFG-5SR/L |
| CFGTR/L2020-5SE | CFGTR/L2020 | FBR/L25-5SE | CFG-5SR/L |
| CFGTR/L2525-5SA | CFGTR/L2525 | FBR/L25-5SA | CFG-5SR/L |
| CFGTR/L2525-5SB | CFGTR/L2525 | FBR/L25-5SB | CFG-5SR/L |
| CFGTR/L2525-5SC | CFGTR/L2525 | FBR/L25-5SC | CFG-5SR/L |
| CFGTR/L2525-5SD | CFGTR/L2525 | FBR/L25-5SD | CFG-5SR/L |
| CFGTR/L2525-5SE | CFGTR/L2525 | FBR/L25-5SE | CFG-5SR/L |
| CFGTR/L2525-5DA | CFGTR/L2525 | FBR/L25-5DA | CFG-5DR/L |
| CFGTR/L2525-5DB | CFGTR/L2525 | FBR/L25-5DB | CFG-5DR/L |
| CFGTR/L2525-5DC | CFGTR/L2525 | FBR/L25-5DC | CFG-5DR/L |
| CFGTR/L2525-5DD | CFGTR/L2525 | FBR/L25-5DD | CFG-5DR/L |
| CFGTR/L2525-5DE | CFGTR/L2525 | FBR/L25-5DE | CFG-5DR/L |
| CFGTR/L2525-6SB | CFGTR/L2525 | FBR/L25-6SB | CFG-6SR/L |
| CFGTR2525-6SC | CFGTR2525 | FBR25-6SC | CFG-6SR |
| CFGTR2525-6SD | CFGTR2525 | FBR25-6SD | CFG-6SR |
| CFGTR/L2525-6SE | CFGTR/L2525 | FBR/L25-6SE | CFG-6SR/L |
| CFGTR3232-8SD | CFGTR3232 | FBR32-8SD | CFG-8SR |
| CFGTR/L3232-8SE | CFGTR/L3232 | FBR/L32-8SE | CFG-8SR/L |

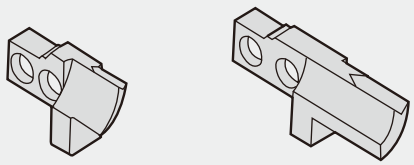
## SPARE PARTS

| Designation | Clamp | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|---|
| CFGTR/L2020-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SA | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SB | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SC | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SD | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-3SE | CFG-3SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SA | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SB | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SC | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SD | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4SE | CFG-4SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DA | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DB | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DC | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DD | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-4DE | CFG-4DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2020-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SA | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SB | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SC | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SD | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5SE | CFG-5SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DA | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DB | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DC | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DD | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-5DE | CFG-5DR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-6SB | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR2525-6SC | CFG-6SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR2525-6SD | CFG-6SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L2525-6SE | CFG-6SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR3232-8SD | CFG-8SR | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |
| CFGTR/L3232-8SE | CFG-8SR/L | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

## FBR/L-#S/D

Blades of toolholder CFGSR/L-#S/D & CFGTR/L-#S/D for face grooving

**Blade**
Shallow groove type (FBR/L□-□S□) Deep groove type (FBR/L□□-□D□)



**Clamp**
Shallow groove type (CFG-□SR/L)
Deep groove type (CFG-□DR/L)

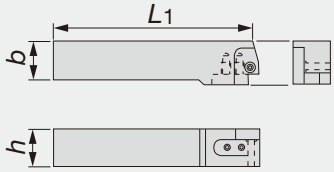
Right hand (R) shown.

| Blade | Min. bore dia. ø*D*m | *ar* | *W* | Clamp |
|---|---|---|---|---|
| FBR/L25-3SA | 30 - 40 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SB | 40 - 50 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SC | 50 - 60 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SD | 60 - 80 | 10 | 3 | CFG-3SR/L |
| FBR/L25-3SE | 80 - 120 | 10 | 3 | CFG-3SR/L |
| FBR/L25-4SA | 30 - 40 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SB | 40 - 50 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SC | 50 - 60 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SD | 60 - 80 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4SE | 80 - 120 | 10 | 4 | CFG-4SR/L |
| FBR/L25-4DA | 30 - 40 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DB | 40 - 50 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DC | 50 - 60 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DD | 60 - 80 | 20 | 4 | CFG-4DR/L |
| FBR/L25-4DE | 80 - 120 | 20 | 4 | CFG-4DR/L |
| FBR/L25-5SA | 30 - 40 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SB | 40 - 50 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SC | 50 - 60 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SD | 60 - 80 | 12 | 5 | CFG-5SR/L |
| FBR/L25-5SE | 80 - 120 | 12 | 5 | CFG-5SR/L |

| Blade | Min. bore dia. ø*D*m | *ar* | *W* | Clamp |
|---|---|---|---|---|
| FBR/L25-5DA | 30 - 40 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DB | 40 - 50 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DC | 50 - 60 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DD | 60 - 80 | 22 | 5 | CFG-5DR/L |
| FBR/L25-5DE | 80 - 120 | 22 | 5 | CFG-5DR/L |
| FBR/L25-6SB | 40 - 50 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SC | 50 - 60 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SD | 60 - 80 | 14 | 6 | CFG-6SR/L |
| FBR/L25-6SE | 80 - 120 | 14 | 6 | CFG-6SR/L |
| FBR25-6DB | 40 - 50 | 24 | 6 | CFG-6DR |
| FBR/L25-6DC | 50 - 60 | 24 | 6 | CFG-6DR/L |
| FBR/L25-6DD | 60 - 80 | 24 | 6 | CFG-6DR/L |
| FBR/L25-6DE | 80 - 120 | 24 | 6 | CFG-6DR/L |
| FBR32-8SD | 60 - 80 | 16 | 8 | CFG-8SR |
| FBR32-8SE | 80 - 120 | 16 | 8 | CFG-8SR |
| FBR32-8DD | 60 - 80 | 26 | 8 | CFG-8DR |
| FBR32-8DE | 80 - 120 | 26 | 8 | CFG-8DR |

## CFGSR/L

Shank of toolholder CFGSR/L-#S/D for face grooving




Right hand (R) shown.

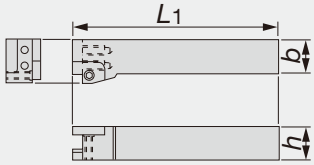
| Designation | h | b | L1 |
|---|---|---|---|
| CFGSR/L2020 | 20 | 20 | 114.3 |
| CFGSR/L2525 | 25 | 25 | 139.3 |
| CFGSR3232 | 32 | 32 | 153.3 |

### SPARE PARTS

| Designation | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|
| CFGSR/L... | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

## CFGTR/L

Shank of perpendicular toolholder CFGTR/L-#S/D for face grooving




Right hand (R) shown.

| Designation | h | b | L1 |
|---|---|---|---|
| CFGTR/L2020 | 20 | 20 | 125.8 |
| CFGTR/L2525 | 25 | 25 | 150.8 |
| CFGTR/L3232 | 32 | 32 | 170.8 |

### SPARE PARTS

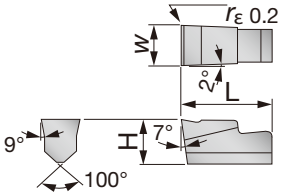
| Designation | Clamping screw | Blade screw | Spring | Washer | Wrench |
|---|---|---|---|---|---|
| CFGTR/L... | CHHM5-18 | CSHB-6 | BP-7 | CPW5 | P-4 |

External

Face Grooving

## INSERT

### FGC




Right hand (R) shown.

| Designation | W±0.1 | Coated T313V | Cermet NS9530 | Uncoated UX30 | L | H |
|---|---|---|---|---|---|---|
| FGC3 | 3 | ● | ● | | 10 | 4.29 |
| FGC4 | 4 | ● | ● | | 10 | 4.5 |
| FGC5 | 5 | ● | ● | | 12 | 5.5 |
| FGC6 | 6 | | | ● | 14 | 6.5 |
| FGC8 | 8 | | | ● | 16 | 8 |

● : Line up

## Grade selection guide

| Grades | Main applications | P group | | | | K group | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 01 | 10 | 20 | 30 | 01 | 10 | 20 | 30 |
| **UX30** | Low to medium speed cutting of steel, cast steel, cast iron and stainless steel | | | | | | | | |
| **NS9530** | Medium to high speed cutting of steel and alloy steel, with satisfactory surface finish | | | | | | | | |
| **T313V** | Low to high speed cutting of steel, cast steel, cast iron and stainless steel<br>Standard cutting conditions | | | | | | | | |

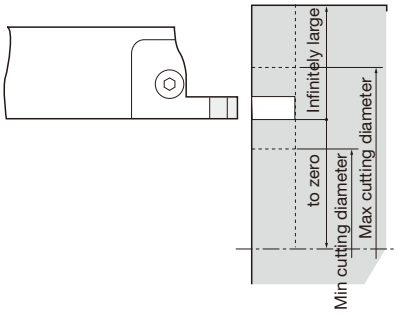
## STANDARD CUTTING CONDITIONS

| Workpiece material: General carbon steel, C45<br>Cutting fluid: Water soluble cutting fluid | Groove width: *W* (mm) | | | | |
|---|---|---|---|---|---|
| | 3 | 4 | 5 | 6 | 8 |
| **Cutting speed $v_c$ (m/min)** | 70 ~ 150 | 70 ~ 150 | 70 ~ 120 | 70 ~ 120 | 50 ~ 100 |
| **Feed *f* (mm/rev)** | 0.05 ~ 0.15 | 0.05 ~ 0.2 | 0.05 ~ 0.15 | 0.05 ~ 0.15 | 0.05 ~ 0.1 |

Notes:
- Above cutting conditions are applied to the shallow groove type (groove depth 10 ~ 16 mm).
- In the case of a deep groove type (groove depth 20 ~ 26 mm), apply 60 ~ 70% of above cutting conditions.
- The use of water soluble cutting fluid is recommended to discharge chips, protect the finished surface, and prevent chipping.

## Notes on cutting diameter

- SA~SG types can widen the groove outward infinitely after grooving from the minimum to maximum diameter.
- SF and SG types can widen the groove inward to minimum zero after grooving from the minimum to maximum diameter. (See the figure)
- SA~SE types can not be used to widen the groove more inward from the minimum diameter.



# MillLine

www.tungaloy.com

# MILLING


High-Feed Milling D002

Shoulder Milling D036

Face Milling D130

Slot Milling D206

Profile Milling D222

Multi-Functional Milling D260

Milling Insert D351

# MillLine - High-Feed Milling

## HYBRIDTACMILL EXH

D004

High-feed endmills

20° ø10 - ø16 mm
max. ap 0.8 mm

P M K N

## DOFEED

D008

Super high-feed milling cutters with 4-cornered double-sided inserts

15° ø16 - ø200 mm
max. ap 1.5 mm

P M K S H

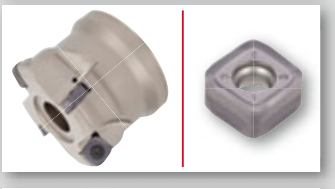
## DO TWIST BALL

D016

Super high-feed cutters for profile milling with rigid clamping

20° ø20 - ø50 mm
max. ap 1.3 mm

P M K S H



## DOFEEDQUAD

D021

Super high-feed cutters for face milling with 8-cornered double-sided inserts

13° ø50 - ø125 mm
max. ap 2 mm

P M K S H

## MILLQUADFEED

D024

Super high-feed milling cutters for large depths of cut

14° ø50 - ø160 mm
max. ap 2.5 mm

P M K S H

## MILLFEED TXP

D026

High-feed milling cutters with single-sided inserts

10°-20° ø20 - ø160 mm
max. ap 3 mm

P M K H

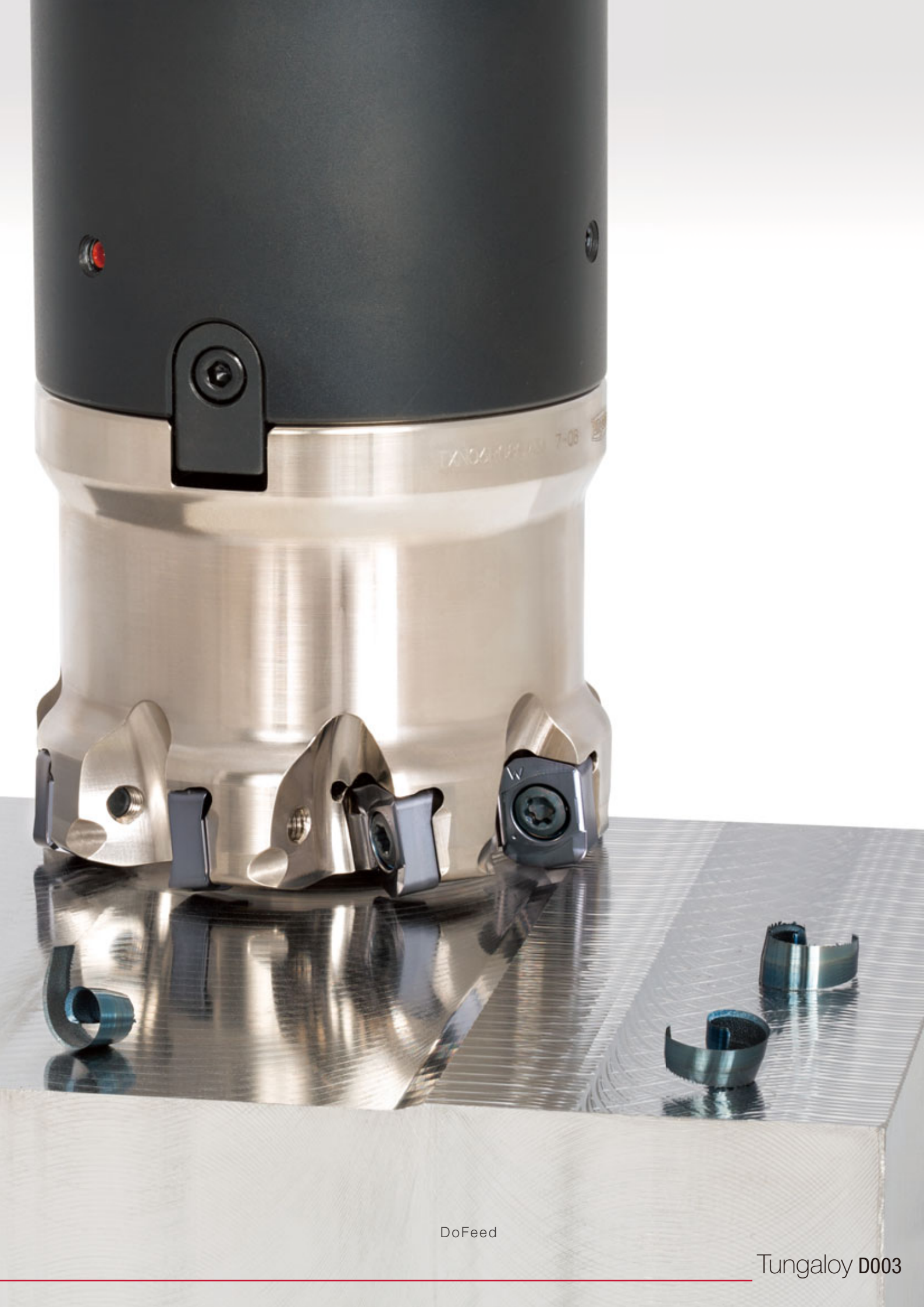
## MILLFEED TXD

D034

Super high-feed cutters for face milling

20° ø125 - ø250 mm
max. ap 3 mm

P M K H



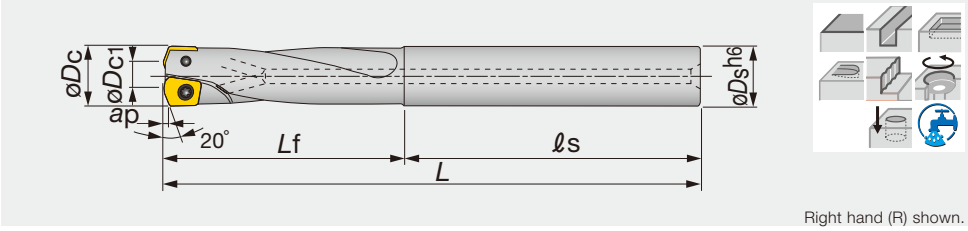
DoFeed

# HYBRIDTACMILL

## EXH

Super high feed milling endmills with center cutting edge

A.R. = +20°, R.R. = +12°

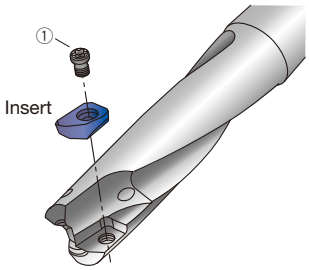



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDc1 | øDs | L | Lf | ℓs | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 0.6 | 10 | 2 | 5 | 10 | 90 | 40 | 50 | XXGT06H2... |
| EXH07R012M12.0-02 | 0.6 | 12 | 2 | 7 | 12 | 98 | 48 | 50 | XXGT07X3... |
| EXH09R016M16.0-02 | 0.8 | 16 | 2 | 10 | 16 | 124 | 64 | 60 | XXGT09X4... |

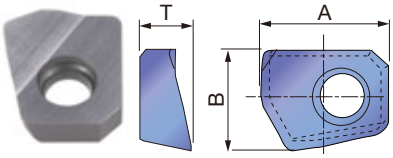
### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| EXH06R010M10.0-02 | CSPD-1.8S | M-1000 | - | IP-6F |
| EXH07R012M12.0-02 | CSPB-2H | M-1000 | - | IP-6F |
| EXH09R016M16.0-02 | CSPB-2.5S | M-1000 | IP-8D | - |

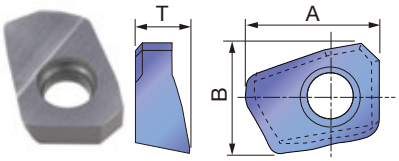


## INSERT

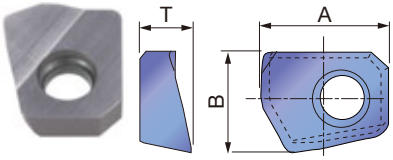
### XXGT EC-MJ (Center cutting edge)



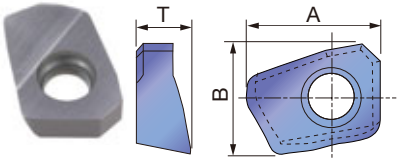

### XXGT EP-MJ (Peripheral cutting edge)




### XXGT FC-AJ (Center cutting edge)




### XXGT FP-AJ (Peripheral cutting edge)




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

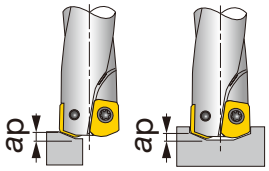
★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated AH730 | Coated DS1200 | A | B | T |
|---|---|---|---|---|---|---|
| XXGT06H205EC-MJ | 0.6 | ● | | 6.2 | 4.9 | 2.5 |
| XXGT07X305EC-MJ | 0.6 | ● | | 7 | 5.9 | 3 |
| XXGT09X408EC-MJ | 0.8 | ● | | 8.9 | 7.9 | 4 |
| XXGT06H205FC-AJ | 0.6 | | ● | 6.2 | 4.9 | 2.5 |
| XXGT07X305FC-AJ | 0.6 | | ● | 7 | 5.9 | 3 |
| XXGT09X408FC-AJ | 0.8 | | ● | 8.9 | 7.9 | 4 |
| XXGT06H205EP-MJ | 0.6 | ● | | 6.2 | 5.1 | 2.5 |
| XXGT07X305EP-MJ | 0.6 | ● | | 7 | 6.3 | 3 |
| XXGT09X408EP-MJ | 0.8 | ● | | 8.9 | 8 | 4 |
| XXGT06H205FP-AJ | 0.6 | | ● | 6.2 | 5.1 | 2.5 |
| XXGT07X305FP-AJ | 0.6 | | ● | 7 | 6.3 | 3 |
| XXGT09X408FP-AJ | 0.8 | | ● | 8.9 | 8 | 4 |

●: Line up

## STANDARD CUTTING CONDITIONS

●Shoulder milling, Slotting

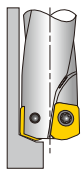



Side cutting Slotting

ap: Axial depth of cut

| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steels | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 250 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 500 m/min | | Vc = 100 ~ 300 m/min | |
| Conditions | | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min |
| Tool dia. (mm) | ø10 | 4770 | 1430 | 3820 | 760 | 4770 | 1430 | 6360 | 2540 | 9550 | 5730 | 6360 | 3180 |
| | ø12 | 3980 | 1190 | 3180 | 630 | 3980 | 1190 | 5300 | 2120 | 7950 | 4770 | 5300 | 2650 |
| | ø16 | 2980 | 890 | 2380 | 470 | 2980 | 890 | 3970 | 1580 | 5960 | 3570 | 3970 | 1980 |
| Depth of cut | ø10 | ap < 0.6 | | ap < 0.5 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | |
| | ø12 | ap < 0.6 | | ap < 0.5 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | | ap < 0.6 | |
| | ø16 | ap < 0.8 | | ap < 0.6 | | ap < 0.8 | | ap < 0.8 | | ap < 0.8 | | ap < 0.8 | |

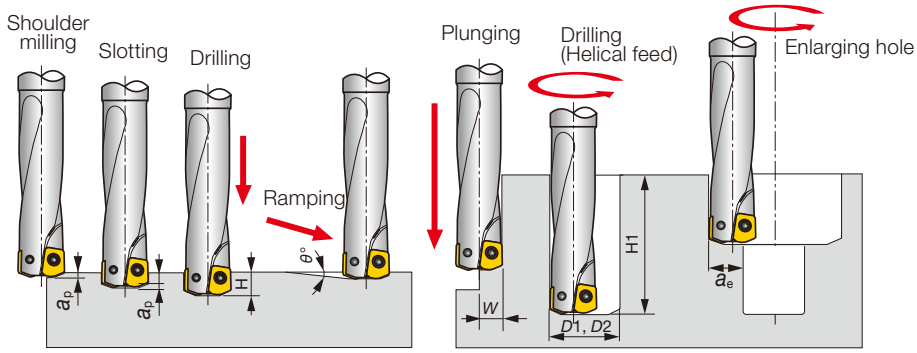
●Plunging



| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steels | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 250 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 300 m/min | | Vc = 100 ~ 500 m/min | | Vc = 100 ~ 300 m/min | |
| Conditions | | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min | No. of rev. n min⁻¹ | Feed speed Vf mm/min |
| Tool dia. (mm) | ø10 | 4770 | 240 | 3820 | 150 | 4770 | 240 | 6360 | 440 | 9550 | 760 | 6360 | 440 |
| | ø12 | 3980 | 200 | 3180 | 130 | 3980 | 200 | 5300 | 370 | 7950 | 640 | 5300 | 370 |
| | ø16 | 2980 | 150 | 2380 | 95 | 2980 | 150 | 3970 | 280 | 5960 | 480 | 3970 | 280 |

Note:
- In slotting or pocketing where chips tend to stay in the cutting zone, use an air blast to remove chips for preventing chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminium alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure that the machine is running normally.

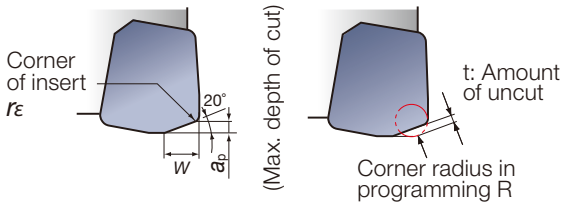
## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max.depth of drilling H | Max. cutting width in plunging W | Max. ramping angle θ° | Min. machinable hole dia. D1 | Max. machinable hole dia. D2 | Max. cutting width in enlarging hole ae | Max.depth of boring H1 |
|---|---|---|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 10 | 0.6 | 5 | 5 | 5 | 12 | 19 | 7 | 30 |
| EXH07R012M12.0-02 | 12 | 0.6 | 6 | 6 | 5 | 14 | 23 | 9 | 36 |
| EXH09R016M16.0-02 | 16 | 0.8 | 8 | 8 | 5 | 18 | 31 | 12.5 | 48 |

## TOOL GEOMETRY FOR PROGRAMMING

When using CAD/CAM, please program it for radius cutter.
The following table shows actual cutting edge geometry and amount of unfinished work cut.



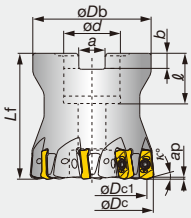

| Designation | øDc | Max. depth of cut ap | Corner of insert rε | Width W | Amount of uncut t | Corner radius in programming R |
|---|---|---|---|---|---|---|
| EXH06R010M10.0-02 | 10 | 0.6 | 0.5 | 2.5 | 0.7 | R0.5 |
| | | | | | 0.6 | R1.0 |
| EXH07R012M12.0-02 | 12 | 0.6 | 0.5 | 2.5 | 0.7 | R0.5 |
| | | | | | 0.6 | R1.0 |
| EXH09R016M16.0-02 | 16 | 0.8 | 0.8 | 3 | 0.8 | R0.5 |
| | | | | | 0.7 | R1.0 |
| | | | | | 0.6 | R1.5 |

MEMO

# DOFEED
## TXN03

Super high feed milling cutters with double sided inserts with 4 edges

A.R. = +6°, R.R. = +12° ~ 13°



| Designation | Max. ap | øDc | z | øDc1 | øDb | ød | ℓ | Lf | b | a | κ° | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXN03R040M16.0E05 | 1 | 40 | 5 | 33.6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 17 | 0.2 | with | LNMU03... |
| TXN03R040M16.0E06 | 1 | 40 | 6 | 33.6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 17 | 0.2 | with | LNMU03... |
| TXN03R050M22.0E05 | 1 | 50 | 5 | 43.6 | 47 | 22 | 20 | 50 | 6.3 | 10.4 | 17 | 0.5 | with | LNMU03... |
| TXN03R050M22.0E08 | 1 | 50 | 8 | 43.6 | 47 | 22 | 20 | 50 | 6.3 | 10.4 | 17 | 0.5 | with | LNMU03... |
| TXN03R050M22.2-08 | 1 | 50 | 8 | 43.6 | 47 | 22.225 | 20 | 50 | 5 | 8 | 17 | 0.5 | with | LNMU03... |

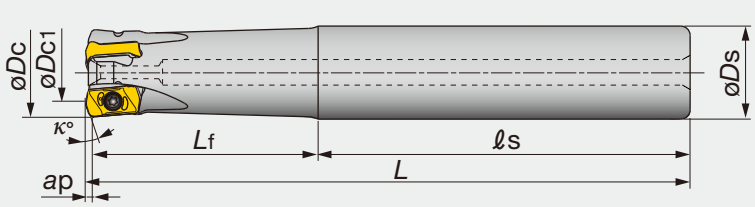
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TXN03R04... | CSPB-2.5 | M-1000 | CM8X30H | IP-8D |
| TXN03R05... | CSPB-2.5 | M-1000 | CM10X30H | IP-8D |

# DOFEED
## EXN03

Super high feed milling endmills with double sided inserts with 4 edges

A.R. = +6°, R.R. = +5° ~ +11°



| Designation | Max. ap | øDc | z | øDc1 | øDs | L | Lf | ℓs | κ° | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXN03R016M16.0-02 | 1 | 16 | 2 | 9.6 | 16 | 100 | 30 | 70 | 15 | 0.2 | with | LNMU03... |
| EXN03R016M16.0-02L | 1 | 16 | 2 | 9.6 | 16 | 150 | 50 | 100 | 15 | 0.2 | with | LNMU03... |
| EXN03R018M16.0-02 | 1 | 18 | 2 | 11.5 | 16 | 100 | 30 | 70 | 17 | 0.2 | with | LNMU03... |
| EXN03R018M16.0-02L | 1 | 18 | 2 | 11.5 | 16 | 150 | 25 | 125 | 17 | 0.2 | with | LNMU03... |
| EXN03R020M20.0-03 | 1 | 20 | 3 | 13.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R020M20.0-03L | 1 | 20 | 3 | 13.5 | 20 | 160 | 80 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R020M20.0-04 | 1 | 20 | 4 | 13.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R022M20.0-03 | 1 | 22 | 3 | 15.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R022M20.0-03L | 1 | 22 | 3 | 15.5 | 20 | 160 | 30 | 130 | 17 | 0.4 | with | LNMU03... |
| EXN03R022M20.0-04 | 1 | 22 | 4 | 15.5 | 20 | 130 | 50 | 80 | 17 | 0.3 | with | LNMU03... |
| EXN03R025M25.0-04 | 1 | 25 | 4 | 18.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R025M25.0-04L | 1 | 25 | 4 | 18.5 | 25 | 180 | 100 | 80 | 17 | 0.6 | with | LNMU03... |
| EXN03R025M25.0-05 | 1 | 25 | 5 | 18.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R028M25.0-04 | 1 | 28 | 4 | 21.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R028M25.0-04L | 1 | 28 | 4 | 21.5 | 25 | 180 | 35 | 145 | 17 | 0.7 | with | LNMU03... |
| EXN03R028M25.0-05 | 1 | 28 | 5 | 21.5 | 25 | 140 | 60 | 80 | 17 | 0.5 | with | LNMU03... |
| EXN03R030M32.0-04 | 1 | 30 | 4 | 23.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R030M32.0-04L | 1 | 30 | 4 | 23.5 | 32 | 200 | 120 | 80 | 17 | 0.9 | with | LNMU03... |
| EXN03R030M32.0-05 | 1 | 30 | 5 | 23.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R032M32.0-05 | 1 | 32 | 5 | 25.5 | 32 | 150 | 70 | 80 | 17 | 0.8 | with | LNMU03... |
| EXN03R032M32.0-05L | 1 | 32 | 5 | 25.5 | 32 | 200 | 120 | 80 | 17 | 1.1 | with | LNMU03... |
| EXN03R032M32.0-06 | 1 | 32 | 6 | 25.5 | 32 | 150 | 70 | 80 | 17 | 0.9 | with | LNMU03... |
| EXN03R035M32.0-05 | 1 | 35 | 5 | 28.5 | 32 | 150 | 35 | 115 | 17 | 0.9 | with | LNMU03... |
| EXN03R035M32.0-05L | 1 | 35 | 5 | 28.5 | 32 | 200 | 35 | 165 | 17 | 1.2 | with | LNMU03... |
| EXN03R035M32.0-06 | 1 | 35 | 6 | 28.5 | 32 | 150 | 35 | 115 | 17 | 0.9 | with | LNMU03... |

### SPARE PARTS

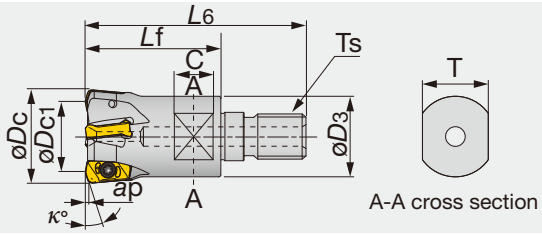
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EXN03... | CSPB-2.5 | M-1000 | IP-8D |

DOFEED

# HXN03-M

Super high feed milling endmills (Dofeed) with TungFlex

A.R. = +6°, R.R. = +5° ~ +11°



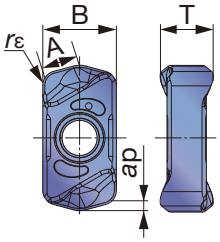
| Designation | Max. ap | øDc | z | øDc1 | L6 | Lf | C | T | øD3 | κ° | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HXN03R016MM08-02 | 1 | 16 | 2 | 9.6 | 42 | 25 | 8 | 10 | 12.8 | 15 | M8 | 0.03 | with | LNMU03... |
| HXN03R018MM08-02 | 1 | 18 | 2 | 11.5 | 42 | 25 | 8 | 10 | 14.5 | 17 | M8 | 0.04 | with | LNMU03... |
| HXN03R020MM10-03 | 1 | 20 | 3 | 13.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R020MM10-04 | 1 | 20 | 4 | 13.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R022MM10-03 | 1 | 22 | 3 | 15.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.06 | with | LNMU03... |
| HXN03R022MM10-04 | 1 | 22 | 4 | 15.5 | 49 | 30 | 10 | 15 | 17.8 | 17 | M10 | 0.07 | with | LNMU03... |
| HXN03R025MM12-04 | 1 | 25 | 4 | 18.5 | 57 | 35 | 10 | 17 | 20.8 | 17 | M12 | 0.1 | with | LNMU03... |
| HXN03R025MM12-05 | 1 | 25 | 5 | 18.5 | 57 | 35 | 10 | 17 | 20.8 | 17 | M12 | 0.11 | with | LNMU03... |
| HXN03R028MM12-04 | 1 | 28 | 4 | 21.5 | 57 | 35 | 10 | 17 | 23 | 17 | M12 | 0.12 | with | LNMU03... |
| HXN03R028MM12-05 | 1 | 28 | 5 | 21.5 | 57 | 35 | 10 | 17 | 23 | 17 | M12 | 0.12 | with | LNMU03... |
| HXN03R030MM16-04 | 1 | 30 | 4 | 23.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.19 | with | LNMU03... |
| HXN03R030MM16-05 | 1 | 30 | 5 | 23.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.2 | with | LNMU03... |
| HXN03R032MM16-05 | 1 | 32 | 5 | 25.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.2 | with | LNMU03... |
| HXN03R032MM16-06 | 1 | 32 | 6 | 25.5 | 63 | 40 | 12 | 22 | 28.8 | 17 | M16 | 0.21 | with | LNMU03... |

## SPARE PARTS

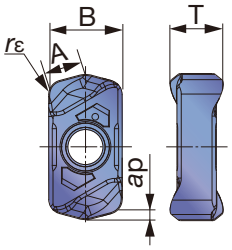
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HXN03... | CSPB-2.5 | M-1000 | IP-8D |

## INSERT

### LNMU03-MJ(for general purpose)




### LNMU03-ML(for low cutting force)




| | | | | |
|---|---|---|---|---|
| P | Steel | | ★ | ★ |
| M | Stainless | ★ | ☆ | ☆ |
| K | Cast iron | | ☆ | |
| N | Non-ferrous | | | |
| S | Superalloys | ☆ | ★ | |
| H | Hard materials | | ★ | ★ |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH130 | AH725 | AH3035 | A | B | T |
|---|---|---|---|---|---|---|---|---|
| LNMU0303ZER-MJ | 1.2 | 1 | ● | ● | ● | 3.2 | 6 | 4.3 |
| LNMU0303ZER-ML | 1.2 | 1 | ● | ● | ● | 3.2 | 6 | 4.3 |

●: Line up

## STANDARD CUTTING CONDITIONS TXN03/EXN03/HXN03

| ISO | Workpiece material | Hard-ness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool dia.: ø*Dc* (mm) ø16 ~ ø22 | ø25 ~ ø50 | Plung-ing | ø16, z = 2 *n* | *Vf* | ø18, z = 2 *n* | *Vf* | ø20 *n* | *Vf* z = 3 | z = 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel S45C, S55C, etc. C45, C55, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | ~ 300HB | For low cutting force | AH725 | ML | 100 - 300 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 3,980 | 4,780 | 3,540 | 4,250 | 3,180 | 5,720 | 7,630 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.6 mm/t | | | | | | |
| | | ~ 300HB | For impact resistance | AH3035 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | Alloy steel SCM440, SCr415, etc. 42CrMo4, 17Cr3, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | ~ 300HB | For low cutting force | AH725 | ML | 100 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| | | ~ 300HB | For impact resistance | AH3035 | MJ | 100 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | Prehardened steel NAK80, PX5, etc. | 30 ~ 40HRC | - | AH3035 | ML | 100 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| M | Stainless steel SUS304, SUS316, etc. X5CrNi18-10, X5CrNiMo17-12-2, etc. | ~ 200HB | First choice | AH130 | ML | 100 - 150 | 0.3 - 0.5 | 0.3 - 0.7 | 0.08 | 2,390 | 1,910 | 2,120 | 1,700 | 1,910 | 2,290 | 3,060 |
| | | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.4 mm/t | | | | | | |
| | | ~ 200HB | For impact resistance | AH130 | MJ | 100 - 150 | 0.3 - 0.8 | 0.3 - 0.8 | 0.08 | 2,390 | 2,390 | 2,120 | 2,120 | 1,910 | 2,870 | 3,820 |
| | | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | |
| K | Grey cast iron FC250, FC300, etc. GG25, GGG30, etc. | 150 ~ 250HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 3,980 | 6,370 | 3,540 | 5,660 | 3,180 | 7,630 | 10,180 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH725 | ML | 100 - 300 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 3,980 | 4,780 | 3,540 | 4,250 | 3,180 | 5,720 | 7,630 |
| | | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.6 mm/t | | | | | | |
| | Ductile cast iron FCD400, etc. GGG40, etc. | 150 ~ 250HB | First choice | AH725 | MJ | 80 - 200 | 0.5 - 1.2 | 0.5 - 1.5 | 0.1 | 2,980 | 4,770 | 2,650 | 4,240 | 2,390 | 5,740 | 7,650 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH725 | ML | 80 - 200 | 0.5 - 0.7 | 0.5 - 1 | 0.1 | 2,980 | 3,580 | 2,650 | 3,180 | 2,390 | 4,300 | 5,740 |
| | | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.6 mm/t | | | | | | |
| S | Titanium alloys Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | ML | 30 - 60 | 0.3 - 0.5 | 0.3 - 0.7 | 0.08 | 800 | 640 | 710 | 570 | 640 | 770 | 1,020 |
| | | | | | | | | | | *Vc* = 40 m/min, *fz* = 0.4 mm/t | | | | | | |
| | Heat-resistant alloys Inconel, Hastelloy, etc. | ~ 40HRC | - | AH725 | MJ | 20 - 50 | 0.1 - 0.2 | 0.1 - 0.3 | 0.05 | 600 | 180 | 530 | 160 | 480 | 216 | 290 |
| | | | | | | | | | | *Vc* = 30 m/min, *fz* = 0.15 mm/t | | | | | | |
| H | Hardened steel: SKD61, etc. X40CrMoV5-1, etc. | 40 ~ 50HRC | First choice | AH3035 | MJ | 80 - 130 | 0.1 - 0.2 | 0.1 - 0.3 | 0.05 | 1,990 | 600 | 1,770 | 530 | 1,590 | 720 | 950 |
| | | | For wear resistance | AH725 | | | | | | *Vc* = 100 m/min, *fz* = 0.15 mm/t | | | | | | |
| | Hardened steel: SKD11, etc. X153CrMoV12, etc. | 50 ~ 60HRC | First choice | AH725 | MJ | 50 - 70 | 0.03 - 0.05 | 0.03 - 0.07 | 0.03 | 1,190 | 100 | 1,060 | 80 | 950 | 114 | 150 |
| | | | For impact resistance | AH3035 | | | | | | *Vc* = 60 m/min, *fz* = 0.04 mm/t | | | | | | |

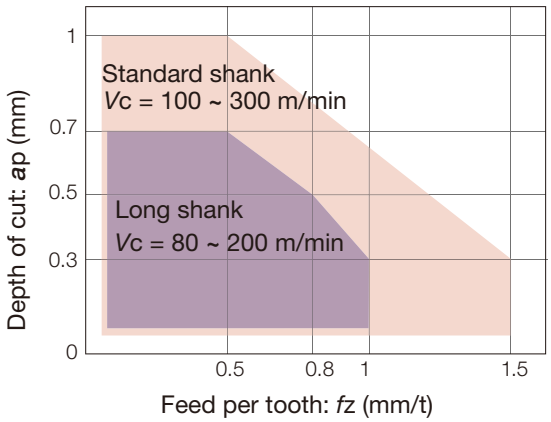
When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

## CAUTIONARY POINTS IN USE

### The use of a standard or long shank

When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.

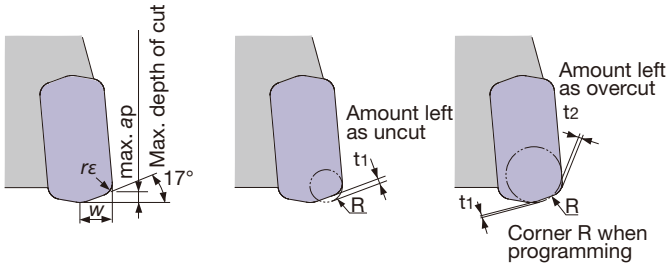



Tool dia.: ø*Dc* = ø16 ~ 35 mm
Workpiece material: S55C / C55 (200HB)

**L/D ratio of overhang**
Standard shank: L/D ≤ 3
Long shank: L/D = 4

### Tool geometry for programming

When programming for CAM, the tool should be considered as a radius cutters. Usually, the corner radius should be set as R = 1.5 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut ($t_1$) and overcut ($t_2$).




| Max. depth of cut max. ap | Corner radius $r_\varepsilon$ | *W* (mm) | Corner R when program-ming | Amount left as uncut $t_1$ | Amount left as overcut $t_2$ |
|---|---|---|---|---|---|
| 1 | 1.2 | 3 | 1 | 0.6 | - |
| | | | 1.5 | 0.5 | - |
| | | | 2 | 0.25 | 0.08 |
| | | | 2.5 | 0.14 | 0.26 |

Each value in table is calculated theoretically at the maximum condition.

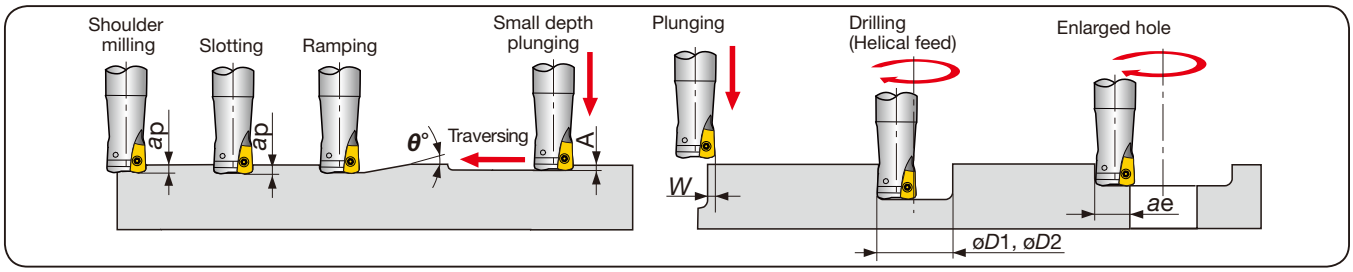
Tool dia.: *øDc* (mm), Number of revolutions: *n* ($min^{-1}$), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.0 mm

| ø22 | | | ø25 | | | ø28 | | | ø30 | | | ø32 | | | ø35 | | | ø40 | | | ø50 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | |
| | z = 3 | z = 4 | | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 5 | z = 6 | | z = 5 | z = 6 | | z = 5 | z = 6 | | z = 5 | z = 8 |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 5,200 | 6,940 | 2,550 | 8,160 | 10,200 | 2,270 | 7,260 | 9,080 | 2,120 | 6,780 | 8,480 | 1,990 | 7,960 | 9,550 | 1,820 | 7,280 | 8,740 | 1,590 | 6,360 | 7,630 | 1,270 | 5,080 | 8,130 |
| *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 1,740 | 2,090 | 2,780 | 1,530 | 3,060 | 3,830 | 1,360 | 2,720 | 3,400 | 1,270 | 2,540 | 3,180 | 1,190 | 2,980 | 3,570 | 1,090 | 2,730 | 3,270 | 950 | 2,380 | 2,850 | 760 | 1,900 | 3,040 |
| *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 1,740 | 2,610 | 3,480 | 1,530 | 3,670 | 4,590 | 1,360 | 3,264 | 4,080 | 1,270 | 3,050 | 3,810 | 1,190 | 3,570 | 4,280 | 1,090 | 3,270 | 3,920 | 950 | 2,850 | 3,420 | 760 | 2,280 | 3,650 |
| *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 6,940 | 9,250 | 2,550 | 10,200 | 12,750 | 2,270 | 9,080 | 11,350 | 2,120 | 8,480 | 10,600 | 1,990 | 9,950 | 11,940 | 1,820 | 9,100 | 10,920 | 1,590 | 7,950 | 9,540 | 1,270 | 6,350 | 10,160 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,890 | 5,200 | 6,940 | 2,550 | 8,160 | 10,200 | 2,270 | 7,260 | 9,080 | 2,120 | 6,780 | 8,480 | 1,990 | 7,960 | 9,550 | 1,820 | 7,280 | 8,740 | 1,590 | 6,360 | 7,630 | 1,270 | 5,080 | 8,130 |
| *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 5,210 | 6,940 | 1,910 | 7,640 | 9,550 | 1,710 | 6,840 | 8,550 | 1,590 | 6,360 | 7,950 | 1,490 | 7,450 | 8,940 | 1,360 | 6,800 | 8,160 | 1,190 | 5,950 | 7,140 | 950 | 4,750 | 5,700 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 2,170 | 3,910 | 5,210 | 1,910 | 6,110 | 7,640 | 1,710 | 5,470 | 6,840 | 1,590 | 5,090 | 6,360 | 1,490 | 5,960 | 7,150 | 1,360 | 5,440 | 6,530 | 1,190 | 4,760 | 5,710 | 950 | 3,800 | 4,560 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 580 | 700 | 930 | 510 | 1,020 | 1,280 | 450 | 900 | 1,130 | 420 | 840 | 1,050 | 400 | 1,000 | 1,200 | 360 | 900 | 1,080 | 320 | 800 | 960 | 250 | 630 | 1,000 |
| *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 430 | 190 | 260 | 380 | 300 | 290 | 340 | 270 | 260 | 320 | 260 | 240 | 300 | 300 | 270 | 270 | 270 | 240 | 240 | 240 | 220 | 190 | 190 | 230 |
| *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 1,450 | 650 | 870 | 1,270 | 1,020 | 1,270 | 1,140 | 910 | 1,140 | 1,060 | 850 | 1,060 | 990 | 990 | 1,190 | 910 | 910 | 1,090 | 800 | 800 | 960 | 640 | 640 | 1,020 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | | |
| 870 | 100 | 140 | 760 | 150 | 190 | 680 | 140 | 170 | 640 | 130 | 160 | 600 | 150 | 180 | 550 | 140 | 170 | 480 | 120 | 140 | 380 | 100 | 150 |
| *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | | | | | | | | | | | | | | | | | | | |

The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The use of standard or long shanks" shown in previous page.

Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

## APPLICATION RANGE




| Designation | Tool dia. *øDc* | Max. depth of cut Max *ap* | Max. ramping angle *θ°* | Max. plunging depth A | Max. cutting width in plunging *W* | Min.machinable hole dia. *øD1* | Max.machinable hole dia. *øD2* | Max. cutting width in enlarged hole *ae* |
|---|---|---|---|---|---|---|---|---|
| E/HXN03R016M... | ø16 | 1 | 2.1 | 0.3 | 3.5 | 22 | 30 | 12.5 |
| E/HXN03R018M... | ø18 | 1 | 1.7 | 0.3 | 3.5 | 26 | 34 | 14.5 |
| E/HXN03R020M... | ø20 | 1 | 1.4 | 0.3 | 3.5 | 30 | 38 | 16.5 |
| E/HXN03R022M... | ø22 | 1 | 1.2 | 0.3 | 3.5 | 34 | 42 | 18.5 |
| E/HXN03R025M... | ø25 | 1 | 1.0 | 0.3 | 3.5 | 40 | 48 | 21.5 |
| E/HXN03R028M... | ø28 | 1 | 0.8 | 0.3 | 3.5 | 46 | 54 | 24.5 |
| E/HXN03R030M... | ø30 | 1 | 0.7 | 0.3 | 3.5 | 50 | 58 | 26.5 |
| E/HXN03R032M... | ø32 | 1 | 0.7 | 0.3 | 3.5 | 54 | 62 | 28.5 |
| EXN03R035M... | ø35 | 1 | 0.6 | 0.3 | 3.5 | 60 | 68 | 31.5 |
| TXN03R040M... | ø40 | 1 | 0.5 | 0.3 | 3.5 | 70 | 78 | 36.5 |
| TXN03R050M... | ø50 | 1 | 0.4 | 0.3 | 3.5 | 90 | 98 | 46.5 |

· For *øDc* above 33 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut.

# DOFEED

## TXN06

Super high feed milling cutters with double sided inserts with 4 edges

A.R. = +10°, R.R. = +2° ~ +6°

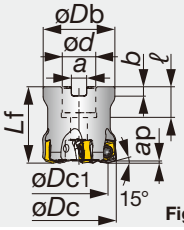
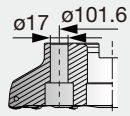



Fig.1

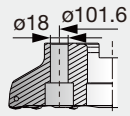
TXN06R200M47.6-12




(øDc = 200 mm)

Fig.2

TXN06R200M60.0E12




(øDc = 200 mm)

Fig.3

| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXN06R050M22.0E04 | 1.5 | 50 | 4 | 37.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LN*U06... | 1 |
| TXN06R050M22.0E05 | 1.5 | 50 | 5 | 37.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LN*U06... | 1 |
| TXN06R050M22.2-04 | 1.5 | 50 | 4 | 37.6 | 47 | 50 | 22.225 | 20 | 8 | 5 | 0.4 | with | LN*U06... | 1 |
| TXN06R050M22.2-05 | 1.5 | 50 | 5 | 37.6 | 47 | 50 | 22.225 | 20 | 8 | 5 | 0.4 | with | LN*U06... | 1 |
| TXN06R052M22.0E04 | 1.5 | 52 | 4 | 39.6 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LN*U06... | 1 |
| TXN06R052M22.0E05 | 1.5 | 52 | 5 | 39.6 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LN*U06... | 1 |
| TXN06R063M22.0E04 | 1.5 | 63 | 4 | 50.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LN*U06... | 1 |
| TXN06R063M22.0E06 | 1.5 | 63 | 6 | 50.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LN*U06... | 1 |
| TXN06R063M22.2-04 | 1.5 | 63 | 4 | 50.6 | 59 | 50 | 22.225 | 20 | 8 | 5 | 0.8 | with | LN*U06... | 1 |
| TXN06R063M22.2-06 | 1.5 | 63 | 6 | 50.6 | 59 | 50 | 22.225 | 20 | 8 | 5 | 0.8 | with | LN*U06... | 1 |
| TXN06R066M27.0E04 | 1.5 | 66 | 4 | 53.6 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | LN*U06... | 1 |
| TXN06R066M27.0E06 | 1.5 | 66 | 6 | 53.6 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.8 | with | LN*U06... | 1 |
| TXN06R080M27.0E05 | 1.5 | 80 | 5 | 67.6 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | LN*U06... | 1 |
| TXN06R080M27.0E08 | 1.5 | 80 | 8 | 67.6 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | LN*U06... | 1 |
| TXN06R080M31.7-05 | 1.5 | 80 | 5 | 67.6 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 1.6 | with | LN*U06... | 1 |
| TXN06R080M31.7-08 | 1.5 | 80 | 8 | 67.6 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 1.6 | with | LN*U06... | 1 |
| TXN06R100M31.7-06 | 1.5 | 100 | 6 | 87.6 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 2.2 | with | LN*U06... | 1 |
| TXN06R100M32.0E06 | 1.5 | 100 | 6 | 87.6 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.2 | with | LN*U06... | 1 |
| TXN06R125M38.1-08 | 1.5 | 125 | 8 | 112.6 | 100 | 63 | 38.1 | 43 | 15.9 | 10 | 3 | with | LN*U06... | 1 |
| TXN06R125M40.0E08 | 1.5 | 125 | 8 | 112.6 | 100 | 63 | 40 | 37 | 16.4 | 9 | 3 | with | LN*U06... | 1 |
| TXN06R160M40.0E10 | 1.5 | 160 | 10 | 147.6 | 100 | 63 | 40 | 37 | 16.4 | 9 | 5 | with | LN*U06... | 1 |
| TXN06R160M50.8-10 | 1.5 | 160 | 10 | 147.6 | 100 | 63 | 50.8 | 46 | 19 | 11 | 4.6 | with | LN*U06... | 1 |
| TXN06R200M47.6-12 | 1.5 | 200 | 12 | 187.6 | 130 | 63 | 47.625 | 38 | 25.4 | 14 | 7.7 | without | LN*U06... | 2 |
| TXN06R200M60.0E12 | 1.5 | 200 | 12 | 187.6 | 130 | 63 | 60 | 38 | 25.7 | 14 | 7.2 | without | LN*U06... | 3 |

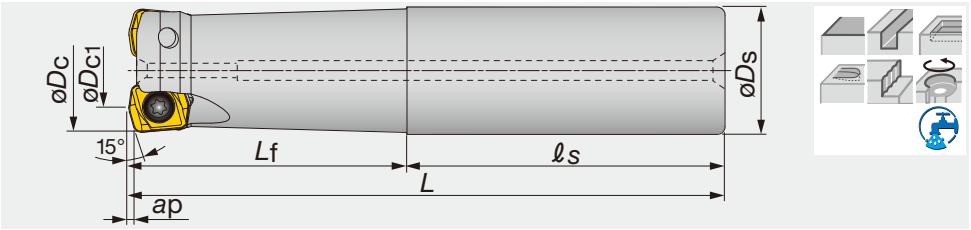
## SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TXN06R050M22.0... | CSPB-5 | H-TB2W | M-1000 | - | FSHM10-40H | BLDIP20/S7 |
| TXN06R050M22.2... | CSPB-5 | H-TB2W | M-1000 | - | CM10X30H | BLDIP20/S7 |
| TXN06R052M22.0... | CSPB-5 | H-TB2W | M-1000 | - | FSHM10-40H | BLDIP20/S7 |
| TXN06R063M... | CSPB-5 | H-TB2W | M-1000 | - | CM10X30H | BLDIP20/S7 |
| TXN06R066,080M27.0... | CSPB-5 | H-TB2W | M-1000 | - | CM12X30H | BLDIP20/S7 |
| TXN06R080,100M31.7... | CSPB-5 | H-TB2W | M-1000 | - | CM16X40H | BLDIP20/S7 |
| TXN06R125M... | CSPB-5 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP20/S7 |
| TXN06R160M40.0... | CSPB-5 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP20/M7 |
| TXN06R160M50.8... | CSPB-5 | H-TB2W | M-1000 | TMBA-M24H | - | BLDIP20/M7 |
| TXN06R200M... | CSPB-5 | H-TB2W | M-1000 | - | - | BLDIP20/M7 |

# DOFEED
## EXN06

Super high feed milling endmills with double sided inserts with 4 edges

A.R. = +10°, R.R. = -2° ~ +6°



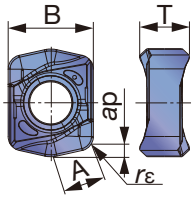

| Designation | Max. ap | øDc | z | øDc1 | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXN06R032M32.0-02 | 1.5 | 32 | 2 | 19.7 | 32 | 150 | 70 | 80 | 0.8 | with | LN*U06... |
| EXN06R032M32.0-02L | 1.5 | 32 | 2 | 19.7 | 32 | 200 | 120 | 80 | 1.1 | with | LN*U06... |
| EXN06R035M32.0-02 | 1.5 | 35 | 2 | 22.7 | 32 | 150 | 45 | 105 | 0.9 | with | LN*U06... |
| EXN06R035M32.0-02L | 1.5 | 35 | 2 | 22.7 | 32 | 200 | 45 | 155 | 1.2 | with | LN*U06... |
| EXN06R040M32.0-03 | 1.5 | 40 | 3 | 27.7 | 32 | 150 | 45 | 105 | 0.9 | with | LN*U06... |
| EXN06R040M32.0-03L | 1.5 | 40 | 3 | 27.7 | 32 | 220 | 45 | 175 | 1.3 | with | LN*U06... |

### SPARE PARTS

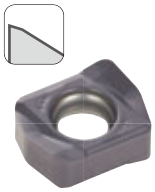
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EXN06 | CSPB-5 | M-1000 | IP-20D |

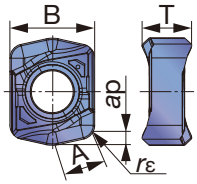
## INSERT

### LNMU06-MJ

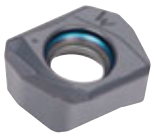


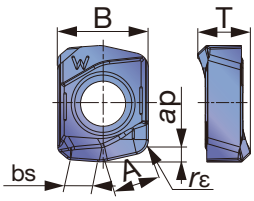

### LNMU06-ML






### LNGU06-W (2 cutting edges)






| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ★ | |
| M | Stainless | | ★ | ☆ | ☆ | |
| K | Cast iron | ★ | | ☆ | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | ☆ | ★ | | |
| H | Hard materials | | | ★ | ★ | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | AH130 | AH725 | AH3035 | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|
| LNMU06X5ZER-MJ | 2 | 1.5 | ● | ● | ● | ● | 6 | 12 | 7 | - |
| LNMU06X5ZER-ML | 2 | 1.5 | ● | ● | ● | ● | 6 | 12 | 7 | - |
| LNGU06X5ZER-W | 2 | 1.5 | | | ● | | 6 | 12 | 7 | 3.6 |

●: Line up

## STANDARD CUTTING CONDITIONS TXN06 / EXN06

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool dia.: *øDc* (mm) ø32 ~ ø200 | Plunging | ø32, z = 2 *n* | ø32, z = 2 *Vf* | ø35, z = 2 *n* | ø35, z = 2 *Vf* | ø40, z = 3 *n* | ø40, z = 3 *Vf* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon steel S45C, S55C etc. C45, C55, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 300 | 0.5 - 1.5 | 0.15 | 1,990 | 3,980 | 1,820 | 3,640 | 1,590 | 4,770 |
| | | | For wear resistance | AH120 | | | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | |
| | | | For impact resistance | AH3035 | | | | | | | | | | |
| | Alloy steel SCM440, SCr415 etc. 42CrMo4, 17Cr3, etc. | ~ 300HB | First choice | AH725 | MJ | 100 - 200 | 0.5 - 1.5 | 0.15 | 1,490 | 2,980 | 1,360 | 2,720 | 1,190 | 3,570 |
| | | | For wear resistance | AH120 | | | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | |
| | | | For impact resistance | AH3035 | | | | | | | | | | |
| | Prehardened steel NAK80, PX5, etc. | 30 ~ 40HRC | - | AH3035 | ML | 100 - 200 | 0.5 - 1 | 0.15 | 1,490 | 2,380 | 1,360 | 2,180 | 1,190 | 2,860 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | |
| M | Stainless steel SUS304, SUS316 etc. X5CrNi18-10, X5CrNiMo17-12-2, etc. | ~ 200HB | First choice | AH130 | ML | 100 - 150 | 0.3 - 0.7 | 0.1 | 1,190 | 1,190 | 1,090 | 1,090 | 950 | 1,430 |
| | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | |
| | | ~ 200HB | For impact resistance | AH130 | MJ | 100 - 150 | 0.3 - 0.8 | 0.1 | 1,190 | 1,430 | 1,090 | 1,310 | 950 | 1,710 |
| | | | | | | | | | *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | |
| K | Grey cast iron FC250, FC300, etc. GG25, GGG30, etc. | 150 ~ 250HB | First choice | AH120 | MJ | 100 - 300 | 0.5 - 1.5 | 0.15 | 1,990 | 3,980 | 1,820 | 3,640 | 1,590 | 4,770 |
| | | | | | | | | | *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH120 | ML | 100 - 300 | 0.5 - 1 | 0.15 | 1,990 | 3,180 | 1,820 | 2,910 | 1,590 | 3,820 |
| | | | | | | | | | *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | |
| | Ductile cast iron FCD400, etc. GGG40, etc. | 150 ~ 250HB | First choice | AH120 | MJ | 80 - 200 | 0.5 - 1.5 | 0.15 | 1,490 | 2,980 | 1,360 | 2,720 | 1,190 | 3,570 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | |
| | | 150 ~ 250HB | For low cutting force | AH120 | ML | 80 - 200 | 0.5 - 1 | 0.15 | 1,490 | 2,380 | 1,360 | 2,180 | 1,190 | 2,860 |
| | | | | | | | | | *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | |
| S | Titanium alloys Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | ML | 30 - 60 | 0.3 - 0.7 | 0.08 | 400 | 400 | 360 | 360 | 320 | 480 |
| | | | | | | | | | *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | |
| | Heat-resistant alloys Inconel, Hastelloy, etc. | ~ 40HRC | - | AH725 | MJ | 20 - 50 | 0.1 - 0.3 | 0.05 | 300 | 120 | 270 | 110 | 240 | 140 |
| | | | | | | | | | *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | |
| H | Hardened steel: SKD61, etc. X40CrMoV5-1, etc. | 40 ~ 50HRC | First choice | AH3035 | MJ | 80 - 130 | 0.1 - 0.3 | 0.05 | 990 | 400 | 910 | 360 | 800 | 480 |
| | | | For wear resistance | AH725 | | | | | *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | |
| | Hardened steel: SKD11, etc. X153CrMoV12, etc. | 50 ~ 60HRC | First choice | AH725 | MJ | 50 - 70 | 0.03 - 0.07 | 0.03 | 600 | 60 | 550 | 60 | 480 | 70 |
| | | | For impact resistance | AH3035 | | | | | *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | |

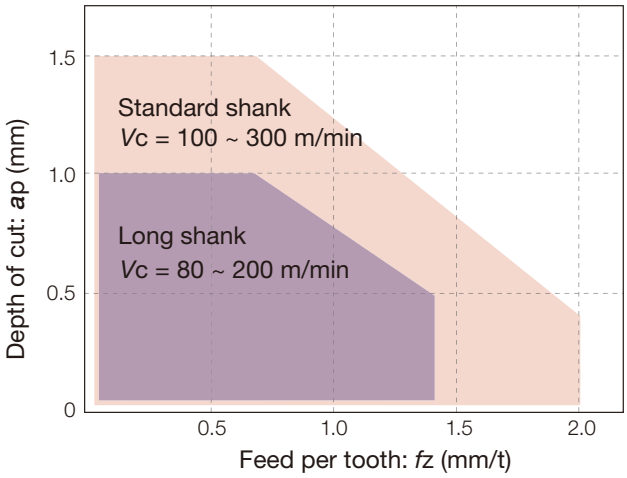
When chips stay in the cutting zone during slotting or pocketing, use air blast to remove chips from the work area.

Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

## CAUTIONARY POINTS IN USE

### The usage of a standard & long shank

When using a long shank, please lower the cutting conditions (*Vc*, *fz*, *ap*) to 70% of the maximum conditions for the standard shank.

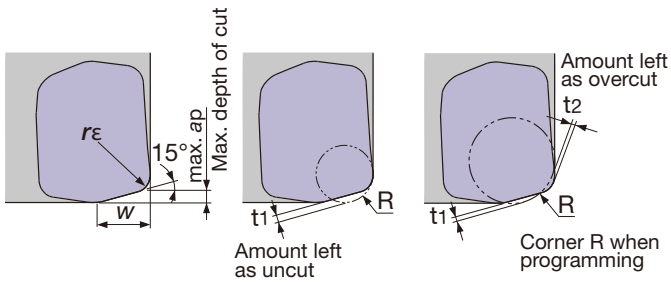



Tool dia.: *øDc* = ø32 ~ 40 mm
Workpiece material: S55C / C55 (200HB)

**L/D ratio of overhang**
Standard shank: L/D ≤ 3
Long shank: L/D = 4

### Tool geometry for programming

When programming for CAM, the tool should be considered as a radius cutters. Usually, the corner radius should be set as R = 3 mm. If a larger radius is used, overcutting will occur. The following table shows the amount left as uncut ($t_1$) and overcut ($t_2$).




| Max. depth of cut max. ap(mm) | Corner radius rε | W (mm) | Corner R when programming | Amount left as uncut t1 | Amount left as overcut t2 |
|---|---|---|---|---|---|
| 1.5 | 2 | 6 | 2 | 1 | - |
| | | | 3 | 0.77 | - |
| | | | 4 | 0.54 | 0.26 |

Each value in table is calculated theoretically at the maximum condition.

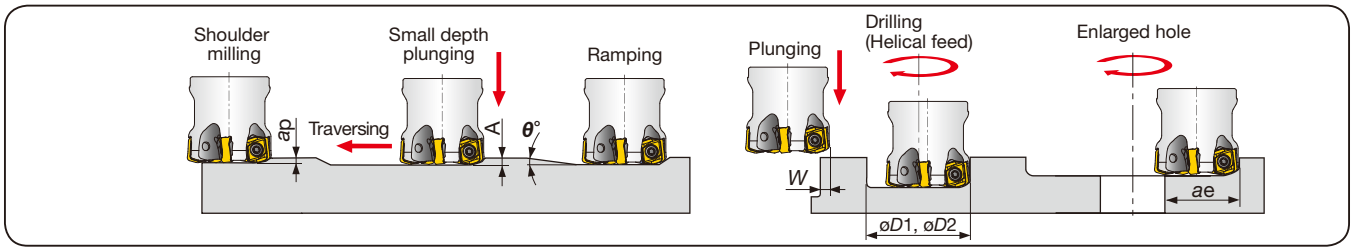
**Tool dia.: øDc (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 1.5 mm, No. of inserts: z**

| ø50 | | | ø52 | | | ø63 | | | ø66 | | | ø80 | | | ø100, z = 6 | | ø125, z = 8 | | ø160, z = 10 | | ø200, z = 12 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | | *n* | *Vf* | *n* | *Vf* | *n* | *Vf* | *n* | *Vf* |
| | z = 4 | z = 5 | | z = 4 | z = 5 | | z = 4 | z = 6 | | z = 4 | z = 6 | | z = 5 | z = 8 | | | | | | | | |
| 1,270 | 5,080 | 6,350 | 1,220 | 4,880 | 6,100 | 1,010 | 4,040 | 6,060 | 960 | 3,840 | 5,760 | 800 | 4,000 | 6,400 | 637 | 3,822 | 510 | 4,076 | 398 | 3,981 | 318 | 3,822 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,800 | 4,750 | 920 | 3,680 | 4,600 | 760 | 3,040 | 4,560 | 720 | 2,880 | 4,320 | 600 | 3,000 | 4,800 | 478 | 2,866 | 382 | 3,057 | 299 | 2,986 | 239 | 2,866 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,040 | 3,800 | 920 | 2,940 | 3,680 | 760 | 2,430 | 3,650 | 720 | 2,300 | 3,460 | 600 | 2,400 | 3,840 | 478 | 2,293 | 382 | 2,446 | 299 | 2,389 | 239 | 2,293 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 760 | 1,520 | 1,900 | 730 | 1,460 | 1,830 | 610 | 1,220 | 1,830 | 580 | 1,160 | 1,740 | 480 | 1,200 | 1,920 | 382 | 1,146 | 306 | 1,223 | 239 | 1,194 | 191 | 1,146 |
| *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 760 | 1,820 | 2,280 | 730 | 1,750 | 2,190 | 610 | 1,470 | 2,200 | 580 | 1,390 | 2,090 | 480 | 1,440 | 2,300 | 382 | 1,376 | 306 | 1,468 | 239 | 1,433 | 191 | 1,376 |
| *Vc* = 120 m/min, *fz* = 0.6 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 1,270 | 5,080 | 6,350 | 1,220 | 4,880 | 6,100 | 1,010 | 4,040 | 6,060 | 960 | 3,840 | 5,760 | 800 | 4,000 | 6,400 | 637 | 3,822 | 510 | 4,076 | 398 | 3,981 | 318 | 3,822 |
| *Vc* = 200 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 1,270 | 4,060 | 5,080 | 1,220 | 3,900 | 4,880 | 1,010 | 3,230 | 4,850 | 960 | 3,070 | 4,610 | 800 | 3,200 | 5,120 | 637 | 3,057 | 510 | 3,261 | 398 | 3,185 | 318 | 3,057 |
| *Vc* = 200 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,800 | 4,750 | 920 | 3,680 | 4,600 | 760 | 3,040 | 4,560 | 720 | 2,880 | 4,320 | 600 | 3,000 | 4,800 | 478 | 2,866 | 382 | 3,057 | 299 | 2,986 | 239 | 2,866 |
| *Vc* = 150 m/min, *fz* = 1 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 950 | 3,040 | 3,800 | 920 | 2,940 | 3,680 | 760 | 2,430 | 3,650 | 720 | 2,300 | 3,460 | 600 | 2,400 | 3,840 | 478 | 2,293 | 382 | 2,446 | 299 | 2,389 | 239 | 2,293 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 250 | 500 | 630 | 240 | 480 | 600 | 200 | 400 | 600 | 190 | 380 | 570 | 160 | 400 | 640 | 127 | 382 | 102 | 408 | 80 | 398 | 64 | 382 |
| *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 190 | 150 | 190 | 180 | 140 | 180 | 150 | 120 | 180 | 140 | 110 | 170 | 120 | 120 | 190 | 96 | 115 | 76 | 122 | 60 | 119 | 48 | 115 |
| *Vc* = 30 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 640 | 510 | 640 | 610 | 490 | 610 | 510 | 410 | 610 | 480 | 380 | 580 | 400 | 400 | 640 | 318 | 382 | 255 | 408 | 199 | 398 | 159 | 382 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | | | | | | |
| 380 | 80 | 100 | 370 | 75 | 90 | 300 | 60 | 90 | 290 | 60 | 85 | 240 | 60 | 100 | 191 | 57 | 153 | 61 | 119 | 60 | 96 | 57 |
| *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | | | | | | | | | | | | | | | | | | |

The above table shows the conditions for standard shank type cutters. When using long shank type cutters, the number of teeth may be different. In this case, the cutting conditions should be changed by referring to: "The usage of standard and long shanks" shown in previous page.

Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

## APPLICATION RANGE

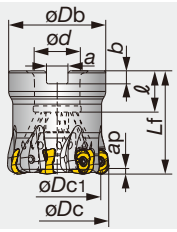


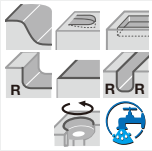

| Designation | Tool dia. øDc | Max. depth of cut Max. ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min.machinable hole dia. øD1 | Max.machinable hole dia. øD2 | Max. cutting width in enlarged hole ae |
|---|---|---|---|---|---|---|---|---|
| EXN06R032M... | ø32 | 1.5 | 2 | 0.5 | 6 | 47 | 59 | 25 |
| EXN06R035M... | ø35 | 1.5 | 1.7 | 0.5 | 6 | 53 | 65 | 28 |
| EXN06R040M... | ø40 | 1.5 | 1.3 | 0.5 | 6 | 63 | 75 | 33 |
| TXN06R050M... | ø50 | 1.5 | 0.9 | 0.5 | 6 | 83 | 95 | 43 |
| TXN06R052M... | ø52 | 1.5 | 0.8 | 0.5 | 6 | 87 | 99 | 45 |
| TXN06R063M... | ø63 | 1.5 | 0.6 | 0.5 | 6 | 109 | 121 | 56 |
| TXN06R066M... | ø66 | 1.5 | 0.5 | 0.5 | 6 | 115 | 127 | 59 |
| TXN06R080M... | ø80 | 1.5 | 0.5 | 0.5 | 6 | 143 | 155 | 73 |
| TXN06R100M... | ø100 | 1.5 | 0.34 | 0.5 | 6 | 183 | 195 | 93 |
| TXN06R125M... | ø120 | 1.5 | 0.26 | 0.5 | 6 | 223 | 235 | 108 |
| TXN06R160M... | ø160 | 1.5 | 0.2 | 0.5 | 6 | 303 | 315 | 153 |
| TXN06R200M... | ø200 | 1.5 | 0.15 | 0.5 | 6 | 383 | 395 | 193 |

· For øDc above 100 mm, slot milling, ramping or contouring is not recommended as chips may be re-cut.

# DOTWIST BALL
## TXLN
Radius cutter with double-sided insert with 4 edges

A.R. = +3°, R.R. = -13°



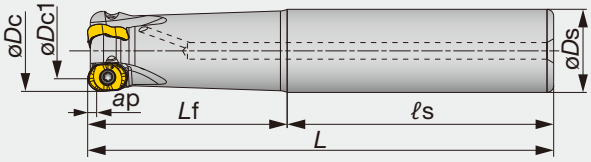

| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXLN04M040B16.0R06 | 4 | 40 | 6 | 32 | 35 | 40 | 16 | 18 | 8.4 | 5.6 | 0.35 | with | LNMX04... |
| TXLN04M050B22.0R07 | 4 | 50 | 7 | 42 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.45 | with | LNMX04... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TXLN04M040B16.0R06 | CSPD-3 | SW6-SD | M-1000 | FSHM8-30H | BLD IP10/S7 |
| TXLN04M050B22.0R07 | CSPD-3 | SW6-SD | M-1000 | CM10X30H | BLD IP10/S7 |

# DOTWIST BALL
## EXLN
Radius cutter with double-sided insert with 4 edges

A.R. = +3°, R.R. = -12° ~ -14°



| Designation | Max. ap | øDc | z | øDc1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 4 | 20 | 2 | 12 | 20 | 80 | 50 | 130 | 0.28 | with | LNMX04... |
| EXLN04M025C25.0R03 | 4 | 25 | 3 | 17 | 25 | 80 | 60 | 140 | 0.46 | with | LNMX04... |
| EXLN04M032C32.0R04 | 4 | 32 | 4 | 24 | 32 | 80 | 70 | 150 | 0.83 | with | LNMX04... |
| EXLN04M032C32.0R05 | 4 | 32 | 5 | 24 | 32 | 80 | 70 | 150 | 0.83 | with | LNMX04... |

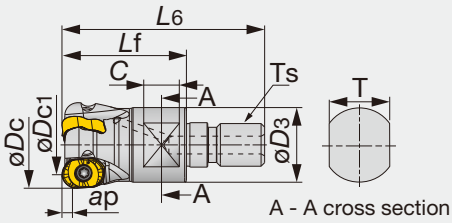
### SPARE PARTS

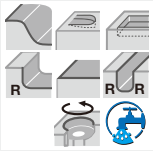
| Designation | Clamping screw | Mono block type wrench |
|---|---|---|
| EXLN04... | CSPD-3 | IP-10D |

# DOTWIST BALL
## HXLN04-M

Radius cutter with double-sided insert with 4 edges, Modular head with metric thread connection

A.R. = +3°, R.R. = -12° ~ -14°



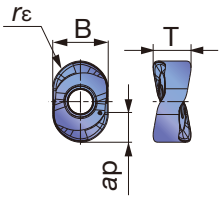
| Designation | Max. ap | øDc | z | øDc1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HXLN04M020M10R02 | 4 | 20 | 2 | 12 | 49 | 30 | 10 | 15 | 18 | M10 | 0.07 | with | LNMX04... |
| HXLN04M025M12R03 | 4 | 25 | 3 | 17 | 57 | 35 | 10 | 17 | 21 | M12 | 0.16 | with | LNMX04... |
| HXLN04M032M16R04 | 4 | 32 | 4 | 24 | 63 | 40 | 12 | 22 | 29 | M16 | 0.2 | with | LNMX04... |

### SPARE PARTS

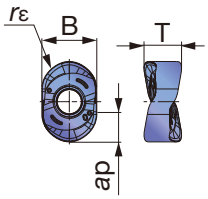
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HXLN04... | CSPD-3 | M-1000 | IP-10D |

## INSERT

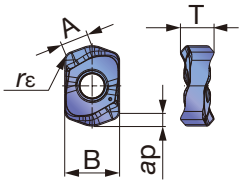
### LNMX-MJ




### LNMX-ML




### LNMX-HJ




| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | ★ | ★ |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | Coated AH3135 | A | B | T |
|---|---|---|---|---|---|---|---|
| LNMX0405R4-MJ | 4 | 4 | ● | ● | - | 8.2 | 5.6 |
| LNMX0405R4-ML | 4 | 4 | ● | ● | - | 8.2 | 5.6 |
| LNMX0405ZER-HJ | 1.3 | 1.3 | ● | ● | 4.3 | 8.2 | 5 |

●: Line up

# STANDARD CUTTING CONDITIONS

## For MJ, ML type (Radius insert)

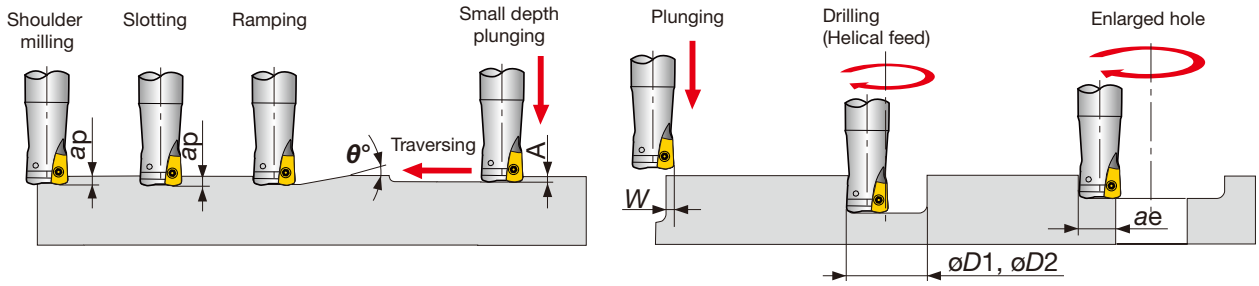
| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S15C, SS400, etc. C15, C20, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | - 300 HB | Second choice | AH3135 | ML | 150 - 250 | 0.2 - 0.6 |
| | Carbon steels, Alloy steels S55C, SCM440, etc. C55, 42CrMoS4, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | - 300 HB | Second choice | AH3135 | ML | 150 - 250 | 0.2 - 0.6 |
| | Prehardened steels NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.15 - 0.4 |
| | | | 30 - 40 HRC | Second choice | AH3135 | ML | 100 - 200 | 0.15 - 0.4 |
| M | Stainless steels SUS304, SUS304, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | First choice | AH3135 | MJ | 100 - 200 | 0.2 - 0.6 |
| | | | - 200 HB | Second choice | AH3135 | ML | 100 - 200 | 0.2 - 0.6 |
| | Stainless steels SUS410, SUS420J1, etc. X12Cr13, X20Cr13, etc. | | - 200 HB | First choice | AH3135 | MJ | 100 - 300 | 0.2 - 0.6 |
| | | | - 200 HB | Second choice | AH3135 | ML | 100 - 300 | 0.2 - 0.6 |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | 150 - 250 HB | Second choice | AH120 | ML | 150 - 250 | 0.2 - 0.6 |
| | Ductile cast irons FCD400, etc. 400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 250 | 0.2 - 0.6 |
| | | | 150 - 250 HB | Second choice | AH120 | ML | 150 - 250 | 0.2 - 0.6 |
| H | Hardened steel | SKD61, etc. X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | MJ | 50 - 150 | 0.1 - 0.3 |
| | | | 40 - 50 HRC | Second choice | AH3135 | ML | 50 - 150 | 0.1 - 0.3 |
| | | SKD11, etc. X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.05 - 0.15 |
| | | | 50 - 60 HRC | Second choice | AH120 | ML | 50 - 70 | 0.05 - 0.15 |

## For HJ type (High feed insert)

| ISO | Workpiece material | | Hardness | Priority | Grade | Chipbreaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S15C, SS400, etc. C15, C20, etc. | | - 300 HB | First choice | AH3135 | HJ | 150 - 250 | 0.5 - 1.3 |
| | | | | Second choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Carbon steels, Alloy steels S55C, SCM440, etc. C55, 42CrMoS4, etc. | | - 300 HB | First choice | AH3135 | HJ | 150 - 250 | 0.5 - 1.3 |
| | | | | Second choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Prehardened steels NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | HJ | 100 - 200 | 0.3 - 0.7 |
| | | | | Second choice | AH120 | HJ | 100 - 200 | 0.3 - 0.7 |
| M | Stainless steels SUS304, SUS304, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | First choice | AH3135 | HJ | 100 - 200 | 0.3 - 0.7 |
| | | | - 200 HB | First choice | AH3135 | HJ | 100 - 300 | 0.3 - 0.7 |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | | 150 - 250 HB | First choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| | Ductile cast irons FCD400, etc. 400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | HJ | 150 - 250 | 0.5 - 1.3 |
| H | Hardened steel | SKD61, etc. X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | HJ | 50 - 150 | 0.1 - 0.5 |
| | | | | Second choice | AH120 | HJ | 50 - 150 | 0.1 - 0.5 |
| | | SKD11, etc. X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | HJ | 50 - 70 | 0.05 - 0.2 |

Note: Recommended cutting conditions are just for reference in general machining.

## APPLICATION RANGE



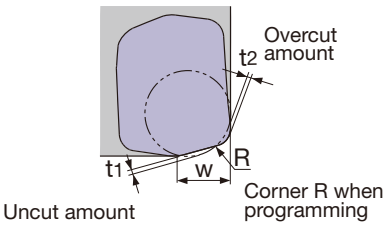

For MJ, ML type

| Designation | Tool dia. øDc | øDc1 | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machining øD1 | Max. machining øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 20 | 12 | 4 | 4.7 | 0.8 | 4 | 28 | 38 | 15 |
| EXLN04M025C25.0R03 | 25 | 17 | 4 | 3 | 0.8 | 4 | 38 | 48 | 20 |
| EXLN04M032C32.0R04 | 32 | 24 | 4 | 2 | 0.8 | 4 | 50 | 62 | 27 |
| EXLN04M032C32.0R05 | 32 | 24 | 4 | 1.7 | 0.7 | 4 | 50 | 62 | 27 |
| TXLN04M040B16.0R06 | 40 | 32 | 4 | 1.3 | 0.7 | 4 | 68 | 78 | 36 |
| TXLN04M050B22.0R07 | 50 | 42 | 4 | 1 | 0.7 | 4 | 88 | 98 | 46 |
| HXLN04M020M10R02 | 20 | 12 | 4 | 4.7 | 0.8 | 4 | 28 | 38 | 15 |
| HXLN04M025M12R03 | 25 | 17 | 4 | 3 | 0.8 | 4 | 38 | 48 | 20 |
| HXLN04M032M16R04 | 32 | 24 | 4 | 2 | 0.8 | 4 | 50 | 62 | 27 |

For HJ type

| Designation | Tool dia. øDc | øDc1 | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machining øD1 | Max. machining øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| EXLN04M020C20.0R02 | 20 | 12 | 1.3 | 4.9 | 0.75 | 4.1 | 27 | 38 | 15.5 |
| EXLN04M025C25.0R03 | 25 | 17 | 1.3 | 3 | 0.75 | 4.1 | 37 | 48 | 20.5 |
| EXLN04M032C32.0R04 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |
| EXLN04M032C32.0R05 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |
| TXLN04M040B16.0R06 | 40 | 32 | 1.3 | 1.4 | 0.75 | 4.1 | 67 | 78 | 35.5 |
| TXLN04M050B22.0R07 | 50 | 42 | 1.3 | 1 | 0.75 | 4.1 | 87 | 98 | 45.5 |
| HXLN04M020M10R02 | 20 | 12 | 1.3 | 4.9 | 0.75 | 4.1 | 27 | 38 | 15.5 |
| HXLN04M025M12R03 | 25 | 17 | 1.3 | 3 | 0.75 | 4.1 | 37 | 48 | 20.5 |
| HXLN04M032M16R04 | 32 | 24 | 1.3 | 2 | 0.75 | 4.1 | 51 | 62 | 27.5 |

## TOOL GEOMETRY FOR PROGRAMMING

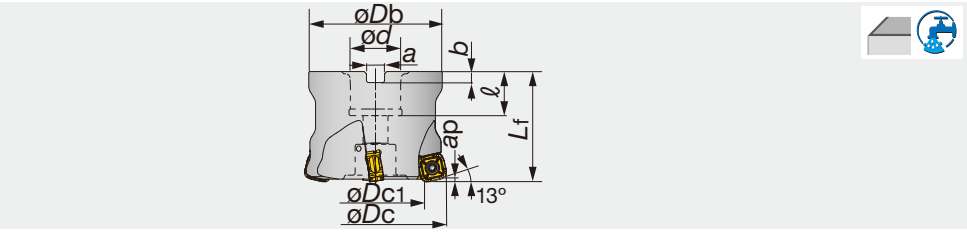



| Max. depth of cut max. ap (mm) | W (mm) | Programmed corner R (mm) | Amount left uncut t1 (mm) | Amount left overcut t2 (mm) |
|---|---|---|---|---|
| 1.3 | 4.1 | R1.5 | 0.8 | 0 |
| 1.3 | 4.1 | R2.0 | 0.65 | 0 |
| 1.3 | 4.1 | R2.5 | 0.5 | 0.05 |
| 1.3 | 4.1 | R3.0 | 0.36 | 0.2 |

MEMO

# DOFEEDQUAD
## TXQ
High feed cutter for face milling

A.R. = +7°, R.R. = -8° ~ -4.5°

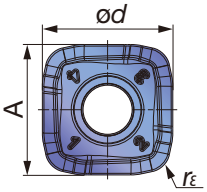


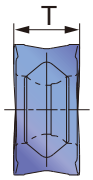

| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXQ12R050M22.0E03 | 2 | 50 | 3 | 33.8 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SQMU1206ZSR-MJ |
| TXQ12R050M22.2-03 | 2 | 50 | 3 | 33.8 | 47 | 50 | 22.225 | 20 | 8 | 5 | 0.4 | with | SQMU1206ZSR-MJ |
| TXQ12R052M22.0E03 | 2 | 52 | 3 | 35.8 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SQMU1206ZSR-MJ |
| TXQ12R063M22.0E04 | 2 | 63 | 4 | 46.8 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | SQMU1206ZSR-MJ |
| TXQ12R063M22.2-04 | 2 | 63 | 4 | 46.8 | 59 | 50 | 22.225 | 20 | 8 | 5 | 0.8 | with | SQMU1206ZSR-MJ |
| TXQ12R066M27.0E04 | 2 | 66 | 4 | 49.8 | 63 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | with | SQMU1206ZSR-MJ |
| TXQ12R080M27.0E05 | 2 | 80 | 5 | 63.8 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.6 | with | SQMU1206ZSR-MJ |
| TXQ12R080M31.7-05 | 2 | 80 | 5 | 63.8 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | SQMU1206ZSR-MJ |
| TXQ12R100M31.7-06 | 2 | 100 | 6 | 83.8 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 2.6 | with | SQMU1206ZSR-MJ |
| TXQ12R100M32.0E06 | 2 | 100 | 6 | 83.8 | 96 | 63 | 32 | 25 | 14.4 | 8 | 3 | with | SQMU1206ZSR-MJ |
| TXQ12R125M38.1-07 | 2 | 125 | 7 | 108.8 | 98 | 63 | 38.1 | 44 | 15.9 | 10 | 3.3 | with | SQMU1206ZSR-MJ |
| TXQ12R125M40.0E07 | 2 | 125 | 7 | 108.8 | 98 | 63 | 40 | 32 | 16.4 | 9 | 3.2 | with | SQMU1206ZSR-MJ |

## SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TXQ12R050, 052M22.0... | CSPB-4 | H-TBS | M-1000 | - | FSHM10-40H | BLDIP15/S7 |
| TXQ12R063M... | CSPB-4 | H-TBS | M-1000 | - | CM10X30H | BLDIP15/S7 |
| TXQ12R066, 080M27.0... | CSPB-4 | H-TBS | M-1000 | - | CM12X30H | BLDIP15/S7 |
| TXQ12R080, 100M31.7... | CSPB-4 | H-TBS | M-1000 | - | CM16X40H | BLDIP15/S7 |
| TXQ12R100M32.0E06 | CSPB-4 | H-TBS | M-1000 | - | CM16X40H | BLDIP15/S7 |
| TXQ12R125M... | CSPB-4 | H-TBS | M-1000 | TMBA-M20H | - | BLDIP15/S7 |

## INSERT
### SQMU-MJ




| | | AH120 | AH130 | AH725 | T3130 |
|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ☆ |
| M | Stainless | | ★ | ☆ | |
| K | Cast iron | ★ | | ☆ | |
| N | Non-ferrous | | | | |
| S | Superalloys | ★ | ☆ | ★ | |
| H | Hard materials | | | ★ | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | AH130 | AH725 | T3130 | A | T | ød |
|---|---|---|---|---|---|---|---|---|---|
| SQMU1206ZSR-MJ | 2 | 2 | ● | ● | ● | ● | 11.7 | 6 | 11.7 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | High carbon steels S45C, etc. C45, etc. | ~ 300HB | First choice | AH725 | 100 - 300 | 0.5 - 2 |
| | | | For wear resistance | T3130 | 100 - 300 | 0.5 - 2 |
| | | | For impact resistance | AH130 | 100 - 300 | 0.5 - 2 |
| | Alloyed steels SCM440, etc. 42CrMo4, etc. | ~ 300HB | First choice | AH725 | 100 - 200 | 0.5 - 1.5 |
| | | | For wear resistance | T3130 | 100 - 200 | 0.5 - 1.5 |
| | | | For impact resistance | AH130 | 100 - 200 | 0.5 - 1.5 |
| | Prehardened steels PX5, NAK80, etc. | 30 ~ 40HRC | - | AH725 | 100 - 200 | 0.5 - 1 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | ~ 200HB | - | AH130 | 100 - 150 | 0.3 - 0.8 |
| K | Grey cast iron FC250, etc. 250, etc. | - | - | AH120 | 100 - 300 | 0.5 - 2 |
| | Ductile cast irons FCD600, etc. 600-3, etc. | - | - | AH120 | 80 - 200 | 0.5 - 2 |
| S | Titanium alloy Ti-6Al-4V, etc. | ~ 40HRC | - | AH725 | 30 - 60 | 0.3 - 0.7 |
| H | Hardened steels SKD61, etc. X40CrMoV5-1, etc. | 40 ~ 50HRC | - | AH725 | 80 - 130 | 0.1 - 0.3 |
| | | 50 ~ 60HRC | - | AH725 | 50 - 70 | 0.03 - 0.07 |

· Slot or pocket milling is not recommended, since chip re-cutting easily occurs.
· Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.

· Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

**Tool dia.: ø*Dc* (mm), Number of revolutions: *n* ($min^{-1}$), Feed speed: *Vf* (mm/min), Max. depth of cut: *ap* = 2 mm**

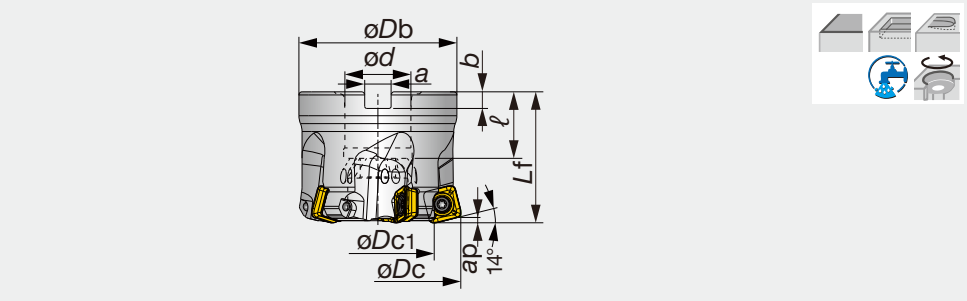
| ø50 | | ø63 | | ø80 | | ø100 | | ø125 | |
|---|---|---|---|---|---|---|---|---|---|
| ***n*** | ***Vf*** | ***n*** | ***Vf*** | ***n*** | ***Vf*** | ***n*** | ***Vf*** | ***n*** | ***Vf*** |
| 1,270 | 4,570 | 1,010 | 4,850 | 790 | 4,740 | 630 | 4,540 | 500 | 4,200 |
| *Vc* = 200 m/min, *fz* = 1.2 mm/t | | | | | | | | | |
| 950 | 2,850 | 750 | 3,000 | 590 | 2,950 | 470 | 2,820 | 380 | 2,660 |
| *Vc* = 150 m/min, *fz* = 1.0 mm/t | | | | | | | | | |
| 950 | 2,280 | 750 | 2,400 | 590 | 2,360 | 470 | 2,260 | 380 | 2,130 |
| *Vc* = 150 m/min, *fz* = 0.8 mm/t | | | | | | | | | |
| 760 | 1,140 | 600 | 1,200 | 470 | 1,180 | 380 | 1,140 | 300 | 1,050 |
| *Vc* = 120 m/min, *fz* = 0.5 mm/t | | | | | | | | | |
| 1,270 | 4,570 | 1,010 | 4,850 | 790 | 4,740 | 630 | 4,540 | 500 | 4,200 |
| *Vc* = 200 m/min, *fz* = 1.2 mm/t | | | | | | | | | |
| 950 | 3,420 | 750 | 3,600 | 590 | 3,540 | 470 | 3,380 | 380 | 3,190 |
| *Vc* = 150 m/min, *fz* = 1.2 mm/t | | | | | | | | | |
| 250 | 370 | 200 | 400 | 150 | 380 | 120 | 360 | 100 | 350 |
| *Vc* = 40 m/min, *fz* = 0.5 mm/t | | | | | | | | | |
| 630 | 380 | 500 | 400 | 390 | 390 | 310 | 370 | 250 | 350 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | |
| 380 | 60 | 300 | 60 | 235 | 60 | 190 | 60 | 150 | 50 |
| *Vc* = 60 m/min, *fz* = 0.05 mm/t | | | | | | | | | |

# MILLQFEED UAD

## TXSW

Super high-feed miling cutter with large depth of cut; Bore type

A.R. = +5°, R.R. = 0°



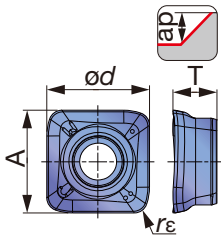

| Designation | Max. ap | øDc | z | øDc1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXSW15M050B22.0R03 | 2.5 | 50 | 3 | 24.1 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SWMT15... |
| TXSW15M063B22.0R04 | 2.5 | 63 | 4 | 37.1 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.66 | with | SWMT15... |
| TXSW15J080B31.7R05 | 2.5 | 80 | 5 | 54.1 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 1.31 | with | SWMT15... |
| TXSW15M080B27.0R05 | 2.5 | 80 | 5 | 54.1 | 76 | 63 | 27 | 22 | 12.4 | 7 | 1.41 | with | SWMT15... |
| TXSW15J100B31.7R06 | 2.5 | 100 | 6 | 74.1 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 2.25 | with | SWMT15... |
| TXSW15M100B32.0R06 | 2.5 | 100 | 6 | 74.1 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.26 | with | SWMT15... |
| TXSW15J125B38.1R07 | 2.5 | 125 | 7 | 99.1 | 100 | 63 | 38.1 | 43 | 15.9 | 10 | 2.91 | with | SWMT15... |
| TXSW15M125B40.0R07 | 2.5 | 125 | 7 | 99.1 | 100 | 63 | 40 | 37 | 16.4 | 9 | 2.83 | with | SWMT15... |
| TXSW15J160B50.8R08 | 2.5 | 160 | 8 | 134.1 | 100 | 63 | 50.8 | 46 | 19 | 11 | 3.93 | with | SWMT15... |
| TXSW15M160B40.0R08 | 2.5 | 160 | 8 | 134.1 | 100 | 63 | 40 | 37 | 16.4 | 9 | 4.23 | with | SWMT15... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Shell locking bolt 2 | Torx bit |
|---|---|---|---|---|---|---|---|
| TXSW15M050B22.0R03 | TS50115I | H-TB2W | M-1000 | - | - | SR PS 118-0273 | BT20S |
| TXSW15M063B22.0R04 | TS50115I | H-TB2W | M-1000 | - | FSHM10-40H | - | BT20S |
| TXSW15J080B31.7R05 | TS50115I | H-TB2W | M-1000 | - | CM16X40H | - | BT20S |
| TXSW15M080B27.0R05 | TS50115I | H-TB2W | M-1000 | - | CM12X30H | - | BT20S |
| TXSW15*100B... | TS50115I | H-TB2W | M-1000 | - | CM16X40H | - | BT20S |
| TXSW15*125B... | TS50115I | H-TB2W | M-1000 | TMBA-M20H | - | - | BT20M |
| TXSW15J160B50.8R08 | TS50115I | H-TB2W | M-1000 | TMBA-M24H | - | - | BT20M |
| TXSW15M160B40.0R08 | TS50115I | H-TB2W | M-1000 | TMBA-M20H | - | - | BT20M |

## INSERT

### SWMT-MJ




| | | AH120 | AH3135 |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | ★ | ★ |

★ : First choice
☆ : Second choice

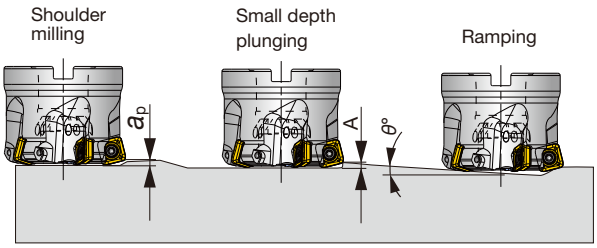
| Designation | rε | Max. ap | Coated AH120 | Coated AH3135 | A | ød | T |
|---|---|---|---|---|---|---|---|
| SWMT1506ZER-MJ | 2 | 2.5 | ● | ● | 15.9 | 15.9 | 6.8 |

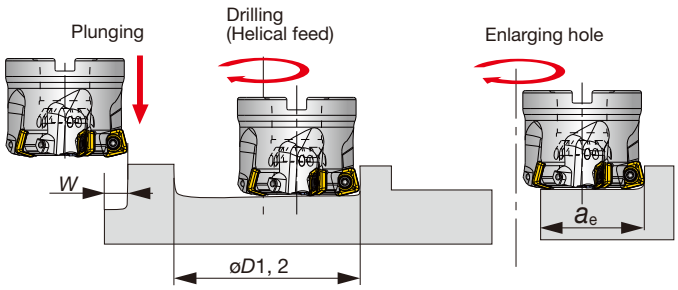
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel S15C, SS400, etc. C15E4, E275A, etc. | | - 300 HB | First choice | AH3135 | MJ | 100 - 300 | 0.5 - 2 |
| | | | - 300 HB | Second choice | AH120 | MJ | 100 - 300 | 0.5 - 2 |
| | Carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc. | | - 300 HB | First choice | AH3135 | MJ | 100 - 200 | 0.5 - 2 |
| | | | - 300 HB | Second choice | AH120 | MJ | 100 - 200 | 0.5 - 2 |
| | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.5 - 1.5 |
| | | | 30 - 40 HRC | Second choice | AH120 | MJ | 100 - 200 | 0.5 - 1.5 |
| M | Stainless steel SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - 200 HB | First choice | AH3135 | MJ | 100 - 150 | 0.3 - 1 |
| K | Grey cast iron FC250, FC300, etc. 250,300, etc. | | 150 -250 HB | First choice | AH120 | MJ | 100 - 300 | 0.5 - 2 |
| | Ductile cast iron FCD400, etc. 600-3, etc. | | 150 -250 HB | First choice | AH120 | MJ | 80 - 200 | 0.5 - 2 |
| S | Titanium alloys Ti-6Al-4V, etc. | | - 40 HRC | First choice | AH3135 | MJ | 30 - 60 | 0.3 - 0.7 |
| | Superalloys Inconel718, etc. | | - 40 HRC | First choice | AH120 | MJ | 20 - 50 | 0.1 - 0.3 |
| H | Hardened steel | SKD61, etc. X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.3 |
| | | SKD11, etc. X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.03 - 0.07 |

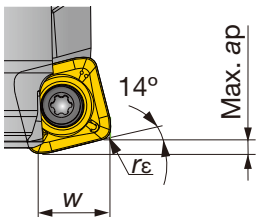
## APPLICATION RANGE

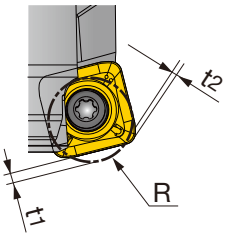



| Designation | Tool dia. øDc | Max. depth of cut ap | Max. plunging depth A | Max. ramping angle θ° | Max. cutting width in plunging W | Min. machining dia. øD1 | Max. machining dia. øD2 | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| TXSW15M050B*** | 50 | 2.5 | 0.7 | 4.8 | 15 | 70 | 95 | 36 |
| TXSW15M063B*** | 63 | 2.5 | 0.7 | 2.9 | 15 | 96 | 121 | 49 |
| TXSW15J, M080B*** | 80 | 2.5 | 0.7 | 2 | 15 | 130 | 155 | 66 |
| TXSW15J, M100B*** | 100 | 2.5 | 0.7 | 1.4 | 15 | 170 | 195 | 86 |
| TXSW15J, M125B*** | 125 | 2.5 | 0.7 | 1 | 15 | 220 | 245 | 111 |
| TXSW15J, M160B*** | 160 | 2.5 | 0.7 | 0.7 | 15 | 290 | 315 | 146 |

## TOOL GEOMETRY FOR PROGRAMMING




| Max. ap (mm) | Actual corner radius rε (mm) | W (mm) | Programmed corner radius R (mm) | Uncut amount t1 (mm) | Overcut amount t2 (mm) |
|---|---|---|---|---|---|
| 2.5 | 2 | 12.7 | 4 | 1.99 | - |
| 2.5 | 2 | 12.7 | 4.5 | 1.88 | - |
| 2.5 | 2 | 12.7 | 5 | 1.78 | 0.01 |

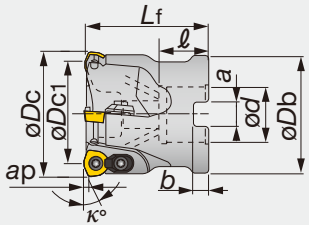
- When programming for CAM, the tool should be considered as a radius cutter. Usually, the corner radius should be set in R = 4.5 mm.
If a larger radius is used, overcutting may occur. The above table shows the uncut (t1) and overcut (t2) amounts for the programmed corner radius.

# MILLFEED

## TXP05/06/08/09

Super high feed milling cutter

A.R. = +5°, R.R. = -4° ~ -6°



| Designation | Max. *ap* | ø*Dc* | z | ø*Dc*1 | ø*Db* | *Lf* | ø*d* | *ℓ* | *a* | *b* | *κ*° | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXP05063RB-E | 1.5 | 63 | 6 | 55.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 15 | 0.8 | with | WPM*05... |
| TXP06050R | 1.5 | 50 | 4 | 41.4 | 47 | 50 | 22 | 20 | 10 | 6 | 20 | 0.4 | without | WPM*06... |
| TXP06050R2 | 1.5 | 50 | 4 | 41.4 | 47 | 50 | 22.225 | 20 | 8 | 5 | 20 | 0.4 | with | WPM*06... |
| TXP06050RA | 1.5 | 50 | 4 | 41.4 | 47 | 50 | 22 | 20 | 10 | 6 | 20 | 0.4 | with | WPM*06... |
| TXP06063RB-E | 1.5 | 63 | 5 | 54.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 20 | 0.7 | with | WPM*06... |
| TXP08050R | 1.5 | 50 | 3 | 38.6 | 47 | 50 | 22 | 19.5 | 10 | 6 | 10 | 0.4 | without | WPMT08... |
| TXP08050R2 | 1.5 | 50 | 3 | 38.6 | 47 | 50 | 22.225 | 19.5 | 8 | 5 | 10 | 0.4 | with | WPMT08... |
| TXP08050RA | 1.5 | 50 | 3 | 38.6 | 47 | 50 | 22 | 19.5 | 10 | 6 | 10 | 0.4 | with | WPMT08... |
| TXP08050R-E | 1.5 | 50 | 3 | 38.6 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.4 | without | WPMT08... |
| TXP08052R-E | 1.5 | 52 | 3 | 40.6 | 50 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.5 | without | WPMT08... |
| TXP08063R | 1.5 | 63 | 4 | 51.6 | 59 | 50 | 22 | 20 | 10 | 6 | 10 | 0.7 | without | WPMT08... |
| TXP08063R2 | 1.5 | 63 | 4 | 51.6 | 59 | 50 | 22.225 | 20 | 8 | 5 | 10 | 0.7 | with | WPMT08... |
| TXP08063RA | 1.5 | 63 | 4 | 51.6 | 59 | 50 | 22 | 20 | 10 | 6 | 10 | 0.7 | with | WPMT08... |
| TXP08063R-E | 1.5 | 63 | 4 | 51.6 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 10 | 0.7 | without | WPMT08... |
| TXP08080R | 1.5 | 80 | 5 | 68.6 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 10 | 1.4 | without | WPMT08... |
| TXP08080RA | 1.5 | 80 | 5 | 68.6 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 10 | 1.4 | with | WPMT08... |
| TXP08100R | 1.5 | 100 | 6 | 88.6 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 10 | 2.5 | without | WPMT08... |
| TXP08100RA | 1.5 | 100 | 6 | 88.6 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 10 | 2.5 | with | WPMT08... |
| TXP08125R | 1.5 | 125 | 7 | 113.6 | 80 | 63 | 38.1 | 45 | 15.9 | 10 | 10 | 3.1 | with | WPMT08... |
| TXP08160R | 1.5 | 160 | 8 | 148.6 | 100 | 63 | 50.8 | 46 | 19 | 11 | 10 | 5.1 | with | WPMT08... |
| TXP09063R | 3 | 63 | 3 | 49.4 | 59 | 50 | 22 | 20 | 10 | 6 | 20 | 0.6 | with | WPMT09... |
| TXP09063R2 | 3 | 63 | 3 | 49.4 | 59 | 50 | 22.225 | 20 | 8 | 5 | 20 | 0.6 | with | WPMT09... |
| TXP09063R-E | 3 | 63 | 3 | 49.4 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 20 | 0.6 | without | WPMT09... |
| TXP09080R | 3 | 80 | 4 | 66.4 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 20 | 1.3 | with | WPMT09... |
| TXP09100R | 3 | 100 | 5 | 86.4 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 20 | 2.4 | with | WPMT09... |
| TXP09125R | 3 | 125 | 6 | 111.4 | 98 | 63 | 38.1 | 38 | 15.9 | 10 | 20 | 3.1 | with | WPMT09... |
| TXP09160R | 3 | 160 | 7 | 146.4 | 100 | 63 | 50.8 | 38 | 19 | 11 | 20 | 4.7 | with | WPMT09... |

## TXP05/06/08/09

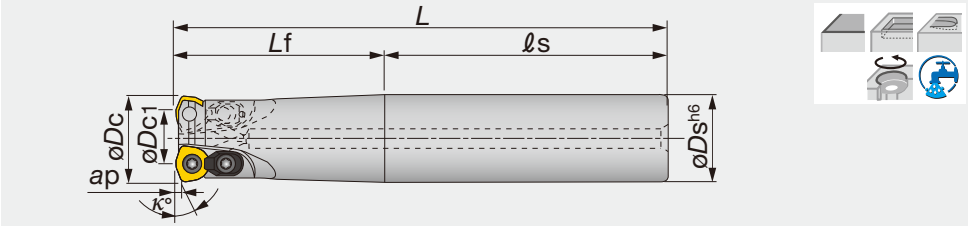
### SPARE PARTS

| Designation | Clamp set | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Shell locking bolt 2 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| TXP05063RB-E | CSY-15 | CSPB-3.5S | M-1000 | - | CM10X30H | - | IP-15D | - |
| TXP06050R | CSY-15 | CSPB-4S | M-1000 | - | - | CAP-CM10X1.5X30 | IP-15D | - |
| TXP06050R2, RA | CSY-15 | CSPB-4S | M-1000 | - | CM10X30H | - | IP-15D | - |
| TXP06063RB-E | CSY-15 | CSPB-4S | M-1000 | - | CM10X30H | - | IP-15D | - |
| TXP08050R | CSX20 | CSTB-5 | M-1000 | - | - | FSHM10-40 | - | T-20T |
| TXP08050R* | CSX20 | CSTB-5 | M-1000 | - | FSHM10-40H | - | - | T-20T |
| TXP0805*R-E | CSX20 | CSTB-5 | M-1000 | - | - | FSHM10-40 | - | T-20T |
| TXP08063R | CSX20 | CSTB-5 | M-1000 | - | - | CAP-CM10X1.5X30 | - | T-20T |
| TXP08063R2 | CSX20 | CSTB-5 | M-1000 | - | CM10X30H | - | - | T-20T |
| TXP08063RA | CSX20 | CSTB-5 | M-1000 | - | CM10X30H | - | - | T-20T |
| TXP08063R-E | CSX20 | CSTB-5 | M-1000 | - | - | - | - | T-20T |
| TXP08080R | CSX20 | CSTB-5 | M-1000 | - | - | CAP-CM16X2.0X40 | - | T-20T |
| TXP08080RA | CSX20 | CSTB-5 | M-1000 | - | CM16X40H | - | - | T-20T |
| TXP08100R | CSX20 | CSTB-5 | M-1000 | - | - | CAP-CM16X2.0X40 | - | T-20T |
| TXP08100RA | CSX20 | CSTB-5 | M-1000 | - | CM16X40H | - | - | T-20T |
| TXP08125R | CSX20 | CSTB-5 | M-1000 | TMBA-M20H | - | - | - | T-20T |
| TXP08160R | CSX20 | CSTB-5 | M-1000 | TMBA-M24H | - | - | - | T-20T |
| TXP09063R* | CSY-20 | CSPB-5 | M-1000 | - | CM10X30H | - | - | IP-20T |
| TXP09063R-E | CSY-20 | CSPB-5 | M-1000 | - | - | - | - | IP-20T |
| TXP09080R | CSY-20 | CSPB-5 | M-1000 | - | CM16X40H | - | - | IP-20T |
| TXP09100R | CSY-20 | CSPB-5 | M-1000 | - | CM16X40H | - | - | IP-20T |
| TXP09125R | CSY-20 | CSPB-5 | M-1000 | TMBA-M20H | - | - | - | IP-20T |
| TXP09160R | CSY-20 | CSPB-5 | M-1000 | TMBA-M24H | - | - | - | IP-20T |

# EXP05/06/08/09

## Super high feed endmill

A.R. = +5°, R.R. = -6°



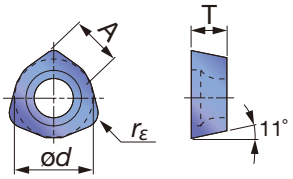

| Designation | Max. ap | øDc | z | øDc1 | øDs | L | Lf | ℓs | κ° | Air hole | Insert | shank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXP05020RL | 1.5 | 20 | 2 | 12.4 | 20 | 180 | 100 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05020RLL | 1.5 | 20 | 2 | 12.4 | 20 | 250 | 130 | 120 | 15 | with | WPM*05... | Cylindrical |
| EXP05020RS | 1.5 | 20 | 2 | 12.4 | 20 | 130 | 50 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RL | 1.5 | 21 | 2 | 13.4 | 20 | 180 | 100 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RLL | 1.5 | 21 | 2 | 13.4 | 20 | 250 | 50 | 200 | 15 | with | WPM*05... | Cylindrical |
| EXP05021RS | 1.5 | 21 | 2 | 13.4 | 20 | 130 | 50 | 80 | 15 | with | WPM*05... | Cylindrical |
| EXP06025RL | 1.5 | 25 | 2 | 16.4 | 25 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06025RLL | 1.5 | 25 | 2 | 16.4 | 25 | 300 | 180 | 120 | 20 | with | WPM*06... | Cylindrical |
| EXP06025RS | 1.5 | 25 | 2 | 16.4 | 25 | 140 | 60 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RL | 1.5 | 26 | 2 | 17.4 | 25 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RLL | 1.5 | 26 | 2 | 17.4 | 25 | 300 | 60 | 240 | 20 | with | WPM*06... | Cylindrical |
| EXP06026RS | 1.5 | 26 | 2 | 17.4 | 25 | 140 | 60 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RL | 1.5 | 32 | 2 | 23.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RLB | 1.5 | 32 | 3 | 23.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RLL | 1.5 | 32 | 2 | 23.4 | 32 | 300 | 180 | 120 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RS | 1.5 | 32 | 2 | 23.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06032RSB | 1.5 | 32 | 3 | 23.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RL | 1.5 | 33 | 2 | 24.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RLB | 1.5 | 33 | 3 | 24.4 | 32 | 200 | 120 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RLL | 1.5 | 33 | 2 | 24.4 | 32 | 300 | 70 | 230 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RS | 1.5 | 33 | 2 | 24.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06033RSB | 1.5 | 33 | 3 | 24.4 | 32 | 150 | 70 | 80 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RL | 1.5 | 40 | 3 | 31.4 | 32 | 250 | 50 | 200 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RLL | 1.5 | 40 | 3 | 31.4 | 32 | 300 | 50 | 250 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RLS42 | 1.5 | 40 | 3 | 31.4 | 42 | 250 | 50 | 200 | 20 | with | WPM*06... | Cylindrical |
| EXP06040RS | 1.5 | 40 | 3 | 31.4 | 32 | 150 | 50 | 100 | 20 | with | WPM*06... | Cylindrical |
| EXP08040RLA | 1.5 | 40 | 2 | 28.6 | 32 | 250 | 50 | 200 | 10 | with | WPMT08... | Cylindrical |
| EXP08040RLL | 1.5 | 40 | 2 | 28.6 | 32 | 300 | 50 | 250 | 10 | with | WPMT08... | Cylindrical |
| EXP08040RSA | 1.5 | 40 | 2 | 28.6 | 32 | 150 | 50 | 100 | 10 | with | WPMT08... | Cylindrical |
| EXP09050RS | 3 | 50 | 2 | 36.4 | 42 | 150 | 50 | 100 | 20 | with | WPMT09... | Cylindrical |
| EXP09050RL | 3 | 50 | 2 | 36.4 | 42 | 250 | 50 | 200 | 20 | with | WPMT09... | Cylindrical |

## SPARE PARTS

| Designation | Clamp set | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| EXP050... | - | CSPB-3.5S | M-1000 | IP-15D | - |
| EXP060... | CSY-15 | CSPB-4S | M-1000 | IP-15D | - |
| EXP080... | CSX20 | CSTB-5 | M-1000 | - | T-20T |
| EXP090... | CSY-20 | CSPB-5 | M-1000 | - | IP-20T |

# INSERT

## WPMW05/06

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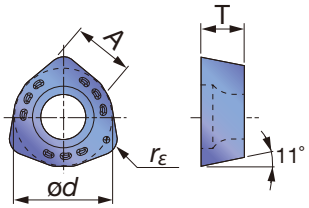
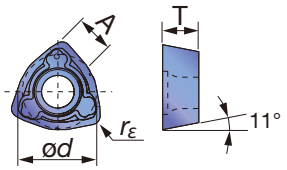
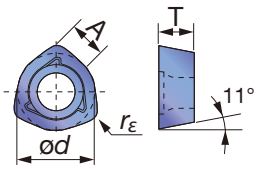


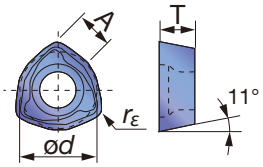

## WPMT05/06/08/09-ML




## WPMT05/06/08/09-MH




## WPMT05/06/08/09-DML




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | ★ | | | | | | | |
| M | Stainless | | ★ | ★ | | | | | | | | | |
| K | Cast iron | ★ | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | ★ | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | | | | | | | | | | | | | A | ød | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH730 | T3130 | | | | | | | | | | | | | | | | | |
| WPMW05H315ZPR | 1.5 | 1.5 | ● | | ● | | ● | | | | | | | | | | | | | | | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-ML | 1.5 | 1.5 | ● | | ● | | ● | | | | | | | | | | | | | | | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-MH | 1.5 | 1.5 | ● | | ● | | | | | | | | | | | | | | | | | 5 | 7.94 | 3.5 |
| WPMT05H315ZPR-DML | 1.5 | 1.5 | | | | ● | | | | | | | | | | | | | | | | 5 | 7.94 | 3.5 |
| WPMW06X415ZPR | 1.5 | 1.5 | ● | | ● | | ● | | | | | | | | | | | | | | | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-ML | 1.5 | 1.5 | ● | ● | ● | | ● | | | | | | | | | | | | | | | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-MH | 1.5 | 1.5 | ● | | ● | | | | | | | | | | | | | | | | | 6 | 9.525 | 4.2 |
| WPMT06X415ZPR-DML | 1.5 | 1.5 | | | | ● | | | | | | | | | | | | | | | | 6 | 9.525 | 4.2 |
| WPMT080615ZSR | 1.5 | 1.5 | ● | ● | ● | | ● | | | | | | | | | | | | | | | 8 | 12.87 | 6.35 |
| WPMT080615ZPR-ML | 1.5 | 1.5 | ● | ● | ● | | ● | | | | | | | | | | | | | | | 8 | 12.87 | 6.35 |
| WPMT080615ZSR-MH | 1.5 | 1.5 | ● | | ● | | | | | | | | | | | | | | | | | 8 | 12.87 | 6.35 |
| WPMT080615ZPR-DML | 1.5 | 1.5 | | | | ● | | | | | | | | | | | | | | | | 8 | 12.87 | 6.35 |
| WPMT090725ZSR | 2.5 | 3 | ● | | ● | | ● | | | | | | | | | | | | | | | 9 | 15 | 7 |
| WPMT090725ZPR-ML | 2.5 | 3 | ● | ● | ● | | ● | | | | | | | | | | | | | | | 9 | 15 | 7 |
| WPMT090725ZSR-MH | 2.5 | 3 | ● | ● | ● | | | | | | | | | | | | | | | | | 9 | 15 | 7 |
| WPMT090725ZPR-DML | 2.5 | 3 | | | | ● | | | | | | | | | | | | | | | | 9 | 15 | 7 |

●: Line up

# STANDARD CUTTING CONDITIONS

## 05·06 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø20, 21 (z = 2) | ø25, 26 (z = 2) | ø32, 33 (z = 2, 3) | ø40 (z = 3) | ø63 (z = 5, 6) | ø80 (z = 6, 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels S50C, etc. C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 0.8 mm/t *ap* =1 mm, *ae* = 1D mm | *Vc* = 150 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| | Alloy steels SCM440, etc. 42CrMo4etc, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | | |
| M | Stainless steels SUS304, etc. X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 100 ~ 250 | 0.8 ~ 2.5 | *Vc* = 150 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 1D mm | *Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | | |
| H | Hard materials SKD11, etc. X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 50 ~ 80 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | | |

## 08 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø40 (z = 2) | ø50 (z = 3) | ø63 (z = 4) | ø80 (z = 5) | ø100 (z = 6) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels S50C, etc. C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 180 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 200 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 100 m/min, *fz* = 0.5 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 120 m/min, *fz* = 0.8 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |
| M | Stainless steels SUS304, etc. X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 130 m/min, *fz* = 1 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 150 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 150 ~ 250 | 0.8 ~ 2.5 | *Vc* = 180 m/min, *fz* = 1.5 mm/t *ap* = 1 mm, *ae* = 40 mm | *Vc* = 200 m/min, *fz* = 2 mm/t *ap* = 1 mm, *ae* = 1D mm | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| H | Hard materials SKD11, etc. X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 50 ~ 80 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |

Note: • The above values of cutting speed show the standard speed when overhang length of tool is below 3D. The cutting speed and the feed rate should be set at the lower limit values when overhang length of tool exceeds 3D.
• Thick and heavy chips are discharged by these TAC mills. Use internal air supply or air-blowing in order to prevent tool failure.

# STANDARD CUTTING CONDITIONS

## 09 type

| ISO | Workpiece material | Insert grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | ø50 (z = 2) | ø63 (z = 3) | ø80 (z = 4) | ø100 (z = 5) | ø125 (z = 6) |
|---|---|---|---|---|---|---|---|---|---|
| P | Carbon Steels S50C, etc. C50, etc. < 300HB | AH120 (T3130) | 100 ~ 250 | 0.5 ~ 2 | *Vc* = 200 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Alloy steels SCM440, etc. 42CrMo4etc, etc. < 300 HB | AH120 (T3130) | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| | Prehardened steels NAK80, PX5, X96CrMoV12, etc. 30 ~ 40HRC | AH120 (T3130) | 80 ~ 150 | 0.5 ~ 1 | *Vc* = 120 m/min, *fz* = 0.8 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |
| M | Stainless steels SUS304, etc. X5CrNi18 9, etc. | AH130 AH140 | 100 ~ 200 | 0.5 ~ 2 | *Vc* = 150 m/min, *fz* = 1.5 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 150 ~ 250 | 0.8 ~ 2.5 | *Vc* = 200 m/min, *fz* = 2 mm/t, *ap* = 2 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.2 mm/t | | | | |
| H | Hard materials SKD11, etc. X153CrMoV12, etc. 40 ~ 50HRC | AH730 | 60 ~ 100 | 0.5 ~ 1 | *Vc* = 70 m/min, *fz* = 0.7 mm/t, *ap* = 0.7 mm, *ae* = 1D mm | | | | |
| | | | | | When plunging in small depth: *fz* = 0.1 mm/t | | | | |

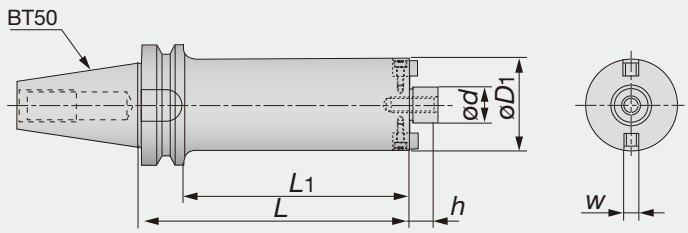
Notes : The cutting speed and feed should be set to 70 to 80 % of the value shown in the above table when overhang length of tool exceeds 3D.

# MILLFEED

## BT50-FMC/FMA

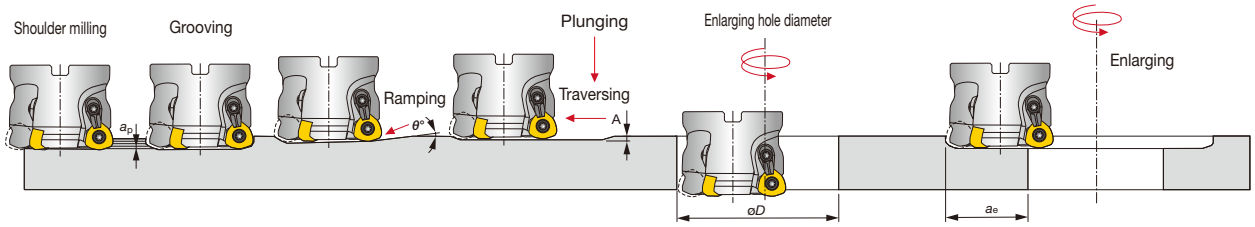
Arbors for “TXP” cutters

*Without air hole




| Designation | *L* | *L*1 | ø*D*1 | ø*d* | *h* | *w* | Kg | Applicable Mills |
|---|---|---|---|---|---|---|---|---|
| BT50-FMC22-138-47 | 138 | 100 | 47 | 22 | 18 | 10 | 5.2 | TXP06050R...<br>TXP08050R... |
| BT50-FMC22-188-47 | 188 | 150 | 47 | 22 | 18 | 10 | 5.9 | |
| BT50-FMC22-243-47 | 243 | 205 | 47 | 22 | 18 | 10 | 6.5 | |
| BT50-FMC22-293-47 | 293 | 255 | 47 | 22 | 18 | 10 | 7.2 | |
| BT50-FMC22-178-59 | 178 | 140 | 59 | 22 | 18 | 10 | 6.8 | TXP08063R...<br>TXP09063R... |
| BT50-FMC22-238-59 | 238 | 200 | 59 | 22 | 18 | 10 | 8 | |
| BT50-FMC22-308-59 | 308 | 270 | 59 | 22 | 18 | 10 | 9.5 | |
| BT50-FMC22-373-59 | 373 | 335 | 59 | 22 | 18 | 10 | 10.9 | |
| BT50-FMA31.75-215-76 | 215 | 177 | 76 | 31.75 | 30 | 12.7 | 10 | TXP08080R...<br>TXP09080R... |
| BT50-FMA31.75-295-76 | 295 | 257 | 76 | 31.75 | 30 | 12.7 | 12.9 | |
| BT50-FMA31.75-375-76 | 375 | 337 | 76 | 31.75 | 30 | 12.7 | 15.8 | |
| BT50-FMA31.75-275-96 | 275 | 237 | 96 | 31.75 | 30 | 12.7 | 16.8 | TXP08100R...<br>TXP09100R... |
| BT50-FMA31.75-375-96 | 375 | 337 | 96 | 31.75 | 30 | 12.7 | 23 | |

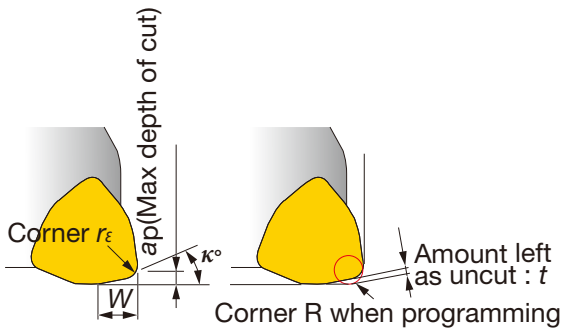
## APPLICATION RANGE




| Designation | øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining hole dia. øD | Max. machining hole dia. øD | Max. cutting width in enlarging hole ae |
|---|---|---|---|---|---|---|---|
| EXP05020RS/L | 20 | 1.5 | 3 | 0.5 | 30 | 37 | 16 |
| EXP05021RS/L | 21 | 1.5 | 2.5 | 0.5 | 32 | 39 | 17 |
| TXP05063RB-E | 63 | 1.5 | 1 | 0.5 | 116 | 123 | 59 |
| TXP05080RB-E | 80 | 1.5 | 0.5 | 0.5 | 150 | 157 | 76 |
| E/HXP06025... | 25 | 1.5 | 5 | 1 | 33 | 47 | 20 |
| E/HXP06026... | 26 | 1.5 | 4.5 | 1 | 35 | 49 | 21 |
| E/HXP06032... | 32 | 1.5 | 3.5 | 1 | 47 | 61 | 27 |
| E/HXP06033... | 33 | 1.5 | 3 | 1 | 49 | 63 | 28 |
| E/HXP06040... | 40 | 1.5 | 2 | 1 | 63 | 77 | 35 |
| HXP06050R... | 50 | 1.5 | 1.5 | 1 | 83 | 97 | 45 |
| TXP06063RB-E | 63 | 1.5 | 1 | 1 | 109 | 123 | 58 |
| TXP06080RB-E | 80 | 1.5 | 0.5 | 1 | 143 | 157 | 75 |
| E/HXP08040R/L | 40 | 1.5 | 6 | 1 | 53 | 77 | 34 |
| T/HXP08050... | 50 | 1.5 | 4 | 1 | 72 | 97 | 44 |
| TXP08052R-E | 52 | 1.5 | 4 | 1 | 76 | 101 | 46 |
| TXP08063... | 63 | 1.5 | 2.5 | 1 | 98 | 123 | 57 |
| TXP08066R-E | 66 | 1.5 | 2.5 | 1 | 104 | 129 | 60 |
| TXP08080... | 80 | 1.5 | 1.5 | 1 | 132 | 157 | 74 |
| TXP08100... | 100 | 1.5 | 1 | 1 | 172 | 197 | 94 |
| EXP09050RS/L | 50 | 3 | 1.5 | 0.8 | 76 | 97 | 43 |
| HXP09050R... | 50 | 3 | 1.5 | 0.8 | 76 | 97 | 43 |
| TXP09063R... | 63 | 3 | 2 | 1.5 | 98 | 123 | 56 |
| TXP09080R... | 80 | 3 | 1.5 | 1.5 | 132 | 157 | 73 |
| TXP09100R... | 100 | 3 | 1 | 1.5 | 172 | 197 | 93 |
| TXP09125R... | 125 | 3 | 0.75 | 1.5 | 222 | 247 | 118 |

## TOOL GEOMETRY FOR PROGRAMMING

When programming for CAD/CAM, the tool should be assumed to be a radius cutter shown in the table below. In this case, the amount left as uncut (t) is shown below.



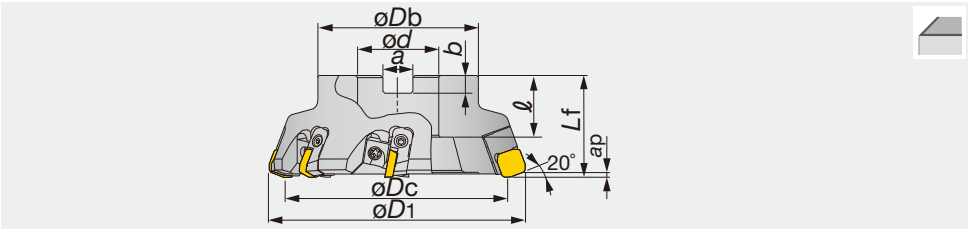

| TXP | Max. depth of cut ap | Corner of insert rε | Cutting edge angle κ° | W | t | Corner R when programming |
|---|---|---|---|---|---|---|
| 05 | 1.5 | 1.5 | 15 | 3.8 | 0.5 | R2 |
| 06 | 1.5 | 1.5 | 20 | 4.3 | 0.7 | R2.5 |
| 08 | 1.5 | 1.5 | 10 | 5.7 | 0.7 | R2 |
| 09 | 3 | 2.5 | 20 | 6.8 | 1.4 | R3 |
| 09 | 3 | 2.5 | 20 | 6.8 | 1.2 | R4 |

# MILLFEED

## TXD15

Highly productive face mill with super high feed

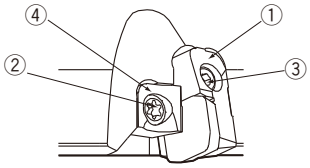
A.R. = +9.5°, R.R. = -5°




| Designation | Max. ap | øDc | z | øD1 | øDb | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TXD15125R | 3 | 106 | 6 | 125 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.4 | SD*N1504ZDSR |
| TXD15160R | 3 | 141 | 8 | 160 | 100 | 63 | 50.8 | 38 | 19 | 11 | 4.2 | SD*N1504ZDSR |
| TXD15200R | 3 | 181 | 10 | 200 | 130 | 63 | 47.625 | 38 | 25.4 | 14 | 6.7 | SD*N1504ZDSR |
| TXD15250R | 3 | 231 | 12 | 250 | 130 | 63 | 47.625 | 38 | 25.4 | 14 | 12.3 | SD*N1504ZDSR |

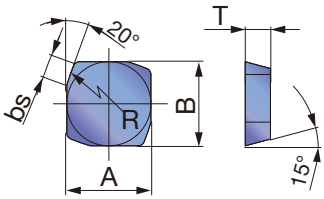
### SPARE PARTS

| Designation | ①Locator | ②Right-left screw | ③Screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TXD15... | LD150R | FDS-8ST-18 | CM4X0.7X20 | WF150R | T-27T |




## INSERTS

### SDCN/SDEN/SDNN 15




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | |
| M | Stainless | | ★ | | | |
| K | Cast iron | ★ | | ★ | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated | | | | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | T1115 | T3130 | | | | |
| SDCN1504ZDSR | 3 | ● | ● | | ● | 15.875 | 15.875 | 4.76 | 3.7 |
| SDEN1504ZDSR | 3 | ● | ● | ● | ● | 15.875 | 15.875 | 4.76 | 3 |
| SDNN1504ZDSR | 3 | ● | ● | ● | ● | 15.875 | 15.875 | 4.76 | 3 |

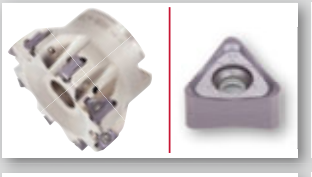
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Work materials | Grades | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) | Width of cut *ae* (mm) | Cutting fluid |
|---|---|---|---|---|---|---|---|
| P | Carbon steels<br>S50C, etc.<br>C50, etc.<br>< 300 HB | T3130 | 150 - 280 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| | | AH120 | 150 - 250 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| | Alloy steels<br>SCM440, etc.<br>41Cr4, etc.<br>< 300 HB | T3130 | 150 - 250 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| | | AH120 | 100 - 200 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| | Alloy steels<br>(Prehardened steels etc.)<br>30 ~ 40 HRC | T3130 | 100 - 200 | 0.5 - 1 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| | | AH120 | 80 - 150 | 0.5 - 1 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| M | Stainless steels<br>SUS304, etc.<br>X5CrNi18-9, etc. | AH140 | 150 - 250 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| K | Cast irons<br>FC250, etc.<br>GG25, etc. | T1115 | 100 - 250 | 1 - 2 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |
| H | Hard materials<br>40 ~ 50HRC | AH120 | 60 - 100 | 0.5 - 1 | 3.0 | ø*D*1 | Dry<br>(or air-blowing) |

Note:
- When ap and ae are the higher limit, use the lower limit of feed rate value shown above.
- The maximum depth of cut for these TAC mills are 3 mm. For milling the work material with rough outer skin or many interrupted areas, reduce the feed per tooth and the maximum depth of cut to 1/2 to 2/3 of the values shown in the table.
- The cutting condition is limited by machine rigidity and power. The operation should be started half of the recommended speed. The amount of vibration and machine power should then be evaluated before increasing the cutting speed.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- This TAC mill is not designed to cope with the centrifugal force and dynamic balance at high speeds over 1000 m/mim. Therefore, the cutting speed in the outer diameter of the mill should not exceed 1000 m/min.

# MillLine - Shoulder Milling



## DOFORCE TRI
D038

Economical and versatile shoulder mills with double-sided triangular inserts

90° ø32 - ø125 mm
max. ap 11 mm

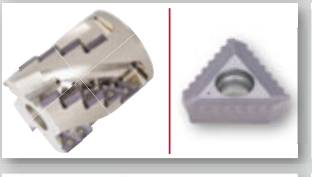
P M K S

## TUNG-TRI
D042

High-precision shoulder mills with single-sided triangular inserts

90° ø12 - ø160 mm
max. ap 15 mm

P M K S



## TUNG TRI SHRED
D051

Square shoulder milling cutters for roughing to produce shredded chips

90° ø50 - ø100 mm
max. ap 16 mm

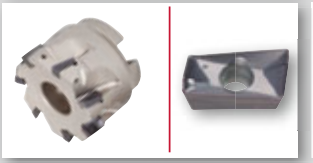
P M K S

## TUNGFORCE REC
D054

Mini square shoulder milling cutters for high productivity

90° ø8 - ø16 mm
max. ap 6 mm

P M K N S H



## TUNGREC
D058

Excellent surface finish and wall accuracy in shoulder milling

90° ø12 - ø160 mm
max. ap 16.7 mm

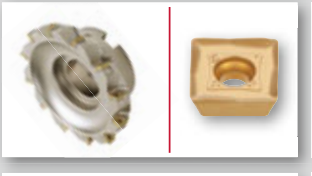
P M K N S

## TUNGQUAD
D074

Ideal tool for milling small parts on small machines

90° ø12 - ø40 mm
max. ap 4 mm

P M K N

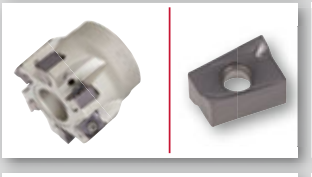


## TUNGMILL
D078

Single-sided inserts with low cutting force for shoulder milling

90° ø50 - ø125 mm
max. ap 10 mm

P M K N

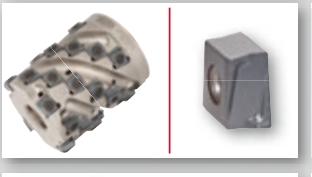


## DOREC
D084

Shoulder milling cutters for general purpose with 4-cornered double-sided inserts

90° ø25 - ø160 mm
max. ap 16 mm

P M K S

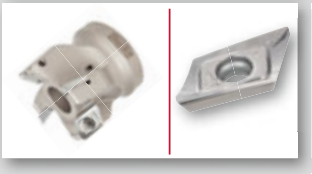


## TECMILL
D088

Shoulder milling cutters for heavy duty with 4-cornered tangentially mounted inserts

90° ø32 - ø125 mm
max. ap 15.1 mm

P M K S



## TUNG-ALUMILL
D090

Highly polished and positive routing cutters for aluminium and non-ferrous metals

90° ø25 - ø125 mm
max. ap 16 mm

N

## Other Shoulder Milling Tools
D093

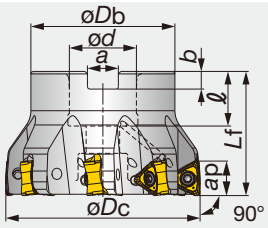
EPH, ELP, EPE, T/EPS17, PES, TSD, THE, TPP, T/ESE3000/4000, TSP4000, TFP4000, DEB1000

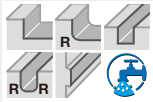
DoForce-Tri

## TPTN12

Square Shoulder milling cutters with double-sided triangular insert

A.R. = +4.2°~ +4.7°, R.R. = -15.4°~ -11.2°




| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | C.bolt | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPTN12M050B22.0R04 | 11 | 50 | 4 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | CM10X30H | TN*U12... |
| TPTN12M050B22.0R05 | 11 | 50 | 5 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | CM10X30H | TN*U12... |
| TPTN12M063B22.0R05 | 11 | 63 | 5 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | CM10X30H | TN*U12... |
| TPTN12M063B22.0R06 | 11 | 63 | 6 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | CM10X30H | TN*U12... |
| TPTN12J080B25.4R06 | 11 | 80 | 6 | 58 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12J080B25.4R08 | 11 | 80 | 8 | 58 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12M080B27.0R06 | 11 | 80 | 6 | 58 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12M080B27.0R08 | 11 | 80 | 8 | 58 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | CM12X30H | TN*U12... |
| TPTN12J100B31.7R07 | 11 | 100 | 7 | 67 | 50 | 31.75 | 32 | 12.7 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12J100B31.7R10 | 11 | 100 | 10 | 67 | 50 | 31.75 | 32 | 12.7 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12M100B32.0R07 | 11 | 100 | 7 | 67 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12M100B32.0R10 | 11 | 100 | 10 | 67 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | TMBA-M16H | TN*U12... |
| TPTN12J125B38.1R08 | 11 | 125 | 8 | 71 | 63 | 38.1 | 38 | 15.9 | 10 | 2.4 | with | TMBA-M20H | TN*U12... |
| TPTN12J125B38.1R12 | 11 | 125 | 12 | 71 | 63 | 38.1 | 38 | 15.9 | 10 | 2.5 | with | TMBA-M20H | TN*U12... |
| TPTN12M125B40.0R08 | 11 | 125 | 8 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.3 | with | TMBA-M20H | TN*U12... |
| TPTN12M125B40.0R12 | 11 | 125 | 12 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.4 | with | TMBA-M20H | TN*U12... |

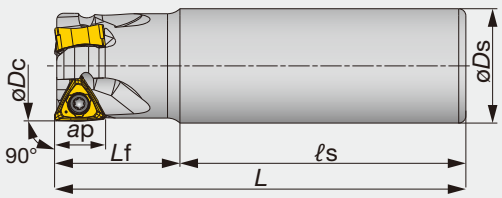
### SPARE PARTS

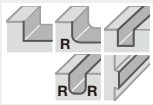
| Designation | Clamping screw | Grip | Torx bit | Lubricant | Shell locking bolt | Shell locking bolt 1 |
|---|---|---|---|---|---|---|
| TPTN12M050, 063B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | - | CM10X30H |
| TPTN12*080B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | - | CM12X30H |
| TPTN12*100B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | TMBA-M16H | - |
| TPTN12*125B... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 | TMBA-M20H | - |

## EPTN12

Square Shoulder milling endmills with double-sided triangular insert

A.R. = +4.2°~ +4.7°, R.R. = -15.4°~ -11.2°



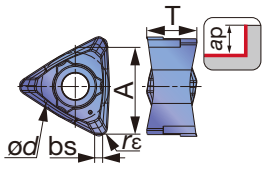

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPTN12M032C32.0R02N | 11 | 32 | 2 | 32 | 80 | 35 | 115 | 0.7 | without | TN*U12... |
| EPTN12M032C32.0R03N | 11 | 32 | 3 | 32 | 80 | 35 | 115 | 0.7 | without | TN*U12... |
| EPTN12M040C32.0R03N | 11 | 40 | 3 | 32 | 80 | 35 | 115 | 0.8 | without | TN*U12... |
| EPTN12M040C32.0R04N | 11 | 40 | 4 | 32 | 80 | 35 | 115 | 0.8 | without | TN*U12... |

### SPARE PARTS

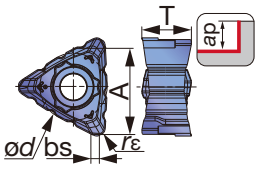
| Designation | Clamping screw | Grip | Torx bit | Lubricant |
|---|---|---|---|---|
| EPTN12... | CSPB-3.5 | H-TB2W | BLDIP15/S7 | M-1000 |

## INSERT

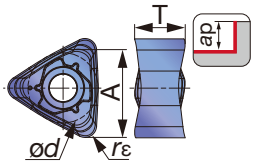
### TNGU-MJ




### TNGU-NMJ




### TNMU-R-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | |
| M | Stainless | | ★ | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH3135 | | | | |
| TNGU120708PER-MJ | 0.8 | 11 | ● | ● | 12 | 9.525 | 7.04 | 1.16 |
| TNGU120708PER-NMJ | 0.8 | 11 | ● | ● | 12 | 9.525 | 7.04 | 1.16 |
| TNMU1207R16PER-MJ | 1.6 | 11 | ● | ● | 12 | 9.525 | 7.04 | - |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, SS400, etc.<br>C15E4, E275A, etc. | - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.08 - 0.3 |
| | | - 300 HB | For low cutting force | AH3135 | NMJ | 100 - 250 | 0.08 - 0.14 |
| | Carbon steel and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | - 300 HB | First choice | AH3135 | MJ | 100 - 230 | 0.08 - 0.3 |
| | | - 300 HB | For low cutting force | AH3135 | NMJ | 100 - 230 | 0.08 - 0.14 |
| | Prehardened steel<br>NAK80, PX5, etc. | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 180 | 0.08 - 0.25 |
| | | 30 - 40 HRC | For low cutting force | AH3135 | NMJ | 100 - 180 | 0.08 - 0.14 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | First choice | AH3135 | MJ | 90 - 200 | 0.08 - 0.25 |
| | | - | For low cutting force | AH3135 | NMJ | 90 - 200 | 0.08 - 0.14 |
| K | Grey cast iron<br>FC250, FC300, etc.<br>250, 300, etc. | 150 - 250 HB | First choice | AH120 | MJ | 140 - 250 | 0.08 - 0.3 |
| | | 150 - 250 HB | For low cutting force | AH120 | NMJ | 140 - 250 | 0.08 - 0.14 |
| | Ductile cast iron<br>FCD400, etc.<br>600-3, etc. | 150 - 250 HB | First choice | AH120 | MJ | 110 - 200 | 0.08 - 0.25 |
| | | 150 - 250 HB | For low cutting force | AH120 | NMJ | 110 - 200 | 0.08 - 0.14 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | First choice | AH120 | MJ | 20 - 60 | 0.08 - 0.2 |
| | | - | For low cutting force | AH120 | NMJ | 20 - 60 | 0.08 - 0.14 |
| | Heat-resistant alloys<br>Inconel718, etc. | - | First choice | AH120 | MJ | 20 - 40 | 0.07 - 0.18 |
| | | - | For low cutting force | AH120 | NMJ | 20 - 40 | 0.07 - 0.14 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

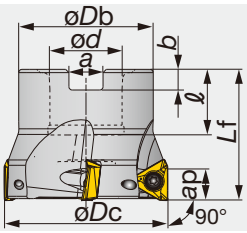
MEMO

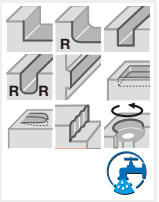
# TUNG-TRI

## TPA06

High precision square shoulder milling cutters with triangular inserts

A.R. = +8.5°~ +11.5°, R.R. = -5.5°~ -12.5°



| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA06R032M16.0E05 | 6 | 32 | 5 | 30 | 16 | 18 | 40 | 5.6 | 8.4 | 0.14 | with | TOMT06... |
| TPA06R040M16.0E06 | 6 | 40 | 6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.22 | with | TOMT06... |
| TPA06R050M22.0E08 | 6 | 50 | 8 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.31 | with | TOMT06... |

### SPARE PARTS

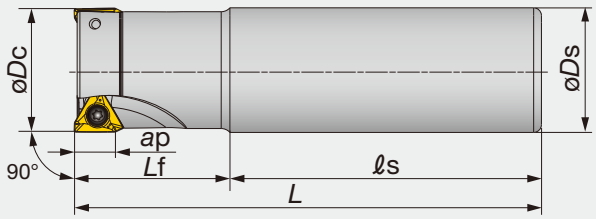
| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TPA06R032M16.0E05 | CSTB-2.5 | M-1000 | FSHM8-30H | T-8D |
| TPA06R040M16.0E06 | CSTB-2.5 | M-1000 | CM8X30H | T-8D |
| TPA06R050M22.0E08 | CSTB-2.5 | M-1000 | CM10X30H | T-8D |

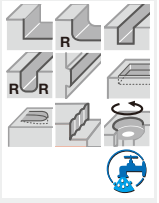
# TUNG-TRI

## EPA06

High precision square shoulder milling endmills with triangular inserts

A.R. = +8.5°~ +11.5°, R.R. = -5.5°~ -12.5°



| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA06R012M16.0-01N | 6 | 12 | 1 | 16 | 50 | 18 | 68 | 0.09 | without | TOMT06... |
| EPA06R016M16.0-02N | 6 | 16 | 2 | 16 | 60 | 24 | 84 | 0.12 | without | TOMT06... |
| EPA06R016M16.0-02L | 6 | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | TOMT06... |
| EPA06R018M16.0-02N | 6 | 18 | 2 | 16 | 60 | 24 | 84 | 0.13 | without | TOMT06... |
| EPA06R018M16.0-02L | 6 | 18 | 2 | 16 | 115 | 30 | 145 | 0.21 | with | TOMT06... |
| EPA06R020M16.0-02N | 6 | 20 | 2 | 16 | 60 | 30 | 90 | 0.14 | without | TOMT06... |
| EPA06R020M20.0-02N | 6 | 20 | 2 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R020M20.0-03N | 6 | 20 | 3 | 20 | 70 | 30 | 100 | 0.22 | without | TOMT06... |
| EPA06R020M20.0-02L | 6 | 20 | 2 | 20 | 135 | 50 | 185 | 0.41 | with | TOMT06... |
| EPA06R022M20.0-02N | 6 | 22 | 2 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R022M20.0-03N | 6 | 22 | 3 | 20 | 70 | 30 | 100 | 0.23 | without | TOMT06... |
| EPA06R022M20.0-02L | 6 | 22 | 2 | 20 | 145 | 40 | 185 | 0.42 | with | TOMT06... |
| EPA06R025M25.0-03N | 6 | 25 | 3 | 25 | 80 | 35 | 115 | 0.41 | without | TOMT06... |
| EPA06R025M25.0-04N | 6 | 25 | 4 | 25 | 80 | 35 | 115 | 0.41 | without | TOMT06... |
| EPA06R025M25.0-02L | 6 | 25 | 2 | 25 | 150 | 70 | 220 | 0.78 | with | TOMT06... |
| EPA06R028M25.0-03N | 6 | 28 | 3 | 25 | 80 | 35 | 115 | 0.42 | without | TOMT06... |
| EPA06R028M25.0-04N | 6 | 28 | 4 | 25 | 80 | 35 | 115 | 0.42 | without | TOMT06... |
| EPA06R028M25.0-02L | 6 | 28 | 2 | 25 | 180 | 40 | 220 | 0.8 | with | TOMT06... |

### SPARE PARTS

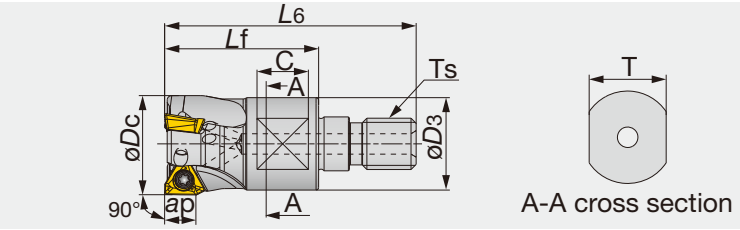
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPA06R012 - 018M... | CSTB-2.5S | M-1000 | T-8D |
| EPA06R020 - 028M... | CSTB-2.5 | M-1000 | T-8D |

# TUNG-TRI

## HPA06-M

High precision square shoulder milling endmills with triangular inserts

A.R. = +8.5°~ +11.5°, R.R. = -12.5°~ -5.5°




| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPA06R016MM08-02 | 6 | 16 | 2 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | with | TOMT06... |
| HPA06R020MM10-03 | 6 | 20 | 3 | 49 | 30 | 10 | 15 | 18 | M10 | 0.06 | with | TOMT06... |
| HPA06R025MM12-04 | 6 | 25 | 4 | 57 | 35 | 10 | 17 | 21 | M12 | 0.1 | with | TOMT06... |
| HPA06R032MM16-05 | 6 | 32 | 5 | 63 | 40 | 12 | 22 | 29 | M16 | 0.20 | with | TOMT06... |

### SPARE PARTS

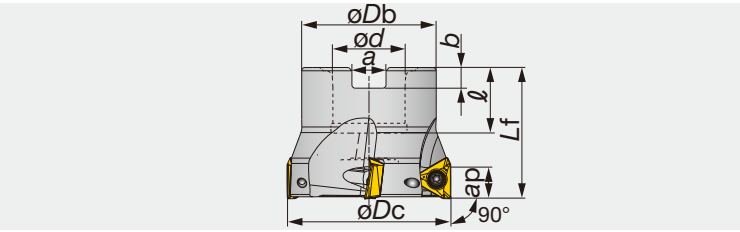
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPA06R016MM08-02 | CSTB-2.5S | M-1000 | T-8D |
| HPA06R020 - 032MM... | CSTB-2.5 | M-1000 | T-8D |

# TUNG-TRI

## TPA10

High precision square shoulder milling cutters with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°




| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA10R040M16.0E04 | 10 | 40 | 4 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.2 | with | TOMT10... |
| TPA10R050M22.0E04 | 10 | 50 | 4 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.31 | with | TOMT10... |
| TPA10R063M22.0E06 | 10 | 63 | 6 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.51 | with | TOMT10... |
| TPA10R080M25.4-07 | 10 | 80 | 7 | 58 | 25.4 | 26 | 50 | 6 | 9.5 | 1.04 | with | TOMT10... |
| TPA10R080M27.0E07 | 10 | 80 | 7 | 58 | 27 | 22 | 50 | 7 | 12.4 | 1.04 | with | TOMT10... |
| TPA10R100M31.7-08 | 10 | 100 | 8 | 70 | 31.75 | 32 | 63 | 8 | 12.7 | 2.02 | with | TOMT10... |
| TPA10R100M32.0E08 | 10 | 100 | 8 | 60 | 32 | 28.5 | 50 | 8 | 14.4 | 2.02 | with | TOMT10... |

### SPARE PARTS

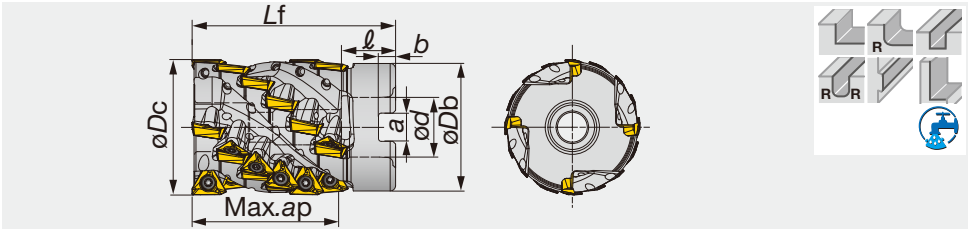
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TPA10R040M16.0E04 | SR14-562/S | SW6-SD | M-1000 | CM8X30H | BLDT10/S7 |
| TPA10R050, 063M... | SR14-562/S | SW6-SD | M-1000 | CM10X30H | BLDT10/S7 |
| TPA10R080M... | SR14-562/S | SW6-SD | M-1000 | CM12X30H | BLDT10/S7 |
| TPA10R100M... | SR14-562/S | SW6-SD | M-1000 | CM16X40H | BLDT10/S7 |

# TUNG-TRI

## TLA10

Extended Flute square shoulder mills for roughing with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°




| Designation | Max. ap | øDc | Z eff | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA10R050L054M22.0E04 | 54 | 50 | 4 | 24 | 47 | 22 | 20 | 75 | 6.3 | 10.4 | 0.64 | with | TOMT10... |
| TLA10R063L054M25.4-04 | 54 | 63 | 4 | 24 | 60 | 25.4 | 26 | 80 | 6 | 9.5 | 1.26 | with | TOMT10... |
| TLA10R063L054M27.0E04 | 54 | 63 | 4 | 24 | 60 | 27 | 22 | 80 | 7 | 12.4 | 1.25 | with | TOMT10... |

### SPARE PARTS

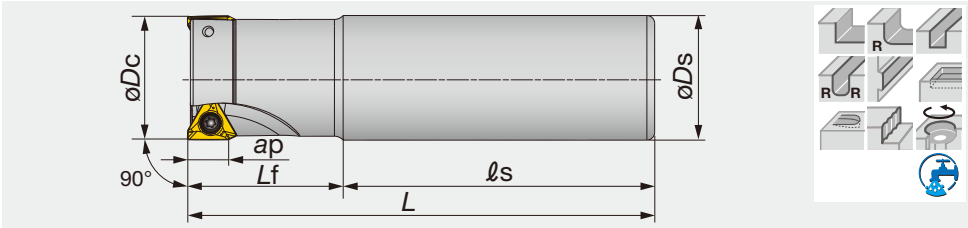
| Designation | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Wrench |
|---|---|---|---|---|---|
| TLA10R050L054M22.0E04 | SR14-562 | M-1000 | CAP-CM10X1.5X55-H | - | T-10D |
| TLA10R063L... | SR14-562 | M-1000 | - | CAP-CM12X1.75X50 | T-10D |

# TUNG-TRI

## EPA10

High precision square shoulder milling endmills with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°




| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA10R025M25.0-02N | 10 | 25 | 2 | 25 | 80 | 35 | 115 | 0.38 | without | TOMT10... |
| EPA10R025M25.0-02L | 10 | 25 | 2 | 25 | 150 | 70 | 220 | 0.75 | with | TOMT10... |
| EPA10R028M25.0-02N | 10 | 28 | 2 | 25 | 80 | 35 | 115 | 0.39 | without | TOMT10... |
| EPA10R028M25.0-02L | 10 | 28 | 2 | 25 | 185 | 35 | 220 | 0.78 | with | TOMT10... |
| EPA10R032M32.0-02N | 10 | 32 | 2 | 32 | 80 | 40 | 120 | 0.66 | without | TOMT10... |
| EPA10R032M32.0-03N | 10 | 32 | 3 | 32 | 80 | 40 | 120 | 0.65 | without | TOMT10... |
| EPA10R032M32.0-02L | 10 | 32 | 2 | 32 | 175 | 80 | 255 | 1.46 | with | TOMT10... |
| EPA10R035M32.0-02N | 10 | 35 | 2 | 32 | 80 | 40 | 120 | 0.7 | without | TOMT10... |
| EPA10R035M32.0-03N | 10 | 35 | 3 | 32 | 80 | 40 | 120 | 0.68 | without | TOMT10... |
| EPA10R035M32.0-02L | 10 | 35 | 2 | 32 | 215 | 40 | 255 | 1.52 | with | TOMT10... |
| EPA10R040M32.0-03N | 10 | 40 | 3 | 32 | 80 | 40 | 120 | 0.72 | without | TOMT10... |
| EPA10R040M32.0-04N | 10 | 40 | 4 | 32 | 80 | 40 | 120 | 0.73 | without | TOMT10... |
| EPA10R040M32.0-02L | 10 | 40 | 2 | 32 | 205 | 50 | 255 | 1.57 | with | TOMT10... |

### SPARE PARTS

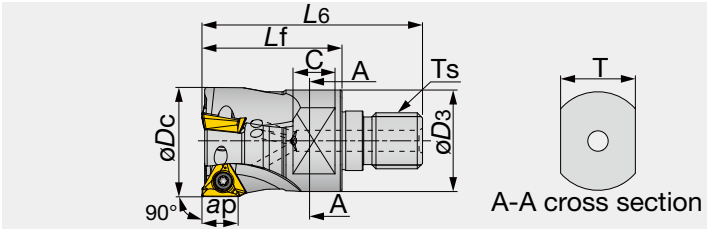
| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPA10... | SR14-562/S | SW6-SD | M-1000 | BLDT10/S7 |

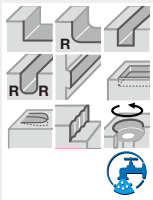
TUNG-TRI

## HPA10-M

High precision square shoulder milling endmills with triangular inserts

A.R. = +9.5°~ +11°, R.R. = -4.5°~ -0.5°



| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPA10R025MM12-02 | 10 | 25 | 2 | 57 | 35 | 10 | 17 | 21 | M12 | 0.08 | with | TOMT10... |
| HPA10R032MM16-03 | 10 | 32 | 3 | 63 | 40 | 12 | 22 | 29 | M16 | 0.18 | with | TOMT10... |

### SPARE PARTS

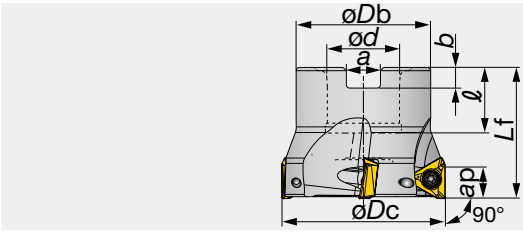
| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| HPA10... | SR14-562/S | SW6-SD | M-1000 | BLDT10/S7 |

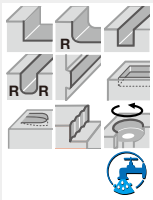
TUNG-TRI

## TPA15

High precision square shoulder milling cutters with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°



| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPA15R050M22.0E04 | 15 | 50 | 4 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.27 | with | TOMT15... |
| TPA15R063M22.0E05 | 15 | 63 | 5 | 41 | 22 | 20 | 40 | 6.3 | 10.4 | 0.41 | with | TOMT15... |
| TPA15R080M25.4-06 | 15 | 80 | 6 | 46 | 25.4 | 26 | 50 | 6 | 9.5 | 0.83 | with | TOMT15... |
| TPA15R080M27.0E06 | 15 | 80 | 6 | 50 | 27 | 22 | 50 | 7 | 12.4 | 0.86 | with | TOMT15... |
| TPA15R100M31.7-07 | 15 | 100 | 7 | 60 | 31.75 | 32 | 50 | 8 | 12.7 | 1.3 | with | TOMT15... |
| TPA15R100M32.0E07 | 15 | 100 | 7 | 60 | 32 | 28.5 | 50 | 8 | 14.4 | 1.27 | with | TOMT15... |
| TPA15R125M38.1-08 | 15 | 125 | 8 | 80 | 38.1 | 38 | 63 | 10 | 15.9 | 2.7 | with | TOMT15... |
| TPA15R125M40.0E08 | 15 | 125 | 8 | 71 | 40 | 32 | 63 | 9 | 16.4 | 2.47 | with | TOMT15... |
| TPA15R160M40.0E10N | 15 | 160 | 10 | 100 | 40 | 32 | 63 | 9 | 16.4 | 4.77 | without | TOMT15... |
| TPA15R160M50.8-10N | 15 | 160 | 10 | 100 | 50.8 | 46 | 63 | 11 | 19 | 4.4 | without | TOMT15... |

### SPARE PARTS

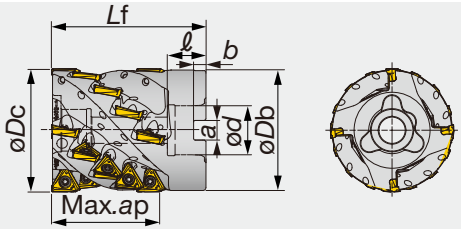
| Designation | Clamping screw | Grip | Lubricant | Center bolt | Center bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TPA15R050M22.0E04 | TS45120I | H-TB2W | M-1000 | - | FSHM10-40H | BT20S |
| TPA15R063M22.0E05 | TS45120I | H-TB2W | M-1000 | - | CM10X30H | BT20S |
| TPA15R080M... | TS45120I | H-TB2W | M-1000 | - | CM12X30H | BT20S |
| TPA15R100M... | TS45120I | H-TB2W | M-1000 | TMBA-M16H | - | BT20S |
| TPA15R125M... | TS45120I | H-TB2W | M-1000 | TMBA-M20H | - | BT20M |
| TPA15R160M... | TS45120I | H-TB2W | M-1000 | - | - | BT20M |

# TUNG-TRI

## TLA15-M

Extended Flute square shoulder mills for roughing with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°



| Designation | Max. ap | øDc | Z eff | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L070M31.7-04M | 70 | 80 | 4 | 20 | 78 | 31.75 | 25 | 100 | 8 | 12.7 | 2.29 | with | TOMT15... |
| TLA15R080L070M32.0E04M | 70 | 80 | 4 | 20 | 78 | 32 | 25 | 100 | 8 | 14.4 | 2.38 | with | TOMT15... |
| TLA15R100L083M38.1-05M | 83 | 100 | 5 | 30 | 98 | 38.1 | 38 | 110 | 10 | 15.9 | 4.24 | with | TOMT15... |
| TLA15R100L083M40.0E05M | 83 | 100 | 5 | 30 | 98 | 40 | 32 | 110 | 9 | 16.4 | 4.26 | with | TOMT15... |

### SPARE PARTS

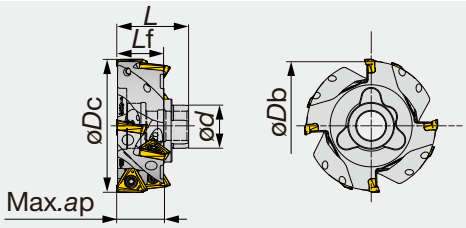
| Designation | Clamping screw | Grip | Torx bit | Lubricant | Shell locking bolt |
|---|---|---|---|---|---|
| TLA15R080... | TS45120I | H-TB2W | BT20S | M-1000 | CM16X75 |
| TLA15R100... | TS45120I | H-TB2W | BT20S | M-1000 | CM20X80 |

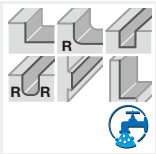
# TUNG-TRI

## TLA15-S

Sub unit to mount on TLA15-M type for longer Max. ap reach

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°




| Designation | Max. ap | øDc | Z eff | z | øDb | ød | L | Lf | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L028-04S | 28 | 80 | 4 | 8 | 77.6 | 27 | 43 | 28.2 | 0.65 | with | TOMT15… |
| TLA15R100L028-05S | 28 | 100 | 5 | 10 | 97.2 | 33 | 46 | 28 | 1.05 | with | TOMT15… |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| TLA15... | TS45120I | H-TB2W | M-1000 | BT20S |

### CENTER BOLT

*Optional parts

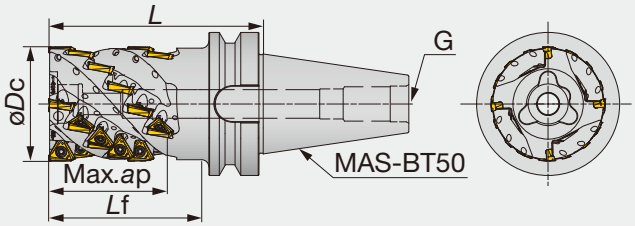
| No.of sub-units | 1 | 2 |
|---|---|---|
| TLA15R080L028-04S | CM16x120 | CM16x140 |
| TLA15R100L028-05S | CM20x120 | CM20x150 |

# TUNG-TRI

## TLA15-BT

Square shoulder mills for roughing with TOMT15 inserts, Main unit with BT tapered shanks

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°



| Designation | Max. ap | øDc | Z eff | z | L | Lf | Kg | Air hole | G | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TLA15R080L083BT50-04M | 83 | 80 | 4 | 24 | 150 | 107 | 6.29 | with | M24 | TOMT15... |
| TLA15R100L097BT50-05M | 97 | 100 | 5 | 35 | 165 | 126.5 | 8.92 | with | M24 | TOMT15... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit | Shell locking bolt |
|---|---|---|---|---|---|
| TLA15R080L083BT50-04M | TS45120I | H-TB2W | M-1000 | BT20S | CAP-CM16×2.0×55 |
| TLA15R100L097BT50-05M | TS45120I | H-TB2W | M-1000 | BT20S | CAP-CM20×2.5×50 |

### CENTER BOLT

*Optional parts

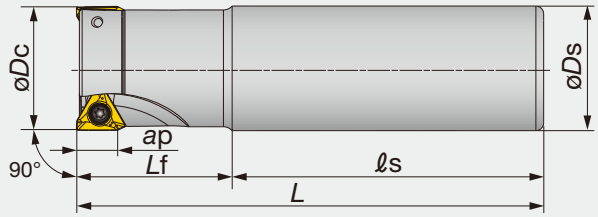
| No.of sub-units | 1 | 2 |
|---|---|---|
| TLA15R080L083BT50-04M | CAP-CM16×2.0×55 | CM16x120 |
| TLA15R100L097BT50-05M | CAP-CM20×2.5×50 | CM20x80 |

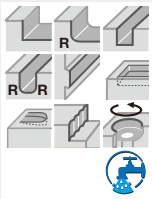
# TUNG-TRI

## EPA15

High precision square shoulder milling endmills with triangular inserts

A.R. = +12°~ +13.5°, R.R. = -6°~ -3.5°



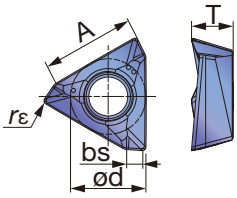

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA15R040M32.0-03N | 15 | 40 | 3 | 32 | 80 | 40 | 120 | 0.73 | without | TOMT15… |
| EPA15R040M32.0-02L | 15 | 40 | 2 | 32 | 205 | 50 | 255 | 1.56 | with | TOMT15… |
| EPA15R050M32.0-04N | 15 | 50 | 4 | 32 | 80 | 40 | 120 | 0.83 | without | TOMT15… |
| EPA15R050M42.0-02L | 15 | 50 | 2 | 42 | 310 | 50 | 360 | 3.84 | with | TOMT15… |

### SPARE PARTS

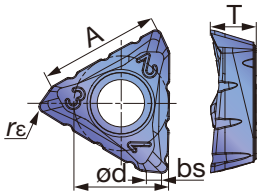
| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPA15... | TS45120I | H-TB2W | M-1000 | BT20S |

## INSERT

### TOMT-MJ




### TOMT-NMJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | |
| M | Stainless | | ★ | |
| K | Cast iron | ★ | | ★ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH3135 | T1215 | | | | |
| TOMT060302PDER-MJ | 0.2 | 6 | ● | ● | | 6.2 | 5.6 | 3.2 | 1.4 |
| TOMT060304PDER-MJ | 0.4 | 6 | ● | ● | | 6.2 | 5.6 | 3.2 | 1.2 |
| TOMT060308PDER-MJ | 0.8 | 6 | ● | ● | ● | 6.2 | 5.6 | 3.2 | 0.8 |
| TOMT100404PDER-MJ | 0.4 | 10 | ● | ● | | 10.5 | 8.6 | 4.7 | 1.5 |
| TOMT100408PDER-MJ | 0.8 | 10 | ● | ● | ● | 10.5 | 8.6 | 4.7 | 1.1 |
| TOMT100416PDER-MJ | 1.6 | 10 | ● | ● | | 10.5 | 8.6 | 4.7 | 0.2 |
| TOMT150604PDER-MJ | 0.4 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 2.2 |
| TOMT150608PDER-MJ | 0.8 | 15 | ● | ● | ● | 15.7 | 12.7 | 6 | 1.9 |
| TOMT150616PDER-MJ | 1.6 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 1.1 |
| TOMT150620PDER-MJ | 2 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 0.7 |
| TOMT150608PDER-NMJ | 0.8 | 15 | ● | ● | | 15.7 | 12.7 | 6 | 1.9 |

●: Line up

## STANDARD CUTTING CONDITIONS

### TPA/EPA/HPA

| ISO | Workpiece material | Hardness | Grade | Cutting speed: *Vc* (m/min) | | | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | T/E/HPA06 | T/E/HPA10 | T/E/HPA15 | T/E/HPA06 | T/E/HPA10 | T/EPA15 |
| P | Low carbon steel<br>SS400, S15C, etc.<br>E275A, C15E4, etc. | - 200 HB | AH3135 | 100 - 220 | 100 - 250 | 100 - 250 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| | High carbon steel<br>S45C, etc.<br>C45, etc. | 200 - 300 HB | AH3135 | 100 - 170 | 100 - 200 | 100 - 230 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| | Alloy steel<br>SCM440, etc.<br>42CrMo4, etc. | 200 - 300 HB | AH3135 | 100 - 170 | 100 - 200 | 100 - 230 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| | Tool steel<br>SKD61, etc.<br>X40CrMoV5-1, etc. | 30 - 40 HRC | AH3135 | 100 - 120 | 100 -150 | 100 - 180 | 0.05 - 0.12 | 0.08 - 0.15 | 0.08 - 0.2 |
| M | Stainless steel<br>SUS304, etc.<br>X5CrNi18-9, etc. | - | AH3135 | 80 - 150 | 80 - 200 | 90 - 200 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.2 |
| K | Grey cast iron<br>FC250, etc.<br>250, etc. | 150 - 250 HB | AH120<br>T1215 | 100 - 200<br>150 - 250 | 100 - 250<br>150 - 300 | 140 - 250<br>200 - 300 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| | Ductile cast iron<br>FCD450, etc.<br>450-10S, etc. | 150 - 250 HB | AH120<br>T1215 | 80 - 150<br>100 - 200 | 80 - 200<br>130 - 250 | 110 - 200<br>150 - 250 | 0.05 - 0.15 | 0.08 - 0.2 | 0.08 - 0.25 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | AH120 | 20 - 50 | 20 - 60 | 20 - 60 | 0.05 - 0.1 | 0.08 - 0.15 | 0.08 - 0.18 |
| | Heat-resistant alloys<br>Inconel 718, etc. | - | AH120 | 20 - 35 | 20 - 40 | 20 - 40 | 0.03 - 0.08 | 0.05 - 0.13 | 0.07 - 0.15 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

- Remove excessive chip accumulation with an air blast.
- For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (*fz*) should be set to the lower recommended value shown in the above table.
- Cutting conditions maybe limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

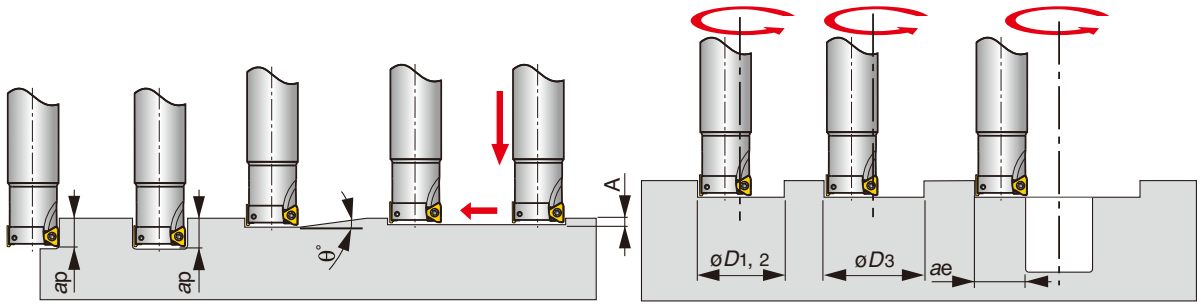
## STANDARD CUTTING CONDITIONS

### TLA (Roughing type)

| ISO | Workpiece material | Hardness | Grade | Cutting speed: *Vc* (m/min) | | Feed per tooth: *fz* (mm/t) | |
|---|---|---|---|---|---|---|---|
| | | | | TLA10 | TLA15 | TLA10 | TLA15 |
| P | Low carbon steel<br>SS400, S15C, etc.<br>E275A, C15E4, etc. | - 200 HB | AH3135 | 100 - 250 | 100 - 250 | 0.08 - 0.18 | 0.08 - 0.22 |
| | High carbon steel<br>S45C, etc.<br>C45, etc. | 200 - 300 HB | AH3135 | 100 - 200 | 100 - 270 | 0.08 - 0.14 | 0.08 - 0.18 |
| | Alloy steel<br>SCM440, etc.<br>42CrMo4, etc. | 200 - 300 HB | AH3135 | 100 - 150 | 100 - 180 | 0.08 - 0.14 | 0.08 - 0.18 |
| M | Stainless steel<br>SUS304, etc.<br>X5CrNi18-9, etc. | - | AH3135 | 80 - 200 | 90 - 200 | 0.08 - 0.15 | 0.08 - 0.18 |
| K | Grey cast iron<br>FC250, etc.<br>250, etc. | 150 - 250 HB | AH120<br>T1215 | 100 - 250<br>150 - 250 | 140 - 250<br>150 - 250 | 0.10 - 0.18 | 0.08 - 0.22 |
| | Ductile cast iron<br>FCD450, etc.<br>450-10S, etc. | 150 - 250 HB | AH120<br>T1215 | 80 - 200<br>150 - 250 | 110 - 200<br>150 - 250 | 0.10 - 0.18 | 0.08 - 0.22 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | AH120 | 20 - 60 | 20 - 60 | 0.00 - 0.14 | 0.06 - 0.15 |
| | Heat-resistant alloys<br>Inconel 718, etc. | - | AH120 | 20 - 40 | 20 - 40 | 0.05 - 0.12 | 0.06 - 0.13 |

Note: When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining depth øD1 | Max. machining diameter øD2 | Max. machining diameter øD3 * | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| EPA06R012… | 12 | 6 | 5 | 0.6 | 18 | 23.6 | 21 | 11.5 |
| E/HPA06R016… | 16 | 6 | 4.3 | 0.6 | 25 | 31.6 | 29 | 15.5 |
| EPA06R018… | 18 | 6 | 3.5 | 0.6 | 29.5 | 35.6 | 33 | 17.5 |
| E/HPA06R020… | 20 | 6 | 2.8 | 0.6 | 33.5 | 39.6 | 37 | 19.5 |
| EPA06R022… | 22 | 6 | 2.5 | 0.6 | 37.5 | 43.6 | 41 | 21.5 |
| E/HPA06R025… | 25 | 6 | 2 | 0.6 | 43.5 | 49.6 | 47 | 24.5 |
| E/HPA10R025… | 25 | 10 | 2 | 0.6 | 42.1 | 49.6 | 47 | 24.5 |
| EPA06R028… | 28 | 6 | 1.8 | 0.6 | 49.5 | 55.6 | 53 | 27.5 |
| EPA10R028… | 28 | 10 | 2 | 0.6 | 48.1 | 55.6 | 53 | 27.5 |
| H/TPA06R032… | 32 | 6 | 1.5 | 0.6 | 57.5 | 63.6 | 61 | 31.5 |
| E/HPA10R032… | 32 | 10 | 2 | 0.6 | 56.1 | 63.6 | 61 | 31.5 |
| EPA10R035… | 35 | 10 | 1.7 | 0.6 | 62.1 | 69.6 | 67 | 34.5 |
| TPA06R040… | 40 | 6 | 1 | 0.6 | 73.5 | 79.6 | 77 | 39.5 |
| E/TPA10R040… | 40 | 10 | 1.4 | 0.6 | 72.1 | 79.6 | 77 | 39.5 |
| EPA15R040… | 40 | 15 | 2.3 | 0.8 | 68.5 | 79.2 | 75.5 | 39 |
| TPA06R050… | 50 | 6 | 0.7 | 0.6 | 94 | 99.6 | 97 | 49.5 |
| TPA10R050… | 50 | 10 | 0.9 | 0.6 | 92.1 | 99.6 | 97 | 49.5 |
| E/TPA15R050… | 50 | 15 | 1.7 | 0.8 | 88.5 | 99.2 | 95.5 | 49 |
| TPA10R063… | 63 | 10 | 0.8 | 0.6 | 118.1 | 125.6 | 123 | 62.5 |
| TPA15R063… | 63 | 15 | 1.4 | 0.8 | 114.5 | 125.2 | 121.5 | 62 |
| TPA10R080… | 80 | 10 | 0.6 | 0.6 | 152.1 | 159.6 | 157 | 79.5 |
| TPA15R080… | 80 | 15 | 1 | 0.8 | 148.5 | 159.2 | 155.5 | 79 |
| TPA10R100… | 100 | 10 | 0.5 | 0.6 | 192.1 | 199.6 | 197 | 99.5 |
| TPA15R100… | 100 | 15 | 0.8 | 0.8 | 188.5 | 199.2 | 195.5 | 99 |
| TPA15R125… | 125 | 15 | 0.6 | 0.8 | 238.5 | 249.2 | 245.5 | 124 |
| TPA15R160… | 160 | 15 | 0.5 | 0.8 | 308.5 | 319.2 | 315.5 | 159 |

*Flat bottom hole

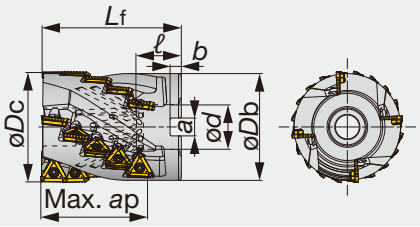
Note: Corner $r\varepsilon$ for dimensions of ø*D*1, ø*D*2 and ø*D*3: $r\varepsilon$ = 0.4 for E/TPA06, E/TPA10 and $r\varepsilon$ = 0.8 for E/TPA15.

# TUNGTSHRED

## LPTC16

Square shoulder milling cutters for roughing with shred insert

A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°




| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPTC16J063B25.4L061R03 | 61 | 63 | 3 | 12 | 59 | 85 | 25.4 | 26 | 9.5 | 6 | 1.25 | TC*T16... |
| LPTC16M063B27.0L061R03 | 61 | 63 | 3 | 12 | 59 | 85 | 27 | 22 | 12.4 | 7 | 1.24 | TC*T16... |
| LPTC16J080B31.7L076R04 | 76 | 80 | 4 | 20 | 76 | 100 | 31.75 | 32 | 12.7 | 8 | 2.44 | TC*T16... |
| LPTC16M080B32.0L076R04 | 76 | 80 | 4 | 20 | 76 | 100 | 32 | 25 | 14.4 | 8 | 2.46 | TC*T16... |

### SPARE PARTS

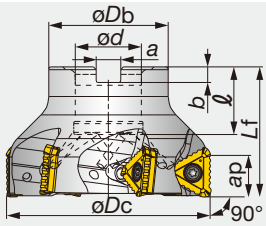
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| LPTC16*063B... | TS 40B100I | H-TB2W | M-1000 | CAP-CM12X1.75X50 | BT15S |
| LPTC16*080B... | TS 40B100I | H-TB2W | M-1000 | CM16X75 | BT15S |

# TUNGTSHRED

## TPTC16

Square shoulder milling cutters with shred insert

A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°




| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPTC16M050B22.0R04 | 16 | 50 | 4 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.29 | TC*T16... |
| TPTC16M063B22.0R05 | 16 | 63 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.44 | TC*T16... |
| TPTC16J080B25.4R06 | 16 | 80 | 6 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.88 | TC*T16... |
| TPTC16M080B27.0R06 | 16 | 80 | 6 | 50 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | TC*T16... |
| TPTC16J100B31.7R07 | 16 | 100 | 7 | 60 | 50 | 31.75 | 26 | 9.5 | 6 | 1.38 | TC*T16... |
| TPTC16M100B32.0R07 | 16 | 100 | 7 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.35 | TC*T16... |

### SPARE PARTS

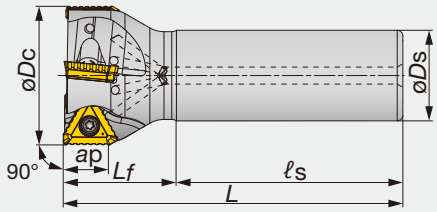
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TPTC16M050B22.0R04 | TS 40B100I | H-TB2W | M-1000 | - | FSHM10-40H | BT15S |
| TPTC16M063B22.0R05 | TS 40B100I | H-TB2W | M-1000 | - | CM10X30H | BT15S |
| TPTC16*080B... | TS 40B100I | H-TB2W | M-1000 | - | CM12X30H | BT15S |
| TPTC16*100B... | TS 40B100I | H-TB2W | M-1000 | TMBA-M16H | - | BT15S |

# EPTC16

Square Shoulder milling cutters with shred insert



A.R. = +5.5°~ +6.5°, R.R. = -11.5°~ -11.3°



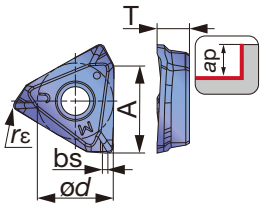

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPTC16M050C32.0R04 | 16 | 50 | 4 | 32 | 80 | 40 | 120 | 0.8 | TC*T16... |
| EPTC16M050C42.0R02L | 16 | 50 | 2 | 42 | 310 | 50 | 360 | 3.8 | TC*T16... |

## SPARE PARTS

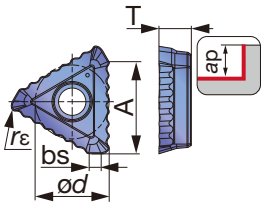
| Designation | Clamping screw | Grip | Lubricant | Torx bit |
|---|---|---|---|---|
| EPTC16... | TS 40B100I | H-TB2W | M-1000 | BT15S |

## INSERT

### TCGT-MJ




### TCMT-NMJ




| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | ☆ |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | Coated AH3135 | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|
| TCGT160608PDER-MJ | 0.8 | 16 | ● | ● | 16 | 13.7 | 5.8 | 1 |
| TCMT160620PDER-NMJ | 2 | 16 | ● | ● | 16 | 13.3 | 5.8 | 2 |

●: Line up

## STANDARD CUTTING CONDITIONS

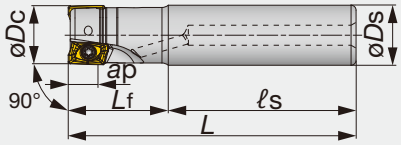
| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, S20C, etc.<br>C15, C20, etc. | - 300 HB | First choice | AH3135 | NMJ* | 100 - 250 | 0.08 - 0.15 |
| | | - 300 HB | For finishing | AH3135 | MJ | 100 - 250 | 0.08 - 0.2 |
| | Carbon steel and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | - 300 HB | First choice | AH3135 | NMJ* | 100 - 230 | 0.08 - 015 |
| | | - 300 HB | For finishing | AH3135 | MJ | 100 - 230 | 0.08 - 0.2 |
| | Prehardened steel<br>NAK80, PX5, etc. | 30 - 40 HRC | First choice | AH3135 | NMJ* | 100 - 180 | 0.08 - 0.15 |
| | | 30 - 40 HRC | For finishing | AH3135 | MJ | 100 - 180 | 0.08 - 0.2 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | First choice | AH3135 | NMJ* | 90 - 200 | 0.08 - 0.15 |
| | | - | For finishing | AH3135 | MJ | 90 - 200 | 0.08 - 0.2 |
| K | Grey cast iron<br>FC250, FC300, etc.<br>250, 300, etc. | 150 - 250 HB | First choice | AH120 | NMJ* | 140 - 250 | 0.08 - 0.15 |
| | | 150 - 250 HB | For finishing | AH120 | MJ | 140 - 250 | 0.08 - 0.25 |
| | Ductile cast iron<br>FCD600, etc.<br>400-15,600-3, etc. | 150 - 250 HB | First choice | AH120 | NMJ* | 140 - 250 | 0.08 - 0.15 |
| | | 150 - 250 HB | For finishing | AH120 | MJ | 140 - 250 | 0.08 - 0.25 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | First choice | AH120 | NMJ* | 20 - 60 | 0.08 - 0.15 |
| | | - | For finishing | AH120 | MJ | 20 - 60 | 0.08 - 0.18 |
| | Heat-resistant alloys<br>Inconel718, etc. | - | First choice | AH120 | NMJ* | 20 - 40 | 0.08 - 0.13 |
| | | - | For finishing | AH120 | MJ | 20 - 40 | 0.08 - 0.15 |

* When you use the NMJ chipbreaker, please set up the feed less than 0.15 mm/t.

## EPAV06

Square shoulder milling endmills in small diameter

A.R. = +6.0°~ +7.6°, R.R. = -37.1°~ -32.4°



| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPAV06M008C10.0R01 | 6 | 8 | 1 | 10 | 60 | 20 | 80 | 0.04 | AVGT06... |
| EPAV06M010C10.0R02 | 6 | 10 | 2 | 10 | 60 | 20 | 80 | 0.04 | AVGT06... |
| EPAV06M010C10.0R02L | 6 | 10 | 2 | 10 | 65 | 35 | 100 | 0.06 | AVGT06... |
| EPAV06M012C12.0R02 | 6 | 12 | 2 | 12 | 60 | 20 | 80 | 0.06 | AVGT06... |
| EPAV06M012C12.0R03 | 6 | 12 | 3 | 12 | 60 | 20 | 80 | 0.06 | AVGT06... |
| EPAV06M012C12.0R02L | 6 | 12 | 2 | 12 | 85 | 35 | 120 | 0.09 | AVGT06... |
| EPAV06M016C16.0R03 | 6 | 16 | 3 | 16 | 70 | 20 | 90 | 0.12 | AVGT06... |
| EPAV06M016C16.0R04 | 6 | 16 | 4 | 16 | 70 | 20 | 90 | 0.12 | AVGT06... |
| EPAV06M016C16.0R03L | 6 | 16 | 3 | 16 | 105 | 35 | 140 | 0.2 | AVGT06... |

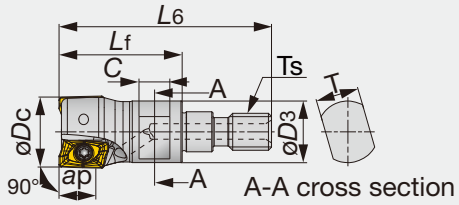
### SPARE PARTS

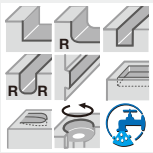
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPAV06M... | CSPB-2H | M-1000 | IP-6DB |

## HPAV06-M

Square shoulder milling endmills in small diameter; Modular head with TungFlex thread connection

A.R. = +6.0°~ +7.6°, R.R. = -37.1°~ -32.4°



| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HPAV06M010M06R02 | 6 | 10 | 2 | 34.5 | 20 | 5 | 7 | 9.5 | M6 | 0.01 | AVGT06... |
| HPAV06M012M06R02 | 6 | 12 | 2 | 34.5 | 20 | 5 | 7 | 10 | M6 | 0.01 | AVGT06... |
| HPAV06M012M06R03 | 6 | 12 | 3 | 34.5 | 20 | 5 | 7 | 10 | M6 | 0.01 | AVGT06... |
| HPAV06M016M08R03 | 6 | 16 | 3 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | AVGT06... |
| HPAV06M016M08R04 | 6 | 16 | 4 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | AVGT06... |

• See page **D228** for TungFlex modular shank.

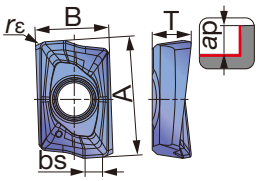
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPAV06M... | CSPB-2H | M-1000 | IP-6DB |

## INSERT

AVGT-MJ

AVGT-AJ




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | ★ | | | |
| M | Stainless | | ★ | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | ★ | ☆ | | | |
| H | Hard materials | ★ | | | | |

★ : First choice
☆ : Second choice

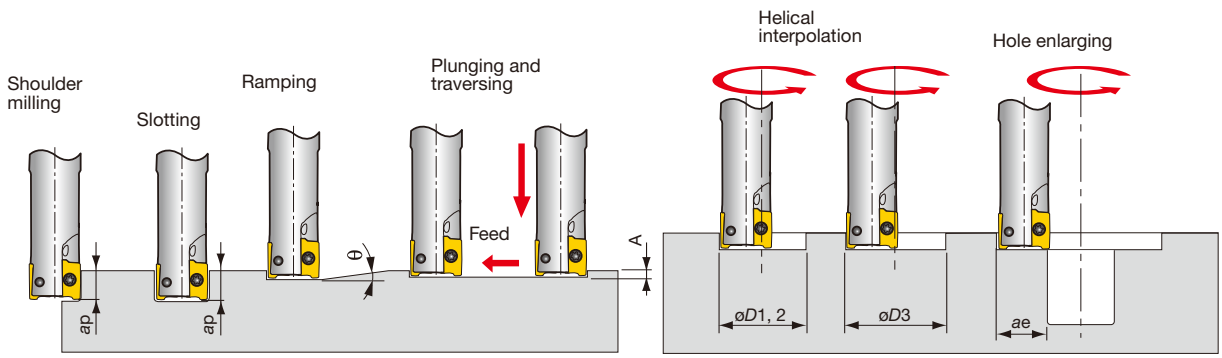
| Designation | rε | Max. ap | Coated AH120 | Coated AH3135 | Un-coated KS05F | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| AVGT060302PBER-MJ | 0.2 | 6 | ● | ● | | 8 | 5 | 2.7 | 1.5 |
| AVGT060304PBER-MJ | 0.4 | 6 | ● | ● | | 8 | 5 | 2.7 | 1.3 |
| AVGT060308PBER-MJ | 0.8 | 6 | ● | ● | | 8 | 5 | 2.6 | 0.9 |
| AVGT060302PBFR-AJ | 0.2 | 6 | | | ● | 8 | 5 | 2.7 | 1.5 |
| AVGT060304PBFR-AJ | 0.4 | 6 | | | ● | 8 | 5 | 2.7 | 1.3 |
| AVGT060308PBFR-AJ | 0.8 | 6 | | | ● | 8 | 5 | 2.6 | 0.9 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C , SS400, etc.<br>C15E4, E275A, etc. | | - 300 HB | First choice | AH3135 | MJ | 230 - 430 | 0.07 - 0.12 |
| | Carbon steel and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | | - 300 HB | First choice | AH3135 | MJ | 150 - 350 | 0.07 - 0.12 |
| | Prehardened steel<br>NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH120 | MJ | 100 - 230 | 0.07 - 0.12 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - | First choice | AH3135 | MJ | 150 - 220 | 0.06 - 0.1 |
| K | Grey cast iron<br>FC250, FC300, etc.<br>250, 300, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 200 - 330 | 0.07 - 0.12 |
| | Ductile cast iron<br>FCD600, etc.<br>600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 150 - 240 | 0.07 - 0.12 |
| N | Aluminium alloys<br>Si < 13% | | - | First choice | KS05F | AJ | 650 - 1000 | 0.07 - 0.12 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | First choice | AH120 | MJ | 70 - 90 | 0.06 - 0.1 |
| | Superalloys<br>Inconel718, etc. | | - | First choice | AH120 | MJ | 45 - 65 | 0.06 - 0.09 |
| H | Hardened steel | SKD61, etc.<br>X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH120 | MJ | 45 - 70 | 0.05 - 0.08 |
| | | SKD11, etc.<br>X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 40 - 65 | 0.04 - 0.06 |

## APPLICATION RANGE




| Designation | Tool dia. øDc | Max. depth of cut ap | Max. ramping angle θ | Max. plunging depth A | Min. machining øD1 | Max. machining øD2 | Max. machining øD3* | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|
| EPAV06_008… | 8 | 6 | - | - | - | - | - | - |
| EPAV/HPAV06_010… | 10 | 6 | 3° | 0.3 | 15 | 19 | 18 | 9.5 |
| EPAV/HPAV06_012… | 12 | 6 | 3° | 0.5 | 18 | 23 | 22 | 11.5 |
| EPAV/HPAV06_016… | 16 | 6 | 2.5° | 0.6 | 25 | 31 | 30 | 15.5 |

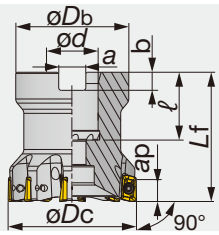
*Flat bottom hole

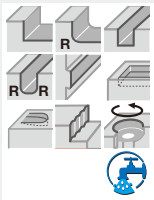
MEMO

# TUNGREC
## TPO07

High precisionsquare shoulder mills with AOMT/AOGT07 inserts

A.R. = +7°, R.R. = +13°~ +18°



| Designation | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO07R032M16.0E08 | 32 | 8 | 30 | 40 | 16 | 21 | 8.4 | 5.6 | 0.1 | with | AO*T0702... |
| TPO07R040M16.0E10 | 40 | 10 | 35 | 40 | 16 | 21 | 8.4 | 5.6 | 0.2 | with | AO*T0702... |
| TPO07R050M22.0E12 | 50 | 12 | 41 | 40 | 22 | 22 | 10.4 | 6.3 | 0.3 | with | AO*T0702... |

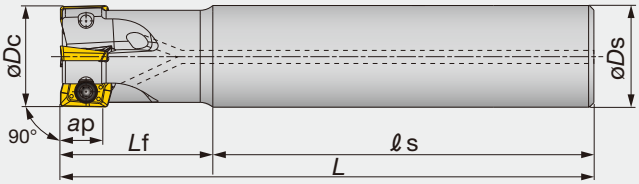
### SPARE PARTS

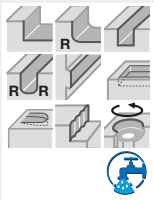
| Designation | Clamping screw | Shell locking bolt | Wrench |
|---|---|---|---|
| TPO07R032, 040... | CSTB-2.5L046 | CM8X30H | T-7DB |
| TPO07R050M22.0E12 | CSTB-2.5L046 | CM10X30H | T-7DB |

# TUNGREC
## EPO07

High precision square shoulder endmills with AOMT/AOGT07 inserts

A.R. = +7°, R.R. = +13°~ +18°



| Designation | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPO07R012M12.0-02 | 12 | 2 | 12 | 50 | 18 | 68 | 0.1 | with | AO*T0702... |
| EPO07R012M12.0-02L | 12 | 2 | 12 | 95 | 30 | 125 | 0.1 | with | AO*T0702... |
| EPO07R016M12.0-02 | 16 | 2 | 12 | 50 | 20 | 70 | 0.1 | with | AO*T0702... |
| EPO07R016M16.0-02L | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AO*T0702... |
| EPO07R016M16.0-04 | 16 | 4 | 16 | 60 | 24 | 84 | 0.1 | with | AO*T0702... |
| EPO07R018M16.0-02L | 18 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AO*T0702... |
| EPO07R018M16.0-04 | 18 | 4 | 16 | 60 | 24 | 84 | 0.1 | with | AO*T0702... |
| EPO07R020M16.0-03 | 20 | 3 | 16 | 60 | 30 | 90 | 0.1 | with | AO*T0702... |
| EPO07R020M20.0-03L | 20 | 3 | 20 | 135 | 50 | 185 | 0.4 | with | AO*T0702... |
| EPO07R020M20.0-05 | 20 | 5 | 20 | 70 | 30 | 100 | 0.2 | with | AO*T0702... |
| EPO07R022M20.0-03L | 22 | 3 | 20 | 135 | 50 | 185 | 0.4 | with | AO*T0702... |
| EPO07R022M20.0-05 | 22 | 5 | 20 | 70 | 30 | 100 | 0.2 | with | AO*T0702... |
| EPO07R025M20.0-03 | 25 | 3 | 20 | 60 | 35 | 95 | 0.3 | with | AO*T0702... |
| EPO07R025M25.0-03L | 25 | 3 | 25 | 150 | 70 | 220 | 0.7 | with | AO*T0702... |
| EPO07R025M25.0-07 | 25 | 7 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T0702... |
| EPO07R028M25.0-03L | 28 | 3 | 25 | 150 | 70 | 220 | 0.7 | with | AO*T0702... |
| EPO07R028M25.0-07 | 28 | 7 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T0702... |

*The *øDc* in the above table shows the diameter when MJ and AJ chipbreakers are used. When HJ chipbreaker is used, the tool diameter is equal to the above shown *øDc* + 0.6 mm.

**The *Lf* and *L* in the above table show the lengths when MJ chipbreaker is used. When AJ chipbreaker is used, the lengths are equal to *Lf*, *L* + 0.1 mm. When HJ chipbreaker is used, the lengths are equal to *Lf*, *L* + 0.5 mm.

### SPARE PARTS

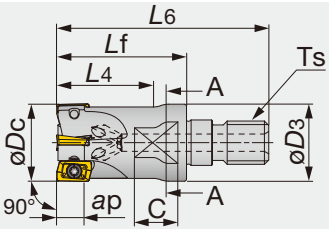
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPO07R012... | SR-10503833-S | T-7DB |
| EPO07R016 - 028... | CSTB-2.5L046 | T-7DB |

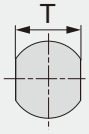
# TUNGREC

## HPO07-M

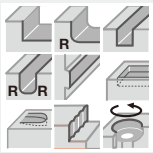
High precision square shoulder endmills (TungRec) for TungFlex, with AOMT/AOGT07 inserts

A.R. = +7°, R.R. = +13°~ +18°



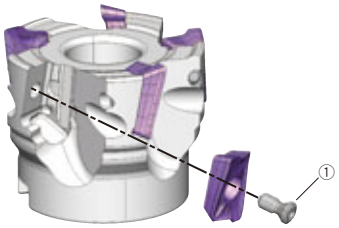

A-A cross section




| Designation | øDc | z | L6 | Lf | L4 | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPO07R012MM06-02 | 12 | 2 | 39.5 | 25 | - | 5 | 7 | 9.8 | M6 | 0.01 | with | AO*T0702... |
| HPO07R012MM08-02 | 12 | 2 | 42 | 25 | 20 | 8 | 10 | 12.8 | M8 | 0.02 | with | AO*T0702... |
| HPO07R016MM08-04 | 16 | 4 | 42 | 25 | - | 8 | 10 | 12.8 | M8 | 0.03 | with | AO*T0702... |
| HPO07R016MM10-04 | 16 | 4 | 49 | 30 | 20 | 10 | 15 | 17.8 | M10 | 0.05 | with | AO*T0702... |
| HPO07R020MM10-05 | 20 | 5 | 49 | 30 | - | 10 | 15 | 17.8 | M10 | 0.06 | with | AO*T0702... |
| HPO07R025MM12-07 | 25 | 7 | 57 | 35 | - | 10 | 17 | 20.8 | M12 | 0.1 | with | AO*T0702... |

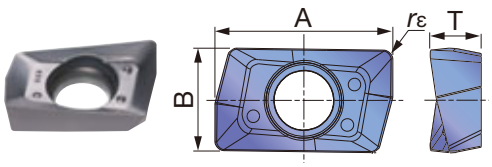
### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPO07R012MM0*-02 | SR-10503833-S | M-1000 | T-7DB |
| HPO07R016 - 025... | CSTB-2.5L046 | M-1000 | T-7DB |

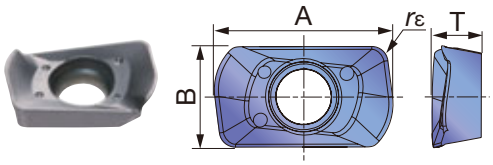



## INSERT

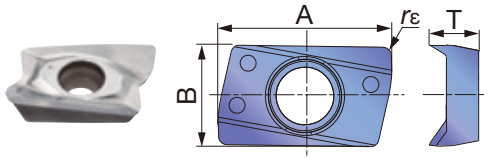
### AOMT07-MJ




### AOMT07-HJ




### AOGT07-AJ




| | | AH140 | AH725 | KS15F |
|---|---|---|---|---|
| P | Steel | | ★ | |
| M | Stainless | ★ | ☆ | |
| K | Cast iron | | ★ | |
| N | Non-ferrous | | | ★ |
| S | Superalloys | | ★ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH140 | Coated AH725 | Un-coated KS15F | A | B | T |
|---|---|---|---|---|---|---|---|---|
| AOMT070202PDPR-MJ | 0.2 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070204PDPR-MJ | 0.4 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070208PDPR-MJ | 0.8 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070216PDPR-MJ | 1.6 | 7 | ● | ● | | 8 | 4.7 | 2.3 |
| AOMT070208PDPR-HJ | 0.8 | 0.8 | ● | ● | | 8.8 | 4.9 | 2.4 |
| AOGT070204PDFR-AJ | 0.4 | 6.4 | | | ● | 8.1 | 4.7 | 2.3 |

●: Line up

## STANDARD CUTTING CONDITIONS

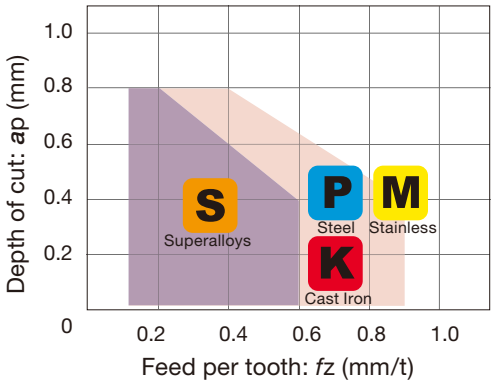
| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) MJ | HJ | AJ |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel S15C, etc. C15E4, etc. | < 200 | AH725 | 90 - 200 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| | High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc. | 200 - 300 | AH725 | 90 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| | Tool steel SKD11, etc. X153CrMoV12, etc. | 150 - 300 | AH725 | 80 - 120 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | AH140 | 90 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| K | Grey cast irons FC250, etc. 250, etc. | 150 - 250 | AH725 | 100 - 180 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| | Ductile cast irons FCD450, etc. 450-10S, etc. | 150 - 250 | AH725 | 80 - 150 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| N | Aluminium alloys Si < 13% | - | KS15F | 300 - 1000 | - | - | 0.08 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | KS15F | 100 - 200 | - | - | 0.08 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.05 - 0.1 | 0.4 - 0.9 | - |
| | Superalloys Inconel 718, etc. | - | AH725 | 20 - 35 | 0.05 - 0.08 | 0.2 - 0.6 | - |

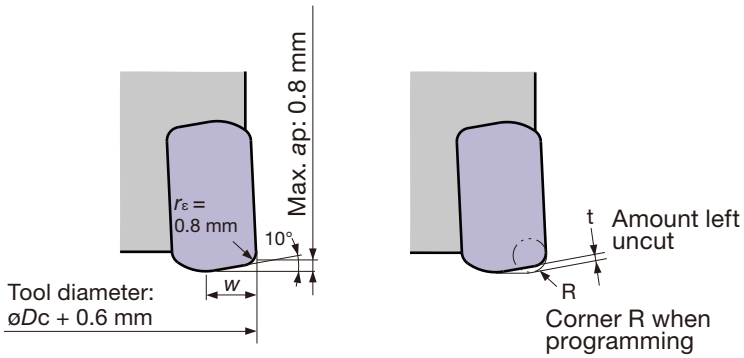
- To remove excessive chip accumulation use an air blast.
- To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
- When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
- Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.
- For application range see page D072.

## CAUTIONARY POINTS WHEN USING HJ INSERTS

HJ type inserts are designed for high feed machining.
Please note the following when using HJ inserts:
1. The shape of HJ insert differs from that of other inserts (MJ, AJ). However the same insert pocket can be used.
2. When using HJ inserts, all the inserts on the cutter body must be HJ type. Do not use other types of inserts (MJ and AJ types) with HJ inserts on the same cutter body.
3. When using CAD/CAM, please program it as a radius cutter. The table below shows the corner R when programming and the uncut area (t).
4. With HJ inserts, the tool diameter increases by 0.6 mm over the diameter ø*Dc* shown in the table.

### TungRec 07 type HJ inserts Standard conditions



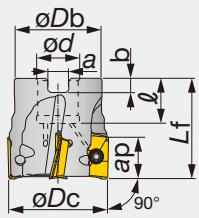

| Max. depth of cut max ap (mm) | Main cutting edge length *W* (mm) | Corner R when programming | Amount left uncut t (mm) |
|---|---|---|---|
| 0.8 | 3 | R 0.5 | 0.4 |
| | | R 1 | 0.3 |

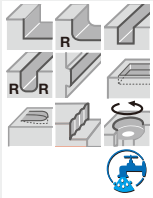
MEMO

# TUNGREC
## TPO11

High precision square shoulder mills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°




| Designation | Max. ap | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO11R040M16.0E06 | 10.6 | 40 | 6 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.21 | with | AS*T11T3... |
| TPO11R050M22.0E07 | 10.6 | 50 | 7 | 45 | 22 | 20 | 40 | 6.3 | 10.4 | 0.35 | with | AS*T11T3... |
| TPO11R063M22.0E08 | 10.6 | 63 | 8 | 47 | 22 | 20 | 45 | 6.3 | 10.4 | 0.59 | with | AS*T11T3... |
| TPO11R080M25.4-10 | 10.6 | 80 | 10 | 58 | 25.4 | 26 | 50 | 6 | 9.5 | 1.07 | with | AS*T11T3... |
| TPO11R100M31.75-11 | 10.6 | 100 | 11 | 70 | 31.75 | 32 | 63 | 8 | 12.7 | 1.95 | with | AS*T11T3... |

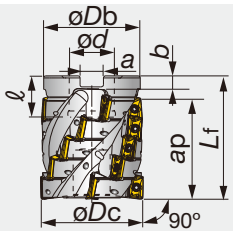
### SPARE PARTS

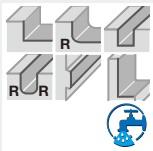
| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TPO11R040M16.0E06 | CSPB-2.5 | M-1000 | CM8X30H | IP-8D |
| TPO11R050, 063... | CSPB-2.5 | M-1000 | CM10X30H | IP-8D |
| TPO11R080M25.4-10 | CSPB-2.5 | M-1000 | CM12X30H | IP-8D |
| TPO11R100M31.75-11 | CSPB-2.5 | M-1000 | CM16X40H | IP-8D |

# TUNGREC
## TLS11

Highly productive square shoulder mills for roughing with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°




| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLS11R050M22.0E04 | 48.8 | 50 | 4 | 20 | 47 | 60 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | AS*T11T3... |

### SPARE PARTS

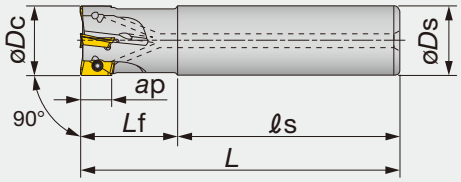
| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TLS11R050M22.0E04 | CSPB-2.5 | M-1000 | CM10X40H | IP-8D |

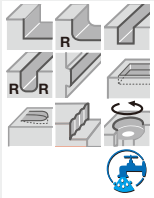
# TUNGREC

## EPO11

High precision square shoulder endmills with ASMT/ASGT11 inserts

A.R. = +8.7°~ +18°, R.R. = –5.3°~ –19.4°



| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPO11R012M16.0-01 | 10.6 | 12 | 1 | 16 | 60 | 25 | 85 | 0.11 | with | AS*T11T3... |
| EPO11R012M16.0-01L | 10.6 | 12 | 1 | 16 | 95 | 30 | 125 | 0.16 | with | AS*T11T3... |
| EPO11R016M16.0-02 | 10.6 | 16 | 2 | 16 | 60 | 25 | 85 | 0.12 | with | AS*T11T3... |
| EPO11R016M16.0-02L | 10.6 | 16 | 2 | 16 | 105 | 40 | 145 | 0.2 | with | AS*T11T3... |
| EPO11R018M16.0-02 | 10.6 | 18 | 2 | 16 | 60 | 25 | 85 | 0.12 | with | AS*T11T3... |
| EPO11R018M16.0-02L | 10.6 | 18 | 2 | 16 | 105 | 40 | 145 | 0.21 | with | AS*T11T3... |
| EPO11R020M20.0-02 | 10.6 | 20 | 2 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R020M20.0-02L | 10.6 | 20 | 2 | 20 | 135 | 50 | 185 | 0.41 | with | AS*T11T3... |
| EPO11R020M20.0-03 | 10.6 | 20 | 3 | 20 | 70 | 30 | 100 | 0.21 | with | AS*T11T3... |
| EPO11R022M20.0-02 | 10.6 | 22 | 2 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R022M20.0-02L | 10.6 | 22 | 2 | 20 | 155 | 30 | 185 | 0.42 | with | AS*T11T3... |
| EPO11R022M20.0-03 | 10.6 | 22 | 3 | 20 | 70 | 30 | 100 | 0.22 | with | AS*T11T3... |
| EPO11R025M25.0-02L | 10.6 | 25 | 2 | 25 | 150 | 70 | 220 | 0.76 | with | AS*T11T3... |
| EPO11R025M25.0-03 | 10.6 | 25 | 3 | 25 | 80 | 35 | 115 | 0.39 | with | AS*T11T3... |
| EPO11R025M25.0-04 | 10.6 | 25 | 4 | 25 | 80 | 35 | 115 | 0.38 | with | AS*T11T3... |
| EPO11R028M25.0-02L | 10.6 | 28 | 2 | 25 | 185 | 35 | 220 | 0.8 | with | AS*T11T3... |
| EPO11R028M25.0-03 | 10.6 | 28 | 3 | 25 | 80 | 35 | 115 | 0.4 | with | AS*T11T3... |
| EPO11R028M25.0-04 | 10.6 | 28 | 4 | 25 | 80 | 35 | 115 | 0.39 | with | AS*T11T3... |
| EPO11R030M25.0-02L | 10.6 | 30 | 2 | 25 | 180 | 40 | 220 | 0.8 | with | AS*T11T3... |
| EPO11R030M25.0-03 | 10.6 | 30 | 3 | 25 | 80 | 40 | 120 | 0.43 | with | AS*T11T3... |
| EPO11R030M25.0-04 | 10.6 | 30 | 4 | 25 | 80 | 40 | 120 | 0.42 | with | AS*T11T3... |
| EPO11R032M32.0-02L | 10.6 | 32 | 2 | 32 | 175 | 80 | 255 | 1.48 | with | AS*T11T3... |
| EPO11R032M32.0-03 | 10.6 | 32 | 3 | 32 | 80 | 40 | 120 | 0.68 | with | AS*T11T3... |
| EPO11R032M32.0-05 | 10.6 | 32 | 5 | 32 | 80 | 40 | 120 | 0.67 | with | AS*T11T3... |
| EPO11R035M32.0-02L | 10.6 | 35 | 2 | 32 | 215 | 40 | 255 | 1.49 | with | AS*T11T3... |
| EPO11R035M32.0-03 | 10.6 | 35 | 3 | 32 | 80 | 40 | 120 | 0.69 | with | AS*T11T3... |
| EPO11R035M32.0-05 | 10.6 | 35 | 5 | 32 | 80 | 40 | 120 | 0.67 | with | AS*T11T3... |
| EPO11R040M32.0-02L | 10.6 | 40 | 2 | 32 | 205 | 50 | 255 | 1.53 | with | AS*T11T3... |
| EPO11R040M32.0-04 | 10.6 | 40 | 4 | 32 | 80 | 40 | 120 | 0.72 | with | AS*T11T3... |
| EPO11R040M32.0-06 | 10.6 | 40 | 6 | 32 | 80 | 40 | 120 | 0.71 | with | AS*T11T3... |
| EPO11R050M32.0-05 | 10.6 | 50 | 5 | 32 | 80 | 40 | 120 | 0.83 | with | AS*T11T3... |
| EPO11R050M32.0-07 | 10.6 | 50 | 7 | 32 | 80 | 40 | 120 | 0.82 | with | AS*T11T3... |
| EPO11R050M42.0-03L | 10.6 | 50 | 3 | 42 | 310 | 50 | 360 | 3.78 | with | AS*T11T3... |

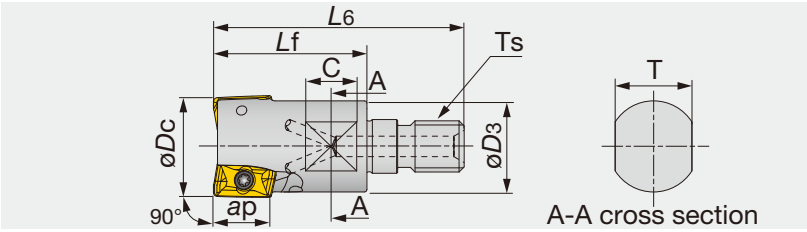
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPO11R012 - 022... | CSPB-2.5S | M-1000 | IP-8D |
| EPO11R025 - 050... | CSPB-2.5 | M-1000 | IP-8D |

# TUNGREC
## HPO11-M

High precision shoulder square endmills (TungRec) with TungFlex, carrying ASMT/ASGT11 inserts

A.R. = +8.7° ~ +18°, R.R. = -5.3° ~ -19.4°




| Designation | Max. ap | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HPO11R020MM10-02 | 10.6 | 20 | 2 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.06 | with | AS*T11T3... |
| HPO11R025MM12-03 | 10.6 | 25 | 3 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with | AS*T11T3... |
| HPO11R032MM16-03 | 10.6 | 32 | 3 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | AS*T11T3... |

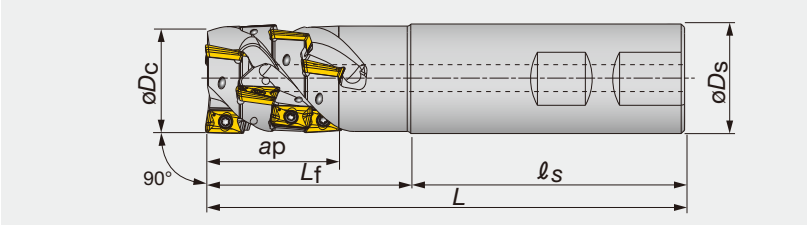
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HPO11R020MM10-02 | CSPB-2.5S | M-1000 | IP-8D |
| HPO11R025, 032... | CSPB-2.5 | M-1000 | IP-8D |

# TUNGREC
## ELS11

Highly productive endmills for roughing with ASMT/ASGT11 inserts

A.R. = +8.7° ~ +18°, R.R. = -5.3° ~ -19.4°



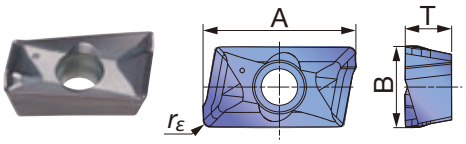

| Designation | Max. ap | øDc | Z eff | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ELS11R025M25.0W02 | 30.4 | 25 | 2 | 6 | 25 | 80 | 40 | 120 | 0.4 | with | AS*T11T3... |
| ELS11R032M32.0W03 | 39.4 | 32 | 3 | 12 | 32 | 80 | 60 | 140 | 0.8 | with | AS*T11T3... |
| ELS11R040M42.0W03 | 40 | 40 | 3 | 12 | 42 | 90 | 60 | 150 | 1.4 | with | AS*T11T3... |

### SPARE PARTS

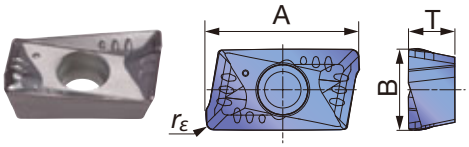
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ELS11... | CSPB-2.5 | M-1000 | IP-8D |

## INSERT

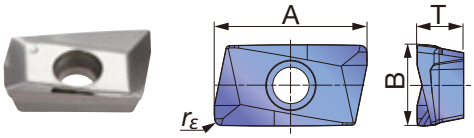
### ASMT11-MJ




### ASMT11-MS




### ASGT11-AJ




| | | AH120 | AH130 | AH140 | AH725 | T1115 | T1215 | T3130 | DS1100 | NS740 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | | | ★ | | ★ | |
| M | Stainless | | ★ | ★ | ☆ | | | | | | |
| K | Cast iron | ★ | | | ☆ | ☆ | ★ | | | | |
| N | Non-ferrous | | | | | | | | ★ | | ★ |
| S | Superalloys | ★ | ★ | | ★ | | | | | | |
| H | Hard materials | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | | Cermet | Un-coated | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH725 | T1115 | T1215 | T3130 | DS1100 | NS740 | KS05F | | | |
| ASMT11T304PDPR-MJ | 0.4 | 10.6 | ● | | | ● | ● | | ● | | ● | | 12.3 | 6.7 | 3.7 |
| ASMT11T308PDPR-MJ | 0.8 | 10.6 | ● | ● | | ● | ● | ● | ● | | ● | | 12.3 | 6.7 | 3.7 |
| ASMT11T312PDPR-MJ | 1.2 | 10.6 | ● | | | ● | | | ● | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T316PDPR-MJ | 1.6 | 10.6 | ● | | | ● | | | ● | | ● | | 12.3 | 6.7 | 3.7 |
| ASMT11T320PDPR-MJ | 2 | 10.6 | ● | | | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T330PDPR-MJ | 3 | 10.6 | ● | | | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASMT11T304PDPR-MS | 0.4 | 10.6 | | ● | ● | | | | | | | | 12.3 | 6.7 | 3.7 |
| ASGT11T304PDFR-AJ | 0.4 | 10.6 | | | | | | | | ● | | ● | 12.3 | 6.7 | 3.7 |
| ASGT11T308PDFR-AJ | 0.8 | 10.6 | | | | | | | | ● | | ● | 12.3 | 6.7 | 3.7 |

●: Line up

## STANDARD CUTTING CONDITIONS

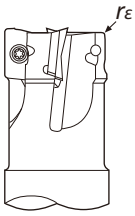
### TPO11/EPO11/HPO11 type

| ISO | Workpiece material | Brinell hardness HB | Priority | Grade | Cutting speed: *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | MJ | MS | AJ |
| P | Low carbon steel S15C, etc. C15E4, etc. | ~ 200 | First choice | AH725 | 100 - 250 | 0.1 - 0.2 | - | - |
| | | ~ 200 | For wear resistance | T3130 | 100 - 250 | 0.1 - 0.2 | - | - |
| | | ~ 200 | For surface appearance | NS740 | 100 - 250 | 0.05 - 0.15 | - | - |
| | High carbon steel and alloy steel S55C, SCM440, etc. C55, 42CrMo4, etc. | 200 ~ 300 | First choice | AH725 | 100 - 200 | 0.1 - 0.15 | - | - |
| | | 200 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.1 - 0.15 | - | - |
| | | 200 ~ 300 | For surface appearance | NS740 | 100 - 200 | 0.05 - 0.12 | - | - |
| | Tool steel SKD11, etc. X153CrMoV12, etc. | 150 ~ 300 | First choice | AH725 | 100 - 150 | 0.1 - 0.15 | - | - |
| | | 150 ~ 300 | For wear resistance | T3130 | 100 - 150 | 0.1 - 0.15 | - | - |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | - | AH130 | 80 - 200 | - | 0.08 - 0.2 | - |
| K | Grey cast irons FC250, etc. 250, etc. | 150 ~ 250 | First choice | AH120 | 100 - 250 | 0.12 - 0.2 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 100 - 250 | 0.12 - 0.2 | - | - |
| | Ductile cast irons FCD450, etc. 450-10S, etc. | 150 ~ 250 | First choice | AH120 | 80 - 200 | 0.12 - 0.2 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215 T1115 | 80 - 200 | 0.12 - 0.2 | - | - |
| N | Aluminium alloys Si < 13% | - | - | DS1100 | 300 - 1000 | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | - | DS1100 | 100 - 200 | - | - | 0.05 - 0.2 |
| | Copper alloys | - | - | KS05F | 200 - 500 | - | - | 0.05 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | - | AH130 | 20 - 60 | - | 0.08 - 0.15 | - |
| | Superalloys Inconel 718, etc. | - | - | AH725 | 20 - 40 | 0.08 - 0.13 | - | - |

## CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius $r_\varepsilon \geq 2.0$ mm, standard cutter bodies have to be modified "R". (Only for TPO11, EPO11, TLS11, ELS11, HPO11)

- From 2nd row onwards, please use insert with $r_\varepsilon = 0.4$ or 0.8 mm
- For application range see page D072.




| Corner radius $r_\varepsilon$ (mm) | The dimension of modifying (mm) |
|---|---|
| 0.4 ~ 1.6 | Unnecessary |
| 2.0 ~ 3.2 | 2 |

# STANDARD CUTTING CONDITIONS

## Roughing type TLS11 / ELS11

| ISO | Workpiece material | Brinell hardness HB | Priority | Grade | Cutting speed: *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | MJ | MS | AJ |
| P | Low carbon steel<br>S15C, etc.<br>C15E4, etc. | ~ 200 | First choice | AH725 | 100 - 250 | 0.10 - 0.18 | - | - |
| | | ~ 200 | For wear resistance | T3130 | 100 - 250 | 0.10 - 0.18 | - | - |
| | High carbon steel and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | 200 ~ 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.14 | - | - |
| | | 200 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.14 | - | - |
| | Tool steel<br>SKD11, etc.<br>X153CrMoV12, etc. | 150 ~ 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.14 | - | - |
| | | 150 ~ 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.14 | - | - |
| M | Stainless steel<br>SUS304, etc. X5CrNi18-9, etc. | - | - | AH130 | 100 - 150 | - | 0.08 - 0.15 | - |
| K | Grey cast irons<br>FC250, etc.<br>250, etc. | 150 ~ 250 | First choice | AH120 | 100 - 250 | 0.10 - 0.18 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215<br>T1115 | 100 - 250 | 0.10 - 0.18 | - | - |
| | Ductile cast irons<br>FCD450, etc.<br>450-10S, etc. | 150 ~ 250 | First choice | AH120 | 80 - 200 | 0.10 - 0.18 | - | - |
| | | 150 ~ 250 | For wear resistance | T1215<br>T1115 | 80 - 200 | 0.10 - 0.18 | - | - |
| N | Aluminium alloys<br>Si < 13% | - | - | DS1100 | 200 - 500 | - | - | 0.05 - 0.18 |
| | Aluminium alloys<br>Si ≥ 13% | - | - | DS1100 | 100 - 200 | - | - | 0.05 - 0.18 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | - | AH130 | 20 - 60 | - | 0.08 - 0.14 | - |
| | Superalloys<br>Inconel718, etc. | - | - | AH725 | 20 - 40 | 0.06 - 0.12 | - | - |

· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

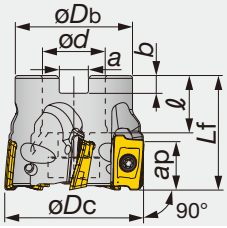
MEMO

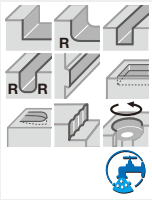
# TUNGREC

## TPO18

High precision square shoulder milling cutters with AOMT/AOGT18 inserts

A.R. = +14° ~ +17°, R.R. = +22° ~ +31°




| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPO18R040M16.0-04 | 16.7 | 40 | 4 | 35 | 40 | 16 | 18 | 8.2 | 5.6 | 0.2 | with | AO*T1805... |
| TPO18R040M16.0E04 | 16.7 | 40 | 4 | 35 | 40 | 16 | 18 | 8.4 | 5.6 | 0.2 | with | AO*T1805... |
| TPO18R050M22.0-05 | 16.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10 | 6 | 0.2 | with | AO*T1805... |
| TPO18R050M22.0E05 | 16.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | AO*T1805... |
| TPO18R063M22.0-06 | 16.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10 | 6 | 0.4 | with | AO*T1805... |
| TPO18R063M22.0E06 | 16.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | AO*T1805... |
| TPO18R080M25.4-07 | 16.7 | 80 | 7 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.8 | with | AO*T1805... |
| TPO18R080M27.0E07 | 16.7 | 80 | 7 | 50 | 50 | 27 | 22 | 12.4 | 7 | 10 | with | AO*T1805... |
| TPO18R100M31.7-08 | 16.7 | 100 | 8 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.2 | with | AO*T1805... |
| TPO18R100M32.0E08 | 16.7 | 100 | 8 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | AO*T1805... |
| TPO18R125M38.1-09 | 16.7 | 125 | 9 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.8 | with | AO*T1805... |
| TPO18R125M40.0E09 | 16.7 | 125 | 9 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.8 | with | AO*T1805... |
| TPO18R160M40.0E10 | 16.7 | 160 | 10 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4.9 | without | AO*T1805... |
| TPO18R160M50.8-10 | 16.7 | 160 | 10 | 100 | 63 | 50.8 | 46 | 19 | 11 | 4.9 | without | AO*T1805... |

### SPARE PARTS

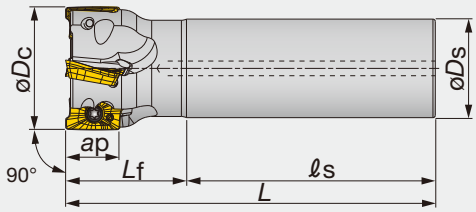
| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TPO18R040M... | CSTB-4L093 | H-TBS | - | FSHM8-30H | BT15M |
| TPO18R050M... | CSTB-4L093 | H-TBS | - | CM10X30H | BT15M |
| TPO18R063M... | CSTB-4L093 | H-TBS | - | CM10X30H | BT15M |
| TPO18R080M... | CSTB-4L120 | H-TBS | - | CM12X30H | BT15M |
| TPO18R100M... | CSTB-4L120 | H-TBS | TMBA-M16H | - | BT15M |
| TPO18R125M... | CSTB-4L120 | H-TBS | TMBA-M20H | - | BT15M |
| TPO18R160M... | CSTB-4L120 | H-TBS | - | - | BT15M |

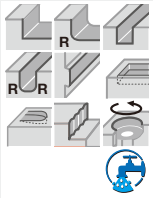
# EPO18

## High precision square shoulder endmills with AOMT/AOGT18 inserts



A.R. = +14° ~ +17°, R.R. = +22° ~ +31°



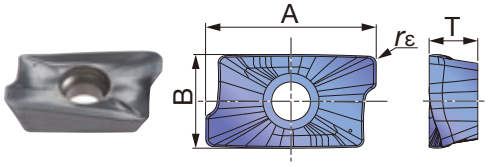

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPO18R025M25.0-02 | 16.7 | 25 | 2 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T1805... |
| EPO18R025M25.0-02L | 16.7 | 25 | 2 | 25 | 150 | 70 | 220 | 0.8 | with | AO*T1805... |
| EPO18R028M25.0-02 | 16.7 | 28 | 2 | 25 | 80 | 35 | 115 | 0.4 | with | AO*T1805... |
| EPO18R028M25.0-02L | 16.7 | 28 | 2 | 25 | 150 | 70 | 220 | 0.8 | with | AO*T1805... |
| EPO18R030M32.0-02 | 16.7 | 30 | 2 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R030M32.0-02L | 16.7 | 30 | 2 | 32 | 175 | 80 | 255 | 1.4 | with | AO*T1805... |
| EPO18R030M32.0-03 | 16.7 | 30 | 3 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R032M32.0-02 | 16.7 | 32 | 2 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R032M32.0-02L | 16.7 | 32 | 2 | 32 | 175 | 80 | 255 | 1.5 | with | AO*T1805... |
| EPO18R032M32.0-03 | 16.7 | 32 | 3 | 32 | 80 | 40 | 120 | 0.6 | with | AO*T1805... |
| EPO18R035M32.0-02 | 16.7 | 35 | 2 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R035M32.0-02L | 16.7 | 35 | 2 | 32 | 175 | 80 | 255 | 1.5 | with | AO*T1805... |
| EPO18R035M32.0-03 | 16.7 | 35 | 3 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M32.0-02L | 16.7 | 40 | 2 | 32 | 205 | 50 | 255 | 1.6 | with | AO*T1805... |
| EPO18R040M32.0-03 | 16.7 | 40 | 3 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M32.0-04 | 16.7 | 40 | 4 | 32 | 80 | 40 | 120 | 0.7 | with | AO*T1805... |
| EPO18R040M42.0-02L | 16.7 | 40 | 2 | 42 | 210 | 100 | 310 | 3 | with | AO*T1805... |
| EPO18R050M32.0-03 | 16.7 | 50 | 3 | 32 | 80 | 40 | 120 | 0.8 | with | AO*T1805... |
| EPO18R050M32.0-05 | 16.7 | 50 | 5 | 32 | 80 | 40 | 120 | 0.8 | with | AO*T1805... |
| EPO18R050M42.0-03L | 16.7 | 50 | 3 | 42 | 310 | 50 | 360 | 3.8 | with | AO*T1805... |
| EPO18R063M32.0-04 | 16.7 | 63 | 4 | 32 | 80 | 45 | 125 | 1 | with | AO*T1805... |
| EPO18R063M32.0-06 | 16.7 | 63 | 6 | 32 | 80 | 45 | 125 | 1.1 | with | AO*T1805... |
| EPO18R063M42.0-03L | 16.7 | 63 | 3 | 42 | 310 | 50 | 360 | 4 | with | AO*T1805... |

### SPARE PARTS

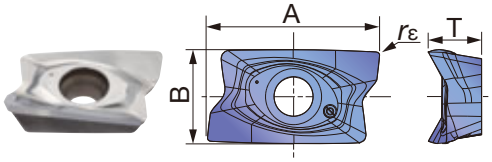
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPO18R025 - 030... | CSTB-4L085 | T-15DB |
| EPO18R032 - 050... | CSTB-4L093 | T-15DB |
| EPO18R063M... | CSTB-4L120 | T-15DB |

## INSERT

### AOMT18-MJ




### AOGT18-AJ




| | | AH140 | AH725 | KS15F |
|---|---|---|---|---|
| P | Steel | | ★ | |
| M | Stainless | ★ | ☆ | |
| K | Cast iron | | ★ | |
| N | Non-ferrous | | | ★ |
| S | Superalloys | | ★ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH140 | Coated AH725 | Un-coated KS15F | A | B | T |
|---|---|---|---|---|---|---|---|---|
| AOMT180508PDPR-MJ | 0.8 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180516PDPR-MJ | 1.6 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180524PDPR-MJ | 2.4 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOMT180532PDPR-MJ | 3.2 | 16.7 | ● | ● | | 19.5 | 10.7 | 5.6 |
| AOGT180504PDFR-AJ | 0.4 | 16.7 | | | ● | 19.8 | 10.8 | 6.1 |
| AOGT180508PDFR-AJ | 0.8 | 16.7 | | | ● | 19.8 | 10.8 | 6.1 |

●: Line up

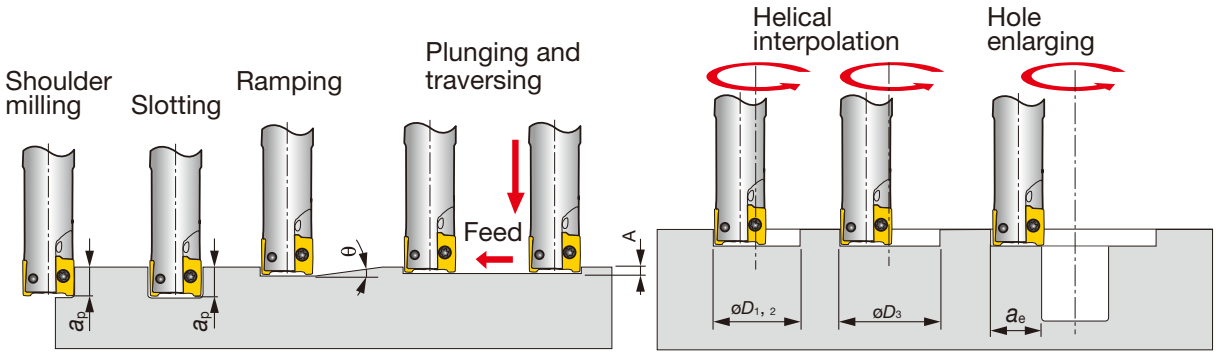
## STANDARD CUTTING CONDITIONS

### TPO18/EPO18 type

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed Vc (m/min) | Feed per tooth: fz (mm/t) MJ | Feed per tooth: fz (mm/t) AJ |
|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, etc. C15E4, etc. | ~ 200 | AH725 | 100 - 250 | 0.08 - 0.25 | - |
| | High carbon steel and alloy steel<br>S55C, SCM440, etc. C55, 42CrMo4, etc. | 200 ~ 300 | AH725 | 100 - 230 | 0.08 - 0.2 | - |
| | Tool steel<br>SKD11, etc. X153CrMoV12, etc. | 150 ~ 300 | AH725 | 100 - 180 | 0.08 - 0.2 | - |
| M | Stainless steel<br>SUS304, etc. X5CrNi18-9, etc. | - | AH140 | 90 - 200 | 0.08 - 0.2 | - |
| K | Grey cast irons<br>FC250, etc. 250, etc. | 150 ~ 250 | AH725 | 140 - 250 | 0.08 - 0.25 | - |
| | Ductile cast irons<br>FCD450, etc. 450-10S, etc. | 150 ~ 250 | AH725 | 110 - 200 | 0.08 - 0.25 | - |
| N | Aluminium alloys<br>Si < 13% | - | KS15F | 300 - 1000 | - | 0.05 - 0.25 |
| | Aluminium alloys<br>Si ≥ 13% | - | KS15F | 100 - 200 | - | 0.05 - 0.25 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | AH725 | 20 - 60 | 0.08 - 0.18 | - |
| | Superalloys<br>Inconel718, etc. | - | AH725 | 20 - 40 | 0.08 - 0.15 | - |

· To remove excessive chip accumulation use an air blast.
· To avoid build up edge on the cutting edges (aluminium machining), use a water soluble coolant.
· When cutting an interrupted surface or a casted skin, the feed per tooth (fz) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

## APPLICATION RANGE




| Designation | Tool dia. øDc | Chipbreaker | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining øD1 | Max. machining øD2 | Max. machining øD3* | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| E/HPO07R012… | 12 | MJ | 7 | 8 | 0.5 | 16 | 23 | 20.5 | 11.5 |
| E/HPO07R016… | 16 | MJ | 7 | 5 | 0.5 | 24 | 31 | 28.5 | 15.5 |
| EPO07R018... | 18 | MJ | 7 | 4 | 0.5 | 28 | 35 | 32.5 | 17.5 |
| E/HPO07R020... | 20 | MJ | 7 | 3.5 | 0.5 | 32 | 39 | 36.5 | 19.5 |
| EPO07R022... | 22 | MJ | 7 | 3 | 0.5 | 36 | 43 | 40.5 | 21.5 |
| E/HPO07R025... | 25 | MJ | 7 | 2.5 | 0.5 | 42 | 49 | 46.5 | 24.5 |
| EPO07R028... | 28 | MJ | 7 | 2 | 0.5 | 48 | 55 | 52.5 | 27.5 |
| TPO07R032… | 32 | MJ | 7 | 1.8 | 0.5 | 56 | 63 | 60.5 | 31.5 |
| TPO07R040 | 40 | MJ | 7 | 1.2 | 0.5 | 72 | 79 | 76.5 | 39.5 |
| TPO07R050… | 50 | MJ | 7 | 0.9 | 0.5 | 92 | 99 | 96.5 | 49.5 |
| E/HPO07R012… | 12 | AJ | 6.4 | 8 | 0.5 | 16 | 23 | 20.5 | 11.5 |
| E/HPO07R016… | 16 | AJ | 6.4 | 5 | 0.5 | 24 | 31 | 28.5 | 15.5 |
| EPO07R018... | 18 | AJ | 6.4 | 4 | 0.5 | 28 | 35 | 32.5 | 17.5 |
| E/HPO07R020... | 20 | AJ | 6.4 | 3.5 | 0.5 | 32 | 39 | 36.5 | 19.5 |
| EPO07R022... | 22 | AJ | 6.4 | 3 | 0.5 | 36 | 43 | 40.5 | 21.5 |
| E/HPO07R025... | 25 | AJ | 6.4 | 2.5 | 0.5 | 42 | 49 | 46.5 | 24.5 |
| EPO07R028... | 28 | AJ | 6.4 | 2 | 0.5 | 48 | 55 | 52.5 | 27.5 |
| TPO07R032… | 32 | AJ | 6.4 | 1.8 | 0.5 | 56 | 63 | 60.5 | 31.5 |
| TPO07R040 | 40 | AJ | 6.4 | 1.2 | 0.5 | 72 | 79 | 76.5 | 39.5 |
| TPO07R050… | 50 | AJ | 6.4 | 0.9 | 0.5 | 92 | 99 | 96.5 | 49.5 |
| E/HPO07R012… | 12.6 | HJ | 0.8 | 5 | 0.5 | 17 | 24 | - | 9.6 |
| E/HPO07R016… | 16.6 | HJ | 0.8 | 3 | 0.5 | 25 | 32 | - | 13.6 |
| EPO07R018... | 18.6 | HJ | 0.8 | 2.5 | 0.5 | 29 | 36 | - | 15.6 |
| E/HPO07R020... | 20.6 | HJ | 0.8 | 2.1 | 0.5 | 33 | 40 | - | 17.6 |
| EPO07R022... | 22.6 | HJ | 0.8 | 1.9 | 0.5 | 37 | 44 | - | 19.6 |
| E/HPO07R025... | 25.6 | HJ | 0.8 | 1.6 | 0.5 | 43 | 50 | - | 22.6 |
| EPO07R028... | 28.6 | HJ | 0.8 | 1.3 | 0.5 | 49 | 56 | - | 25.6 |
| TPO07R032… | 32.6 | HJ | 0.8 | 1.1 | 0.5 | 57 | 64 | - | 29.6 |
| TPO07R040 | 40.6 | HJ | 0.8 | 0.8 | 0.5 | 73 | 80 | - | 37.6 |
| TPO07R050… | 50.6 | HJ | 0.8 | 0.6 | 0.5 | 93 | 100 | - | 47.6 |
| EPO11R012… | 12 | MJ, MS, AJ | 10.6 | 6 | 0.5 | 15 | 23 | 21 | 11.5 |
| EPO11R016… | 16 | MJ, MS, AJ | 10.6 | 5 | 0.5 | 20 | 31 | 29 | 15.5 |
| EPO11R018… | 18 | MJ, MS, AJ | 10.6 | 4 | 0.5 | 26 | 35 | 33 | 17.5 |
| E/HPO11R020… | 20 | MJ, MS, AJ | 10.6 | 3 | 0.5 | 28 | 39 | 37 | 19.5 |
| EPO11R022... | 22 | MJ, MS, AJ | 10.6 | 2.5 | 0.5 | 31 | 43 | 41 | 21.5 |

| Designation | Tool-ø øDc | Chipbreaker | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Min. machining øD1 | Max. machining øD2 | Max. machining øD3* | Max. cutting width in enlarging ae |
|---|---|---|---|---|---|---|---|---|---|
| E/HPO11R025… | 25 | MJ, MS, AJ | 10.6 | 2 | 0.5 | 38 | 49 | 47 | 24.5 |
| EPO11R028... | 28 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 42 | 53 | 51 | 27.5 |
| EPO11R030… | 30 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 48 | 55 | 53 | 29.5 |
| E/HPO11R032… | 32 | MJ, MS, AJ | 10.6 | 1.5 | 0.5 | 52 | 59 | 57 | 31.5 |
| EPO11R035… | 35 | MJ, MS, AJ | 10.6 | 1 | 0.5 | 56 | 67 | 65 | 34.5 |
| E/TPO11R040… | 40 | MJ, MS, AJ | 10.6 | 1 | 0.5 | 68 | 79 | 77 | 39.5 |
| TPO11R050… | 50 | MJ, MS, AJ | 10.6 | 0.7 | 0.5 | 68 | 99 | 97 | 49.5 |
| TPO11R063… | 63 | MJ, MS, AJ | 10.6 | 0.5 | 0.5 | 114 | 125 | 123 | 62.5 |
| TPO11R080… | 80 | MJ, MS, AJ | 10.6 | 0.4 | 0.5 | 148 | 159 | 157 | 79.5 |
| TPO11R100… | 100 | MJ, MS, AJ | 10.6 | 0.3 | 0.5 | 188 | 199 | 197 | 99.5 |
| EPO18R025... | 25 | MJ, AJ | 16.7 | 6 | 1 | 32 | 48 | 44 | 24 |
| EPO18R028... | 28 | MJ, AJ | 16.7 | 4.5 | 1 | 38 | 54 | 50 | 27 |
| EPO18R030… | 30 | MJ, AJ | 16.7 | 4 | 1 | 42 | 58 | 54 | 29 |
| EPO18R032… | 32 | MJ, AJ | 16.7 | 3.5 | 1 | 46 | 62 | 58 | 31 |
| EPO18R035… | 35 | MJ, AJ | 16.7 | 3 | 1 | 52 | 68 | 64 | 34 |
| E/TPO18R040… | 40 | MJ, AJ | 16.7 | 2.5 | 1 | 62 | 78 | 74 | 39 |
| E/TPO18R050… | 50 | MJ, AJ | 16.7 | 1.9 | 1 | 82 | 98 | 94 | 49 |
| E/TPO18R063 | 63 | MJ, AJ | 16.7 | 1.4 | 1 | 108 | 124 | 120 | 62 |
| TPO18R080… | 80 | MJ, AJ | 16.7 | 1 | 1 | 142 | 158 | 154 | 79 |
| TPO18R100… | 100 | MJ, AJ | 16.7 | 0.8 | 1 | 182 | 198 | 194 | 99 |
| TPO18R125… | 125 | MJ, AJ | 16.7 | 0.6 | 1 | 232 | 248 | 244 | 124 |
| TPO18R160… | 160 | MJ, AJ | 16.7 | 0.4 | 1 | 302 | 318 | 314 | 159 |

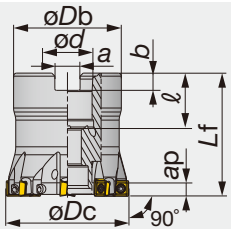
*Flat bottom hole
Note: Corner $r_\varepsilon$ for dimensions of $øD_1$, $øD_2$, and $øD_3$: $r_\varepsilon$ = 0.4 for EPO07 / EPO11 and $r_\varepsilon$ = 0.8 for EPO18.

# TUNGQUAD

## TPD05

Highly dense square shoulder mills with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -7° ~ +12°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPD05R032M16.0E06 | 4 | 32 | 6 | 30 | 32 | 16 | 20 | 8.4 | 5.6 | 0.1 | with | SD*T0502... |
| TPD05R040M22.0E08 | 4 | 40 | 8 | 38 | 40 | 22 | 22 | 10.4 | 6.3 | 0.2 | with | SD*T0502... |

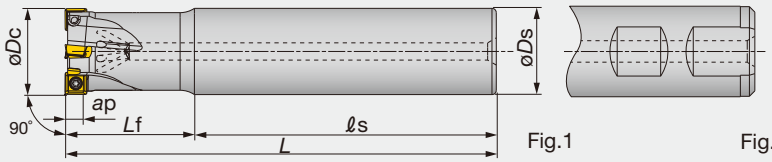
### SPARE PARTS

| Designation | Clamping screw | Shell locking bolt | Wrench |
|---|---|---|---|
| TPD05R032M16.0E06 | CSPB-2L043 | CM8X30H | IP-6DB |
| TPD05R040M22.0E08 | CSPB-2L043 | CM10X30H | IP-6DB |

## EPD05

Highly dense square shoulder endmills with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -7° ~ +12°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Shank | Insert | Shank type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPD05R012M12.0-02 | 4 | 12 | 2 | 12 | 62 | 18 | 80 | 0.1 | with | Straight | SD*T0502... | Fig.1 |
| EPD05R016M16.0-03 | 4 | 16 | 3 | 16 | 90 | 20 | 110 | 0.2 | with | Straight | SD*T0502... | Fig.1 |
| EPD05R020M20.0W04 | 4 | 20 | 4 | 20 | 80 | 25 | 105 | 0.2 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R025M20.0W05 | 4 | 25 | 5 | 20 | 90 | 25 | 115 | 0.3 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R032M25.0W06 | 4 | 32 | 6 | 25 | 98 | 32 | 130 | 0.5 | with | Weldon | SD*T0502... | Fig.2 |
| EPD05R040M32.0W08 | 4 | 40 | 8 | 32 | 100 | 40 | 140 | 0.8 | with | Weldon | SD*T0502... | Fig.2 |

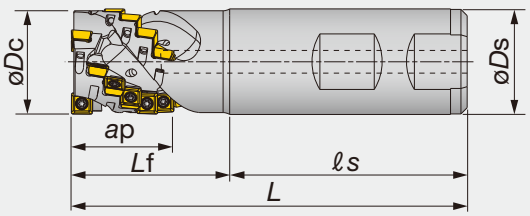
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| EPD05... | CSPB-2L043 | IP-6DB |

## ELD05

Highly dense square shoulder endmills for roughing with small SDMT/SDHT05 inserts

A.R. = +5°, R.R. = -3°



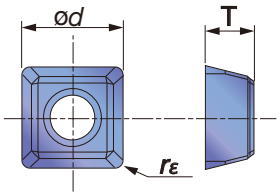

| Designation | Max. ap | øDc | Z eff | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ELD05R020M20.0W02 | 20.3 | 20 | 2 | 10 | 20 | 53 | 32 | 85 | 0.2 | with | SD*T0502... |
| ELD05R025M25.0W03 | 24.2 | 25 | 3 | 18 | 25 | 59 | 36 | 95 | 0.3 | with | SD*T0502... |

### SPARE PARTS

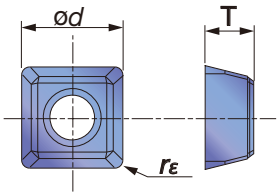
| Designation | Clamping screw | Wrench |
|---|---|---|
| ELD05... | CSPB-2L043 | IP-6DB |

## INSERT

### SDMT05-MJ




### SDHT05-AJ




| | | Coated | | Un-coated |
|---|---|---|---|---|
| | | AH140 | AH725 | TH10 |
| P | Steel | | ★ | |
| M | Stainless | ★ | ☆ | |
| K | Cast iron | | ★ | |
| N | Non-ferrous | | | ★ |
| S | Superalloys | | ★ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH140 | AH725 | TH10 | T | ød |
|---|---|---|---|---|---|---|---|
| SDMT050204PN-MJ | 0.4 | 4 | ● | ● | | 2.38 | 5.09 |
| SDHT050204FN-AJ | 0.4 | 4 | | | ● | 2.39 | 5.09 |

●: Line up

## STANDARD CUTTING CONDITIONS

### ■ Bore, shank type TPD05/EPD05

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S15C, etc. C15E4, etc. | ~ 200 | AH725 | 230 - 320 | 0.04 - 0.1 |
| | High carbon steels<br>S45C, etc. C45, etc. | 200 ~ 300 | AH725 | 150 - 230 | 0.04 - 0.1 |
| | Alloyed steels<br>SCM440, etc. 42CrMo4, etc. | 150 ~ 300 | AH725 | 150 - 230 | 0.04 - 0.1 |
| | Tool steels<br>SKD11, etc. X153CrMoV12, etc. | ~ 300 | AH725 | 110 - 130 | 0.03 - 0.09 |
| M | Stainless steels<br>SUS304, etc. X5CrNi18-9, etc. | - | AH140 | 100 - 200 | 0.03 - 0.09 |
| K | Grey cast irons<br>FC250, etc. 250, etc. | 150 ~ 250 | AH725 | 200 - 300 | 0.05 - 0.12 |
| | Ductile cast irons<br>FCD400, etc. 450-10S, etc. | 150 ~ 250 | AH725 | 160 - 240 | 0.05 - 0.12 |
| N | Aluminium alloys<br>Si < 13% | - | TH10 | 350 - 500 | 0.05 - 0.15 |
| | Aluminium alloys<br>Si ≥ 13% | - | TH10 | 100 - 200 | 0.05 - 0.15 |

* For deep and wide cutting, set the *Vc* and *fz* to the lower recommended limits and check the vibration and spindle load of the machine.

# STANDARD CUTTING CONDITIONS

## Roughing type ELD05

| ISO | Workpiece material | Brinell hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S15C, etc. C15E4, etc. | ~ 200 | AH725 | 100 - 250 | 0.04 - 0.1 |
| | High carbon steels<br>S45C, etc. C45, etc. | 200 ~ 300 | AH725 | 100 - 200 | 0.04 - 0.1 |
| | Alloyed steels<br>SCM440, etc. 42CrMo4, etc. | 150 ~ 300 | AH725 | 100 - 200 | 0.04 - 0.1 |
| | Tool steels<br>SKD11, etc. X153CrMoV12, etc. | ~ 300 | AH725 | 100 - 130 | 0.03 - 0.09 |
| M | Stainless steels<br>SUS304, etc. X5CrNi18-9, etc. | - | AH140 | 100 - 150 | 0.03 - 0.09 |
| K | Grey cast irons<br>FC250, etc. 250, etc. | 150 ~ 250 | AH725 | 100 - 250 | 0.05 - 0.12 |
| | Ductile cast irons<br>FCD400, etc. 450-10S, etc. | 150 ~ 250 | AH725 | 80 - 200 | 0.05 - 0.12 |
| N | Aluminium alloys<br>Si < 13% | - | TH10 | 200 - 500 | 0.05 - 0.15 |
| | Aluminium alloys<br>Si ≥ 13% | - | TH10 | 100 - 200 | 0.05 - 0.15 |

MEMO

# TPW13

## Square shoulder mills with screw clamped SWMT/SWGT13 inserts



A.R. = +11.5°, R.R. = -13° ~ -10.5°

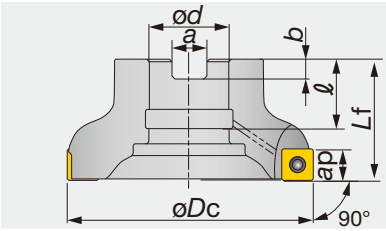



Fig.1

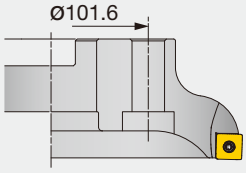


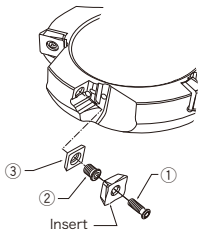

Fig.2

Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Airhole | Insert | Style |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPW13R050M22.0-03 | 10 | 50 | 3 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | SW*T1304... | 1 |
| TPW13R050M22.0-04 | 10 | 50 | 4 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | SW*T1304... | 1 |
| TPW13R050M22.0E04 | 10 | 50 | 4 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | SW*T1304... | 1 |
| TPW13R050M22.0E05 | 10 | 50 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | SW*T1304... | 1 |
| TPW13R063M22.0-04 | 10 | 63 | 4 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | SW*T1304... | 1 |
| TPW13R063M22.0-05 | 10 | 63 | 5 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | SW*T1304... | 1 |
| TPW13R063M22.0E05 | 10 | 63 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T1304... | 1 |
| TPW13R063M22.0E06 | 10 | 63 | 6 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T1304... | 1 |
| TPW13R080M25.4-04 | 10 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 0.8 | with | SW*T1304... | 1 |
| TPW13R080M25.4-06 | 10 | 80 | 6 | 50 | 25.4 | 26 | 9.5 | 6 | 0.8 | with | SW*T1304... | 1 |
| TPW13R100M31.7-05 | 10 | 100 | 5 | 50 | 31.75 | 38 | 12.7 | 8 | 1.2 | with | SW*T1304... | 1 |
| TPW13R100M31.7-07 | 10 | 100 | 7 | 50 | 31.75 | 38 | 12.7 | 8 | 1.2 | with | SW*T1304... | 1 |
| TPW13R125M38.1-06 | 10 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 10 | 2.4 | with | SW*T1304... | 1 |
| TPW13R125M38.1-08 | 10 | 125 | 8 | 63 | 38.1 | 38 | 15.9 | 10 | 2.4 | with | SW*T1304... | 1 |
| TPW13R160M50.8-08 | 10 | 160 | 8 | 63 | 50.8 | 38 | 19 | 11 | 4 | without | SW*T1304... | 1 |
| TPW13R160M50.8-12 | 10 | 160 | 12 | 63 | 50.8 | 38 | 19 | 11 | 4 | without | SW*T1304... | 1 |
| TPW13R200M47.6-10 | 10 | 200 | 10 | 63 | 47.625 | 38 | 25.4 | 14 | 7.4 | without | SW*T1304... | 2 |

## SPARE PARTS

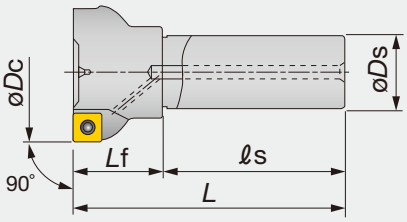
| Designation | ①Clamping screw | Lubricant | ②Shim screw | Shell locking bolt | Shell locking bolt 1 | ③Shim | Wrench for ① | Wrench for ② |
|---|---|---|---|---|---|---|---|---|
| TPW13R050, 063... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM10X30H | FSSP1102 | IP-15D | P-3.5 |
| TPW13R080M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM12X30H | FSSP1102 | IP-15D | P-3.5 |
| TPW13R100M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M16H | - | FSSP1102 | IP-15D | P-3.5 |
| TPW13R125M... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M20H | - | FSSP1102 | IP-15D | P-3.5 |
| TPW13R160, 200... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | - | FSSP1102 | IP-15D | P-3.5 |



## EPW13

Square shoulder endmills with screw clamped SWMT/SWGT13 inserts

A.R. = +11.5°, R.R. = -13° ~ -10.5°

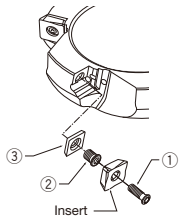



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPW13R032M32.0-02 | 10 | 32 | 2 | 32 | 80 | 35 | 115 | 0.6 | with | SW*T1304... |
| EPW13R040M32.0-03 | 10 | 40 | 3 | 32 | 80 | 35 | 115 | 0.7 | with | SW*T1304... |
| EPW13R050M32.0-03 | 10 | 50 | 3 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T1304... |
| EPW13R050M32.0-04 | 10 | 50 | 4 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T1304... |
| EPW13R063M32.0-04 | 10 | 63 | 4 | 32 | 80 | 40 | 120 | 1 | with | SW*T1304... |
| EPW13R063M32.0-05 | 10 | 63 | 5 | 32 | 80 | 40 | 120 | 1 | with | SW*T1304... |
| EPW13R080M32.0-04 | 10 | 80 | 4 | 32 | 80 | 40 | 120 | 1.3 | with | SW*T1304... |
| EPW13R080M32.0-06 | 10 | 80 | 6 | 32 | 80 | 40 | 120 | 0.8 | with | SW*T1304... |

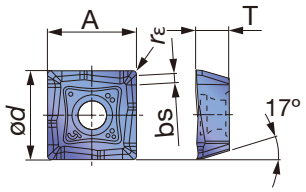
### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | ②Shim screw | ③Shim | Wrench for ① | Wrench for ② |
|---|---|---|---|---|---|---|
| EPW13R032, 040... | CSPB-3.5 | M-1000 | - | - | IP-15D | - |
| EPW13R050 - 080... | CSPB-3.5 | M-1000 | DTS5-3.5SS | FSSP1102 | IP-15D | P-3.5 |

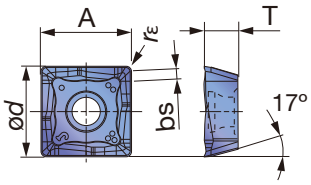


## INSERT

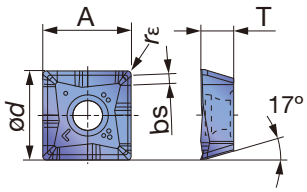
### SWGT1304-MJ



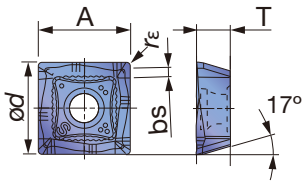

### SWMT1304-MJ



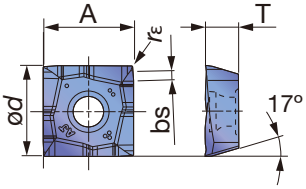

### SWMT1304-ML




### SWMT1304-MS




### SWGT1304-AJ




| | | AH120 | AH130 | AH140 | T1115 | T1215 | T3130 | DS1100 | NS740 | KS05F |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | | ★ | | ★ | |
| M | Stainless | | ★ | ★ | | | | | | |
| K | Cast iron | ★ | | | ★ | ★ | | | | |
| N | Non-ferrous | | | | | | | ★ | | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | Cermet | Un-coated | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | T1115 | T1215 | T3130 | DS1100 | NS740 | KS05F | | | | |
| SWGT1304PDPR-MJ | 0.8 | 10 | ● | | | | | | | ● | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDPR-MJ | 0.8 | 10 | ● | ● | ● | ● | ● | ● | | ● | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDER-ML | 0.8 | 10 | ● | | | | | | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWMT1304PDPR-MS | 0.8 | 10 | | ● | ● | | | | | | | 13.6 | 13.6 | 5 | 1.4 |
| SWGT1304PDFR-AJ | 0 | 10 | | | | | | | ● | | ● | 13.6 | 13.6 | 5 | 1.6 |

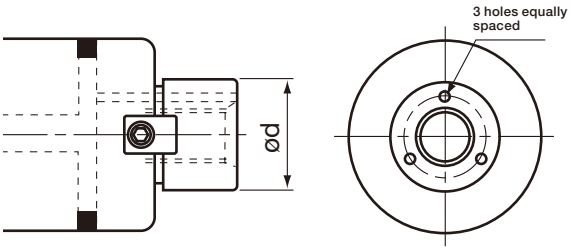
●: Line up

# STANDARD CUTTING CONDITIONS TPW / EPW13 TYPE

| ISO | Workpiece material | Recommended insert grade | Cutting speed Vc (m/min) | Roughing (Depth of cut: ap ≥ 1.0 mm) Feed per tooth: *fz* (mm/t) | | | | Light cutting to finishing (Depth of cut: ap ≥ 1.0 mm) Feed per tooth: *fz* (mm/t) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MJ | ML | MS | AJ | MJ | ML | MS | AJ |
| P | Mild steels Low carbon steels < 180HB | AH120 (First choice) | 100 - 270 | 0.05 - 0.25 | 0.05 - 0.2 | - | - | 0.05 - 0.2 | 0.05 - 0.18 | - | - |
| | | T3130 (Priority on wear resistance) | 150 - 300 | 0.05 - 0.25 | - | - | - | 0.05 - 0.2 | - | - | - |
| | | AH130 / AH140 (Priority on impact resistance) | 80 - 180 | 0.05 - 0.25 | - | 0.05 - 0.2 | - | 0.05 - 0.2 | - | 0.05 - 0.18 | - |
| | | NS740 (Priority on surface finish) | 100 - 300 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| | Carbon steels Alloy steels < 300HB | AH120 (First choice) | 100 - 230 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| | | T3130 (Priority on wear resistance) | 150 - 280 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | AH130 / AH140 (Priority on impact resistance) | 80 - 150 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | NS740 (Priority on surface finish) | 100 - 230 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| | Die steels < 30HRC | AH120 (First choice) | 100 - 180 | 0.05 - 0.15 | 0.05 - 0.12 | - | - | 0.05 - 0.12 | 0.05 - 0.1 | - | - |
| | | T3130 (Priority on wear resistance) | 100 - 180 | 0.05 - 0.15 | - | - | - | 0.05 - 0.12 | - | - | - |
| M | Stainless steels < 50HB | AH130 / AH140 (First choice) | 80 - 200 | 0.05 - 0.2 | - | 0.05 - 0.18 | - | 0.05 - 0.18 | - | 0.05 - 0.15 | - |
| | | AH120 (Priority on wear resistance) | 150 - 250 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| K | Grey cast irons Ductile cast irons | T1215 (First choice) | 100 - 250 | 0.05 - 0.2 | - | - | - | 0.05 - 0.18 | - | - | - |
| | | AH120 (Priority on impact resistance) | 100 - 250 | 0.05 - 0.2 | 0.05 - 0.15 | - | - | 0.05 - 0.18 | 0.05 - 0.12 | - | - |
| N | Aluminium alloys Si < 13 % | DS1100 / KS05F (First choice) | 300 - 1000 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13 % | DS1100 / KS05F (First choice) | 80 - 300 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |
| | Copper alloys | DS1100 / KS05F (First choice) | 200 - 500 | - | - | - | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 |

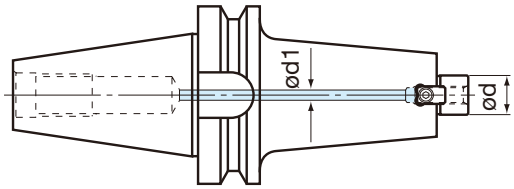
Notes:
- When machining at large depth of cut or large cutting width, *Vc* and *fz* should be reduced.
- As a rule, dry machining (including air blow) is recommended. But, for excessive chip welding, such as when machining stainless steels, use a water soluble cutting fluid. In this case, use AH140 and set the cutting speed to *Vc* ≤ 100 m/min.
- When machining mild steel, carbon steel or alloy steel in wet conditions the T3130 is recommended. In this case, *Vc* and *fz* should be reduced.
- TPW13 type can not be used for ramping, plunging and drilling.

## Face mill arbors with center through-coolant hole




| Cutter diameter *øD* (mm) | 50/63 | 80 | 100 | 125 | 160 |
|---|---|---|---|---|---|
| Nominal diameter *ød* (mm) | 22 | 25.4 | 31.75 | 38.1 | 50.8 |
| Arbor type | FMH22 | FMH25.4 | FMH31.75 | FMH38.1 | FMH50.8 |

## Notes on arbors: when using TAW13 or TPW13 type, use through center air.




| Nominal diameter *ød* (mm) | 16 | 22 | 25.4 | 31.75 | 38.1 | 50.8 |
|---|---|---|---|---|---|---|
| Applicable arbor types | SMA SM1 | FMC SM1 | FMA FMC | FMA SMB | FMA | FMA |
| Through hole diameter *ød*1 (mm) | 4 ~ 6 | 5 ~ 8 | 6 ~ 9 | 10 ~ 13 | 10 ~ 15 | 10 ~ 15 |

When using the TAW13 or TPW13 type with through center air (coolant or mist), the correct arbor must be used with through center air supplying.

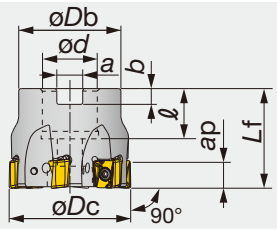
## ■ Cautionary notes in use

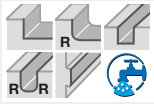
● In slotting or pocketing, when chips are likely to remain in the cutting zone, internal air supplying or air blow is recommended to prevent chip recutting.
● Use of inserts other than those specified, can result in poor cutting and cause damage to the cutter body. Therefore, specified inserts from the Tungaloy catalogue must be used.
● Before changing or indexing the inserts, remove chips or other foreign matter from the insert, insert pocket and cutter body by using an air blast or cloth.
● The inserts should be clamped by using the wrench supplied with the TAC Mill.
● After a long period of use, the clamping screws and wrench may become deformed or damaged. These elements must be replaced as soon as possible.

MEMO

Square shoulder mills with LQMU type double sided tough inserts with 4 edges

A.R. = +4° ~ +5°, R.R. = +13° ~ +15°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPQ11R040M16.0E04 | 9 | 40 | 4 | 35 | 40 | 16 | 20 | 8.4 | 5.6 | 0.2 | with | LQMU1107... |
| TPQ11R050M22.0E06 | 9 | 50 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LQMU1107... |
| TPQ11R063M22.0E07 | 9 | 63 | 7 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LQMU1107... |
| TPQ11R080M25.4-10 | 9 | 80 | 10 | 55 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | with | LQMU1107... |
| TPQ11R080M27.0E10 | 9 | 80 | 10 | 58 | 50 | 27 | 26 | 12.4 | 7 | 1 | with | LQMU1107... |
| TPQ11R100M31.7-12 | 9 | 100 | 12 | 66 | 50 | 31.75 | 32 | 12.95 | 8 | 1.6 | with | LQMU1107... |
| TPQ11R100M32.0E12 | 9 | 100 | 12 | 66 | 50 | 32 | 32 | 14.4 | 8 | 1.6 | with | LQMU1107... |
| TPQ18R050M22.0E03 | 16 | 50 | 3 | 47 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | LQMU1808... |
| TPQ18R063M25.4-04 | 16 | 63 | 4 | 55 | 50 | 25.4 | 26 | 9.5 | 6 | 0.7 | with | LQMU1808... |
| TPQ18R063M27.0E04 | 16 | 63 | 4 | 58 | 50 | 27 | 26 | 12.4 | 7 | 0.5 | with | LQMU1808... |
| TPQ18R080M25.4-05 | 16 | 80 | 5 | 55 | 50 | 25.4 | 26 | 9.5 | 6 | 0.9 | with | LQMU1808... |
| TPQ18R080M27.0E05 | 16 | 80 | 5 | 58 | 50 | 27 | 26 | 12.4 | 7 | 0.9 | with | LQMU1808... |
| TPQ18R100M31.7-06 | 16 | 100 | 6 | 70 | 50 | 31.75 | 32 | 12.95 | 8 | 1.4 | with | LQMU1808... |
| TPQ18R100M32.0E06 | 16 | 100 | 6 | 66 | 50 | 32 | 32 | 14.4 | 8 | 1.4 | with | LQMU1808... |
| TPQ18R125M38.1-08 | 16 | 125 | 8 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.9 | with | LQMU1808... |
| TPQ18R125M40.0E08 | 16 | 125 | 8 | 82 | 63 | 40 | 38 | 16.4 | 9 | 2.9 | with | LQMU1808... |
| TPQ18R160M50.8-09 | 16 | 160 | 9 | 100 | 63 | 50.8 | 38 | 19 | 11 | 4.1 | without | LQMU1808... |
| TPQ18R160M40.0E09 | 16 | 160 | 9 | 100 | 63 | 40 | 38 | 16.4 | 9 | 4.1 | without | LQMU1808... |

## SPARE PARTS

| Designation | Clamping screw | Grip | Grip 1 | Torx bit | Center bolt |
|---|---|---|---|---|---|
| TPQ11R040M... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM8×30H |
| TPQ11R050M... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM10×30H |
| TPQ11R063M... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM10×30H |
| TPQ11R080M... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | CM12×30H |
| TPQ11R100M... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | TMBA-M16H |
| TPQ18R050M... | SR14-591 | - | H-TB | BT20M | CM10×30H |
| TPQ18R063M... | SR14-591 | - | H-TB | BT20M | CM12×30H |
| TPQ18R080M... | SR14-591 | - | H-TB | BT20M | CM12×30H |
| TPQ18R100M... | SR14-591 | - | H-TB | BT20M | TMBA-M16H |
| TPQ18R125M... | SR14-591 | - | H-TB | BT20M | TMBA-M20H |
| TPQ18R160M... | SR14-591 | - | H-TB | BT20M | - |

# EPQ11,18

Square shoulder endmills with LQMU type double sided tough inserts with 4 edges

A.R. = +4° ~ +5°, R.R. = +13° ~ +15°

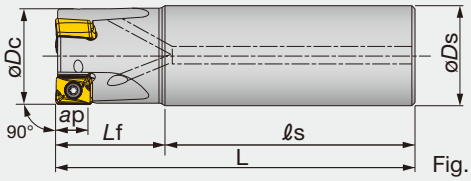



Fig.1

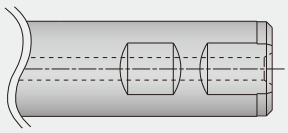
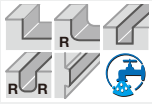


Fig.2




Right hand (R) shown.

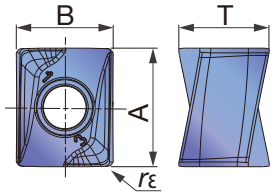
| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert | Shank style |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPQ11R025M25.0-02 | 9 | 25 | 2 | 25 | 70 | 30 | 100 | 0.3 | with | LQMU1107... | Fig.1 |
| EPQ11R032M32.0-03 | 9 | 32 | 3 | 32 | 80 | 35 | 115 | 0.7 | with | LQMU1107... | Fig.1 |
| EPQ11R040M32.0-04 | 9 | 40 | 4 | 32 | 80 | 35 | 115 | 0.8 | with | LQMU1107... | Fig.1 |
| EPQ11R050M32.0-05 | 9 | 50 | 5 | 32 | 80 | 40 | 120 | 0.9 | with | LQMU1107... | Fig.1 |
| EPQ11R063M32.0-06 | 9 | 63 | 6 | 32 | 80 | 40 | 120 | 1.1 | with | LQMU1107... | Fig.1 |
| EPQ11R080M32.0-07 | 9 | 80 | 7 | 32 | 80 | 40 | 120 | 1.4 | with | LQMU1107... | Fig.1 |
| EPQ18R040M32.0W03 | 16 | 40 | 3 | 32 | 75 | 35 | 110 | 0.7 | with | LQMU1808... | Fig.2 |
| EPQ18R050M32.0W04 | 16 | 50 | 4 | 32 | 75 | 40 | 115 | 0.9 | with | LQMU1808... | Fig.2 |

## SPARE PARTS

| Designation | Clamping screw | Grip | Grip 1 | Torx bit | Wrench |
|---|---|---|---|---|---|
| EPQ11... | CSTB-3.5L115 | SW6-SD | - | BLDT10/S7 | T-10D |
| EPQ18... | SR14-591 | - | H-TB | BT20M | T-20D |

## INSERT

### LQMU11/18-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | AH140 | AH725 | A | T | B |
|---|---|---|---|---|---|---|---|---|
| LQMU110704PNER-MJ | 0.4 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110708PNER-MJ | 0.8 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110716PNER-MJ | 1.6 | 9 | ● | ● | ● | 11 | 8.3 | 9 |
| LQMU110720PNER-MJ | 2 | 9 | ● | | | 11 | 8.3 | 9 |
| LQMU180804PNER-MJ | 0.4 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180808PNER-MJ | 0.8 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180816PNER-MJ | 1.6 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |
| LQMU180824PNER-MJ | 2.4 | 16 | ● | ● | ● | 17.5 | 10.9 | 11.5 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, etc.<br>C15E, etc. | - 200 | AH725 | 100 - 250 | 0.1 - 0.25 |
| | High carbon steel<br>S45C, S55C, etc.<br>C45, C55, etc. | 200 - 300 | AH725 | 100 - 230 | 0.1 - 0.2 |
| | Alloy steel<br>SCM440, SCr415, etc.<br>42CrMo4, etc. | 150 - 300 | AH725 | 100 - 230 | 0.1 - 0.2 |
| | Tool steel<br>D2, etc.<br>X153CrMoV12, etc. | - 300 | AH725 | 100 - 180 | 0.1 - 0.2 |
| M | Stainless steel<br>SUS304, etc.<br>X5CrNi18-9, etc. | - | AH140 | 90 - 180 | 0.1 - 0.25 |
| K | Grey cast iron<br>FC250, etc.<br>250, etc. | 150 - 250 | AH120 | 140 - 250 | 0.1 - 0.25 |
| | Ductile cast iron<br>FCD400, etc.<br>450-10S, etc. | 150 - 250 | AH120 | 110 - 200 | 0.1 - 0.25 |
| S | Superalloys<br>Inconel 718, Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.08 - 0.2 |

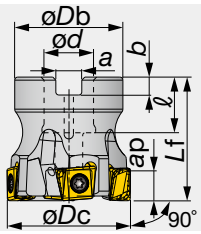
· To remove excessive chip accumulation use an air blast.
· When cutting an interrupted surface or a casted skin, the feed per tooth (*fz*) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, work piece rigidity and spindle output. When the cutting width, depth or over hang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

# TECMILL

## TPM11,16

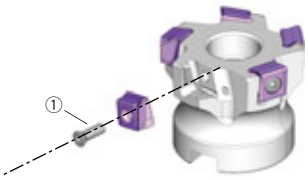
Square shoulder mills with LMMU type tangential clamped insert with 4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPM11R050M22.0-05 | 9.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | LMMU1107... |
| TPM11R050M22.0E05 | 9.7 | 50 | 5 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | LMMU1107... |
| TPM11R063M22.0-06 | 9.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | LMMU1107... |
| TPM11R063M22.0E06 | 9.7 | 63 | 6 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | LMMU1107... |
| TPM11R080M25.4-07 | 9.7 | 80 | 7 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.9 | with | LMMU1107... |
| TPM11R080M25.4-09 | 9.7 | 80 | 9 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | with | LMMU1107... |
| TPM11R100M31.7-08 | 9.7 | 100 | 8 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.4 | with | LMMU1107... |
| TPM11R100M31.7-11 | 9.7 | 100 | 11 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | LMMU1107... |
| TPM16R080M25.4-05 | 15.1 | 80 | 5 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | with | LMMU1609... |
| TPM16R100M31.7-06 | 15.1 | 100 | 6 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.6 | with | LMMU1609... |
| TPM16R125M38.1-07 | 15.1 | 125 | 7 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 3 | with | LMMU1609... |




### SPARE PARTS

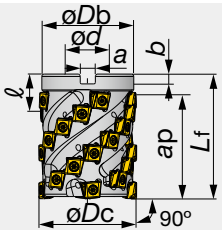
| Designation | ①Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TPM11R050, 063... | CSTB-3.5L110 | H-TB | - | CM10X30H | BT15S |
| TPM11R080M... | CSTB-3.5L110 | H-TB | - | CM12X30H | BT15S |
| TPM11R100M... | CSTB-3.5L110 | H-TB | TMBA-M16H | - | BT15S |
| TPM16R080M25.4-05 | CSTB-5L159 | H-TB | - | CM12X30H | BT20S |
| TPM16R100M31.7-06 | CSTB-5L159 | H-TB | TMBA-M16H | - | BT20S |
| TPM16R125M38.1-07 | CSTB-5L159 | H-TB | TMBA-M20H | - | BT20S |

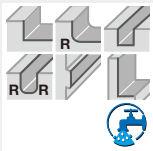
# TECMILL

## TLM11

Square shoulder mills for roughing with LMMU type tangential clamped insert with 4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°




| Designation | Max. ap | øDc | Z eff | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TLM11R050M22.0E03 | 58.5 | 50 | 3 | 21 | 47 | 70 | 22 | 20 | 10.4 | 6.3 | 0.8 | with | LMMU1107... |
| TLM11R063M27.0E04 | 66.9 | 63 | 4 | 32 | 59 | 80 | 27 | 22 | 12.4 | 7 | 1.4 | with | LMMU1107... |
| TLM11R063M25.4-04 | 66.9 | 63 | 4 | 32 | 59 | 80 | 25.4 | 26 | 9.5 | 6 | 1.4 | with | LMMU1107... |

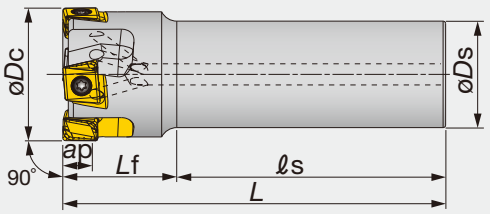
### SPARE PARTS

| Designation | Clamping screw | Grip | Shell locking bolt | Torx bit |
|---|---|---|---|---|
| TLM11R050M22.0E03 | SM35-114-H0 | H-TB | SD06-A3 | BT15S |
| TLM11R063M27.0E04 | SM35-114-H0 | H-TB | SD08-98 | BT15S |
| TLM11R063M25.4-04 | SM35-114-H0 | H-TB | SD08-98 | BT15S |

# EPM11

Square shoulder endmills with LMMU type tangential clamped insert with 4 edges

A.R. = +5° ~ +6°, R.R. = +9° ~ +13°



Right hand (R) shown.

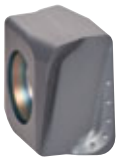
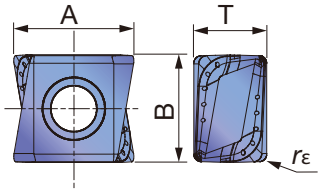
| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPM11R032M32.0-03 | 9.7 | 32 | 3 | 32 | 80 | 35 | 115 | 0.6 | with | LMMU1107... |
| EPM11R040M32.0-04 | 9.7 | 40 | 4 | 32 | 80 | 35 | 115 | 0.7 | with | LMMU1107... |
| EPM11R050M32.0-04 | 9.7 | 50 | 4 | 32 | 80 | 40 | 120 | 0.9 | with | LMMU1107... |
| EPM11R063M32.0-06 | 9.7 | 63 | 6 | 32 | 80 | 40 | 120 | 1.2 | with | LMMU1107... |
| EPM11R080M32.0-07 | 9.7 | 80 | 7 | 32 | 80 | 40 | 120 | 1.6 | with | LMMU1107... |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| EPM11... | CSTB-3.5L110 | T-15DB |

## INSERT

### LMMU11/16-MJ


| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | | ☆ | |
| M | Stainless | | ★ | ☆ | | | |
| K | Cast iron | ★ | | ☆ | ☆ | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | ★ | | ★ | | | |
| H | Hard materials | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH140 | AH725 | T1115 | T3130 | | | |
| LMMU110708PNER-MJ | 0.8 | 9.7 | ● | ● | ● | ● | ● | 11.7 | 10.5 | 7.1 |
| LMMU110716PNER-MJ | 1.6 | 9.7 | ● | ● | ● | ● | ● | 11.5 | 10.5 | 7.1 |
| LMMU110724PNER-MJ | 2.4 | 9.7 | ● | ● | ● | ● | ● | 11.3 | 10.5 | 7.1 |
| LMMU110732PNER-MJ | 3.2 | 9.7 | ● | ● | ● | ● | ● | 11.1 | 10.5 | 7.1 |
| LMMU160908PNER-MJ | 0.8 | 15.1 | ● | ● | ● | ● | ● | 17.3 | 16 | 9.5 |
| LMMU160916PNER-MJ | 1.6 | 15.1 | ● | ● | ● | ● | ● | 17.1 | 16 | 9.5 |
| LMMU160924PNER-MJ | 2.4 | 15.1 | ● | ● | ● | ● | | 16.9 | 16 | 9.5 |
| LMMU160932PNER-MJ | 3.2 | 15.1 | ● | ● | ● | ● | | 16.8 | 16 | 9.5 |

●: Line up

# STANDARD CUTTING CONDITIONS

## TPM11, 16 / EPM11

| ISO | Workpiece materials | Brinell hardness HB | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Low carbon steels (S15C / C15E / C15E4 etc.) | - 200 | First choice | AH725 | 100 - 250 | 0.12 - 0.3 |
| | | - 200 | For impact resistance | AH140 | 80 - 180 | 0.12 - 0.3 |
| | | - 200 | For wear resistance | T3130 | 120 - 250 | 0.12 - 0.3 |
| | High carbon steels (S45C / C45 etc.) | 200 - 300 | First choice | AH725 | 100 - 230 | 0.12 - 0.25 |
| | | 200 - 300 | For impact resistance | AH140 | 80 - 180 | 0.12 - 0.25 |
| | | 200 - 300 | For wear resistance | T3130 | 120 - 250 | 0.12 - 0.25 |
| | Alloyed steels (SCM440 / 42CrMo4 etc.) | 150 - 300 | First choice | AH725 | 100 - 230 | 0.12 - 0.25 |
| | | 150 - 300 | For impact resistance | AH140 | 80 - 150 | 0.12 - 0.25 |
| | | 150 - 300 | For wear resistance | T3130 | 120 - 250 | 0.12 - 0.25 |
| | Tool steels (SKD61/ X40CrMoV5-1 etc.) | - 300 | First choice | AH725 | 100 - 180 | 0.12 - 0.25 |
| | | - 300 | For impact resistance | AH140 | 80 - 120 | 0.12 - 0.25 |
| | | - 300 | For wear resistance | T3130 | 100 - 180 | 0.12 - 0.25 |
| M | Stainless steels (SUS304 / X5CrNi18-9 etc.) | - | First choice | AH140 | 90 - 180 | 0.12 - 0.3 |
| K | Grey cast irons (FC250 / GG25 / 250 etc.) | 150 - 250 | First choice | AH120 | 140 - 250 | 0.12 - 0.3 |
| | | 150 - 250 | For wear resistance | T1115 | 140 - 250 | 0.12 - 0.3 |
| | Ductile cast irons (FCD450 / GGG45 / 450-10S etc.) | 150 - 250 | First choice | AH120 | 110 - 200 | 0.12 - 0.3 |
| | | 150 - 250 | For wear resistance | T1115 | 110 - 200 | 0.12 - 0.3 |
| S | Heat-resisting alloy (Inconel 718 / Ti-6Al-4V etc.) | - | First choice | AH725 | 20 - 50 | 0.1 - 0.2 |

· To remove excessive chip accumulation use an air blast.
· When cutting an interrupted surface or a casting skin, the feed (fz) should be reduced to the lower recommended value shown in the above table.
· Cutting conditions are limited by machine power, work piece rigidity and spindle output. When the cutting width, depth or overhang length is large, set Vc and fz to the lower recommended values and check the machine power and vibration.

## TLM11

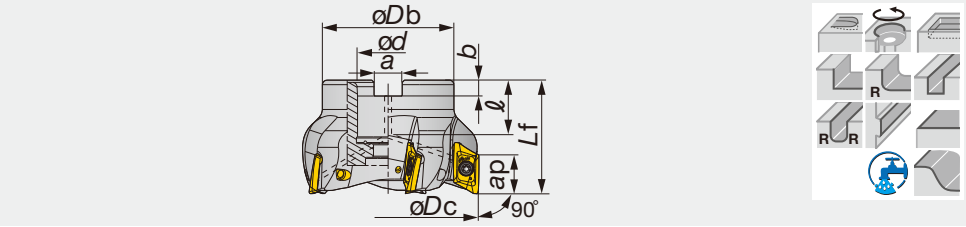
| ISO | Workpiece materials | Brinell hardness HB | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Low carbon steels (S15C / C15E4 etc.) | - 200 | First choice | AH725 | 100 - 250 | 0.10 - 0.23 |
| | | - 200 | For impact resistance | AH140 | 80 - 180 | 0.10 - 0.23 |
| | | - 200 | For wear resistance | T3130 | 100 - 250 | 0.10 - 0.23 |
| | High carbon steels (S45C / C45 etc. | 200 - 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.21 |
| | | 200 - 300 | For impact resistance | AH140 | 80 - 150 | 0.08 - 0.21 |
| | | 200 - 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.21 |
| | Alloyed steels (SCM440 / 42CrMo4 etc.) | 150 - 300 | First choice | AH725 | 100 - 200 | 0.08 - 0.21 |
| | | 150 - 300 | For impact resistance | AH140 | 80 - 150 | 0.08 - 0.21 |
| | | 150 - 300 | For wear resistance | T3130 | 100 - 200 | 0.08 - 0.21 |
| | Tool steels (SKD61/ X40CrMoV5-1 etc.) | - 300 | First choice | AH725 | 100 - 150 | 0.08 - 0.21 |
| | | - 300 | For impact resistance | AH140 | 80 - 120 | 0.08 - 0.21 |
| | | - 300 | For wear resistance | T3130 | 100 - 150 | 0.08 - 0.21 |
| M | Stainless steels (SUS304 / X5CrNi18-9 etc.) | - | First choice | AH140 | 90 - 150 | 0.08 - 0.21 |
| K | Grey cast irons (FC250 / 250 etc.) | 150 - 250 | First choice | AH120 | 100 - 250 | 0.10 - 0.25 |
| | | 150 - 250 | For wear resistance | T1115 | 100 - 250 | 0.10 - 0.25 |
| | Ductile cast irons (FCD450 / GGG45 etc.) | 150 - 250 | First choice | AH120 | 100 - 250 | 0.10 - 0.25 |
| | | 150 - 250 | For wear resistance | T1115 | 100 - 250 | 0.10 - 0.25 |
| S | Heat-resisting alloy (Inconel 718 / Ti-6Al-4V etc.) | - | First choice | AH725 | 20 - 50 | 0.06 - 0.15 |

# TUNG-ALUMILL

## TPV16

90° shoulder milling shellmills with screw clamped XVCT16 inserts for aluminum machining

A.R. = +10° ~ +11°, R.R. = -9° ~ -5.5°




| Designation | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Max. RPM (min$^{-1}$) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPV16R040M16.0E03 | 40 | 3 | 38 | 16 | 20 | 50 | 5.6 | 8.4 | 0.23 | with | 30,000 | XVCT1605... |
| TPV16R050M22.0E04 | 50 | 4 | 45 | 22 | 22 | 50 | 6.3 | 10.4 | 0.33 | with | 27,000 | XVCT1605... |
| TPV16R063M22.0E05 | 63 | 5 | 47 | 22 | 22 | 50 | 6.3 | 10.4 | 0.54 | with | 24,000 | XVCT1605... |
| TPV16R080M27.0E05 | 80 | 5 | 58 | 27 | 28 | 50 | 7 | 12.4 | 0.86 | with | 21,000 | XVCT1605... |
| TPV16R100M32.0E06 | 100 | 6 | 66 | 32 | 26 | 63 | 8 | 14.4 | 1.55 | with | 19,000 | XVCT1605... |
| TPV16R125M40.0E07 | 125 | 7 | 85 | 40 | 32 | 63 | 9 | 16.4 | 2.53 | with | 17,000 | XVCT1605... |

### SPARE PARTS

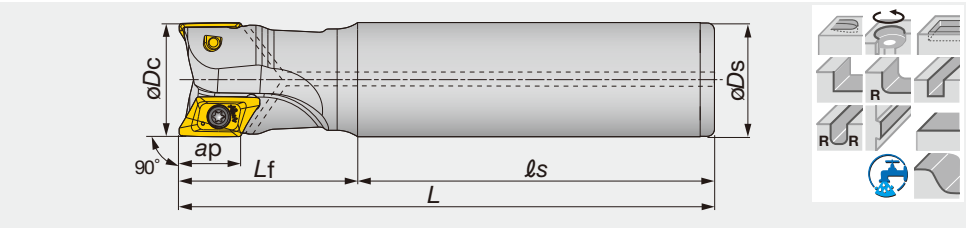
| Designation | Clamping screw | Grip | Shell locking bolt | Torx bit |
|---|---|---|---|---|
| TPV16R040M16.0E03 | TS40093I/HG | H-TBS | SHM8X1.25X35-C | BT15S |
| TPV16R050 - 063... | TS40093I/HG | H-TBS | SHM10X1.5X30-C | BT15S |
| TPV16R080M27.0E05 | TS40093I/HG | H-TBS | LHM12X1.75X30-C | BT15S |
| TPV16R100M32.0E06 | TS40093I/HG | H-TBS | SHM16X2X35-C | BT15S |
| TPV16R125M40.0E07 | TS40093I/HG | H-TBS | SHM20X2.5X40-C | BT15S |

# TUNG-ALUMILL

## EPV16

90° endmills with screw clamped XVCT16 inserts for aluminum machining

A.R. = +6° ~ +10°, R.R. = -12° ~ -9°



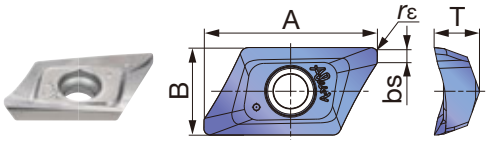

| Designation | øDc | z | øDs | ℓs | Lf | L | Kg | Air hole | Max. RPM (min$^{-1}$) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPV16R025M25.0-02 | 25 | 2 | 25 | 70 | 55 | 125 | 0.37 | with | 38,000 | XVCT1605... |
| EPV16R025M25.0-02L | 25 | 2 | 25 | 100 | 70 | 170 | 0.53 | with | 38,000 | XVCT1605... |
| EPV16R032M32.0-02 | 32 | 2 | 32 | 100 | 50 | 150 | 0.77 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-02L | 32 | 2 | 32 | 120 | 80 | 200 | 1.03 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-03 | 32 | 3 | 32 | 100 | 50 | 150 | 0.76 | with | 34,000 | XVCT1605... |
| EPV16R032M32.0-03L | 32 | 3 | 32 | 120 | 80 | 200 | 1.03 | with | 34,000 | XVCT1605... |
| EPV16R040M32.0-03 | 40 | 3 | 32 | 120 | 50 | 170 | 0.94 | with | 30,000 | XVCT1605... |
| EPV16R040M32.0-03L | 40 | 3 | 32 | 195 | 55 | 250 | 1.43 | with | 30,000 | XVCT1605... |

### SPARE PARTS

| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| EPV16R025M... | TS40085I/HG | H-TBS | BT15S |
| EPV16R032M... | TS40093I/HG | H-TBS | BT15S |
| EPV16R040M... | TS40093I/HG | H-TBS | BT15S |

## INSERT

### XVCT16-AJ




| | | | |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | ★ | |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Un-coated TH10 | A | B | T | bs |
|---|---|---|---|---|---|---|---|
| XVCT160504R-AJ | 0.4 | 16 | ● | 22.2 | 11.2 | 5.9 | 1.3 |
| XVCT160508R-AJ | 0.8 | 16 | ● | 22.2 | 11.2 | 5.9 | 1 |
| XVCT160512R-AJ | 1.2 | 15.5 | ● | 21.7 | 11.2 | 5.8 | 1 |
| XVCT160516R-AJ | 1.6 | 15 | ● | 21.2 | 11.2 | 5.75 | 1 |
| XVCT160520R-AJ | 2 | 14.5 | ● | 20.8 | 11.2 | 5.75 | 1 |
| XVCT160530R-AJ | 3 | 14 | ● | 19.5 | 11.2 | 5.6 | 1 |
| XVCT160532R-AJ | 3.2 | 14 | ● | 19.2 | 11.2 | 5.6 | 1 |
| XVCT160540R-AJ | 4 | 13 | ● | 18.4 | 11.2 | 5.5 | 1.2 |
| XVCT160550R-AJ | 5 | 13 | ● | 18.4 | 11.2 | 5.4 | 0.4 |

●: Line up

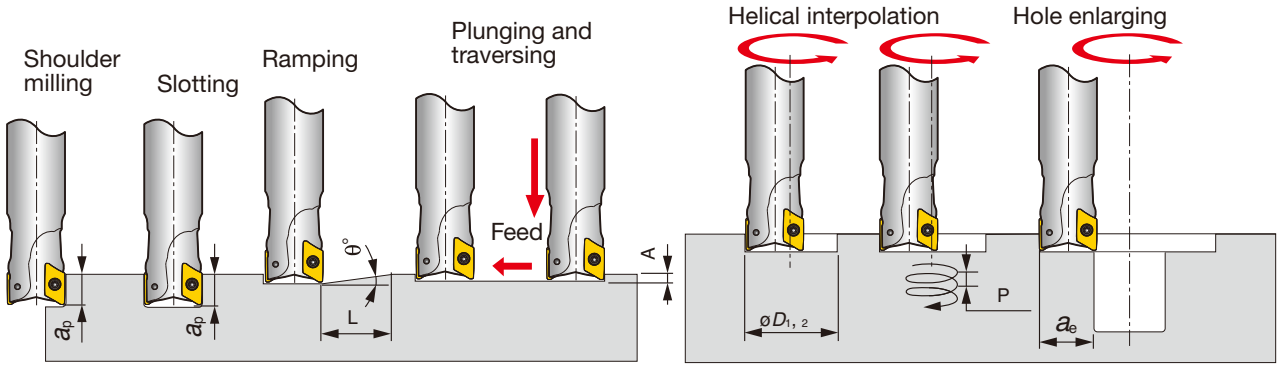
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Chip-breaker | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| N | Aluminium alloy | 60 | TH10 | AJ | 300 - 5000 | 0.15 - 0.35 |
| | | 100 | TH10 | AJ | 200 - 2000 | 0.1 - 0.25 |
| | Cast aluminium alloy Si ≤ 12% | 75 | TH10 | AJ | 200 - 2000 | 0.15 - 0.3 |
| | | 90 | TH10 | AJ | 200 - 1500 | 0.1 - 0.25 |
| | Cast aluminium alloy Si > 12% | 130 | TH10 | AJ | 200 - 1000 | 0.07 - 0.15 |
| | Copper alloys Pb > 1% | 110 | TH10 | AJ | 200 - 800 | 0.07 - 0.15 |
| | Copper alloys | 90 | TH10 | AJ | 300 - 1000 | 0.1 - 0.15 |
| | | 100 | TH10 | AJ | 300 - 800 | 0.1 - 0.15 |
| | Duroplastics, fiber plastics | - | TH10 | AJ | 100 - 500 | 0.1 - 0.15 |
| | Hard rubber | - | TH10 | AJ | 100 - 300 | 0.1 - 0.15 |

**Safety guidelines**

1. Use only the original inserts, cutters and spare parts.
2. Insert pocket must be cleaned before clamping the insert.
3. Clamp torque of screw should be 4.5 N·m.
4. For safety reasons, use a new screw when changing the insert.
5. Maximum RPM values are determined based on the burst test. Using RPM beyond maximum values may cause insert breakage, machine damage or personal injury.
6. XVCT insert has sharp cutting edges. Always wear gloves for protection from injury when handling.

## APPLICATION RANGE



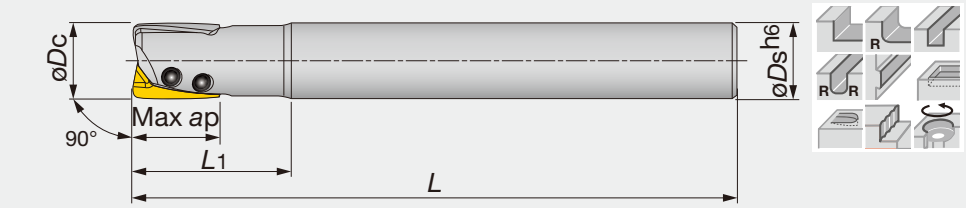

| Designation | Tool øDc | Corner radius rε | Max. depth of cut ap | Straight ramp down: Max. ramping angle θ° | Straight ramp down: Min. length L | Step down: Max. plunging depth A | Helical ramp down: Min. machining øD1 | Helical ramp down: Min. pitch/rev P | Helical ramp down: Max. machining øD2 | Helical ramp down: Max. pitch/rev P | Hole enlarging: Max. width ae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPV16R025... | 25 | 0.4, 0.8 | 16 | 22 | 40 | 4.2 | 29.1 | 4.4 | 50 | 13.6 | 22.5 |
| EPV16R025... | 25 | 1.2 | 15.5 | 22 | 40 | 4.2 | 29.1 | 4.4 | 50 | 13.6 | 22.5 |
| EPV16R025... | 25 | 1.6 | 15 | 22 | 38 | 3.7 | 29.1 | 4.4 | 50 | 13.2 | 22.5 |
| EPV16R025... | 25 | 2 | 14.5 | 22 | 38 | 3.7 | 29.1 | 4.4 | 50 | 13.2 | 22.5 |
| EPV16R025... | 25 | 3, 3.2 | 14 | 21 | 38 | 2.5 | 29.1 | 4.2 | 50 | 12.3 | 22.5 |
| EPV16R025... | 25 | 4, 5 | 13 | 18.5 | 40 | 2.3 | 29.1 | 3.7 | 50 | 12.3 | 22.5 |
| EPV16R032... | 32 | 0.4, 0.8 | 16 | 16.5 | 54 | 4 | 43.1 | 8.8 | 64 | 13.6 | 28.8 |
| EPV16R032... | 32 | 1.2 | 15.5 | 16.5 | 54 | 4 | 43.1 | 8.8 | 64 | 13.6 | 28.8 |
| EPV16R032... | 32 | 1.6 | 15 | 16 | 54 | 3.5 | 43.1 | 8.5 | 64 | 13.2 | 28.8 |
| EPV16R032... | 32 | 2 | 14.5 | 16 | 54 | 3.5 | 43.1 | 8.5 | 64 | 13.2 | 28.8 |
| EPV16R032... | 32 | 3, 3.2 | 14 | 15 | 54 | 3 | 43.1 | 7.9 | 64 | 12.3 | 28.8 |
| EPV16R032... | 32 | 4, 5 | 13 | 13.5 | 56 | 2.5 | 43.1 | 7.1 | 64 | 12.3 | 28.8 |
| T/EPV16R040... | 40 | 0.4, 0.8 | 16 | 11.5 | 79 | 4 | 59.1 | 10.4 | 80 | 13.6 | 36 |
| T/EPV16R040... | 40 | 1.2 | 15.5 | 11.5 | 79 | 4 | 59.1 | 10.4 | 80 | 13.6 | 36 |
| T/EPV16R040... | 40 | 1.6 | 15 | 11 | 80 | 3.5 | 59.1 | 9.9 | 80 | 13.2 | 36 |
| T/EPV16R040... | 40 | 2 | 14.5 | 11 | 80 | 3.5 | 59.1 | 9.9 | 80 | 13.2 | 36 |
| T/EPV16R040... | 40 | 3, 3.2 | 14 | 10 | 82 | 3 | 59.1 | 9 | 80 | 12.3 | 36 |
| T/EPV16R040... | 40 | 4, 5 | 13 | 8.5 | 90 | 2.5 | 59.1 | 7.6 | 80 | 12.3 | 36 |
| TPV16R050... | 50 | 0.4, 0.8 | 16 | 9.5 | 96 | 4 | 79.1 | 13 | 100 | 13.6 | 45 |
| TPV16R050... | 50 | 1.2 | 15.5 | 9.5 | 96 | 4 | 79.1 | 13 | 100 | 13.6 | 45 |
| TPV16R050... | 50 | 1.6 | 15 | 9 | 98 | 3.5 | 79.1 | 12.3 | 100 | 13.2 | 45 |
| TPV16R050... | 50 | 2 | 14.5 | 9 | 98 | 3.5 | 79.1 | 12.3 | 100 | 13.2 | 45 |
| TPV16R050... | 50 | 3.0, 3.2 | 14 | 8 | 103 | 3 | 79.1 | 10.9 | 100 | 12.3 | 45 |
| TPV16R050... | 50 | 4, 5 | 13 | 7 | 110 | 2.5 | 79.1 | 9.5 | 100 | 12.3 | 45 |
| TPV16R063... | 63 | 0.4, 0.8 | 16 | 7 | 130 | 4 | 105.1 | 13.6 | 126 | 13.6 | 56.7 |
| TPV16R063... | 63 | 1.2 | 15.5 | 7 | 130 | 4 | 105.1 | 13.6 | 126 | 13.6 | 56.7 |
| TPV16R063... | 63 | 1.6 | 15 | 6.5 | 136 | 3.5 | 105.1 | 12.8 | 126 | 13.2 | 56.7 |
| TPV16R063... | 63 | 2 | 14.5 | 6.5 | 136 | 3.5 | 105.1 | 12.8 | 126 | 13.2 | 56.7 |
| TPV16R063... | 63 | 3.0, 3.2 | 14 | 6 | 136 | 3 | 105.1 | 11.8 | 126 | 12.3 | 56.7 |
| TPV16R063... | 63 | 4, 5 | 13 | 5.5 | 140 | 2.5 | 105.1 | 10.8 | 126 | 12.3 | 56.7 |
| TPV16R080... | 80 | 0.4, 0.8 | 16 | 5 | 183 | 4 | 139.1 | 13.6 | 160 | 13.6 | 72 |
| TPV16R080... | 80 | 1.2 | 15.5 | 5 | 183 | 4 | 139.1 | 13.6 | 160 | 13.6 | 72 |
| TPV16R080... | 80 | 1.6 | 15 | 4.5 | 197 | 3.5 | 139.1 | 12.4 | 160 | 13.2 | 72 |
| TPV16R080... | 80 | 2 | 14.5 | 4.5 | 197 | 3.5 | 139.1 | 12.4 | 160 | 13.2 | 72 |
| TPV16R080... | 80 | 3, 3.2 | 14 | 4 | 207 | 3 | 139.1 | 11 | 160 | 12.3 | 72 |
| TPV16R080... | 80 | 4, 5 | 13 | 3.5 | 221 | 2.5 | 139.1 | 9.6 | 160 | 12.3 | 72 |
| TPV16R100... | 100 | 0.4, 0.8 | 16 | 3.5 | 262 | 4 | 179.1 | 12.9 | 200 | 13.6 | 90 |
| TPV16R100... | 100 | 1.2 | 15.5 | 3.5 | 262 | 4 | 179.1 | 12.9 | 200 | 13.6 | 90 |
| TPV16R100... | 100 | 1.6 | 15 | 3 | 296 | 3.5 | 179.1 | 11.1 | 200 | 13.2 | 90 |
| TPV16R100... | 100 | 2 | 14.5 | 3 | 296 | 3.5 | 179.1 | 11.1 | 200 | 13.2 | 90 |
| TPV16R100... | 100 | 3, 3.2 | 14 | 2.5 | 332 | 3 | 179.1 | 9.2 | 200 | 12.3 | 90 |
| TPV16R100... | 100 | 4, 5 | 13 | 2.5 | 309 | 2.5 | 179.1 | 9.2 | 200 | 11.6 | 90 |
| TPV16R125... | 125 | 0.4, 0.8 | 16 | 2.5 | 367 | 4 | 229.1 | 12.1 | 125 | 13.6 | 112.5 |
| TPV16R125... | 125 | 1.2 | 15.5 | 2.5 | 367 | 4 | 229.1 | 12.1 | 125 | 13.6 | 112.5 |
| TPV16R125... | 125 | 1.6 | 15 | 2 | 444 | 3.5 | 229.1 | 9.7 | 125 | 13.2 | 112.5 |
| TPV16R125... | 125 | 2 | 14.5 | 2 | 444 | 3.5 | 229.1 | 9.7 | 125 | 13.2 | 112.5 |
| TPV16R125... | 125 | 3, 3.2 | 14 | 1.5 | 554 | 3 | 229.1 | 7.3 | 125 | 8.7 | 112.5 |
| TPV16R125... | 125 | 4, 5 | 13 | 1.5 | 516 | 2.5 | 229.1 | 7.3 | 125 | 8.7 | 112.5 |

# HYBRIDTACMILL

## EPH

High precision square shoulder endmills in small diameter with XHGR type insert

A.R. = +14.7° ~ +19.5°, R.R. = -14.9° ~ -17.8°

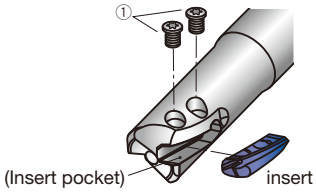



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øDs | L | L1 | Insert |
|---|---|---|---|---|---|---|---|
| EPH11R010M10.0-2 | 10 | 10 | 2 | 10 | 80 | 21 | XHGR1102... |
| EPH11R010M10.0-2L | 10 | 10 | 2 | 10 | 100 | 36 | XHGR1102... |
| EPH13R012M12.0-2 | 12 | 12 | 2 | 12 | 80 | 25 | XHGR1302... |
| EPH13R012M12.0-2L | 12 | 12 | 2 | 12 | 110 | 43 | XHGR1302... |
| EPH13R013M12.0-2 | 12 | 13 | 2 | 12 | 110 | 25 | XHGR1302... |
| EPH13R014M12.0-2 | 12 | 14 | 2 | 12 | 110 | 25 | XHGR1302... |
| EPH18R016M16.0-2 | 16 | 16 | 2 | 16 | 100 | 33 | XHGR18T2... |
| EPH18R016M16.0-2L | 16 | 16 | 2 | 16 | 130 | 56 | XHGR18T2... |
| EPH18R016M16.0-3 | 16 | 16 | 3 | 16 | 100 | 33 | XHGR18T2... |
| EPH18R016M16.0-3L | 16 | 16 | 3 | 16 | 130 | 56 | XHGR18T2... |
| EPH18R017M16.0-3 | 16 | 17 | 3 | 16 | 130 | 33 | XHGR18T2... |
| EPH18R018M16.0-3 | 16 | 18 | 3 | 16 | 130 | 33 | XHGR18T2... |
| EPH18R020M20.0-3 | 16 | 20 | 3 | 20 | 110 | 41 | XHGR18T2... |
| EPH18R020M20.0-3L | 16 | 20 | 3 | 20 | 140 | 71 | XHGR18T2... |
| EPH18R021M20.0-3 | 16 | 21 | 3 | 20 | 140 | 41 | XHGR18T2... |
| EPH18R025M25.0-4 | 16 | 25 | 4 | 25 | 120 | 51 | XHGR18T2... |
| EPH18R025M25.0-4L | 16 | 25 | 4 | 25 | 160 | 88.5 | XHGR18T2... |
| EPH18R026M25.0-4 | 16 | 26 | 4 | 25 | 160 | 51 | XHGR18T2... |

### SPARE PARTS

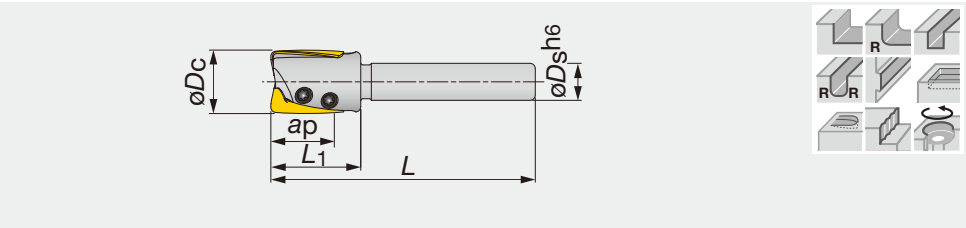
| Designation | ①Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| EPH11R... | CSP-2L033 | - | IP-6F |
| EPH13R... | CSPB-2.2SH | IP-7D | - |
| EPH18R... | CSPB-2.5SH | IP-7D | - |



## EPH with slim shank

High precision square shoulder endmills with XHGR type insert, slim shank for small lathes

A.R. = +14.7° ~ +19.5°, R.R. = -14.9° ~ -17.8°



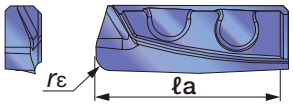

| Designation | Max.ap | øDc | z | øDs | L | L1 | Insert |
|---|---|---|---|---|---|---|---|
| EPH11R010M06.0-2 | 10 | 10 | 2 | 6 | 50 | 15 | XHGR1102... |
| EPH13R012M07.0-2 | 12 | 12 | 2 | 7 | 50 | 17 | XHGR1302... |
| EPH18R016M10.0-3 | 16 | 16 | 3 | 10 | 60 | 22 | XHGR18T2... |
| EPH18R020M10.0-3 | 16 | 20 | 3 | 10 | 60 | 22 | XHGR18T2... |

### SPARE PARTS

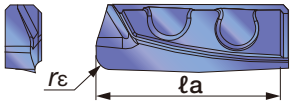
| Designation | Clamping screw | Wrench | Wrench 1 |
|---|---|---|---|
| EPH11R010M06.0-2 | CSP-2L033 | - | IP-6F |
| EPH13R012M07.0-2 | CSPB-2.2SH | IP-7D | - |
| EPH18R0**M10.0-3 | CSPB-2.5SH | IP-7D | - |

## INSERT

### XHGR11/13/18-AJ




### XHGR11/13/18-MJ




| | | Coated | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH730 | DS1200 | ℓa |
|---|---|---|---|---|---|
| XHGR110202ER-MJ | 0.2 | 10 | ● | | 11 |
| XHGR110204ER-MJ | 0.4 | 10 | ● | | 11 |
| XHGR110205ER-MJ | 0.5 | 10 | ● | | 11 |
| XHGR110208ER-MJ | 0.8 | 10 | ● | | 11 |
| XHGR110210ER-MJ | 1 | 10 | ● | | 11 |
| XHGR110212ER-MJ | 1.2 | 10 | ● | | 11 |
| XHGR110215ER-MJ | 1.5 | 10 | ● | | 11 |
| XHGR110216ER-MJ | 1.6 | 10 | ● | | 11 |
| XHGR110220ER-MJ | 2 | 10 | ● | | 11 |
| XHGR130202ER-MJ | 0.2 | 12 | ● | | 13 |
| XHGR130204ER-MJ | 0.4 | 12 | ● | | 13 |
| XHGR130205ER-MJ | 0.5 | 12 | ● | | 13 |
| XHGR130208ER-MJ | 0.8 | 12 | ● | | 13 |
| XHGR130210ER-MJ | 1 | 12 | ● | | 13 |
| XHGR130212ER-MJ | 1.2 | 12 | ● | | 13 |
| XHGR130215ER-MJ | 1.5 | 12 | ● | | 13 |
| XHGR130216ER-MJ | 1.6 | 12 | ● | | 13 |
| XHGR130220ER-MJ | 2 | 12 | ● | | 13 |
| XHGR18T202ER-MJ | 0.2 | 16 | ● | | 18 |
| XHGR18T204ER-MJ | 0.4 | 16 | ● | | 18 |
| XHGR18T205ER-MJ | 0.5 | 16 | ● | | 18 |
| XHGR18T208ER-MJ | 0.8 | 16 | ● | | 18 |
| XHGR18T210ER-MJ | 1 | 16 | ● | | 18 |
| XHGR18T212ER-MJ | 1.2 | 16 | ● | | 18 |
| XHGR18T215ER-MJ | 1.5 | 16 | ● | | 18 |

●: Line up

| | | | | |
|---|---|---|---|---|
| P | Steel | ★ | | |
| M | Stainless | ★ | | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | ★ | |
| S | Superalloys | | | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

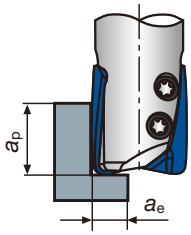
| Designation | rε | Max. ap | Coated | | ℓa |
|---|---|---|---|---|---|
| | | | AH730 | DS1200 | |
| XHGR18T216ER-MJ | 1.6 | 16 | ● | | 18 |
| XHGR18T220ER-MJ | 2 | 16 | ● | | 18 |
| XHGR110200FR-AJ | 0 | 10 | | ● | 11 |
| XHGR110202FR-AJ | 0.2 | 10 | | ● | 11 |
| XHGR110204FR-AJ | 0.4 | 10 | | ● | 11 |
| XHGR110205FR-AJ | 0.5 | 10 | | ● | 11 |
| XHGR110208FR-AJ | 0.8 | 10 | | ● | 11 |
| XHGR110210FR-AJ | 1 | 10 | | ● | 11 |
| XHGR110212FR-AJ | 1.2 | 10 | | ● | 11 |
| XHGR110215FR-AJ | 1.5 | 10 | | ● | 11 |
| XHGR110216FR-AJ | 1.6 | 10 | | ● | 11 |
| XHGR110220FR-AJ | 2 | 10 | | ● | 11 |
| XHGR130200FR-AJ | 0 | 12 | | ● | 13 |
| XHGR130202FR-AJ | 0.2 | 12 | | ● | 13 |
| XHGR130204FR-AJ | 0.4 | 12 | | ● | 13 |
| XHGR130205FR-AJ | 0.5 | 12 | | ● | 13 |
| XHGR130208FR-AJ | 0.8 | 12 | | ● | 13 |
| XHGR130210FR-AJ | 1 | 12 | | ● | 13 |
| XHGR130212FR-AJ | 1.2 | 12 | | ● | 13 |
| XHGR130215FR-AJ | 1.5 | 12 | | ● | 13 |
| XHGR130216FR-AJ | 1.6 | 12 | | ● | 13 |
| XHGR130220FR-AJ | 2 | 12 | | ● | 13 |
| XHGR18T200FR-AJ | 0 | 16 | | ● | 18 |
| XHGR18T202FR-AJ | 0.2 | 16 | | ● | 18 |
| XHGR18T204FR-AJ | 0.4 | 16 | | ● | 18 |
| XHGR18T205FR-AJ | 0.5 | 16 | | ● | 18 |
| XHGR18T208FR-AJ | 0.8 | 16 | | ● | 18 |
| XHGR18T210FR-AJ | 1 | 16 | | ● | 18 |
| XHGR18T212FR-AJ | 1.2 | 16 | | ● | 18 |
| XHGR18T215FR-AJ | 1.5 | 16 | | ● | 18 |
| XHGR18T216FR-AJ | 1.6 | 16 | | ● | 18 |
| XHGR18T220FR-AJ | 2 | 16 | | ● | 18 |

Note: When using inserts with a corner radius in excess of 1mm,additional work to the cutter body is needed.

●: Line up

# STANDARD CUTTING CONDITIONS

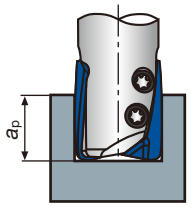
## ● Shoulder milling




ap: Axial depth of cut
ae: Radial depth of cut

| ISO | Workpiece material | Cutting speed Vc (m/min) | Feed rate fz (mm/t) | Cutting conditions | | |
|---|---|---|---|---|---|---|
| | | | | ø10 ≤ øDc < ø12 | ø12 ≤ øDc < ø16 | ø16 ≤ øDc ≤ ø26 |
| P | Carbon steels<br>Alloy steels<br>< 30HRC | 60 ~ 180 | 0.03 ~ 0.1 | Vc = 120 m/mim, fz = 0.08 mm/t | | |
| | | | | ap 7.5 mm | ap 9 mm | ap 12 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| | Alloy steels<br>prehardened steels<br>30 ~ 40HRC | 50 ~ 150 | 0.03 ~ 0.08 | Vc = 100 m/min, fz = 0.05 mm/t | | |
| | | | | ap 5.5 mm | ap 6.5 mm | ap 9 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| M | Stainless steels<br>< 250HB | 50 ~ 150 | 0.03 ~ 0.06 | Vc = 100 m/min, fz = 0.04 mm/t | | |
| | | | | ap 4.5 mm | ap 5.5 mm | ap 7.5 mm |
| | | | | ae 1.5 mm | ae 1.5 mm | ae 2 mm |
| K | Cast irons | 80 ~ 200 | 0.03 ~ 0.1 | Vc = 140 m/min, fz = 0.08 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |
| N | Aluminium alloys<br>Si < 12% | 100 ~ 300 | 0.03 ~ 0.1 | Vc = 200 m/min, fz = 0.07 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |
| | Aluminium alloys<br>Si > 13% | 80 ~ 180 | 0.03 ~ 0.08 | Vc = 130 m/min, fz = 0.06 mm/t | | |
| | | | | ap 9.5 mm | ap 11.5 mm | ap 15.5 mm |
| | | | | ae 2 mm | ae 2 mm | ae 3 mm |

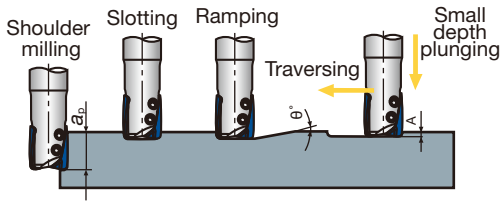
## ● Slotting

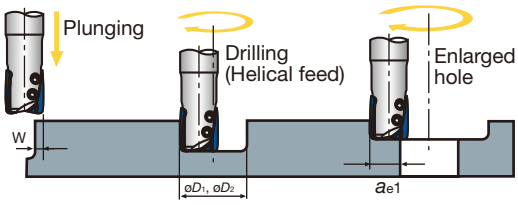



| ISO | Workpiece material | Cutting speed Vc (m/min) | Feed rate fz (mm/t) | Cutting conditions | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | ø10 ≤ øDc < ø12 | ø12 ≤ øDc < ø16 | ø16 ≤ øDc ≤ ø18 | ø18 < øDc ≤ ø21 | ø21 < øDc ≤ ø26 |
| P | Carbon steels<br>Alloy steels<br>< 30HRC | 60 ~ 180 | 0.03 ~ 0.1 | Vc = 100 m/mim, fz = 0.06 mm/t | | | | |
| | | | | ap 1.5 mm | ap 2 mm | ap 3 mm | ap 2.5 mm | ap 2.5 mm |
| | Alloy steels<br>prehardened steels<br>30 ~ 40HRC | 50 ~ 150 | 0.03 ~ 0.08 | Vc = 70 m/min, fz = 0.05 mm/t | | | | |
| | | | | ap 1 mm | ap 1.5 mm | ap 2 mm | ap 1.5 mm | ap 1.5 mm |
| M | Stainless steels<br>< 250HB | 50 ~ 150 | 0.03 ~ 0.06 | Vc = 70 m/min, fz = 0.04 mm/t | | | | |
| | | | | ap 1 mm | ap 1 mm | ap 1.5 mm | ap 1.5 mm | ap 1.5 mm |
| K | Cast irons | 80 ~ 200 | 0.03 ~ 0.1 | Vc = 120 m/min, fz = 0.07 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |
| N | Aluminium alloys<br>Si < 12% | 100 ~ 300 | 0.03 ~ 0.1 | Vc = 150 m/min, fz = 0.07 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |
| | Aluminium alloys<br>Si > 13% | 80 ~ 180 | 0.03 ~ 0.08 | Vc = 110 m/min, fz = 0.06 mm/t | | | | |
| | | | | ap 3.5 mm | ap 4 mm | ap 4.5 mm | ap 3.5 mm | ap 3 mm |

Notes:
- ●When slotting, use a rigid machine.
- ●When chips stay in the cutting zone during slotting or pocketing, use air to remove chips from the work area.
- ●If chips tend to stick to the cutting edge (such as aluminium alloy machining), use a water soluble cutting fluid.
- ●If cutting a casting skin or heavily interrupted work surface, decrease the feed per tooth and maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- ●Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- ●Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure the machine is running normally.

## APPLICATION RANGE



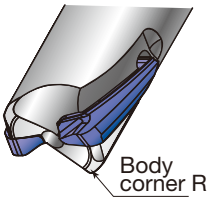




| Type | Designation | Tool ø øDc | Max. depth of cut ap | Max. ramping angle θ° | Max. plunging depth A | Max. cutting width in plunging W | Min. machinable hole ø øD1 | Max. machinable hole ø øD2* | Max. cutting width in enlarged hole ae1* |
|---|---|---|---|---|---|---|---|---|---|
| Straight | EPH11R010M10.0-2 | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M12.0-2 | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M16.0-2 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R016M16.0-3 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M20.0-3 | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |
| | EPH18R025M25.0-4 | 25 | 16 | 1.5 | 0.3 | 4 | 39 | 49.5 | 24.7 |
| Long | EPH11R010M10.0-2L | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M12.0-2L | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M16.0-2L | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R016M16.0-3L | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M20.0-3L | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |
| | EPH18R025M25.0-4L | 25 | 16 | 1.5 | 0.3 | 4 | 39 | 49.5 | 24.7 |
| Undercut | EPH13R013M12.0-2 | 13 | 12 | 2 | 0.3 | 3 | 17 | 25.5 | 12.7 |
| | EPH13R014M12.0-2 | 14 | 12 | 1.5 | 0.3 | 3 | 19 | 27.5 | 13.7 |
| | EPH18R017M16.0-3 | 17 | 16 | 3 | 0.3 | 4 | 23 | 33.5 | 16.7 |
| | EPH18R018M16.0-3 | 18 | 16 | 2.5 | 0.3 | 4 | 25 | 35.5 | 17.7 |
| | EPH18R021M20.0-3 | 21 | 16 | 2 | 0.3 | 4 | 31 | 41.5 | 20.7 |
| | EPH18R026M25.0-4 | 26 | 16 | 1.5 | 0.3 | 4 | 41 | 51.5 | 25.7 |
| For small lathes | EPH11R010M06.0-2 | 10 | 10 | 3 | 0.3 | 3 | 13 | 19.5 | 9.7 |
| | EPH13R012M07.0-2 | 12 | 12 | 3.5 | 0.3 | 3 | 16 | 23.5 | 11.7 |
| | EPH18R016M10.0-3 | 16 | 16 | 3.5 | 0.3 | 4 | 22 | 31.5 | 15.7 |
| | EPH18R020M10.0-3 | 20 | 16 | 2 | 0.3 | 4 | 29 | 39.5 | 19.7 |

*Where the insert corner radius ≤ 0.2 mm

### Notes on using large radius inserts

When using the inserts which have a large corner radius in excess of 1.0 mm, additional work is needed to the corner of the body.

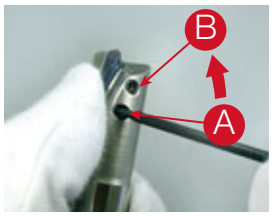



| Insert corner radius $r_\varepsilon$ (mm) | Required rework to body corner R (mm) |
|---|---|
| $0 \le r_\varepsilon \le 1.0$ | No additional work |
| $1.0 < r_\varepsilon \le 2.0$ | R2.0 |

### Insert mounting procedure (EPH-type)

**Fasten the inserts in order of Ⓐ to Ⓑ**

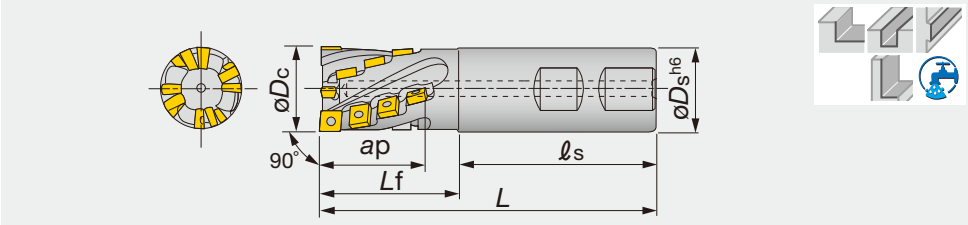
① After loosening the clamping screws, insert the insert in the insert pocket of the body while pushing it with your finger.
② Lightly fasten the clamping screws in order of A and B.
③ For all the inserts, carry out the above steps ① and ②.
④ Securely tighten the clamping screws in order of Ⓐ and Ⓑ.
(Refer to the standard tightening torque values.)
⑤ For all the inserts, carry out the above step ④.
⑥ Check the condition of insert seating, clearance between the insert and insert pocket, the tool diameter, and the peripheral edge runout.



## ELP

Square shoulder endmills with long cutting edge for roughingoperation

A.R. = +11°, R.R. = -6° ~ -5°




| Designation | ap | øDc | z eff | øDs | ℓs | Lf | L | Air hole | End cutting edge inserts | Both end and peripheral edge inserts |
|---|---|---|---|---|---|---|---|---|---|---|
| ELP07032R-A | 38 | 32 | 2 | 32 | 80 | 60 | 140 | with | ACMT0603... (2) | APMT0703... (14) |
| ELP07032R | 38 | 32 | 2 | 32 | 80 | 60 | 140 | without | ACMT0603... (2) | APMT0703... (14) |
| ELP07040R-A | 44 | 40 | 2 | 42 | 80 | 70 | 150 | with | ACMT0603... (2) | APMT0703... (16) |
| ELP07040R | 44 | 40 | 2 | 42 | 80 | 70 | 150 | without | ACMT0603... (2) | APMT0703... (16) |
| ELP09040R-A | 48 | 40 | 2 | 42 | 80 | 70 | 150 | with | ACMT07T3... (2) | APMT09T3... (14) |
| ELP09040R | 48 | 40 | 2 | 42 | 80 | 70 | 150 | without | ACMT07T3... (2) | APMT09T3... (14) |
| ELP09050R-A | 56 | 50 | 2 | 42 | 80 | 80 | 160 | with | ACMT07T3... (2) | APMT09T3... (16) |
| ELP09050R | 56 | 50 | 2 | 42 | 80 | 80 | 160 | without | ACMT07T3... (2) | APMT09T3... (16) |
| ELP12050R-A | 58 | 50 | 2 | 42 | 80 | 80 | 160 | with | ACMT1004... (2) | APMT1204... (12) |
| ELP12050R | 58 | 50 | 2 | 42 | 80 | 80 | 160 | without | ACMT1004... (2) | APMT1204... (12) |
| ELP12063R-A | 68 | 63 | 2 | 42 | 80 | 90 | 170 | with | ACMT1004... (2) | APMT1204... (14) |
| ELP12063R | 68 | 63 | 2 | 42 | 80 | 90 | 170 | without | ACMT1004... (2) | APMT1204... (14) |

● () is the number of used insert

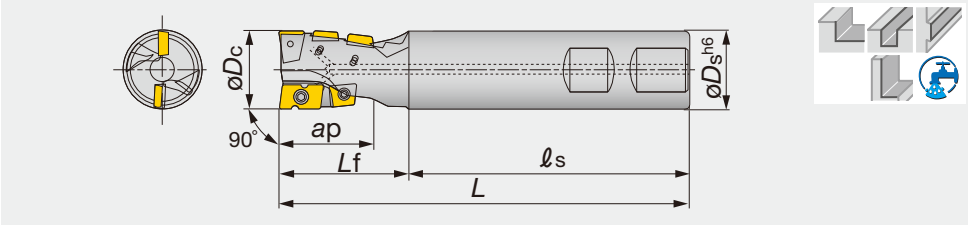
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| ELP07... | CSTB-2.5 | T-8D |
| ELP09... | CSTB-3 | T-9D |
| ELP12... | CSTB-4M | T-15D |

## ELP**RA

Square shoulder endmills with long cutting edge for roughingoperation

A.R. = +15°, R.R. = -6° ~ -5°




| Designation | ap | øDc | z eff | øDs | ℓs | Lf | L | Air hole | End cutting edge inserts | Both end and peripheral edge inserts |
|---|---|---|---|---|---|---|---|---|---|---|
| ELP13025RA-A | 28 | 25 | 2 | 25 | 90 | 40 | 130 | with | ADMT1303... (1) | APMT0703... (4) |
| ELP13025RA | 28 | 25 | 2 | 25 | 90 | 40 | 130 | without | ADMT1303... (1) | APMT0703... (4) |
| ELP17032RA-A | 35 | 32 | 2 | 32 | 90 | 50 | 140 | with | ADMT17T3... (1) | APMT09T3... (4) |
| ELP17032RA | 35 | 32 | 2 | 32 | 90 | 50 | 140 | without | ADMT17T3... (1) | APMT09T3... (4) |
| ELP21040RA-A | 44 | 40 | 2 | 42 | 90 | 60 | 150 | with | ADMT2104... (1) | APMT1204... (4) |
| ELP21040RA | 44 | 42 | 2 | 40 | 90 | 60 | 150 | without | ADMT2104... (1) | APMT1204... (4) |

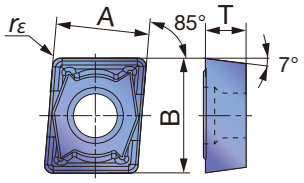
● () is the number of used insert

### SPARE PARTS

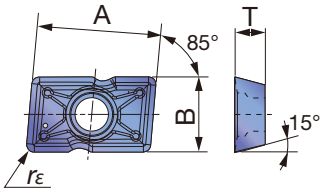
| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| ELP13... | CSPD-3 | CSPB-2.5 | M-1000 | IP-10D | IP-8D |
| ELP17... | CSPD-3 | CSPB-4S | M-1000 | IP-10D | IP-15D |
| ELP21... | CSTB-5 | CSPB-4 | M-1000 | IP-15D | T-20D |

## INSERT

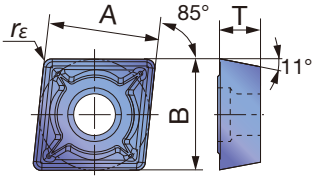
### ACMT06/07/10-MJ




### ADMT13/17/21-MJ




### APMT07/09/12-MJ




| | | | | | |
|---|---|---|---|---|---|
| P | Steel | ★ | | ☆ | ★ |
| M | Stainless | | ★ | | |
| K | Cast iron | ★ | | | |
| N | Non-ferrous | | | | |
| S | Superalloys | ★ | | | |
| H | Hard materials | | | | |

★ : First choice
☆ : Second choice

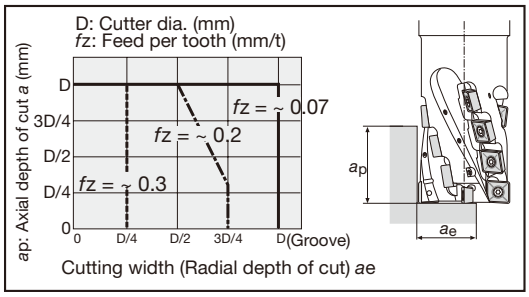
| Designation | rε | Coated | | | | A | B | T |
|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | | | |
| ACMT060308PR-MJ | 0.8 | ● | ● | ● | ● | 6 | 7.8 | 3.18 |
| ACMT07T308PR-MJ | 0.8 | ● | ● | ● | ● | 7.5 | 9.5 | 3.97 |
| ACMT100408PR-MJ | 0.8 | ● | ● | ● | ● | 10 | 12.7 | 4.76 |
| ADMT130308PR-MJ | 0.8 | ● | ● | | ● | 13.1 | 8 | 3.18 |
| ADMT17T308PR-MJ | 0.8 | ● | ● | | ● | 16.6 | 9.5 | 3.97 |
| ADMT210408PR-MJ | 0.8 | ● | ● | | ● | 20.6 | 12.7 | 4.76 |
| APMT070308PN-MJ | 0.8 | ● | ● | ● | ● | 7.9 | 7.9 | 3.18 |
| APMT09T308PN-MJ | 0.8 | ● | ● | ● | ● | 9.5 | 9.5 | 3.97 |
| APMT120408PN-MJ | 0.8 | ● | ● | ● | ● | 12.7 | 12.7 | 4.76 |

●: Line up

# STANDARD CUTTING CONDITIONS

## ELP type

| ISO | Workpiece material | Grade | Cutter diameter (mm) ø32 Vc (m/min) | ø32 fz (mm/t) | ø40 Vc (m/min) | ø40 fz (mm/t) | ø50 Vc (m/min) | ø50 fz (mm/t) | ø63 Vc (m/min) | ø63 fz (mm/t) |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Mild steels, Low carbon steels SS400, S25C, etc. E275A, C15E4, etc. | T3130 (AH120) | 60 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 | 70 ~ 150 | 0.1 ~ 0.3 |
| P | High carbon steels, Alloy steels S50C, SCM440, etc. C55, 42CrMo4, etc. | T3130 (AH120) | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |
| P | Die steels SKD11, etc. X153CrMoV12, etc. | T3130 (AH120) | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| M | Stainless steels SUS304, etc. X5CrNi18-9, etc. | AH140 | 70 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| K | Cast irons FC250, FCD500, etc. 250, 450-10S, etc. | AH120 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |




- *Vc*: Cutting speed
- *fz*: Feed per tooth (Feed per revolution is *fz* × 2 as effective number of teeth is equal to two)

Notes :
- Dry cutting (or air-blowing) is generally recommended. When chips tend to adhere to the cutting edges such as in milling stainless steel, use a water-soluble cutting fluid.
- When the cutting width is larger than a half of the cutter diameter or chips tend to stay in the cutting area, use an air blast to remove chips.
- To get the best of the tool performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended. Excessive tool overhang from the toolholder should be avoided to prevent chatter.

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## ELP**RA type

| ISO | Workpiece material | Grade | Cutter diameter (mm) ø25 Vc (m/min) | ø25 fz (mm/t) | ø32 Vc (m/min) | ø32 fz (mm/t) | ø40 Vc (m/min) | ø40 fz (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Mild steels, Low carbon steels SS400, S25C, etc. E275A, C15E4, etc. | T3130 (AH120) | 60 ~ 150 | 0.08 ~ 0.2 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |
| P | High carbon steels, Alloy steels S50C, SCM440, etc. C55, 42CrMo4, etc. | T3130 (AH120) | 60 ~ 120 | 0.08 ~ 0.2 | 60 ~ 120 | 0.1 ~ 0.3 | 60 ~ 120 | 0.1 ~ 0.3 |
| P | Die steels SKD11, etc. X153CrMoV12, etc. | T3130 (AH120) | 60 ~ 100 | 0.08 ~ 0.2 | 60 ~ 100 | 0.1 ~ 0.3 | 60 ~ 100 | 0.1 ~ 0.3 |
| M | Stainless steels SUS304, etc. X5CrNi18-9, etc. | AH140 | 70 ~ 120 | 0.08 ~ 0.2 | 70 ~ 120 | 0.1 ~ 0.3 | 70 ~ 120 | 0.1 ~ 0.3 |
| K | Cast irons FC250, FCD500, etc. 250, 450-10S, etc. | AH120 | 60 ~ 150 | 0.08 ~ 0.2 | 60 ~ 150 | 0.1 ~ 0.3 | 60 ~ 150 | 0.1 ~ 0.3 |

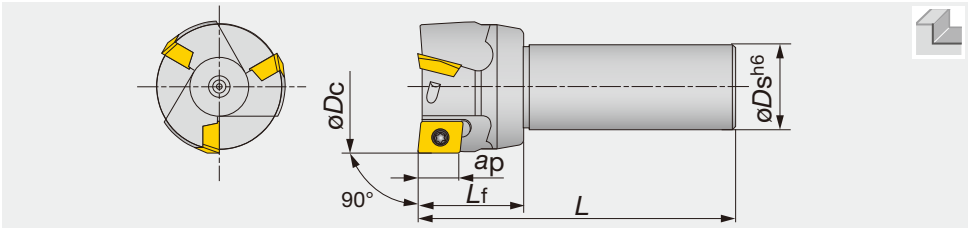
- *Vc*: Cutting speed
- *fz*: Feed per tooth (Feed per revolution is *fz* × 2 as effective number of teeth is equal to two)

Notes :
- To get the best of the tool's performance, use of a high-accuracy, side-lock type toolholder or milling chuck which has a high gripping force is recommended.
- Excessive tool overhang from the toolholder should be avoided to prevent chatter.

## EPE4000,5000,6000

High precision shoulder square endmills with AECW inserts

A.R. = +12° ~ +17°, R.R. = -10° ~ 0°



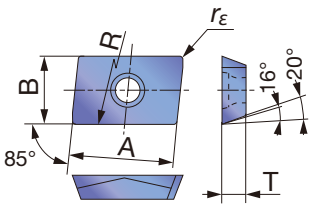

| Designation | Max. ap | øDc | z | øDs | Lf | L | Insert |
|---|---|---|---|---|---|---|---|
| EPE4020R | 12 | 20 | 1 | 20 | 30 | 100 | AE*W14... |
| EPE4025R | 12 | 25 | 2 | 25 | 35 | 115 | AE*W14... |
| EPE5030R | 14 | 30 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE5035R | 14 | 35 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE5040R | 14 | 40 | 2 | 32 | 40 | 120 | AE*W16... |
| EPE6050R | 16 | 50 | 3 | 32 | 40 | 120 | AE*W18... |
| EPE6063R | 16 | 63 | 4 | 32 | 45 | 125 | AE*W18... |

### SPARE PARTS

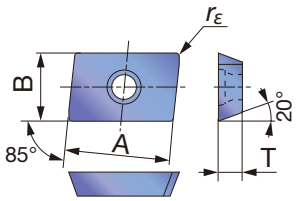
| Designation | Clamping screw | Wrench |
|---|---|---|
| EPE402*R | CSTB-3S | T-9D |
| EPE50**R | CSTB-4S | T-15D |
| EPE60**R | CSTB-4M | T-15D |

## INSERT

### AECW14/16/18




### AEMW14/16/18




| | | AH120 | GH330 | NS740 | UX30 | TH10 |
|---|---|---|---|---|---|---|
| P | Steel | ★ | ★ | ★ | ☆ | |
| M | Stainless | ★ | ★ | | | |
| K | Cast iron | ★ | ★ | | | |
| N | Non-ferrous | | | | | ★ |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | Cermet | Uncoated | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | GH330 | NS740 | UX30 | TH10 | | | |
| AECW1403PEFR | 0.4 | 12 | | | | | ● | 14 | 9 | 3.18 |
| AECW1403PESR | 0.4 | 12 | ● | ● | ● | ● | | 14 | 9 | 3.18 |
| AECW16T3PEFR | 0.4 | 14 | | | | | ● | 16 | 12 | 3.97 |
| AECW16T3PESR | 0.4 | 14 | ● | ● | ● | ● | | 16 | 12 | 3.97 |
| AECW1804PEFR | 0.4 | 16 | | | | | ● | 18 | 12 | 4.76 |
| AECW1804PESR | 0.4 | 16 | ● | ● | ● | ● | | 18 | 12 | 4.76 |
| AEMW1403PEFR | 0.4 | 12 | | | | | ● | 14 | 8.9 | 3.18 |
| AEMW1403PETR | 0.4 | 12 | | ● | ● | ● | | 14 | 8.9 | 3.18 |
| AEMW16T3PEFR | 0.4 | 14 | | | | | ● | 16 | 11.9 | 3.97 |
| AEMW16T3PETR | 0.4 | 14 | | ● | ● | ● | | 16 | 11.9 | 3.97 |
| AEMW1804PEFR | 0.4 | 16 | | | | | ● | 18 | 11.9 | 4.76 |
| AEMW1804PETR | 0.4 | 16 | | ● | ● | ● | | 18 | 11.9 | 4.76 |

●: Line up

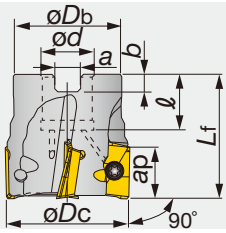
## STANDARD CUTTING CONDITIONS

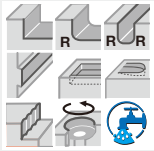
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) ø20 ~ 35 mm | Cutting speed *Vc* (m/min) ø40 ~ 63 mm | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Mild steels·Unhardened steels<br>< 180 HB<br>SS400,S15C, etc.<br>C15E4, E275A, etc. | AH120 · GH330 | 80 ~ 150 | 130 ~ 230 | 0.1 ~ 0.2 |
| | | NS740 | 100 ~ 150 | 130 ~ 180 | 0.1 ~ 0.15 |
| | | UX30 | 80 ~ 150 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Carbon steels, Alloy steels<br>< 300HB<br>S55C,SCM440, etc.<br>C55, 42CrMo4, etc. | AH120 · GH330 | 80 ~ 100 | 100 ~ 200 | 0.1 ~ 0.2 |
| | | NS740 | 80 ~ 100 | 100 ~ 150 | 0.1 ~ 0.15 |
| | | UX30 | 80 ~ 100 | 80 ~ 120 | 0.1 ~ 0.2 |
| | Die steels<br>< 300HB | AH120 · GH330<br>NS740 | 80 ~ 100 | 100 ~ 120 | 0.1 ~ 0.15 |
| M | Stainless steels<br>SUS304, etc.<br>X5CrNi18-9, etc. | AH120 · GH330 | 100 ~ 200 | 120 ~ 200 | 0.1 ~ 0.2 |
| K | Cast irons<br>Ductile cast irons | TH10 | 80 ~ 100 | 80 ~ 100 | 0.1 ~ 0.15 |
| | | AH120 | 80 ~ 150 | 80 ~ 150 | 0.1 ~ 0.2 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 300 | 300 ~ 500 | 0.1 ~ 0.25 |

## TPS17

Square shoulder mills with ASMT/ASGT17 inserts, suitable for multi purpose machining

A.R. = +9°, R.R. = -20°~ -7°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPS17040RB | 16.2 | 40 | 4 | 40 | 16 | 18 | 8.2 | 5.6 | 0.2 | with | AS*T1705... |
| TPS17040RB-E | 16.2 | 40 | 4 | 40 | 16 | 19 | 8.4 | 5.6 | 0.2 | without | AS*T1705... |
| TPS17050RB | 16.1 | 50 | 5 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | AS*T1705... |
| TPS17050RB-E | 16.1 | 50 | 5 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | without | AS*T1705... |
| TPS17063RB | 16 | 63 | 6 | 45 | 22 | 20 | 10 | 6 | 0.6 | with | AS*T1705... |
| TPS17063RB-E | 16 | 63 | 6 | 45 | 22 | 20 | 10.4 | 6.3 | 0.6 | without | AS*T1705... |
| TPS17080RB | 16 | 80 | 8 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | with | AS*T1705... |
| TPS17100RB | 16 | 100 | 9 | 63 | 31.75 | 32 | 12.7 | 8 | 2.2 | with | AS*T1705... |
| TPS17125RB | 16 | 125 | 11 | 63 | 38.1 | 47 | 15.9 | 10 | 3.3 | with | AS*T1705... |
| TPS17160RB | 16 | 160 | 12 | 63 | 50.8 | 47 | 19 | 11 | 5.5 | with | AS*T1705... |

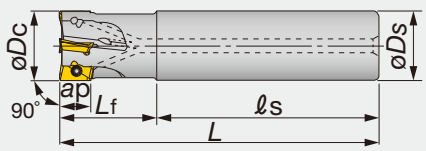
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Shell locking bolt 2 | Wrench |
|---|---|---|---|---|---|---|
| TPS17040RB | CSPB-4S | M-1000 | - | FSHM8-30H | - | IP-15D |
| TPS17040RB-E | CSPB-4S | M-1000 | - | - | FSHM8-30 | IP-15D |
| TPS17050RB | CSPB-4S | M-1000 | - | CM10X30H | - | IP-15D |
| TPS17050RB-E | CSPB-4S | M-1000 | - | - | CAP-CM10X1.5X30 | IP-15D |
| TPS17063RB | CSPB-4S | M-1000 | - | CM10X30H | - | IP-15D |
| TPS17063RB-E | CSPB-4S | M-1000 | - | - | CAP-CM10X1.5X30 | IP-15D |
| TPS17080RB | CSPB-4S | M-1000 | - | CM12X30H | - | IP-15D |
| TPS17100RB | CSPB-4S | M-1000 | - | CM16X40H | - | IP-15D |
| TPS17125RB | CSPB-4S | M-1000 | TMBA-M20H | - | - | IP-15D |
| TPS17160RB | CSPB-4S | M-1000 | TMBA-M24H | - | - | IP-15D |

# EPS17

## Square shoulder endmills with ASMT/ASGT17 inserts

A.R. = +9°~ +17° ,R.R. = -20°~ -7°



Right hand (R) shown.

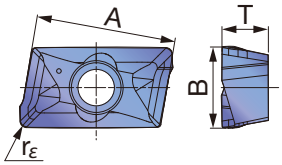
| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *Lf* | *L* | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EPS17025RS | 16.3 | 25 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17025RL | 16.3 | 25 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17026RS | 16.3 | 26 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17026RL | 16.3 | 26 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17030RS | 16.2 | 30 | 2 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17030RSB | 16.2 | 30 | 3 | 25 | 80 | 35 | 115 | with | AS*T1705... |
| EPS17030RL | 16.2 | 30 | 2 | 25 | 150 | 70 | 220 | with | AS*T1705... |
| EPS17032RSB-E | 16.2 | 32 | 3 | 32 | 70 | 40 | 110 | with | AS*T1705... |
| EPS17032RS | 16.2 | 32 | 2 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17032RSB | 16.2 | 32 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17032RL | 16.2 | 32 | 2 | 32 | 175 | 80 | 255 | with | AS*T1705... |
| EPS17033RS | 16.2 | 33 | 2 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17033RSB | 16.2 | 33 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17033RL | 16.2 | 33 | 2 | 32 | 175 | 80 | 255 | with | AS*T1705... |
| EPS17040RS | 16.2 | 40 | 3 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17040RSB | 16.2 | 40 | 4 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17040RL | 16.2 | 40 | 2 | 32 | 205 | 50 | 255 | with | AS*T1705... |
| EPS17040RLS42 | 16.2 | 40 | 2 | 42 | 210 | 100 | 310 | with | AS*T1705... |
| EPS17050RSB | 16.1 | 50 | 5 | 32 | 80 | 40 | 120 | with | AS*T1705... |
| EPS17050RL | 16.1 | 50 | 3 | 42 | 310 | 50 | 360 | with | AS*T1705... |
| EPS17063RSB | 16 | 63 | 6 | 32 | 80 | 45 | 125 | with | AS*T1705... |
| EPS17063RL | 16 | 63 | 3 | 42 | 310 | 50 | 360 | with | AS*T1705... |

### SPARE PARTS

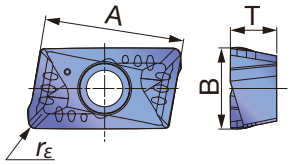
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EPS17 | CSPB-4S | M-1000 | IP-15D |

## INSERT

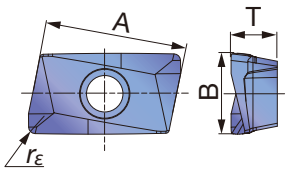
### ASMT17-MJ




### ASMT17-MS




### ASGT17-AJ




| | | AH120 | AH130 | AH140 | T1115 | T3130 | DS1100 | NS740 | KS05F |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | | ★ | | ★ | |
| M | Stainless | | ★ | ★ | | | | | |
| K | Cast iron | ★ | | | ★ | | | | |
| N | Non-ferrous | | | | | | ★ | | ★ |
| S | Superalloys | ★ | ★ | | | | | | |
| H | Hard materials | | | | | | | | |

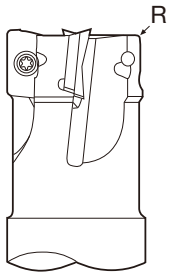
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | Cermet | Un-coated | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | T1115 | T3130 | DS1100 | NS740 | KS05F | | | |
| ASMT170504PDPR-MJ | 0.4 | 16 | ● | | | ● | ● | | ● | | 16.9 | 9.8 | 5.6 |
| ASMT170508PDPR-MJ | 0.8 | 16 | ● | | | ● | ● | | ● | | 16.9 | 9.8 | 5.6 |
| ASMT170512PDPR-MJ | 1.2 | 16 | ● | | | | ● | | | | 16.9 | 9.8 | 5.6 |
| ASMT170516PDPR-MJ | 1.6 | 16 | ● | | | | ● | | ● | | 16.9 | 9.8 | 5.6 |
| ASMT170520PDPR-MJ | 2 | 16 | ● | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170530PDPR-MJ | 3 | 16 | ● | | | | | | | | 16.9 | 9.8 | 5.6 |
| ASMT170532PDPR-MJ | 3.2 | 16 | ● | | | | ● | | ● | | 16.9 | 9.8 | 5.6 |
| ASMT170508PDPR-MS | 0.8 | 16 | | ● | ● | | | | | | 16.9 | 9.8 | 5.6 |
| ASGT170504PDFR-AJ | 0.4 | 16 | | | | | | ● | | ● | 16.9 | 9.8 | 5.6 |
| ASGT170508PDFR-AJ | 0.8 | 16 | | | | | | ● | | ● | 16.9 | 9.8 | 5.6 |

●: Line up

## CAUTIONARY POINT IN MODIFYING CUTTER BODIES

When using inserts with corner radius $r_\varepsilon \geq 2.0$ mm, standard cutter bodies have to be modified "R".



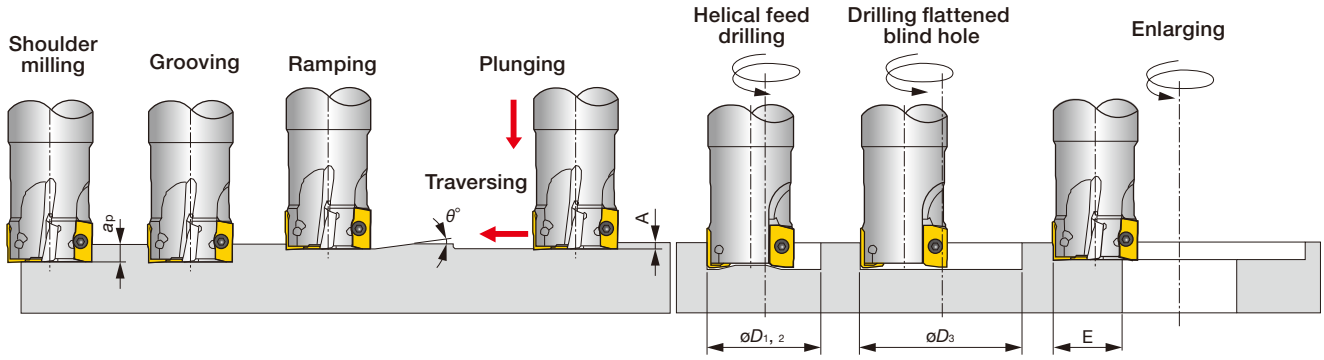

| Corner radius $r_\varepsilon$ (mm) | The dimension of modifying (mm) |
|---|---|
| 0.4 ~ 1.6 | Unnecessary |
| 2.0 ~ 3.2 | 2 |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | | | Feed per tooth *fz* (mm/t) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Cutter dia. ø12 | Cutter dia. ø16, ø20 | Cutter dia. > ø25 | Cutter dia. ø12 | Cutter dia. ø16, ø20 | Cutter dia. > ø25 |
| P | Mild steel, Low Carbon steels SS400, S25C, etc. C10, E275A, etc. < 180HB | NS740 | MJ | 80 ~ 100 | 100 ~ 120 | 100 ~ 150 | 0.05 ~ 0.08 | 0.05 ~ 0.12 | 0.05 ~ 0.15 |
| | | AH120 | MJ | 80 ~ 100 | 100 ~ 150 | 100 ~ 150 | 0.05 ~ 0.1 | 0.12 ~ 0.2 | 0.12 ~ 0.2 |
| | Carbon steels, Alloy steels S50C, SCM440, etc. C55, 42CrMo4, etc. < 300HB | NS740 | MJ | 80 ~ 100 | 80 ~ 100 | 80 ~ 120 | 0.05 ~ 0.08 | 0.05 ~ 0.08 | 0.05 ~ 0.1 |
| | | T3130 | MJ | 80 ~ 100 | 80 ~ 120 | 100 ~ 200 | 0.05 ~ 0.1 | 0.10 ~ 0.15 | 0.1 ~ 0.2 |
| | Die steels S50C, SCM440, etc. X96CrMoV12, etc. < 300HB | T3130 | MJ | 80 ~ 100 | 80 ~ 120 | 100 ~ 150 | 0.05 ~ 0.1 | 0.1 ~ 0.15 | 0.12 ~ 0.2 |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, etc. < 250HB | AH130 | MS | 80 ~ 100 | 100 ~ 150 | 100 ~ 200 | 0.05 ~ 0.1 | 0.12 ~ 0.15 | 0.12 ~ 0.2 |
| K | Grey Cast irons, DuctileCast irons etc. FC250, FCD400, etc. 250, 400-15S, etc. | T1115 | MJ | 80 ~ 100 | 100 ~ 150 | 100 ~ 200 | 0.08 ~ 0.12 | 0.12 ~ 0.2 | 0.15 ~ 0.25 |
| N | Aluminium alloys Si < 13% | DS1100 | AJ | 300 ~ 1000 | 300 ~ 1000 | 300 ~ 1000 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |
| | Aluminium alloys Si ≥ 13% | DS1100 | AJ | 100 ~ 200 | 100 ~ 200 | 100 ~ 200 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |
| | Copper alloys | KS05F | AJ | 200 ~ 500 | 200 ~ 500 | 200 ~ 500 | 0.05 ~ 0.2 | 0.05 ~ 0.2 | 0.05 ~ 0.2 |

Notes:
- When using at L/D ≥ 4, machining at the lower feed rate.
- This TAC mill is not designed to cope with the centrifugal force and dynamic balance at high speeds over 1000 m/min. Therefore, the cutting speed in the outer diameter of the mill should not exceed 1000 m/min.

## APPLICATION RANGE



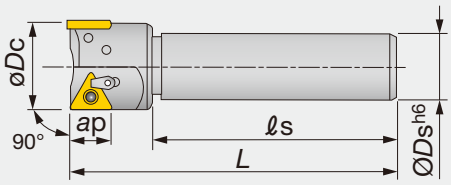

| Designation | Tool ø | Max. depth of cut ap (mm) | Max. ramping angle θ° | Max. plunging depth A (mm) | Min. machining hole dia. øD1 (mm)* | Max. machining hole dia. øD2 (mm)* | Hole dia. in drilling (Blind hole) øD3 (mm)* | Max. cutting width in enlarging hole E (mm) |
|---|---|---|---|---|---|---|---|---|
| EPS17025RS/L | 25 | 16.3 | 5 | 1 | 32 | 48 | 46 ~ 48 | 24 |
| EPS17026RS/L | 26 | 16.3 | 5 | 1 | 34 | 51 | 49 ~ 51 | 25.5 |
| EPS17030RS/B/L | 30 | 16.2 | 4 | 1 | 42 | 59 | 57 ~ 59 | 29.5 |
| EPS17032RS/B/L | 32 | 16.2 | 3.5 | 1 | 46 | 62 | 60 ~ 62 | 31 |
| EPS17033RS/B/L | 33 | 16.2 | 3.5 | 1 | 48 | 65 | 63 ~ 65 | 32.5 |
| E/TPS17040RS/B/L | 40 | 16.2 | 2.5 | 1 | 62 | 78 | 76 ~ 78 | 39 |
| EPS17040RLS42 | 40 | 16.2 | 2.5 | 1 | 62 | 78 | 76 ~ 78 | 39 |
| E/TPS17050RS/B/L | 50 | 16.1 | 1.5 | 1 | 82 | 98 | 96 ~ 98 | 49 |
| E/TPS17063RS/B/L | 63 | 16 | 1 | 1 | 108 | 124 | 122 ~ 124 | 62 |
| TPS17080RB | 80 | 16 | 0.7 | 1 | 142 | 158 | 156 ~ 158 | 79 |
| TPS17100RB | 100 | 16 | 0.5 | 1 | 182 | 198 | 196 ~ 198 | 99 |
| TPS17125RB | 125 | 16 | 0.4 | 1 | 232 | 248 | 246 ~ 248 | 124 |
| TPS17160RB | 160 | 16 | 0.3 | 1 | 302 | 318 | 316 ~ 318 | 159 |

Notes : Corner $t_\varepsilon$ for dimensions of ø$D$1, ø$D$2, and ø$D$3: $r_\varepsilon = 0.8$

## PES1500

Square shoulder endmills with triangle inserts

A.R. = +3°~ +5°, R.R. = -8°~ 0°




| Designation | Max. *ap* | *øDc* | z | *øDs* | *ℓs* | *L* | Insert |
|---|---|---|---|---|---|---|---|
| PES1535R | 19 | 35 | 2 | 32 | 120 | 160 | TP*A43... |
| PES1540R | 19 | 40 | 2 | 32 | 120 | 160 | TP*A43... |
| PES1550R | 19 | 50 | 3 | 32 | 120 | 160 | TP*A43... |

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Wrench |
|---|---|---|---|
| PES15... | CSG-5T | CSTA-4 | T-15D |

## INSERT

### TPCA/TPMA

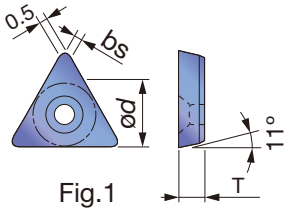



Fig.1

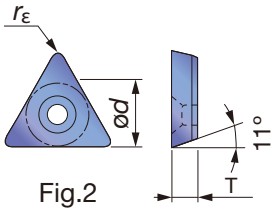



Fig.2

| | | Cermet | | Uncoated | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | ★ | | |
| M | Stainless | | | | | |
| K | Cast iron | | | | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | *rε* | Max. *ap* | NS740 | | UX30 | TH10 | | *ød* | T | bs | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPCA43ZTRW1 | - | 19 | | | | ● | | 12.7 | 4.76 | 1 | 1 |
| TPMA432TNW1 | 0.8 | 19 | ● | | ● | ● | | 12.7 | 4.76 | - | 2 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (m/min) |
|---|---|---|---|---|
| P | Mild steels | UX30 | 100 ~ 150 | 0.1 ~ 0.3 |
| | Carbon steels | UX30 | 100 ~ 120 | 0.1 ~ 0.25 |
| | Alloy steels | UX30 | 80 ~ 100 | 0.1 ~ 0.2 |
| | Die steels 20 ~ 30HRC | UX30 | 50 ~ 70 | 0.1 ~ 0.2 |
| K | Cast irons | TH10 | 70 ~ 90 | 0.1 ~ 0.3 |
| N | Non-ferrous metals | TH10 | 200 ~ 500 | 0.05 ~ 0.2 |

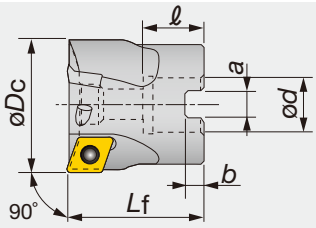
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

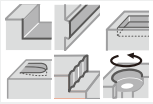
MEMO

## TSD10,17

Multi purpose square mills

TSD10,17 A.R.=+10°,R.R.=-3°~0°



| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSD10040R | 9 | 40 | 3 | 40 | 16 | 18 | 8.2 | 5.6 | 0.2 | GD*T10... |
| TSD10050R | 9 | 50 | 3 | 40 | 22 | 20 | 10 | 6 | 0.3 | GD*T10... |
| TSD17063R | 15 | 63 | 3 | 50 | 22 | 20 | 10 | 6 | 0.5 | GD*T17... |
| TSD17080R | 15 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 0.8 | GD*T17... |

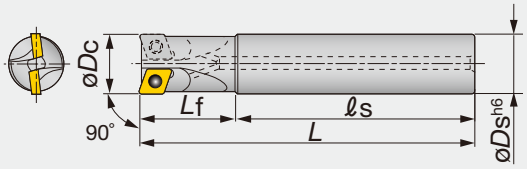
### SPARE PARTS

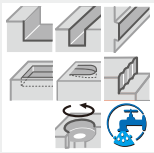
| Designation | Clamping screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TSD10040R | CSTB-3.5H | M-1000 | FSHM8-30 | T-15D |
| TSD10050R | CSTB-3.5H | M-1000 | - | T-15D |
| TSD170**R | CSTB-5 | M-1000 | - | T-20D |

## ESD10,17

Multi purpose square endmills

ESD10 A.R.=+8.5°~+10°,R.R.=-10°~-5°
ESD17 A.R.=+10°,R.R.=-5°~-3°



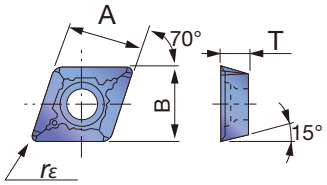
| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ESD10020RSA | 9 | 20 | 1 | 20 | 90 | 30 | 120 | with | GD*T10... |
| ESD10020RS | 9 | 20 | 1 | 20 | 90 | 30 | 120 | without | GD*T10... |
| ESD10020RLA | 9 | 20 | 1 | 20 | 135 | 50 | 185 | with | GD*T10... |
| ESD10020RL | 9 | 20 | 1 | 20 | 135 | 50 | 185 | without | GD*T10... |
| ESD10025RSA | 9 | 25 | 2 | 25 | 100 | 40 | 140 | with | GD*T10... |
| ESD10025RS | 9 | 25 | 2 | 25 | 100 | 40 | 140 | without | GD*T10... |
| ESD10025RLA | 9 | 25 | 2 | 25 | 150 | 70 | 220 | with | GD*T10... |
| ESD10025RL | 9 | 25 | 2 | 25 | 150 | 70 | 220 | without | GD*T10... |
| ESD10032RSA | 9 | 32 | 2 | 32 | 110 | 50 | 160 | with | GD*T10... |
| ESD10032RS | 9 | 32 | 2 | 32 | 110 | 50 | 160 | without | GD*T10... |
| ESD10032RLA | 9 | 32 | 2 | 32 | 175 | 80 | 255 | with | GD*T10... |
| ESD10032RL | 9 | 32 | 2 | 32 | 175 | 80 | 255 | without | GD*T10... |
| ESD17040RSA | 15 | 40 | 2 | 42 | 120 | 60 | 180 | with | GD*T17... |
| ESD17040RS | 15 | 40 | 2 | 42 | 120 | 60 | 180 | without | GD*T17... |
| ESD17040RLA | 15 | 40 | 2 | 42 | 210 | 100 | 310 | with | GD*T17... |
| ESD17040RL | 15 | 40 | 2 | 42 | 210 | 100 | 310 | without | GD*T17... |
| ESD17050RSA | 15 | 50 | 2 | 42 | 160 | 50 | 210 | with | GD*T17... |
| ESD17050RS | 15 | 50 | 2 | 42 | 160 | 50 | 210 | without | GD*T17... |
| ESD17050RLA | 15 | 50 | 2 | 42 | 310 | 50 | 360 | with | GD*T17... |
| ESD17050RL | 15 | 50 | 2 | 42 | 310 | 50 | 360 | without | GD*T17... |
| ESD17063RSA | 15 | 63 | 3 | 42 | 190 | 50 | 240 | with | GD*T17... |
| ESD17063RS | 15 | 63 | 3 | 42 | 190 | 50 | 240 | without | GD*T17... |
| ESD17063RLA | 15 | 63 | 3 | 42 | 310 | 50 | 360 | with | GD*T17... |
| ESD17063RL | 15 | 63 | 3 | 42 | 310 | 50 | 360 | without | GD*T17... |

### SPARE PARTS

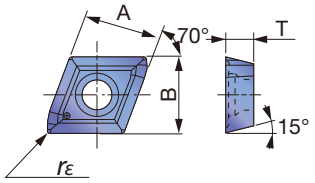
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ESD100**R** | CSTB-3.5H | M-1000 | T-15D |
| ESD170**R** | CSTB-5 | M-1000 | T-20D |

## INSERT

### GDMT10/17-MJ




### GDGT10/17-AJ




| | | AH120 | AH140 | AH330 | T3130 | DS1100 | UX30 | TH10 |
|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | ★ | ★ | | ☆ | |
| M | Stainless | | ★ | | | | | |
| K | Cast iron | ★ | | | | | | |
| N | Non-ferrous | | | | | ★ | | ★ |
| S | Superalloys | ★ | | | | | | |
| H | Hard materials | | | | | | | |

★ : First choice
☆ : Second choice

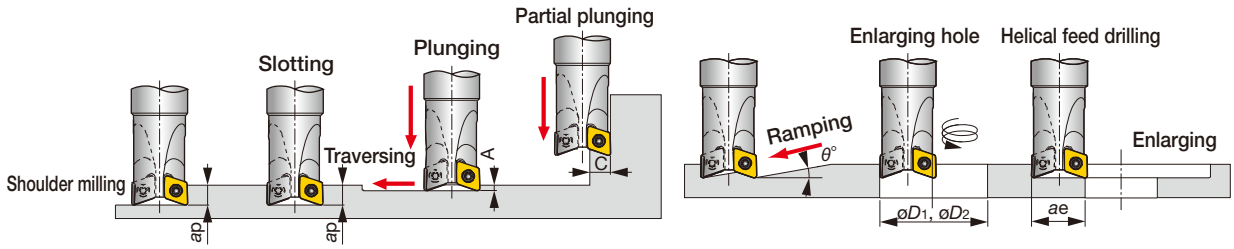
| Designation | rε | Max. ap | Coated | | | | | Uncoated | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH140 | AH330 | T3130 | DS1100 | UX30 | TH10 | | | |
| GDMT10H3PDPR-MJ | 0.8 | 9 | ● | ● | ● | ● | | ● | | 10 | 10 | 3.5 |
| GDMT17X6PDPR-MJ | 1.2 | 15 | ● | ● | ● | ● | | ● | | 16 | 16 | 6 |
| GDGT10H3PDFR-AJ | 0.4 | 9 | | | | | ● | | ● | 10 | 10 | 3.5 |
| GDGT17X6PDFR-AJ | 0.8 | 15 | | | | | ● | | ● | 16 | 16 | 6 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | ESD (ø20 ~ 32 mm) Cutting speed Vc (m/min) | ESD Feed per tooth fz (mm/t) Shouldering, grooving, Z-feed milling | ESD Feed per tooth fz (mm/t) Partial plunging | T/ESD (ø40 ~ 80 mm) Cutting speed Vc (m/min) | T/ESD Feed per tooth fz (mm/t) Shouldering, grooving, Z-feed milling | T/ESD Feed per tooth fz (mm/t) Partial plunging |
|---|---|---|---|---|---|---|---|---|
| P | Carbon steels S50C, etc. C50, etc. < 300 HB | AH120 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | | AH330 | 120 ~ 230 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 150 ~ 250 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | UX30 | 80 ~ 130 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | T3130 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| | | AH330 | 100 ~ 200 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 120 ~ 230 | 0.05 ~ 0.15 | 0.03 ~ 0.06 |
| | | UX30 | 80 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 100 ~ 120 | 0.05 ~ 0.15 | 0.03 ~ 0.06 |
| | | T3130 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| | Die steels SKD61, etc. X96CrMoV12, etc. < 300 HB | AH120 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.06 |
| | | AH330 | 80 ~ 160 | 0.05 ~ 0.1 | 0.03 ~ 0.05 | 100 ~ 200 | 0.05 ~ 0.13 | 0.03 ~ 0.05 |
| | | UX30 | 60 ~ 100 | 0.05 ~ 0.1 | 0.03 ~ 0.05 | 80 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.05 |
| | | T3130 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.06 |
| M | Stainless steels SUS304, etc. X5CrNi18-9, etc. | AH140 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 100 ~ 180 | 0.05 ~ 0.25 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.03 ~ 0.1 |
| | | AH330 | 120 ~ 230 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 150 ~ 250 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| | | UX30 | 80 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 100 ~ 130 | 0.05 ~ 0.2 | 0.03 ~ 0.08 |
| N | Aluminium alloys | DS1100 | 200 ~ 1000 | 0.05 ~ 0.25 | 0.05 ~ 0.15 | 200 ~ 1000 | 0.05 ~ 0.25 | 0.05 ~ 0.15 |
| | Copper alloys | TH10 | 200 ~ 400 | 0.05 ~ 0.25 | 0.05 ~ 0.15 | 200 ~ 400 | 0.05 ~ 0.25 | 0.05 ~ 0.15 |

## APPLICATION RANGE

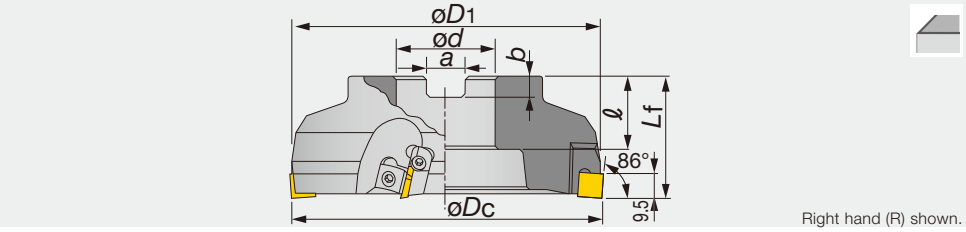



| Designation | Tool øDc (mm) | Max. depth of cut ap (mm) | Max. plunging depth A (mm) | Max. plunging width C (mm) | Max. ramping angle θ° | Min. machinable hole dia. øD1 (mm) | Max. machinable hole dia. øD2 (mm) | Max. cutting width in enlarging hole ae (mm) |
|---|---|---|---|---|---|---|---|---|
| ESD10020R... | 20 | 9 | 2.5 | 8 | 10 | 24 | 38 | 18 |
| ESD10025R... | 25 | 9 | 2.5 | 9 | 10 | 32 | 48 | 23 |
| ESD10032R... | 32 | 9 | 2.5 | 9 | 6.5 | 46 | 62 | 30 |
| ESD17040RS/L (A) | 40 | 15 | 4.5 | 15 | 10 | 50 | 77 | 38 |
| ESD17050RS/L (A) | 50 | 15 | 4.5 | 15 | 8 | 70 | 97 | 48 |
| ESD17063RS/L (A) | 63 | 15 | 4.5 | 15 | 5.5 | 96 | 123 | 61 |
| TSD10040R | 40 | 9 | 2.5 | 9 | 5 | 62 | 78 | 38 |
| TSD10050R | 50 | 9 | 2.5 | 9 | 4 | 82 | 98 | 48 |
| TSD17063R | 63 | 15 | 4.5 | 15 | 5.5 | 96 | 123 | 61 |
| TSD17080R | 80 | 15 | 4.5 | 15 | 4 | 130 | 157 | 78 |

## THE4000RIA

86° wedge type face mill for aluminum machining

A.R. = 13°, R.R. = +7° ~ +9°

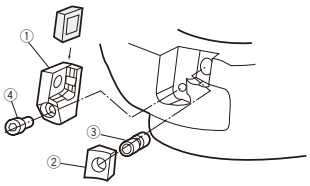



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| THE4003RIA | 6 | 80 | 4 | 80 | 50 | 25.4 | 26 | 9.5 | 6 | 1.5 | S/WE*N42... |
| THE4004RIA | 6 | 100 | 5 | 99 | 63 | 31.75 | 32 | 12.7 | 8 | 2.1 | S/WE*N42... |
| THE4005RIA | 6 | 125 | 6 | 124 | 63 | 38.1 | 38 | 15.9 | 10 | 3.2 | S/WE*N42... |

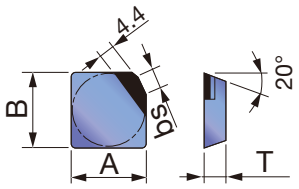
### SPARE PARTS

| Designation | ①Locator | ②Wedge | ③Right-left screw | ④Locator fixing screw | Wrench |
|---|---|---|---|---|---|
| THE4003RIA | LE413R | WP440R | FDS-8SS | CM4X0.7X14 | TP-4 |
| THE400*RIA | LE413R | WP440R | FDS-8S | CM4X0.7X14 | TP-4 |

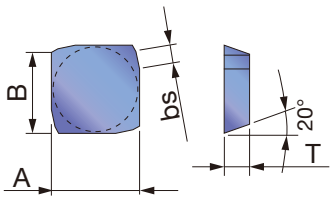


## INSERTS

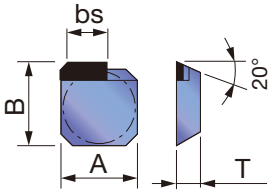
### SECN42ZFR-DIA




### SEEN/SECN 42Z




### WECN42ZFR-DIA




| | | Un-coated | PCD |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | ★ | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | Max. *ap* | TH10 | DX140 | A | B | T | bs |
|---|---|---|---|---|---|---|---|
| SECN42ZFR-DIA | 3.5 | | ● | 12.7 | 12.7 | 3.18 | 2.5 |
| SECN42ZFR | 6 | ● | | 12.7 | 12.7 | 3.18 | 2.5 |
| SEEN42ZFR | 6 | ● | | 12.7 | 12.7 | 3.18 | 2.5 |
| WECN42ZFR-DIA | 0.5 | | ● | 12.4 | 12.93 | 3.18 | 6 |

●: Line up

T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type.

## STANDARD CUTTING CONDITIONS

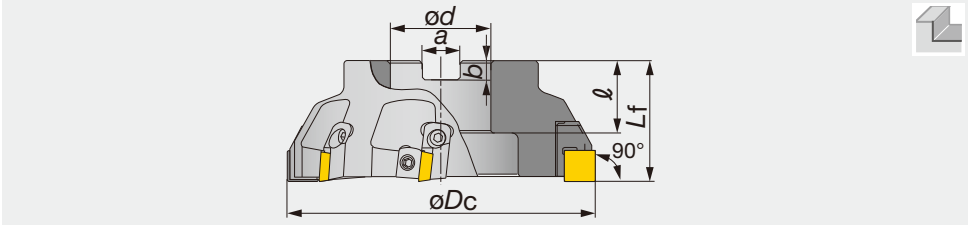
| ISO | Work materials | Grades | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| N | Aluminium alloys (Si < 13%) | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Aluminium alloys (Si ≥ 13%) | TH10 | 80 ~ 200 | 0.1 ~ 0.2 |
| | | DX140 | 200 ~ 400 | 0.1 ~ 0.2 |
| | Duralumin | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.05 ~ 0.2 |

Note : Use of water-soluble cutting fluid is recommended.
Maximum depth of cut for SECN42ZFR-DIA is 3.5 mm.

## TPP16

Square shoulder mills with wedge clamped SPMR16 inserts in large depth of cut.

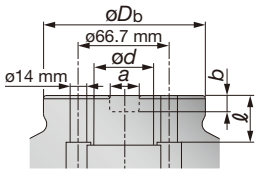
A.R.=+6°,R.R.=-8°



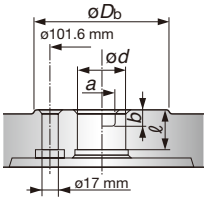

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TPP16080RI | 12 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | SPMR1605... |
| TPP16080RI-E | 12 | 80 | 4 | 50 | 27 | 26 | 12.4 | 7 | 1 | SPMR1605... |
| TPP16100RI | 12 | 100 | 5 | 63 | 31.75 | 32 | 12.7 | 8 | 1.8 | SPMR1605... |
| TPP16100RI-E | 12 | 100 | 5 | 63 | 32 | 32 | 14.4 | 8 | 1.8 | SPMR1605... |
| TPP16125RI | 12 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 10 | 2.8 | SPMR1605... |
| TPP16125RI-E | 12 | 125 | 6 | 63 | 40 | 32 | 16.4 | 9 | 2.8 | SPMR1605... |
| TPP16160RI | 12 | 160 | 8 | 63 | 50.8 | 38 | 19 | 11 | 4.6 | SPMR1605... |
| TPP16160RI-E | 12 | 160 | 8 | 63 | 40 | 29 | 16.4 | 9 | 4.6 | SPMR1605... |
| TPP16200RI | 12 | 200 | 10 | 63 | 47.625 | 38 | 25.4 | 14 | 6.9 | SPMR1605... |
| TPP16200RI-E | 12 | 200 | 10 | 63 | 60 | 38 | 25.7 | 14 | 6.9 | SPMR1605... |
| TPP16250RI | 12 | 250 | 12 | 63 | 47.625 | 38 | 25.4 | 14 | 13 | SPMR1605... |
| TPP16250RI-E | 12 | 250 | 12 | 63 | 60 | 38 | 25.7 | 14 | 13 | SPMR1605... |
| TPP16315RI | 12 | 315 | 14 | 63 | 47.625 | 38 | 25.4 | 14 | 22.2 | SPMR1605... |
| TPP16315RI-E | 12 | 315 | 14 | 63 | 60 | 38 | 25.7 | 14 | 22.2 | SPMR1605... |

## Arbor type

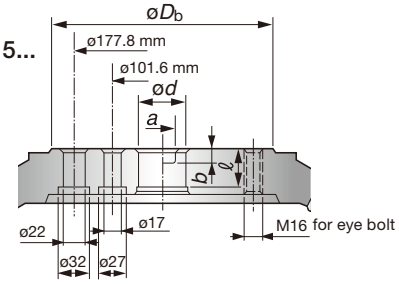
**TPP16160...**




**TPP16200/250...**

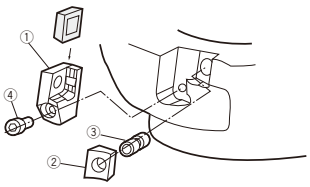



**TPP16315...**



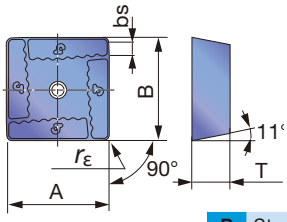

### SPARE PARTS

| Designation | ①Locator | ②Wedge | ③Right-left screw | ④Locator fixing screw | Wrench |
|---|---|---|---|---|---|
| TPP16080RI | LPP16R | WPP16R | FDS-8SS | CM5X0.8X12 | TP-4 |
| TPP16080RI-E | LPP16R | WPP16R | FDS-8SS | CM5X0.8X12 | TP-4 |
| TPP16100RI | LPP16R | WPP16R | FDS-8SS | CM5X0.8X12 | TP-4 |
| TPP16125RI | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16160RI-E | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16200RI | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16200RI-E | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16250RI | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16250RI-E | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16315RI | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |
| TPP16315RI-E | LPP16R | WPP16R | FDS-8S | CM5X0.8X12 | TP-4 |

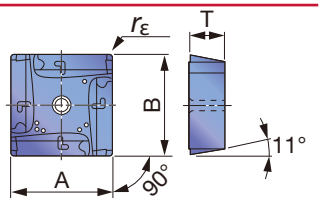


## INSERT

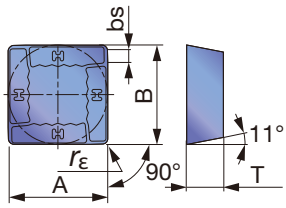
### SPMR16-MJ




### SPMR16-ML




### SPMR16-MH




| | | GH330 | T1115 | T3130 | UX30 |
|---|---|---|---|---|---|
| P | Steel | ★ | | ★ | ☆ |
| M | Stainless | | | | |
| K | Cast iron | | ★ | | |
| N | Non-ferrous | | | | |
| S | Superalloys | | | | |
| H | Hard materials | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | Un-coated | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | GH330 | T1115 | T3130 | UX30 | | | | |
| SPMR1605PPTR-MJ | 0.8 | 12 | ● | ● | ● | ● | 16 | 16 | 5.56 | 2 |
| SPMR1605PPPR-ML | 0.8 | 12 | ● | | | | 16 | 16 | 5.56 | - |
| SPMR1605PPTR-MH | 0.8 | 12 | ● | | ● | ● | 16 | 16 | 5.56 | 2 |

●: Line up

# STANDARD CUTTING CONDITIONS

## For MJ-chipbreaker inserts (General purpose)

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 100 ~ 230 | 0.1 ~ 0.25 | 130 ~ 250 | 0.1 ~ 0.3 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.25 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.28 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.28 |
| | Die steels < 30 HRC | GH330 | 100 ~ 150 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | GH330 | 150 ~ 200 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |

## For ML-chipbreaker inserts (Sharpness-priority)

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 130 ~ 230 | 0.05 ~ 0.17 | 150 ~ 250 | 0.05 ~ 0.2 |
| | | AH330 | 130 ~ 370 | 0.05 ~ 0.17 | 150 ~ 400 | 0.05 ~ 0.2 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 150 ~ 180 | 0.05 ~ 0.12 | 150 ~ 200 | 0.05 ~ 0.15 |
| M | Stainless steels < 250 HB | GH330 | 150 ~ 200 | 0.05 ~ 0.12 | 200 ~ 250 | 0.05 ~ 0.15 |

## For MH-chipbreaker inserts (Toughness-priority)

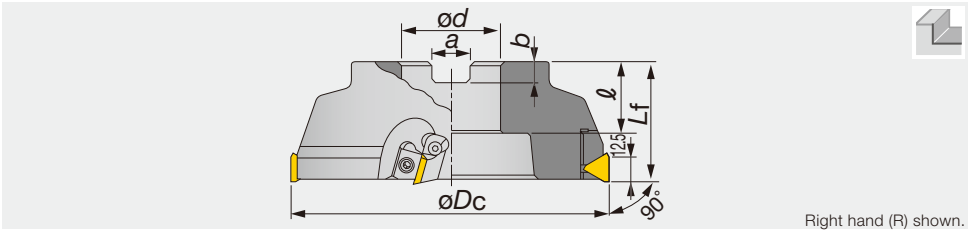
| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* > 1.5 mm) | | Finishing (Depth of cut: *ap* = 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | GH330 | 100 ~ 230 | 0.15 ~ 0.3 | 130 ~ 250 | 0.15 ~ 0.35 |
| | | T3130 | 130 ~ 300 | 0.15 ~ 0.33 | 180 ~ 300 | 0.15 ~ 0.38 |
| | | UX30 | 100 ~ 180 | 0.15 ~ 0.3 | 130 ~ 200 | 0.15 ~ 0.35 |
| | Carbon steels Alloy steels < 300 HB | GH330 | 100 ~ 180 | 0.15 ~ 0.24 | 130 ~ 200 | 0.15 ~ 0.35 |
| | | T3130 | 130 ~ 280 | 0.15 ~ 0.3 | 180 ~ 280 | 0.15 ~ 0.35 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.24 | 100 ~ 150 | 0.15 ~ 0.35 |
| | Die steels < 30 HRC | GH330 | 100 ~ 150 | 0.15 ~ 0.22 | 100 ~ 150 | 0.15 ~ 0.28 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.22 | 80 ~ 130 | 0.15 ~ 0.28 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.15 ~ 0.24 | 100 ~ 200 | 0.15 ~ 0.3 |
| | | UX30 | 80 ~ 130 | 0.15 ~ 0.24 | 80 ~ 130 | 0.15 ~ 0.3 |

Notes:
- As a rule, dry cutting (or air-blowing) is generally recommended.
- If a cutting fluid is used, the cutting speed should be set to the lower side of the values shown in the above table.
- When being used in square shoulder milling, climb milling is recommended.
- In square shoulder milling of stainless steel, when chips tend to be recut during cutting, change to up-milling mode.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TSE3000R

Square shoulder mills with wedge clamped high-posi triangle inserts

A.R.= +17°, R.R.= +5°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSE3050R | 8 | 50 | 3 | 40 | 22 | 20 | 10 | 6 | 0.3 | TE*N32/TEKR1603... |
| TSE3050R-E | 8 | 50 | 3 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | TE*N32/TEKR1603... |
| TSE3063R | 8 | 63 | 3 | 40 | 22 | 20 | 10 | 6 | 0.5 | TE*N32/TEKR1603... |
| TSE3063RE | 8 | 63 | 3 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | TE*N32/TEKR1603... |
| TSE3003RIA | 8 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | TE*N32/TEKR1603... |
| TSE3003RIAE | 8 | 80 | 4 | 50 | 27 | 26 | 12.4 | 7 | 1 | TE*N32/TEKR1603... |
| TSE3004RIA | 8 | 100 | 6 | 63 | 31.75 | 32 | 12.7 | 8 | 2 | TE*N32/TEKR1603... |
| TSE3004RIA-E | 8 | 100 | 6 | 63 | 32 | 32 | 14.4 | 8 | 2 | TE*N32/TEKR1603... |
| TSE3005RIA | 8 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 10 | 3.1 | TE*N32/TEKR1603... |
| TSE3006RIA | 8 | 160 | 8 | 63 | 50.8 | 38 | 19 | 11 | 5.2 | TE*N32/TEKR1603... |

Note: TSE3050R-E and TSE3063R-E are not irregular pitch spec.

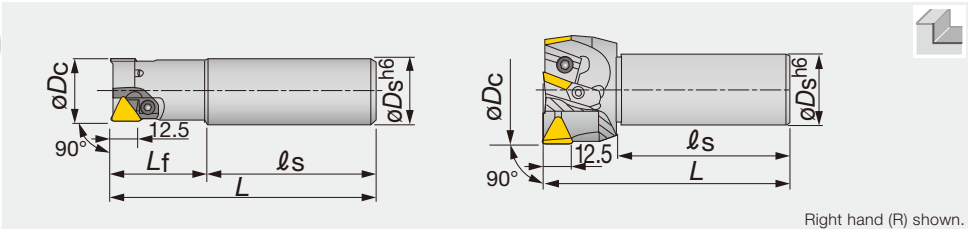
### SPARE PARTS

| Designation | ①Clamp set | ②Locator | ③Screw | ④Wedge | ⑤Right-left screw | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| TSE3050R..., 63R... | CSL-4 | - | - | - | - | - | P-3 |
| TSE300*RIA-E | - | LE303R | CM4X0.7X12 | WF330R | FDS-8S | TP-4 | - |

## ESE3000R

Square shoulder endmills with wedge clamped high-posi triangle inserts

A.R.= +17°, R.R.= +5°




Right hand (R) shown.

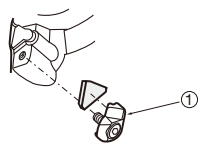
| Designation | Max.ap | øDc | z | øDs | ℓs | Lf | L | Insert |
|---|---|---|---|---|---|---|---|---|
| ESE3020R | 8 | 20 | 1 | 20 | 70 | 30 | 100 | TE*N32/TEKR1603... |
| ESE3025R | 8 | 25 | 1 | 25 | 80 | 35 | 115 | TE*N32/TEKR1603... |
| ESE3030R | 8 | 30 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3035R | 8 | 35 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3040R | 8 | 40 | 2 | 32 | 80 | 45 | 125 | TE*N32/TEKR1603... |
| ESE3050R | 8 | 50 | 3 | 32 | 80 | - | 115 | TE*N32/TEKR1603... |
| ESE3063R | 8 | 63 | 4 | 32 | 80 | - | 115 | TE*N32/TEKR1603... |

Note: The TAC Endmills shown above are not irregular pitch spec.

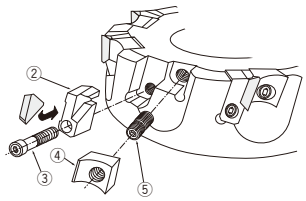
### SPARE PARTS

| Designation | Clamp set | Locator | Right-left screw | Shell locking bolt | Wedge | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| ESE3020 - 50R | CSL-4 | - | - | - | - | - | P-3 |
| ESE3063R | - | LE302R | DS-8S | SHCM4-10 | WP302R | TP-4 | - |

TSE3050R ~ 3063R-E
ESE3020R ~ 3040R

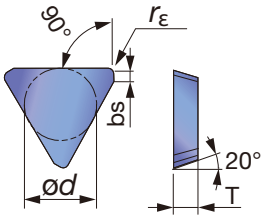



TSE3003RIA-E, 3004RIA-E
ESE3050R ~ 3063R

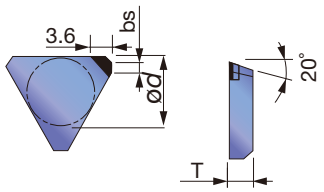


## INSERT

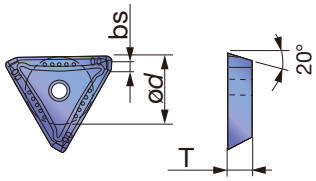
### TECN/TEEN 32Z




### TECN32ZFR-DIA




### TEKR16-MS




| | | Coated | | | | | | | | Cermet | | | Uncoated | | | PCD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ☆ | ☆ | | ★ | | ★ | ★ | | ☆ | | | | |
| M | Stainless | | ★ | ★ | | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | ★ | | ★ | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECN32ZFR | - | 8 | | | | | | | | | | | ● | | 9.525 | 3.18 | 1.37 |
| TECN32ZTR | 0.8 | 8 | | | | | | | | ● | ● | ● | | | 9.525 | 3.18 | 1 |
| TEEN32ZFR | - | 8 | | | | | | | | | | | ● | | 9.525 | 3.18 | 1.37 |
| TEEN32ZTR | 0.8 | 8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 9.525 | 3.18 | 1 |
| TECN32ZFR-DIA | - | 2.5 | | | | | | | | | | | | ● | 9.525 | 3.18 | 1.37 |
| TEKR1603PEPR-MS | - | 8 | | | ● | | | | | | | | | | 9.525 | 3.18 | 1.49 |

Note: T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type.

●: Line up
DX140 : Packing Quantity = 1 pc.

## STANDARD CUTTING CONDITIONS

### Applied to cutter dia. ≤ ø40 mm

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Mild steels<br>Unhardened steels<br>< 180 HB | T3130 | 60 ~ 180 | 0.05 ~ 0.2 |
| | | NS740 · N308 | 60 ~ 150 | 0.05 ~ 0.15 |
| | | AH130 · GH330 · UX30 | 60 ~ 130 | 0.05 ~ 0.2 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 60 ~ 150 | 0.05 ~ 0.18 |
| | | UX30 · AH120 | 60 ~ 130 | 0.05 ~ 0.18 |
| | | NS740 · N308 | 60 ~ 130 | 0.05 ~ 0.15 |
| | Die steels<br>< 30 HRC | T3130 · UX30 · AH120 | 80 ~ 130 | 0.05 ~ 0.2 |
| | | NS740 · N308 | 60 ~ 130 | 0.05 ~ 0.15 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 100 ~ 180 | 0.08 ~ 0.2 |
| | | AH120 · GH330 | 100 ~ 200 | 0.08 ~ 0.2 |
| | | TU40 | 80 ~ 130 | 0.08 ~ 0.2 |
| K | Cast irons | T1115 | 100 ~ 150 | 0.05 ~ 0.2 |
| N | Aluminium alloys | TH10 | 200 ~ 400 | 0.05 ~ 0.2 |

### Applied to cutter dia. ≥ ø50 mm

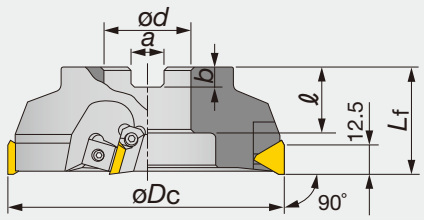
| ISO | Workpiece material | Grade | Roughing (Depth of cut: > 1.5 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | AH120 · GH330 | 130 ~ 230 | 0.1 ~ 0.2 | 130 ~ 250 | 0.1 ~ 0.23 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.23 | 150 ~ 300 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 130 ~ 200 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.2 |
| | | UX30 · AH130 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.23 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | AH120 · GH330 | 100 ~ 200 | 0.1 ~ 0.18 | 130 ~ 230 | 0.1 ~ 0.2 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.2 | 180 ~ 280 | 0.1 ~ 0.23 |
| | | NS740 · N308 | 100 ~ 150 | 0.1 ~ 0.15 | 150 ~ 200 | 0.1 ~ 0.18 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Die steels<br>< 30 HRC | T3130 · AH120 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 · GH330 | 150 ~ 200 | 0.1 ~ 0.18 | 200 ~ 250 | 0.1 ~ 0.25 |
| K | Cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.2 |
| | | TH10 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.25 | 350 ~ 1000 | 0.1 ~ 0.25 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.15 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.15 | 200 ~ 500 | 0.1 ~ 0.2 |

Note:
- Dry cutting is recommended except for aluminium alloys
- Maximum depth of cut for TECN32ZFR-DIA is 2.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TSE4000RIA

Square shoulder mills with wedge clamped high-posi triangle inserts

A.R. = +17°, R.R. = +5°

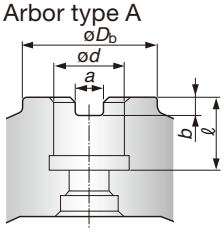



Right hand (R) shown.

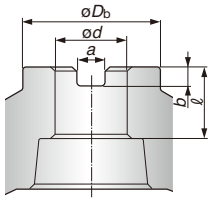
| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|
| TSE4003RIA | 10 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 60 | 1 | A |
| TSE4004RIA | 10 | 100 | 6 | 63 | 31.75 | 32 | 12.7 | 80 | 1.9 | A |
| TSE4005RIA | 10 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 100 | 2.9 | B |
| TSE4006RIA | 10 | 160 | 8 | 63 | 50.8 | 38 | 19 | 110 | 4.9 | B |
| TSE4008RIA | 10 | 200 | 10 | 63 | 47.625 | 38 | 25.4 | 140 | 7.4 | C |
| TSE4010RIA | 10 | 250 | 12 | 63 | 47.625 | 38 | 25.4 | 140 | 13.8 | C |
| TSE4012RIA | 10 | 315 | 14 | 63 | 47.625 | 38 | 25.4 | 140 | 22.1 | D |
| TSE4003RIAE | 10 | 80 | 4 | 50 | 27 | 26 | 12.4 | 70 | 1 | A |
| TSE4004RIAE | 10 | 100 | 6 | 63 | 32 | 32 | 14.4 | 80 | 1.9 | A |
| TSE4005RIAE | 10 | 125 | 6 | 63 | 40 | 32 | 16.4 | 90 | 2.9 | B |
| TSE4006RIAE | 10 | 160 | 8 | 63 | 40 | 29 | 16.4 | 90 | 4.9 | B |

## Arbor type

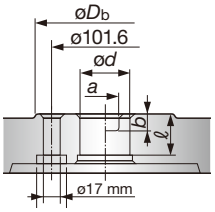
Arbor type A



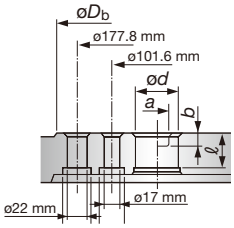

Arbor type B




Arbor type C

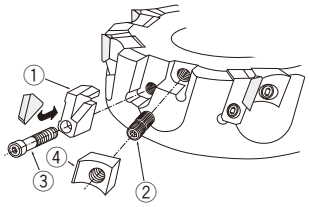



Arbor type D




### SPARE PARTS

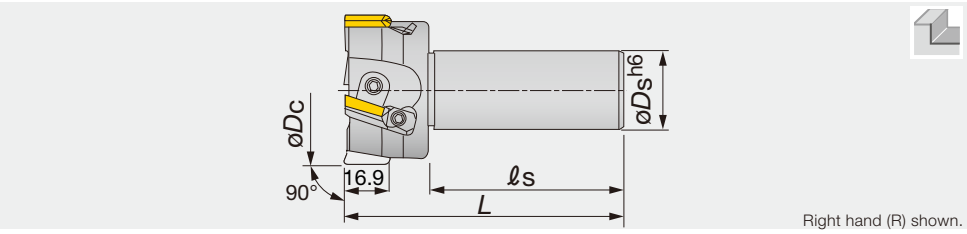
| Designation | ①Locator | ②Right-left screw | ③Locator fixing screw | Shell locking bolt | ④Wedge | Wrench |
|---|---|---|---|---|---|---|
| TSE4003RIA | LE403R | FDS-8SS | CM4X0.7X14 | CAP-CM12X1.75X30 | WF330N | TP-4 |
| TSE4004RIA | LE403R | FDS-8S | CM4X0.7X14 | CAP-CM16X2.0X40 | WF330N | TP-4 |
| TSE4005 - 12... | LE405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |
| TSE4003RIAE | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |
| TSE4004RIAE | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |
| TSE4005RIAE | LE405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |
| TSE4006RIAE | LE405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |



## ESE4000R

Square shoulder endmills with wedge clamped high-posi triangle inserts

A.R. = +17°, R.R. = +1° ~ +4°




| Designation | Max. ap | øDc | z | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|
| ESE4050RA | 10 | 50 | 3 | 32 | 80 | 115 | TE*N43/TEKR2204... |
| ESE4063RA | 10 | 63 | 4 | 32 | 80 | 115 | TE*N43/TEKR2204... |
| ESE4003RIA-S32 | 10 | 80 | 4 | 32 | 80 | 120 | TE*N43/TEKR2204... |

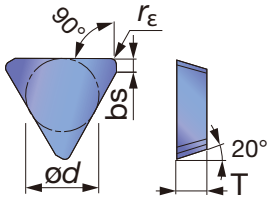
Note: TSE4050RA and TSE4063RA are not irregular pitch spec.

### SPARE PARTS

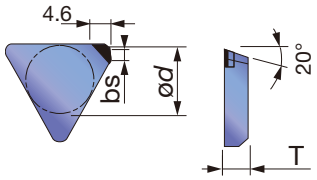
| Designation | Locator | Right-left screw | Locator fixing screw | Shell locking bolt | Wedge | Wrench |
|---|---|---|---|---|---|---|
| ESE4050RA | LE402AR | DS-8S | - | SHCM4-10 | WT402R | TP-4 |
| ESE4063RA | LE402AR | DS-8 | - | SHCM4-10 | WT402R | TP-4 |
| ESE4003RIA-S32 | LE403R | FDS-8S | CM4X0.7X14 | - | WF330N | TP-4 |

## INSERT

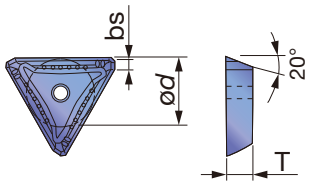
### TECN/TEEN 43Z




### TECN43ZFR-DIA




### TEKR22-MS




| | | Coated | | | | | | | Cermet | | Uncoated | | PCD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 |
| P | Steel | ★ | | | ☆ | ☆ | | ★ | ★ | ★ | ☆ | | |
| M | Stainless | | ★ | ★ | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECN43ZFR | 1 | 10 | | | | | | | | | | | ● | | 12.7 | 4.76 | 2 |
| TECN43ZTR | 1 | 10 | | | | | | | | ● | ● | ● | | | 12.7 | 4.76 | 1.31 |
| TEEN43ZFR | 1 | 10 | | | | | | | | | | | ● | | 12.7 | 4.76 | 2 |
| TEEN43ZTR | 1 | 10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | 12.7 | 4.76 | 1.31 |
| TECN43ZFR-DIA | - | 3.5 | | | | | | | | | | | | ● | 12.7 | 4.76 | 2 |
| TEKR2204PEPR-MS | - | 10 | | | ● | | | | | | | | | | 12.7 | 4.76 | 1.8 |

Note: T-DIA is trade name for Tungaloy's PCD grade. Available in one-corner type

●: Line up
DX140 : Packing Quantity = 1 pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut *ap*: > 1.5 mm) | | Finishing (Depth of cut *ap*: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | AH330 | 130 ~ 370 | 0.1 ~ 0.2 | 150 ~ 400 | 0.1 ~ 0.23 |
| | | AH120 · GH330 | 130 ~ 230 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.23 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.23 | 180 ~ 300 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 130 ~ 200 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.2 |
| | | UX30 · AH140 | 100 ~ 180 | 0.1 ~ 0.2 | 130 ~ 200 | 0.1 ~ 0.23 |
| | Carbon steels Alloy steels < 300 HB | AH330 | 100 ~ 300 | 0.1 ~ 0.18 | 150 ~ 320 | 0.1 ~ 0.2 |
| | | AH120 · GH330 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.2 |
| | | T3130 | 130 ~ 280 | 0.1 ~ 0.2 | 180 ~ 280 | 0.1 ~ 0.23 |
| | | AH140 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 200 | 0.1 ~ 0.18 |
| | | NS740 · N308 | 100 ~ 150 | 0.1 ~ 0.15 | 150 ~ 200 | 0.1 ~ 0.18 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | Die steels < 30 HRC | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| | | T3130 · AH120 · GH330 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | AH130 · AH140 | 80 ~ 180 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 150 ~ 200 | 0.1 ~ 0.18 | 200 ~ 250 | 0.1 ~ 0.25 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | TH10 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.25 | 350 ~ 1000 | 0.1 ~ 0.25 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.15 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.15 | 200 ~ 500 | 0.1 ~ 0.2 |

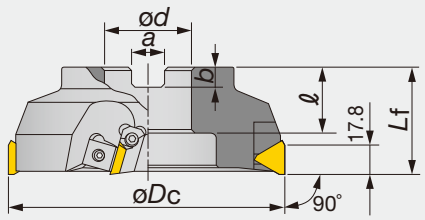
Note:
- Dry cutting is recommended for all materials except for aluminium alloys.
- Maximum depth of cut for TECN43ZFR-DIA is 3.5 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## TSP4000IA

Square shoulder mills with wedge clamped 11° relief triangle inserts

A.R. = +5°, R.R. = 0°

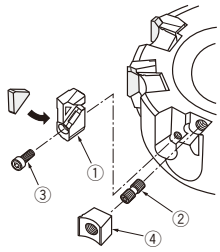



Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSP4003RIA | 10 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | TP*N43 / TP*R... |
| TSP4004RIA | 10 | 100 | 6 | 63 | 31.75 | 32 | 12.7 | 8 | 2 | TP*N43 / TP*R... |
| TSP4005RIA | 10 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 10 | 3.1 | TP*N43 / TP*R... |
| TSP4006RIA | 10 | 160 | 8 | 63 | 50.8 | 38 | 19 | 11 | 5.1 | TP*N43 / TP*R... |
| TSP4008RIA | 10 | 200 | 10 | 63 | 47.625 | 38 | 25.4 | 14 | 7.7 | TP*N43 / TP*R... |
| TSP4010RIA | 10 | 250 | 12 | 63 | 47.625 | 38 | 25.4 | 14 | 14.1 | TP*N43 / TP*R... |
| TSP4012RIA | 10 | 315 | 14 | 63 | 47.625 | 38 | 25.4 | 14 | 22.60 | TP*N43 / TP*R... |

### SPARE PARTS

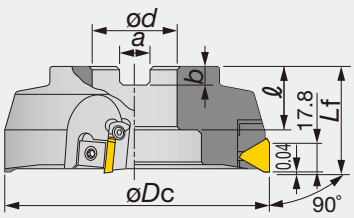
| Designation | ①Locator | ②Right-left screw | ③Locator fixing screw | Shell locking bolt | ④Wedge | Wrench |
|---|---|---|---|---|---|---|
| TSP4003RIA | LP403R | FDS-8S | CM4X0.7X14 | CAP-CM12X1.75X30 | WF330N | TP-4 |
| TSP4004RIA | LP403R | FDS-8S | CM4X0.7X14 | CAP-CM16X2.0X40 | WF330N | TP-4 |
| TSP40**RIA | LP405R | FDS-8S | CM4X0.7X14 | - | WF500R | TP-4 |



## TFP4000IA

Square shoulder mills combined with finisher

A.R. = +5°, R.R. = 0°



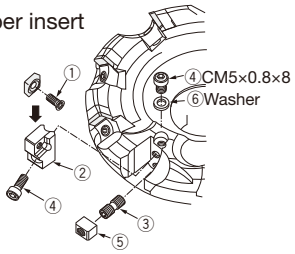

Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TFP4004RIA | 10 | 100 | 5 | 63 | 31.75 | 32 | 12.7 | 8 | 2 | TP*N43 / TP*R... |
| TFP4005RIA | 10 | 125 | 6 | 63 | 38.1 | 38 | 15.9 | 10 | 3.1 | TP*N43 / TP*R... |
| TFP4006RIA | 10 | 160 | 8 | 63 | 50.8 | 38 | 19 | 11 | 5.2 | TP*N43 / TP*R... |
| TFP4008RIA | 10 | 200 | 10 | 63 | 47.625 | 38 | 25.4 | 14 | 7.9 | TP*N43 / TP*R... |

### A. SPARE PARTS FOR WIPER INSERT

| Designation | ①Clamping screw | ②Locator | ③Right-Left screw | ④Locator fixing screw | ④Locator fixing screw | ⑤Wedge | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| TFP40... | CSTA-5S | LW400R | FDS-8S | CM4X0.7X14 | CM5X0.8X16 | FW-305 | T-15D | TP-4 |

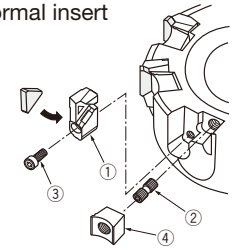
**A** Wiper insert




### B. SPARE PARTS FOR NORMAL INSERT

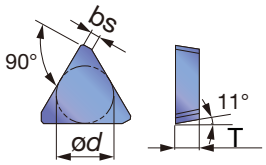
| Designation | ①Locator | ②Right-Left screw | ③Locator fixing screw | ④Wedge 1 | Wrench |
|---|---|---|---|---|---|
| TFP4004RIA | LP403R | FDS-8S | CM4X0.7X14 | WF330N | TP-4 |
| TFP4005 - 08... | LP405R | FDS-8S | CM4X0.7X14 | WF500R | TP-4 |

**B** Normal insert

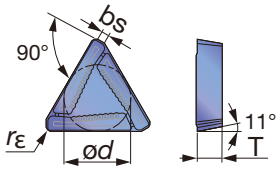


## INSERTS

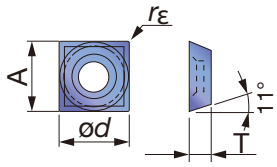
### TPCN/TPEN/TPKN 43Z




### TPKR/TPMR-MJ




### SPHA-FNW




| | | Coated | | | | | | | Cermet | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | GH330 | T1115 | T3130 | | NS740 | N308 | | UX30 | TH10 | | |
| P | Steel | ★ | | | ☆ | | ★ | | ★ | ☆ | | ☆ | | | |
| M | Stainless | | ★ | ★ | | | | | | | | | | | |
| K | Cast iron | ★ | | | | ★ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ★ | | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH120 | AH130 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | ød | A | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPCN43ZFR | - | 10 | | | | | | | | | | ● | 12.7 | - | 4.76 | 2 |
| TPCN43ZTR | - | 10 | | | | | | | ● | ● | ● | | 12.7 | - | 4.76 | 2 |
| TPEN43ZTR | - | 10 | | | | | | | ● | | | | 12.7 | - | 4.76 | 2 |
| TPEN43ZTRCR | - | 10 | | | | | | ● | | | | | 12.7 | - | 4.76 | 2 |
| TPKN43ZFR | - | 10 | | | | | | | | | | ● | 12.7 | - | 4.76 | 2 |
| TPKN43ZTR | - | 10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | 12.7 | - | 4.76 | 2 |
| TPKR43ZSR-MJ | - | 10 | | | | ● | | ● | | | | | 12.7 | - | 4.76 | 1.5 |
| TPMR2204PDSR-MJ | 0.8 | 10 | | | | ● | | ● | | | | | 12.7 | - | 4.76 | 1.2 |
| TPKN43ZFL | - | 10 | | | | | | | | | | ● | 12.7 | - | 4.76 | 2 |
| SPHA431FNW | 0.4 | - | | | | | | | | ● | | ● | 12.7 | 12.7 | 4.76 | - |

●: Line up

## STANDARD CUTTING CONDITIONS

### TSP4000IA · TFP4000IA (When finishing insert is not in use)

| ISO | Work materials | Grades | Roughing (Depth of cut: ap > 1.5 mm) Cutting speed Vc (m/min) | Roughing Feed per tooth fz (mm/t) | Finishing (Depth of cut: ap = 0.3 ~ 0.7 mm) Cutting speed Vc (m/min) | Finishing Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| P | Mild steels Unhardened steels (< 180 HB) | AH120 · GH330 | 100 ~ 230 | 0.1 ~ 0.25 | 130 ~ 250 | 0.1 ~ 0.3 |
| | | T3130 | 130 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.25 | 130 ~ 200 | 0.1 ~ 0.3 |
| | | NS740 · N308 | 130 ~ 200 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Carbon steels Alloy steels (< 300 HB) | AH120 · GH330 | 100 ~ 180 | 0.1 ~ 0.2 | 150 ~ 200 | 0.1 ~ 0.28 |
| | | T3130 | 130 ~ 180 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.28 |
| | | NS740 · N308 | 100 ~ 150 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | Die steels (< 30 HRC) | T3130 · AH120 · GH330 | 100 ~ 150 | 0.1 ~ 0.18 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.18 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels (< 250 HB) | AH130 · AH140 | 150 ~ 200 | 0.15 ~ 0.23 | 200 ~ 230 | 0.15 ~ 0.25 |
| | | AH120 | 150 ~ 230 | 0.15 ~ 0.2 | 200 ~ 250 | 0.15 ~ 0.23 |
| K | Cast irons Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | TH10 · UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.25 |

Notes:
•Dry cutting is recommended for above materials.
•When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## Standard cutting conditions for Metal-Jack inserts TPM/KR

### TSP4000IA · TFP4000IA (When finishing insert is not in use)

| ISO | Work materials | Feed per tooth *fz* (mm/t) (Roughing [Depth of cut: > 1.5 mm]) | |
|---|---|---|---|
| | | K: TPKR43ZSR-MJ | M: TPMR2204PDSR-MJ |
| P | Mild steels·Unhardened steels (< 180 HB) | 0.1 ~ 0.23 | 0.1 ~ 0.4 |
| | Carbon steels · Alloy steels (< 300 HB) | 0.1 ~ 0.2 | 0.1 ~ 0.35 |
| | Die steels (< 30 HRC) | 0.1 ~ 0.18 | 0.1 ~ 0.25 |

Note : For cutting speeds and finishing conditions, see upper table.

## Standard cutting conditions (When finishing insert is in use)

### TFP4000IA (For finishing)

| ISO | Work materials | Grades | | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|
| | | General insert | Finishing insert | |
| P | Mild steels·Unhardened steels (< 180 HB) | NS740 | N308 | 180 ~ 300 |
| | | N308 | N308 | 180 ~ 250 |
| | Carbon steels · Alloy steels (< 300 HB) | NS740 | N308 | 150 ~ 250 |
| | | N308 | N308 | 150 ~ 230 |
| K | Cast irons. Ductile cast irons | T1115 | TH10 | 100 ~ 150 |

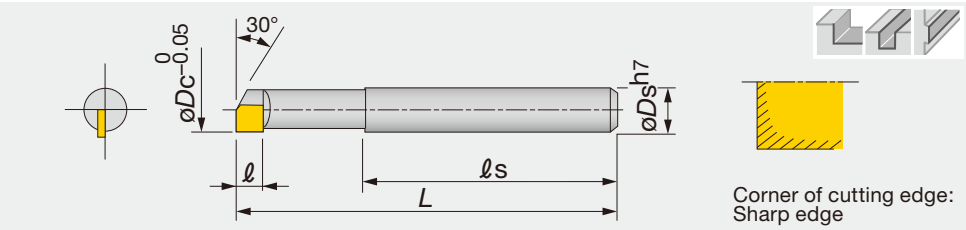
Notes:
- Above conditions are applied when the finishing insert is used.
- Generally, high-speed, high-feed and small depth of cut are recommended for TFP4000IA type cutters.
- When cutting width is larger than 60 mm, the maximum depth of cut should be around 1 mm.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

| Starting guideline | | |
|---|---|---|
| Depth of cut $a_p$ (mm) | Feed per rev. *f* (mm/rev) | Feed per tooth $f_z$ (mm/t) |
| > 1.0 | 1 ~ 1.6 | 0.15 ~ 0.2 |
| 0.2 ~ 0.7 | 1.6 ~ 2.5 | 0.18 ~ 0.3 |
| < 0.1 | 2 ~ 3.5 | 0.2 ~ 0.4 |

Notes: When cutting width is larger than 60 mm, the maximum depth of cut should be around 1 mm.

## DEB1000

T-DIA Endmill




| Designation | DX140 | Z | øDc | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|---|
| DEB1040 | ● | 1 | 4 | 6 | 3.5 | 32 | 45 |
| DEB1050 | ● | 1 | 5 | 6 | 3.5 | 35 | 50 |
| DEB1060 | ● | 1 | 6 | 6 | 3.5 | 35 | 50 |
| DEB1080 | ● | 1 | 8 | 8 | 5 | 37 | 55 |
| DEB1100 | ● | 1 | 10 | 10 | 5 | 40 | 60 |
| DEB1120 | ● | 1 | 12 | 12 | 5 | 45 | 65 |

●: Line up

Notes:
- As cutting edge is very sharp, please handle carefully.
- Please keep the overhang length from milling chuck of tool as short as possible.

Shoulder Milling

## STANDARD CUTTING CONDITIONS

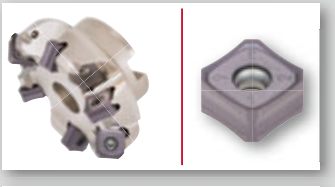
### DEB1000

For side milling $a_p \leq 3D$, $a_e = 0.1$ mm

| ISO | Workpiece material | Mill dia. (mm) | Cutting Speed Vc (m/min) | No. of revolutions n (min$^{-1}$) | Table feed Vf (mm/min) |
|---|---|---|---|---|---|
| N | Aluminium alloys, Copper alloys | ø4 | 120 - 180 | 12,000 | 120 |
| | | ø5 | 120 - 180 | 9,600 | 120 |
| | | ø6 | 120 - 180 | 8,000 | 120 |
| | | ø8 | 120 - 180 | 6,000 | 120 |
| | | ø10 | 120 - 180 | 4,800 | 120 |
| | | ø12 | 120 - 180 | 4,000 | 100 |

- Set the protrusion length as short as possible. Reduce number of revolutions and table feed in order to prevent chattering when the protrusion length is long.
- Use the machine with high rigidity.
- Adjust the number of revolutions and the table feed according to the situation of use. (depth of cut or machine rigidity etc.)

# MillLine - Face Milling



## DOTRIPLEMILL — D132

Face milling cutters with double-sided square, octagonal, and round inserts

45° ø50 - ø160 mm
max. ap 6 mm

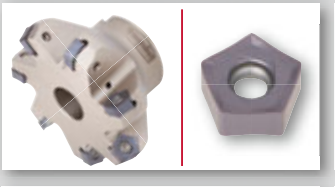
P M K S H

## DOOCTO / DOQUAD — D135

Face milling cutters with screw-on and wedge clamping systems featuring 4 types of inserts for a broader application range

45° ø63 - ø315 mm
max. ap 7.5 mm

P M K S H

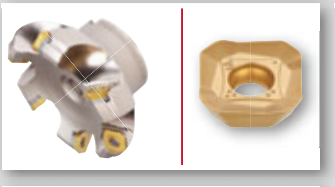


## DOPENT — D141

Economical, double-sided inserts with 10 cutting edges for general-purpose milling

70° ø32 - ø160 mm
max. ap 6.4 mm

P M K N S

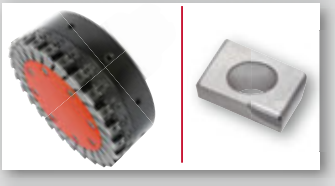


## TUNGMILL — D145

Single-sided inserts with low cutting force for face milling

45° ø25 - ø160 mm
max. ap 5 mm

P M K N

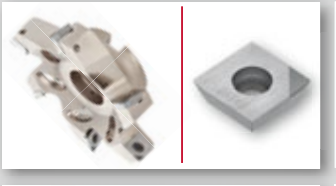


## TUNGSPEEDMILL — D150

Incredibly productive high-speed machining with PCD inserts

90° ø25 - ø125 mm
max. ap 11 mm

N



## TFE — D152

Lightweight cutters with screw clamping system suitable for low-rigid machines

85° ø63 - ø125 mm
max. ap 8 mm

P M K N

## DPD — D155

Lightweight cutters in wedge clamping design with PCD inserts

90° ø80 - ø160 mm
max. ap 8 mm

N

## ISO Milling — D160

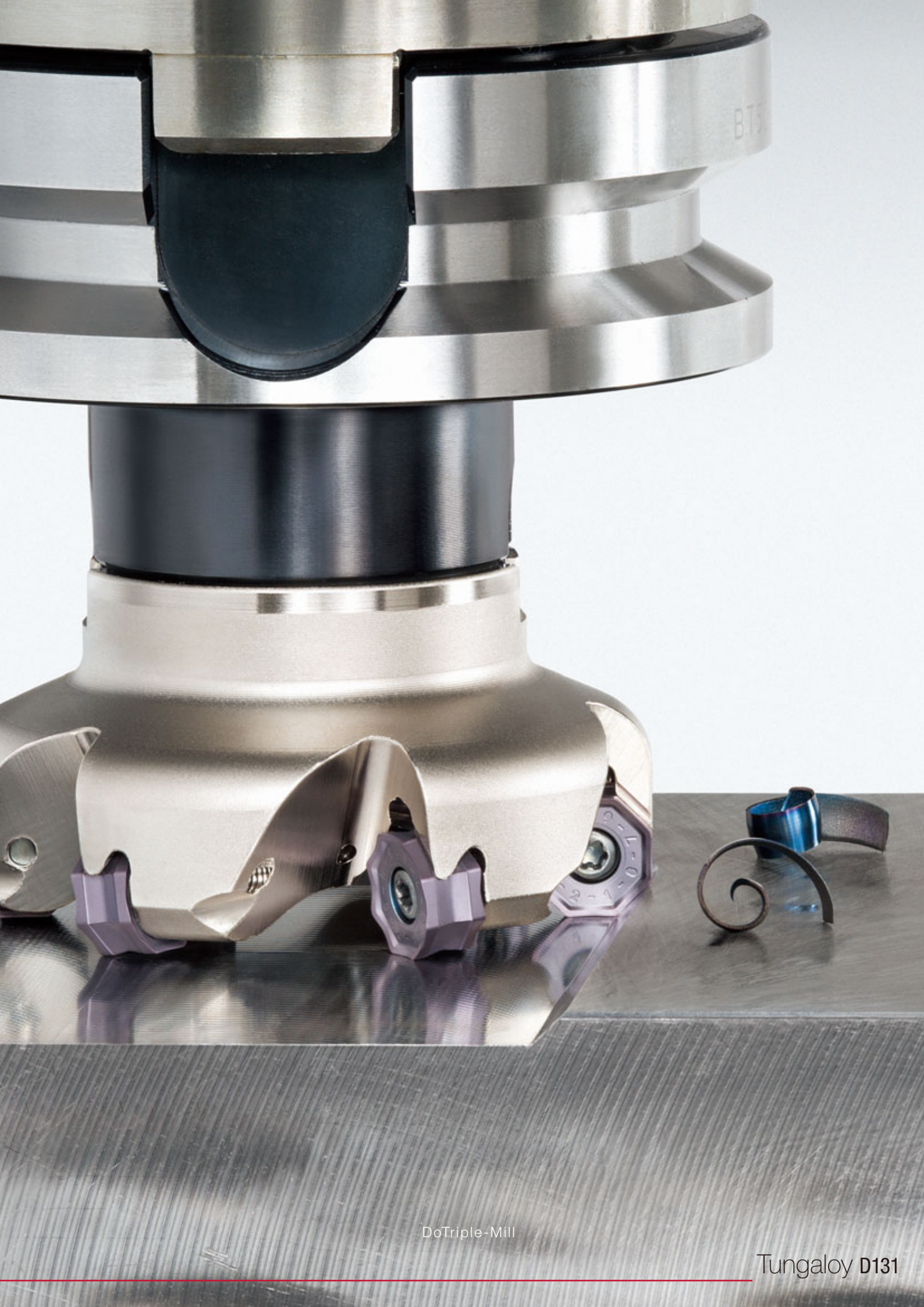
45° - TME4400/5400, TMD4400/5400, TGD, TFD, THF4400/5400
75° - TGP4100/4200/5100
Clamping systems - S-TAQ, QC System

## Milling Tools with Round Inserts — D196

TRD6000, TRF6000

## Milling Tools for Finishing — D200

NMS, MS, MSR, SFP4000

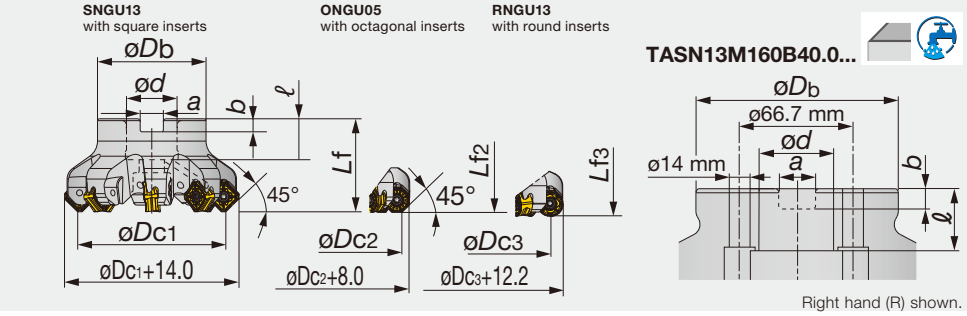


DoTriple-Mill

# TASN13

45° face milling cutter to seat double sided square, octagonal, round insert

A.R.=+6.0°,R.R.=-6.8°~-6.3°




Right hand (R) shown.

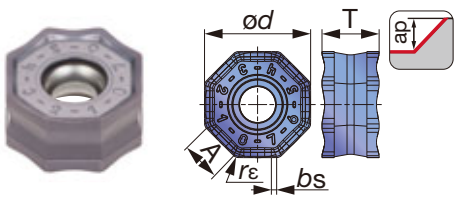
| Designation | øDc1 | øDc2 | øDc3 | z | øDb | Lf1 | Lf2 | Lf3 | ød | ℓ | a | b | Kg | Air hole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TASN13M050B22.0R04 | 50 | 53 | 48.7 | 4 | 41 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.4 | with |
| TASN13M050B22.0R05 | 50 | 53 | 48.7 | 5 | 41 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.4 | with |
| TASN13M063B22.0R05 | 63 | 66 | 61.7 | 5 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.7 | with |
| TASN13M063B22.0R06 | 63 | 66 | 61.7 | 6 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.6 | with |
| TASN13M063B22.0R08 | 63 | 66 | 61.7 | 8 | 47 | 40 | 38.5 | 38.5 | 22 | 20 | 10.4 | 6.3 | 0.6 | with |
| TASN13M080B27.0R05 | 80 | 83 | 78.7 | 5 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.1 | with |
| TASN13M080B27.0R08 | 80 | 83 | 78.7 | 8 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.1 | with |
| TASN13M080B27.0R10 | 80 | 83 | 78.7 | 10 | 58 | 50 | 48.5 | 48.5 | 27 | 22 | 12.4 | 7 | 1.2 | with |
| TASN13J080B25.4R05 | 80 | 83 | 78.7 | 5 | 58 | 50 | 48.5 | 48.5 | 25.4 | 26 | 9.5 | 6 | 1.2 | with |
| TASN13J080B25.4R08 | 80 | 83 | 78.7 | 8 | 58 | 50 | 48.5 | 48.5 | 25.4 | 26 | 9.5 | 6 | 1.1 | with |
| TASN13J080B25.4R10 | 80 | 83 | 78.7 | 10 | 58 | 50 | 48.5 | 48.5 | 25.4 | 26 | 9.5 | 6 | 1.2 | with |
| TASN13M100B32.0R06 | 100 | 103 | 98.7 | 6 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13M100B32.0R08 | 100 | 103 | 98.7 | 8 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13M100B32.0R12 | 100 | 103 | 98.7 | 12 | 60 | 50 | 48.5 | 48.5 | 32 | 28.5 | 14.4 | 8 | 1.4 | with |
| TASN13J100B31.7R06 | 100 | 103 | 98.7 | 6 | 60 | 50 | 48.5 | 48.5 | 31.75 | 32 | 12.7 | 8 | 1.4 | with |
| TASN13J100B31.7R08 | 100 | 103 | 98.7 | 8 | 60 | 50 | 48.5 | 48.5 | 31.75 | 32 | 12.7 | 8 | 1.4 | with |
| TASN13J100B31.7R12 | 100 | 103 | 98.7 | 12 | 60 | 50 | 48.5 | 48.5 | 31.75 | 32 | 12.7 | 8 | 1.4 | with |
| TASN13M125B40.0R07 | 125 | 128 | 123.7 | 7 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.2 | with |
| TASN13M125B40.0R10 | 125 | 128 | 123.7 | 10 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.3 | with |
| TASN13M125B40.0R14 | 125 | 128 | 123.7 | 14 | 71 | 63 | 61.5 | 61.5 | 40 | 32 | 16.4 | 9 | 2.5 | with |
| TASN13J125B38.1R07 | 125 | 128 | 123.7 | 7 | 80 | 63 | 61.5 | 61.5 | 38.1 | 38 | 15.9 | 10 | 2.6 | with |
| TASN13J125B38.1R10 | 125 | 128 | 123.7 | 10 | 80 | 63 | 61.5 | 61.5 | 38.1 | 38 | 15.9 | 10 | 2.7 | with |
| TASN13J125B38.1R14 | 125 | 128 | 123.7 | 14 | 80 | 63 | 61.5 | 61.5 | 38.1 | 38 | 15.9 | 10 | 2.9 | with |
| TASN13M160B40.0R08 | 160 | 163 | 158.7 | 8 | 100 | 63 | 61.5 | 61.5 | 40 | 29 | 16.4 | 9 | 4.1 | without |
| TASN13M160B40.0R12 | 160 | 163 | 158.7 | 12 | 100 | 63 | 61.5 | 61.5 | 40 | 29 | 16.4 | 9 | 4.2 | without |
| TASN13J160B50.8R08 | 160 | 163 | 158.7 | 8 | 100 | 63 | 61.5 | 61.5 | 50.8 | 38 | 19 | 11 | 4.1 | without |
| TASN13J160B50.8R12 | 160 | 163 | 158.7 | 12 | 100 | 63 | 61.5 | 61.5 | 50.8 | 38 | 19 | 11 | 4.2 | without |

## SPARE PARTS

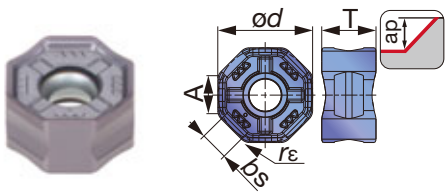
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TASN13M0**B22.0R0* | CSPB-4 | H-TB2W | M-1000 | - | CM10X30H | BLDIP15/S7 |
| TASN13*080B2*.*R0* | CSPB-4 | H-TB2W | M-1000 | - | CM12X30H | BLDIP15/S7 |
| TASN13*100B3*.*R0* | CSPB-4 | H-TB2W | M-1000 | TMBA-M16H | - | BLDIP15/S7 |
| TASN13*125B**.*R** | CSPB-4 | H-TB2W | M-1000 | TMBA-M20H | - | BLDIP15/S7 |
| TASN13*160B*0.*R** | CSPB-4 | H-TB2W | M-1000 | - | - | BLDIP15/M7 |

## INSERT

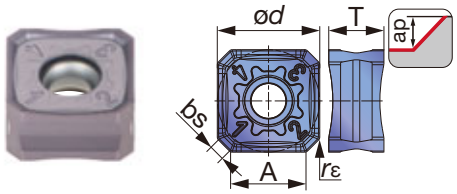
### ONGU-MJ



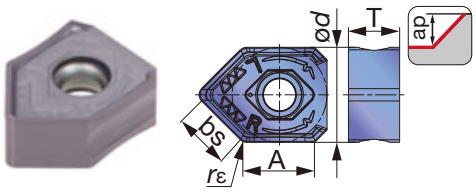

### ONGU-W



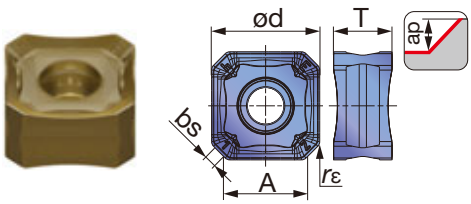

### SNGU-MJ



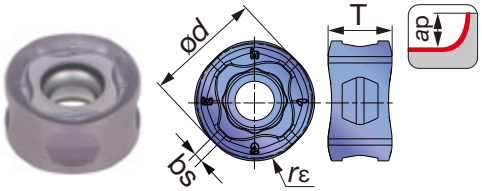

### SNGU-W




### SNGU-MH




### RNGU-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | ★ |
| M | Stainless | | ★ | ★ |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | Coated AH3135 | Coated T3225 | A | ød | T | bs |
|---|---|---|---|---|---|---|---|---|---|
| ONGU0507ANEN-MJ | 0.8 | 3.4 | ● | ● | ● | 4.9 | 13 | 7 | 0.7 |
| ONGU0507ANEN-W | 1.6 | 3.4 | ● | ● | | 5 | 13 | 7.44 | 3.9 |
| SNGU1307ANEN-MJ | 0.5 | 6 | ● | ● | ● | 9.4 | 13 | 7 | 2 |
| SNGU1307ANEN-W | 1.2 | 6 | ● | ● | | 9.6 | 13 | 7 | 7.5 |
| SNGU1307ANEN-MH | 0.8 | 6 | | | ● | 9 | 13 | 7 | 2 |
| RNGU1307ZNER-MJ | 6 | 6 | ● | ● | | - | 13 | 7.1 | 1 |

●: Line up

# STANDARD CUTTING CONDITIONS

## SNGU13/ONGU05

| ISO | Workpiece material | | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, etc.<br>C15, etc. | | 200 - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.1 - 0.5 |
| | | | 200 - 300 HB | For wear resistance | T3225 | MJ | 200 - 350 | 0.1 - 0.4 |
| | High carbon and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | | 150 - 300 HB | First choice | AH3135 | MJ | 100 - 250 | 0.1 - 0.4 |
| | | | 150 - 300 HB | For wear resistance | T3225 | MJ | 180 - 300 | 0.1 - 0.4 |
| | Prehardened steel<br>NAK80, PX5, etc. | | 30 - 40 HRC | First choice | AH3135 | MJ | 100 - 200 | 0.1 - 0.4 |
| | | | 30 - 40 HRC | For wear resistance | T3225 | MJ | 150 - 250 | 0.1 - 0.4 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | | ~ 200 HB | First choice | AH3135 | MJ | 100 - 200 | 0.1 - 0.35 |
| | | | ~ 200 HB | For wear resistance | T3225 | MJ | 100 - 250 | 0.1 - 0.3 |
| | Stainless cast steel<br>SCH20XNb, etc.<br>GX40NiCrSiNb38-19, etc. | | - | First choice | T3225 | MH | 60 - 120 | 0.1 - 0.3 |
| | | | - | Second choice | AH3135 | MJ | 60 - 120 | 0.1 - 0.3 |
| K | Gray cast iron<br>FC250, etc.<br>250, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 100 - 250 | 0.1 - 0.5 |
| | Ductile cast iron<br>FCD400, FCD600, etc.<br>400-15, 600-3, etc. | | 150 - 250 HB | First choice | AH120 | MJ | 80 - 200 | 0.1 - 0.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | ~ 40 HRC | First choice | AH3135 | MJ | 30 - 60 | 0.1 - 0.3 |
| | Heat-resistant alloys<br>Inconel718, etc. | | ~ 40 HRC | First choice | AH120 | MJ | 10 - 40 | 0.05 - 0.15 |
| H | Hardened steel | SKD61, etc.<br>X40CrMoV5-1, etc. | 40 - 50 HRC | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.2 |
| | | SKD11, etc.<br>X153CrMoV12, etc. | 50 - 60 HRC | First choice | AH120 | MJ | 50 - 70 | 0.03 - 0.1 |

## RNGU13

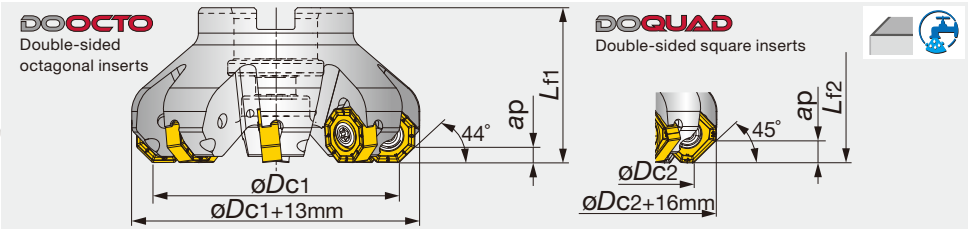
| ISO | Workpiece material | | Hardness | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Low carbon steel<br>S15C, etc.<br>C15, etc. | | 200 - 300 HB | AH3135 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | High carbon and alloy steel<br>S55C, SCM440, etc.<br>C55, 42CrMo4, etc. | | 150 - 300 HB | AH3135 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | Prehardened steel<br>NAK80, PX5, etc. | | 30 - 40 HRC | AH3135 | 100 - 200 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | | - 200 HB | AH3135 | 100 - 200 | ap = 6 mm : 0.1 - 0.25<br>ap = 2 mm : 0.3 - 0.7<br>ap = 1 mm : 0.6 - 1.3 |
| K | Gray cast iron<br>FC250, etc.<br>250, etc. | | 150 - 250 HB | AH120 | 100 - 250 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| | Ductile cast iron<br>FCD400, FCD600, etc.<br>400-15, 600-3, etc. | | 150 - 250 HB | AH120 | 80 - 200 | ap = 6 mm : 0.1 - 0.3<br>ap = 2 mm : 0.4 - 0.8<br>ap = 1 mm : 0.8 - 1.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - 40 HRC | AH3135 | 30 - 60 | ap = 1 mm : 0.15 - 0.8 |
| | Heat-resistant alloys<br>Inconel718, etc. | | - 40 HRC | AH120 | 10 - 40 | ap = 1 mm : 0.05 - 0.3 |
| H | Hardened steel | X40CrMoV5-1, etc. | 40 - 50 HRC | AH3135 | 80 - 130 | ap = 1 mm : 0.1 - 0.25 |
| | | X153CrMoV12, etc. | 50 - 60 HRC | AH120 | 50 - 70 | ap = 0.5 mm : 0.03 - 0.1 |

# DOOCTO DOQUAD

## TAN07

45° screw clamp type face mills with double sided octagonal or square inserts

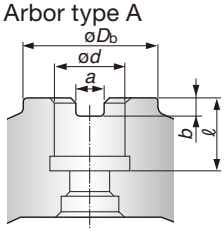
A.R.=-6°,R.R.=+15.5°



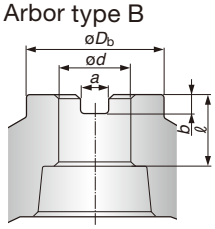

| Designation | øDc1 | øDc2 | z | øDb | Lf1 | Lf2 | ød | ℓ | a | b | Kg | Air hole | Insert | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAN07R063M22.0E05 | 63 | 60.3 | 5 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SN*U/ON*U/OWMT... | A |
| TAN07R063M22.0E06 | 63 | 60.3 | 6 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | SN*U/ON*U/OWMT... | A |
| TAN07R080M25.4-06 | 80 | 77.3 | 6 | 50 | 50 | 51.4 | 25.4 | 26 | 9.5 | 6 | 1 | with | SN*U/ON*U/OWMT... | A |
| TAN07R080M25.4-08 | 80 | 77.3 | 8 | 50 | 50 | 51.4 | 25.4 | 26 | 9.5 | 6 | 1 | with | SN*U/ON*U/OWMT... | A |
| TAN07R080M27.0E06 | 80 | 77.3 | 6 | 50 | 50 | 51.4 | 27 | 22 | 12.4 | 7 | 1 | with | SN*U/ON*U/OWMT... | A |
| TAN07R080M27.0E08 | 80 | 77.3 | 8 | 50 | 50 | 51.4 | 27 | 22 | 12.4 | 7 | 1 | with | SN*U/ON*U/OWMT... | A |
| TAN07R100M31.7-07 | 100 | 97.3 | 7 | 60 | 50 | 51.4 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R100M31.7-10 | 100 | 97.3 | 10 | 60 | 50 | 51.4 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R100M32.0E07 | 100 | 97.3 | 7 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R100M32.0E10 | 100 | 97.3 | 10 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R125M38.1-08 | 125 | 122.3 | 8 | 80 | 63 | 64.4 | 38.1 | 38 | 15.9 | 10 | 2.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R125M38.1-12 | 125 | 122.3 | 12 | 80 | 63 | 64.4 | 38.1 | 38 | 15.9 | 10 | 2.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R125M40.0E08 | 125 | 122.3 | 8 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R125M40.0E12 | 125 | 122.3 | 12 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | with | SN*U/ON*U/OWMT... | B |
| TAN07R160M40.0E10 | 160 | 157.3 | 10 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 4 | without | SN*U/ON*U/OWMT... | D |
| TAN07R160M40.0E15 | 160 | 157.3 | 15 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 4 | without | SN*U/ON*U/OWMT... | D |
| TAN07R160M50.8-10 | 160 | 157.3 | 10 | 100 | 63 | 64.4 | 50.8 | 38 | 19 | 11 | 4 | without | SN*U/ON*U/OWMT... | B |
| TAN07R160M50.8-15 | 160 | 157.3 | 15 | 100 | 63 | 64.4 | 50.8 | 38 | 19 | 11 | 4 | without | SN*U/ON*U/OWMT... | B |
| TAN07R200M47.6-12 | 200 | 197.3 | 12 | 130 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 6.6 | without | SN*U/ON*U/OWMT... | C |
| TAN07R200M47.6-18 | 200 | 197.3 | 18 | 130 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 6.7 | without | SN*U/ON*U/OWMT... | C |
| TAN07R200M60.0E12 | 200 | 197.3 | 12 | 135 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 6.5 | without | SN*U/ON*U/OWMT... | C |
| TAN07R200M60.0E18 | 200 | 197.3 | 18 | 135 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 6.5 | without | SN*U/ON*U/OWMT... | C |
| TAN07R250M47.6-15 | 250 | 247.3 | 15 | 130 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 9.3 | without | SN*U/ON*U/OWMT... | C |
| TAN07R250M47.6-21 | 250 | 247.3 | 21 | 130 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 9.4 | without | SN*U/ON*U/OWMT... | C |
| TAN07R250M60.0E15 | 250 | 247.3 | 15 | 130 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 9 | without | SN*U/ON*U/OWMT... | C |
| TAN07R250M60.0E21 | 250 | 247.3 | 21 | 130 | 63 | 64.4 | 60 | 38 | 25.7 | 14 | 9 | without | SN*U/ON*U/OWMT... | C |
| TAN07R315M47.6-18 | 315 | 312.3 | 18 | 220 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 17.9 | without | SN*U/ON*U/OWMT... | C |
| TAN07R315M47.6-24 | 315 | 312.3 | 24 | 220 | 63 | 64.4 | 47.625 | 38 | 25.4 | 14 | 18 | without | SN*U/ON*U/OWMT... | C |
| TAN07R315M60.0E18 | 315 | 312.3 | 18 | 220 | 80 | 81.4 | 60 | 38 | 25.7 | 14 | 18 | without | SN*U/ON*U/OWMT... | E |
| TAN07R315M60.0E24 | 315 | 312.3 | 24 | 220 | 80 | 81.4 | 60 | 38 | 25.7 | 14 | 18 | without | SN*U/ON*U/OWMT... | E |

## Arbor type

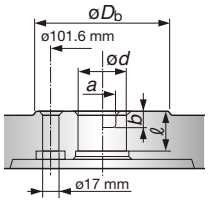
Arbor type A



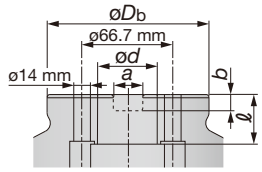

Arbor type B



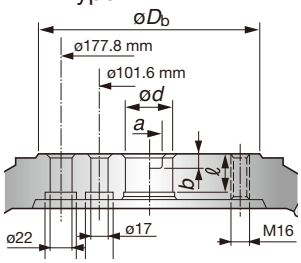

Arbor type C




Arbor type D

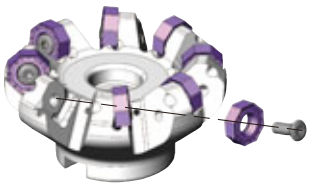



Arbor type E




### SPARE PARTS

| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TAN07R063M22.0... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | CM10X30H | BLDIP20/S7 |
| TAN07R080M25.4... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | CM12X30H | BLDIP20/S7 |
| TAN07R100M31.7... | SRM5X0.8IP20X+ACROLYTE | H-TB | TMBA-M16H | - | BLDIP20/S7 |
| TAN07R125M38.1... | SRM5X0.8IP20X+ACROLYTE | H-TB | TMBA-M20H | - | BLDIP20/S7 |
| TAN07R160 - 315... | SRM5X0.8IP20X+ACROLYTE | H-TB | - | - | BLDIP20/M7 |

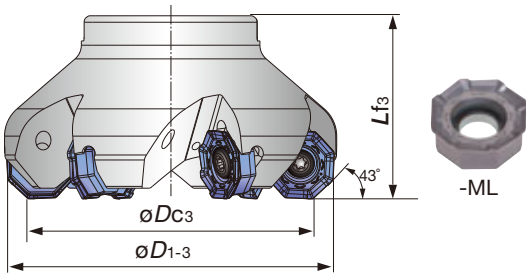


## Screw-on type

DOOCTO

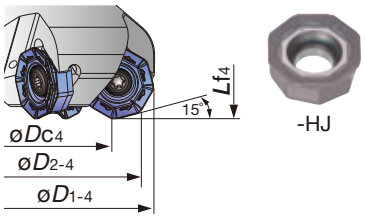
Cutter diameter and height with single sided octagonal insert

OWMT-ML insert




ap = 3.5 mm

OWMT-HJ insert



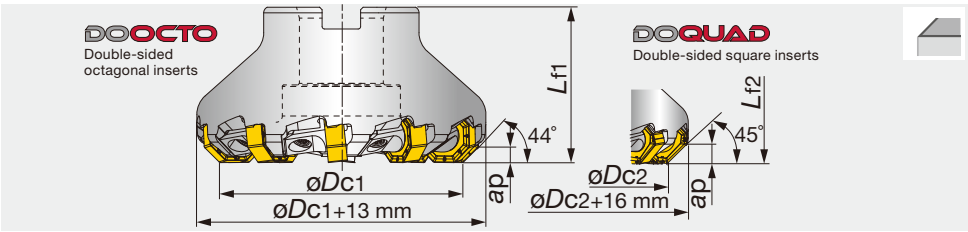

ap = 1.5 mm
(7.5 mm, with double corner use)

| Designation | Dimensions (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | øDc3 | øD1-3 | øDc4 | øD2-4 | øD1-4 | Lf3 | Lf4 |
| TAN07R063M... | 63.5 | 76 | 55.7 | 67.2 | 76.4 | 41 | 41.4 |
| TAN07R080M... | 80.5 | 93 | 72.7 | 84.2 | 93.4 | 51 | 51.4 |
| TAN07R100M... | 100.5 | 113 | 92.7 | 104.2 | 113.4 | 51 | 51.4 |
| TAN07R125M... | 125.5 | 138 | 117.7 | 129.2 | 138.4 | 64 | 64.4 |
| TAN07R160M... | 160.5 | 173 | 152.7 | 164.2 | 173.4 | 64 | 64.4 |
| TAN07R200M... | 200.5 | 213 | 192.7 | 204.2 | 213.4 | 64 | 64.4 |
| TAN07R250M... | 250.5 | 263 | 242.7 | 252.2 | 263.4 | 64 | 64.4 |
| TAN07R315M... | 315.5 | 328 | 307.7 | 319.2 | 328.4 | 64 | 64.4 |

Note: OWMT08 inserts can be only used with screw on type cutters.

## TAN07-W

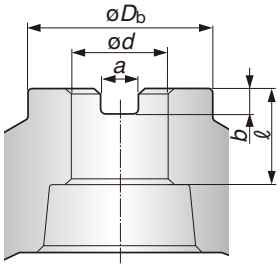
45° wedge clamp type face mills with double sided octagonal or square inserts.



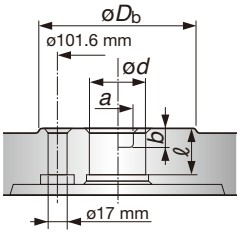

| Designation | øDc1 | øDc2 | z | øDb | Lf1 | Lf2 | ød | ℓ | a | b | Kg | Air hole | Insert | Arbor type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAN07R063M22.0E08W | 63 | 60.3 | 8 | 41 | 40 | 41.4 | 22 | 20 | 10.4 | 6.3 | 0.6 | without | SN*U/ON*U/OWMT... | B |
| TAN07R080M25.4-10W | 80 | 77.3 | 10 | 50 | 50 | 51.4 | 25.4 | 26 | 9.5 | 6 | 1 | without | SN*U/ON*U/OWMT... | B |
| TAN07R080M27.0E10W | 80 | 77.3 | 10 | 50 | 50 | 51.4 | 27 | 25 | 12.4 | 7 | 1.1 | without | SN*U/ON*U/OWMT... | B |
| TAN07R100M31.7-14W | 100 | 97.3 | 14 | 60 | 50 | 51.4 | 31.75 | 32 | 12.7 | 8 | 1.3 | without | SN*U/ON*U/OWMT... | B |
| TAN07R100M32.0E14W | 100 | 97.3 | 14 | 60 | 50 | 51.4 | 32 | 28.5 | 14.4 | 8 | 1.6 | without | SN*U/ON*U/OWMT... | B |
| TAN07R125M38.1-18W | 125 | 122.3 | 18 | 80 | 63 | 64.4 | 38.1 | 38 | 15.9 | 10 | 2.8 | without | SN*U/ON*U/OWMT... | B |
| TAN07R125M40.0E18W | 125 | 122.3 | 18 | 71 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 2.5 | without | SN*U/ON*U/OWMT... | B |
| TAN07R160M50.8-22W | 160 | 157.3 | 22 | 100 | 63 | 64.4 | 50.8 | 38 | 19 | 11 | 4 | without | SN*U/ON*U/OWMT... | B |
| TAN07R160M40.0E22W | 160 | 157.3 | 22 | 100 | 63 | 64.4 | 40 | 29 | 16.4 | 9 | 3.6 | without | SN*U/ON*U/OWMT... | D |
| TAN07R200M60.0E28W | 200 | 197.3 | 28 | 135 | 63 | 64.4 | 60 | 39 | 25.7 | 14 | 5.8 | without | SN*U/ON*U/OWMT... | C |

## Arbor type

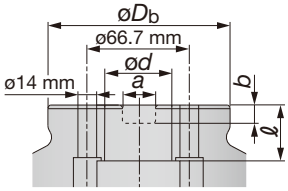
Arbor type B




Arbor type C




Arbor type D



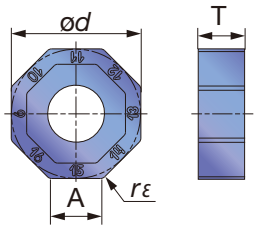

### SPARE PARTS

| Designation | Grip | Locator | Clamping screw | Torx bit |
|---|---|---|---|---|
| TAN07-W | H-TBS | CLARM-10-TUNG1 | DS-6P | BLDIP15/S7 |

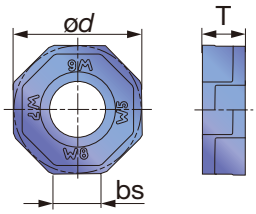
Face Milling

## INSERT

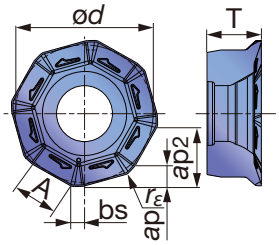
### ONMU/ONHU0705-MJ / -ML



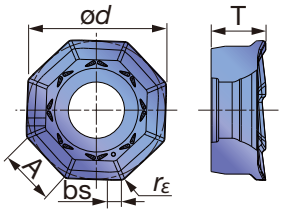

### ONHU0705-W



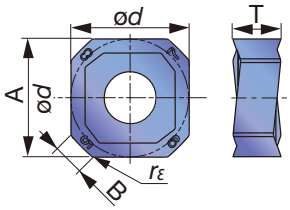

### OWMT0807-HJ



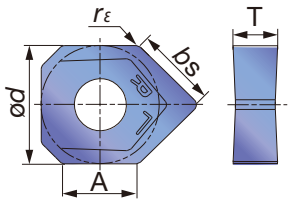

### OWMT0807-ML




### SNMU/SNHU1706 -MJ / -ML




### SNHU1706-W




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ★ | | | |
| M | Stainless | | ★ | ☆ | ☆ | ★ | | | |
| K | Cast iron | ★ | | | ☆ | | ★ | ★ | |
| N | Non-ferrous | | | | | | | | |
| S | Superalloys | ★ | ☆ | | ★ | ☆ | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

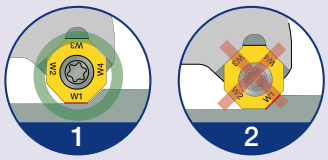
| Designation | rε | Max. ap | Coated | | | | | | | | ød | T | B | ød | bs | Max. ap[2.] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH725 | AH3135 | T1115 | T1215 | | | | | | | |
| ONMU0705ANPN-MJ | 0.8 | 4.75 | | | ● | ● | ● | ● | ● | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANPN-MJ | 0.8 | 4.75 | | | ● | ● | | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONMU0705ANPN-ML | 0.8 | 4.75 | ● | | | | ● | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANTN-ML | 0.8 | 4.75 | ● | | ● | ● | | | | | 7.2 | 6.2 | - | 17.3 | - | - |
| ONHU0705ANPR-W * | - | 4.75 | ● | | | | | | | | 7.2 | 5.8 | - | 17.5 | 6.4 | - |
| OWMT0807ZNER-HJ | 1.2 | 1.5 | | | | | ● | | | | - | 7.4 | - | 19 | 1 | 7.5 |
| OWMT0807AAER-ML | 0.8 | 3.5 | | ● | | | ● | | | | 5.2 | 7.4 | - | - | 1.2 | - |
| SNMU1706ANPR-MJ | 0.8 | 7.5 | | | ● | ● | ● | | ● | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANPR-MJ | 0.8 | 7.5 | | | ● | ● | | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNMU1706ANTR-ML | 0.8 | 7.5 | ● | | | | ● | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANTR-ML | 0.8 | 7.5 | ● | | | | | | | | 11 | 6.98 | 4.4 | 17.3 | 1.8 | - |
| SNHU1706ANFN-W * | 0.4 | 7.5 | ● | | | | | | | | 17.3 | 6.5 | - | 17.3 | 11 | - |

* Pay attention to the wiper insert installation procedure below.

●: Line up

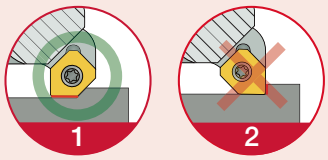
## Attention for wiper inserts

### DOOCTO




Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: $f$ < 5.5 mm/rev

### DOQUAD




Attach only one wiper insert on the cutter and make sure the wiper edge faces the machining surface.
Feed rate: $f$ < 9.5 mm/rev

# STANDARD CUTTING CONDITIONS

## Double-sided inserts

| ISO | Workpiece material | Hardness | Priority | Recommendation | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| | | | | Grade | Chipbreaker | | |
| P | Low carbon steel S15C, SS400, etc. C15E, etc. | - 200 HB | First choice | AH3135 | ML | 100 - 300 | 0.2 - 0.5 |
| | | - 200 HB | For wear resistance | AH725 | ML | 100 - 300 | 0.2 - 0.5 |
| | | - 200 HB | For fracture resistance | AH140 | MJ | 80 - 180 | 0.2 - 0.5 |
| | High carbon steel S45C, S55C, etc. C45E, C55E, etc. | 200 - 300 HB | First choice | AH3135 | MJ | 100 - 230 | 0.2 - 0.4 |
| | | 200 - 300 HB | For wear resistance | AH725 | MJ | 100 - 230 | 0.2 - 0.4 |
| | | 200 - 300 HB | For fracture resistance | AH140 | MJ | 80 - 180 | 0.2 - 0.4 |
| | Alloy steel SCM440, SCr415, etc. 42CrMo4, 17Cr3, etc. | 150 - 330 HB | First choice | AH3135 | MJ | 100 - 200 | 0.2 - 0.4 |
| | | 150 - 330 HB | For wear resistance | AH725 | MJ | 100 - 200 | 0.2 - 0.4 |
| | | 150 - 330 HB | For fracture resistance | AH140 | MJ | 80 - 150 | 0.2 - 0.4 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - 200 HB | First choice | AH3135 | ML | 100 - 150 | 0.1 - 0.3 |
| K | Grey cast iron FC350, FC450 etc. GG35, GG45, etc. | 150 - 250 HB | First choice | AH120 | ML | 100 - 250 | 0.1 - 0.5 |
| | | 150 - 250 HB | For fracture resistance | AH725 | MJ | 100 - 250 | 0.1 - 0.5 |
| | | 150 - 250 HB | For wear resistance | T1215 | MJ | 150 - 300 | 0.1 - 0.5 |
| | Ductile cast iron FCD600, etc. GGG60, etc. | 150 - 300HB | First choice | AH120 | ML | 80 - 200 | 0.1 - 0.4 |
| | | 150 - 300 HB | For fracture resistance | AH725 | MJ | 80 - 200 | 0.1 - 0.4 |
| | | 150 - 300 HB | For wear resistance | T1215 | MJ | 100 - 250 | 0.1 - 0.4 |
| H | Hardened steel | HRC 40 - 50 | First choice | AH3135 | MJ | 80 - 130 | 0.1 - 0.2 |
| | | HRC 50 - 60 | First choice | AH3135 | MJ | 50 - 70 | 0.05 - 0.1 |

## Single-sided inserts

| ISO | Workpiece material | Hardness | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | |
|---|---|---|---|---|---|---|---|
| | | | | | | ML | HJ* |
| P | Low carbon steel S15C, SS400, etc. C15E, etc. | - 200 | First choice | AH3135 | 100 - 300 | 0.1 - 0.5 | 0.5 - 2.0 |
| | | - 200 | For fracture resistance | AH130 | 100 - 300 | 0.1 - 0.5 | - |
| | High carbon steel S45C, S55C, etc. C45E, C55E, etc. | 200 - 300 HB | First choice | AH3135 | 100 - 230 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 200 - 300 HB | For fracture resistance | AH130 | 100 - 230 | 0.1 - 0.4 | - |
| | Alloy steel SCM440, SCr415, etc. 42CrMo4, 17Cr3, etc. | 150 - 330 HB | First choice | AH3135 | 100 - 200 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 150 - 330 HB | For fracture resistance | AH130 | 100 - 200 | 0.1 - 0.4 | - |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - 200 HB | First choice | AH3135 | 100 - 150 | 0.1 - 0.3 | 0.3 - 0.7 |
| | | - 200 HB | For fracture resistance | AH130 | 100 - 150 | 0.1 - 0.3 | - |
| K | Grey cast iron FC350, FC450 etc. GG35, GG45, etc. | 150 - 250 HB | First choice | AH3135 | 100 - 250 | 0.1 - 0.5 | 0.5 - 2.0 |
| | | 150 - 250 HB | For fracture resistance | AH130 | 100 - 250 | 0.1 - 0.5 | - |
| | Ductile cast iron FCD600, etc. GGG60, etc. | 150 - 250 HB | First choice | AH3135 | 80 - 200 | 0.1 - 0.4 | 0.5 - 1.5 |
| | | 150 - 250 HB | For fracture resistance | AH130 | 80 - 200 | 0.1 - 0.4 | - |
| S | Titanium alloy Ti-6Al-4V, etc. | - HRC 40 | First choice | AH3135 | 30 - 60 | 0.1 - 0.3 | 0.3 - 0.7 |
| | | - HRC 40 | For fracture resistance | AH130 | 30 - 60 | 0.1 - 0.3 | - |
| | Heat resistant alloy Inconel718, etc. | - HRC 40 | First choice | AH3135 | 10 - 40 | 0.05 - 0.15 | 0.1 - 0.3 |
| | | - HRC 40 | For fracture resistance | AH130 | 10 - 40 | 0.05 - 0.15 | - |
| H | Hardened steel | HRC 40 - 50 | First choice | AH3135 | 80 - 130 | - | 0.1 - 0.3 |
| | | HRC 50 - 60 | First choice | AH3135 | 50 - 70 | - | 0.03 - 0.07 |

* Apply 20% of recommended feed when using HJ insert with *ap* over 1.5 mm.

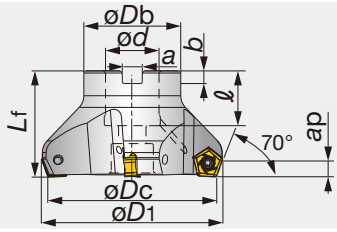
MEMO

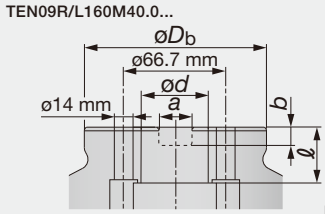
# DOPENT

## TEN09R/L

70° face mills with double sided pentagonal inserts.

A.R.=-6°,R.R.=-10°~-2°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TEN09R050M22.0-03 | 6.4 | 50 | 3 | 56 | 41 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | PN*U0905... |
| TEN09R050M22.0-04 | 6.4 | 50 | 4 | 56 | 41 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | PN*U0905... |
| TEN09R050M22.0-06 | 6.4 | 50 | 6 | 56 | 41 | 40 | 22 | 20 | 10 | 6 | 0.3 | with | PN*U0905... |
| TEN09R050M22.0E04 | 6.4 | 50 | 4 | 56 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | PN*U0905... |
| TEN09R050M22.0E06 | 6.4 | 50 | 6 | 56 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | PN*U0905... |
| TEN09R063M22.0-04 | 6.4 | 63 | 4 | 69 | 41 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | PN*U0905... |
| TEN09R063M22.0-06 | 6.4 | 63 | 6 | 69 | 41 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | PN*U0905... |
| TEN09R063M22.0-08 | 6.4 | 63 | 8 | 69 | 41 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | PN*U0905... |
| TEN09R063M22.0E06 | 6.4 | 63 | 6 | 69 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | PN*U0905... |
| TEN09R063M22.0E08 | 6.4 | 63 | 8 | 69 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.5 | with | PN*U0905... |
| TEN09R080M25.4-04 | 6.4 | 80 | 4 | 86 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.9 | with | PN*U0905... |
| TEN09R080M25.4-07 | 6.4 | 80 | 7 | 86 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.9 | with | PN*U0905... |
| TEN09R080M25.4-10 | 6.4 | 80 | 10 | 86 | 46 | 50 | 25.4 | 26 | 9.5 | 6 | 0.9 | with | PN*U0905... |
| TEN09R080M27.0E07 | 6.4 | 80 | 7 | 86 | 50 | 50 | 27 | 22 | 12.4 | 7 | 0.9 | with | PN*U0905... |
| TEN09R080M27.0E10 | 6.4 | 80 | 10 | 86 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | PN*U0905... |
| TEN09R100M31.7-05 | 6.4 | 100 | 5 | 106 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.3 | with | PN*U0905... |
| TEN09R/L100M31.7-08* | 6.4 | 100 | 8 | 106 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.3 | with | PN*U0905... |
| TEN09R100M31.7-12 | 6.4 | 100 | 12 | 106 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.4 | with | PN*U0905... |
| TEN09R/L100M32.0E08* | 6.4 | 100 | 8 | 106 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.3 | with | PN*U0905... |
| TEN09R100M32.0E12 | 6.4 | 100 | 12 | 106 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.4 | with | PN*U0905... |
| TEN09R125M38.1-06 | 6.4 | 125 | 6 | 131 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.6 | with | PN*U0905... |
| TEN09R/L125M38.1-10* | 6.4 | 125 | 10 | 131 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.7 | with | PN*U0905... |
| TEN09R125M38.1-16 | 6.4 | 125 | 16 | 131 | 80 | 63 | 38.1 | 43 | 15.9 | 10 | 2.9 | with | PN*U0905... |
| TEN09R/L125M40.0E10* | 6.4 | 125 | 10 | 131 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.3 | with | PN*U0905... |
| TEN09R125M40.0E16 | 6.4 | 125 | 16 | 131 | 71 | 63 | 40 | 32 | 16.4 | 9 | 2.5 | with | PN*U0905... |
| TEN09R160M50.8-07 | 6.4 | 160 | 7 | 166 | 100 | 63 | 50.8 | 46 | 19 | 11 | 4.4 | without | PN*U0905... |
| TEN09R/L160M40.0E12* | 6.4 | 160 | 12 | 166 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4 | without | PN*U0905... |
| TEN09R160M40.0E20 | 6.4 | 160 | 20 | 166 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4.3 | without | PN*U0905... |
| TEN09R/L160M50.8-12* | 6.4 | 160 | 12 | 166 | 100 | 63 | 50.8 | 46 | 19 | 11 | 4.6 | without | PN*U0905... |
| TEN09R160M50.8-20 | 6.4 | 160 | 20 | 166 | 100 | 63 | 50.8 | 46 | 19 | 11 | 4.9 | without | PN*U0905... |

* For TEN09L (left-hand cutter), use the neutral-hand inserts.

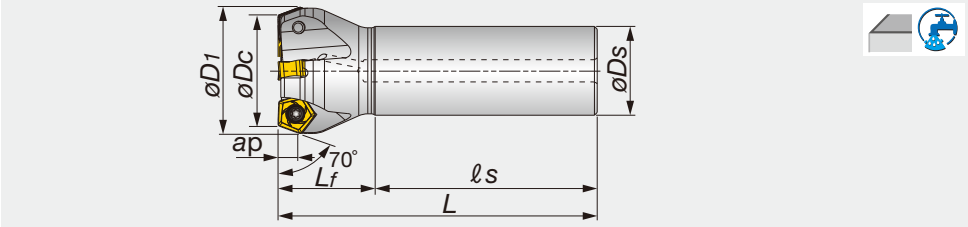
### SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|---|
| TEN09R050 - 063... | CSTR-4L100 | H-TBS | M-1000 | - | CM10X30H | BT15S |
| TEN09R080... | CSTR-4L100 | H-TBS | M-1000 | - | CM12X30H | BT15S |
| TEN09R/L100... | CSTR-4L100 | H-TBS | M-1000 | TMBA-M16H | - | BT15S |
| TEN09R125...06 | CSTR-4L100 | H-TBS | M-1000 | TMBA-M20H | - | BT15M |
| TEN09R/L125M...10 | CSTR-4L100 | H-TBS | M-1000 | TMBA-M20H | - | BT15M |
| TEN09R125M...16 | CSTR-4L100 | H-TBS | M-1000 | TMBA-M20H | - | BT15S |
| TEN09R160M...07 | CSTR-4L100 | H-TBS | M-1000 | - | - | BT15M |
| TEN09R/L160M...12 | CSTR-4L100 | H-TBS | M-1000 | - | - | BT15M |
| TEN09R160M...20 | CSTR-4L100 | H-TBS | M-1000 | - | - | BT15S |

## EEN09

70° endmills with double sided pentagonal inserts.

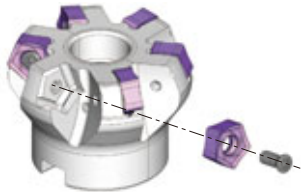
A.R.=-6°,R.R.=-2°~-10°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EEN09R032M32.0-03 | 6.4 | 32 | 3 | 38 | 32 | 80 | 35 | 115 | 0.7 | with | PN*U0905... |
| EEN09R040M32.0-04 | 6.4 | 40 | 4 | 46 | 32 | 80 | 35 | 115 | 0.7 | with | PN*U0905... |
| EEN09R050M32.0-04 | 6.4 | 50 | 4 | 56 | 32 | 80 | 40 | 120 | 0.9 | with | PN*U0905... |
| EEN09R063M32.0-06 | 6.4 | 63 | 6 | 69 | 32 | 80 | 40 | 120 | 1 | with | PN*U0905... |
| EEN09R080M32.0-07 | 6.4 | 80 | 7 | 86 | 32 | 80 | 40 | 120 | 1.3 | with | PN*U0905... |

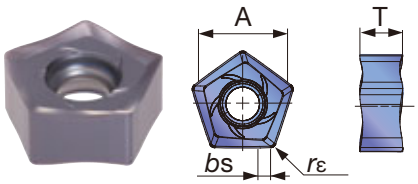
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EEN09 | CSTR-4L100 | M-1000 | T-15D |

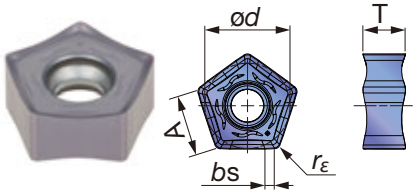


## INSERT

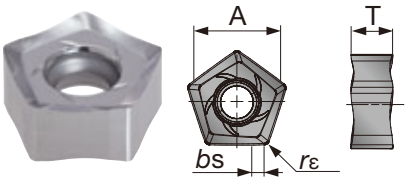
### PNCU0905-MJ (Right-hand)



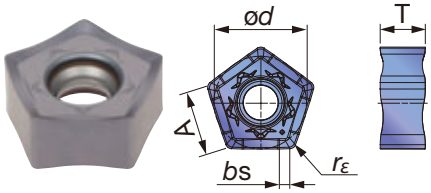

### PNCU0905-ML (Neutral-hand)



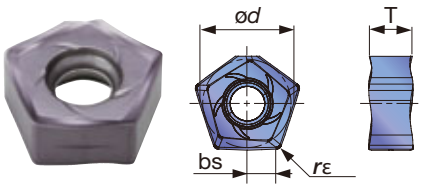

### PNCU0905-AJ (Right-hand)




### PNMU0905-MJ (Neutral-hand)




### PNCU0905-W (Right-hand)




| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | TH10 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | ★ | | | ☆ | ★ | |
| M | Stainless | | ☆ | ☆ | ★ | | | | | |
| K | Cast iron | ★ | | ☆ | | ★ | ★ | | | |
| N | Non-ferrous | | | | | | | | | ★ |
| S | Superalloys | ☆ | | ★ | ☆ | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | Cermet | Un-coated | A | T | ød | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | TH10 | | | | |
| PNCU0905GNER-MJ | 0.8 | 6.4 | ● | ● | ● | | ● | | ● | ● | | 8.9 | 5.93 | 12.2 | 1.4 |
| PNCU0905GNEN-ML | 0.8 | 6.4 | | | | ● | | | | | | 8.9 | 5.96 | 12.2 | 1.4 |
| PNCU0905GNFR-AJ | 0.8 | 6.4 | | | | | | | | | ● | 8.9 | 6.25 | 12.2 | 1.4 |
| PNMU0905GNEN-MJ | 0.8 | 6.4 | ● | | | ● | | ● | | | | 8.9 | 6 | 12.2 | 1.4 |
| PNCU0905GNER-W | 0.8 | 2 | | | ● | | | | | | | - | 5.93 | 12.2 | 3.8 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Selection criteria | Recommended grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Low carbon steel S15C, etc. C15, etc. | - 200 | First choice | AH3135, AH725 | MJ | 100 - 250 | 0.1 - 0.6 |
| | | - 200 | Low cutting force | AH3135 | ML | 100 - 250 | 0.1- 0.5 |
| | | - 200 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.6 |
| | | - 200 | Priority on surface quality | NS740 | MJ | 100 - 250 | 0.1 - 0.5 |
| | High carbon steel S45C, etc. C45, etc. | 200 - 300 | First choice | AH3135, AH725 | MJ | 100 - 230 | 0.1 - 0.5 |
| | | 200 - 300 | Low cutting force | AH3135 | ML | 100 - 230 | 0.1- 0.4 |
| | | 200 - 300 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.5 |
| | | 200 - 300 | Priority on surface quality | NS740 | MJ | 100 - 250 | 0.1 - 0.4 |
| | Alloyed steel SCM440, etc. 42CrMo4, etc. | 150 - 300 | First choice | AH3135, AH725 | MJ | 100 - 230 | 0.1 - 0.5 |
| | | 150 - 300 | Low cutting force | AH3135 | ML | 100 - 230 | 0.1- 0.4 |
| | | 150 - 300 | Priority on wear resistance | T3130 | MJ | 120 - 250 | 0.1 - 0.5 |
| | | 150 - 300 | Priority on fracture resistance | NS740 | MJ | 100 - 250 | 0.1 - 0.4 |
| | Tool steel SKD11, etc. X153CrMoV12, etc. | - 300 | First choice | AH3135, AH725 | MJ | 100 - 180 | 0.1 - 0.5 |
| | | - 300 | Low cutting force | AH3135 | ML | 100 - 180 | 0.1- 0.4 |
| | | - 300 | Priority on wear resistance | T3130 | MJ | 120 - 180 | 0.1 - 0.5 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | First choice | AH3135 | ML | 90 - 180 | 0.1 - 0.4 |
| | | - | Priority on fracture resistance | AH3135, AH140 | MJ | 90 - 180 | 0.1 - 0.45 |
| K | Grey cast irons FCD400, etc. 250, etc. | - | First choice | AH120 | MJ | 140 - 250 | 0.1 - 0.6 |
| | | - | Priority on wear resistance | T1215 | MJ | 150 - 280 | 0.1 - 0.6 |
| | Ductile cast iron FCD400, etc. 400-15S, etc. | - | First choice | AH120 | MJ | 100 - 200 | 0.1 - 0.6 |
| | | - | Priority on wear resistance | T1215 | MJ | 120 - 220 | 0.1 - 0.6 |
| N | Aluminium alloys Si < 13% | - | First choice | TH10 | AJ | 500 - 1500 | 0.1 - 0.5 |
| | Aluminium alloys Si ≥ 13% | - | First choice | TH10 | AJ | 150 - 500 | 0.1 - 0.5 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH3135 | ML | 30 - 60 | 0.1 - 0.4 |
| | | - | Priority on fracture resistance | AH3135 | MJ | 30 - 60 | 0.1 - 0.4 |
| | Heat-resistance alloys Inconel 718, etc. | - | First choice | AH725 | MJ | 20 - 50 | 0.04 - 0.1 |

· Remove excessive chip with an air blast to prevent chip jamming.
· Use water-soluble coolant to avoid built-up edge in case extreme welding occurs on cutting edges. (ex. aluminium machining).
· For the operation with depth of cut which varies (ex. casting skin) and machining of workpiece materials with interrupted surface, the feed (*fz*) should be set to the lower recommended value shown in the above table.
· Cutting conditions may be limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

## Installation of the extra close pitch cutter inserts

- The extra close pitch cutter has a slanted screw.
- Locate insert and then fasten the screw. (Fig. A)
- Appropriate torque is 3.5 N·m.
- After fastening the screw, please ensure there is no space between the cutter body and insert. (Fig. B)

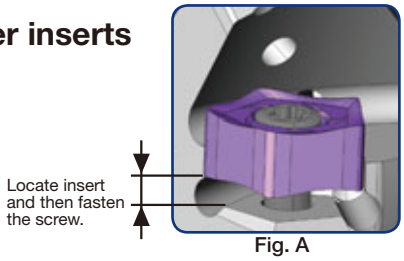


Fig. A

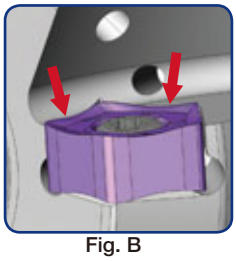


Fig. B

## NOTES ON USE OF WIPER INSERT

- To achieve a good surface finish, a wiper insert is recommended. (PNCU0905GNER-W)
- When using the wiper insert, install the insert as shown in Fig. C. Ensure that the groove is at the front as shown in Fig. D.
- The wiper insert has two wiping corners. (Fig. D)
- Do not use the other corners. It may break the tool body.

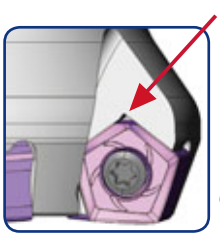


Fig. C

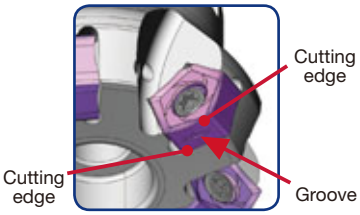
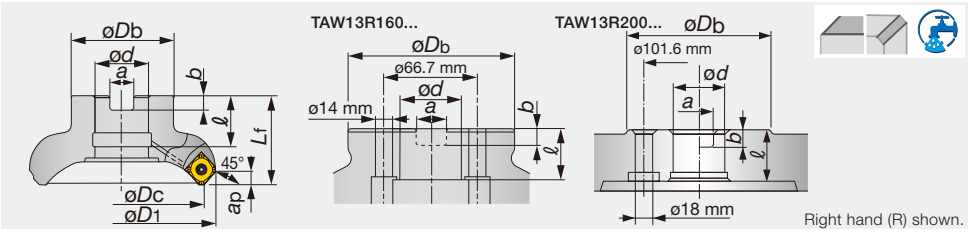


Fig. D

# TAW13

30°~ 45° face mills with screw clamped SWMT/SWGT13 inserts

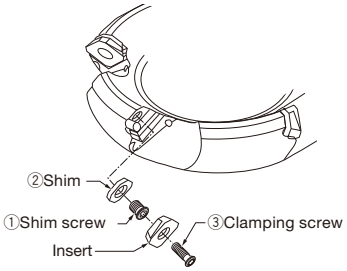
A.R.=+17°~+20°,R.R.=-16°~-11°




| Designation | øDc | z | øD1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TAW13R050M22.0-03 | 50 | 3 | 63 | 41 | 40 | 22 | 20 | 10 | 6 | 0.4 | with | SW*T13... |
| TAW13R050M22.0-04 | 50 | 4 | 63 | 41 | 40 | 22 | 20 | 10 | 6 | 0.4 | with | SW*T13... |
| TAW13R050M22.0E04 | 50 | 4 | 63 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T13... |
| TAW13R050M22.0E05 | 50 | 5 | 63 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | SW*T13... |
| TAW13R063M22.0-04 | 63 | 4 | 76 | 41 | 40 | 22 | 20 | 10 | 6 | 0.5 | with | SW*T13... |
| TAW13R063M22.0-05 | 63 | 5 | 76 | 41 | 40 | 22 | 20 | 10 | 6 | 0.6 | with | SW*T13... |
| TAW13R063M22.0E05 | 63 | 5 | 76 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | SW*T13... |
| TAW13R063M22.0E06 | 63 | 6 | 76 | 41 | 40 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | SW*T13... |
| TAW13R080M25.4-04 | 80 | 4 | 94 | 50 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | with | SW*T13... |
| TAW13R080M25.4-06 | 80 | 6 | 94 | 50 | 50 | 25.4 | 26 | 9.5 | 6 | 1 | with | SW*T13... |
| TAW13R080M27.0E06 | 80 | 6 | 94 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | SW*T13... |
| TAW13R080M27.0E08 | 80 | 8 | 94 | 50 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | SW*T13... |
| TAW13R100M31.7-05 | 100 | 5 | 114 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | SW*T13... |
| TAW13R100M31.7-07 | 100 | 7 | 114 | 60 | 50 | 31.75 | 32 | 12.7 | 8 | 1.5 | with | SW*T13... |
| TAW13R100M32.0E07 | 100 | 7 | 114 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SW*T13... |
| TAW13R100M32.0E10 | 100 | 10 | 114 | 60 | 50 | 32 | 28.5 | 14.4 | 8 | 1.5 | with | SW*T13... |
| TAW13R125M38.1-06 | 125 | 6 | 139 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.8 | with | SW*T13... |
| TAW13R125M38.1-08 | 125 | 8 | 139 | 80 | 63 | 38.1 | 38 | 15.9 | 10 | 2.7 | with | SW*T13... |
| TAW13R125M40.0E08 | 125 | 8 | 139 | 80 | 63 | 40 | 32 | 16.4 | 9 | 2.7 | with | SW*T13... |
| TAW13R125M40.0E12 | 125 | 12 | 139 | 80 | 63 | 40 | 32 | 16.4 | 9 | 3 | with | SW*T13... |
| TAW13R160M40.0E10 | 160 | 10 | 174 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4.4 | without | SW*T13... |
| TAW13R160M40.0E16 | 160 | 16 | 174 | 100 | 63 | 40 | 29 | 16.4 | 9 | 4.4 | without | SW*T13... |
| TAW13R160M50.8-07 | 160 | 7 | 174 | 100 | 63 | 50.8 | 40 | 19 | 11 | 4.4 | without | SW*T13... |
| TAW13R160M50.8-10 | 160 | 10 | 174 | 100 | 63 | 50.8 | 40 | 19 | 11 | 4.4 | without | SW*T13... |
| TAW13R200M47.6-08 | 200 | 8 | 213 | 130 | 63 | 47.625 | 38 | 25.4 | 14 | 8 | without | SW*T13... |

## SPARE PARTS

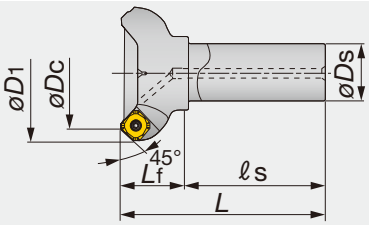
| Designation | ③Clamping screw | Lubricant | ①Shim screw | Shell locking bolt | Shell locking bolt 1 | ②Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| TAW13R050 - 063... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM10X30H | FSSA1102 | IP-15D | P-3.5 |
| TAW13R080... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | CM12X30H | FSSA1102 | IP-15D | P-3.5 |
| TAW13R100... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M16H | - | FSSA1102 | IP-15D | P-3.5 |
| TAW13R125... | CSPB-3.5 | M-1000 | DTS5-3.5SS | TMBA-M20H | - | FSSA1102 | IP-15D | P-3.5 |
| TAW13R160... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | - | FSSA1102 | IP-15D | P-3.5 |
| TAW13R200... | CSPB-3.5 | M-1000 | DTS5-3.5SS | - | - | FSSA1102 | IP-15D | P-3.5 |



## EAW13

30°~ 45° endmills with screw clamped SWMT/SWGT13 inserts

A.R.=+17°~+20°,R.R.=-16°~-11°

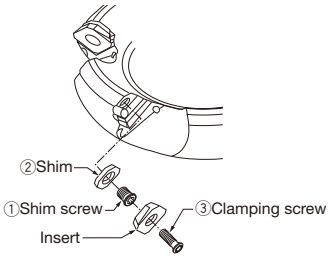



Right hand (R) shown.

| Designation | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EAW13R025M25.0-02 | 25 | 2 | 39 | 25 | 80 | 35 | 115 | 0.4 | with | SW*T13/WWCW13... |
| EAW13R032M32.0-02 | 32 | 2 | 46 | 32 | 80 | 35 | 115 | 0.7 | with | SW*T13/WWCW13... |
| EAW13R040M32.0-03 | 40 | 3 | 54 | 32 | 80 | 35 | 115 | 0.8 | with | SW*T13/WWCW13... |
| EAW13R050M32.0-03 | 50 | 3 | 63 | 32 | 80 | 40 | 120 | 1 | with | SW*T13/WWCW13... |
| EAW13R050M32.0-04 | 50 | 4 | 63 | 32 | 80 | 40 | 120 | 0.9 | with | SW*T13/WWCW13... |
| EAW13R063M32.0-04 | 63 | 4 | 76 | 32 | 80 | 40 | 120 | 1.1 | with | SW*T13/WWCW13... |
| EAW13R063M32.0-05 | 63 | 5 | 76 | 32 | 80 | 40 | 120 | 1.1 | with | SW*T13/WWCW13... |
| EAW13R080M32.0-04 | 80 | 4 | 94 | 32 | 80 | 40 | 120 | 1.5 | with | SW*T13/WWCW13... |
| EAW13R080M32.0-06 | 80 | 6 | 94 | 32 | 80 | 40 | 120 | 1.4 | with | SW*T13/WWCW13... |

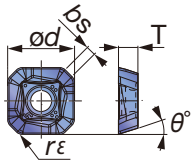
### SPARE PARTS

| Designation | ③Clamping screw | Lubricant | ①Shim screw | ②Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| EAW13R025**~040** | CSPB-3.5 | M-1000 | - | - | IP-15D | - |
| EAW13R050**~080** | CSPB-3.5 | M-1000 | DTS5-3.5SS | FSSA1102 | IP-15D | P-3.5 |

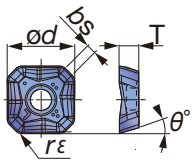


## INSERT

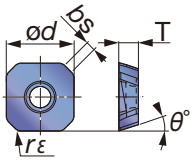
### SWMT13T3-MJ



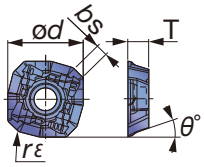

### SWMT13T3-ML



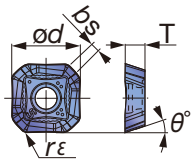

### SWMW13T3 (Flat)



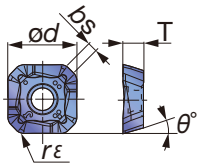

### SWMT13T3-HJ



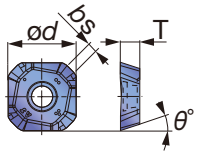

### SWMT13T3-MS



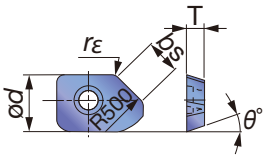

### SWGT13T3-MJ



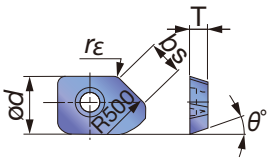

### SWGT13T3-AJ



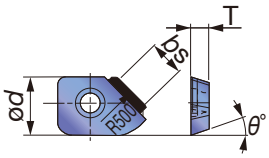

### WWCW13T3AFER-WS




### WWCW13T3AFFR-WS




### WWCW13T3AFFR-WD




| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | | | | ★ | | | | ★ | | | | |
| M | Stainless | | ★ | ☆ | ★ | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | ★ | ★ | ★ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | ★ | | | | | ★ | | ★ |
| S | Superalloys | ★ | ☆ | | ☆ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | | | | Cermet | | Un-coated | | PCD | | ød | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH3135 | GH110 | T1115 | T1215 | T3130 | DS1100 | | NS740 | | KS05F | | DX140 | | | | | |
| SWMT13T3AFPR-MJ | 1.5 | 4 | ● | ● | ● | ● | | ● | ● | ● | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMT13T3AFER-ML | 1.5 | 2.5 | ● | | | | | | | | | | | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMW13T3AFTR | 1.5 | 5 | ● | | | | | ● | ● | ● | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWMT13T3AFPR-HJ | 1.5 | 2 | ● | ● | ● | | | ● | ● | ● | | | | | | | | | 14.7 | 4 | 18.5 | 2.3 |
| SWMT13T3AFPR-MS | 1 | 4 | | ● | ● | ● | | | | | | | | | | | | | 14.1 | 4 | 18.5 | 2 |
| SWGT13T3AFPR-MJ | 1.5 | 4 | ● | | | | | | | | | | ● | | | | | | 13.9 | 4 | 18.5 | 2 |
| SWGT13T3AFFR-AJ | - | 4 | | | | | | | | | ● | | | | ● | | | | 14.1 | 4 | 18.5 | 2 |
| WWCW13T3AFER-WS | 1.5 | - | | | | | ● | | | | | | ● | | | | | | 12.8 | 4 | 18.5 | 7.8 |
| WWCW13T3AFFR-WS | 1.5 | - | | | | | | | | | ● | | | | ● | | | | 12.8 | 4 | 18.5 | 7.8 |
| WWCW13T3AFFR-WD | - | - | | | | | | | | | | | | | | | ● | | 12.8 | 4 | 18.5 | 7.8 |

●: Line up
DX140 : Packing Quantity = 1 pc.

Face Milling

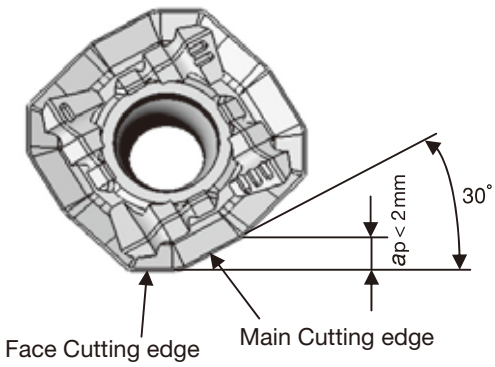
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Priority | Grade | Cutting speed *vc* (m/min) | Roughing (Depth of cut: > 1.0 mm) Feed per tooth: *fz* (mm/t) MJ | ML | HJ | MS | Flat | AJ |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Mild and low carbon steels SS400, etc. E275A, etc. < 180 HB | First choice | AH3135 AH120 | 100 - 270 | 0.05 - 0.3 | 0.05 - 0.25 | 0.2 - 0.6 | 0.1 - 0.25 | 0.05 - 0.3 | - |
| | | Priority on wear resistance | T3130 | 150 - 300 | 0.05 - 0.3 | - | 0.2 - 0.6 | - | 0.05 - 0.3 | - |
| | | Priority on surface quality | NS740 | 100 - 300 | 0.05 - 0.23 | - | - | - | 0.05 - 0.23 | - |
| | Carbon and alloy steels S45C, SCM440, etc. C45, 42CrMo4, etc. < 300 HB | First choice | AH3135 AH120 | 100 - 230 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.5 | - | 0.05 - 0.25 | - |
| | | Priority on wear resistance | T3130 | 150 - 280 | 0.05 - 0.25 | - | 0.2 - 0.5 | - | 0.05 - 0.25 | - |
| | | Priority on surface quality | NS740 | 100 - 230 | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 | - |
| | Die steels X96CrMoV12, etc. < 30 HRC | First choice | AH3135 AH120 | 100 - 180 | 0.05 - 0.2 | 0.05 - 0.2 | 0.2 - 0.4 | - | 0.05 - 0.2 | - |
| | | Priority on wear resistance | T3130 | 100 - 180 | 0.05 - 0.2 | - | 0.2 - 0.4 | - | 0.05 - 0.2 | - |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. < 250 HB | First choice | AH3135 AH130 | 80 - 200 | 0.1 - 0.25 | - | 0.2 - 0.5 | 0.1 - 0.2 | - | - |
| | | Priority on wear resistance | AH120 | 150 - 250 | 0.1 - 0.25 | 0.1 - 0.2 | 0.2 - 0.5 | - | 0.1 - 0.25 | - |
| K | Grey cast irons FC25, FC300, etc. 250, 300, etc. | First choice | T1215 | 180 - 300 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on impact resistance | AH120 | 150 - 250 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | Ductile cast irons FCD400, FCD600, etc. 400-15S, 600-3, etc. | First choice | T1215 | 120 - 200 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on impact resistance | AH120 | 100 - 180 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| N | Aluminium alloys Si < 13 % | - | DS1100 KS05F | 300 - 1000 | - | - | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | DS1100 KS05F | 80 - 300 | - | - | - | - | - | 0.05 - 0.2 |
| | Copper alloys | - | DS1100 KS05F | 200 - 500 | - | - | - | - | - | 0.05 - 0.2 |

### Notes for use of HJ-type inserts

**HJ-type inserts can be used for high feed machining.**
**When using the insert, care should be taken with the following:**

- The maximum depth of cut is *ap* = 2 mm. Select feeds within the above value.
- Do not use the HJ-type inserts with other types (such as MJ- and MS-types) in the same body.
- The outer shape of the HJ-type insert is different from those of other types (such as MJ- and MS-types), but the insert can be held in the same insert pocket.




### Notes on use of wiper insert

- When requiring good surface finishes, use of a wiper insert (WWCW13T3AF_ R-W_ ) is recommended. In general, installing one wiper insert delivers superior surface finishes.
- When using the wiper insert, install the insert as shown in Fig. A. If the insert is installed as shown in Fig. B, breakage of the insert is inevitable and normal surface finish can not be obtained.
- The wiper insert must not be used together with HJ-type inserts
- The wiper insert has one wiping corner.
- The peripheral cutting edge of the wiper insert is retracted from the edge of the normal inserts. Therefore, the feed per tooth (*fz* mm/t) of the normal insert following the wiper insert is double that of other inserts.
- When using the wiper insert, depth of cut (*ap*) less than 1 mm is recommended.

Fig. A

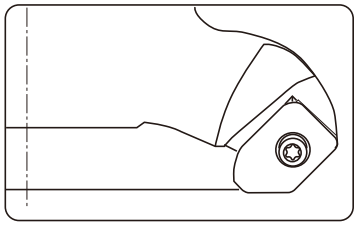
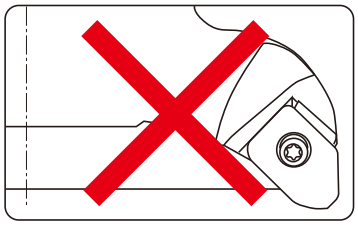


Fig. B



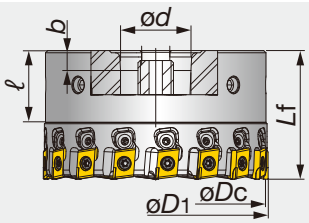
| ISO | Workpiece material | Priority | Grade | Cutting speed *vc* (m/min) | Light cutting to finishing (Depth of cut: ≤ 1.0 mm) Feed per tooth: *fz* (mm/t) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MJ | ML | HJ | MS | Flat | AJ |
| P | Mild and low carbon steels SS400, etc. E275A, etc. < 180 HB | First choice | AH3135 AH120 | 100 - 270 | 0.05 - 0.25 | 0.05 - 0.2 | 0.2 - 0.6 | 0.1 - 0.2 | 0.05 - 0.25 | - |
| | | Priority on wear resistance | T3130 | 150 - 300 | 0.05 - 0.25 | - | 0.2 - 0.6 | - | 0.05 - 0.25 | - |
| | | Priority on surface quality | NS740 | 100 - 300 | 0.05 - 0.2 | - | - | - | 0.05 - 0.2 | - |
| | Carbon and alloy steels S45C, SCM440, etc. C45, 42CrMo4, etc. < 300 HB | First choice | AH3135 AH120 | 100 - 230 | 0.05 - 0.2 | 0.05 - 0.15 | 0.2 - 0.5 | - | 0.05 - 0.2 | - |
| | | Priority on wear resistance | T3130 | 150 - 280 | 0.05 - 0.2 | - | 0.2 - 0.5 | - | 0.05 - 0.2 | - |
| | | Priority on surface quality | NS740 | 100 - 230 | 0.05 - 0.18 | - | - | - | 0.05 - 0.18 | - |
| | Die steels X96CrMoV12, etc. < 30 HRC | First choice | AH3135 AH120 | 100 - 180 | 0.05 - 0.18 | 0.05 - 0.12 | 0.2 - 0.4 | - | 0.05 - 0.18 | - |
| | | Priority on wear resistance | T3130 | 100 - 180 | 0.05 - 0.18 | - | 0.2 - 0.4 | - | 0.05 - 0.18 | - |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. < 250 HB | First choice | AH3135 AH130 | 80 - 200 | 0.1 - 0.2 | - | 0.2 - 0.5 | 0.1 - 0.18 | - | - |
| | | Priority on wear resistance | AH120 | 150 - 250 | 0.1 - 0.2 | 0.1 - 0.18 | 0.2 - 0.5 | - | 0.1 - 0.2 | - |
| K | Grey cast irons FC25, FC300, etc. 250, 300, etc. | First choice | T1215 | 180 - 300 | 0.1 - 0.2 | - | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | | Priority on impact resistance | AH120 | 150 - 250 | 0.1 - 0.2 | 0.05 - 0.18 | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | Ductile cast irons FCD400, FCD600, etc. 400-15S, 600-3, etc. | First choice | T1215 | 120 - 200 | 0.1 - 0.2 | - | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| | | Priority on impact resistance | AH120 | 100 - 180 | 0.1 - 0.2 | 0.05 - 0.18 | 0.2 - 0.6 | - | 0.1 - 0.2 | - |
| N | Aluminium alloys Si < 13 % | - | DS1100 KS05F | 300 - 1000 | - | - | - | - | - | 0.05 - 0.2 |
| | Aluminium alloys Si ≥ 13% | - | DS1100 KS05F | 80 - 300 | - | - | - | - | - | 0.05 - 0.2 |
| | Copper alloys | - | DS1100 KS05F | 200 - 500 | - | - | - | - | - | 0.05 - 0.2 |

Notes:
- When cutting at a large depth of cut or a large cutting width, the cutting speed (*vc*) and feed (*fz*) should be set to the lower side of the values shown in the above table.
- Dry cutting (or air-blowing) is generally recommended. However, when chips tend to excessively adhere to the cutting edges when machining stainless steel, use a water soluble cutting fluid. In this case, use the AH130 grade at speeds lower than *vc* = 100 m/min.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- TAW13 type TAC mills cannot be used for axial-feed cutting such as ramping, plunging and drilling.

TUNGSMILL SPEED

## TPYP12

High speed milling cutter with PCD insert for non ferrous materials




| Designation | øDc | øD1 | z | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPYP12M050B22.0R08 | 50 | 51.4 | 8 | 55 | 22 | 20 | 10.4 | 6.3 | 0.9 | with | YPEB12X3-*P... |
| TPYP12M063B22.0R10 | 63 | 64.4 | 10 | 55 | 22 | 20 | 10.4 | 6.3 | 1.3 | with | YPEB12X3-*A... |
| TPYP12M080B27.0R12 | 80 | 81.4 | 12 | 58 | 27 | 22 | 12.4 | 7 | 2.2 | with | YPEB12X3-*A... |
| TPYP12J080B25.4R12 | 80 | 81.4 | 12 | 58 | 25.4 | 26 | 9.5 | 6 | 2.2 | with | YPEB12X3-*A... |
| TPYP12M100B32.0R16 | 100 | 101.4 | 16 | 58 | 32 | 25 | 14.4 | 8 | 1.9 | with | YPEB12X3-*A... |
| TPYP12J100B31.7R16 | 100 | 101.4 | 16 | 58 | 31.75 | 32 | 12.7 | 8 | 1.9 | with | YPEB12X3-*A... |
| TPYP12M125B40.0R20 | 125 | 126.4 | 20 | 58 | 40 | 28 | 16.4 | 9 | 2.9 | with | YPEB12X3-*A... |
| TPYP12J125B38.1R20 | 125 | 126.4 | 20 | 58 | 38.1 | 38 | 15.9 | 10 | 2.9 | with | YPEB12X3-*A... |

*D1: Outside diameter
Dc: diameter with 01 type insert

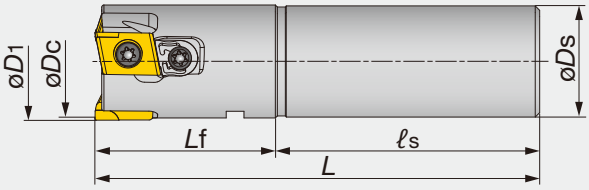
### SPARE PARTS

| Designation | Clamping screw | Wrench | Locator fixing screw | Locator | Wrench | Cover | Center bolt |
|---|---|---|---|---|---|---|---|
| TPYP12M050B22.0R08 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | - | RSFTS-050M |
| TPYP12M063B22.0R10 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6063M | VC004762I10035F |
| TPYP12M080B27.0R12 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6080 | VC00TEDI12040F |
| TPYP12J080B25.4R12 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6080 | VC00TEDI12040F |
| TPYP12M100B32.0R16 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6100 | VC00TANG16040F |
| TPYP12J100B31.7R16 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6100 | VC00TANG16040F |
| TPYP12M125B40.0R20 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6125 | VC00TEDI20040F |
| TPYP12J125B38.1R20 | VX040024A | T-15F | RSRGR5M40 | RSFTC1008 | T-8F | RSFTS6125 | VC00TEDI20040F |

TUNGSMILL SPEED

## EPYP12

High speed milling endmill with PCD insert for non ferrous materials




| Designation | øDc | øD1 | z | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EPYP12M025C25.0R03 | 25 | 26.4 | 3 | 25 | 100 | 50 | 50 | 0.4 | with | YPEB12X3-*P... |
| EPYP12M032C25.0R05 | 32 | 33.4 | 5 | 25 | 100 | 45 | 55 | 0.5 | with | YPEB12X3-*P... |

*D1: Outside diameter
Dc: diameter with 01 type insert

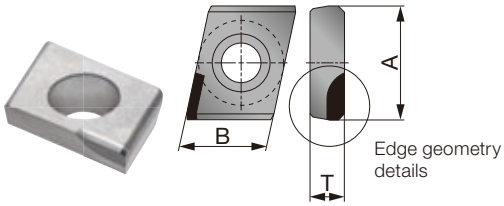
### SPARE PARTS

| Designation | Clamping screw | Wrench | Locator fixing screw | Locator | Wrench |
|---|---|---|---|---|---|
| EPYP12M025C25.0R03 | VX040024A | T-15F | VX040028A | RSFTC1011 | T-8F |
| EPYP12M032C25.0R05 | VX040024A | T-15F | RSRGR5M40 | RSFTC1009 | T-8F |

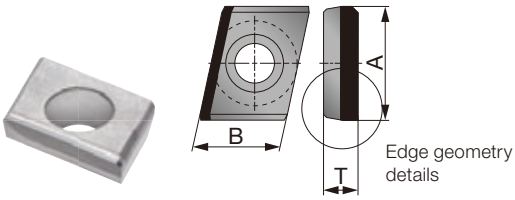
Face Milling

## INSERT

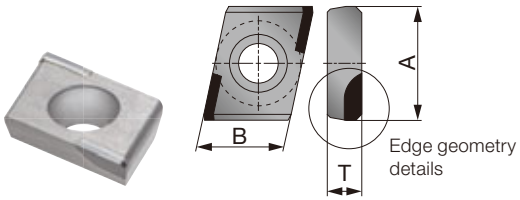
### YPEB12X3-1A/P



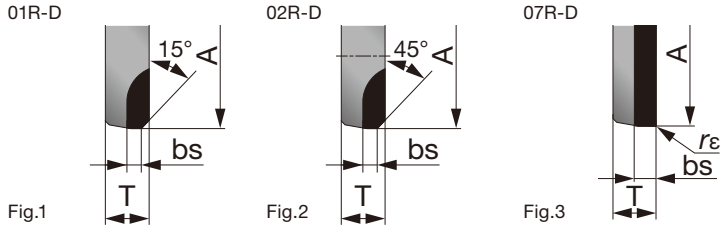

### YPEB12X-FP




### YPEB12X3-2A/P




### Edge geometry details




| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | ★ |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | No. of corner | rε | Max. ap | PCD DX160 | A | B | T | bs | Applicable cutter diameters | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| YPEB12X3-1A01R-D | 1 | - | 4 | ● | 12.77 | 9.525 | 3.85 | 1.59 | Dc>ϕ50mm | 1 |
| YPEB12X3-1A02R-D | 1 | - | 4 | ● | 12.756 | 9.525 | 3.85 | 1.29 | Dc>ϕ50mm | 2 |
| YPEB12X3-1A07R-D | 1 | 0.4 | 4 | ● | 12.756 | 9.525 | 3.85 | 1.34 | Dc>ϕ50mm | 3 |
| YPEB12X3-1P02R-D | 1 | - | 4 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 2 |
| YPEB12X3-1P07R-D | 1 | 0.4 | 4 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 3 |
| YPEB12X3-FP02R-D | 1 | - | 11 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 2 |
| YPEB12X3-FP07R-D | 1 | 0.4 | 11 | ● | 12.817 | 9.525 | 3.85 | 1.37 | Dc≤ϕ50mm | 3 |
| YPEB12X3-2A01R-D | 2 | - | 4 | ● | 12.8 | 9.525 | 3.868 | 1.59 | Dc>ϕ50mm | 1 |
| YPEB12X3-2A02R-D | 2 | - | 4 | ● | 12.8 | 9.525 | 3.868 | 2.07 | Dc>ϕ50mm | 2 |
| YPEB12X3-2A07R-D | 2 | 0.4 | 4 | ● | 12.8 | 9.525 | 3.868 | 2.07 | Dc>ϕ50mm | 3 |
| YPEB12X3-2P07R-D | 2 | 0.4 | 4 | ● | 12.876 | 9.525 | 3.85 | 2.07 | Dc≤ϕ50mm | 3 |

●: Line up

Package quantity : 2pcs.

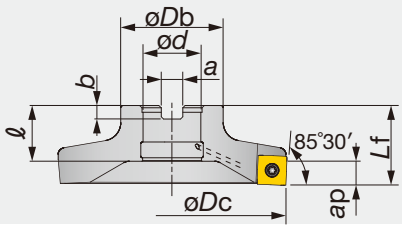
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting Speed Vc (m/min) | Feed per tooth fz (mm/z) |
|---|---|---|---|---|
| N | Aluminum cast Si<13% | DX160 | ≤6000 | 0.05 - 0.25 |
| | Aluminum cast Si≥13% | DX160 | ≤1500 | 0.05 - 0.25 |
| | Copper, brass, etc | DX160 | ≤2000 | 0.05 - 0.25 |
| | Non metalic material | DX160 | ≤3000 | 0.05 - 0.25 |

## TFE12R

86° face mills with screw clamped inserts for aluminum machining

A.R. = +13°, R.R. = +7°

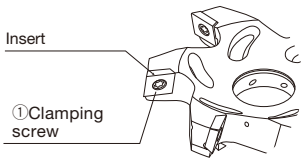



Air through type

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TFE12063R | 8 | 63 | 3 | 45 | 35 | 22 | 19 | 10 | 6 | 0.34 | with | SEG*12X4... |
| TFE12080R | 8 | 80 | 4 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 0.45 | with | SEG*12X4... |
| TFE12100R | 8 | 100 | 6 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 0.59 | with | SEG*12X4... |
| TFE12125R | 8 | 125 | 6 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 0.9 | with | SEG*12X4... |

### SPARE PARTS

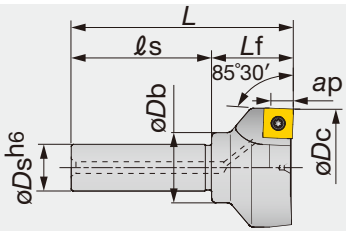
| Designation | ① Clamping screw | Lubricant | Shell locking bolt | Shell locking bolt 1 | Wrench |
|---|---|---|---|---|---|
| TFE12063R | CSPB-4S | M-1000 | - | CM10X30H | IP-15D |
| TFE12080R | CSPB-4S | M-1000 | TMBA-M12H | - | IP-15D |
| TFE12100R | CSPB-4S | M-1000 | TMBA-M12H | - | IP-15D |
| TFE12125R | CSPB-4S | M-1000 | TMBA-M12H | - | IP-15D |




## EFE12R

86° endmills with screw clamped inserts for aluminum machining

A.R. = +13°, R.R. = +7°

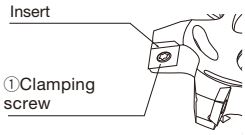



Air through type

| Designation | Max. ap | øDc | z | øDs | øDb | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EFE12050R | 8 | 50 | 3 | 20 | 30 | 60 | 35 | 95 | 0.37 | with | SEG*12X4... |

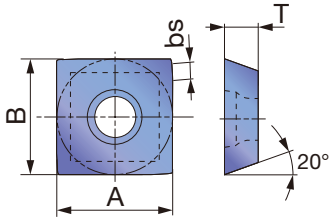
### SPARE PARTS

| Designation | ① Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EFE12000R | CSPB-4S | M-1000 | IP-15D |

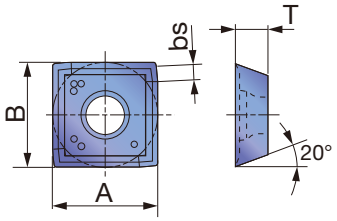


## INSERT

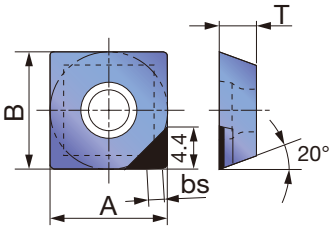
### SEGW12X4ZEPR / ZEFR



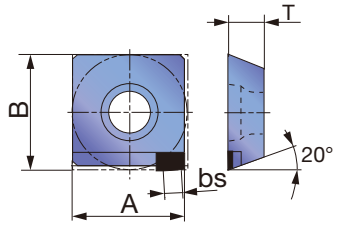

### SEGT12X4-AJ



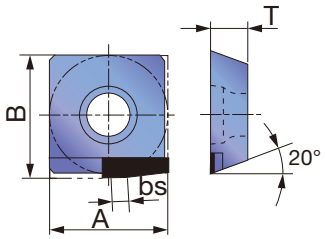

### SEGW12X4ZEFR-D




### SEGW12X4ZEFR-WD




### SEGW12X4ZEFR-BD




| | | Coated | | | Cermet | Un-coated | PCD |
|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | | |
| M | Stainless | | ★ | | | | |
| K | Cast iron | ★ | | | | | |
| N | Non-ferrous | | | ★ | | ★ | ★ |
| S | Superalloys | ★ | | | | | |
| H | Hard materials | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | AH140 | DS1100 | NS740 | KS05F | DX140 | A | B | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SEGW12X4ZEFR | 8 | | | | | ● | | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEPR | 8 | ● | ● | | ● | | | 12.7 | 12.7 | 4 | 1.4 |
| SEGT12X4ZEFR-AJ | 8 | | | ● | | ● | | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEFR-D | 3.5 | | | | | | ● | 12.7 | 12.7 | 4 | 1.8 |
| SEGW12X4ZEFR-WD | - | | | | | | ● | 12.4 | 12.8 | 4 | 2 |
| SEGW12X4ZEFR-BD | - | | | | | | ● | 12.4 | 13.1 | 4 | 1.8 |

●: Line up

DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Designation | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| P | Carbon steels and alloy steels < 300HB | AH120 | SEGW12X4ZEPR | 100 ~ 180 | 0.03 ~ 0.15 |
| | | NS740 | SEGW12X4ZEPR | 100 ~ 180 | 0.03 ~ 0.15 |
| M | Stainless steels < 250HB | AH140 | SEGW12X4ZEPR | 80 ~ 180 | 0.03 ~ 0.15 |
| K | Grey and ductile cast irons | AH120 | SEGW12X4ZEPR | 100 ~ 200 | 0.03 ~ 0.15 |
| N | Cast aluminium alloy / Die-cast Si < 13% | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Cast aluminium alloy / Die-cast Si ≥ 13% | KS05F | SEGT12X4ZEFR-AJ | 80 ~ 200 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 500 | 0.05 ~ 0.2 |
| | Aluminium alloy Tensile strength < 350 N/mm$^2$ | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Aluminium alloy Tensile strength > 350 N/mm$^2$ | KS05F | SEGW12X4ZEFR | 200 ~ 1500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 1500 | 0.05 ~ 0.2 |
| | Copper alloy | KS05F | SEGT12X4ZEFR-AJ | 200 ~ 500 | 0.05 ~ 0.2 |
| | | DX140 | SEGW12X4ZEFR-D | 200 ~ 500 | 0.05 ~ 0.2 |

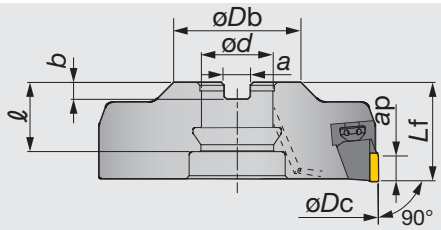
Notes:

- In milling aluminium and copper alloys:
  (1) For improved surface finish, use together with wiper insert SEGW12X4ZEFR-WD
  (2) For reducing burr occurrence, use together with deburring inserts SEGW12X4ZEFR-BD
- When milling aluminium and copper alloys, use of a water soluble cutting fluid is recommended. When milling steels, cast irons, and stainless steels, dry cutting is recommended.
- When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

## DPD09

Light weight square mills with PCD inserts for alminum machining

A.R. = +8.5°, R.R. = +3° ~ +5°

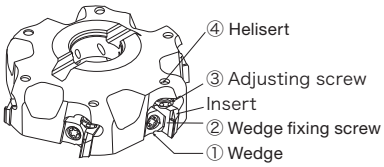



Air through type

| Designation | Max. ap | øDc | z | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPD09080R | 7 | 80 | 4 | 50 | 41 | 25.4 | 23 | 9.5 | 6 | 0.8 | with | YDEN0905... |
| DPD09080RB | 7 | 80 | 6 | 50 | 41 | 25.4 | 28.5 | 9.5 | 6 | 0.82 | with | YDEN0905... |
| DPD09100R | 7 | 100 | 6 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 1.13 | with | YDEN0905... |
| DPD09100RB | 7 | 100 | 8 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 1.17 | with | YDEN0905... |
| DPD09125R | 7 | 125 | 6 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 1.7 | with | YDEN0905... |
| DPD09125RB | 7 | 125 | 10 | 50 | 35 | 25.4 | 24.5 | 9.5 | 6 | 1.77 | with | YDEN0905... |
| DPD09160R | 7 | 160 | 8 | 60 | 52 | 31.75 | 40 | 12.7 | 8 | 3.28 | with | YDEN0905... |
| DPD09160RB | 7 | 160 | 12 | 60 | 52 | 31.75 | 40 | 12.7 | 8 | 3.25 | with | YDEN0905... |

### SPARE PARTS

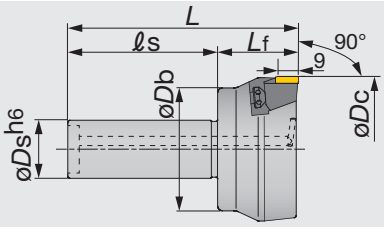
| Designation | ① Wedge | ② Wedge fixing screw | ③ Adjusting screw | ④ Helisert | Center bolt | Center bolt 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|
| DPD09080R* | FW-304R-T | FDS-8ST-18 | AJM5 | LM5-0.8X1DNS | - | CM12X30H | T-27T | T-7F |
| DPD09100R* | FW-304R-T | FDS-8ST-18 | AJM5 | LM5-0.8X1DNS | TMBA-M12H | - | T-27T | T-7F |
| DPD09125R* | FW-304R-T | FDS-8ST-18 | AJM5 | LM5-0.8X1DNS | TMBA-M12H | - | T-27T | T-7F |
| DPD09160R* | FW-304R-T | FDS-8ST-18 | AJM5 | LM5-0.8X1DNS | TMBA-M16H | - | T-27T | T-7F |




## EDPD09

Light weight square endmills with PCD inserts for alminum machining

A.R. = +8.5°, R.R. = +3°

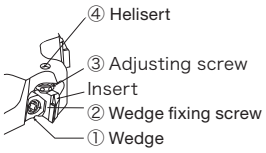



Air through type

| Designation | Max. ap | øDc | z | øDs | øDb | ℓs | Lf | L | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EDPD09063R | 7 | 63 | 3 | 25 | 37 | 60 | 40 | 100 | 0.75 | with | YDEN0905... |

### SPARE PARTS

| Designation | ① Wedge | ② Wedgte fixing screw | ③ Adjusting screw | ④ Helisert | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| EDPD09063R | FW-304R-T | FDS-8SST | AJM5 | LM5-0.8X1DNS | T-27T | T-7F |

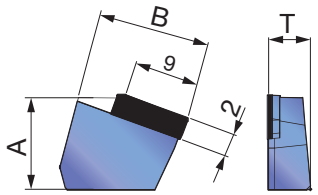



Reference pages

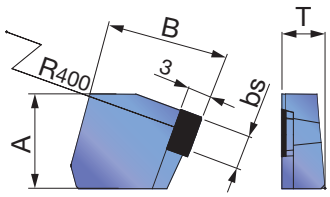
Inserts → **D156**, Standard cutting conditions → **D157**

## INSERT

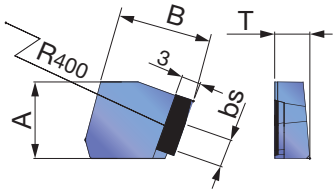
### YDEN0905PDFR-D




### YDEN0905PDFR-WD




### YDEN0905PDFR-BD




| | | | |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | ★ | |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | PCD DX140 | A | B | T | bs |
|---|---|---|---|---|---|---|
| YDEN0905PDFR-D | 7 | ● | 12.4 | 15.1 | 5.7 | - |
| YDEN0905PDFR-WD | - | ● | 12.4 | 15.2 | 5.7 | 4.5 |
| YDEN0905PDFR-BD | - | ● | 12.4 | 15.2 | 5.7 | 4.5 |

Note: As a principle, our company re-grinds these inserts.

●: Line up

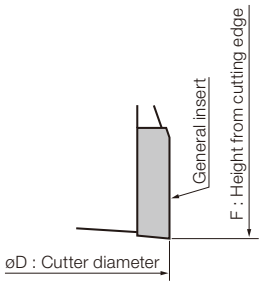
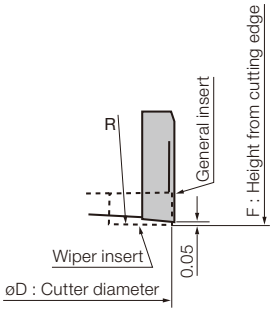
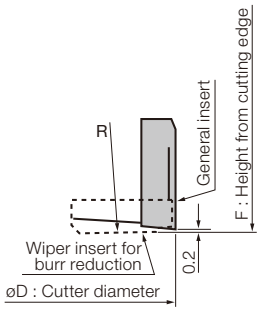
Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Designation | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|
| N | Aluminium alloy castings & die castings Si < 13% | DX140 | YDEN0905PDFR-D | 500 ~ 4000 | 0.05 ~ 0.2 |
| | Aluminium alloy castings & die castings Si ≥ 13% | DX140 | YDEN0905PDFR-D | 200 ~ 500 | 0.05 ~ 0.2 |
| | Rolled aluminium alloys | DX140 | YDEN0905PDFR-D | 500 ~ 4000 | 0.05 ~ 0.2 |
| | Copper alloys | DX140 | YDEN0905PDFR-D | 200 ~ 500 | 0.05 ~ 0.2 |

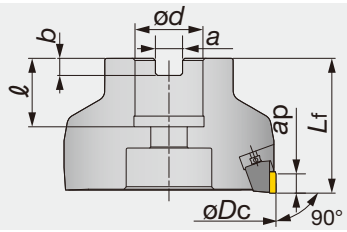
Notes:
(1) When requiring improved surface finish, use the wiper insert together with regular inserts YDEN0905PDFR-WD.
(2) When requiring reduced burr occurrence, use the deburring inserts together with regular inserts YDEN0905PDFR-BD.
(3) When using the cutter at speeds over 1500m/min, use an arbor or tool-holder balanced to within G16.
(4) Wet cutting, using a water soluble cutting fluid, is recommended.
(5) When the length-to-diameter overhang ratio of the tool (L/D) exceeds 3, reduce cutting speed and feed to 70 to 80% of the values given in the table.

## HOW TO PUT EACH INSERT TOGETHER

| | | For general | Accuracy of machining surface priority | Burr reduction priority |
|---|---|---|---|---|
| Applicable insert | General insert YDEN0905PDFR-D | ◎ | ◎ | ◎ |
| | Wiper insert YDEN0905PDFR-WD | – | ◎ | – |
| | Wiper insert for burr reduction YDEN0905PDFR-BD | – | – | ◎ |
| | Number of Inserts by type | All general | 1 or 2 wiper inserts in cutter body | General insert : Burr wiper insert = 1 : 1 |
| Specification of insert setting | |  |  |  |
| Accuracy of machining surface (roughness and undulation) | | △ | ◎ | ○ |
| Burr of machining surface | | △ | ○ | ◎ |

## High precision shoulder square mills with PCD inserts for aluminum machining

A.R. = +7° ~ +8.5°, R.R. = 0° ~ +5°

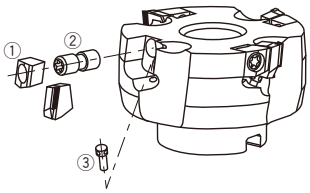



Right hand (R) shown.

| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| DPD24063R | 7 | 63 | 4 | 40 | 22 | 20 | 10 | 6 | 0.6 | YDEN2405... |
| DPD24080R | 7 | 80 | 4 | 50 | 25.4 | 26 | 9.5 | 6 | 1.1 | YDEN2405... |
| DPD24100R | 7 | 100 | 4 | 50 | 31.75 | 32 | 12.7 | 8 | 2.1 | YDEN2405... |
| DPD24125R | 7 | 125 | 6 | 50 | 38.1 | 38 | 15.9 | 10 | 3.2 | YDEN2405... |
| DPD24160R | 7 | 160 | 6 | 63 | 50.8 | 38 | 19 | 11 | 4.8 | YDEN2405... |

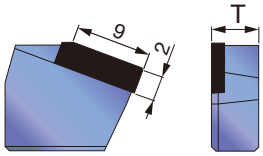
### SPARE PARTS

| Designation | ③ Adjusting screw | ② Wedge fixing screw | ① Wedge | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| DPD24063R | ASM34L | FDS-8ST-18 | FW-242R | T-27T | T-6F |
| DPD24080R,100R | ASM34L | FDS-8ST | FW-243R | T-27T | T-6F |
| DPD24125R,160R | ASM34L | FDS-8ST | FW-245R | T-27T | T-6F |

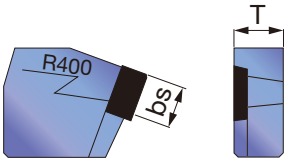



## INSERTS

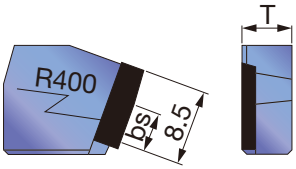
### YDEN2405PDFR-D




### YDEN2405PDFR-WD




### YDEN2405PDFR-BD




| | | PCD |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | ★ |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | DX140 | T | bs |
|---|---|---|---|---|
| YDEN2405PDFR-D | 7 | ● | 5.6 | - |
| YDEN2405PDFR-WD | - | ● | 5.6 | 4.5 |
| YDEN2405PDFR-BD | - | ● | 5.6 | 4.5 |

●: Line up

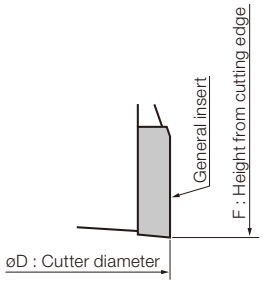
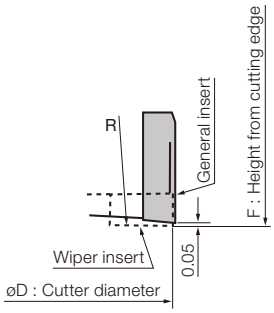
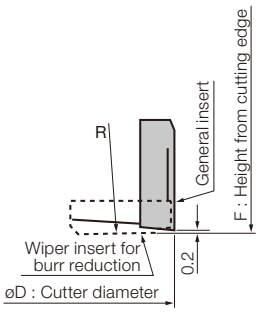
Package quantity = 1pcs.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece materials | Grades | Roughing | | Finishing | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| N | Aluminium alloys (Si < 13%) | DX140 | 200 ~ 1500 | 0.05 ~ 0.2 | 200 ~ 1500 | 0.05 ~ 0.25 |
| | Aluminium alloys (Si ≥ 13%) | DX140 | 200 ~ 400 | 0.05 ~ 0.2 | 200 ~ 400 | 0.05 ~ 0.25 |
| | Copper alloys | DX140 | 200 ~ 500 | 0.05 ~ 0.2 | 200 ~ 500 | 0.05 ~ 0.25 |

Note :
- Use of water-soluble cutting fluid is recommended.
- Dry cutting is also possible. However, wet cutting excels in chipbreaking and attaining superior surface quality.
- DPD24-type is not designed to cope with the centrifugal force and dynamic balance at high speed over 1,500 m/min. Therefore, the cutting speed in the outer diameter of mill should not exceed 1,500m/min.

## HOW TO PUT EACH INSERT TOGETHER

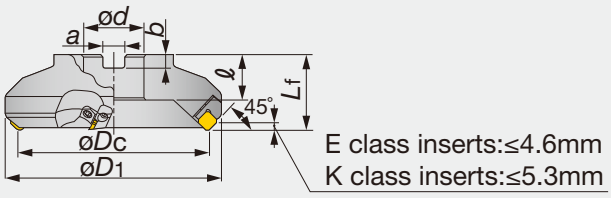
| | | For general | Accuracy of machining surface priority | Burr reduction priority |
|---|---|---|---|---|
| Applicable insert | General insert YDEN2405PDFR-D | ◎ | ◎ | ◎ |
| | Wiper insert YDEN2405PDFR-WD | – | ◎ | – |
| | Wiper insert for burr reduction YDEN2405PDFR-BD | – | – | ◎ |
| | Number of Inserts by type | All general | 1 or 2 wiper inserts in cutter body | General insert : Burr wiper insert = 1 : 1 |
| Specification of insert setting | |   |   |   |
| Accuracy of machining surface (roughness and undulation) | | △ | ◎ | ○ |
| Burr of machining surface | | △ | ○ | ◎ |

Face Milling

## TME4400R/LI

45˚ face mills with wedge clamped high-posi square inserts

A.R. = +24˚, R.R. = -8˚ ~ -6˚




Right hand (R) shown.

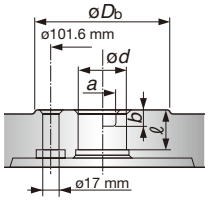
| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TME4403R/LI | 4 | 80 | 4 | 101.5 | 50 | 25.4 | 26 | 9.5 | 6 | 1.43 | SE*N1203 |
| TME4403RI-E | 4 | 80 | 4 | 101.5 | 50 | 27 | 26 | 12.4 | 7 | 1.43 | SE*N1203 |
| TME4404R/LI | 4 | 100 | 5 | 120.2 | 63 | 31.75 | 32 | 12.7 | 8 | 2.74 | SE*N1203 |
| TME4404RI-E | 4 | 100 | 5 | 120.2 | 63 | 32 | 32 | 14.4 | 8 | 2.74 | SE*N1203 |
| TME4405R/LI | 4 | 125 | 6 | 145.2 | 63 | 38.1 | 38 | 15.9 | 10 | 4.04 | SE*N1203 |
| TME4405RI-E | 4 | 125 | 6 | 145.2 | 63 | 40 | 32 | 16.4 | 9 | 4.04 | SE*N1203 |
| TME4406R/LI | 4 | 160 | 8 | 181.2 | 63 | 50.8 | 38 | 19 | 11 | 5.82 | SE*N1203 |
| TME4406RI-E | 4 | 160 | 8 | 181.2 | 63 | 40 | 29 | 16.4 | 9 | 5.82 | SE*N1203 |
| TME4408R/LI | 4 | 200 | 10 | 220.5 | 63 | 47.625 | 38 | 25.4 | 14 | 9.18 | SE*N1203 |
| TME4410R/LI | 4 | 250 | 12 | 269.8 | 63 | 47.625 | 38 | 25.4 | 14 | 16.64 | SE*N1203 |
| TME4412RI | 4 | 315 | 14 | 334.4 | 63 | 47.625 | 38 | 25.4 | 14 | 25.72 | SE*N1203 |

Note: Cutting edge height (*Lf*) is for when SEEN1203AG*N type inserts are used.

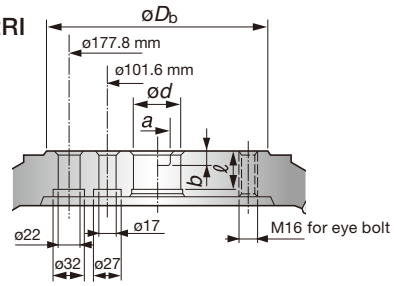
Face Milling

## Arbor type

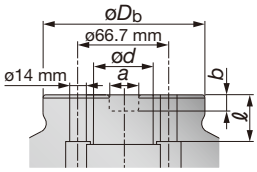
### TME4408/10R/LI




### TME4412RI

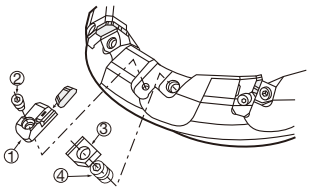



### TME4406RI-E




### SPARE PARTS

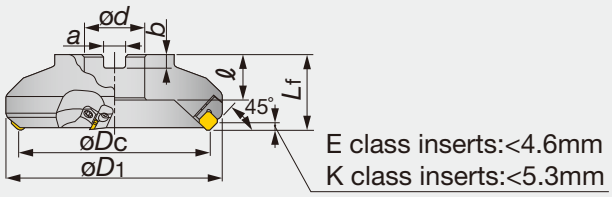
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TME4403RI | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4403LI | LE444L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4403RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4404RI | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4404LI | LE444L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4404RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4405RI | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4405LI | LE444L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4405RI-E | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4406RI | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4406LI | LE446L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4406RI-E | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4408RI | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4408LI | LE446L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4410RI | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4410LI | LE446L | FDS-8S | CM4X0.7X14 | WF444L | TP-4 |
| TME4412RI | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |



## TME4400RB

45˚ high dense face mills with wedg clamped high-posi square inserts

A.R. = +24˚, R.R. = -8˚ ~ -6˚



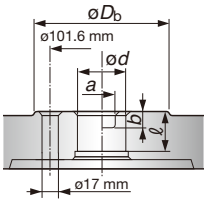

Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TME4463RB-E | 4 | 63 | 5 | 87.2 | 40 | 22 | 20 | 10.4 | 6.3 | 1.0 | SE*N1203 |
| TME4403RB | 4 | 80 | 6 | 101.5 | 50 | 25.4 | 26 | 9.5 | 6 | 1.43 | SE*N1203 |
| TME4403RB-E | 4 | 80 | 6 | 101.5 | 50 | 27 | 26 | 12.4 | 7 | 1.43 | SE*N1203 |
| TME4404RB | 4 | 100 | 7 | 120.2 | 63 | 31.75 | 32 | 12.7 | 8 | 2.77 | SE*N1203 |
| TME4404RB-E | 4 | 100 | 7 | 120.2 | 63 | 32 | 32 | 14.4 | 8 | 2.77 | SE*N1203 |
| TME4405RB | 4 | 125 | 9 | 145.2 | 63 | 38.1 | 38 | 15.9 | 10 | 4.06 | SE*N1203 |
| TME4405RB-E | 4 | 125 | 9 | 145.2 | 63 | 40 | 32 | 16.4 | 9 | 4.06 | SE*N1203 |
| TME4406RB | 4 | 160 | 12 | 181.2 | 63 | 50.8 | 38 | 19 | 11 | 5.86 | SE*N1203 |
| TME4406RB-E | 4 | 160 | 12 | 181.2 | 63 | 40 | 29 | 16.4 | 9 | 5.86 | SE*N1203 |
| TME4408RB | 4 | 200 | 15 | 220.5 | 63 | 47.625 | 38 | 25.4 | 14 | 9.24 | SE*N1203 |

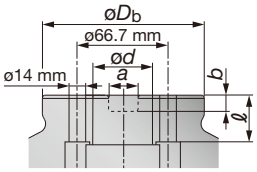
Note: Cutting edge height (*Lf*) is for when SEEN1203AG*N type inserts are used.

## Arbor type

### TME4408RB

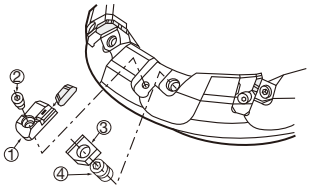



### TME4406RB-E




### SPARE PARTS

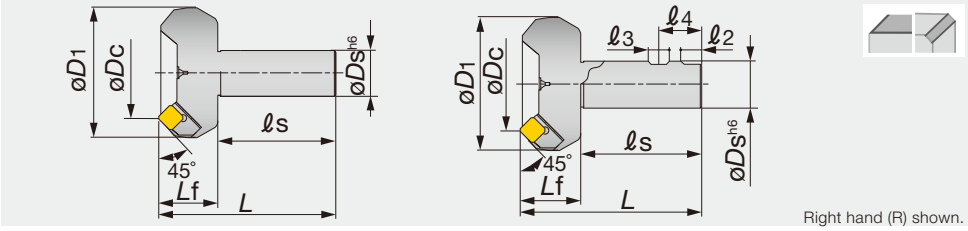
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TME4463RB-E | LE444R | DS-8 | CM4X0.7X14 | WT402R | TP-4 |
| TME4403RB | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4404RB | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4405RB | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4406RB | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4403 - 06RB-E | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |
| TME4408RB | LE446R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |



## EME4400

45° endmills with wedg clamped high-posi square inserts

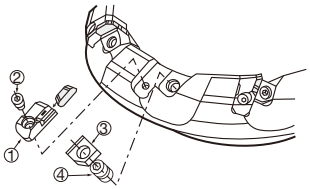
A.R. = +24°, R.R. = -13° ~ -8°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | ℓ2 | ℓ3 | ℓ4 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EME4450R | 4 | 50 | 3 | 73.4 | 32 | 80 | 40 | 120 | - | - | - | SE*N1203... |
| EME4463R | 4 | 63 | 4 | 87.2 | 32 | 80 | 40 | 120 | - | - | - | SE*N1203... |
| EME4403RI | 4 | 80 | 5 | 101.5 | 32 | 80 | 40 | 120 | 19 | 14 | 36 | SE*N1203... |
| EME4404RI | 4 | 100 | 5 | 120.2 | 32 | 80 | 40 | 120 | 19 | 14 | 36 | SE*N1203... |

### SPARE PARTS

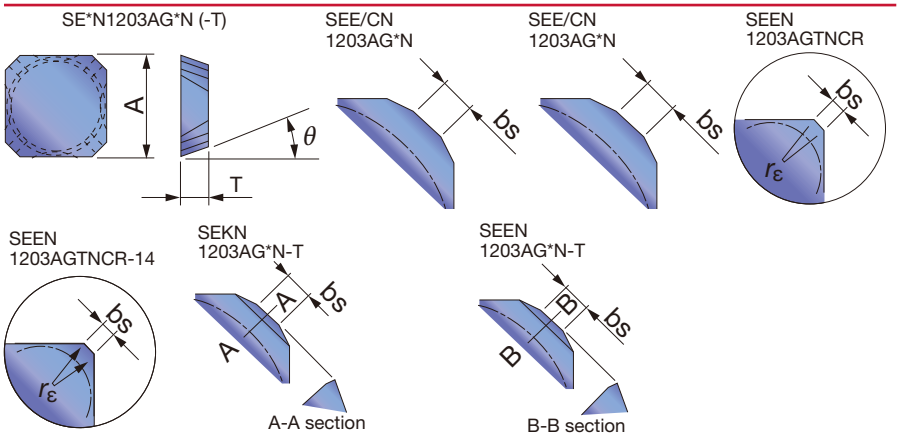
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| EME4400 | LE444R | FDS-8S | CM4X0.7X14 | WF444R | TP-4 |




Face Milling

## INSERT

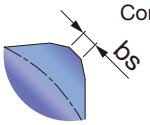
### SECN/SEEN/SEKN 1203




### SEKR1203-MJ

SEKR1203AGSR-MJ
SEKR1203AGPN-MS

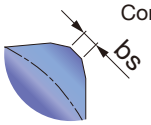
Corner detalls




### SEKR1203-MS

SEKR1203AGSR-MJ
SEKR1203AGPN-MS

Corner detalls




| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ☆ | | ★ | | ★ | | ☆ | | |
| M | Stainless | | ★ | ☆ | ☆ | ☆ | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ★ | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated | | | | | | | Cermet | Uncoated | | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | UX30 | TH10 | | | | |
| SECN1203AGFN | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGFN | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTN | 4 | ● | ● | ● | | ● | ● | | ● | ● | | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTN-T | 4 | | | | | | | ● | ● | ● | | 12.7 | 3.18 | 20 | 2.4 |
| SEEN1203AGTNCR | 4 | ● | ● | ● | ● | | | ● | | | | 12.7 | 3.18 | 20 | 1.6 |
| SEEN1203AGTNCR-14 | 4 | | | | | | | | ● | | | 12.7 | 3.18 | 20 | 1.4 |
| SEKN1203AGFN-T | 4 | | | | | | | | | | ● | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTN | 4 | ● | ● | ● | ● | ● | | ● | ● | ● | | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTN-T | 4 | | | | | ● | ● | ● | ● | ● | | 12.7 | 3.18 | 20 | 1.6 |
| SEKN1203AGTNCR | 4 | | | | | | | | ● | | | 12.7 | 3.18 | 20 | 1.6 |
| SEKR1203AGSR-MJ | 4 | ● | | | ● | ● | | ● | | | | 12.7 | 3.18 | 20 | 1.6 |
| SEKR1203AGPN-MS | 4 | | ● | ● | | | | | | | | 12.7 | 3.18 | 20 | 1.6 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | AH120 · T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

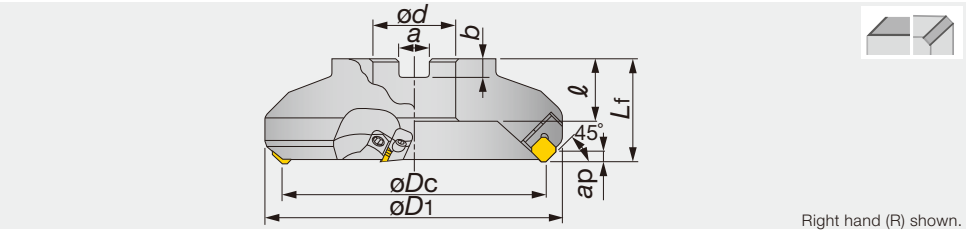
Notes:
- Dry cutting is recommended for all materials except for aluminium alloys.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

MEMO

## TME5400RI

45˚ face mills with wedge clamped high-posi square inserts

A.R. = +24˚, R.R. = -8˚ ~ -6˚

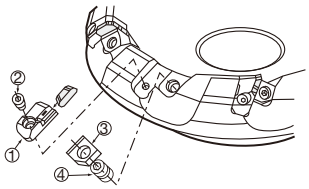



Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TME5404RI | 6 | 100 | 5 | 123.6 | 63 | 31.75 | 32 | 12.7 | 8 | 2.82 | SE**1504... |
| TME5405RI | 6 | 125 | 6 | 148.6 | 63 | 38.1 | 38 | 15.9 | 10 | 4.08 | SE**1504... |
| TME5406RI | 6 | 160 | 8 | 183 | 63 | 50.8 | 38 | 19 | 11 | 5.99 | SE**1504... |
| TME5408RI | 6 | 200 | 10 | 223 | 63 | 47.625 | 38 | 25.4 | 14 | 9.23 | SE**1504... |
| TME5410RI | 6 | 250 | 12 | 273 | 63 | 47.625 | 38 | 25.4 | 14 | 16.94 | SE**1504... |
| TME5412RI | 6 | 315 | 14 | 338 | 63 | 47.625 | 38 | 25.4 | 14 | 25.94 | SE**1504... |

**SPARE PARTS**

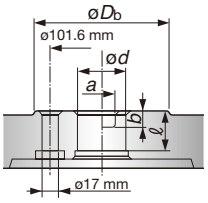
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TME5400RI | LE540R | FDS-8S | CM4X0.7X14 | WF540R | TP-4 |



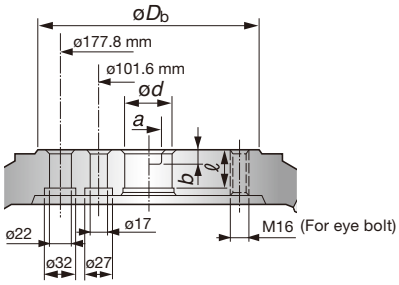

Face Milling

## Arbor type

### TME5408/10RI



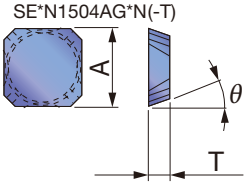

### TME5412RI



# INSERTS

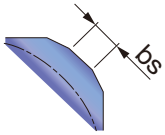
## SECN/SEEN/SEKN 1504

SE*N1504AG*N(-T)

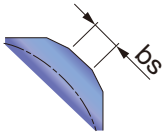



Corner details

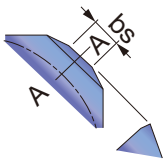
SEKN1504AG*N




SEEN1504AGTN



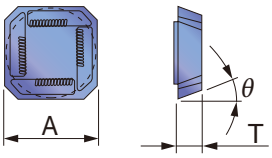

SEKN1504AGTN-T



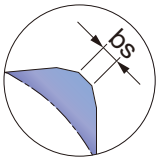

A-A section

## SEKR1504-MJ

SEKR1504AGSR-MJ
(With 3-dimensional chipbreaker)




Corner details




| | | Coated | | | | | Cermet | | Uncoated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | | NS740 | | TH10 | UX30 | |
| P | Steel | ☆ | | ★ | ★ | | ★ | | | ☆ | |
| M | Stainless | | ★ | | | | | | | | |
| K | Cast iron | ★ | | | | | | | | | |
| N | Non-ferrous | | | | | | | | ★ | | |
| S | Superalloys | ★ | | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | AH140 | GH330 | T3130 | | NS740 | | TH10 | UX30 | | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SEEN1504AGTN | 6 | | | | | | ● | | | ● | | 15.875 | 4.76 | 20 | 2.4 |
| SEKN1504AGFN | 6 | | | | | | | | ● | | | 15.875 | 4.76 | 20 | 1.6 |
| SEKN1504AGTN | 6 | ● | ● | ● | ● | | ● | | | ● | | 15.875 | 4.76 | 20 | 1.6 |
| SEKN1504AGTN-T | 6 | | | | ● | | ● | | | | | 15.875 | 4.76 | 20 | 1.6 |
| SEKR1504AGSR-MJ | 6 | | | ● | ● | | | | | | | 15.875 | 4.76 | 20 | 1.6 |

●: Line up

# STANDARD CUTTING CONDITIONS

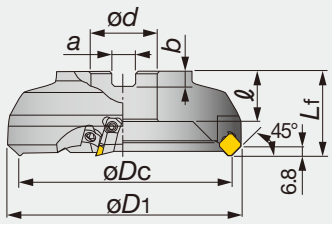
| ISO | Workpiece materials | Grades | Roughing (Depth of cut: 1.5 ~ 6 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels (< 180 HB) | NS740 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.33 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.35 | 180 ~ 300 | 0.1 ~ 0.35 |
| | Carbon steels Alloy steels (< 300 HB) | T3130 | 150 ~ 280 | 0.1 ~ 0.35 | 180 ~ 280 | 0.1 ~ 0.35 |
| | | AH120 · GH330 | 100 ~ 200 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.33 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.25 | 150 ~ 200 | 0.1 ~ 0.3 |
| | Die steels (< 30 HRC) | T3130 · AH120 | 100 ~ 150 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.2 |
| M | Stainless steels (< 250 HB) | AH140 | 80 ~ 180 | 0.15 ~ 0.3 | 100 ~ 200 | 0.15 ~ 0.33 |
| | | AH120 | 150 ~ 230 | 0.15 ~ 0.3 | 200 ~ 250 | 0.15 ~ 0.3 |
| K | Cast irons, Ductile cast irons | AH120 | 100 ~ 200 | 0.1 ~ 0.3 | 100 ~ 200 | 0.1 ~ 0.3 |
| N | Aluminium alloys (Si < 13%) | TH10 | 200 ~ 1000 | 0.05 ~ 0.3 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Note: • Dry cutting is recommended for all materials except for aluminium alloys.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TMD4400R/LI

45˚ face mills with wedge clamped square inserts

A.R. = +15˚, R.R. = -3˚



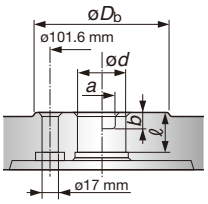

Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TMD4403R/LI | 4 | 80 | 4 | 96 | 50 | 25.4 | 26 | 9.5 | 6 | 1.4 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4404R/LI | 4 | 100 | 5 | 115 | 63 | 31.75 | 32 | 12.7 | 8 | 2.5 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4405R/LI | 4 | 125 | 6 | 139 | 63 | 38.1 | 38 | 15.9 | 10 | 3.60 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4406R/LI | 4 | 160 | 8 | 173 | 63 | 50.8 | 38 | 19 | 11 | 5.6 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4408R/LI | 4 | 200 | 10 | 213 | 63 | 47.625 | 38 | 25.4 | 14 | 8.7 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4410R/LI | 4 | 250 | 12 | 263 | 63 | 47.625 | 38 | 25.4 | 14 | 16.3 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TMD4412RI | 4 | 315 | 14 | 327 | 63 | 47.625 | 38 | 25.4 | 14 | 25.2 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

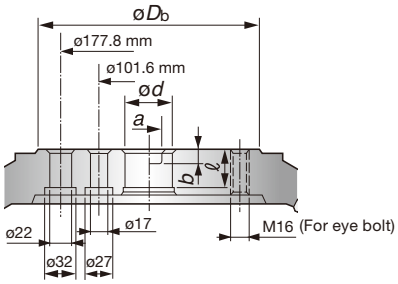
Face Milling

## Arbor type

**TMD4408/10R/LI**

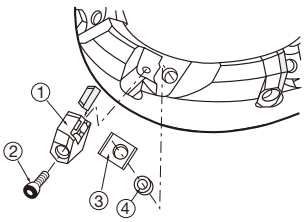



**TMD4412RI**




### SPARE PARTS

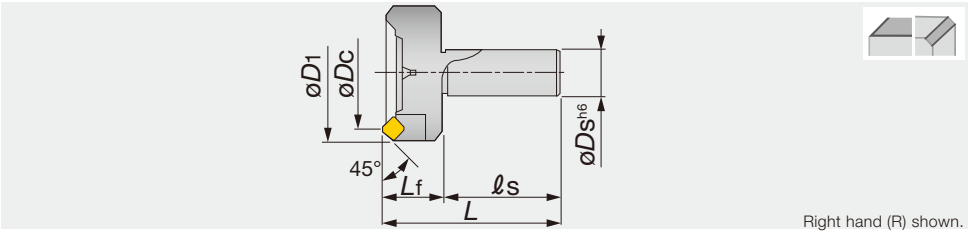
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TMD4403RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4403LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4404RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4404LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4405RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4405LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4406RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4406LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4408RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4408LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4410RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TMD4410LI | LD440L | FDS-8S | CM4X0.7X14 | WP440L | TP-4 |
| TMD4412RI | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |



## EMD4400RI

45° endmills with wedge clamped square inserts

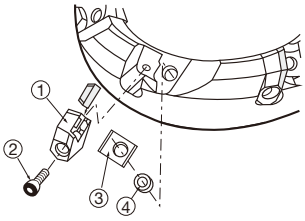
A.R. = +15°, R.R. = -3°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EMD4403RI-S32 | 4 | 80 | 4 | 95 | 32 | 80 | 40 | 120 | 2 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

### SPARE PARTS

| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| EMD4403RI-S32 | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |

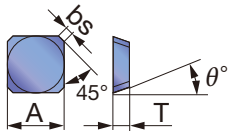



Face Milling

# INSERT

## SDCN/SDEN/SDKN 42Z

General inserts
SD*N42Z*N



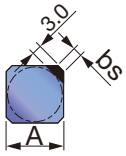

Corner details
SDKN42ZTN16

SD*N42ZTN20

SDKN42ZTNCR
SDEN42ZTNCR

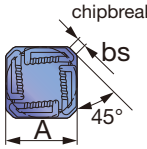
## SDCN42ZFN-DIA

SDCN42ZFN-DIA




## SDKR42Z-MJ

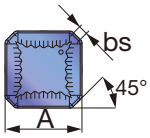
SDKR42ZSR-MJ
(With 3-dimensional chipbreaker)



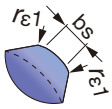

Corner details

## SDMR/SDKR 1203-MJ

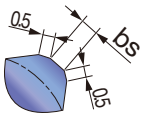
SD*R1203AETN-MJ
(With 3-dimensional chipbreaker)




Corner details
SDMR1203AETN-MJ

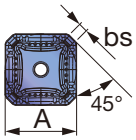



SDKR1203AETN-MJ

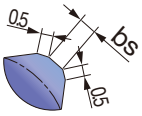



## SDKR42Z-MS

SDKR42ZPN-MS

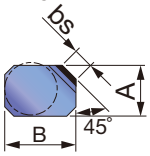



Corner details




## WDCN42ZFR-DIA

Wiper inserts
WDCN42ZFR-DIA




| | | Coated | | | | | | | | Cermet | | | Uncoated | | | PCD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | ☆ | | ★ | | ★ | ☆ | | ☆ | | | | | |
| M | Stainless | | ★ | ☆ | | | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | | ★ | | ★ | | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | A | B | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDCN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN | 4 | | | | | | | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN20 | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDEN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTN | 4 | ● | | ● | | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTNCR | 4 | ● | | ● | ● | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDEN42ZTN20 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDKN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTN | 4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTNCR | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKN42ZTN16 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDCN42ZFN-DIA | 2 | | | | | | | | | | | | ● | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKR42ZSR-MJ | 4 | ● | | | ● | ● | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDMR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR42ZPN-MS | 4 | | ● | ● | | | | | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| WDCN42ZFR-DIA | 0.5 | | | | | | | | | | | | ● | 12.2 | 15.64 | 3.18 | 15 | 4.9 |

●: Line up
DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

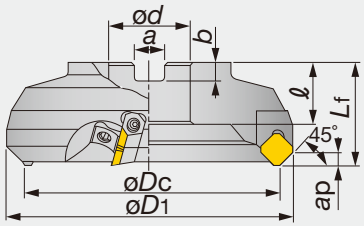
| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.25 | 100 ~ 150 | 0.1 ~ 0.28 |
| | Die steels<br>< 30 HRC | AH120 · T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.18 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Note: • Dry cutting is recommended for all materials except for aluminium alloys.
• Maximum depth of cut for DX140 SDCN42ZFN-DIA is 2 mm.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TMD5400RI

45˚ face mills with wedge clamped square inserts

A.R. = +15˚, R.R. = -3˚

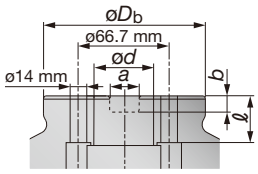



Right hand (R) shown.

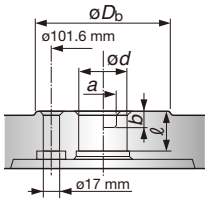
| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TMD5404RI | 6 | 100 | 4 | 118 | 63 | 31.75 | 32 | 12.7 | 8 | 2.5 | SD*N53Z... |
| TMD5404RI-E | 6 | 100 | 4 | 118 | 63 | 32 | 32 | 14.4 | 8 | 2.5 | SD*N53Z... |
| TMD5405RI | 6 | 125 | 6 | 142 | 63 | 38.1 | 38 | 15.9 | 10 | 2.5 | SD*N53Z... |
| TMD5405RI-E | 6 | 125 | 6 | 142 | 63 | 40 | 32 | 16.4 | 9 | 3.7 | SD*N53Z... |
| TMD5406RI | 6 | 160 | 6 | 176 | 63 | 50.8 | 38 | 19 | 11 | 5.8 | SD*N53Z... |
| TMD5406RI-E | 6 | 160 | 6 | 176 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SD*N53Z... |
| TMD5408RI | 6 | 200 | 8 | 216 | 63 | 47.625 | 38 | 25.4 | 14 | 9 | SD*N53Z... |
| TMD5408RI-E | 6 | 200 | 8 | 216 | 63 | 60 | 38 | 25.7 | 14 | 9 | SD*N53Z... |
| TMD5410RI | 6 | 250 | 10 | 265 | 63 | 47.625 | 38 | 25.4 | 14 | 16.3 | SD*N53Z... |
| TMD5410RI-E | 6 | 250 | 10 | 265 | 63 | 60 | 38 | 25.7 | 14 | 16.3 | SD*N53Z... |
| TMD5412RI | 6 | 315 | 12 | 330 | 63 | 47.625 | 38 | 25.4 | 14 | 25.2 | SD*N53Z... |
| TMD5412RI-E | 6 | 315 | 12 | 330 | 63 | 60 | 38 | 25.7 | 14 | 25.2 | SD*N53Z... |

## Arbor type

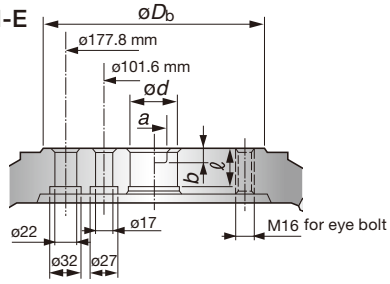
**TMD5406RI-E**




**TMD5408/10...**

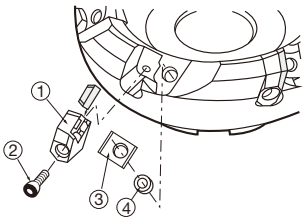



**TMD5412RI-E**




### SPARE PARTS

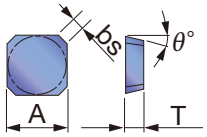
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| TMD54**RI* | LD540R | FDS-8S | CM4X0.7X20 | WF500R | TP-4 |



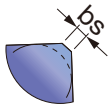
## INSERT

### SDCN/SDEN 53Z

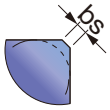
SD*N53Z*N



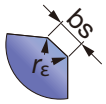

SDEN53ZTN20
Corner details



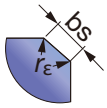

SDKN53ZTN16
Corner details




SDEN53ZTNCR
Corner details

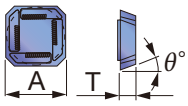


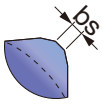

SDKN53ZTNCR
Corner details




### SDKR53-MJ

SDKR53ZSR-MJ
(With 3-dimensional chipbreaker)




| | | Coated | | | | | Cermet | | Uncoated | |
|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ☆ | ★ | ★ | ☆ | ☆ | |
| M | Stainless | | ★ | ☆ | | | | | | |
| K | Cast iron | ★ | | | | | | | | |
| N | Non-ferrous | | | | | | | | | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | |
| H | Hard materials | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | AH130 | AH140 | GH330 | T3130 | NS740 | N308 | UX30 | TH10 | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDCN53ZTN | 6 | | | | | | ● | ● | | | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZFN | 6 | | | | | | | | | ● | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZTN | 6 | | | | ● | | ● | | ● | | 15.875 | 4.76 | 15 | 1.2 |
| SDEN53ZTNCR | 6 | | | | | | ● | | | | 15.875 | 4.76 | 15 | 1.4 |
| SDEN53ZTN20 | 6 | | | | | ● | | | | | 15.875 | 4.76 | 15 | 2 |
| SDKN53ZFN | 6 | | | | | | | | | ● | 15.875 | 4.76 | 15 | 1.2 |
| SDKN53ZTN | 6 | ● | ● | ● | ● | | ● | ● | ● | | 15.875 | 4.76 | 15 | 1.2 |
| SDKN53ZTNCR | 6 | | | | | | ● | | | | 15.875 | 4.76 | 15 | 1.6 |
| SDKN53ZTN16 | 6 | | | | | ● | | | | | 15.875 | 4.76 | 15 | 1.6 |
| SDKR53ZSR-MJ | 6 | | | | ● | ● | | | | | 15.875 | 4.76 | 15 | 2 |

●: Line up

## STANDARD CUTTING CONDITIONS

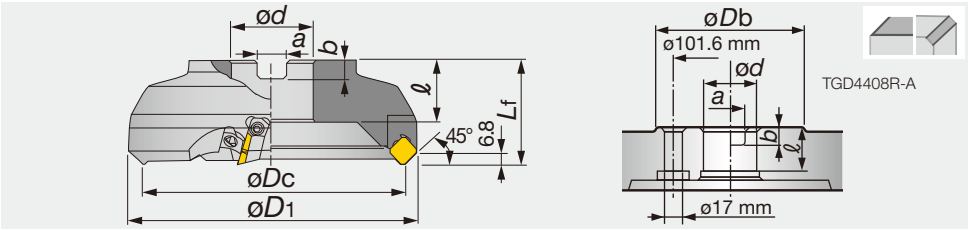
| ISO | Workpiece material | Grade | Roughing (Depth of cut: ap 1.5 ~ 6 mm) | | Finishing (Depth of cut: ap 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed vc (m/min) | Feed per tooth fz (mm/t) | Cutting speed vc (m/min) | Feed per tooth fz (mm/t) |
| P | Mild steels Unhardened steels < 180 HB | NS740 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.35 | 150 ~ 250 | 0.1 ~ 0.35 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.35 | 180 ~ 300 | 0.1 ~ 0.35 |
| | | AH130 | 100 ~ 180 | 0.1 ~ 0.35 | 130 ~ 200 | 0.1 ~ 0.35 |
| | Carbon steels Alloy steels < 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.35 | 180 ~ 280 | 0.1 ~ 0.35 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.25 | 150 ~ 200 | 0.1 ~ 0.3 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.3 | 150 ~ 200 | 0.1 ~ 0.35 |
| | Die steels < 30 HRC | T3130 · AH120 | 100 ~ 150 | 0.1 ~ 0.2 | 100 ~ 150 | 0.1 ~ 0.2 |
| M | Stainless steels < 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.3 | 100 ~ 200 | 0.15 ~ 0.33 |
| | | AH120 · GH330 | 150 ~ 230 | 0.15 ~ 0.3 | 200 ~ 250 | 0.15 ~ 0.3 |
| K | Cast irons, Ductile cast irons | AH120 | 100 ~ 200 | 0.1 ~ 0.3 | 100 ~ 200 | 0.1 ~ 0.3 |
| N | Aluminium alloys Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.3 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Notes: • Dry cutting is recommended for all materials except for aluminium alloys.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TGD4400-A

45° face mills with wedge clamped square inserts

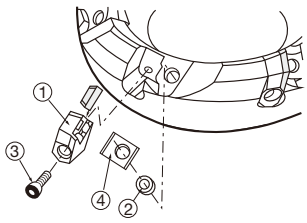
A.R. = +15°, R.R. = -3°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGD4403R-A | 4 | 80 | 6 | 96 | 50 | 25.4 | 26 | 9.5 | 6 | 1.4 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TGD4404R-A | 4 | 100 | 6 | 115 | 63 | 31.75 | 32 | 12.7 | 8 | 2.5 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TGD4405R-A | 4 | 125 | 8 | 139 | 63 | 38.1 | 38 | 15.9 | 10 | 3.6 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TGD4406R-A | 4 | 160 | 8 | 173 | 63 | 50.8 | 38 | 19 | 11 | 5.6 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| TGD4408R-A | 4 | 200 | 10 | 213 | 63 | 47.625 | 38 | 25.4 | 14 | 8.7 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

### SPARE PARTS

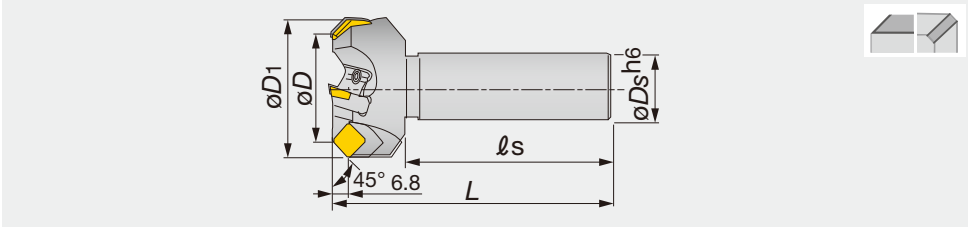
| Designation | ① Locator | ② Wedge fixing screw | ③ Screw | ④ Wedge | Wrench |
|---|---|---|---|---|---|
| TGD4400-A | LD440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |




## EGD4400

45° endmills with wedge clamped square inserts

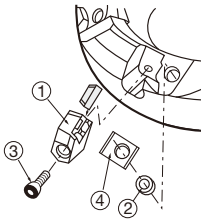
A.R. = +15°, R.R. = -3°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EGD4450R | 4 | 50 | 4 | 67 | 32 | 80 | 35 | 115 | 1.1 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |
| EGD4463R | 4 | 63 | 4 | 79 | 32 | 80 | 35 | 115 | 1.4 | SD*N42.../SD*R1203.../ WDCN42ZFR-DIA |

### SPARE PARTS

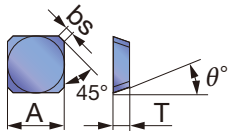
| Designation | ① Locator | ② Wedge fixing screw | ③ Screw | ④ Wedge | Wrench |
|---|---|---|---|---|---|
| EGD4400 | LD442R | DS-8 | BM3X0.5X6 | WP193TR | TP-4 |



# INSERT

## SDCN/SDEN/SDKN 42Z

General inserts
SD*N42Z*N



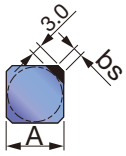

Corner details
SDKN42ZTN16

SD*N42ZTN20

SDKN42ZTNCR
SDEN42ZTNCR

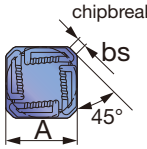
## SDCN42ZFN-DIA

SDCN42ZFN-DIA




## SDKR42Z-MJ

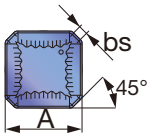
SDKR42ZSR-MJ
(With 3-dimensional chipbreaker)



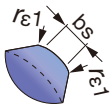

Corner details

## SDMR/SDKR 1203-MJ

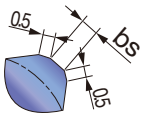
SD*R1203AETN-MJ
(With 3-dimensional chipbreaker)




Corner details
SDMR1203AETN-MJ

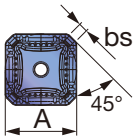



SDKR1203AETN-MJ

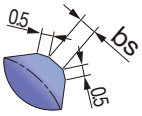



## SDKR42Z-MS

SDKR42ZPN-MS

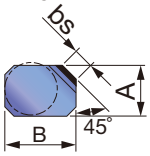



Corner details




## WDCN42ZFR-DIA

Wiper inserts
WDCN42ZFR-DIA




| | | Coated | | | | | | | Cermet | | Uncoated | | PCD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ★ | ☆ | | ★ | ★ | ☆ | ☆ | | |
| M | Stainless | | ★ | ☆ | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | ★ |
| S | Superalloys | ★ | ☆ | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | A | B | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDCN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN | 4 | | | | | | | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDCN42ZTN20 | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDEN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTN | 4 | ● | | ● | | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDEN42ZTNCR | 4 | ● | | ● | ● | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDEN42ZTN20 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 2 |
| SDKN42ZFN | 4 | | | | | | | | | | | ● | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTN | 4 | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKN42ZTNCR | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKN42ZTN16 | 4 | | | | | | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDCN42ZFN-DIA | 2 | | | | | | | | | | | | ● | 12.7 | - | 3.18 | 15 | 1.2 |
| SDKR42ZSR-MJ | 4 | ● | | | ● | ● | | ● | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDMR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR1203AETN-MJ | 4 | | | | | | | | ● | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| SDKR42ZPN-MS | 4 | | ● | ● | | | | | | | | | | 12.7 | - | 3.18 | 15 | 1.6 |
| WDCN42ZFR-DIA | 0.5 | | | | | | | | | | | | ● | 12.2 | 15.64 | 3.18 | 15 | 4.9 |

●: Line up
DX140 : Package quantity = 1pc.

## STANDARD CUTTING CONDITIONS

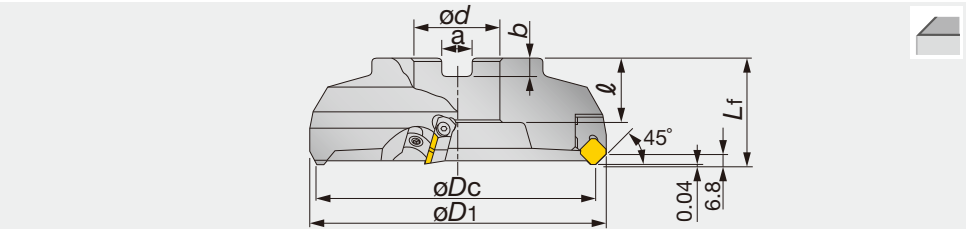
| ISO | Workpiece material | Grade | Roughing (Depth of cut: *ap* 1.5 ~ 4 mm) | | Finishing (Depth of cut: *ap* 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 | 150 ~ 300 | 0.1 ~ 0.2 | 150 ~ 300 | 0.1 ~ 0.25 |
| | | AH330 | 150 ~ 400 | 0.1 ~ 0.25 | 150 ~ 400 | 0.1 ~ 0.28 |
| | | AH120 | 150 ~ 250 | 0.1 ~ 0.25 | 150 ~ 250 | 0.1 ~ 0.28 |
| | | T3130 | 150 ~ 280 | 0.1 ~ 0.28 | 180 ~ 300 | 0.1 ~ 0.3 |
| | | AH130 · AH140 | 100 ~ 180 | 0.1 ~ 0.28 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 230 | 0.1 ~ 0.25 | 180 ~ 280 | 0.1 ~ 0.28 |
| | | NS740 | 100 ~ 230 | 0.1 ~ 0.18 | 150 ~ 230 | 0.1 ~ 0.23 |
| | | AH330 | 100 ~ 320 | 0.1 ~ 0.23 | 150 ~ 320 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.23 | 150 ~ 200 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | AH120 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | AH330 | 100 ~ 250 | 0.1 ~ 0.15 | 100 ~ 250 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH130 · AH140 | 80 ~ 180 | 0.15 ~ 0.25 | 100 ~ 200 | 0.15 ~ 0.28 |
| | | AH120 | 150 ~ 230 | 0.15 ~ 0.23 | 200 ~ 250 | 0.15 ~ 0.25 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| N | Aluminium alloys<br>Si < 13% | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 | 350 ~ 1000 | 0.1 ~ 0.3 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.18 | 350 ~ 1000 | 0.1 ~ 0.2 |
| | Copper alloy | TH10 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 500 | 0.1 ~ 0.25 |

Note: • Dry cutting is recommended for all materials except for aluminium alloys.
• Maximum depth of cut for DX140 SDCN42ZFN-DIA is 2 mm.
• When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
• No. of revolutions ($min^{-1}$) = Cutting speed 3 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions 3 Feed per tooth 3 No. of inserts

## TFD4400-A

45° face mills combined with finisher

A.R. = +15°, R.R. = -3°




| Designation | Max. ap | z | øDc | øD1 | ød | ℓ | Lf | b | a | Kg |
|---|---|---|---|---|---|---|---|---|---|---|
| TFD4404R-A | 4 | 6 | 100 | 115 | 31.75 | 32 | 63 | 8 | 12.7 | 2.3 |
| TFD4405R-A | 4 | 8 | 125 | 139 | 38.1 | 38 | 63 | 10 | 15.9 | 3.4 |
| TFD4406R-A | 4 | 8 | 160 | 173 | 50.8 | 38 | 63 | 11 | 19 | 5.7 |

### SPARE PARTS

For general insert / For finishing insert

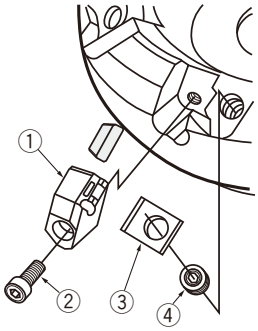
| Designation | ① Locator | ② Locator fixing screw | ③ Wedge | ⑤ Locator | ⑥ Locator fixing screw | ⑦ Wedge | ⑨ Clamping screw | ⑩ Adjusuting screw | ⑪ Washer |
|---|---|---|---|---|---|---|---|---|---|
| TFD4400-A | LD440R | CMX4X0.7X14 | WP440R | LW400R | CM5X0.8X16 | FW-305 | CSTA-5S | CMX5X0.8X8 | L5 |

### SPARE PARTS

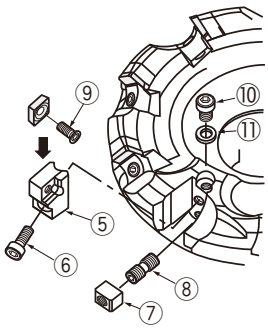
Common parts

| Designation | ④⑧ Wedge fixing screw | Wrench | Wrench 1 | Protection part | Spring washer |
|---|---|---|---|---|---|
| TFD4400-A | FDS-8S | T-15D | TP-4 | PF-43 | 5S |

For general insert




For finishing insert

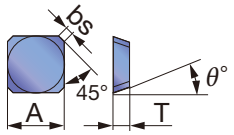



Face Milling

# INSERT

## SDCN/SDEN/SDKN 42Z

General inserts
SD*N42Z*N



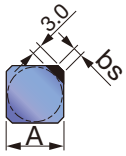

Corner details
SDKN42ZTN16

SD*N42ZTN20

SDKN42ZTNCR
SDEN42ZTNCR

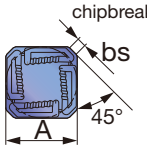
## SDCN42ZFN-DIA

SDCN42ZFN-DIA




## SDKR42Z-MJ

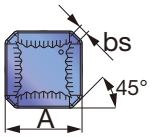
SDKR42ZSR-MJ
(With 3-dimensional chipbreaker)



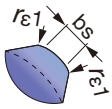

Corner details

## SDMR/SDKR 1203-MJ

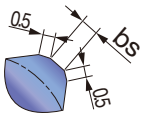
SD*R1203AETN-MJ
(With 3-dimensional chipbreaker)




Corner details
SDMR1203AETN-MJ

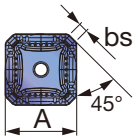



SDKR1203AETN-MJ

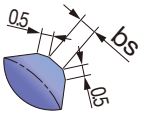



## SDKR42Z-MS

SDKR42ZPN-MS

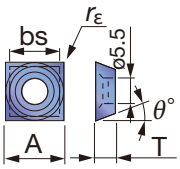



Corner details




## SPHA-FNW

Finishing insert
SPHA431FNW




| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | | ☆ | ☆ | | ★ | ★ | ☆ | | ☆ | | | |
| M | Stainless | | ★ | ☆ | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | ★ | | | | | | | | |
| N | Non-ferrous | | | | | | | | | | | | ★ | ★ | |
| S | Superalloys | ★ | ☆ | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | | | Cermet | | | Un-coated | | PCD | | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | | UX30 | TH10 | DX140 | | | | | |
| SDCN42ZFN | - | 4 | | | | | | | | | | | | ● | | | 12.7 | 3.18 | 15 | 1.2 |
| SDCN42ZTN | - | 4 | | | | | | | | ● | ● | | ● | | | | 12.7 | 3.18 | 15 | 1.2 |
| SDCN42ZTN20 | - | 4 | | | | | | | | ● | | | | | | | 12.7 | 3.18 | 15 | 2 |
| SDEN42ZFN | - | 4 | | | | | | | | | | | | ● | | | 12.7 | 3.18 | 15 | 1.2 |
| SDEN42ZTN | - | 4 | ● | | ● | | ● | ● | | ● | ● | | ● | | | | 12.7 | 3.18 | 15 | 1.2 |
| SDEN42ZTNCR | - | 4 | ● | | ● | ● | | | | ● | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDEN42ZTN20 | - | 4 | | | | | | | ● | | | | | | | | 12.7 | 3.18 | 15 | 2 |
| SDKN42ZFN | - | 4 | | | | | | | | | | | | ● | | | 12.7 | 3.18 | 15 | 1.2 |
| SDKN42ZTN | - | 4 | ● | ● | ● | ● | ● | ● | | ● | ● | | ● | | | | 12.7 | 3.18 | 15 | 1.2 |
| SDKN42ZTNCR | - | 4 | | | | | | | | ● | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDKN42ZTN16 | - | 4 | | | | | | | ● | | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDCN42ZFN-DIA | - | 2 | | | | | | | | | | | | | ● | | 12.7 | 3.18 | 15 | 1.2 |
| SDKR42ZSR-MJ | - | 4 | ● | | | ● | ● | | ● | | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDKR1203AETN-MJ | - | 4 | | | | | | | | ● | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDMR1203AETN-MJ | - | 4 | | | | | | | | ● | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SDKR42ZPN-MS | - | 4 | | ● | ● | | | | | | | | | | | | 12.7 | 3.18 | 15 | 1.6 |
| SPHA431FNW | 0.4 | - | | | | | | | | | ● | | | ● | | | 12.7 | 4.76 | 11 | 11.9 |

●: Line up
DX140 : Packing Quantity = 1 pc.

## STANDARD CUTTING For finishing insert

| ISO | Workpiece materials | Cutting speed | | |
|---|---|---|---|---|
| | | Grades | | Cutting speed *vc* (m/min) |
| | | Normal | Finishing | |
| P | Mild steels,Unhardened steels (< 180 HB) | NS740 · N308 | N308 | 180 ~ 250 |
| P | Carbon steels, Alloy steels (< 300 HB) | NS740 · N308 | N308 | 150 ~ 230 |
| P | Die steels (< 30 HRC) | NS740 · N308 | N308 | 130 ~ 160 |
| M | Stainless steels, Cast irons | AH130 · AH140 | N308 | 180 ~ 230 |
| K | Ductile cast irons | T1115 · TH10 | TH10 | 100 ~ 150 |
| N | Aluminium alloys (Si < 13%) | TH10 | TH10 | 350 ~ 1000 |

Note: • Above conditions are applied when finishing insert is used.
• In general, high speed, high feed and small depth of cut are recommended.
• When using the cutter without finishing insert, the standard conditions are same as that of TGD4400-A.

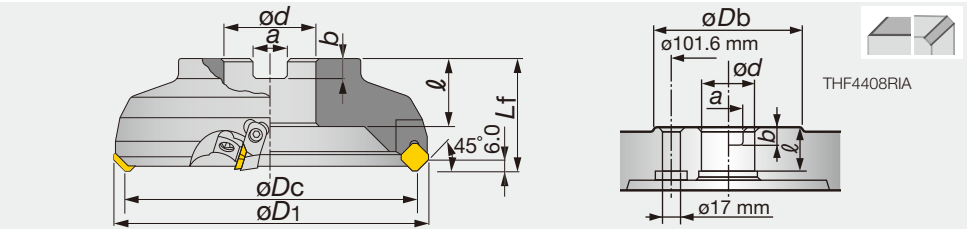
| Depth of cut and feed | | |
|---|---|---|
| Depth of cut $a_p$ (mm) | Feed per revolution of finishing inserts *f* (mm/rev) | Feed per tooth of general inserts $f_z$ (mm/t) |
| ≥ 1.0 | 0.1 ~ 2.5 | 0.15 ~ 0.25 |
| 0.2 ~ 0.7 | 2.0 ~ 3.5 | 0.2 ~ 0.4 |
| ≤ 0.1 | 2.5 ~ 4.5 | 0.3 ~ 0.6 |

Note: • When cutting width is larger than 60 mm, maximum depth of cut is 1 mm.
• No. of revolutions ($min^{-1}$) = Cutting speed 3 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions 3 Feed per tooth 3 No. of inserts

## THF4400RIA

45° wedge type face mill for aluminum machining

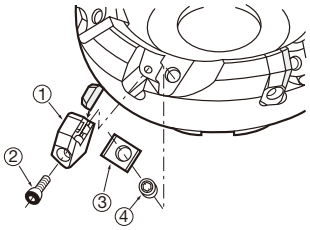
A.R. = +17°, R.R. = +5°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| THF4403RIA | 4 | 80 | 5 | 94 | 50 | 25.4 | 26 | 9.5 | 6 | 1.2 | SF*N42... |
| THF4404RIA | 4 | 100 | 6 | 113 | 63 | 31.75 | 32 | 12.7 | 8 | 2.1 | SF*N42... |
| THF4405RIA | 4 | 125 | 8 | 137 | 63 | 38.1 | 38 | 15.9 | 10 | 3.2 | SF*N42... |
| THF4406RIA | 4 | 160 | 8 | 172 | 63 | 50.8 | 38 | 19 | 11 | 5 | SF*N42... |
| THF4408RIA | 4 | 200 | 10 | 211 | 63 | 47.625 | 38 | 25.4 | 14 | 8.2 | SF*N42... |

### SPARE PARTS

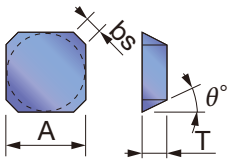
| Designation | ① Locator | ④ Wedge fixing screw | ② Locator fixing screw | ③ Wedge | Wrench |
|---|---|---|---|---|---|
| THF4400RIA | LF440R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |




## INSERTS

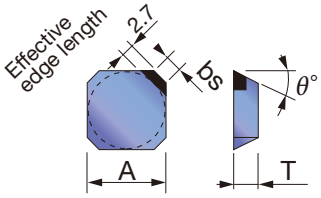
### SFCN/SFEN 42Z

General insert
SF*N42Z*N



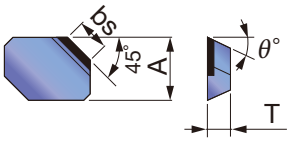

### SFCN42

SFCN42ZFN-DIA




### WFCN42-DIA

Wiper insert
WFCN42ZFR-DIA




| | | Un-coated | PCD |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | ★ | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | TH10 | DX140 | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|
| SFCN42ZFN | 4 | ● | | 12.7 | 3.18 | 25 | 2 |
| SFEN42ZFN | 4 | ● | | 12.7 | 3.18 | 25 | 2 |
| SFCN42ZFN-DIA | 2 | | ● | 12.7 | 3.18 | 25 | 2 |
| WFCN42ZFR-DIA | - | | ● | 12.2 | 3.18 | 25 | 5.3 |

●: Line up

## STANDARD CUTTING CONDITIONS

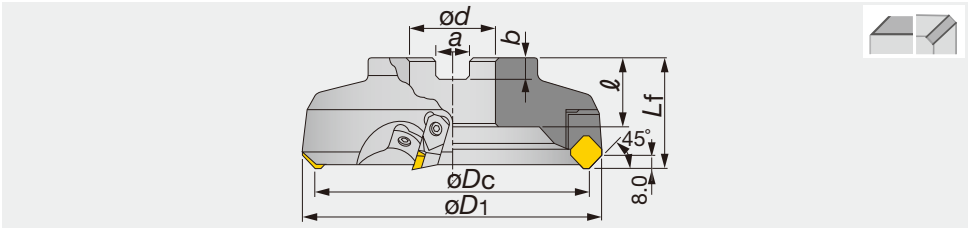
| ISO | Workpiece materials | Grades | Depth of cut: *ap* 0.1 ~ 6 mm | |
|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| N | Aluminium alloys (Si < 13%) | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Aluminium alloys (Si ≥ 13%) | TH10 | 80 ~ 200 | 0.1 ~ 0.2 |
| | | DX140 | 200 ~ 400 | 0.1 ~ 0.2 |
| | Duralumin | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.05 ~ 0.2 |

Notes:
- Use of water-soluble cutting fluid is recommended.
- Maximum depth of cut for SFCN53ZFN-DIA is 2 mm.

## THF5400RIA

45° Wedge type face mill for aluminum machining with large depth of cut

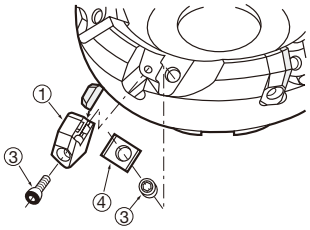
A.R. = +17°,R.R. = +5°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| THF5404RIA | 6 | 100 | 4 | 117 | 63 | 31.75 | 32 | 12.7 | 8 | 2.5 | SF*N53.../ WFCN53ZFR-DIA |
| THF5405RIA | 6 | 125 | 5 | 141 | 63 | 38.1 | 38 | 15.9 | 10 | 3.7 | SF*N53.../ WFCN53ZFR-DIA |
| THF5406RIA | 6 | 160 | 6 | 175 | 63 | 50.8 | 38 | 19 | 11 | 5.5 | SF*N53.../ WFCN53ZFR-DIA |

### SPARE PARTS

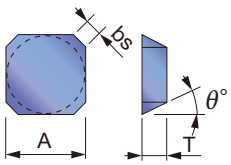
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| THF5400RIA | LF540R | FDS-8S | CM4X0.7X20 | WF500R | TP-4 |




## INSERTS

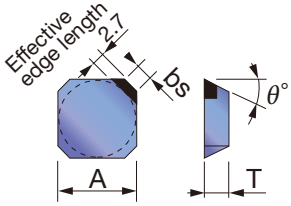
### SFCN/SFEN 53Z

General insert
SF*N53Z*N



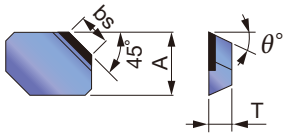

### SFCN53ZFN-DIA

SFCNZFN-DIA




### 53ZFR-DIA

Wiper insert
WFCN53ZFR-DIA




| | | Un-coated | PCD |
|---|---|---|---|
| P | Steel | | |
| M | Stainless | | |
| K | Cast iron | | |
| N | Non-ferrous | ★ | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | TH10 | DX140 | A | T | θ° | bs |
|---|---|---|---|---|---|---|---|
| SFCN53ZFN | 6 | ● | | 15.9 | 4.76 | 25 | 2 |
| SFEN53ZFN | 6 | ● | | 15.9 | 4.76 | 25 | 2 |
| SFCN53ZFN-DIA | 2 | | ● | 15.9 | 4.76 | 25 | 2 |
| WFCN53ZFR-DIA | - | | ● | 15.2 | 4.76 | 25 | 7.7 |

Notes:
- T-DIA is Tungaloy's trade name for polycrystalline sintered diamond.The insert is one-corner type.
- Inserts can be used for former PS-series TAC mills.

●: Line up
DX140: Package Quantity=1pcs.

## STANDARD CUTTING CONDITIONS

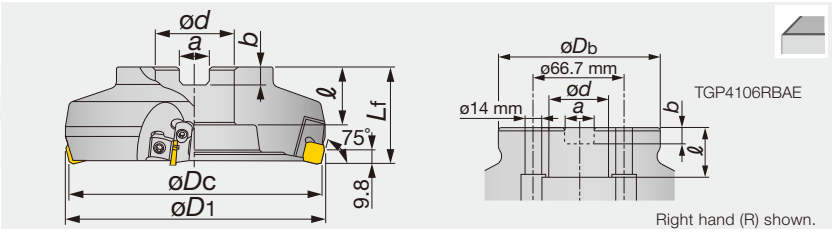
| ISO | Workpiece materials | Grades | Depth of cut: *ap* 0.1 ~ 6 mm | |
|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| N | Aluminium alloys (Si < 13%) | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Aluminium alloys (Si ≥ 13%) | TH10 | 80 ~ 200 | 0.1 ~ 0.2 |
| | | DX140 | 200 ~ 400 | 0.1 ~ 0.2 |
| | Duralumin | TH10 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | | DX140 | 200 ~ 1000 | 0.05 ~ 0.2 |
| | Copper alloys | TH10 | 200 ~ 500 | 0.05 ~ 0.2 |

Notes:
- Use of water-soluble cutting fluid is recommended.
- Maximum depth of cut for SFCN53ZFN-DIA is 2 mm.

## TGP4100RIA/BA/RBAE

75° face mills with wedge clamped square inserts

A.R. = +7°, R.R. = +1°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGP4103RIA | 7 | 80 | 5 | 89 | 50 | 25.4 | 26 | 9.5 | 6 | 1.3 | SP*N42... |
| TGP4104RIA | 7 | 100 | 6 | 108 | 63 | 31.75 | 32 | 12.7 | 8 | 2.4 | SP*N42... |
| TGP4104RBA | 7 | 100 | 8 | 108 | 63 | 31.75 | 32 | 12.7 | 8 | 2.4 | SP*N42... |
| TGP4104RBAE | 7 | 100 | 8 | 108 | 63 | 32 | 25 | 14.4 | 8 | 2.4 | SP*N42... |
| TGP4105RIA | 7 | 125 | 8 | 132 | 63 | 38.1 | 38 | 15.9 | 10 | 3.6 | SP*N42... |
| TGP4105RBA | 7 | 125 | 10 | 132 | 63 | 38.1 | 38 | 15.9 | 10 | 3.6 | SP*N42... |
| TGP4105RBAE | 7 | 125 | 10 | 132 | 63 | 40 | 32 | 16.4 | 9 | 3.6 | SP*N42... |
| TGP4106RIA | 7 | 160 | 8 | 167 | 63 | 50.8 | 38 | 19 | 11 | 5.9 | SP*N42... |
| TGP4106RBA | 7 | 160 | 12 | 167 | 63 | 50.8 | 38 | 19 | 11 | 5.8 | SP*N42... |
| TGP4106RBAE | 7 | 160 | 12 | 167 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SP*N42... |

### SPARE PARTS

| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TGP4103RIA | LP413R | FDS-8S | CM4X0.7X14 | WF310R | TP-4 |
| TGP4104, 05, 06RIA | LP413R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |
| TGP4104, 05, 06RBA | LP413R | FDS-8S | CM4X0.7X14 | WF310R | TP-4 |
| TGP4104, 05, 06RBAE | LP413R | FDS-8S | CM4X0.7X14 | WF310R | TP-4 |

# INSERT

## SPCN/SPEN/SPKN 42S

SP*N42S*R/L

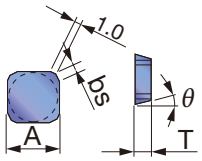



Fig.1

SPEN423*N
Corner details

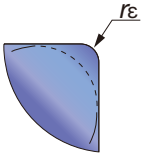



Fig.2

SPKR42SSR-MJ
(With 3-dimensional chipbreaker)

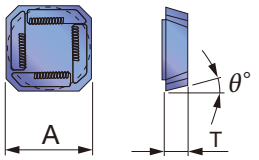
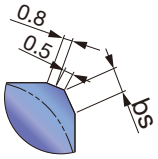



Fig.3

Corner details




WPAN42SFRS
Wiper insert one-corner type

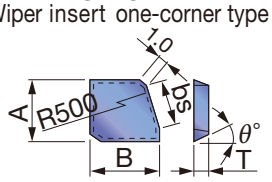



Fig.4

WPAN42SFR
Two-corner type

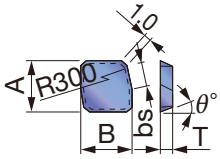



Fig.5

Right hand (R) shown.

| | | Coated | | | | | Cermet | | Ceramic | Uncoated | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | FX105 | UX30 | TH10 |
| P | Steel | ★ | | ☆ | | ★ | ★ | ☆ | | ☆ | |
| M | Stainless | | ★ | | | | | | | | |
| K | Cast iron | ★ | | | ★ | | | | ★ | | |
| N | Non-ferrous | | | | | | | | | | ★ |
| S | Superalloys | ★ | | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | AH120 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | FX105 | UX30 | TH10 | A | B | T | θ° | bs | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPCN42STR | 0 | 7 | | | | | | ● | ● | | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPCN42SFR | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPEN42STR | 0 | 7 | | | | | | ● | | | | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPKN42STR | 0 | 7 | ● | ● | ● | ● | ● | ● | ● | ●* | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPKN42STL | 0 | 7 | | | | | | ● | | | ● | | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPKN42SFR | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPKN42SFL | 0 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | 1.4 | 1 |
| SPKR42SSR-MJ | 0 | 7 | | | ● | ● | ● | | | | | | 12.7 | - | 3.18 | 11 | 0 | 3 |
| WPAN42SFR | 0 | - | | | | | | | ● | | | ● | 12.4 | 14.9 | 3.18 | 11 | 5.2 | 5 |
| WPAN42SFRS | 0 | - | | | | | | | | | | ● | 12.4 | 13.8 | 3.18 | 11 | 9.6 | 4 |
| SPGN120312TN | 1.2 | 7 | | | | | | | | ●* | | | 12.7 | - | 3.18 | 11 | - | 2 |
| SPEN423TN | 1.2 | 7 | | | | | ● | ● | | | ● | | 12.7 | - | 3.18 | 11 | - | 2 |
| SPEN423FN | 1.2 | 7 | | | | | | | | | | ● | 12.7 | - | 3.18 | 11 | - | 2 |

Note: * marked inserts should not be used with wiper inserts.

●: Line up

Face Milling

# STANDARD CUTTING CONDITIONS

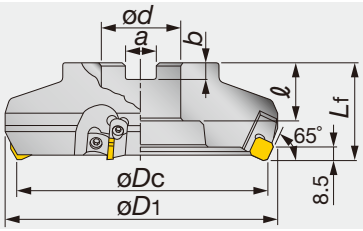
| ISO | Workpiece material | Grade | Roughing (Depth of cut: ap 1.5 ~ 4 mm) Cutting speed vc (m/min) | Roughing Feed per tooth fz (mm/t) | Finishing (Depth of cut: ap 0.3 ~ 0.7 mm) Cutting speed vc (m/min) | Finishing Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.23 |
| | | TH10 · UX30 | 80 ~ 130 | 0.1 ~ 0.2 | 80 ~ 130 | 0.1 ~ 0.23 |
| | | FX105 | 200 ~ 500 | 0.1 ~ 0.2 | 200 ~ 600 | 0.1 ~ 0.3 |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | NS740 · N308 | 150 ~ 250 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.23 |
| | | AH120 · GH330 | 150 ~ 250 | 0.1 ~ 0.23 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | T3130 | 150 ~ 300 | 0.1 ~ 0.25 | 180 ~ 300 | 0.1 ~ 0.28 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.25 | 130 ~ 200 | 0.1 ~ 0.28 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 150 ~ 280 | 0.1 ~ 0.23 | 180 ~ 280 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | AH330 · AH120 | 100 ~ 200 | 0.1 ~ 0.2 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.23 | 100 ~ 150 | 0.1 ~ 0.25 |
| | Carbon steels<br>Alloy steels<br>> 300 HB | T3130 · GH330 | 150 ~ 230 | 0.1 ~ 0.23 | 180 ~ 280 | 0.1 ~ 0.25 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.23 | 100 ~ 150 | 0.1 ~ 0.25 |
| | Die steels<br>< 30 HRC | T3130 | 100 ~ 150 | 0.1 ~ 0.15 | 100 ~ 150 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.15 | 80 ~ 130 | 0.1 ~ 0.2 |
| M | Stainless steels<br>< 250 HB | AH120 · AH140 | 150 ~ 230 | 0.15 ~ 0.2 | 200 ~ 250 | 0.15 ~ 0.23 |
| | | UX30 | 150 ~ 180 | 0.15 ~ 0.2 | 180 ~ 200 | 0.15 ~ 0.23 |

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.
- No. of revolutions ($min^{-1}$) = Cutting speed 3 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions 3 Feed per tooth 3 No. of inserts

## TGP4200R-A

65° face mills with wedge clamped square inserts

A.R. = +5°,R.R. = +1°




Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGP4203R-A | 6 | 80 | 5 | 95 | 50 | 25.4 | 26 | 9.5 | 6 | 1.4 | SP*N42.../ WPAN42ZFR |
| TGP4204R-A | 6 | 100 | 6 | 114 | 63 | 31.75 | 32 | 12.7 | 8 | 2.4 | SP*N42.../ WPAN42ZFR |
| TGP4205R-A | 6 | 125 | 8 | 139 | 63 | 38.1 | 38 | 15.9 | 10 | 3.9 | SP*N42.../ WPAN42ZFR |
| TGP4206R-A | 6 | 160 | 10 | 174 | 63 | 50.8 | 38 | 19 | 11 | 6.1 | SP*N42.../ WPAN42ZFR |

### SPARE PARTS

| Designation | Locator | Wedge fixing screw | Locator fixing screw | Wedge | Wrench |
|---|---|---|---|---|---|
| TGP42**R-A | LP413R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |

Face Milling

## INSERTS

### SPAN/SPCN/SPEN/SPKN 42Z

General insert
SP*N42Z*R/L

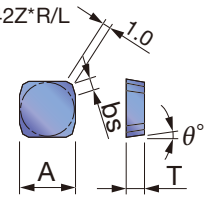



Fig.1

SPEN423*N

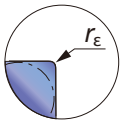



Fig.2

Wiper insert Two-corner type
WPAN42Z*R/L

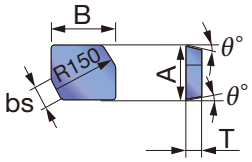



Fig.3

Right hand (R) shown.

| | | Coated | | | Cermet | | | Uncoated | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ★ | | ★ | ☆ | ☆ | ☆ | |
| M | Stainless | | | | | | | | |
| K | Cast iron | ★ | | | | | | | ★ |
| N | Non-ferrous | | | | | | | | ★ |
| S | Superalloys | | | | | | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | T1115 | T3130 | NS740 | X407 | N308 | UX30 | TH10 | A | B | T | θ° | bs | rε | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPAN42ZFR | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPCN42ZFL | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPCN42ZFR | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPCN42ZTR | 6 | | | ● | ● | ● | | | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPEN423TN | 6 | | ● | ● | | | ● | | 12.7 | - | 3.18 | 11 | - | 1.2 | 2 |
| SPEN423FN | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | - | 1.2 | 2 |
| SPEN42ZTR | 6 | | | ● | | | | | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPKN42ZFL | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPKN42ZFR | 6 | | | | | | | ● | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| SPKN42ZTR | 6 | ● | ● | ● | ● | ● | ● | | 12.7 | - | 3.18 | 11 | 2 | - | 1 |
| WPAN42ZFR | 6 | | | | | | | ● | 12.2 | 14.28 | 3.18 | 11 | 4.5 | - | 3 |

Notes: Inserts can be used for former PS-series TAC mills.

●: Line up

## STANDARD CUTTING CONDITIONS

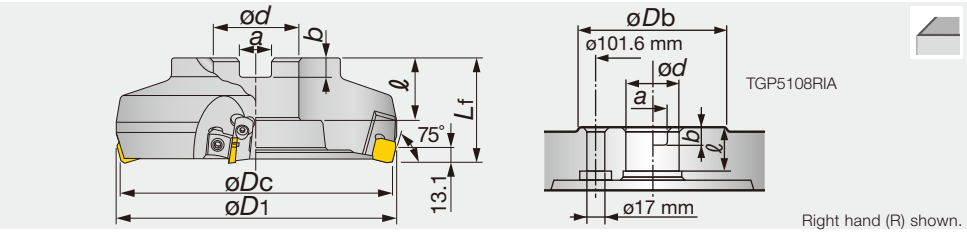
| ISO | Workpiece materials | Grades | Roughing (Depth of cut: 1.5 ~ 6 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>(< 180 HB) | T3130 | 150 ~ 250 | 0.1 ~ 0.25 | 180 ~ 250 | 0.1 ~ 0.28 |
| | | NS740 | 100 ~ 250 | 0.1 ~ 0.18 | 150 ~ 250 | 0.1 ~ 0.23 |
| | Carbon steels<br>Alloy steels<br>(< 300 HB) | T3130 | 130 ~ 250 | 0.1 ~ 0.23 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | NS740 | 100 ~ 180 | 0.1 ~ 0.18 | 150 ~ 200 | 0.1 ~ 0.23 |
| K | Cast irons<br>Ductile cast irons | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.23 |
| M | Stainless steels<br>(< 250 HB) | T3130 | 150 ~ 250 | 0.15 ~ 0.2 | 200 ~ 250 | 0.15 ~ 0.23 |
| | | UX30 | 150 ~ 180 | 0.15 ~ 0.2 | 180 ~ 200 | 0.15 ~ 0.23 |

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TGP5100RIA

75° face mills with wedge clamped square inserts with largedepth of cut

A.R. = +7°,R.R. = +1°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGP5104RIA | 10 | 100 | 5 | 109 | 63 | 31.75 | 32 | 12.7 | 8 | 2.3 | SP*N53... |
| TGP5105RIA | 10 | 125 | 6 | 133 | 63 | 38.1 | 38 | 15.9 | 10 | 3.5 | SP*N53... |
| TGP5106RIA | 10 | 160 | 8 | 167 | 63 | 50.8 | 38 | 19 | 11 | 5.7 | SP*N53... |
| TGP5108RIA | 10 | 200 | 10 | 207 | 63 | 47.625 | 38 | 25.4 | 14 | 8.4 | SP*N53... |

### SPARE PARTS

| Designation | Locator | Wedge fixing screw | Locator fixing screw | Wedge | Wrench |
|---|---|---|---|---|---|
| TGP51**RIA | LP514R | FDS-8S | CM4X0.7X14 | WF500R | TP-4 |

Face Milling

## INSERTS

### SPCN/SPKN 53S

SP*N53S*R/L

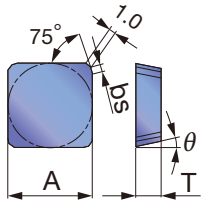



Fig.1

SPKN53STR20

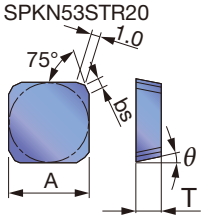



Fig.2

SPKR53SSR-MJ
(With 3-dimensional chipbreaer)

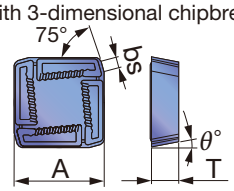



Fig.3

Right hand (R) shown.

| | | Coated | | | | Cermet | | | Uncoated | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ★ | | ★ | | ★ | ☆ | | ☆ | | |
| M | Stainless | ★ | | ☆ | | | | | ☆ | | |
| K | Cast iron | | ★ | | | | | | | ☆ | |
| N | Non-ferrous | | | | | | | | | ★ | |
| S | Superalloys | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | A | T | θ° | bs | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPCN53SFR | 10 | | | | | | | ● | 15.875 | 4.76 | 11 | 1.2 | 1 |
| SPCN53STR | 10 | | | | | ● | ● | | 15.875 | 4.76 | 11 | 1.2 | 1 |
| SPKN53SFR | 10 | | | | | | | ● | 15.875 | 4.76 | 11 | 1.2 | 1 |
| SPKN53STL | 10 | | | | | | ● | | 15.875 | 4.76 | 11 | 1.2 | 1 |
| SPKN53STR | 10 | ● | ● | | ● | | ● | | 15.875 | 4.76 | 11 | 1.2 | 1 |
| SPKN53STR20 | 10 | | | ● | | | | | 15.875 | 4.76 | 11 | 2 | 2 |
| SPKR53SSR-MJ | 10 | ● | | ● | | | | | 15.875 | 4.76 | 11 | 2 | 3 |

●: Line up

## STANDARD CUTTING CONDITIONS

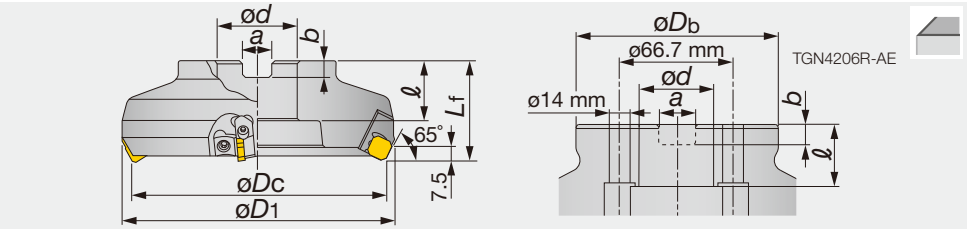
| ISO | Workpiece materials | Grades | Roughing (Depth of cut: 1.5 ~ 8 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels Unhardened steels (< 180 HB) | T3130 | 150 ~ 300 | 0.1 ~ 0.35 | 180 ~ 300 | 0.1 ~ 0.35 |
| | | NS740 · N308 | 100 ~ 250 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | GH330 | 150 ~ 250 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.33 |
| | Carbon steels Alloy steels (< 300 HB) | T3130 | 150 ~ 280 | 0.1 ~ 0.3 | 180 ~ 280 | 0.1 ~ 0.35 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.25 | 150 ~ 200 | 0.1 ~ 0.3 |
| | | GH330 | 100 ~ 200 | 0.1 ~ 0.28 | 150 ~ 200 | 0.1 ~ 0.33 |
| K | Cast irons Ductile cast irons | TH10 | 80 ~ 130 | 0.1 ~ 0.3 | 80 ~ 130 | 0.1 ~ 0.3 |
| | | T1115 | 100 ~ 200 | 0.1 ~ 0.3 | 100 ~ 200 | 0.1 ~ 0.3 |
| M | Stainless steels (< 250 HB) | T3130 | 150 ~ 250 | 0.15 ~ 0.25 | 200 ~ 250 | 0.15 ~ 0.28 |
| | | GH330 | 150 ~ 230 | 0.15 ~ 0.3 | 200 ~ 250 | 0.15 ~ 0.3 |

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

## TGN4200R-A

65° wedge type face mill with negative square insert

A.R. = -5°, R.R. = -5°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TGN4203R-A | 6 | 80 | 5 | 92 | 50 | 25.4 | 26 | 9.5 | 6 | 1.5 | SN*N43Z*/SNMN1204... |
| TGN4203R-AE | 6 | 80 | 5 | 92 | 50 | 27 | 22 | 12.4 | 7 | 1.5 | SN*N43Z*/SNMN1204... |
| TGN4204R-A | 6 | 100 | 6 | 112 | 63 | 31.75 | 32 | 12.7 | 8 | 2.4 | SN*N43Z*/SNMN1204... |
| TGN4204R-AE | 6 | 100 | 6 | 112 | 63 | 32 | 32 | 14.4 | 8 | 2.4 | SN*N43Z*/SNMN1204... |
| TGN4205R-A | 6 | 125 | 8 | 136 | 63 | 38.1 | 38 | 15.9 | 10 | 3.9 | SN*N43Z*/SNMN1204... |
| TGN4205R-AE | 6 | 125 | 8 | 136 | 63 | 40 | 32 | 16.4 | 9 | 3.9 | SN*N43Z*/SNMN1204... |
| TGN4206R-A | 6 | 160 | 10 | 171 | 63 | 50.8 | 38 | 19 | 11 | 6.1 | SN*N43Z*/SNMN1204... |
| TGN4206R-AE | 6 | 160 | 10 | 171 | 63 | 40 | 29 | 16.4 | 9 | 6.1 | SN*N43Z*/SNMN1204... |

### SPARE PARTS

| Designation | Locator | Right-left screw | Screw | Wedge | Wrench |
|---|---|---|---|---|---|
| TGN42... | LN423R | FDS-8S | CM4X0.7X14 | WP440R | TP-4 |

Face Milling

## INSERT

### SNCN/SNKN43Z

SN*N43Z*N

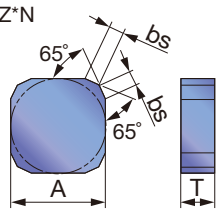



Fig.1

### SNMN1204-TN

SN*N43Z*N

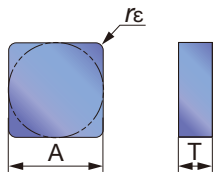



Fig.2

### SNKF43Z

SNKF43Z*N

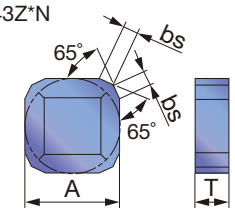



Fig.3

| | | Coated | | | | Cermet | | Ceramic | | | Uncoated | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Steel | | ★ | | | ★ | ☆ | | | | ☆ | | | |
| M | Stainless | | | | | | | | | | | | | |
| K | Cast iron | ★ | | | | | | | ★ | | | | | |
| N | Non-ferrous | | | | | | | | | | | ★ | | |
| S | Superalloys | | | | | | | | | | | | | |
| H | Hard materials | | | | | | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | T1115 | T3130 | | | NS740 | N308 | | FX105 | | | UX30 | TH10 | | | | | A | T | bs | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNCN43ZFN | - | 6 | | | | | | | | | | | | ● | | | | | 12.7 | 4.76 | 2 | 1 |
| SNCN43ZTN | - | 6 | | | | | ● | ● | | | | | ● | | | | | | 12.7 | 4.76 | 2 | 1 |
| SNKF43ZFN | - | 6 | | | | | | | | | | | | ● | | | | | 12.7 | 4.76 | 2 | 3 |
| SNKF43ZTN | - | 6 | ● | | | | | | | | | | ● | | | | | | 12.7 | 4.76 | 2 | 3 |
| SNKN43ZTN | - | 6 | ● | ● | | | ● | | | ● | | | ● | | | | | | 12.7 | 4.76 | 2 | 1 |
| SNMN120408TN | 0.8 | 6 | | | | | | | | ● | | | | | | | | | 12.7 | 4.76 | - | 2 |
| SNMN120412TN | 1.2 | 6 | ● | ● | | | | | | ● | | | ● | | | | | | 12.7 | 4.76 | - | 2 |
| SNMN120416TN | 1.6 | 6 | | | | | | | | ● | | | | | | | | | 12.7 | 4.76 | - | 2 |
| SNMN120420TN | 2 | 6 | | | | | | | | ● | | | | | | | | | 12.7 | 4.76 | - | 2 |
| SNMN120424TN | 2.4 | 6 | | | | | | | | ● | | | | | | | | | 12.7 | 4.76 | - | 2 |

Notes: Inserts can be used for former PS-series TAC mills.

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Roughing (Depth of cut: 1.5 ~ 4 mm) | | Finishing (Depth of cut: 0.3 ~ 0.7 mm) | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Mild steels<br>Unhardened steels<br>< 180 HB | T3130 | 150 ~ 250 | 0.1 ~ 0.3 | 180 ~ 250 | 0.1 ~ 0.3 |
| | | NS740 · N308 | 100 ~ 200 | 0.1 ~ 0.2 | 150 ~ 250 | 0.1 ~ 0.25 |
| | | UX30 | 100 ~ 180 | 0.1 ~ 0.3 | 130 ~ 200 | 0.1 ~ 0.3 |
| | Carbon steels<br>Alloy steels<br>< 300 HB | T3130 | 130 ~ 250 | 0.1 ~ 0.3 | 150 ~ 250 | 0.1 ~ 0.3 |
| | | NS740 · N308 | 100 ~ 180 | 0.1 ~ 0.2 | 150 ~ 200 | 0.1 ~ 0.25 |
| | | UX30 | 80 ~ 130 | 0.1 ~ 0.3 | 100 ~ 150 | 0.1 ~ 0.3 |
| K | Cast irons<br>Ductile cast irons | TH10 · UX30 | 80 ~ 130 | 0.1 ~ 0.25 | 80 ~ 130 | 0.1 ~ 0.3 |
| | | T1115 | 100 ~ 200 | 0.1 ~ 0.2 | 100 ~ 200 | 0.1 ~ 0.25 |
| | | FX105 | 200 ~ 500 | 0.1 ~ 0.35 | 200 ~ 600 | 0.1 ~ 0.4 |

Notes:
- Dry cutting is recommended for above materials.
- When wet machining mild steels, carbon steels and alloy steels, use T3130 at lower cutting conditions.

# The world's highest level repeatability

# S-TAQ System

## ● Improved surface quality and increased tool life

- Two-face restricted (1/10 short taper and flange face) coupling.
- High-level coupling performance contributes to high accuracy and excellent rigidity.
- Excellent dynamic balance reduces vibration, chatter, and cutting noise at high speeds.

## ● Improved productivity

- High speed machining can reduce machining time.
- High repeatability can eliminate trial cut.

## ● Labor-saving tool change

- Can eliminate detaching the toolholder from the main spindle.
- Can eliminate the brakes for the main spindle.
- Labor-saving clamping by only one T-wrench.

Face Milling

## Performance

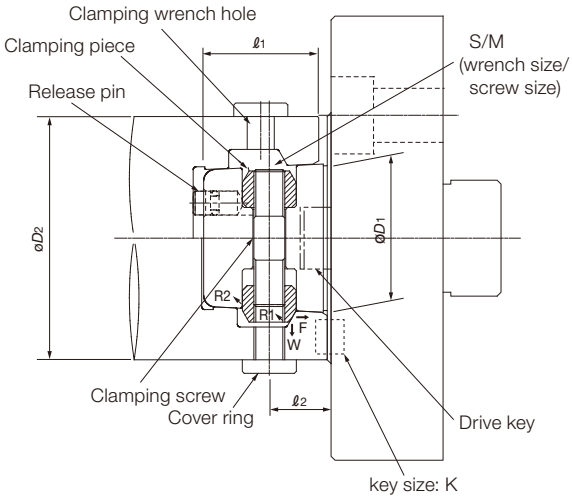
Original clamp system provides high rigidity, accuracy and operating speed.

### ● Clamping force (Strong clamp system)

· Lubricant coating on clamping piece.
· 4-points balancing clamp.
· Sufficient clamping for the smaller diameter part of taper.

| Designation | Dimensions (mm) øD1 | øD2 | ℓ1 | ℓ2 | S/M | K | Recommend clamping torque (N·m) | Clamping force (N) |
|---|---|---|---|---|---|---|---|---|
| TAQ32 | 19 | 32 | 18 | 8.5 | 3/M6 | 8 | 3 | $4\times10^3$ |
| TAQ40 | 24 | 40 | 21 | 10 | 3/M6 | 1 0 | 5 | $5.5\times10^3$ |
| TAQ50 | 30 | 50 | 25 | 12 | 4/M8 | 12 | 8 | $9\times10^3$ |
| TAQ63 | 38 | 63 | 32 | 15 | 4/M8 | 16 | 10 | $12\times10^3$ |
| TAQ80 | 48 | 80 | 40 | 18 | 5/M10 | 18 | 20 | $18\times10^3$ |
| TAQ100 | 60 | 100 | 50 | 22 | 6/M12 | 20 | 30 | $23\times10^3$ |

## Part assembly




W: Driving force by clamping screw
F: Clamping force
R1 = R2: Receiving force of clamping piece

# DATA

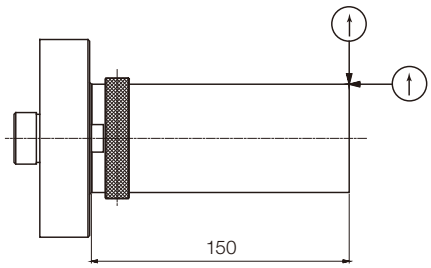
Comparison of clamping force

| | Taper | Taper dia.(mm)/holder dia.(mm) | Recommend clamping torque (N/m) | Draw-in force (N) | Draw-in force / Torque (m-1) |
|---|---|---|---|---|---|
| TAQ63 | 1 / 10 | 38 / 63 | 10 | $12\times10^3$ | 1200 |
| QC adapter | 10° | 35 / 70 | 20 | $9.8\times10^3$ | 490 |
| Other makes A | 4° | 35 / 62 | 22.5 | $9.8\times10^3$ | 436 |

## ●Repeatability for accuracy

| | |
|---|---|
| Radial run out | Within 0.003 mm |
| Axial run out | Within 0.002 mm |

Note: Measured at 150 mm far from end face.

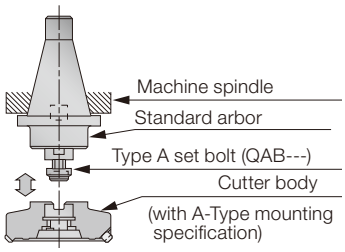


# QC system for TAC Mills

TAC mills QC system facilitate easy and quick mounting of the cutter body (face milling cutter, etc.) to the machine tools.

## Small dia. TAC mills QC system Dia. ø80 ~ 160

### Type A QC system




**Features**

- Cutter body replacement is possible without removing the bolt.
- A QC system is made up only by installing the Type A set bolt to our standard arbor. (The cutter body is made to A-Type mounting specification.)
- Standard arbor used ensures superior economy and rigidity.

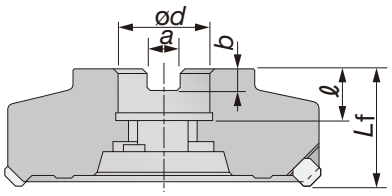
**Replacement method**

Mounting - Direct the set bolt direction to align with the cutter spot facing hole, then mount the cutter. Turn the set bolt one to two turns for tightening.

Removal - Loosen the bolt one turn, press the cutter to the spindle, and turn the set bolt one to two turns. The cutter can now be removed.

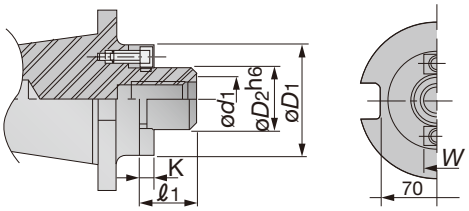
### A-type QC Mounting System for Small Diameter TAC Mills

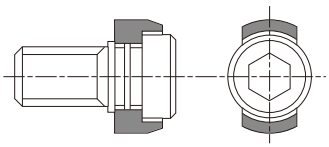
● Dimensional details of mount (For ø80 to ø160 dia. TAC mills)




● Arbors

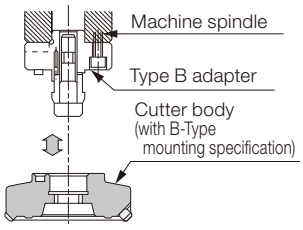
Standard arbors (FMA, FMC type) can't be used. Special arbors applicable for bellow dimensions can be made to order on request.



| Cutter dia. (mm) | Dimensions (mm) ød | b | a | ℓ | Lf | Dimensions (mm) øD2 | øD1 | ød1 | ℓ1 | W | K | Cutter fixing screw for A-type | | Hex wrench size(mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ø80 | 25.4 | 6 | 9.5 | 20 | 50 | 25.4 | 50 | M12 | 18 | 9.5 | 5 | QAB-3 (R/L) | Hex. Socket-head screw M12 × 30 | 10 |
| ø100 | 31.75 | 8 | 12.7 | 22 | 50 | 31.75 | 60 | M16 | 20 | 12.7 | 7 | QAB-4 (R/L) | Hex. Socket-head screw M12 × 30 | 14 |
| ø125 | 38.1 | 10 | 15.9 | 27 | 63 | 38.1 | 80 | M20 | 25 | 15.9 | 9 | QAB-5 (R/L) | | 17 |
| ø160 | 50.8 | 11 | 19 | 27 | 63 | 50.8 | 100 | M24 | 25 | 19.05 | 10 | QAB-6 (R/L) | | 19 |

### Type B QC system




**Features**

- Cutter body replacement is possible without removing the bolt.
- Loosening of the adapter is not enough to remove the cutter. This is to prevent the cutter from falling.
- Type B QC adapter and Type B cutter installation are necessary.
- It is not necessary to set the set bolt direction with that of the cutter hole. The cutter is fit into the adapter only by aligning the match marks.

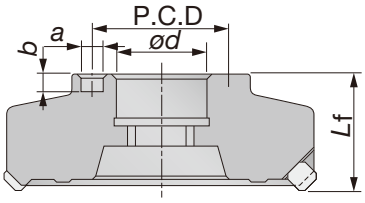
**Replacement method**

Mounting - Set the cutter into the adapter. Direct the cutter match mark to align with that of adapter, then the cutter enters the adapter. Turn the cutter by 90° and turn adapter bolt one to two turns for tightening.

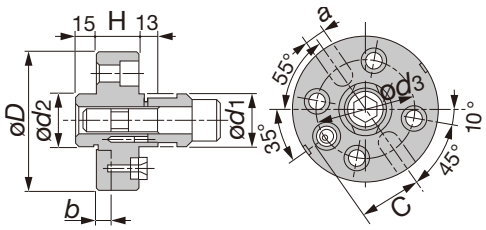
Removal - Loosen adapter bolt by one or two turns and turn the cutter by 90°. The cutter can now be removed.

### B-type QC Mounting System for Small Diameter TAC Mills

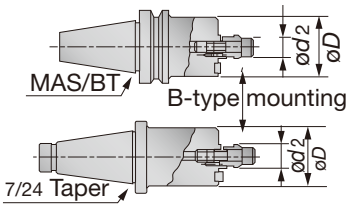
● Dimensional details of mount (For ø80 to ø160 dia. TAC mills)




● Dimensional details of B-type adapters




Instead of the above B-type adapters, BT- and T-type arbors can be also used for B-type QC mount cutters. These arbors are made to order on request.

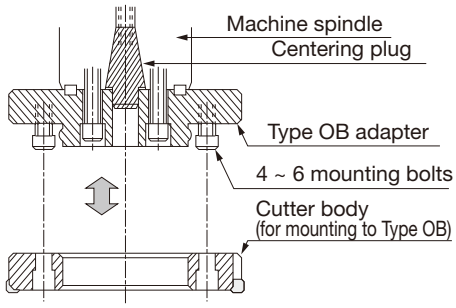



| Cutter dia. (mm) | Dimensions (mm) ød | b | a | Lf | P.C.D |
|---|---|---|---|---|---|
| ø80 | 25.4 | 7 | 10 | 50 | 45 |
| ø100 | 31.75 | 7 | 12 | 63 | 55 |
| ø125 | 38.1 | 7 | 15 | 63 | 70 |
| ø160 | 50.8 | 7 | 18 | 63 | 85 |

| Cutter dia. (mm) | Dimensions (mm) ød1 | c | øD | ød2 | a | b | ød3 | S | H |
|---|---|---|---|---|---|---|---|---|---|
| ø80 | 25.4 | 22.5 | 80 | 25.4 | 9.5 | 7 | 45 | M10 | 25 |
| ø100 | 31.75 | 27.5 | 100 | 31.75 | 12.7 | 8 | 55 | M10 | 25 |
| ø125 | 38.1 | 35 | 100 | 38.1 | 15.9 | 10 | 70 | M12 | 30 |
| ø160 | 50.8 | 42.5 | 125 | 50.8 | 19 | 11 | 85 | M16 | 30 |

## Large dia. TAC mills QC system Dia. ø200 ~

### Type OB QC system (Elongated mounting hole type)




**Features**

- The cutter body can be replaced without removing bolt.
- Cutter does not fall when only the bolt is removed.
- The cutter body weight is about one half of usual cutter.
- The cutter bolt is fixed to the adapter with four to six large bolts, ensuring high rigidity.

**Replacement method**

Mounting - Align the adapter tightening bolts (4 ~ 6) to the cutter mounting holes, turn the cutter whilst pressing it against the adapter, and turn the bolt to tighten.

Removal - Loosen the bolt slightly, and by one turn, turn the cutter to remove it from the adapter.

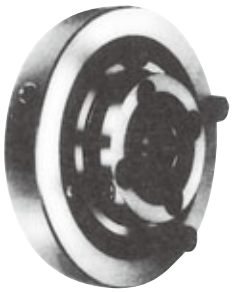
Face Milling

### OB-type QC Mounting System for Large Diameter TAC Mills (Elongated mounting hole type)

**Cutter body (ø200 ~ ø400 mm)**

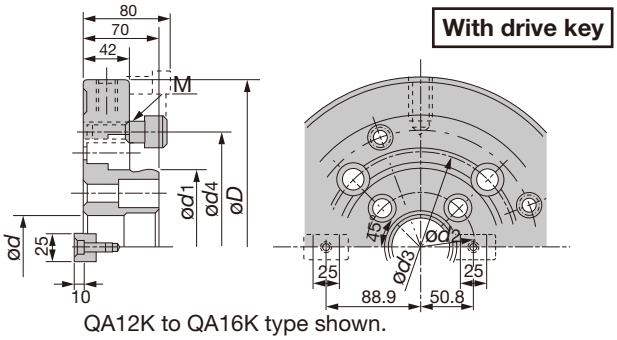
This system is applied to "flush edge-top" Standard type TAC mills with OB mount.
For the details of the OB-type cutter bodies.

OB type adapter

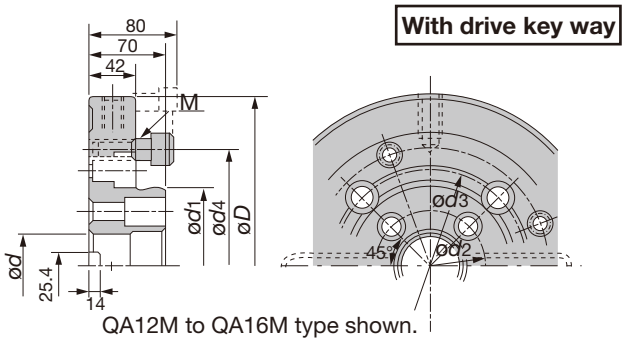


OB type cutter body

● Dimensional details of mount of OB-type adapters




QA12K to QA16K type shown.




QA12M to QA16M type shown.

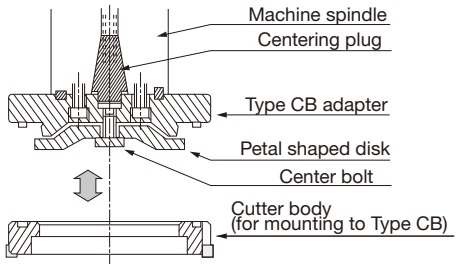
| Adapter Designation | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | øD | ød | ød1 | ød2 | ød3 | ød4 | M | N |
| QA08K/M | 198 | 47.625 | 63.5 | 101.6 | - | 114.3 | M16×40 | 4 |
| QA10K/M | 248 | 60 | 133.35 | 101.6 | - | 177.8 | M16×50 | 4 |
| QA12K/M | 313 | 60 | 146.05 | 101.6 | 177.8 | 215.9 | M20×50 | 4 |
| QA14K/M | 353 | 60 | 215.9 | 101.6 | 177.8 | 260.4 | M20×50 | 6 |
| QA16K/M | 398 | 60 | 254 | 101.6 | 177.8 | 304.8 | M20×50 | 6 |

Notes: In Designation, K indicates "with drive key" type, and M indicates "with drive key way" type.
("N" shows number of tapped holes.)

Notes:
- Dimension ød can be made to customer's specifications.
- Special centering plugs for ø60 mm hole are made to order.

# Large dia. TAC mills QC system Dia. ø200 ~

## Type CB QC system (center bolt type)




**Features**

- Move the petal-shaped disk up and down with one center bolt in the adapter, removing the cutter. Since only one bolt is used, replacement takes only one half of the time required by Type CB.
- The cutter body is lighter by 20% than that of OB type and easy to handle.
- Compatible with auto clamp unit.
- The cutter does not fall when the center bolt only is loosened.

**Replacement method**

Mounting - Align the cutter notch with the adapter clamper and turn the cutter whilst pressing it against the adapter. Tighten with the center bolt.

Removal - Loosen the center bolt once and lift the cutter upward in the spindle direction. Turn the cutter further slightly, and the cutter can be removed from the adapter.

## CB-type QC Mounting System for Large Diameter TAC Mills (Center bolt type)

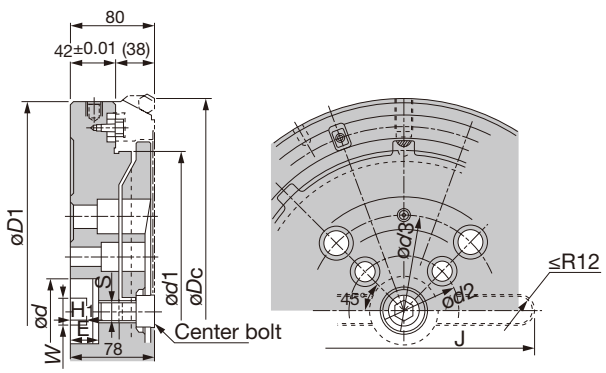
### Cutter body (ø200 ~ ø400 mm)

This system is applied to "flush edge-top" type TAC mills with CB mount.

CB type adapter

CB type cutter body

● Dimensional details of mount of CB-type adapters



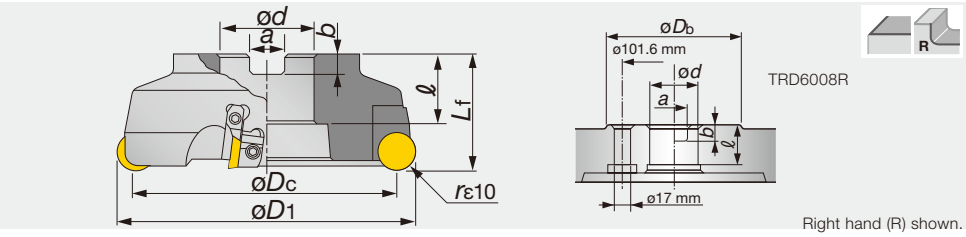

| Adapter Designation | Dimensions (mm) | | | | | | | | | | | Center bolt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | øDc | ød | øD1 | ød1 | ød2 | ød3 | W | H1 | J | S | E | |
| QACB-08MR/L | 200 | 47.625 | 195 | 119.97 | 101.6 | - | 25.4 | 14 | 150 | M20 | 25 | TMBA-M20 |
| QACB-10MR/L | 250 | 60 | 245 | 159.97 | 101.6 | - | 25.4 | 14 | 150 | M20 | 25 | TMBA-M20 |
| QACB-12MR/L | 315 | 60 | 310 | 214.97 | 101.6 | - | 25.4 | 14 | 150 | M20 | 25 | TMBA-M20 |
| QACB-14MR/L | 355 | 60 | 350 | 254.97 | - | 177.8 | 25.4 | 14 | 245 | M20 | 25 | TMBA-M20 |
| QACB-16MR/L | 400 | 60 | 395 | 299.95 | - | 177.8 | 25.4 | 14 | 245 | M20 | 25 | TMBA-M20 |

Note: • Dimension ød can be made to customer's specifications.
• Because of the dimensional restriction of "E", standard CO- type centering plugs can not be used for the adapters shown in the above table. Special centering plugs applicable for the above adapters can be made to order on request.

## TRD6000

Face mill with 20mm button insert

A.R. = +8°,R.R. = -3°




Right hand (R) shown.

| Designation | Max. ap | øD1 | z | øDc | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRD6003R | 10 | 80 | 4 | 60 | 63 | 25.4 | 26 | 9.5 | 6 | 1.2 | RD**2004... |
| TRD6004R | 10 | 100 | 5 | 80 | 63 | 31.75 | 32 | 12.7 | 8 | 2.1 | RD**2004... |
| TRD6005R | 10 | 125 | 6 | 105 | 63 | 38.1 | 38 | 15.9 | 10 | 3.2 | RD**2004... |
| TRD6006R | 10 | 160 | 8 | 140 | 63 | 50.8 | 38 | 19 | 11 | 5.4 | RD**2004... |
| TRD6008R | 10 | 200 | 10 | 180 | 63 | 47.625 | 38 | 25.4 | 14 | 8.6 | RD**2004... |

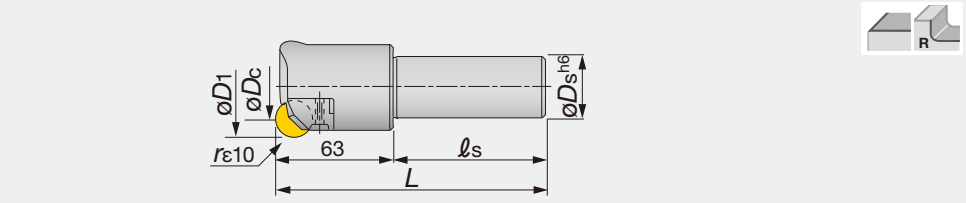
### SPARE PARTS

| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TRD6003R | LR603R | FDS-8S | CM4X0.7X20 | WR603R | TP-4 |
| TRD600*R | LR603R | FDS-8 | CM4X0.7X20 | WR603R | TP-4 |

## ERD6000

Indexable endmill with 20mm button insert

A.R. = +8°,R.R. = -2°~ +3°



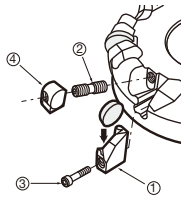

Right hand (R) shown.

| Designation | Max. ap | øD1 | z | øDc | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|---|
| ERD6050RA | 10 | 50 | 3 | 30 | 32 | 80 | 143 | RD**2004... |
| ERD6063RA | 10 | 63 | 3 | 43 | 32 | 80 | 143 | RD**2004... |

### SPARE PARTS

| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| ERD60... | LR602R | FDS-6Z | SHCM4-16 | WR602R | TP-3A |

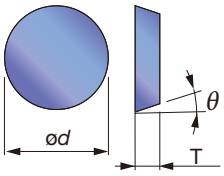
Note: Plunging up to 4mm depth is possible.




Face Milling

## INSERT

### RDCN/RDCA/RDKN2004




| | | Coated | | Uncoated | | |
|---|---|---|---|---|---|---|
| P | Steel | ★ | | ☆ | | |
| M | Stainless | | | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | | UX30 | TH10 | | A | T | θ° |
|---|---|---|---|---|---|---|---|---|---|
| RDCA2004TN | 10 | | | ● | | | 20 | 4.76 | 15 |
| RDCN2004TN | 10 | | | ● | | | 20 | 4.76 | 15 |
| RDKN2004FN | 10 | | | | ● | | 20 | 4.76 | 15 |
| RDKN2004TN | 10 | ● | | ● | | | 20 | 4.76 | 15 |

The above figure shows RD*N-type insert.
• RDCA type inserts have a hole.
Note: The inserts can be used for the former PS series.

●: Line up

Face Milling

## STANDARD CUTTING CONDITIONS

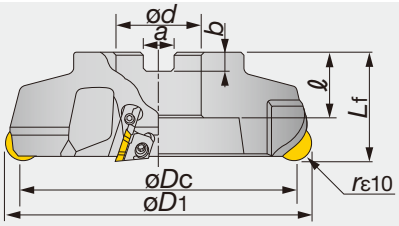
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Depth of cut: 0.4 ~ 1 Feed per tooth *fz* (mm/t) | Depth of cut: 1.5 ~ 3 Feed per tooth *fz* (mm/t) | Depth of cut: 4 ~ 6 Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|
| P | Carbon steels, alloy steels < 300HB | AH120 | 150 ~ 250 | 0.3 ~ 0.5 | 0.2 ~ 0.3 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 150 | 0.3 ~ 0.6 | 0.2 ~ 0.3 | 0.1 ~ 0.2 |
| | Die steels < 30HRC | AH120 | 100 ~ 150 | 0.2 ~ 0.4 | 0.15 ~ 0.3 | 0.1 ~ 0.2 |
| | | UX30 | 80 ~ 130 | 0.25 ~ 0.5 | 0.15 ~ 0.3 | 0.1 ~ 0.2 |
| K | Grey cast irons, ductile cast irons | AH120 | 100 ~ 150 | 0.3 ~ 0.6 | 0.2 ~ 0.4 | 0.1 ~ 0.25 |
| | | TH10 | 80 ~ 130 | 0.3 ~ 0.6 | 0.2 ~ 0.4 | 0.1 ~ 0.25 |
| H | Hardened steels 40 ~ 55HRC | AH120 | 20 ~ 60 | 0.1 ~ 0.2 | 0.05 ~ 0.2 | - |
| | | UX30 | 20 ~ 60 | 0.1 ~ 0.2 | 0.05 ~ 0.2 | - |

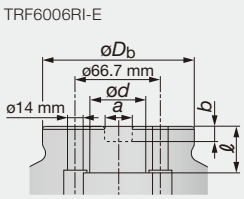
Note: Feed rate should be inversely proportional to depth of cut and selected depending on machine rigidity.

## TRF6000

Face mill with 20mm high posi-rake button insert

A.R. = +19°,R.R. = +3°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TRF6003RI | 10 | 80 | 4 | 100 | 50 | 25.4 | 26 | 9.5 | 6 | 1.4 | RFEN2004... |
| TRF6004RI | 10 | 100 | 5 | 120 | 63 | 31.75 | 32 | 12.7 | 8 | 2.5 | RFEN2004... |
| TRF6005RI | 10 | 125 | 6 | 145 | 63 | 38.1 | 38 | 15.9 | 10 | 3.9 | RFEN2004... |
| TRF6006RI | 10 | 160 | 8 | 180 | 63 | 50.8 | 38 | 19 | 11 | 5.8 | RFEN2004... |
| TRF6008RI | 10 | 200 | 10 | 220 | 63 | 47.625 | 38 | 25.4 | 14 | 9.8 | RFEN2004... |
| TRF6003RI-E | 10 | 80 | 4 | 100 | 50 | 27 | 26 | 12.4 | 7 | 1.4 | RFEN2004... |
| TRF6004RI-E | 10 | 100 | 5 | 120 | 63 | 32 | 32 | 14.4 | 8 | 2.5 | RFEN2004... |
| TRF6005RI-E | 10 | 125 | 6 | 145 | 63 | 40 | 32 | 16.4 | 9 | 3.9 | RFEN2004... |
| TRF6006RI-E | 10 | 160 | 8 | 180 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | RFEN2004... |

### SPARE PARTS

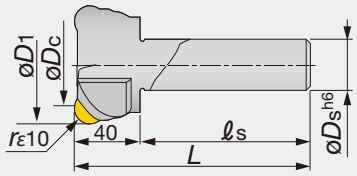
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| TRF6003 - 6006RI/RI-E | LF602R | FDS-8S | CM4X0.7X20 | WF603R | TP-4 |
| TRF6008RI | LF602R | FDS-8S | CM4X0.7X20 | WF608R | TP-4 |

Face Milling

## ERF6000

Indexable endmill with 20mm high posi-rake button insert for difficult-to-cut material

A.R. = +19°,R.R. = +3°

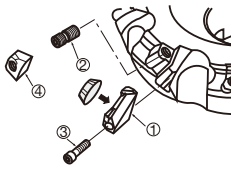


| Designation | øDc | z | øD1 | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|
| ERF6050R | 50 | 3 | 70 | 32 | 80 | 120 | RFEN2004... |
| ERF6063R | 63 | 4 | 83 | 32 | 80 | 120 | RFEN2004... |
| ERF6050R-E | 50 | 3 | 70 | 32 | 80 | 120 | RFEN2004... |
| ERF6063R-E | 63 | 4 | 83 | 32 | 80 | 120 | RFEN2004... |

### SPARE PARTS

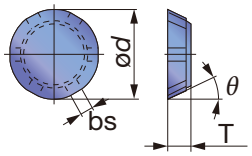
| Designation | ①Locator | ②Wedge fixing screw | ③Locator fixing screw | ④Wedge | Wrench |
|---|---|---|---|---|---|
| ERF60... | LF602R | FDS-6Z | CM4X0.7X20 | WF602R | TP-3A |

Note: The above TAC Endmills are not irregular pitch spec.

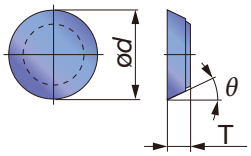


## INSERT

### RFEN2004




### RFEN2004M0TN




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | ☆ | | ☆ | |
| M | Stainless | ★ | ★ | | ☆ | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | | | | ★ |
| H | Hard materials | | | | | ★ |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated | | | Un-coated | | ød | T | θ° | bs |
|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | | UX30 | KS20 | | | | |
| RFEN2004ZFTN | 3 | ● | ● | | ● | ● | 20 | 4.76 | 25 | 2.8 |
| RFEN2004M0TN | 10 | | ● | | ● | ● | 20 | 4.76 | 25 | - |

●: Line up

Note: • RFEN2004M0TN type inserts should not be used for finishing requiring surface finish better than 12s.
• RFEN2004ZFTN type inserts can be used both finishing and roughing at depth of cut up to 3mm.
• RFEN2004M0TN does not have flattened flanks.

## STANDARD CUTTING CONDITIONS

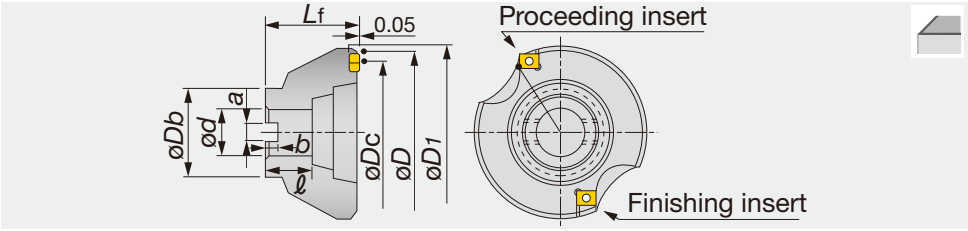
| ISO | Workpiece material | | Grade | Depth of cut = 1 ~ 3 mm | | Depth of cut = 0.4 ~ 1 mm | | Cutting fluid |
|---|---|---|---|---|---|---|---|---|
| | | | | Cutting speed *vc*(m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *vc*(m/min) | Feed per tooth *fz* (mm/t) | |
| M | Stainless steels | Austenitic, Ferritic SUS304, etc. X5CrNi18-9, etc. < 300HB | AH120 · GH330 | 150 ~ 250 | 0.20 ~ 0.35 | 180 ~ 250 | 0.2 ~ 0.5 | Dry cutting |
| | | | UX30 | 150 ~ 230 | 0.20 ~ 0.35 | 180 ~ 250 | 0.2 ~ 0.5 | Dry cutting |
| | | Precipitatio hardening SUS630, etc. X5CrNiCuNb16-4, etc. < 35HRC | AH120 · GH330 | 150 ~ 200 | 0.15 ~ 0.3 | 180 ~ 250 | 0.2 ~ 0.4 | Dry cutting |
| | | | UX30 | 130 ~ 180 | 0.15 ~ 0.3 | 150 ~ 200 | 0.2 ~ 0.4 | Dry cutting |
| S | Superalloys Inconel, Hastelloy, etc. | | KS20 | 20 ~ 30 | 0.10 ~ 0.15 | 20 ~ 50 | 0.2 ~ 0.4 | Water insoluble type |
| | Titanium alloys Ti-6Al-4V, etc. | | KS20 | 40 ~ 50 | 0.15 ~ 0.35 | 40 ~ 60 | 0.2 ~ 0.5 | Water soluble type or dry cutting |
| H | Hard materials 40 ~ 50HRC | | KS20 | 20 ~ 50 | 0.05 ~ 0.1 | 20 ~ 50 | 0.05 ~ 0.2 | Water insoluble type |

Note: Cutting width should be within 60 to 70 % of effective cutter diameter.
• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## NMS09

Face mills with negative rectangle insert for highly precision finishing

A.R. = 10°, R.R. = -30°




| Designation | Max. ap | øDc | z | øD | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NMS09080R | 0.2 | 80 | 2 | 92 | 100.7 | 50 | 25.4 | 26 | 9.5 | 6 | 1.49 | LNCQ0906... |
| NMS09100R | 0.2 | 100 | 2 | 112 | 120.7 | 50 | 31.75 | 32 | 12.7 | 8 | 2.1 | LNCQ0906... |
| NMS09125R | 0.2 | 125 | 2 | 137 | 145.7 | 63 | 38.1 | 38 | 15.9 | 10 | 4.07 | LNCQ0906... |
| NMS09160R | 0.2 | 160 | 2 | 172 | 180.7 | 63 | 50.8 | 38 | 19 | 11 | 6.15 | LNCQ0906... |
| NMS09200R | 0.2 | 200 | 2 | 212 | 220.7 | 63 | 47.625 | 38 | 25.4 | 14 | 9.67 | LNCQ0906... |

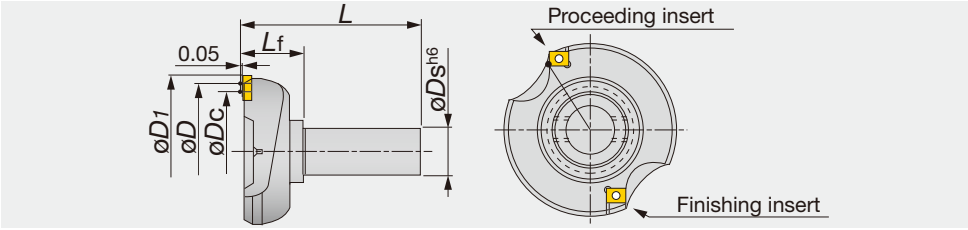
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| NMS09... | CSTB-4 | T-15D |

## EMS09

Endmill with negative rectangle insert for highly precision finishing

A.R. = +10°, R.R. = -30°




| Designation | Max. ap | øDc | z | øD | øD1 | øDs | Lf | L | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EMS09080R | 0.2 | 80 | 2 | 92 | 100.7 | 32 | 40 | 120 | LNCQ0906... |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| EMS09080R | CSTB-4 | T-15D |

# INSERT

## LNCQ0906N-100(50)L

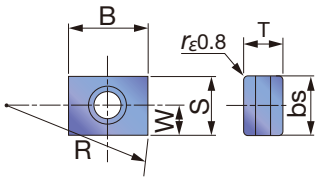



fig.1

## LNCQ0906-50S

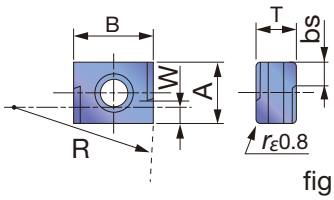



fig.2

| | | Coated | | | Cermet | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | |
| M | Stainless | ★ | | | ★ | |
| K | Cast iron | ★ | ★ | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | ★ | | | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | AH120 | GH110 | NS740 | A | B | T | R | W | bs | fig |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LNCQ0906N-100L | 0.2 | ● | ● | ● | 9.525 | 12.7 | 6.35 | 100 | 4.763 | 7.9 | 1 |
| LNCQ0906N-50L | 0.2 | ● | ● | ● | 9.525 | 12.7 | 6.35 | 50 | 4.763 | 7.9 | 1 |
| LNCQ0906R-50S | 0.2 | ● | ● | ● | - | 12.7 | 6.35 | 50 | 2.3 | 4 | 2 |

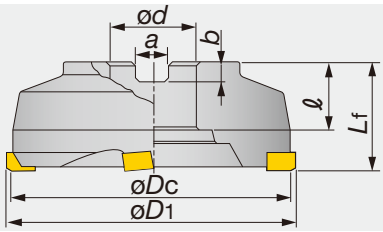
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed $v_c$ (m/min) | LNCQ0906N-100(50)L Depth of cut $a_p$ (mm) | LNCQ0906N-100(50)L Feed per tooth $f$ (mm/rev) | LNCQ0906R-50S Depth of cut $a_p$ (mm) | LNCQ0906R-50S Feed per tooth $f$ (mm/rev) |
|---|---|---|---|---|---|---|---|
| P | Mild steels SS400, etc. E275A, etc. < 180 HB | NS740 | 200 ~ 300 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |
| | Carbon steels S55C, etc. C55, etc. < 300 HB | NS740 | 150 ~ 250 | | | | |
| | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | NS740 | 120 ~ 200 | | | | |
| | Die steels SKD61, etc. X40CrMoV5-1, etc. < 300 HB | NS740 | 100 ~ 150 | | | | |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc. | AH120 NS740 | 150 ~ 220 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |
| K | Cast irons FC250, etc. 250, etc. | GH110 AH120 | 120 ~ 200 | < 0.2 | 2 ~ 6 | ≤0.2 | 1 ~ 2.5 |

## Face mills with adjustable structure for super finishing

A.R. = -5°,R.R. = -30°

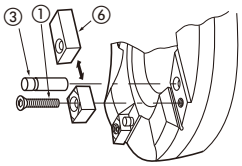


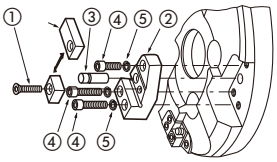

Right hand (R) shown.

| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MS04R/L | 0.1 | 100 | 2 | 105 | 55 | 31.75 | 32 | 12.7 | 8 | 3 | SN**56... |
| MS05R/L | 0.1 | 125 | 2 | 130 | 60 | 38.1 | 38 | 15.9 | 10 | 4 | SN**56... |
| MS06R/L | 0.1 | 150 | 4 | 155 | 60 | 50.8 | 38 | 19 | 11 | 5 | SN**56... |
| MS08R/L | 0.1 | 200 | 4 | 205 | 60 | 47.625 | 38 | 25.4 | 14 | 8.5 | SN**56... |
| MS10R/L | 0.1 | 250 | 4 | 255 | 60 | 47.625 | 38 | 25.4 | 14 | 14 | SN**56... |
| MS12R/L | 0.1 | 300 | 4 | 305 | 60 | 47.625 | 38 | 25.4 | 14 | 23 | SN**56... |

### SPARE PARTS

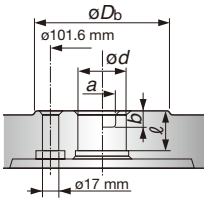
| Designation | ① Clamping screw | ② Locator | ③ Pin | ④ Locator fixing screw | ⑤ Washer | ⑥ Protector | Wrench |
|---|---|---|---|---|---|---|---|
| MS04R/L | CST-5 | - | SP-8 | - | - | PMS4R/L | T-25D |
| MS05R/L, MS06R/L | CST-5 | - | SP-8 | - | - | PMS5R/L | T-25D |
| MS08R/L, MS12R/L | CST-5 | LMS56R/L | SP-8 | CM6x25, CM6x16 | VA6 | PMS5R/L | T-25D |



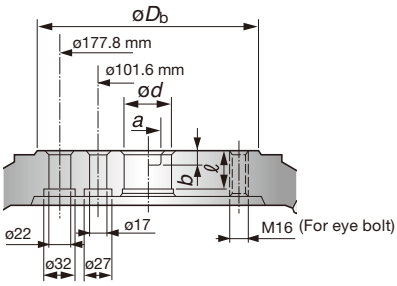




## Arbor type

### MS08, 10R/L

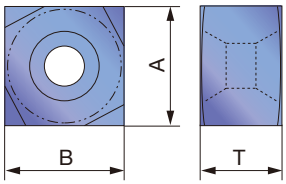



### MS12R/L

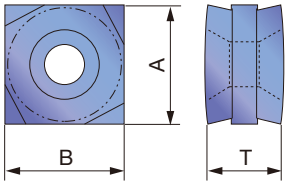


## INSERTS

### SNAA/SNCC56FTR




### SNAG/SNCJ56FTR




| | | Cermet |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | ☆ |

★ : First choice
☆ : Second choice

| Designation | Max. ap | X407 | A | B | T |
|---|---|---|---|---|---|
| SNAA56FTR | 0.1 | ● | 7.85 | 15.875 | 9.52 |
| SNAG56FTR | 0.1 | | 7.85 | 15.875 | 9.52 |
| SNCC56FTR | 0.1 | | 7.85 | 15.875 | 9.52 |
| SNCJ56FTR | 0.1 | | 7.85 | 15.875 | 9.52 |

●: Line up

## STANDARD CUTTING CONDITIONS

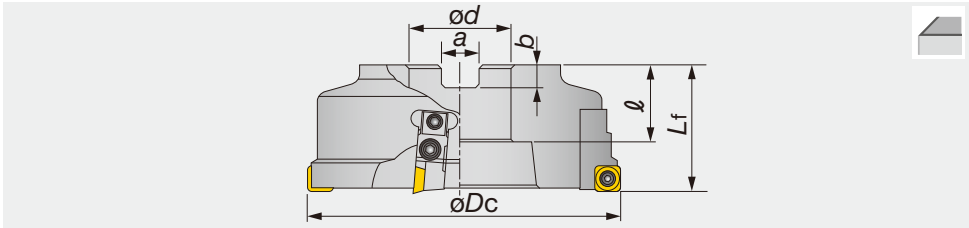
| ISO | Work materials | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) |
|---|---|---|---|---|---|
| P | Mild steels | X407 | 260 ~ 300 | ≤ 6 | ≤ 0.1 |
| | Carbon steels | X407 | 120 ~ 180 | ≤ 6 | ≤ 0.1 |
| | Alloy steels | X407 | 120 ~ 180 | ≤ 6 | ≤ 0.1 |
| | Die steels | X407 | 120 ~ 180 | ≤ 6 | ≤ 0.1 |
| H | Carbon steel (> 40HRC) | X407 | 150 ~ 200 | ≤ 3 | ≤ 0.05 |

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
- Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

## SFP4000R

Face mills with adjustable structure for super finishing

A.R. = +5°,R.R. = -20°




| Designation | Max. ap | øDc | z | Lf | ød | ℓ | a | b | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| SFP4004R | 0.1 | 100 | 2 | 63 | 31.75 | 32 | 12.7 | 8 | 2.3 | SPHA435FNW |
| SFP4005R | 0.1 | 125 | 2 | 63 | 38.1 | 38 | 15.9 | 10 | 3.5 | SPHA435FNW |
| SFP4006R | 0.1 | 160 | 4 | 63 | 50.8 | 38 | 19 | 11 | 5.8 | SPHA435FNW |
| SFP4008R | 0.1 | 200 | 4 | 63 | 47.625 | 38 | 25.4 | 14 | 9 | SPHA435FNW |
| SFP4004R-E | 0.1 | 100 | 2 | 63 | 32 | 32 | 14.4 | 8 | 2.3 | SPHA435FNW |
| SFP4005R-E | 0.1 | 125 | 2 | 63 | 40 | 32 | 16.4 | 9 | 3.5 | SPHA435FNW |
| SFP4006R-E | 0.1 | 160 | 4 | 63 | 40 | 29 | 16.4 | 9 | 5.8 | SPHA435FNW |

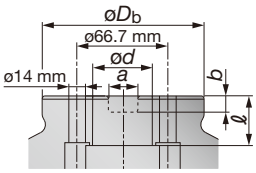
SPARE PARTS

| Designation | Clamping screw | Locator | Right-left screw | Locator fixing screw | Socket-head screw | Wedge | Wrench | Washer | Washer 1 | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| SFP40... | CSTA-5S | LW400R | FDS-8S | CM5X0.8X16 | CM5X0.8X8 | FW-305 | T-15D | 5S | L5 | P-4 |

Face Milling

## Arbor type

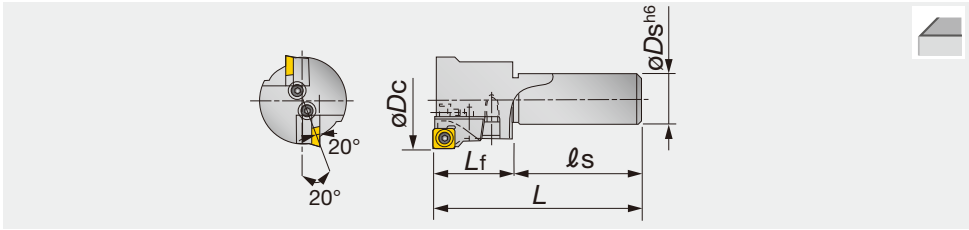
### SFP4006R-E




## EFP4000R

Endmills with adjustable structure for super finishing

A.R. = +5°, R.R. = -20°




| Designation | Max. ap | øDc | z | øDs | ℓs | L | Lf | Insert |
|---|---|---|---|---|---|---|---|---|
| EFP4050R | 0.1 | 50 | 1 | 32 | 80 | 120 | 40 | SPHA435FNW |
| EFP4063R | 0.1 | 63 | 2 | 32 | 80 | 130 | 50 | SPHA435FNW |

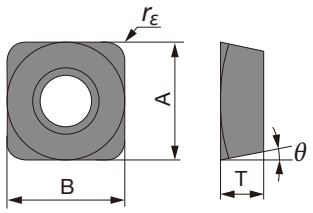
EFP4050R doesn't have adjustable system.

SPARE PARTS

| Designation | Clamping Screw | Locator | Right-left screw | Locator fixing screw | Socket-head screw | Wedge | Wrench | Washer | Washer 1 | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| EFP4050R | CSTA-5S | LW402R | - | CM5X0.8X16 | - | - | T-15D | - | - | - |
| EFP4063R | CSTA-5S | LW400R | FDS-8S | CM5X0.8X16 | CM5X0.8X18 | FW-305 | T-15D | 5S | L5 | P-4 |

## INSERT

### SPHA435




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | | ★ |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Cermet N308 | Un-coated TH10 | A | B | T | θ° |
|---|---|---|---|---|---|---|---|---|
| SPHA435FNW | 2 | 0.1 | ● | ● | 12.7 | 12.7 | 4.76 | 11 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed per revolution f (mm/rev) SFP | Feed per revolution f (mm/rev) EFP | Depth of cut ap (mm) |
|---|---|---|---|---|---|---|
| P | Mild steels | N308 | 180 ~ 250 | ≤6 | ≤4 | ≤0.1 |
| | Carbon steels | N308 | 150 ~ 200 | ≤6 | ≤4 | ≤0.1 |
| | Alloy steels | N308 | 150 ~ 200 | ≤6 | ≤4 | ≤0.1 |
| M | Stainless steels | N308 | 160 ~ 200 | ≤4 | ≤3 | ≤0.1 |
| K | Cast irons | TH10 | 100 ~ 150 | ≤5 | ≤3 | ≤0.2 |
| N | Non-ferrous metals | TH10 | 200 ~ 500 | ≤6 | ≤4 | ≤0.1 |

Note:
Under above conditions, attainable surface roughness is 3 to 4 μm *Rz*JIS for steels and 6 ~ 12 μm *Rz*JIS for cast irons.
• No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Cutter diameter
• Table feed (mm/min) = No. of revolutions × Feed per tooth × No. of inserts

# MillLine - Slot Milling

## TUNGMINISLIT

D208

Thin width slitting cutter with self-clamping insert

**ø63 - ø125 mm**
**Slot width 1.6 - 4.1 mm**

P M K

## TUNGTHINSLIT

D211

Slot milling cutters available in axial drive type working with 6-cornered tangentially mounted inserts

**ø80 - ø200 mm**
**Slot width 4 - 8 mm**

P M K S

## TUNGUNIVERSALSLOT

D213

Axial and radial drive type slot milling cutters with 6-cornered radially mounted inserts

**ø80 - ø160 mm**
**Slot width 9 - 16 mm**

P M K S

## TECTANGENTIALSLOT

D216

Axial and radial drive type slot milling cutters for wider slots with tangentially mounted inserts

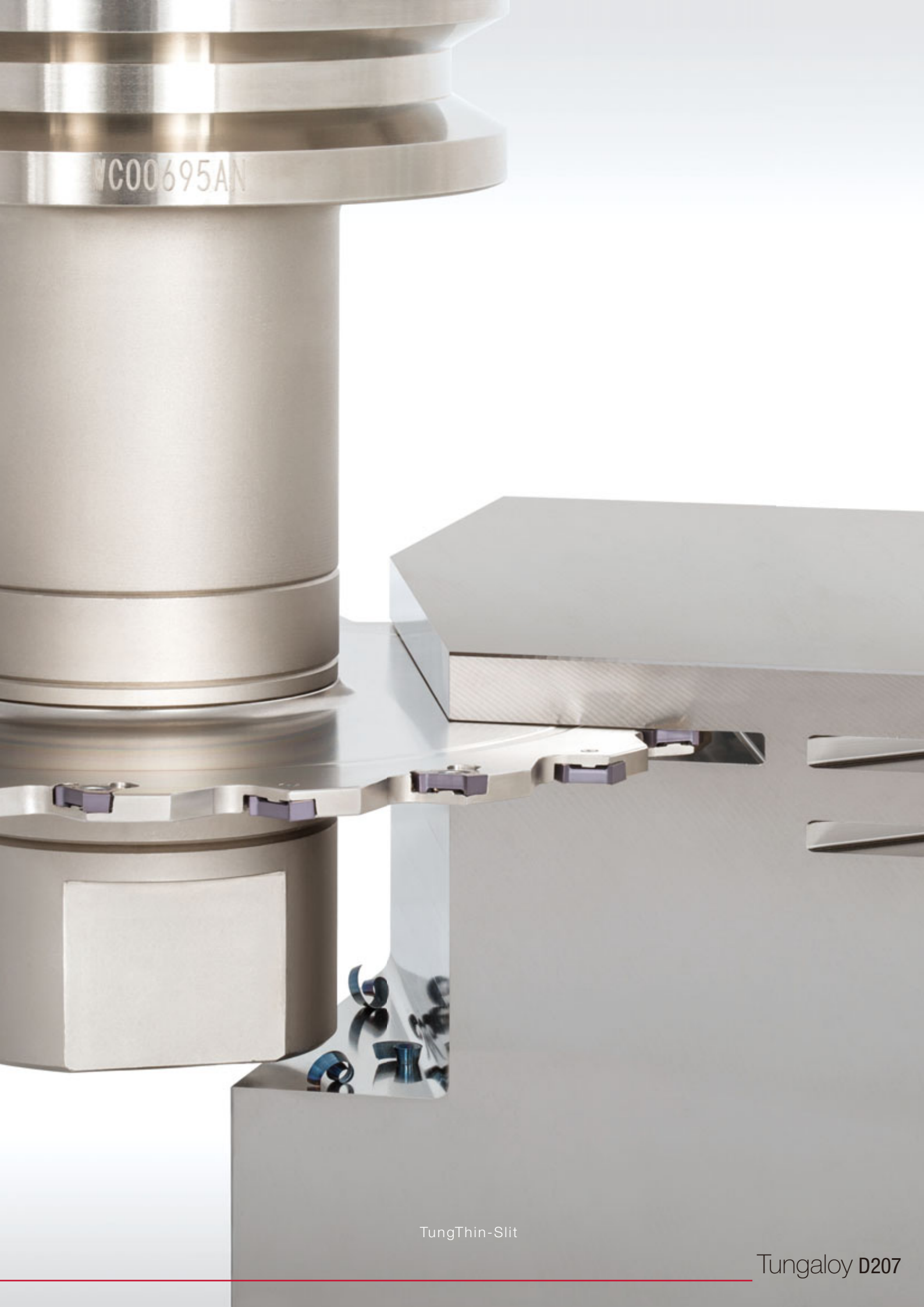
**ø100 - ø250 mm**
**Slot width 16 - 25 mm**

P M K S

## Other Slot Milling Tools

D219

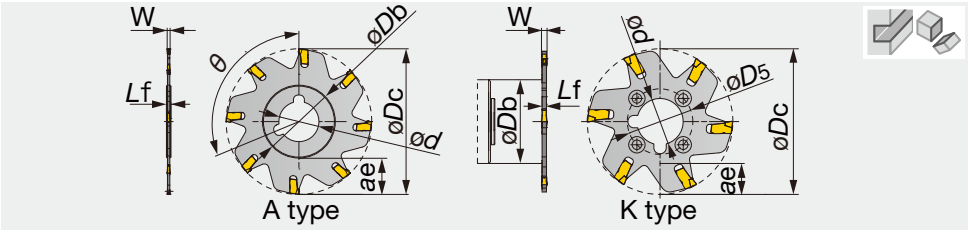
SVN4000




TungThin-Slit

# S/ASG

Side cutter for thin slitting and cutting off




| Designation | W min | W max | øDc | z | øDb | ød | øD5 | Lf | Max. ae | θ° | SS | SS | Drive flange | type | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSG01R063-E1.6 | 1.6 | 1.6 | 63 | 6 | 32 | 10 | 22 | 2.4 | 14 | 0 | SW25-32 | SW1.00-32 | - | K | SSS16N |
| ASG01N076-1.6 | 1.6 | 1.6 | 76.2 | 8 | 39 | 25.4 | - | 2.4 | 14 | 112.5 | - | - | - | A | SSS16N |
| ASG01N080-E1.6 | 1.6 | 1.6 | 80 | 8 | 39 | 22 | - | 2.4 | 16 | 112.5 | - | - | - | A | SSS16N |
| ASG01N100-1.6 | 1.6 | 1.6 | 100 | 10 | 39 | 25.4 | - | 2.4 | 30 | 90 | - | - | - | A | SSS16N |
| ASG01N100-E1.6 | 1.6 | 1.6 | 100 | 10 | 39 | 22 | - | 2.4 | 30 | 90 | - | - | - | A | SSS16N |
| ASG01N125-1.6 | 1.6 | 1.6 | 125 | 12 | 64 | 31.75 | - | 2.4 | 30 | 75 | - | - | - | A | SSS16N |
| ASG01N125-E1.6 | 1.6 | 1.6 | 125 | 12 | 64 | 27 | - | 2.4 | 30 | 75 | - | - | - | A | SSS16N |
| SSG02R063-E2 | 1.85 | 2.5 | 63 | 6 | 32 | 10 | 22 | 2.4 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SSM/S22N |
| ASG02N076-2 | 1.85 | 2.5 | 76.2 | 8 | 39 | 25.4 | - | 2.4 | 17 | 112.5 | - | - | - | A | SSM/S22N |
| ASG02N080-E2 | 1.85 | 2.5 | 80 | 8 | 39 | 22 | - | 2.4 | 20 | 112.5 | - | - | - | A | SSM/S22N |
| ASG02N100-2 | 1.85 | 2.5 | 100 | 10 | 39 | 25.4 | - | 2.4 | 30 | 90 | - | - | - | A | SSM/S22N |
| ASG02N100-E2 | 1.85 | 2.5 | 100 | 10 | 39 | 22 | - | 2.4 | 30 | 90 | - | - | - | A | SSM/S22N |
| ASG02N125-2 | 1.85 | 2.5 | 125 | 12 | 60 | 31.75 | - | 2.4 | 32 | 75 | - | - | - | A | SSM/S22N |
| ASG02N125-E2 | 1.85 | 2.5 | 125 | 12 | 60 | 27 | - | 2.4 | 32 | 75 | - | - | - | A | SSM/S22N |
| SSG03R063-E3 | 2.65 | 3.5 | 63 | 5 | 32 | 10 | 22 | 2.4 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SSM/S31N |
| SSG03R080-3 | 2.65 | 3.5 | 80 | 6 | 46 | 25.4 | 36 | 2.4 | 16 | 0 | SW32-25.4-46-J | SW1.25-46 | R1.00-46 | K | SSM/S31N |
| SSG03R080-E3 | 2.65 | 3.5 | 80 | 6 | 40(1) | 22 | 32 | 2.4 | 19(2) | 0 | SW32-40 | - | R22-46 | K | SSM/S31N |
| SSG03R100-3 | 2.65 | 3.5 | 100 | 6 | 46 | 25.4 | 36 | 2.4 | 26 | 0 | SW32-25.4-46-J | SW1.25-46 | R1.00-46 | K | SSM/S31N |
| SSG03R100-E3 | 2.65 | 3.5 | 100 | 6 | 40(1) | 22 | 32 | 2.4 | 29(3) | 0 | SW32-40 | - | R22-46 | K | SSM/S31N |
| SSG03R125-3 | 2.65 | 3.5 | 125 | 8 | 55 | 31.75 | 45 | 2.4 | 34 | 0 | - | - | R1.25-55 | K | SSM/S31N |
| SSG03R125-E3 | 2.65 | 3.5 | 125 | 8 | 55 | 32 | 45 | 2.4 | 34 | 0 | S32-55 | - | R32-55 | K | SSM/S31N |
| SSG04R063-E4 | 4 | 4.5 | 63 | 5 | 32 | 10 | 22 | 3.2 | 15 | 0 | SW25-32 | SW1.00-32 | - | K | SSM/S41N |
| SSG04R080-4 | 4 | 4.5 | 80 | 6 | 46 | 25.4 | 36 | 3.2 | 16 | 0 | SW32-25.4-46-J | SW1.25-46 | R1.00-46 | K | SSM/S41N |
| SSG04R080-E4 | 4 | 4.5 | 80 | 6 | 40(1) | 22 | 32 | 3.2 | 19(2) | 0 | SW32-40 | - | R22-46 | K | SSM/S41N |
| SSG04R100-4 | 4 | 4.5 | 100 | 6 | 46 | 25.4 | 36 | 3.2 | 26 | 0 | SW32-25.4-46-J | SW1.25-46 | R1.00-46 | K | SSM/S41N |
| SSG04R100-E4 | 4 | 4.5 | 100 | 6 | 40(1) | 22 | 32 | 3.2 | 29(3) | 0 | SW32-40 | - | R22-46 | K | SSM/S41N |
| SSG04R125-4 | 4 | 4.5 | 125 | 8 | 55 | 31.75 | 45 | 3.2 | 34 | 0 | - | - | R1.25-55 | K | SSM/S41N |
| SSG04R125-E4 | 4 | 4.5 | 125 | 8 | 55 | 32 | 45 | 3.2 | 34 | 0 | S32-55 | - | R32-55 | K | SSM/S41N |

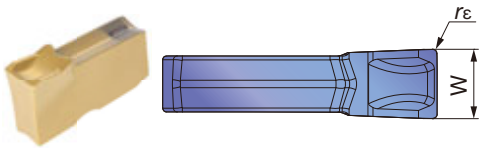
(1) When using a drive flange, øDb = 46 mm
(2) When using a drive flange, Max. *ae* = 16 mm
(3) When using a drive flange, Max. *ae* = 26 mm

## SPARE PARTS

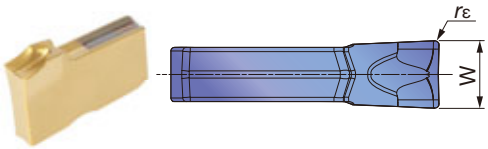
| Designation | Extractor |
|---|---|
| SSG01/02... | ESG 0.5 |
| ASG01/02... | ESG 0.5 |
| SSG03/04... | ESG1 |

## INSERT

### SSM




### SSS




| | | |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | ★ |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | rε | Coated GH130 | W±0.04 |
|---|---|---|---|
| SSM22N | 0.2 | ● | 2.2 |
| SSM31N | 0.2 | ● | 3.1 |
| SSM41N | 0.25 | ● | 4.1 |
| SSS16N | 0.16 | ● | 1.6 |
| SSS22N | 0.2 | ● | 2.2 |
| SSS31N | 0.2 | ● | 3.1 |
| SSS41N | 0.25 | ● | 4.1 |

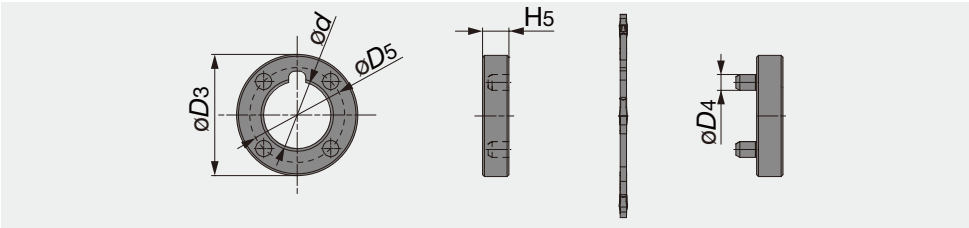
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Insert | Cutting speed *Vc* (m/min) | Chip thickness t (mm) |
|---|---|---|---|---|---|
| P | Low carbon steel<br>SS400, S15C, etc.<br>E275A, C15E4, etc. | - 200 | SSM... | 150 - 230 | 0.05 - 0.15 |
| | High carbon steel<br>S45C, S55C, etc.<br>E355D, C55, etc. | 200 - 300 | SSM... | 100 - 170 | 0.04 - 0.13 |
| | Alloy steels<br>SCM440, SCr415, etc.<br>42CrMo4, 20Cr4, etc. | 150 - 300 | SSM... | 90 - 160 | 0.04 - 0.13 |
| | Tool steel<br>SKD11, SKD61, etc.<br>X153CrMoV12, X40CrMoV5-1, etc. | - 300 | SSM... | 70 - 120 | 0.04 - 0.13 |
| M | Stainless steel<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | SSS... | 90 - 200 | 0.04 - 0.13 |
| K | Grey cast iron<br>FC250, FC300, etc.<br>250, 300, etc. | 150 - 250 | SSM... | 100 - 200 | 0.05 - 0.15 |
| | Ductile cast iron<br>FCD400, etc,<br>400-15S, etc. | 150 - 250 | SSM... | 80 - 130 | 0.05 - 0.15 |

## R (drive flange set)

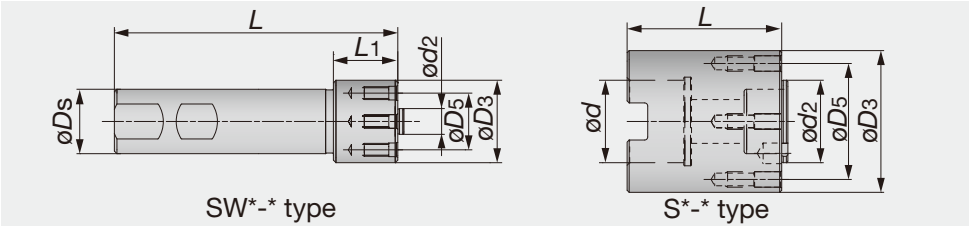
Drive flange set for side cutters




| Designation | ød | øD3 | øD4 | øD5 | H5 |
|---|---|---|---|---|---|
| R1.00-46 | 25.4 | 46 | 5 | 36 | 10 |
| R22-46 | 22 | 46 | 6 | 45 | 10 |
| R1.25-55 | 31.75 | 55 | 6 | 45 | 10 |
| R32-55 | 32 | 55 | 6 | 45 | 10 |

## SW/S

Drive shanks for side cutters



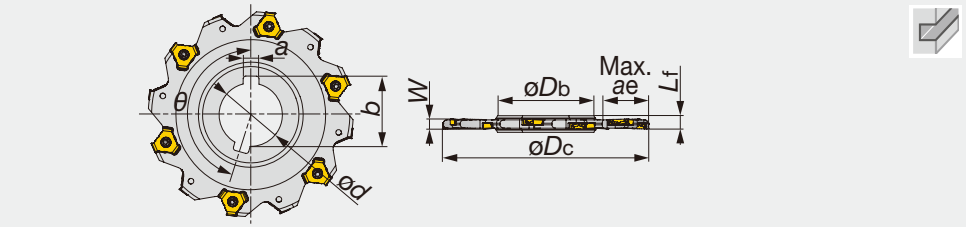

| Designation | øDs | ød | ød2 | øD3 | øD5 | L1 | L |
|---|---|---|---|---|---|---|---|
| SW25-32 | 25 | - | 10 | 32 | 22 | 25 | 110 |
| SW32-40 | 32 | - | 22 | 40 | 32 | 30 | 120 |
| SW32-25.4-46-J | 32 | - | 25.4 | 46 | 36 | 30 | 120 |
| SW1.00-32 | 25.4 | - | 10 | 32 | 22 | 25.4 | 110 |
| SW1.25-46 | 31.75 | - | 25.4 | 46 | 36 | 30 | 120 |
| S32-55 | - | 32 | 32 | 55 | 45 | - | 60 |

### SPARE PARTS

| Designation | Screw | Wrench | | |
|---|---|---|---|---|
| | | Mono block type | Torx bit | Handle |
| SW25-32 | SR76-961 | SETT-15/5 | - | - |
| SW32-40 | SR76-963 | SETT-15/5 | - | - |
| SW32-25.4-46-J | SR76-963 | SETT-15/5 | - | - |
| SW1.00-32 | SR76-961 | SETT-15/5 | - | - |
| SW1.25-46 | SR76-963 | SETT-15/5 | - | - |
| S32-55 | SR76-943 | - | BT20M | H-TB |

# ASV 02/03/04/05

Axial drive type slot milling cutter with tangentially mounted inserts



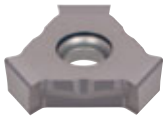

| Designation | W | øDc | Edge/Z | øDb | ød | Lf | b | a | Max. ae | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASV02N080-4 | 4 | 80 | 5/10 | 41 | 25.4 | 6 | 28 | 6.35 | 15 | 162 | TVKX0202... |
| ASV02N080-E4 | 4 | 80 | 5/10 | 41 | 27 | 6 | 29.8 | 7 | 15 | 162 | TVKX0202... |
| ASV02N100-4 | 4 | 100 | 6/12 | 48 | 31.75 | 6 | 35.2 | 7.92 | 20 | 165 | TVKX0202... |
| ASV02N100-E4 | 4 | 100 | 6/12 | 47 | 32 | 6 | 34.8 | 8 | 20 | 165 | TVKX0202... |
| ASV02N125-4 | 4 | 125 | 8/16 | 58 | 38.1 | 6 | 42.3 | 9.52 | 30 | 168.75 | TVKX0202... |
| ASV02N125-E4 | 4 | 125 | 8/16 | 55 | 40 | 6 | 43.5 | 10 | 30 | 168.75 | TVKX0202... |
| ASV02N160-4 | 4 | 160 | 10/20 | 58 | 38.1 | 6 | 42.3 | 9.52 | 45 | 171 | TVKX0202... |
| ASV02N160-E4 | 4 | 160 | 10/20 | 55 | 40 | 6 | 43.5 | 10 | 45 | 171 | TVKX0202... |
| ASV03N080-5 | 5 | 80 | 5/10 | 41 | 25.4 | 6.5 | 28 | 6.35 | 15 | 162 | TVKX03X3... |
| ASV03N080-E5 | 5 | 80 | 5/10 | 41 | 27 | 6.5 | 29.8 | 7 | 15 | 162 | TVKX03X3... |
| ASV03N100-5 | 5 | 100 | 6/12 | 48 | 31.75 | 6.5 | 35.2 | 7.92 | 20 | 165 | TVKX03X3... |
| ASV03N100-E5 | 5 | 100 | 6/12 | 47 | 32 | 6.5 | 34.8 | 8 | 20 | 165 | TVKX03X3... |
| ASV03N125-5 | 5 | 125 | 8/16 | 58 | 38.1 | 6.5 | 42.3 | 9.52 | 30 | 168.75 | TVKX03X3... |
| ASV03N125-E5 | 5 | 125 | 8/16 | 55 | 40 | 6.5 | 43.5 | 10 | 30 | 168.75 | TVKX03X3... |
| ASV03N160-5 | 5 | 160 | 10/20 | 58 | 38.1 | 6.5 | 42.3 | 9.52 | 45 | 171 | TVKX03X3... |
| ASV03N160-E5 | 5 | 160 | 10/20 | 55 | 40 | 6.5 | 43.5 | 10 | 45 | 171 | TVKX03X3... |
| ASV04N080-6 | 6 | 80 | 4/8 | 41 | 25.4 | 8 | 28 | 6.35 | 17 | 157.5 | TVKX04H3... |
| ASV04N080-E6 | 6 | 80 | 4/8 | 41 | 27 | 8 | 29.8 | 7 | 17 | 157.5 | TVKX04H3... |
| ASV04N100-6 | 6 | 100 | 5/10 | 48 | 31.75 | 8 | 35.2 | 7.92 | 23.5 | 162 | TVKX04H3... |
| ASV04N100-E6 | 6 | 100 | 5/10 | 47 | 32 | 8 | 34.8 | 8 | 23.5 | 162 | TVKX04H3... |
| ASV04N125-6 | 6 | 125 | 6/12 | 58 | 38.1 | 8 | 42.3 | 9.52 | 31 | 165 | TVKX04H3... |
| ASV04N125-E6 | 6 | 125 | 6/12 | 55 | 40 | 8 | 43.5 | 10 | 32.5 | 165 | TVKX04H3... |
| ASV04N160-6 | 6 | 160 | 8/16 | 58 | 38.1 | 8 | 42.3 | 9.52 | 48.5 | 168.75 | TVKX04H3... |
| ASV04N160-E6 | 6 | 160 | 8/16 | 55 | 40 | 8 | 43.5 | 10 | 50 | 168.75 | TVKX04H3... |
| ASV04N200-6 | 6 | 200 | 10/20 | 69 | 50.8 | 8 | 55.8 | 12.7 | 63 | 171 | TVKX04H3... |
| ASV04N200-E6 | 6 | 200 | 10/20 | 69 | 50 | 8 | 53.5 | 12 | 63 | 171 | TVKX04H3... |
| ASV05N080-8 | 8 | 80 | 4/8 | 41 | 25.4 | 10 | 28 | 6.35 | 17 | 157.5 | TVKX0504... |
| ASV05N080-E8 | 8 | 80 | 4/8 | 41 | 27 | 10 | 29.8 | 7 | 17 | 157.5 | TVKX0504... |
| ASV05N100-8 | 8 | 100 | 5/10 | 48 | 31.75 | 10 | 35.2 | 7.92 | 23.5 | 162 | TVKX0504... |
| ASV05N100-E8 | 8 | 100 | 5/10 | 47 | 32 | 10 | 34.8 | 8 | 23.5 | 162 | TVKX0504... |
| ASV05N125-8 | 8 | 125 | 6/12 | 58 | 38.1 | 10 | 42.3 | 9.52 | 31 | 165 | TVKX0504... |
| ASV05N125-E8 | 8 | 125 | 6/12 | 55 | 40 | 10 | 43.5 | 10 | 32.5 | 165 | TVKX0504... |
| ASV05N160-8 | 8 | 160 | 8/16 | 58 | 38.1 | 10 | 42.3 | 9.52 | 48.5 | 168.75 | TVKX0504... |
| ASV05N160-E8 | 8 | 160 | 8/16 | 55 | 40 | 10 | 43.5 | 10 | 50 | 168.75 | TVKX0504... |
| ASV05N200-8 | 8 | 200 | 10/20 | 69 | 50.8 | 10 | 55.8 | 12.7 | 63 | 171 | TVKX0504... |
| ASV05N200-E8 | 8 | 200 | 10/20 | 69 | 50 | 10 | 53.5 | 12 | 63 | 171 | TVKX0504... |

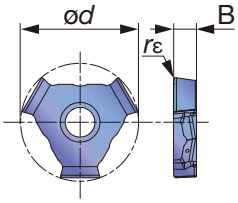
## SPARE PARTS

| Designation | Clamping screw | Grip | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|
| ASV02/03N... | SR114-018-L3.40 | - | M-1000 | - | T-6D |
| ASV04N... | SR14-500/L5.1 | H-TB2W | M-1000 | BT15S | - |
| ASV05N... | SR14-500-L7.0 | H-TB2W | M-1000 | BT15S | - |

## INSERT

### TVKX-MJ






| | | | | | |
|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | |
| M | Stainless | | ★ | ☆ | |
| K | Cast iron | ★ | | ☆ | |
| N | Non-ferrous | | | | |
| S | Superalloys | ★ | ☆ | ★ | |
| H | Hard materials | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coated AH120 | Coated AH130 | Coated AH725 | B | ød |
|---|---|---|---|---|---|---|
| TVKX020202TN-MJ | 0.2 | ● | | ● | 2.4 | 9.4 |
| TVKX020204TN-MJ | 0.4 | ● | | ● | 2.4 | 9.4 |
| TVKX03X302TN-MJ | 0.2 | ● | | ● | 3.2 | 9.4 |
| TVKX03X304TN-MJ | 0.4 | ● | | ● | 3.2 | 9.4 |
| TVKX04H304TN-MJ | 0.4 | ● | ● | ● | 3.5 | 16.9 |
| TVKX04H308TN-MJ | 0.8 | ● | ● | ● | 3.5 | 16.9 |
| TVKX050404TN-MJ | 0.4 | ● | ● | ● | 4.5 | 16.9 |
| TVKX050408TN-MJ | 0.8 | ● | ● | ● | 4.5 | 16.9 |

●: Line up

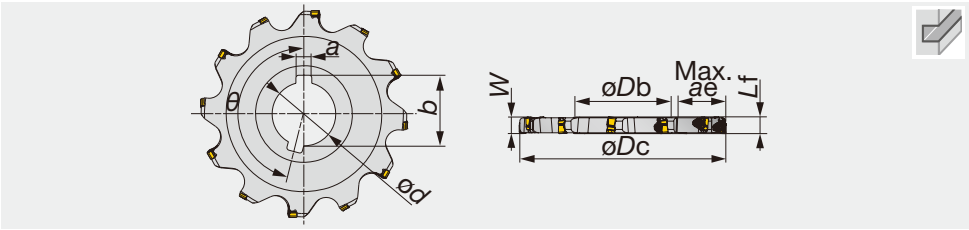
Slot Milling

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed Vc (m/min) | Feed per edge line: fz (mm/t) ASV ae / øDc (mm) 10% | ASV 20% | ASV 30% | ASV ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels SS400, etc. E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | | - 200 | For impact resistance | AH130 | 90 - 180 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | High carbon steels S45C, etc. C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | 200 - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | Alloy steels SCM440, etc. 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | 150 - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | Tool steels SKD61, etc. X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| | | - 300 | For impact resistance | AH130 | 90 - 180 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | - | AH130 | 90 - 200 | 0.07 - 0.22 | 0.05 - 0.16 | 0.04 - 0.14 | 0.04 - 0.13 |
| K | Grey cast irons FC250, etc. 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.08 - 0.25 | 0.06 - 0.19 | 0.05 - 0.16 | 0.05 - 0.15 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | | - | For impact resistance | AH130 | 30 - 40 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |
| | | - | For impact resistance | AH130 | 20 - 35 | 0.07 - 0.12 | 0.05 - 0.09 | 0.04 - 0.07 | 0.04 - 0.07 |

# ASW 06/07/09

## Axial drive type slot milling cutter



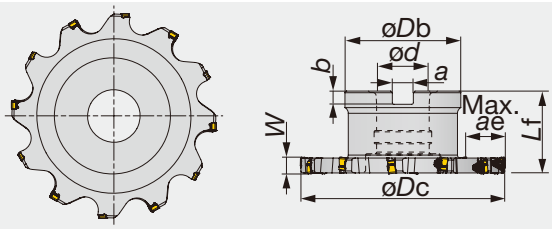

| Designation | W | øDc | Edge/Z | øDb | ød | Lf | b | a | Max. ae | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ASW06N080-10 | 10 | 80 | 4/8 | 41 | 25.4 | 10 | 28 | 6.35 | 18.5 | 157.5 | WNGU0603... |
| ASW06N080-E10 | 10 | 80 | 4/8 | 41 | 27 | 10 | 29.8 | 7 | 18.5 | 157.5 | WNGU0603... |
| ASW06N100-10 | 10 | 100 | 5/10 | 48 | 31.75 | 10 | 35.2 | 7.92 | 25 | 162 | WNGU0603... |
| ASW06N100-E10 | 10 | 100 | 5/10 | 47 | 32 | 10 | 34.8 | 8 | 25.5 | 162 | WNGU0603... |
| ASW06N125-10 | 10 | 125 | 6/12 | 58 | 38.1 | 10 | 42.3 | 9.52 | 32.5 | 165 | WNGU0603... |
| ASW06N125-E10 | 10 | 125 | 6/12 | 55 | 40 | 10 | 43.5 | 10 | 34 | 165 | WNGU0603... |
| ASW06N160-10 | 10 | 160 | 7/14 | 58 | 38.1 | 10 | 42.3 | 9.52 | 50 | 167.14 | WNGU0603... |
| ASW06N160-E10 | 10 | 160 | 7/14 | 55 | 40 | 10 | 43.5 | 10 | 51.5 | 167.14 | WNGU0603... |
| ASW07N100-12 | 12 | 100 | 5/10 | 48 | 31.75 | 12 | 35.2 | 7.92 | 25 | 162 | WNGU07T3... |
| ASW07N100-E12 | 12 | 100 | 5/10 | 47 | 32 | 12 | 34.8 | 8 | 25.5 | 162 | WNGU07T3... |
| ASW07N125-12 | 12 | 125 | 6/12 | 58 | 38.1 | 12 | 42.3 | 9.52 | 32.5 | 165 | WNGU07T3... |
| ASW07N125-E12 | 12 | 125 | 6/12 | 55 | 40 | 12 | 43.5 | 10 | 34 | 165 | WNGU07T3... |
| ASW07N160-12 | 12 | 160 | 7/14 | 58 | 38.1 | 12 | 42.3 | 9.52 | 50 | 167.14 | WNGU07T3... |
| ASW07N160-E12 | 12 | 160 | 7/14 | 55 | 40 | 12 | 43.5 | 10 | 51.5 | 167.14 | WNGU07T3... |
| ASW09N100-14 | 14 | 100 | 5/10 | 48 | 31.75 | 14 | 35.2 | 7.92 | 25 | 162 | WNGU0904... |
| ASW09N100-E14 | 14 | 100 | 5/10 | 47 | 32 | 14 | 34.8 | 8 | 25.5 | 162 | WNGU0904... |
| ASW09N160-14 | 14 | 160 | 7/14 | 58 | 38.1 | 14 | 42.3 | 9.52 | 50 | 167.14 | WNGU0904... |
| ASW09N160-E14 | 14 | 160 | 7/14 | 55 | 40 | 14 | 43.5 | 10 | 51.5 | 167.14 | WNGU0904... |
| ASW09N160-16 | 16 | 160 | 7/14 | 58 | 38.1 | 16 | 42.3 | 9.52 | 50 | 167.14 | WNGU0904... |
| ASW09N160-E16 | 16 | 160 | 7/14 | 55 | 40 | 16 | 43.5 | 10 | 51.5 | 167.14 | WNGU0904... |

## SPARE PARTS

| Designation | Clamping screw | Clamping screw 1 | Grip | Grip 1 | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|---|---|
| ASW06N... | - | CSPB-2.5 | - | - | M-1000 | - | IP-8D |
| ASW07N100/125-... | - | CSPD-3 | - | SW6-SD | M-1000 | BLD IP10/S7 | - |
| ASW07N160-... | - | CSPD-3 | - | - | M-1000 | - | IP-10D |
| ASW09N100-... | CSPB-3.5 | - | H-TB2W | - | M-1000 | BLDIP15/S7 | - |
| ASW09N160-... | CSPB-3.5 | - | - | - | M-1000 | - | IP-15D |

# TSW 06/07/09

Radial drive type slot milling cutter




| Designation | W | øDc | Edge/Z | øDb | ød | Lf | b | a | Max. ae | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TSW06R100-10 | 10 | 100 | 5/10 | 50 | 25.4 | 50 | 6 | 9.5 | 24 | WNGU0603... |
| TSW06R100-E10 | 10 | 100 | 5/10 | 58 | 27 | 50 | 7 | 12.4 | 20 | WNGU0603... |
| TSW06R125-10 | 10 | 125 | 6/12 | 70 | 31.75 | 50 | 8 | 12.7 | 26.5 | WNGU0603... |
| TSW06R125-E10 | 10 | 125 | 6/12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | WNGU0603... |
| TSW06R160-10 | 10 | 160 | 7/14 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | WNGU0603... |
| TSW06R160-E10 | 10 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU0603... |
| TSW07R100-12 | 12 | 100 | 5/10 | 50 | 25.4 | 50 | 6 | 9.5 | 24 | WNGU07T3... |
| TSW07R100-E12 | 12 | 100 | 5/10 | 58 | 27 | 50 | 7 | 12.4 | 20 | WNGU07T3... |
| TSW07R125-12 | 12 | 125 | 6/12 | 70 | 31.75 | 50 | 8 | 12.7 | 26.5 | WNGU07T3... |
| TSW07R125-E12 | 12 | 125 | 6/12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | WNGU07T3... |
| TSW07R160-12 | 12 | 160 | 7/14 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | WNGU07T3... |
| TSW07R160-E12 | 12 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU07T3... |
| TSW09R160-16 | 16 | 160 | 7/14 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | WNGU0904... |
| TSW09R160-E16 | 16 | 160 | 7/14 | 82 | 40 | 63 | 9 | 16.4 | 38 | WNGU0904... |

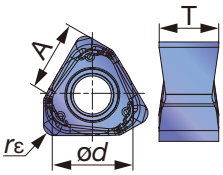


## SPARE PARTS

| Designation | Clamping screw | Clamping screw 1 | Grip | Lubricant | Torx bit | Wrench |
|---|---|---|---|---|---|---|
| TSW06R... | - | CSPB-2.5 | - | M-1000 | - | IP-8D |
| TSW07R100/125-... | - | CSPD-3 | SW6-SD | M-1000 | BLD IP10/S7 | - |
| TSW07R160-... | - | CSPD-3 | - | M-1000 | - | IP-10D |
| TSW09R160-... | CSPB-3.5 | - | - | M-1000 | - | IP-15D |

## INSERT

### WNGU-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | ☆ | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coated AH120 | AH130 | AH725 | A | ød | T |
|---|---|---|---|---|---|---|---|
| WNGU060308TN-MJ | 0.8 | ● | ● | ● | 5.6 | 6.1 | 4.4 |
| WNGU060316TN-MJ | 1.6 | ● | ● | ● | 5.6 | 6.1 | 4.4 |
| WNGU07T308TN-MJ | 0.8 | ● | ● | ● | 6.8 | 7.4 | 5.5 |
| WNGU07T316TN-MJ | 1.6 | ● | ● | ● | 6.8 | 7.4 | 5.5 |
| WNGU090408TN-MJ | 0.8 | ● | ● | ● | 8.5 | 8.6 | 6.5 |
| WNGU090416TN-MJ | 1.6 | ● | ● | ● | 8.5 | 8.6 | 6.5 |

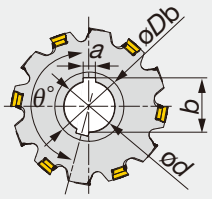
●: Line up

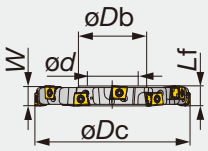
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per edge line: *fz* (mm/t) TSW / ASW ae / ø*Dc* (mm) 10% | 20% | 30% | ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels SS400, etc. E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | - 200 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | High carbon steels S45C, etc. C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | 200 - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | Alloy steels SCM440, etc. 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | 150 - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | Tool steels SKD61, etc. X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| | | - 300 | For impact resistance | AH130 | 90 - 180 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | - | AH130 | 90 - 200 | 0.12 - 0.33 | 0.09 - 0.25 | 0.07 - 0.21 | 0.07 - 0.2 |
| K | Grey cast irons FC250, etc. 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.12 - 0.42 | 0.09 - 0.31 | 0.07 - 0.27 | 0.07 - 0.25 |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.12 - 0.42 | 0.09 - 0.31 | 0.07 - 0.27 | 0.07 - 0.25 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | | - | For impact resistance | AH130 | 30 - 40 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |
| | | - | For impact resistance | AH130 | 20 - 35 | 0.1 - 0.17 | 0.08 - 0.13 | 0.06 - 0.11 | 0.06 - 0.1 |

# ASN 10/12/15

Axial drive type slot milling cutter with tangentially mounted inserts



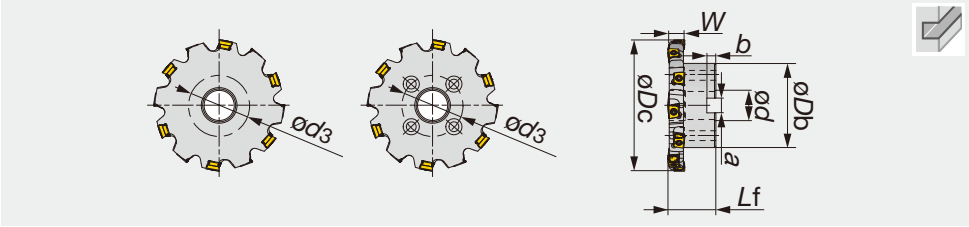

| Designation | W | øDc | Z eff | z | øDb | ød | Lf | b | a | Max. ae | θ° | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASN10R100M31.7-16-05 | 16 | 100 | 5 | 10 | 48 | 31.75 | 16 | 35.2 | 7.92 | 25 | 162 | LMEU1008**ZNEN-MJ |
| ASN10R100M32.0E16-05 | 16 | 100 | 5 | 10 | 47 | 32 | 16 | 34.8 | 8 | 25.5 | 162 | LMEU1008**ZNEN-MJ |
| ASN10R125M38.1-16-06 | 16 | 125 | 6 | 12 | 58 | 38.1 | 16 | 42.3 | 9.52 | 32.5 | 165 | LMEU1008**ZNEN-MJ |
| ASN10R125M40.0E16-06 | 16 | 125 | 6 | 12 | 55 | 40 | 16 | 43.5 | 10 | 34 | 165 | LMEU1008**ZNEN-MJ |
| ASN10R160M38.1-16-07 | 16 | 160 | 7 | 14 | 58 | 38.1 | 16 | 42.3 | 9.52 | 50 | 167.14 | LMEU1008**ZNEN-MJ |
| ASN10R160M40.0E16-07 | 16 | 160 | 7 | 14 | 55 | 40 | 16 | 43.5 | 10 | 51.5 | 167.14 | LMEU1008**ZNEN-MJ |
| ASN10R200M50.0E16-08 | 16 | 200 | 8 | 16 | 69 | 50 | 16 | 53.6 | 12 | 64.5 | 168.75 | LMEU1008**ZNEN-MJ |
| ASN12R100M31.7-19-05 | 19 | 100 | 5 | 10 | 48 | 31.75 | 19 | 35.2 | 7.92 | 25 | 162 | LMEU1206**ZNEN-MJ |
| ASN12R100M32.0E19-05 | 19 | 100 | 5 | 10 | 47 | 32 | 19 | 34.8 | 8 | 25.5 | 162 | LMEU1208**ZNEN-MJ |
| ASN12R125M38.1-19-06 | 19 | 125 | 6 | 12 | 58 | 38.1 | 19 | 42.3 | 9.52 | 32.5 | 165 | LMEU1206**ZNEN-MJ |
| ASN12R125M40.0E19-06 | 19 | 125 | 6 | 12 | 55 | 40 | 19 | 43.5 | 10 | 34 | 165 | LMEU1208**ZNEN-MJ |
| ASN12R160M38.1-19-07 | 19 | 160 | 7 | 14 | 58 | 38.1 | 19 | 42.3 | 9.52 | 50 | 167.14 | LMEU1206**ZNEN-MJ |
| ASN12R160M40.0E19-07 | 19 | 160 | 7 | 14 | 55 | 40 | 19 | 43.5 | 10 | 51.5 | 167.14 | LMEU1208**ZNEN-MJ |
| ASN12R200M50.0E19-08 | 19 | 200 | 8 | 16 | 69 | 50 | 19 | 53.6 | 12 | 64.5 | 168.75 | LMEU1208**ZNEN-MJ |
| ASN12R250M50.0E19-09 | 19 | 250 | 9 | 18 | 84 | 50 | 19 | 53.6 | 12 | 82 | 170 | LMEU1208**ZNEN-MJ |
| ASN15R125M38.1-25-05 | 25 | 125 | 5 | 10 | 58 | 38.1 | 25 | 42.3 | 9.52 | 32.5 | 162 | LMEU1509**ZNEN-MJ |
| ASN15R125M40.0E25-05 | 25 | 125 | 5 | 10 | 55 | 40 | 25 | 43.5 | 10 | 34 | 165 | LMEU1509**ZNEN-MJ |
| ASN15R160M38.1-25-06 | 25 | 160 | 6 | 12 | 58 | 38.1 | 25 | 42.3 | 9.52 | 50 | 165 | LMEU1509**ZNEN-MJ |
| ASN15R160M40.0E25-06 | 25 | 160 | 6 | 12 | 55 | 40 | 25 | 43.5 | 10 | 51.5 | 167.14 | LMEU1509**ZNEN-MJ |
| ASN15R200M50.0E25-07 | 25 | 200 | 7 | 14 | 69 | 50 | 25 | 53.6 | 12 | 64.5 | 168.75 | LMEU1509**ZNEN-MJ |
| ASN15R250M50.0E25-08 | 25 | 250 | 8 | 16 | 84 | 50 | 25 | 53.6 | 12 | 82 | 170 | LMEU1509**ZNEN-MJ |

## SPARE PARTS

| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| ASN10/12R... | SM40-143-H0 | H-TB | BT15S |
| ASN15R... | CSTB-5L159 | H-TB | BT20S |

## TSN

Radial drive type slot milling cutter with tangentially mounted inserts



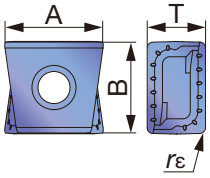

| Designation | W | øDc | Z eff | z | øDb | ød | Lf | b | a | Max. ae | ød3 | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TSN10R100M25.4-16-05 | 16 | 100 | 5 | 10 | 50 | 25.4 | 50 | 6 | 9.5 | 24 | - | LMEU1008**ZNEN-MJ |
| TSN10R100M27.0E16-05 | 16 | 100 | 5 | 10 | 58 | 27 | 50 | 7 | 12.4 | 20 | - | LMEU1008**ZNEN-MJ |
| TSN10R125M31.7-16-06 | 16 | 125 | 6 | 12 | 70 | 31.75 | 50 | 8 | 12.7 | 26.5 | - | LMEU1008**ZNEN-MJ |
| TSN10R125M32.0E16-06 | 16 | 125 | 6 | 12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1008**ZNEN-MJ |
| TSN10R160M38.1-16-07 | 16 | 160 | 7 | 14 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | - | LMEU1008**ZNEN-MJ |
| TSN10R160M40.0E16-07 | 16 | 160 | 7 | 14 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1008**ZNEN-MJ |
| TSN10R200M40.0E16-08 | 16 | 200 | 8 | 16 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1008**ZNEN-MJ |
| TSN10R200M47.6-16-08 | 16 | 200 | 8 | 16 | 135 | 47.625 | 63 | 14 | 25.4 | 31.5 | 101.6 | LMEU1008**ZNEN-MJ |
| TSN12R100M25.4-19-05 | 19 | 100 | 5 | 10 | 50 | 25.4 | 50 | 6 | 9.5 | 24 | - | LMEU1208**ZNEN-MJ |
| TSN12R100M27.0E19-05 | 19 | 100 | 5 | 10 | 58 | 27 | 50 | 7 | 12.4 | 20 | - | LMEU1208**ZNEN-MJ |
| TSN12R125M31.7-19-06 | 19 | 125 | 6 | 12 | 70 | 31.75 | 50 | 8 | 12.7 | 26.5 | - | LMEU1208**ZNEN-MJ |
| TSN12R125M32.0E19-06 | 19 | 125 | 6 | 12 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1208**ZNEN-MJ |
| TSN12R160M38.1-19-07 | 19 | 160 | 7 | 14 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | - | LMEU1208**ZNEN-MJ |
| TSN12R160M40.0E19-07 | 19 | 160 | 7 | 14 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1208**ZNEN-MJ |
| TSN12R200M40.0E19-08 | 19 | 200 | 8 | 16 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1208**ZNEN-MJ |
| TSN12R200M47.6-19-08 | 19 | 200 | 8 | 16 | 135 | 47.625 | 63 | 14 | 25.4 | 31.5 | 101.6 | LMEU1208**ZNEN-MJ |
| TSN12R250M47.6-19-09 | 19 | 250 | 9 | 18 | 140 | 47.625 | 63 | 14 | 25.4 | 54 | 101.6 | LMEU1208**ZNEN-MJ |
| TSN12R250M60.0E19-09 | 19 | 250 | 9 | 18 | 135 | 60 | 63 | 14 | 25.7 | 60 | 101.6 | LMEU1208**ZNEN-MJ |
| TSN15R125M31.7-25-05 | 25 | 125 | 5 | 10 | 70 | 31.75 | 50 | 8 | 12.7 | 26.5 | - | LMEU1509**ZNEN-MJ |
| TSN15R125M32.0E25-05 | 25 | 125 | 5 | 10 | 66 | 32 | 50 | 8 | 14.4 | 28.5 | - | LMEU1509**ZNEN-MJ |
| TSN15R160M38.1-25-06 | 25 | 160 | 6 | 12 | 100 | 38.1 | 63 | 10 | 15.9 | 29 | - | LMEU1509**ZNEN-MJ |
| TSN15R160M40.0E25-06 | 25 | 160 | 6 | 12 | 82 | 40 | 63 | 9 | 16.4 | 38 | - | LMEU1509**ZNEN-MJ |
| TSN15R200M40.0E25-07 | 25 | 200 | 7 | 14 | 95 | 40 | 63 | 9 | 16.4 | 55 | 66.7 | LMEU1509**ZNEN-MJ |
| TSN15R200M47.6-25-07 | 25 | 200 | 7 | 14 | 135 | 47.625 | 63 | 14 | 25.4 | 31.5 | 101.6 | LMEU1509**ZNEN-MJ |
| TSN15R250M47.6-25-08 | 25 | 250 | 8 | 16 | 140 | 47.625 | 63 | 14 | 25.4 | 54 | 101.6 | LMEU1509**ZNEN-MJ |
| TSN15R250M60.0E25-08 | 25 | 250 | 8 | 16 | 135 | 60 | 63 | 14 | 25.7 | 60 | 101.6 | LMEU1509**ZNEN-MJ |

### SPARE PARTS

| Designation | Clamping screw | Grip | Torx bit |
|---|---|---|---|
| TSN10/12R... | SM40-143-H0 | H-TB | BT15S |
| TSN15R... | CSTB-5L159 | H-TB | BT20S |

## INSERT

### LMEU-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | | ★ |
| M | Stainless | | ★ | ☆ |
| K | Cast iron | ★ | | ☆ |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | | ★ |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Coated AH120 | Coated AH140 | Coated AH725 | A | B | T |
|---|---|---|---|---|---|---|---|
| LMEU100808ZNEN-MJ | 0.8 | ● | ● | ● | 12.7 | 10.5 | 8 |
| LMEU100816ZNEN-MJ | 1.6 | ● | ● | ● | 12.5 | 10.5 | 8 |
| LMEU100824ZNEN-MJ | 2.4 | ● | ● | ● | 12.4 | 10.5 | 8 |
| LMEU100832ZNEN-MJ | 3.2 | ● | ● | ● | 12.2 | 10.5 | 8 |
| LMEU120808ZNEN-MJ | 0.8 | ● | ● | ● | 13.6 | 12.7 | 8 |
| LMEU120816ZNEN-MJ | 1.6 | ● | ● | ● | 13.4 | 12.7 | 8 |
| LMEU120824ZNEN-MJ | 2.4 | ● | ● | ● | 13.2 | 12.7 | 8 |
| LMEU120832ZNEN-MJ | 3.2 | ● | ● | ● | 13.1 | 12.7 | 8 |
| LMEU150908ZNEN-MJ | 0.8 | ● | ● | ● | 15.6 | 15 | 9.5 |
| LMEU150916ZNEN-MJ | 1.6 | ● | ● | ● | 15.4 | 15 | 9.5 |
| LMEU150924ZNEN-MJ | 2.4 | ● | ● | ● | 15.3 | 15 | 9.5 |
| LMEU150932ZNEN-MJ | 3.2 | ● | ● | ● | 15.1 | 15 | 9.5 |

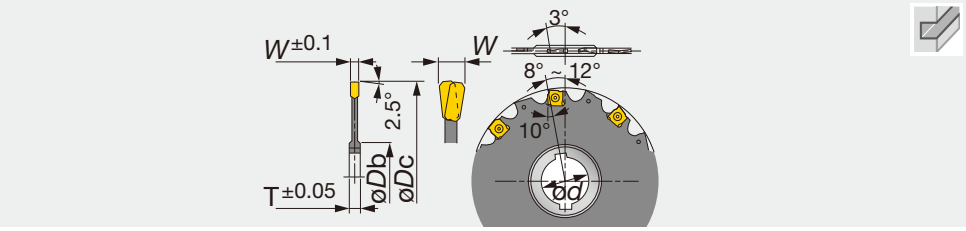
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness (HB) | Priority | Grade | Cutting speed *Vc* (m/min) | Feed per edge line: *fz* (mm/t) TSN / ASN ae / ø*Dc* (mm) 10% | 20% | 30% | ≤ 50% |
|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels SS400, etc. E275A, etc. | - 200 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | - 200 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | High carbon steels S45C, etc. C45, etc. | 200 - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | 200 - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | Alloy steels SCM440, etc. 42CrMo4, etc. | 150 - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | 150 - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | Tool steels SKD61, etc. X40CrMoV5-1, etc. | - 300 | First choice | AH725 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| | | - 300 | For impact resistance | AH140 | 90 - 180 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| M | Stainless steel SUS304, etc. X5CrNi18-9, etc. | - | - | AH140 | 90 - 200 | 0.22 - 0.42 | 0.16 - 0.31 | 0.14 - 0.27 | 0.13 - 0.25 |
| K | Grey cast irons FC250, etc. 250, etc. | 150 - 250 | - | AH120 | 120 - 230 | 0.22 - 0.5 | 0.16 - 0.38 | 0.14 - 0.32 | 0.13 - 0.3 |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 | - | AH120 | 90 - 150 | 0.22 - 0.33 | 0.16 - 0.25 | 0.14 - 0.21 | 0.13 - 0.2 |
| S | Titanium alloys Ti-6Al-4V, etc. | - | First choice | AH725 | 30 - 40 | 0.12 - 0.22 | 0.09 - 0.16 | 0.07 - 0.14 | 0.07 - 0.13 |
| | Nickel-based alloys Inconel 718, etc. | - | First choice | AH725 | 20 - 35 | 0.12 - 0.22 | 0.09 - 0.16 | 0.07 - 0.14 | 0.07 - 0.13 |

## SVN4000

Indexable side slotting cutter for 5 - 8 mm width




| Designation | øDc | W | Edge/z | ød | øDb | T | Insert |
|---|---|---|---|---|---|---|---|
| SVN4100-5M | 100 | 5 | 2/10 | 32 | 48 | 8 | SNEN12T2... |
| SVN4100-6M | 100 | 6 | 2/10 | 32 | 48 | 10 | SNEN1233... |
| SVN4100-8M | 100 | 8 | 4/8 | 32 | 48 | 12 | SNEN1233... |
| SVN4125-5M | 125 | 5 | 2/12 | 32 | 48 | 8 | SNEN12T2... |
| SVN4125-6M | 125 | 6 | 2/12 | 32 | 48 | 10 | SNEN1233... |
| SVN4125-8M | 125 | 8 | 4/12 | 32 | 48 | 12 | SNEN1233... |
| SVN4160-5M | 160 | 5 | 2/16 | 40 | 58 | 8 | SNEN12T2... |
| SVN4160-6M | 160 | 6 | 2/16 | 40 | 58 | 10 | SNEN1233... |
| SVN4160-8M | 160 | 8 | 4/16 | 40 | 58 | 12 | SNEN1233... |
| SVN4200-5M | 200 | 5 | 2/20 | 40 | 68 | 8 | SNEN12T2... |
| SVN4200-6M | 200 | 6 | 2/20 | 40 | 68 | 10 | SNEN1233... |
| SVN4200-8M | 200 | 8 | 4/20 | 40 | 68 | 12 | SNEN1233... |

### SPARE PARTS

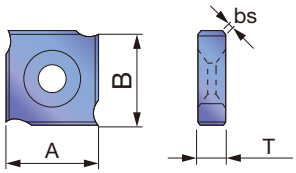
| Designation | Clamping screw | Wrench |
|---|---|---|
| SVN4100-5M | CST-3.5S | T-9D |
| SVN4100-6/8M | CST-3.5 | T-9D |
| SVN4125-5M | CST-3.5S | T-9D |
| SVN4125-6/8M | CST-3.5 | T-9D |
| SVN4160-5M | CST-3.5S | T-9D |
| SVN4160-6/8M | CST-3.5 | T-9D |
| SVN4200-5M | CST-3.5S | T-9D |
| SVN4200-6/8M | CST-3.5 | T-9D |

● Notes on specifications of specials made to order

① The cutter widths (ℓ) are available in a range from 5 mm to 12 mm.
② The maximum cutter diameter available is ø960 mm.
③ Special mounting specifications are also available on request.

## INSERT

### SNEN12




| | | UX30 | TH10 |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | | |
| K | Cast iron | | ★ |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

| Designation | Uncoated UX30 | Uncoated TH10 | A | B | T | bs | Honing |
|---|---|---|---|---|---|---|---|
| SNEN12T2ZFN | | ● | 12.7 | 12.7 | 2.8 | 0.15 | without |
| SNEN12T2ZTN | ● | | 12.7 | 12.7 | 2.8 | 0.15 | with |
| SNEN1233ZFN | | ● | 12.7 | 12.7 | 3.3 | 0.15 | without |
| SNEN1233ZTN | ● | | 12.7 | 12.7 | 3.3 | 0.15 | with |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) |
|---|---|---|---|
| P | Carbon steels < 300 HB | UX30 | 80 ~ 120 |
| | Die steels < 300 HB | UX30 | 60 ~ 80 |
| K | Cast irons | TH10 | 80 ~ 100 |
| N | Aluminium alloys | TH10 | 600 ~ 1000 |

Note: SVN4000 type TAC mills should be used only for roughing. Attainable accuracy of groove width is ±0.1 mm.

- No. of revolutions $n$ ($min^{-1}$) = Cutting speed $Vc$ (m/min) × 1000 ÷ 3.14 ÷ Cutter ø (mm)
- Feed speed $Vf$ (mm/min) = $n$ ($min^{-1}$) × Feed per tooth $fz$ (mm/t) × z (No. of inserts)

MEMO

# MillLine - Profile Milling

## DO TWIST BALL

D016

Radius cutters with double-sided inserts with rigid clamping

ø20 - ø50 mm
max. ap 4 mm

P M K S H

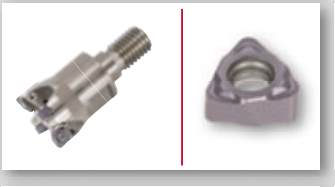
## BALL FINISH NOSE

D224

Indexable endmill for high-precision finishing with 2 effective cutting edges

ø8 - ø32 mm

P M K N H



## DO MINI MILL

D229

Double-sided positive inserts for finishing to semi-finishing in profiling operations

ø16 - ø25 mm
max. ap 1 mm

P H

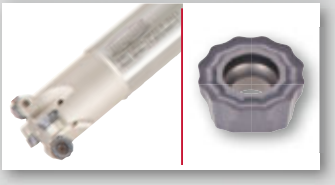
## FIXRMILL

D230

Radius cutters with single-sided inserts for profile milling of complex parts

ø20 - ø66 mm
max. ap 8 mm

P M K H



## ROUNDSPLIT

D235

Radius cutters featuring single-sided inserts with serrated cutting edges for anti-chatter

ø32 - ø125 mm
max. ap 8 mm

P M K N S

## Other radius mills

D240

T/ERD12/16, E/HWD

P M K H

## Single Effective Tools - Ball Cutters

D246

TBN1000, EBP, EBB, EBD, BBB

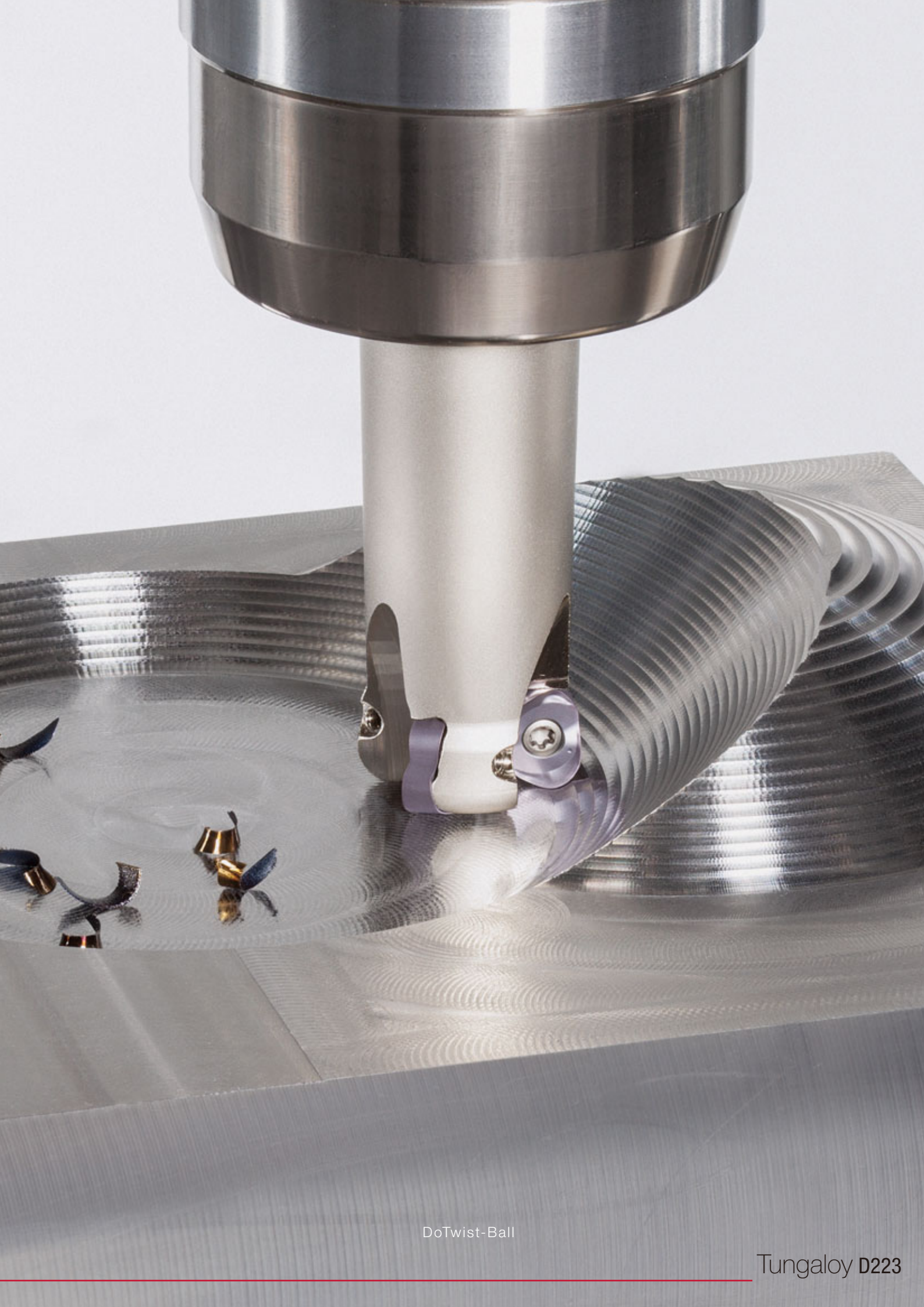
P K H

## Z-FEEDMILL

D254

Z-direction plunging tools for high metal removal

P K H



DoTwist-Ball

# BALL FINISH NOSE

## EBFM

Indexable endmills for high precision finish

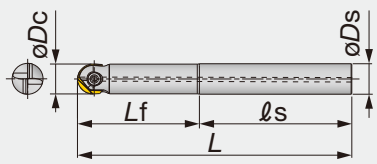



Fig. 1

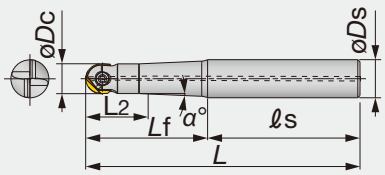
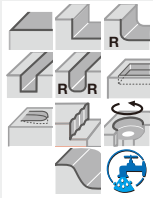



Fig. 2




| Designation | Material | øDc | øDs | ℓs | Lf | L | L2 | α° | Air hole | Fig | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EBFM08T12S100 | Steel | 8 | 12 | 80 | 20 | 100 | 10 | 9.5 | with | 2 | ZF*M080... |
| EBFM08S08C100 | Carbide | 8 | 8 | 70 | 30 | 100 | - | - | without | 1 | ZF*M080... |
| EBFM08S08C140 | Carbide | 8 | 8 | 75 | 65 | 140 | - | - | without | 1 | ZF*M080... |
| EBFM10T12S100 | Steel | 10 | 12 | 75 | 25 | 100 | 15 | 5 | with | 2 | ZF*M100... |
| EBFM10S10C140 | Carbide | 10 | 10 | 65 | 75 | 140 | - | - | without | 1 | ZF*M100... |
| EBFM10S10C220 | Carbide | 10 | 10 | 80 | 140 | 220 | - | - | without | 1 | ZF*M100... |
| EBFM12S12S110 | Steel | 12 | 12 | 80 | 30 | 110 | - | - | with | 1 | ZF*M120... |
| EBFM12S12C160 | Carbide | 12 | 12 | 70 | 90 | 160 | - | - | without | 1 | ZF*M120... |
| EBFM12S12C220 | Carbide | 12 | 12 | 70 | 150 | 220 | - | - | without | 1 | ZF*M120... |
| EBFM16T20S130 | Steel | 16 | 20 | 80 | 50 | 130 | 15.5 | 1.5 | with | 2 | ZF*M160... |
| EBFM16S16C160 | Carbide | 16 | 16 | 80 | 80 | 160 | - | - | without | 1 | ZF*M160... |
| EBFM16S16C220 | Carbide | 16 | 16 | 70 | 150 | 220 | - | - | without | 1 | ZF*M160... |
| EBFM20T25S180 | Steel | 20 | 25 | 100 | 80 | 180 | 24 | 2.5 | with | 2 | ZF*M200... |
| EBFM20S20C220 | Carbide | 20 | 20 | 100 | 120 | 220 | - | - | without | 1 | ZF*M200... |
| EBFM20S20C300 | Carbide | 20 | 20 | 80 | 220 | 300 | - | - | without | 1 | ZF*M200... |
| EBFM25T32S200 | Steel | 25 | 32 | 100 | 100 | 200 | 32 | 1.5 | with | 2 | ZF*M250... |
| EBFM25S25C220 | Carbide | 25 | 25 | 100 | 120 | 220 | - | - | without | 1 | ZF*M250... |
| EBFM25S25C300 | Carbide | 25 | 25 | 80 | 220 | 300 | - | - | without | 1 | ZF*M250... |
| EBFM30T32S220 | Steel | 30 | 32 | 120 | 100 | 220 | 35 | 0.5 | with | 2 | ZF*M300... |
| EBFM30S32C250 | Carbide | 30 | 32 | 100 | 150 | 250 | - | - | without | 1 | ZF*M300... |
| EBFM30S32C350 | Carbide | 30 | 32 | 100 | 250 | 350 | - | - | without | 1 | ZF*M300... |
| EBFM32S32S250 | Steel | 32 | 32 | 150 | 100 | 250 | - | - | with | 1 | ZF*M320... |
| EBFM32S32C300 | Carbide | 32 | 32 | 80 | 220 | 300 | - | - | without | 1 | ZF*M320... |

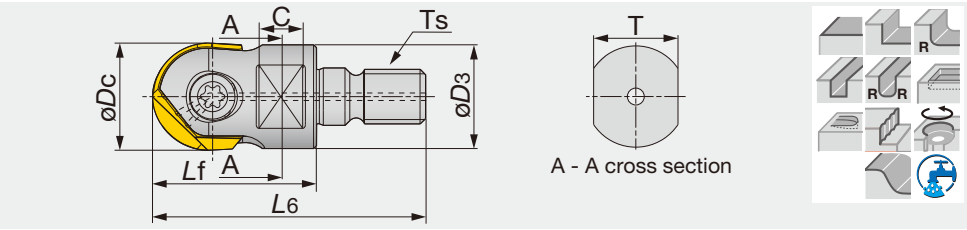
### SPARE PARTS

| Designation | Clamping screw | Torx bit | Grip | Wrench |
|---|---|---|---|---|
| EBFM08... | TS 25F080A | - | - | T-8D |
| EBFM10... | TS 30F100A | - | - | T-10D |
| EBFM12... | TS 40F120A | - | - | T-15D |
| EBFM16... | TS 50F160A | BT20S | H-TB2W | - |
| EBFM20... | TS 60F200A | BLDT25/M7 | H-TB2W | - |
| EBFM25... | TS 70F250A | BLDT25/M7 | H-TB2W | - |
| EBFM30... | TS 80F300A | - | - | T-T30 |
| EBFM32... | TS 80F300A | - | - | T-T30 |

# BALLFINISH NOSE

## HBFM

Indexable endmills with TungFlex thread connection for high precision finish




| Designation | øDc | L6 | Lf | C | T | øD3 | Ts | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|
| HBFM10M06 | 10 | 34.5 | 20 | 5 | 7 | 9.7 | M6 | with | ZF*M100... |
| HBFM12M06 | 12 | 37.5 | 23 | 5 | 7 | 11.5 | M6 | with | ZF*M120... |
| HBFM12M08 | 12 | 40 | 23 | 8 | 10 | 13 | M8 | with | ZF*M120... |
| HBFM16M08 | 16 | 47 | 30 | 8 | 10 | 13 | M8 | with | ZF*M160... |
| HBFM20M10 | 20 | 49 | 30 | 10 | 15 | 19 | M10 | with | ZF*M200... |
| HBFM25M12 | 25 | 57 | 35 | 10 | 17 | 24 | M12 | with | ZF*M250... |
| HBFM30M16 | 30 | 66 | 43 | 12 | 22 | 29 | M16 | with | ZF*M300... |
| HBFM32M16 | 32 | 66 | 43 | 12 | 22 | 29.5 | M16 | with | ZF*M320... |

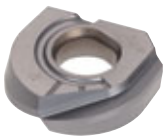
See page **D228** for TungFlex modular shank.

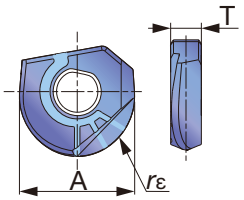
### SPARE PARTS

| Designation | Clamping screw | Torx bit | Grip | Wrench |
|---|---|---|---|---|
| HBFM10... | TS 30F100A | - | - | T-10D |
| HBFM12... | TS 40F120A | - | - | T-15D |
| HBFM16... | TS 50F160A | BT20S | H-TB2W | - |
| HBFM20... | TS 60F200A | BLDT25/M7 | H-TB2W | - |
| HBFM25... | TS 70F250A | BLDT25/M7 | H-TB2W | - |
| HBFM30... | TS 80F300A | - | - | T-T30 |
| HBFM32... | TS 80F300A | - | - | T-T30 |

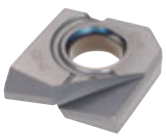
## INSERT

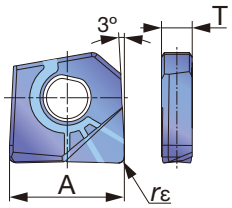
### ZFBM-MJ






### ZFRM-MJ






| | | | |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ☆ |
| K | Cast iron | ★ | ☆ |
| N | Non-ferrous | | ☆ |
| S | Superalloys | | ★ |
| H | Hard materials | ★ | ☆ |

★ : First choice
☆ : Second choice

| Designation | rε | Coated | | A | T |
|---|---|---|---|---|---|
| | | AH710 | AH725 | | |
| ZFBM080R00-MJ | 4 | ● | ● | 8 | 2.4 |
| ZFBM100R00-MJ | 5 | ● | ● | 10 | 2.9 |
| ZFBM120R00-MJ | 6 | ● | ● | 12 | 3.4 |
| ZFBM160R00-MJ | 8 | ● | ● | 16 | 4.4 |
| ZFBM200R00-MJ | 10 | ● | ● | 20 | 5.4 |
| ZFBM250R00-MJ | 12.5 | ● | ● | 25 | 6.4 |
| ZFBM300R00-MJ | 15 | ● | ● | 30 | 7.4 |
| ZFBM320R00-MJ | 16 | ● | ● | 32 | 7.4 |
| ZFRM120R05-MJ | 0.5 | ● | ● | 12 | 3.4 |
| ZFRM120R10-MJ | 1 | ● | ● | 12 | 3.4 |
| ZFRM160R05-MJ | 0.5 | ● | ● | 16 | 4.4 |
| ZFRM160R10-MJ | 1 | ● | ● | 16 | 4.4 |
| ZFRM160R15-MJ | 1.5 | ● | ● | 16 | 4.4 |
| ZFRM200R10-MJ | 1 | ● | ● | 20 | 5.4 |
| ZFRM200R15-MJ | 1.5 | ● | ● | 20 | 5.4 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Max. depth of cut | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | D8 | D10 | D12 | D16 | D20 | D25 | D30 | D32 |
| P | Low carbon steel, alloy steel | 85 - 180 HB | First choice | AH725 | ≤ 0.04D | 180 - 260 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | | 85 - 180 HB | For wear resistance | AH710 | ≤ 0.04D | 180 - 260 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | High carbon steel, alloy steel | 180 - 280 HB | First choice | AH725 | ≤ 0.03D | 150 - 230 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | | 180 - 280 HB | For wear resistance | AH710 | ≤ 0.03D | 180 - 230 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.35 | 0.35 |
| | Prehardened steel Die & mold tool steel | 40 - 48 HRC | First choice | AH710 | ≤ 0.03D | 180 - 300 | 0.15 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| | | 40 - 48 HRC | For fracture resistance | AH725 | ≤ 0.03D | 180 - 300 | 0.15 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| M | Stainless steel | 135 - 200 HB | First choice | AH725 | ≤ 0.03D | 100 - 250 | 0.1 | 0.15 | 0.2 | 0.2 | 0.25 | 0.25 | 0.3 | 0.3 |
| K | Cast iron | 150 - 240 HB | First choice | AH710 | ≤ 0.04D | 90 - 350 | 0.2 | 0.2 | 0.25 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| | | 150 - 240 HB | For fracture resistance | AH725 | ≤ 0.04D | 90 - 350 | 0.2 | 0.2 | 0.25 | 0.3 | 0.3 | 0.35 | 0.4 | 0.4 |
| N | Aluminium | - | First choice | AH725 | ≤ 0.03D | 200 - 400 | 0.25 | 0.25 | 0.35 | 0.35 | 0.35 | 0.4 | 0.4 | 0.45 |
| H | High hardened steel | 48 - 65 HRC | First choice | AH710 | ≤ 0.02D | 100 - 350 | 0.08 | 0.08 | 0.1 | 0.13 | 0.15 | 0.2 | 0.2 | 0.25 |

· Remove excessive chip accumulation with an air blast.
· For the operation with depth of cut which varies (ex.casting skin) and machining of workpiece materials with interrupted surface, the feed per tooth (*fz*) should be set to the lower recommended value shown in the above table.
· Cutting conditions maybe limited depending on machine power, workpiece rigidity, and spindle output. When the cutting width, depth, or overhang length is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

### How to clamp the insert

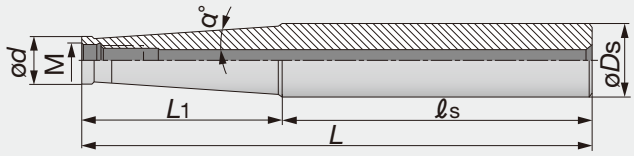
1. Clear chips and dust from the pocket.
2. Place the insert in the pocket. The insert can be placed only in one direction.
3. Tighten the screw while pressing the insert into the pocket.

### How to check the run-out

1. Clamp the insert on the shank.
2. Clamp the shank on a high-precision arbor.
3. Measure the run-out on tool presetter or by dial gauge.

Notes:
1. Due to the helical cutting edge, it is important that the run-out is inspected with the insert clamped on the shank.
2. Do not use micrometer or caliper to inspect the insert diameter as inaccurate dimensions may be provided.

## TungFlex - Modular shank



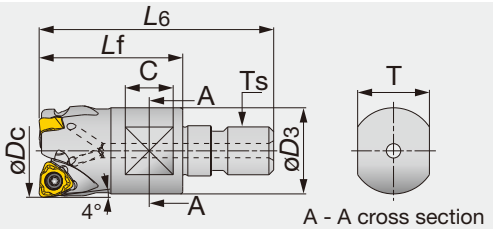

| Designation | øDs | L | ℓs | L1 | ød | M | α° | Shank type |
|---|---|---|---|---|---|---|---|---|
| SM06-L60C10 | 10 | 60 | 40 | 20 | 9.7 | M6 | 0 | Cylindrical |
| SM06-L105-C12 | 12 | 105 | 45 | 60 | 9.7 | M6 | 1.2 | Cylindrical |
| SM06-L125-C16 | 16 | 125 | 65 | 60 | 9.7 | M6 | 3.3 | Cylindrical |
| SM08-L73C16 | 16 | 73 | 48 | 25 | 13 | M8 | 0 | Cylindrical |
| SM08-L128-C16 | 16 | 128 | 48 | 80 | 13 | M8 | 0.9 | Cylindrical |
| SM08-L170-C20 | 20 | 170 | 103.2 | 66.8 | 13 | M8 | 3.3 | Cylindrical |
| SM10-L80-C20 | 20 | 80 | 50 | 30 | 18 | M10 | 0 | Cylindrical |
| SM10-L130-C20 | 20 | 130 | 50 | 80 | 18 | M10 | 0.6 | Cylindrical |
| SM10-L200-C25 | 25 | 200 | 142.8 | 57.2 | 19 | M10 | 3.3 | Cylindrical |
| SM12-L86-C25 | 25 | 86 | 56 | 30 | 21 | M12 | 5.1 | Cylindrical |
| SM12-L200-C32 | 32 | 200 | 122 | 78 | 21 | M12 | 4.4 | Cylindrical |
| SM16-L95-C32 | 32 | 95 | 60 | 35 | 29 | M16 | 1.7 | Cylindrical |
| SM16-L230-C32 | 32 | 230 | 180 | 50 | 29 | M16 | 1.8 | Cylindrical |

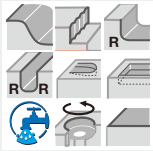
DOMINIMILL

# HFWX04-M

Small-radius cutter for finishing operation; Modular head with TungFlex thread connection

A.R. = 0°, R.R. = -14°



| Designation | øDc | z | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HFWX04M016M08R02 | 16 | 2 | 42 | 25 | 8 | 10 | 13 | M8 | 0.03 | with | WXHU04... |
| HFWX04M020M10R03 | 20 | 3 | 49 | 30 | 10 | 15 | 18 | M10 | 0.05 | with | WXHU04... |
| HFWX04M025M12R04 | 25 | 4 | 52 | 30 | 10 | 17 | 21 | M12 | 0.09 | with | WXHU04... |

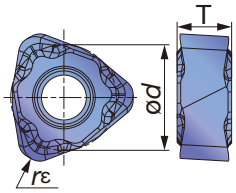
See page **D228** for TungFlex modular shank.

## SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HFWX04M... | SR34-514 | M-1000 | T-7F |

## INSERT

### WXHU-MJ




| | | |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | ★ |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH110 | ød | T |
|---|---|---|---|---|---|
| WXHU040305R-MJ | 0.5 | 0.5 | ● | 6.35 | 3.18 |
| WXHU040310R-MJ | 1 | 1 | ● | 6.35 | 3.18 |

* For plunging, width up to 2 mm is possible.

●: Line up

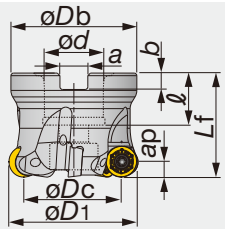
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | | Hardness | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| P | High carbon steel S45C, S55C, etc. C45, C55, etc. | | 200 - 300 HB | AH110 | 100 - 300 | 0.1 - 0.3 |
| P | Alloy steel SCM440, etc. 42CrMo4, SCr145, etc. | | 150 - 300 HB | AH110 | 100 - 300 | 0.1 - 0.3 |
| P | Prehardened steel NAK80, PX5, etc. | | 30 - 40 HRC | AH110 | 100 - 300 | 0.05 - 0.3 |
| H | Hardened steel | SKD61, etc. X40CrMoV5-1, etc. | 40 - 50 HRC | AH110 | 80 - 130 | 0.1 - 0.3 |
| H | Hardened steel | SKD11, etc. X153CrMoV12, etc. | 50 - 60 HRC | AH110 | 50 - 100 | 0.05 - 0.15 |

# FIXRMILL
## TRP10/12/16

Radius cutter series bore type with anti-rotation system

A.R. = +4°, R.R. = -4°



| Designation | Max. ap | øDc | z | øD1 | øDb | ød | ℓ | Lf | b | a | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRP10R040M16.0E05 | 5 | 30 | 5 | 40 | 35 | 16 | 18 | 40 | 5.6 | 8.4 | 0.2 | with | RPMT10T3... |
| TRP12R050M22.0E05 | 6 | 38 | 5 | 50 | 47 | 22 | 20 | 40 | 6.3 | 10.4 | 0.3 | with | RPMT1204... |
| TRP12R052M22.0E05 | 6 | 40 | 5 | 52 | 49 | 22 | 20 | 40 | 6.3 | 10.4 | 0.3 | with | RPMT1204... |
| TRP12R063M22.0E06 | 6 | 51 | 6 | 63 | 59 | 22 | 20 | 40 | 6.3 | 10.4 | 0.6 | with | RPMT1204... |
| TRP12R066M27.0E06 | 6 | 54 | 6 | 66 | 62 | 27 | 22 | 40 | 7 | 12.4 | 0.6 | with | RPMT1204... |
| TRP16R063M22.0E05 | 8 | 47 | 5 | 63 | 59 | 22 | 20 | 40 | 6.3 | 10.4 | 0.6 | with | RPMT1606... |
| TRP16R066M27.0E05 | 8 | 50 | 5 | 66 | 62 | 27 | 22 | 40 | 7 | 12.4 | 0.7 | with | RPMT1606... |

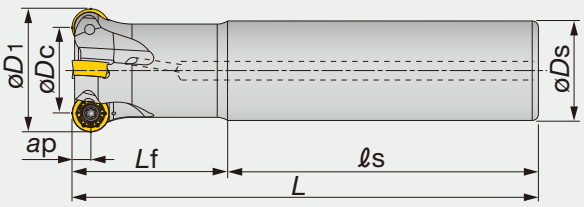
### SPARE PARTS

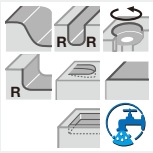
| Designation | Clamping screw | Grip | Lubricant | Shell locking bolt | Torx bit |
|---|---|---|---|---|---|
| TRP10R040M16.0E05 | CSPB-3.5S | H-TBS | M-1000 | FSHM8-30H | BLDIP15/S7 |
| TRP12R050 - 063M22.0... | CSTR-4L100 | H-TBS | M-1000 | CM10X30H | BT15S |
| TRP12R066M27.0E06 | CSTR-4L100 | H-TBS | M-1000 | CM12X30H | BT15S |
| TRP16R063M22.0E05 | CSPB-5 | H-TBS | M-1000 | CM10X30H | BLDIP20/S7 |
| TRP16R066M27.0E05 | CSPB-5 | H-TBS | M-1000 | CM12X30H | BLDIP20/S7 |

# FIXRMILL
## ERP10/12/16

Radius cutter series shank type with anti-rotation system

A.R. = +10°~ +4°, R.R. = -2°~ -8.5°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ERP10R020M20.0-02 | 5 | 10 | 2 | 20 | 20 | 100 | 50 | 150 | with | RPMT10T3... |
| ERP10R025M25.0-02 | 5 | 15 | 2 | 25 | 25 | 90 | 60 | 150 | with | RPMT10T3... |
| ERP10R032M32.0-04 | 5 | 22 | 4 | 32 | 32 | 80 | 70 | 150 | with | RPMT10T3... |
| ERP10R035M32.0-04 | 5 | 25 | 4 | 35 | 32 | 100 | 50 | 150 | with | RPMT10T3... |
| ERP12R032M32.0-03 | 6 | 20 | 3 | 32 | 32 | 100 | 50 | 150 | with | RPMT1204... |
| ERP12R040M32.0-04 | 6 | 28 | 4 | 40 | 32 | 100 | 50 | 150 | with | RPMT1204... |
| ERP16R040M32.0-02 | 8 | 24 | 2 | 40 | 32 | 100 | 50 | 150 | with | RPMT1606... |

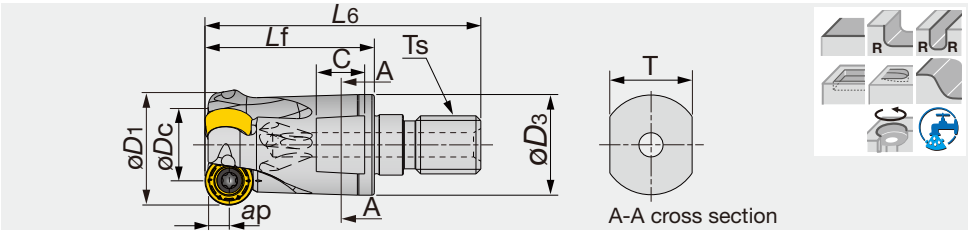
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ERP10R... | CSPB-3.5S | M-1000 | IP-15D |
| ERP12R... | CSTR-4L100 | M-1000 | T-15DB |
| ERP16R... | CSPB-5 | M-1000 | IP-20D |

# FIXRMILL
## HRP-M

Radius cutter series modular type (TungFlex) with anti-rotation system

A.R. = 1°~ 4°, R.R. = -8.5°~ 2°




| Designation | Max. ap | øDc | z | øD1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HRP10R020MM10-02 | 5 | 10 | 2 | 20 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.1 | with | RPMT10T3... |
| HRP10R025MM12-02 | 5 | 15 | 2 | 25 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with | RPMT10T3... |
| HRP10R032MM16-04 | 5 | 22 | 4 | 32 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | RPMT10T3... |
| HRP12R032MM16-03 | 6 | 20 | 3 | 32 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with | RPMT1204... |

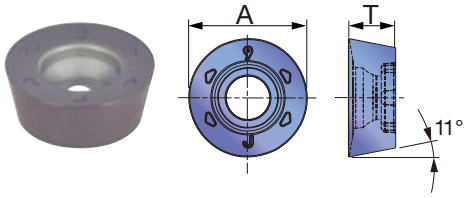
See page **D228** for TungFlex modular shank.

### SPARE PARTS

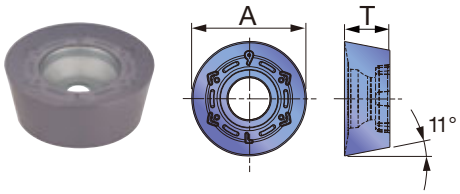
| Designation | Clamping screw | Lubricant | Wrench | |
|---|---|---|---|---|
| | | | Bit | Grip |
| HRP10R... | CSPB-3.5S | M-1000 | BLD IP15/S7 | H-TBS |
| HRP12R... | CSTR-4L100 | M-1000 | BT15S | H-TBS |

## INSERT

### RPMT-MJ




### RPMT-ML




| | | | | |
|---|---|---|---|---|
| P | Steel | | ★ | |
| M | Stainless | ★ | ☆ | ★ |
| K | Cast iron | | ☆ | |
| N | Non-ferrous | | | |
| S | Superalloys | ☆ | ★ | |
| H | Hard materials | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated | | | A | T |
|---|---|---|---|---|---|---|
| | | AH130 | AH725 | AH4035 | | |
| RPMT10T3EN-MJ | 5 | ● | ● | ● | 10 | 3.97 |
| RPMT10T3EN-ML | 5 | ● | ● | ● | 10 | 3.97 |
| RPMT1204EN-MJ | 6 | ● | ● | ● | 12 | 4.76 |
| RPMT1204EN-ML | 6 | ● | ● | ● | 12 | 4.76 |
| RPMT1606EN-MJ | 8 | ● | ● | ● | 16 | 6.35 |
| RPMT1606EN-ML | 8 | ● | ● | ● | 16 | 6.35 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness | Priority | Grade | Chip-breaker | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|---|---|---|
| P | Carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | < 300 HB | First choice | AH725 | MJ | 120 - 250 | 0.3 - 0.7 |
| | | < 300 HB | for impact resistance | AH130 | MJ | 120 - 250 | 0.3 - 0.7 |
| | Alloy steels<br>SCM440, SCr415, etc.<br>42CrMo4, 17Cr3, etc. | 150 - 300 HB | First choice | AH725 | MJ | 100 - 250 | 0.2 - 0.6 |
| | | 150 - 300 HB | for impact resistance | AH130 | MJ | 100 - 250 | 0.2 - 0.6 |
| | Tool steels<br>SKD11, etc.<br>X153CrMoV12, etc. | < 300 HB | | AH725 | ML | 80 - 180 | 0.2 - 0.4 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9,<br>X5CrNiMo17-12-3, etc. | < 200 HB | First choice | AH130 | ML | 100 - 250 | 0.2 - 0.6 |
| | | < 200 HB | for impact resistance | AH130 | MJ | 100 - 250 | 0.2 - 0.6 |
| | Stainless steels<br>SUS430, etc.<br>X6Cr17, etc. | < 200 HB | First choice | AH4035 | ML | 100 - 300 | 0.2 - 0.6 |
| | | < 200 HB | for impact resistance | AH4035 | MJ | 100 - 300 | 0.2 - 0.6 |
| K | Grey cast irons<br>FCD250, etc.<br>250, etc. | 150 - 250 HB | - | AH725 | ML | 120 - 250 | 0.3 - 0.7 |
| | Ductile cast irons<br>FCD400, etc.<br>400-15S, etc. | 150 - 250 HB | - | AH725 | ML | 100 - 200 | 0.3 - 0.7 |
| H | Hardened steels<br>SKD61, etc<br>X40CrMoV5-1, etc. | 40 - 50 HRC | - | AH725 | MJ | 60 - 140 | 0.1 - 0.3 |
| | Hardened steels<br>SKD11, etc.<br>X153CrMoV12, etc. | 50 - 60 HRC | - | AH725 | MJ | 20 - 60 | 0.05 - 0.2 |

· Use air blast to remove chips from the work area in slot milling or pocketing operation.
· When machining at high cutting speeds of more than *Vc* = 1000 m/min, the dynamic balance of the tools must be adjusted.

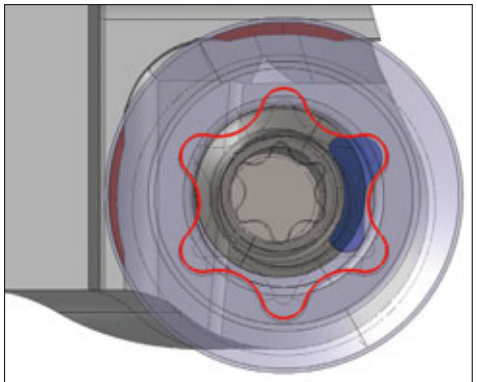
· Cutting conditions are limited by machine power, workpiece rigidity and spindle output. When the cutting width or depth is large, set *Vc* and *fz* to the lower recommended values and check the machine power and vibration.

Tool dia.: ø*Dc* (mm), Number of revolutions: *n* (min$^{-1}$), Feed speed: *Vf* (mm/min), Depth of cut: ap = 2.0 mm

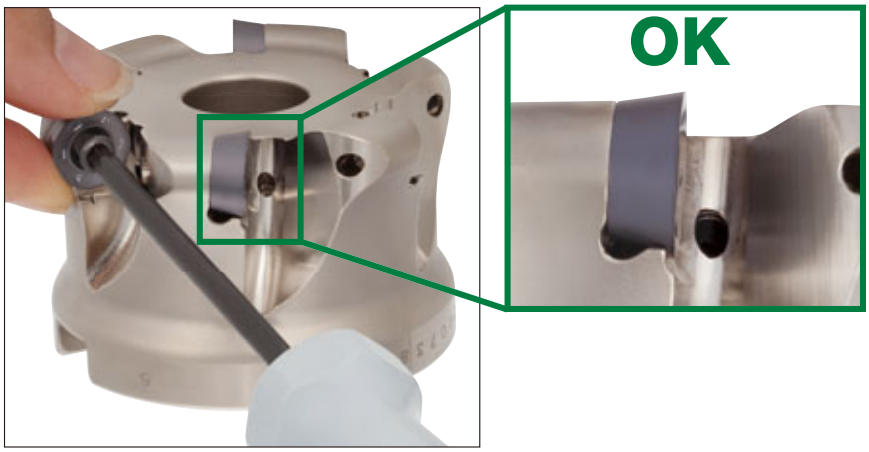
| ø20 | | ø25 | | ø32 | | | ø35 | | ø40 | | | | ø50 | | ø63 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *n* | *Vf* | *n* | *Vf* | *n* | *Vf* | | *n* | *Vf* | *n* | *Vf* | | | *n* | *Vf* | *n* | *Vf* | |
| | E/HRP10 | | E/HRP10, E/HRP12 | | E/HRP10 | E/HRP12 | | ERP10 | | TRP10 | ERP12 | ERP16 | | ERP12 | | TRP12 | TRP16 |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2070 | 1240 | 1660 | 1000 | 1290 | 1550 | 1160 | 1180 | 1420 | 1030 | 1550 | 1240 | 620 | 830 | 1250 | 660 | 1190 | 990 |
| *Vc* = 130 m/min, *fz* = 0.3 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2710 | 2160 | 2170 | 1740 | 1690 | 2700 | 2030 | 1550 | 2480 | 1350 | 2700 | 2160 | 1080 | 1080 | 2160 | 860 | 2060 | 1720 |
| *Vc* = 170 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 3180 | 2540 | 2550 | 2040 | 1990 | 3180 | 2390 | 1820 | 2910 | 1590 | 3180 | 2540 | 1270 | 1270 | 2540 | 1010 | 2420 | 2020 |
| *Vc* = 200 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 3180 | 2540 | 2550 | 2040 | 1990 | 3180 | 2390 | 1820 | 2910 | 1590 | 3180 | 2540 | 1270 | 1270 | 2540 | 1010 | 2420 | 2020 |
| *Vc* = 200 m/min, *fz* = 0.4 mm/t | | | | | | | | | | | | | | | | | |
| 2870 | 2870 | 2290 | 2290 | 1790 | 3580 | 2690 | 1640 | 3280 | 1430 | 3580 | 2860 | 1430 | 1150 | 2880 | 910 | 2730 | 2280 |
| *Vc* = 180 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 2390 | 2390 | 1910 | 1910 | 1490 | 2980 | 2240 | 1360 | 2720 | 1190 | 2980 | 2380 | 1190 | 950 | 2380 | 760 | 2280 | 1900 |
| *Vc* = 150 m/min, *fz* = 0.5 mm/t | | | | | | | | | | | | | | | | | |
| 1590 | 630 | 1270 | 510 | 990 | 790 | 590 | 910 | 730 | 800 | 800 | 640 | 320 | 640 | 640 | 510 | 610 | 510 |
| *Vc* = 100 m/min, *fz* = 0.2 mm/t | | | | | | | | | | | | | | | | | |
| 640 | 150 | 510 | 120 | 400 | 190 | 140 | 360 | 170 | 320 | 190 | 150 | 75 | 250 | 150 | 200 | 140 | 120 |
| *Vc* = 40 m/min, *fz* = 0.12 mm/t | | | | | | | | | | | | | | | | | |

## ■ Notification for clamping

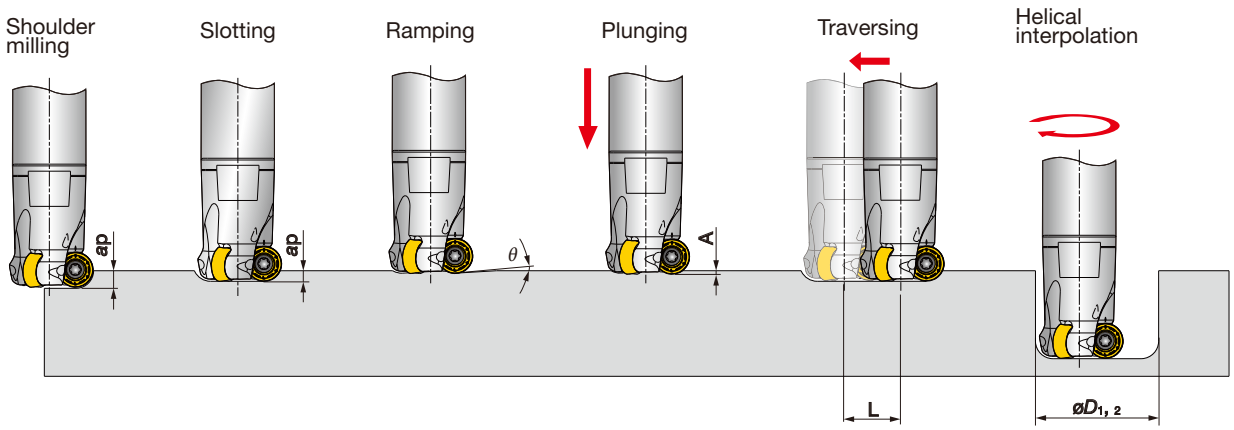
· When installing the insert, please carefully locate the insert in the seat and fasten the screw.



Make sure the insert cavity fits the protrusion on the body



## APPLICATION RANGE



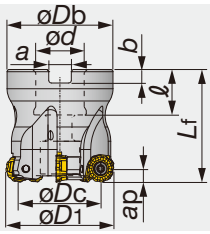

| Designation | Tool-ø øDc (mm) | Max. depth of cut ap (mm) | Max. ramping angle θ° | Max. plunging depth A (mm) | Machining length for removing uncut portion L (mm) | Min.machining øD1(mm) | *Max. machining øD2 (mm) |
|---|---|---|---|---|---|---|---|
| E/HRP10R020M... | 20 | 5 | 2 | 0.3 | 12 | 27 | 39 |
| E/HRP10R025M... | 25 | 5 | 3.1 | 0.7 | 16 | 35 | 49 |
| E/HRP10R032M... | 32 | 5 | 8 | 2.5 | 23 | 46 | 63 |
| E/HRP12R032M... | 32 | 6 | 9.2 | 2.5 | 21 | 43 | 63 |
| ERP10R035M32.0-04 | 35 | 5 | 8.2 | 3 | 26 | 51 | 69 |
| ERP12R040M32.0-04 | 40 | 6 | 3.8 | 1.6 | 29 | 59 | 79 |
| ERP16R040M32.0-02 | 40 | 8 | 7 | 2.3 | 25 | 54 | 79 |
| TRP10R040M16.0E05 | 40 | 5 | 6 | 2.7 | 31 | 62 | 79 |
| TRP12R050M22.0E05 | 50 | 6 | 4 | 2.5 | 39 | 79 | 99 |
| TRP12R052M22.0E05 | 52 | 6 | 4 | 2.5 | 41 | 83 | 103 |
| TRP12R063M22.0E06 | 63 | 6 | 3 | 2.5 | 52 | 105 | 125 |
| TRP12R066M27.0E06 | 66 | 6 | 2.8 | 2.5 | 55 | 111 | 131 |
| TRP16R063M22.0E05 | 63 | 8 | 3.3 | 2.5 | 48 | 99 | 125 |
| TRP16R066M27.0E05 | 66 | 8 | 3.1 | 2.5 | 51 | 105 | 131 |

*For flat bottom hole

# ROUNDSPLIT
## TRC12/16

Face mills with button insert of 6mm or 8mm radius

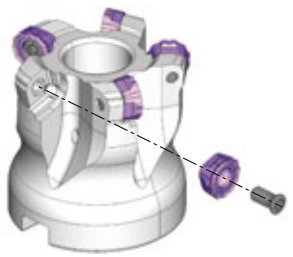
A.R. = +0°, R.R. = -1°~ -5°



| Designation | Max. ap | øDc | z | øD1 | øDb | Lf | ød | ℓ | a | b | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRC12R040M16.0-04 | 6 | 28 | 4 | 40 | 35 | 40 | 16 | 18 | 8.2 | 5.6 | 0.2 | with | RCMT1204... |
| TRC12R040M16.0E04 | 6 | 28 | 4 | 40 | 35 | 40 | 16 | 19 | 8.4 | 5.6 | 0.2 | with | RCMT1204... |
| TRC12R050M22.0-05 | 6 | 38 | 5 | 50 | 47 | 50 | 22 | 20 | 10 | 6 | 0.4 | with | RCMT1204... |
| TRC12R050M22.0E05 | 6 | 38 | 5 | 50 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1204... |
| TRC12R050M22.2-05 | 6 | 38 | 5 | 50 | 47 | 50 | 22.225 | 20 | 8 | 5 | 0.4 | with | RCMT1204... |
| TRC12R052M22.0E05 | 6 | 40 | 5 | 52 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1204... |
| TRC12R063M22.0-06 | 6 | 51 | 6 | 63 | 59 | 50 | 22 | 20 | 10 | 6 | 0.7 | with | RCMT1204... |
| TRC12R063M22.0E06 | 6 | 51 | 6 | 63 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1204... |
| TRC12R063M22.2-06 | 6 | 51 | 6 | 63 | 59 | 50 | 22.225 | 20 | 8 | 5 | 0.7 | with | RCMT1204... |
| TRC12R066M22.0E06 | 6 | 54 | 6 | 66 | 62 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1204... |
| TRC12R080M27.0E07 | 6 | 68 | 7 | 80 | 76 | 50 | 27 | 22 | 12.4 | 7 | 1.1 | with | RCMT1204... |
| TRC12R080M31.7-07 | 6 | 68 | 7 | 80 | 76 | 63 | 31.750 | 32 | 12.7 | 8 | 1.5 | with | RCMT1204... |
| TRC16R050M22.0-04 | 8 | 34 | 4 | 50 | 47 | 50 | 22 | 20 | 10 | 6 | 0.4 | with | RCMT1606... |
| TRC16R050M22.0E04 | 8 | 34 | 4 | 50 | 47 | 50 | 22 | 20 | 10.4 | 6.3 | 0.3 | with | RCMT1606... |
| TRC16R050M22.2-04 | 8 | 34 | 4 | 50 | 47 | 50 | 22.225 | 20 | 8 | 5 | 0.4 | with | RCMT1606... |
| TRC16R052M22.0E04 | 8 | 36 | 4 | 52 | 49 | 50 | 22 | 20 | 10.4 | 6.3 | 0.4 | with | RCMT1606... |
| TRC16R063M22.0-05 | 8 | 47 | 5 | 63 | 59 | 50 | 22 | 20 | 10 | 6 | 0.6 | with | RCMT1606... |
| TRC16R063M22.0E05 | 8 | 47 | 5 | 63 | 59 | 50 | 22 | 20 | 10.4 | 6.3 | 0.6 | with | RCMT1606... |
| TRC16R063M22.2-05 | 8 | 47 | 5 | 63 | 59 | 50 | 22.225 | 20 | 8 | 5 | 0.7 | with | RCMT1606... |
| TRC16R066M22.0E05 | 8 | 50 | 5 | 66 | 62 | 50 | 22 | 20 | 10.4 | 6.3 | 0.7 | with | RCMT1606... |
| TRC16R080M27.0E06 | 8 | 64 | 6 | 80 | 76 | 50 | 27 | 22 | 12.4 | 7 | 1 | with | RCMT1606... |
| TRC16R080M31.7-06 | 8 | 64 | 6 | 80 | 76 | 63 | 31.75 | 32 | 12.7 | 8 | 1.3 | with | RCMT1606... |
| TRC16R100M31.7-07 | 8 | 84 | 7 | 100 | 96 | 63 | 31.75 | 32 | 12.7 | 8 | 1.6 | with | RCMT1606... |
| TRC16R100M32.0E07 | 8 | 84 | 7 | 100 | 96 | 63 | 32 | 25 | 14.4 | 8 | 2.4 | with | RCMT1606... |
| TRC16R125M38.1-08 | 8 | 109 | 8 | 125 | 98 | 63 | 38.1 | 43 | 15.9 | 10 | 3.6 | with | RCMT1606... |
| TRC16R125M40.0E08 | 8 | 109 | 8 | 125 | 98 | 63 | 40 | 32 | 16.4 | 9 | 3 | with | RCMT1606... |

## SPARE PARTS

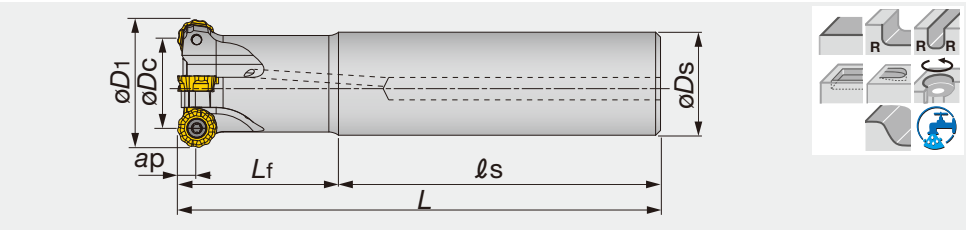
| Designation | Clamping screw | Grip | Shell locking bolt | Shell locking bolt 1 | Torx bit |
|---|---|---|---|---|---|
| TRC12R040... | CSTB-4L090 | H-TBS | - | FSHM8-30H | BT15S |
| TRC12R050 - 066... | CSTB-4L090 | H-TBS | - | CM10X30H | BT15S |
| TRC12R080M27.0E07 | CSTB-4L090 | H-TBS | - | CM12X30H | BT15S |
| TRC12R080M31.7-07 | CSTB-4L090 | H-TBS | - | CM16X40H | BT15S |
| TRC16R050 - 052... | CSTB-5L120 | H-TB | - | FSHM10-40H | BT20S |
| TRC16R063 - 066... | CSTB-5L120 | H-TB | - | CM10X30H | BT20S |
| TRC16R080M27.0E06 | CSTB-5L120 | H-TB | - | CM12X30H | BT20S |
| TRC16R080M31.7-06 | CSTB-5L120 | H-TB | - | CM16X40H | BT20S |
| TRC16R100... | CSTB-5L120 | H-TB | - | CM16X40H | BT20S |
| TRC16R125... | CSTB-5L120 | H-TB | TMBA-M20H | - | BT20M |



# ROUNDSPLIT
## ERC12/16

Indexable endmills with button insert of 6mm or 8mm radius

A.R. = +0°, R.R. = -1°~ -5°



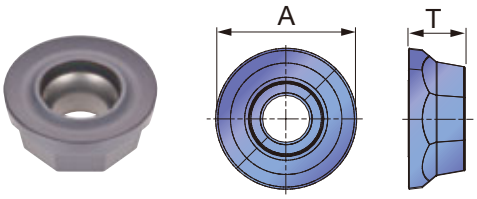

| Designation | Max. ap | øDc | z | øD1 | øDs | L | Lf | ℓs | Kg | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ERC12R032M32.0-03 | 6 | 20 | 3 | 32 | 32 | 150 | 70 | 80 | 0.8 | with | RCMT1204... |
| ERC12R032M32.0-03L | 6 | 20 | 3 | 32 | 32 | 250 | 150 | 100 | 1.3 | with | RCMT1204... |
| ERC12R032M32.0-03LL | 6 | 20 | 3 | 32 | 32 | 300 | 180 | 120 | 1.6 | with | RCMT1204... |
| ERC12R033M32.0-03 | 6 | 21 | 3 | 33 | 32 | 150 | 70 | 80 | 0.8 | with | RCMT1204... |
| ERC12R033M32.0-03L | 6 | 21 | 3 | 33 | 32 | 250 | 150 | 100 | 1.4 | with | RCMT1204... |
| ERC12R033M32.0-03LL | 6 | 21 | 3 | 33 | 32 | 300 | 70 | 230 | 1.7 | with | RCMT1204... |
| ERC12R040M32.0-04 | 6 | 28 | 4 | 40 | 32 | 150 | 50 | 100 | 0.8 | with | RCMT1204... |
| ERC12R040M32.0-04L | 6 | 28 | 4 | 40 | 32 | 250 | 50 | 200 | 1.5 | with | RCMT1204... |
| ERC12R040M32.0-04LL | 6 | 28 | 4 | 40 | 32 | 300 | 50 | 250 | 1.8 | with | RCMT1204... |
| ERC12R050M42.0-05 | 6 | 38 | 5 | 50 | 42 | 150 | 50 | 100 | 1.5 | with | RCMT1204... |
| ERC12R050M42.0-05L | 6 | 38 | 5 | 50 | 42 | 250 | 50 | 200 | 2.6 | with | RCMT1204... |
| ERC12R050M42.0-05LL | 6 | 38 | 5 | 50 | 42 | 300 | 50 | 250 | 3 | with | RCMT1204... |
| ERC16R040M32.0-02 | 8 | 24 | 2 | 40 | 32 | 150 | 50 | 100 | 0.8 | with | RCMT1606... |
| ERC16R040M32.0-02L | 8 | 24 | 2 | 40 | 32 | 250 | 50 | 200 | 1.4 | with | RCMT1606... |
| ERC16R040M32.0-02LL | 8 | 24 | 2 | 40 | 32 | 300 | 50 | 250 | 1.7 | with | RCMT1606... |
| ERC16R050M42.0-03 | 8 | 34 | 3 | 50 | 42 | 150 | 50 | 100 | 1.4 | with | RCMT1606... |
| ERC16R050M42.0-03L | 8 | 34 | 3 | 50 | 42 | 250 | 50 | 200 | 2.4 | with | RCMT1606... |
| ERC16R050M42.0-03LL | 8 | 34 | 3 | 50 | 42 | 300 | 50 | 250 | 3 | with | RCMT1606... |

### SPARE PARTS

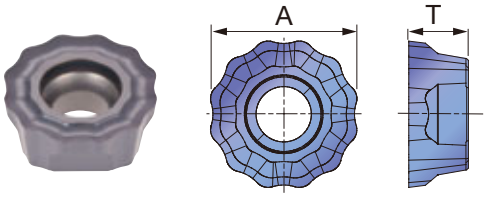
| Designation | Clamping screw | Wrench |
|---|---|---|
| ERC12R... | CSTB-4L090 | T-15DB |
| ERC16R040... | CSTB-5L105 | T-20DB |
| ERC16R050... | CSTB-5L120 | T-20DB |

## INSERT

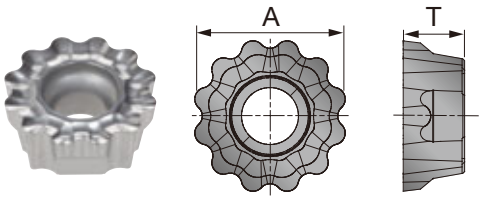
### RCMT-MJ




### RCMT-NMJ




### RCMT-NAJ




| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | | |
| M | Stainless | | ★ | ☆ | | |
| K | Cast iron | ★ | | ☆ | | |
| N | Non-ferrous | | | | ★ | |
| S | Superalloys | ★ | | ★ | | |
| H | Hard materials | | | | | |

★ : First choice
☆ : Second choice

| Designation | Max. ap | Coated | | | Un-coated | A | T |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | KS15F | | |
| RCMT1204EN-MJ | 6 | ● | ● | ● | | 12 | 4.8 |
| RCMT1204EN-NMJ | 6 | ● | ● | ● | | 12 | 4.8 |
| RCMT1204FN-NAJ | 6 | | | | ● | 12 | 4.8 |
| RCMT1606EN-MJ | 8 | ● | ● | ● | | 16 | 6.5 |
| RCMT1606EN-NMJ | 8 | ● | ● | ● | | 16 | 6.5 |
| RCMT1606FN-NAJ | 8 | | | | ● | 16 | 6.5 |

●: Line up

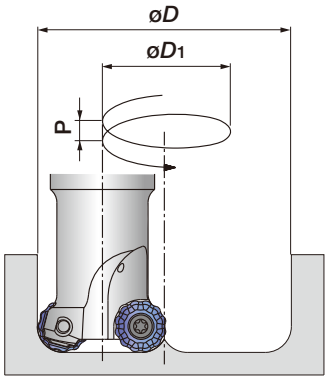
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Hardness HB | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) each chipbreaker | | |
|---|---|---|---|---|---|---|---|
| | | | | | MJ | NMJ | NAJ |
| P | Low carbon steels<br>S15C, SS400, etc.<br>C15E4, E275A, etc. | ~ 200 | AH725 | 100 - 220 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| | High carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | 200 ~ 300 | AH725 | 100 - 200 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| | Alloyed steels<br>SCM440, SCr415, etc.<br>42CrMo4, 20Cr4, etc. | 150 ~ 300 | AH725 | 100 - 200 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| | Tool steels<br>SK, SKH, etc.<br>X40CrMoV5-1, etc. | ~ 300 | AH725 | 100 - 180 | 0.2 - 0.7 | 0.17 - 0.25 | - |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-3, etc. | - | AH140 | 90 - 180 | 0.2 - 0.6 | 0.15 - 0.25 | - |
| K | Grey cast irons<br>FC250, FC300, etc.<br>250, 300, etc. | 150 ~ 250 | AH120 | 140 - 250 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| | Ductile cast irons<br>FCD400, etc.<br>400-15S, etc. | 150 ~ 250 | AH120 | 140 - 250 | 0.2 - 0.7 | 0.17 - 0.3 | - |
| N | Aluminium alloys<br>Si < 13% | - | KS15F | 500 - 1200 | - | - | 0.1 - 0.3 |
| | Aluminium alloys<br>Si ≥ 13% | - | KS15F | 100 - 300 | - | - | 0.1 - 0.3 |
| S | Heat-resisting alloy<br>Inconel 718, Ti-6Al-4V, etc. | - | AH725 | 20 - 50 | 0.2 - 0.6 | 0.15 - 0.25 | - |

· To remove excessive chip accumulation use an air blast.
· When chips stick to the cutting edges (aluminium machining), use a water soluble cutting fluid.

· Cutting conditions are limited by machine power and material rigidity. When the cutting width or depth is large, set Vc and fz below the recommended values and check the machine vibration and spindle load.

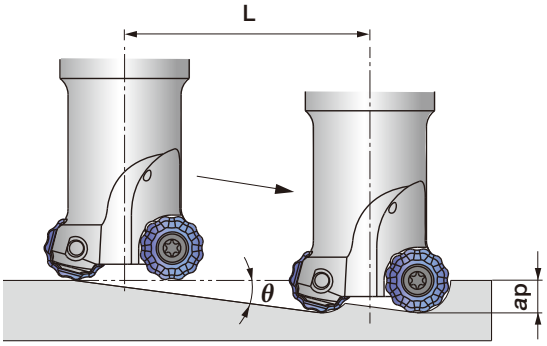
## Holemaking with helical feed




| Designation | Tool ø øDc (mm) | Min. machining diameter (mm) | | Max. machining diameter (mm) | | Pitch P (mm) |
|---|---|---|---|---|---|---|
| | | øD | øD1 | øD | øD1 | |
| ERC12R032… | ø32 | 52 | 20 | 62 | 30 | < 6 |
| ERC12R033… | ø33 | 54 | 21 | 64 | 31 | < 6 |
| T/ERC12R040… | ø40 | 68 | 28 | 78 | 38 | < 6 |
| T/ERC12R050… | ø50 | 88 | 38 | 98 | 48 | < 6 |
| TRC12R063… | ø63 | 114 | 51 | 124 | 61 | < 6 |
| TRC12R080… | ø80 | 148 | 68 | 158 | 78 | < 6 |
| ERC16R040… | ø40 | 64 | 24 | 78 | 38 | < 8 |
| T/ERC16R050… | ø50 | 84 | 34 | 98 | 48 | < 8 |
| TRC16R063… | ø63 | 110 | 47 | 124 | 61 | < 8 |
| TRC16R080… | ø80 | 144 | 64 | 158 | 78 | < 8 |
| TRC16R100… | ø100 | 184 | 84 | 198 | 98 | < 8 |
| TRC16R125… | ø125 | 234 | 109 | 248 | 123 | < 8 |

When holemaking with a helical feed, the pitch (P) needs to be set at lower values than that shown above.

## Ramping



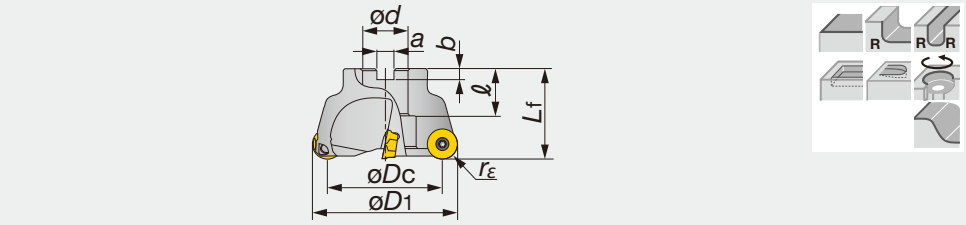

| Designation | Tool ø øDc (mm) | Max. ramping angle θ° | L: tool pass length when ramping angle is 2 degrees | | | | |
|---|---|---|---|---|---|---|---|
| | | | ap (mm) | | | | |
| | | | 2 | 3 | 4 | 6 | 8 |
| ERC12R032… | ø32 | 10 | 57 | 85 | 114 | 171 | – |
| ERC12R033… | ø33 | 9 | 57 | 85 | 114 | 171 | – |
| T/ERC12R040… | ø40 | 6 | 57 | 85 | 114 | 171 | – |
| T/ERC12R050… | ø50 | 4 | 57 | 85 | 114 | 171 | – |
| TRC12R063… | ø63 | 3 | 57 | 85 | 114 | 171 | – |
| TRC12R080… | ø80 | 2.3 | 57 | 85 | 114 | 171 | – |
| ERC16R040… | ø40 | 12 | 57 | 85 | 114 | 171 | 229 |
| T/ERC16R050… | ø50 | 7.4 | 57 | 85 | 114 | 171 | 229 |
| TRC16R063… | ø63 | 6 | 57 | 85 | 114 | 171 | 229 |
| TRC16R080… | ø80 | 4.3 | 57 | 85 | 114 | 171 | 229 |
| TRC16R100… | ø100 | 3 | 57 | 85 | 114 | 171 | 229 |
| TRC16R125… | ø125 | 2.4 | 57 | 85 | 114 | 171 | 229 |

Tool pass length: L = ap / tan θ, Ramping angle needs to be set at smaller than 2 degrees in order to prevent chips from getting tangled.

## TRD12/16

Face mills with button insert of 6 mm or 8 mm radius

A.R. = +10°, R.R. = -6°~ 0°




| Designation | Max. ap | øDc | z | øD1 | Lf | ød | ℓ | a | b | rε | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRD12040R | 6 | 28 | 3 | 40 | 40 | 16 | 18 | 8.2 | 5.6 | 6 | 0.2 | RDM*1204... |
| TRD12050R | 6 | 38 | 4 | 50 | 40 | 22 | 20 | 10 | 6 | 6 | 0.3 | RDM*1204... |
| TRD12063R | 6 | 51 | 4 | 63 | 40 | 22 | 20 | 10 | 6 | 6 | 0.4 | RDM*1204... |
| TRD12080R | 6 | 68 | 5 | 80 | 50 | 25.4 | 26 | 9.5 | 6 | 6 | 0.8 | RDM*1204... |
| TRD16063R | 8 | 47 | 3 | 63 | 40 | 22 | 20 | 10 | 6 | 8 | 0.4 | RDM*1606... |
| TRD16080R | 8 | 64 | 4 | 80 | 50 | 25.4 | 26 | 9.5 | 6 | 8 | 0.7 | RDM*1606... |
| TRD16100R | 8 | 84 | 5 | 100 | 50 | 31.75 | 32 | 12.7 | 8 | 8 | 1.1 | RDM*1606... |
| TRD16125R | 8 | 109 | 6 | 125 | 63 | 38.1 | 38 | 15.9 | 10 | 8 | 2.4 | RDM*1606... |
| TRD12050R-E | 6 | 38 | 4 | 50 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.3 | RDM*1204... |
| TRD12052R-E | 6 | 40 | 4 | 52 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.3 | RDM*1204... |
| TRD12063R-E | 6 | 51 | 5 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 6 | 0.4 | RDM*1204... |
| TRD12066R-E | 6 | 54 | 5 | 66 | 40 | 22 | 20 | 12.4 | 7 | 6 | 0.5 | RDM*1204... |
| TRD12080R-E | 6 | 68 | 6 | 80 | 50 | 27 | 22 | 12.4 | 7 | 6 | 0.8 | RDM*1204... |
| TRD12100R-E | 6 | 88 | 6 | 100 | 50 | 32 | 26 | 14.4 | 8 | 6 | 1.4 | RDM*1204... |
| TRD16063R-E | 8 | 47 | 4 | 63 | 40 | 22 | 20 | 10.4 | 6.3 | 8 | 0.4 | RDM*1606... |
| TRD16066R-E | 8 | 50 | 4 | 66 | 50 | 27 | 22 | 12.4 | 7 | 8 | 0.5 | RDM*1606... |
| TRD16080R-E | 8 | 64 | 5 | 80 | 50 | 27 | 22 | 12.4 | 7 | 8 | 0.7 | RDM*1606... |
| TRD16100R-E | 8 | 84 | 6 | 100 | 50 | 32 | 26 | 14.4 | 8 | 8 | 1.1 | RDM*1606... |

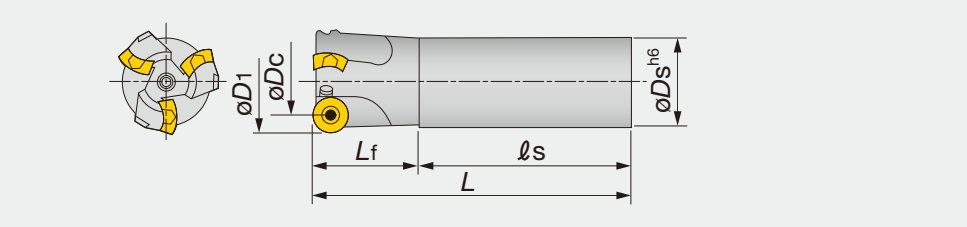
### SPARE PARTS

| Designation | Clamp screw | Lubricant | Shell locking bolt | Wrench |
|---|---|---|---|---|
| TRD12040R | CSTB-3.5 | M-1000 | FSHM8-30 | T-15D |
| TRD12050, 63R | CSTB-3.5 | M-1000 | CAP-CM10X1.5X30 | T-15D |
| TRD12080, 100R | CSTB-3.5 | M-1000 | - | T-15D |
| TRD16063R | CSTB-5 | M-1000 | CAP-CM10X1.5X30 | T-20D |
| TRD12...-E | CSTB-3.5 | M-1000 | - | T-15D |
| TRD16...-E | CSTB-5 | M-1000 | - | T-20D |

## ERD12/16

Indexable endmills with button insert of 6 mm or 8 mm radius

A.R. = +8°~ 10°, R.R. = -6°~ -2°




| Designation | Max. ap | øDc | z | øD1 | øDs | L | Lf | ℓs | Insert |
|---|---|---|---|---|---|---|---|---|---|
| ERD12032RS | 6 | 20 | 2 | 32 | 32 | 150 | 50 | 100 | RDM*1204... |
| ERD12032RL | 6 | 20 | 2 | 32 | 32 | 250 | 50 | 200 | RDM*1204... |
| ERD12040RS | 6 | 28 | 3 | 40 | 32 | 150 | 50 | 100 | RDM*1204... |
| ERD12040RL | 6 | 28 | 3 | 40 | 32 | 250 | 50 | 200 | RDM*1204... |
| ERD12050RS | 6 | 38 | 4 | 50 | 42 | 150 | 50 | 100 | RDM*1204... |
| ERD12050RL | 6 | 38 | 4 | 50 | 42 | 250 | 50 | 200 | RDM*1204... |
| ERD12063RS | 6 | 51 | 4 | 63 | 42 | 150 | 50 | 100 | RDM*1204... |
| ERD12063RL | 6 | 51 | 4 | 63 | 42 | 250 | 50 | 200 | RDM*1204... |
| ERD16040RS | 8 | 24 | 2 | 40 | 32 | 150 | 50 | 100 | RDM*1606... |
| ERD16040RL | 8 | 24 | 2 | 40 | 32 | 250 | 50 | 200 | RDM*1606... |
| ERD16050RS | 8 | 34 | 3 | 50 | 42 | 150 | 50 | 100 | RDM*1606... |
| ERD16050RL | 8 | 34 | 3 | 50 | 42 | 250 | 50 | 200 | RDM*1606... |
| ERD16063RS | 8 | 47 | 3 | 63 | 42 | 150 | 50 | 100 | RDM*1606... |
| ERD16063RL | 8 | 47 | 3 | 63 | 42 | 250 | 50 | 200 | RDM*1606... |

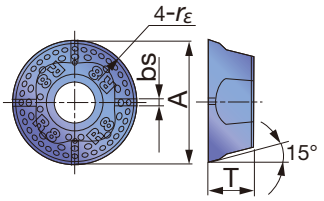
### SPARE PARTS

| Designation | Clamp screw | Lubricant | Wrench |
|---|---|---|---|
| ERD120**R* | CSTB-3.5 | M-1000 | T-15D |
| ERD160**R* | CSTB-5 | M-1000 | T-20D |

## INSERT

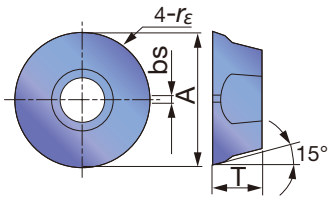
### RDMT12/16-MJ

Button insert with pressed MJ chipbreaker




### RDMW12/16

Flat-top button insert with 6 mm or 8 mm radius




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | | ★ | ★ | | ☆ | |
| M | Stainless | | ★ | ☆ | | | | | |
| K | Cast iron | ★ | | | | | | | |
| N | Non-ferrous | | | | | | | | |
| S | Superalloys | ★ | ☆ | | | | | | |
| H | Hard materials | | | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated | | | | | Un-coated | A | T | bs |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | AH330 | T3130 | UX30 | | | |
| RDMT1204ZDPN-MJ | 6 | 6 | ● | | ● | ● | ● | ● | 12.8 | 4.76 | 0.8 |
| RDMW1204ZDSN | 6 | 6 | ● | | ● | | ● | | 12.8 | 4.8 | 0.8 |
| RDMT1606ZDPN-MJ | 8 | 8 | ● | ● | ● | ● | ● | ● | 16.8 | 6.35 | 0.8 |
| RDMW1606ZDSN | 8 | 8 | ● | | ● | | ● | | 16.8 | 6.4 | 0.8 |

●: Line up

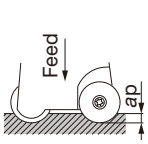
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *f* (mm/t) | |
|---|---|---|---|---|---|
| | | | | T/ERD12 | T/ERD16 |
| P | Carbon steels<br>S55C, etc.<br>C50, etc.<br>< 300 HB | AH120 | 170 (120 ~ 220) | 0.3 ~ 0.5 | 0.3 ~ 0.6 |
| | | AH330 | 190 (140 ~ 240) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| | | UX30 | 100 (80 ~ 120) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| | Alloy steels<br>SCM440, etc.<br>42CrMo4, 17Cr3, etc.<br>< 300 HB | AH120 | 150 (100 ~ 200) | 0.2 ~ 0.45 | 0.2 ~ 0.5 |
| | | AH330 | 170 (120 ~ 220) | 0.15 ~ 0.35 | 0.15 ~ 0.4 |
| | | UX30 | 90 (60 ~ 120) | 0.15 ~ 0.35 | 0.15 ~ 0.4 |
| | Die steels<br>SKD61, etc.<br>X96CrMoV12, etc.<br>< 300 HB | AH120 | 130 (80 ~ 180) | 0.2 ~ 0.35 | 0.25 ~ 0.45 |
| | | AH330 | 150 (100 ~ 200) | 0.1 ~ 0.3 | 0.1 ~ 0.4 |
| M | Stainless steels<br>SUS304, etc. X5CrNi18 9, etc. | AH130·AH140 | 150 (100 ~ 200) | 0.2 ~ 0.3 | 0.2 ~ 0.4 |
| K | Grey Cast irons<br>FC250, etc.<br>250, etc. | AH120 | 180 (120 ~ 240) | 0.3 ~ 0.5 | 0.3 ~ 0.6 |
| | | AH330 | 200 (150 ~ 250) | 0.2 ~ 0.4 | 0.2 ~ 0.5 |
| H | Hard materials < 45 HRC | AH120 | 100 (60 ~ 140) | 0.08 ~ 0.25 | 0.1 ~ 0.3 |

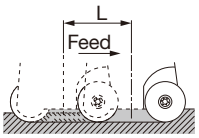
Note: When the depth of cut is smaller than 2 mm, use the higher limit of feed values shown above. When larger than 3 mm, use the lower limit of the feed values.

## Plunging + traverse feed milling (Unit: mm)

Plunging

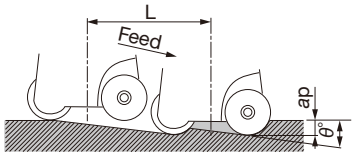



Traverse feed milling

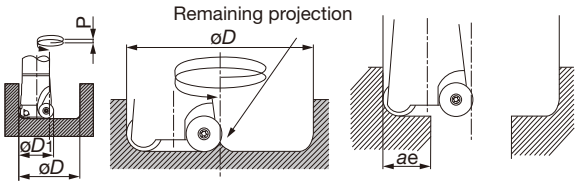



Unit: mm

## Ramping




## Helical feed drilling




| Designation | øD1 | Max. plunging depth ap | Max. ramping angle θ° | Min. traverse length to flatten the bottom surface L | Min. machining diameter øD | Max. machining diameter øD | Pitch P | øDc-ra ae |
|---|---|---|---|---|---|---|---|---|
| TRD12050R... | 50 | 4 | 6 | øD1 - 11 | 88 | 98 | < 6 | 44 |
| TRD12052R-E | 52 | 4 | 5.5 | øD1 - 11 | 92 | 102 | < 6 | 46 |
| TRD12063R... | 63 | 4 | 4 | øD1 - 11 | 114 | 124 | < 6 | 57 |
| TRD12066R... | 66 | 4 | 4 | øD1 - 11 | 120 | 130 | < 6 | 60 |
| TRD12080R... | 80 | 4 | 2.5 | øD1 - 11 | 148 | 158 | < 6 | 74 |
| TRD12100R... | 100 | 4 | 1.5 | øD1 - 11 | 188 | 198 | < 6 | 94 |
| TRD16063R... | 63 | 5.5 | 6 | øD1 - 15 | 110 | 124 | < 8 | 55 |
| TRD16066R... | 66 | 5.5 | 6 | øD1 - 15 | 120 | 130 | < 8 | 58 |
| TRD16080R... | 80 | 5.5 | 4 | øD1 - 15 | 144 | 158 | < 8 | 72 |
| TRD16100R... | 100 | 5.5 | 3 | øD1 - 15 | 184 | 198 | < 8 | 92 |
| ERD12032RS/L | 32 | 4 | 16 | øD1 - 11 | 52 | 62 | < 6 | 26 |
| ERD12040RS/L | 40 | 4 | 8 | øD1 - 11 | 68 | 78 | < 6 | 34 |
| ERD12050RS/L | 50 | 4 | 6 | øD1 - 11 | 88 | 98 | < 6 | 44 |
| ERD12063RS/L | 63 | 4 | 4 | øD1 - 11 | 114 | 124 | < 6 | 57 |
| ERD16040RS/L | 40 | 5.5 | 20 | øD1 - 15 | 64 | 78 | < 8 | 32 |
| ERD16050RS/L | 50 | 5.5 | 10 | øD1 - 15 | 84 | 98 | < 8 | 42 |
| ERD16063RS/L | 63 | 5.5 | 6 | øD1 - 15 | 110 | 124 | < 8 | 55 |

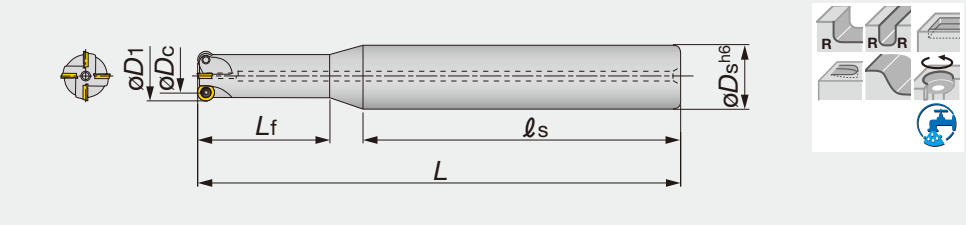
øD1 : Tool diameter
øD : Drilling diameter
P : Z-axis feed per one round of tool pass (Pitch of helical cycle)

Notes:
- In plunging, the maximum plunging depth is limited as shown in the above table.
- In plunging, set the Z-axis feed in a range of 0.05 to 0.1 mm/t.
- When plunging, use peck-feed every 1 mm (or smaller than 1 mm) to break chips.
- tanθ = depth of cut: ap / length of tool pass: L
- In ramping, the ramping angle should be set within the maximum ramping angle.
- In helical feed hole machining, the machinable hole diameters are limited by the tool diameter as shown in the above tables.
- When machining between the minimum and maximum machining diameters, a projection remains in the center of the bottom surface of the hole as shown in the Figure at right. Remove it by traverse feed milling.

## EWD05/07/10

Indexable endmills with buttom inserts of 2.5, 3.5, and 5 mm radius

A.R. = 0°, R.R. = -3°~ +0.5°




| Designation | Max. ap | øDc | z | øD1 | øDs | ℓs | Lf | L | Air hole | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EWD05010R | 2.5 | 5 | 2 | 10 | 20 | 80 | 20 | 130 | with | RDMW05... |
| EWD05012R | 2.5 | 7 | 3 | 12 | 20 | 80 | 20 | 130 | with | RDMW05... |
| EWD07015R | 3.5 | 8 | 3 | 15 | 20 | 100 | 40 | 150 | with | RDMW07... |
| EWD05015R | 2.5 | 10 | 4 | 15 | 20 | 100 | 40 | 150 | with | RDMW05... |
| EWD10020R | 5.0 | 10 | 2 | 20 | 25 | 120 | 40 | 170 | with | RDMW10... |
| EWD07020R | 3.5 | 13 | 4 | 20 | 25 | 120 | 40 | 170 | with | RDMW07... |
| EWD05020R | 2.5 | 15 | 5 | 20 | 25 | 120 | 40 | 170 | with | RDMW05... |
| EWD10025R | 5.0 | 15 | 3 | 25 | 32 | 125 | 45 | 195 | with | RDMW10... |
| EWD07025R | 3.5 | 18 | 5 | 25 | 32 | 125 | 45 | 195 | with | RDMW07... |

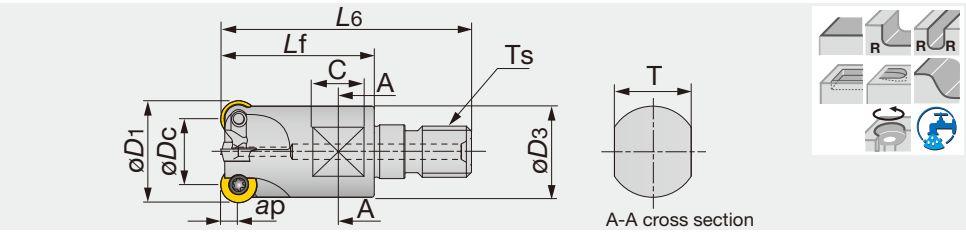
### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EWD050**R | CSTD-1.8 | M-1000 | T-6D |
| EWD070**R | CSTB-2.5S | M-1000 | T-8D |
| EWD100**R | CSTB-3.5H | M-1000 | T-15D |

## HWD07-M

Indexable endmills with TungFlex, carrying buttom inserts of 3.5 mm radius

A.R. = 0°, R.R. = -3°~ +0.5°




| Designation | Max. ap | øDc | z | øD1 | L6 | Lf | C | T | øD3 | Ts | Kg | Air hole |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD07R015MM08-03 | 3.5 | 8 | 3 | 15 | 42 | 25 | 8 | 10 | 12.8 | M8 | 0.03 | with |
| HWD07R020MM10-04 | 3.5 | 13 | 4 | 20 | 49 | 30 | 10 | 15 | 17.8 | M10 | 0.06 | with |
| HWD07R025MM12-05 | 3.5 | 18 | 5 | 25 | 57 | 35 | 10 | 17 | 20.8 | M12 | 0.1 | with |
| HWD07R030MM16-05 | 3.5 | 23 | 5 | 30 | 63 | 40 | 12 | 22 | 28.8 | M16 | 0.2 | with |

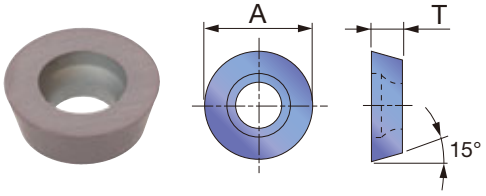
See page **D228** for TungFlex modular shank.

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| HWD07-M... | CSTB-2.5S | M-1000 | T-8D |

## INSERT

### RDMW05/07/10




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

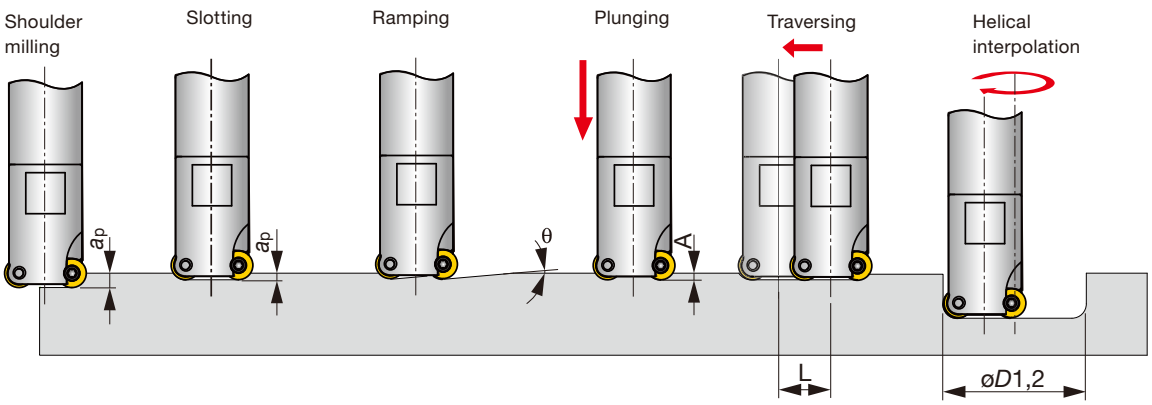
| Designation | Max. ap | Coated AH120 | A | T |
|---|---|---|---|---|
| RDMW0501M0 | 2.5 | ● | 5 | 1.4 |
| RDMW0702M0 | 3.5 | ● | 7 | 2.38 |
| RDMW1003M0 | 5.0 | ● | 10 | 3.18 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Depth of cut *ap* (mm) Cutter dia. ø10, 12 | Cutter dia. ø15, 20 | Cutter dia. ø25 |
|---|---|---|---|---|---|---|---|
| P | Carbon steels S15C, SS400, etc. C45, etc. < 300 HB | AH120 | 200 ~ 500 | 0.15 ~ 0.45 | ~ 0.5 | ~ 0.7 | ~ 1 |
| P | Alloy steels S55C, SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 | 120 ~ 350 | 0.15 ~ 0.35 | ~ 0.5 | ~ 0.7 | ~ 1 |
| P | Die steels SKD61, etc. X40CrMoV5-1, etc. < 300 HB | AH120 | 100 ~ 300 | 0.1 ~ 0.3 | ~ 0.5 | ~ 0.7 | ~ 1 |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 200 ~ 500 | 0.2 ~ 0.5 | ~ 0.5 | ~ 0.7 | ~ 1 |
| H | Hardened steels, Prehardened steels < 40HRC | AH120 | 70 ~ 200 | 0.1 ~ 0.25 | ~ 0.5 | ~ 0.7 | ~ 1 |

## APPLICATION RANGE

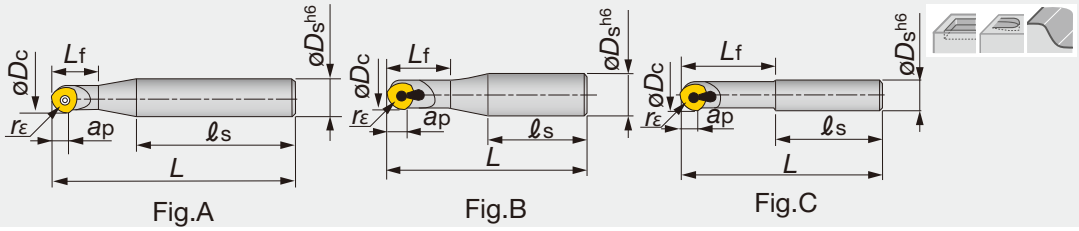



| Designation | Tool-ø øDc | Max. depth of cut ap | Max. ramping θ° | Max. plunging depth A | Machining length for removing uncut portion L | Max. machining øD1 | *Max. machining øD2 |
|---|---|---|---|---|---|---|---|
| HWD07R015MM08-03 | 15 | 3.5 | 25 | 2 | øDc - 6 | 23 | 28 |
| HWD07R020MM10-04 | 20 | 3.5 | 11 | 2 | øDc - 6 | 33 | 38 |
| HWD07R025MM12-05 | 25 | 3.5 | 7 | 2 | øDc - 6 | 43 | 48 |
| HWD07R030MM16-05 | 30 | 3.5 | 5.5 | 2 | øDc - 6 | 53 | 58 |

*For flat bottom hole

## TBN1000

Indexable ball-nose endmill for semi-finishing



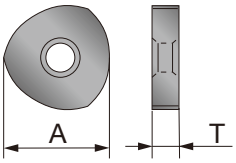

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | rε | Insert | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| TBN1100S | 5 | 10 | 1 | 16 | 60 | 15 | 90 | 5 | ZNCA1002FN2 | A |
| TBN1120S | 6 | 12 | 1 | 16 | 70 | 20 | 110 | 6 | ZNCA1203FN | A |
| TBN1160S | 8 | 16 | 1 | 20 | 85 | 25 | 130 | 8 | ZNCA1603FN | A |
| TBN1200S | 10 | 20 | 1 | 25 | 100 | 35 | 160 | 10 | ZN**2004... | A |
| TBN1250S | 12.5 | 25 | 1 | 32 | 100 | 45 | 175 | 12.5 | ZN**2505... | B |
| TBN1300S | 15 | 30 | 1 | 32 | 100 | 90 | 190 | 15 | ZN**3005... | C |

### SPARE PARTS

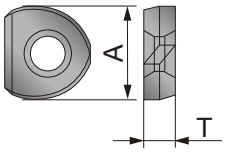
| Designation | Clamping screw | Clamp | Right-left screw | Wrench |
|---|---|---|---|---|
| TBN1100S | CSTB-2.5B | - | - | T-8D |
| TBN1120S | CSTB-3S | - | - | T-9D |
| TBN1160S | CSTB-4S | - | - | T-15D |
| TBN1200S | CSTA-5SS | - | - | T-15D |
| TBN1250S, 1300S | CSTA-5S | CP536 | DS-6T | T-15D |

## INSERT

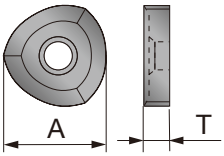
### ZNCA-FN




### ZNCA-FN2




### ZNMM-EN



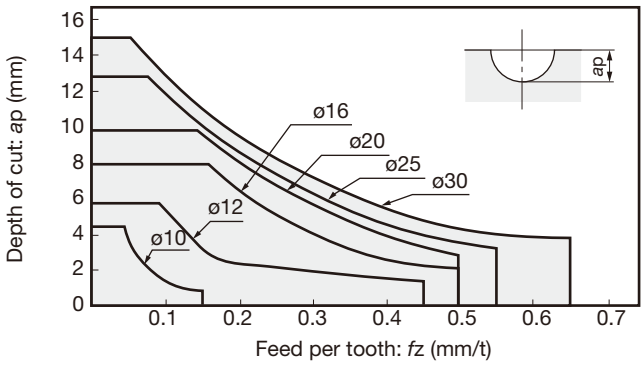

| | | Uncoated | | |

## STANDARD CUTTING CONDITIONS

For finishing

| ISO | Workpiece material | Grade | Cutting Speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|
| P | High carbon steel<br>S45C, S55C, etc. C45, C55, etc. | UX30 | 80 - 120 | 0.1 - 0.3 | 0.3 - 0.5 |
| | Tool steel<br>SK, SKH, etc. X153CrMoV12, etc. | UX30 | 60 - 100 | 0.08 - 0.25 | 0.3 - 0.5 |
| K | Cast iron<br>FC250, FCD400, etc. 250, 400-15S, etc. | TH10 | 80 - 120 | 0.1 - 0.5 | 0.3 - 0.5 |

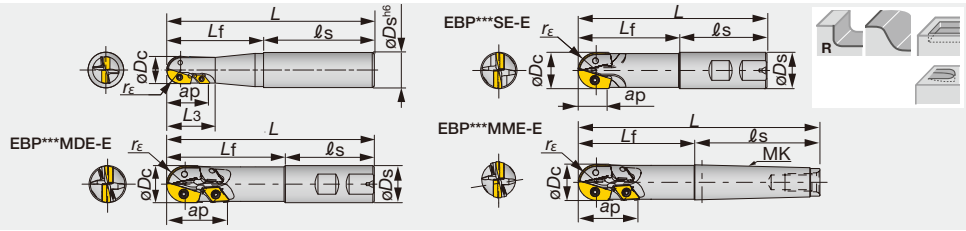
## GUIDELINES FOR SELECTING DEPTH OF CUT AND FEED




Workpiece material: Carbon steel (JIS S55C)
Insert grade: UX30
Machine power: ø10 ~ ø16: 7.5 kW
ø20 ~ ø30: 22.5 kW
No. of revolutions: ø10 ~ ø16: 2000 $min^{-1}$
ø20 ~ ø30: 1500 $min^{-1}$

## EBP

Indexable ball-nose endmill for semi-finishing



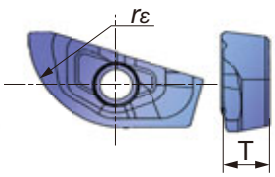

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | L3 | rε | MK | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EBP020SD-E | 16 | 20 | 2 | 20 | 56 | 60 | 116 | - | 10 | - | ZPET2004-MJ | - |
| EBP020SS | 16 | 20 | 2 | 25 | 80 | 60 | 140 | 30 | 10 | - | ZPET2004-MJ | - |
| EBP020MDE-E | 29.5 | 20 | 2 (4) | 20 | 56 | 70 | 126 | - | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP020MME-E | 29.5 | 20 | 2 (4) | - | 69 | 70 | 139 | - | 10 | MK2 | ZPET2004-MJ | DCMW070204TN |
| EBP020MSE | 29.5 | 20 | 2 (4) | 25 | 80 | 70 | 150 | 35 | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP020LSE | 29.5 | 20 | 2 (4) | 25 | 180 | 70 | 250 | 35 | 10 | - | ZPET2004-MJ | DCMW070204TN |
| EBP025SD-E | 21 | 25 | 2 | 25 | 60 | 70 | 130 | - | 12.5 | - | ZPET2505-MJ | - |
| EBP025SS | 21 | 25 | 2 | 32 | 80 | 70 | 150 | 35 | 12.5 | - | ZPET2505-MJ | - |
| EBP025MDE-E | 41 | 25 | 2 (4) | 25 | 60 | 80 | 140 | - | 12.5 | - | ZPET2505-MJ | DCMW11T304TN |
| EBP025MME-E | 41 | 25 | 2 (4) | - | 86 | - | 166 | - | 12.5 | MK3 | ZPET2505-MJ | DCMW11T304TN |
| EBP025MSE | 41 | 25 | 2 (4) | 32 | 100 | 80 | 180 | 50 | 12.5 | | ZPET2505-MJ | DCMW11T304TN |
| EBP025LSE | 41 | 25 | 2 (4) | 32 | 220 | 80 | 300 | 50 | 12.5 | - | ZPET2505-MJ | DCMW11T304TN |
| EBP030SS | 24 | 30 | 2 | 32 | 80 | 80 | 160 | 40 | 15 | - | ZPET3006-MJ | - |
| EBP030MSE | 45 | 30 | 2 (4) | 32 | 100 | 100 | 200 | 55 | 15 | - | ZPET3006-MJ | DCMW11T304TN |
| EBP030LSE | 45 | 30 | 2 (4) | 32 | 250 | 100 | 350 | 55 | 15 | - | ZPET3006-MJ | DCMW11T304TN |
| EBP032SD-E | 25 | 32 | 2 | 32 | 60 | | 140 | - | 16 | - | ZPET3206-MJ | - |
| EBP032MDE-E | 46 | 32 | 2 (4) | 32 | 60 | 100 | 160 | - | 16 | - | ZPET3206-MJ | DCMW11T304TN |
| EBP032MME-E | 46 | 32 | 2 (4) | - | 109 | 100 | 209 | - | 16 | MK4 | ZPET3206-MJ | DCMW11T304TN |

### SPARE PARTS

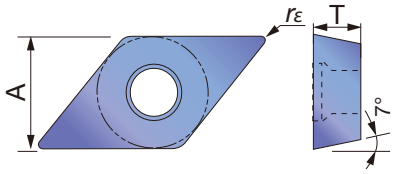
| Designation | Clamping screw for Insert 1 | Clamping screw for Insert 2 | Lubricant | Wrench for Insert 1 | Wrench 1 for Insert 1 |
|---|---|---|---|---|---|
| EBP020SS/SD-E | CSTD-3T | - | M-1000 | T-10D | - |
| EBP025SS/SD-E | CSTB-4S | - | M-1000 | T-15D | - |
| EBP030SS/032SD-E | CSTB-5S | - | M-1000 | T-20D | - |
| EBP020*SE/M*E-E | CSTB-2.5S | CSTD-3T | M-1000 | T-10D | T-8D |
| EBP025*SE/M*E-E | CSTB-4S | - | M-1000 | T-15D | - |
| EBP030*SE/032M*E-E | CSTB-4S | CSTB-5S | M-1000 | T-15D | T-20D |

## INSERT

### ZPET-MJ (for Radius)




### DCMW-TN (for Peripheral)




| | | AH120 | AH330 |
|---|---|---|---|
| P | Steel | ☆ | ★ |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | ★ | |
| H | Hard materials | | |

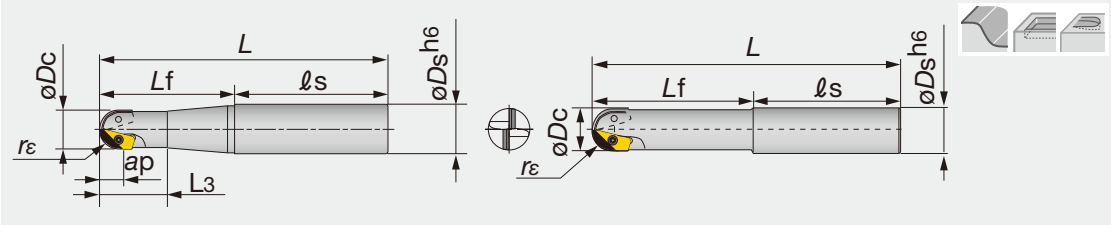
★ : First choice
☆ : Second choice

| Designation | rε | Coated AH120 | Coated AH330 | A | T |
|---|---|---|---|---|---|
| ZPET2004-MJ | 10 | ● | ● | - | 4.5 |
| ZPET2505-MJ | 12.5 | ● | ● | - | 4.63 |
| ZPET3006-MJ | 15 | ● | ● | - | 6.75 |
| ZPET3206-MJ | 16 | ● | ● | - | 6.75 |
| DCMW070204TN | 0.4 | ● | ● | 6.4 | 2.4 |
| DCMW11T304TN | 0.4 | ● | ● | 9.5 | 4 |

●: Line up

## EBB

Indexable ball-nose endmill for semi-finishing with CBN insert



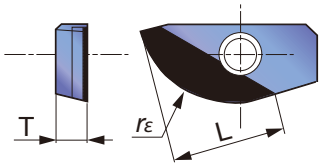

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | L3 | rε | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EBB020MS | 12 | 20 | 2 | 25 | 80 | 70 | 150 | 35 | 10 | ZPCW2003-QBN |
| EBB025MS | 15.5 | 25 | 2 | 32 | 100 | 80 | 180 | 50 | 12.5 | ZPCW25H3-QBN |
| EBB030MS | 18 | 30 | 2 | 32 | 100 | 100 | 200 | - | 15 | ZPCW30T3-QBN |
| EBB040MS | 23 | 40 | 2 | 42 | 100 | 150 | 250 | - | 20 | ZPCW4004-QBN |
| EBB050MS | 28 | 50 | 2 | 50 | 100 | 150 | 250 | - | 25 | ZPCW5004-QBN |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | Clamp set |
|---|---|---|---|---|
| EBB020MS | CSTB-3S | M-1000 | T-9D | - |
| EBB025MS | CSTB-3.5 | M-1000 | T-15D | - |
| EBB030MS | CSTB-4S | M-1000 | T-15D | - |
| EBB040MS | CSTB-5 | M-1000 | T-20D | CSP22 |
| EBB050MS | CSTB-5 | M-1000 | T-20D | CSP22 |

## INSERT

### ZPCW-QBN




| | | |
|---|---|---|
| P | Steel | |
| M | Stainless | |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard materials | |

★ : First choice
☆ : Second choice

| Designation | rε | CBN BX950 | T | L |
|---|---|---|---|---|
| ZPCW2003-QBN | 10 | ● | 3.18 | 12 |
| ZPCW25H3-QBN | 12.5 | ● | 3.5 | 15.5 |
| ZPCW30T3-QBN | 15 | ● | 3.97 | 18 |
| ZPCW4004-QBN | 20 | ● | 4.76 | 23 |
| ZPCW5004-QBN | 25 | ● | 4.76 | 28 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | No. of revolutions $n$ (min$^{-1}$) | Feed per tooth $fz$ (mm/t) | Depth of cut $ap$ (mm) | Pick feed $Pf$ (mm) |
|---|---|---|---|---|---|
| K | Cast irons FC250, etc. 250, etc. | 5,000 ~ 15,000 | 0.2 ~ 0.5 | ~ 1 | ~ 3 |
| | Ductile cast irons FCD500, etc. 600-3, etc. | 5,000 ~ 15,000 | 0.2 ~ 0.5 | ~ 1 | ~ 3 |

## EBD

Indexable ball-nose endmill for roughing

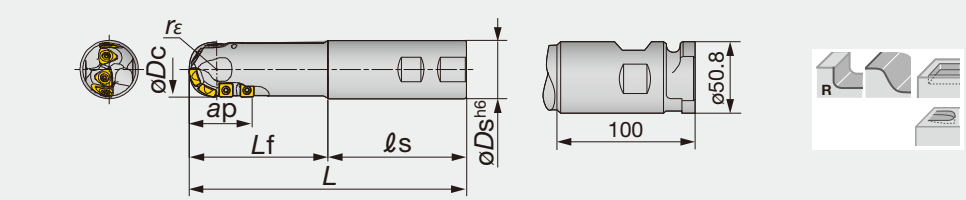



Fig. A

Fig. B Combination shank

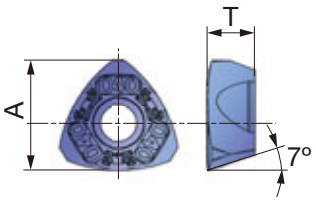
| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | rε | Fig. | Insert for R | Insert for P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EBD040SSE | 45 | 40 | 4 (7) | 42 | 100 | 100 | 200 | 20 | A | ZDMT4005-MJ | SCMT09T308-23 |
| EBD040MSE | 45 | 40 | 4 (7) | 42 | 100 | 150 | 250 | 20 | A | ZDMT4005-MJ | SCMT09T308-23 |
| EBD050SSE | 59 | 50 | 4 (7) | 42 | 100 | 100 | 200 | 25 | A | ZDMT5006-MJ | SCMT120408-23 |
| EBD050MSE | 59 | 50 | 4 (7) | 42 | 100 | 150 | 250 | 25 | A | ZDMT5006-MJ | SCMT120408-23 |
| EBD050SCE | 59 | 50 | 4 (7) | 50.8 | 100 | 100 | 200 | 25 | B | ZDMT5006-MJ | SCMT120408-23 |
| EBD050MCE | 59 | 50 | 4 (7) | 50.8 | 100 | 150 | 250 | 25 | B | ZDMT5006-MJ | SCMT120408-23 |

### SPARE PARTS

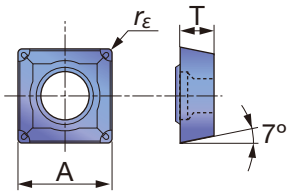
| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| EBD040*SE | CSTB-4M | M-1000 | T-15T |
| EBD050**E | CSTB-5 | M-1000 | T-20T |

## INSERT

### ZDMT-MJ (For R-edge)




### SCMT-23 (For peripheral edge)




| | | |
|---|---|---|
| P | Steel | ☆ |
| M | Stainless | |
| K | Cast iron | ★ |
| N | Non-ferrous | |
| S | Superalloys | ★ |
| H | Hard materials | ☆ |

★ : First choice
☆ : Second choice

| Designation | rε | Coated AH120 | A | T |
|---|---|---|---|---|
| ZDMT4005-MJ | - | ● | 13 | 5.5 |
| ZDMT5006-MJ | - | ● | 16.2 | 6.5 |
| SCMT09T308-23 | 0.8 | ● | 9.525 | 3.97 |
| SCMT120408-23 | 0.8 | ● | 12.7 | 4.76 |

●: Line up

Profile Milling

# STANDARD CUTTING CONDITIONS

## EBP

| ISO | Workpiece material | Grade | Machining type | Cutting speed *Vc* (m/min) | Table feed *vf* (mm/min) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Tool dia. ø20 | Tool dia. ø25 | Tool dia. ø30 |
| P | Carbon steels S55C, etc. C55, etc. < 300 HB | AH120 | (1) | 200 (170 ~ 230) | 760 (610 ~ 910) | 610 (460 ~ 760) | 510 (360 ~ 660) |
| | | AH120 | (2) | 230 (200 ~ 260) | 1100 (900 ~ 1300) | 880 (680 ~ 1080) | 730 (530 ~ 930) |
| | | AH120 | (3) | 180 (150 ~ 200) | 570 (420 ~ 350) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 | (1) | 180 (150 ~ 210) | 680 (530 ~ 830) | 550 (400 ~ 700) | 450 (300 ~ 600) |
| | | AH120 | (2) | 210 (180 ~ 240) | 1000 (800 ~ 1200) | 800 (600 ~ 400) | 670 (470 ~ 870) |
| | | AH120 | (3) | 160 (130 ~ 180) | 510 (360 ~ 660) | 400 (250 ~ 550) | 340 (190 ~ 490) |
| | Die steels SKD11, etc. X96CrMoV12, etc. < 300 HB | AH330 | (1) | 150 (120 ~ 180) | 570 (420 ~ 720) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| | | AH330 | (2) | 180 (150 ~ 210) | 860 (660 ~ 1060) | 690 (490 ~ 890) | 570 (370 ~ 770) |
| | | AH330 | (3) | 130 (100 ~ 150) | 410 (260 ~ 560) | 330 (180 ~ 480) | 280 (130 ~ 430) |
| K | Cast irons FC250, etc. 250, etc. | AH120 | (1) | 200 (170 ~ 230) | 950 (800 ~ 1100) | 760 (610 ~ 910) | 640 (490 ~ 790) |
| | | AH120 | (2) | 230 (200 ~ 260) | 1200 (900 ~ 1400) | 1000 (700 ~ 1200) | 830 (530 ~ 1030) |
| | | AH120 | (3) | 180 (150 ~ 200) | 570 (420 ~ 720) | 460 (310 ~ 610) | 380 (230 ~ 530) |
| H | Hardened steels Prehardened steels < 45 HRC | AH120 | (1) | 80 (60 ~ 100) | 250 (150 ~ 350) | 200 (100 ~ 300) | 160 (100 ~ 260) |
| | | AH120 | (2) | 100 (70 ~ 130) | 310 (160 ~ 460) | 250 (100 ~ 400) | 210 (100 ~ 360) |
| | | AH120 | (3) | 60 (40 ~ 80) | 190 (140 ~ 240) | 150 (100 ~ 200) | 130 (80 ~ 180) |

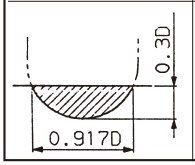
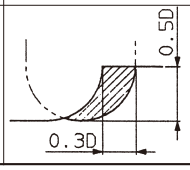
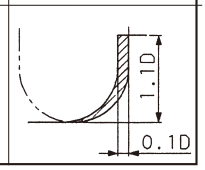
Notes:
- Cutting speeds shown in the left table are of the most outer diameter of the tool.
- The values of the cutting speeds and feeds shown in the table are of under general cutting conditions. The values should be modified depending on the power and rigidity of the machine to be used, and work holding conditions.
- When using the long shank type, the depth of cut, pick feed, cutting speed, and table feed should be reduced to 70 %-90 % of the values shown in the tables.

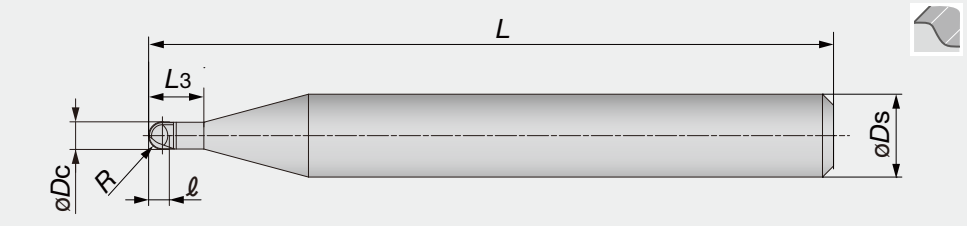
## EBD

| ISO | Workpiece material | Grade | Machining type | Cutting speed *Vc* (m/min) | Table feed *vf* (mm/min) | |
|---|---|---|---|---|---|---|
| | | | | | Tool dia. ø40 | Tool dia. ø50 |
| P | Carbon steels S55C, etc. C55, etc. < 300 HB | AH120 | (1) | 180 (150 ~ 210) | 490 (400 ~ 570) | 390 (330 ~ 460) |
| | | AH120 | (2) | 200 (170 ~ 230) | 480 (410 ~ 550) | 380 (330 ~ 440) |
| | | AH120 | (3) | 160 (130 ~ 190) | 260 (210 ~ 300) | 200 (160 ~ 240) |
| | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 | (1) | 160 (130 ~ 190) | 430 (350 ~ 510) | 350 (280 ~ 410) |
| | | AH120 | (2) | 180 (150 ~ 210) | 430 (360 ~ 500) | 340 (290 ~ 400) |
| | | AH120 | (3) | 140 (110 ~ 170) | 220 (180 ~ 270) | 180 (140 ~ 220) |
| | Die steels SKD11, etc. X96CrMoV12, etc. < 300 HB | AH120 | (1) | 140 (110 ~ 170) | 380 (300 ~ 460) | 300 (240 ~ 370) |
| | | AH120 | (2) | 160 (130 ~ 190) | 380 (310 ~ 460) | 310 (250 ~ 360) |
| | | AH120 | (3) | 120 (90 ~ 150) | 190 (140 ~ 240) | 150 (120 ~ 190) |
| K | Cast irons FC250, etc. 250, etc. | AH120 | (1) | 200 (170 ~ 230) | 640 (510 ~ 680) | 510 (410 ~ 540) |
| | | AH120 | (2) | 220 (190 ~ 250) | 600 (510 ~ 680) | 480 (410 ~ 540) |
| | | AH120 | (3) | 180 (150 ~ 210) | 340 (290 ~ 400) | 280 (230 ~ 320) |
| H | Hardened steels Prehardened steels < 45 HRC | AH120 | (1) | 90 (70 ~ 110) | 210 (160 ~ 260) | 170 (130 ~ 210) |
| | | AH120 | (2) | 100 (80 ~ 120) | 200 (160 ~ 250) | 160 (130 ~ 200) |
| | | AH120 | (3) | 60 (50 ~ 90) | 100 (80 ~ 140) | 80 (60 ~ 120) |

Notes:
- Cutting speeds shown in the left table are of the most outer diameter of the tool.
- The values of the cutting speeds and feeds shown in the table are of under general cutting conditions. The values should be modified depending on the power and rigidity of the machine to be used, and work holding conditions.
- When using the long shank type, the depth of cut, pick feed, cutting speed, and table feed should be reduced to 70 %-90 % of the values shown in the tables.

## Machining types

| (1) Grooving | (2) Shouldering at shallow depth of cut | (3) Shouldering at deep depth of cut |
|---|---|---|
|  |  |  |




| Designation | BX850 | z | R | øDc | ℓ | L3 | L | øDs |
|---|---|---|---|---|---|---|---|---|
| BBB2006 | ● | 2 | 0.3 | 0.6 | 0.5 | 1.2 | 50 | 6 |
| BBB2008 | ● | 2 | 0.4 | 0.8 | 0.6 | 1.6 | 50 | 6 |
| BBB2010 | ● | 2 | 0.5 | 1 | 0.7 | 2 | 50 | 6 |
| BBB2020 | ● | 2 | 1 | 2 | 1.5 | 4 | 50 | 6 |

●: Line up

## Tolerance (BBB2000)

| Mill dia. | Tolerance on dia. | Tolerance on shank |
|---|---|---|
| 0.3 ~ 1.0 | ±0.005 | h6 |

## ●BBB2000 (T-CBN Ball Endmills)

| Workpiece material | Prehardened steels (NAK80, etc.) Die steels (JIS SKD61, etc.) | | | Die steels (JIS SKD11, DRM1 & 2, etc.) | | | High speed steel and die steel (JIS SKH, DRM3, etc.) | | | Inclined angle of workpiece (θ1)/ Effective neck length (Z) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | ~ 52 HRC | | | ~ 62 HRC | | | ~ 70 HRC | | | | | | |
| Ball radius (R) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | Depth of cut ap ~ pf (mm) | Feed rate (mm/min) | No. of revolutions n (min-1) | | | | |
| 0.3 | 0.02×0.03 | 2,000 | 50,000 | 0.01×0.02 | 2,000 | 50,000 | 0.01×0.02 | 1,500 | 50,000 | 0°30′/1.25 | 1°/1.30 | 2°/1.35 | 3°/1.45 |
| 0.4 | 0.03×0.05 | 2,000 | | 0.02×0.03 | 2,000 | | 0.01×0.03 | 1,500 | | 0°30′/1.65 | 1°/1.70 | 2°/1.80 | 3°/1.90 |
| 0.5 | 0.05×0.05 | 3,000 | | 0.03×0.05 | 3,000 | | 0.02×0.03 | 2,000 | | 0°30′/2.05 | 1°/2.10 | 2°/2.25 | 3°/2.40 |
| 1.0 | 0.10×0.10 | 5,000 | | 0.05×0.05 | 5,000 | | 0.03×0.05 | 3,000 | | 0°30′/4.15 | 1°/4.25 | 2°/4.50 | 3°/4.80 |

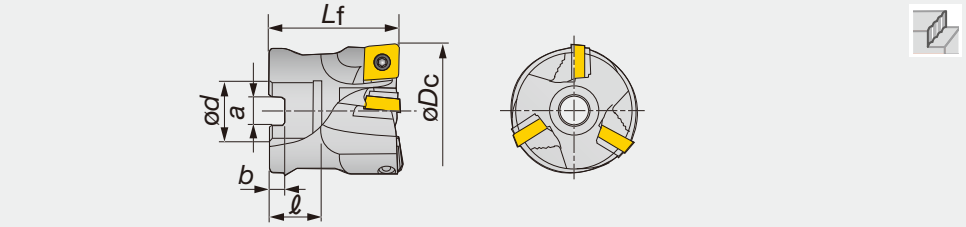
Notes:
- Depths of cut (*ap*) shown in the table are the allowable maximum values.
- Mist cooling or air blow is recommended.
- The maximum number of revolutions of the machine to be used is lower than 50,000 $min^{-1}$, the revolutions and feed rate should be modified at same rate.
- Use smallest possible overhang.

MEMO

## TZP12

Plunging cutter for roughing operation with screw clamp

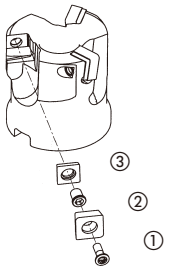
A.R. = +26°, R.R. = -2°




| Designation | øDc | z | ød | ℓ | Lf | b | a | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TZP12050R | 50 | 3 | 22 | 20 | 50 | 6 | 10 | 0.38 | APMT120416PR-MJ |
| TZP12050R-E | 50 | 3 | 22 | 20 | 50 | 6.3 | 10.4 | 0.38 | APMT120416PR-MJ |
| TZP12063R | 63 | 3 | 22 | 20 | 50 | 6 | 10 | 0.72 | APMT120416PR-MJ |
| TZP12063R-E | 63 | 3 | 22 | 20 | 50 | 6.3 | 10.4 | 0.72 | APMT120416PR-MJ |
| TZP12080R | 80 | 4 | 31.75 | 32 | 63 | 8 | 12.7 | 1.51 | APMT120416PR-MJ |

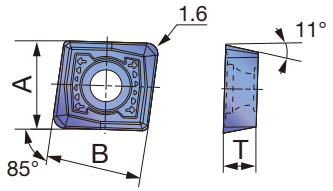
### SPARE PARTS

| Designation | ①Clamping screw | Lubricant | ②Shim screw | ③Shim | Wrench (①) | Wrench 1 ((②)) |
|---|---|---|---|---|---|---|
| TZP12 | CSTB-3.5T | M-1000 | DTS5-3.5SS | ZSA1102 | T-20D | P-3.5 |




## INSERT

### APMT120416-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | |
| M | Stainless | | | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | | |
| H | Hard materials | | | |

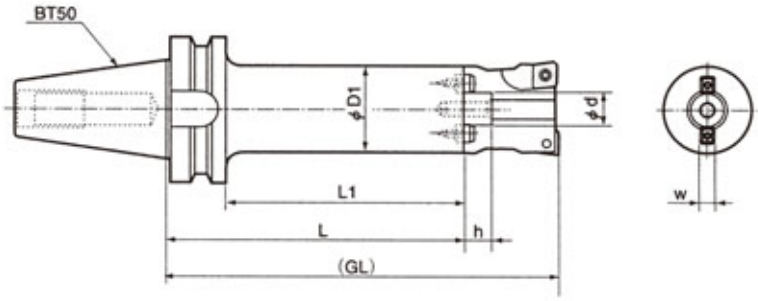
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | Coated T3130 | A | B | T |
|---|---|---|---|---|---|---|---|
| APMT120416PR-MJ | 1.6 | 10 | ● | ● | 12.7 | 13.5 | 4.76 |

●: Line up

Profile Milling

## ARBORS



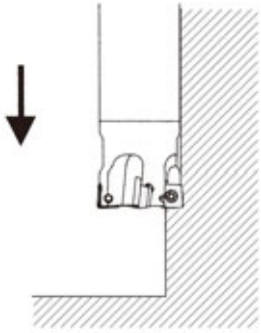

| Designation | Dimensions (mm) | | | | | | | Weight (kg) | Applicable Mills |
|---|---|---|---|---|---|---|---|---|---|
| | *L* | *L*1 | (GL) | ø*D*1 | ø*d* | *h* | w | | |
| BT50-FMC22-343-47 | 343 | 305 | 393 | 47 | 22 | 18 | 10 | 7.9 | TZP12050R... |
| BT50-FMC22-293-47 | 293 | 255 | 343 | 47 | 22 | 18 | 10 | 7.2 | TZP12050R... |
| BT50-FMC22-243-47 | 243 | 205 | 293 | 47 | 22 | 18 | 10 | 6.5 | TZP12050R... |
| BT50-FMC22-433-59 | 433 | 395 | 483 | 59 | 22 | 18 | 10 | 12.2 | TZP12063R... |
| BT50-FMC22-373-59 | 373 | 335 | 423 | 59 | 22 | 18 | 10 | 10.9 | TZP12063R... |
| BT50-FMC22-308-59 | 308 | 270 | 358 | 59 | 22 | 18 | 10 | 9.5 | TZP12063R... |
| BT50-FMA31.75-455-76 | 455 | 417 | 518 | 76 | 31.75 | 30 | 12.7 | 18.6 | TZP12080R... |
| BT50-FMA31.75-375-76 | 375 | 337 | 438 | 76 | 31.75 | 30 | 12.7 | 15.8 | TZP12080R... |
| BT50-FMA31.75-295-76 | 295 | 257 | 358 | 76 | 31.75 | 30 | 12.7 | 12.9 | TZP12080R... |

Note: (GL) is a length as TZP12 type cutter is mounted.

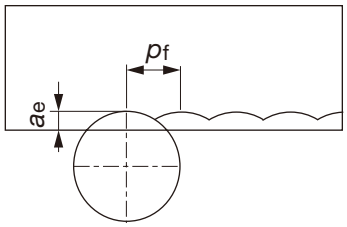
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels, Alloy steels | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Die steels < 300 HB | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Prehardened steels < 45 HRC | AH120 | 60 ~ 120 | 0.1 ~ 0.2 |
| K | Cast irons | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |

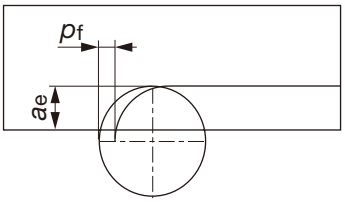
Z-feed milling



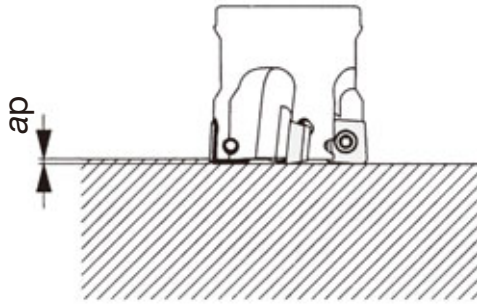
Machining method (1)




Machining method (2)




Traverse feed milling



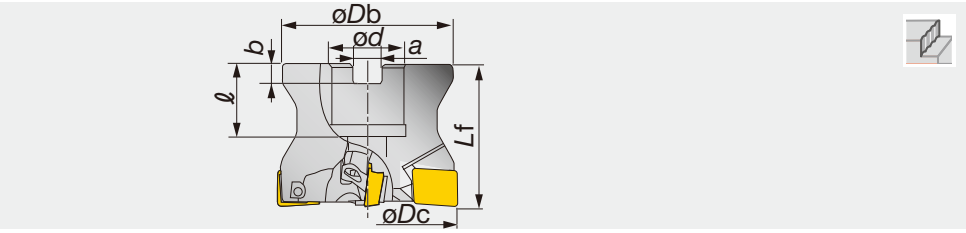

| Machining method | Z-feed milling | | Traverse feed milling |
|---|---|---|---|
| | Pick feed $p_f$ (mm) | Radial depth of cut *ae* (mm) | Depth of cut *ap* (mm) |
| (1) | Tool dia. øD/2 | Within effective cutting edge length | ~ 0.5 |
| (2) | Within effective cutting edge length | Tool dia. øD/2 | |

Note: In Z-feed milling, select either of the machining method (1) or (2) and decide the depth of cut according to the application.

## TZP19

Plunging cutter for roughing operation with wedge clamp

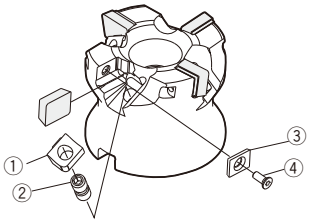
A.R. = +16°, R.R. = -2°




| Designation | øDc | z | øDb | ød | ℓ | Lf | b | a | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| TZP19080R | 80 | 4 | 76 | 31.75 | 32 | 63 | 8 | 12.7 | 1.32 | APMR190616PR-MJ |
| TZP19100R | 100 | 5 | 96 | 31.75 | 32 | 63 | 8 | 12.7 | 2.41 | APMR190616PR-MJ |
| TZP19125R | 125 | 6 | 98 | 38.1 | 38 | 63 | 10 | 15.9 | 3.17 | APMR190616PR-MJ |

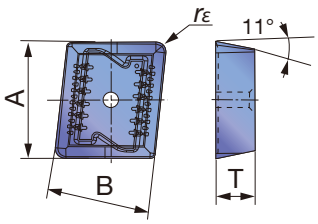
### SPARE PARTS

| Designation | ④Clamping screw | ②Right-left screw | ③Shim | ①Wedge | Wrench (④) | Wrench1(②) |
|---|---|---|---|---|---|---|
| TZP19 | CSTA-4 | FDS-8ST | ZSA1502 | WPP16R | T-15D | T-27T |




## INSERT

### APMR190616-MJ




| | | | | |
|---|---|---|---|---|
| P | Steel | ☆ | ★ | |
| M | Stainless | | | |
| K | Cast iron | ★ | | |
| N | Non-ferrous | | | |
| S | Superalloys | ★ | | |
| H | Hard materials | | | |

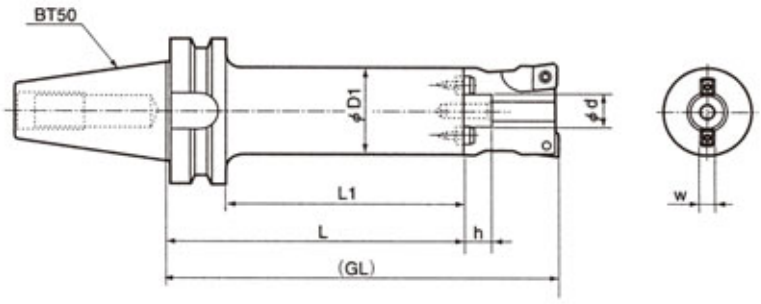
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH120 | Coated T3130 | A | B | T |
|---|---|---|---|---|---|---|---|
| APMR190616PR-MJ | 1.6 | 17 | ● | ● | 19.05 | 15.875 | 6.35 |

●: Line up

Profile Milling

## ARBORS

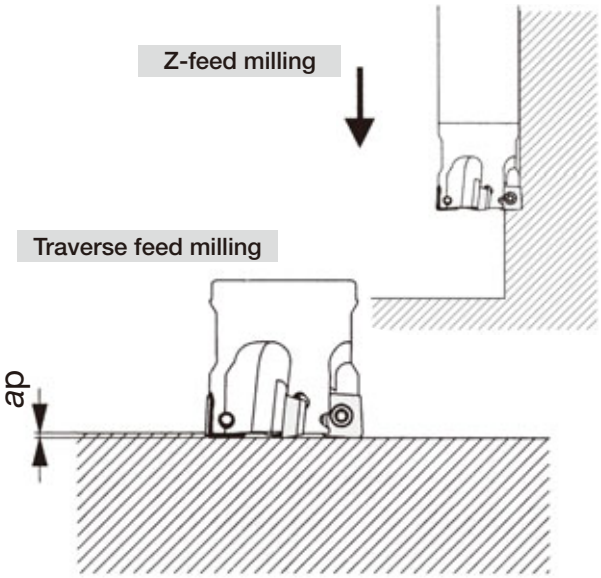



| Designation | Dimensions (mm) | | | | | | | Weight (kg) | Applicable Mills |
|---|---|---|---|---|---|---|---|---|---|
| | *L* | *L*1 | (GL) | ø*D*1 | ø*d* | *h* | w | | |
| BT50-FMA31.75-455-76 | 455 | 417 | 518 | 76 | 31.75 | 30 | 12.7 | 18.6 | TZP19080R |
| BT50-FMA31.75-375-76 | 375 | 337 | 438 | 76 | 31.75 | 30 | 12.7 | 15.8 | TZP19080R |
| BT50-FMA31.75-295-76 | 295 | 257 | 358 | 76 | 31.75 | 30 | 12.7 | 12.9 | TZP19080R |
| BT50-FMA31.75-375-96 | 375 | 337 | 438 | 96 | 31.75 | 30 | 12.7 | 23 | TZP19100R |
| BT50-FMA38.1-375-98 | 375 | 337 | 438 | 98 | 38.1 | 34 | 15.9 | 23.8 | TZP19125R |

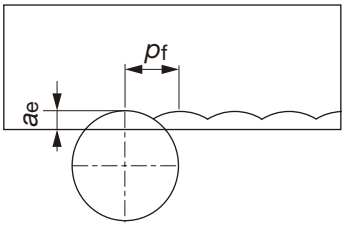
Note: (GL) is a length as TZP19 type cutter is mounted.

## STANDARD CUTTING CONDITIONS

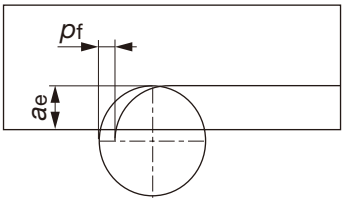
| ISO | Work materials | Grades | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels, Alloy steels | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Die steels (JIS SKD) < 300 HB | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |
| | | T3130 | 150 ~ 250 | 0.1 ~ 0.25 |
| | Prehardened steels < 45 HRC | AH120 | 60 ~ 120 | 0.1 ~ 0.2 |
| K | Cast irons (JIS FC and FCD) | AH120 | 100 ~ 200 | 0.1 ~ 0.3 |




Machining method (1)




Machining method (2)



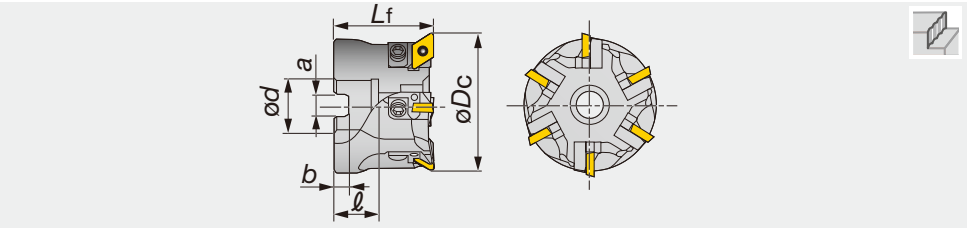

| Machining method | Z-feed milling | | Traverse feed milling |
|---|---|---|---|
| | Pick feed $p_f$ (mm) | Radial depth of cut *ae* (mm) | Depth of cut *ap* (mm) |
| (1) | Tool dia. øD/2 | Within effective cutting edge length | ~0.5 |
| (2) | Within effective cutting edge length | Tool dia. øD/2 | |

Note: In Z-feed milling, select either of the machining method (1) or (2) and decide the depth of cut according to the application.

## TZF11

Plunging cutter for finishing operation

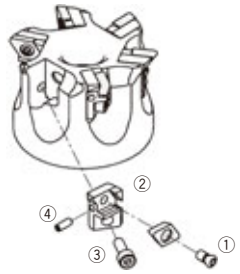
A.R. = 0°, R.R. = -6° ~ 0°




| Designation | z | øDc | ød | ℓ | Lf | b | a | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TZF11050R | 4 | 50 | 22 | 20 | 45 | 6 | 10 | 0.38 | DPCW11T3ZFR |
| TZF11050R-E | 4 | 50 | 22 | 20 | 45 | 6.3 | 10.4 | 0.38 | DPCW11T3ZFR |
| TZF11063R | 6 | 63 | 22 | 20 | 45 | 6 | 10 | 0.72 | DPCW11T3ZFR |
| TZF11063R-E | 6 | 63 | 22 | 20 | 45 | 6.3 | 10.4 | 0.72 | DPCW11T3ZFR |
| TZF11080R | 7 | 80 | 31.75 | 32 | 63 | 8 | 12.7 | 1.51 | DPCW11T3ZFR |

### SPARE PARTS

| Designation | ①Clamping screw | ②Locator | Lubricant | ③Cartridge fixing screw | ④Cartridge fixing screw | Shell locking bolt | Wrench (①) | Wrench 1 (④) | Wrench 2 (③) |
|---|---|---|---|---|---|---|---|---|---|
| TZF11050R* | CSTB-4S | SDUPR09CZ-11 | M-1000 | CM4X0.7X12 | SSHM3-10 | FSHM10-40 | T-15D | P-1.5 | P-3 |
| TZF11063R* | CSTB-4S | SDUPR09CZ-11 | M-1000 | CM4X0.7X12 | SSHM3-10 | - | T-15D | P-1.5 | P-3 |
| TZF11080R | CSTB-4S | SDUPR09CZ-11 | M-1000 | CM4X0.7X12 | SSHM3-10 | - | T-15D | P-1.5 | P-3 |

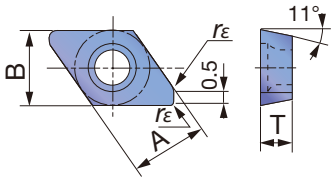



Profile Milling

## INSERT

### DPCW11T3

Precious ground insert for finishing with plunging tool



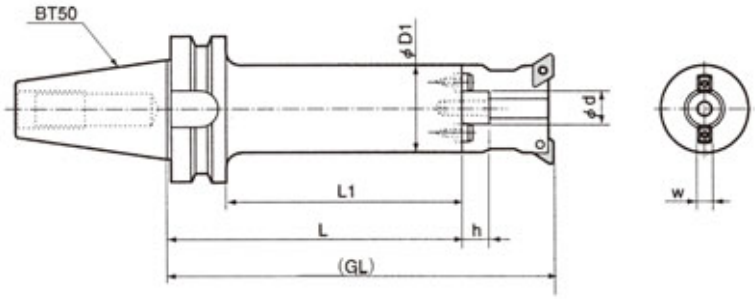

| | | | | | | |
|---|---|---|---|---|---|---|
| P | Steel | ☆ | ☆ | | ★ | |
| M | Stainless | | ★ | | | |
| K | Cast iron | ★ | | | | |
| N | Non-ferrous | | | | | |
| S | Superalloys | | | | | |
| H | Hard materials | | | | ☆ | |

★ : First choice
☆ : Second choice

| Designation | rε | Coated | | | Cermet | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH740 | | NS740 | | | | |
| DPCW11T3ZFR | 1 | ● | ● | | ● | | 9.5 | 9.5 | 4 |

●: Line up

## ARBORS



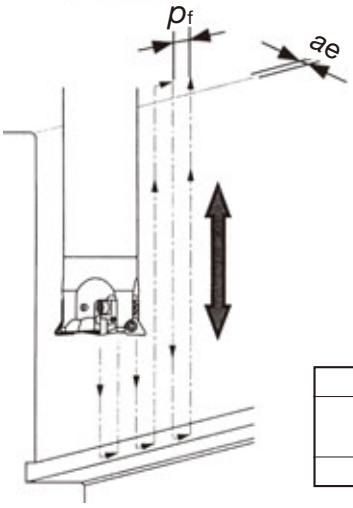

| Designation | Dimensions (mm) | | | | | | | Weight (kg) | Applicable Mills |
|---|---|---|---|---|---|---|---|---|---|
| | *L* | *L*1 | (GL) | ø*D*1 | ø*d* | *h* | w | | |
| BT50-FMC22-343-47 | 343 | 305 | 388 | 47 | 22 | 18 | 10 | 7.9 | TZF11050R... |
| BT50-FMC22-293-47 | 293 | 255 | 338 | 47 | 22 | 18 | 10 | 7.2 | TZF11050R... |
| BT50-FMC22-243-47 | 243 | 205 | 288 | 47 | 22 | 18 | 10 | 6.5 | TZF11050R... |
| BT50-FMC22-433-59 | 433 | 395 | 478 | 59 | 22 | 18 | 10 | 12.2 | TZF11063R... |
| BT50-FMC22-373-59 | 373 | 335 | 418 | 59 | 22 | 18 | 10 | 10.9 | TZF11063R... |
| BT50-FMC22-308-59 | 308 | 270 | 353 | 59 | 22 | 18 | 10 | 9.5 | TZF11063R... |
| BT50-FMA31.75-455-76 | 455 | 417 | 518 | 76 | 31.75 | 30 | 12.7 | 18.6 | TZF11080R... |
| BT50-FMA31.75-375-76 | 375 | 337 | 438 | 76 | 31.75 | 30 | 12.7 | 15.8 | TZF11080R... |
| BT50-FMA31.75-295-76 | 295 | 257 | 358 | 76 | 31.75 | 30 | 12.7 | 12.9 | TZF11080R... |

## STANDARD CUTTING CONDITIONS

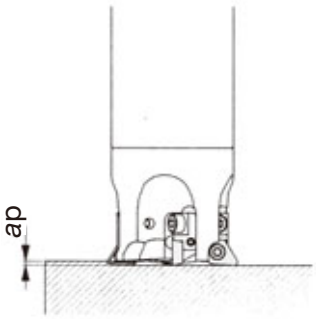
| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels, Alloy steels < 300 HB | NS740 | 300 (150 ~ 400) | 0.15 (0.05 ~ 0.2) |
| | | AH740 | 250 (150 ~ 350) | 0.15 (0.05 ~ 0.2) |
| K | Cast irons 250, etc. | AH740 | 300 (200 ~ 500) | 0.15 (0.05 ~ 0.2) |
| | Ductile cast irons 600-3, etc. | AH740 | 250 (150 ~ 350) | 0.15 (0.05 ~ 0.2) |
| H | Prehardened steels, Hard materials 40-55 HRC | AH740 | 150 (100 ~ 200) | 0.1 (0.05 ~ 0.15) |

- Dry cutting (or air blow) at a depth of cut up *ae* to 0.3 mm (allowable max. 0.5 mm) and a pick feed *pf* from 0.5 to 1.0 mm is recommended.
- TZF11 type cutters are not designed to adjust dynamic balance. Therefore, when the tool's overhang ratio (cutter diameter-to-length) exceeds 6:1, special care should be taken with the revolution speed. (At first, start the machining at 50 % of the speed shown in the table of the standard cutting conditions, and then gradually increase the speed whilst confirming safety.)
- To produce highly accurate surface finish, use the cutter on a machine with sufficient rigidity.

Z-feed milling




Traverse feed milling




| Z-feed milling | | Traverse feed milling |
|---|---|---|
| Pick feed *pf* (mm) | Radial depth of cut *ae* (mm) | Depth of cut *ap* (mm) |
| 0.5 ~ 1 | ~ 0.5 | ~ 0.5 |

### ●Cautionary points in use

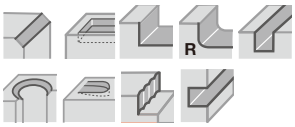
- Use the cutter for finish milling of vertical wall surfaces requiring long tool-overhang of L/D > 6.
- Radial cutting edge run-out should be adjusted within 0.01 mm.
- In addition to Z-feed milling, TZF11 type cutters can be also used for traverse feed milling. (*ap* ≤ 0.5 mm)

# MillLine - Multi-Functional Milling

## TUNGMEISTER

Endmills with exchangeable heads for reduced tool change time

**ø6 mm - ø25 mm**



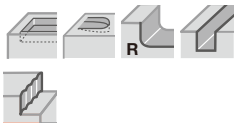
D262

P M K N S H

## HYBRIDTACMILL

Multi-functional endmills

**ø10 mm - ø16 mm / max. ap 8 mm**



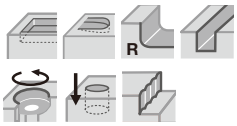
D290

P M K N

## EVX

Multi-functional endmills in larger diameters

**ø16 mm - ø63 mm / max. ap 15 mm**



D293

P M K

## ECC

Chamfering endmills for large lengths

**ø34 mm - ø55 mm**

D296

P M K

## ECP

Chamfering endmills for small lengths

**ø10 mm - ø36 mm**

D298

P K

## TCB

Counter boring tool for flat bottom finish

**ø14 mm - ø43 mm**

D299

P M K

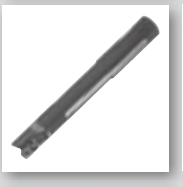
## Thread Milling

Threading tool with a single indexable insert

**M28 - M90**

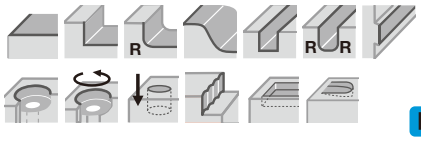
D301

P M



## TMS

High rigidity modular system



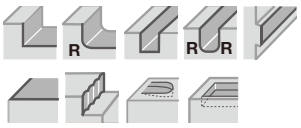
D302

P M K N H

## Solid Endmill

Solid carbide endmills for various applications

**ø0.4 mm - ø25 mm**



D310

P M K N S H

TungMeister

Tungaloy **D261**

TUNGMEISTER

# Designation system

## Shank

| V | SS | D10 | L070 | S | 06 | - | W | - | A |
|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | | ⑦ | | ⑧ |

| ① Series | |
|---|---|
| V | TungMeister |

| ② Shank type | |
|---|---|
| SS | Straight neck |
| TS | Taper neck |
| SC | Slotting |
| ST | for T-Slotting |
| AD | TungFlex adapter |

| ③ Shank diameter (mm) | |
|---|---|
| D08 | ø8 |
| D10 | ø10 |
| D12 | ø12 |
| D16 | ø16 |
| D20 | ø20 |
| D25 | ø25 |
| D32 | ø32 |
| VSC, VAD type | |
| 100 | ø10 |
| 120 | ø12 |
| 130 | ø13 |
| 180 | ø18 |
| 210 | ø21 |

| ④ Length (mm) | |
|---|---|
| L070 | 70 |

| ⑤ Shape of shank | |
|---|---|
| S | Cylindrical |
| W | Weldon |

| ⑥ Connection screw size | |
|---|---|
| 05 | S05 |
| 06 | S06 |
| 08 | S08 |
| 10 | S10 |
| 12 | S12 |
| 15 | S15 |

| ⑦ Shank material | |
|---|---|
| S | Steel |
| C | Carbide |
| W | Tungsten |

| ⑧ Additional feature | |
|---|---|
| A | with coolant hole |
| M | Thread size (TungFlex adapters) |

## Head

### ● Square endmill

| V | E | E | 080 | L05.0 | R00 | - | 03 | S05 |
|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ |

### ● Ball nose endmill

| V | B | D | 200 | L15.0 | - | BG | - | 04 | S12 |
|---|---|---|---|---|---|---|---|---|---|
| ① | ② | ③ | ④ | ⑤ | | ⑥ | ⑦ | ⑧ | ⑨ |

| ① Series | |
|---|---|
| V | TungMeister |

| ② Cutting edge | |
|---|---|
| E | Square |
| B | Ball |
| R | Radius |
| FX | for high feed |
| CA | for chamfering |
| CP | Spot drilling |
| CW | for chamfering (front and back) |
| CR | for R chamfering |
| GC | for counter boring |
| DP | for center drilling |
| S | for slotting |
| T | for T-slot milling |

| ③ Helix angle / Rake face | |
|---|---|
| B | 0° |
| C | 15° |
| D | 30° |
| E | 38° ~ 50° |
| F | 60° |
| T | Land |

| ④ Diameter (mm) | |
|---|---|
| 060 | ø6 |
| 200 | ø20 |

| ⑤ Cutting edge length (mm) | |
|---|---|
| Length | |
| L07.0 | 7 |
| L15.0 | 15 |
| Groove width | |
| W1.50 | 1.5 |
| W1.57 | 1.57 |
| W10.0 | 10 |

| ⑥ Corner shape / Angle | |
|---|---|
| Nose radius | |
| R00 | Sharp edge |
| R005 | R0.05 |
| R01 | R0.1 |
| R05 | R0.5 |
| R10 | R1.0 |
| Chamfer type | |
| C15 | 0.15 x 45° |
| C30 | 0.3 x 45° |
| C60 | 0.6 x 45° |
| Chamfering head | |
| A30 | 30° |
| A60 | 60° |
| R chamfering head | |
| R10 | R1.0 |
| R16 | R1.6 |
| Ball nose | |
| SG | Sphere / high precision |
| BM | Ball / general purpose |
| BG | Ball / high precision |

| ⑦ Additional feature | |
|---|---|
| I | Irregular pitch |
| A | for aluminium |
| R | for roughing |
| C | Combined edge |

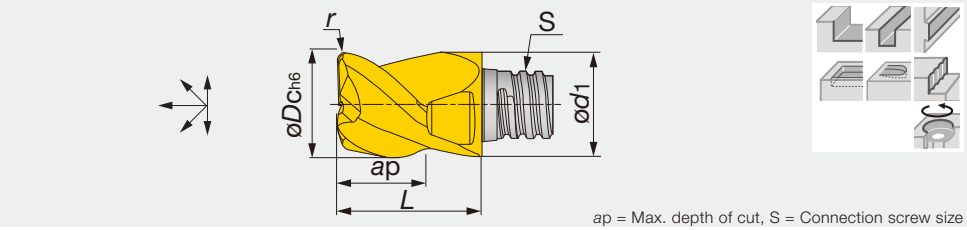
| ⑧ The number of flutes | |
|---|---|
| General | |
| 02 | 2 |
| 06 | 6 |
| Grooving head VST type | |
| 3 | 3 |
| 4 | 4 |

| ⑨ Connection screw size | |
|---|---|
| S05 | S05 |
| S06 | S06 |
| S08 | S08 |
| S10 | S10 |
| S12 | S12 |
| S15 | S15 |

# TUNGMEISTER

## VEE**-03...

TungMeister square head with 3 flutes for general purpose




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R00-03S05 | ● | 3 | 45° | 8 | 7.7 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-03S06 | ● | 3 | 45° | 10 | 9.7 | 7 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-03S08 | ● | 3 | 45° | 12 | 11.70 | 9 | - | S08 | 16.5 | KEYV-S08 | 15 |

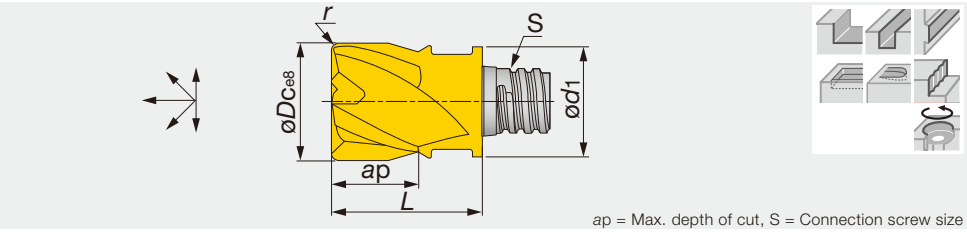
●: Line up

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VED**-04..., VEE**-04...

TungMeister square head with 4 flutes for general purposes




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE060L05.0R00-04S05 | ● | 4 | 45° | 6 | 8 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R00-04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | - | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R05-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 0.5 | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R10-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 1 | S05 | 10 | KEYV-S05 | 7 |
| VED080L05.0R15-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 1.5 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R05-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R05-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R10-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10-04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R05-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R05-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R10-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R10-04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0R00-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R05-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 0.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R05-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 0.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R10-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R10-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R15-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 1.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R15-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 1.5 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R20-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R20-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R30-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 3 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R30-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 3 | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R40-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 4 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0R40-04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 4 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0R00-04S12 | ● | 4 | 45° | 20 | 18.3 | 15 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R05-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 0.5 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R10-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 1 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R20-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 2 | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R30-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 3 | S12 | 25.5 | KEYV-S12 | 28 |

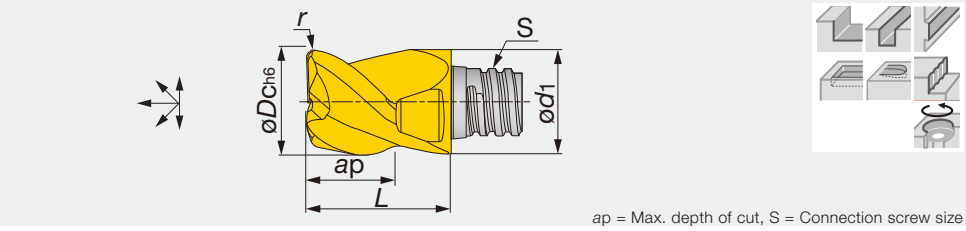
●: Line up

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VEE**-03...

TungMeister square head with 3 flutes for key way




| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE077L04.0R02-03S05 | ● | 3 | 38° | 7.7 | 7.7 | 4 | 0.2 | S05 | 10 | KEYV-S05 | 7 |
| VEE097L05.0R03-03S06 | ● | 3 | 38° | 9.7 | 9.7 | 5 | 0.3 | S06 | 13 | KEYV-S06 | 10 |
| VEE117L07.0R03-03S08 | ● | 3 | 38° | 11.7 | 11.7 | 7 | 0.3 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE157L08.0R03-03S10 | ● | 3 | 38° | 15.7 | 15.3 | 8 | 0.3 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE197L12.0R04-03S12 | ● | 3 | 38° | 19.7 | 18.3 | 12 | 0.4 | S12 | 25.5 | KEYV-S12 | 28 |

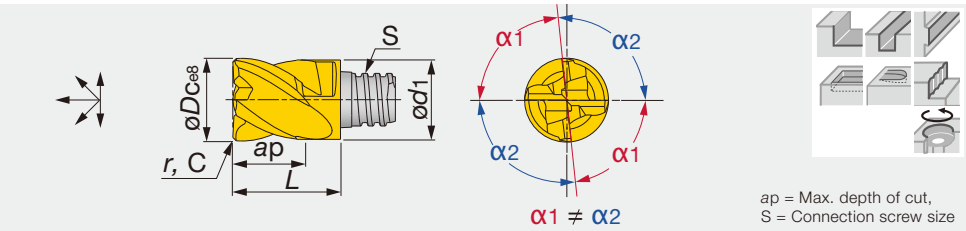
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VEE**I...

TungMeister square head with irregular pitch flute for chatter free cutting




| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C30I04S05 | ● | 4 | 38° | 8 | 7.7 | 5 | - | 0.3 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0C40I04S06 | ● | 4 | 38° | 10 | 9.7 | 7 | - | 0.4 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0C50I04S08 | ● | 4 | 38° | 12 | 11.7 | 9 | - | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0C60I04S10 | ● | 4 | 38° | 16 | 15.3 | 12 | - | 0.6 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0C60I04S12 | ● | 4 | 38° | 20 | 18.3 | 15 | - | 0.6 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE250L22.0C60I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | - | 0.6 | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R00I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | - | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R05I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 0.5 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R10I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 1 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R20I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 2 | - | S15 | 37 | KEYV-W20 | 40 |
| VEE250L22.0R30I04S15 | ● | 4 | 38° | 25 | 23.9 | 22 | 3 | - | S15 | 37 | KEYV-W20 | 40 |

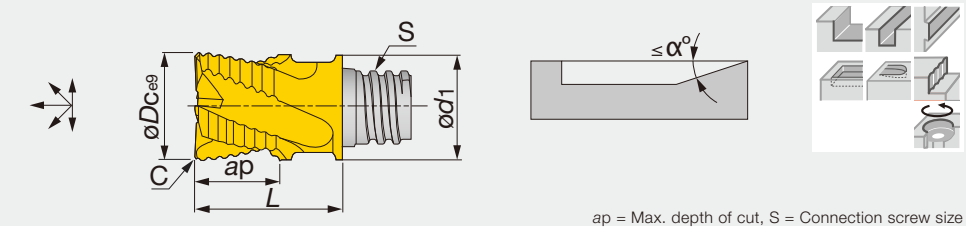
*Torque: Recommended torque (N·m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs.
VEE250: Packing quantity = 1pc.

●: Line up

# TUNGMEISTER

## VEE**R...

TungMeister square head with serated edges for roughing




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | C | S | L | α° | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C25R04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | 0.25 | S05 | 10 | 90 | KEYV-S05 | 7 |
| VEE100L07.0C30R04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.3 | S06 | 13 | 90 | KEYV-S06 | 10 |
| VEE120L09.0C35R04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.35 | S08 | 16.5 | 90 | KEYV-S08 | 15 |
| VEE160L12.0C40R05S10 | ● | 5 | 45° | 16 | 15.3 | 12 | 0.4 | S10 | 20.5 | 7 | KEYV-S10 | 28 |
| VEE200L15.0C40R06S12 | ● | 6 | 45° | 20 | 18.3 | 15 | 0.4 | S12 | 25.5 | 3 | KEYV-S12 | 28 |
| VEE250L22.0C50R06S15 | ● | 6 | 45° | 25 | 23.9 | 22 | 0.5 | S15 | 37 | 3 | KEYV-W20 | 40 |

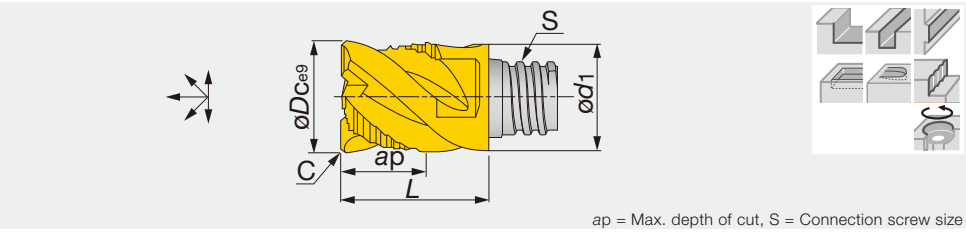
●: Line up

*Torque: Recommended torque (N·m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs.
VEE250: Packing quantity = 1pc.

# TUNGMEISTER

## VEE**C...

TungMeister square head with combined edges of finish and serated




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0C30C04S05 | ● | 4 | 45° | 8 | 7.7 | 5 | 0.3 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0C30C04S06 | ● | 4 | 45° | 10 | 9.7 | 7 | 0.3 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0C40C04S08 | ● | 4 | 45° | 12 | 11.7 | 9 | 0.4 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L12.0C60C04S10 | ● | 4 | 45° | 16 | 15.3 | 12 | 0.6 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L15.0C60C04S12 | ● | 4 | 45° | 20 | 18.3 | 15 | 0.6 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE250L22.0C60C04S15 | ● | 4 | 45° | 25 | 23.9 | 22 | 0.6 | S15 | 37 | KEYV-W20 | 40 |

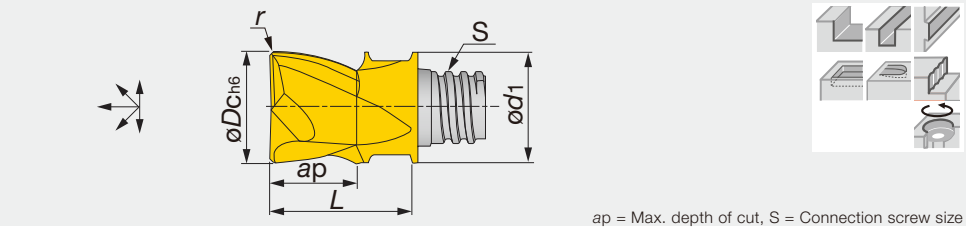
●: Line up

*Torque: Recommended torque (N·m) for clamping.
VEE080 ~ VEE200: Packing quantity = 2 pcs.
VEE250: Packing quantity = 1pc.

# TUNGMEISTER

## VEE**A02...

TungMeister square head with 2 flutes for aluminium machining




| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE100L07.0R05A02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10A02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R05A02S08 | ● | 2 | 45° | 12 | 11.7 | 9 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |

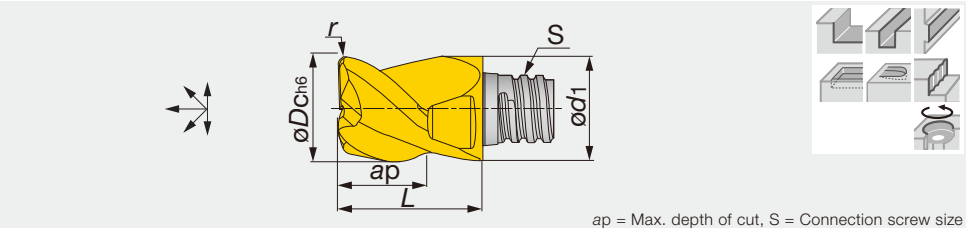
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VEE**A03...

TungMeister square head with 3 flutes for aluminium machining




| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R05A03S05 | ● | 3 | 45° | 8 | 7.7 | 5 | 0.5 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L06.0R05A03S06 | ● | 3 | 45° | 10 | 9.7 | 6 | 0.5 | S06 | 13 | KEYV-S06 | 10 |
| VEE100L06.0R10A03S06 | ● | 3 | 45° | 10 | 9.7 | 6 | 1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L08.0R05A03S08 | ● | 3 | 45° | 12 | 11.7 | 8 | 0.5 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L08.0R10A03S08 | ● | 3 | 45° | 12 | 11.7 | 8 | 1 | S08 | 16.5 | KEYV-S08 | 15 |
| VEE160L10.0R00A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L10.0R10A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | 1 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L10.0R20A03S10 | ● | 3 | 45° | 16 | 15.3 | 10 | 2 | S10 | 20.5 | KEYV-S10 | 28 |
| VEE200L12.0R05A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 0.5 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L12.0R10A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 1 | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L12.0R20A03S12 | ● | 3 | 45° | 20 | 18.3 | 12 | 2 | S12 | 25.5 | KEYV-S12 | 28 |

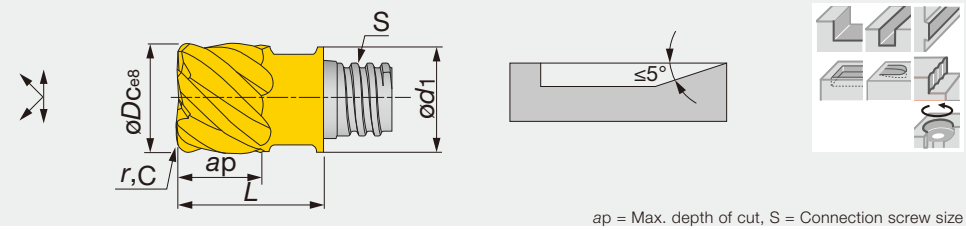
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VED**-06..., VEE**-06...

TungMeister square head with 6 flutes for difficult-to-cut material machining




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | AH750 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEE080L05.0R05-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 0.5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R10-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 1 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0R15-06S05 | ● | | 6 | 45° | 8 | 7.7 | 5 | 1.5 | - | S05 | 10 | KEYV-S05 | 7 |
| VEE080L05.0C10-06S05 | | ● | 6 | 50° | 8 | 7.7 | 5 | - | 0.1 | S05 | 10 | KEYV-S05 | 7 |
| VEE100L07.0R00-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | - | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R05-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 0.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R05-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 0.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R10-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 1 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R10-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 1 | - | S06 | 13 | KEYV-S06 | 10 |
| VED100L07.0R15-06S06 | ● | | 6 | 30° | 10 | 9.7 | 7 | 1.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0R15-06S06 | ● | | 6 | 45° | 10 | 9.7 | 7 | 1.5 | - | S06 | 13 | KEYV-S06 | 10 |
| VEE100L07.0C10-06S06 | | ● | 6 | 50° | 10 | 9.7 | 7 | - | 0.1 | S06 | 13 | KEYV-S06 | 10 |
| VEE120L09.0R00-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | - | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R05-06S08 | ● | | 6 | 30° | 12 | 11.7 | 9 | 0.5 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VED120L09.0R10-06S08 | ● | | 6 | 30° | 12 | 11.7 | 9 | 1 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R10-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | 1 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0R15-06S08 | ● | | 6 | 45° | 12 | 11.7 | 9 | 1.5 | - | S08 | 16.5 | KEYV-S08 | 15 |
| VEE120L09.0C10-06S08 | | ● | 6 | 50° | 12 | 11.7 | 9 | - | 0.1 | S08 | 16.5 | KEYV-S08 | 15 |

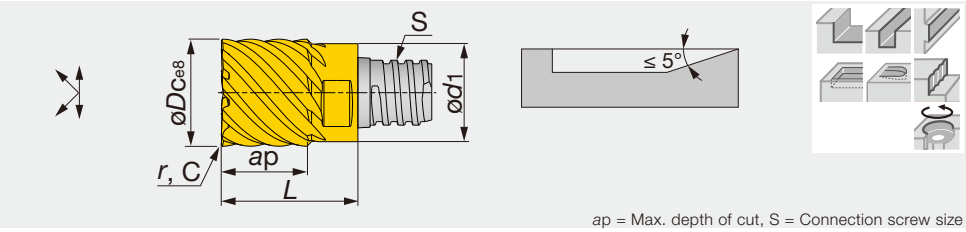
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VED**-08,10..., VEE**-08,10...

TungMeister square head with 8, 10 flutes for difficult-to-cut material machining




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | AH750 | z | Helx | øDc | ød1 | Max. ap | r | C | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VED160L12.0R05-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 0.5 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R10-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 1 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R16-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 1.6 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VED160L12.0R20-08S10 | ● | | 8 | 30° | 16 | 15.3 | 12 | 2 | - | S10 | 20.5 | KEYV-S10 | 28 |
| VEE160L12.0C20-08S10 | | ● | 8 | 50° | 16 | 15.3 | 12 | - | 0.2 | S10 | 20.5 | KEYV-S10 | 28 |
| VED200L15.0R10-10S12 | ● | | 10 | 30° | 20 | 18.3 | 15 | 1 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VED200L15.0R20-10S12 | ● | | 10 | 30° | 20 | 18.3 | 15 | 2 | - | S12 | 25.5 | KEYV-S12 | 28 |
| VEE200L15.0C20-10S12 | | ● | 10 | 50° | 20 | 18.3 | 15 | - | 0.2 | S12 | 25.5 | KEYV-S12 | 28 |
| VED250L22.0R10-10S15 | ● | | 10 | 30° | 25 | 23.9 | 22 | 1 | - | S15 | 37 | KEYV-W20 | 40 |
| VED250L22.0R20-10S15 | ● | | 10 | 30° | 25 | 23.9 | 22 | 2 | - | S15 | 37 | KEYV-W20 | 40 |

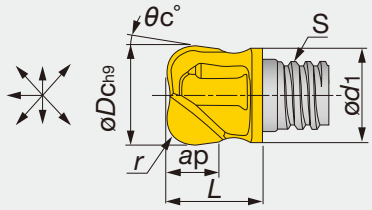
*Torque: Recommended torque (N·m) for clamping.
VEE / VED160 - 200: Packing quantity = 2 pcs.
VED250: Packing quantity = 1pc.

●: Line up

# TUNGMEISTER

## VRB**-02...,VRC**-02...

TungMeister radius head with 2 pressed flutes



ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | θc° | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VRC100L07.0R05-02S06 | ● | 2 | 15° | 10 | 9.5 | 7 | 0.5 | 5 | S06 | 12.4 | KEYV-S06 | 10 |
| VRC100L07.0R10-02S06 | ● | 2 | 15° | 10 | 9.5 | 7 | 1 | 5 | S06 | 12.4 | KEYV-S06 | 10 |
| VRB100L06.0R20-02S06 | ● | 2 | 0° | 10 | 9.2 | 6 | 2 | 7 | S06 | 12.4 | KEYV-S06 | 10 |
| VRB120L05.7R30-02S06 | ● | 2 | 0° | 12 | 9.5 | 5.7 | 3 | 7 | S06 | 9.1 | **KEYV-S08 | 10 |
| VRB120L05.4R40-02S06 | ● | 2 | 0° | 12 | 9.5 | 5.4 | 4 | 7 | S06 | 9.1 | **KEYV-S08 | 10 |
| VRB120L06.3R16-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.9 | 1.6 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.2R20-02S08 | ● | 2 | 0° | 12 | 11.5 | 6.2 | 2 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.1R25-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.8 | 2.5 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L06.1R30-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.7 | 3 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB120L05.9R40-02S08 | ● | 2 | 0° | 12 | 11.5 | 5.5 | 4 | 7 | S08 | 11.1 | KEYV-S08 | 15 |
| VRB160L08.0R50-02S10 | ● | 2 | 0° | 16 | 15.2 | 8 | 5 | 7 | S10 | 20.2 | KEYV-S10 | 28 |
| VRB200L11.1R30-02S12 | ● | 2 | 0° | 20 | 18.3 | 11 | 3 | 7 | S12 | 17 | KEYV-S12 | 28 |
| VRB200L11.5R40-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.3 | 4 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.5R50-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.3 | 5 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.4R60-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.2 | 6 | 7 | S12 | 17.3 | KEYV-S12 | 28 |
| VRB200L11.3R80-02S12 | ● | 2 | 0° | 20 | 18.3 | 11.1 | 8 | 7 | S12 | 17.3 | KEYV-S12 | 28 |

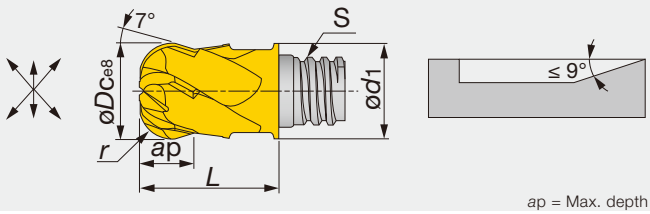
●: Line up

Note: Suitable for contouring operation. Some heads require different wrench sizes.
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VRD**-06...

TungMeister radius head with 6 ground flutes



ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VRD080L04.0R20-06S05 | ● | 6 | 30° | 8 | 7.7 | 4 | 2 | S05 | 10 | KEYV-S05 | 7 |
| VRD100L05.0R30-06S06 | ● | 6 | 30° | 10 | 9.7 | 5 | 3 | S06 | 13 | KEYV-S06 | 10 |
| VRD120L07.0R40-06S08 | ● | 6 | 30° | 12 | 11.7 | 7 | 4 | S08 | 16.5 | KEYV-S08 | 15 |
| VRD160L09.0R50-06S10 | ● | 6 | 30° | 16 | 15.3 | 9 | 5 | S10 | 20.5 | KEYV-S10 | 28 |

●: Line up

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

## STANDARD CUTTING CONDITIONS

### Shoulder milling (VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S45C, S55C, etc. C45, C55, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| P | High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc. | - 300 HB | 60 - 140 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| P | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 60 - 120 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 40 - 100 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| K | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *Dc* | 0.25 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| N | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.25 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.05 x *øDc* |
| S | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.10 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.05 x *øDc* |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.05 x *øDc* |
| H | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x *øDc* | 0.05 x *øDc* |

### Slot milling (VEE: 3 flutes, VED/VEE: 4 flutes, VEE-A, VEE-I, VEE-R, VEE-C, VRB, VRC, VRD)

| ISO | Workpiece material | Hardness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S45C, S55C, etc. C45, C55, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| P | High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc. | - 300 HB | 60 - 140 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| P | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 60 - 120 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 40 - 100 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| K | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 HB | 80 - 200 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.10 | 0.5 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| N | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| S | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.5 x *øDc* |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.2 x *øDc* |
| H | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.07 - 0.1 | 0.2 x *øDc* |

## STANDARD CUTTING CONDITIONS

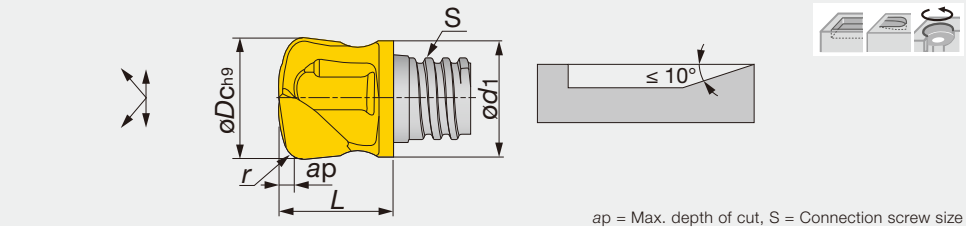
### Shoulder milling (VED / VEE: 6 flutes, VED / VEE: 8, 10 flutes)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: ø*Dc* (mm) 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S | Titanium alloys Ti-6Al-4V, etc. | - | 60 - 120 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| | Heat-resistant alloys Inconel 718, etc. | - | 30 - 60 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 80 - 160 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |
| | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 40 - 90 | 0.05 - 0.09 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.15 | 0.1 - 0.17 | 0.1 - 0.17 | 0.6 x ø*Dc* | 0.02 x ø*Dc* |

# TUNGMEISTER

## VFX**-02...

TungMeister radius head for super high-feed milling




| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r(1) | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VFX100L00.6R20-02S06 | ● | 2 | 0° | 10 | 9.6 | 0.6 | 2 | S06 | 12.5 | KEYV-S06 | 10 |
| VFX120L01.0R25-02S08 | ● | 2 | 0° | 12 | 11.5 | 1.0 | 2.5 | S08 | 11.1 | KEYV-S08 | 15 |
| VFX160L01.1R30-02S10 | ● | 2 | 0° | 16 | 15.2 | 1.1 | 3 | S10 | 20 | KEYV-S10 | 28 |
| VFX200L01.5R33-02S12 | ● | 2 | 0° | 20 | 18.3 | 1.5 | 3.3 | S12 | 17.5 | KEYV-S12 | 28 |

●: Line up

(1) Corner radius for CAM programing
Note: For VFX head, taper neck shank or Tungsten shank should be recommended.
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

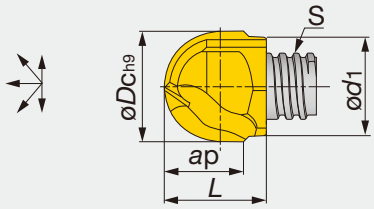
## STANDARD CUTTING CONDITIONS

### High feed milling (VFX)

| ISO | Workpiece material | Hardness | Cutting speed Vc (m/min) | ø10a Feed per tooth fz (mm/t) | ø10a Depth of cut ap (mm) | ø12 Feed per tooth fz (mm/t) | ø12 Depth of cut ap (mm) | ø16 Feed per tooth fz (mm/t) | ø16 Depth of cut ap (mm) | ø20 Feed per tooth fz (mm/t) | ø20 Depth of cut ap (mm) | Width of cut ae (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S45C, S55C, etc. C45, C55, etc. | - 300 HB | 100 - 200 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.5 | 0.5 - 0.9 | 0.75 | 0.6 - 1 | 1 | 0.6 x øDc |
| | High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc. | - 300 HB | 80 - 180 | 0.2 - 0.6 | 0.5 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 1 | 0.6 x øDc |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 80 - 160 | 0.2 - 0.5 | 0.4 | 0.2 - 0.5 | 0.4 | 0.3 - 0.6 | 0.5 | 0.3 - 0.6 | 0.75 | 0.6 x øDc |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 60 - 100 | 0.2 - 0.6 | 0.4 | 0.2 - 0.6 | 0.4 | 0.3 - 0.7 | 0.5 | 0.3 - 0.7 | 0.75 | 0.6 x øDc |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | 150 - 250 HB | 100 - 220 | 0.3 - 0.7 | 0.5 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 0.75 | 0.6 - 1 | 1 | 0.6 x øDc |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 HB | 100 - 220 | 0.2 - 0.6 | 0.5 | 0.3 - 0.7 | 0.75 | 0.4 - 0.8 | 0.75 | 0.5 - 0.9 | 1 | 0.6 x øDc |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.2 - 0.5 | 0.4 | 0.2 - 0.5 | 0.4 | 0.2 - 0.6 | 0.5 | 0.2 - 0.6 | 0.5 | 0.25 x øDc |
| | Heat-resistant alloys Inconel 718, etc. | - | 20 - 40 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.4 | 0.1 - 0.3 | 0.4 | 0.25 x øDc |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 40 - 80 | 0.2 - 0.4 | 0.3 | 0.2 - 0.4 | 0.3 | 0.3 - 0.5 | 0.4 | 0.3 - 0.5 | 0.4 | 0.45 x øDc |
| | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.1 - 0.2 | 0.2 | 0.1 - 0.2 | 0.2 | 0.1 - 0.3 | 0.3 | 0.1 - 0.3 | 0.3 | 0.25 x øDc |

# TUNGMEISTER
## VBB**-BM...

TungMeister ball nose head with pressed edge for roughing




ap = Max. depth of cut, S = Connection screw size

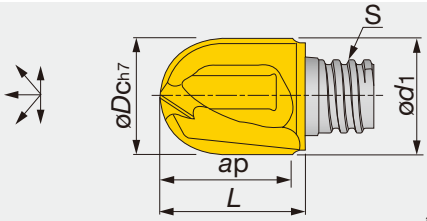
| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB080L08.0-BM-02S05 | ● | 2 | 0° | 8 | 7.6 | 8 | S05 | 10 | KEYV-S05 | 7 |
| VBB100L10.0-BM-02S06 | ● | 2 | 0° | 10 | 9.5 | 10 | S06 | 12.4 | KEYV-S06 | 10 |
| VBB120L12.0-BM-02S08 | ● | 2 | 0° | 12 | 11.5 | 11.5 | S08 | 15.3 | KEYV-S08 | 15 |
| VBB160L16.0-BM-02S10 | ● | 2 | 0° | 16 | 15.2 | 16 | S10 | 19.1 | KEYV-S10 | 28 |

●: Line up

• For roughing
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER
## VBB**-BG...

TungMeister ball nose head with ground edge for semi-finishing




ap = Max. depth of cut, S = Connection screw size

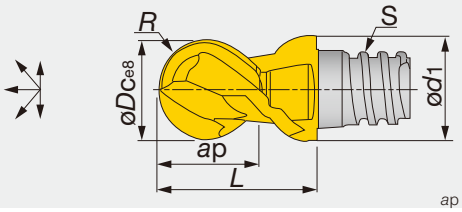
| Designation | AH750 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB080L08.0-BG-02S05 | ● | 2 | 0° | 8 | 7.6 | 8 | S05 | 10 | KEYV-S05 | 7 |
| VBB100L10.0-BG-02S06 | ● | 2 | 0° | 10 | 9.6 | 10 | S06 | 12.4 | KEYV-S06 | 10 |
| VBB120L12.0-BG-02S08 | ● | 2 | 0° | 12 | 11.5 | 12 | S08 | 15.3 | KEYV-S08 | 15 |
| VBB160L16.0-BG-02S10 | ● | 2 | 0° | 16 | 15.2 | 16 | S10 | 19.1 | KEYV-S10 | 28 |

●: Line up

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER
## VBD**-BG...

TungMeister ball nose head with 2 flutes and helical ground edge for finishing




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBD080L05.0-BG-02S05 | ● | 2 | 30° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD100L07.0-BG-02S06 | ● | 2 | 30° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13.0 | KEYV-S06 | 10 |
| VBD120L09.0-BG-02S08 | ● | 2 | 30° | 12 | 11.7 | 9 | 5.978(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBD160L09.5-BG-02S10 | ● | 2 | 30° | 16 | 15.3 | 9 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |

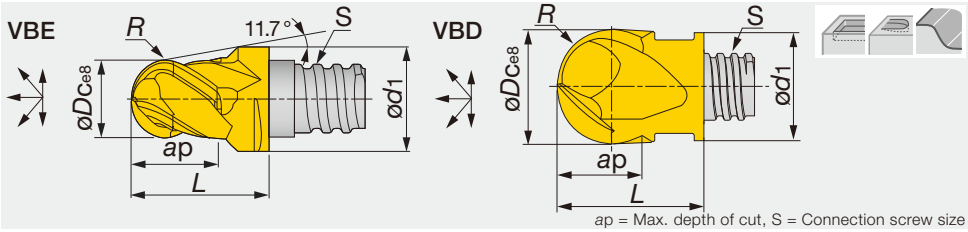
●: Line up

• The tolerance of R : (1) ± 0.01 (2) ± 0.012
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VBD**-BG..., VBE**-BG...

TungMeister ball nose head with 4 flutes and helical ground edge for finishing




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBE060L05.5-BG-04S05 | ● | 4 | 38° | 6 | 8 | 5.5 | 2.987(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD080L05.0-BG-04S05 | ● | 4 | 30° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBD100L07.0-BG-04S06 | ● | 4 | 30° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13 | KEYV-S06 | 10 |
| VBD120L09.0-BG-04S08 | ● | 4 | 30° | 12 | 11.7 | 9 | 5.978(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBD160L12.0-BG-04S10 | ● | 4 | 30° | 16 | 15.3 | 12 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |
| VBD200L15.0-BG-04S12 | ● | 4 | 30° | 20 | 18.3 | 15 | 9.972(2) | S12 | 25.5 | KEYV-S12 | 28 |
| VBD250L22.0-BG-04S15 | ● | 4 | 30° | 25 | 23.9 | 22 | 12.470(3) | S15 | 37 | KEYV-W20 | 40 |

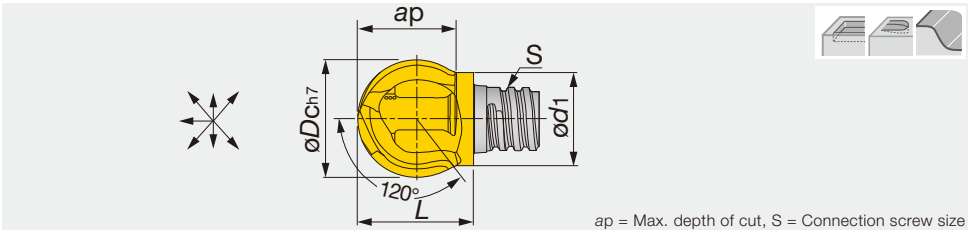
• The tolerance of R : (1) ± 0.01 (2) ± 0.012 (3) ± 0.02
*Torque: Recommended torque (N·m) for clamping.
VBE060/VBD080 ~ VBD200: Packing quantity = 2 pcs.
VBD250: Packing quantity = 1pc.

●: Line up

# TUNGMEISTER

## VBB**-SG...

TungMeister ball nose head with spherical designed edge,available for pull-cutting on the wall




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|
| VBB100L08.0-SG-02S05 | ● | 2 | 0° | 10 | 7.6 | 7.5 | S05 | 10 | KEYV-S05 | 7 |
| VBB120L09.6-SG-02S06 | ● | 2 | 0° | 12 | 9.5 | 9 | S06 | 11.6 | *KEYV-S08 | 10 |
| VBB160L12.9-SG-02S08 | ● | 2 | 0° | 16 | 12.2 | 12 | S08 | 15.4 | *KEYV-S10 | 15 |
| VBB200L16.1-SG-02S10 | ● | 2 | 0° | 20 | 15.2 | 15 | S10 | 18.4 | KEYV-S10 | 28 |

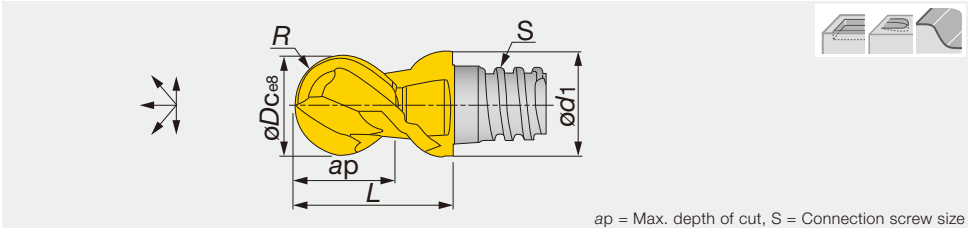
• For pull-cutting on the vertical wall
* Some heads require different size of wrench.
**Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VBE**-BGA...

TungMeister ball nose head with 2 flutes and helical ground edge for Al machining




ap = Max. depth of cut, S = Connection screw size

| Designation | KS15F | z | Helx | øDc | ød1 | Max. ap | R | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VBE080L05.0-BGA02S05 | ● | 2 | 45° | 8 | 7.7 | 5 | 3.982(1) | S05 | 10 | KEYV-S05 | 7 |
| VBE100L07.0-BGA02S06 | ● | 2 | 45° | 10 | 9.7 | 7 | 4.982(1) | S06 | 13 | KEYV-S06 | 10 |
| VBE120L09.0-BGA02S08 | ● | 2 | 45° | 12 | 11.7 | 9 | 5.987(2) | S08 | 16.5 | KEYV-S08 | 15 |
| VBE160L12.0-BGA02S10 | ● | 2 | 45° | 16 | 15.3 | 12 | 7.978(2) | S10 | 20.5 | KEYV-S10 | 28 |
| VBE200L15.0-BGA02S12 | ● | 2 | 45° | 20 | 18.3 | 15 | 9.972(2) | S12 | 25.5 | KEYV-S12 | 28 |

• The tolerance of R : (1) ± 0.01 (2) ± 0.012
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

## Standard cutting conditions: Profiling for roughing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S45C, S55C, etc. C45, C55, etc. | - 300 HB | 100 - 200 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| | High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc. | - 300 HB | 80 - 180 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 80 - 160 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 60 - 100 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | 150 - 250 HB | 100 - 220 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 HB | 100 - 220 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 200 - 700 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| | Aluminium alloys Si ≥13% | - | 100 - 300 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.4 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| | Heat-resistant alloys Inconel 718, etc. | 50 - 60 HRC | 20 - 40 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | - | 40 - 80 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |
| | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 60 | 0.03 - 0.07 | 0.04 - 0.08 | 0.05 - 0.10 | 0.06 - 0.11 | 0.07 - 0.13 | 0.08 - 0.15 | 0.08 - 0.15 | 0.3 x *øDc* | 0.2 x *øDc* |

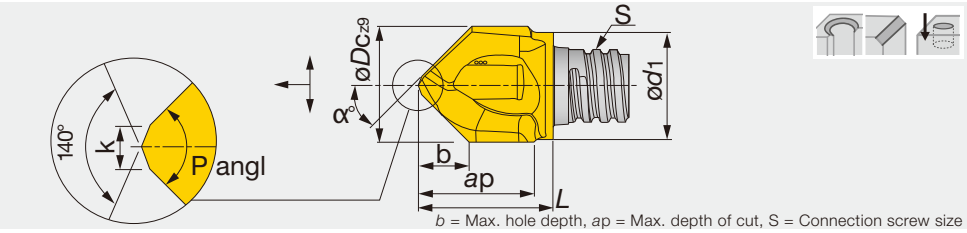
## Standard cutting conditions: Profiling for semi-finishing and finishing (VBB-BM / BG / SG, VBD-BG, VBE-BGA)

| ISO | Workpiece material | Hard-ness | Cutting speed *Vc* (m/min) | Feed per tooth: *fz* (mm/t) Tool diameter: *øDc* (mm) 6 | 8 | 10 | 12 | 16 | 20 | 25 | Depth of cut *ap* (mm) | Pick feed *Pf* (mm) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels S45C, S55C, etc. C45, C55, etc. | - 300 HB | 120 - 250 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| | High carbon steels SCM440, SCr415, etc. 42CrMo4, 15Cr3, etc. | - 300 HB | 100 - 220 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| | Prehardened steel PX5, NAK80, etc. | 30 - 40 HRC | 100 - 200 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| M | Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 HB | 80 - 120 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| K | Grey cast irons FC250, FC300, etc. 250, 300, etc. | 150 - 250 HB | 120 - 280 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| | Ductile cast irons FCD400, etc. 400-15S, etc. | 150 - 250 HB | 120 - 280 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| N | Aluminium alloys Si < 13% | - | 300 - 1000 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| | Aluminium alloys Si ≥13% | - | 150 - 400 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.1 x *øDc* | 0.15 x *øDc* |
| S | Titanium alloys Ti-6Al-4V, etc. | - | 50 - 100 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| | Heat-resistant alloys Inconel 718, etc. | 50 - 60 HRC | 30 - 50 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| H | Hardened steel SKD61, SKT4, etc. X40CrMoV5 1, 55NiCrMoV6, etc. | - | 50 - 100 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |
| | Hardened steel SKD11, SKH, etc. X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 30 - 80 | 0.04 - 0.09 | 0.06 - 0.11 | 0.07 - 0.12 | 0.08 - 0.13 | 0.09 - 0.16 | 0.1 - 0.18 | 0.1 - 0.18 | 0.08 x *øDc* | 0.1 x *øDc* |

# TUNGMEISTER

## VCP**-02...

TungMeister head with 2 pressed flutes for spot drilling and chamfering




| Designation | AH725 | P angl | z | Helx | øDc | ød1 | Max. ap | b | S | L | k | α° | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCP100L09.5A30-02S06 | ● | 60 | 2 | 0° | 10 | 9.5 | 8.5 | 7.5 | S06 | 11.75 | 1.5 | 30 | KEYV-S06 | 10 |
| VCP120L12.0A30-02S08 | ● | 60 | 2 | 0° | 12 | 11.5 | 11 | 9.2 | S08 | 15.4 | 1.5 | 30 | KEYV-S08 | 15 |
| VCP160L15.0A30-02S10 | ● | 60 | 2 | 0° | 16 | 15.2 | 16 | 12 | S10 | 20.2 | 2.5 | 30 | KEYV-S10 | 28 |
| VCP080L07.7A45-02S05 | ● | 90 | 2 | 0° | 8 | 7.6 | 7.5 | 3.7 | S05 | 9.75 | 1 | 45 | KEYV-S05 | 7 |
| VCP083L07.9A45-02S05 | ● | 90 | 2 | 0° | 8.3 | 7.6 | 7.5 | 3.8 | S05 | 10 | 1 | 45 | KEYV-S05 | 7 |
| VCP100L09.0A45-02S06 | ● | 90 | 2 | 0° | 10 | 9.5 | 9.5 | 4.4 | S06 | 11.75 | 1.5 | 45 | KEYV-S06 | 10 |
| VCP104L09.0A45-02S06 | ● | 90 | 2 | 0° | 10.4 | 9.5 | 9.5 | 4.6 | S06 | 11.75 | 1.5 | 45 | KEYV-S06 | 10 |
| VCP120L12.0A45-02S08 | ● | 90 | 2 | 0° | 12 | 11.5 | 11.5 | 5.4 | S08 | 15.4 | 1.5 | 45 | KEYV-S08 | 15 |
| VCP124L12.0A45-02S08 | ● | 90 | 2 | 0° | 12.4 | 11.5 | 11.5 | 5.6 | S08 | 15.4 | 1.5 | 45 | KEYV-S08 | 15 |
| VCP160L15.0A45-02S10 | ● | 90 | 2 | 0° | 16 | 15.2 | 15 | 7.1 | S10 | 18.8 | 1.5 | 45 | KEYV-S10 | 28 |
| VCP165L15.0A45-02S10 | ● | 90 | 2 | 0° | 16.5 | 15.2 | 15 | 7.1 | S10 | 18.8 | 1.5 | 45 | KEYV-S10 | 28 |
| VCP100L09.5A60-02S06 | ● | 120 | 2 | 0° | 10 | 9.5 | 9.5 | 2.7 | S06 | 12.7 | 1.5 | 60 | KEYV-S06 | 10 |
| VCP120L12.0A60-02S08 | ● | 120 | 2 | 0° | 12 | 11.5 | 11.5 | 3.3 | S08 | 15.2 | 1.5 | 60 | KEYV-S08 | 15 |
| VCP160L15.5A60-02S10 | ● | 120 | 2 | 0° | 16 | 15.2 | 16 | 4.4 | S10 | 19.9 | 1.5 | 60 | KEYV-S10 | 28 |

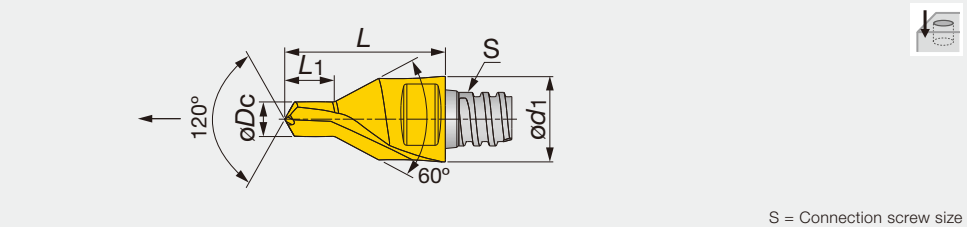
●: Line up

• Min. chamfering: ø1.5 mm
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

# TUNGMEISTER

## VDP**-02...

TungMeister head for center drilling




| Designation | AH725 | z | Helx | øDc | ød1 | L1 | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VDP328L04.6A30-02S05 | ● | 2 | 0° | 3.28 | 8 | 4.6 | S05 | 15 | KEYV-S05 | 7 |
| VDP412L05.9A30-02S06 | ● | 2 | 0° | 4.12 | 10 | 5.9 | S06 | 19 | KEYV-S06 | 10 |
| VDP513L07.2A30-02S08 | ● | 2 | 0° | 5.13 | 12 | 7.2 | S08 | 23 | KEYV-S08 | 15 |
| VDP646L08.9A30-02S10 | ● | 2 | 0° | 6.46 | 16 | 8.9 | S10 | 28 | KEYV-S10 | 28 |

●: Line up

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

## STANDARD CUTTING CONDITIONS

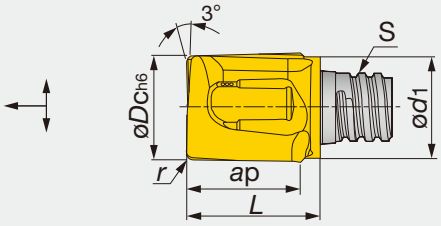
### Drilling (VCP, VDP)

| ISO | Workpiece material | | Hardness | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | VDP328 | VDP412 | VDP513 | VDP646 | VCP |
| P | Low carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | | - 300 HB | 40 - 80 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| P | High carbon steels<br>SCM440, SCr415, etc.<br>42CrMo4, 15Cr3, etc. | | - 300 HB | 30 - 50 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| P | Prehardened steel<br>PX5, NAK80, etc. | | 30 - 40 HRC | 20 - 30 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 15 - 25 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.06 - 0.12 | 0.06 - 0.12 |
| K | Grey cast irons<br>FC250, FC300, etc.<br>250, 300, etc. | | 150 - 250 HB | 60 - 100 | 0.05 - 0.09 | 0.07 - 0.12 | 0.07 - 0.12 | 0.12 - 0.18 | 0.12 - 0.18 |
| K | Ductile cast irons<br>FCD400, etc.<br>400-15S, etc. | | 150 - 250 HB | 60 - 100 | 0.04 - 0.08 | 0.05 - 0.10 | 0.05 - 0.10 | 0.10 - 0.15 | 0.10 - 0.15 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | 15 - 25 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 |
| S | Heat-resistant alloys<br>Inconel 718, etc. | | - | 10 - 20 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 |
| H | Hardened steel | SKD61, SKT4, etc.<br>X40CrMoV5 1,<br>55NiCrMoV6, etc. | 40 - 50 HRC | 15 - 25 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 | 0.04 - 0.07 |
| H | Hardened steel | SKD11, SKH, etc.<br>X153CrMoV12,<br>HS18-0-1, etc. | 50 - 60 HRC | 10 - 20 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 | 0.03 - 0.06 |

# TUNGMEISTER

## VGC**-02...

TungMeister head for counter boring




ap = Max. depth of cut, S = Connection screw size

| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | r | S | L | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VGC078L08.0R02-02S05 | ● | 2 | 10° | 7.8 | 7.60 | 8.0 | 0.20 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R04-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 0.40 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R10-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 1.00 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC080L08.0R20-02S05 | ● | 2 | 10° | 8 | 7.60 | 8.0 | 2.00 | S05 | 10.0 | KEYV-S05 | 7.0 |
| VGC098L09.0R03-02S06 | ● | 2 | 10° | 9.8 | 9.50 | 9.5 | 0.30 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R04-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 0.40 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R10-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 1.00 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC100L09.0R20-02S06 | ● | 2 | 10° | 10 | 9.50 | 9.5 | 2.00 | S06 | 12.4 | KEYV-S06 | 10.0 |
| VGC117L10.0R03-02S08 | ● | 2 | 10° | 11.7 | 11.50 | 10.0 | 0.30 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R04-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 0.40 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R10-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 1.00 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC120L10.0R20-02S08 | ● | 2 | 10° | 12 | 11.50 | 10.0 | 2.00 | S08 | 14.2 | KEYV-S08 | 15.0 |
| VGC157L15.0R03-02S10 | ● | 2 | 10° | 15.7 | 15.20 | 15.0 | 0.30 | S10 | 19.0 | KEYV-S10 | 28.0 |
| VGC160L15.0R04-02S10 | ● | 2 | 10° | 16 | 15.20 | 15.0 | 0.40 | S10 | 19.0 | KEYV-S10 | 28.0 |
| VGC160L15.0R08-02S10 | ● | 2 | 10° | 16 | 15.20 | 15.0 | 0.80 | S10 | 19.0 | KEYV-S10 | 28.0 |

• Can drill with step feed
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

## STANDARD CUTTING CONDITIONS

### Counter boring (VGC)

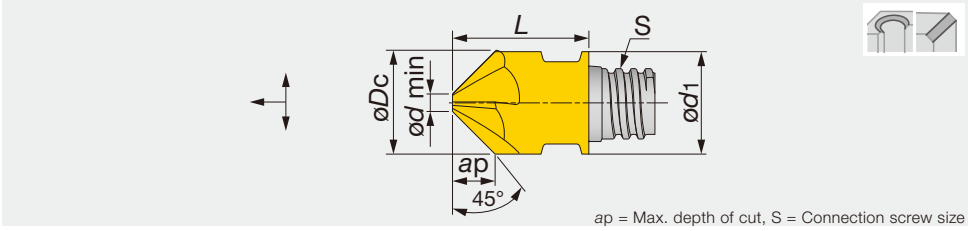
| ISO | Workpiece material | | Hardness | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | | - 300 HB | 40 - 80 | 0.04 - 0.08 |
| P | High carbon steels<br>SCM440, SCr415, etc.<br>42CrMo4, 15Cr3, etc. | | - 300 HB | 30 - 50 | 0.04 - 0.08 |
| P | Prehardened steel<br>PX5, NAK80, etc. | | 30 - 40 HRC | 20 - 30 | 0.04 - 0.08 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 15 - 25 | 0.04 - 0.08 |
| K | Grey cast irons<br>FC250, FC300, etc.<br>250, 300, etc. | | 150 - 250 HB | 60 - 100 | 0.05 - 0.09 |
| K | Ductile cast irons<br>FCD400, etc.<br>400-15S, etc. | | 150 - 250 HB | 60 - 100 | 0.04 - 0.08 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | 15 - 25 | 0.04 - 0.07 |
| S | Heat-resistant alloys<br>Inconel 718, etc. | | - | 10 - 20 | 0.03 - 0.06 |
| H | Hardened steel | SKD61, SKT4, etc.<br>X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 15 - 25 | 0.04 - 0.07 |
| H | Hardened steel | SKD11, SKH, etc.<br>X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 10 - 20 | 0.03 - 0.06 |

・When drilling, the step feed (woodpeckering feed) operation should be applied with the depth of 0.3 - 0.5 mm per step.
・Apply the same cutting conditions as the VEE type head when conducting shoulder milling or slotting operations.

# TUNGMEISTER

## VCA**-04,06...

TungMeister head with 4 or 6 flutes for countersinking and chamfering




| Designation | AH725 | z | Helx | øDc | ød1 | Max. ap | ød min | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VCA100L04.0A45-04S06 | ● | 4 | 0° | 10 | 10 | 4 | 1.95 | S06 | 13 | KEYV-S06 | 10 |
| VCA120L05.0A45-04S08 | ● | 4 | 0° | 12 | 12 | 5 | 1.95 | S08 | 16.5 | KEYV-S08 | 15 |
| VCA127L05.3A45-04S08 | ● | 4 | 0° | 12.7 | 12.7 | 5.3 | 1.98 | S08 | 16.5 | KEYV-S08 | 15 |
| VCA160L06.5A45-06S10 | ● | 6 | 0° | 16 | 16 | 6.5 | 3 | S10 | 20.3 | KEYV-S10 | 28 |
| VCA200L07.5A45-06S12 | ● | 6 | 0° | 20 | 18.3 | 7.5 | 5 | S12 | 25.5 | KEYV-S12 | 28 |

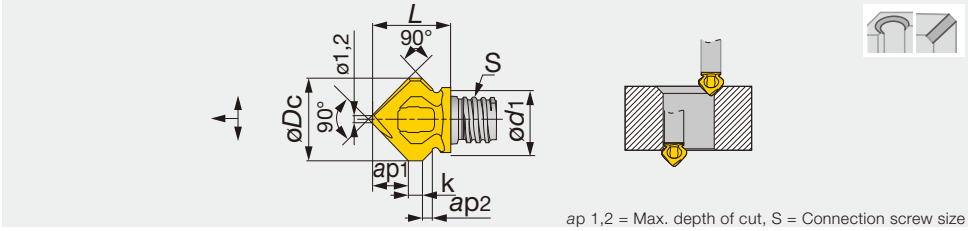
**Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VCW**-02...

TungMeister head for countersinking, top and bottom chamfering




| Designation | AH725 | z | Helx | øDc | ød1 | ap1 | ap2 | k | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCW118L05.0A45-02S06 | ● | 2 | 0° | 11.8 | 9.3 | 5 | 1.2 | 2 | S06 | 11.2 | KEYV-S06 | 10 |

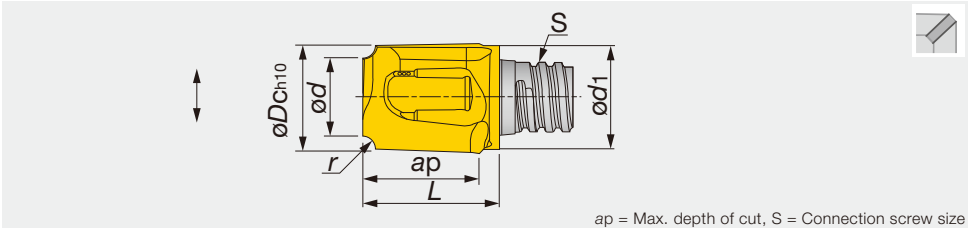
• Available for chamfering of reverse side
* Some heads require different wrench sizes.
**Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VCR**-02...

TungMeister head with 2 pressed flutes for concave radius chamfering




| Designation | AH725 | z | Helx | øDc | ød1 | ød | Max. ap | r | S | L | Wrench | Torque** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VCR080L07.5R10-02S05 | ● | 2 | 0° | 8 | 7.6 | 5.8 | 7.5 | 1 | S05 | 10.5 | KEYV-S05 | 7 |
| VCR100L09.5R16-02S06 | ● | 2 | 0° | 10 | 9.5 | 6.8 | 9.5 | 1.6 | S06 | 12.5 | KEYV-S06 | 10 |
| VCR100L09.5R25-02S06 | ● | 2 | 0° | 10 | 9.5 | 5.1 | 9.5 | 2.5 | S06 | 12.5 | KEYV-S06 | 10 |
| VCR127L12.0R30-02S08 | ● | 2 | 0° | 12.7 | 12.2 | 6.5 | 12.0 | 3 | S08 | 15.6 | KEYV-S08 | 15 |
| VCR127L12.0R40-02S08 | ● | 2 | 0° | 12.7 | 12.2 | 4.7 | 12.0 | 4 | S08 | 15.6 | KEYV-S08 | 15 |
| VCR160L15.0R50-02S10 | ● | 2 | 0° | 16 | 15.2 | 6.2 | 15.0 | 5 | S10 | 19.1 | KEYV-S10 | 28 |
| VCR200L07.0R60-02S12 | ● | 2 | 0° | 20 | 18.3 | 8 | 7.0 | 6 | S12 | 17.4 | KEYV-S12 | 28 |

**Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

## STANDARD CUTTING CONDITIONS

### Chamfering and countersinking (VCA, VCW, VCR, VCP)

| ISO | Workpiece material | | Hardness | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | | - 300 HB | 60 - 100 | 0.06 - 0.12 |
| | High carbon steels<br>SCM440, SCr415, etc.<br>42CrMo4, 15Cr3, etc. | | - 300 HB | 50 - 80 | 0.06 - 0.12 |
| | Prehardened steel<br>PX5, NAK80, etc. | | 30 - 40 HRC | 40 - 70 | 0.06 - 0.12 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | | - 200 HB | 30 - 50 | 0.06 - 0.12 |
| K | Grey cast irons<br>FC250, FC300, etc.<br>250, 300, etc. | | 150 - 250 HB | 80 - 120 | 0.06 - 0.12 |
| | Ductile cast irons<br>FC250, FC300, etc.<br>400-15S, etc. | | 150 - 250 HB | 80 - 120 | 0.06 - 0.12 |
| N | Aluminium alloys | | - | 100 - 200 | 0.08 - 0.15 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | | - | 30 - 50 | 0.05 - 0.1 |
| | Heat-resistant alloys<br>Inconel 718, etc. | | - | 20 - 40 | 0.04 - 0.08 |
| H | Hardened steel | SKD61, SKT4, etc.<br>X40CrMoV5 1, 55NiCrMoV6, etc. | 40 - 50 HRC | 30 - 50 | 0.05 - 0.1 |
| | | SKD11, SKH, etc.<br>X153CrMoV12, HS18-0-1, etc. | 50 - 60 HRC | 20 - 40 | 0.04 - 0.08 |

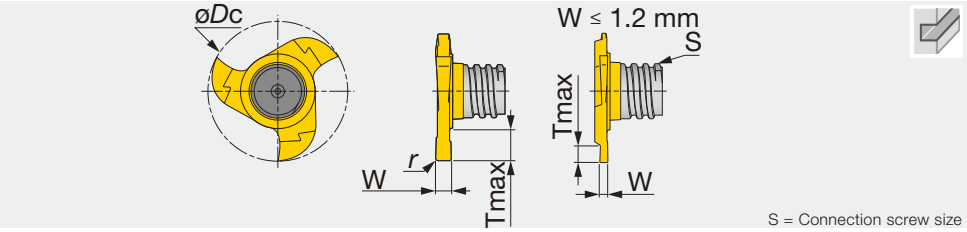
## TOLERANCE OF TOOL DIAMETER

| Basic dimensions (mm) | | Permissible dimensional deviations (μm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| > | ≤ | e8 | e9 | h6 | h7 | h9 | h10 | z9 |
| 6 | 10 | -25<br>-47 | -25<br>-61 | 0<br>-9 | 0<br>-15 | 0<br>-36 | 0<br>-58 | +78<br>+42 |
| 10 | 14 | -32<br>-59 | -32<br>-75 | 0<br>-11 | 0<br>-18 | 0<br>-43 | 0<br>-70 | +93<br>+50 |
| 14 | 18 | -32<br>-59 | -32<br>-75 | 0<br>-11 | 0<br>-18 | 0<br>-43 | 0<br>-70 | +103<br>+60 |
| 18 | 30 | -40<br>-73 | -40<br>-92 | 0<br>-13 | 0<br>-21 | 0<br>-52 | 0<br>-84 | - |

● JISB0401-2: 1998 (ISO286-2: 1988) extract

# VST**-3...

## TungMeister head for slotting of 1.5 - 3.17mm width with 3 teeth




| Designation | GH130 | z | Helx | øDc | W± 0.02 | r | S | T max | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VST157W1.50R010-3S06 | ● | 3 | 0 | 15.7 | 1.5 | 0.1 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W1.57R020-3S06 | ● | 3 | 0 | 15.7 | 1.57 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.00R020-3S06 | ● | 3 | 0 | 15.7 | 2 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.39R020-3S06 | ● | 3 | 0 | 15.7 | 2.39 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W2.50R020-3S06 | ● | 3 | 0 | 15.7 | 2.5 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W3.00R020-3S06 | ● | 3 | 0 | 15.7 | 3 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST157W3.17R020-3S06 | ● | 3 | 0 | 15.7 | 3.17 | 0.2 | S06 | 2.8 | KEYV-177 | 10 |
| VST177W1.20R005-3S06 | ● | 3 | 0 | 17.7 | 1.2(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.40R005-3S06 | ● | 3 | 0 | 17.7 | 1.4(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.50R010-3S06 | ● | 3 | 0 | 17.7 | 1.5 | 0.1 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.57R020-3S06 | ● | 3 | 0 | 17.7 | 1.57 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W1.70R005-3S06 | ● | 3 | 0 | 17.7 | 1.7(1) | 0.05 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.00R020-3S06 | ● | 3 | 0 | 17.7 | 2 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.20R110-3S06 | ● | 3 | 0 | 17.7 | 2.2 | 1.1 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.39R020-3S06 | ● | 3 | 0 | 17.7 | 2.39 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W2.50R020-3S06 | ● | 3 | 0 | 17.7 | 2.5 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W3.00R020-3S06 | ● | 3 | 0 | 17.7 | 3 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |
| VST177W3.17R020-3S06 | ● | 3 | 0 | 17.7 | 3.17 | 0.2 | S06 | 3.8 | KEYV-177 | 10 |

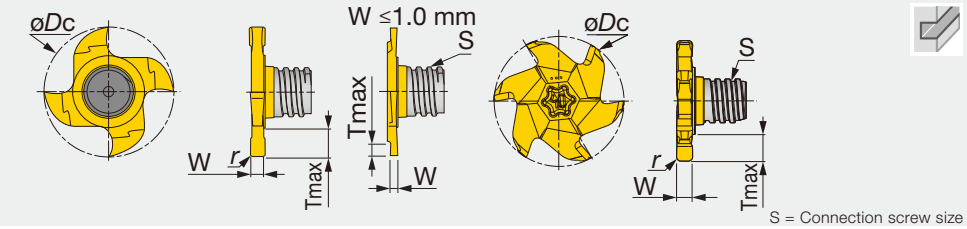
(1) W is based on DIN471 / 472
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VST**-4,6...

TungMeister head for slotting of 0.76 - 10mm width with 4, 6 teeth




| Designation | GH130 | Helx | z | øDc | W±0.02 | r | S | T max | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VST217W0.76R000-4S08 | ● | 0 | 4 | 21.7 | 0.76(1) | - | S08 | 1.5 | KEYV-217 | 15 |
| VST217W0.86R000-4S08 | ● | 0 | 4 | 21.7 | 0.86(1) | - | S08 | 1.7 | KEYV-217 | 15 |
| VST217W0.96R000-4S08 | ● | 0 | 4 | 21.7 | 0.96(1) | - | S08 | 1.9 | KEYV-217 | 15 |
| VST217W1.00R005-4S08 | ● | 0 | 4 | 21.7 | 1 | 0.05 | S08 | 2 | KEYV-217 | 15 |
| VST217W1.20R005-4S08 | ● | 0 | 4 | 21.7 | 1.2(1) | 0.05 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.40R005-4S08 | ● | 0 | 4 | 21.7 | 1.4(1) | 0.05 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.57R000-4S08 | ● | 0 | 4 | 21.7 | 1.57 | - | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.70R010-4S08 | ● | 0 | 4 | 21.7 | 1.7(1) | 0.1 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W1.95R020-4S08 | ● | 0 | 4 | 21.7 | 1.95(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.00R020-4S08 | ● | 0 | 4 | 21.7 | 2 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.25R020-4S08 | ● | 0 | 4 | 21.7 | 2.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.39R020-4S08 | ● | 0 | 4 | 21.7 | 2.39 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.50R020-4S08 | ● | 0 | 4 | 21.7 | 2.5 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W2.75R020-4S08 | ● | 0 | 4 | 21.7 | 2.75(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.00R020-4S08 | ● | 0 | 4 | 21.7 | 3 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.17R020-4S08 | ● | 0 | 4 | 21.7 | 3.17 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W3.25R020-4S08 | ● | 0 | 4 | 21.7 | 3.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.00R020-4S08 | ● | 0 | 4 | 21.7 | 4 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.25R020-4S08 | ● | 0 | 4 | 21.7 | 4.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W4.75R020-4S08 | ● | 0 | 4 | 21.7 | 4.75 | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST217W5.25R020-4S08 | ● | 0 | 4 | 21.7 | 5.25(1) | 0.2 | S08 | 4.5 | KEYV-217 | 15 |
| VST277W2.50R020-6S10 | ● | 0 | 6 | 27.7 | 2.5 | 0.2 | S10 | 6 | KEYV-T40L | 28 |
| VST277W5.25R020-6S10 | ● | 0 | 6 | 27.7 | 5.25 | 0.2 | S10 | 6 | KEYV-T40L | 28 |
| VST277W10.0R020-6S10 | ● | 0 | 6 | 27.7 | 10 | 0.2 | S10 | 6 | KEYV-T40L | 28 |

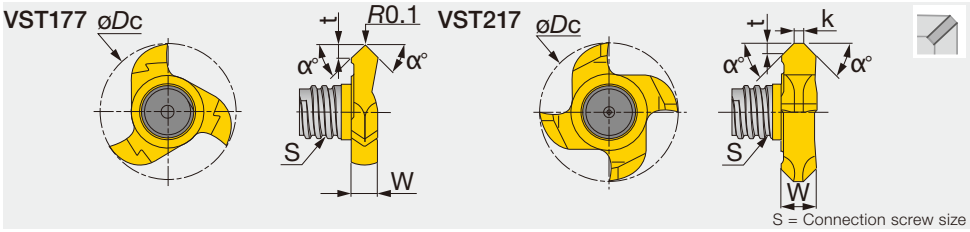
(1) W is based on DIN471 / 472
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VST**A45...

TungMeister head for chamfering on slots




| Designation | GH130 | z | Helx | øDc | W | α° | S | t | k | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VST177L01.40A45-3S06 | ● | 3 | 0 | 17.7 | 3.4 | 45 | S06 | 1.4 | - | KEYV-177 | 10 |
| VST217L01.70A45-4S08 | ● | 4 | 0 | 21.7 | 5.5 | 45 | S08 | 1.7 | 1.5 | KEYV-217 | 15 |

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

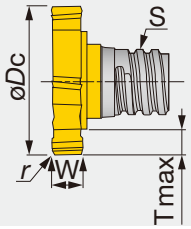
●: Line up

Multi Function

# TUNGMEISTER

## VTB**-06...

TungMeister head for T-slotting of 3 - 8mm width




S = Connection screw size

| Designation | GH130 | z | Helx | øDc - 0 0.05 | W ± 0.02 | T max | S | r | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VTB135W3.00R04-06S05 | ● | 6 | 0° | 13.5 | 3 | 2.65 | S05 | 0.4 | KEYV-T20 | 7 |
| VTB135W4.00R04-06S05 | ● | 6 | 0° | 13.5 | 4 | 2.65 | S05 | 0.4 | KEYV-T20 | 7 |
| VTB160W2.00R04-06S06 | ● | 6 | 0° | 16 | 2 | 2.9 | S06 | 0.4 | KEYV-T20 | 10 |
| VTB160W3.00R04-06S06 | ● | 6 | 0° | 16 | 3 | 2.9 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB160W4.00R04-06S06 | ● | 6 | 0° | 16 | 4 | 2.9 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB165W2.00R04-06S06 | ● | 6 | 0° | 16.5 | 2 | 3.15 | S06 | 0.4 | KEYV-T20 | 10 |
| VTB165W3.00R04-06S06 | ● | 6 | 0° | 16.5 | 3 | 3.15 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB165W4.00R04-06S06 | ● | 6 | 0° | 16.5 | 4 | 3.15 | S06 | 0.4 | KEYV-T25 | 10 |
| VTB195W4.00R04-06S08 | ● | 6 | 0° | 19.5 | 4 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB195W5.00R04-06S08 | ● | 6 | 0° | 19.5 | 5 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB195W6.00R04-06S08 | ● | 6 | 0° | 19.5 | 6 | 3.45 | S08 | 0.4 | KEYV-T30L | 15 |
| VTB225W5.00R04-06S08 | ● | 6 | 0° | 22.5 | 5 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB225W6.00R04-06S08 | ● | 6 | 0° | 22.5 | 6 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB225W8.00R04-06S08 | ● | 6 | 0° | 22.5 | 8 | 4.95 | S08 | 0.4 | KEYV-T40L | 15 |
| VTB250W6.00R04-06S08 | ● | 6 | 0° | 25 | 6 | 5.9 | S08 | 0.4 | KEYV-T50L | 15 |
| VTB250W8.00R04-06S08 | ● | 6 | 0° | 25 | 8 | 5.9 | S08 | 0.4 | KEYV-T50L | 15 |
| VTB250W5.00R04-06S10 | ● | 6 | 0° | 25 | 5 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |
| VTB250W6.00R04-06S10 | ● | 6 | 0° | 25 | 6 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |
| VTB250W8.00R04-06S10 | ● | 6 | 0° | 25 | 8 | 4.3 | S10 | 0.4 | KEYV-T50L | 28 |

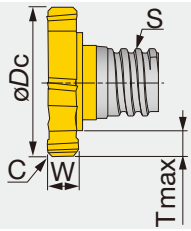
*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

# TUNGMEISTER

## VTB**C15-06...

TungMeister head for T-slotting of 2 mm width with chamfered edges




S = Connection screw size

| Designation | GH130 | z | Helx | øDc - 0 0.05 | W ± 0.05 | T max | S | C | Wrench | Torque* |
|---|---|---|---|---|---|---|---|---|---|---|
| VTB135W2.00C15-06S05 | ● | 6 | 0° | 13.5 | 2 | 2.65 | S05 | 0.15 | KEYV-T20 | 7 |

*Torque: Recommended torque (N·m) for clamping.
Packing quantity = 2 pcs.

●: Line up

## STANDARD CUTTING CONDITIONS

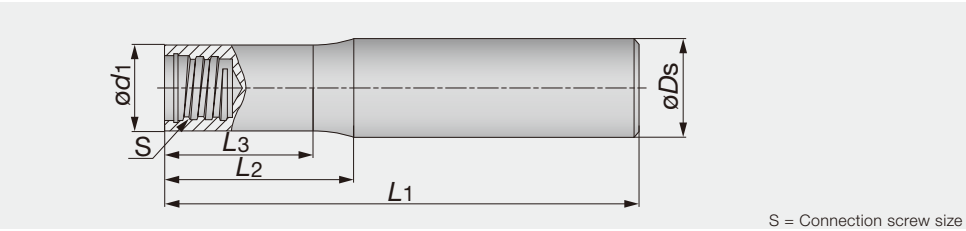
### Slotting (VST, VTB)

| ISO | Workpiece material | Hardness HB | VST type | | VTB type | |
|---|---|---|---|---|---|---|
| | | | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) | Cutting speed *Vc* (m/min) | Feed per tooth *fz* (mm/t) |
| P | Low carbon steels<br>S45C, S55C, etc.<br>C45, C55, etc. | - 300 | 80 - 180 | 0.05 - 0.15 | 80 - 180 | 0.08 - 0.18 |
| | High carbon steels<br>SCM440, SCr415, etc.<br>42CrMo4, 15Cr3, etc. | - 300 | 60 - 120 | 0.04 - 0.12 | 60 - 120 | 0.05 - 0.15 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | - 200 | 50 - 120 | 0.04 - 0.12 | 50 - 120 | 0.05 - 0.15 |
| K | Grey cast irons<br>FC250, FC300, etc.<br>250, 300, etc. | 150 - 250 | 100 - 200 | 0.05 - 0.15 | 100 - 200 | 0.08 - 0.18 |
| | Ductile cast irons<br>FCD400, etc.<br>400-15S, etc. | 150 - 250 | 100 - 200 | 0.04 - 0.12 | 100 - 200 | 0.05 - 0.15 |
| N | Aluminium alloys<br>Si < 13% | - | 200 - 600 | 0.05 - 0.15 | 200 - 600 | 0.08 - 0.18 |
| | Aluminium alloys<br>Si ≥13% | - | 100 - 300 | 0.03 - 0.13 | 100 - 300 | 0.05 - 0.15 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | 40 - 60 | 0.04 - 0.12 | 40 - 60 | 0.05 - 0.15 |
| | Heat-resistant alloys<br>Inconel 718, etc. | - | 15 - 35 | 0.02 - 0.1 | 15 - 35 | 0.02 - 0.1 |

# TUNGMEISTER

## VSSD...

TungMeister, straight neck and cylindrical shank

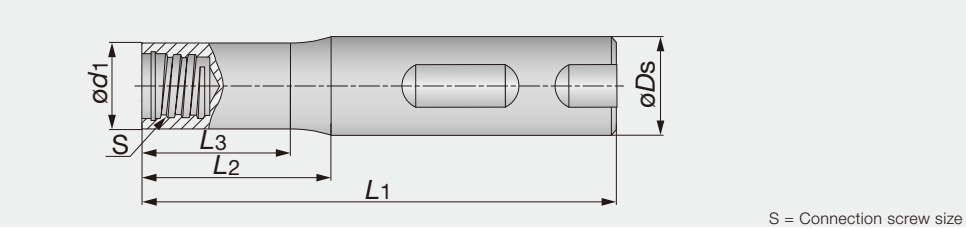



| Designation | øDs | ød1 | L1 | L2 | L3 | S | Type | Material |
|---|---|---|---|---|---|---|---|---|
| VSSD08L060S05-S | 8 | 7.6 | 60 | 15 | 12.5 | S05 | CYLINDRICAL | STEEL |
| VSSD08L070S05-C | 8 | 7.6 | 70 | 20 | 18.5 | S05 | CYLINDRICAL | CARBIDE |
| VSSD08L090S05-C | 8 | 7.6 | 90 | 40 | 38.5 | S05 | CYLINDRICAL | CARBIDE |
| VSSD08L110S05-C | 8 | 7.6 | 110 | 60 | 58.5 | S05 | CYLINDRICAL | CARBIDE |
| VSSD10L070S06-C | 10 | 9.6 | 70 | 20 | 18.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L075S06-S | 10 | 9.6 | 75 | 20 | 17.5 | S06 | CYLINDRICAL | STEEL |
| VSSD10L090S06-C | 10 | 9.6 | 90 | 40 | 38.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L110S06-C | 10 | 9.6 | 110 | 60 | 58.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD10L150S06-C | 10 | 9.6 | 150 | 100 | 98.5 | S06 | CYLINDRICAL | CARBIDE |
| VSSD12L070S08-C | 12 | 11.5 | 70 | 20 | 17 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L090S08-C | 12 | 11.5 | 90 | 40 | 38 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L090S08-S | 12 | 11.5 | 90 | 16 | 13.5 | S08 | CYLINDRICAL | STEEL |
| VSSD12L110S08-C | 12 | 11.5 | 110 | 60 | 58 | S08 | CYLINDRICAL | CARBIDE |
| VSSD12L130S08-C | 12 | 11.5 | 130 | 80 | 78 | S08 | CYLINDRICAL | CARBIDE |
| VSSD16L090S10-C | 16 | 15.2 | 90 | 40 | 38 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L100S10-S | 16 | 15.2 | 100 | 20 | 18 | S10 | CYLINDRICAL | STEEL |
| VSSD16L110S10-C | 16 | 15.2 | 110 | 60 | 58 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L130S10-C | 16 | 15.2 | 130 | 80 | 78 | S10 | CYLINDRICAL | CARBIDE |
| VSSD16L150S10-C | 16 | 15.2 | 150 | 100 | 98 | S10 | CYLINDRICAL | CARBIDE |
| VSSD20L090S12-C | 20 | 18.3 | 90 | 40 | 37 | S12 | CYLINDRICAL | CARBIDE |
| VSSD20L120S12-S | 20 | 18.3 | 120 | 25 | 20.5 | S12 | CYLINDRICAL | STEEL |
| VSSD20L130S12-C | 20 | 18.3 | 130 | 80 | 77 | S12 | CYLINDRICAL | CARBIDE |
| VSSD20L200S12-C | 20 | 18.3 | 200 | 120 | 117 | S12 | CYLINDRICAL | CARBIDE |
| VSSD25L120S15-C | 25 | 23.9 | 120 | 60 | 58 | S15 | CYLINDRICAL | CARBIDE |
| VSSD25L135S15-S | 25 | 23.9 | 135 | 35 | 33 | S15 | CYLINDRICAL | STEEL |
| VSSD25L170S15-C | 25 | 23.9 | 170 | 100 | 98 | S15 | CYLINDRICAL | CARBIDE |
| VSSD25L250S15-C | 25 | 23.9 | 250 | 150 | 148 | S15 | CYLINDRICAL | CARBIDE |

# TUNGMEISTER

## VSSD**W...

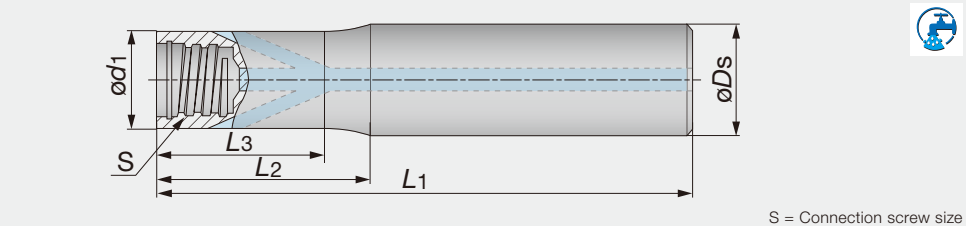
TungMeister, straight neck and weldon shank




| Designation | øDs | ød1 | L1 | L2 | L3 | S | Shank | Material |
|---|---|---|---|---|---|---|---|---|
| VSSD12L055W05-S | 12 | 7.6 | 55 | 3.8 | - | S05 | WELDON | STEEL |
| VSSD16L065W06-S | 16 | 9.6 | 65 | 6 | - | S06 | WELDON | STEEL |
| VSSD16L065W08-S | 16 | 11.5 | 65 | 4 | - | S08 | WELDON | STEEL |
| VSSD20L070W10-S | 20 | 15.2 | 70 | 4 | - | S10 | WELDON | STEEL |
| VSSD25L075W12-S | 25 | 18.3 | 75 | 6 | - | S12 | WELDON | STEEL |

# VSSD**-W-A

TungMeister, straight shank and neck with coolant hole

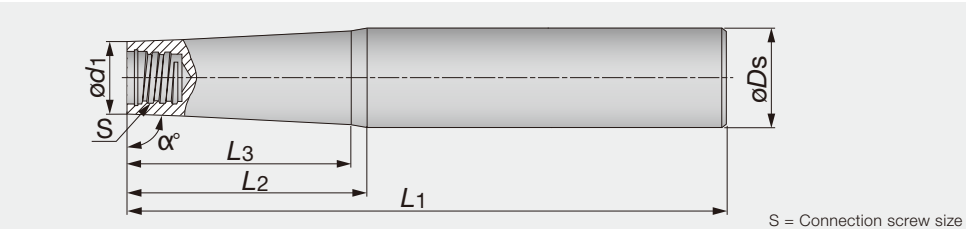



| Designation | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|
| VSSD10L070S06-W-A | 10 | 9.6 | 70 | 20 | 19 | S06 | TUNGSTEN |
| VSSD10L090S06-W-A | 10 | 9.6 | 90 | 40 | 39 | S06 | TUNGSTEN |
| VSSD10L110S06-W-A | 10 | 9.6 | 110 | 60 | 59 | S06 | TUNGSTEN |
| VSSD12L070S08-W-A | 12 | 11.5 | 70 | 20 | 19 | S08 | TUNGSTEN |
| VSSD12L090S08-W-A | 12 | 11.5 | 90 | 40 | 39 | S08 | TUNGSTEN |
| VSSD12L110S08-W-A | 12 | 11.5 | 110 | 60 | 59 | S08 | TUNGSTEN |
| VSSD12L130S08-W-A | 12 | 11.5 | 130 | 80 | 79 | S08 | TUNGSTEN |
| VSSD16L070S10-W-A | 16 | 15.2 | 70 | 20 | 18.5 | S10 | TUNGSTEN |
| VSSD16L090S10-W-A | 16 | 15.2 | 90 | 40 | 36.5 | S10 | TUNGSTEN |
| VSSD16L110S10-W-A | 16 | 15.2 | 110 | 60 | 58.5 | S10 | TUNGSTEN |
| VSSD16L130S10-W-A | 16 | 15.2 | 130 | 80 | 78.5 | S10 | TUNGSTEN |
| VSSD20L090S12-W-A | 20 | 18.3 | 90 | 40 | 37 | S12 | TUNGSTEN |
| VSSD20L130S12-W-A | 20 | 18.3 | 130 | 80 | 77 | S12 | TUNGSTEN |

# TUNGMEISTER

## VTSD...

TungMeister, straight shank and taper neck

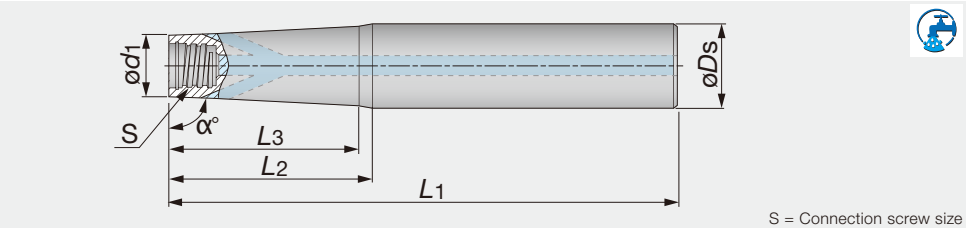



| Designation | α° | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|---|
| VTSD12L080S05-S | 85 | 12 | 7.6 | 80 | 25 | - | S05 | STEEL |
| VTSD12L100S05-S | 89 | 12 | 7.6 | 100 | 35 | 29 | S05 | STEEL |
| VTSD12L110S05-C | 89 | 12 | 7.6 | 110 | 60 | 56 | S05 | CARBIDE |
| VTSD12L130S05-C | 89 | 12 | 7.6 | 130 | 80 | 77 | S05 | CARBIDE |
| VTSD16L125S06-S | 85 | 16 | 9.6 | 125 | 34 | 31 | S06 | STEEL |
| VTSD16L130S08-C | 89 | 16 | 11.5 | 130 | 80 | 76.5 | S08 | CARBIDE |
| VTSD16L140S08-S | 85 | 16 | 11.5 | 140 | 22 | 19 | S08 | STEEL |
| VTSD16L150S05-C | 89 | 16 | 7.6 | 150 | 100 | 91 | S05 | CARBIDE |
| VTSD16L150S06-C | 89 | 16 | 9.6 | 150 | 100 | 94.5 | S06 | CARBIDE |
| VTSD16L150S08-C | 89 | 16 | 11.5 | 150 | 100 | 98 | S08 | CARBIDE |
| VTSD16L160S06-S | 89 | 16 | 9.6 | 160 | 55 | 46.5 | S06 | STEEL |
| VTSD16L170S06-C | 89 | 16 | 9.6 | 170 | 120 | 116.5 | S06 | CARBIDE |
| VTSD20L140S10-S | 85 | 20 | 15.2 | 140 | 27.5 | - | S10 | STEEL |
| VTSD20L170S08-C | 89 | 20 | 11.5 | 170 | 120 | 112 | S08 | CARBIDE |
| VTSD20L170S08-S | 89 | 20 | 11.5 | 170 | 80 | 69.5 | S08 | STEEL |
| VTSD20L170S10-C | 89 | 20 | 15.2 | 170 | 120 | 119 | S10 | CARBIDE |
| VTSD20L190S10-C | 89 | 20 | 15.2 | 190 | 140 | - | S10 | CARBIDE |
| VTSD20L190S10-S | 89 | 20 | 15.2 | 190 | 80 | 73 | S10 | STEEL |
| VTSD20L210S10-C | 89 | 20 | 15.2 | 210 | 160 | - | S10 | CARBIDE |
| VTSD25L160S12-S | 85 | 25 | 18.3 | 160 | 40 | - | S12 | STEEL |
| VTSD25L170S10-S | 85 | 25 | 15.2 | 170 | 56 | - | S10 | STEEL |
| VTSD25L180S12-C | 89 | 25 | 18.3 | 180 | 120 | 115 | S12 | CARBIDE |
| VTSD25L210S12-S | 89 | 25 | 18.3 | 210 | 100 | 94.5 | S12 | STEEL |
| VTSD25L250S12-C | 89 | 25 | 18.3 | 250 | 140 | 136.5 | S12 | CARBIDE |
| VTSD32L155S15-S | 85 | 32 | 23.9 | 155 | 45 | - | S15 | STEEL |
| VTSD32L190S12-S | 85 | 32 | 18.3 | 190 | 80 | - | S12 | STEEL |
| VTSD32L220S15-S | 88 | 32 | 23.9 | 220 | 100 | - | S15 | STEEL |
| VTSD32L250S15-C | 89 | 32 | 23.9 | 250 | 150 | 145 | S15 | CARBIDE |
| VTSD32L300S15-C | 89 | 32 | 23.9 | 300 | 200 | 198 | S15 | CARBIDE |

# TUNGMEISTER

## VTSD**-W-A

TungMeister, straight shank and taper neck with coolant hole



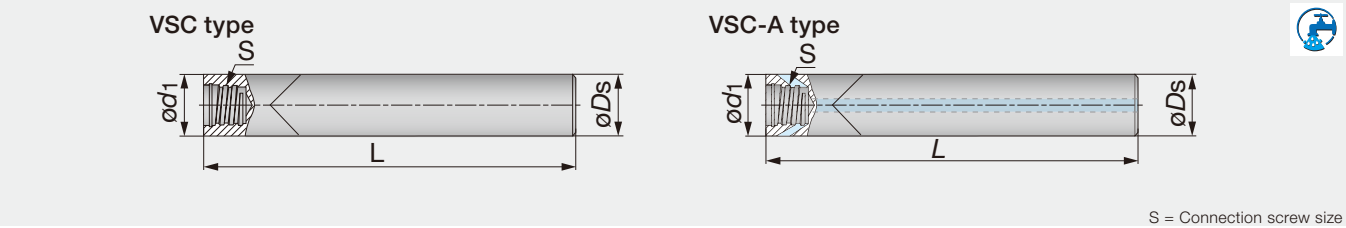

| Designation | α° | øDs | ød1 | L1 | L2 | L3 | S | Material |
|---|---|---|---|---|---|---|---|---|
| VTSD12L110S06-W-A | 89 | 12 | 9.6 | 110 | 60 | 59 | S06 | TUNGSTEN |
| VTSD16L170S06-W-A | 89 | 16 | 9.6 | 170 | 120 | 116 | S06 | TUNGSTEN |

Multi Function

# TUNGMEISTER

## VSC...

TungMeister, straight shank for VST type slotting heads



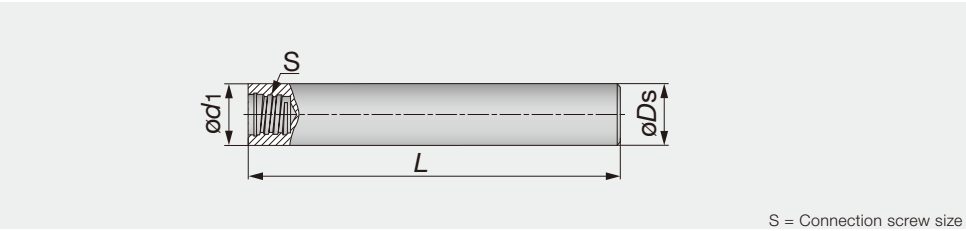

| Designation | øDs | ød1 | L | S | Air hole | Material |
|---|---|---|---|---|---|---|
| VSC100L100S06-C | 10 | 10 | 100 | S06 | without | CARBIDE |
| VSC120L100S08-C-A | 12 | 12 | 100 | S08 | with | CARBIDE |

Note: • For VSC-C type shank, just VST slotting head is recommended.
If other heads are used on the VSC-C shank, the depth of cut must be smaller than the max. ap in each head.
The VSC-C type shank does not have external clearance, so the shank may interfere with the work piece.

# TUNGMEISTER

## VSTD...

TungMeister, straight shank for VTB type slotting heads



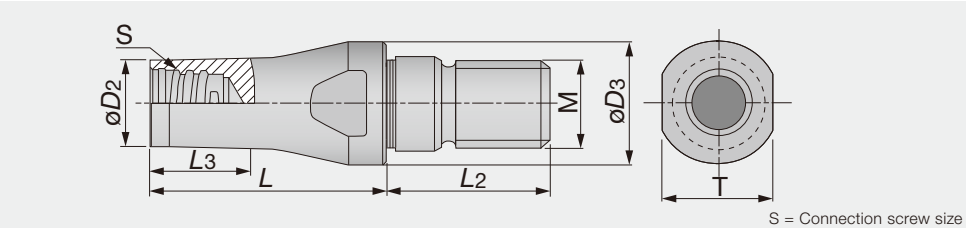

| Designation | øDs | ød1 | L | S | Material |
|---|---|---|---|---|---|
| VSTD08L070S05-S | 8 | 8 | 70 | S05 | STEEL |
| VSTD10L080S06-S | 10 | 10 | 80 | S06 | STEEL |
| VSTD12L090S08-S | 12 | 12 | 90 | S08 | STEEL |
| VSTD16L100S10-S | 16 | 16 | 100 | S10 | STEEL |

Note: • For VSTD type shank, just VTB grooving head is recommended.
If other heads are used on the VSTD shank, the depth of cut must be smaller than the max. ap in each head.
The VSTD type shank does not have external clearance, so the shank may interfere with the work piece.

# TUNGMEISTER TUNGFLEX

## VAD**-M...

TungFlex conversion adaptor with TungMeister




| Designation | øD2 | øD3 | L | L2 | L3 | S | M | T |
|---|---|---|---|---|---|---|---|---|
| VAD130L016S08-S-M8 | 11.7 | 13 | 16 | 17.5 | 6 | S08 | M8 | 11 |
| VAD130L025S08-S-M8 | 11.7 | 13 | 25 | 17.5 | 20 | S08 | M8 | 11 |
| VAD180L020S08-S-M10 | 11.7 | 18 | 20 | 20 | 12 | S08 | M10 | 13 |
| VAD180L025S08-S-M10 | 11.7 | 18 | 25 | 20 | 15 | S08 | M10 | 11 |
| VAD210L020S08-S-M12 | 11.7 | 21 | 20 | 20 | 10 | S08 | M12 | 12.75 |
| VAD210L025S08-S-M12 | 11.7 | 21 | 25 | 20 | 13 | S08 | M12 | 12.75 |

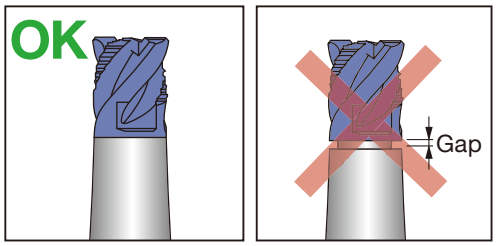
## WRENCH

| Appearance | Designation | Connection screw size | Torque (N·m) | Applicable head |
|---|---|---|---|---|
| | KEYV-S05 | S05 | 7 | Square<br>Ball<br>Radius<br>Drilling<br>Chamfering<br>Counter boring |
| | KEYV-S06 | S06 | 10 | |
| | KEYV-S08 | S08 | 15 | |
| | KEYV-S10 | S10 | 28 | |
| | KEYV-S12 | S12 | 28 | |
| | KEYV-W20 | S15 | 40 | |
| | KEYV-177 | S06 | 10 | Slotting VST type |
| | KEYV-217 | S08 | 15 | |
| | KEYV-T40L | S08 | 15 | Slotting VST, VTB type |
| | | S10 | 28 | |
| | KEYV-T20 | S05 | 7 | Slotting VTB type |
| | | S06 | 10 | |
| | KEYV-T25 | S06 | 10 | |
| | KEYV-T30L | S08 | 15 | |
| | KEYV-T50L | S08 | 15 | |
| | | S10 | 28 | |

Note: Optional parts

## CAUTIONARY POINTS IN USE

- The cutting heads specified by Tungaloy must be used. Avoid using alternate heads that are not Tungaloy products as this will damage the shank and can cause severe accident or injury.
- Before setting the head, clean the connection screw with an air blast or a wiping cloth to remove chips and other foreign matter that may remain.
- Do not apply the lubricant to the connection screw.
- Please use the correct “Wrench” with the correct cutting head. Tighten the head slowly until the face of the head contacts the shank. (Please refer to the picture shown on the right.) Do not re-tightening or over-tightening. Excessive tightening may cause the cutting head to break.
- Do not apply excessive force or a hammer when tightening or exchanging the cutting heads.

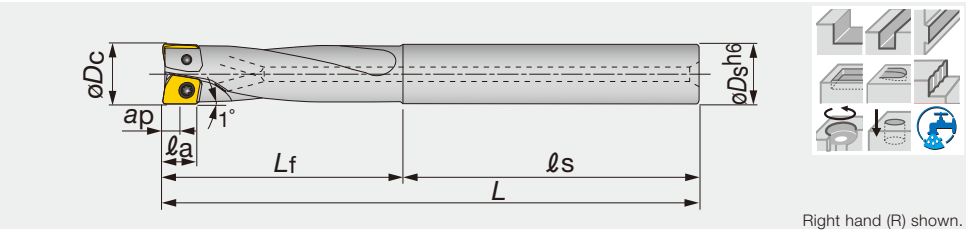


MEMO

# HYBRIDTACMILL
## EVH

Multi purpose endmills with center edge in small diameter

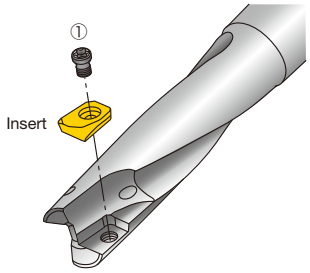
A.R. = +20, R.R. = +12




| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | ℓa | L | Insert |
|---|---|---|---|---|---|---|---|---|---|
| EVH06R010M10.0-02 | 3 | 10 | 2 | 10 | 50 | 40 | 5 | 90 | XVGT06H20... |
| EVH07R012M12.0-02 | 3.5 | 12 | 2 | 12 | 50 | 48 | 6 | 98 | XVGT07X30... |
| EVH09R016M16.0-02 | 4.5 | 16 | 2 | 16 | 60 | 64 | 8 | 124 | XVGT09X40... |

### SPARE PARTS

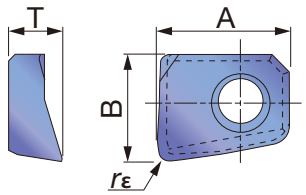
| Designation | ① Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| EVH06R010M10.0-02 | CSPD-1.8S | M-1000 | - | IP-6F |
| EVH07R012M12.0-02 | CSPB-2H | M-1000 | - | IP-6F |
| EVH09R016M16.0-02 | CSPB-2.5S | M-1000 | IP-8D | - |



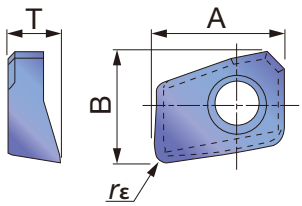

Multi Function

## INSERT

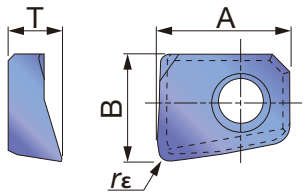
### XVGT EC-MJ (Central)



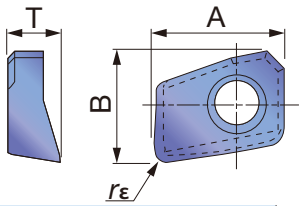

### XVGT EP-MJ (Peripheral)




### XVGT FC-AJ (Central)




### XVGT FP-Peripheral)




| | | AH730 | DS1200 |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | ★ |
| S | Superalloys | | |
| H | Hard materials | | |

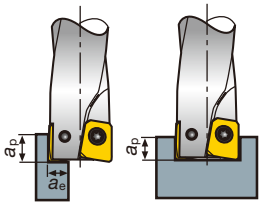
★ : First choice
☆ : Second choice

| Designation | rε | Max. ap | Coated AH730 | Coated DS1200 | A | B | T |
|---|---|---|---|---|---|---|---|
| XVGT06H205EC-MJ | 0.5 | 3 | ● | | 6.2 | 5 | 2.5 |
| XVGT07X305EC-MJ | 0.5 | 3.5 | ● | | 7.1 | 6.1 | 3 |
| XVGT09X405EC-MJ | 0.5 | 4.5 | ● | | 9 | 8.2 | 4 |
| XVGT06H205EP-MJ | 0.5 | 3 | ● | | 6.2 | 5.3 | 2.5 |
| XVGT07X305EP-MJ | 0.5 | 3.5 | ● | | 7.1 | 6.4 | 3 |
| XVGT09X405EP-MJ | 0.5 | 4.5 | ● | | 9 | 8.2 | 4 |
| XVGT06H205FC-AJ | 0.5 | 3 | | ● | 6.2 | 5 | 2.5 |
| XVGT07X305FC-AJ | 0.5 | 3.5 | | ● | 7.1 | 6.1 | 3 |
| XVGT09X405FC-AJ | 0.5 | 4.5 | | ● | 9 | 8.2 | 4 |
| XVGT06H205FP-AJ | 0.5 | 3 | | ● | 6.2 | 5.3 | 2.5 |
| XVGT07X305FP-AJ | 0.5 | 3.5 | | ● | 7.1 | 6.4 | 3 |
| XVGT09X405FP-AJ | 0.5 | 4.5 | | ● | 9 | 8.2 | 4 |

●: Line up

## STANDARD CUTTING CONDITIONS

●Shoulder milling, Slotting

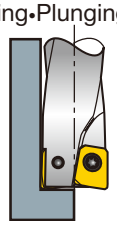



Side cutting Slotting

$a_p$: Axial depth of cut
$a_e$: Radial depth of cut

| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 30 ~ 100 m/min | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 60 ~ 140 m/min | | $V_c$ = 100 ~ 300 m/min | | $V_c$ = 100 ~ 200 m/min | |
| Conditions | | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min |
| Tool dia. (mm) | ø10 | 2550 | 380 | 1910 | 190 | 2550 | 380 | 3180 | 510 | 6370 | 1020 | 4770 | 670 |
| | ø12 | 2120 | 320 | 1590 | 160 | 2120 | 320 | 2650 | 420 | 5300 | 850 | 3980 | 560 |
| | ø16 | 1590 | 240 | 1190 | 120 | 1590 | 240 | 1990 | 320 | 3980 | 640 | 2980 | 420 |
| Depth of cut | Side cutting | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.2D | | $a_p$ < 0.25D $a_e$ < 0.3D | | $a_p$ < 0.25D $a_e$ < 0.3D | | $a_p$ < 0.25D $a_e$ < 0.3D | |
| | Slotting | $a_p$ < 0.1D | | $a_p$ < 0.1D | | $a_p$ < 0.1D | | $a_p$ < 0.15D | | $a_p$ < 0.2D | | $a_p$ < 0.2D | |

●Drilling•Plunging

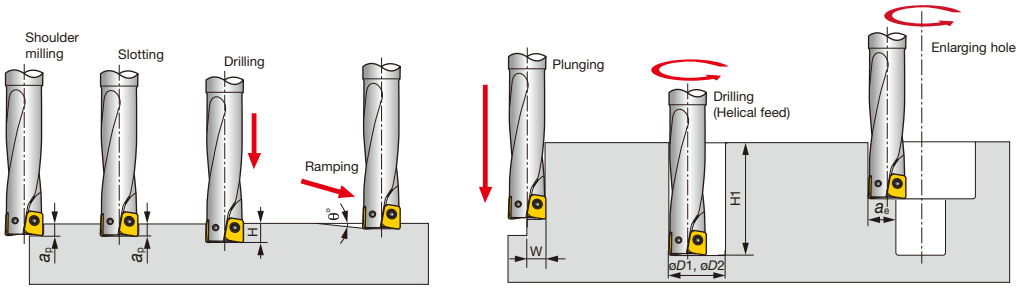


| Workpiece material | | Carbon steels and alloy steels | | Alloy steels and prehardened steelst | | Stainless steels | | Cast irons | | Aluminium alloys (Si < 13%) | | Aluminium alloys (Si ≥ 13%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hardness | | < 30HRC | | 30 ~ 40HRC | | < 250HB | | – | | – | | – | |
| Cutting speed | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 30 ~ 100 m/min | | $V_c$ = 50 ~ 120 m/min | | $V_c$ = 60 ~ 140 m/min | | $V_c$ = 100 ~ 300 m/min | | $V_c$ = 100 ~ 300 m/min | |
| Conditions | | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min | No. of rev. $n$ $min^{-1}$ | Feed speed $V_f$ mm/min |
| Tool dia. (mm) | ø10 | 2550 | 130 | 1910 | 80 | 2550 | 130 | 3180 | 190 | 6370 | 450 | 4770 | 290 |
| | ø12 | 2120 | 110 | 1590 | 65 | 2120 | 110 | 2650 | 160 | 5300 | 370 | 3980 | 240 |
| | ø16 | 1590 | 80 | 1190 | 50 | 1590 | 80 | 1990 | 120 | 3980 | 280 | 2980 | 180 |

Note:

- In slotting or pocketing where chips tend to stay in the cutting zone, use air blast to remove chips to prevent chip recutting.
- When chips tend to weld excessively on the cutting edge such as in machining aluminum alloys, use a water soluble cutting fluid.
- In the case of cutting a casting skin or a heavily interrupted work surface, decrease the feed per tooth and the maximum depth of cut to 1/2 to 2/3 times the values shown in the table.
- Tool overhang length must be as short as possible to avoid chatter. When the tool overhang length is long, decrease the number of revolutions and feed.
- Cutting conditions are generally limited by the rigidity and power of the machine and the rigidity of the workpiece. When setting the conditions, start from half of the values of the standard cutting conditions and then increase the value gradually while making sure that the machine is running normally.

## APPLICATION RANGE

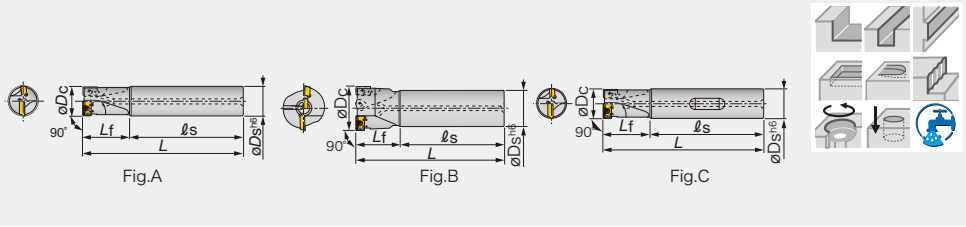



| Designation | Tool dia. | Max. depth of cut ap (mm) | Max.drilling depth H (mm) | Max.cutting width in plunging W (mm) | Max. ramping angle θ° | Min. machinable hole dia. øD1(mm) | Min. machinable hole dia. øD2 (mm) | Max. cutting width in enlarging hole ae (mm) | Max.depth of boring H1 (mm) |
|---|---|---|---|---|---|---|---|---|---|
| EVH06R010M10.0-02 | ø10 | 3 | 5 | 5 | 5 | 12 | 19 | 9 | 30 |
| EVH07R012M12.0-02 | ø12 | 3.5 | 6 | 6 | 5 | 14 | 23 | 11 | 36 |
| EVH09R016M16.0-02 | ø16 | 4.5 | 8 | 8 | 5 | 18 | 31 | 15 | 48 |

## EVX

Multi purpose endmills with center edge in medium diameter

Standard type A.R. = +2°~ +5°, R.R. = -10°~ -3.5°
Long type A.R. = +5°, R.R. = -4°~ -2°



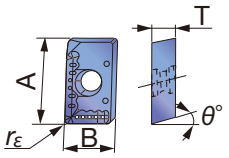

| Designation | Max. ap | øDc | z | øDs | ℓs | Lf | L | Air hole | Fig. | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| EVX08016RSA-E | 7 | 16 | 2 | 16 | 55 | 30 | 85 | with | C | XXMU08... |
| EVX08016RLA-E | 7 | 16 | 2 | 16 | 55 | 50 | 105 | with | C | XXMU08... |
| EVX08016RSA | 7 | 16 | 2 | 16 | 90 | 30 | 120 | with | A | XXMU08... |
| EVX08016RS | 7 | 16 | 2 | 16 | 90 | 30 | 120 | without | A | XXMU08... |
| EVX08016RLA | 7 | 16 | 2 | 16 | 135 | 40 | 175 | with | A | XXMU08... |
| EVX08016RL | 7 | 16 | 2 | 16 | 135 | 40 | 175 | without | A | XXMU08... |
| EVX10020RSA-E | 9 | 20 | 2 | 20 | 60 | 30 | 90 | with | C | XXMU10... |
| EVX10020RSA | 9 | 20 | 2 | 20 | 90 | 30 | 120 | with | A | XXMU10... |
| EVX10020RS | 9 | 20 | 2 | 20 | 90 | 30 | 120 | without | A | XXMU10... |
| EVX10020RLA-E | 9 | 20 | 2 | 20 | 60 | 60 | 120 | with | C | XXMU10... |
| EVX10020RLA | 9 | 20 | 2 | 20 | 135 | 50 | 185 | with | A | XXMU10... |
| EVX10020RL | 9 | 20 | 2 | 20 | 135 | 50 | 185 | without | A | XXMU10... |
| EVX12025RSA-E | 11.5 | 25 | 2 | 25 | 60 | 40 | 100 | with | C | XXMU12... |
| EVX12025RLA-E | 11.5 | 25 | 2 | 25 | 60 | 75 | 135 | with | C | XXMU12... |
| EVX12025RSA | 11.5 | 25 | 2 | 25 | 100 | 40 | 140 | with | A | XXMU12... |
| EVX12025RS | 11.5 | 25 | 2 | 25 | 100 | 40 | 140 | without | A | XXMU12... |
| EVX12025RLA | 11.5 | 25 | 2 | 25 | 150 | 70 | 220 | with | A | XXMU12... |
| EVX12025RL | 11.5 | 25 | 2 | 25 | 150 | 70 | 220 | without | A | XXMU16 |
| EVX16032RSA-E | 15 | 32 | 2 | 25 | 60 | 50 | 110 | with | C | XXMU16... |
| EVX16032RLA-E | 15 | 32 | 2 | 25 | 60 | 95 | 155 | with | C | XXMU16... |
| EVX16032RSA | 15 | 32 | 2 | 32 | 110 | 50 | 160 | with | A | XXMU16... |
| EVX16032RS | 15 | 32 | 2 | 32 | 110 | 50 | 160 | without | A | XXMU16... |
| EVX16032RLA | 15 | 32 | 2 | 32 | 175 | 80 | 255 | with | A | XXMU16... |
| EVX16032RL | 15 | 32 | 2 | 32 | 175 | 80 | 255 | without | A | XXMU16... |
| EVX12040RSA | 11.5 | 40 | 2 | 42 | 120 | 60 | 180 | with | B | XXMU12, WCMT05... |
| EVX12040RS | 11.5 | 40 | 2 | 42 | 120 | 60 | 180 | without | B | XXMU12, WCMT05... |
| EVX12040RLA | 11.5 | 40 | 2 | 42 | 210 | 100 | 310 | with | B | XXMU12, WCMT05... |
| EVX12040RL | 11.5 | 40 | 2 | 42 | 210 | 100 | 310 | without | B | XXMU12, WCMT05... |
| EVX16050RSA | 15 | 50 | 2 | 42 | 160 | 50 | 210 | with | B | XXMU16, WCMT06... |
| EVX16050RS | 15 | 50 | 2 | 42 | 160 | 50 | 210 | without | B | XXMU16, WCMT06... |
| EVX16050RLA | 15 | 50 | 2 | 42 | 310 | 50 | 360 | with | B | XXMU16, WCMT06... |
| EVX16050RL | 15 | 50 | 2 | 42 | 310 | 50 | 360 | without | B | XXMU16, WCMT06... |
| EVX16063RSA | 15 | 63 | 2 | 42 | 190 | 50 | 240 | with | B | XXMU16, WCMT06... |
| EVX16063RS | 15 | 63 | 2 | 42 | 190 | 50 | 240 | without | B | XXMU16, WCMT06... |
| EVX16063RLA | 15 | 63 | 2 | 42 | 310 | 50 | 360 | with | B | XXMU16, WCMT06... |
| EVX16063RL | 15 | 63 | 2 | 42 | 310 | 50 | 360 | without | B | XXMU16, WCMT06... |

### SPARE PARTS

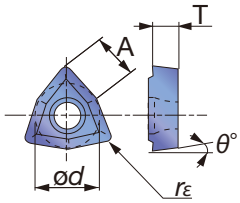
| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| EVX08016R... | - | CSPB-2.2 | M-1000 | IP-7D | - |
| EVX10020R... | - | CSPB-2.5 | M-1000 | IP-8D | - |
| EVX12025R... | - | CSPD-3 | M-1000 | IP-10D | - |
| EVX16032R... | CSPB-3.5 | - | M-1000 | IP-15D | - |
| EVX12040R... | - | CSPD-3 | M-1000 | IP-10D | - |
| EVX16050, 63R... | CSPB-3.5 | CSTB-3.5D | M-1000 | IP-15D | T-9D |

## INSERT

### XXMU-MJ




### WCMT-D4




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | | ★ |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard materials | | |

★ : First choice
☆ : Second choice

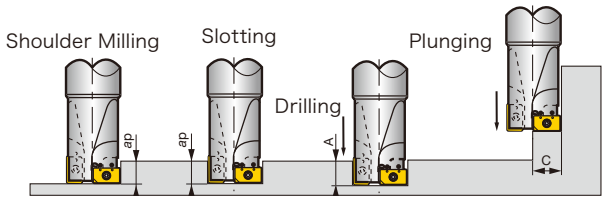
| Designation | rε | Coated AH120 | Coated AH140 | A | ød | T | θ° | B |
|---|---|---|---|---|---|---|---|---|
| XXMU08T204PR-MJ | 0.4 | ● | ● | 8.2 | - | 2.78 | 10 | 5.6 |
| XXMU10H308PR-MJ | 0.8 | ● | ● | 10.6 | - | 3.5 | 11 | 6.8 |
| XXMU12X408PR-MJ | 0.8 | ● | ● | 13.2 | - | 4.2 | 11 | 7.9 |
| XXMU16X508PR-MJ | 0.8 | ● | ● | 16.8 | - | 5 | 11 | 11.1 |
| WCMT050308-D4 | 0.8 | ● | ● | 5.4 | 7.94 | 3.18 | 7 | - |
| WCMT06T308-D4 | 0.8 | ● | ● | 6.5 | 9.525 | 3.97 | 7 | - |

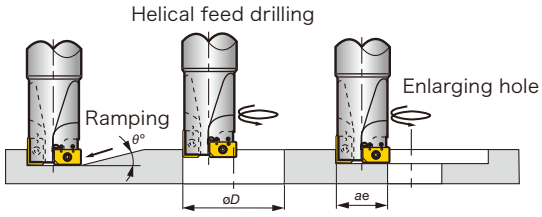
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | øD: ø16 ~ ø20 mm Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) Shouldering·Grooving | Feed per tooth fz (mm/t) Drilling | øD: ø25 ~ ø63 mm Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) Shouldering·Grooving | Feed per tooth fz (mm/t) Drilling |
|---|---|---|---|---|---|---|---|---|
| P | Carbon steels S50C, etc. C55, etc. < 300 HB | AH120 | 100 ~ 180 | 0.05 ~ 0.2 | 0.03 ~ 0.08 | 120 ~ 200 | 0.08 ~ 0.25 | 0.05 ~ 0.1 |
| P | Alloy steels SCM440, etc. 42CrMo4, etc. < 300 HB | AH120 | 80 ~ 160 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 100 ~ 180 | 0.08 ~ 0.2 | 0.05 ~ 0.1 |
| P | Die steels SKD11, etc. X96CrMoV12, etc. < 300 HB | AH120 | 60 ~ 120 | 0.05 ~ 0.13 | 0.03 ~ 0.06 | 80 ~ 150 | 0.08 ~ 0.15 | 0.03 ~ 0.08 |
| M | Stainless steels SUS304, etc. X5CrNi18 9, etc. | AH140 | 70 ~ 140 | 0.05 ~ 0.15 | 0.03 ~ 0.08 | 90 ~ 160 | 0.08 ~ 0.2 | 0.03 ~ 0.08 |
| K | Cast irons FC250, etc. 250, etc. | AH120 | 100 ~ 180 | 0.05 ~ 0.25 | 0.03 ~ 0.1 | 120 ~ 200 | 0.08 ~ 0.25 | 0.05 ~ 0.1 |

## APPLICATION RANGE

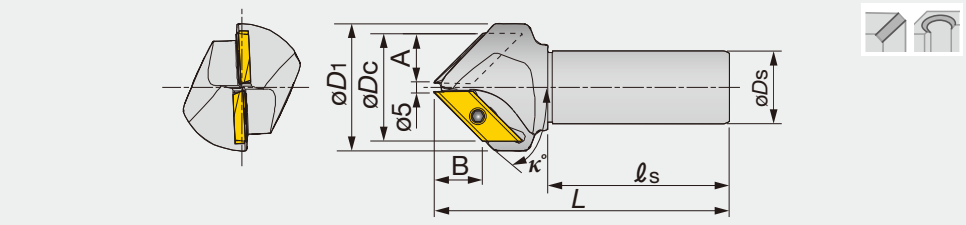



| | Designation | Tool diameter ø*Dc* | Max. depth of cut (*ap*) | Max. drilling depth (A) | Max. cutting width in plunging (C) | Max. ramping angle (*θ*°) | Min. machining hole dia. (ø*D*min) | Max. machining hole dia. (ø*D*max) | Max. cutting width in enlarging hole (*ae*) |
|---|---|---|---|---|---|---|---|---|---|
| Standard type / Long type | EVX08016R... | 16 | 7 | 8 | 8 | 3° | 19.2 | 30 | 14 |
| | EVX10020R... | 20 | 9 | 10 | 10 | 3° | 24 | 38 | 18 |
| | EVX12025R... | 25 | 11.5 | 12.5 | 12.5 | 3° | 30 | 48 | 23 |
| | EVX16032R... | 32 | 15 | 16 | 16 | 3° | 38.4 | 62 | 30 |
| | EVX12040RS/L (A) | 40 | 11.5 | 20 | 20 | 3° | 48 | 78 | 38 |
| | EVX16050RS/L (A) | 50 | 15 | 25 | 25 | 3° | 60 | 98 | 48 |
| | EVX16063RS/L (A) | 63 | 15 | 31.5 | 31.5 | 3° | 75.6 | 124 | 61 |

## ECC31

Indexable chamfering cutter with large parallelogram insert



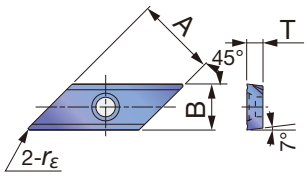

| Designation | øDc | z | κ° | øD1 | A | B | øDs | ℓs | L | Insert |
|---|---|---|---|---|---|---|---|---|---|---|
| ECC31005R-30 | 34 | 1 | 30 | 40 | 14.5 | 25.5 | 32 | 80 | 130.2 | XCET3104... |
| ECC31005R-45 | 46 | 2 | 45 | 56 | 20.5 | 20.5 | 32 | 80 | 130.1 | XCET3104... |
| ECC31005R-60 | 55 | 2 | 60 | 72 | 25.5 | 14.5 | 32 | 80 | 130.1 | XCET3104... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench |
|---|---|---|---|
| ECC31... | CSTB-5S | M-1000 | T-20D |

## INSERT

### XCET31




| | | Coated | | Cermet | | Un-coated | |
|---|---|---|---|---|---|---|---|
| P | Steel | ☆ | | ★ | | ☆ | |
| M | Stainless | ★ | | | | | |
| K | Cast iron | ★ | | | | | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | | | | | | |
| H | Hard meterials | | | | | | |

★ : First choice
☆ : Second choice

| Designation | rε | AH330 | NS740 | UX30 | A | B | T |
|---|---|---|---|---|---|---|---|
| XCET310404ER | 0.4 | ● | ● | ● | 22 | 12.7 | 4.5 |

●: Line up

## STANDARD CUTTING CONDITIONS

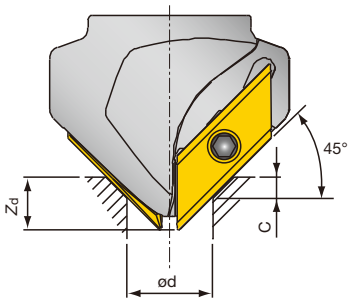
| ISO | Workpiece material | Grade | No. of revolutions: *n* (min$^{-1}$) | Feed per tooth: *fz* (mm/t) |
|---|---|---|---|---|
| P | Carbon steels S55C, etc. C55, etc.<br>Alloy steels SCM440, etc. 42CrMo4, etc.<br>< 300 HB | NS740 | 1000 - 3000 - 7000 | 0.1 - 0.25 |
| | | UX30 | 700 - 2000 - 4900 | 0.1 - 0.25 |
| | Die steels<br>SKD61, etc. X40CrMoV5-1, etc.<br>< 300 HB | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.2 |
| M | Stainless steels<br>SUS304, etc. X5CrNi18-10, etc.<br>< 250 HB | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.25 |
| K | Cast irons<br>FC250, etc. 250, etc. | AH330 | 1000 - 3000 - 7000 | 0.1 - 0.25 |

Notes:
- When the hole diameter to be chamfered is small or the cutting edges near the front end of tool are used, use at higher side of the revolution range shown in the Table.
  In contrast, when the hole diameter to be chamfered is large or the cutting edges far from the tool's front end are used, use the lower side of the revolution range shown in the Table.
- When chamfering a small diameter hole (smaller than ø10 mm) in a plunge-milling mode, peck-feeding should not be used.
- When the hole diameter to be chamfered is smaller than ø10 mm or the cutting edges near the tool's front end are used, the feed should be set within 0.15 mm/t.

## Guidelines for programming

Z-axis plunging depth $Z_d$ (mm) in 45° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) 0.5 | 1 | 1.5 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|
| 5 | 0.7 | 1.2 | 1.7 | 2.2 | 3.2 | - | - |
| 6 | 1.2 | 1.7 | 2.2 | 2.7 | 3.7 | - | - |
| 6.8 | 1.6 | 2.1 | 2.6 | 3.1 | 4.1 | - | - |
| 8 | 2.2 | 2.7 | 3.2 | 3.7 | 4.7 | - | - |
| 8.5 | 2.4 | 2.9 | 3.4 | 3.9 | 4.9 | - | - |
| 10 | 3.2 | 3.7 | 4.2 | 4.7 | 5.7 | 6.7 | 7.7 |
| 10.2 | 3.3 | 3.8 | 4.3 | 4.8 | 5.8 | 6.8 | 7.8 |
| 12 | 4.2 | 4.7 | 5.2 | 5.7 | 6.7 | 7.7 | 8.7 |
| 14 | 5.2 | 5.7 | 6.2 | 6.7 | 7.7 | 8.7 | 9.7 |
| 16 | 6.2 | 6.7 | 7.2 | 7.7 | 8.7 | 9.7 | 10.7 |
| 17.5 | 6.9 | 7.4 | 7.9 | 8.4 | 9.4 | 10.4 | 11.4 |
| 20 | 8.2 | 8.7 | 9.2 | 9.7 | 10.7 | 11.7 | 12.7 |
| 21 | 8.7 | 9.2 | 9.7 | 10.2 | 11.2 | 12.2 | 13.2 |
| 24 | 10.2 | 10.7 | 11.2 | 11.7 | 12.7 | 13.7 | 14.7 |
| 30 | 13.2 | 13.7 | 14.2 | 14.7 | 15.7 | 16.7 | 17.7 |
| 33 | 14.7 | 15.2 | 15.7 | 16.2 | 17.2 | 18.2 | 19.2 |
| 36 | 16.2 | 16.7 | 17.2 | 17.7 | 18.7 | 19.7 | - |
| 42 | 19.2 | 19.7 | 20.2 | - | - | - | - |

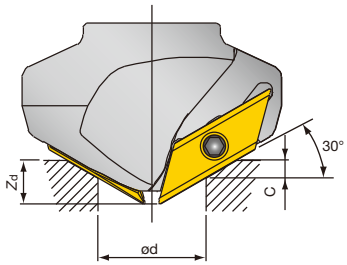



**Tool: ECC31005R-45**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth $Z_d$ (mm) in 30° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 |
|---|---|---|---|---|---|---|---|
| 5 | 0.6 | 1.1 | 1.6 | 2.1 | - | - | - |
| 6 | 0.9 | 1.4 | 1.9 | 2.4 | - | - | - |
| 6.8 | 1.1 | 1.6 | 2.1 | 2.6 | - | - | - |
| 8 | 1.4 | 1.9 | 2.4 | 2.9 | - | - | - |
| 8.5 | 1.6 | 2.1 | 2.6 | 3.1 | - | - | - |
| 10 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 |
| 10.2 | 2.1 | 2.6 | 3.1 | 3.6 | 4.1 | 4.6 | 5.1 |
| 12 | 2.6 | 3.1 | 3.6 | 4.1 | 4.6 | 5.1 | 5.6 |
| 16 | 3.7 | 4.2 | 4.7 | 5.2 | 5.7 | 6.2 | 6.7 |
| 17.5 | 4.2 | 4.7 | 5.2 | 5.7 | 6.2 | 6.7 | 7.2 |
| 20 | 4.9 | 5.4 | 5.9 | 6.4 | 6.9 | 7.4 | 7.9 |
| 21 | 5.2 | 5.7 | 6.2 | 6.7 | 7.2 | 7.7 | 8.2 |
| 24 | 6.1 | 6.6 | 7.1 | 7.6 | 8.1 | 8.6 | 9.1 |
| 30 | 7.8 | 8.3 | 8.8 | 9.3 | 9.8 | 10.3 | 10.8 |
| 33 | 8.7 | 9.2 | 9.7 | 10.2 | 10.7 | 11.2 | 11.7 |
| 36 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | 12.5 |
| 38 | 10.1 | 10.6 | 11.1 | 11.6 | 12.1 | 12.6 | 13.1 |
| 42 | 11.2 | 11.7 | 12.2 | 12.7 | 13.2 | 13.7 | 14.2 |
| 46 | 12.4 | 12.9 | 13.4 | 13.9 | 14.4 | - | - |
| 48 | 13 | 13.5 | 14 | 14.5 | - | - | - |
| 52 | 14.1 | - | - | - | - | - | - |

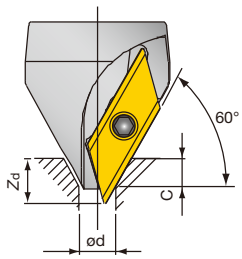



**Tool: ECC31005R-60**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

Z-axis plunging depth $Z_d$ (mm) in 60° chamfering of hole

| Hole dia. ød (mm) | Size of chamfering C (mm) 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 |
|---|---|---|---|---|---|---|---|---|
| 5 | 0.8 | 1.3 | 1.8 | 2.3 | 2.8 | - | - | - |
| 6 | 1.7 | 2.2 | 2.7 | 3.2 | 3.7 | - | - | - |
| 6.8 | 2.4 | 2.9 | 3.4 | 3.9 | 4.4 | - | - | - |
| 8 | 3.4 | 3.9 | 4.4 | 4.9 | 5.4 | - | - | - |
| 8.5 | 3.8 | 4.3 | 4.8 | 5.3 | 5.8 | - | - | - |
| 10 | 5.1 | 5.6 | 6.1 | 6.6 | 7.1 | 7.6 | 8.1 | 8.6 |
| 10.2 | 5.3 | 5.8 | 6.3 | 6.8 | 7.3 | 7.8 | 8.3 | 8.8 |
| 12 | 6.9 | 7.4 | 7.9 | 8.4 | 8.9 | 9.4 | 9.9 | 10.4 |
| 16 | 10.3 | 10.8 | 11.3 | 11.8 | 12.3 | 12.8 | 13.3 | 13.8 |
| 17.5 | 11.6 | 12.1 | 12.6 | 13.1 | 13.6 | 14.1 | 14.6 | 15.1 |
| 20 | 13.7 | 14.2 | 14.7 | 15.2 | 15.7 | 16.2 | 16.7 | 17.2 |
| 21 | 14.6 | 15.1 | 15.6 | 16.1 | 16.6 | 17.1 | 17.6 | 18.1 |
| 24 | 17.2 | 17.7 | 18.2 | 18.7 | 19.2 | 19.7 | 20.2 | 20.7 |
| 30 | 22.4 | 22.9 | 23.4 | 23.9 | 24.4 | 24.9 | 25.4 | - |
| 33 | 24.9 | 25.4 | - | - | - | - | - | - |

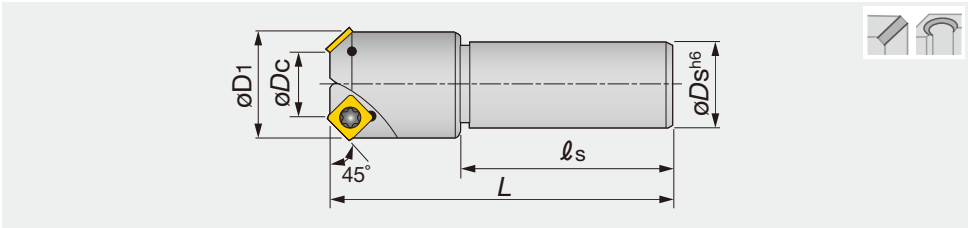



**Tool: ECC31005R-30**

Note: When the hole depth is smaller than the Z-axis plunging depth (Zd), special care should be taken to avoid an interference between the tool's front end and the bottom of the hole.

## ECP4400R

Indexable chamfering cutter with square insert



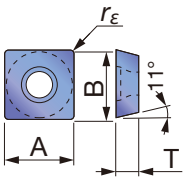

| Designation | øDc | z | øD1 | øDs | L | ℓs | Insert |
|---|---|---|---|---|---|---|---|
| ECP440AR | 10 | 1 | 27.5 | 32 | 130 | 80 | SPMA422*N |
| ECP4423R | 23 | 2 | 40.3 | 32 | 130 | 80 | SPMA422*N |
| ECP4436R | 36 | 3 | 53.3 | 32 | 130 | 80 | SPMA422*N |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| ECP44... | CSTA-4 | T-15D |

## INSERT

### SPMA42




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P | Steel | ★ | ☆ | | ☆ | | |
| M | Stainless | | | | | | |
| K | Cast iron | | | | | ★ | |
| N | Non-ferrous | | | | | | |
| S | Superalloys | | | | | | |
| H | Hard meterials | | | | | | |

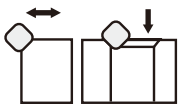
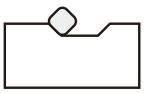
★ : First choice
☆ : Second choice

| Designation | rε | Cermet NS740 | Cermet N308 | | Uncoated UX30 | Uncoated TH10 | | A | B | T |
|---|---|---|---|---|---|---|---|---|---|---|
| SPMA422TN | 0.8 | ● | ● | | ● | | | 12.7 | 12.7 | 3.18 |
| SPMA422FN | 0.8 | | | | | ● | | 12.7 | 12.7 | 3.18 |

●: Line up

## STANDARD CUTTING CONDITIONS

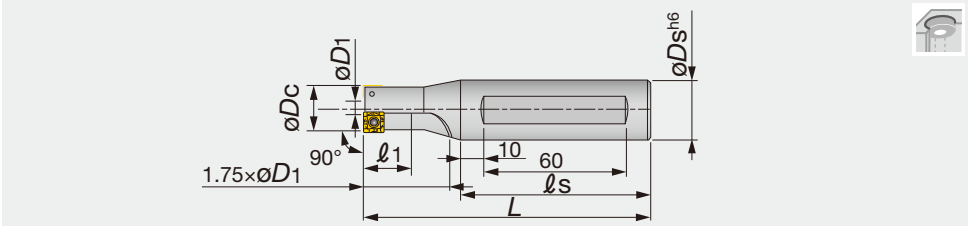
Multi Function

| Operations | | Workpiece material | Grade | Cutting speed Vc (m/min) | Maximum depth of cut ap (mm) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|---|---|
| Single or double chamfering hole chamfering  | P | Carbon steels, Alloy steels < 300HB | NS740 · N308 UX30 | 100 - 150 | - | 0.2 - 0.5 |
| | P | Die steels < 30HRC | NS740 · N308 UX30 | 50 - 70 | - | 0.15 - 0.4 |
| | K | Cast irons | TH10 | 90 - 110 | - | 0.2 - 0.6 |
| Facing Grooving  | P | Carbon steels, Alloy steels < 300HB | NS740 · N308 UX30 | 100 - 150 | 3 | 0.1 - 0.15 |
| | P | Die steels < 30HRC | UX30 | 50 - 70 | 2 | 0.1 - 0.15 |
| | K | Cast irons | TH10 | 90 - 110 | 3 | 0.1 - 0.15 |

Notes:
- When chamfering stainless steel, down-milling is recommended. Conventional milling may cause edge chipping.
- When chamfering above C3.0, the feed per tooth should be set at the lower side of the value shown in the above table.

## TCB

Indexable counter boring endmill



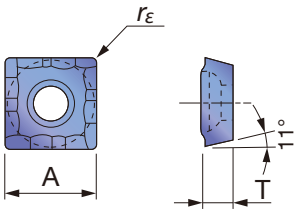

| Designation | øDc | z | øD1 | ℓ1 | L | ℓs | øDs | Insert |
|---|---|---|---|---|---|---|---|---|
| TCB-140 | 14 | 1 | 4 | 18 | 117 | 80 | 25 | SPMP831DS |
| TCB-175 | 17.5 | 2 | 7.1 | 22 | 115 | 80 | 25 | SPMP831DS |
| TCB-200 | 20 | 2 | 8.2 | 25 | 120 | 80 | 25 | SPMP042ERD |
| TCB-230 | 23 | 2 | 11 | 29 | 126 | 80 | 25 | SPMP042ERD |
| TCB-260 | 26 | 2 | 14 | 33 | 132 | 80 | 32 | SPMP042ERD |
| TCB-290 | 29 | 2 | 14 | 30 | 138 | 80 | 32 | SPMM322ERD |
| TCB-320 | 32 | 2 | 16.9 | - | 144 | 80 | 32 | SPMM322ERD |
| TCB-350 | 35 | 2 | 14 | - | 150 | 80 | 32 | SPMM432ERD |
| TCB-390 | 39 | 2 | 17.9 | - | 158 | 80 | 32 | SPMM432ERD |
| TCB-430 | 43 | 2 | 21.7 | - | 171 | 85 | 42 | SPMM432ERD |

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TCB-140 | CSTB-2.2S | T-7D |
| TCB-175 | CSTB-2.2 | T-7D |
| TCB-200 - 260 | CSTA-NO3 | T-9D |
| TCB-290, 320 | CSTA-NO5 | T-9D |
| TCB-350 - 430 | CSTA-4 | T-15D |

## INSERT

### SPMP/SPMM




| | | | |
|---|---|---|---|
| P | Steel | ★ | |
| M | Stainless | ★ | |
| K | Cast iron | ★ | |
| N | Non-ferrous | | |
| S | Superalloys | | |
| H | Hard meterials | | |

★ : First choice
☆ : Second choice

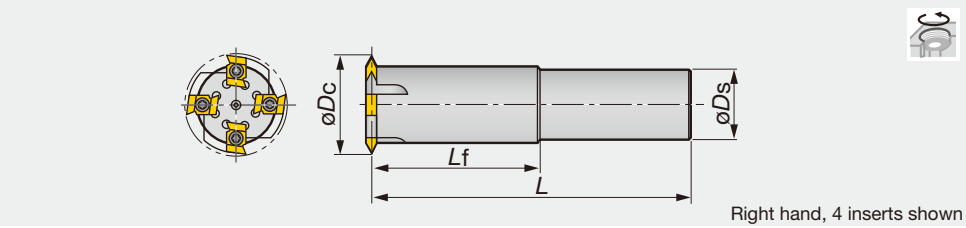
| Designation | rε | Coated T313W | | | | | | | | | | A | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPMP831DS | 0.4 | ● | | | | | | | | | | 6.35 | 2.38 |
| SPMP042ERD | 0.8 | ● | | | | | | | | | | 7.938 | 3.18 |
| SPMM322ERD | 0.8 | ● | | | | | | | | | | 9.525 | 3.18 |
| SPMM432ERD | 0.8 | ● | | | | | | | | | | 12.7 | 4.76 |

●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) | Cutting fluid |
|---|---|---|---|---|---|
| P | Carbon steels | T313W | 80 - 150 | 0.12 - 0.24 | Water soluble type |
| M | Stainless steels, Mild steels | T313W | 150 - 200 | 0.05 - 0.12 | Water soluble type |
| K | Cast irons | T313W | 70 - 130 | 0.2 - 0.4 | Water soluble type or dry cutting |

Notes :
- For cutters under 20 mm diameter, be sure to use a cutting fluid and select lower cutting speeds than shown above.
- For TCB-140 type, reduce the feeds to 1/2 of the values shown in the table.




Right hand, 4 inserts shown

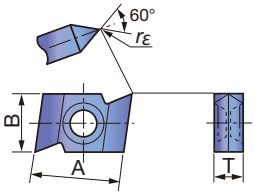
| Designation | øDc | z | øDs | Lf | L | Range of internal thread | Insert |
|---|---|---|---|---|---|---|---|
| D23-D25-45R | 23 | 1 | 25 | 45 | 115 | M28 - M30 | T1-R... |
| D25-D25-45R | 25 | 1 | 25 | 45 | 115 | M32 - M42 | T1-R... |
| D38-D32-85R | 38 | 2 | 32 | 85 | 165 | M45 - M56 | T1-R... |
| D50-D42-100R | 50 | 4 | 42 | 100 | 190 | M58 - M68 | T1-R... |
| D55-D42-100R | 55 | 4 | 42 | 100 | 190 | M64 - M85 | T2-R... |
| D60-D42-100R | 60 | 4 | 42 | 100 | 190 | M70 - M85 | T2-R... |
| D80-D42-100R | 80 | 6 | 42 | 100 | 190 | M90 - | T2-R... |

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| D23-D25... - D50-D42... | CSTB-4 | T-15F |
| D55-D42... - D80-D42... | CSTB-5 | T-20F |

## INSERT

### T*-R...




| | | GH330 |
|---|---|---|
| P | Steel | ★ |
| M | Stainless | ★ |
| K | Cast iron | |
| N | Non-ferrous | |
| S | Superalloys | |
| H | Hard meterials | |

★ : First choice
☆ : Second choice

| Designation | rε | GH330 (Coated) | A | B | T |
|---|---|---|---|---|---|
| T1-R14 | 0.14 | ● | 14.4 | 9.525 | 4.76 |
| T1-R28 | 0.28 | ● | 14.4 | 9.525 | 4.76 |
| T2-R14 | 0.14 | ● | 17.8 | 12.7 | 6.35 |
| T2-R28 | 0.28 | ● | 17.8 | 12.7 | 6.35 |

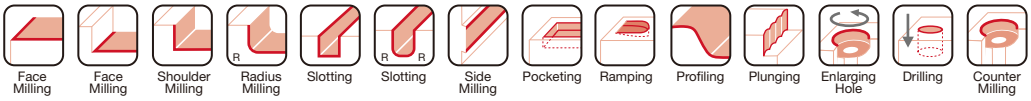
●: Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Grade | Cutting speed Vc (m/min) | Feed per tooth fz (mm/t) |
|---|---|---|---|---|
| P | Mild steels / Unharded steels < 200HB | GH330 | 150 ~ 200 | 0.3 ~ 0.4 |
| | Carbon steels / Alloy steels < 300HB | GH330 | 150 ~ 200 | 0.17 ~ 0.26 |
| | Die steels < 50HRC | GH330 | 30 ~ 50 | 0.14 ~ 0.2 |
| M | Stainless steels < 300HB | GH330 | 150 - 200 | 0.05 - 0.12 |

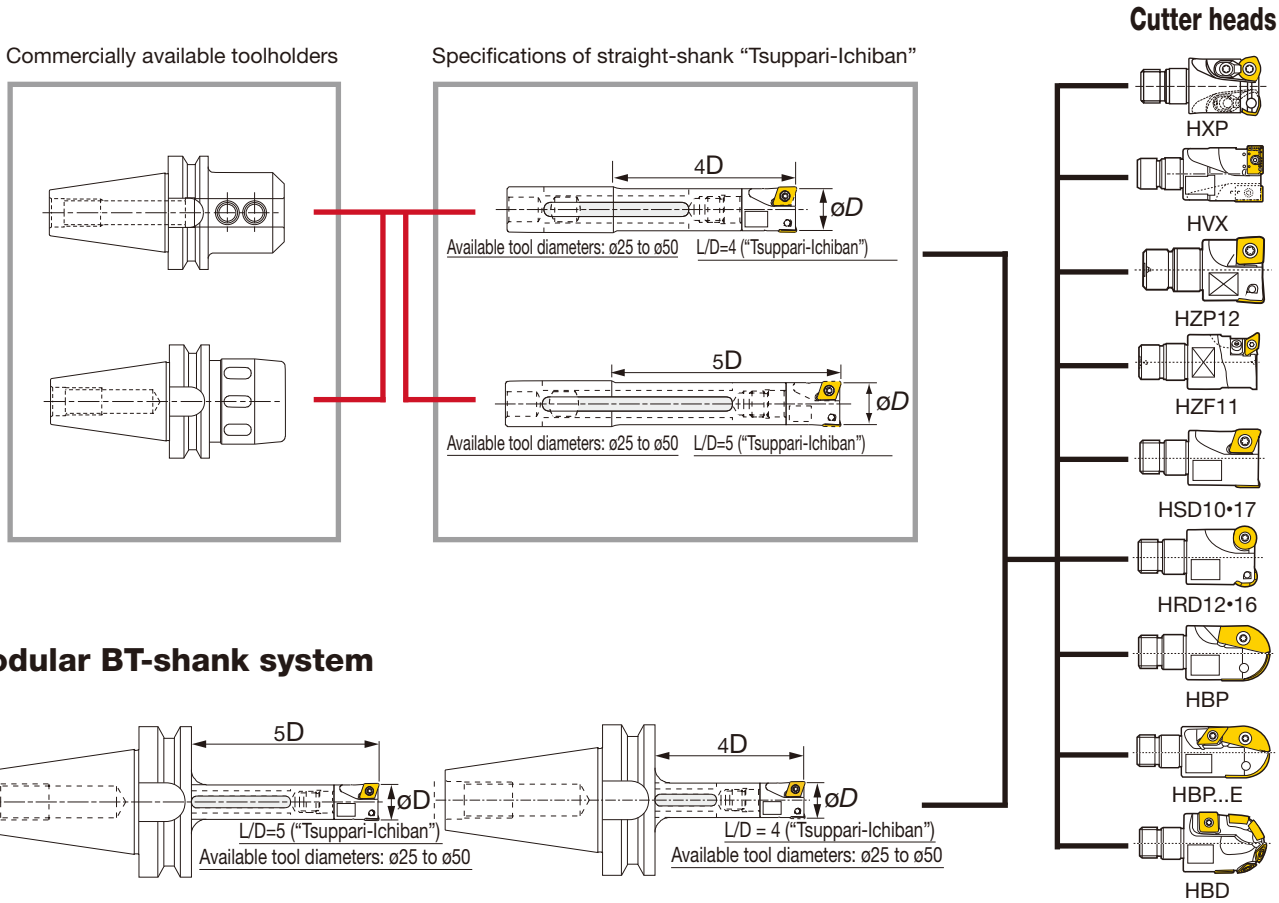
- Climb milling is recommended.
- When threading a blind hole, use the right hand cutter in right-hand rotation. Cut up from the bottom to prevent chip recutting.
- When machining internal threads from the mouth, use the left-hand cutter in left-hand rotation.

## "Tsuppari-Ichiban" Modular tool system



- **Interchangeable head design allows easy tool management and helps select an optimum tool.**
- **"Tsuppari-Ichiban" shank performs high efficiency machining even in long-reach applications.**

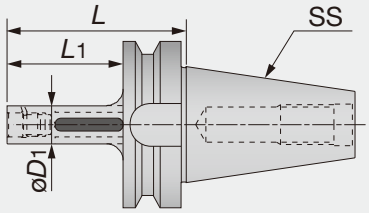
### Modular straight shank system




### Modular BT-shank system

## TMS BT shank

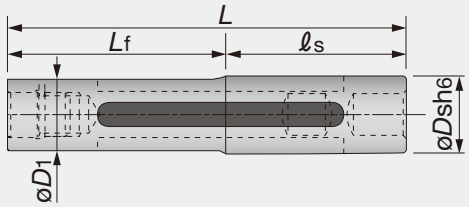
T-Bar Modular System (TMS) with BT shank




| Designation | SS | øD1 | L | L1 | Cutter |
|---|---|---|---|---|---|
| HBT40D025L097T | BT40 | 23 | 97 | 70 | H...25 |
| HBT40D025L122T | BT40 | 23 | 122 | 95 | H...25 |
| HBT40D030L107T | BT40 | 28 | 107 | 80 | HBP030 |
| HBT40D030L137T | BT40 | 28 | 137 | 110 | HBP030 |
| HBT40D032L125T | BT40 | 30 | 125 | 98 | H...32 |
| HBT40D032L157T | BT40 | 30 | 157 | 130 | H...32 |
| HBT50D025L108T | BT50 | 23 | 108 | 70 | H...25 |
| HBT50D025L133T | BT50 | 23 | 133 | 95 | H...25 |
| HBT50D030L118T | BT50 | 28 | 118 | 80 | HBP030 |
| HBT50D030L148T | BT50 | 28 | 148 | 110 | HBP030 |
| HBT50D032L136T | BT50 | 30 | 136 | 98 | H...32 |
| HBT50D032L168T | BT50 | 30 | 168 | 130 | H...32 |
| HBT50D040L148T | BT50 | 38 | 148 | 110 | H...40 |
| HBT50D040L188T | BT50 | 38 | 188 | 150 | H...40 |
| HBT50D050L188T | BT50 | 42 | 188 | 150 | H...50 |
| HBT50D050L238T | BT50 | 42 | 238 | 200 | H...50 |

## TMS straight shank

T-Bar Modular System (TMS) with straight shank

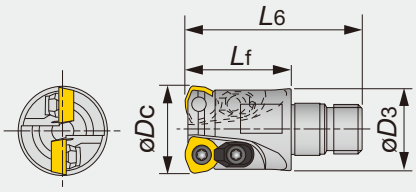


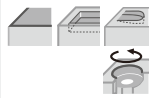

| Designation | øDs | øD1 | L | ℓs | Lf | Cutter |
|---|---|---|---|---|---|---|
| HD02525L128T | 25 | 23 | 128 | 58 | 70 | H...25 |
| HD02525L153T | 25 | 23 | 153 | 58 | 95 | H...25 |
| HD03032L145T | 32 | 28 | 145 | 65 | 80 | HBP030 |
| HD03032L175T | 32 | 28 | 175 | 65 | 110 | HBP030 |
| HD03232L163T | 32 | 30 | 163 | 65 | 98 | H...32 |
| HD03232L195T | 32 | 30 | 195 | 65 | 130 | H...32 |
| HD04042L182T | 42 | 38 | 182 | 72 | 110 | H...40 |
| HD04042L222T | 42 | 38 | 222 | 72 | 150 | H...40 |
| HD05042L222T | 42 | 42 | 222 | 150 | 72 | H...50 |
| HD05042L272T | 42 | 42 | 272 | 150 | 122 | H...50 |

## HXP

Super high feed endmills with T-Bar Modular System (TMS)

A.R. = +4° ~ +5°, R.R. = -6° ~ -35°



| Designation | øDc | z | L6 | Lf | øD3 | Insert | (Option) Wrench |
|---|---|---|---|---|---|---|---|
| HXP06025R | 25 | 2 | 50 | 30 | 23 | WPM*06X415ZP... | KS-21 |
| HXP06026R | 26 | 2 | 50 | 30 | 23 | WPM*06X415ZP... | KS-21 |
| HXP06032R | 32 | 2 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06032RB | 32 | 3 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06033R | 33 | 2 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06033RB | 33 | 3 | 64 | 35 | 30 | WPM*06X415ZP... | KS-27 |
| HXP06040R | 40 | 3 | 84 | 50 | 38 | WPM*06X415ZP... | KS-32 |
| HXP08040R | 40 | 2 | 84 | 50 | 38 | WPMT080615Z*R... | KS-32 |
| HXP06050R | 50 | 4 | 88 | 50 | 42 | WPM*06X415ZP... | KS-36 |
| HXP08050R | 50 | 3 | 88 | 50 | 42 | WPMT080615Z*R... | KS-36 |
| HXP09050R | 50 | 2 | 88 | 50 | 42 | WPMT090725Z*R... | KS-36 |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Clamp set | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| HXP06025R - HXP06050R | CSPB-4S | M-1000 | CSY-15 | IP-15D | - |
| HXP08040R, HXP08050R | CSTB-5 | M-1000 | CSX20 | - | T-20T |
| HXP09050R | CSPB-5 | M-1000 | CSY-20 | - | IP-20T |

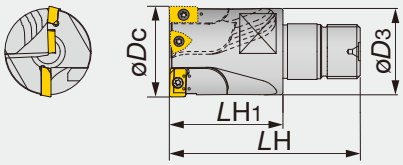


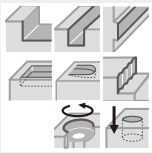
HXP: Inserts → **D029**, Standard cutting conditions → **D030**

## HVX

Multi purpose endmills with center edge in medium diameter, with T-Bar Modular System (TMS)

A.R. = 0° ~ +20°, R.R. = -6° ~ 1°



| Designation | øDc | z | LH | LH1 | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HVX12025R | 25 | 2 | 55 | 35 | 23 | HD..., HBT... | XXMU12X408PR-MJ | - |
| HVX16032R | 32 | 2 | 69 | 40 | 30 | HD..., HBT... | XXMU16X508PR-MJ | - |
| HVX12040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | XXMU12X408PR-MJ | WCMT050308-D4 |
| HVX16050R | 50 | 2 | 88 | 50 | 42 | HD..., HBT... | XXMU16X508PR-MJ | WCMT06T308-D4 |

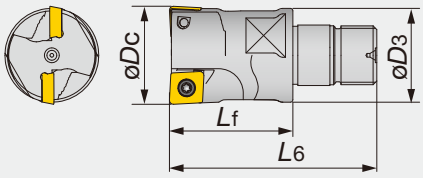
### SPARE PARTS

| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 | WRENCH 2 |
|---|---|---|---|---|---|---|
| HVX12025R | - | CSPD-3 | M-1000 | IP-10D | - | KS-21 |
| HVX16032R | CSPB-3.5 | - | M-1000 | IP-15D | - | KS-27 |
| HVX12040R | - | CSPD-3 | M-1000 | IP-10D | - | KS-32 |
| HVX16050R | CSPB-3.5 | CSTB-3.5D | M-1000 | IP-15D | T-9D | KS-36 |

## HZP

"Z-feed" plunging cutter for roughing operation with screw clamp, with T-Bar Modular System (TMS)

A.R. = +26°, R.R. = -2°



| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HZP12032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | APMT120416PR-MJ |
| HZP12040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | APMT120416PR-MJ |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | WRENCH 1 |
|---|---|---|---|---|
| HZP12032R | CSTB-3.5T | M-1000 | T-20D | KS-27 |
| HZP12040R | CSTB-3.5T | M-1000 | T-20D | KS-32 |



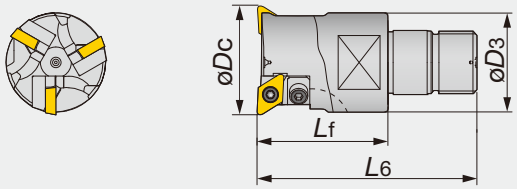
HVX: Inserts, Standard cutting conditions → **D294**

HZP: Inserts → **D254**, Standard cutting conditions → **D255**

## HZF

"Z-feed" plunging endmill for finishing operation, with T-Bar Modular System (TMS)

A.R. = 0°, R.R. = 0°




| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HZF11032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | DPCW11T3ZFR |
| HZF11040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | DPCW11T3ZFR |

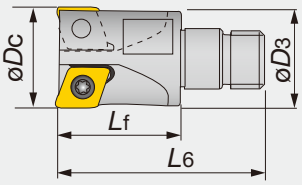
### SPARE PARTS

| Designation | Clamping screw | Cartridge | Adjusting screw | Lubricant | Cartridge clamping screw | Wrench | Wrench1 | Wrench2 | Wrench3 |
|---|---|---|---|---|---|---|---|---|---|
| HZF11032R | CSTB-4S | SDUPR09CZ-11 | - | M-1000 | - | T-15D | - | - | KS-27 |
| HZF11040R | CSTB-4S | SDUPR09CZ-11 | SSHM3-10 | M-1000 | CM4X0.7X12 | T-15D | P-1.5 | P-3 | KS-32 |

## HSD

Multi purpose square endmills, with T-Bar Modular System (TMS)

A.R. = +25°, R.R. = -6° ~ 0°




| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HSD10025R | 25 | 2 | 50 | 30 | 23 | HD..., HBT... | GD*T10H3PD... |
| HSD10032R | 32 | 2 | 59 | 50 | 30 | HD..., HBT... | GD*T10H3PD... |
| HSD10040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | GD*T10H3PD... |
| HSD17040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | GD*T17X6PD... |
| HSD10050R | 50 | 3 | 88 | 50 | 42 | HD..., HBT... | GD*T10H3PD... |
| HSD17050R | 50 | 2 | 88 | 50 | 42 | HD..., HBT... | GD*T17X6PD... |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HSD10025R | CSTB-3.5H | M-1000 | T-15D | KS-21 |
| HSD10032R | CSTB-3.5H | M-1000 | T-15D | KS-27 |
| HSD10040R | CSTB-3.5H | M-1000 | T-15D | KS-32 |
| HSD17040R | CSTB-5 | M-1000 | T-20D | KS-32 |
| HSD10050R | CSTB-3.5H | M-1000 | T-15D | KS-36 |
| HSD17050R | CSTB-5 | M-1000 | T-20D | KS-36 |



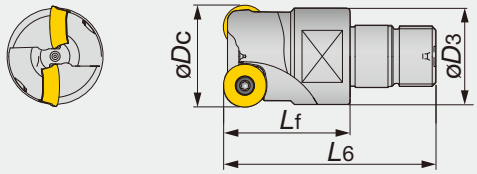
HZF: Inserts → **D258**, Standard cutting conditions → **D259**

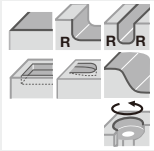
HSD: Inserts, Standard cutting conditions → **D112**

## HRD

Indexable endmills with button insert of 6 mm or 8 mm radius, with T-Bar Modular System (TMS)

A.R. = +21° ~ +23°, R.R. = -6° ~ -4°



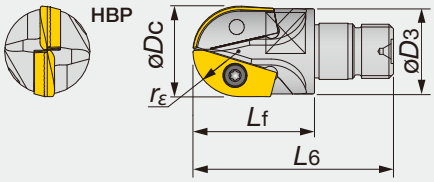

| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert |
|---|---|---|---|---|---|---|---|
| HRD12032R | 32 | 2 | 59 | 30 | 30 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD12040R | 40 | 3 | 84 | 50 | 38 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD16040R | 40 | 2 | 84 | 50 | 38 | HD..., HBT... | RDM*1606ZD*N(-MJ) |
| HRD12050R | 50 | 4 | 88 | 50 | 42 | HD..., HBT... | RDM*1204ZD*N(-MJ) |
| HRD16050R | 50 | 3 | 88 | 50 | 42 | HD..., HBT... | RDM*1606ZD*N(-MJ) |

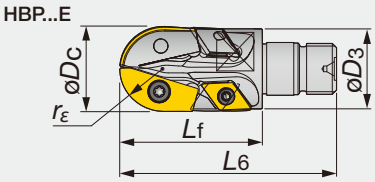
### SPARE PARTS

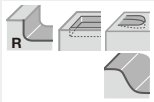
| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HRD12032R | CSTB-3.5 | M-1000 | T-15D | KS-27 |
| HRD12040R | CSTB-3.5 | M-1000 | T-15D | KS-32 |
| HRD16040R | CSTB-5 | M-1000 | T-20D | KS-32 |
| HRD12050R | CSTB-3.5 | M-1000 | T-15D | KS-36 |
| HRD16050R | CSTB-5 | M-1000 | T-20D | KS-36 |

## HBP

Indexable ball-nose endmill for semi-finishing, with T-Bar Modular System (TMS)




| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HBP025 | 25 | 2 | 55 | 35 | 23 | HD..., HBT... | ZPET2505-MJ | - |
| HBP025E | 25 | 2 (4) | 65 | 45 | 23 | HD..., HBT... | ZPET2505-MJ | DCMW11T304TN |
| HBP030 | 30 | 2 | 66 | 40 | 28 | HD..., HBT... | ZPET3006-MJ | - |
| HBP030E | 30 | 2 (4) | 76 | 50 | 28 | HD..., HBT... | ZPET3006-MJ | DCMW11T304TN |

### SPARE PARTS

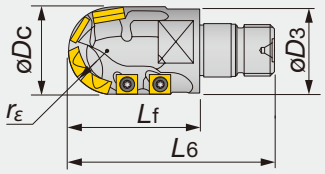
| Designation | Clamping screw | Clamping screw 1 | Lubricant | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| HBP025* | CSTB-4S | - | M-1000 | T-15D | - | KS-21 |
| HBP030 | CSTB-5S | - | M-1000 | T-20D | - | KS-24 |
| HBP030E | CSTB-4S | CSTB-5S | M-1000 | T-15D | T-20D | KS-24 |

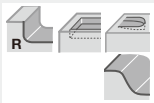

HRD: Inserts → **D241**, Standard cutting conditions → **D242**

HBP: Inserts → **D248**, Standard cutting conditions → **D251**

## HBD

Indexable ball-nose endmill for roughing, with T-Bar Modular System (TMS)




| Designation | øDc | z | L6 | Lf | øD3 | Shank | Insert 1 | Insert 2 |
|---|---|---|---|---|---|---|---|---|
| HBD040E | 40 | 2(7) | 94 | 60 | 38 | HD..., HBT... | ZDMT4005-MJ | SCMT09T308-23 |
| HBD050E | 50 | 2(7) | 113 | 75 | 42 | HD..., HBT... | ZDMT5006-MJ | SCMT120408-23 |

### SPARE PARTS

| Designation | Clamping screw | Lubricant | Wrench | Wrench 1 |
|---|---|---|---|---|
| HBD040E | CSTB-4M | M-1000 | T-15T | KS-32 |
| HBD050E | CSTB-5 | M-1000 | T-20T | KS-36 |



HBD: Inserts → **D250**, Standard cutting conditions → **D251**

MEMO

# Designation

| ① Solid Carbide Endmill Code |
|---|

| ② Endmill type | |
|---|---|
| C | Square endmill |
| CA | Square endmill for aluminium |
| CC | Square endmill with chamfered |
| CH | Square endmill for finishing |
| B | Ball nose |
| FF | High feed |
| FS | FinishMeister |
| CP | Chip splitter |
| CR/RC/RF | Rougher |
| TR | Tapered & radius |
| BRF | Ball nose & rougher |

| ③ Cutting diameter (mm) | |
|---|---|
| 004 | 0.4 |
| 045 | 4.5 |
| 100 | 10 |

| ① | ② | ③ | | | | ⑥ |
|---|---|---|---|---|---|---|
| TE | C | 009 | A | 2 | - | 0135 |
| TE | C | 100 | E | 4L | - | 22 |
| | | | ④ | ⑤ | | ⑥ |

| ④ Helix angle | |
|---|---|
| N | 0° |
| C | 10° |
| T | 20° |
| A | 30° |
| E | 38° |
| B | 45° |
| D | 50° |
| F | 55° |
| H | Variable helix |

| ⑤ No. of flutes | |
|---|---|
| 2 | 2 flutes |
| 3 | 3 flutes |
| 4 | 4 flutes |
| 4M | 4 flutes & medium length |
| 4L | 4 flutes & long length |
| 4X | 4 flutes & extra long length |
| 4MF | 4 flutes & medium length for hardened steel |
| 44 | 4 variable pitch flutes |

| ⑥ Effective cutting length (mm) | |
|---|---|
| 006 | 0.6 |
| 0135 | 1.35 |
| 06 | 6 |
| 20 | 20 |



## Tungaloy Premium PVD Coated Grades

Tungaloy has achieved remarkable gains in metal removal rates and tool life with solid carbide endmills with a PVD coating, on a very tough submicron substrate.
These new materials provide high toughness and resistance to micro-cracks and chipping.

* TiAlN on a submicron substrate = AH725
* TiAlN on ultra-fine grain substrate = AH750

| Diameter range | Cutting diameter $øD^{e8}$ | Shank $ød^{h6}$ |
|---|---|---|
| < 3 | -0.014 - 0.028 | 0 - 0.007 |
| 3 - 6 | -0.02 - 0.038 | 0 - 0.008 |
| 6 - 10 | -0.025 - 0.047 | 0 - 0.009 |
| 10 - 18 | -0.032 - 0.059 | 0 - 0.011 |
| 18 - 30 | -0.04 - 0.073 | 0 - 0.013 |

| | |
|---|---|
| /04 | 4 |
| /10 /1.5 | 10 / 1.5° |
| /14 | 14 |

⑦ Length of neck / Angle neck (mm)

| | |
|---|---|
| C | Cylindrical |
| W | Weldon |

⑧ Shank type

| | |
|---|---|
| 055 | 5.5 |
| 08 | 8 |
| 4 | 4 |

⑨ Shank diameter (mm)

| ⑦ | ⑧ | ⑨ | | |
|---|---|---|---|---|
| /06 | C | 4 | M | E66 |
| /32 | C | 10 | CF- | 72 |
| | | | ⑩ | ⑪ |

| ⑩ Workpiece material / Additional feature | |
|---|---|
| - | General |
| S | Stainless steel |
| M | Steel medium hardness ≤ 55 HRC |
| H | Steel high hardness ≥ 55 HRC |
| R02A | Aluminium |
| CF | VARIABLEMEISTER |
| R16 | Corner radius: 1.6 |

| ⑪ Overall length / Corner radius | |
|---|---|
| 66 | 66 mm |
| 180 | 180 mm |
| E** | Eco type |
| M | Medium |
| R08 | Corner radius: 0.8 |

Multi Function

## AH725

- High thermal and chemical stability.
- High hardness 3500 HV makes higher speeds, machining of harder materials, and dry machining possible. The TiAlN coating can be applied at 800° C.
- Recommended for hardened steel, high-temperature and steel alloys.
- Improves and expedites finishing on dies and molds.
- Longer tool life in high speed machining.

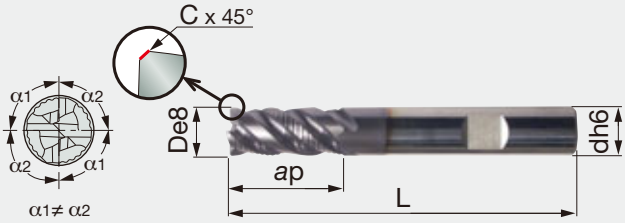
## AH750

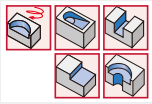
- Excellent for machining hard steel up to 70 HRC and high temperature alloys.
- The small grain size improves cutting edge strength and tends to chip less.

FINISHMEISTER VARIABLEMEISTER

## TEFS**E44-**CF...

4 flutes, 38° helix, variable pitch, combination, medium length



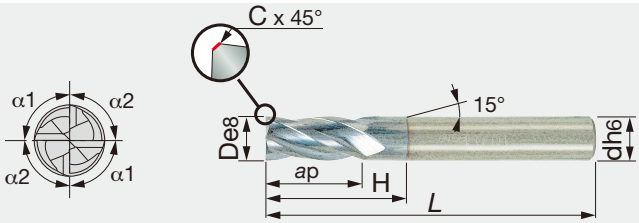



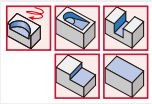
| Designation | AH725 | D | d | C | ap | L | Shank |
|---|---|---|---|---|---|---|---|
| TEFS060E44-14W06CF-57 | ● | 6 | 6 | 0.25 | 14 | 57 | Weldon |
| TEFS080E44-18W08CF-63 | ● | 8 | 8 | 0.3 | 18 | 63 | Weldon |
| TEFS100E44-22W10CF-72 | ● | 10 | 10 | 0.4 | 22 | 72 | Weldon |
| TEFS120E44-26W12CF-83 | ● | 12 | 12 | 0.5 | 26 | 83 | Weldon |
| TEFS140E44-30W14CF-83 | ● | 14 | 14 | 0.5 | 30 | 83 | Weldon |
| TEFS160E44-34W16CF-92 | ● | 16 | 16 | 0.6 | 34 | 92 | Weldon |
| TEFS200E44-42W20CF-104 | ● | 20 | 20 | 0.6 | 42 | 104 | Weldon |
| TEFS250E44-52W25CF-121 | ● | 25 | 25 | 0.6 | 52 | 121 | Weldon |

VARIABLEMEISTER

## TEC**E*L-**CF...

4 flutes endmill, 38° helix, variable pitch for chatter dampening



| Designation | AH725 | D | d | C | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC030E4L-8/11C06CF-57 | ● | 3 | 6 | 0.1 | 8 | 11 | 57 | Cylindrical |
| TEC040E4L-10/14C06CF-57 | ● | 4 | 6 | 0.15 | 10 | 14 | 57 | Cylindrical |
| TEC050E4L-12/17C06CF-57 | ● | 5 | 6 | 0.18 | 12 | 17 | 57 | Cylindrical |
| TEC060E4L-14/20C06CF-57 | ● | 6 | 6 | 0.25 | 14 | 20 | 57 | Cylindrical |
| TEC080E4L-18/26C08CF-63 | ● | 8 | 8 | 0.3 | 18 | 26 | 63 | Cylindrical |
| TEC100E4L-22/32C10CF-72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Cylindrical |
| TEC120E4L-26/38C12CF-83 | ● | 12 | 12 | 0.5 | 26 | 38 | 83 | Cylindrical |
| TEC160E4L-34/50C16CF-100 | ● | 16 | 16 | 0.6 | 34 | 50 | 100 | Cylindrical |
| TEC200E4L-42/60C20CF-125 | ● | 20 | 20 | 0.6 | 42 | 60 | 125 | Cylindrical |
| TEC250E4L-52/65C25CF-121 | ● | 25 | 25 | 0.6 | 52 | 65 | 121 | Cylindrical |

5 flutes endmill, 38° helix, variable pitch for chatter danpening, medium length endmills

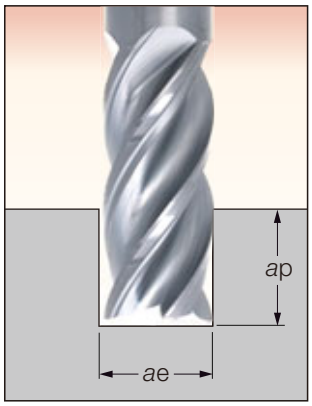
| Designation | AH725 | D | d | C | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC060E5L-15C06CF-57 | ● | 6 | 6 | 0.2 | 15 | - | 57 | Cylindrical |
| TEC080E5L-20C08CF-63 | ● | 8 | 8 | 0.25 | 20 | - | 63 | Cylindrical |
| TEC100E5L-25C10CF-72 | ● | 10 | 10 | 0.3 | 25 | - | 72 | Cylindrical |
| TEC120E5L-30C12CF-83 | ● | 12 | 12 | 0.4 | 30 | - | 83 | Cylindrical |
| TEC160E5L-40C16CF-100 | ● | 16 | 16 | 0.5 | 40 | - | 100 | Cylindrical |
| TEC200E5L-50C20CF-125 | ● | 20 | 20 | 0.5 | 50 | - | 125 | Cylindrical |

For recommended feed, see next page.



●: Line up

## Recommended feed - VariableMeister solid carbide endmills



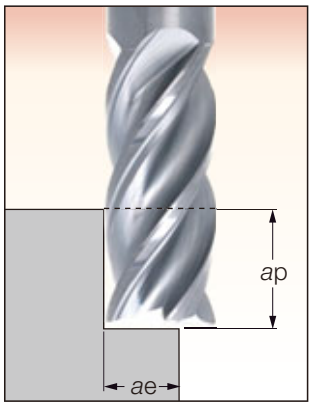

*ae* = D

*ap* = D × 0.5 ~ 1

| *øD* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.06 |
| 8 | 0.03 | 0.08 |
| 10 | 0.03 | 0.09 |
| 12 | 0.035 | 0.1 |
| 16 | 0.05 | 0.12 |
| 20 | 0.05 | 0.15 |
| 25 | 0.05 | 0.15 |

*ap* = D × 1 ~ 2

| *øD* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.05 |
| 8 | 0.03 | 0.05 |
| 10 | 0.03 | 0.05 |
| 12 | 0.035 | 0.06 |
| 16 | 0.04 | 0.07 |
| 20 | 0.05 | 0.08 |
| 25 | 0.05 | 0.08 |




*ae* = D × 45 ~ 75 %

*ap* = D × 0.5 ~ 1

| *øD* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.07 |
| 8 | 0.03 | 0.09 |
| 10 | 0.03 | 0.1 |
| 12 | 0.035 | 0.11 |
| 16 | 0.05 | 0.13 |
| 20 | 0.05 | 0.17 |
| 25 | 0.05 | 0.17 |

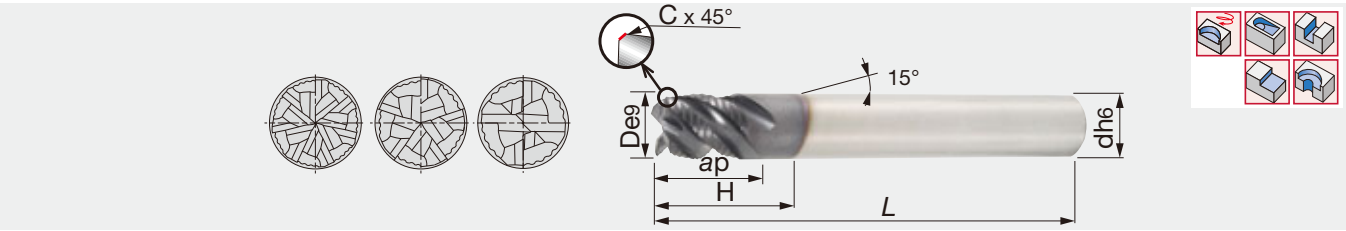
*ap* = D × 1 ~ 2

| *øD* | Min. *fz* | Max. *fz* |
|---|---|---|
| 6 | 0.025 | 0.06 |
| 8 | 0.03 | 0.08 |
| 10 | 0.03 | 0.09 |
| 12 | 0.035 | 0.1 |
| 16 | 0.05 | 0.11 |
| 20 | 0.05 | 0.11 |
| 25 | 0.05 | 0.11 |

• For the cutting conditions, please see D346.

## TECR**B*S...

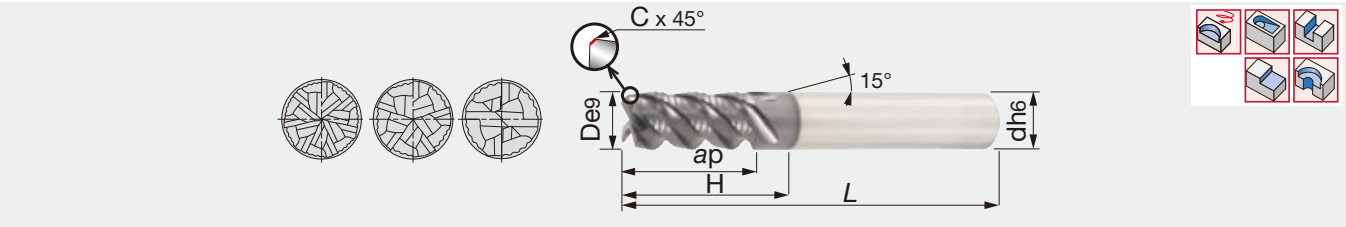
4 - 7 flutes rougher, 45° helix, short length (1xD)




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR050B4S-05W06-57 | ● | 5 | 6 | 0.2 | 5 | 10 | 57 | 4 | ● | Weldon |
| TECR060B4S-06W06-57 | ● | 6 | 6 | 0.25 | 6 | - | 57 | 4 | ● | Weldon |
| TECR080B4S-08W08-63 | ● | 8 | 8 | 0.25 | 8 | - | 63 | 4 | ● | Weldon |
| TECR100B4S-10W10-72 | ● | 10 | 10 | 0.3 | 10 | - | 72 | 4 | ● | Weldon |
| TECR120B4S-12W12-83 | ● | 12 | 12 | 0.35 | 12 | - | 83 | 4 | ● | Weldon |
| TECR160B5S-16W16-92 | ● | 16 | 16 | 0.4 | 16 | - | 92 | 5 | | Weldon |
| TECR200B7S-20W20-104 | ● | 20 | 20 | 0.4 | 20 | - | 104 | 7 | | Weldon |

## TECR**B*M...

4 - 7 flutes rougher, 45° helix, medium length (2xD)




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR050B4M-10W06-57 | ● | 5 | 6 | 0.2 | 10 | 15 | 57 | 4 | ● | Weldon |
| TECR060B4M-12W06-57 | ● | 6 | 6 | 0.25 | 12 | - | 57 | 4 | ● | Weldon |
| TECR080B4M-16W08-63 | ● | 8 | 8 | 0.25 | 16 | - | 63 | 4 | ● | Weldon |
| TECR100B4M-20W10-72 | ● | 10 | 10 | 0.3 | 20 | - | 72 | 4 | ● | Weldon |
| TECR120B4M-24W12-83 | ● | 12 | 12 | 0.35 | 24 | - | 83 | 4 | ● | Weldon |
| TECR160B5M-32W16-92 | ● | 16 | 16 | 0.4 | 32 | - | 92 | 5 | | Weldon |
| TECR200B7M-40W20-104 | ● | 20 | 20 | 0.4 | 40 | - | 104 | 7 | | Weldon |

First choice in roughing applications.

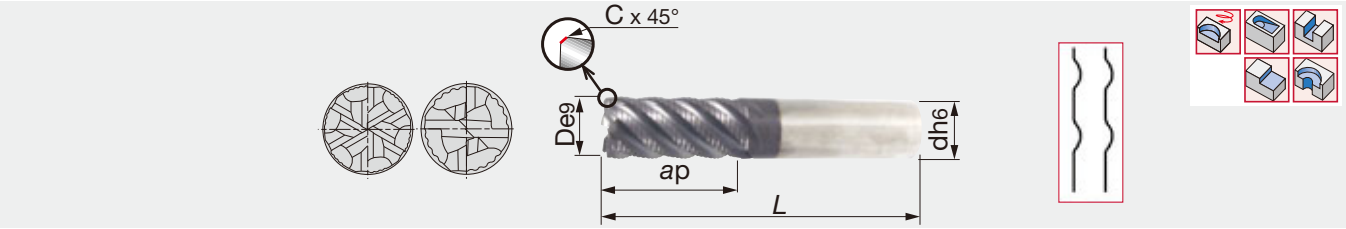


●: Line up

SHREDMEISTER

## TECR**B*MF...

4, 6 flutes rougher, 45° helix, medium length,for machining hardened steel and titanium alloys



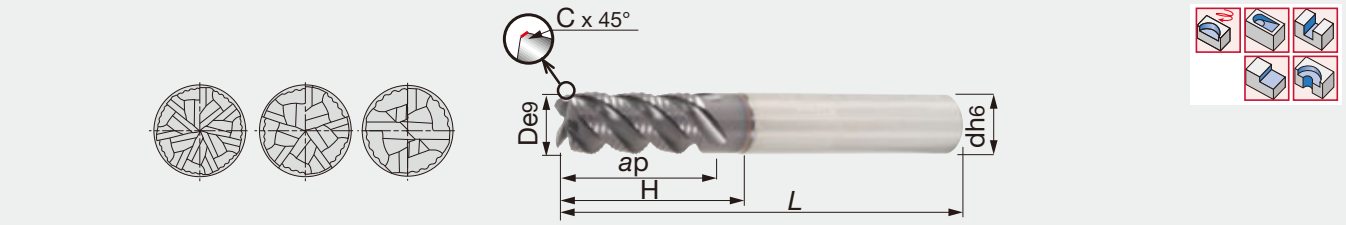

| Designation | AH725 | D | d | C | ap | L | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TECR060B4MF-14W06-57 | ● | 6 | 6 | 0.25 | 14 | 57 | 4 | Weldon |
| TECR080B4MF-18W08-63 | ● | 8 | 8 | 0.3 | 18 | 63 | 4 | Weldon |
| TECR100B4MF-22W10-72 | ● | 10 | 10 | 0.3 | 22 | 72 | 4 | Weldon |
| TECR120B4MF-26W12-83 | ● | 12 | 12 | 0.4 | 26 | 83 | 4 | Weldon |
| TECR140B4MF-30W14-83 | ● | 14 | 14 | 0.4 | 30 | 83 | 4 | Weldon |
| TECR160B6MF-34W16-92 | ● | 16 | 16 | 0.5 | 34 | 92 | 6 | Weldon |
| TECR200B6MF-42W20-104 | ● | 20 | 20 | 0.7 | 42 | 104 | 6 | Weldon |
| TECR250B6MF-52W25-121 | ● | 25 | 25 | 0.9 | 52 | 121 | 6 | Weldon |

The rougher's cutting edge profile has shallow serrations. This is a very durable design which leaves only a small amount of material for the finishing cut.

SHREDMEISTER

## TECR**B*L...

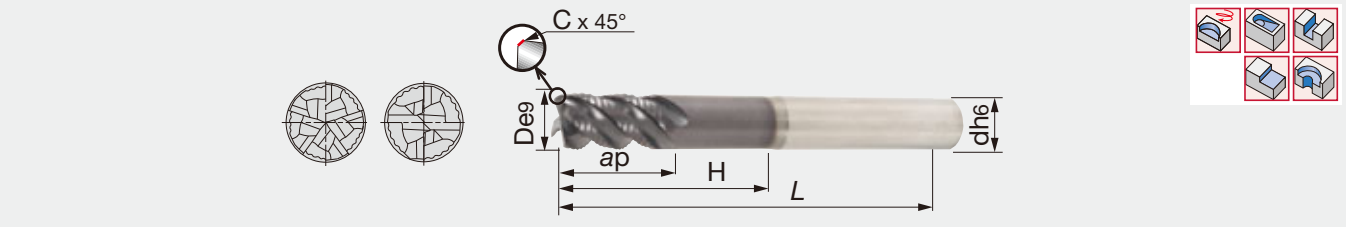
4 - 7 flutes rougher, 45° helix, long reach (3xD)




| Designation | AH725 | D | d | C | ap | H | L | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR060B4L-12/18W06-57 | ● | 6 | 6 | 0.25 | 12 | 18 | 57 | 4 | ● | Weldon |
| TECR080B4L-16/24W08-63 | ● | 8 | 8 | 0.25 | 16 | 24 | 63 | 4 | ● | Weldon |
| TECR100B4L-20/30W10-72 | ● | 10 | 10 | 0.3 | 20 | 30 | 72 | 4 | ● | Weldon |
| TECR120B4L-24/36W12-83 | ● | 12 | 12 | 0.35 | 24 | 36 | 83 | 4 | ● | Weldon |
| TECR160B5L-32/48W16-100 | ● | 16 | 16 | 0.4 | 32 | 48 | 100 | 5 | | Weldon |
| TECR200B7L-40/60W20-110 | ● | 20 | 20 | 0.4 | 40 | 60 | 110 | 7 | | Weldon |

## TECR**B*X...

4 - 5 flutes rougher, 45° helix, extra long reach (4xD)



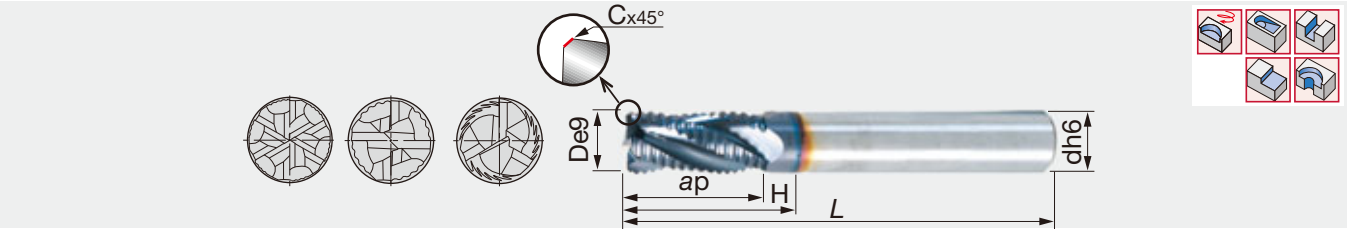

| Designation | AH725 | D | d | C | ap | H | L | z | | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TECR080B4X-12/32W08-68 | ● | 8 | 8 | 0.25 | 12 | 32 | 68 | 4 | ● | Weldon |
| TECR100B4X-15/40W10-80 | ● | 10 | 10 | 0.3 | 15 | 40 | 80 | 4 | ● | Weldon |
| TECR120B4X-18/48W12-100 | ● | 12 | 12 | 0.35 | 18 | 48 | 100 | 4 | ● | Weldon |
| TECR160B5X-24/64W16-115 | ● | 16 | 16 | 0.4 | 24 | 64 | 115 | 5 | | Weldon |

First choice in roughing applications.

●: Line up

## TERF**A..., TERF**E...

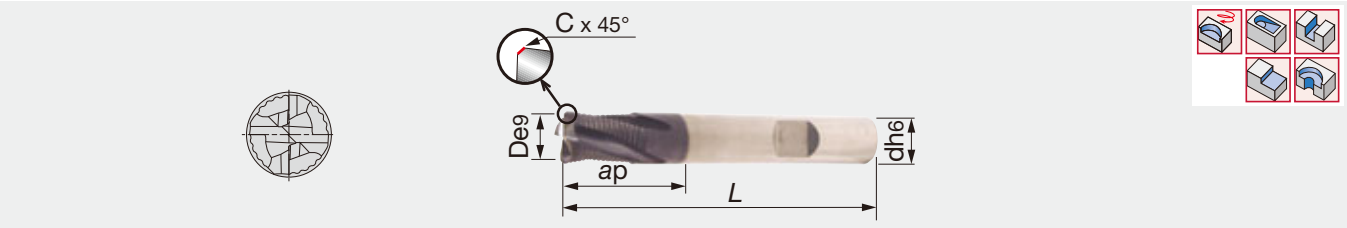
3 - 6 flutes rougher, 30° and 38° helix, medium length fine pitch for alloy steel, stainless steel




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Helix | z | Shank |
|---|---|---|---|---|---|---|---|---|---|---|
| TERF040E3-08C06-57 | ● | 4 | 6 | 0.25 | 8 | 13 | 57 | 38° | 3 | Cylindrical |
| TERF050E3-10C06-57 | ● | 5 | 6 | 0.3 | 10 | 17 | 57 | 38° | 3 | Cylindrical |
| TERF060E3-13C06-57 | ● | 6 | 6 | 0.3 | 13 | 21 | 57 | 38° | 3 | Cylindrical |
| TERF070E3-20C08-63 | ● | 7 | 8 | 0.3 | 20 | 26 | 63 | 38° | 3 | Cylindrical |
| TERF080E3-20C08-63 | ● | 8 | 8 | 0.3 | 20 | 28 | 63 | 38° | 3 | Cylindrical |
| TERF090A4-22C10-72 | ● | 9 | 10 | 0.3 | 22 | 30 | 72 | 30° | 4 | Cylindrical |
| TERF100A4-22C10-72 | ● | 10 | 10 | 0.3 | 22 | 30 | 72 | 30° | 4 | Cylindrical |
| TERF110A4-25C12-83 | ● | 11 | 12 | 0.3 | 25 | 32 | 83 | 30° | 4 | Cylindrical |
| TERF120A4-25C12-83 | ● | 12 | 12 | 0.4 | 25 | 37 | 83 | 30° | 4 | Cylindrical |
| TERF140A4-25C14-83 | ● | 14 | 14 | 0.5 | 25 | 37 | 83 | 30° | 4 | Cylindrical |
| TERF160A4-32C16-92 | ● | 16 | 16 | 0.5 | 32 | 44 | 92 | 30° | 4 | Cylindrical |
| TERF180A4-32C18-92 | ● | 18 | 18 | 0.5 | 32 | 44 | 92 | 30° | 4 | Cylindrical |
| TERF200A4-38C20-104 | ● | 20 | 20 | 0.6 | 38 | 55 | 104 | 30° | 4 | Cylindrical |
| TERF250A6-45C25-121 | ● | 25 | 25 | 0.6 | 45 | 64 | 121 | 30° | 6 | Cylindrical |

## TECR**T4M...

4 flutes rougher, 20° helix, medium length




| Designation | AH725 | D | *d* | C | *ap* | *L* | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TECR060T4M-10W06-57 | ● | 6 | 6 | 0.3 | 10 | 57 | 4 | Weldon |
| TECR080T4M-16W08-63 | ● | 8 | 8 | 0.4 | 16 | 63 | 4 | Weldon |
| TECR100T4M-20W10-72 | ● | 10 | 10 | 0.4 | 20 | 72 | 4 | Weldon |
| TECR120T4M-24W12-83 | ● | 12 | 12 | 0.4 | 24 | 83 | 4 | Weldon |
| TECR160T4M-32W16-92 | ● | 16 | 16 | 0.5 | 32 | 92 | 4 | Weldon |
| TECR200T4M-40W20-104 | ● | 20 | 20 | 0.5 | 40 | 104 | 4 | Weldon |

**For maximum metal removal.**

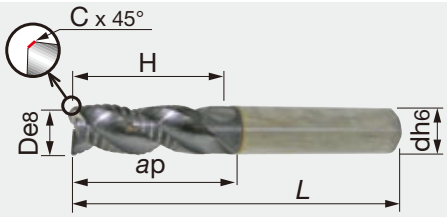


●: Line up

# TECP**E*L...

## 3 flutes chip splitter rougher, 38° helix, medium length

**M**
Stainless




| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECP050E3L-12/17W06S57 | ● | 5 | 6 | 0.3 | 12 | 17 | 57 | Weldon |
| TECP060E3L-14/20W06S57 | ● | 6 | 6 | 0.4 | 14 | 20 | 57 | Weldon |
| TECP080E3L-18/26W08S63 | ● | 8 | 8 | 0.4 | 18 | 26 | 63 | Weldon |
| TECP100E3L-22/32W10S72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Weldon |
| TECP120E3L-26/38W12S83 | ● | 12 | 12 | 0.4 | 26 | 38 | 83 | Weldon |
| TECP140E3L-30/44W14S100 | ● | 14 | 14 | 0.6 | 30 | 44 | 100 | Weldon |
| TECP160E3L-34/50W16S100 | ● | 16 | 16 | 0.5 | 34 | 50 | 100 | Weldon |
| TECP200E3L-42/62W20S125 | ● | 20 | 20 | 0.5 | 42 | 62 | 125 | Weldon |

## 4 flutes chip splitter rougher, 38° helix, medium length

| Designation | AH725 | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECP050E4L-12/17W06S57 | ● | 5 | 6 | 0.3 | 12 | 17 | 57 | Weldon |
| TECP060E4L-14/20W06S57 | ● | 6 | 6 | 0.4 | 14 | 20 | 57 | Weldon |
| TECP080E4L-18/26W08S63 | ● | 8 | 8 | 0.4 | 18 | 26 | 63 | Weldon |
| TECP100E4L-22/32W10S72 | ● | 10 | 10 | 0.4 | 22 | 32 | 72 | Weldon |
| TECP120E4L-26/38W12S83 | ● | 12 | 12 | 0.4 | 26 | 38 | 83 | Weldon |
| TECP140E4L-30/44W14S100 | ● | 14 | 14 | 0.6 | 30 | 44 | 100 | Weldon |
| TECP160E4L-34/50W16S100 | ● | 16 | 16 | 0.5 | 34 | 50 | 100 | Weldon |
| TECP200E4L-42/62W20S125 | ● | 20 | 20 | 0.5 | 42 | 62 | 125 | Weldon |

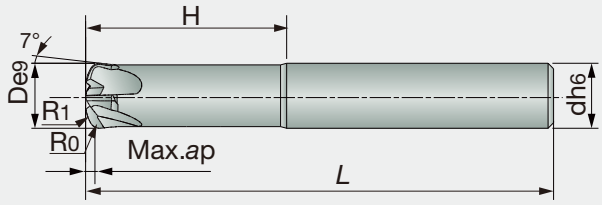
**Most recommended for machining stainless steel.**

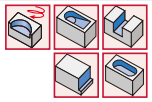


●: Line up

# TEFF**N4...

## High feed, 4 flutes solid carbide endmills



| Designation | AH750 | D | *d* | R0(1) | R1 | Max. *ap* | H | L | Max. fz mm/t |
|---|---|---|---|---|---|---|---|---|---|
| TEFF060N4-030/20C06R1M | ● | 6 | 6 | 1.2 | 5.3 | 0.3 | 20 | 57 | 0.3 |
| TEFF080N4-035/26C08R13M | ● | 8 | 8 | 1.6 | 7 | 0.4 | 26 | 63 | 0.4 |
| TEFF100N4-040/30C10R16M | ● | 10 | 10 | 2 | 8.8 | 0.5 | 30 | 72 | 0.5 |
| TEFF120N4-045/34C12R2M | ● | 12 | 12 | 2.5 | 10.6 | 0.6 | 34 | 83 | 0.5 |
| TEFF160N4-055/42C16R26M | ● | 16 | 16 | 3.3 | 14 | 0.8 | 42 | 92 | 0.6 |
| TEFF200N4-060/46C20R32M | ● | 20 | 20 | 4 | 17.7 | 1 | 46 | 104 | 0.7 |

(1) R0 should be used for programming.

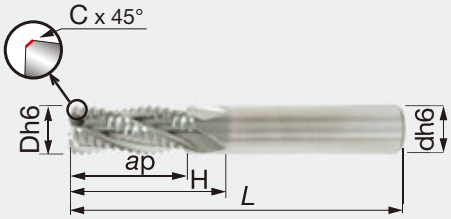


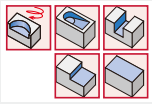
●: Line up

## TERC**E3...

3 flutes rougher, 38° helix, medium length for maximum stock removal in aluminium.
Coarse pitch for aluminium and nonferrous materials.

N
Non-ferrous



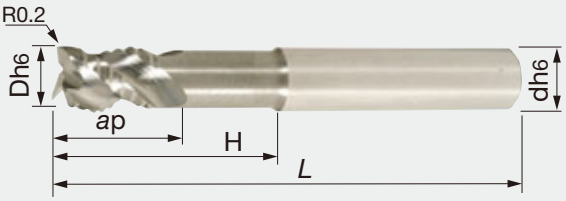



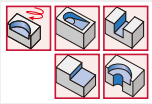
| Designation | KS15F | D | *d* | C | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TERC060E3-13C06-57 | ● | 6 | 6 | 0.5 | 13 | 21 | 57 | Cylindrical |
| TERC080E3-20C08-63 | ● | 8 | 8 | 0.5 | 20 | 28 | 63 | Cylindrical |
| TERC100E3-22C10-72 | ● | 10 | 10 | 0.6 | 22 | 30 | 72 | Cylindrical |
| TERC120E3-25C12-83 | ● | 12 | 12 | 0.6 | 25 | 37 | 83 | Cylindrical |
| TERC140E3-25C14-83 | ● | 14 | 14 | 0.6 | 25 | 37 | 83 | Cylindrical |
| TERC160E3-32C16-92 | ● | 16 | 16 | 0.6 | 32 | 44 | 92 | Cylindrical |
| TERC200E3-38C20-104 | ● | 20 | 20 | 0.7 | 38 | 55 | 104 | Cylindrical |

## TECR**B3...

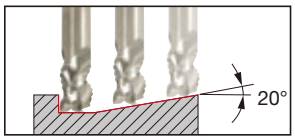
3 flutes rougher for aluminium, 45° helix, medium length

N
Non-ferrous



| Designation | KS15F | D | *d* | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TECR060B3-09/21C06R02A57 | ● | 6 | 6 | 9 | 21 | 57 | Cylindrical |
| TECR080B3-12/27C08R02A63 | ● | 8 | 8 | 12 | 27 | 63 | Cylindrical |
| TECR100B3-12/31C10R02A72 | ● | 10 | 10 | 12 | 31 | 72 | Cylindrical |
| TECR120B3-12/37C12R02A83 | ● | 12 | 12 | 12 | 37 | 83 | Cylindrical |
| TECR160B3-14/43C16R02A92 | ● | 16 | 16 | 14 | 43 | 92 | Cylindrical |
| TECR200B3-17/53C20R02A104 | ● | 20 | 20 | 17 | 53 | 104 | Cylindrical |




Rampdown angle

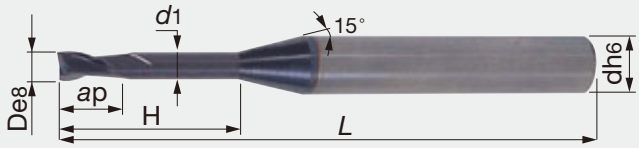


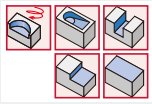
●: Line up

# TEC**A2-**C*M...

2 flutes endmill for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials



| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC004A2-006/02C4M45 | ● | 0.4 | 4 | 0.37 | 0.6 | 2 | 45 | Cylindrical |
| TEC004A2-006/04C4M45 | ● | 0.4 | 4 | 0.37 | 0.6 | 4 | 45 | Cylindrical |
| TEC005A2-007/02C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 2 | 45 | Cylindrical |
| TEC005A2-007/04C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 4 | 45 | Cylindrical |
| TEC005A2-007/06C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 6 | 45 | Cylindrical |
| TEC006A2-009/02C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 2 | 45 | Cylindrical |
| TEC006A2-009/04C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 4 | 45 | Cylindrical |
| TEC006A2-009/06C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 6 | 45 | Cylindrical |
| TEC007A2-010/02C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 2 | 45 | Cylindrical |
| TEC007A2-010/04C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 4 | 45 | Cylindrical |
| TEC007A2-010/06C4M45 | ● | 0.7 | 4 | 0.65 | 1 | 6 | 45 | Cylindrical |
| TEC008A2-012/04C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 4 | 45 | Cylindrical |
| TEC008A2-012/06C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 6 | 45 | Cylindrical |
| TEC008A2-012/08C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 8 | 45 | Cylindrical |
| TEC009A2-0135/06C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 6 | 45 | Cylindrical |
| TEC009A2-0135/08C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 8 | 45 | Cylindrical |
| TEC009A2-0135/10C4M45 | ● | 0.9 | 4 | 0.85 | 1.35 | 10 | 45 | Cylindrical |
| TEC010A2-015/04C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 4 | 45 | Cylindrical |
| TEC010A2-015/06C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 6 | 45 | Cylindrical |
| TEC010A2-015/08C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 8 | 45 | Cylindrical |
| TEC010A2-015/10C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 10 | 45 | Cylindrical |
| TEC010A2-015/12C4M45 | ● | 1 | 4 | 0.93 | 1.5 | 12 | 45 | Cylindrical |
| TEC010A2-015/16C4M50 | ● | 1 | 4 | 0.93 | 1.5 | 16 | 50 | Cylindrical |
| TEC012A2-018/06C4M45 | ● | 1.2 | 4 | 1.17 | 1.8 | 6 | 45 | Cylindrical |
| TEC012A2-018/08C4M45 | ● | 1.2 | 4 | 1.15 | 1.8 | 8 | 45 | Cylindrical |
| TEC012A2-018/10C4M45 | ● | 1.2 | 4 | 1.15 | 1.8 | 10 | 45 | Cylindrical |
| TEC012A2-018/12C4M45 | ● | 1.2 | 4 | 1.13 | 1.8 | 12 | 45 | Cylindrical |
| TEC012A2-018/16C4M50 | ● | 1.2 | 4 | 1.13 | 1.8 | 16 | 50 | Cylindrical |
| TEC014A2-021/06C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 6 | 45 | Cylindrical |
| TEC014A2-021/08C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 8 | 45 | Cylindrical |
| TEC014A2-021/10C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 10 | 45 | Cylindrical |
| TEC014A2-021/12C4M45 | ● | 1.4 | 4 | 1.33 | 2.1 | 12 | 45 | Cylindrical |
| TEC014A2-021/16C4M50 | ● | 1.4 | 4 | 1.31 | 2.1 | 16 | 50 | Cylindrical |
| TEC015A2-023/06C4M45 | ● | 1.5 | 4 | 1.47 | 2.3 | 6 | 45 | Cylindrical |
| TEC015A2-023/08C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 8 | 45 | Cylindrical |
| TEC015A2-023/10C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 10 | 45 | Cylindrical |
| TEC015A2-023/12C4M45 | ● | 1.5 | 4 | 1.43 | 2.3 | 12 | 45 | Cylindrical |
| TEC015A2-023/16C4M50 | ● | 1.5 | 4 | 1.41 | 2.3 | 16 | 50 | Cylindrical |

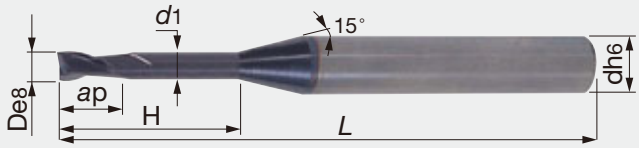


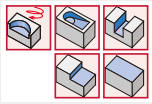
●: Line up

# TEC**A2-**C*M...

2 flutes endmill for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials



| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEC015A2-023/18C4M55 | ● | 1.5 | 4 | 1.41 | 2.3 | 18 | 55 | Cylindrical |
| TEC015A2-023/20C4M55 | ● | 1.5 | 4 | 1.41 | 2.3 | 20 | 55 | Cylindrical |
| TEC016A2-024/06C4M45 | ● | 1.6 | 4 | 1.57 | 2.4 | 6 | 45 | Cylindrical |
| TEC016A2-024/08C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 8 | 45 | Cylindrical |
| TEC016A2-024/10C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 10 | 45 | Cylindrical |
| TEC016A2-024/12C4M45 | ● | 1.6 | 4 | 1.53 | 2.4 | 12 | 45 | Cylindrical |
| TEC016A2-024/16C4M50 | ● | 1.6 | 4 | 1.53 | 2.4 | 16 | 50 | Cylindrical |
| TEC016A2-024/18C4M55 | ● | 1.6 | 4 | 1.53 | 2.4 | 18 | 55 | Cylindrical |
| TEC016A2-024/20C4M55 | ● | 1.6 | 4 | 1.53 | 2.4 | 20 | 55 | Cylindrical |
| TEC016A2-024/26C4M60 | ● | 1.6 | 4 | 1.53 | 2.4 | 26 | 60 | Cylindrical |
| TEC018A2-027/06C4M45 | ● | 1.8 | 4 | 1.77 | 2.7 | 6 | 45 | Cylindrical |
| TEC018A2-027/08C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 8 | 45 | Cylindrical |
| TEC018A2-027/10C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 10 | 45 | Cylindrical |
| TEC018A2-027/12C4M45 | ● | 1.8 | 4 | 1.73 | 2.7 | 12 | 45 | Cylindrical |
| TEC018A2-027/16C4M50 | ● | 1.8 | 4 | 1.71 | 2.7 | 16 | 50 | Cylindrical |
| TEC018A2-027/18C4M55 | ● | 1.8 | 4 | 1.71 | 2.7 | 18 | 55 | Cylindrical |
| TEC018A2-027/20C4M55 | ● | 1.8 | 4 | 1.69 | 2.7 | 20 | 55 | Cylindrical |
| TEC020A2-030/06C4M45 | ● | 2 | 4 | 1.97 | 3 | 6 | 45 | Cylindrical |
| TEC020A2-030/08C4M45 | ● | 2 | 4 | 1.95 | 3 | 8 | 45 | Cylindrical |
| TEC020A2-030/10C4M45 | ● | 2 | 4 | 1.95 | 3 | 10 | 45 | Cylindrical |
| TEC020A2-030/12C4M45 | ● | 2 | 4 | 1.93 | 3 | 12 | 45 | Cylindrical |
| TEC020A2-030/16C4M50 | ● | 2 | 4 | 1.91 | 3 | 16 | 50 | Cylindrical |
| TEC020A2-030/20C4M55 | ● | 2 | 4 | 1.89 | 3 | 20 | 55 | Cylindrical |
| TEC020A2-030/30C4M70 | ● | 2 | 4 | 1.89 | 3 | 30 | 70 | Cylindrical |
| TEC025A2-037/08C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 8 | 45 | Cylindrical |
| TEC025A2-037/10C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 10 | 45 | Cylindrical |
| TEC025A2-037/12C4M45 | ● | 2.5 | 4 | 2.4 | 3.7 | 12 | 45 | Cylindrical |
| TEC025A2-037/16C4M55 | ● | 2.5 | 4 | 2.4 | 3.7 | 16 | 55 | Cylindrical |
| TEC025A2-037/20C4M60 | ● | 2.5 | 4 | 2.4 | 3.7 | 20 | 60 | Cylindrical |
| TEC025A2-037/30C4M80 | ● | 2.5 | 4 | 2.4 | 3.7 | 30 | 80 | Cylindrical |
| TEC030A2-045/08C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 8 | 45 | Cylindrical |
| TEC030A2-045/10C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 10 | 45 | Cylindrical |
| TEC030A2-045/12C6M45 | ● | 3 | 6 | 2.85 | 4.5 | 12 | 45 | Cylindrical |
| TEC030A2-045/16C6M55 | ● | 3 | 6 | 2.85 | 4.5 | 16 | 55 | Cylindrical |
| TEC030A2-045/20C6M60 | ● | 3 | 6 | 2.85 | 4.5 | 20 | 60 | Cylindrical |
| TEC030A2-045/30C6M70 | ● | 3 | 6 | 2.85 | 4.5 | 30 | 70 | Cylindrical |
| TEC030A2-045/40C6M90 | ● | 3 | 6 | 2.85 | 4.5 | 40 | 90 | Cylindrical |

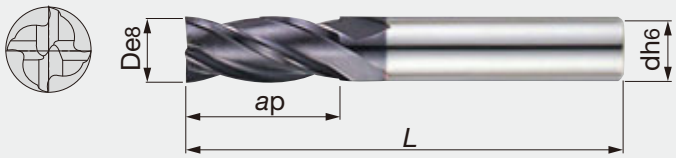


●: Line up

## TEC**A4-**C...

4 flutes, 30° helix, medium length for materials up to 65 HRC

H Hard Materials

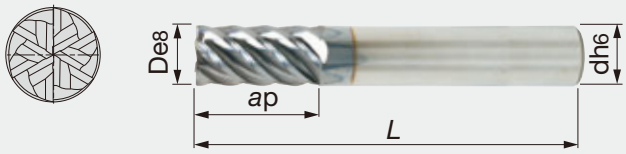



| Designation | AH750 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEC040A4-11C06-45 | ● | 4 | 6 | 11 | 45 | Cylindrical |
| TEC050A4-13C06-50 | ● | 5 | 6 | 13 | 50 | Cylindrical |
| TEC060A4-13C06-50 | ● | 6 | 6 | 13 | 50 | Cylindrical |
| TEC070A4-16C08-60 | ● | 7 | 8 | 16 | 60 | Cylindrical |
| TEC080A4-19C08-60 | ● | 8 | 8 | 19 | 60 | Cylindrical |
| TEC090A4-19C10-70 | ● | 9 | 10 | 19 | 70 | Cylindrical |
| TEC100A4-22C10-70 | ● | 10 | 10 | 22 | 70 | Cylindrical |
| TEC120A4-26C12-75 | ● | 12 | 12 | 26 | 75 | Cylindrical |
| TEC140A4-26C14-85 | ● | 14 | 14 | 26 | 85 | Cylindrical |
| TEC160A4-32C16-100 | ● | 16 | 16 | 32 | 100 | Cylindrical |
| TEC180A4-32C18-100 | ● | 18 | 18 | 32 | 100 | Cylindrical |
| TEC200A4-38C20-105 | ● | 20 | 20 | 38 | 105 | Cylindrical |

## TECH**B6...

6 flutes endmill, 45° helix, medium length for finishing hardened steels, for materials up to 65 HRC

H Hard Materials




| Designation | AH750 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TECH060B6-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TECH080B6-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TECH100B6-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TECH120B6-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TECH160B6-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TECH200B6-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

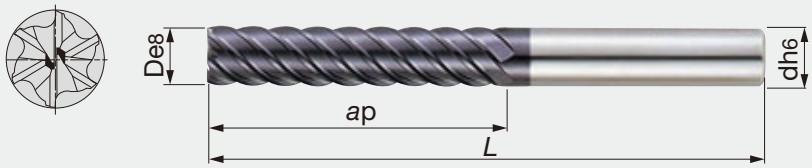


●: Line up

## TEC**B6...

6 flutes, 45° helix, extra long length, for materials up to 65 HRC

H
Hard Materials




| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC060B6-26C06-70 | ● | 6 | 6 | 26 | 70 | Cylindrical |
| TEC080B6-36C08-90 | ● | 8 | 8 | 36 | 90 | Cylindrical |
| TEC100B6-46C10-100 | ● | 10 | 10 | 46 | 100 | Cylindrical |
| TEC120B6-56C12-110 | ● | 12 | 12 | 56 | 110 | Cylindrical |
| TEC160B6-66C16-130 | ● | 16 | 16 | 66 | 130 | Cylindrical |
| TEC200B6-76C20-140 | ● | 20 | 20 | 76 | 140 | Cylindrical |
| TEC250B6-92C25-180 | ● | 25 | 25 | 92 | 180 | Cylindrical |

## TEC**D6...

6 flutes endmill, 50° helix, medium length, for materials up to 65 HRC

H
Hard Materials

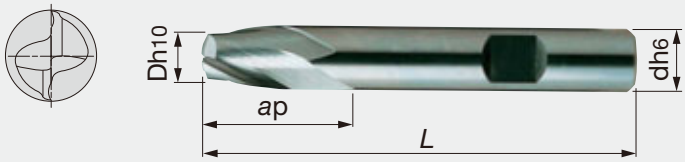
| Designation | AH750 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC060D6-13C06H57 | ● | 6 | 6 | 13 | 57 | Cylindrical |
| TEC080D6-20C08H63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC100D6-22C10H72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120D6-25C12H83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140D6-30C14H83 | ● | 14 | 14 | 30 | 83 | Cylindrical |
| TEC160D6-32C16H92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC200D6-38C20H104 | ● | 20 | 20 | 38 | 104 | Cylindrical |



●: Line up

# TEC**A2...

2 flutes, 30° helix, short cutting length



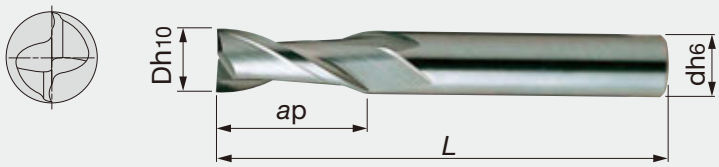

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020A2-03W06-E50 | ● | 2 | 6 | 3 | 50 | Weldon |
| TEC030A2-04W06-E50 | ● | 3 | 6 | 4 | 50 | Weldon |
| TEC035A2-04W06-E50 | ● | 3.5 | 6 | 4 | 50 | Weldon |
| TEC040A2-05W06-E54 | ● | 4 | 6 | 5 | 54 | Weldon |
| TEC045A2-05W06-E54 | ● | 4.5 | 6 | 5 | 54 | Weldon |
| TEC050A2-06W06-E54 | ● | 5 | 6 | 6 | 54 | Weldon |
| TEC060A2-07W06-E54 | ● | 6 | 6 | 7 | 54 | Weldon |
| TEC070A2-08W08-E58 | ● | 7 | 8 | 8 | 58 | Weldon |
| TEC080A2-09W08-E58 | ● | 8 | 8 | 9 | 58 | Weldon |
| TEC090A2-10W10-E66 | ● | 9 | 10 | 10 | 66 | Weldon |
| TEC100A2-11W10-E66 | ● | 10 | 10 | 11 | 66 | Weldon |
| TEC120A2-12W12-E73 | ● | 12 | 12 | 12 | 73 | Weldon |
| TEC140A2-14W14-E75 | ● | 14 | 14 | 14 | 75 | Weldon |
| TEC160A2-16W16-E82 | ● | 16 | 16 | 16 | 82 | Weldon |
| TEC180A2-18W18-E84 | ● | 18 | 18 | 18 | 84 | Weldon |
| TEC200A2-20W20-E92 | ● | 20 | 20 | 20 | 92 | Weldon |



●: Line up

# TEC**A2...

2 flutes, medium length, 30° helix



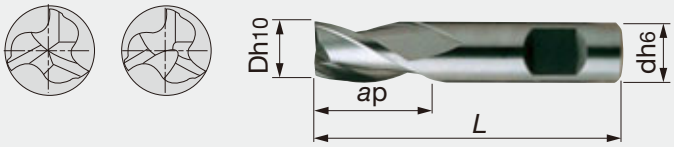

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC010A2-03C04-E50 | ● | 1 | 4 | 3 | 50 | Cylindrical |
| TEC015A2-045C04-E50 | ● | 1.5 | 4 | 4.5 | 50 | Cylindrical |
| TEC020A2-08C02-E32 | ● | 2 | 2 | 8 | 32 | Cylindrical |
| TEC025A2-08C025-E32 | ● | 2.5 | 2.5 | 8 | 32 | Cylindrical |
| TEC030A2-12C03-E38 | ● | 3 | 3 | 12 | 38 | Cylindrical |
| TEC035A2-12C035-E32 | ● | 3.5 | 3.5 | 12 | 32 | Cylindrical |
| TEC040A2-12C04-E50 | ● | 4 | 4 | 12 | 50 | Cylindrical |
| TEC045A2-14C045-E50 | ● | 4.5 | 4.5 | 14 | 50 | Cylindrical |
| TEC050A2-14C05-E50 | ● | 5 | 5 | 14 | 50 | Cylindrical |
| TEC055A2-16C055-E50 | ● | 5.5 | 5.5 | 16 | 50 | Cylindrical |
| TEC060A2-16C06-E50 | ● | 6 | 6 | 16 | 50 | Cylindrical |
| TEC070A2-20C07-E60 | ● | 7 | 7 | 20 | 60 | Cylindrical |
| TEC080A2-20C08-E63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC090A2-20C09-E60 | ● | 9 | 9 | 20 | 60 | Cylindrical |
| TEC100A2-22C10-E72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120A2-22C12-E70 | ● | 12 | 12 | 22 | 70 | Cylindrical |
| TEC140A2-25C14-E75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160A2-25C16-E75 | ● | 16 | 16 | 25 | 75 | Cylindrical |
| TEC200A2-32C20-E100 | ● | 20 | 20 | 32 | 100 | Cylindrical |



●: Line up

## TEC**A3..., TEC**E3...

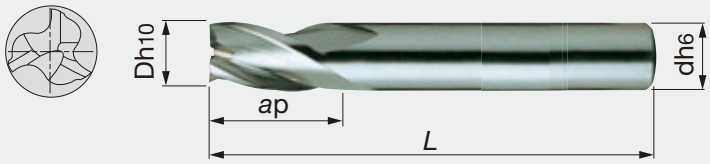
3 flutes, 30° and 38° helix, short length




| Designation | AH725 | D | *d* | *ap* | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TEC020E3-04C06-E35 | ● | 2 | 6 | 4 | 35 | 38 | Cylindrical |
| TEC025E3-05C06-E36 | ● | 2.5 | 6 | 5 | 36 | 38 | Cylindrical |
| TEC030E3-05C06-E36 | ● | 3 | 6 | 5 | 36 | 38 | Cylindrical |
| TEC035A3-06W06-E37 | ● | 3.5 | 6 | 6 | 37 | 30 | Weldon |
| TEC040E3-07C06-E38 | ● | 4 | 6 | 7 | 38 | 38 | Cylindrical |
| TEC045A3-08W06-E38 | ● | 4.5 | 6 | 8 | 38 | 30 | Weldon |
| TEC050A3-08C06-E39 | ● | 5 | 6 | 8 | 39 | 30 | Cylindrical |
| TEC055A3-08W06-E39 | ● | 5.5 | 6 | 8 | 39 | 30 | Weldon |
| TEC060E3-08C06-E39 | ● | 6 | 6 | 8 | 39 | 38 | Cylindrical |
| TEC070A3-10W08-E42 | ● | 7 | 8 | 10 | 42 | 30 | Weldon |
| TEC080E3-11C08-E43 | ● | 8 | 8 | 11 | 43 | 38 | Cylindrical |
| TEC090A3-11W10-E48 | ● | 9 | 10 | 11 | 48 | 30 | Weldon |
| TEC100E3-13C10-E50 | ● | 10 | 10 | 13 | 50 | 38 | Cylindrical |
| TEC120A3-15C12-E55 | ● | 12 | 12 | 15 | 55 | 30 | Cylindrical |

## TEC**A3..., TEC**E3...

3 flutes, 30° and 38° helix, medium length



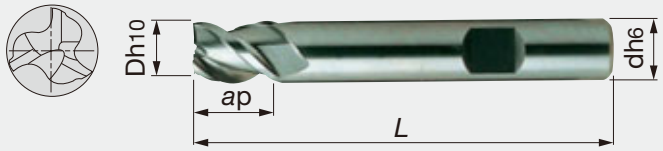

| Designation | AH725 | D | *d* | *ap* | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TEC020E3-08C02-E32 | ● | 2 | 2 | 8 | 32 | 38 | Cylindrical |
| TEC030E3-12C03-E38 | ● | 3 | 3 | 12 | 38 | 38 | Cylindrical |
| TEC040E3-12C04-E50 | ● | 4 | 4 | 12 | 50 | 38 | Cylindrical |
| TEC050E3-14C05-E50 | ● | 5 | 5 | 14 | 50 | 38 | Cylindrical |
| TEC060E3-16C06-E50 | ● | 6 | 6 | 16 | 50 | 38 | Cylindrical |
| TEC070E3-20C07-E60 | ● | 7 | 7 | 20 | 60 | 38 | Cylindrical |
| TEC080E3-20C08-E63 | ● | 8 | 8 | 20 | 63 | 38 | Cylindrical |
| TEC090A3-20C09-E60 | ● | 9 | 9 | 20 | 60 | 30 | Cylindrical |
| TEC100E3-22C10-E72 | ● | 10 | 10 | 22 | 72 | 38 | Cylindrical |
| TEC120E3-22C12-E73 | ● | 12 | 12 | 22 | 73 | 38 | Cylindrical |
| TEC140A3-25C14-E75 | ● | 14 | 14 | 25 | 75 | 30 | Cylindrical |
| TEC160A3-25C16-E75 | ● | 16 | 16 | 25 | 75 | 30 | Cylindrical |
| TEC200E3-32C20-E104 | ● | 20 | 20 | 32 | 104 | 38 | Cylindrical |



●: Line up

# TEC**B3-**W...

3 flutes, 45° helix, short length



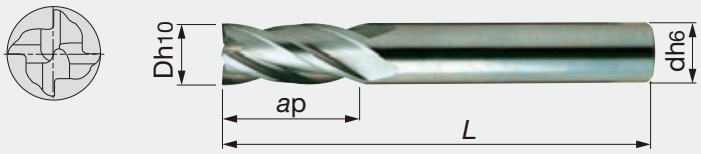

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020B3-03W06-50 | ● | 2 | 6 | 3 | 50 | Weldon |
| TEC030B3-04W06-50 | ● | 3 | 6 | 4 | 50 | Weldon |
| TEC040B3-05W06-54 | ● | 4 | 6 | 5 | 54 | Weldon |
| TEC050B3-06W06-54 | ● | 5 | 6 | 6 | 54 | Weldon |
| TEC060B3-07W06-54 | ● | 6 | 6 | 7 | 54 | Weldon |
| TEC080B3-09W08-58 | ● | 8 | 8 | 9 | 58 | Weldon |
| TEC100B3-11W10-66 | ● | 10 | 10 | 11 | 66 | Weldon |
| TEC120B3-12W12-73 | ● | 12 | 12 | 12 | 73 | Weldon |
| TEC140B3-14W14-75 | ● | 14 | 14 | 14 | 75 | Weldon |
| TEC160B3-16W16-82 | ● | 16 | 16 | 16 | 82 | Weldon |
| TEC180B3-18W18-84 | ● | 18 | 18 | 18 | 84 | Weldon |
| TEC200B3-20W20-92 | ● | 20 | 20 | 20 | 92 | Weldon |



●: Line up

## TEC**A4-**C**-E...

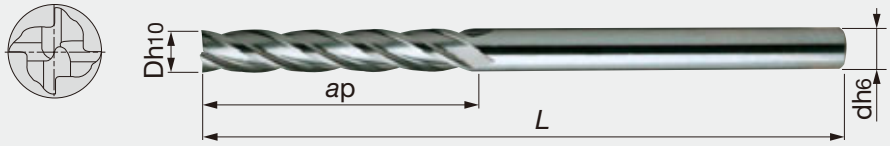
4 flutes, 30° helix, medium length




| Designation | AH725 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEC020A4-08C02-E32 | ● | 2 | 2 | 8 | 32 | Cylindrical |
| TEC025A4-08C025-E32 | ● | 2.5 | 2.5 | 8 | 32 | Cylindrical |
| TEC030A4-12C03-E32 | ● | 3 | 3 | 12 | 32 | Cylindrical |
| TEC035A4-12C035-E32 | ● | 3.5 | 3.5 | 12 | 32 | Cylindrical |
| TEC040A4-12C04-E50 | ● | 4 | 4 | 12 | 50 | Cylindrical |
| TEC045A4-14C045-E50 | ● | 4.5 | 4.5 | 14 | 50 | Cylindrical |
| TEC050A4-14C05-E50 | ● | 5 | 5 | 14 | 50 | Cylindrical |
| TEC055A4-16C055-E50 | ● | 5.5 | 5.5 | 16 | 50 | Cylindrical |
| TEC060A4-16C06-E50 | ● | 6 | 6 | 16 | 50 | Cylindrical |
| TEC070A4-20C07-E60 | ● | 7 | 7 | 20 | 60 | Cylindrical |
| TEC080A4-20C08-E60 | ● | 8 | 8 | 20 | 60 | Cylindrical |
| TEC090A4-20C09-E60 | ● | 9 | 9 | 20 | 60 | Cylindrical |
| TEC100A4-22C10-E72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120A4-22C12-E70 | ● | 12 | 12 | 22 | 70 | Cylindrical |
| TEC140A4-25C14-E75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160A4-25C16-E75 | ● | 16 | 16 | 25 | 75 | Cylindrical |
| TEC200A4-32C20-E100 | ● | 20 | 20 | 32 | 100 | Cylindrical |

## TEC**A4-**C**-E...

4 flutes, 30° helix, extra long




| Designation | AH725 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEC030A4-30C03-E75 | ● | 3 | 3 | 30 | 75 | Cylindrical |
| TEC040A4-30C04-E75 | ● | 4 | 4 | 30 | 75 | Cylindrical |
| TEC050A4-40C05-E100 | ● | 5 | 5 | 40 | 100 | Cylindrical |
| TEC060A4-50C06-E150 | ● | 6 | 6 | 50 | 150 | Cylindrical |
| TEC080A4-50C08-E150 | ● | 8 | 8 | 50 | 150 | Cylindrical |
| TEC100A4-60C10-E150 | ● | 10 | 10 | 60 | 150 | Cylindrical |
| TEC120A4-75C12-E150 | ● | 12 | 12 | 75 | 150 | Cylindrical |
| TEC140A4-65C14-E150 | ● | 14 | 14 | 65 | 150 | Cylindrical |
| TEC160A4-65C16-E150 | ● | 16 | 16 | 65 | 150 | Cylindrical |
| TEC200A4-65C20-E150 | ● | 20 | 20 | 65 | 150 | Cylindrical |

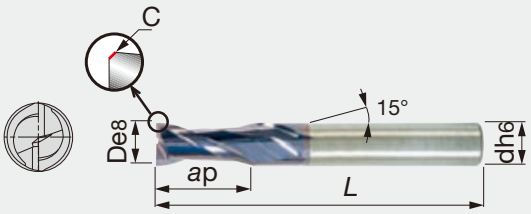


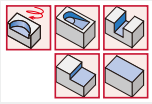
●: Line up

## TECC**A2..., TECC**B2...

2 flutes slot drill, 30° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



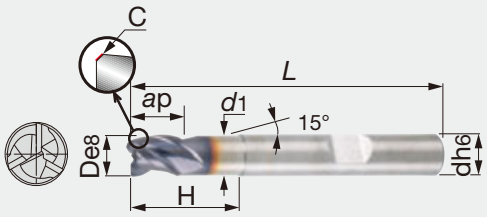



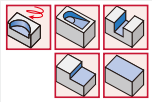
| Designation | AH725 | D | *d* | *ap* | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B2-07C03-38 | ● | 2 | 3 | 7 | 38 | 45° | Cylindrical |
| TECC030A2-10C03-38 | ● | 3 | 3 | 10 | 38 | 30° | Cylindrical |
| TECC040A2-12C04-50 | ● | 4 | 4 | 12 | 50 | 30° | Cylindrical |
| TECC050A2-14C05-50 | ● | 5 | 5 | 14 | 50 | 30° | Cylindrical |
| TECC060A2-16C06-57 | ● | 6 | 6 | 16 | 57 | 30° | Cylindrical |
| TECC080A2-20C08-63 | ● | 8 | 8 | 20 | 63 | 30° | Cylindrical |
| TECC100A2-22C10-72 | ● | 10 | 10 | 22 | 72 | 30° | Cylindrical |
| TECC120A2-25C12-83 | ● | 12 | 12 | 25 | 83 | 30° | Cylindrical |
| TECC160A2-32C16-92 | ● | 16 | 16 | 32 | 92 | 30° | Cylindrical |
| TECC200A2-38C20-104 | ● | 20 | 20 | 38 | 104 | 30° | Cylindrical |

## TECS**E3..., TECCS**E3...

3 flutes slot drill, 38° helix, short length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| D>10 | 0.25x45° |



| Designation | AH725 | D | *d* | *d*1 | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECS020E3-03W06-57 | ● | 2 | 6 | 1.9 | 3 | 7 | 57 | Weldon |
| TECS030E3-04W06-57 | ● | 3 | 6 | 2.9 | 4 | 10 | 57 | Weldon |
| TECS040E3-05W06-57 | ● | 4 | 6 | 3.9 | 5 | 12 | 57 | Weldon |
| TECS050E3-06W06-57 | ● | 5 | 6 | 4.9 | 6 | 14 | 57 | Weldon |
| TECCS060E3-07W06-57 | ● | 6 | 6 | 5.9 | 7 | 16 | 57 | Weldon |
| TECCS080E3-09W08-63 | ● | 8 | 8 | 7.6 | 9 | 20 | 63 | Weldon |
| TECCS100E3-11W10-72 | ● | 10 | 10 | 9.5 | 11 | 22 | 72 | Weldon |
| TECCS120E3-12W12-83 | ● | 12 | 12 | 11.3 | 12 | 25 | 83 | Weldon |
| TECCS160E3-16W16-92 | ● | 16 | 16 | 15.2 | 16 | 32 | 92 | Weldon |
| TECCS200E3-20W20-104 | ● | 20 | 20 | 19 | 20 | 38 | 104 | Weldon |

**Due to short and stable design, feed can be increased by 25%.**

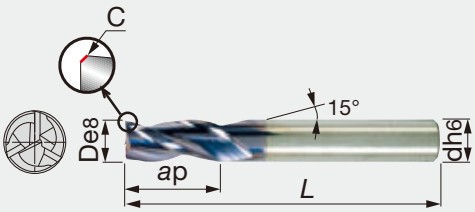


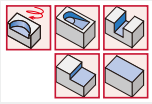
●: Line up

# TECC**B3..., TECC**E3...

3 flutes slot drill, 38° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



| Designation | AH725 | D | *d* | $a_p$ | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B3-07C03-38 | ● | 2 | 3 | 7 | 38 | 45° | Cylindrical |
| TECC030E3-10C03-38 | ● | 3 | 3 | 10 | 38 | 38° | Cylindrical |
| TECC040E3-12C04-50 | ● | 4 | 4 | 12 | 50 | 38° | Cylindrical |
| TECC050E3-14C05-50 | ● | 5 | 5 | 14 | 50 | 38° | Cylindrical |
| TECC060E3-16C06-57 | ● | 6 | 6 | 16 | 57 | 38° | Cylindrical |
| TECC080E3-20C08-63 | ● | 8 | 8 | 20 | 63 | 38° | Cylindrical |
| TECC100E3-22C10-72 | ● | 10 | 10 | 22 | 72 | 38° | Cylindrical |
| TECC120E3-25C12-83 | ● | 12 | 12 | 25 | 83 | 38° | Cylindrical |
| TECC160E3-32C16-92 | ● | 16 | 16 | 32 | 92 | 38° | Cylindrical |
| TECC200E3-38C20-104 | ● | 20 | 20 | 38 | 104 | 38° | Cylindrical |

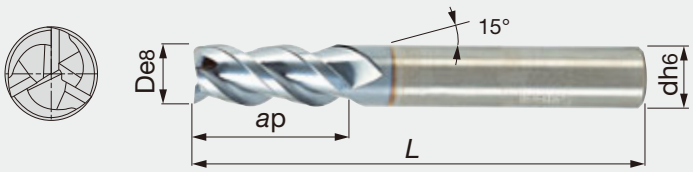
Multi-purpose endmills.
Also suitable for deep slotting.

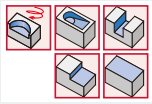


●: Line up

## TEC**B3-**C...

3 flutes slot drill, 45° helix, medium length



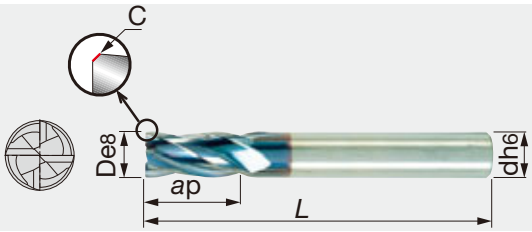
| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020B3-07C06-57 | ● | 2 | 6 | 7 | 57 | Cylindrical |
| TEC030B3-10C06-57 | ● | 3 | 6 | 10 | 57 | Cylindrical |
| TEC040B3-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TEC050B3-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TEC060B3-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TEC070B3-16C07-60 | ● | 7 | 7 | 16 | 60 | Cylindrical |
| TEC080B3-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC090B3-20C09-67 | ● | 9 | 9 | 20 | 67 | Cylindrical |
| TEC100B3-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120B3-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140B3-25C14-75 | ● | 14 | 14 | 25 | 75 | Cylindrical |
| TEC160B3-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC180B3-32C18-92 | ● | 18 | 18 | 32 | 92 | Cylindrical |
| TEC200B3-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

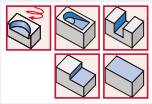
Excellent for deep slotting and shoulder milling.

## TECC**A4..., TECC**B4...

4 flutes endmill, 30° and 45° helix, medium length

| øD | C |
|---|---|
| D≤4 | 0.1x45° |
| 4< D≤10 | 0.15x45° |
| 10< D | 0.25x45° |



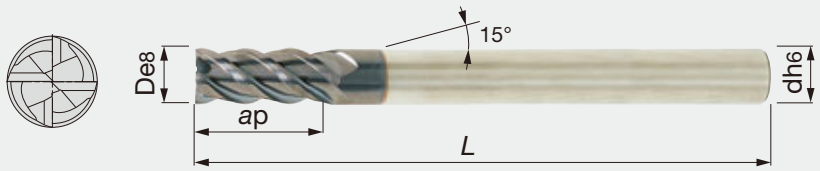
| Designation | AH725 | D | *d* | *ap* | *L* | Helix | Shank |
|---|---|---|---|---|---|---|---|
| TECC020B4-07C03-38 | ● | 2 | 3 | 7 | 38 | 45 | Cylindrical |
| TECC030A4-10C03-38 | ● | 3 | 3 | 10 | 38 | 30 | Cylindrical |
| TECC040A4-12C04-50 | ● | 4 | 4 | 12 | 50 | 30 | Cylindrical |
| TECC050A4-14C05-50 | ● | 5 | 5 | 14 | 50 | 30 | Cylindrical |
| TECC060A4-16C06-57 | ● | 6 | 6 | 16 | 57 | 30 | Cylindrical |
| TECC080A4-20C08-63 | ● | 8 | 8 | 20 | 63 | 30 | Cylindrical |
| TECC100A4-22C10-72 | ● | 10 | 10 | 22 | 72 | 30 | Cylindrical |
| TECC120A4-25C12-83 | ● | 12 | 12 | 25 | 83 | 30 | Cylindrical |
| TECC160A4-32C16-92 | ● | 16 | 16 | 32 | 92 | 30 | Cylindrical |
| TECC200A4-38C20-104 | ● | 20 | 20 | 38 | 104 | 30 | Cylindrical |

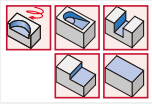


●: Line up

# TEC**B4...

4 flutes endmill, 45° helix, medium length



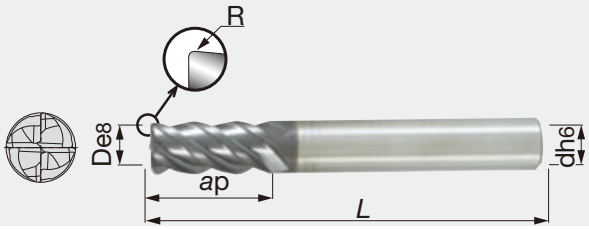
| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEC020B4-07C06-57 | ● | 2 | 6 | 7 | 57 | Cylindrical |
| TEC030B4-10C06-57 | ● | 3 | 6 | 10 | 57 | Cylindrical |
| TEC040B4-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TEC050B4-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TEC060B4-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TEC080B4-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TEC100B4-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TEC120B4-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TEC140B4-25C14-83 | ● | 14 | 14 | 25 | 83 | Cylindrical |
| TEC160B4-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TEC180B4-32C18-92 | ● | 18 | 18 | 32 | 92 | Cylindrical |
| TEC200B4-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

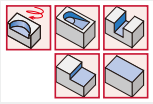


●: Line up

# TEC**B4-**R...

4 flutes endmill with radius corner, 45° helix, medium length



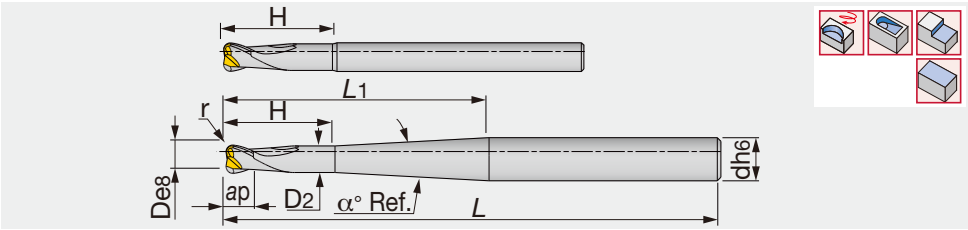
| Designation | AH725 | D | *d* | R | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TEC060B4-16C06R05-57 | ● | 6 | 6 | 0.5 | 16 | 57 | Cylindrical |
| TEC060B4-16C06R1-57 | ● | 6 | 6 | 1 | 16 | 57 | Cylindrical |
| TEC080B4-20C08R05-63 | ● | 8 | 8 | 0.5 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R1-63 | ● | 8 | 8 | 1 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R15-63 | ● | 8 | 8 | 1.5 | 20 | 63 | Cylindrical |
| TEC080B4-20C08R2-63 | ● | 8 | 8 | 2 | 20 | 63 | Cylindrical |
| TEC100B4-22C10R05-72 | ● | 10 | 10 | 0.5 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R1-72 | ● | 10 | 10 | 1 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R15-72 | ● | 10 | 10 | 1.5 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R2-72 | ● | 10 | 10 | 2 | 22 | 72 | Cylindrical |
| TEC100B4-22C10R3-72 | ● | 10 | 10 | 3 | 22 | 72 | Cylindrical |
| TEC120B4-25C12R05-83 | ● | 12 | 12 | 0.5 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R1-83 | ● | 12 | 12 | 1 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R15-83 | ● | 12 | 12 | 1.5 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R2-83 | ● | 12 | 12 | 2 | 25 | 83 | Cylindrical |
| TEC120B4-25C12R3-83 | ● | 12 | 12 | 3 | 25 | 83 | Cylindrical |
| TEC160B4-32C16R05-92 | ● | 16 | 16 | 0.5 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R1-92 | ● | 16 | 16 | 1 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R2-92 | ● | 16 | 16 | 2 | 32 | 92 | Cylindrical |
| TEC160B4-32C16R3-92 | ● | 16 | 16 | 3 | 32 | 92 | Cylindrical |
| TEC200B4-38C20R05-104 | ● | 20 | 20 | 0.5 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R1-104 | ● | 20 | 20 | 1 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R2-104 | ● | 20 | 20 | 2 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R3-104 | ● | 20 | 20 | 3 | 38 | 104 | Cylindrical |
| TEC200B4-38C20R4-104 | ● | 20 | 20 | 4 | 38 | 104 | Cylindrical |



●: Line up

## TETR**A2-**R...

2 flutes toroidal endmills

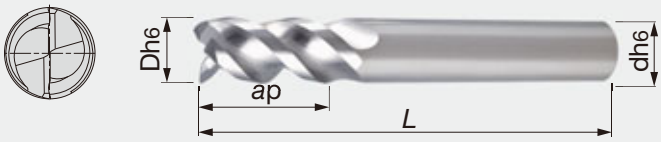



| Designation | AH725 | D | d | D2 | r | ap | H | L1 | α° | L | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TETR020A2-2/08C06R05M80 | ● | 2 | 6 | 1.9 | 0.5 | 2 | 8 | 40 | 3.6 | 80 | Cylindrical |
| TETR030A2-2/12C06R05M80 | ● | 3 | 6 | 2.8 | 0.5 | 2 | 12 | 40 | 3.3 | 80 | Cylindrical |
| TETR040A2-3/16C06R1M80 | ● | 4 | 6 | 3.7 | 1 | 3 | 16 | 40 | 2.8 | 80 | Cylindrical |
| TETR060A2-4/25C06R2M80 | ● | 6 | 6 | 5.6 | 2 | 4 | 25 | - | 0 | 80 | Cylindrical |
| TETR060A2-4/25C08R2M100 | ● | 6 | 8 | 5.6 | 2 | 4 | 25 | 66 | 2.0 | 100 | Cylindrical |
| TETR080A2-4/32C08R2M100 | ● | 7 | 8 | 7.6 | 2 | 4 | 32 | - | 0 | 100 | Cylindrical |
| TETR080A2-4/32C10R2M120 | ● | 7 | 10 | 7.6 | 2 | 4 | 32 | 66 | 2.0 | 120 | Cylindrical |
| TETR100A2-6/40C10R3M120 | ● | 10 | 10 | 9.6 | 3 | 6 | 40 | - | 0 | 120 | Cylindrical |
| TETR100A2-6/40C12R3M158 | ● | 10 | 12 | 9.6 | 3 | 6 | 40 | 110 | 1.0 | 158 | Cylindrical |

## TECA**B2...

2 flutes aluminium slot drill, 45° helix, medium length

N
Non-ferrous




| Designation | KS15F | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TECA040B2-12C06-57 | ● | 4 | 6 | 12 | 57 | Cylindrical |
| TECA050B2-14C06-57 | ● | 5 | 6 | 14 | 57 | Cylindrical |
| TECA060B2-16C06-57 | ● | 6 | 6 | 16 | 57 | Cylindrical |
| TECA080B2-20C08-63 | ● | 8 | 8 | 20 | 63 | Cylindrical |
| TECA100B2-22C10-72 | ● | 10 | 10 | 22 | 72 | Cylindrical |
| TECA120B2-25C12-83 | ● | 12 | 12 | 25 | 83 | Cylindrical |
| TECA160B2-32C16-92 | ● | 16 | 16 | 32 | 92 | Cylindrical |
| TECA200B2-38C20-104 | ● | 20 | 20 | 38 | 104 | Cylindrical |

Special design for aluminium



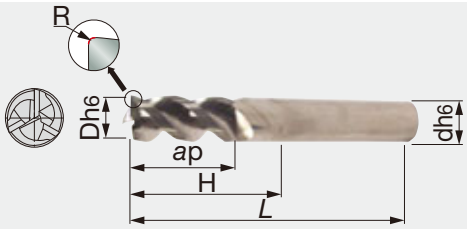
●: Line up

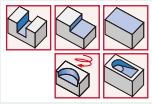
VARIABLEMEISTER
TUNGALOY

## TECA**H3-**CF-R...

Solid carbide endmills for aluminium, center cutting, 3 flutes, 39 - 41° variable helix for chatter dampening

N
Non-ferrous



| Designation | KS15F | D | *d* | R | *ap* | H | *L* | Shank |
|---|---|---|---|---|---|---|---|---|
| TECA030H3-07/12C06CF-R01 | ● | 3 | 6 | 0.1 | 7 | 12 | 57 | Cylindrical |
| TECA040H3-10/16C06CF-R02 | ● | 4 | 6 | 0.2 | 10 | 16 | 57 | Cylindrical |
| TECA050H3-12/20C06CF-R02 | ● | 5 | 6 | 0.2 | 12 | 20 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R02 | ● | 6 | 6 | 0.2 | 9 | 18 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R04 | ● | 6 | 6 | 0.4 | 9 | 18 | 57 | Cylindrical |
| TECA060H3-09/18C06CF-R08 | ● | 6 | 6 | 0.8 | 9 | 18 | 57 | Cylindrical |
| TECA080H3-12/24C08CF-R02 | ● | 8 | 8 | 0.2 | 12 | 24 | 63 | Cylindrical |
| TECA080H3-12/24C08CF-R04 | ● | 8 | 8 | 0.4 | 12 | 24 | 63 | Cylindrical |
| TECA080H3-12/24C08CF-R08 | ● | 8 | 8 | 0.8 | 12 | 24 | 63 | Cylindrical |
| TECA100H3-15/30C10CF-R02 | ● | 10 | 10 | 0.2 | 15 | 30 | 72 | Cylindrical |
| TECA100H3-15/30C10CF-R04 | ● | 10 | 10 | 0.4 | 15 | 30 | 72 | Cylindrical |
| TECA100H3-15/30C10CF-R08 | ● | 10 | 10 | 0.8 | 15 | 30 | 72 | Cylindrical |
| TECA120H3-18/36C12CF-R02 | ● | 12 | 12 | 0.2 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R04 | ● | 12 | 12 | 0.4 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R08 | ● | 12 | 12 | 0.8 | 18 | 36 | 83 | Cylindrical |
| TECA120H3-18/36C12CF-R16 | ● | 12 | 12 | 1.6 | 18 | 36 | 83 | Cylindrical |
| TECA160H3-24/48C16CF-R02 | ● | 16 | 16 | 0.2 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R04 | ● | 16 | 16 | 0.4 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R08 | ● | 16 | 16 | 0.8 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R16 | ● | 16 | 16 | 1.6 | 24 | 48 | 92 | Cylindrical |
| TECA160H3-24/48C16CF-R20 | ● | 16 | 16 | 2 | 24 | 48 | 92 | Cylindrical |
| TECA200H3-30/60C20CF-R04 | ● | 20 | 20 | 0.4 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R08 | ● | 20 | 20 | 0.8 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R16 | ● | 20 | 20 | 1.6 | 30 | 60 | 110 | Cylindrical |
| TECA200H3-30/60C20CF-R20 | ● | 20 | 20 | 2 | 30 | 60 | 110 | Cylindrical |



●: Line up

## TEBRF**T*-...

3, 4 flutes roughing ball nose, 20° helix long length for materials up to 55 HRC

H
Hard Materials

| Designation | AH750 | D | *d* | R | *ap* | *L* | z | Shank |
|---|---|---|---|---|---|---|---|---|
| TEBRF060T3-16C06M57 | ● | 6 | 6 | 3 | 16 | 57 | 3 | Cylindrical |
| TEBRF080T3-16C08M63 | ● | 8 | 8 | 4 | 16 | 63 | 3 | Cylindrical |
| TEBRF100T4-22C10M72 | ● | 10 | 10 | 5 | 22 | 72 | 4 | Cylindrical |
| TEBRF120T4-26C12M83 | ● | 12 | 12 | 6 | 26 | 83 | 4 | Cylindrical |
| TEBRF140T4-26C14M83 | ● | 14 | 14 | 7 | 26 | 83 | 4 | Cylindrical |
| TEBRF160T4-32C16M92 | ● | 16 | 16 | 8 | 32 | 92 | 4 | Cylindrical |
| TEBRF180T4-32C18M92 | ● | 18 | 18 | 9 | 32 | 92 | 4 | Cylindrical |
| TEBRF200T4-38C20M104 | ● | 20 | 20 | 10 | 38 | 104 | 4 | Cylindrical |

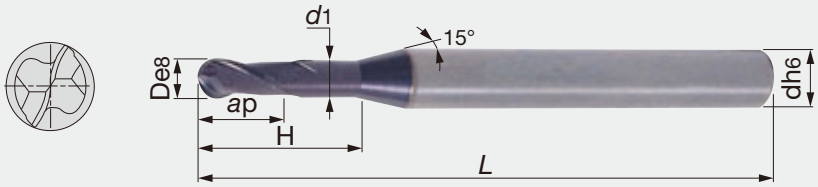


●: Line up

# TEB**A2-**C**M...

2 flutes ball nose for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials




| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEB004A2-006/02C4M45 | ● | 0.4 | 4 | 0.36 | 0.6 | 2 | 45 | Cylindrical |
| TEB004A2-006/03C4M45 | ● | 0.4 | 4 | 0.36 | 0.6 | 3 | 45 | Cylindrical |
| TEB005A2-007/02C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 2 | 45 | Cylindrical |
| TEB005A2-007/04C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 4 | 45 | Cylindrical |
| TEB005A2-007/06C4M45 | ● | 0.5 | 4 | 0.45 | 0.7 | 6 | 45 | Cylindrical |
| TEB006A2-009/02C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 2 | 45 | Cylindrical |
| TEB006A2-009/04C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 4 | 45 | Cylindrical |
| TEB006A2-009/06C4M45 | ● | 0.6 | 4 | 0.55 | 0.9 | 6 | 45 | Cylindrical |
| TEB008A2-012/04C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 4 | 45 | Cylindrical |
| TEB008A2-012/06C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 6 | 45 | Cylindrical |
| TEB008A2-012/08C4M45 | ● | 0.8 | 4 | 0.75 | 1.2 | 8 | 45 | Cylindrical |
| TEB010A2-015/04C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 4 | 45 | Cylindrical |
| TEB010A2-015/06C4M45 | ● | 1 | 4 | 0.97 | 1.5 | 6 | 45 | Cylindrical |
| TEB010A2-015/08C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 8 | 45 | Cylindrical |
| TEB010A2-015/10C4M45 | ● | 1 | 4 | 0.95 | 1.5 | 10 | 45 | Cylindrical |
| TEB010A2-015/12C4M45 | ● | 1 | 4 | 0.93 | 1.5 | 12 | 45 | Cylindrical |
| TEB010A2-015/16C4M50 | ● | 1 | 4 | 0.93 | 1.5 | 16 | 50 | Cylindrical |
| TEB012A2-018/08C4M45 | ● | 1.2 | 4 | 1.17 | 1.8 | 8 | 45 | Cylindrical |
| TEB012A2-018/12C4M45 | ● | 1.2 | 4 | 1.13 | 1.8 | 12 | 45 | Cylindrical |
| TEB014A2-021/08C4M45 | ● | 1.4 | 4 | 1.35 | 2.1 | 8 | 45 | Cylindrical |
| TEB014A2-021/12C4M45 | ● | 1.4 | 4 | 1.33 | 2.1 | 12 | 45 | Cylindrical |
| TEB014A2-021/16C4M50 | ● | 1.4 | 4 | 1.31 | 2.1 | 16 | 50 | Cylindrical |
| TEB015A2-023/06C4M45 | ● | 1.5 | 4 | 1.47 | 2.3 | 6 | 45 | Cylindrical |
| TEB015A2-023/08C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 8 | 45 | Cylindrical |
| TEB015A2-023/10C4M45 | ● | 1.5 | 4 | 1.45 | 2.3 | 10 | 45 | Cylindrical |
| TEB015A2-023/12C4M45 | ● | 1.5 | 4 | 1.43 | 2.3 | 12 | 45 | Cylindrical |
| TEB015A2-023/16C4M50 | ● | 1.5 | 4 | 1.41 | 2.3 | 16 | 50 | Cylindrical |
| TEB015A2-023/20C4M55 | ● | 1.5 | 4 | 1.39 | 2.3 | 20 | 55 | Cylindrical |
| TEB016A2-024/08C4M45 | ● | 1.6 | 4 | 1.55 | 2.4 | 8 | 45 | Cylindrical |
| TEB016A2-024/12C4M45 | ● | 1.6 | 4 | 1.53 | 2.4 | 12 | 45 | Cylindrical |
| TEB016A2-024/16C4M50 | ● | 1.6 | 4 | 1.51 | 2.4 | 16 | 50 | Cylindrical |
| TEB016A2-024/20C4M55 | ● | 1.6 | 4 | 1.49 | 2.4 | 20 | 55 | Cylindrical |

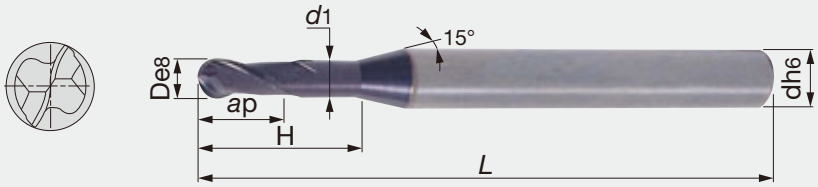


●: Line up

## TEB**A2-**C**M...

2 flutes ball nose for rib processing, 30° helix for materials up to 65 HRC

H
Hard Materials




| Designation | AH750 | D | d | d1 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|
| TEB018A2-027/08C4M45 | ● | 1.8 | 4 | 1.75 | 2.7 | 8 | 45 | Cylindrical |
| TEB018A2-027/12C4M45 | ● | 1.8 | 4 | 1.73 | 2.7 | 12 | 45 | Cylindrical |
| TEB018A2-027/16C4M50 | ● | 1.8 | 4 | 1.71 | 2.7 | 16 | 50 | Cylindrical |
| TEB018A2-027/20C4M55 | ● | 1.8 | 4 | 1.69 | 2.7 | 20 | 55 | Cylindrical |
| TEB020A2-030/06C4M45 | ● | 2 | 4 | 1.97 | 3 | 6 | 45 | Cylindrical |
| TEB020A2-030/10C4M45 | ● | 2 | 4 | 1.93 | 3 | 10 | 45 | Cylindrical |
| TEB020A2-030/12C4M50 | ● | 2 | 4 | 1.93 | 3 | 12 | 50 | Cylindrical |
| TEB020A2-030/16C4M50 | ● | 2 | 4 | 1.91 | 3 | 16 | 50 | Cylindrical |
| TEB020A2-030/20C4M55 | ● | 2 | 4 | 1.89 | 3 | 20 | 55 | Cylindrical |
| TEB020A2-030/30C4M70 | ● | 2 | 4 | 1.89 | 3 | 30 | 70 | Cylindrical |
| TEB030A2-045/08C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 8 | 50 | Cylindrical |
| TEB030A2-045/10C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 10 | 50 | Cylindrical |
| TEB030A2-045/12C6M50 | ● | 3 | 6 | 2.85 | 4.5 | 12 | 50 | Cylindrical |
| TEB030A2-045/16C6M55 | ● | 3 | 6 | 2.85 | 4.5 | 16 | 55 | Cylindrical |
| TEB030A2-045/20C6M60 | ● | 3 | 6 | 2.85 | 4.5 | 20 | 60 | Cylindrical |
| TEB030A2-045/30C6M70 | ● | 3 | 6 | 2.85 | 4.5 | 30 | 70 | Cylindrical |

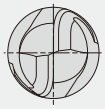


●: Line up

## TEB**A2-**C**H...

2 flutes ball nose, 30° helix, stub cut length for materials up to 55 - 70 HRC

H
Hard Materials



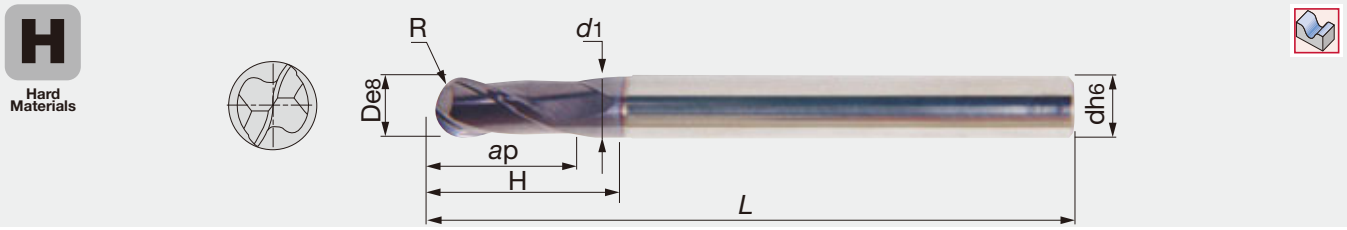
| Designation | AH750 | D | d | d1 | R±0.01 | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|---|
| TEB010A2-01/02C04H50 | ● | 1 | 4 | 0.95 | 0.5 | 1 | 2.2 | 50 | Cylindrical |
| TEB020A2-02/04C06H50 | ● | 2 | 6 | 1.9 | 1 | 2 | 4 | 50 | Cylindrical |
| TEB030A2-03/06C06H60 | ● | 3 | 6 | 2.9 | 1.5 | 3 | 6 | 60 | Cylindrical |
| TEB040A2-04/08C06H70 | ● | 4 | 6 | 3.9 | 2 | 4 | 8 | 70 | Cylindrical |
| TEB050A2-05/10C06H80 | ● | 5 | 6 | 4.9 | 2.5 | 5 | 10 | 80 | Cylindrical |
| TEB060A2-06/12C06H90 | ● | 6 | 6 | 5.9 | 3 | 6 | 12 | 90 | Cylindrical |
| TEB080A2-08/16C08H100 | ● | 8 | 8 | 7.9 | 4 | 8 | 16 | 100 | Cylindrical |
| TEB100A2-10/20C10H100 | ● | 10 | 10 | 9.9 | 5 | 10 | 20 | 100 | Cylindrical |
| TEB120A2-12/24C12H110 | ● | 12 | 12 | 11.9 | 6 | 12 | 24 | 110 | Cylindrical |
| TEB160A2-16/32C16H140 | ● | 16 | 16 | 15.8 | 8 | 16 | 32 | 140 | Cylindrical |
| TEB200A2-20/40C20H160 | ● | 20 | 20 | 19.8 | 10 | 20 | 40 | 160 | Cylindrical |



●: Line up

## TEB**A2-**C**M...

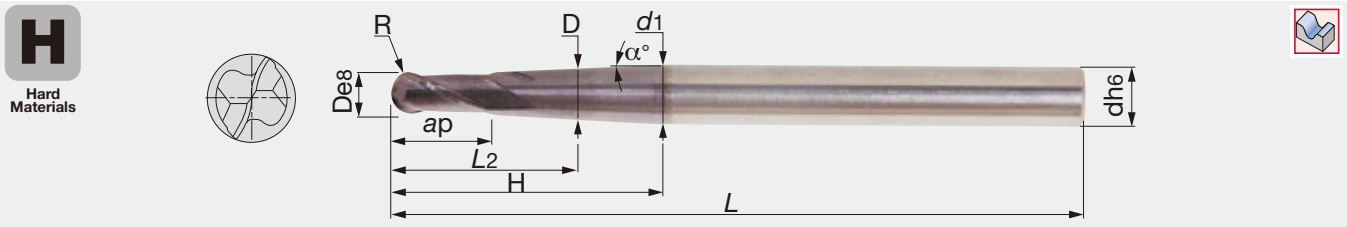
2 flutes long ball nose with neck, 30° helix for materials up to 65 HRC




| Designation | AH750 | D | d | d1 | R | ap | H | L | Shank |
|---|---|---|---|---|---|---|---|---|---|
| TEB030A2-08C06M70 | ● | 3 | 6 | - | 1.5 | 8 | - | 70 | Cylindrical |
| TEB040A2-08C06M70 | ● | 4 | 6 | - | 2 | 8 | - | 70 | Cylindrical |
| TEB050A2-12C06M80 | ● | 5 | 6 | - | 2.5 | 12 | - | 80 | Cylindrical |
| TEB060A2-12/22C06M80 | ● | 6 | 6 | 5.8 | 3 | 12 | 22 | 80 | Cylindrical |
| TEB080A2-14/27C08M90 | ● | 8 | 8 | 7.8 | 4 | 14 | 27 | 90 | Cylindrical |
| TEB100A2-18/31C10M100 | ● | 10 | 10 | 9.8 | 5 | 18 | 31 | 100 | Cylindrical |
| TEB120A2-22/35C12M110 | ● | 12 | 12 | 11.8 | 6 | 22 | 35 | 110 | Cylindrical |
| TEB160A2-30/50C16M140 | ● | 16 | 16 | 15.8 | 8 | 30 | 50 | 140 | Cylindrical |
| TEB200A2-38/58C20M160 | ● | 20 | 20 | 19.8 | 10 | 38 | 58 | 160 | Cylindrical |

## TEB**A2-**C**M...

2 flutes ball nose, tapered neck for materials up to 65 HRC



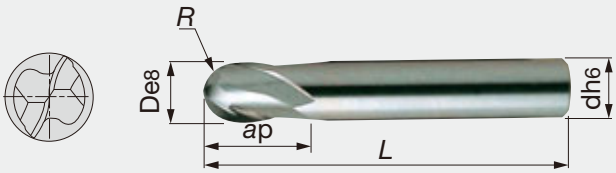

| Designation | AH750 | D | d | d1 | R±0.01 | ap | L2 | H | α° | L | Shank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TEB010A2-02/04/3.0C06M80 | ● | 1 | 6 | 5 | 0.5 | 2 | 4 | 42 | 3 | 80 | Cylindrical |
| TEB020A2-04/06/3.0C06M80 | ● | 2 | 6 | 5.7 | 1 | 4 | 6 | 41 | 3 | 80 | Cylindrical |
| TEB030A2-06/08/3.0C06M70 | ● | 3 | 6 | 5.6 | 1.5 | 6 | 8 | 32 | 3 | 70 | Cylindrical |
| TEB040A2-08/10/1.5C06M90 | ● | 4 | 6 | 6 | 2 | 8 | 10 | 49 | 1.5 | 90 | Cylindrical |
| TEB050A2-10/12/1.5C08M110 | ● | 5 | 8 | 7.6 | 2.5 | 10 | 12 | 61 | 1.5 | 110 | Cylindrical |
| TEB060A2-12/15/1.5C08M110 | ● | 6 | 8 | 8 | 3 | 12 | 15 | 53 | 1.5 | 110 | Cylindrical |
| TEB080A2-14/17/1.5C10M120 | ● | 8 | 10 | 10 | 4 | 14 | 17 | 55 | 1.5 | 120 | Cylindrical |
| TEB100A2-18/21/1.5C12M130 | ● | 10 | 12 | 12 | 5 | 18 | 21 | 59 | 1.5 | 130 | Cylindrical |
| TEB120A2-22/25/1.5C16M160 | ● | 12 | 16 | 15 | 6 | 22 | 25 | 83 | 1.5 | 160 | Cylindrical |



●: Line up

# TEB**A2-**C**-E...

2 flutes ball nose, 30° helix, short length




| Designation | AH725 | D | *d* | R | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|---|
| TEB020A2-06C03-E38 | ● | 2 | 3 | 1 | 6 | 38 | Cylindrical |
| TEB020A2-04C06-E48 | ● | 2 | 6 | 1 | 4 | 48 | Cylindrical |
| TEB025A2-04C06-E48 | ● | 2.5 | 6 | 1.3 | 4 | 48 | Cylindrical |
| TEB030A2-04C06-E48 | ● | 3 | 6 | 1.5 | 4 | 48 | Cylindrical |
| TEB040A2-06C06-E50 | ● | 4 | 6 | 2 | 6 | 50 | Cylindrical |
| TEB050A2-07C06-E51 | ● | 5 | 6 | 2.5 | 7 | 51 | Cylindrical |
| TEB060A2-07C06-E51 | ● | 6 | 6 | 3 | 7 | 51 | Cylindrical |
| TEB080A2-09C08-E59 | ● | 8 | 8 | 4 | 9 | 59 | Cylindrical |
| TEB100A2-10C10-E60 | ● | 10 | 10 | 5 | 10 | 60 | Cylindrical |
| TEB120A2-14C12-E71 | ● | 12 | 12 | 6 | 14 | 71 | Cylindrical |
| TEB140A2-14C14-E71 | ● | 14 | 14 | 7 | 14 | 71 | Cylindrical |
| TEB160A2-16C16-E76 | ● | 16 | 16 | 8 | 16 | 76 | Cylindrical |
| TEB180A2-18C18-E76 | ● | 18 | 18 | 9 | 18 | 76 | Cylindrical |
| TEB200A2-20C20-E82 | ● | 20 | 20 | 10 | 20 | 82 | Cylindrical |



●: Line up

SOLIDMEISTER TUNGALOY

## TEB**A2-**C**-...

2 flutes ball nose, 30° helix, short length

| Designation | AH725 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEB030A2-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A2-07C06-57 | ● | 4 | 6 | 7 | 57 | Cylindrical |
| TEB050A2-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A2-08C06-57 | ● | 6 | 6 | 8 | 57 | Cylindrical |
| TEB080A2-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A2-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A2-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A2-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A2-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

Short and stable design for profiling (roughing).

SOLIDMEISTER TUNGALOY

## TEB**A3...

3 flutes ball nose, 30° helix, short length

| Designation | AH725 | D | d | ap | L | Shank |
|---|---|---|---|---|---|---|
| TEB030A3-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A3-07C06-57 | ● | 4 | 6 | 7 | 57 | Cylindrical |
| TEB050A3-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A3-08C06-57 | ● | 6 | 6 | 9 | 57 | Cylindrical |
| TEB080A3-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A3-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A3-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A3-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A3-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

Short and stable design for contouring (roughing).



●: Line up

# TEB**A4...

4 flutes ball nose, 30° helix, short length

| Designation | AH725 | D | *d* | *ap* | *L* | Shank |
|---|---|---|---|---|---|---|
| TEB030A4-05C06-57 | ● | 3 | 6 | 5 | 57 | Cylindrical |
| TEB040A4-07C06-50 | ● | 4 | 6 | 7 | 50 | Cylindrical |
| TEB050A4-08C06-57 | ● | 5 | 6 | 8 | 57 | Cylindrical |
| TEB060A4-08C06-57 | ● | 6 | 6 | 9 | 57 | Cylindrical |
| TEB080A4-11C08-63 | ● | 8 | 8 | 11 | 63 | Cylindrical |
| TEB100A4-13C10-72 | ● | 10 | 10 | 13 | 72 | Cylindrical |
| TEB120A4-14C12-83 | ● | 12 | 12 | 14 | 83 | Cylindrical |
| TEB160A4-16C16-92 | ● | 16 | 16 | 16 | 92 | Cylindrical |
| TEB200A4-20C20-104 | ● | 20 | 20 | 20 | 104 | Cylindrical |

Short and stable design for profiling (finishing).



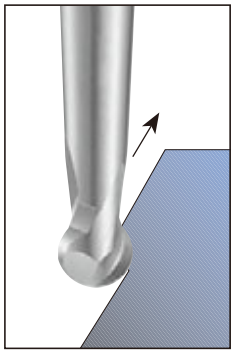
●: Line up

## Ball Nose Characteristics

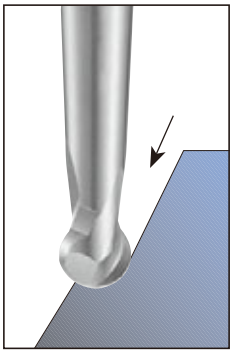
- Die & mold making, turbine manufacturing and aircraft industry, etc.
- Useful for intricate-shaped surfaces.
- Profiling of up to 70 HRC high hardened steels and alloy steels, nickel based alloys, titanium alloys.
- Ultra-fine grain carbide which increases both toughness and hardness.
- Suitable for dry and high speed cutting.
- Special sphere shaped tool geometry provides increased tool life and enables higher speed and feed operations.

## Milling Features

- Operating angle 208° - 212°
- Excellent surface roughness and high milling process.
- Enables milling with high speed and feed in back milling mode.



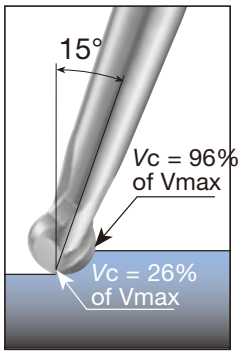
**Favorable Back Milling**



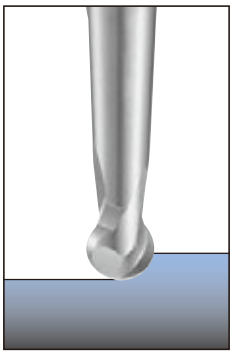
**Unfavorable Drilling**

## Operating Recommendations

- It is recommended to machine with the tool inclined at a 15° angle. This technique eliminates cutting at nearly zero speed at the tool axis. Cutting is more efficient, and tool life substantially improves.
- Decreased cutting force.
- Excellent surface roughness and brightness.




**Favorable Profiling**



**Unfavorable Profiling**

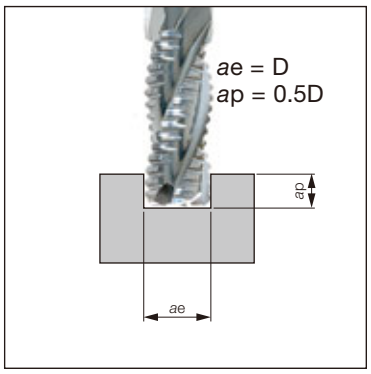
MEMO

# MACHINING DATA FOR SHREDMEISTER ROUGHER ENDMILLS

| ISO | Material | | Condition | Tensile Strength (N/mm2) | Hardness HB | Cutting speed: *Vc* (m/min) min | max |
|---|---|---|---|---|---|---|---|
| P | Non-alloy steel and cast steel, free cutting steel | < 0.25 %C | Annealed | 420 | 125 | 260 | 280 |
| | | ≥ 0.25 %C | Annealed | 650 | 190 | 200 | 230 |
| | | < 0.55 %C | Quenched and tempered | 850 | 250 | 160 | 190 |
| | | ≥ 0.55 %C | Annealed | 750 | 220 | 160 | 180 |
| | | ≥ 0.55 %C | Quenched and tempered | 1000 | 300 | 140 | 160 |
| | Low alloy steel and cast steel (less than 5% all elements) | | Annealed | 600 | 200 | 160 | 190 |
| | | | Quenched and tempered | 930 | 275 | 120 | 140 |
| | | | Quenched and tempered | 1000 | 300 | 130 | 150 |
| | | | Quenched and tempered | 1200 | 350 | 140 | 160 |
| | High alloy steel, cast steel, and tool steel | | Annealed | 680 | 200 | 130 | 160 |
| | | | Quenched and tempered | 1100 | 325 | 70 | 90 |
| M | Stainless steel and cast steel | | Ferritic / martensitic | 680 | 200 | 110 | 200 |
| | | | Martensitic | 820 | 240 | 60 | 180 |
| | | | Austenitic | 600 | 180 | 80 | 120 |
| K | Cast iron nodular (GGG) | | Ferritic / pearlitic | - | 180 | 80 | 260 |
| | | | Pearlitic | - | 260 | 130 | 240 |
| | Grey cast iron (GG) | | Ferritic | - | 160 | 150 | 280 |
| | | | Pearlitic | - | 250 | 90 | 280 |
| | Malleable cast iron | | Ferritic | - | 130 | 150 | 280 |
| | | | Pearlitic | - | 230 | 140 | 240 |
| N | Aluminium-wrought alloy | | Not cureable | - | 60 | 810 | 840 |
| | | | Cured | - | 100 | 730 | 830 |
| | Aluminium-cast, alloyed | ≤ 12% Si | Not cureable | - | 75 | 800 | 840 |
| | | | Cured | - | 90 | 730 | 830 |
| | | > 12% Si | High temperature | - | 130 | 320 | 340 |
| | Copper alloys | > 1% Pb | Free cutting | - | 110 | 400 | 430 |
| | | | Brass | - | 90 | 400 | 430 |
| | | | Electrolitic copper | - | 100 | 270 | 300 |
| | Non-metallic | | Duroplastics, fiber plastics | - | - | - | - |
| | | | Hard rubber | - | - | - | - |
| S | High temp. alloys | Fe based | Annealed | - | 200 | 20 | 40 |
| | | Fe based | Cured | - | 280 | 20 | 30 |
| | | Ni or Co based | Annealed | - | 250 | 20 | 30 |
| | | Ni or Co based | Cured | - | 350 | 20 | 30 |
| | | Ni or Co based | Cast | - | 320 | 30 | 70 |
| | Titanium and Ti alloys | | | RM 400 | - | 30 | 70 |
| | | | Alpha + beta alloys cured | RM 1050 | - | 30 | 70 |
| H | Hardened steel | | Hardened | - | 55 HRC | 30 | 50 |
| | | | Hardened | - | 60 HRC | 30 | 40 |
| | Chilled cast iron | | Cast | - | 400 | 60 | 80 |
| | Cast iron | | Hardened | - | 55 HRC | 30 | 50 |

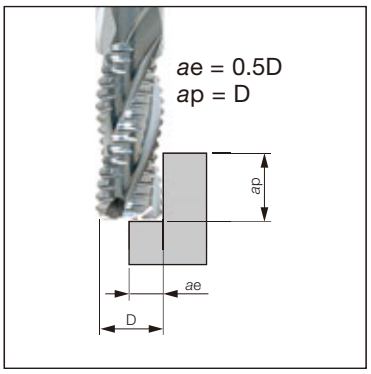
## Recommended Feeds

### Slotting




| D (mm) | Min. *fz* | Max. *fz* |
|---|---|---|
| 1 | 0.006 | 0.01 |
| 1.3 | 0.006 | 0.02 |
| 1.5 | 0.006 | 0.04 |
| 1.8 | 0.01 | 0.05 |
| 2 | 0.01 | 0.06 |
| 2.3 | 0.01 | 0.06 |
| 2.5 | 0.01 | 0.06 |
| 2.8 | 0.02 | 0.07 |
| 3 | 0.02 | 0.08 |
| 3.3 | 0.02 | 0.08 |
| 4 | 0.03 | 0.09 |
| 4.3 | 0.03 | 0.09 |
| 5 | 0.04 | 0.1 |
| 6 | 0.05 | 0.12 |
| 7 | 0.06 | 0.14 |
| 8 | 0.06 | 0.16 |
| 9 | 0.06 | 0.16 |
| 10 | 0.06 | 0.18 |
| 12 | 0.07 | 0.2 |
| 14 | 0.08 | 0.22 |
| 16 | 0.1 | 0.24 |
| 18 | 0.1 | 0.26 |
| 20 | 0.1 | 0.3 |
| 25 | 0.12 | 0.3 |

### Shoulder milling



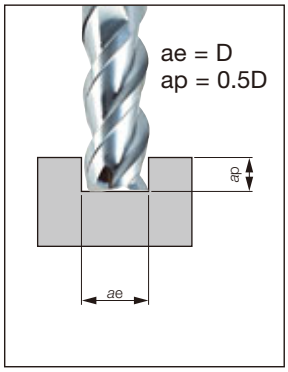

| D (mm) | Min. *fz* | Max. *fz* |
|---|---|---|
| 1 | 0.006 | 0.014 |
| 1.3 | 0.006 | 0.024 |
| 1.5 | 0.006 | 0.044 |
| 1.8 | 0.01 | 0.056 |
| 2 | 0.01 | 0.066 |
| 2.3 | 0.01 | 0.066 |
| 2.5 | 0.01 | 0.066 |
| 2.8 | 0.02 | 0.076 |
| 3 | 0.02 | 0.088 |
| 3.3 | 0.02 | 0.088 |
| 4 | 0.03 | 0.098 |
| 4.3 | 0.03 | 0.098 |
| 5 | 0.04 | 0.11 |
| 6 | 0.05 | 0.132 |
| 7 | 0.06 | 0.154 |
| 8 | 0.06 | 0.176 |
| 9 | 0.06 | 0.176 |
| 10 | 0.06 | 0.196 |
| 12 | 0.07 | 0.216 |
| 14 | 0.08 | 0.238 |
| 16 | 0.1 | 0.26 |
| 18 | 0.1 | 0.28 |
| 20 | 0.1 | 0.34 |
| 25 | 0.12 | 0.36 |

## MACHINING DATA FOR SOLID CARBIDE ENDMILLS

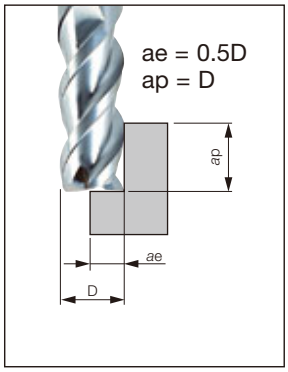
| ISO | Material | | Condition | Tensile Strength (N/mm2) | Hardness HB | Cutting speed: *Vc* (m/min) min | max |
|---|---|---|---|---|---|---|---|
| P | Non-alloy steel and cast steel, free cutting steel | < 0.25 %C | Annealed | 420 | 125 | 220 | 230 |
| | | ≥ 0.25 %C | Annealed | 650 | 190 | 170 | 190 |
| | | < 0.55 %C | Quenched and tempered | 850 | 250 | 140 | 150 |
| | | ≥ 0.55 %C | Annealed | 750 | 220 | 140 | 150 |
| | | ≥ 0.55 %C | Quenched and tempered | 1000 | 300 | 120 | 130 |
| | Low alloy steel and cast steel (less than 5% all elements) | | Annealed | 600 | 200 | 140 | 150 |
| | | | Quenched and tempered | 930 | 275 | 100 | 110 |
| | | | Quenched and tempered | 1000 | 300 | 110 | 120 |
| | | | Quenched and tempered | 1200 | 350 | 120 | 130 |
| | High alloy steel, cast steel, and tool steel | | Annealed | 680 | 200 | 110 | 130 |
| | | | Quenched and tempered | 1100 | 325 | 60 | 70 |
| M | Stainless steel and cast steel | | Ferritic / martensitic | 680 | 200 | 100 | 170 |
| | | | Martensitic | 820 | 240 | 60 | 150 |
| | | | Austenitic | 600 | 180 | 70 | 100 |
| K | Cast iron nodular (GGG) | | Ferritic / pearlitic | - | 180 | 70 | 220 |
| | | | Pearlitic | - | 260 | 110 | 200 |
| | Grey cast iron (GG) | | Ferritic | - | 160 | 130 | 230 |
| | | | Pearlitic | - | 250 | 70 | 230 |
| | Malleable cast iron | | Ferritic | - | 130 | 130 | 230 |
| | | | Pearlitic | - | 230 | 110 | 200 |
| N | Aluminium-wrought alloy | | Not cureable | - | 60 | 670 | 700 |
| | | | Cured | - | 100 | 610 | 690 |
| | Aluminium-cast, alloyed | ≤ 12% Si | Not cureable | - | 75 | 670 | 700 |
| | | | Cured | - | 90 | 610 | 690 |
| | | > 12% Si | High temperature | - | 130 | 270 | 280 |
| | Copper alloys | > 1% Pb | Free cutting | - | 110 | 330 | 350 |
| | | | Brass | - | 90 | 330 | 350 |
| | | | Electrolitic copper | - | 100 | 230 | 250 |
| | Non-metallic | | Duroplastics, fiber plastics | - | - | - | - |
| | | | Hard rubber | - | - | - | - |
| S | High temp. alloys | Fe based | Annealed | - | 200 | 20 | 30 |
| | | Fe based | Cured | - | 280 | 20 | 20 |
| | | Ni or Co based | Annealed | - | 250 | 20 | 20 |
| | | Ni or Co based | Cured | - | 350 | 20 | 20 |
| | | Ni or Co based | Cast | - | 320 | 30 | 60 |
| | Titanium and Ti alloys | | | RM 400 | - | 30 | 60 |
| | | | Alpha + beta alloys cured | RM 1050 | - | 30 | 60 |
| H | Hardened steel | | Hardened | - | 55 HRC | 30 | 40 |
| | | | Hardened | - | 60 HRC | 30 | 30 |
| | Chilled cast iron | | Cast | - | 400 | 50 | 60 |
| | Cast iron | | Hardened | - | 55 HRC | 30 | 40 |

## Recommended Feeds

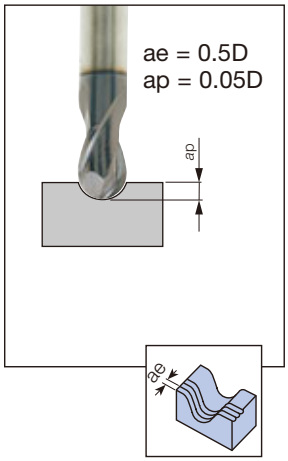
**Slotting**




**Shoulder milling**




**Profiling**




| Slotting | | | Shoulder milling / Profiling | |
|---|---|---|---|---|
| D (mm) | Min. *fz* | Max. *fz* | Min. *fz* | Max. *fz* |
| 1 | 0.003 | 0.005 | 0.003 | 0.007 |
| 1.3 | 0.003 | 0.01 | 0.003 | 0.012 |
| 1.5 | 0.003 | 0.02 | 0.003 | 0.022 |
| 1.8 | 0.005 | 0.025 | 0.005 | 0.028 |
| 2 | 0.005 | 0.03 | 0.005 | 0.033 |
| 2.3 | 0.005 | 0.03 | 0.005 | 0.033 |
| 2.5 | 0.005 | 0.03 | 0.005 | 0.03 |
| 2.8 | 0.01 | 0.035 | 0.01 | 0.038 |
| 3 | 0.01 | 0.04 | 0.01 | 0.044 |
| 3.3 | 0.015 | 0.04 | 0.01 | 0.044 |
| 4 | 0.015 | 0.045 | 0.015 | 0.049 |
| 4.3 | 0.020 | 0.045 | 0.015 | 0.049 |
| 5 | 0.025 | 0.05 | 0.02 | 0.055 |
| 6 | 0.03 | 0.06 | 0.025 | 0.066 |
| 7 | 0.03 | 0.07 | 0.03 | 0.077 |
| 8 | 0.03 | 0.08 | 0.03 | 0.088 |
| 9 | 0.03 | 0.08 | 0.03 | 0.088 |
| 10 | 0.035 | 0.09 | 0.03 | 0.098 |
| 12 | 0.04 | 0.1 | 0.035 | 0.108 |
| 14 | 0.05 | 0.11 | 0.04 | 0.119 |
| 16 | 0.05 | 0.12 | 0.05 | 0.13 |
| 18 | 0.05 | 0.13 | 0.05 | 0.14 |
| 20 | 0.05 | 0.15 | 0.05 | 0.17 |
| 25 | 0.06 | 0.15 | 0.06 | 0.18 |

| | | | |
|---|---|---|---|
| 1. For Slotting | M type materials | — | *ap* max = 0.5D |
| | S type materials | — | *ap* max = 0.25D |
| 2. For Finishing | P type materials | — | *ap* max = 1.5D |
| 3. For Roughing | | | *ap* max = 1.5D |
| | | | V = 1.25 x *Vc* |

**High speed cutting on Hard materials (up to 60 HRC):**
Apply small depth of cut: *ap* (0.1 - 0.3 mm) at *Vc* 80 - 160 m/min

## GRADE PRIORITIES FOR SOLID CARBIDE ENDMILLS

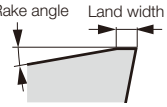
In most cases the best performance can be attained without using coolant for specific grades. However, it should be noted that if for any reason coolant must be used, it could possibly affect tool life and sometimes cause insert failure, due to thermal shock.

| Material Groups | ISO P | ISO H | ISO M | ISO S | ISO K | ISO N |
|---|---|---|---|---|---|---|
| | Steel | Hard Materials | Stainless | Superalloys | Cast Iron | Non-ferrous |
| | Harder<br>AH750<br>**AH725**<br>Tougher | Harder<br>**AH750**<br>AH725<br>Tougher | Harder<br>**AH725**<br>Tougher | Harder<br>AH750<br>**AH725**<br>KS15F<br>Tougher | Harder<br>AH750<br>**AH725**<br>Tougher | Harder<br>AH725<br>**KS15F**<br>Tougher |

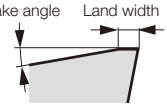
■ First choice

# Milling Insert

## ● ACMT**PR-MJ

| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | |
| | ACMT060308PR-MJ | ● | ● | ● | ● | ELP07/09/12... Page D098 |
| | ACMT07T308PR-MJ | ● | ● | ● | ● | |
| | ACMT100408PR-MJ | ● | ● | ● | ● | |
|   -MJ | | | | | | |

## ● ADMT**PR-MJ

| Shape | Designation | Coated | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH140 | T3130 | |
| | ADMT130308PR-MJ | ● | ● | ● | ELP13/17/21... Page D098 |
| | ADMT17T308PR-MJ | ● | ● | ● | |
| | ADMT210408PR-MJ | ● | ● | ● | |
|   -MJ | | | | | |

## ● AECW**PEFR, AECW**PESR, AEMW**PEFR, AEMW**PETR

| Shape | Designation | Coated | | Cermet | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | NS740 | UX30 | TH10 | |
| | AECW1403PEFR | | | | | ● | EPE4000/5000/6000... Page D101 |
| | AECW1403PESR | ● | ● | ● | ● | | |
| | AECW16T3PEFR | | | | | ● | |
| | AECW16T3PESR | ● | ● | ● | ● | | |
| | AECW1804PEFR | | | | | ● | |
| | AECW1804PESR | ● | ● | ● | ● | | |
| | AEMW1403PEFR | | | | | ● | |
| | AEMW1403PETR | | ● | ● | ● | | |
| | AEMW16T3PEFR | | | | | ● | |
| | AEMW16T3PETR | | ● | ● | ● | | |
| | AEMW1804PEFR | | | | | ● | |
| | AEMW1804PETR | | ● | ● | ● | | |

## ● ANEA542TN, ANEA642TN

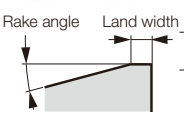
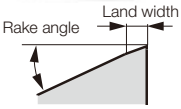
| Shape | Designation | Uncoated | Applicable mills |
|---|---|---|---|
| | | UX30 | |
| | ANEA542TN | ● | VSN... (Former products) |
| | ANEA642TN | ● | |

●: Line up

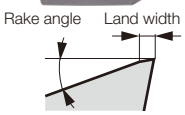
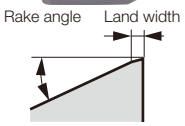
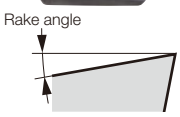
Insert

# Milling Insert

## ● ANMT**PPPR-MJ, ANMT**PPPR-ML

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | T3130 | | | | | | | | | | |
| | ANMT09T3PPPR-MJ | ● | ● | ● | | | | | | | | | | EPN09 (Former products) |
| | ANMT09T3PPPR-ML | ● | | | | | | | | | | | | |
|   -MJ | ANMT1404PPPR-MJ | ● | ● | ● | | | | | | | | | | EPN14... TPN14... (Former products) |
| | ANMT1404PPPR-ML | ● | | | | | | | | | | | | |
|   -ML | | | | | | | | | | | | | | |

## ● AOMT**PDPR-MJ, AOGT**PDFR-AJ, AOMT070208PDPR-HJ

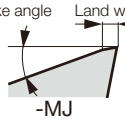
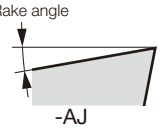
| Shape | Designation | Coated | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH140 | AH725 | | KS15F | | | | | | | | | |
| | AOMT070202PDPR-MJ | ● | ● | | | | | | | | | | | TUNGREC TPO07... Page D058 EPO07... Page D058 HPO07... Page D059 |
| | AOMT070204PDPR-MJ | ● | ● | | | | | | | | | | | |
|   -MJ | AOMT070208PDPR-MJ | ● | ● | | | | | | | | | | | |
| | AOMT070216PDPR-MJ | ● | ● | | | | | | | | | | | |
| | AOMT070208PDPR-HJ | ● | ● | | | | | | | | | | | |
| | AOGT070204PDFR-AJ | | | | ● | | | | | | | | | |
|   -HJ | | | | | | | | | | | | | | |
|   -AJ | | | | | | | | | | | | | | |

●: Line up

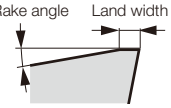
Insert

# Milling Insert

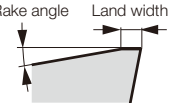
## ● AOMT**PDPR-MJ, AOGT**PDFR-AJ

| Shape | Designation | Coated | | Uncoated | Applicable mills |
|---|---|---|---|---|---|
| | | AH140 | AH725 | KS15F | |
| Rake angle Land width  -MJ | AOMT180508PDPR-MJ | ● | ● | | TUNGREC TPO18... Page D069 EPO18... Page D070 |
| | AOMT180516PDPR-MJ | ● | ● | | |
| | AOMT180524PDPR-MJ | ● | ● | | |
| | AOMT180532PDPR-MJ | ● | ● | | |
| | AOGT180504PDFR-AJ | | | ● | |
| | AOGT180508PDFR-AJ | | | ● | |
| Rake angle  -AJ | | | | | |

## ● APMT**PN-MJ

| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | |
| Rake angle Land width  -MJ | APMT070308PN-MJ | ● | ● | ● | ● | ELP07/09/12... Page D098 |
| | APMT09T308PN-MJ | ● | ● | ● | ● | |
| | APMT120408PN-MJ | ● | ● | ● | ● | |

## ● APMT120416PR-MJ

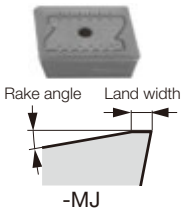
| Shape | Designation | Coated | | Applicable mills |
|---|---|---|---|---|
| | | AH120 | T3130 | |
| Rake angle Land width  -MJ | APMT120416PR-MJ | ● | ● | TZP12... Page D254 |

●: Line up

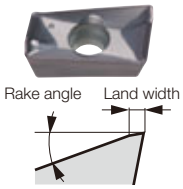
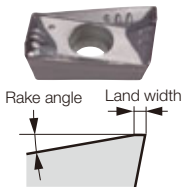
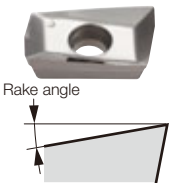
Insert

# Milling Insert

## ● APMR190616PR-MJ

| Shape | Designation | Coated | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | T3130 | | | | | | | | | | | | |
|   | APMR190616PR-MJ | ● | ● | | | | | | | | | | | | TZP19...<br>Page D256 |

## ● ASMT**PDPR-MJ, ASGT11**PDFR-AJ, ASMT11T304PDPR-MS

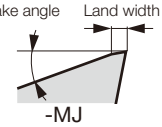
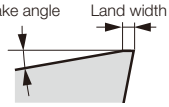
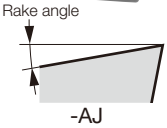
| Shape | Designation | Coated | | | | | | | | Cermet | | Uncoated | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH725 | T1115 | T1215 | T3130 | DS1100 | NS740 | | KS05F | | | |
|   | ASMT11T304PDPR-MJ | ● | | | ● | ● | | ● | | ● | | | | | TUNGREC |
| | ASMT11T308PDPR-MJ | ● | ● | | ● | ● | ● | ● | | ● | | | | | TPO11...<br>Page D062 |
| | ASMT11T312PDPR-MJ | ● | | | ● | | | ● | | | | | | | |
| | ASMT11T316PDPR-MJ | ● | | | ● | | | ● | | ● | | | | | TLS11...<br>Page D062 |
| | ASMT11T320PDPR-MJ | ● | | | | | | | | | | | | | |
| | ASMT11T330PDPR-MJ | ● | | | | | | | | | | | | | EPO11...<br>Page D063 |
| | ASMT11T304PDPR-MS | | ● | ● | | | | | | | | | | | |
|   | ASGT11T304PDFR-AJ | | | | | | | | ● | | | ● | | | HPO11...<br>Page D064 |
| | ASGT11T308PDFR-AJ | | | | | | | | ● | | | ● | | | |
|   | | | | | | | | | | | | | | | ELS11...<br>Page D064 |

●: Line up

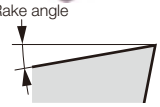
Insert

# Milling Insert

## ● ASMT17**PDPR-MJ, ASGT17**PDFR-AJ, ASMT170508PDPR-MS

| Shape | Designation | Coated | | | | | | Cermet | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | T1115 | T3130 | DS1100 | NS740 | | KS05F | | | | | | |
| Rake angle Land width  -MJ | ASMT170504PDPR-MJ | ● | | | ● | ● | | ● | | | | | | | | TPS17... Page D103 |
| | ASMT170508PDPR-MJ | ● | | | ● | ● | | ● | | | | | | | | |
| | ASMT170512PDPR-MJ | ● | | | | ● | | | | | | | | | | EPS17... Page D104 |
| | ASMT170516PDPR-MJ | ● | | | | ● | | ● | | | | | | | | |
| | ASMT170520PDPR-MJ | ● | | | | | | | | | | | | | | |
| | ASMT170530PDPR-MJ | ● | | | | | | | | | | | | | | |
| | ASMT170532PDPR-MJ | ● | | | | ● | | ● | | | | | | | | |
| Rake angle Land width  -MS | ASMT170508PDPR-MS | | ● | ● | | | | | | | | | | | | |
| | ASGT170504PDFR-AJ | | | | | | ● | | | ● | | | | | | |
| | ASGT170508PDFR-AJ | | | | | | ● | | | ● | | | | | | |
| Rake angle  -AJ | | | | | | | | | | | | | | | | |

## ● AVGT**PBER-MJ, AVGT**PBFR-AJ

| Shape | Designation | Coated | | | Uncoated | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | KS05F | | | | | | | | | | | |
| Rake angle  -MJ | AVGT060302PBER-MJ | ● | ● | | | | | | | | | | | | | TUNGFREC EPAV... Page D054 |
| | AVGT060304PBER-MJ | ● | ● | | | | | | | | | | | | | |
| | AVGT060308PBER-MJ | ● | ● | | | | | | | | | | | | | |
| | AVGT060302PBFR-AJ | | | | ● | | | | | | | | | | | HPAV06... Page D054 |
| | AVGT060304PBFR-AJ | | | | ● | | | | | | | | | | | |
| | AVGT060308PBFR-AJ | | | | ● | | | | | | | | | | | |
| Rake angle -AJ | | | | | | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert

## ● CPMW**-EN, CPMT**-EN

| Shape | Designation | Coated | Uncoated | | Applicable mills |
|---|---|---|---|---|---|
| | | GH330 | UX30 | | |
| | CPMW050208EN | ● | ● | | EVP1000 (Former products) |
| | CPMW06T208EN | ● | ● | | |
| | CPMT080308EN | ● | ● | | |

## ● DCMW**TN

| Shape | Designation | Coated | | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | AH330 | | |
| | DCMW070204TN | ● | ● | | EBP... Page D248 |
| | DCMW11T304TN | ● | ● | | HBP... Page D307 |

## ● DPCW11T3ZFR

| Shape | Designation | Coated | Cermet | | Applicable mills |
|---|---|---|---|---|---|
| | | AH740 | NS740 | | |
| | DPCW11T3ZFR | ● | ● | | TZF11... Page D258<br>HZF11... Page D306 |

## ● EDKW53ZTR

| Shape | Designation | Coated | Uncoated | | Applicable mills |
|---|---|---|---|---|---|
| | | GH330 | UX30 | | |
| | EDKW53ZTR | ● | ● | | ESD5000 (Former products) |

●: Line up

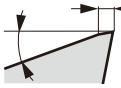
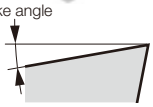
Insert

# Milling Insert

## ● ENEQ**TN-T

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | | | | |
| | ENEQ090508TN-T | ● | | | | | | | | | | | | VSNE09... (Former products) |
| | ENEQ100508TN-T | ● | | | | | | | | | | | | VSNE10... (Former products) |
| | ENEQ130608TN-T | ● | | | | | | | | | | | | VSNE13... (Former products) |
| | ENEQ160608TN-T | ● | | | | | | | | | | | | VSNE16... (Former products) |

## ● GDMT**PDPR-MJ, GDGT**PDFR-AJ

| Shape | Designation | Coated | | | | | | Uncoated | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | T3130 | DS1100 | | UX30 | TH10 | | | | | | |
| | GDMT10H3PDPR-MJ | ● | ● | ● | ● | | | ● | | | | | | | TSD10/17... Page D110 |
| | GDMT17X6PDPR-MJ | ● | ● | ● | ● | | | ● | | | | | | | |
| | GDGT10H3PDFR-AJ | | | | | ● | | | ● | | | | | | ESD10/17... Page D111 |
| Rake angle Land width  -MJ | GDGT17X6PDFR-AJ | | | | | ● | | | ● | | | | | | |
| Rake angle  -AJ | | | | | | | | | | | | | | | HSD10/17... Page D306 |

## ● HEHN532FN

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | | | |
| | HEHN532FN | ● | | | | | | | | | | | | QYE5300 (Former products) |

●: Line up

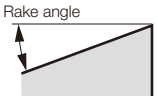
Insert

# Milling Insert

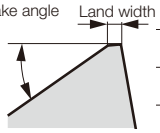
## ● HPKN532FN

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | | | |
| | HPKN532FN | ● | | | | | | | | | | | | QYP5300 (Former products) |

## ● LMEU**ZNEN-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | | | | | | | | | | |
|   -MJ | LMEU100808ZNEN-MJ | ● | ● | ● | | | | | | | | | | TECTSLOT ASN 10/12/15... Page D216 TSN 10/12/15... Page D217 |
| | LMEU100816ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU100824ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU100832ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU120808ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU120816ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU120824ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU120832ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU150908ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU150916ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU150924ZNEN-MJ | ● | ● | ● | | | | | | | | | | |
| | LMEU150932ZNEN-MJ | ● | ● | ● | | | | | | | | | | |

## ● LMMU**PNER-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | T1115 | T3130 | | | | | | | | |
|   -MJ | LMMU110708PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | TECMILL TPM11/16... Page D087 TLM11... Page D087 EPM11... Page D088 |
| | LMMU110716PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | |
| | LMMU110724PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | |
| | LMMU110732PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | |
| | LMMU160908PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | |
| | LMMU160916PNER-MJ | ● | ● | ● | ● | ● | | | | | | | | |
| | LMMU160924PNER-MJ | ● | ● | ● | ● | | | | | | | | | |
| | LMMU160932PNER-MJ | ● | ● | ● | ● | | | | | | | | | |

●: Line up

# Milling Insert

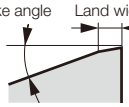
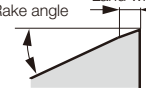
## ● LNCA64ZTR

| Shape | Designation | Coated | | | Uncoated | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T3130 | | | UX30 | | | | | | | | | | | |
| | LNCA64ZTR | ● | | | ● | | | | | | | | | | | VSN6000I (Former products) |

## ● LNCQ0906N-**L, LNCQ0906R-50S

| Shape | Designation | Coated | | | Cermet | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH110 | | NS740 | | | | | | | | | | | |
| | LNCQ0906N-100L | ● | ● | | ● | | | | | | | | | | | NMS09... Page D200 |
| | LNCQ0906N-50L | ● | ● | | ● | | | | | | | | | | | |
| Rake angle | LNCQ0906R-50S | ● | ● | | ● | | | | | | | | | | | EMS09... Page D200 |

## ● LNMU0303ZER-MJ, LNMU0303ZER-ML

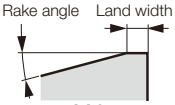
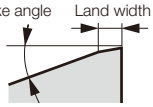
| Shape | Designation | Coated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH130 | AH725 | AH3035 | | | | | | | | | | | | |
| | LNMU0303ZER-MJ | ● | ● | ● | | | | | | | | | | | | DOFEED |
| | LNMU0303ZER-ML | ● | ● | ● | | | | | | | | | | | | TXN03... Page D008 |
| Rake angle Land width  -MJ | | | | | | | | | | | | | | | | EXN03... Page D008 |
| Rake angle Land width  -ML | | | | | | | | | | | | | | | | HXN03... Page D009 |

●: Line up

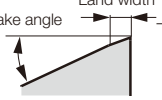
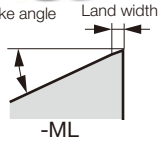
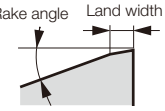
Insert

# Milling Insert

## ● LNMU06X5ZER-MJ, LNMU06X5ZER-ML, LNGU06X5ZER-W

| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | AH3035 | |
| Rake angle Land width  -MJ | LNMU06X5ZER-MJ | ● | ● | ● | ● | DOFEED TXN06... Page D012 EXN06... Page D013 |
| Rake angle Land width  -ML | LNMU06X5ZER-ML | ● | ● | ● | ● | |
| -W | LNGU06X5ZER-W | | | ● | | |

## ● LNMX0405R4-MJ, LNMX0405R4-ML, LNMX0405R4-HJ

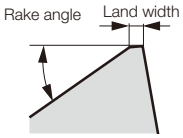
| Shape | Designation | Coated | | Applicable mills |
|---|---|---|---|---|
| | | AH120 | AH3135 | |
| Land width Rake angle  -MJ | LNMX0405R4-MJ | ● | ● | DOTWIST BALL TXLN... Page D016 EXLN... Page D016 HXLN... Page D017 |
| Rake angle Land width  -ML | LNMX0405R4-ML | ● | ● | |
| Rake angle Land width  -HJ | LNMX0405ZER-HJ | ● | ● | |

●: Line up

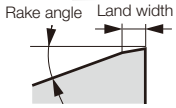
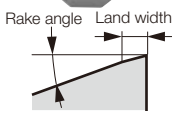
Insert

# Milling Insert

● **LQMU**PNER-MJ**

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | | | | | | | | | | |
|   -MJ | **LQMU110704PNER-MJ** | ● | ● | ● | | | | | | | | | | DOREC<br>TPQ11/18...<br>Page D084<br>EPQ11/18...<br>Page D085 |
| | **LQMU110708PNER-MJ** | ● | ● | ● | | | | | | | | | | |
| | **LQMU110716PNER-MJ** | ● | ● | ● | | | | | | | | | | |
| | **LQMU110720PNER-MJ** | ● | | | | | | | | | | | | |
| | **LQMU180804PNER-MJ** | ● | ● | ● | | | | | | | | | | |
| | **LQMU180808PNER-MJ** | ● | ● | ● | | | | | | | | | | |
| | **LQMU180816PNER-MJ** | ● | ● | ● | | | | | | | | | | |
| | **LQMU180824PNER-MJ** | ● | ● | ● | | | | | | | | | | |

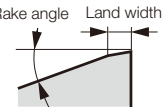
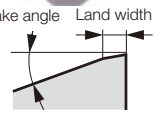
● **ONMU0705ANPN-MJ, ONHU0705ANPN-MJ, ONMU0705ANPN-ML, ONHU0705ANTN-ML, ONHU0705ANPR-W**

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | | | | | | | |
|   -MJ | **ONMU0705ANPN-MJ** | | ● | ● | ● | ● | ● | | | | | | | DOOCTO<br>DOQUAD<br>TAN07...<br>Page D135 |
| | **ONHU0705ANPN-MJ** | | ● | ● | | | | | | | | | | |
| | **ONMU0705ANPN-ML** | ● | | | ● | | | | | | | | | |
| | **ONHU0705ANTN-ML** | ● | ● | ● | | | | | | | | | | |
| | **ONHU0705ANPR-W** | ● | | | | | | | | | | | | |
|   -ML | | | | | | | | | | | | | | |
| -W | | | | | | | | | | | | | | |

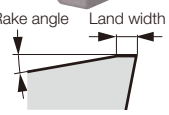
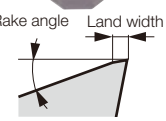
●: Line up

# Milling Insert

## ● ONGU0507ANEN-MJ, ONGU0507ANEN-W

| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | T3225 | | |
|   -MJ | ONGU0507ANEN-MJ | ● | ● | ● | | DOTMILL TASN13... Page D132 |
| | ONGU0507ANEN-W | ● | ● | | | |
|   -W | | | | | | |

## ● OWMT0807ZNER-HJ, OWMT0807AAER-ML

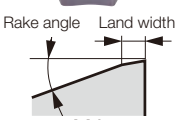
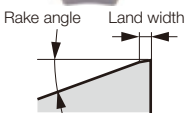
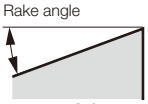
| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | AH130 | AH3135 | | | |
|   -HJ | OWMT0807ZNER-HJ | | ● | | | DOOCTO DOQUAD TAN07... Page D135 |
| | OWMT0807AAER-ML | ● | ● | | | |
|   -ML | | | | | | |

●: Line up

Insert

# Milling Insert

● **PNCU0905GNER-MJ, PNCU0905GNEN-ML, PNCU0905GNFR-AJ, PNMU0905GNEN-MJ, PNCU0905GNER-W**

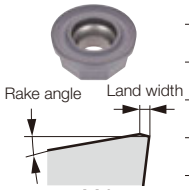
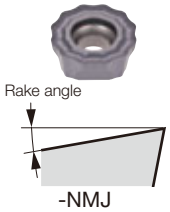
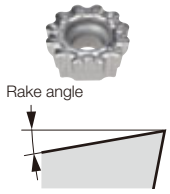
| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1115 | T1215 | T3130 | NS740 | | TH10 | | | | | |
|   -MJ | **PNCU0905GNER-MJ** | ● | ● | ● | | ● | | ● | ● | | | | | | | DOPENT |
| | **PNCU0905GNEN-ML** | | | | ● | | | | | | | | | | | TEN09R/L... |
| | **PNCU0905GNFR-AJ** | | | | | | | | | | ● | | | | | Page D141 |
| | **PNMU0905GNEN-MJ** | ● | | | ● | | ● | | | | | | | | | EEN09... |
| | **PNCU0905GNER-W** | | | ● | | | | | | | | | | | | Page D142 |
|   -ML | | | | | | | | | | | | | | | | |
|   -AJ | | | | | | | | | | | | | | | | |
| -W | | | | | | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert

## ● RCMT**EN-MJ, RCMT**EN-NMJ, RCMT**FN-NAJ

| Shape | Designation | Coated | | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | KS15F | | |
|   -MJ | RCMT1204EN-MJ | ● | ● | ● | | | ROUNDSPLIT TRC12/16... Page D235 ERC12/16... Page D236 |
| | RCMT1204EN-NMJ | ● | ● | ● | | | |
| | RCMT1204FN-NAJ | | | | ● | | |
| | RCMT1606EN-MJ | ● | ● | ● | | | |
| | RCMT1606EN-NMJ | ● | ● | ● | | | |
| | RCMT1606FN-NAJ | | | | ● | | |
|   -NMJ | | | | | | | |
|   -NAJ | | | | | | | |

## ● RDCA2004TN, RDCN2004TN, RDKN2004...

| Shape | Designation | Coated | Uncoated | | Applicable mills |
|---|---|---|---|---|---|
| | | AH120 | UX30 | TH10 | |
| | RDCA2004TN | | ● | | TRD6000 Page D196 ERD6000 Page D196 |
| | RDCN2004TN | | ● | | |
| | RDKN2004FN | | | ● | |
| | RDKN2004TN | ● | ● | | |

## ● RDCM1203TN, RDMA1203TN

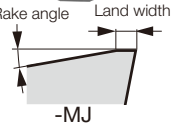
| Shape | Designation | Uncoated | Applicable mills |
|---|---|---|---|
| | | UX30 | |
| | RDCM1203TN | ● | ERD4000 (Former products) |
| | RDMA1203TN | ● | |

●: Line up

Insert

# Milling Insert

## ● RDMT**ZDPN-MJ, RDMW**ZDSN

| Shape | Designation | Coated | | | | | Uncoated | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | T3130 | UX30 | | | | | | | |
| | RDMT1204ZDPN-MJ | ● | | ● | ● | ● | ● | | | | | | | TRD12/16... Page D240 |
| | RDMW1204ZDSN | ● | | ● | | ● | | | | | | | | |
| Rake angle Land width  -MJ | RDMT1606ZDPN-MJ | ● | ● | ● | ● | ● | ● | | | | | | | ERD12/16... Page D241 |
| | RDMW1606ZDSN | ● | | ● | | ● | | | | | | | | |
| | | | | | | | | | | | | | | |

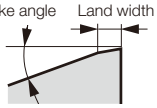
## ● RDMW**M0

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | | | | |
| | RDMW0501M0 | ● | | | | | | | | | | | | EWD05/07/10... Page D244 |
| | RDMW0702M0 | ● | | | | | | | | | | | | |
| | RDMW1003M0 | ● | | | | | | | | | | | | HWD07... Page D244 |
| | | | | | | | | | | | | | | |

## ● RFEN2004ZFTN, RFEN2004M0TN

| Shape | Designation | Coated | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | GH330 | | UX30 | KS20 | | | | | | | | |
| | RFEN2004ZFTN | ● | ● | | ● | ● | | | | | | | | TRF6000 Page D198 |
| | RFEN2004M0TN | | ● | | ● | ● | | | | | | | | |
| | | | | | | | | | | | | | | ERF6000 Page D198 |

## ● RNGU1307ZNER-MJ

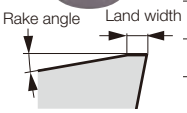
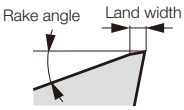
| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | | |
| | RNGU1307ZNER-MJ | ● | ● | | | | | | | | | | | DOTMILL TASN13... Page D132 |
| Rake angle Land width  -MJ | | | | | | | | | | | | | | |

●: Line up

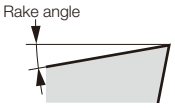
Insert

# Milling Insert

## ● RPMT**EN-MJ, RPMT**EN-ML

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH130 | AH725 | AH4035 | | | | | | | | | | |
|   -MJ | RPMT10T3EN-MJ | ● | ● | ● | | | | | | | | | | FIXRMILL TRP10/12/16... Page D230 ERP10/12/16... Page D230 HRP10/12... Page D231 |
| | RPMT10T3EN-ML | ● | ● | ● | | | | | | | | | | |
| | RPMT1204EN-MJ | ● | ● | ● | | | | | | | | | | |
| | RPMT1204EN-ML | ● | ● | ● | | | | | | | | | | |
| | RPMT1606EN-MJ | ● | ● | ● | | | | | | | | | | |
| | RPMT1606EN-ML | ● | ● | ● | | | | | | | | | | |
|   -ML | | | | | | | | | | | | | | |

## ● SCMT**-23

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | | | | |
|   -23 | SCMT09T308-23 | ● | | | | | | | | | | | | EBD... Page D250 HBD... Page D308 |
| | SCMT120408-23 | ● | | | | | | | | | | | | |

## ● SDCN1504ZDSR, SDEN1504ZDSR, SDNN1504ZDSR

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | T1115 | T3130 | | | | | | | | | |
| | SDCN1504ZDSR | ● | ● | | ● | | | | | | | | | MILLFEED TXD15... Page D034 |
| | SDEN1504ZDSR | ● | ● | ● | ● | | | | | | | | | |
| | SDNN1504ZDSR | ● | ● | ● | ● | | | | | | | | | |

●: Line up

Insert

# Milling Insert

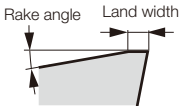
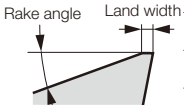
## ● SDCN42HTR, SDKN42HTR

| Shape | Designation | Coated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | | | | | | | | | | | | | |
| | SDCN42HTR | ● | | | | | | | | | | | | | | EUD4600 (Former products) |
| | SDKN42HTR | ● | | | | | | | | | | | | | | |

## ● SDKN42EF..., SDEN42EFTR24

| Shape | Designation | Coated | | | Cermet | | | Uncoated | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T3130 | | | NS740 | | | TH10 | UX30 | | | | | | | |
| | SDKN42EFTR | ● | | | ● | | | | | | | | | | | TMD4100I (Former products) |
| | SDKN42EFFR | | | | | | | ● | | | | | | | | |
| | SDEN42EFTR24 | | | | ● | | | | ● | | | | | | | |

## ● SDCN42Z..., SDEN42Z..., SDKN42Z..., SDCN42ZFN-DIA, SDKR42ZSR-MJ, SDMR1203AETN-MJ, SDKR1203AETN-MJ, SDKR42ZPN-MS

| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | PCD | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | |
| | SDCN42ZFN | | | | | | | | | | | ● | | | | TMD4400R/LI Page D168 |
| | SDCN42ZTN | | | | | | | | ● | ● | ● | | | | | |
| | SDCN42ZTN20 | | | | | | | | ● | | | | | | | EMD4400RI Page D169 |
| | SDEN42ZFN | | | | | | | | | | | ● | | | | |
| | SDEN42ZTN | ● | | ● | | ● | ● | | ● | ● | ● | | | | | TGD4400-A Page D174 |
| | SDEN42ZTNCR | ● | | ● | ● | | | | ● | | | | | | | |
|   -MJ | SDEN42ZTN20 | | | | | | | ● | | | | | | | | EGD4400 Page D174 |
| | SDKN42ZFN | | | | | | | | | | | ● | | | | |
| | SDKN42ZTN | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | | | TFD4400-A Page D177 |
| | SDKN42ZTNCR | | | | | | | | ● | | | | | | | |
|   -MS | SDKN42ZTN16 | | | | | | | ● | | | | | | | | |
| | SDCN42ZFN-DIA | | | | | | | | | | | | ● | | | |
| | SDKR42ZSR-MJ | ● | | | ● | ● | | ● | | | | | | | | |
| | SDMR1203AETN-MJ | | | | | | | | ● | | | | | | | |
| | SDKR1203AETN-MJ | | | | | | | | ● | | | | | | | |
| | SDKR42ZPN-MS | | ● | ● | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

●: Line up

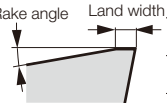
Insert

# Milling Insert

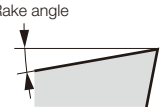
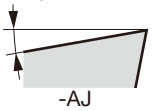
## ●SDCN53HTR, SDKN53HTR

| Shape | Designation | Coated | | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | | | | | | | | | | | | | | |
| | SDCN53HTR | ● | | | | | | | | | | | | | | | TUD5600 (Former products) |
| | SDKN53HTR | ● | | | | | | | | | | | | | | | |

## ● SDCN53ZTN, SDEN53Z..., SDKN53Z..., SDKR53ZSR-MJ

| Shape | Designation | Coated | | | | | Cermet | | | Uncoated | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | GH330 | T3130 | NS740 | N308 | | UX30 | TH10 | | | | | | |
| | SDCN53ZTN | | | | | | ● | ● | | | | | | | | | TMD5400RI Page D172 |
| | SDEN53ZFN | | | | | | | | | | ● | | | | | | |
| | SDEN53ZTN | | | | ● | | ● | | | ● | | | | | | | |
| | SDEN53ZTNCR | | | | | | ● | | | | | | | | | | |
| | SDEN53ZTN20 | | | | | ● | | | | | | | | | | | |
| | SDKN53ZFN | | | | | | | | | | ● | | | | | | |
| Rake angle Land width  -MJ | SDKN53ZTN | ● | ● | ● | ● | | ● | ● | | ● | | | | | | | |
| | SDKN53ZTNCR | | | | | | ● | | | | | | | | | | |
| | SDKN53ZTN16 | | | | | ● | | | | | | | | | | | |
| | SDKR53ZSR-MJ | | | | ● | ● | | | | | | | | | | | |

## ● SDMT050204PN-MJ, SDHT050204FN-AJ

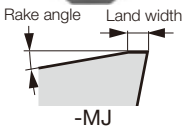
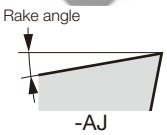
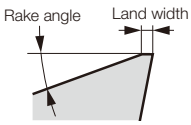
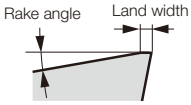
| Shape | Designation | Coated | | | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH140 | AH725 | | TH10 | | | | | | | | | | | | |
| | SDMT050204PN-MJ | ● | ● | | | | | | | | | | | | | | TUNGQUAD TPD05... Page D074 EPD05... Page D074 ELD05... Page D074 |
| | SDHT050204FN-AJ | | | | ● | | | | | | | | | | | | |
| Rake angle  -MJ | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| Rake angle  -AJ | | | | | | | | | | | | | | | | | |

●: Line up

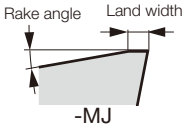
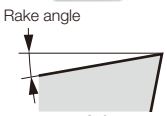
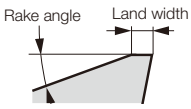
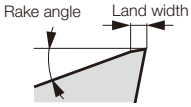
Insert

# Milling Insert

● **SDMT1204AFPN-MJ, SDMT1204AFTN-MJ, SDMT1204AFPN-ML, SDMT1204AFPN-MS, SDGT1204AFTN-MJ, SDGT1204AFFN-AJ**

| Shape | Designation | Coated | | | | | Cermet | | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | GH330 | T3130 | NS740 | | | TH10 | | | | |
|   -MJ | SDMT1204AFPN-MJ | ● | ● | ● | ● | ● | | | | | | | | TAD12... |
| | SDMT1204AFTN-MJ | | | | | | ● | | | | | | | EAD12... |
| | SDMT1204AFPN-ML | ● | | ● | | | | | | | | | | (Former products) |
| | SDMT1204AFPN-MS | | ● | | | | | | | | | | | |
| | SDGT1204AFTN-MJ | ● | | ● | | | ● | | | | | | | |
| | SDGT1204AFFN-AJ | | | | | | | | | ● | | | | |
|   -AJ | | | | | | | | | | | | | | |
|   -ML | | | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | |

● **SDMT1204PDSR-MJ, SDMT1204PDTR-MJ, SDMT1204PDPR-ML, SDMT1204PDPR-MS SDGT1204PDTR-MJ, SDGT1204PDFR-AJ**

| Shape | Designation | Coated | | | | | Cermet | | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH330 | GH330 | T3130 | NS740 | | | TH10 | | | | |
|   -MJ | SDMT1204PDSR-MJ | ● | ● | ● | ● | ● | | | | | | | | TPD12... |
| | SDMT1204PDTR-MJ | | | | | | ● | | | | | | | EPD12... |
| | SDMT1204PDPR-ML | ● | | ● | | | | | | | | | | (Former products) |
| | SDMT1204PDPR-MS | | ● | | | | | | | | | | | |
| | SDGT1204PDTR-MJ | ● | | ● | | | ● | | | | | | | |
| | SDGT1204PDFR-AJ | | | | | | | | | ● | | | | |
|   -AJ | | | | | | | | | | | | | | |
|   -ML | | | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | |

●: Line up

# Milling Insert

● **SDMW090308TN, SDMW120408TN**

| Shape | Designation | Uncoated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | | | | | | |
| | **SDMW090308TN** | ● | | | | | | | | | | | | | | ELD3000<br>ELD4000<br>(Former products) |
| | **SDMW120408TN** | ● | | | | | | | | | | | | | | |

● **SECN1203AGFN, SEEN1203AG..., SEKN1203AG..., SEKR1203AGSR-MJ, SEKR1203AGPN-MS**

| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | | UX30 | TH10 | | | | |
| | **SECN1203AGFN** | | | | | | | | | | | ● | | | | TME4400R/LI<br>Page D160 |
| | **SEEN1203AGFN** | | | | | | | | | | | ● | | | | |
| | **SEEN1203AGTN** | ● | ● | ● | | ● | ● | | ● | | ● | | | | | TME4400RB<br>Page D161 |
| | **SEEN1203AGTN-T** | | | | | | | ● | ● | | ● | | | | | |
| | **SEEN1203AGTNCR** | ● | ● | ● | ● | | | ● | | | | | | | | EME4400<br>Page D162 |
| | **SEEN1203AGTNCR-14** | | | | | | | | ● | | | | | | | |
| Rake angle Land width | **SEKN1203AGFN-T** | | | | | | | | | | | ● | | | | |
| | **SEKN1203AGTN** | ● | ● | ● | ● | ● | | ● | ● | | ● | | | | | |
| -MJ | **SEKN1203AGTN-T** | | | | | ● | ● | ● | ● | | ● | | | | | |
| | **SEKN1203AGTNCR** | | | | | | | | ● | | | | | | | |
| | **SEKR1203AGSR-MJ** | ● | | | ● | ● | | ● | | | | | | | | |
| | **SEKR1203AGPN-MS** | | ● | ● | | | | | | | | | | | | |
| Rake angle Land width | | | | | | | | | | | | | | | | |
| -MS | | | | | | | | | | | | | | | | |

● **SE*N1504AG..., SEKR1504AGSR-MJ**

| Shape | Designation | Coated | | | | | Cermet | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T3130 | | NS740 | | | TH10 | UX30 | | | | | |
| | **SEEN1504AGTN** | | | | | | ● | | | | ● | | | | | TME5400RI<br>Page D166 |
| | **SEKN1504AGFN** | | | | | | | | | ● | | | | | | |
| | **SEKN1504AGTN** | ● | ● | ● | ● | | ● | | | | ● | | | | | |
| | **SEKN1504AGTN-T** | | | | ● | | ● | | | | | | | | | |
| | **SEKR1504AGSR-MJ** | | | ● | ● | | | | | | | | | | | |
| Rake angle Land width | | | | | | | | | | | | | | | | |
| -MJ | | | | | | | | | | | | | | | | |

●: Line up

Insert

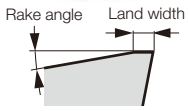
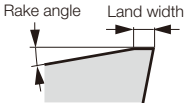
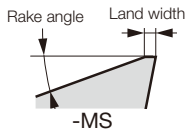
# Milling Insert

● **SECN422TN, SECN422FN, SEEN422TN, SEEN422FN, SECN422FN-DIA**

| Shape | Designation | ISO Designation (Metric) | Cermet | | | | Uncoated | | | PCD | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | NS740 | N308 | | | UX30 | TH10 | | DX140 | | | | | |
| | SECN422TN | SECN120308TN | ● | ● | | | ● | | | | | | | | EGE4000 (Former products) |
| | SECN422FN | SECN120308FN | | | | | | ● | | | | | | | |
| | SEEN422TN | SEEN120308TN | ● | ● | | | ● | | | | | | | | QHE4000 |
| | SEEN422FN | SEEN120308FN | | | | | | ● | | | | | | | |
| | SECN422FN-DIA | SECN120308FN-D | | | | | | | | ● | | | | | |
| -DIA | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

● **SEEN1203AFTNCR-14, SEKN42AFTN, SEKN42AFFN, SEKN42AFTN16, SEKR42AFSR-MJ, SEKR1203AFPN-MS, SEKR1203AFTN-MJ, SEMR1203AFTN-MJ**

| Shape | Designation | ISO Designation (Metric) | Coated | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | AH120 | AH130 | AH140 | GH330 | T3130 | | NS740 | | TH10 | UX30 | |
| | SEEN1203AFTNCR-14 | | | | | | | | ● | | | | TGE4400I |
| | SEKN42AFTN | SEKN1203AFTN | ● | ● | ● | ● | | | | | | ● | EGE4400 (Former products) |
| | SEKN42AFFN | SEKN1203AFFN | | | | | | | | | ● | | |
| | SEKN42AFTN16 | SEKN1203AFTN-16 | | | | | ● | | ● | | | | |
| | SEKR42AFSR-MJ | SEKR1203AFSR-MJ | | | | ● | ● | | | | | | |
|   | SEKR1203AFPN-MS | | | | ● | | | | | | | | |
| | SEKR1203AFTN-MJ | | | | | | | | ● | | | | |
| | SEMR1203AFTN-MJ | | | | | | | | ● | | | | |
| SEKR-MJ | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
|   | | | | | | | | | | | | | |
| SEMR-MJ | | | | | | | | | | | | | |
|   | | | | | | | | | | | | | |
| -MS | | | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert

● SECN42EFTRCR, SEEN42EFTRCR, SEKN42EFTR, SEKN42EFFR

| Shape | Designation | ISO Designation (Metric) | Coated | | | Cermet | | | Uncoated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | GH330 | T3130 | | NS740 | | | UX30 | TH10 | | | | |
| | SECN42EFTRCR | SECN1203EFTR | | | | ● | | | | | | | | EGE4100 (Former products) |
| | SEEN42EFTRCR | SEEN1203EFTR | | | | ● | | | | | | | | |
| | SEKN42EFTR | SEKN1203EFTR | ● | ● | | ● | | | | | | | | |
| | SEKN42EFFR | SEKN1203EFFR | | | | | | | | ● | | | | |
| | | | | | | | | | | | | | | |

● SE*N42ZFR, SECN42ZFR-DIA

| Shape | Designation | Uncoated | | | PCD | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | DX140 | | | | | | | | | | |
| | SECN42ZFR-DIA | | | | ● | | | | | | | | | | THE4000RIA Page D114 |
| | SECN42ZFR | ● | | | | | | | | | | | | | |
| | SEEN42ZFR | ● | | | | | | | | | | | | | |
| -DIA | | | | | | | | | | | | | | | |

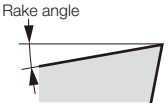
DX140: Packing quantity = 1pc.

●: Line up

Insert

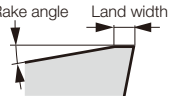
# Milling Insert

● **SEGW12X4ZEFR, SEGW12X4ZEPR, SEGT12X4ZEFR-AJ, SEGW12X4ZEFR-D, SEGW12X4ZEFR-WD, SEGW12X4ZEFR-BD**

| Shape | Designation | Coated | | | Cermet | | | Uncoated | | | PCD | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | DS1100 | NS740 | | | KS05F | | | DX140 | | | | | | |
| | SEGW12X4ZEFR | | | | | | | ● | | | | | | | | | TFE12R... Page D152 |
| | SEGW12X4ZEPR | ● | ● | | ● | | | | | | | | | | | | |
| | SEGT12X4ZEFR-AJ | | | ● | | | | ● | | | | | | | | | EFE12R... Page D152 |
| | SEGW12X4ZEFR-D | | | | | | | | | | ● | | | | | | |
| | SEGW12X4ZEFR-WD | | | | | | | | | | ● | | | | | | |
| | SEGW12X4ZEFR-BD | | | | | | | | | | ● | | | | | | |
| Rake angle  -AJ | | | | | | | | | | | | | | | | | |
| -D (General insert) | | | | | | | | | | | | | | | | | |
| -WD (Wiper insert) | | | | | | | | | | | | | | | | | |
| -BD (Wiper insert) | | | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

●**SEKR1504AFSR-MJ**

| Shape | Designation | Coated | | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T3130 | | | | | | | | | | | | | | | |
| | SEKR1504AFSR-MJ | ● | | | | | | | | | | | | | | | (Former products) |
| Rake angle Land width  -MJ | | | | | | | | | | | | | | | | | |

●: Line up

# Milling Insert

## ● SF*N42ZFN, SFCN42ZFN-DIA

| Shape | Designation | Uncoated | PCD | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | DX140 | | | | | | | |
| | SFCN42ZFN | ● | | | | | | | | THF4400RIA Page D180 |
| | SFEN42ZFN | ● | | | | | | | | |
| | SFCN42ZFN-DIA | | ● | | | | | | | |
| -DIA | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● SF*N53ZFN, SFCN53ZFN-DIA

| Shape | Designation | Uncoated | PCD | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | DX140 | | | | | | | |
| | SFCN53ZFN | ● | | | | | | | | THF5400RIA Page D182 |
| | SFEN53ZFN | ● | | | | | | | | |
| | SFCN53ZFN-DIA | | ● | | | | | | | |
| -DIA | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● SN**56FTR

| Shape | Designation | Cermet | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|
| | | X407 | | | | | | | | |
| | SNAA56FTR | ● | | | | | | | | MS... Page D202 |
| | SNAG56FTR | | | | | | | | | |
| | SNCC56FTR | | | | | | | | | |
| | SNCJ56FTR | | | | | | | | | |

●: Line up

Insert

# Milling Insert

● SNCN43Z..., SNKF43Z..., SNKN43ZTN

| Shape | Designation | Coated | | | Cermet | | | Ceramic | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1115 | T3130 | | NS740 | N308 | | FX105 | | UX30 | TH10 | | | | | |
| | SNCN43ZFN | | | | | | | | | | ● | | | | | TGN4200R-A<br>Page D190 |
| | SNCN43ZTN | | | | ● | ● | | | | ● | | | | | | |
| | SNKF43ZFN | | | | | | | | | | ● | | | | | |
| | SNKF43ZTN | ● | | | | | | | | ● | | | | | | |
| | SNKN43ZTN | ● | ● | | ● | | | ● | | ● | | | | | | |

● SNMU1706ANPR-MJ, SNHU1706ANPR-MJ, SNMU1706ANTR-ML, SNHU1706ANTR-ML, SNHU1706ANFN-W

| Shape | Designation | Coated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | AH725 | AH3135 | T1215 | | | | | | | | | | |
| | SNMU1706ANPR-MJ | | ● | ● | ● | ● | | | | | | | | | | DOOCTO<br>DOQUAD |
| | SNHU1706ANPR-MJ | | ● | ● | | | | | | | | | | | | |
| Rake angle Land width | SNMU1706ANTR-ML | ● | | | ● | | | | | | | | | | | TAN07...<br>Page D135 |
| | SNHU1706ANTR-ML | ● | | | | | | | | | | | | | | |
| | SNHU1706ANFN-W | ● | | | | | | | | | | | | | | |
| -MJ | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| Land width Rake angle | | | | | | | | | | | | | | | | |
| -ML | | | | | | | | | | | | | | | | |

● SNEN12**Z...

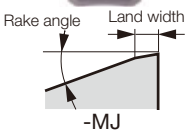
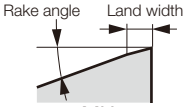
| Shape | Designation | Uncoated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | TH10 | | | | | | | | | | | | | |
| | SNEN12T2ZFN | | ● | | | | | | | | | | | | | SVN4000<br>Page D219 |
| | SNEN12T2ZTN | ● | | | | | | | | | | | | | | |
| Land width | SNEN1233ZFN | | ● | | | | | | | | | | | | | |
| Rake angle | SNEN1233ZTN | ● | | | | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert

● **SNGU1307ANEN-MJ, SNGU1307ANEN-W, SNGU1307ANEN-MH**

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | T3225 | | | | | | | | | | |
| | **SNGU1307ANEN-MJ** | ● | ● | ● | | | | | | | | | | DOTMILL TASN13... Page D132 |
| | **SNGU1307ANEN-W** | ● | ● | | | | | | | | | | | |
|   -MJ | **SNGU1307ANEN-MH** | | | ● | | | | | | | | | | |
| -W | | | | | | | | | | | | | | |
|   -MH | | | | | | | | | | | | | | |

● **SNMN1204**TN**

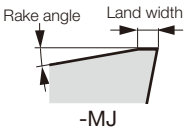
| Shape | Designation | Coated | | | Ceramic | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | T1115 | T3130 | FX105 | | UX30 | | | | | | |
| | **SNMN120408TN** | | | | ● | | | | | | | | TGN4200R-A Page D190 |
| | **SNMN120412TN** | ● | ● | ● | ● | | ● | | | | | | |
| | **SNMN120416TN** | | | | ● | | | | | | | | |
| | **SNMN120420TN** | | | | ● | | | | | | | | |
| | **SNMN120424TN** | | | | ● | | | | | | | | |

●: Line up

Insert

# Milling Insert

● SPCN42..., SPEN42..., SPKN42..., SPKR42SSR-MJ, SPGN120312TN

| Shape | Designation | Coated | | | | | Cermet | | | Ceramic | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | GH330 | T1115 | T3130 | NS740 | N308 | | FX105 | | UX30 | TH10 | | | |
| | SPCN42STR | | | | | | ● | ● | | | | ● | | | | TGP4100RIA/BA Page D184 |
| | SPCN42SFR | | | | | | | | | | | | ● | | | |
| | SPEN42STR | | | | | | ● | | | | | | | | | |
| | SPKN42STR | ● | ● | ● | ● | ● | ● | ● | | ● | | ● | | | | |
| | SPKN42STL | | | | | | ● | | | | | ● | | | | |
| | SPKN42SFR | | | | | | | | | | | | ● | | | |
| | SPKN42SFL | | | | | | | | | | | | ● | | | |
|   | SPKR42SSR-MJ | | | ● | ● | ● | | | | | | | | | | |
| | SPGN120312TN | | | | | | | | | ● | | | | | | |
| | SPEN423TN | | | | | ● | ● | | | | | ● | | | | |
| | SPEN423FN | | | | | | | | | | | | ● | | | |
| | | | | | | | | | | | | | | | | |

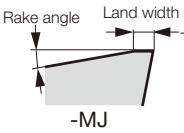
● SP*N42...

| Shape | Designation | Coated | | | Cermet | | | Uncoated | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1115 | T3130 | | NS740 | X407 | N308 | UX30 | TH10 | | | | | | | |
| | SPAN42ZFR | | | | | | | | ● | | | | | | | TGP4200R-A Page D186 |
| | SPCN42ZFL | | | | | | | | ● | | | | | | | |
| | SPCN42ZFR | | | | | | | | ● | | | | | | | |
| | SPCN42ZTR | | | | ● | ● | ● | | | | | | | | | |
| | SPEN423TN | | ● | | ● | | | ● | | | | | | | | |
| | SPEN423FN | | | | | | | | ● | | | | | | | |
| | SPEN42ZTR | | | | ● | | | | | | | | | | | |
| | SPKN42ZFL | | | | | | | | ● | | | | | | | |
| | SPKN42ZFR | | | | | | | | ● | | | | | | | |
| | SPKN42ZTR | ● | ● | | ● | ● | ● | ● | | | | | | | | |

●: Line up

# Milling Insert

## ● SP*N53S..., SPKR53SSR-MJ

| Shape | Designation | Coated | | | Cermet | | Uncoated | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | T1115 | T3130 | NS740 | N308 | | UX30 | TH10 | | | | | |
| | SPCN53SFR | | | | | | | | ● | | | | | TGP5100RIA<br>Page D188 |
| | SPCN53STR | | | | | ● | | ● | | | | | | |
| | SPKN53SFR | | | | | | | | ● | | | | | |
| | SPKN53STL | | | | | | | ● | | | | | | |
| | SPKN53STR | ● | ● | | ● | | | ● | | | | | | |
| | SPKN53STR20 | | | ● | | | | | | | | | | |
|  | SPKR53SSR-MJ | ● | | ● | | | | | | | | | | |

## ● SPGN120412TN

| Shape | Designation | Coated | | | Ceramic | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T1115 | | | FX105 | | | | | | | | | |
| | SPGN120412TN | ● | | | ● | | | | | | | | | QFP4000<br>(Former products) |

## ● SPHA**FNW

| Shape | Designation | Cermet | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N308 | | | TH10 | | | | | | | | | |
| | SPHA431FNW | ● | | | ● | | | | | | | | | TSP4000IA<br>Page D125<br>TFP4000IA<br>Page D126<br>TFD4400-A<br>Page D177<br>SFP4000R<br>Page D204<br>EFP4000R<br>Page D204 |
| | SPHA435FNW | ● | | | ● | | | | | | | | | |
| | | | | | | | | | | | | | | |

●: Line up

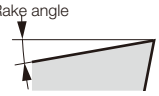
Insert

# Milling Insert

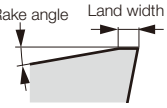
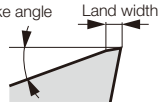
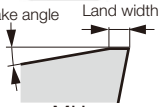
## ● SPMA422...

| Shape | Designation | Cermet | | | Uncoated | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | N308 | | UX30 | TH10 | | | | | | | |
| | SPMA422TN | ● | ● | | ● | | | | | | | | ECP4400R Page D298 |
| | SPMA422FN | | | | | ● | | | | | | | |

## ● SPMP..., SPMM**ERD

| Shape | Designation | Coated | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T313W | | | | | | | | | | | |
| Rake angle  | SPMP831DS | ● | | | | | | | | | | | TCB... Page D299 |
| | SPMP042ERD | ● | | | | | | | | | | | |
| | SPMM322ERD | ● | | | | | | | | | | | |
| | SPMM432ERD | ● | | | | | | | | | | | |

## ● SPMR1605PPTR-MJ, SPMR1605PPPR-ML, SPMR1605PPTR-MH

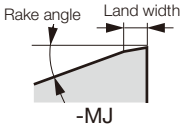
| Shape | Designation | Coated | | | Uncoated | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | T1115 | T3130 | UX30 | | | | | | | | |
| Rake angle Land width  -MJ | SPMR1605PPTR-MJ | ● | ● | ● | ● | | | | | | | | TPP16... Page D116 |
| Rake angle Land width  -ML | SPMR1605PPPR-ML | ● | | | | | | | | | | | |
| Rake angle Land width  -MH | SPMR1605PPTR-MH | ● | | ● | ● | | | | | | | | |

●: Line up

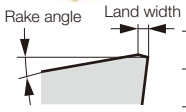
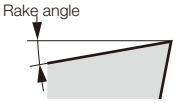
Insert

# Milling Insert

## ● SQMU1206ZSR-MJ

| Shape | Designation | Coated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | T3130 | | |
|   -MJ | SQMU1206ZSR-MJ | ● | ● | ● | ● | | DOFEEDQUAD TXQ... Page D021 |

## ● SSM..., SSS...

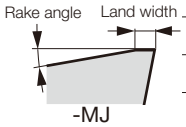
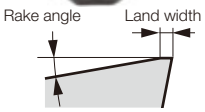
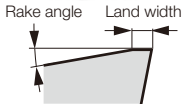
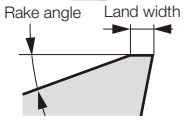
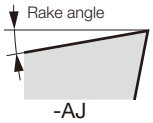
| Shape | Designation | Coated | | | | Applicable mills |
|---|---|---|---|---|---|---|
| | | GH130 | | | | |
|   SSM | SSM22N | ● | | | | TUNGMSLIT S/ASG... Page D208 |
| | SSM31N | ● | | | | |
| | SSM41N | ● | | | | |
| | SSS16N | ● | | | | |
| | SSS22N | ● | | | | |
| | SSS31N | ● | | | | |
| | SSS41N | ● | | | | |
|   SSS | | | | | | |

●: Line up

Insert

# Milling Insert

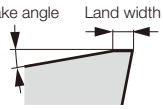
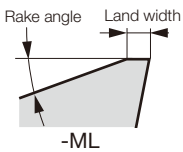
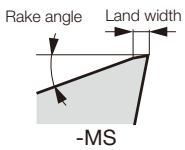
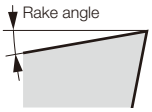
● **SWMT13T3AFPR-MJ, SWMT13T3AFER-ML, SWMW13T3AFTR, SWMT13T3AFPR-HJ, SWMT13T3AFPR-MS, SWGT13T3AFPR-MJ, SWGT13T3AFFR-AJ**

| Shape | Designation | Coated | | | | | | | | | | Cermet | | Uncoated | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH3135 | T1115 | T1215 | T3130 | DS1100 | | | NS740 | | KS05F | | |
|   -MJ | **SWMT13T3AFPR-MJ** | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | TUNGMILL |
| | **SWMT13T3AFER-ML** | ● | | | | | | | | | | | | | | TAW13... |
| | **SWMW13T3AFTR** | ● | | | | ● | ● | ● | | | | ● | | | | Page D145 |
| | **SWMT13T3AFPR-HJ** | ● | ● | ● | | ● | ● | ● | | | | | | | | EAW13... |
| | **SWMT13T3AFPR-MS** | | ● | ● | ● | | | | | | | | | | | Page D146 |
| | **SWGT13T3AFPR-MJ** | ● | | | | | | | | | | ● | | | | |
| | **SWGT13T3AFFR-AJ** | | | | | | | | ● | | | | | ● | | |
|   -ML | | | | | | | | | | | | | | | | |
| -FL | | | | | | | | | | | | | | | | |
|   -HJ | | | | | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | | | |
|   -AJ | | | | | | | | | | | | | | | | |

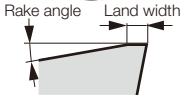
●: Line up

# Milling Insert

● **SWMT1304PDPR-MJ, SWMT1304PDER-ML, SWMT1304PDPR-MS, SWGT1304PDPR-MJ, SWGT1304PDFR-AJ**

| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | T1115 | T1215 | T3130 | DS1100 | NS740 | | KS05F | | | | |
|   -MJ | **SWMT1304PDPR-MJ** | ● | ● | ● | ● | ● | ● | | ● | | | | | | TUNGMILL TPW13... Page D078 EPW13... Page D079 |
| | **SWMT1304PDER-ML** | ● | | | | | | | | | | | | | |
| | **SWMT1304PDPR-MS** | | ● | ● | | | | | | | | | | | |
| | **SWGT1304PDPR-MJ** | ● | | | | | | | ● | | | | | | |
| | **SWGT1304PDFR-AJ** | | | | | | | ● | | | ● | | | | |
|   -ML | | | | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | | |
|   -AJ | | | | | | | | | | | | | | | |

● **SWMT1506ZER-MJ**

| Shape | Designation | Coated | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | | | |
|   -MJ | **SWMT1506ZER-MJ** | ● | ● | | | | | | | | | | | | MILLQ UAD FEED TXSW... Page D024 |

●: Line up

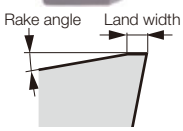
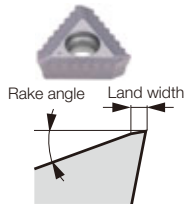
Insert

# Milling Insert

● T*-R...

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | GH330 | | | | | | | | | | | | |
| | T1-R14 | ● | | | | | | | | | | | | Single tooth threading mills<br>Page D301 |
| | T1-R28 | ● | | | | | | | | | | | | |
| | T2-R14 | ● | | | | | | | | | | | | |
| | T2-R28 | ● | | | | | | | | | | | | |

● TCGT160608PDER-MJ, TCMT160620PDER-NMJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | | |
| | TCGT160608PDER-MJ | ● | ● | | | | | | | | | | | TUNG-TRISHRED<br>LPTC16...<br>Page D051<br>TPTC16...<br>Page D051<br>EPTC16...<br>Page D052 |
| | TCMT160620PDER-NMJ | ● | ● | | | | | | | | | | | |
|   -MJ | | | | | | | | | | | | | | |
|   -NMJ | | | | | | | | | | | | | | |

●TDMN**N

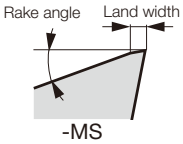
| Shape | Designation | Cermet | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | TH10 | UX30 | | | | | | | | |
| | TDMN110304TN | ● | | | | ● | | | | | | | | ESD2000<br>(Former products) |
| | TDMN110304FN | | | | ● | | | | | | | | | |
| | TDMN110308TN | ● | | | | ● | | | | | | | | |

●: Line up

Insert

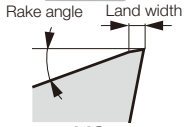
# Milling Insert

## ● TECN32...,TEEN32..., TECN32ZFR-DIA, TEKR1603PEPR-MS

| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | PCD | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | |
| | TECN32ZFR | | | | | | | | | | | ● | | | | TSE3000R Page D119 |
| | TECN32ZTR | | | | | | | | ● | ● | ● | | | | | |
| | TEEN32ZFR | | | | | | | | | | | ● | | | | ESE3000R Page D119 |
| -DIA | TEEN32ZTR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | TECN32ZFR-DIA | | | | | | | | | | | | ● | | | |
| | TEKR1603PEPR-MS | | | ● | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● TECN43..., TEEN43..., TECN43ZFR-DIA, TEKR2204PEPR-MS

| Shape | Designation | Coated | | | | | | | Cermet | | Uncoated | | PCD | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH330 | GH330 | T1115 | T3130 | NS740 | N308 | UX30 | TH10 | DX140 | | | |
| | TECN43ZFR | | | | | | | | | | | ● | | | | TSE4000RIA Page D122 |
| | TECN43ZTR | | | | | | | | ● | ● | ● | | | | | |
| | TEEN43ZFR | | | | | | | | | | | ● | | | | ESE4000R Page D123 |
| -DIA | TEEN43ZTR | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | |
| | TECN43ZFR-DIA | | | | | | | | | | | | ● | | | |
| | TEKR2204PEPR-MS | | | ● | | | | | | | | | | | | |
|   -MS | | | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

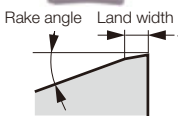
●: Line up

Insert

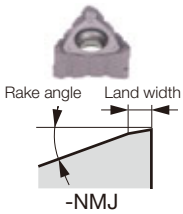
# Milling Insert

## ● TNGU120708PER-MJ, TNGU120708PER-NMJ, TNMU1207R16PER-MJ

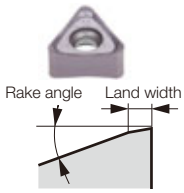
| Shape | Designation | Coated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | | | | | | | | | | | | | |
| | TNGU120708PER-MJ | ● | ● | | | | | | | | | | | | | DOFTRI TPTN12... Page D038 EPTN12... Page D038 |
| | TNGU120708PER-NMJ | ● | ● | | | | | | | | | | | | | |
| | TNMU1207R16PER-MJ | ● | ● | | | | | | | | | | | | | |



TNGU-MJ



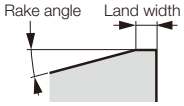
-NMJ



TNMU-MJ

## ●TNKF64ZTR

| Shape | Designation | Uncoated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | | | | | | |
| | TNKF64ZTR | ● | | | | | | | | | | | | | | TPN6400I (Former products) |



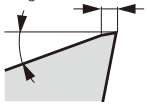
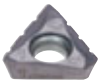
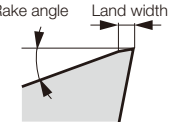

●: Line up

# Milling Insert

## ●TNMN43ZENS

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | | | | |
| | TNMN43ZENS | ● | | | | | | | | | | | | TSN4000<br>ESN4000<br>(Former products) |

## ● TOMT**PDER-MJ, TOMT150608PDER-NMJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH3135 | T1215 | | | | | | | | | | |
| | TOMT060302PDER-MJ | ● | ● | | | | | | | | | | | TUNG-TRI |
| | TOMT060304PDER-MJ | ● | ● | | | | | | | | | | | TPA06... Page D042 |
| Rake angle Land width | TOMT060308PDER-MJ | ● | ● | ● | | | | | | | | | | EPA06... Page D042 |
|  | TOMT100404PDER-MJ | ● | ● | | | | | | | | | | | HPA06... Page D043 |
| | TOMT100408PDER-MJ | ● | ● | ● | | | | | | | | | | TPA10... Page D043 |
| -MJ | TOMT100416PDER-MJ | ● | ● | | | | | | | | | | | TLA10... Page D044 |
| | TOMT150604PDER-MJ | ● | ● | | | | | | | | | | | EPA10... Page D044 |
|  | TOMT150608PDER-MJ | ● | ● | ● | | | | | | | | | | HPA10... Page D045 |
| Rake angle Land width | TOMT150616PDER-MJ | ● | ● | | | | | | | | | | | TPA15... Page D045 |
|  | TOMT150620PDER-MJ | ● | ● | | | | | | | | | | | TLA15... Page D046 |
| | TOMT150608PDER-NMJ | ● | ● | | | | | | | | | | | EPA15... Page D047 |
| -NMJ | | | | | | | | | | | | | | |

## ● TPCA43ZTRW1, TPMA432TNW1

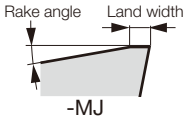
| Shape | Designation | Cermet | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | UX30 | TH10 | | | | | | | | |
| | TPCA43ZTRW1 | | | | | ● | | | | | | | | PES1500...<br>Page D108 |
| | TPMA432TNW1 | ● | | | ● | ● | | | | | | | | |

●: Line up

Insert

# Milling Insert

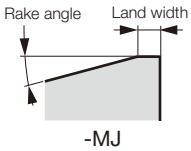
## ● TP*N43Z..., TPKR43ZSR-MJ, TPMR2204PDSR-MJ

| Shape | Designation | Coated | | | | | | | Cermet | | | Uncoated | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | GH330 | T1115 | T3130 | | NS740 | N308 | | UX30 | TH10 | | | |
| | TPCN43ZFR | | | | | | | | | | | | ● | | | TSP4000IA<br>Page D125<br>TFP4000IA<br>Page D126 |
| | TPCN43ZTR | | | | | | | | ● | ● | | ● | | | | |
| | TPEN43ZTR | | | | | | | | ● | | | | | | | |
| | TPEN43ZTRCR | | | | | | ● | | | | | | | | | |
| | TPKN43ZFR | | | | | | | | | | | | ● | | | |
| | TPKN43ZTR | ● | ● | ● | ● | ● | ● | | ● | ● | | ● | | | | |
|   | TPKR43ZSR-MJ | | | | ● | | ● | | | | | | | | | |
| | TPMR2204PDSR-MJ | | | | ● | | ● | | | | | | | | | |
| | TPKN43ZFL | | | | | | | | | | | | ● | | | |
| | | | | | | | | | | | | | | | | |

## ●TPMN**TN

| Shape | Designation | Cermet | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NS740 | | | | | | | | | | | | | | |
| | TPMN110304TN | ● | | | | | | | | | | | | | | (Former products) |
| | TPMN110308TN | ● | | | | | | | | | | | | | | |
| | TPMN160308TN | ● | | | | | | | | | | | | | | |
| | TPMN160312TN | ● | | | | | | | | | | | | | | |
| | TPMN220408TN | ● | | | | | | | | | | | | | | |
| | TPMN220412TN | ● | | | | | | | | | | | | | | |

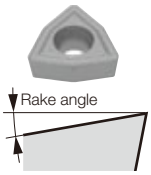
## ● TVKX**TN-MJ

| Shape | Designation | Coated | | | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | | | | | | | | | | | | |
| | TVKX020202TN-MJ | ● | | ● | | | | | | | | | | | | TUNGTSLIT<br>ASV 02/03/04/05...<br>Page D211 |
| | TVKX020204TN-MJ | ● | | ● | | | | | | | | | | | | |
| | TVKX03X302TN-MJ | ● | | ● | | | | | | | | | | | | |
|   | TVKX03X304TN-MJ | ● | | ● | | | | | | | | | | | | |
| | TVKX04H304TN-MJ | ● | ● | ● | | | | | | | | | | | | |
| | TVKX04H308TN-MJ | ● | ● | ● | | | | | | | | | | | | |
| | TVKX050404TN-MJ | ● | ● | ● | | | | | | | | | | | | |
| | TVKX050408TN-MJ | ● | ● | ● | | | | | | | | | | | | |

●: Line up

# Milling Insert

## ● WCMT**-D4

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | | | | | | | | | | | |
|   | **WCMT050308-D4** | ● | ● | | | | | | | | | | | EVX... Page D293 |
| | **WCMT06T308-D4** | ● | ● | | | | | | | | | | | HVX... Page D305 |

## ● WDCN42ZFR-DIA

| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| Wiper insert -DIA | **WDCN42ZFR-DIA** | ● | | | | | | | | | | | | TMD4400R/LI Page D168<br>EMD4400RI Page D169<br>TGD4400-A Page D174<br>EGD4400 Page D174 |

DX140: Packing quantity = 1pc.

## ● WECN42ZFR-DIA

| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| Wiper insert -DIA | **WECN42ZFR-DIA** | ● | | | | | | | | | | | | THE4000RIA Page D114 |

DX140: Packing quantity = 1pc.

## ● WFCN**ZFR-DIA

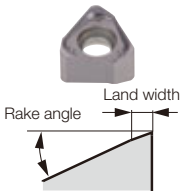
| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| Wiper insert -DIA | **WFCN42ZFR-DIA** | ● | | | | | | | | | | | | THF4400RIA Page D180 |
| | **WFCN53ZFR-DIA** | ● | | | | | | | | | | | | THF5400RIA Page D182 |

DX140: Packing quantity = 1pc.

●: Line up

# Milling Insert

## ● WNGU**TN-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH725 | | | | | | | | | | |
|   | WNGU060308TN-MJ | ● | ● | ● | | | | | | | | | | TUNGUSLOT UNIVERSAL<br>ASW 06/07/09...<br>Page D213<br>TSW 06/07/09...<br>Page D214 |
| | WNGU060316TN-MJ | ● | ● | ● | | | | | | | | | | |
| | WNGU07T308TN-MJ | ● | ● | ● | | | | | | | | | | |
| | WNGU07T316TN-MJ | ● | ● | ● | | | | | | | | | | |
| | WNGU090408TN-MJ | ● | ● | ● | | | | | | | | | | |
| | WNGU090416TN-MJ | ● | ● | ● | | | | | | | | | | |

## ● WPAN42SFR

| Shape | Designation | Cermet | | | Uncoated | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N308 | | | TH10 | | | | | | | | | |
| Wiper insert (Two corner type) | WPAN42SFR | ● | | | ● | | | | | | | | | TGP4100RIA/BA<br>Page D184 |

## ● WPAN42SFRS

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | | | |
| Wiper insert (One corner type) | WPAN42SFRS | ● | | | | | | | | | | | | TGP4100RIA/BA<br>Page D184 |

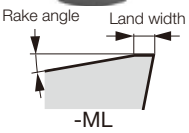
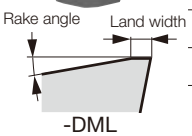
## ● WPAN42ZFR

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | | | |
| Wiper insert (Two corner type) | WPAN42ZFR | ● | | | | | | | | | | | | TGP4200R-A<br>Page D186 |

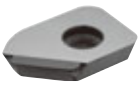
●: Line up

# Milling Insert

## ● WPMT**ZPR..., WPMT**ZPR-ML, WPMT**-MH, WPMT**-DML, WPMW**-ZSR

| Shape | Designation | Coated | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | AH120 | AH130 | AH140 | AH730 | T3130 | |
| | WPMW05H315ZPR | ● | | ● | | ● | MILLFEED |
| | WPMT05H315ZPR-ML | ● | | ● | | ● | TXP05/06/08/09... Page D026 |
| | WPMT05H315ZPR-MH | ● | | ● | | | |
| | WPMT05H315ZPR-DML | | | | ● | | EXP05/06/08/09... Page D028 |
| | WPMW06X415ZPR | ● | | ● | | ● | |
|   -ML | WPMT06X415ZPR-ML | ● | ● | ● | | ● | HXP... Page D304 |
| | WPMT06X415ZPR-MH | ● | | ● | | | |
| | WPMT06X415ZPR-DML | | | | ● | | |
| -MH | WPMT080615ZSR | ● | ● | ● | | ● | |
| | WPMT080615ZPR-ML | ● | ● | ● | | ● | |
| | WPMT080615ZSR-MH | ● | | ● | | | |
| | WPMT080615ZPR-DML | | | | ● | | |
| | WPMT090725ZSR | ● | | ● | | ● | |
| | WPMT090725ZPR-ML | ● | ● | ● | | ● | |
|   -DML | WPMT090725ZSR-MH | ● | ● | ● | | | |
| | WPMT090725ZPR-DML | | | | ● | | |

## ● WWCW13T3AFER-WS, WWCW13T3AFFR-WS, WWCW13T3AFFR-WD

| Shape | Designation | Coated | | Cermet | Uncoated | PCD | Applicable mills |
|---|---|---|---|---|---|---|---|
| | | GH110 | DS1100 | NS740 | KS05F | DX140 | |
| | WWCW13T3AFER-WS | ● | | ● | | | TUNGMILL |
| | WWCW13T3AFFR-WS | | ● | | ● | | TAW13... Page D145 |
| | WWCW13T3AFFR-WD | | | | | ● | EAW13... Page D146 |
|  -WD | | | | | | | |

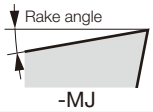
DX140: Packing quantity = 1pc.

●: Line up

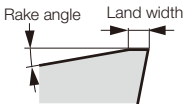
Insert

# Milling Insert

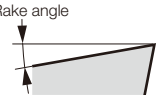
## ● WXHU**R-MJ

| Shape | Designation | Coated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH110 | | | | | | | | | | |
|   -MJ | WXHU040305R-MJ | ● | | | | | | | | | | DOMMILL HFWX04... Page D229 |
| | WXHU040310R-MJ | ● | | | | | | | | | | |

## ● XCET310404ER

| Shape | Designation | Coated | | | Cermet | | | Uncoated | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH330 | | | NS740 | | | UX30 | | | | | | |
|   | XCET310404ER | ● | | | ● | | | ● | | | | | | ECC31... Page D296 |

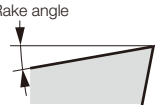
## ● XVCT16**R-AJ

| Shape | Designation | Uncoated | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TH10 | | | | | | | | | | |
|   -AJ | XVCT160504R-AJ | ● | | | | | | | | | | TUNG-ALUMILL TPV16... Page D090 EPV16... Page D090 |
| | XVCT160508R-AJ | ● | | | | | | | | | | |
| | XVCT160512R-AJ | ● | | | | | | | | | | |
| | XVCT160516R-AJ | ● | | | | | | | | | | |
| | XVCT160520R-AJ | ● | | | | | | | | | | |
| | XVCT160530R-AJ | ● | | | | | | | | | | |
| | XVCT160532R-AJ | ● | | | | | | | | | | |
| | XVCT160540R-AJ | ● | | | | | | | | | | |
| | XVCT160550R-AJ | ● | | | | | | | | | | |

●: Line up

# Milling Insert

● XVGT**EC-MJ, XVGT**FP-MJ, XVGT**FC-AJ, XVGT**FP-AJ

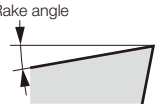
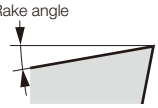
| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH730 | DS1200 | | | | | | | | | | | |
| Center edge insert | XVGT06H205EC-MJ | ● | | | | | | | | | | | | HYBRIDTACMILL EVH... Page D290 |
| | XVGT07X305EC-MJ | ● | | | | | | | | | | | | |
| | XVGT09X405EC-MJ | ● | | | | | | | | | | | | |
| | XVGT06H205EP-MJ | ● | | | | | | | | | | | | |
| Peripheral edge insert | XVGT07X305EP-MJ | ● | | | | | | | | | | | | |
| | XVGT09X405EP-MJ | ● | | | | | | | | | | | | |
| | XVGT06H205FC-AJ | | ● | | | | | | | | | | | |
| | XVGT07X305FC-AJ | | ● | | | | | | | | | | | |
| Rake angle  -MJ | XVGT09X405FC-AJ | | ● | | | | | | | | | | | |
| | XVGT06H205FP-AJ | | ● | | | | | | | | | | | |
| | XVGT07X305FP-AJ | | ● | | | | | | | | | | | |
| Rake angle -AJ | XVGT09X405FP-AJ | | ● | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert

● XHGR**ER-MJ, XHGR**FR-AJ

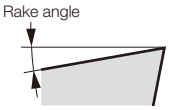
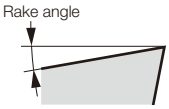
| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH730 | DS1200 | | | | | | | | | | | |
| | XHGR110202ER-MJ | ● | | | | | | | | | | | | HYBRIDTACMILL EPH11/13/18... Page D093 |
| | XHGR110204ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110205ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110208ER-MJ | ● | | | | | | | | | | | | |
| Rake angle  -MJ | XHGR110210ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110212ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110215ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110216ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110220ER-MJ | ● | | | | | | | | | | | | |
| Rake angle  -AJ | XHGR130202ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130204ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130205ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130208ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130210ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130212ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130215ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130216ER-MJ | ● | | | | | | | | | | | | |
| | XHGR130220ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T202ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T204ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T205ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T208ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T210ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T212ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T215ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T216ER-MJ | ● | | | | | | | | | | | | |
| | XHGR18T220ER-MJ | ● | | | | | | | | | | | | |
| | XHGR110200FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110202FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110204FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110205FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110208FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110210FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110212FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110215FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110216FR-AJ | | ● | | | | | | | | | | | |
| | XHGR110220FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130200FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130202FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130204FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130205FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130208FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130210FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130212FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130215FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130216FR-AJ | | ● | | | | | | | | | | | |
| | XHGR130220FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T200FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T202FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T204FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T205FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T208FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T210FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T212FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T215FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T216FR-AJ | | ● | | | | | | | | | | | |
| | XHGR18T220FR-AJ | | ● | | | | | | | | | | | |



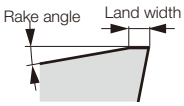
●: Line up

# Milling Insert

● XXGT**EC-MJ, XXGT**EP-MJ, XXGT**FC-AJ, XXGT**FP-AJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH730 | DS1200 | | | | | | | | | | | |
| Center edge insert | XXGT06H205EC-MJ | ● | | | | | | | | | | | | HYBRIDTACMILL EXH... Page D004 |
| | XXGT07X305EC-MJ | ● | | | | | | | | | | | | |
| | XXGT09X408EC-MJ | ● | | | | | | | | | | | | |
| Peripheral edge insert | XXGT06H205FC-AJ | | ● | | | | | | | | | | | |
| | XXGT07X305FC-AJ | | ● | | | | | | | | | | | |
| | XXGT09X408FC-AJ | | ● | | | | | | | | | | | |
| | XXGT06H205EP-MJ | ● | | | | | | | | | | | | |
| | XXGT07X305EP-MJ | ● | | | | | | | | | | | | |
| | XXGT09X408EP-MJ | ● | | | | | | | | | | | | |
|   -MJ | XXGT06H205FP-AJ | | ● | | | | | | | | | | | |
| | XXGT07X305FP-AJ | | ● | | | | | | | | | | | |
|   -AJ | XXGT09X408FP-AJ | | ● | | | | | | | | | | | |

● XXMU**PR-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | | | | | | | | | | | |
|   -MJ | XXMU08T204PR-MJ | ● | ● | | | | | | | | | | | EVX... Page D293 HVX... Page D305 |
| | XXMU10H308PR-MJ | ● | ● | | | | | | | | | | | |
| | XXMU12X408PR-MJ | ● | ● | | | | | | | | | | | |
| | XXMU16X508PR-MJ | ● | ● | | | | | | | | | | | |

●: Line up

# Milling Insert

## ● YDEN0905PDFR-D, YDEN0905PDFR-WD, YDEN0905PDFR-BD

| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| General insert | YDEN0905PDFR-D | ● | | | | | | | | | | | | DPD09... Page D155 |
| | YDEN0905PDFR-WD | ● | | | | | | | | | | | | |
| | YDEN0905PDFR-BD | ● | | | | | | | | | | | | EDPD09... Page D155 |
| Wiper insert | | | | | | | | | | | | | | |
| Wiper insert | | | | | | | | | | | | | | |

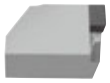
DX140: Packing quantity = 1pc.

## ● YDEN1505ADFR-D, YDEN1505ADFR-WD

| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| General insert | YDEN1505ADFR-D | ● | | | | | | | | | | | | DAD15... |
| | YDEN1505ADFR-WD | ● | | | | | | | | | | | | |
| Wiper insert | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

## ● YDEN1505PDFR-D, YDEN1505PDFR-WD

| Shape | Designation | PCD | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | | | |
| General insert | YDEN1505PDFR-D | ● | | | | | | | | | | | | DPD15... |
| | YDEN1505PDFR-WD | ● | | | | | | | | | | | | EDPD15... |
|  Wiper insert | | | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

●: Line up

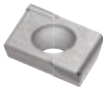
# Milling Insert

● **YDEN2405PDFR-D, YDEN2405PDFR-WD, YDEN2405PDFR-BD**

| Shape | Designation | PCD | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX140 | | | | | | | | | | |
| General insert | **YDEN2405PDFR-D** | ● | | | | | | | | | | DPD24... Page D158 |
| | **YDEN2405PDFR-WD** | ● | | | | | | | | | | |
| | **YDEN2405PDFR-BD** | ● | | | | | | | | | | |
| Wiper insert | | | | | | | | | | | | |
| Wiper insert | | | | | | | | | | | | |

DX140: Packing quantity = 1pc.

● **YPEB12X3-1A**-D, YPEB12X3-1P**-D, YPEB12X3-2A**-D, YPEB12X3-FP**-D, YPEB12X3-2P07R-D**

| Shape | Designation | PCD | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DX160 | | | | | | | | | | |
| -1A/P | **YPEB12X3-1A01R-D** | ● | | | | | | | | | | TUNGSMILL TPYP12... Page D150 EPYP12... Page D150 |
| | **YPEB12X3-1A02R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-1A07R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-1P02R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-1P07R-D** | ● | | | | | | | | | | |
| -FP | **YPEB12X3-FP02R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-FP07R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-2A01R-D** | ● | | | | | | | | | | |
|  -2A/P | **YPEB12X3-2A02R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-2A07R-D** | ● | | | | | | | | | | |
| | **YPEB12X3-2P07R-D** | ● | | | | | | | | | | |

DX160: Packing quantity = 2pcs.

●**YPEN1505PPTR-Q**

| Shape | Designation | T-CBN | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX950 | | | | | | | | | | |
| | **YPEN1505PPTR-Q** | ● | | | | | | | | | | QPP15... |

BX950: Packing quantity = 1pc.

●: Line up

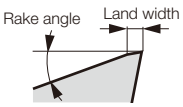
Insert

# Milling Insert

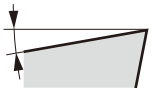
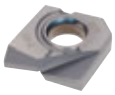
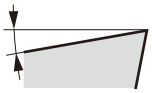
## ● ZDCA**TN

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | | | | | | | | | | | | |
| | ZDCA0804TN | ● | | | | | | | | | | | | TBF1000 (Former products) |
| | ZDCA1105TN | ● | | | | | | | | | | | | |

## ● ZDMT**-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | | | | | | | | | | | | |
| | ZDMT4005-MJ | ● | | | | | | | | | | | | EBD... Page D250 |
| | ZDMT5006-MJ | ● | | | | | | | | | | | | HBD... Page D308 |
|   -MJ | | | | | | | | | | | | | | |

## ● ZFBM**-MJ, ZFRM**-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH710 | AH725 | | | | | | | | | | | |
| | ZFBM080R00-MJ | ● | ● | | | | | | | | | | | BALL FNOSE EBFM... Page D224 HBFM... Page D225 |
| | ZFBM100R00-MJ | ● | ● | | | | | | | | | | | |
| | ZFBM120R00-MJ | ● | ● | | | | | | | | | | | |
| Rake angle | ZFBM160R00-MJ | ● | ● | | | | | | | | | | | |
|  | ZFBM200R00-MJ | ● | ● | | | | | | | | | | | |
| | ZFBM250R00-MJ | ● | ● | | | | | | | | | | | |
| ZFBM-MJ | ZFBM300R00-MJ | ● | ● | | | | | | | | | | | |
| | ZFBM320R00-MJ | ● | ● | | | | | | | | | | | |
|  | ZFRM120R05-MJ | ● | ● | | | | | | | | | | | |
| | ZFRM120R10-MJ | ● | ● | | | | | | | | | | | |
| Rake angle | ZFRM160R05-MJ | ● | ● | | | | | | | | | | | |
|  | ZFRM160R10-MJ | ● | ● | | | | | | | | | | | |
| | ZFRM160R15-MJ | ● | ● | | | | | | | | | | | |
| ZFRM-MJ | ZFRM200R10-MJ | ● | ● | | | | | | | | | | | |
| | ZFRM200R15-MJ | ● | ● | | | | | | | | | | | |

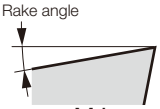
●: Line up

# Milling Insert

## ● ZNCA**FN, ZNMM**EN

| Shape | Designation | Uncoated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | UX30 | TH10 | | | | | | | | | | | |
| | ZNCA1002FN2 | ● | ● | | | | | | | | | | | TBN1000 Page D246 |
| | ZNCA1203FN | ● | ● | | | | | | | | | | | |
| | ZNCA1603FN | ● | ● | | | | | | | | | | | |
| | ZNCA2004FN | ● | ● | | | | | | | | | | | |
| | ZNCA2505FN | ● | ● | | | | | | | | | | | |
| | ZNCA3005FN | ● | ● | | | | | | | | | | | |
| | ZNMM2004EN | ● | | | | | | | | | | | | |
| | ZNMM2505EN | ● | | | | | | | | | | | | |
| | ZNMM3005EN | ● | | | | | | | | | | | | |

## ● ZPET**-MJ

| Shape | Designation | Coated | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH330 | | | | | | | | | | | |
| | ZPET2004-MJ | ● | ● | | | | | | | | | | | EBP... Page D248 |
| | ZPET2505-MJ | ● | ● | | | | | | | | | | | HBP... Page D307 |
| | ZPET3006-MJ | ● | ● | | | | | | | | | | | |
| Rake angle  -MJ | | | | | | | | | | | | | | |

## ● ZPCW**-QBN

| Shape | Designation | T-CBN | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX950 | | | | | | | | | | | | |
| | ZPCW2003-QBN | ● | | | | | | | | | | | | EBB... Page D249 |
| | ZPCW25H3-QBN | ● | | | | | | | | | | | | |
| | ZPCW30T3-QBN | ● | | | | | | | | | | | | |
| | ZPCW4004-QBN | ● | | | | | | | | | | | | |
| | ZPCW5004-QBN | ● | | | | | | | | | | | | |

BX950: Packing quantity = 1pc.

●: Line up

# Milling Insert CBN

● **2QP-SNGN..**

| Shape | Designation | CBN | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX910 | | | | | | | | | | |
| | **2QP-SNGN090308** | ● | | | | | | | | | | |
| | **2QP-SNGN090312** | ● | | | | | | | | | | |

● **2QP-SPGW..., 2QP-SPGN...**

| Shape | Designation | CBN | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX910 | | | | | | | | | | |
| 2QP-SPGW | **2QP-SPGW09T308** | ● | | | | | | | | | | |
| | **2QP-SPGW09T312** | ● | | | | | | | | | | |
| | **2QP-SPGW120408** | ● | | | | | | | | | | |
| | **2QP-SPGW120412** | ● | | | | | | | | | | |
| | **2QP-SPGW120416** | ● | | | | | | | | | | |
| 2QP-SPGN | **2QP-SPGN090308** | ● | | | | | | | | | | |
| | **2QP-SPGN090312** | ● | | | | | | | | | | |

● **3QP-TPGW..., 3QP-TPGN...**

| Shape | Designation | CBN | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BX910 | | | | | | | | | | |
| 3QP-TPGW | **3QP-TPGW110308** | ● | | | | | | | | | | |
| | **3QP-TPGN110308** | ● | | | | | | | | | | |
| | **3QP-TPGN110312** | ● | | | | | | | | | | |
| 3QP-TPGN | | | | | | | | | | | | |

●: Line up

Insert

# Milling Insert CBN

● S-CNGN..., S-RNGN..., S-SNGN..., S-TNGN...

| Shape | Designation | CBN | | | | | | | | | | | | Applicable mills |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BXC90 | | | | | | | | | | | | |
| S-CNGN | S-CNGN090308 | ● | | | | | | | | | | | | |
| | S-CNGN090312 | ● | | | | | | | | | | | | |
| | S-CNGN120408 | ● | | | | | | | | | | | | |
| | S-CNGN120412 | ● | | | | | | | | | | | | |
| S-RNGN | S-RNGN090300 | ● | | | | | | | | | | | | |
| | S-RNGN120400 | ● | | | | | | | | | | | | |
| S-SNGN | S-SNGN090308 | ● | | | | | | | | | | | | |
| | S-SNGN090312 | ● | | | | | | | | | | | | |
| | S-SNGN120308 | ● | | | | | | | | | | | | |
| | S-SNGN120312 | ● | | | | | | | | | | | | |
| | S-SNGN120408 | ● | | | | | | | | | | | | |
| | S-SNGN120412 | ● | | | | | | | | | | | | |
| S-TNGN | S-TNGN110308 | ● | | | | | | | | | | | | |
| | S-TNGN110312 | ● | | | | | | | | | | | | |
| | S-TNGN160408 | ● | | | | | | | | | | | | |
| | S-TNGN160412 | ● | | | | | | | | | | | | |

●: Line up

Insert

MEMO

# DrillLine

www.tungaloy.com

# DRILLING


2 Effective Drill E004

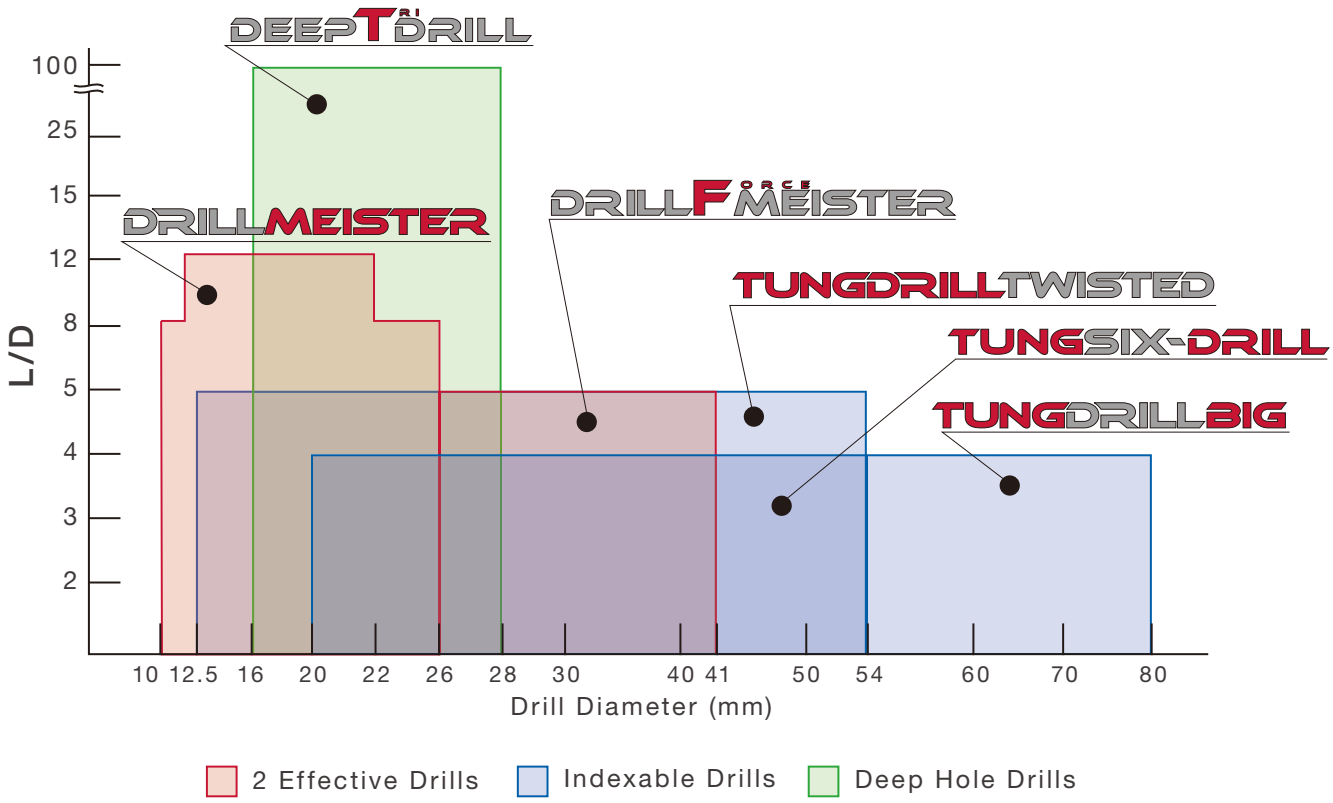
Indexable Drill E070

Deep Hole Drill E102

# Basic Selection of Drilling Tools

Application ranges of drilling tools

## Indexable & Head-Changeable Drills




## Hole diameter tolerance*

### TUNGSIX-DRILL

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 2 | ø20 - ø27 | + 0.25 / 0 |
| | ø28 - ø54 | + 0.3 / 0 |
| 3 | ø20 - ø27 | + 0.25 / 0 |
| | ø28 - ø54 | + 0.3 / 0 |
| 4 | ø20 - ø27 | + 0.3 / 0 |
| | ø28 - ø54 | + 0.35 / 0 |

### TUNGDRILLTWISTED

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 2 | ø12.5 - ø17 | + 0.25 / 0 |
| | ø17.5 - ø54 | + 0.3 / 0 |
| 3 | ø12.5 - ø17 | + 0.25 / 0 |
| | ø17.5 - ø54 | + 0.3 / 0 |
| 4 | ø12.5 - ø17 | + 0.4 / 0 |
| | ø17.5 - ø54 | + 0.45 / 0 |
| 5 | ø12.5 - ø17 | + 0.4 / 0 |
| | ø17.5 - ø54 | + 0.45 / 0 |

### DRILLMEISTER

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| TID 1.5 | ø10 - ø25.9 | + 0.05 / 0 |
| TID 3 | ø10 - ø25.9 | + 0.05 / 0 |
| TID 5 | ø10 - ø17.9 | + 0.06 / 0 |
| | ø18 - ø25.9 | + 0.065 / 0 |
| TID 8 | ø10 - ø17.9 | + 0.07 / 0 |
| | ø18 - ø25.9 | + 0.085 / 0 |
| TID 12 | ø12 - ø17.9 | + 0.08 / 0 |
| | ø18 - ø25.9 | + 0.095 / 0 |
| TIDC 3 | ø10 - ø19.9 | + 0.05 / 0 |
| TIDC 5 | ø10 - ø19.9 | + 0.05 / 0 |

### DRILLFORCEMEISTER

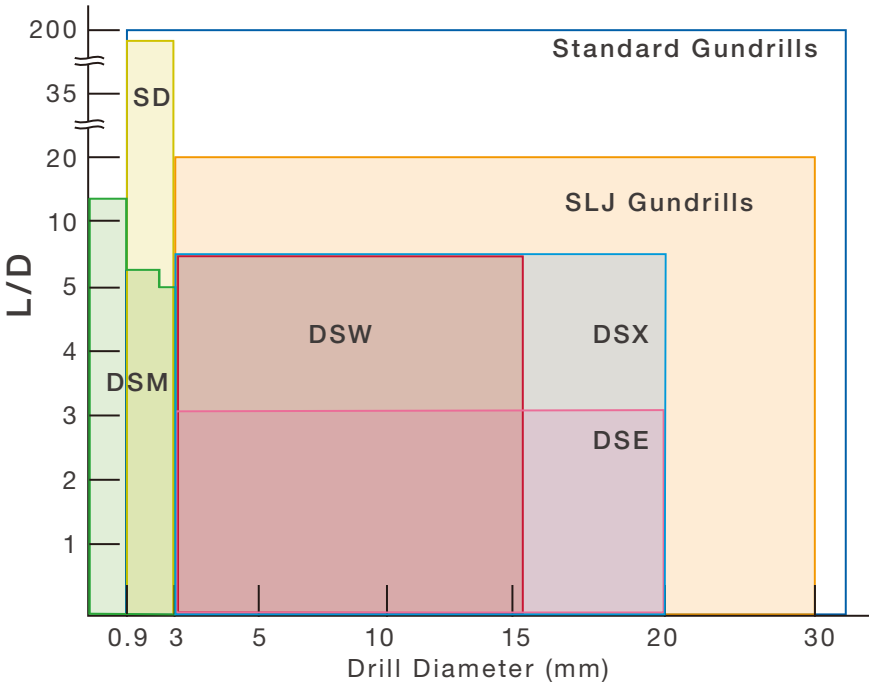
| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 3 | ø26 - ø29.9 | + 0.05 / 0 |
| | ø30 - ø41 | + 0.06 / 0 |
| 5 | ø26 - ø29.9 | + 0.08 / 0 |
| | ø30 - ø41 | + 0.09 / 0 |

### DEEPTDRILL

| L/D | Tool diameter | Hole diameter tolerance* |
|---|---|---|
| 10 | ø16 - ø28 | + 0.05 / - 0.1 |
| 15 | ø16 - ø28 | + 0.05 / - 0.1 |
| 25 | ø16 - ø28 | + 0.05 / - 0.1 |

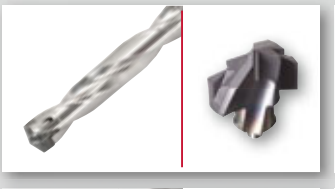
* Just for reference

## Solid Drills, Brazed Carbide Drills



# DrillLine - 2 Effective Drill

## Head-Changeable Drill



### DRILLMEISTER

E006

Drills with head-changeable system

ø10 mm - ø25.9 mm / L/D = 1.5, 3, 5, 8, 12 ※ L/D =12 : ø12 ~ ø22.9

### DRILLFORCEMEISTER

E020

Drills featuring indexable inserts with 2-effective cutting edges for large diameter drilling

ø26 mm - ø41 mm / L/D = 3, 5

## Solid Drill

### SOLIDDRILL

E025

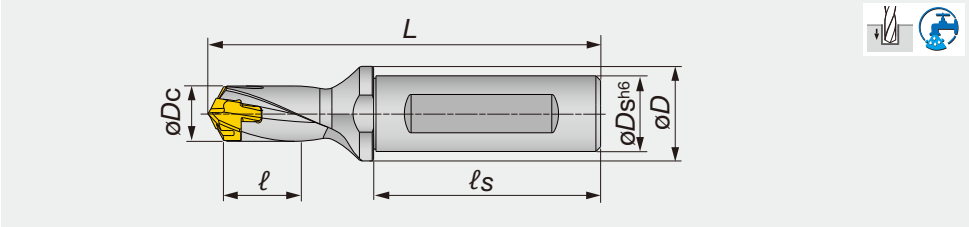
Solid carbide drills for excellent performance

DrillForce-Meister

# DRILLMEISTER

## TID L/D=1.5

Indexable head drill




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID060F12-1.5 | 6 - 6.4 | 12 | 16 | 9 | 45 | 68 | 6 | DMP060-DMP064 |
| TID065F12-1.5 | 6.5 - 6.9 | 12 | 16 | 10 | 45 | 69.1 | 6 | DMP065-DMP069 |
| TID070F12-1.5 | 7 - 7.4 | 12 | 16 | 11 | 45 | 70.1 | 7 | DMP070-DMP074 |
| TID075F12-1.5 | 7.5 - 7.9 | 12 | 16 | 11.3 | 45 | 70.9 | 7 | DMP075-DMP079 |
| TID080F12-1.5 | 8 - 8.9 | 12 | 16 | 12 | 45 | 72.4 | 8 | DMP080-DMP089 |
| TID090F12-1.5 | 9 - 9.9 | 12 | 16 | 14 | 45 | 74.3 | 9 | DMP090-DMP099 |
| TID100F16-1.5 | 10 - 10.9 | 16 | 20 | 15 | 48 | 79.2 | 10 | DMP100 - DMP109 |
| TID110F16-1.5 | 11 - 11.9 | 16 | 20 | 17 | 48 | 81.1 | 11 | DMP110 - DMP119 |
| TID120F16-1.5 | 12 - 12.9 | 16 | 20 | 18 | 48 | 83 | 12 | DMP120 - DMP129 |
| TID130F16-1.5 | 13 - 13.9 | 16 | 20 | 20 | 48 | 85.1 | 13 | DMP130 - DMP139 |
| TID140F16-1.5 | 14 - 14.9 | 16 | 20 | 21 | 48 | 89.1 | 14 | DMP140 - DMP149 |
| TID150F20-1.5 | 15 - 15.9 | 20 | 25 | 23 | 50 | 96.2 | 15 | DMP150 - DMP159 |
| TID160F20-1.5 | 16 - 16.9 | 20 | 25 | 24 | 50 | 99.3 | 16 | DMP160 - DMP169 |
| TID170F20-1.5 | 17 - 17.9 | 20 | 25 | 26 | 50 | 102.4 | 17 | DMP170 - DMP179 |
| TID180F25-1.5 | 18 - 18.9 | 25 | 32 | 27 | 56 | 111.5 | 18 | DMP180 - DMP189 |
| TID190F25-1.5 | 19 - 19.9 | 25 | 32 | 29 | 56 | 114.5 | 19 | DMP190 - DMP199 |
| TID200F25-1.5 | 20 - 20.9 | 25 | 32 | 30 | 56 | 117.6 | 20 | DMP200 - DMP209 |
| TID210F25-1.5 | 21 - 21.9 | 25 | 32 | 32 | 56 | 120.7 | 21 | DMP210 - DMP219 |
| TID220F25-1.5 | 22 - 22.9 | 25 | 32 | 33 | 56 | 123.8 | 22 | DMP220 - DMP229 |
| TID230F32-1.5 | 23 - 23.9 | 32 | 42 | 35 | 60 | 130.8 | 23 | DMP230 - DMP239 |
| TID240F32-1.5 | 24 - 24.9 | 32 | 42 | 36 | 60 | 133.9 | 24 | DMP240 - DMP249 |
| TID250F32-1.5 | 25 - 25.9 | 32 | 42 | 38 | 60 | 137 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø6 - ø25.9 | +0.05 / 0 |

*Just for reference

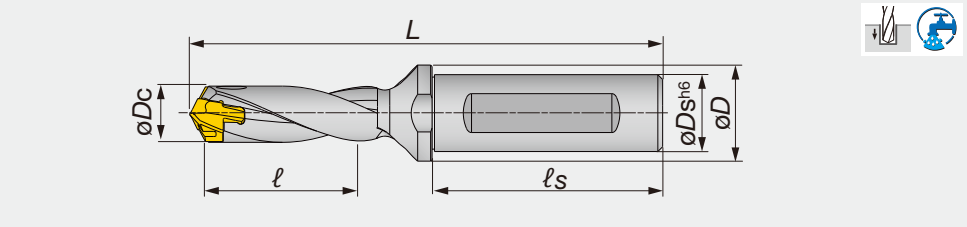
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID060-090 | K-TID6-9.99 |
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# DRILLMEISTER

## TID L/D=3

Indexable head drill




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID060F12-3 | 6 - 6.4 | 12 | 16 | 18 | 45 | 77 | 6 | DMP060-DMP064 |
| TID065F12-3 | 6.5 - 6.9 | 12 | 16 | 20 | 45 | 78.8 | 6 | DMP065-DMP069 |
| TID070F12-3 | 7 - 7.4 | 12 | 16 | 21 | 45 | 80.6 | 7 | DMP070-DMP074 |
| TID075F12-3 | 7.5 - 7.9 | 12 | 16 | 23 | 45 | 82.1 | 7 | DMP075-DMP079 |
| TID080F12-3 | 8 - 8.4 | 12 | 16 | 24 | 45 | 84.4 | 8 | DMP080-DMP084 |
| TID085F12-3 | 8.5 - 8.9 | 12 | 16 | 26 | 45 | 85.9 | 8 | DMP085-DMP089 |
| TID090F12-3 | 9 - 9.4 | 12 | 16 | 27 | 45 | 87.8 | 9 | DMP090-DMP094 |
| TID095F12-3 | 9.5 - 9.9 | 12 | 16 | 29 | 45 | 89.3 | 9 | DMP095-DMP099 |
| TID100F16-3 | 10 - 10.4 | 16 | 20 | 30 | 48 | 94.2 | 10 | DMP100 - DMP104 |
| TID105F16-3 | 10.5 - 10.9 | 16 | 20 | 32 | 48 | 95.7 | 10 | DMP105 - DMP109 |
| TID110F16-3 | 11 - 11.4 | 16 | 20 | 33 | 48 | 97.6 | 11 | DMP110 - DMP114 |
| TID115F16-3 | 11.5 - 11.9 | 16 | 20 | 35 | 48 | 99.1 | 11 | DMP115 - DMP119 |
| TID120F16-3 | 12 - 12.4 | 16 | 20 | 36 | 48 | 101 | 12 | DMP120 - DMP124 |
| TID125F16-3 | 12.5 - 12.9 | 16 | 20 | 37 | 48 | 102.5 | 12 | DMP125 - DMP129 |
| TID130F16-3 | 13 - 13.4 | 16 | 20 | 39 | 48 | 104.6 | 13 | DMP130 - DMP134 |
| TID135F16-3 | 13.5 - 13.9 | 16 | 20 | 41 | 48 | 106.1 | 13 | DMP135 - DMP139 |
| TID140F16-3 | 14 - 14.4 | 16 | 20 | 42 | 48 | 110.1 | 14 | DMP140 - DMP144 |
| TID145F16-3 | 14.5 - 14.9 | 16 | 20 | 44 | 48 | 111.6 | 14 | DMP145 - DMP149 |
| TID150F20-3 | 15 - 15.9 | 20 | 25 | 45 | 50 | 118.7 | 15 | DMP150 - DMP159 |
| TID160F20-3 | 16 - 16.9 | 20 | 25 | 48 | 50 | 123.3 | 16 | DMP160 - DMP169 |
| TID170F20-3 | 17 - 17.9 | 20 | 25 | 51 | 50 | 127.9 | 17 | DMP170 - DMP179 |
| TID180F25-3 | 18 - 18.9 | 25 | 32 | 54 | 56 | 138.5 | 18 | DMP180 - DMP189 |
| TID190F25-3 | 19 - 19.9 | 25 | 32 | 57 | 56 | 143 | 19 | DMP190 - DMP199 |
| TID200F25-3 | 20 - 20.9 | 25 | 32 | 60 | 56 | 147.6 | 20 | DMP200 - DMP209 |
| TID210F25-3 | 21 - 21.9 | 25 | 32 | 63 | 56 | 152.2 | 21 | DMP210 - DMP219 |
| TID220F25-3 | 22 - 22.9 | 25 | 32 | 66 | 56 | 156.8 | 22 | DMP220 - DMP229 |
| TID230F32-3 | 23 - 23.9 | 32 | 42 | 69 | 60 | 165.3 | 23 | DMP230 - DMP239 |
| TID240F32-3 | 24 - 24.9 | 32 | 42 | 72 | 60 | 169.9 | 24 | DMP240 - DMP249 |
| TID250F32-3 | 25 - 25.9 | 32 | 42 | 75 | 60 | 174.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø6 - ø25.9 | +0.05 / 0 |

*Just for reference

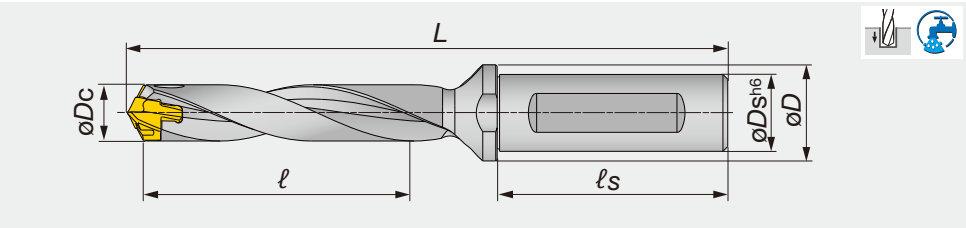
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID060-095 | K-TID6-9.99 |
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# DRILLMEISTER

## TID L/D=5

Indexable head drill




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID060F12-5 | 6 - 6.4 | 12 | 16 | 30 | 45 | 89 | 6 | DMP060-DMP064 |
| TID065F12-5 | 6.5 - 6.9 | 12 | 16 | 33 | 45 | 91.8 | 6 | DMP065-DMP069 |
| TID070F12-5 | 7 - 7.4 | 12 | 16 | 35 | 45 | 94.6 | 7 | DMP070-DMP074 |
| TID075F12-5 | 7.5 - 7.9 | 12 | 16 | 38 | 45 | 97.1 | 7 | DMP075-DMP079 |
| TID080F12-5 | 8 - 8.4 | 12 | 16 | 40 | 45 | 100.4 | 8 | DMP080-DMP084 |
| TID085F12-5 | 8.5 - 8.9 | 12 | 16 | 43 | 45 | 102.9 | 8 | DMP085-DMP089 |
| TID090F12-5 | 9 - 9.4 | 12 | 16 | 45 | 45 | 105.8 | 9 | DMP090-DMP094 |
| TID095F12-5 | 9.5 - 9.9 | 12 | 16 | 48 | 45 | 108.3 | 9 | DMP095-DMP099 |
| TID100F16-5 | 10 - 10.4 | 16 | 20 | 50 | 48 | 114.2 | 10 | DMP100 - DMP104 |
| TID105F16-5 | 10.5 - 10.9 | 16 | 20 | 53 | 48 | 116.7 | 10 | DMP105 - DMP109 |
| TID110F16-5 | 11 - 11.4 | 16 | 20 | 55 | 48 | 119.6 | 11 | DMP110 - DMP114 |
| TID115F16-5 | 11.5 - 11.9 | 16 | 20 | 58 | 48 | 122.1 | 11 | DMP115 - DMP119 |
| TID120F16-5 | 12 - 12.4 | 16 | 20 | 60 | 48 | 125 | 12 | DMP120 - DMP124 |
| TID125F16-5 | 12.5 - 12.9 | 16 | 20 | 62 | 48 | 127.5 | 12 | DMP125 - DMP129 |
| TID130F16-5 | 13 - 13.4 | 16 | 20 | 65 | 48 | 130.6 | 13 | DMP130 - DMP134 |
| TID135F16-5 | 13.5 - 13.9 | 16 | 20 | 68 | 48 | 133.1 | 13 | DMP135 - DMP139 |
| TID140F16-5 | 14 - 14.4 | 16 | 20 | 70 | 48 | 138.2 | 14 | DMP140 - DMP144 |
| TID145F16-5 | 14.5 - 14.9 | 16 | 20 | 73 | 48 | 140.7 | 14 | DMP145 - DMP149 |
| TID150F20-5 | 15 - 15.9 | 20 | 25 | 75 | 50 | 148.7 | 15 | DMP150 - DMP159 |
| TID160F20-5 | 16 - 16.9 | 20 | 25 | 80 | 50 | 155.3 | 16 | DMP160 - DMP169 |
| TID170F20-5 | 17 - 17.9 | 20 | 25 | 85 | 50 | 161.9 | 17 | DMP170 - DMP179 |
| TID180F25-5 | 18 - 18.9 | 25 | 32 | 90 | 56 | 174.5 | 18 | DMP180 - DMP189 |
| TID190F25-5 | 19 - 19.9 | 25 | 32 | 95 | 56 | 181 | 19 | DMP190 - DMP199 |
| TID200F25-5 | 20 - 20.9 | 25 | 32 | 100 | 56 | 187.6 | 20 | DMP200 - DMP209 |
| TID210F25-5 | 21 - 21.9 | 25 | 32 | 105 | 56 | 194.2 | 21 | DMP210 - DMP219 |
| TID220F25-5 | 22 - 22.9 | 25 | 32 | 110 | 56 | 200.8 | 22 | DMP220 - DMP229 |
| TID230F32-5 | 23 - 23.9 | 32 | 42 | 115 | 60 | 211.3 | 23 | DMP230 - DMP239 |
| TID240F32-5 | 24 - 24.9 | 32 | 42 | 120 | 60 | 217.9 | 24 | DMP240 - DMP249 |
| TID250F32-5 | 25 - 25.9 | 32 | 42 | 125 | 60 | 224.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø6 - ø17.9 | +0.06 / 0 |
| ø18 - ø25.9 | +0.065 / 0 |

*Just for reference

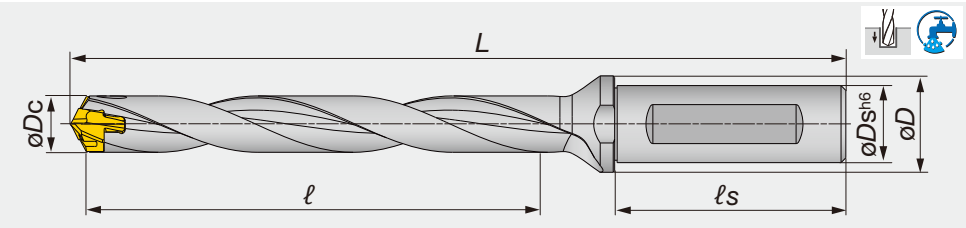
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID060-095 | K-TID6-9.99 |
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# DRILLMEISTER

## TID L/D=8

Indexable head drill




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TID070F12-8 | 7 - 7.4 | 12 | 16 | 56 | 45 | 115.6 | 7 | DMP070-DMP074 |
| TID075F12-8 | 7.5 - 7.9 | 12 | 16 | 60 | 45 | 119.6 | 7 | DMP075-DMP079 |
| TID080F12-8 | 8 - 8.4 | 12 | 16 | 64 | 45 | 124.4 | 8 | DMP080-DMP084 |
| TID085F12-8 | 8.5 - 8.9 | 12 | 16 | 68 | 45 | 128.4 | 8 | DMP085-DMP089 |
| TID090F12-8 | 9 - 9.4 | 12 | 16 | 72 | 45 | 132.8 | 9 | DMP090-DMP094 |
| TID095F12-8 | 9.5 - 9.9 | 12 | 16 | 76 | 45 | 136.8 | 9 | DMP095-DMP099 |
| TID100F16-8 | 10 - 10.4 | 16 | 20 | 80 | 48 | 144.2 | 10 | DMP100 - DMP104 |
| TID105F16-8 | 10.5 - 10.9 | 16 | 20 | 84 | 48 | 148.2 | 10 | DMP105 - DMP109 |
| TID110F16-8 | 11 - 11.4 | 16 | 20 | 88 | 48 | 152.6 | 11 | DMP110 - DMP114 |
| TID115F16-8 | 11.5 - 11.9 | 16 | 20 | 92 | 48 | 156.6 | 11 | DMP115 - DMP119 |
| TID120F16-8 | 12 - 12.4 | 16 | 20 | 96 | 48 | 161 | 12 | DMP120 - DMP124 |
| TID125F16-8 | 12.5 - 12.9 | 16 | 20 | 100 | 48 | 165 | 12 | DMP125 - DMP129 |
| TID130F16-8 | 13 - 13.4 | 16 | 20 | 104 | 48 | 169.6 | 13 | DMP130 - DMP134 |
| TID135F16-8 | 13.5 - 13.9 | 16 | 20 | 108 | 48 | 173.6 | 13 | DMP135 - DMP139 |
| TID140F16-8 | 14 - 14.4 | 16 | 20 | 112 | 48 | 180.1 | 14 | DMP140 - DMP144 |
| TID145F16-8 | 14.5 - 14.9 | 16 | 20 | 116 | 48 | 184.2 | 14 | DMP145 - DMP149 |
| TID150F20-8 | 15 - 15.9 | 20 | 25 | 120 | 50 | 193.7 | 15 | DMP150 - DMP159 |
| TID160F20-8 | 16 - 16.9 | 20 | 25 | 128 | 50 | 203.3 | 16 | DMP160 - DMP169 |
| TID170F20-8 | 17 - 17.9 | 20 | 25 | 136 | 50 | 212.9 | 17 | DMP170 - DMP179 |
| TID180F25-8 | 18 - 18.9 | 25 | 32 | 144 | 56 | 228.5 | 18 | DMP180 - DMP189 |
| TID190F25-8 | 19 - 19.9 | 25 | 32 | 152 | 56 | 238 | 19 | DMP190 - DMP199 |
| TID200F25-8 | 20 - 20.9 | 25 | 32 | 160 | 56 | 247.6 | 20 | DMP200 - DMP209 |
| TID210F25-8 | 21 - 21.9 | 25 | 32 | 168 | 56 | 257.2 | 21 | DMP210 - DMP219 |
| TID220F25-8 | 22 - 22.9 | 25 | 32 | 176 | 56 | 266.8 | 22 | DMP220 - DMP229 |
| TID230F32-8 | 23 - 23.9 | 32 | 42 | 184 | 60 | 280.3 | 23 | DMP230 - DMP239 |
| TID240F32-8 | 24 - 24.9 | 32 | 42 | 192 | 60 | 289.9 | 24 | DMP240 - DMP249 |
| TID250F32-8 | 25 - 25.9 | 32 | 42 | 200 | 60 | 299.5 | 25 | DMP250 - DMP259 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø7 - ø17.9 | +0.07 / 0 |
| ø18 - ø25.9 | +0.085 / 0 |

*Just for reference

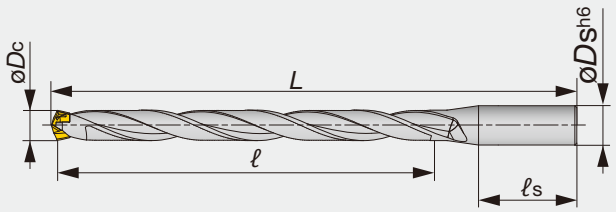
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID060-095 | K-TID6-9.99 |
| TID100-190 | K-TID10-19.99 |
| TID200-250 | K-TID20-26.99 |

# DRILLMEISTER

## TID L/D=12

Indexable head drill




*Cylindrical shank

| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TID120R16-12 | 12 - 12.4 | 16 | 144 | 48 | 209 | 12 | DMP120 - 124 |
| TID125R16-12 | 12.5 - 12.9 | 16 | 150 | 48 | 215 | 12 | DMP125 - 129 |
| TID130R16-12 | 13 - 13.4 | 16 | 156 | 48 | 221.6 | 13 | DMP130 - 134 |
| TID135R16-12 | 13.5 - 13.9 | 16 | 162 | 48 | 227.6 | 13 | DMP135 - 139 |
| TID140R16-12 | 14 - 14.4 | 16 | 168 | 48 | 236.2 | 14 | DMP140 - 144 |
| TID145R16-12 | 14.5 - 14.9 | 16 | 174 | 48 | 242.2 | 14 | DMP145 - 149 |
| TID150R20-12 | 15 - 15.9 | 20 | 180 | 50 | 253.7 | 15 | DMP150 - 159 |
| TID160R20-12 | 16 - 16.9 | 20 | 192 | 50 | 267.3 | 16 | DMP160 - 169 |
| TID170R20-12 | 17 - 17.9 | 20 | 204 | 50 | 280.9 | 17 | DMP170 - 179 |
| TID180R25-12 | 18 - 18.9 | 25 | 216 | 56 | 300.5 | 18 | DMP180 - 189 |
| TID190R25-12 | 19 - 19.9 | 25 | 228 | 56 | 314 | 19 | DMP190 - 199 |
| TID200R25-12 | 20 - 20.9 | 25 | 240 | 56 | 327.6 | 20 | DMP200 - 209 |
| TID210R25-12 | 21 - 21.9 | 25 | 252 | 56 | 341.2 | 21 | DMP210 - 219 |
| TID220R25-12 | 22 - 22.9 | 25 | 264 | 56 | 354.8 | 22 | DMP220 - 229 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø12 - ø17.9 | +0.08 / 0 |
| ø18 - ø25.9 | +0.095 / 0 |

*Just for reference

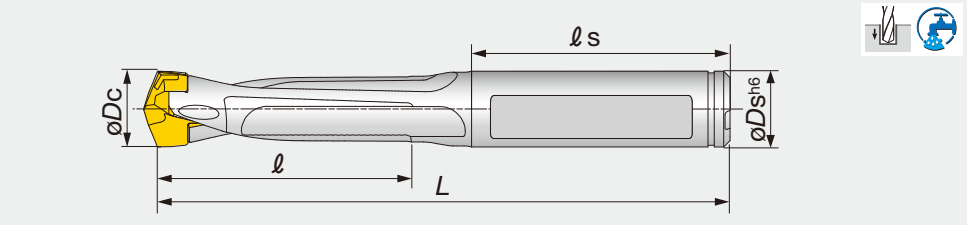
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TID100-190 | K-TID10-19.99 |
| TID200-220 | K-TID20-26.99 |

# DRILLMEISTER

## TIDC L/D=3

Indexable head drill




| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TIDC100C10-3 | 10 - 10.4 | 10 | 30 | 41 | 86.1 | 10 | DMP100 - DMP104 |
| TIDC105C11-3 | 10.5 - 10.9 | 11 | 31.5 | 41 | 87.6 | 10 | DMP105 - DMP109 |
| TIDC110C11-3 | 11 - 11.4 | 11 | 33 | 41 | 89.5 | 11 | DMP110 - DMP114 |
| TIDC115C12-3 | 11.5 - 11.9 | 12 | 34.5 | 41 | 91 | 11 | DMP115 - DMP119 |
| TIDC120C12-3 | 12 - 12.4 | 12 | 36 | 41 | 92.8 | 12 | DMP120 - DMP124 |
| TIDC125C13-3 | 12.5 - 12.9 | 13 | 37.5 | 46 | 98.3 | 12 | DMP125 - DMP129 |
| TIDC130C13-3 | 13 - 13.4 | 13 | 39 | 47 | 102.4 | 13 | DMP130 - DMP134 |
| TIDC135C14-3 | 13.5 - 13.9 | 14 | 40.5 | 43 | 99.9 | 13 | DMP135 - DMP139 |
| TIDC140C14-3 | 14 - 14.4 | 14 | 42 | 44 | 103 | 14 | DMP140 - DMP144 |
| TIDC145C15-3 | 14.5 - 14.9 | 15 | 43.5 | 45 | 105.5 | 14 | DMP145 - DMP149 |
| TIDC150C15-3 | 15 - 15.9 | 15 | 45 | 45 | 107.5 | 15 | DMP150 - DMP159 |
| TIDC160C16-3 | 16 - 16.9 | 16 | 48 | 48 | 117.5 | 16 | DMP160 - DMP169 |
| TIDC170C17-3 | 17 - 17.9 | 17 | 51 | 48 | 119.7 | 17 | DMP170 - DMP179 |
| TIDC180C18-3 | 18 - 18.9 | 18 | 54 | 48 | 123.3 | 18 | DMP180 - DMP189 |
| TIDC190C19-3 | 19 - 19.9 | 19 | 57 | 54 | 132.4 | 19 | DMP190 - DMP199 |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø19.9 | +0.05 / 0 |

*Just for reference

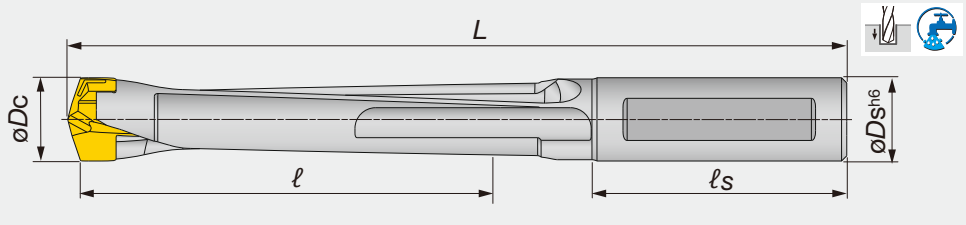
### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TIDC100-190 | K-TID10-19.99 |

# DRILLMEISTER

## TIDC L/D=5

Indexable head drill




| Designation | øDc | øDs | ℓ | ℓs | L | Pocket size | Head |
|---|---|---|---|---|---|---|---|
| TIDC100C10-5 | 10 - 10.4 | 10 | 50 | 41 | 106.1 | 10 | DMP100 - DMP104 |
| TIDC105C11-5 | 10.5 - 10.9 | 11 | 52.5 | 41 | 108.6 | 10 | DMP105 - DMP109 |
| TIDC110C11-5 | 11 - 11.4 | 11 | 55 | 41 | 111.5 | 11 | DMP110 - DMP114 |
| TIDC115C12-5 | 11.5 - 11.9 | 12 | 57.5 | 41 | 114 | 11 | DMP115 - DMP119 |
| TIDC120C12-5 | 12 - 12.4 | 12 | 60 | 41 | 116.8 | 12 | DMP120 - DMP124 |
| TIDC125C13-5 | 12.5 - 12.9 | 13 | 62.5 | 46 | 124.3 | 12 | DMP125 - DMP129 |
| TIDC130C13-5 | 13 - 13.4 | 13 | 65 | 47 | 128.4 | 13 | DMP130 - DMP134 |
| TIDC135C14-5 | 13.5 - 13.9 | 14 | 67.5 | 43 | 126.9 | 13 | DMP135 - DMP139 |
| TIDC140C14-5 | 14 - 14.4 | 14 | 70 | 44 | 131 | 14 | DMP140 - DMP144 |
| TIDC145C15-5 | 14.5 - 14.9 | 15 | 72.5 | 45 | 134.5 | 14 | DMP145 - DMP149 |
| TIDC150C15-5 | 15 - 15.9 | 15 | 75 | 45 | 137.5 | 15 | DMP150 - DMP159 |
| TIDC160C16-5 | 16 - 16.9 | 16 | 80 | 48 | 149.5 | 16 | DMP160 - DMP169 |
| TIDC170C17-5 | 17 - 17.9 | 17 | 85 | 48 | 153.7 | 17 | DMP170 - DMP179 |
| TIDC180C18-5 | 18 - 18.9 | 18 | 90 | 48 | 159.3 | 18 | DMP180 - DMP189 |
| TIDC190C19-5 | 19 - 19.9 | 19 | 95 | 54 | 170.4 | 19 | DMP190 - DMP199 |

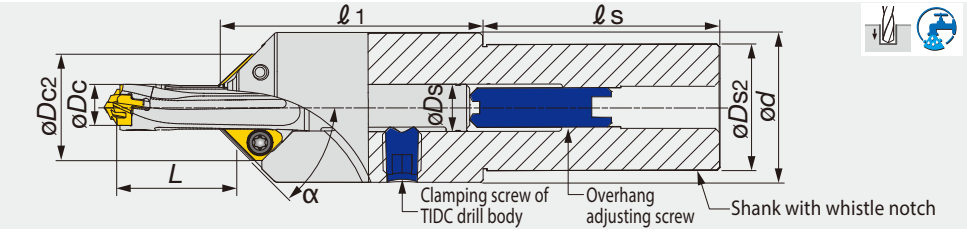
| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø10 - ø19.9 | +0.05 / 0 |

*Just for reference

### SPARE PARTS

| Designation | Clamping key |
|---|---|
| TIDC100-190 | K-TID10-19.99 |

# DRILLMEISTER
## TIDCF
Chamfering adapter




| Designation | øDc | øDs2 | ød | øDc2 | ℓ1 | ℓs | L* L/D = 3 | L* L/D = 5 | Drill body | øDs |
|---|---|---|---|---|---|---|---|---|---|---|
| TIDCF100-W32 | 10 - 10.4 | 32 | 38 | 24.9 | 67.3 | 60 | 14.5 - 31.8 | 31.7 - 51.8 | TIDC100C10-... | 10 |
| TIDCF110-W32 | 10.5 - 10.9 | 32 | 38 | 25.9 | 67.3 | 60 | 15.7 - 33.3 | 31.2 - 54.2 | TIDC105C11-... | 11 |
| TIDCF110-W32 | 11 - 11.4 | 32 | 38 | 25.9 | 67.3 | 60 | 16.2 - 35.3 | 34.1 - 57.3 | TIDC110C11-... | 11 |
| TIDCF120-W32 | 11.5 - 11.9 | 32 | 38 | 26.9 | 67.3 | 60 | 15.1 - 36.7 | 33.8 - 59.4 | TIDC115C12-... | 12 |
| TIDCF120-W32 | 12 - 12.4 | 32 | 38 | 26.9 | 67.3 | 60 | 16.5 - 37.7 | 36.6 - 61.6 | TIDC120C12-... | 12 |
| TIDCF130-W32 | 12.5 - 12.9 | 32 | 38 | 27.9 | 67.3 | 60 | 16.1 - 39.6 | 39.7 - 64.8 | TIDC125C13-... | 13 |
| TIDCF130-W32 | 13 - 13.4 | 32 | 38 | 27.9 | 67.3 | 60 | 17.5 - 41.5 | 42.7 - 68 | TIDC130C13-... | 13 |
| TIDCF140-W32 | 13.5 - 13.9 | 32 | 38 | 28.4 | 67.3 | 60 | 17.7 - 42.9 | 41.4 - 70.3 | TIDC135C14-... | 14 |
| TIDCF140-W32 | 14 - 14.4 | 32 | 38 | 28.4 | 67.3 | 60 | 18.1 - 45 | 44.8 - 73.1 | TIDC140C14-... | 14 |
| TIDCF150-W32 | 14.5 - 14.9 | 32 | 38 | 29.4 | 67.3 | 60 | 19.2 - 44.6 | 44 - 73.9 | TIDC145C15-... | 15 |
| TIDCF150-W32 | 15 - 15.9 | 32 | 38 | 29.4 | 67.3 | 60 | 19.7 - 47.4 | 47.6 - 80.7 | TIDC150C15-... | 15 |
| TIDCF160-W32 | 16 - 16.9 | 32 | 38 | 30.4 | 67.3 | 60 | 19.5 - 55.3 | 57 - 87.5 | TIDC160C16-... | 16 |
| TIDCF170-W32 | 17 - 17.9 | 32 | 38 | 31.4 | 67.3 | 60 | 21.4 - 54.9 | 55.9 - 88.5 | TIDC170C17-... | 17 |
| TIDCF180-W32 | 18 - 18.9 | 32 | 38 | 32.4 | 67.3 | 60 | 24.2 - 65.2 | 60 - 93 | TIDC180C18-... | 18 |
| TIDCF190-W32 | 19 - 19.9 | 32 | 38 | 33.4 | 75 | 60 | 28.5 - 62.3 | 67 - 100 | TIDC190C19-... | 19 |

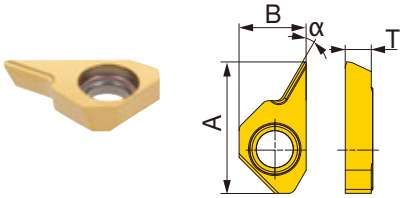
• *L** is the dimension when using 45° chamfering insert.

### SPARE PARTS

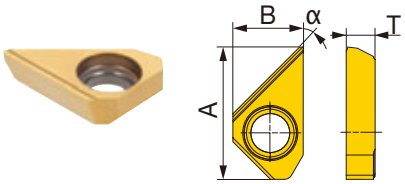
| Designation | Insert screw | Grip | Overhang adjusting screw | Clamping screw of TIDC drill body | Torx bit | Wrench |
|---|---|---|---|---|---|---|
| TIDCF | SR14-544/S | SW6-SD | SRM10X10DIN916 | SRM10X1.5S | BT15S | HW5.0 |

## CHAMFERING INSERT

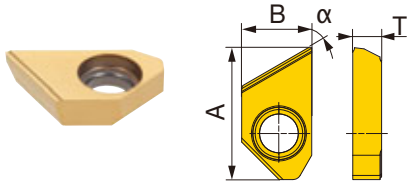
### XHGT-30A




### XHGR-45A




### XHGR-60A



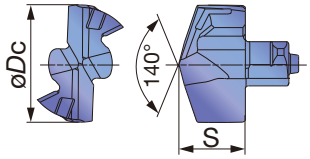

| Designation | GH730 | A | B | T | Chamfering angle α° | Maximum width of chamfer ** |
|---|---|---|---|---|---|---|
| XHGT090300-30A | ● | 16 | 8.5 | 3.3 | 30 | 1.5 |
| XHGR090300-45A | ● | 16 | 8.5 | 3.3 | 45 | 6 |
| XHGR090300-60A | ● | 16 | 8.5 | 3.3 | 60 | 3.5 |

**Please reduce the feed rate to half when chamfering over 60% of maximum width of chamfer

● : Line up
Package quantity = 2 pcs.

# DRILL HEAD

## DMP




| Designation | øDc | AH725 | S | Pocket size | Body |
|---|---|---|---|---|---|
| DMP060 | 6 | ● | 4 | 6 | TID*060* |
| DMP061 | 6.1 | ● | 4 | 6 | TID*060* |
| DMP062 | 6.2 | ● | 4 | 6 | TID*060* |
| DMP063 | 6.3 | ● | 4 | 6 | TID*060* |
| DMP064 | 6.4 | ● | 4 | 6 | TID*060* |
| DMP065 | 6.5 | ● | 4.3 | 6 | TID*065* |
| DMP066 | 6.6 | ● | 4.3 | 6 | TID*065* |
| DMP067 | 6.7 | ● | 4.3 | 6 | TID*065* |
| DMP068 | 6.8 | ● | 4.3 | 6 | TID*065* |
| DMP069 | 6.9 | ● | 4.3 | 6 | TID*065* |
| DMP070 | 7 | ● | 4.6 | 7 | TID*070* |
| DMP071 | 7.1 | ● | 4.6 | 7 | TID*070* |
| DMP072 | 7.2 | ● | 4.6 | 7 | TID*070* |
| DMP073 | 7.3 | ● | 4.6 | 7 | TID*070* |
| DMP074 | 7.4 | ● | 4.6 | 7 | TID*070* |
| DMP075 | 7.5 | ● | 4.6 | 7 | TID*075* |
| DMP076 | 7.6 | ● | 4.6 | 7 | TID*075* |
| DMP077 | 7.7 | ● | 4.6 | 7 | TID*075* |
| DMP078 | 7.8 | ● | 4.6 | 7 | TID*075* |
| DMP079 | 7.9 | ● | 4.6 | 7 | TID*075* |
| DMP080 | 8 | ● | 5.4 | 8 | TID*080* |
| DMP081 | 8.1 | ● | 5.4 | 8 | TID*080* |
| DMP082 | 8.2 | ● | 5.4 | 8 | TID*080* |
| DMP083 | 8.3 | ● | 5.4 | 8 | TID*080* |
| DMP084 | 8.4 | ● | 5.4 | 8 | TID*080* |
| DMP085 | 8.5 | ● | 5.4 | 8 | TID*085* |
| DMP086 | 8.6 | ● | 5.4 | 8 | TID*085* |
| DMP087 | 8.7 | ● | 5.4 | 8 | TID*085* |
| DMP088 | 8.8 | ● | 5.4 | 8 | TID*085* |
| DMP089 | 8.9 | ● | 5.4 | 8 | TID*085* |
| DMP090 | 9 | ● | 5.8 | 9 | TID*090* |
| DMP091 | 9.1 | ● | 5.8 | 9 | TID*090* |
| DMP092 | 9.2 | ● | 5.8 | 9 | TID*090* |
| DMP093 | 9.3 | ● | 5.8 | 9 | TID*090* |
| DMP094 | 9.4 | ● | 5.8 | 9 | TID*090* |
| DMP095 | 9.5 | ● | 5.8 | 9 | TID*095* |
| DMP096 | 9.6 | ● | 5.8 | 9 | TID*095* |
| DMP097 | 9.7 | ● | 5.8 | 9 | TID*095* |
| DMP098 | 9.8 | ● | 5.8 | 9 | TID*095* |
| DMP099 | 9.9 | ● | 5.8 | 9 | TID*095* |
| DMP100 | 10 | ● | 6.05 | 10 | TID*100... |
| DMP101 | 10.1 | ● | 6.05 | 10 | TID*100... |
| DMP102 | 10.2 | ● | 6.05 | 10 | TID*100... |
| DMP103 | 10.3 | ● | 6.05 | 10 | TID*100... |
| DMP104 | 10.4 | ● | 6.05 | 10 | TID*100... |
| DMP105 | 10.5 | ● | 6.05 | 10 | TID*105... |
| DMP106 | 10.6 | ● | 6.05 | 10 | TID*105... |
| DMP107 | 10.7 | ● | 6.05 | 10 | TID*105... |
| DMP108 | 10.8 | ● | 6.05 | 10 | TID*105... |
| DMP109 | 10.9 | ● | 6.05 | 10 | TID*105... |
| DMP110 | 11 | ● | 6.45 | 11 | TID*110... |
| DMP111 | 11.1 | ● | 6.45 | 11 | TID*110... |
| DMP112 | 11.2 | ● | 6.45 | 11 | TID*110... |
| DMP113 | 11.3 | ● | 6.45 | 11 | TID*110... |
| DMP114 | 11.4 | ● | 6.45 | 11 | TID*110... |
| DMP115 | 11.5 | ● | 6.45 | 11 | TID*115... |
| DMP116 | 11.6 | ● | 6.45 | 11 | TID*115... |
| DMP117 | 11.7 | ● | 6.45 | 11 | TID*115... |
| DMP118 | 11.8 | ● | 6.45 | 11 | TID*115... |
| DMP119 | 11.9 | ● | 6.45 | 11 | TID*115... |
| DMP120 | 12 | ● | 6.8 | 12 | TID*120... |
| DMP121 | 12.1 | ● | 6.8 | 12 | TID*120... |
| DMP122 | 12.2 | ● | 6.8 | 12 | TID*120... |
| DMP123 | 12.3 | ● | 6.8 | 12 | TID*120... |
| DMP124 | 12.4 | ● | 6.8 | 12 | TID*120... |
| DMP125 | 12.5 | ● | 6.8 | 12 | TID*125... |
| DMP126 | 12.6 | ● | 6.8 | 12 | TID*125... |
| DMP127 | 12.7 | ● | 6.8 | 12 | TID*125... |
| DMP128 | 12.8 | ● | 6.8 | 12 | TID*125... |
| DMP129 | 12.9 | ● | 6.8 | 12 | TID*125... |
| DMP130 | 13 | ● | 7.4 | 13 | TID*130... |
| DMP131 | 13.1 | ● | 7.4 | 13 | TID*130... |
| DMP132 | 13.2 | ● | 7.4 | 13 | TID*130... |
| DMP133 | 13.3 | ● | 7.4 | 13 | TID*130... |
| DMP134 | 13.4 | ● | 7.4 | 13 | TID*130... |
| DMP135 | 13.5 | ● | 7.4 | 13 | TID*135... |
| DMP136 | 13.6 | ● | 7.4 | 13 | TID*135... |
| DMP137 | 13.7 | ● | 7.4 | 13 | TID*135... |
| DMP138 | 13.8 | ● | 7.4 | 13 | TID*135... |
| DMP139 | 13.9 | ● | 7.4 | 13 | TID*135... |
| DMP140 | 14 | ● | 7.95 | 14 | TID*140... |
| DMP141 | 14.1 | ● | 7.95 | 14 | TID*140... |
| DMP142 | 14.2 | ● | 7.95 | 14 | TID*140... |
| DMP143 | 14.3 | ● | 7.95 | 14 | TID*140... |
| DMP144 | 14.4 | ● | 7.95 | 14 | TID*140... |
| DMP145 | 14.5 | ● | 7.95 | 14 | TID*145... |
| DMP146 | 14.6 | ● | 7.95 | 14 | TID*145... |
| DMP147 | 14.7 | ● | 7.95 | 14 | TID*145... |
| DMP148 | 14.8 | ● | 7.95 | 14 | TID*145... |
| DMP149 | 14.9 | ● | 7.95 | 14 | TID*145... |
| DMP150 | 15 | ● | 8.53 | 15 | TID*150... |
| DMP151 | 15.1 | ● | 8.53 | 15 | TID*150... |
| DMP152 | 15.2 | ● | 8.53 | 15 | TID*150... |
| DMP153 | 15.3 | ● | 8.53 | 15 | TID*150... |
| DMP154 | 15.4 | ● | 8.53 | 15 | TID*150... |
| DMP155 | 15.5 | ● | 8.53 | 15 | TID*150... |
| DMP156 | 15.6 | ● | 8.53 | 15 | TID*150... |
| DMP157 | 15.7 | ● | 8.53 | 15 | TID*150... |
| DMP158 | 15.8 | ● | 8.53 | 15 | TID*150... |
| DMP159 | 15.9 | ● | 8.53 | 15 | TID*150... |
| DMP160 | 16 | ● | 9.1 | 16 | TID*160... |
| DMP161 | 16.1 | ● | 9.1 | 16 | TID*160... |
| DMP162 | 16.2 | ● | 9.1 | 16 | TID*160... |
| DMP163 | 16.3 | ● | 9.1 | 16 | TID*160... |
| DMP164 | 16.4 | ● | 9.1 | 16 | TID*160... |
| DMP165 | 16.5 | ● | 9.1 | 16 | TID*160... |
| DMP166 | 16.6 | ● | 9.1 | 16 | TID*160... |
| DMP167 | 16.7 | ● | 9.1 | 16 | TID*160... |

| Designation | øDc | AH725 | S | Pocket size | Body |
|---|---|---|---|---|---|
| DMP168 | 16.8 | ● | 9.1 | 16 | TID*160... |
| DMP169 | 16.9 | ● | 9.1 | 16 | TID*160... |
| DMP170 | 17 | ● | 9.7 | 17 | TID*170... |
| DMP171 | 17.1 | ● | 9.7 | 17 | TID*170... |
| DMP172 | 17.2 | ● | 9.7 | 17 | TID*170... |
| DMP173 | 17.3 | ● | 9.7 | 17 | TID*170... |
| DMP174 | 17.4 | ● | 9.7 | 17 | TID*170... |
| DMP175 | 17.5 | ● | 9.7 | 17 | TID*170... |
| DMP176 | 17.6 | ● | 9.7 | 17 | TID*170... |
| DMP177 | 17.7 | ● | 9.7 | 17 | TID*170... |
| DMP178 | 17.8 | ● | 9.7 | 17 | TID*170... |
| DMP179 | 17.9 | ● | 9.7 | 17 | TID*170... |
| DMP180 | 18 | ● | 10.3 | 18 | TID*180... |
| DMP181 | 18.1 | ● | 10.3 | 18 | TID*180... |
| DMP182 | 18.2 | ● | 10.3 | 18 | TID*180... |
| DMP183 | 18.3 | ● | 10.3 | 18 | TID*180... |
| DMP184 | 18.4 | ● | 10.3 | 18 | TID*180... |
| DMP185 | 18.5 | ● | 10.3 | 18 | TID*180... |
| DMP186 | 18.6 | ● | 10.3 | 18 | TID*180... |
| DMP187 | 18.7 | ● | 10.3 | 18 | TID*180... |
| DMP188 | 18.8 | ● | 10.3 | 18 | TID*180... |
| DMP189 | 18.9 | ● | 10.3 | 18 | TID*180... |
| DMP190 | 19 | ● | 10.8 | 19 | TID*190... |
| DMP191 | 19.1 | ● | 10.8 | 19 | TID*190... |
| DMP192 | 19.2 | ● | 10.8 | 19 | TID*190... |
| DMP193 | 19.3 | ● | 10.8 | 19 | TID*190... |
| DMP194 | 19.4 | ● | 10.8 | 19 | TID*190... |
| DMP195 | 19.5 | ● | 10.8 | 19 | TID*190... |
| DMP196 | 19.6 | ● | 10.8 | 19 | TID*190... |
| DMP197 | 19.7 | ● | 10.8 | 19 | TID*190... |
| DMP198 | 19.8 | ● | 10.8 | 19 | TID*190... |
| DMP199 | 19.9 | ● | 10.8 | 19 | TID*190... |
| DMP200 | 20 | ● | 11.4 | 20 | TID*200... |
| DMP201 | 20.1 | ● | 11.4 | 20 | TID*200... |
| DMP202 | 20.2 | ● | 11.4 | 20 | TID*200... |
| DMP203 | 20.3 | ● | 11.4 | 20 | TID*200... |
| DMP204 | 20.4 | ● | 11.4 | 20 | TID*200... |
| DMP205 | 20.5 | ● | 11.4 | 20 | TID*200... |
| DMP206 | 20.6 | ● | 11.4 | 20 | TID*200... |
| DMP207 | 20.7 | ● | 11.4 | 20 | TID*200... |
| DMP208 | 20.8 | ● | 11.4 | 20 | TID*200... |
| DMP209 | 20.9 | ● | 11.4 | 20 | TID*200... |
| DMP210 | 21 | ● | 11.98 | 21 | TID*210... |
| DMP211 | 21.1 | ● | 11.98 | 21 | TID*210... |
| DMP212 | 21.2 | ● | 11.98 | 21 | TID*210... |
| DMP213 | 21.3 | ● | 11.98 | 21 | TID*210... |
| DMP214 | 21.4 | ● | 11.98 | 21 | TID*210... |
| DMP215 | 21.5 | ● | 11.98 | 21 | TID*210... |
| DMP216 | 21.6 | ● | 11.98 | 21 | TID*210... |
| DMP217 | 21.7 | ● | 11.98 | 21 | TID*210... |
| DMP218 | 21.8 | ● | 11.98 | 21 | TID*210... |
| DMP219 | 21.9 | ● | 11.98 | 21 | TID*210... |
| DMP220 | 22 | ● | 12.56 | 22 | TID*220... |
| DMP221 | 22.1 | ● | 12.56 | 22 | TID*220... |
| DMP222 | 22.2 | ● | 12.56 | 22 | TID*220... |
| DMP223 | 22.3 | ● | 12.56 | 22 | TID*220... |
| DMP224 | 22.4 | ● | 12.56 | 22 | TID*220... |
| DMP225 | 22.5 | ● | 12.56 | 22 | TID*220... |
| DMP226 | 22.6 | ● | 12.56 | 22 | TID*220... |
| DMP227 | 22.7 | ● | 12.56 | 22 | TID*220... |
| DMP228 | 22.8 | ● | 12.56 | 22 | TID*220... |
| DMP229 | 22.9 | ● | 12.56 | 22 | TID*220... |
| DMP230 | 23 | ● | 13.13 | 23 | TID*230... |
| DMP231 | 23.1 | ● | 13.13 | 23 | TID*230... |
| DMP232 | 23.2 | ● | 13.13 | 23 | TID*230... |
| DMP233 | 23.3 | ● | 13.13 | 23 | TID*230... |
| DMP234 | 23.4 | ● | 13.13 | 23 | TID*230... |
| DMP235 | 23.5 | ● | 13.13 | 23 | TID*230... |
| DMP236 | 23.6 | ● | 13.13 | 23 | TID*230... |
| DMP237 | 23.7 | ● | 13.13 | 23 | TID*230... |
| DMP238 | 23.8 | ● | 13.13 | 23 | TID*230... |
| DMP239 | 23.9 | ● | 13.13 | 23 | TID*230... |
| DMP240 | 24 | ● | 13.7 | 24 | TID*240... |
| DMP241 | 24.1 | ● | 13.7 | 24 | TID*240... |
| DMP242 | 24.2 | ● | 13.7 | 24 | TID*240... |
| DMP243 | 24.3 | ● | 13.7 | 24 | TID*240... |
| DMP244 | 24.4 | ● | 13.7 | 24 | TID*240... |
| DMP245 | 24.5 | ● | 13.7 | 24 | TID*240... |
| DMP246 | 24.6 | ● | 13.7 | 24 | TID*240... |
| DMP247 | 24.7 | ● | 13.7 | 24 | TID*240... |
| DMP248 | 24.8 | ● | 13.7 | 24 | TID*240... |
| DMP249 | 24.9 | ● | 13.7 | 24 | TID*240... |
| DMP250 | 25 | ● | 14.3 | 25 | TID*250... |
| DMP251 | 25.1 | ● | 14.3 | 25 | TID*250... |
| DMP252 | 25.2 | ● | 14.3 | 25 | TID*250... |
| DMP253 | 25.3 | ● | 14.3 | 25 | TID*250... |
| DMP254 | 25.4 | ● | 14.3 | 25 | TID*250... |
| DMP255 | 25.5 | ● | 14.3 | 25 | TID*250... |
| DMP256 | 25.6 | ● | 14.3 | 25 | TID*250... |
| DMP257 | 25.7 | ● | 14.3 | 25 | TID*250... |
| DMP258 | 25.8 | ● | 14.3 | 25 | TID*250... |
| DMP259 | 25.9 | ● | 14.3 | 25 | TID*250... |

Package Quantity: ø10 - ø19.9 = 2 pcs.
ø20 - ø25.9 = 1 pc.

● : Line up

| Head diameter | Head diameter tolerance |
|---|---|
| ø10 - ø17.9 | +0.018 / 0 |
| ø18 - ø25.9 | +0.021 / 0 |

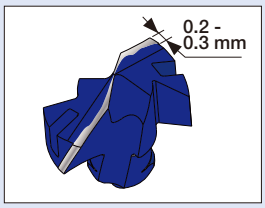
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) øDc (mm) ø10 - ø11.9 | ø12 - ø13.9 | ø14 - ø15.9 | ø16 - ø19.9 | ø20 - ø25.9 |
|---|---|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3)<br>SS400, SM490, S25C, etc.<br>C15E4, E275A, E355D, etc. | 80 - 140 | 0.15 - 0.28 | 0.18 - 0.3 | 0.2 - 0.35 | 0.25 - 0.45 | 0.25 - 0.45 |
| P | High carbon steels (C > 0.3)<br>S45C, S55C, etc.<br>C45, C55, etc. | 70 - 120 | 0.15 - 0.28 | 0.18 - 0.3 | 0.2 - 0.35 | 0.25 - 0.45 | 0.25 - 0.45 |
| P | Low alloy steels<br>SCM415, etc.<br>18CrMo4, etc. | 70 - 120 | 0.14 - 0.28 | 0.16 - 0.32 | 0.18 - 0.35 | 0.23 - 0.4 | 0.25 - 0.45 |
| P | Alloy steels<br>SCM440, SCr420, etc.<br>42CrMo4, 20Cr4, etc. | 40 - 90 | 0.14 - 0.28 | 0.16 - 0.32 | 0.18 - 0.35 | 0.23 - 0.4 | 0.25 - 0.45 |
| M | Stainless steels<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | 30 - 70 | 0.12 - 0.18 | 0.14 - 0.2 | 0.16 - 0.24 | 0.16 - 0.26 | 0.18 - 0.3 |
| K | Grey cast irons<br>FC250, etc.<br>GG25, etc. | 80 - 180 | 0.2 - 0.35 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.55 | 0.35 - 0.6 |
| K | Ductile cast irons<br>FCD700, etc.<br>GGG70, etc. | 80 - 140 | 0.2 - 0.35 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.55 | 0.35 - 0.6 |
| N | Aluminium alloys<br>ADC12, etc.<br>AlSi11Cu3, etc. | 80 - 220 | 0.25 - 0.4 | 0.3 - 0.45 | 0.35 - 0.5 | 0.4 - 0.6 | 0.5 - 0.75 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | 20 - 50 | 0.08 - 0.15 | 0.1 - 0.28 | 0.12 - 0.2 | 0.14 - 0.22 | 0.18 - 0.27 |
| S | Nickel-based alloys | 20 - 50 | 0.08 - 0.13 | 0.1 - 0.15 | 0.12 - 0.18 | 0.12 - 0.22 | 0.14 - 0.22 |

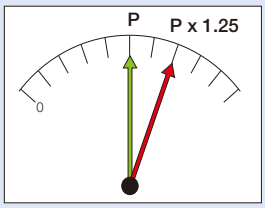
- Cutting conditions in the above table show standard cutting conditions.
- Cutting conditions may change due to the rigidity and power of the machine and the workpiece material.
- Machined hole diameter may change depending upon the rigidity of the machine tool or cutting conditions.
- In case of L/D = 8,12 drill, the recommended range of cutting speeds and feeds is between the minimum and median values listed above.

## When to change drill heads (Criteria for the end of tool life)

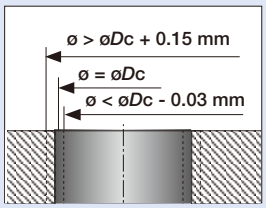
The criteria to identify the time for tool change are as follows:



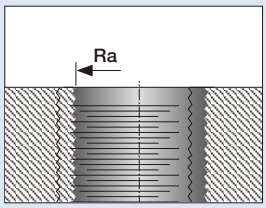

Width of corner wear reaches 0.2 – 0.3 mm.



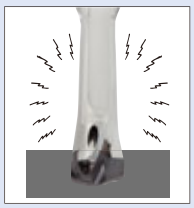

Spindle load exceeds 125% of the normal value.




Hole diameter is 0.15 mm larger or 0.03 mm smaller than the drill diameter.



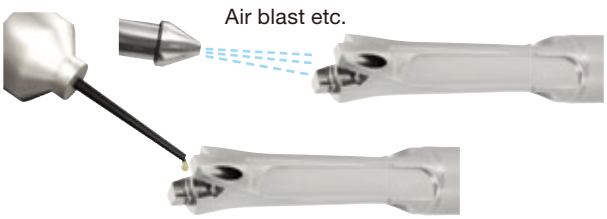

Surface roughness deteriorates.



Vibration or unusual noise occurs.

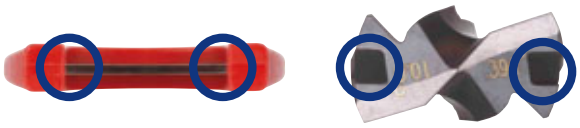
## ● How to clamp the drill head

### ① Clean and lubricate the pocket.

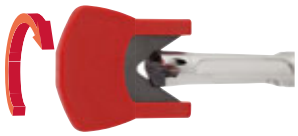



### ② Set the drill head into the pocket.

### ③ Set the clamping key on the drill head



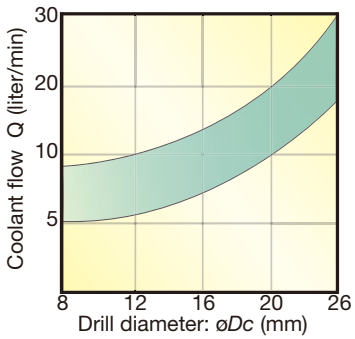
### ④ Clamp

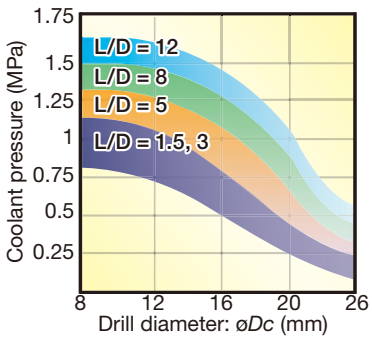


## ● Coolant supply

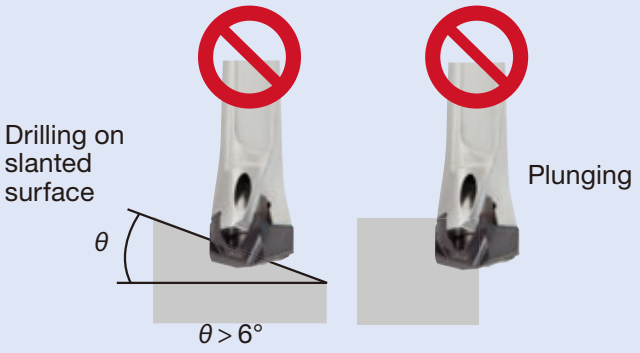
Internal coolant supply is recommended.

### ■ The required coolant flow and pressure



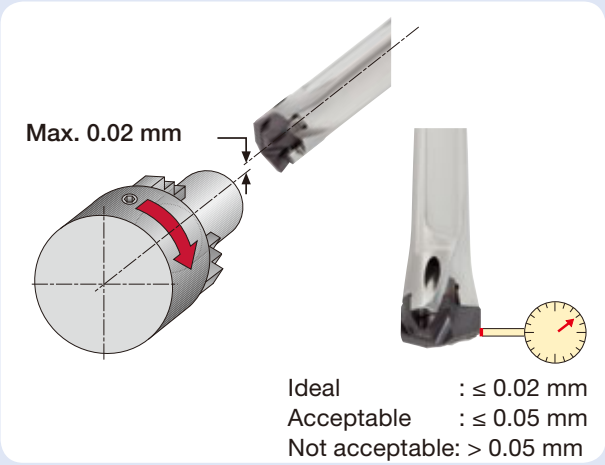



● **Applications that are not recommended**




● **Run-out**

Run-out should be less than 0.02 mm.




## INSTRUCTION OF CLAMPING HEAD

Fig. #1

Fig. #2

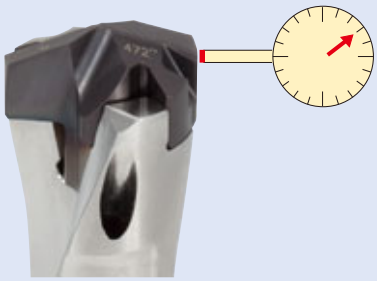


Fig. #3

### Procedure

① Clean the clamping areas on the drill body and the head with an air blast, lubricate them, and put the drill head in the pocket.

② Set the clamping key in the groove on the drill head. Push the head toward the pocket with equal torque on the right and the left sides, and turn the clamping key to clamp the head completely. (Fig. #1)

③ Be sure that there is no gap between the bottom of the head and the drill body. A shim in the thickness of around 0.01 mm is useful to check the gap. (Fig. #2)

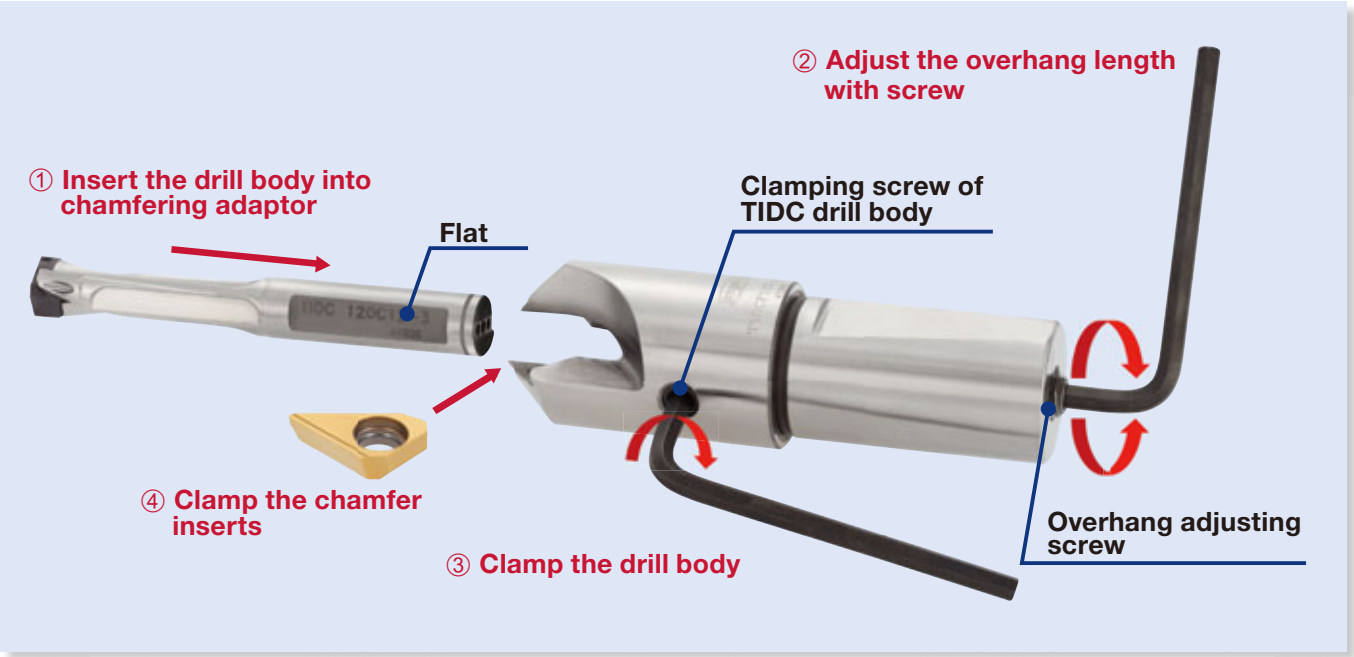
④ If there is a gap thicker than 0.01 mm, unclamp the head and return to the procedure No. ①

⑤ Check the run-out at the margin of the drill head. Run-out must be less than 0.05 mm. (Fig. #3) (Recommended value: less than 0.02 mm)
If the run-out exceeds 0.05 mm, unclamp the head and return to the procedure No. ① .

Note #1: If the clamping torque is not equally applied on the right and the left sides of the drill head, there may be a gap between the head and the body, which increases the run-out of the head.
Note #2: The low accuracy in holding the drill body may affect the run-out. If the run-out is large, check the accuracy in holding the drill body.

## HOW TO MOUNT THE TIDC DRILL BODY INTO THE CHAMFER ADAPTOR

The overhang length of the drill can be changed by the adjusting screw at the bottom of the adaptor.
The rear end of the drill body must be in contact with the adjusting screw as the screw supports the drill against thrust force when drilling.




### Procedure

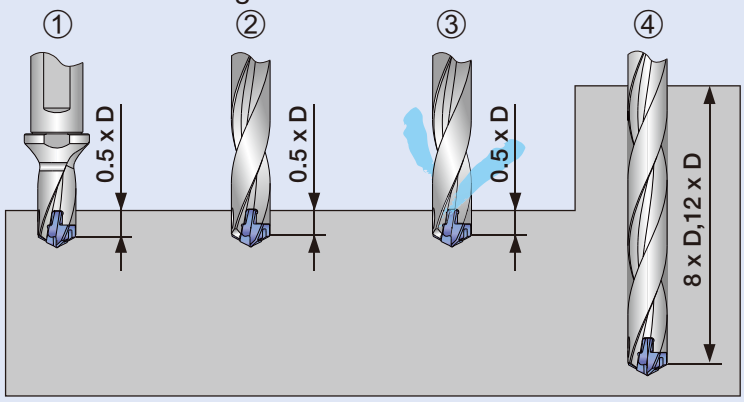
① Place the TIDC drill body into the chamfer adaptor without chamfer inserts.
② Adjust the overhang length of the drill body with the adjusting screw at the bottom of the adaptor.
③ Adjust the position of the drill body so that the drill body is fixed at the flat and tighten the clamping screw of the drill body. This aligns the flutes of the TIDC drill body with the chamfer inserts.
④ To clamp the chamfer inserts, tighten the clamping screw of the insert while pushing the insert into the insert pocket.

### Notice

Before removing the drill body from the adaptor, chamfer inserts must be unclamped.
The overhang adjusting screw can be handled from the top of the adaptor with flat-blade screwdriver. In this way, the overhang length of the drill body can be adjusted after the adaptor is positioned on the drill shank.

## CAUTION FOR USING DRILLS WITH L/D = 8, 12

Prior to using the drill with L/D = 8, 12 a pilot hole should be drilled with a short or centering drill.

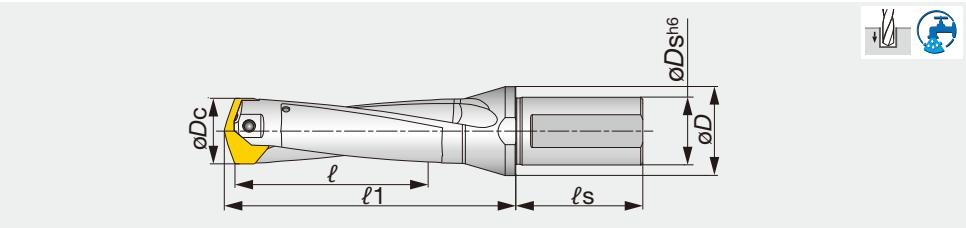



① Drill a pilot hole in the depth of 0.5 x D.
② Rotate the drill at a low speed, such as 100 $min^{-1}$, and feed it slowly into the pilot hole until the drill reaches several millimeters from the bottom.
③ Supply the coolant and rotate the drill at the recommended speed.
④ Drill the required depth under the recommended cutting conditions.

# DRILL FORCE MEISTER

## TIS L/D=3

Head indexable large drill




| Designation | øDc | øDs | øD | ℓ | ℓ1 | ℓs | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TIS260F32-3 | 26 - 26.9 | 32 | 40 | 78 | 117 | 60 | 26 | SMP26* |
| TIS270F32-3 | 27 - 27.9 | 32 | 40 | 81 | 120 | 60 | 27 | SMP27* |
| TIS280F32-3 | 28 - 28.9 | 32 | 40 | 84 | 128.4 | 60 | 28 | SMP28* |
| TIS290F32-3 | 29 - 29.9 | 32 | 40 | 87 | 131.4 | 60 | 29 | SMP29* |
| TIS300F32-3 | 30 - 30.9 | 32 | 42 | 90 | 134.7 | 60 | 30 | SMP30* |
| TIS310F32-3 | 31 - 31.9 | 32 | 42 | 93 | 137.7 | 60 | 31 | SMP31* |
| TIS320F40-3 | 32 - 32.9 | 40 | 48 | 96 | 143 | 68 | 32 | SMP32* |
| TIS330F40-3 | 33 - 33.9 | 40 | 48 | 99 | 146 | 68 | 33 | SMP33* |
| TIS340F40-3 | 34 - 34.9 | 40 | 48 | 102 | 149 | 68 | 34 | SMP34* |
| TIS350F40-3 | 35 - 35.9 | 40 | 48 | 105 | 152.4 | 68 | 35 | SMP35* |
| TIS360F40-3 | 36 - 36.9 | 40 | 48 | 108 | 155.4 | 68 | 36 | SMP36* |
| TIS370F40-3 | 37 - 37.9 | 40 | 48 | 111 | 158.4 | 68 | 37 | SMP37* |
| TIS380F40-3 | 38 - 38.9 | 40 | 50 | 114 | 166.9 | 68 | 38 | SMP38* |
| TIS390F40-3 | 39 - 39.9 | 40 | 50 | 117 | 169.9 | 68 | 39 | SMP39* |
| TIS400F40-3 | 40 - 41 | 40 | 50 | 120 | 172.9 | 68 | 40 | SMP40* |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø26 - ø29.9 | +0.05 / 0 |
| ø30 - ø41 | +0.06 / 0 |

*Just for reference

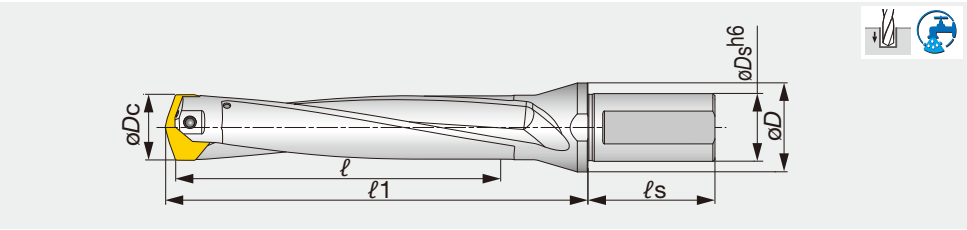
### SPARE PARTS

| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| | | Torx Bit | Grip |
| TIS260F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS270F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS280F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS290F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS300F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS310F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS320F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS330F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS340F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS350F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS360F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS370F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS380F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS390F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS400F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |

# DRILL FORCE MEISTER

## TIS L/D=5

Head indexable large drill




| Designation | øDc | øDs | øD | ℓ | ℓ1 | ℓs | Pocket size | Head |
|---|---|---|---|---|---|---|---|---|
| TIS260F32-5 | 26 - 26.9 | 32 | 40 | 130 | 169 | 60 | 26 | SMP26* |
| TIS270F32-5 | 27 - 27.9 | 32 | 40 | 135 | 174 | 60 | 27 | SMP27* |
| TIS280F32-5 | 28 - 28.9 | 32 | 40 | 140 | 184.4 | 60 | 28 | SMP28* |
| TIS290F32-5 | 29 - 29.9 | 32 | 40 | 145 | 189.4 | 60 | 29 | SMP29* |
| TIS300F32-5 | 30 - 30.9 | 32 | 42 | 150 | 194.7 | 60 | 30 | SMP30* |
| TIS310F32-5 | 31 - 31.9 | 32 | 42 | 155 | 199.7 | 60 | 31 | SMP31* |
| TIS320F40-5 | 32 - 32.9 | 40 | 48 | 160 | 207 | 68 | 32 | SMP32* |
| TIS330F40-5 | 33 - 33.9 | 40 | 48 | 165 | 212 | 68 | 33 | SMP33* |
| TIS340F40-5 | 34 - 34.9 | 40 | 48 | 170 | 217 | 68 | 34 | SMP34* |
| TIS350F40-5 | 35 - 35.9 | 40 | 48 | 175 | 222.4 | 68 | 35 | SMP35* |
| TIS360F40-5 | 36 - 36.9 | 40 | 48 | 180 | 227.4 | 68 | 36 | SMP36* |
| TIS370F40-5 | 37 - 37.9 | 40 | 48 | 185 | 232.4 | 68 | 37 | SMP37* |
| TIS380F40-5 | 38 - 38.9 | 40 | 50 | 190 | 242.9 | 68 | 38 | SMP38* |
| TIS390F40-5 | 39 - 39.9 | 40 | 50 | 195 | 247.9 | 68 | 39 | SMP39* |
| TIS400F40-5 | 40 - 41 | 40 | 50 | 200 | 252.9 | 68 | 40 | SMP40* |

| Tool diameter | Hole diameter tolerance* |
|---|---|
| ø26 - ø29.9 | +0.08 / 0 |
| ø30 - ø41 | +0.09 / 0 |

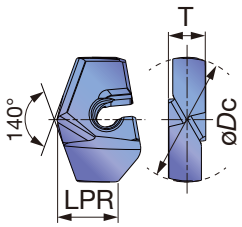
*Just for reference

### SPARE PARTS

| Designation | Clamping screw | Wrench | |
|---|---|---|---|
| | | Torx Bit | Grip |
| TIS260F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS270F32-* | TS50230D3 | BLDT20/S7 | H-TB2W |
| TIS280F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS290F32-* | TS50250D35 | BLDT25/S7 | H-TB2W |
| TIS300F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS310F32-* | TS60265D4 | BLDT25/S7 | H-TB2W |
| TIS320F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS330F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS340F40-* | TS60285D42 | BLDT25/S7 | H-TB2W |
| TIS350F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS360F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS370F40-* | TS60320D5 | BLDT25/S7 | H-TB2W |
| TIS380F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS390F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |
| TIS400F40-* | TS80340D6 | BLDT25/S7 | H-TB2W |

# DRILL HEAD

## SMP




| Designation | øDc | AH725 | T | LPR | Pocket size | Body |
|---|---|---|---|---|---|---|
| SMP260 | 26 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP261 | 26.1 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP265 | 26.5 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP267 | 26.7 | ● | 7.5 | 11.6 | 26 | TIS260F32-* |
| SMP270 | 27 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP271 | 27.1 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP272 | 27.2 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP275 | 27.5 | ● | 7.5 | 11.1 | 27 | TIS270F32-* |
| SMP280 | 28 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP281 | 28.1 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP285 | 28.5 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP286 | 28.6 | ● | 8 | 11.7 | 28 | TIS280F32-* |
| SMP290 | 29 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP291 | 29.1 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP295 | 29.5 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP296 | 29.6 | ● | 8 | 11.3 | 29 | TIS290F32-* |
| SMP300 | 30 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP301 | 30.1 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP302 | 30.2 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP303 | 30.3 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP305 | 30.5 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP308 | 30.8 | ● | 8.5 | 14.1 | 30 | TIS300F32-* |
| SMP310 | 31 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP311 | 31.1 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP315 | 31.5 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP318 | 31.8 | ● | 8.5 | 13.7 | 31 | TIS310F32-* |
| SMP320 | 32 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP321 | 32.1 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP325 | 32.5 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP328 | 32.8 | ● | 9 | 14.5 | 32 | TIS320F40-* |
| SMP330 | 33 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP331 | 33.1 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP333 | 33.3 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP335 | 33.5 | ● | 9 | 14.1 | 33 | TIS330F40-* |
| SMP340 | 34 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP341 | 34.1 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP345 | 34.5 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP349 | 34.9 | ● | 9 | 13.7 | 34 | TIS340F40-* |
| SMP350 | 35 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP351 | 35.1 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP355 | 35.5 | ● | 10 | 16.6 | 35 | TIS350F40-* |
| SMP360 | 36 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP361 | 36.1 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP365 | 36.5 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP366 | 36.6 | ● | 10 | 16.1 | 36 | TIS360F40-* |
| SMP370 | 37 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP371 | 37.1 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP375 | 37.5 | ● | 10 | 15.7 | 37 | TIS370F40-* |
| SMP380 | 38 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP381 | 38.1 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP385 | 38.5 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP388 | 38.8 | ● | 10.5 | 17 | 38 | TIS380F40-* |
| SMP390 | 39 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP391 | 39.1 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP395 | 39.5 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP397 | 39.7 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP398 | 39.8 | ● | 10.5 | 16.6 | 39 | TIS390F40-* |
| SMP400 | 40 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP401 | 40.1 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP405 | 40.5 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |
| SMP410 | 41 | ● | 10.5 | 16.2 | 40 | TIS400F40-* |

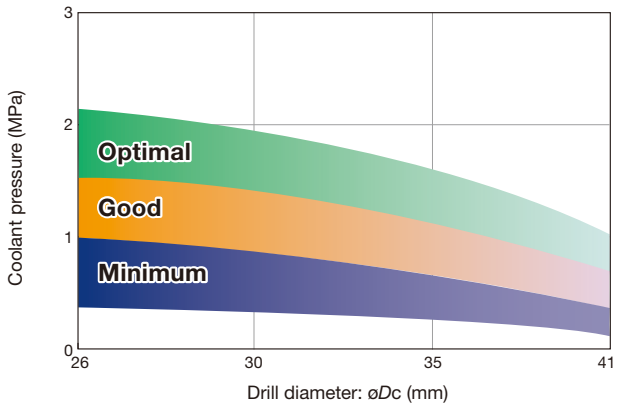
| Tool diameter | Head diameter tolerance |
|---|---|
| ø26 - ø29.9 | ±0.015 |
| ø30 - ø41 | ±0.020 |

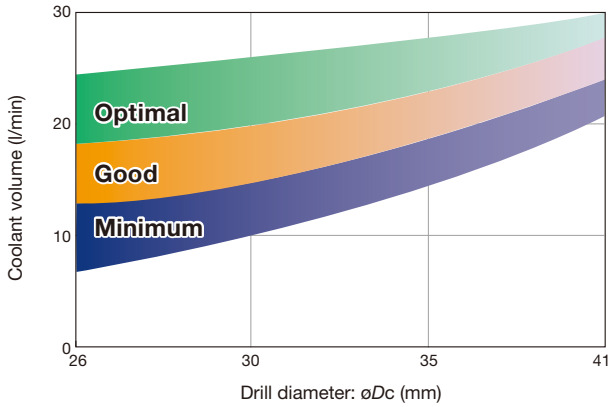
● : Line up
Package quantity =1pc

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) øDc (mm) ø26 - ø29.9 | ø30 - ø35.9 | ø36 - ø41 |
|---|---|---|---|---|---|
| P | Low carbon steels<br>S15C, S20C, etc. C15, C20, etc. | 80 - 140 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| | Carbon steels, Alloy steels<br>S55C, SCM440, etc. C55, 42CrMoS4, etc. | 80 - 130 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| | Prehardened steels<br>NAK80, PX5, etc. | 50 - 100 | 0.2 - 0.5 | 0.2 - 0.5 | 0.2 - 0.55 |
| M | Stainless steels<br>SUS304, SUS316X5, etc.<br>CrNi18-9, X5CrNiMo17-12-2, etc. | 40 - 80 | 0.15 - 0.3 | 0.15 - 0.3 | 0.2 - 0.35 |
| K | Grey cast irons<br>250, 300, etc. | 80 - 180 | 0.25 - 0.55 | 0.25 - 0.55 | 0.3 - 0.6 |
| | Ductile cast irons<br>FCD400, FCD600, etc. 400-15, 600-3, etc. | 80 - 140 | 0.25 - 0.55 | 0.25 - 0.55 | 0.3 - 0.6 |
| N | Non ferrous materials | 100 - 200 | 0.4 - 0.6 | 0.4 - 0.6 | 0.5 - 0.7 |
| S | Heat-resistant alloy<br>Inconel718, etc. | 20 - 50 | 0.1 - 0.2 | 0.1 - 0.2 | 0.1 - 0.25 |
| | Titanium alloys<br>Ti-6Al-4V, etc. | 30 - 60 | 0.1 - 0.3 | 0.1 - 0.3 | 0.1 - 0.35 |
| H | Hardened materials | 20 - 60 | 0.1 - 0.2 | 0.1 - 0.2 | 0.1 - 0.25 |

## RECOMMENDED COOLANT PRESSURE AND VOLUME

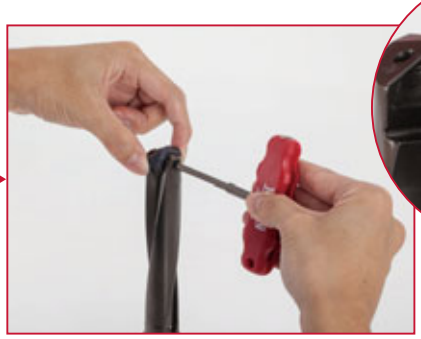



## HOW TO CHANGE DRILL HEAD

To unclamp rotate the screw 3-5 times counter-clockwise.

No need to remove the screw from the body.



- Please change the screw to new one when the screw does not rotate smoothly

MEMO

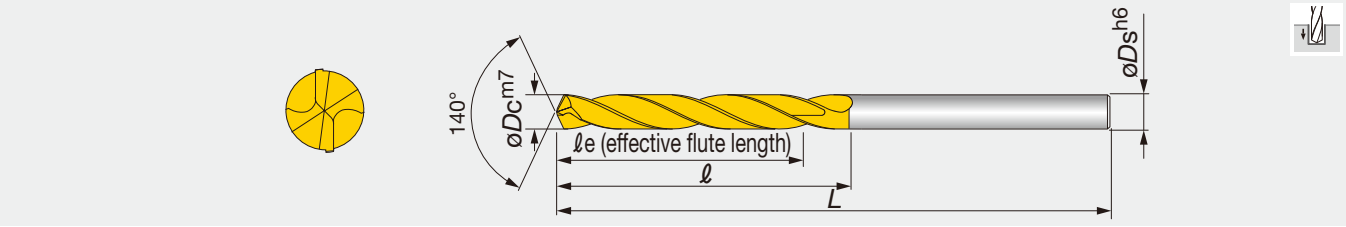
# SOLIDDRILL Quick Guide

| Series | ø*d* (mm) | L/D | Point Angle | Oil Hole | Coated | Un coated | Description | P Steel | M Stainless | K Cast iron | N Non-ferrous | S Superalloys | H Hard materials | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DSM<br>DSM-CP | ø0.1 - ø3 | 5, 10, 15 | 140<br>90 & 140 | | ● | | Micro solid drill with ø3 mm shanks<br>DSM-CP: Centering drill for DSM | ● | ● | ● | ● | ● | ● | E048 - E051 |
| DSW | ø3 - ø16 | 3, 5, 8 | 140 | With, Without | ● | | Shank size: DIN | ● | ● | ● | ● | ● | ● | E026 - E034 |
| DSX | ø3 - ø20 | 3, 5, 8 | 140 | With | ● | | Shank size: 1.0 mm increments | ● | ● | ● | ● | ● | ● | E038 - E043 |
| DSE | ø3 - ø16 | 2, 3 | 140 | | ● | | For drilling thin plates with low cutting force<br>Shank size: Same as the drill diameter | ● | ● | ● | ● | ● | ● | E044 - E047 |
| DMX | ø3 - ø16 | 2, 3 | 130 | | ● | | Shank size: Same as the drill diameter | ● | ● | ● | ● | ● | ● | E052 - E055 |
| DMD-S | ø6 - ø13 | 3 | 135 | | | ● | Helix angle 15° | | | | | | ● | E056, E057 |
| DMX-F | ø3 - ø20 | 3, 5 | 130 | | | ● | Shank size: Same as the drill diameter | | | ● | ● | | | E058 - E062 |
| FDS | ø2.57 - ø11 | 3 | 135 | | | ● | Drills for reaming pre-tap holes with straight flute | | | ● | ● | | | E063 |
| FDC | ø5 - ø16 | 5, 8 | 135 | With | | ● | Drills for reaming at high feed with straight flute | | | ● | ● | | | E064, E065 |
| CDS | ø0.4 - ø13 | 5 - 12 | 120 | | | ● | Shank size: Same as the drill diameter<br>Hole depth: Up to L/D 12 | | | ● | ● | | | E066 - E068 |

# SOLIDDRILL

## DSW-DE3

Soliddrill with 140° point angle without oil hole & DIN shank, L/D = 3, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW030-014-06DE3 | 3 | ● | 6 | 14 | 20 | 62 |
| DSW031-014-06DE3 | 3.1 | ● | 6 | 14 | 20 | 62 |
| DSW032-014-06DE3 | 3.2 | ● | 6 | 14 | 20 | 62 |
| DSW033-014-06DE3 | 3.3 | ● | 6 | 14 | 20 | 62 |
| DSW034-014-06DE3 | 3.4 | ● | 6 | 14 | 20 | 62 |
| DSW035-014-06DE3 | 3.5 | ● | 6 | 14 | 20 | 62 |
| DSW036-014-06DE3 | 3.6 | ● | 6 | 14 | 20 | 62 |
| DSW037-014-06DE3 | 3.7 | ● | 6 | 14 | 20 | 62 |
| DSW038-017-06DE3 | 3.8 | ● | 6 | 17 | 24 | 66 |
| DSW039-017-06DE3 | 3.9 | ● | 6 | 17 | 24 | 66 |
| DSW040-017-06DE3 | 4 | ● | 6 | 17 | 24 | 66 |
| DSW041-017-06DE3 | 4.1 | ● | 6 | 17 | 24 | 66 |
| DSW042-017-06DE3 | 4.2 | ● | 6 | 17 | 24 | 66 |
| DSW043-017-06DE3 | 4.3 | ● | 6 | 17 | 24 | 66 |
| DSW044-017-06DE3 | 4.4 | ● | 6 | 17 | 24 | 66 |
| DSW045-017-06DE3 | 4.5 | ● | 6 | 17 | 24 | 66 |
| DSW046-017-06DE3 | 4.6 | ● | 6 | 17 | 24 | 66 |
| DSW047-017-06DE3 | 4.7 | ● | 6 | 17 | 24 | 66 |
| DSW048-020-06DE3 | 4.8 | ● | 6 | 20 | 28 | 66 |
| DSW049-020-06DE3 | 4.9 | ● | 6 | 20 | 28 | 66 |
| DSW050-020-06DE3 | 5 | ● | 6 | 20 | 28 | 66 |
| DSW051-020-06DE3 | 5.1 | ● | 6 | 20 | 28 | 66 |
| DSW052-020-06DE3 | 5.2 | ● | 6 | 20 | 28 | 66 |
| DSW053-020-06DE3 | 5.3 | ● | 6 | 20 | 28 | 66 |
| DSW054-020-06DE3 | 5.4 | ● | 6 | 20 | 28 | 66 |
| DSW055-020-06DE3 | 5.5 | ● | 6 | 20 | 28 | 66 |
| DSW056-020-06DE3 | 5.6 | ● | 6 | 20 | 28 | 66 |
| DSW057-020-06DE3 | 5.7 | ● | 6 | 20 | 28 | 66 |
| DSW058-020-06DE3 | 5.8 | ● | 6 | 20 | 28 | 66 |
| DSW059-020-06DE3 | 5.9 | ● | 6 | 20 | 28 | 66 |
| DSW060-020-06DE3 | 6 | ● | 6 | 20 | 28 | 66 |
| DSW061-024-08DE3 | 6.1 | ● | 8 | 24 | 34 | 79 |
| DSW062-024-08DE3 | 6.2 | ● | 8 | 24 | 34 | 79 |
| DSW063-024-08DE3 | 6.3 | ● | 8 | 24 | 34 | 79 |
| DSW064-024-08DE3 | 6.4 | ● | 8 | 24 | 34 | 79 |
| DSW065-024-08DE3 | 6.5 | ● | 8 | 24 | 34 | 79 |
| DSW066-024-08DE3 | 6.6 | ● | 8 | 24 | 34 | 79 |
| DSW067-024-08DE3 | 6.7 | ● | 8 | 24 | 34 | 79 |
| DSW068-024-08DE3 | 6.8 | ● | 8 | 24 | 34 | 79 |
| DSW069-024-08DE3 | 6.9 | ● | 8 | 24 | 34 | 79 |
| DSW070-024-08DE3 | 7 | ● | 8 | 24 | 34 | 79 |
| DSW071-029-08DE3 | 7.1 | ● | 8 | 29 | 41 | 79 |
| DSW072-029-08DE3 | 7.2 | ● | 8 | 29 | 41 | 79 |
| DSW073-029-08DE3 | 7.3 | ● | 8 | 29 | 41 | 79 |
| DSW074-029-08DE3 | 7.4 | ● | 8 | 29 | 41 | 79 |
| DSW075-029-08DE3 | 7.5 | ● | 8 | 29 | 41 | 79 |
| DSW076-029-08DE3 | 7.6 | ● | 8 | 29 | 41 | 79 |
| DSW077-029-08DE3 | 7.7 | ● | 8 | 29 | 41 | 79 |
| DSW078-029-08DE3 | 7.8 | ● | 8 | 29 | 41 | 79 |
| DSW079-029-08DE3 | 7.9 | ● | 8 | 29 | 41 | 79 |
| DSW080-029-08DE3 | 8 | ● | 8 | 29 | 41 | 79 |
| DSW081-035-10DE3 | 8.1 | ● | 10 | 35 | 47 | 89 |

| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW082-035-10DE3 | 8.2 | ● | 10 | 35 | 47 | 89 |
| DSW083-035-10DE3 | 8.3 | ● | 10 | 35 | 47 | 89 |
| DSW084-035-10DE3 | 8.4 | ● | 10 | 35 | 47 | 89 |
| DSW085-035-10DE3 | 8.5 | ● | 10 | 35 | 47 | 89 |
| DSW086-035-10DE3 | 8.6 | ● | 10 | 35 | 47 | 89 |
| DSW087-035-10DE3 | 8.7 | ● | 10 | 35 | 47 | 89 |
| DSW088-035-10DE3 | 8.8 | ● | 10 | 35 | 47 | 89 |
| DSW089-035-10DE3 | 8.9 | ● | 10 | 35 | 47 | 89 |
| DSW090-035-10DE3 | 9 | ● | 10 | 35 | 47 | 89 |
| DSW091-035-10DE3 | 9.1 | ● | 10 | 35 | 47 | 89 |
| DSW092-035-10DE3 | 9.2 | ● | 10 | 35 | 47 | 89 |
| DSW093-035-10DE3 | 9.3 | ● | 10 | 35 | 47 | 89 |
| DSW094-035-10DE3 | 9.4 | ● | 10 | 35 | 47 | 89 |
| DSW095-035-10DE3 | 9.5 | ● | 10 | 35 | 47 | 89 |
| DSW096-035-10DE3 | 9.6 | ● | 10 | 35 | 47 | 89 |
| DSW097-035-10DE3 | 9.7 | ● | 10 | 35 | 47 | 89 |
| DSW098-035-10DE3 | 9.8 | ● | 10 | 35 | 47 | 89 |
| DSW099-035-10DE3 | 9.9 | ● | 10 | 35 | 47 | 89 |
| DSW100-035-10DE3 | 10 | ● | 10 | 35 | 47 | 89 |
| DSW101-040-12DE3 | 10.1 | ● | 12 | 40 | 55 | 102 |
| DSW102-040-12DE3 | 10.2 | ● | 12 | 40 | 55 | 102 |
| DSW103-040-12DE3 | 10.3 | ● | 12 | 40 | 55 | 102 |
| DSW104-040-12DE3 | 10.4 | ● | 12 | 40 | 55 | 102 |
| DSW105-040-12DE3 | 10.5 | ● | 12 | 40 | 55 | 102 |
| DSW106-040-12DE3 | 10.6 | ● | 12 | 40 | 55 | 102 |
| DSW107-040-12DE3 | 10.7 | ● | 12 | 40 | 55 | 102 |
| DSW108-040-12DE3 | 10.8 | ● | 12 | 40 | 55 | 102 |
| DSW109-040-12DE3 | 10.9 | ● | 12 | 40 | 55 | 102 |
| DSW110-040-12DE3 | 11 | ● | 12 | 40 | 55 | 102 |
| DSW111-040-12DE3 | 11.1 | ● | 12 | 40 | 55 | 102 |
| DSW112-040-12DE3 | 11.2 | ● | 12 | 40 | 55 | 102 |
| DSW113-040-12DE3 | 11.3 | ● | 12 | 40 | 55 | 102 |
| DSW114-040-12DE3 | 11.4 | ● | 12 | 40 | 55 | 102 |
| DSW115-040-12DE3 | 11.5 | ● | 12 | 40 | 55 | 102 |
| DSW116-040-12DE3 | 11.6 | ● | 12 | 40 | 55 | 102 |
| DSW117-040-12DE3 | 11.7 | ● | 12 | 40 | 55 | 102 |
| DSW118-040-12DE3 | 11.8 | ● | 12 | 40 | 55 | 102 |
| DSW119-040-12DE3 | 11.9 | ● | 12 | 40 | 55 | 102 |
| DSW120-040-12DE3 | 12 | ● | 12 | 40 | 55 | 102 |
| DSW121-043-14DE3 | 12.1 | ● | 14 | 43 | 60 | 107 |
| DSW122-043-14DE3 | 12.2 | ● | 14 | 43 | 60 | 107 |
| DSW123-043-14DE3 | 12.3 | ● | 14 | 43 | 60 | 107 |
| DSW124-043-14DE3 | 12.4 | ● | 14 | 43 | 60 | 107 |
| DSW125-043-14DE3 | 12.5 | ● | 14 | 43 | 60 | 107 |
| DSW126-043-14DE3 | 12.6 | ● | 14 | 43 | 60 | 107 |
| DSW127-043-14DE3 | 12.7 | ● | 14 | 43 | 60 | 107 |
| DSW128-043-14DE3 | 12.8 | ● | 14 | 43 | 60 | 107 |
| DSW129-043-14DE3 | 12.9 | ● | 14 | 43 | 60 | 107 |
| DSW130-043-14DE3 | 13 | ● | 14 | 43 | 60 | 107 |
| DSW131-043-14DE3 | 13.1 | ● | 14 | 43 | 60 | 107 |
| DSW132-043-14DE3 | 13.2 | ● | 14 | 43 | 60 | 107 |
| DSW133-043-14DE3 | 13.3 | ● | 14 | 43 | 60 | 107 |

● : Line up

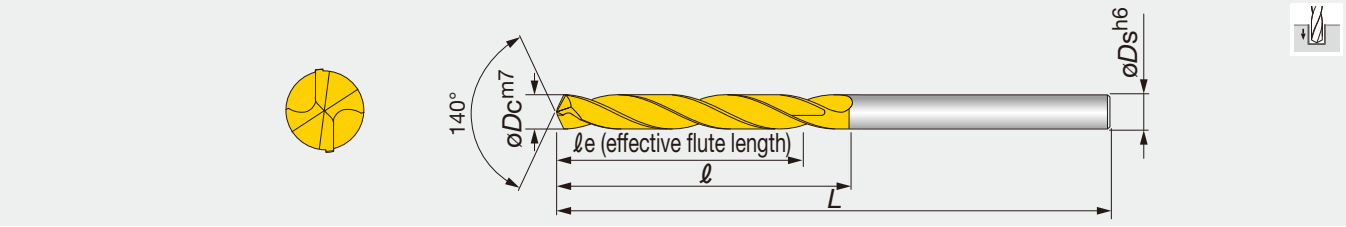
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-043-14DE3 | 13.4 | ● | 14 | 43 | 60 | 107 |
| DSW135-043-14DE3 | 13.5 | ● | 14 | 43 | 60 | 107 |
| DSW136-043-14DE3 | 13.6 | ● | 14 | 43 | 60 | 107 |
| DSW137-043-14DE3 | 13.7 | ● | 14 | 43 | 60 | 107 |
| DSW138-043-14DE3 | 13.8 | ● | 14 | 43 | 60 | 107 |
| DSW139-043-14DE3 | 13.9 | ● | 14 | 43 | 60 | 107 |
| DSW140-043-14DE3 | 14 | ● | 14 | 43 | 60 | 107 |
| DSW141-045-16DE3 | 14.1 | ● | 16 | 45 | 65 | 115 |
| DSW142-045-16DE3 | 14.2 | ● | 16 | 45 | 65 | 115 |
| DSW143-045-16DE3 | 14.3 | ● | 16 | 45 | 65 | 115 |
| DSW144-045-16DE3 | 14.4 | ● | 16 | 45 | 65 | 115 |
| DSW145-045-16DE3 | 14.5 | ● | 16 | 45 | 65 | 115 |
| DSW146-045-16DE3 | 14.6 | ● | 16 | 45 | 65 | 115 |
| DSW147-045-16DE3 | 14.7 | ● | 16 | 45 | 65 | 115 |
| DSW148-045-16DE3 | 14.8 | ● | 16 | 45 | 65 | 115 |
| DSW149-045-16DE3 | 14.9 | ● | 16 | 45 | 65 | 115 |
| DSW150-045-16DE3 | 15 | ● | 16 | 45 | 65 | 115 |
| DSW151-045-16DE3 | 15.1 | ● | 16 | 45 | 65 | 115 |
| DSW152-045-16DE3 | 15.2 | ● | 16 | 45 | 65 | 115 |
| DSW153-045-16DE3 | 15.3 | ● | 16 | 45 | 65 | 115 |
| DSW154-045-16DE3 | 15.4 | ● | 16 | 45 | 65 | 115 |
| DSW155-045-16DE3 | 15.5 | ● | 16 | 45 | 65 | 115 |
| DSW156-045-16DE3 | 15.6 | ● | 16 | 45 | 65 | 115 |
| DSW157-045-16DE3 | 15.7 | ● | 16 | 45 | 65 | 115 |
| DSW158-045-16DE3 | 15.8 | ● | 16 | 45 | 65 | 115 |
| DSW159-045-16DE3 | 15.9 | ● | 16 | 45 | 65 | 115 |
| DSW160-045-16DE3 | 16 | ● | 16 | 45 | 65 | 115 |

● : Line up

# SOLIDDRILL

## DSW-DE5

Soliddrill with 140° point angle without oil hole & DIN shank, L/D = 5, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW030-023-06DE5 | 3 | ● | 6 | 23 | 28 | 66 |
| DSW031-023-06DE5 | 3.1 | ● | 6 | 23 | 28 | 66 |
| DSW032-023-06DE5 | 3.2 | ● | 6 | 23 | 28 | 66 |
| DSW033-023-06DE5 | 3.3 | ● | 6 | 23 | 28 | 66 |
| DSW034-023-06DE5 | 3.4 | ● | 6 | 23 | 28 | 66 |
| DSW035-023-06DE5 | 3.5 | ● | 6 | 23 | 28 | 66 |
| DSW036-023-06DE5 | 3.6 | ● | 6 | 23 | 28 | 66 |
| DSW037-023-06DE5 | 3.7 | ● | 6 | 23 | 28 | 66 |
| DSW038-029-06DE5 | 3.8 | ● | 6 | 29 | 36 | 74 |
| DSW039-029-06DE5 | 3.9 | ● | 6 | 29 | 36 | 74 |
| DSW040-029-06DE5 | 4 | ● | 6 | 29 | 36 | 74 |
| DSW041-029-06DE5 | 4.1 | ● | 6 | 29 | 36 | 74 |
| DSW042-029-06DE5 | 4.2 | ● | 6 | 29 | 36 | 74 |
| DSW043-029-06DE5 | 4.3 | ● | 6 | 29 | 36 | 74 |
| DSW044-029-06DE5 | 4.4 | ● | 6 | 29 | 36 | 74 |
| DSW045-029-06DE5 | 4.5 | ● | 6 | 29 | 36 | 74 |
| DSW046-029-06DE5 | 4.6 | ● | 6 | 29 | 36 | 74 |
| DSW047-029-06DE5 | 4.7 | ● | 6 | 29 | 36 | 74 |
| DSW048-035-06DE5 | 4.8 | ● | 6 | 35 | 44 | 82 |
| DSW049-035-06DE5 | 4.9 | ● | 6 | 35 | 44 | 82 |
| DSW050-035-06DE5 | 5 | ● | 6 | 35 | 44 | 82 |
| DSW051-035-06DE5 | 5.1 | ● | 6 | 35 | 44 | 82 |
| DSW052-035-06DE5 | 5.2 | ● | 6 | 35 | 44 | 82 |
| DSW053-035-06DE5 | 5.3 | ● | 6 | 35 | 44 | 82 |
| DSW054-035-06DE5 | 5.4 | ● | 6 | 35 | 44 | 82 |
| DSW055-035-06DE5 | 5.5 | ● | 6 | 35 | 44 | 82 |
| DSW056-035-06DE5 | 5.6 | ● | 6 | 35 | 44 | 82 |
| DSW057-035-06DE5 | 5.7 | ● | 6 | 35 | 44 | 82 |
| DSW058-035-06DE5 | 5.8 | ● | 6 | 35 | 44 | 82 |
| DSW059-035-06DE5 | 5.9 | ● | 6 | 35 | 44 | 82 |
| DSW060-035-06DE5 | 6 | ● | 6 | 35 | 44 | 82 |
| DSW061-043-08DE5 | 6.1 | ● | 8 | 43 | 53 | 91 |
| DSW062-043-08DE5 | 6.2 | ● | 8 | 43 | 53 | 91 |
| DSW063-043-08DE5 | 6.3 | ● | 8 | 43 | 53 | 91 |
| DSW064-043-08DE5 | 6.4 | ● | 8 | 43 | 53 | 91 |
| DSW065-043-08DE5 | 6.5 | ● | 8 | 43 | 53 | 91 |
| DSW066-043-08DE5 | 6.6 | ● | 8 | 43 | 53 | 91 |
| DSW067-043-08DE5 | 6.7 | ● | 8 | 43 | 53 | 91 |
| DSW068-043-08DE5 | 6.8 | ● | 8 | 43 | 53 | 91 |
| DSW069-043-08DE5 | 6.9 | ● | 8 | 43 | 53 | 91 |
| DSW070-043-08DE5 | 7 | ● | 8 | 43 | 53 | 91 |
| DSW071-043-08DE5 | 7.1 | ● | 8 | 43 | 53 | 91 |
| DSW072-043-08DE5 | 7.2 | ● | 8 | 43 | 53 | 91 |
| DSW073-043-08DE5 | 7.3 | ● | 8 | 43 | 53 | 91 |
| DSW074-043-08DE5 | 7.4 | ● | 8 | 43 | 53 | 91 |
| DSW075-043-08DE5 | 7.5 | ● | 8 | 43 | 53 | 91 |
| DSW076-043-08DE5 | 7.6 | ● | 8 | 43 | 53 | 91 |
| DSW077-043-08DE5 | 7.7 | ● | 8 | 43 | 53 | 91 |
| DSW078-043-08DE5 | 7.8 | ● | 8 | 43 | 53 | 91 |
| DSW079-043-08DE5 | 7.9 | ● | 8 | 43 | 53 | 91 |
| DSW080-043-08DE5 | 8 | ● | 8 | 43 | 53 | 91 |
| DSW081-049-10DE5 | 8.1 | ● | 10 | 49 | 61 | 103 |

| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW082-049-10DE5 | 8.2 | ● | 10 | 49 | 61 | 103 |
| DSW083-049-10DE5 | 8.3 | ● | 10 | 49 | 61 | 103 |
| DSW084-049-10DE5 | 8.4 | ● | 10 | 49 | 61 | 103 |
| DSW085-049-10DE5 | 8.5 | ● | 10 | 49 | 61 | 103 |
| DSW086-049-10DE5 | 8.6 | ● | 10 | 49 | 61 | 103 |
| DSW087-049-10DE5 | 8.7 | ● | 10 | 49 | 61 | 103 |
| DSW088-049-10DE5 | 8.8 | ● | 10 | 49 | 61 | 103 |
| DSW089-049-10DE5 | 8.9 | ● | 10 | 49 | 61 | 103 |
| DSW090-049-10DE5 | 9 | ● | 10 | 49 | 61 | 103 |
| DSW091-049-10DE5 | 9.1 | ● | 10 | 49 | 61 | 103 |
| DSW092-049-10DE5 | 9.2 | ● | 10 | 49 | 61 | 103 |
| DSW093-049-10DE5 | 9.3 | ● | 10 | 49 | 61 | 103 |
| DSW094-049-10DE5 | 9.4 | ● | 10 | 49 | 61 | 103 |
| DSW095-049-10DE5 | 9.5 | ● | 10 | 49 | 61 | 103 |
| DSW096-049-10DE5 | 9.6 | ● | 10 | 49 | 61 | 103 |
| DSW097-049-10DE5 | 9.7 | ● | 10 | 49 | 61 | 103 |
| DSW098-049-10DE5 | 9.8 | ● | 10 | 49 | 61 | 103 |
| DSW099-049-10DE5 | 9.9 | ● | 10 | 49 | 61 | 103 |
| DSW100-049-10DE5 | 10 | ● | 10 | 49 | 61 | 103 |
| DSW101-056-12DE5 | 10.1 | ● | 12 | 56 | 71 | 118 |
| DSW102-056-12DE5 | 10.2 | ● | 12 | 56 | 71 | 118 |
| DSW103-056-12DE5 | 10.3 | ● | 12 | 56 | 71 | 118 |
| DSW104-056-12DE5 | 10.4 | ● | 12 | 56 | 71 | 118 |
| DSW105-056-12DE5 | 10.5 | ● | 12 | 56 | 71 | 118 |
| DSW106-056-12DE5 | 10.6 | ● | 12 | 56 | 71 | 118 |
| DSW107-056-12DE5 | 10.7 | ● | 12 | 56 | 71 | 118 |
| DSW108-056-12DE5 | 10.8 | ● | 12 | 56 | 71 | 118 |
| DSW109-056-12DE5 | 10.9 | ● | 12 | 56 | 71 | 118 |
| DSW110-056-12DE5 | 11 | ● | 12 | 56 | 71 | 118 |
| DSW111-056-12DE5 | 11.1 | ● | 12 | 56 | 71 | 118 |
| DSW112-056-12DE5 | 11.2 | ● | 12 | 56 | 71 | 118 |
| DSW113-056-12DE5 | 11.3 | ● | 12 | 56 | 71 | 118 |
| DSW114-056-12DE5 | 11.4 | ● | 12 | 56 | 71 | 118 |
| DSW115-056-12DE5 | 11.5 | ● | 12 | 56 | 71 | 118 |
| DSW116-056-12DE5 | 11.6 | ● | 12 | 56 | 71 | 118 |
| DSW117-056-12DE5 | 11.7 | ● | 12 | 56 | 71 | 118 |
| DSW118-056-12DE5 | 11.8 | ● | 12 | 56 | 71 | 118 |
| DSW119-056-12DE5 | 11.9 | ● | 12 | 56 | 71 | 118 |
| DSW120-056-12DE5 | 12 | ● | 12 | 56 | 71 | 118 |
| DSW121-060-14DE5 | 12.1 | ● | 14 | 60 | 77 | 124 |
| DSW122-060-14DE5 | 12.2 | ● | 14 | 60 | 77 | 124 |
| DSW123-060-14DE5 | 12.3 | ● | 14 | 60 | 77 | 124 |
| DSW124-060-14DE5 | 12.4 | ● | 14 | 60 | 77 | 124 |
| DSW125-060-14DE5 | 12.5 | ● | 14 | 60 | 77 | 124 |
| DSW126-060-14DE5 | 12.6 | ● | 14 | 60 | 77 | 124 |
| DSW127-060-14DE5 | 12.7 | ● | 14 | 60 | 77 | 124 |
| DSW128-060-14DE5 | 12.8 | ● | 14 | 60 | 77 | 124 |
| DSW129-060-14DE5 | 12.9 | ● | 14 | 60 | 77 | 124 |
| DSW130-060-14DE5 | 13 | ● | 14 | 60 | 77 | 124 |
| DSW131-060-14DE5 | 13.1 | ● | 14 | 60 | 77 | 124 |
| DSW132-060-14DE5 | 13.2 | ● | 14 | 60 | 77 | 124 |
| DSW133-060-14DE5 | 13.3 | ● | 14 | 60 | 77 | 124 |

● : Line up

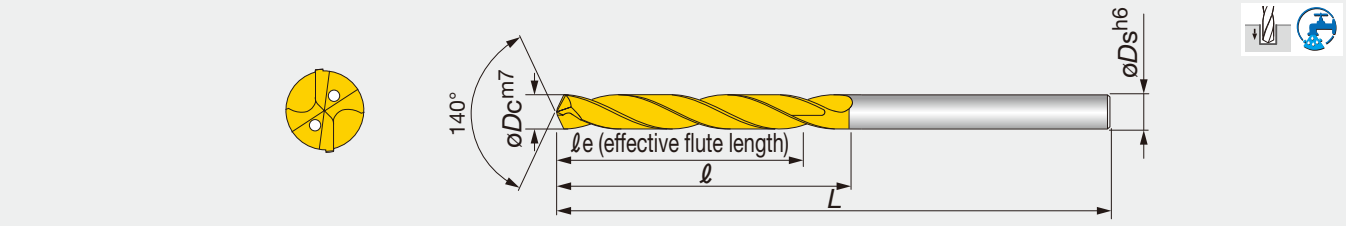
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-060-14DE5 | 13.4 | ● | 14 | 60 | 77 | 124 |
| DSW135-060-14DE5 | 13.5 | ● | 14 | 60 | 77 | 124 |
| DSW136-060-14DE5 | 13.6 | ● | 14 | 60 | 77 | 124 |
| DSW137-060-14DE5 | 13.7 | ● | 14 | 60 | 77 | 124 |
| DSW138-060-14DE5 | 13.8 | ● | 14 | 60 | 77 | 124 |
| DSW139-060-14DE5 | 13.9 | ● | 14 | 60 | 77 | 124 |
| DSW140-060-14DE5 | 14 | ● | 14 | 60 | 77 | 124 |
| DSW141-063-16DE5 | 14.1 | ● | 16 | 63 | 83 | 133 |
| DSW142-063-16DE5 | 14.2 | ● | 16 | 63 | 83 | 133 |
| DSW143-063-16DE5 | 14.3 | ● | 16 | 63 | 83 | 133 |
| DSW144-063-16DE5 | 14.4 | ● | 16 | 63 | 83 | 133 |
| DSW145-063-16DE5 | 14.5 | ● | 16 | 63 | 83 | 133 |
| DSW146-063-16DE5 | 14.6 | ● | 16 | 63 | 83 | 133 |
| DSW147-063-16DE5 | 14.7 | ● | 16 | 63 | 83 | 133 |
| DSW148-063-16DE5 | 14.8 | ● | 16 | 63 | 83 | 133 |
| DSW149-063-16DE5 | 14.9 | ● | 16 | 63 | 83 | 133 |
| DSW150-063-16DE5 | 15 | ● | 16 | 63 | 83 | 133 |
| DSW151-063-16DE5 | 15.1 | ● | 16 | 63 | 83 | 133 |
| DSW152-063-16DE5 | 15.2 | ● | 16 | 63 | 83 | 133 |
| DSW153-063-16DE5 | 15.3 | ● | 16 | 63 | 83 | 133 |
| DSW154-063-16DE5 | 15.4 | ● | 16 | 63 | 83 | 133 |
| DSW155-063-16DE5 | 15.5 | ● | 16 | 63 | 83 | 133 |
| DSW156-063-16DE5 | 15.6 | ● | 16 | 63 | 83 | 133 |
| DSW157-063-16DE5 | 15.7 | ● | 16 | 63 | 83 | 133 |
| DSW158-063-16DE5 | 15.8 | ● | 16 | 63 | 83 | 133 |
| DSW159-063-16DE5 | 15.9 | ● | 16 | 63 | 83 | 133 |
| DSW160-063-16DE5 | 16 | ● | 16 | 63 | 83 | 133 |

● : Line up

# SOLIDDRILL

## DSW-DI5

Soliddrill with 140° point angle with oil hole & DIN shank, L/D = 5, dia = ø3 - ø16 mm




| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW030-023-06DI5 | 3 | ● | 6 | 23 | 28 | 66 |
| DSW031-023-06DI5 | 3.1 | ● | 6 | 23 | 28 | 66 |
| DSW032-023-06DI5 | 3.2 | ● | 6 | 23 | 28 | 66 |
| DSW033-023-06DI5 | 3.3 | ● | 6 | 23 | 28 | 66 |
| DSW034-023-06DI5 | 3.4 | ● | 6 | 23 | 28 | 66 |
| DSW035-023-06DI5 | 3.5 | ● | 6 | 23 | 28 | 66 |
| DSW036-023-06DI5 | 3.6 | ● | 6 | 23 | 28 | 66 |
| DSW037-023-06DI5 | 3.7 | ● | 6 | 23 | 28 | 66 |
| DSW038-029-06DI5 | 3.8 | ● | 6 | 29 | 36 | 74 |
| DSW039-029-06DI5 | 3.9 | ● | 6 | 29 | 36 | 74 |
| DSW040-029-06DI5 | 4 | ● | 6 | 29 | 36 | 74 |
| DSW041-029-06DI5 | 4.1 | ● | 6 | 29 | 36 | 74 |
| DSW042-029-06DI5 | 4.2 | ● | 6 | 29 | 36 | 74 |
| DSW043-029-06DI5 | 4.3 | ● | 6 | 29 | 36 | 74 |
| DSW044-029-06DI5 | 4.4 | ● | 6 | 29 | 36 | 74 |
| DSW045-029-06DI5 | 4.5 | ● | 6 | 29 | 36 | 74 |
| DSW046-029-06DI5 | 4.6 | ● | 6 | 29 | 36 | 74 |
| DSW047-029-06DI5 | 4.7 | ● | 6 | 29 | 36 | 74 |
| DSW048-035-06DI5 | 4.8 | ● | 6 | 35 | 44 | 82 |
| DSW049-035-06DI5 | 4.9 | ● | 6 | 35 | 44 | 82 |
| DSW050-035-06DI5 | 5 | ● | 6 | 35 | 44 | 82 |
| DSW051-035-06DI5 | 5.1 | ● | 6 | 35 | 44 | 82 |
| DSW052-035-06DI5 | 5.2 | ● | 6 | 35 | 44 | 82 |
| DSW053-035-06DI5 | 5.3 | ● | 6 | 35 | 44 | 82 |
| DSW054-035-06DI5 | 5.4 | ● | 6 | 35 | 44 | 82 |
| DSW055-035-06DI5 | 5.5 | ● | 6 | 35 | 44 | 82 |
| DSW056-035-06DI5 | 5.6 | ● | 6 | 35 | 44 | 82 |
| DSW057-035-06DI5 | 5.7 | ● | 6 | 35 | 44 | 82 |
| DSW058-035-06DI5 | 5.8 | ● | 6 | 35 | 44 | 82 |
| DSW059-035-06DI5 | 5.9 | ● | 6 | 35 | 44 | 82 |
| DSW060-035-06DI5 | 6 | ● | 6 | 35 | 44 | 82 |
| DSW061-043-08DI5 | 6.1 | ● | 8 | 43 | 53 | 91 |
| DSW062-043-08DI5 | 6.2 | ● | 8 | 43 | 53 | 91 |
| DSW063-043-08DI5 | 6.3 | ● | 8 | 43 | 53 | 91 |
| DSW064-043-08DI5 | 6.4 | ● | 8 | 43 | 53 | 91 |
| DSW065-043-08DI5 | 6.5 | ● | 8 | 43 | 53 | 91 |
| DSW066-043-08DI5 | 6.6 | ● | 8 | 43 | 53 | 91 |
| DSW067-043-08DI5 | 6.7 | ● | 8 | 43 | 53 | 91 |
| DSW068-043-08DI5 | 6.8 | ● | 8 | 43 | 53 | 91 |
| DSW069-043-08DI5 | 6.9 | ● | 8 | 43 | 53 | 91 |
| DSW070-043-08DI5 | 7 | ● | 8 | 43 | 53 | 91 |
| DSW071-043-08DI5 | 7.1 | ● | 8 | 43 | 53 | 91 |
| DSW072-043-08DI5 | 7.2 | ● | 8 | 43 | 53 | 91 |
| DSW073-043-08DI5 | 7.3 | ● | 8 | 43 | 53 | 91 |
| DSW074-043-08DI5 | 7.4 | ● | 8 | 43 | 53 | 91 |
| DSW075-043-08DI5 | 7.5 | ● | 8 | 43 | 53 | 91 |
| DSW076-043-08DI5 | 7.6 | ● | 8 | 43 | 53 | 91 |
| DSW077-043-08DI5 | 7.7 | ● | 8 | 43 | 53 | 91 |
| DSW078-043-08DI5 | 7.8 | ● | 8 | 43 | 53 | 91 |
| DSW079-043-08DI5 | 7.9 | ● | 8 | 43 | 53 | 91 |
| DSW080-043-08DI5 | 8 | ● | 8 | 43 | 53 | 91 |
| DSW081-049-10DI5 | 8.1 | ● | 10 | 49 | 61 | 103 |

| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW082-049-10DI5 | 8.2 | ● | 10 | 49 | 61 | 103 |
| DSW083-049-10DI5 | 8.3 | ● | 10 | 49 | 61 | 103 |
| DSW084-049-10DI5 | 8.4 | ● | 10 | 49 | 61 | 103 |
| DSW085-049-10DI5 | 8.5 | ● | 10 | 49 | 61 | 103 |
| DSW086-049-10DI5 | 8.6 | ● | 10 | 49 | 61 | 103 |
| DSW087-049-10DI5 | 8.7 | ● | 10 | 49 | 61 | 103 |
| DSW088-049-10DI5 | 8.8 | ● | 10 | 49 | 61 | 103 |
| DSW089-049-10DI5 | 8.9 | ● | 10 | 49 | 61 | 103 |
| DSW090-049-10DI5 | 9 | ● | 10 | 49 | 61 | 103 |
| DSW091-049-10DI5 | 9.1 | ● | 10 | 49 | 61 | 103 |
| DSW092-049-10DI5 | 9.2 | ● | 10 | 49 | 61 | 103 |
| DSW093-049-10DI5 | 9.3 | ● | 10 | 49 | 61 | 103 |
| DSW094-049-10DI5 | 9.4 | ● | 10 | 49 | 61 | 103 |
| DSW095-049-10DI5 | 9.5 | ● | 10 | 49 | 61 | 103 |
| DSW096-049-10DI5 | 9.6 | ● | 10 | 49 | 61 | 103 |
| DSW097-049-10DI5 | 9.7 | ● | 10 | 49 | 61 | 103 |
| DSW098-049-10DI5 | 9.8 | ● | 10 | 49 | 61 | 103 |
| DSW099-049-10DI5 | 9.9 | ● | 10 | 49 | 61 | 103 |
| DSW100-049-10DI5 | 10 | ● | 10 | 49 | 61 | 103 |
| DSW101-056-12DI5 | 10.1 | ● | 12 | 56 | 71 | 118 |
| DSW102-056-12DI5 | 10.2 | ● | 12 | 56 | 71 | 118 |
| DSW103-056-12DI5 | 10.3 | ● | 12 | 56 | 71 | 118 |
| DSW104-056-12DI5 | 10.4 | ● | 12 | 56 | 71 | 118 |
| DSW105-056-12DI5 | 10.5 | ● | 12 | 56 | 71 | 118 |
| DSW106-056-12DI5 | 10.6 | ● | 12 | 56 | 71 | 118 |
| DSW107-056-12DI5 | 10.7 | ● | 12 | 56 | 71 | 118 |
| DSW108-056-12DI5 | 10.8 | ● | 12 | 56 | 71 | 118 |
| DSW109-056-12DI5 | 10.9 | ● | 12 | 56 | 71 | 118 |
| DSW110-056-12DI5 | 11 | ● | 12 | 56 | 71 | 118 |
| DSW111-056-12DI5 | 11.1 | ● | 12 | 56 | 71 | 118 |
| DSW112-056-12DI5 | 11.2 | ● | 12 | 56 | 71 | 118 |
| DSW113-056-12DI5 | 11.3 | ● | 12 | 56 | 71 | 118 |
| DSW114-056-12DI5 | 11.4 | ● | 12 | 56 | 71 | 118 |
| DSW115-056-12DI5 | 11.5 | ● | 12 | 56 | 71 | 118 |
| DSW116-056-12DI5 | 11.6 | ● | 12 | 56 | 71 | 118 |
| DSW117-056-12DI5 | 11.7 | ● | 12 | 56 | 71 | 118 |
| DSW118-056-12DI5 | 11.8 | ● | 12 | 56 | 71 | 118 |
| DSW119-056-12DI5 | 11.9 | ● | 12 | 56 | 71 | 118 |
| DSW120-056-12DI5 | 12 | ● | 12 | 56 | 71 | 118 |
| DSW121-060-14DI5 | 12.1 | ● | 14 | 60 | 77 | 124 |
| DSW122-060-14DI5 | 12.2 | ● | 14 | 60 | 77 | 124 |
| DSW123-060-14DI5 | 12.3 | ● | 14 | 60 | 77 | 124 |
| DSW124-060-14DI5 | 12.4 | ● | 14 | 60 | 77 | 124 |
| DSW125-060-14DI5 | 12.5 | ● | 14 | 60 | 77 | 124 |
| DSW126-060-14DI5 | 12.6 | ● | 14 | 60 | 77 | 124 |
| DSW127-060-14DI5 | 12.7 | ● | 14 | 60 | 77 | 124 |
| DSW128-060-14DI5 | 12.8 | ● | 14 | 60 | 77 | 124 |
| DSW129-060-14DI5 | 12.9 | ● | 14 | 60 | 77 | 124 |
| DSW130-060-14DI5 | 13 | ● | 14 | 60 | 77 | 124 |
| DSW131-060-14DI5 | 13.1 | ● | 14 | 60 | 77 | 124 |
| DSW132-060-14DI5 | 13.2 | ● | 14 | 60 | 77 | 124 |
| DSW133-060-14DI5 | 13.3 | ● | 14 | 60 | 77 | 124 |

● : Line up

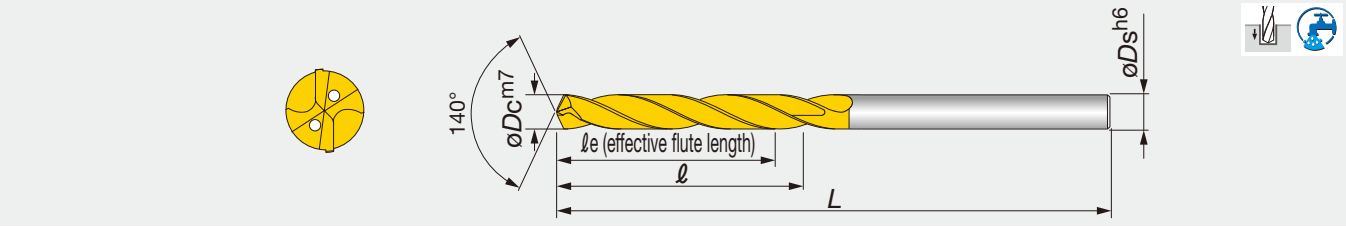
| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW134-060-14DI5 | 13.4 | ● | 14 | 60 | 77 | 124 |
| DSW135-060-14DI5 | 13.5 | ● | 14 | 60 | 77 | 124 |
| DSW136-060-14DI5 | 13.6 | ● | 14 | 60 | 77 | 124 |
| DSW137-060-14DI5 | 13.7 | ● | 14 | 60 | 77 | 124 |
| DSW138-060-14DI5 | 13.8 | ● | 14 | 60 | 77 | 124 |
| DSW139-060-14DI5 | 13.9 | ● | 14 | 60 | 77 | 124 |
| DSW140-060-14DI5 | 14 | ● | 14 | 60 | 77 | 124 |
| DSW141-063-16DI5 | 14.1 | ● | 16 | 63 | 83 | 133 |
| DSW142-063-16DI5 | 14.2 | ● | 16 | 63 | 83 | 133 |
| DSW143-063-16DI5 | 14.3 | ● | 16 | 63 | 83 | 133 |
| DSW144-063-16DI5 | 14.4 | ● | 16 | 63 | 83 | 133 |
| DSW145-063-16DI5 | 14.5 | ● | 16 | 63 | 83 | 133 |
| DSW146-063-16DI5 | 14.6 | ● | 16 | 63 | 83 | 133 |
| DSW147-063-16DI5 | 14.7 | ● | 16 | 63 | 83 | 133 |
| DSW148-063-16DI5 | 14.8 | ● | 16 | 63 | 83 | 133 |
| DSW149-063-16DI5 | 14.9 | ● | 16 | 63 | 83 | 133 |
| DSW150-063-16DI5 | 15 | ● | 16 | 63 | 83 | 133 |
| DSW151-063-16DI5 | 15.1 | ● | 16 | 63 | 83 | 133 |
| DSW152-063-16DI5 | 15.2 | ● | 16 | 63 | 83 | 133 |
| DSW153-063-16DI5 | 15.3 | ● | 16 | 63 | 83 | 133 |
| DSW154-063-16DI5 | 15.4 | ● | 16 | 63 | 83 | 133 |
| DSW155-063-16DI5 | 15.5 | ● | 16 | 63 | 83 | 133 |
| DSW156-063-16DI5 | 15.6 | ● | 16 | 63 | 83 | 133 |
| DSW157-063-16DI5 | 15.7 | ● | 16 | 63 | 83 | 133 |
| DSW158-063-16DI5 | 15.8 | ● | 16 | 63 | 83 | 133 |
| DSW159-063-16DI5 | 15.9 | ● | 16 | 63 | 83 | 133 |
| DSW160-063-16DI5 | 16 | ● | 16 | 63 | 83 | 133 |

● : Line up

# SOLIDDRILL

## DSW-DI8

Soliddrill with 140° point angle with oil hole & DIN shank, L/D = 8, dia = ø3 - ø10 mm

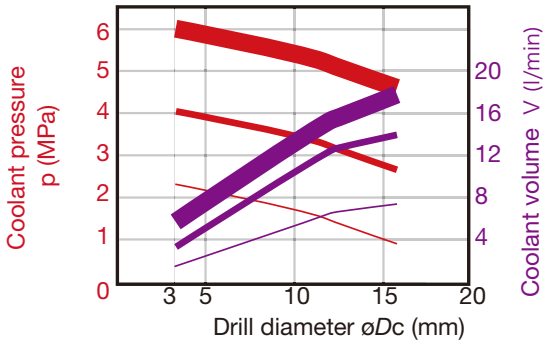



| Designation | øDc | AH725 | øDs | ℓe | ℓ | L |
|---|---|---|---|---|---|---|
| DSW030-029-06DI8 | 3 | ● | 6 | 29 | 34 | 72 |
| DSW031-029-06DI8 | 3.1 | ● | 6 | 29 | 34 | 72 |
| DSW032-029-06DI8 | 3.2 | ● | 6 | 29 | 34 | 72 |
| DSW033-029-06DI8 | 3.3 | ● | 6 | 29 | 34 | 72 |
| DSW034-029-06DI8 | 3.4 | ● | 6 | 29 | 34 | 72 |
| DSW035-029-06DI8 | 3.5 | ● | 6 | 29 | 34 | 72 |
| DSW036-029-06DI8 | 3.6 | ● | 6 | 29 | 34 | 72 |
| DSW037-029-06DI8 | 3.7 | ● | 6 | 29 | 34 | 72 |
| DSW038-036-06DI8 | 3.8 | ● | 6 | 36 | 43 | 81 |
| DSW039-036-06DI8 | 3.9 | ● | 6 | 36 | 43 | 81 |
| DSW040-036-06DI8 | 4 | ● | 6 | 36 | 43 | 81 |
| DSW041-036-06DI8 | 4.1 | ● | 6 | 36 | 43 | 81 |
| DSW042-036-06DI8 | 4.2 | ● | 6 | 36 | 43 | 81 |
| DSW043-036-06DI8 | 4.3 | ● | 6 | 36 | 43 | 81 |
| DSW044-036-06DI8 | 4.4 | ● | 6 | 36 | 43 | 81 |
| DSW045-036-06DI8 | 4.5 | ● | 6 | 36 | 43 | 81 |
| DSW046-036-06DI8 | 4.6 | ● | 6 | 36 | 43 | 81 |
| DSW047-036-06DI8 | 4.7 | ● | 6 | 36 | 43 | 81 |
| DSW048-048-06DI8 | 4.8 | ● | 6 | 48 | 57 | 95 |
| DSW049-048-06DI8 | 4.9 | ● | 6 | 48 | 57 | 95 |
| DSW050-048-06DI8 | 5 | ● | 6 | 48 | 57 | 95 |
| DSW051-048-06DI8 | 5.1 | ● | 6 | 48 | 57 | 95 |
| DSW052-048-06DI8 | 5.2 | ● | 6 | 48 | 57 | 95 |
| DSW053-048-06DI8 | 5.3 | ● | 6 | 48 | 57 | 95 |
| DSW054-048-06DI8 | 5.4 | ● | 6 | 48 | 57 | 95 |
| DSW055-048-06DI8 | 5.5 | ● | 6 | 48 | 57 | 95 |
| DSW056-048-06DI8 | 5.6 | ● | 6 | 48 | 57 | 95 |
| DSW057-048-06DI8 | 5.7 | ● | 6 | 48 | 57 | 95 |
| DSW058-048-06DI8 | 5.8 | ● | 6 | 48 | 57 | 95 |
| DSW059-048-06DI8 | 5.9 | ● | 6 | 48 | 57 | 95 |
| DSW060-048-06DI8 | 6 | ● | 6 | 48 | 57 | 95 |
| DSW061-064-08DI8 | 6.1 | ● | 8 | 64 | 76 | 114 |
| DSW062-064-08DI8 | 6.2 | ● | 8 | 64 | 76 | 114 |
| DSW063-064-08DI8 | 6.3 | ● | 8 | 64 | 76 | 114 |
| DSW064-064-08DI8 | 6.4 | ● | 8 | 64 | 76 | 114 |
| DSW065-064-08DI8 | 6.5 | ● | 8 | 64 | 76 | 114 |
| DSW066-064-08DI8 | 6.6 | ● | 8 | 64 | 76 | 114 |
| DSW067-064-08DI8 | 6.7 | ● | 8 | 64 | 76 | 114 |
| DSW068-064-08DI8 | 6.8 | ● | 8 | 64 | 76 | 114 |
| DSW069-064-08DI8 | 6.9 | ● | 8 | 64 | 76 | 114 |
| DSW070-064-08DI8 | 7 | ● | 8 | 64 | 76 | 114 |
| DSW071-064-08DI8 | 7.1 | ● | 8 | 64 | 76 | 114 |
| DSW072-064-08DI8 | 7.2 | ● | 8 | 64 | 76 | 114 |
| DSW073-064-08DI8 | 7.3 | ● | 8 | 64 | 76 | 114 |
| DSW074-064-08DI8 | 7.4 | ● | 8 | 64 | 76 | 114 |
| DSW075-064-08DI8 | 7.5 | ● | 8 | 64 | 76 | 114 |
| DSW076-064-08DI8 | 7.6 | ● | 8 | 64 | 76 | 114 |
| DSW077-064-08DI8 | 7.7 | ● | 8 | 64 | 76 | 114 |
| DSW078-064-08DI8 | 7.8 | ● | 8 | 64 | 76 | 114 |
| DSW079-064-08DI8 | 7.9 | ● | 8 | 64 | 76 | 114 |
| DSW080-064-08DI8 | 8 | ● | 8 | 64 | 76 | 114 |
| DSW081-080-10DI8 | 8.1 | ● | 10 | 80 | 95 | 142 |
| DSW082-080-10DI8 | 8.2 | ● | 10 | 80 | 95 | 142 |
| DSW083-080-10DI8 | 8.3 | ● | 10 | 80 | 95 | 142 |
| DSW084-080-10DI8 | 8.4 | ● | 10 | 80 | 95 | 142 |
| DSW085-080-10DI8 | 8.5 | ● | 10 | 80 | 95 | 142 |
| DSW086-080-10DI8 | 8.6 | ● | 10 | 80 | 95 | 142 |
| DSW087-080-10DI8 | 8.7 | ● | 10 | 80 | 95 | 142 |
| DSW088-080-10DI8 | 8.8 | ● | 10 | 80 | 95 | 142 |
| DSW089-080-10DI8 | 8.9 | ● | 10 | 80 | 95 | 142 |
| DSW090-080-10DI8 | 9 | ● | 10 | 80 | 95 | 142 |
| DSW091-080-10DI8 | 9.1 | ● | 10 | 80 | 95 | 142 |
| DSW092-080-10DI8 | 9.2 | ● | 10 | 80 | 95 | 142 |
| DSW093-080-10DI8 | 9.3 | ● | 10 | 80 | 95 | 142 |
| DSW094-080-10DI8 | 9.4 | ● | 10 | 80 | 95 | 142 |
| DSW095-080-10DI8 | 9.5 | ● | 10 | 80 | 95 | 142 |
| DSW096-080-10DI8 | 9.6 | ● | 10 | 80 | 95 | 142 |
| DSW097-080-10DI8 | 9.7 | ● | 10 | 80 | 95 | 142 |
| DSW098-080-10DI8 | 9.8 | ● | 10 | 80 | 95 | 142 |
| DSW099-080-10DI8 | 9.9 | ● | 10 | 80 | 95 | 142 |
| DSW100-080-10DI8 | 10 | ● | 10 | 80 | 95 | 142 |

● : Line up

## Recommended coolant pressure and volume for internal coolant supply:

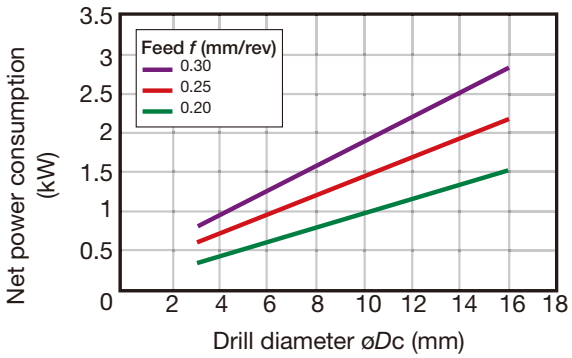
The following graph is a reference guide for pressure and volume. Values should be adjusted according to work material and actual chip evacuation.




: Ideal pressure
: Enough pressure
: Minimum pressure
: Ideal volume
: Enough volume
: Minimum volume

## Reference for required spindle power:

The required spindle power may vary depending on the type of work material or hardness. A spindle with sufficient power should be used when referring to the below graph.




Work material : Alloy steel (SNCM439)
Cutting speed : *Vc* = 100 m/min

## Designation system

| DSW | 088 | - | 035 | - | 10 | - | D | E | 3 |
|---|---|---|---|---|---|---|---|---|---|
| ① | ② | | ③ | | ④ | | ⑤ | ⑥ | ⑦ |

| ① Series | |
|---|---|
| DSW | Series name of solid drill |

| ② Drill dia. øDc (mm) | |
|---|---|
| 088 | ø8.8 |

| ③ Effective flute length ℓe (mm) | |
|---|---|
| 035 | 35 |

| ④ Shank diameter øDs (mm) | |
|---|---|
| 10 | ø10 |

| ⑤ DIN 6535 - Form HA |
|---|

| ⑥ Coolant Supply | |
|---|---|
| E | External (without coolant hole) |
| I | Internal (with coolant hole) |

| ⑦ Drilling depth |
|---|
| **Approximate value of L/D ratio.** Caution: Code may be different from the actual length. This is dependent upon the tool diameter. |

**Caution: "Effective flute length" shows the maximum flute length for effective chip evacuation. The actual drilling depth may be shorter than described depending on the work material or cutting conditions.**

# STANDARD CUTTING CONDITIONS

## DSW-DE (External supply)

| ISO | Workpiece material | Brinell hardness (HB) | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|
| | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 |
| P | Low carbon steels (C < 0.3)<br>SS400, SM490, S25C, etc.<br>C15E4, E275A, E355D, etc. | ~ 180 | 40 - 100 | 60 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| | Carbon steels (C > 0.3)<br>S45C, S55C, , etc.<br>C45, C55, etc. | 180 ~ 300 | 40 - 90 | 50 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.4 |
| | High alloy steels<br>SCM440, etc.<br>42CrMo4, etc. | 250 ~ 350 | 40 - 80 | 50 - 100 | 50 - 100 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.35 |
| M | Stainless steels<br>SUS304, etc.<br>X5CrNi18-9, etc. | ~ 200 | 20 - 40 | 30 - 50 | 30 - 60 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 |
| K | Grey cast irons<br>FC300, etc.<br>250, etc. | ~ 200 | 40 - 90 | 50 - 95 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| | Ductile cast irons<br>FCD450, etc.<br>450-10S, etc. | ~ 300 | 30 - 80 | 40 - 90 | 45 - 90 | 0.1 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| N | Aluminium alloys<br>ADC12, etc.<br>AlSi11Cu3, etc. | - | 40 - 90 | 50 - 100 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | 20 - 40 | 20 - 40 | 20 - 40 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.4 |
| | Heat-resistant alloys, Inconel<br>Inconel 718, etc. | 250 ~ | 10 - 30 | 10 - 30 | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 |
| H | High hardened steels<br>SKD11, etc.<br>X153CrMoV12, etc. | ~ 40HRC | 20 - 40 | 20 - 40 | 20 - 40 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.2 |

· The cutting parameters shown in the table are merely a starting guideline for general machining. Values should be varied depending on the power or rigidity of the machine to be used. Optimum conditions should be selected depending on the actual chip control or damage on edges.
· When using the smaller diameter tools in each range, set the feed "*f*" to the lower recommended values.
· The coolant supply is critical for the provision of stable machining conditions and enhanced tool life. A large coolant volume should be supplied, especially when drilling difficult-to-cut materials.
· When drilling stainless steel with low machinability such as austenitic stainless steel with a depth deeper than L/D = 3, a pecking cycle or internal coolant supply is recommended.

## DSW-DI (Internal supply)

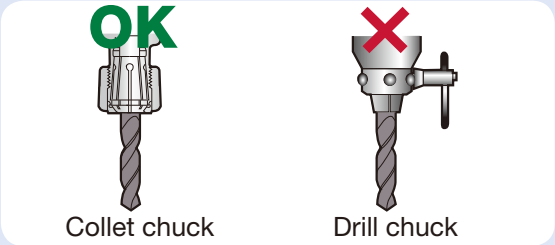
| ISO | Workpiece material | Brinell hardness (HB) | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|
| | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø16 |
| P | Low carbon steels (C < 0.3)<br>SS400, SM490, S25C, etc.<br>C15E4, E275A, E355D, etc. | ~ 180 | 70 - 140 | 80 - 160 | 90 - 190 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| | Carbon steels (C > 0.3)<br>S45C, S55C, , etc.<br>C45, C55, etc. | 180 ~ 300 | 50 - 130 | 70 - 160 | 80 - 170 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.4 |
| | High alloy steels<br>SCM440, etc.<br>42CrMo4, etc. | 250 ~ 350 | 40 - 100 | 60 - 140 | 60 - 160 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.35 |
| M | Stainless steels<br>SUS304, etc.<br>X5CrNi18-9, etc. | ~ 200 | 25 - 75 | 50 - 100 | 50 - 120 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 |
| K | Grey cast irons<br>FC300, etc.<br>250, etc. | ~ 200 | 80 - 140 | 100 - 160 | 100 - 180 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| | Ductile cast irons<br>FCD450, etc.<br>450-10S, etc. | ~ 300 | 70 - 140 | 80 - 150 | 80 - 170 | 0.1 - 0.3 | 0.2 - 0.4 | 0.2 - 0.45 |
| N | Aluminium alloys<br>ADC12, etc.<br>AlSi11Cu3, etc. | - | 60 - 200 | 60 - 200 | 60 - 200 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.5 |
| S | Titanium alloys<br>Ti-6Al-4V, etc. | - | 20 - 60 | 30 - 80 | 30 - 80 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.4 |
| | Heat-resistant alloys, Inconel<br>Inconel 718, etc. | 250 ~ | 10 - 30 | 10 - 40 | 10 - 40 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.15 |
| H | High hardened steels<br>SKD11, etc.<br>X153CrMoV12, etc. | ~ 40HRC | 20 - 50 | 30 - 60 | 30 - 60 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.2 |

· The cutting parameters shown in the table are merely a starting guideline for general machining. Values should be varied depending on the power or rigidity of the machine to be used. Optimum conditions should be selected depending on the actual chip control or damage on edges.
· When using the smaller diameter tools in each range, set the feed "*f*" to the lower recommended values.
· Oil holes that become blocked may cause drill breakages. A filter to prevent the circulation of chips must be used on the coolant supply system.

# Guidelines for correct usage of carbide drills

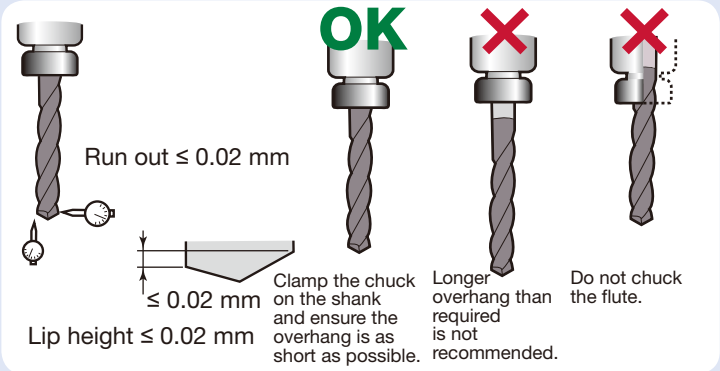
## ●Holders for solid carbide drills:

A collet chuck holder is recommended for use with carbide drills. When using a milling chuck holder, a collet chuck with a straight shank or straight collet should be used.



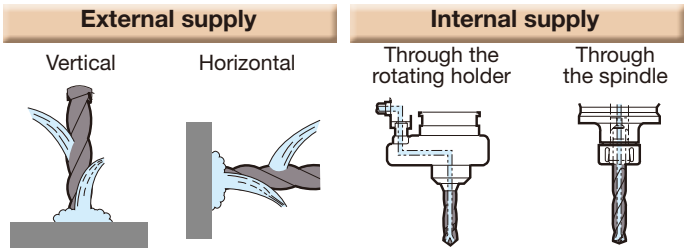

## ●Chucking drills:

- Radial run out and lip height should be less than 0.02mm. If run out or lip height is larger (close to 0.05mm), machining is possible. However, less accurate holes or short tool life may be a result.
- Overhang length should be as short as possible.




## ●Coolant Supply:

When using a drill without a coolant hole, such as the DSW-DE type, coolant should always be directed to the entrance of the hole. Maintaining this supplying is very important for stable drilling performance.

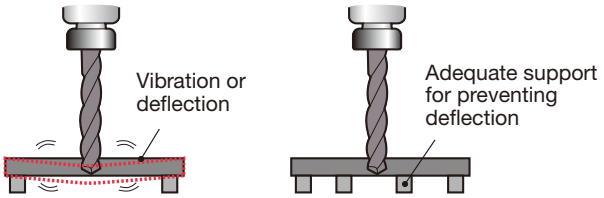



External coolant should be supplied at high pressure and directed at the hole entry point.

Coolant pressure: 0.5 - 2.0 MPa (Air pressure for MQL: 0.3 - 0.5 MPa)

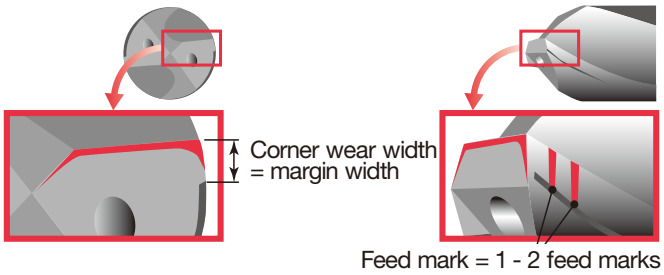
## ●Clamping workpieces:

As solid carbide drills have a higher thrust force, machining with low rigidity or inadequate support can cause fractures or breakages through vibration. It is important the workpiece is rigidly clamped and has adequate support.




## ●The criteria of tool life:

- Corner wear width: equal to margin width
- Feed mark: 1 - 2 feed marks on the margin
- Spindle load increase: 30% higher than starting level
- Irregular situation: worse chip control, hole diameter change, worse surface finish, larger burrs, bigger sound.



# Regrinding Procedures

## Regrinding method [Applied to DSW]

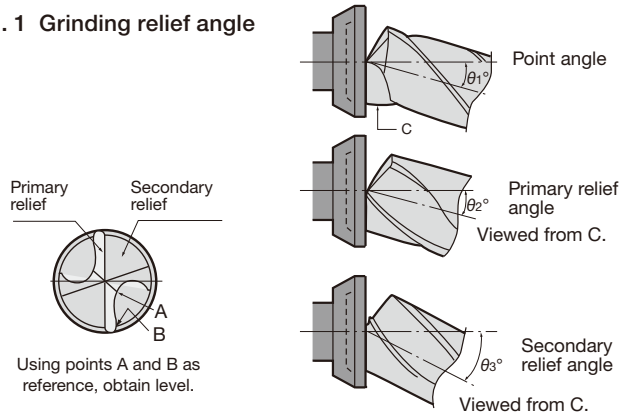
**Before regrinding**
Check the cutting edge for damage and wear. If any large fracture is found, remove with a silicon carbide wheel.

### (1) Grinding the flank

● Use a 280 to 400 grit diamond cup type wheel of 100 ~ 200 mm in diameter.

1) Grind the relief surface so that primary relief angle ($\theta$) of 2° can be formed as shown in Fig.1. After grinding the other side likewise, do sparkout grinding so that the difference of the lip height will be kept within 0.02 mm.
2) In the cases of DSW types: After grinding the primary relief angle ($\theta$) 2°, without rotating the drill, grind the secondary relief surface so that the relief angle ($\theta$) of 3° can be formed. In the same way as 2), take care to bring the ridge line formed between the primary and secondary relief surfaces to the drill center. (Values ($\theta$) of 1° ~ 3° are shown in Table 1)

Fig. 1 Grinding relief angle



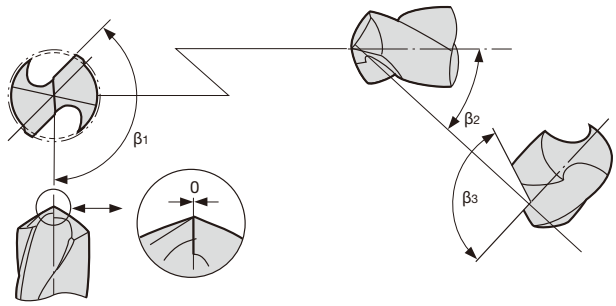

### (2) Thinning

- Use a 280 ~ 400 grit diamond straight-type wheel of 100 ~ 200 mm in diameter.
- Conduct thinning in the same manner as cross thinning (X-type).
- Values of $\beta 1$ to $\beta 3$ written in the figures are given in the Table 2.

| Table 1 | $\theta 1$ (Point angle) | $\theta 2$ (Primary relief angle) | $\theta 3$ (Secondary relief angle) |
|---|---|---|---|
| **DSW** | –20° | –6° ~ –12° | –23° ~ –27° |

| Table 2 | $\beta 1$ | $\beta 2$ | $\beta 3$ |
|---|---|---|---|
| **DSW** | 147° ~ 153° | 30° ~ 42° | 95° ~ 110° |

Fig. 2




### (3) Honing

- The honing angle $\theta$ and width H should be varied depending on the drill type, diameter, and work material. Recommended honing specifications are given in the Table below.
- Honing procedures (refer to Fig.3)
  (1) Round the R portion shown in Fig.3 in large.
  (2) Then, roughly hone the cutting edge lines by using an electro-deposited diamond file of around 170 grit.
  (3) Carry out finish honing by using a diamond hand stick of 400 to 600 grit.
- The honing width should be changed depending on the drill diameter. For smaller side of diameters, the width should be in smaller side of values given in the Table.

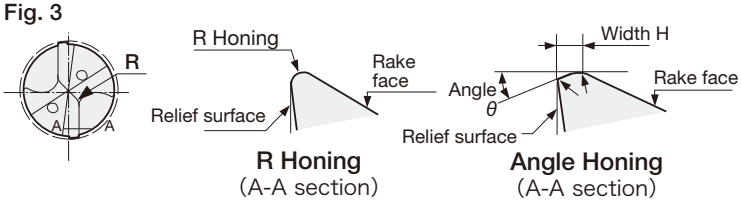
### • Angle honing

| | ~ ø6 mm | ø6 ~ ø10 mm | ø10 ~ ø16 mm |
|---|---|---|---|
| $\theta$ | - 20° | - 20° | - 20° |
| H | 0.03 ~ 0.05 | 0.05 ~ 0.08 | 0.08 ~ 0.1 |

### • R Honing

| Dimensions (mm) | R Honing R (mm) |
|---|---|
| ø*Dc* ≤ ø6 | 0.02 ~ 0.04 |
| ø6 < ø*Dc* ≤ ø16 | 0.03 ~ 0.05 |

Fig. 3




R Honing (A-A section)

Angle Honing (A-A section)

After regrinding, check the following before use.

- The difference of the lip height is kept within 0.02 mm.
- Any damaged portion on the cutting edges is not left.
- Cutting edges are properly honed.
- Any grinding burr is not left.

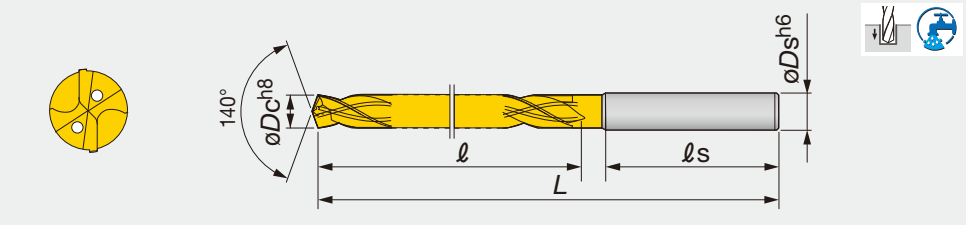
Notes:
- For more details on regrinding, consult the nearest Tungaloy sales office.

MEMO

# GIGAJETDRILL

## DSX-F03

Soliddrill with 140° point angle with oil hole, L/D = 3, dia = ø3 - ø20 mm




| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F03 | 3 | ● | 3 | 15 | 48 | 68 |
| DSX0310F03 | 3.1 | ● | 4 | 18 | 48 | 71 |
| DSX0320F03 | 3.2 | ● | 4 | 18 | 48 | 71 |
| DSX0330F03 | 3.3 | ● | 4 | 18 | 48 | 71 |
| DSX0340F03 | 3.4 | ● | 4 | 18 | 48 | 71 |
| DSX0350F03 | 3.5 | ● | 4 | 18 | 48 | 71 |
| DSX0360F03 | 3.6 | ● | 4 | 20 | 48 | 73 |
| DSX0370F03 | 3.7 | ● | 4 | 20 | 48 | 73 |
| DSX0380F03 | 3.8 | ● | 4 | 20 | 48 | 73 |
| DSX0390F03 | 3.9 | ● | 4 | 20 | 48 | 73 |
| DSX0400F03 | 4 | ● | 4 | 20 | 48 | 73 |
| DSX0410F03 | 4.1 | ● | 5 | 23 | 50 | 78 |
| DSX0420F03 | 4.2 | ● | 5 | 23 | 50 | 78 |
| DSX0430F03 | 4.3 | ● | 5 | 23 | 50 | 78 |
| DSX0440F03 | 4.4 | ● | 5 | 23 | 50 | 78 |
| DSX0450F03 | 4.5 | ● | 5 | 23 | 50 | 78 |
| DSX0460F03 | 4.6 | ● | 5 | 25 | 50 | 80 |
| DSX0470F03 | 4.7 | ● | 5 | 25 | 50 | 80 |
| DSX0480F03 | 4.8 | ● | 5 | 25 | 50 | 80 |
| DSX0490F03 | 4.9 | ● | 5 | 25 | 50 | 80 |
| DSX0500F03 | 5 | ● | 5 | 25 | 50 | 80 |
| DSX0510F03 | 5.1 | ● | 6 | 28 | 52 | 82 |
| DSX0520F03 | 5.2 | ● | 6 | 28 | 52 | 82 |
| DSX0530F03 | 5.3 | ● | 6 | 28 | 52 | 82 |
| DSX0540F03 | 5.4 | ● | 6 | 28 | 52 | 82 |
| DSX0550F03 | 5.5 | ● | 6 | 28 | 52 | 82 |
| DSX0560F03 | 5.6 | ● | 6 | 30 | 52 | 82 |
| DSX0570F03 | 5.7 | ● | 6 | 30 | 52 | 82 |
| DSX0580F03 | 5.8 | ● | 6 | 30 | 52 | 82 |
| DSX0590F03 | 5.9 | ● | 6 | 30 | 52 | 82 |
| DSX0600F03 | 6 | ● | 6 | 30 | 52 | 82 |
| DSX0610F03 | 6.1 | ● | 7 | 33 | 53 | 86 |
| DSX0620F03 | 6.2 | ● | 7 | 33 | 53 | 86 |
| DSX0630F03 | 6.3 | ● | 7 | 33 | 53 | 86 |
| DSX0640F03 | 6.4 | ● | 7 | 33 | 53 | 86 |
| DSX0650F03 | 6.5 | ● | 7 | 33 | 53 | 86 |
| DSX0660F03 | 6.6 | ● | 7 | 35 | 53 | 88 |
| DSX0670F03 | 6.7 | ● | 7 | 35 | 53 | 88 |
| DSX0680F03 | 6.8 | ● | 7 | 35 | 53 | 88 |
| DSX0690F03 | 6.9 | ● | 7 | 35 | 53 | 88 |
| DSX0700F03 | 7 | ● | 7 | 35 | 53 | 88 |
| DSX0710F03 | 7.1 | ● | 8 | 38 | 54 | 92 |
| DSX0720F03 | 7.2 | ● | 8 | 38 | 54 | 92 |
| DSX0730F03 | 7.3 | ● | 8 | 38 | 54 | 92 |
| DSX0740F03 | 7.4 | ● | 8 | 38 | 54 | 92 |
| DSX0750F03 | 7.5 | ● | 8 | 38 | 54 | 92 |
| DSX0760F03 | 7.6 | ● | 8 | 40 | 54 | 94 |
| DSX0770F03 | 7.7 | ● | 8 | 40 | 54 | 94 |
| DSX0780F03 | 7.8 | ● | 8 | 40 | 54 | 94 |
| DSX0790F03 | 7.9 | ● | 8 | 40 | 54 | 94 |
| DSX0800F03 | 8 | ● | 8 | 40 | 54 | 94 |
| DSX0810F03 | 8.1 | ● | 9 | 43 | 55 | 100 |
| DSX0820F03 | 8.2 | ● | 9 | 43 | 55 | 100 |
| DSX0830F03 | 8.3 | ● | 9 | 43 | 55 | 100 |
| DSX0840F03 | 8.4 | ● | 9 | 43 | 55 | 100 |
| DSX0850F03 | 8.5 | ● | 9 | 43 | 55 | 100 |
| DSX0860F03 | 8.6 | ● | 9 | 45 | 55 | 100 |
| DSX0870F03 | 8.7 | ● | 9 | 45 | 55 | 100 |
| DSX0880F03 | 8.8 | ● | 9 | 45 | 55 | 100 |
| DSX0890F03 | 8.9 | ● | 9 | 45 | 55 | 100 |
| DSX0900F03 | 9 | ● | 9 | 45 | 55 | 100 |
| DSX0910F03 | 9.1 | ● | 10 | 48 | 56 | 106 |
| DSX0920F03 | 9.2 | ● | 10 | 48 | 56 | 106 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F03 | 9.3 | ● | 10 | 48 | 56 | 106 |
| DSX0940F03 | 9.4 | ● | 10 | 48 | 56 | 106 |
| DSX0950F03 | 9.5 | ● | 10 | 48 | 56 | 106 |
| DSX0960F03 | 9.6 | ● | 10 | 50 | 56 | 106 |
| DSX0970F03 | 9.7 | ● | 10 | 50 | 56 | 106 |
| DSX0980F03 | 9.8 | ● | 10 | 50 | 56 | 106 |
| DSX0990F03 | 9.9 | ● | 10 | 50 | 56 | 106 |
| DSX1000F03 | 10 | ● | 10 | 50 | 56 | 106 |
| DSX1010F03 | 10.1 | ● | 11 | 53 | 61 | 116 |
| DSX1020F03 | 10.2 | ● | 11 | 53 | 61 | 116 |
| DSX1030F03 | 10.3 | ● | 11 | 53 | 61 | 116 |
| DSX1040F03 | 10.4 | ● | 11 | 53 | 61 | 116 |
| DSX1050F03 | 10.5 | ● | 11 | 53 | 61 | 116 |
| DSX1060F03 | 10.6 | ● | 11 | 55 | 61 | 116 |
| DSX1070F03 | 10.7 | ● | 11 | 55 | 61 | 116 |
| DSX1080F03 | 10.8 | ● | 11 | 55 | 61 | 116 |
| DSX1090F03 | 10.9 | ● | 11 | 55 | 61 | 116 |
| DSX1100F03 | 11 | ● | 11 | 55 | 61 | 116 |
| DSX1110F03 | 11.1 | ● | 12 | 58 | 62 | 122 |
| DSX1120F03 | 11.2 | ● | 12 | 58 | 62 | 122 |
| DSX1130F03 | 11.3 | ● | 12 | 58 | 62 | 122 |
| DSX1140F03 | 11.4 | ● | 12 | 58 | 62 | 122 |
| DSX1150F03 | 11.5 | ● | 12 | 58 | 62 | 122 |
| DSX1160F03 | 11.6 | ● | 12 | 60 | 62 | 122 |
| DSX1170F03 | 11.7 | ● | 12 | 60 | 62 | 122 |
| DSX1180F03 | 11.8 | ● | 12 | 60 | 62 | 122 |
| DSX1190F03 | 11.9 | ● | 12 | 60 | 62 | 122 |
| DSX1200F03 | 12 | ● | 12 | 60 | 62 | 122 |
| DSX1210F03 | 12.1 | ● | 13 | 65 | 63 | 128 |
| DSX1220F03 | 12.2 | ● | 13 | 65 | 63 | 128 |
| DSX1230F03 | 12.3 | ● | 13 | 65 | 63 | 128 |
| DSX1240F03 | 12.4 | ● | 13 | 65 | 63 | 128 |
| DSX1250F03 | 12.5 | ● | 13 | 65 | 63 | 128 |
| DSX1260F03 | 12.6 | ● | 13 | 65 | 63 | 128 |
| DSX1270F03 | 12.7 | ● | 13 | 65 | 63 | 128 |
| DSX1280F03 | 12.8 | ● | 13 | 65 | 63 | 128 |
| DSX1290F03 | 12.9 | ● | 13 | 65 | 63 | 128 |
| DSX1300F03 | 13 | ● | 13 | 65 | 63 | 128 |
| DSX1310F03 | 13.1 | ● | 14 | 70 | 64 | 134 |
| DSX1320F03 | 13.2 | ● | 14 | 70 | 64 | 134 |
| DSX1330F03 | 13.3 | ● | 14 | 70 | 64 | 134 |
| DSX1340F03 | 13.4 | ● | 14 | 70 | 64 | 134 |
| DSX1350F03 | 13.5 | ● | 14 | 70 | 64 | 134 |
| DSX1360F03 | 13.6 | ● | 14 | 70 | 64 | 134 |
| DSX1370F03 | 13.7 | ● | 14 | 70 | 64 | 134 |
| DSX1380F03 | 13.8 | ● | 14 | 70 | 64 | 134 |
| DSX1390F03 | 13.9 | ● | 14 | 70 | 64 | 134 |
| DSX1400F03 | 14 | ● | 14 | 70 | 64 | 134 |
| DSX1410F03 | 14.1 | ● | 15 | 75 | 65 | 140 |
| DSX1420F03 | 14.2 | ● | 15 | 75 | 65 | 140 |
| DSX1430F03 | 14.3 | ● | 15 | 75 | 65 | 140 |
| DSX1440F03 | 14.4 | ● | 15 | 75 | 65 | 140 |
| DSX1450F03 | 14.5 | ● | 15 | 75 | 65 | 140 |
| DSX1460F03 | 14.6 | ● | 15 | 75 | 65 | 140 |
| DSX1470F03 | 14.7 | ● | 15 | 75 | 65 | 140 |
| DSX1480F03 | 14.8 | ● | 15 | 75 | 65 | 140 |
| DSX1490F03 | 14.9 | ● | 15 | 75 | 65 | 140 |
| DSX1500F03 | 15 | ● | 15 | 75 | 65 | 140 |
| DSX1510F03 | 15.1 | ● | 16 | 80 | 66 | 146 |
| DSX1520F03 | 15.2 | ● | 16 | 80 | 66 | 146 |
| DSX1530F03 | 15.3 | ● | 16 | 80 | 66 | 146 |
| DSX1540F03 | 15.4 | ● | 16 | 80 | 66 | 146 |
| DSX1550F03 | 15.5 | ● | 16 | 80 | 66 | 146 |

● : Line up

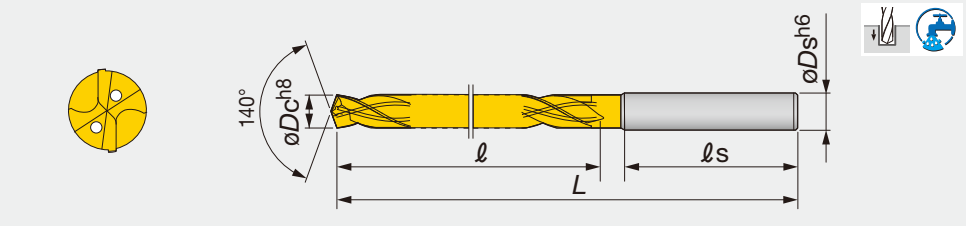
| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX1560F03 | 15.6 | ● | 16 | 80 | 66 | 146 |
| DSX1570F03 | 15.7 | ● | 16 | 80 | 66 | 146 |
| DSX1580F03 | 15.8 | ● | 16 | 80 | 66 | 146 |
| DSX1590F03 | 15.9 | ● | 16 | 80 | 66 | 146 |
| DSX1600F03 | 16 | ● | 16 | 80 | 66 | 146 |
| DSX1650F03 | 16.5 | ● | 17 | 85 | 67 | 152 |
| DSX1700F03 | 17 | ● | 17 | 85 | 67 | 152 |
| DSX1750F03 | 17.5 | ● | 18 | 90 | 68 | 158 |
| DSX1800F03 | 18 | ● | 18 | 90 | 68 | 158 |
| DSX1850F03 | 18.5 | ● | 19 | 95 | 69 | 164 |
| DSX1900F03 | 19 | ● | 19 | 95 | 69 | 164 |
| DSX1950F03 | 19.5 | ● | 20 | 100 | 70 | 170 |
| DSX2000F03 | 20 | ● | 20 | 100 | 70 | 170 |

● : Line up

# GIGAJETDRILL

## DSX-F05

Soliddrill with 140° point angle with oil hole, L/D = 5, dia = ø3 - ø20 mm




| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F05 | 3 | ● | 3 | 24 | 48 | 77 |
| DSX0310F05 | 3.1 | ● | 4 | 28 | 48 | 81 |
| DSX0320F05 | 3.2 | ● | 4 | 28 | 48 | 81 |
| DSX0330F05 | 3.3 | ● | 4 | 28 | 48 | 81 |
| DSX0340F05 | 3.4 | ● | 4 | 28 | 48 | 81 |
| DSX0350F05 | 3.5 | ● | 4 | 28 | 48 | 81 |
| DSX0360F05 | 3.6 | ● | 4 | 32 | 48 | 85 |
| DSX0370F05 | 3.7 | ● | 4 | 32 | 48 | 85 |
| DSX0380F05 | 3.8 | ● | 4 | 32 | 48 | 85 |
| DSX0390F05 | 3.9 | ● | 4 | 32 | 48 | 85 |
| DSX0400F05 | 4 | ● | 4 | 32 | 48 | 85 |
| DSX0410F05 | 4.1 | ● | 5 | 36 | 50 | 91 |
| DSX0420F05 | 4.2 | ● | 5 | 36 | 50 | 91 |
| DSX0430F05 | 4.3 | ● | 5 | 36 | 50 | 91 |
| DSX0440F05 | 4.4 | ● | 5 | 36 | 50 | 91 |
| DSX0450F05 | 4.5 | ● | 5 | 36 | 50 | 91 |
| DSX0460F05 | 4.6 | ● | 5 | 40 | 50 | 94 |
| DSX0470F05 | 4.7 | ● | 5 | 40 | 50 | 94 |
| DSX0480F05 | 4.8 | ● | 5 | 40 | 50 | 94 |
| DSX0490F05 | 4.9 | ● | 5 | 40 | 50 | 94 |
| DSX0500F05 | 5 | ● | 5 | 40 | 50 | 94 |
| DSX0510F05 | 5.1 | ● | 6 | 44 | 52 | 96 |
| DSX0520F05 | 5.2 | ● | 6 | 44 | 52 | 96 |
| DSX0530F05 | 5.3 | ● | 6 | 44 | 52 | 96 |
| DSX0540F05 | 5.4 | ● | 6 | 44 | 52 | 96 |
| DSX0550F05 | 5.5 | ● | 6 | 44 | 52 | 96 |
| DSX0560F05 | 5.6 | ● | 6 | 48 | 52 | 100 |
| DSX0570F05 | 5.7 | ● | 6 | 48 | 52 | 100 |
| DSX0580F05 | 5.8 | ● | 6 | 48 | 52 | 100 |
| DSX0590F05 | 5.9 | ● | 6 | 48 | 52 | 100 |
| DSX0600F05 | 6 | ● | 6 | 48 | 52 | 100 |
| DSX0610F05 | 6.1 | ● | 7 | 52 | 53 | 105 |
| DSX0620F05 | 6.2 | ● | 7 | 52 | 53 | 105 |
| DSX0630F05 | 6.3 | ● | 7 | 52 | 53 | 105 |
| DSX0640F05 | 6.4 | ● | 7 | 52 | 53 | 105 |
| DSX0650F05 | 6.5 | ● | 7 | 52 | 53 | 105 |
| DSX0660F05 | 6.6 | ● | 7 | 56 | 53 | 109 |
| DSX0670F05 | 6.7 | ● | 7 | 56 | 53 | 109 |
| DSX0680F05 | 6.8 | ● | 7 | 56 | 53 | 109 |
| DSX0690F05 | 6.9 | ● | 7 | 56 | 53 | 109 |
| DSX0700F05 | 7 | ● | 7 | 56 | 53 | 109 |
| DSX0710F05 | 7.1 | ● | 8 | 60 | 54 | 114 |
| DSX0720F05 | 7.2 | ● | 8 | 60 | 54 | 114 |
| DSX0730F05 | 7.3 | ● | 8 | 60 | 54 | 114 |
| DSX0740F05 | 7.4 | ● | 8 | 60 | 54 | 114 |
| DSX0750F05 | 7.5 | ● | 8 | 60 | 54 | 114 |
| DSX0760F05 | 7.6 | ● | 8 | 64 | 54 | 118 |
| DSX0770F05 | 7.7 | ● | 8 | 64 | 54 | 118 |
| DSX0780F05 | 7.8 | ● | 8 | 64 | 54 | 118 |
| DSX0790F05 | 7.9 | ● | 8 | 64 | 54 | 118 |
| DSX0800F05 | 8 | ● | 8 | 64 | 54 | 118 |
| DSX0810F05 | 8.1 | ● | 9 | 68 | 55 | 127 |
| DSX0820F05 | 8.2 | ● | 9 | 68 | 55 | 127 |
| DSX0830F05 | 8.3 | ● | 9 | 68 | 55 | 127 |
| DSX0840F05 | 8.4 | ● | 9 | 68 | 55 | 127 |
| DSX0850F05 | 8.5 | ● | 9 | 68 | 55 | 127 |
| DSX0860F05 | 8.6 | ● | 9 | 72 | 55 | 127 |
| DSX0870F05 | 8.7 | ● | 9 | 72 | 55 | 127 |
| DSX0880F05 | 8.8 | ● | 9 | 72 | 55 | 127 |
| DSX0890F05 | 8.9 | ● | 9 | 72 | 55 | 127 |
| DSX0900F05 | 9 | ● | 9 | 72 | 55 | 127 |
| DSX0910F05 | 9.1 | ● | 10 | 76 | 56 | 136 |
| DSX0920F05 | 9.2 | ● | 10 | 76 | 56 | 136 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F05 | 9.3 | ● | 10 | 76 | 56 | 136 |
| DSX0940F05 | 9.4 | ● | 10 | 76 | 56 | 136 |
| DSX0950F05 | 9.5 | ● | 10 | 76 | 56 | 136 |
| DSX0960F05 | 9.6 | ● | 10 | 80 | 56 | 136 |
| DSX0970F05 | 9.7 | ● | 10 | 80 | 56 | 136 |
| DSX0980F05 | 9.8 | ● | 10 | 80 | 56 | 136 |
| DSX0990F05 | 9.9 | ● | 10 | 80 | 56 | 136 |
| DSX1000F05 | 10 | ● | 10 | 80 | 56 | 136 |
| DSX1010F05 | 10.1 | ● | 11 | 84 | 61 | 149 |
| DSX1020F05 | 10.2 | ● | 11 | 84 | 61 | 149 |
| DSX1030F05 | 10.3 | ● | 11 | 84 | 61 | 149 |
| DSX1040F05 | 10.4 | ● | 11 | 84 | 61 | 149 |
| DSX1050F05 | 10.5 | ● | 11 | 84 | 61 | 149 |
| DSX1060F05 | 10.6 | ● | 11 | 88 | 61 | 149 |
| DSX1070F05 | 10.7 | ● | 11 | 88 | 61 | 149 |
| DSX1080F05 | 10.8 | ● | 11 | 88 | 61 | 149 |
| DSX1090F05 | 10.9 | ● | 11 | 88 | 61 | 149 |
| DSX1100F05 | 11 | ● | 11 | 88 | 61 | 149 |
| DSX1110F05 | 11.1 | ● | 12 | 92 | 62 | 158 |
| DSX1120F05 | 11.2 | ● | 12 | 92 | 62 | 158 |
| DSX1130F05 | 11.3 | ● | 12 | 92 | 62 | 158 |
| DSX1140F05 | 11.4 | ● | 12 | 92 | 62 | 158 |
| DSX1150F05 | 11.5 | ● | 12 | 92 | 62 | 158 |
| DSX1160F05 | 11.6 | ● | 12 | 96 | 62 | 158 |
| DSX1170F05 | 11.7 | ● | 12 | 96 | 62 | 158 |
| DSX1180F05 | 11.8 | ● | 12 | 96 | 62 | 158 |
| DSX1190F05 | 11.9 | ● | 12 | 96 | 62 | 158 |
| DSX1200F05 | 12 | ● | 12 | 96 | 62 | 158 |
| DSX1210F05 | 12.1 | ● | 13 | 104 | 63 | 167 |
| DSX1220F05 | 12.2 | ● | 13 | 104 | 63 | 167 |
| DSX1230F05 | 12.3 | ● | 13 | 104 | 63 | 167 |
| DSX1240F05 | 12.4 | ● | 13 | 104 | 63 | 167 |
| DSX1250F05 | 12.5 | ● | 13 | 104 | 63 | 167 |
| DSX1260F05 | 12.6 | ● | 13 | 104 | 63 | 167 |
| DSX1270F05 | 12.7 | ● | 13 | 104 | 63 | 167 |
| DSX1280F05 | 12.8 | ● | 13 | 104 | 63 | 167 |
| DSX1290F05 | 12.9 | ● | 13 | 104 | 63 | 167 |
| DSX1300F05 | 13 | ● | 13 | 104 | 63 | 167 |
| DSX1310F05 | 13.1 | ● | 14 | 112 | 64 | 176 |
| DSX1320F05 | 13.2 | ● | 14 | 112 | 64 | 176 |
| DSX1330F05 | 13.3 | ● | 14 | 112 | 64 | 176 |
| DSX1340F05 | 13.4 | ● | 14 | 112 | 64 | 176 |
| DSX1350F05 | 13.5 | ● | 14 | 112 | 64 | 176 |
| DSX1360F05 | 13.6 | ● | 14 | 112 | 64 | 176 |
| DSX1370F05 | 13.7 | ● | 14 | 112 | 64 | 176 |
| DSX1380F05 | 13.8 | ● | 14 | 112 | 64 | 176 |
| DSX1390F05 | 13.9 | ● | 14 | 112 | 64 | 176 |
| DSX1400F05 | 14 | ● | 14 | 112 | 64 | 176 |
| DSX1410F05 | 14.1 | ● | 15 | 120 | 65 | 185 |
| DSX1420F05 | 14.2 | ● | 15 | 120 | 65 | 185 |
| DSX1430F05 | 14.3 | ● | 15 | 120 | 65 | 185 |
| DSX1440F05 | 14.4 | ● | 15 | 120 | 65 | 185 |
| DSX1450F05 | 14.5 | ● | 15 | 120 | 65 | 185 |
| DSX1460F05 | 14.6 | ● | 15 | 120 | 65 | 185 |
| DSX1470F05 | 14.7 | ● | 15 | 120 | 65 | 185 |
| DSX1480F05 | 14.8 | ● | 15 | 120 | 65 | 185 |
| DSX1490F05 | 14.9 | ● | 15 | 120 | 65 | 185 |
| DSX1500F05 | 15 | ● | 15 | 120 | 65 | 185 |
| DSX1510F05 | 15.1 | ● | 16 | 128 | 66 | 194 |
| DSX1520F05 | 15.2 | ● | 16 | 128 | 66 | 194 |
| DSX1530F05 | 15.3 | ● | 16 | 128 | 66 | 194 |
| DSX1540F05 | 15.4 | ● | 16 | 128 | 66 | 194 |
| DSX1550F05 | 15.5 | ● | 16 | 128 | 66 | 194 |

● : Line up

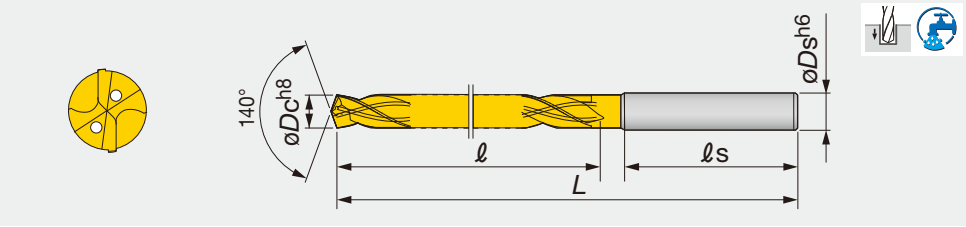
| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX1560F05 | 15.6 | ● | 16 | 128 | 66 | 194 |
| DSX1570F05 | 15.7 | ● | 16 | 128 | 66 | 194 |
| DSX1580F05 | 15.8 | ● | 16 | 128 | 66 | 194 |
| DSX1590F05 | 15.9 | ● | 16 | 128 | 66 | 194 |
| DSX1600F05 | 16 | ● | 16 | 128 | 66 | 194 |
| DSX1650F05 | 16.5 | ● | 17 | 136 | 67 | 203 |
| DSX1700F05 | 17 | ● | 17 | 136 | 67 | 203 |
| DSX1750F05 | 17.5 | ● | 18 | 144 | 68 | 212 |
| DSX1800F05 | 18 | ● | 18 | 144 | 68 | 212 |
| DSX1850F05 | 18.5 | ● | 19 | 152 | 69 | 221 |
| DSX1900F05 | 19 | ● | 19 | 152 | 69 | 221 |
| DSX1950F05 | 19.5 | ● | 20 | 160 | 70 | 230 |
| DSX2000F05 | 20 | ● | 20 | 160 | 70 | 230 |

● : Line up

# GIGAJETDRILL

## DSX-F08

Soliddrill with 140° point angle with oil hole, L/D = 8, dia = ø3 - ø16 mm




| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0300F08 | 3 | ● | 3 | 33 | 48 | 86 |
| DSX0310F08 | 3.1 | | 4 | 39 | 48 | 92 |
| DSX0320F08 | 3.2 | | 4 | 39 | 48 | 92 |
| DSX0330F08 | 3.3 | | 4 | 39 | 48 | 92 |
| DSX0340F08 | 3.4 | | 4 | 39 | 48 | 92 |
| DSX0350F08 | 3.5 | ● | 4 | 39 | 48 | 92 |
| DSX0360F08 | 3.6 | | 4 | 44 | 48 | 97 |
| DSX0370F08 | 3.7 | | 4 | 44 | 48 | 97 |
| DSX0380F08 | 3.8 | | 4 | 44 | 48 | 97 |
| DSX0390F08 | 3.9 | | 4 | 44 | 48 | 97 |
| DSX0400F08 | 4 | ● | 4 | 44 | 48 | 97 |
| DSX0410F08 | 4.1 | | 5 | 50 | 50 | 105 |
| DSX0420F08 | 4.2 | | 5 | 50 | 50 | 105 |
| DSX0430F08 | 4.3 | | 5 | 50 | 50 | 105 |
| DSX0440F08 | 4.4 | | 5 | 50 | 50 | 105 |
| DSX0450F08 | 4.5 | ● | 5 | 50 | 50 | 105 |
| DSX0460F08 | 4.6 | | 5 | 55 | 50 | 110 |
| DSX0470F08 | 4.7 | | 5 | 55 | 50 | 110 |
| DSX0480F08 | 4.8 | | 5 | 55 | 50 | 110 |
| DSX0490F08 | 4.9 | | 5 | 55 | 50 | 110 |
| DSX0500F08 | 5 | ● | 5 | 55 | 50 | 110 |
| DSX0510F08 | 5.1 | ● | 6 | 61 | 52 | 113 |
| DSX0520F08 | 5.2 | | 6 | 61 | 52 | 113 |
| DSX0530F08 | 5.3 | | 6 | 61 | 52 | 113 |
| DSX0540F08 | 5.4 | | 6 | 61 | 52 | 113 |
| DSX0550F08 | 5.5 | ● | 6 | 61 | 52 | 113 |
| DSX0560F08 | 5.6 | | 6 | 66 | 52 | 118 |
| DSX0570F08 | 5.7 | | 6 | 66 | 52 | 118 |
| DSX0580F08 | 5.8 | | 6 | 66 | 52 | 118 |
| DSX0590F08 | 5.9 | | 6 | 66 | 52 | 118 |
| DSX0600F08 | 6 | ● | 6 | 66 | 52 | 118 |
| DSX0610F08 | 6.1 | | 7 | 72 | 53 | 125 |
| DSX0620F08 | 6.2 | | 7 | 72 | 53 | 125 |
| DSX0630F08 | 6.3 | | 7 | 72 | 53 | 125 |
| DSX0640F08 | 6.4 | | 7 | 72 | 53 | 125 |
| DSX0650F08 | 6.5 | ● | 7 | 72 | 53 | 125 |
| DSX0660F08 | 6.6 | | 7 | 77 | 53 | 130 |
| DSX0670F08 | 6.7 | | 7 | 77 | 53 | 130 |
| DSX0680F08 | 6.8 | | 7 | 77 | 53 | 130 |
| DSX0690F08 | 6.9 | | 7 | 77 | 53 | 130 |
| DSX0700F08 | 7 | ● | 7 | 77 | 53 | 130 |
| DSX0710F08 | 7.1 | | 8 | 83 | 54 | 137 |
| DSX0720F08 | 7.2 | | 8 | 83 | 54 | 137 |
| DSX0730F08 | 7.3 | | 8 | 83 | 54 | 137 |
| DSX0740F08 | 7.4 | | 8 | 83 | 54 | 137 |
| DSX0750F08 | 7.5 | ● | 8 | 83 | 54 | 137 |
| DSX0760F08 | 7.6 | | 8 | 88 | 54 | 142 |
| DSX0770F08 | 7.7 | | 8 | 88 | 54 | 142 |
| DSX0780F08 | 7.8 | | 8 | 88 | 54 | 142 |
| DSX0790F08 | 7.9 | | 8 | 88 | 54 | 142 |
| DSX0800F08 | 8 | ● | 8 | 88 | 54 | 142 |
| DSX0810F08 | 8.1 | | 9 | 94 | 55 | 154 |
| DSX0820F08 | 8.2 | | 9 | 94 | 55 | 154 |
| DSX0830F08 | 8.3 | ● | 9 | 94 | 55 | 154 |
| DSX0840F08 | 8.4 | | 9 | 94 | 55 | 154 |
| DSX0850F08 | 8.5 | ● | 9 | 94 | 55 | 154 |
| DSX0860F08 | 8.6 | | 9 | 99 | 55 | 154 |
| DSX0870F08 | 8.7 | | 9 | 99 | 55 | 154 |
| DSX0880F08 | 8.8 | | 9 | 99 | 55 | 154 |
| DSX0890F08 | 8.9 | | 9 | 99 | 55 | 154 |
| DSX0900F08 | 9 | ● | 9 | 99 | 55 | 154 |
| DSX0910F08 | 9.1 | | 10 | 105 | 56 | 166 |
| DSX0920F08 | 9.2 | | 10 | 105 | 56 | 166 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX0930F08 | 9.3 | | 10 | 105 | 56 | 166 |
| DSX0940F08 | 9.4 | | 10 | 105 | 56 | 166 |
| DSX0950F08 | 9.5 | ● | 10 | 105 | 56 | 166 |
| DSX0960F08 | 9.6 | | 10 | 110 | 56 | 166 |
| DSX0970F08 | 9.7 | | 10 | 110 | 56 | 166 |
| DSX0980F08 | 9.8 | | 10 | 110 | 56 | 166 |
| DSX0990F08 | 9.9 | | 10 | 110 | 56 | 166 |
| DSX1000F08 | 10 | ● | 10 | 110 | 56 | 166 |
| DSX1010F08 | 10.1 | | 11 | 116 | 61 | 182 |
| DSX1020F08 | 10.2 | | 11 | 116 | 61 | 182 |
| DSX1030F08 | 10.3 | | 11 | 116 | 61 | 182 |
| DSX1040F08 | 10.4 | | 11 | 116 | 61 | 182 |
| DSX1050F08 | 10.5 | ● | 11 | 116 | 61 | 182 |
| DSX1060F08 | 10.6 | | 11 | 121 | 61 | 182 |
| DSX1070F08 | 10.7 | | 11 | 121 | 61 | 182 |
| DSX1080F08 | 10.8 | | 11 | 121 | 61 | 182 |
| DSX1090F08 | 10.9 | | 11 | 121 | 61 | 182 |
| DSX1100F08 | 11 | ● | 11 | 121 | 61 | 182 |
| DSX1110F08 | 11.1 | | 12 | 127 | 62 | 194 |
| DSX1120F08 | 11.2 | | 12 | 127 | 62 | 194 |
| DSX1130F08 | 11.3 | | 12 | 127 | 62 | 194 |
| DSX1140F08 | 11.4 | | 12 | 127 | 62 | 194 |
| DSX1150F08 | 11.5 | ● | 12 | 127 | 62 | 194 |
| DSX1160F08 | 11.6 | | 12 | 132 | 62 | 194 |
| DSX1170F08 | 11.7 | | 12 | 132 | 62 | 194 |
| DSX1180F08 | 11.8 | | 12 | 132 | 62 | 194 |
| DSX1190F08 | 11.9 | | 12 | 132 | 62 | 194 |
| DSX1200F08 | 12 | ● | 12 | 132 | 62 | 194 |
| DSX1210F08 | 12.1 | | 13 | 143 | 63 | 206 |
| DSX1220F08 | 12.2 | | 13 | 143 | 63 | 206 |
| DSX1230F08 | 12.3 | | 13 | 143 | 63 | 206 |
| DSX1240F08 | 12.4 | | 13 | 143 | 63 | 206 |
| DSX1250F08 | 12.5 | ● | 13 | 143 | 63 | 206 |
| DSX1260F08 | 12.6 | | 13 | 143 | 63 | 206 |
| DSX1270F08 | 12.7 | | 13 | 143 | 63 | 206 |
| DSX1280F08 | 12.8 | | 13 | 143 | 63 | 206 |
| DSX1290F08 | 12.9 | | 13 | 143 | 63 | 206 |
| DSX1300F08 | 13 | ● | 13 | 143 | 63 | 206 |
| DSX1310F08 | 13.1 | | 14 | 154 | 64 | 218 |
| DSX1320F08 | 13.2 | | 14 | 154 | 64 | 218 |
| DSX1330F08 | 13.3 | | 14 | 154 | 64 | 218 |
| DSX1340F08 | 13.4 | | 14 | 154 | 64 | 218 |
| DSX1350F08 | 13.5 | ● | 14 | 154 | 64 | 218 |
| DSX1360F08 | 13.6 | | 14 | 154 | 64 | 218 |
| DSX1370F08 | 13.7 | | 14 | 154 | 64 | 218 |
| DSX1380F08 | 13.8 | | 14 | 154 | 64 | 218 |
| DSX1390F08 | 13.9 | | 14 | 154 | 64 | 218 |
| DSX1400F08 | 14 | ● | 14 | 154 | 64 | 218 |
| DSX1410F08 | 14.1 | | 15 | 165 | 65 | 230 |
| DSX1420F08 | 14.2 | | 15 | 165 | 65 | 230 |
| DSX1430F08 | 14.3 | | 15 | 165 | 65 | 230 |
| DSX1440F08 | 14.4 | | 15 | 165 | 65 | 230 |
| DSX1450F08 | 14.5 | ● | 15 | 165 | 65 | 230 |
| DSX1460F08 | 14.6 | | 15 | 165 | 65 | 230 |
| DSX1470F08 | 14.7 | | 15 | 165 | 65 | 230 |
| DSX1480F08 | 14.8 | | 15 | 165 | 65 | 230 |
| DSX1490F08 | 14.9 | | 15 | 165 | 65 | 230 |
| DSX1500F08 | 15 | ● | 15 | 165 | 65 | 230 |
| DSX1510F08 | 15.1 | | 16 | 176 | 66 | 242 |
| DSX1520F08 | 15.2 | | 16 | 176 | 66 | 242 |
| DSX1530F08 | 15.3 | | 16 | 176 | 66 | 242 |
| DSX1540F08 | 15.4 | | 16 | 176 | 66 | 242 |
| DSX1550F08 | 15.5 | ● | 16 | 176 | 66 | 242 |

● : Line up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSX1560F08 | 15.6 | | 16 | 176 | 66 | 242 |
| DSX1570F08 | 15.7 | | 16 | 176 | 66 | 242 |
| DSX1580F08 | 15.8 | | 16 | 176 | 66 | 242 |
| DSX1590F08 | 15.9 | | 16 | 176 | 66 | 242 |
| DSX1600F08 | 16 | ● | 16 | 176 | 66 | 242 |

● : Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Examples JIS (ISO) | Hardness | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 |
| P | Mild steels, Low carbon steels | SS400, S25C, etc. St42-1, C25, etc. | < 180HB | 70 - 140 | 80 - 160 | 90 - 190 | 0.15 - 0.25 | 0.2 - 0.35 | 0.25 - 0.4 |
| P | Carbon steels, Alloy steels | S45C, SCM440, etc. C45, 42CrMo4, etc. | 180 ~ 300HB | 50 - 130 | 70 - 160 | 80 - 170 | 0.15 - 0.25 | 0.2 - 0.35 | 0.25 - 0.4 |
| P | High alloy steels etc. | SCM440H, etc. 42CrMoS4, etc. | 250 ~ 350HB | 40 - 100 | 60 - 140 | 60 - 160 | 0.1 - 0.2 | 0.15 - 0.3 | 0.15 - 0.3 |
| M | Stainless steels | SUS304, etc. X5CrNi18-9, etc. | < 200HB | 30 - 70 | 50 - 100 | 50 - 120 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.35 |
| K | Grey cast irons | FC250, etc. 250, etc. | < 200HB | 80 - 140 | 100 - 160 | 100 - 180 | 0.15 - 0.35 | 0.2 - 0.4 | 0.25 - 0.5 |
| K | Ductile cast irons | FCD450, etc. 450-10S, etc. | < 300HB | 70 - 140 | 80 - 150 | 80 - 170 | 0.15 - 0.35 | 0.2 - 0.4 | 0.25 - 0.45 |
| N | Aluminium alloys | ADC12, etc. AlSi11Cu3, etc. | - | 80 - 160 | 100 - 180 | 100 - 190 | 0.15 - 0.35 | 0.2 - 0.45 | 0.25 - 0.6 |
| S | Titanium alloys | Ti-6Al-4V, etc. | - | 25 - 60 | 30 - 80 | 30 - 80 | 0.1 - 0.2 | 0.1 - 0.25 | 0.15 - 0.35 |
| S | Heat-resistant alloys | Inconel, etc. | 250HB < | 10 - 30 | 10 - 40 | 10 - 40 | 0.02 - 0.1 | 0.05 - 0.15 | 0.1 - 0.25 |
| H | High hardened steels | SKD11, etc. X153CrMoV12, etc. | < 40HRC | 20 - 50 | 30 - 60 | 30 - 60 | 0.08 - 0.1 | 0.1 - 0.15 | 0.12 - 0.2 |

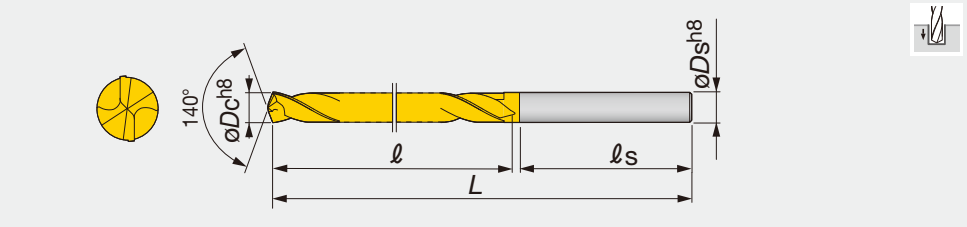
Note:
- The cutting parameters shown in the table are merely a starting guideline for general machining.
- Values should be varied depending on the power or rigidity of the machine to be used. For the smaller side of drill diameters, select lower feeds.
- Chip packing in the oil holes may cause drill breakage. A filter preventing the circulation of chips should be used on coolant supply.
- Inconel is trademark of Huntington Alloys, Inc.

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

# GIGAPOWERDRILL

## DSE-F02

Soliddrill with 140° point angle without oil hole & shank size same as diameter, L/D = 2, dia = ø3 -ø16 mm




| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0300F02 | 3 | ● | 3 | 16 | 30 | 46 |
| DSE0310F02 | 3.1 | | 3.1 | 18 | 31 | 49 |
| DSE0320F02 | 3.2 | ● | 3.2 | 18 | 31 | 49 |
| DSE0330F02 | 3.3 | | 3.3 | 18 | 31 | 49 |
| DSE0340F02 | 3.4 | ● | 3.4 | 20 | 32 | 52 |
| DSE0350F02 | 3.5 | ● | 3.5 | 20 | 32 | 52 |
| DSE0360F02 | 3.6 | | 3.6 | 20 | 32 | 52 |
| DSE0370F02 | 3.7 | | 3.7 | 20 | 32 | 52 |
| DSE0380F02 | 3.8 | | 3.8 | 22 | 33 | 55 |
| DSE0390F02 | 3.9 | | 3.9 | 22 | 33 | 55 |
| DSE0400F02 | 4 | ● | 4 | 22 | 33 | 55 |
| DSE0410F02 | 4.1 | | 4.1 | 22 | 33 | 55 |
| DSE0420F02 | 4.2 | | 4.2 | 22 | 33 | 55 |
| DSE0430F02 | 4.3 | ● | 4.3 | 24 | 34 | 58 |
| DSE0440F02 | 4.4 | | 4.4 | 24 | 34 | 58 |
| DSE0450F02 | 4.5 | ● | 4.5 | 24 | 34 | 58 |
| DSE0460F02 | 4.6 | | 4.6 | 24 | 34 | 58 |
| DSE0470F02 | 4.7 | | 4.7 | 24 | 34 | 58 |
| DSE0480F02 | 4.8 | | 4.8 | 26 | 36 | 62 |
| DSE0490F02 | 4.9 | | 4.9 | 26 | 36 | 62 |
| DSE0500F02 | 5 | ● | 5 | 26 | 36 | 62 |
| DSE0510F02 | 5.1 | ● | 5.1 | 26 | 36 | 62 |
| DSE0520F02 | 5.2 | | 5.2 | 26 | 36 | 62 |
| DSE0530F02 | 5.3 | | 5.3 | 26 | 36 | 62 |
| DSE0540F02 | 5.4 | | 5.4 | 28 | 38 | 66 |
| DSE0550F02 | 5.5 | ● | 5.5 | 28 | 38 | 66 |
| DSE0560F02 | 5.6 | ● | 5.6 | 28 | 38 | 66 |
| DSE0570F02 | 5.7 | | 5.7 | 28 | 38 | 66 |
| DSE0580F02 | 5.8 | | 5.8 | 28 | 38 | 66 |
| DSE0590F02 | 5.9 | | 5.9 | 28 | 38 | 66 |
| DSE0600F02 | 6 | ● | 6 | 28 | 38 | 66 |
| DSE0610F02 | 6.1 | | 6.1 | 31 | 39 | 70 |
| DSE0620F02 | 6.2 | | 6.2 | 31 | 39 | 70 |
| DSE0630F02 | 6.3 | | 6.3 | 31 | 39 | 70 |
| DSE0640F02 | 6.4 | ● | 6.4 | 31 | 39 | 70 |
| DSE0650F02 | 6.5 | ● | 6.5 | 31 | 39 | 70 |
| DSE0660F02 | 6.6 | | 6.6 | 31 | 39 | 70 |
| DSE0670F02 | 6.7 | | 6.7 | 31 | 39 | 70 |
| DSE0680F02 | 6.8 | ● | 6.8 | 34 | 40 | 74 |
| DSE0690F02 | 6.9 | | 6.9 | 34 | 40 | 74 |
| DSE0700F02 | 7 | ● | 7 | 34 | 40 | 74 |
| DSE0710F02 | 7.1 | | 7.1 | 34 | 40 | 74 |
| DSE0720F02 | 7.2 | | 7.2 | 34 | 40 | 74 |
| DSE0730F02 | 7.3 | | 7.3 | 34 | 40 | 74 |
| DSE0740F02 | 7.4 | | 7.4 | 34 | 40 | 74 |
| DSE0750F02 | 7.5 | ● | 7.5 | 34 | 40 | 74 |
| DSE0760F02 | 7.6 | | 7.6 | 37 | 42 | 79 |
| DSE0770F02 | 7.7 | | 7.7 | 37 | 42 | 79 |
| DSE0780F02 | 7.8 | | 7.8 | 37 | 42 | 79 |
| DSE0790F02 | 7.9 | | 7.9 | 37 | 42 | 79 |
| DSE0800F02 | 8 | ● | 8 | 37 | 42 | 79 |
| DSE0810F02 | 8.1 | | 8.1 | 37 | 42 | 79 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0820F02 | 8.2 | | 8.2 | 37 | 42 | 79 |
| DSE0830F02 | 8.3 | | 8.3 | 37 | 42 | 79 |
| DSE0840F02 | 8.4 | | 8.4 | 37 | 42 | 79 |
| DSE0850F02 | 8.5 | ● | 8.5 | 37 | 42 | 79 |
| DSE0860F02 | 8.6 | | 8.6 | 40 | 44 | 84 |
| DSE0870F02 | 8.7 | | 8.7 | 40 | 44 | 84 |
| DSE0880F02 | 8.8 | | 8.8 | 40 | 44 | 84 |
| DSE0890F02 | 8.9 | | 8.9 | 40 | 44 | 84 |
| DSE0900F02 | 9 | ● | 9 | 40 | 44 | 84 |
| DSE0910F02 | 9.1 | | 9.1 | 40 | 44 | 84 |
| DSE0920F02 | 9.2 | | 9.2 | 40 | 44 | 84 |
| DSE0930F02 | 9.3 | | 9.3 | 40 | 44 | 84 |
| DSE0940F02 | 9.4 | | 9.4 | 40 | 44 | 84 |
| DSE0950F02 | 9.5 | ● | 9.5 | 40 | 44 | 84 |
| DSE0960F02 | 9.6 | | 9.6 | 43 | 46 | 89 |
| DSE0970F02 | 9.7 | | 9.7 | 43 | 46 | 89 |
| DSE0980F02 | 9.8 | | 9.8 | 43 | 46 | 89 |
| DSE0990F02 | 9.9 | | 9.9 | 43 | 46 | 89 |
| DSE1000F02 | 10 | ● | 10 | 43 | 46 | 89 |
| DSE1010F02 | 10.1 | | 10.1 | 43 | 46 | 89 |
| DSE1020F02 | 10.2 | | 10.2 | 43 | 46 | 89 |
| DSE1030F02 | 10.3 | ● | 10.3 | 43 | 46 | 89 |
| DSE1040F02 | 10.4 | | 10.4 | 43 | 46 | 89 |
| DSE1050F02 | 10.5 | ● | 10.5 | 43 | 46 | 89 |
| DSE1060F02 | 10.6 | | 10.6 | 43 | 46 | 89 |
| DSE1070F02 | 10.7 | | 10.7 | 47 | 48 | 95 |
| DSE1080F02 | 10.8 | | 10.8 | 47 | 48 | 95 |
| DSE1090F02 | 10.9 | | 10.9 | 47 | 48 | 95 |
| DSE1100F02 | 11 | ● | 11 | 47 | 48 | 95 |
| DSE1110F02 | 11.1 | | 11.1 | 47 | 48 | 95 |
| DSE1120F02 | 11.2 | | 11.2 | 47 | 48 | 95 |
| DSE1130F02 | 11.3 | | 11.3 | 47 | 48 | 95 |
| DSE1140F02 | 11.4 | | 11.4 | 47 | 48 | 95 |
| DSE1150F02 | 11.5 | ● | 11.5 | 47 | 48 | 95 |
| DSE1160F02 | 11.6 | | 11.6 | 47 | 48 | 95 |
| DSE1170F02 | 11.7 | | 11.7 | 47 | 48 | 95 |
| DSE1180F02 | 11.8 | | 11.8 | 47 | 48 | 95 |
| DSE1190F02 | 11.9 | | 11.9 | 51 | 51 | 102 |
| DSE1200F02 | 12 | ● | 12 | 51 | 51 | 102 |
| DSE1210F02 | 12.1 | | 12.1 | 51 | 51 | 102 |
| DSE1220F02 | 12.2 | | 12.2 | 51 | 51 | 102 |
| DSE1230F02 | 12.3 | | 12.3 | 51 | 51 | 102 |
| DSE1240F02 | 12.4 | | 12.4 | 51 | 51 | 102 |
| DSE1250F02 | 12.5 | ● | 12.5 | 51 | 51 | 102 |
| DSE1260F02 | 12.6 | | 12.6 | 51 | 51 | 102 |
| DSE1270F02 | 12.7 | | 12.7 | 51 | 51 | 102 |
| DSE1280F02 | 12.8 | | 12.8 | 51 | 51 | 102 |
| DSE1290F02 | 12.9 | | 12.9 | 51 | 51 | 102 |
| DSE1300F02 | 13 | ● | 13 | 51 | 51 | 102 |
| DSE1310F02 | 13.1 | | 13.1 | 51 | 51 | 102 |
| DSE1320F02 | 13.2 | | 13.2 | 51 | 51 | 102 |
| DSE1330F02 | 13.3 | | 13.3 | 54 | 53 | 107 |

● : Line up

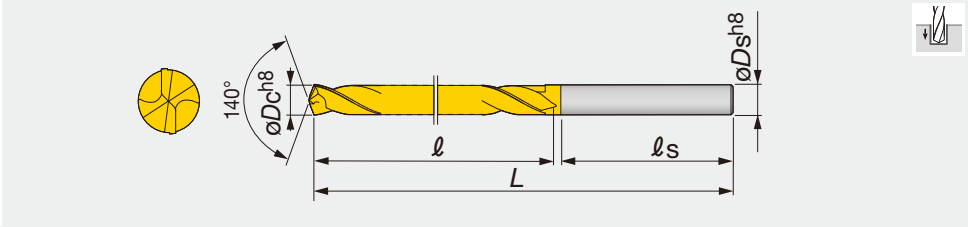
| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE1340F02 | 13.4 | | 13.4 | 54 | 53 | 107 |
| DSE1350F02 | 13.5 | ● | 13.5 | 54 | 53 | 107 |
| DSE1360F02 | 13.6 | | 13.6 | 54 | 53 | 107 |
| DSE1370F02 | 13.7 | | 13.7 | 54 | 53 | 107 |
| DSE1380F02 | 13.8 | | 13.8 | 54 | 53 | 107 |
| DSE1390F02 | 13.9 | | 13.9 | 54 | 53 | 107 |
| DSE1400F02 | 14 | ● | 14 | 54 | 53 | 107 |
| DSE1410F02 | 14.1 | | 14.1 | 56 | 55 | 111 |
| DSE1420F02 | 14.2 | | 14.2 | 56 | 55 | 111 |
| DSE1430F02 | 14.3 | | 14.3 | 56 | 55 | 111 |
| DSE1440F02 | 14.4 | | 14.4 | 56 | 55 | 111 |
| DSE1450F02 | 14.5 | ● | 14.5 | 56 | 55 | 111 |
| DSE1460F02 | 14.6 | | 14.6 | 56 | 55 | 111 |
| DSE1470F02 | 14.7 | | 14.7 | 56 | 55 | 111 |
| DSE1480F02 | 14.8 | | 14.8 | 56 | 55 | 111 |
| DSE1490F02 | 14.9 | | 14.9 | 56 | 55 | 111 |
| DSE1500F02 | 15 | ● | 15 | 56 | 55 | 111 |
| DSE1510F02 | 15.1 | | 15.1 | 58 | 57 | 115 |
| DSE1520F02 | 15.2 | | 15.2 | 58 | 57 | 115 |
| DSE1530F02 | 15.3 | | 15.3 | 58 | 57 | 115 |
| DSE1540F02 | 15.4 | | 15.4 | 58 | 57 | 115 |
| DSE1550F02 | 15.5 | ● | 15.5 | 58 | 57 | 115 |
| DSE1560F02 | 15.6 | | 15.6 | 58 | 57 | 115 |
| DSE1570F02 | 15.7 | | 15.7 | 58 | 57 | 115 |
| DSE1580F02 | 15.8 | | 15.8 | 58 | 57 | 115 |
| DSE1590F02 | 15.9 | | 15.9 | 58 | 57 | 115 |
| DSE1600F02 | 16 | ● | 16 | 58 | 57 | 115 |

● : Line up

# GIGAPOWERDRILL

## DSE-F03

Soliddrill with 140° point angle without oil hole & shank size same as diameter, L/D = 3, dia = ø3 -ø16 mm




| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0300F03 | 3 | ● | 3 | 21 | 39 | 60 |
| DSE0310F03 | 3.1 | | 3.1 | 24 | 36 | 60 |
| DSE0320F03 | 3.2 | ● | 3.2 | 24 | 36 | 60 |
| DSE0330F03 | 3.3 | | 3.3 | 24 | 36 | 60 |
| DSE0340F03 | 3.4 | ● | 3.4 | 24 | 36 | 60 |
| DSE0350F03 | 3.5 | ● | 3.5 | 24 | 36 | 60 |
| DSE0360F03 | 3.6 | | 3.6 | 27 | 33 | 60 |
| DSE0370F03 | 3.7 | | 3.7 | 27 | 33 | 60 |
| DSE0380F03 | 3.8 | | 3.8 | 27 | 33 | 60 |
| DSE0390F03 | 3.9 | | 3.9 | 27 | 33 | 60 |
| DSE0400F03 | 4 | ● | 4 | 27 | 33 | 60 |
| DSE0410F03 | 4.1 | | 4.1 | 29 | 34 | 63 |
| DSE0420F03 | 4.2 | | 4.2 | 29 | 34 | 63 |
| DSE0430F03 | 4.3 | ● | 4.3 | 29 | 34 | 63 |
| DSE0440F03 | 4.4 | | 4.4 | 29 | 34 | 63 |
| DSE0450F03 | 4.5 | ● | 4.5 | 29 | 34 | 63 |
| DSE0460F03 | 4.6 | | 4.6 | 32 | 36 | 68 |
| DSE0470F03 | 4.7 | | 4.7 | 32 | 36 | 68 |
| DSE0480F03 | 4.8 | | 4.8 | 32 | 36 | 68 |
| DSE0490F03 | 4.9 | | 4.9 | 32 | 36 | 68 |
| DSE0500F03 | 5 | ● | 5 | 32 | 36 | 68 |
| DSE0510F03 | 5.1 | ● | 5.1 | 34 | 38 | 72 |
| DSE0520F03 | 5.2 | | 5.2 | 34 | 38 | 72 |
| DSE0530F03 | 5.3 | | 5.3 | 34 | 38 | 72 |
| DSE0540F03 | 5.4 | | 5.4 | 34 | 38 | 72 |
| DSE0550F03 | 5.5 | ● | 5.5 | 34 | 38 | 72 |
| DSE0560F03 | 5.6 | | 5.6 | 36 | 38 | 74 |
| DSE0570F03 | 5.7 | | 5.7 | 36 | 38 | 74 |
| DSE0580F03 | 5.8 | | 5.8 | 36 | 38 | 74 |
| DSE0590F03 | 5.9 | | 5.9 | 36 | 38 | 74 |
| DSE0600F03 | 6 | ● | 6 | 41 | 40 | 81 |
| DSE0610F03 | 6.1 | | 6.1 | 41 | 40 | 81 |
| DSE0620F03 | 6.2 | | 6.2 | 41 | 40 | 81 |
| DSE0630F03 | 6.3 | | 6.3 | 41 | 40 | 81 |
| DSE0640F03 | 6.4 | | 6.4 | 41 | 40 | 81 |
| DSE0650F03 | 6.5 | ● | 6.5 | 41 | 40 | 81 |
| DSE0660F03 | 6.6 | | 6.6 | 43 | 40 | 83 |
| DSE0670F03 | 6.7 | | 6.7 | 43 | 40 | 83 |
| DSE0680F03 | 6.8 | ● | 6.8 | 43 | 40 | 83 |
| DSE0690F03 | 6.9 | | 6.9 | 43 | 40 | 83 |
| DSE0700F03 | 7 | ● | 7 | 43 | 40 | 83 |
| DSE0710F03 | 7.1 | | 7.1 | 45 | 42 | 87 |
| DSE0720F03 | 7.2 | | 7.2 | 45 | 42 | 87 |
| DSE0730F03 | 7.3 | | 7.3 | 45 | 42 | 87 |
| DSE0740F03 | 7.4 | ● | 7.4 | 45 | 42 | 87 |
| DSE0750F03 | 7.5 | ● | 7.5 | 45 | 42 | 87 |
| DSE0760F03 | 7.6 | | 7.6 | 48 | 42 | 90 |
| DSE0770F03 | 7.7 | | 7.7 | 48 | 42 | 90 |
| DSE0780F03 | 7.8 | | 7.8 | 48 | 42 | 90 |
| DSE0790F03 | 7.9 | | 7.9 | 48 | 42 | 90 |
| DSE0800F03 | 8 | ● | 8 | 48 | 42 | 90 |
| DSE0810F03 | 8.1 | | 8.1 | 53 | 43 | 96 |
| DSE0820F03 | 8.2 | | 8.2 | 53 | 43 | 96 |
| DSE0830F03 | 8.3 | | 8.3 | 53 | 43 | 96 |
| DSE0840F03 | 8.4 | | 8.4 | 53 | 43 | 96 |
| DSE0850F03 | 8.5 | ● | 8.5 | 53 | 43 | 96 |
| DSE0860F03 | 8.6 | ● | 8.6 | 55 | 43 | 98 |
| DSE0870F03 | 8.7 | | 8.7 | 55 | 43 | 98 |
| DSE0880F03 | 8.8 | | 8.8 | 55 | 43 | 98 |
| DSE0890F03 | 8.9 | | 8.9 | 55 | 43 | 98 |
| DSE0900F03 | 9 | ● | 9 | 55 | 43 | 98 |
| DSE0910F03 | 9.1 | | 9.1 | 58 | 44 | 102 |
| DSE0920F03 | 9.2 | | 9.2 | 58 | 44 | 102 |

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE0930F03 | 9.3 | | 9.3 | 58 | 44 | 102 |
| DSE0940F03 | 9.4 | | 9.4 | 58 | 44 | 102 |
| DSE0950F03 | 9.5 | ● | 9.5 | 58 | 44 | 102 |
| DSE0960F03 | 9.6 | | 9.6 | 60 | 45 | 105 |
| DSE0970F03 | 9.7 | | 9.7 | 60 | 45 | 105 |
| DSE0980F03 | 9.8 | | 9.8 | 60 | 45 | 105 |
| DSE0990F03 | 9.9 | | 9.9 | 60 | 45 | 105 |
| DSE1000F03 | 10 | ● | 10 | 60 | 45 | 105 |
| DSE1010F03 | 10.1 | | 10.1 | 66 | 46 | 112 |
| DSE1020F03 | 10.2 | | 10.2 | 66 | 46 | 112 |
| DSE1030F03 | 10.3 | ● | 10.3 | 66 | 46 | 112 |
| DSE1040F03 | 10.4 | | 10.4 | 66 | 46 | 112 |
| DSE1050F03 | 10.5 | ● | 10.5 | 66 | 46 | 112 |
| DSE1060F03 | 10.6 | | 10.6 | 68 | 46 | 114 |
| DSE1070F03 | 10.7 | | 10.7 | 68 | 46 | 114 |
| DSE1080F03 | 10.8 | | 10.8 | 68 | 46 | 114 |
| DSE1090F03 | 10.9 | | 10.9 | 68 | 46 | 114 |
| DSE1100F03 | 11 | ● | 11 | 68 | 46 | 114 |
| DSE1110F03 | 11.1 | | 11.1 | 71 | 47 | 118 |
| DSE1120F03 | 11.2 | | 11.2 | 71 | 47 | 118 |
| DSE1130F03 | 11.3 | | 11.3 | 71 | 47 | 118 |
| DSE1140F03 | 11.4 | | 11.4 | 71 | 47 | 118 |
| DSE1150F03 | 11.5 | ● | 11.5 | 71 | 47 | 118 |
| DSE1160F03 | 11.6 | | 11.6 | 73 | 48 | 121 |
| DSE1170F03 | 11.7 | | 11.7 | 73 | 48 | 121 |
| DSE1180F03 | 11.8 | | 11.8 | 73 | 48 | 121 |
| DSE1190F03 | 11.9 | | 11.9 | 73 | 48 | 121 |
| DSE1200F03 | 12 | ● | 12 | 73 | 48 | 121 |
| DSE1210F03 | 12.1 | | 12.1 | 76 | 59 | 135 |
| DSE1220F03 | 12.2 | | 12.2 | 76 | 59 | 135 |
| DSE1230F03 | 12.3 | | 12.3 | 76 | 59 | 135 |
| DSE1240F03 | 12.4 | | 12.4 | 76 | 59 | 135 |
| DSE1250F03 | 12.5 | ● | 12.5 | 76 | 59 | 135 |
| DSE1260F03 | 12.6 | | 12.6 | 78 | 59 | 137 |
| DSE1270F03 | 12.7 | | 12.7 | 78 | 59 | 137 |
| DSE1280F03 | 12.8 | | 12.8 | 78 | 59 | 137 |
| DSE1290F03 | 12.9 | | 12.9 | 78 | 59 | 137 |
| DSE1300F03 | 13 | ● | 13 | 78 | 59 | 137 |
| DSE1310F03 | 13.1 | | 13.1 | 84 | 60 | 144 |
| DSE1320F03 | 13.2 | | 13.2 | 84 | 60 | 144 |
| DSE1330F03 | 13.3 | | 13.3 | 84 | 60 | 144 |
| DSE1340F03 | 13.4 | | 13.4 | 84 | 60 | 144 |
| DSE1350F03 | 13.5 | ● | 13.5 | 84 | 60 | 144 |
| DSE1360F03 | 13.6 | | 13.6 | 86 | 61 | 147 |
| DSE1370F03 | 13.7 | | 13.7 | 86 | 61 | 147 |
| DSE1380F03 | 13.8 | | 13.8 | 86 | 61 | 147 |
| DSE1390F03 | 13.9 | | 13.9 | 86 | 61 | 147 |
| DSE1400F03 | 14 | ● | 14 | 86 | 61 | 147 |
| DSE1410F03 | 14.1 | | 14.1 | 89 | 62 | 151 |
| DSE1420F03 | 14.2 | | 14.2 | 89 | 62 | 151 |
| DSE1430F03 | 14.3 | | 14.3 | 89 | 62 | 151 |
| DSE1440F03 | 14.4 | | 14.4 | 89 | 62 | 151 |
| DSE1450F03 | 14.5 | ● | 14.5 | 89 | 62 | 151 |
| DSE1460F03 | 14.6 | | 14.6 | 91 | 62 | 153 |
| DSE1470F03 | 14.7 | | 14.7 | 91 | 62 | 153 |
| DSE1480F03 | 14.8 | | 14.8 | 91 | 62 | 153 |
| DSE1490F03 | 14.9 | | 14.9 | 91 | 62 | 153 |
| DSE1500F03 | 15 | ● | 15 | 91 | 62 | 153 |
| DSE1510F03 | 15.1 | | 15.1 | 94 | 63 | 157 |
| DSE1520F03 | 15.2 | | 15.2 | 94 | 63 | 157 |
| DSE1530F03 | 15.3 | | 15.3 | 94 | 63 | 157 |
| DSE1540F03 | 15.4 | | 15.4 | 94 | 63 | 157 |
| DSE1550F03 | 15.5 | ● | 15.5 | 94 | 63 | 157 |

● : Line up

| Designation | øDc | AH180 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DSE1560F03 | 15.6 | | 15.6 | 96 | 64 | 160 |
| DSE1570F03 | 15.7 | | 15.7 | 96 | 64 | 160 |
| DSE1580F03 | 15.8 | | 15.8 | 96 | 64 | 160 |
| DSE1590F03 | 15.9 | | 15.9 | 96 | 64 | 160 |
| DSE1600F03 | 16 | ● | 16 | 96 | 64 | 160 |

● : Line up

## STANDARD CUTTING CONDITIONS

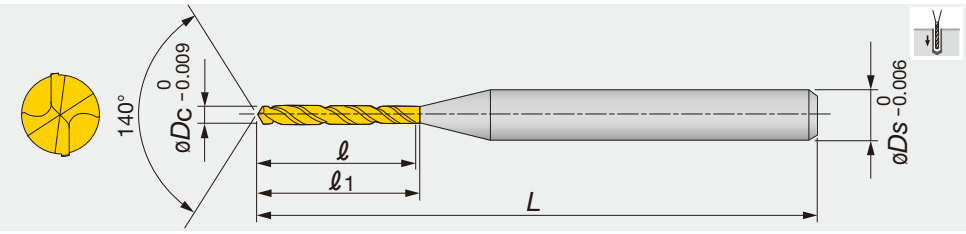
| ISO | Workpiece material | Examples | Hardness | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ø3 ~ ø6 | ø6 ~ ø10 | ø10 ~ ø20 | ø3 ~ ø6 | ø5 ~ ø10 | ø10 ~ ø20 |
| P | Mild steels, Low carbon steels | SS400, etc. E275A, etc. | < 180HB | 40 - 100 | 60 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.2 - 0.5 |
| P | Carbon steels, Alloy steels | S45C, etc. C45, etc. | 180 ~ 300HB | 40 - 90 | 50 - 120 | 60 - 130 | 0.15 - 0.3 | 0.15 - 0.35 | 0.15 - 0.4 |
| P | High alloy steels etc. | SCM440, etc. 42CrMo4, etc. | 250 ~ 350HB | 40 - 80 | 50 - 100 | 50 - 100 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.35 |
| M | Stainless steels | SUS304, etc. X5CrNi18-9, etc. | < 200HB | 10 - 20 | 10 - 20 | 10 - 20 | 0.05 - 0.15 | 0.05 - 0.15 | 0.05 - 0.15 |
| K | Grey cast irons | FC300, etc. 300, etc. | < 200HB | 40 - 90 | 50 - 95 | 50 - 100 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| K | Ductile cast irons | FCD700, etc. 600-3, etc. | < 300HB | 35 - 80 | 40 - 85 | 45 - 90 | 0.15 - 0.3 | 0.2 - 0.4 | 0.2 - 0.4 |
| S | Titanium alloys | Ti-6Al-4V, etc. | | 20 - 40 | 20 - 40 | 20 - 40 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.4 |
| S | Heat-resistant alloys | Inconel718, etc. | 250HB < | 10 - 30 | 10 - 30 | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 |
| H | High hardened steels | SKD11, etc. X153CrMoV12, etc. | < 40HRC | 20 - 40 | 20 - 40 | 20 - 40 | 0.05 - 0.15 | 0.05 - 0.15 | 0.07 - 0.2 |

Notes:
- Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
- When using the smaller side of the diameter range, the feed rate should be set lower.
- When drilling difficult-to-cut materials, coolant supplying conditions are critical for successful drilling. So, the use of constant and flood coolant is highly recommended.
- For the standard DSE-type drills, somewhat large honing width intended for drilling of general steels is applied. But, when drilling difficult-to-cut materials having high hardness, requiring lowering the feed rate, the honing width should be modified.
- The drills with special honing specification are made to order on request.
- Inconel is trademark of Huntington Alloys, Inc.

# GIGAMINIDRILL

## DSM

Micro soliddrill with std. shank size of ø3 mm, without coolant hole, dia.= ø0.1 mm - ø3 mm, L/D = 5 -15




| Designation | øDc | Coated YH170 | Coated YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0010G10 | 0.1 | ● | | 3 | 1.15 | 1.4 | 38 |
| DSM0011G10 | 0.11 | ● | | 3 | 1.25 | 1.5 | 38 |
| DSM0012G10 | 0.12 | ● | | 3 | 1.35 | 1.6 | 38 |
| DSM0013G10 | 0.13 | ● | | 3 | 1.55 | 1.8 | 38 |
| DSM0014G10 | 0.14 | ● | | 3 | 1.65 | 1.9 | 38 |
| DSM0015G10 | 0.15 | ● | | 3 | 1.75 | 2 | 38 |
| DSM0016G10 | 0.16 | ● | | 3 | 1.85 | 2.1 | 38 |
| DSM0017G10 | 0.17 | ● | | 3 | 1.95 | 2.2 | 38 |
| DSM0018G10 | 0.18 | ● | | 3 | 2.15 | 2.4 | 38 |
| DSM0019G10 | 0.19 | ● | | 3 | 2.25 | 2.5 | 38 |
| DSM0020G10 | 0.2 | ● | | 3 | 2.35 | 2.6 | 38 |
| DSM0021G10 | 0.21 | ● | | 3 | 2.45 | 2.7 | 38 |
| DSM0022G10 | 0.22 | ● | | 3 | 2.55 | 2.8 | 38 |
| DSM0023G10 | 0.23 | ● | | 3 | 2.75 | 3 | 38 |
| DSM0024G10 | 0.24 | ● | | 3 | 2.85 | 3.1 | 38 |
| DSM0025G10 | 0.25 | ● | | 3 | 3 | 3.3 | 38 |
| DSM0026G10 | 0.26 | ● | | 3 | 3.1 | 3.4 | 38 |
| DSM0027G10 | 0.27 | ● | | 3 | 3.2 | 3.5 | 38 |
| DSM0028G10 | 0.28 | ● | | 3 | 3.4 | 3.7 | 38 |
| DSM0029G10 | 0.29 | ● | | 3 | 3.5 | 3.8 | 38 |
| DSM0030G10 | 0.3 | ● | | 3 | 3.9 | 4.2 | 38 |
| DSM0031G15 | 0.31 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0032G15 | 0.32 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0033G15 | 0.33 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0034G15 | 0.34 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0035G15 | 0.35 | ● | | 3 | 5.6 | 5.9 | 38 |
| DSM0036G15 | 0.36 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0037G15 | 0.37 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0038G15 | 0.38 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0039G15 | 0.39 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0040G15 | 0.4 | ● | | 3 | 6.5 | 6.8 | 38 |
| DSM0041G15 | 0.41 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0042G15 | 0.42 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0043G15 | 0.43 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0044G15 | 0.44 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0045G15 | 0.45 | ● | | 3 | 7.4 | 7.7 | 38 |
| DSM0046G15 | 0.46 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0047G15 | 0.47 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0048G15 | 0.48 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0049G15 | 0.49 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0050G15 | 0.5 | ● | | 3 | 8.1 | 8.7 | 38 |
| DSM0051G10 | 0.51 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0052G10 | 0.52 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0053G10 | 0.53 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0054G10 | 0.54 | | | 3 | 6.6 | 7.2 | 38 |
| DSM0055G10 | 0.55 | ● | | 3 | 6.6 | 7.2 | 38 |
| DSM0056G10 | 0.56 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0057G10 | 0.57 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0058G10 | 0.58 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0059G10 | 0.59 | | | 3 | 7.3 | 7.9 | 38 |
| DSM0060G10 | 0.6 | ● | | 3 | 7.3 | 7.9 | 38 |
| DSM0061G10 | 0.61 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0062G10 | 0.62 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0063G10 | 0.63 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0064G10 | 0.64 | | | 3 | 7.9 | 8.5 | 38 |
| DSM0065G10 | 0.65 | ● | | 3 | 7.9 | 8.5 | 38 |
| DSM0066G10 | 0.66 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0067G10 | 0.67 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0068G10 | 0.68 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0069G10 | 0.69 | | | 3 | 8.6 | 9.2 | 38 |
| DSM0070G10 | 0.7 | ● | | 3 | 8.6 | 9.2 | 38 |
| DSM0071G10 | 0.71 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0072G10 | 0.72 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0073G10 | 0.73 | | | 3 | 9.2 | 9.8 | 38 |
| DSM0074G10 | 0.74 | | | 3 | 9.2 | 9.8 | 38 |

| Designation | øDc | Coated YH170 | Coated YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0075G10 | 0.75 | ● | | 3 | 9.2 | 9.8 | 38 |
| DSM0076G10 | 0.76 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0077G10 | 0.77 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0078G10 | 0.78 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0079G10 | 0.79 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0080G10 | 0.8 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0081G10 | 0.81 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0082G10 | 0.82 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0083G10 | 0.83 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0084G10 | 0.84 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0085G10 | 0.85 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0086G10 | 0.86 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0087G10 | 0.87 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0088G10 | 0.88 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0089G10 | 0.89 | | | 3 | 9.9 | 10.5 | 38 |
| DSM0090G10 | 0.9 | ● | | 3 | 9.9 | 10.5 | 38 |
| DSM0091G10 | 0.91 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0092G10 | 0.92 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0093G10 | 0.93 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0094G10 | 0.94 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0095G10 | 0.95 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0096G10 | 0.96 | | | 3 | 11 | 11.6 | 38 |
| DSM0097G10 | 0.97 | ● | | 3 | 11 | 11.6 | 38 |
| DSM0098G10 | 0.98 | | | 3 | 11 | 11.6 | 38 |
| DSM0099G10 | 0.99 | | | 3 | 11 | 11.6 | 38 |
| DSM0100G10 | 1 | ● | | 3 | 11.5 | 12.1 | 38 |
| DSM0101G05 | 1.01 | | | 3 | 8 | 8.6 | 38 |
| DSM0102G05 | 1.02 | | | 3 | 8 | 8.6 | 38 |
| DSM0103G05 | 1.03 | | | 3 | 8 | 8.6 | 38 |
| DSM0104G05 | 1.04 | | | 3 | 8 | 8.6 | 38 |
| DSM0105G05 | 1.05 | | | 3 | 8 | 8.6 | 38 |
| DSM0106G05 | 1.06 | | | 3 | 8 | 8.6 | 38 |
| DSM0107G05 | 1.07 | | | 3 | 8 | 8.6 | 38 |
| DSM0108G05 | 1.08 | ● | | 3 | 8 | 8.6 | 38 |
| DSM0109G05 | 1.09 | | | 3 | 8 | 8.6 | 38 |
| DSM0110G05 | 1.1 | ● | | 3 | 8 | 8.6 | 38 |
| DSM0111G05 | 1.11 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0112G05 | 1.12 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0113G05 | 1.13 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0114G05 | 1.14 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0115G05 | 1.15 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0116G05 | 1.16 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0117G05 | 1.17 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0118G05 | 1.18 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0119G05 | 1.19 | | | 3 | 8.9 | 9.5 | 38 |
| DSM0120G05 | 1.2 | ● | | 3 | 8.9 | 9.5 | 38 |
| DSM0121G05 | 1.21 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0122G05 | 1.22 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0123G05 | 1.23 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0124G05 | 1.24 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0125G05 | 1.25 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0126G05 | 1.26 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0127G05 | 1.27 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0128G05 | 1.28 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0129G05 | 1.29 | | | 3 | 9.7 | 10.3 | 38 |
| DSM0130G05 | 1.3 | ● | | 3 | 9.7 | 10.3 | 38 |
| DSM0131G05 | 1.31 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0132G05 | 1.32 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0133G05 | 1.33 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0134G05 | 1.34 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0135G05 | 1.35 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0136G05 | 1.36 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0137G05 | 1.37 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0138G05 | 1.38 | | | 3 | 10.5 | 11.1 | 38 |
| DSM0139G05 | 1.39 | | | 3 | 10.5 | 11.1 | 38 |

● : Line up

| Designation | øDc | Coated YH170 | Coated YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0140G05 | 1.4 | ● | | 3 | 10.5 | 11.1 | 38 |
| DSM0141G05 | 1.41 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0142G05 | 1.42 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0143G05 | 1.43 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0144G05 | 1.44 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0145G05 | 1.45 | ● | | 3 | 11.3 | 11.9 | 38 |
| DSM0146G05 | 1.46 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0147G05 | 1.47 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0148G05 | 1.48 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0149G05 | 1.49 | | | 3 | 11.3 | 11.9 | 38 |
| DSM0150G05 | 1.5 | ● | | 3 | 11.3 | 11.9 | 38 |
| DSM0151G05 | 1.51 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0152G05 | 1.52 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0153G05 | 1.53 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0154G05 | 1.54 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0155G05 | 1.55 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0156G05 | 1.56 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0157G05 | 1.57 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0158G05 | 1.58 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0159G05 | 1.59 | | | 3 | 12.1 | 12.7 | 45 |
| DSM0160G05 | 1.6 | ● | | 3 | 12.1 | 12.7 | 45 |
| DSM0161G05 | 1.61 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0162G05 | 1.62 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0163G05 | 1.63 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0164G05 | 1.64 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0165G05 | 1.65 | ● | | 3 | 12.9 | 13.6 | 45 |
| DSM0166G05 | 1.66 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0167G05 | 1.67 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0168G05 | 1.68 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0169G05 | 1.69 | | | 3 | 12.9 | 13.6 | 45 |
| DSM0170G05 | 1.7 | ● | | 3 | 12.9 | 13.6 | 45 |
| DSM0171G05 | 1.71 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0172G05 | 1.72 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0173G05 | 1.73 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0174G05 | 1.74 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0175G05 | 1.75 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0176G05 | 1.76 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0177G05 | 1.77 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0178G05 | 1.78 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0179G05 | 1.79 | | | 3 | 13.7 | 14.3 | 45 |
| DSM0180G05 | 1.8 | ● | | 3 | 13.7 | 14.3 | 45 |
| DSM0181G05 | 1.81 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0182G05 | 1.82 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0183G05 | 1.83 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0184G05 | 1.84 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0185G05 | 1.85 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0186G05 | 1.86 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0187G05 | 1.87 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0188G05 | 1.88 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0189G05 | 1.89 | | | 3 | 14.5 | 15.1 | 45 |
| DSM0190G05 | 1.9 | ● | | 3 | 14.5 | 15.1 | 45 |
| DSM0191G05 | 1.91 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0192G05 | 1.92 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0193G05 | 1.93 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0194G05 | 1.94 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0195G05 | 1.95 | ● | | 3 | 15.3 | 15.9 | 45 |
| DSM0196G05 | 1.96 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0197G05 | 1.97 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0198G05 | 1.98 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0199G05 | 1.99 | | | 3 | 15.3 | 15.9 | 45 |
| DSM0200G05 | 2 | | ● | 3 | 15.3 | 15.9 | 45 |
| DSM0201G05 | 2.01 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0202G05 | 2.02 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0203G05 | 2.03 | | ● | 3 | 16.1 | 16.7 | 45 |
| DSM0204G05 | 2.04 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0205G05 | 2.05 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0206G05 | 2.06 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0207G05 | 2.07 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0208G05 | 2.08 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0209G05 | 2.09 | | | 3 | 16.1 | 16.7 | 45 |
| DSM0210G05 | 2.1 | | ● | 3 | 16.1 | 16.7 | 45 |
| DSM0211G05 | 2.11 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0212G05 | 2.12 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0213G05 | 2.13 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0214G05 | 2.14 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0215G05 | 2.15 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0216G05 | 2.16 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0217G05 | 2.17 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0218G05 | 2.18 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0219G05 | 2.19 | | | 3 | 16.9 | 17.5 | 45 |
| DSM0220G05 | 2.2 | | ● | 3 | 16.9 | 17.5 | 45 |

| Designation | øDc | Coated YH170 | Coated YH180 | øDs | ℓ | ℓ1 | L |
|---|---|---|---|---|---|---|---|
| DSM0221G05 | 2.21 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0222G05 | 2.22 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0223G05 | 2.23 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0224G05 | 2.24 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0225G05 | 2.25 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0226G05 | 2.26 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0227G05 | 2.27 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0228G05 | 2.28 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0229G05 | 2.29 | | | 3 | 17.7 | 18.3 | 45 |
| DSM0230G05 | 2.3 | | ● | 3 | 17.7 | 18.3 | 45 |
| DSM0231G05 | 2.31 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0232G05 | 2.32 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0233G05 | 2.33 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0234G05 | 2.34 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0235G05 | 2.35 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0236G05 | 2.36 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0237G05 | 2.37 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0238G05 | 2.38 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0239G05 | 2.39 | | | 3 | 18.5 | 19.1 | 55 |
| DSM0240G05 | 2.4 | | ● | 3 | 18.5 | 19.1 | 55 |
| DSM0241G05 | 2.41 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0242G05 | 2.42 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0243G05 | 2.43 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0244G05 | 2.44 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0245G05 | 2.45 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0246G05 | 2.46 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0247G05 | 2.47 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0248G05 | 2.48 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0249G05 | 2.49 | | | 3 | 19.3 | 19.9 | 55 |
| DSM0250G05 | 2.5 | | ● | 3 | 19.3 | 19.9 | 55 |
| DSM0251G05 | 2.51 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0252G05 | 2.52 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0253G05 | 2.53 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0254G05 | 2.54 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0255G05 | 2.55 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0256G05 | 2.56 | | ● | 3 | 20.1 | 20.7 | 55 |
| DSM0257G05 | 2.57 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0258G05 | 2.58 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0259G05 | 2.59 | | | 3 | 20.1 | 20.7 | 55 |
| DSM0260G05 | 2.6 | | ● | 3 | 20.1 | 20.7 | 55 |
| DSM0261G05 | 2.61 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0262G05 | 2.62 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0263G05 | 2.63 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0264G05 | 2.64 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0265G05 | 2.65 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0266G05 | 2.66 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0267G05 | 2.67 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0268G05 | 2.68 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0269G05 | 2.69 | | | 3 | 20.9 | 21.5 | 55 |
| DSM0270G05 | 2.7 | | ● | 3 | 20.9 | 21.5 | 55 |
| DSM0271G05 | 2.71 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0272G05 | 2.72 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0273G05 | 2.73 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0274G05 | 2.74 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0275G05 | 2.75 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0276G05 | 2.76 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0277G05 | 2.77 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0278G05 | 2.78 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0279G05 | 2.79 | | | 3 | 21.7 | 22.3 | 55 |
| DSM0280G05 | 2.8 | | ● | 3 | 21.7 | 22.3 | 55 |
| DSM0281G05 | 2.81 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0282G05 | 2.82 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0283G05 | 2.83 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0284G05 | 2.84 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0285G05 | 2.85 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0286G05 | 2.86 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0287G05 | 2.87 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0288G05 | 2.88 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0289G05 | 2.89 | | | 3 | 22.5 | 23.1 | 55 |
| DSM0290G05 | 2.9 | | ● | 3 | 22.5 | 23.1 | 55 |
| DSM0291G05 | 2.91 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0292G05 | 2.92 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0293G05 | 2.93 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0294G05 | 2.94 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0295G05 | 2.95 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0296G05 | 2.96 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0297G05 | 2.97 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0298G05 | 2.98 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0299G05 | 2.99 | | | 3 | 23.3 | 23.9 | 55 |
| DSM0300G05 | 3 | | ● | 3 | 23.3 | 23.9 | 55 |

● : Line up

## STANDARD CUTTING CONDITIONS

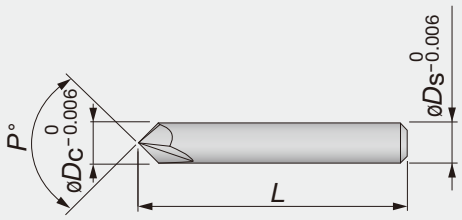
| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ø0.1 ~ ø0.3 | ø0.3 ~ ø0.5 | ø0.5 ~ ø3 | ø0.1 ~ ø0.3 | ø0.3 ~ ø0.5 | ø0.5 ~ ø1 | ø1 ~ ø2 | ø2 ~ ø3 |
| P | Carbon and alloy steels | 5 - 20 | 15 - 30 | 25 - 60 | 0.001 - 0.004 | 0.002 - 0.01 | 0.005 - 0.05 | 0.03 - 0.09 | 0.05 - 0.1 |
| M | Stainless steels | 2 - 12 | 6 - 18 | 10 - 20 | 0.0005 - 0.004 | 0.002 - 0.008 | 0.005 - 0.03 | 0.01 - 0.04 | 0.02 - 0.05 |
| K | Grey cast irons | 5 - 15 | 10 - 25 | 20 - 50 | 0.0005 - 0.004 | 0.002- 0.012 | 0.005 - 0.03 | 0.01 - 0.06 | 0.03 - 0.12 |
| | Ductile cast irons | 5 - 15 | 10 - 25 | 20 - 50 | 0.001 - 0.003 | 0.002 - 0.01 | 0.005 - 0.02 | 0.01 - 0.05 | 0.03 - 0.1 |
| N | Aluminium alloys | 10 - 20 | 10 - 30 | 20 - 50 | 0.001 - 0.01 | 0.005 - 0.03 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 |
| | Copper / Brass | 10 - 20 | 10 - 30 | 20 - 50 | 0.001 - 0.01 | 0.005 - 0.03 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 |
| S | Heat-resistant alloys | 2 - 6 | 5 - 10 | 8 - 20 | 0.0005 - 0.003 | 0.002 - 0.004 | 0.002 - 0.004 | 0.002 - 0.004 | Not recommended |
| H | High hardened steels | 4 - 8 | 6 - 10 | 6 - 16 | 0.0005 - 0.002 | 0.001 - 0.005 | 0.005 - 0.02 | 0.01 - 0.03 | 0.02 - 0.06 |

Note:
- When the drilling depth is deeper than L/D = 5, use drill pecking every 10 to 50% of the drill diameter.
- The above cutting conditions are applied to when a water soluble cutting fluid is used. For drilling a hole smaller than ø0.3 mm, use of a starting drill is recommended.
- When setting the drill, the drill run out should be within 0.002 mm on the taper. (Especially for the drill diameter smaller than ø0.5 mm)

# GIGAMINIDRILL

## DSM-CP

Centering drill for DSM




| Designation | øDc | YH170 | øDs | L | P° |
|---|---|---|---|---|---|
| DSM-CP90 | 3 | ● | 3 | 38.1 | 90 |
| DSM-CP140 | 3 | ● | 3 | 38.1 | 140 |

● : Line up

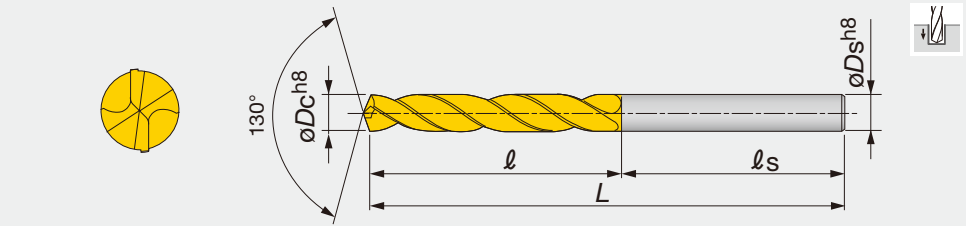
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed: Vc (m/min) | Feed: f (mm/rev) | |
|---|---|---|---|---|
| | | | DSM-CP90 | DSM-CP140 |
| P | Carbon, Mild and Alloy steels | 30 - 80 | 0.01 - 0.06 | 0.03 - 0.08 |
| K | Grey and ductile cast irons | 30 - 80 | 0.02 - 0.06 | 0.05 - 0.1 |
| N | Aluminium alloys | 60 - 120 | 0.02 - 0.1 | 0.05 - 0.15 |
| M | Stainless steels | 15 - 40 | 0.01 - 0.03 | 0.02 - 0.06 |
| H | High hardened steels (~45HRC) | 10 - 40 | Not recommended | 0.01 - 0.05 |

Notes: • For hard materials and stainless steels which have work-hardening nature, DSM-CP140 is recommended.
• Above cutting conditions are of using a water-soluble cutting fluid. When using a water-insoluble type, set the cutting speed to lower side.

## DMX L/D=2 (S type)

Soliddrill with 130° point angle without oil hole & shank size equal to drill dia., L/D = 2, dia = ø3 - ø20 mm




| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX030S | 3 | ● | 3 | 16 | 30 | 46 |
| DMX031S | 3.1 | ● | 3.1 | 18 | 31 | 49 |
| DMX032S | 3.2 | ● | 3.2 | 18 | 31 | 49 |
| DMX033S | 3.3 | ● | 3.3 | 18 | 31 | 49 |
| DMX034S | 3.4 | ● | 3.4 | 20 | 32 | 52 |
| DMX035S | 3.5 | ● | 3.5 | 20 | 32 | 52 |
| DMX036S | 3.6 | ● | 3.6 | 20 | 32 | 52 |
| DMX037S | 3.7 | ● | 3.7 | 20 | 32 | 52 |
| DMX038S | 3.8 | ● | 3.8 | 22 | 33 | 55 |
| DMX039S | 3.9 | ● | 3.9 | 22 | 33 | 55 |
| DMX040S | 4 | ● | 4 | 22 | 33 | 55 |
| DMX041S | 4.1 | ● | 4.1 | 22 | 33 | 55 |
| DMX042S | 4.2 | ● | 4.2 | 22 | 33 | 55 |
| DMX043S | 4.3 | ● | 4.3 | 24 | 34 | 58 |
| DMX044S | 4.4 | ● | 4.4 | 24 | 34 | 58 |
| DMX045S | 4.5 | ● | 4.5 | 24 | 34 | 58 |
| DMX046S | 4.6 | ● | 4.6 | 24 | 34 | 58 |
| DMX047S | 4.7 | ● | 4.7 | 24 | 34 | 58 |
| DMX048S | 4.8 | ● | 4.8 | 26 | 36 | 62 |
| DMX049S | 4.9 | ● | 4.9 | 26 | 36 | 62 |
| DMX050S | 5 | ● | 5 | 26 | 36 | 62 |
| DMX051S | 5.1 | ● | 5.1 | 26 | 36 | 62 |
| DMX052S | 5.2 | ● | 5.2 | 26 | 36 | 62 |
| DMX053S | 5.3 | ● | 5.3 | 26 | 36 | 62 |
| DMX054S | 5.4 | ● | 5.4 | 28 | 38 | 66 |
| DMX055S | 5.5 | ● | 5.5 | 28 | 38 | 66 |
| DMX056S | 5.6 | ● | 5.6 | 28 | 38 | 66 |
| DMX057S | 5.7 | ● | 5.7 | 28 | 38 | 66 |
| DMX058S | 5.8 | ● | 5.8 | 28 | 38 | 66 |
| DMX059S | 5.9 | ● | 5.9 | 28 | 38 | 66 |
| DMX060S | 6 | ● | 6 | 28 | 38 | 66 |
| DMX061S | 6.1 | ● | 6.1 | 31 | 39 | 70 |
| DMX062S | 6.2 | ● | 6.2 | 31 | 39 | 70 |
| DMX063S | 6.3 | ● | 6.3 | 31 | 39 | 70 |
| DMX064S | 6.4 | ● | 6.4 | 31 | 39 | 70 |
| DMX065S | 6.5 | ● | 6.5 | 31 | 39 | 70 |
| DMX066S | 6.6 | ● | 6.6 | 31 | 39 | 70 |
| DMX067S | 6.7 | ● | 6.7 | 31 | 39 | 70 |
| DMX068S | 6.8 | ● | 6.8 | 34 | 40 | 74 |
| DMX069S | 6.9 | ● | 6.9 | 34 | 40 | 74 |
| DMX070S | 7 | ● | 7 | 34 | 40 | 74 |
| DMX071S | 7.1 | ● | 7.1 | 34 | 40 | 74 |
| DMX072S | 7.2 | ● | 7.2 | 34 | 40 | 74 |
| DMX073S | 7.3 | ● | 7.3 | 34 | 40 | 74 |
| DMX074S | 7.4 | ● | 7.4 | 34 | 40 | 74 |
| DMX075S | 7.5 | ● | 7.5 | 34 | 40 | 74 |
| DMX076S | 7.6 | ● | 7.6 | 37 | 42 | 79 |
| DMX077S | 7.7 | ● | 7.7 | 37 | 42 | 79 |
| DMX078S | 7.8 | ● | 7.8 | 37 | 42 | 79 |
| DMX079S | 7.9 | ● | 7.9 | 37 | 42 | 79 |
| DMX080S | 8 | ● | 8 | 37 | 42 | 79 |
| DMX081S | 8.1 | ● | 8.1 | 37 | 42 | 79 |
| DMX082S | 8.2 | ● | 8.2 | 37 | 42 | 79 |
| DMX083S | 8.3 | ● | 8.3 | 37 | 42 | 79 |
| DMX084S | 8.4 | ● | 8.4 | 37 | 42 | 79 |
| DMX085S | 8.5 | ● | 8.5 | 37 | 42 | 79 |
| DMX086S | 8.6 | ● | 8.6 | 40 | 44 | 84 |
| DMX087S | 8.7 | ● | 8.7 | 40 | 44 | 84 |
| DMX088S | 8.8 | ● | 8.8 | 40 | 44 | 84 |
| DMX089S | 8.9 | ● | 8.9 | 40 | 44 | 84 |
| DMX090S | 9 | ● | 9 | 40 | 44 | 84 |
| DMX091S | 9.1 | ● | 9.1 | 40 | 44 | 84 |
| DMX092S | 9.2 | ● | 9.2 | 40 | 44 | 84 |

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX093S | 9.3 | ● | 9.3 | 40 | 44 | 84 |
| DMX094S | 9.4 | ● | 9.4 | 40 | 44 | 84 |
| DMX095S | 9.5 | ● | 9.5 | 40 | 44 | 84 |
| DMX096S | 9.6 | ● | 9.6 | 43 | 46 | 89 |
| DMX097S | 9.7 | ● | 9.7 | 43 | 46 | 89 |
| DMX098S | 9.8 | ● | 9.8 | 43 | 46 | 89 |
| DMX099S | 9.9 | ● | 9.9 | 43 | 46 | 89 |
| DMX100S | 10 | ● | 10 | 43 | 46 | 89 |
| DMX101S | 10.1 | ● | 10.1 | 43 | 46 | 89 |
| DMX102S | 10.2 | ● | 10.2 | 43 | 46 | 89 |
| DMX103S | 10.3 | ● | 10.3 | 43 | 46 | 89 |
| DMX104S | 10.4 | ● | 10.4 | 43 | 46 | 89 |
| DMX105S | 10.5 | ● | 10.5 | 43 | 46 | 89 |
| DMX106S | 10.6 | ● | 10.6 | 43 | 46 | 89 |
| DMX107S | 10.7 | ● | 10.7 | 47 | 48 | 95 |
| DMX108S | 10.8 | ● | 10.8 | 47 | 48 | 95 |
| DMX109S | 10.9 | ● | 10.9 | 47 | 48 | 95 |
| DMX110S | 11 | ● | 11 | 47 | 48 | 95 |
| DMX111S | 11.1 | ● | 11.1 | 47 | 48 | 95 |
| DMX112S | 11.2 | ● | 11.2 | 47 | 48 | 95 |
| DMX113S | 11.3 | ● | 11.3 | 47 | 48 | 95 |
| DMX114S | 11.4 | ● | 11.4 | 47 | 48 | 95 |
| DMX115S | 11.5 | ● | 11.5 | 47 | 48 | 95 |
| DMX116S | 11.6 | ● | 11.6 | 47 | 48 | 95 |
| DMX117S | 11.7 | ● | 11.7 | 47 | 48 | 95 |
| DMX118S | 11.8 | ● | 11.8 | 47 | 48 | 95 |
| DMX119S | 11.9 | ● | 11.9 | 51 | 51 | 102 |
| DMX120S | 12 | ● | 12 | 51 | 51 | 102 |
| DMX121S | 12.1 | ● | 12.1 | 51 | 51 | 102 |
| DMX122S | 12.2 | ● | 12.2 | 51 | 51 | 102 |
| DMX123S | 12.3 | ● | 12.3 | 51 | 51 | 102 |
| DMX124S | 12.4 | ● | 12.4 | 51 | 51 | 102 |
| DMX125S | 12.5 | ● | 12.5 | 51 | 51 | 102 |
| DMX126S | 12.6 | ● | 12.6 | 51 | 51 | 102 |
| DMX127S | 12.7 | ● | 12.7 | 51 | 51 | 102 |
| DMX128S | 12.8 | ● | 12.8 | 51 | 51 | 102 |
| DMX129S | 12.9 | ● | 12.9 | 51 | 51 | 102 |
| DMX130S | 13 | ● | 13 | 51 | 51 | 102 |
| DMX131S | 13.1 | ● | 13.1 | 51 | 51 | 102 |
| DMX132S | 13.2 | ● | 13.2 | 51 | 51 | 102 |
| DMX133S | 13.3 | ● | 13.3 | 54 | 53 | 107 |
| DMX134S | 13.4 | ● | 13.4 | 54 | 53 | 107 |
| DMX135S | 13.5 | ● | 13.5 | 54 | 53 | 107 |
| DMX136S | 13.6 | ● | 13.6 | 54 | 53 | 107 |
| DMX137S | 13.7 | ● | 13.7 | 54 | 53 | 107 |
| DMX138S | 13.8 | ● | 13.8 | 54 | 53 | 107 |
| DMX139S | 13.9 | ● | 13.9 | 54 | 53 | 107 |
| DMX140S | 14 | ● | 14 | 54 | 53 | 107 |
| DMX141S | 14.1 | ● | 14.1 | 56 | 55 | 111 |
| DMX142S | 14.2 | ● | 14.2 | 56 | 55 | 111 |
| DMX143S | 14.3 | ● | 14.3 | 56 | 55 | 111 |
| DMX144S | 14.4 | ● | 14.4 | 56 | 55 | 111 |
| DMX145S | 14.5 | ● | 14.5 | 56 | 55 | 111 |
| DMX146S | 14.6 | ● | 14.6 | 56 | 55 | 111 |
| DMX147S | 14.7 | ● | 14.7 | 56 | 55 | 111 |
| DMX148S | 14.8 | ● | 14.8 | 56 | 55 | 111 |
| DMX149S | 14.9 | ● | 14.9 | 56 | 55 | 111 |
| DMX150S | 15 | ● | 15 | 56 | 55 | 111 |
| DMX151S | 15.1 | ● | 15.1 | 58 | 57 | 115 |
| DMX152S | 15.2 | ● | 15.2 | 58 | 57 | 115 |
| DMX153S | 15.3 | ● | 15.3 | 58 | 57 | 115 |
| DMX154S | 15.4 | ● | 15.4 | 58 | 57 | 115 |
| DMX155S | 15.5 | ● | 15.5 | 58 | 57 | 115 |

● : Line up

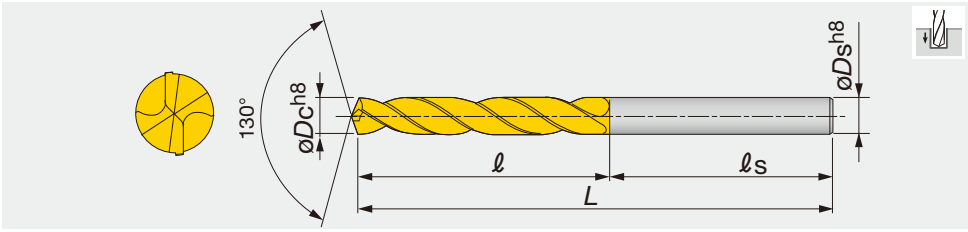
| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX156S | 15.6 | ● | 15.6 | 58 | 57 | 115 |
| DMX157S | 15.7 | ● | 15.7 | 58 | 57 | 115 |
| DMX158S | 15.8 | ● | 15.8 | 58 | 57 | 115 |
| DMX159S | 15.9 | ● | 15.9 | 58 | 57 | 115 |
| DMX160S | 16 | ● | 16 | 58 | 57 | 115 |
| DMX165S | 16.5 | ● | 16.5 | 60 | 59 | 119 |
| DMX170S | 17 | ● | 17 | 60 | 59 | 119 |
| DMX175S | 17.5 | ● | 17.5 | 62 | 61 | 123 |
| DMX180S | 18 | ● | 18 | 62 | 61 | 123 |
| DMX185S | 18.5 | ● | 18.5 | 64 | 63 | 127 |
| DMX190S | 19 | ● | 19 | 64 | 63 | 127 |
| DMX195S | 19.5 | ● | 19.5 | 66 | 65 | 131 |
| DMX200S | 20 | ● | 20 | 66 | 65 | 131 |

- Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
- Use a water-soluble cutting fluid.

● : Line up

## DMX L/D=3 (M type)

Soliddrill with 130° point angle without oil hole & shank size equal to drill dia., L/D = 3, dia = ø3 - ø20 mm




| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX030M | 3 | ● | 3 | 21 | 39 | 60 |
| DMX031M | 3.1 | ● | 3.1 | 24 | 36 | 60 |
| DMX032M | 3.2 | ● | 3.2 | 24 | 36 | 60 |
| DMX033M | 3.3 | ● | 3.3 | 24 | 36 | 60 |
| DMX034M | 3.4 | ● | 3.4 | 24 | 36 | 60 |
| DMX035M | 3.5 | ● | 3.5 | 24 | 36 | 60 |
| DMX036M | 3.6 | ● | 3.6 | 27 | 33 | 60 |
| DMX037M | 3.7 | ● | 3.7 | 27 | 33 | 60 |
| DMX038M | 3.8 | ● | 3.8 | 27 | 33 | 60 |
| DMX039M | 3.9 | ● | 3.9 | 27 | 33 | 60 |
| DMX040M | 4 | ● | 4 | 27 | 33 | 60 |
| DMX041M | 4.1 | ● | 4.1 | 29 | 34 | 63 |
| DMX042M | 4.2 | ● | 4.2 | 29 | 34 | 63 |
| DMX043M | 4.3 | ● | 4.3 | 29 | 34 | 63 |
| DMX044M | 4.4 | ● | 4.4 | 29 | 34 | 63 |
| DMX045M | 4.5 | ● | 4.5 | 29 | 34 | 63 |
| DMX046M | 4.6 | ● | 4.6 | 32 | 36 | 68 |
| DMX047M | 4.7 | ● | 4.7 | 32 | 36 | 68 |
| DMX048M | 4.8 | ● | 4.8 | 32 | 36 | 68 |
| DMX049M | 4.9 | ● | 4.9 | 32 | 36 | 68 |
| DMX050M | 5 | ● | 5 | 32 | 36 | 68 |
| DMX051M | 5.1 | ● | 5.1 | 34 | 38 | 72 |
| DMX052M | 5.2 | ● | 5.2 | 34 | 38 | 72 |
| DMX053M | 5.3 | ● | 5.3 | 34 | 38 | 72 |
| DMX054M | 5.4 | ● | 5.4 | 34 | 38 | 72 |
| DMX055M | 5.5 | ● | 5.5 | 34 | 38 | 72 |
| DMX056M | 5.6 | ● | 5.6 | 36 | 38 | 74 |
| DMX057M | 5.7 | ● | 5.7 | 36 | 38 | 74 |
| DMX058M | 5.8 | ● | 5.8 | 36 | 38 | 74 |
| DMX059M | 5.9 | ● | 5.9 | 36 | 38 | 74 |
| DMX060M | 6 | ● | 6 | 41 | 40 | 81 |
| DMX061M | 6.1 | ● | 6.1 | 41 | 40 | 81 |
| DMX062M | 6.2 | ● | 6.2 | 41 | 40 | 81 |
| DMX063M | 6.3 | ● | 6.3 | 41 | 40 | 81 |
| DMX064M | 6.4 | ● | 6.4 | 41 | 40 | 81 |
| DMX065M | 6.5 | ● | 6.5 | 41 | 40 | 81 |
| DMX066M | 6.6 | ● | 6.6 | 43 | 40 | 83 |
| DMX067M | 6.7 | ● | 6.7 | 43 | 40 | 83 |
| DMX068M | 6.8 | ● | 6.8 | 43 | 40 | 83 |
| DMX069M | 6.9 | ● | 6.9 | 43 | 40 | 83 |
| DMX070M | 7 | ● | 7 | 43 | 40 | 83 |
| DMX071M | 7.1 | ● | 7.1 | 45 | 42 | 87 |
| DMX072M | 7.2 | ● | 7.2 | 45 | 42 | 87 |
| DMX073M | 7.3 | ● | 7.3 | 45 | 42 | 87 |
| DMX074M | 7.4 | ● | 7.4 | 45 | 42 | 87 |
| DMX075M | 7.5 | ● | 7.5 | 45 | 42 | 87 |
| DMX076M | 7.6 | ● | 7.6 | 48 | 42 | 90 |
| DMX077M | 7.7 | ● | 7.7 | 48 | 42 | 90 |
| DMX078M | 7.8 | ● | 7.8 | 48 | 42 | 90 |
| DMX079M | 7.9 | ● | 7.9 | 48 | 42 | 90 |
| DMX080M | 8 | ● | 8 | 48 | 42 | 90 |
| DMX081M | 8.1 | ● | 8.1 | 53 | 43 | 96 |
| DMX082M | 8.2 | ● | 8.2 | 53 | 43 | 96 |
| DMX083M | 8.3 | ● | 8.3 | 53 | 43 | 96 |
| DMX084M | 8.4 | ● | 8.4 | 53 | 43 | 96 |
| DMX085M | 8.5 | ● | 8.5 | 53 | 43 | 96 |
| DMX086M | 8.6 | ● | 8.6 | 55 | 43 | 98 |
| DMX087M | 8.7 | ● | 8.7 | 55 | 43 | 98 |
| DMX088M | 8.8 | ● | 8.8 | 55 | 43 | 98 |
| DMX089M | 8.9 | ● | 8.9 | 55 | 43 | 98 |
| DMX090M | 9 | ● | 9 | 55 | 43 | 98 |
| DMX091M | 9.1 | ● | 9.1 | 58 | 44 | 102 |
| DMX092M | 9.2 | ● | 9.2 | 58 | 44 | 102 |

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX093M | 9.3 | ● | 9.3 | 58 | 44 | 102 |
| DMX094M | 9.4 | ● | 9.4 | 58 | 44 | 102 |
| DMX095M | 9.5 | ● | 9.5 | 58 | 44 | 102 |
| DMX096M | 9.6 | ● | 9.6 | 60 | 45 | 105 |
| DMX097M | 9.7 | ● | 9.7 | 60 | 45 | 105 |
| DMX098M | 9.8 | ● | 9.8 | 60 | 45 | 105 |
| DMX099M | 9.9 | ● | 9.9 | 60 | 45 | 105 |
| DMX100M | 10 | ● | 10 | 60 | 45 | 105 |
| DMX101M | 10.1 | ● | 10.1 | 66 | 46 | 112 |
| DMX102M | 10.2 | ● | 10.2 | 66 | 46 | 112 |
| DMX103M | 10.3 | ● | 10.3 | 66 | 46 | 112 |
| DMX104M | 10.4 | ● | 10.4 | 66 | 46 | 112 |
| DMX105M | 10.5 | ● | 10.5 | 66 | 46 | 112 |
| DMX106M | 10.6 | ● | 10.6 | 68 | 46 | 114 |
| DMX107M | 10.7 | ● | 10.7 | 68 | 46 | 114 |
| DMX108M | 10.8 | ● | 10.8 | 68 | 46 | 114 |
| DMX109M | 10.9 | ● | 10.9 | 68 | 46 | 114 |
| DMX110M | 11 | ● | 11 | 68 | 46 | 114 |
| DMX111M | 11.1 | ● | 11.1 | 71 | 47 | 118 |
| DMX112M | 11.2 | ● | 11.2 | 71 | 47 | 118 |
| DMX113M | 11.3 | ● | 11.3 | 71 | 47 | 118 |
| DMX114M | 11.4 | ● | 11.4 | 71 | 47 | 118 |
| DMX115M | 11.5 | ● | 11.5 | 71 | 47 | 118 |
| DMX116M | 11.6 | ● | 11.6 | 73 | 48 | 121 |
| DMX117M | 11.7 | ● | 11.7 | 73 | 48 | 121 |
| DMX118M | 11.8 | ● | 11.8 | 73 | 48 | 121 |
| DMX119M | 11.9 | ● | 11.9 | 73 | 48 | 121 |
| DMX120M | 12 | ● | 12 | 73 | 48 | 121 |
| DMX121M | 12.1 | ● | 12.1 | 76 | 59 | 135 |
| DMX122M | 12.2 | ● | 12.2 | 76 | 59 | 135 |
| DMX123M | 12.3 | ● | 12.3 | 76 | 59 | 135 |
| DMX124M | 12.4 | ● | 12.4 | 76 | 59 | 135 |
| DMX125M | 12.5 | ● | 12.5 | 76 | 59 | 135 |
| DMX126M | 12.6 | ● | 12.6 | 78 | 59 | 137 |
| DMX127M | 12.7 | ● | 12.7 | 78 | 59 | 137 |
| DMX128M | 12.8 | ● | 12.8 | 78 | 59 | 137 |
| DMX129M | 12.9 | ● | 12.9 | 78 | 59 | 137 |
| DMX130M | 13 | ● | 13 | 78 | 59 | 137 |
| DMX131M | 13.1 | ● | 13.1 | 84 | 60 | 144 |
| DMX132M | 13.2 | ● | 13.2 | 84 | 60 | 144 |
| DMX133M | 13.3 | ● | 13.3 | 84 | 60 | 144 |
| DMX134M | 13.4 | ● | 13.4 | 84 | 60 | 144 |
| DMX135M | 13.5 | ● | 13.5 | 84 | 60 | 144 |
| DMX136M | 13.6 | ● | 13.6 | 86 | 61 | 147 |
| DMX137M | 13.7 | ● | 13.7 | 86 | 61 | 147 |
| DMX138M | 13.8 | ● | 13.8 | 86 | 61 | 147 |
| DMX139M | 13.9 | ● | 13.9 | 86 | 61 | 147 |
| DMX140M | 14 | ● | 14 | 86 | 61 | 147 |
| DMX141M | 14.1 | ● | 14.1 | 89 | 62 | 151 |
| DMX142M | 14.2 | ● | 14.2 | 89 | 62 | 151 |
| DMX143M | 14.3 | ● | 14.3 | 89 | 62 | 151 |
| DMX144M | 14.4 | ● | 14.4 | 89 | 62 | 151 |
| DMX145M | 14.5 | ● | 14.5 | 89 | 62 | 151 |
| DMX146M | 14.6 | ● | 14.6 | 91 | 62 | 153 |
| DMX147M | 14.7 | ● | 14.7 | 91 | 62 | 153 |
| DMX148M | 14.8 | ● | 14.8 | 91 | 62 | 153 |
| DMX149M | 14.9 | ● | 14.9 | 91 | 62 | 153 |
| DMX150M | 15 | ● | 15 | 91 | 62 | 153 |
| DMX151M | 15.1 | ● | 15.1 | 94 | 63 | 157 |
| DMX152M | 15.2 | ● | 15.2 | 94 | 63 | 157 |
| DMX153M | 15.3 | ● | 15.3 | 94 | 63 | 157 |
| DMX154M | 15.4 | ● | 15.4 | 94 | 63 | 157 |
| DMX155M | 15.5 | ● | 15.5 | 94 | 63 | 157 |

● : Line up

| Designation | øDc | AH170 | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| DMX156M | 15.6 | ● | 15.6 | 96 | 64 | 160 |
| DMX157M | 15.7 | ● | 15.7 | 96 | 64 | 160 |
| DMX158M | 15.8 | ● | 15.8 | 96 | 64 | 160 |
| DMX159M | 15.9 | ● | 15.9 | 96 | 64 | 160 |
| DMX160M | 16 | ● | 16 | 96 | 64 | 160 |
| DMX165M | 16.5 | ● | 16.5 | 102 | 65 | 167 |
| DMX170M | 17 | ● | 17 | 102 | 65 | 167 |
| DMX175M | 17.5 | ● | 17.5 | 102 | 65 | 167 |
| DMX180M | 18 | ● | 18 | 102 | 65 | 167 |
| DMX185M | 18.5 | ● | 18.5 | 114 | 65 | 179 |
| DMX190M | 19 | ● | 19 | 114 | 65 | 179 |
| DMX195M | 19.5 | ● | 19.5 | 114 | 65 | 179 |
| DMX200M | 20 | ● | 20 | 114 | 65 | 179 |

- Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
- Use a water-soluble cutting fluid.

● : Line up

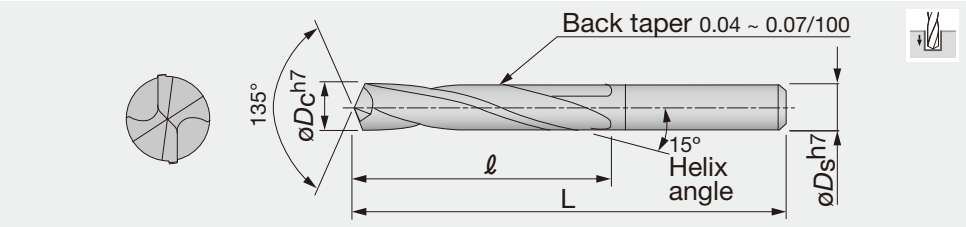
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Examples (JIS) | Hardness | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ø3 ~ ø5 | ø5 ~ ø10 | ø10 ~ ø16 | ø16 ~ ø20 |
| P | Mild steels· Low Carbon steels | SS400, etc. E275A, etc. | < 180HB | 40 - 80 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 |
| P | Carbon steels · Alloy steels | S45C, etc. C55, etc. | 180 ~ 300HB | 40 - 80 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 |
| P | High alloy steets etc. | SCM440, etc. 42CrMo4, etc. | 250 ~ 350HB | 40 - 70 | 0.1 - 0.2 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 |
| M | Stainless steels | SUS304, etc. X5CrNi18-9, etc. | < 200HB | 20 - 40 | 0.05 - 0.2 | 0.1 - 0.25 | 0.1 - 0.3 | 0.15 - 0.3 |
| K | Grey cast irons | FC300, etc. 300, etc. | < 300HB | 40 - 80 | 0.15 - 0.35 | 0.25 - 0.45 | 0.3 - 0.6 | 0.35 - 0.65 |
| K | Ductile cast irons | FCD700, etc. 600-3, etc. | < 300HB | 40 - 80 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 | 0.3 - 0.6 |
| S | Titanium alloys | Ti-6Al-4V, etc. | | 20 - 40 | 0.1- 0.2 | 0.15 - 0.25 | 0.15 - 0.3 | 0.2 - 0.4 |
| S | Heat-resistant alloys | Inconel, etc. | 250HB < | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 | 0.07 - 0.12 |
| H | High hardened steels | SKD11, etc. X153CrMoV12, etc. | < 45HRC | 10 - 30 | 0.03 - 0.07 | 0.05 - 0.1 | 0.07 - 0.12 | 0.07 - 0.12 |

Note:
- Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
- When using the smaller side of the diameter range, the feed rate should be set lower.
- When drilling difficult-to-cut materials, coolant supplying conditions are critical for successful drilling. So, the use of constant and flood coolant is highly recommended.
- For the standard DMX-type drills, somewhat large honing width intended for drilling of general steels is applied. But, when drilling difficult-to-cut materials having high hardness, requiring lowering the feed rate, the honing width should be modified.
- The drills with special honing specification are made to order on request.
- Inconel is trademark of Huntington Alloys, Inc.

## DMD-S

For hardened material drilling soliddrill with 135° point angle and 15° helix angle, without oil hole




### L/D = 3

| Designation | øDc | EM10 | ℓ | L |
|---|---|---|---|---|
| DMD-006S | 0.6 | | 5 | 40 |
| DMD-007S | 0.7 | | 6 | 40 |
| DMD-008S | 0.8 | | 6 | 40 |
| DMD-009S | 0.9 | ● | 6 | 40 |
| DMD-010S | 1 | ● | 6 | 40 |
| DMD-011S | 1.1 | | 6 | 40 |
| DMD-012S | 1.2 | | 8 | 40 |
| DMD-013S | 1.3 | | 8 | 40 |
| DMD-014S | 1.4 | | 9 | 40 |
| DMD-015S | 1.5 | | 9 | 40 |
| DMD-016S | 1.6 | | 10 | 50 |
| DMD-017S | 1.7 | | 10 | 50 |
| DMD-018S | 1.8 | | 11 | 50 |
| DMD-019S | 1.9 | | 11 | 50 |
| DMD-020S | 2 | | 12 | 50 |
| DMD-021S | 2.1 | | 12 | 50 |
| DMD-022S | 2.2 | | 13 | 50 |
| DMD-023S | 2.3 | | 13 | 50 |
| DMD-024S | 2.4 | | 14 | 50 |
| DMD-025S | 2.5 | | 14 | 50 |
| DMD-026S | 2.6 | | 14 | 50 |
| DMD-027S | 2.7 | | 16 | 50 |
| DMD-028S | 2.8 | | 16 | 50 |
| DMD-029S | 2.9 | | 16 | 50 |
| DMD-030S | 3 | ● | 16 | 50 |
| DMD-031S | 3.1 | | 18 | 55 |
| DMD-032S | 3.2 | | 18 | 55 |
| DMD-033S | 3.3 | | 18 | 55 |
| DMD-034S | 3.4 | | 20 | 55 |
| DMD-035S | 3.5 | | 20 | 55 |
| DMD-036S | 3.6 | | 20 | 55 |
| DMD-037S | 3.7 | | 22 | 55 |
| DMD-038S | 3.8 | | 22 | 55 |
| DMD-039S | 3.9 | | 22 | 55 |
| DMD-040S | 4 | | 22 | 55 |
| DMD-041S | 4.1 | | 23 | 60 |
| DMD-042S | 4.2 | | 23 | 60 |
| DMD-043S | 4.3 | | 23 | 60 |
| DMD-044S | 4.4 | | 23 | 60 |
| DMD-045S | 4.5 | | 25 | 60 |
| DMD-046S | 4.6 | | 25 | 60 |
| DMD-047S | 4.7 | | 25 | 60 |
| DMD-048S | 4.8 | | 27 | 60 |
| DMD-049S | 4.9 | | 27 | 60 |
| DMD-050S | 5 | | 27 | 60 |
| DMD-051S | 5.1 | | 28 | 65 |
| DMD-052S | 5.2 | | 28 | 65 |
| DMD-053S | 5.3 | | 28 | 65 |
| DMD-054S | 5.4 | | 30 | 65 |
| DMD-055S | 5.5 | | 30 | 65 |
| DMD-056S | 5.6 | | 32 | 65 |
| DMD-057S | 5.7 | | 32 | 65 |
| DMD-058S | 5.8 | | 35 | 65 |
| DMD-059S | 5.9 | | 35 | 65 |
| DMD-060S | 6 | | 35 | 65 |
| DMD-061S | 6.1 | | 38 | 70 |
| DMD-062S | 6.2 | | 38 | 70 |
| DMD-063S | 6.3 | | 38 | 70 |
| DMD-064S | 6.4 | | 38 | 70 |
| DMD-065S | 6.5 | | 38 | 70 |
| DMD-066S | 6.6 | | 38 | 70 |
| DMD-067S | 6.7 | | 38 | 70 |
| DMD-068S | 6.8 | | 38 | 70 |

| Designation | øDc | EM10 | ℓ | L |
|---|---|---|---|---|
| DMD-069S | 6.9 | | 38 | 70 |
| DMD-070S | 7 | | 38 | 70 |
| DMD-071S | 7.1 | | 40 | 75 |
| DMD-072S | 7.2 | | 40 | 75 |
| DMD-073S | 7.3 | | 40 | 75 |
| DMD-074S | 7.4 | | 40 | 75 |
| DMD-075S | 7.5 | | 40 | 75 |
| DMD-076S | 7.6 | | 45 | 80 |
| DMD-077S | 7.7 | | 45 | 80 |
| DMD-078S | 7.8 | | 45 | 80 |
| DMD-079S | 7.9 | | 45 | 80 |
| DMD-080S | 8 | | 45 | 80 |
| DMD-081S | 8.1 | | 50 | 85 |
| DMD-082S | 8.2 | | 50 | 85 |
| DMD-083S | 8.3 | | 50 | 85 |
| DMD-084S | 8.4 | | 50 | 85 |
| DMD-085S | 8.5 | | 50 | 85 |
| DMD-086S | 8.6 | | 50 | 85 |
| DMD-087S | 8.7 | | 50 | 85 |
| DMD-088S | 8.8 | | 50 | 85 |
| DMD-089S | 8.9 | | 50 | 85 |
| DMD-090S | 9 | | 55 | 90 |
| DMD-091S | 9.1 | | 55 | 90 |
| DMD-092S | 9.2 | | 55 | 90 |
| DMD-093S | 9.3 | | 55 | 90 |
| DMD-094S | 9.4 | | 55 | 90 |
| DMD-095S | 9.5 | | 55 | 90 |
| DMD-096S | 9.6 | | 55 | 90 |
| DMD-097S | 9.7 | | 55 | 90 |
| DMD-098S | 9.8 | | 55 | 90 |
| DMD-099S | 9.9 | | 55 | 90 |
| DMD-100S | 10 | | 60 | 100 |
| DMD-101S | 10.1 | | 60 | 100 |
| DMD-102S | 10.2 | | 60 | 100 |
| DMD-103S | 10.3 | | 60 | 100 |
| DMD-104S | 10.4 | | 60 | 100 |
| DMD-105S | 10.5 | | 60 | 100 |
| DMD-106S | 10.6 | | 60 | 100 |
| DMD-107S | 10.7 | | 60 | 100 |
| DMD-108S | 10.8 | | 60 | 100 |
| DMD-109S | 10.9 | | 60 | 100 |
| DMD-110S | 11 | | 70 | 110 |
| DMD-111S | 11.1 | | 70 | 110 |
| DMD-112S | 11.2 | | 70 | 110 |
| DMD-113S | 11.3 | | 70 | 110 |
| DMD-114S | 11.4 | | 70 | 110 |
| DMD-115S | 11.5 | | 70 | 110 |
| DMD-116S | 11.6 | | 70 | 110 |
| DMD-117S | 11.7 | | 70 | 110 |
| DMD-118S | 11.8 | | 70 | 110 |
| DMD-119S | 11.9 | | 70 | 110 |
| DMD-120S | 12 | | 80 | 120 |
| DMD-121S | 12.1 | | 80 | 120 |
| DMD-122S | 12.2 | | 80 | 120 |
| DMD-123S | 12.3 | | 80 | 120 |
| DMD-124S | 12.4 | | 80 | 120 |
| DMD-125S | 12.5 | | 80 | 120 |
| DMD-126S | 12.6 | | 80 | 120 |
| DMD-127S | 12.7 | | 80 | 120 |
| DMD-128S | 12.8 | | 80 | 120 |
| DMD-129S | 12.9 | | 80 | 120 |
| DMD-130S | 13 | | 90 | 130 |

● : Line up

| øDc | Tool diameter tolerance h7(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.01 |
| 3 < øDc ≤ 6 | 0 ~ -0.012 |
| 6 < øDc ≤ 10 | 0 ~ -0.015 |
| 10 < øDc ≤ 13 | 0 ~ -0.018 |

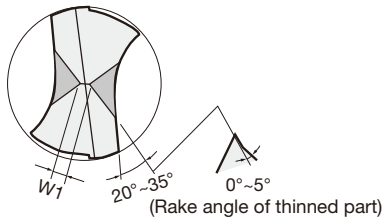
## CAUTIONARY POINTS IN USE

- The standard cutting conditions are only the general guidelines. When using on a low rigidity drilling machine, using a small diameter drill, or drilling a hard material, the cutting speed and feed rate should be set lower.
- Cutting edges should be honed as follows:
  Honing width: 0.02 to 0.05 mm
  Honing angle: - 20° to - 30°

## CAUTIONARY POINTS IN REGRINDING

- Regrinding must be carried out before the corner wear reaches the same as the margin width.
- Use of a diamond wheel (#200 to #400) is recommended. Avoid use of a silicon carbide wheel and hand grinding.
- Thin the drill point. Cross thinning shown in the figure below is recommended. The recommended thinning width (W1) is 1/3 to 1/4 times the web thickness. In this case, too sharp thinned edge may cause drill breakage.

Thinning for DMD-S drills




## STANDARD CUTTING CONDITIONS

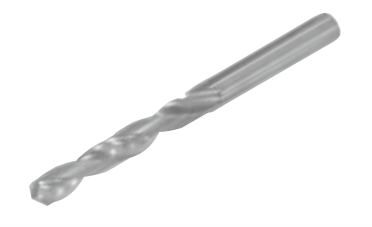
| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | Feed: *f* (mm/rev) |
|---|---|---|---|
| H | Hardened steels (< 50HRC) | 8 - 18 | 0.02 - 0.1 |
| | Hardened steels (> 50HRC) | 3 - 9 | 0.01 - 0.06 |
| P | High-manganese steels | 8 - 12 | 0.03 - 0.1 |
| S | Inconel | 10 - 20 | 0.02 - 0.08 |
| K | Chilld cast irons | 8 - 12 | 0.02 - 0.08 |

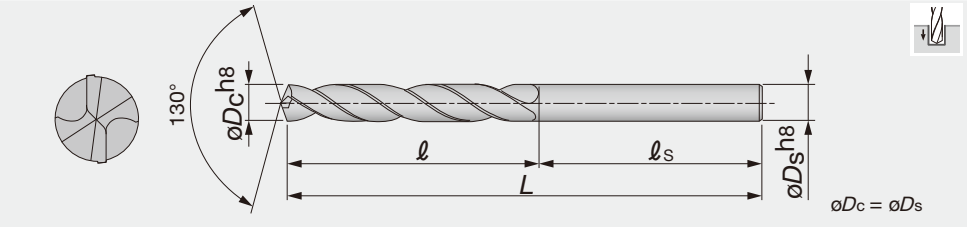
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## DMX-F

Soliddrill for aluminum and cast iron drilling, without oil hole & shank size same as diameter

### L/D = 2 (S type)






| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FS | 3 | ● | 16 | 30 | 46 |
| DMX0310FS | 3.1 | | 18 | 31 | 49 |
| DMX0320FS | 3.2 | | 18 | 31 | 49 |
| DMX0330FS | 3.3 | | 18 | 31 | 49 |
| DMX0340FS | 3.4 | ● | 20 | 32 | 52 |
| DMX0350FS | 3.5 | ● | 20 | 32 | 52 |
| DMX0360FS | 3.6 | | 20 | 32 | 52 |
| DMX0370FS | 3.7 | | 20 | 32 | 52 |
| DMX0380FS | 3.8 | | 22 | 33 | 55 |
| DMX0390FS | 3.9 | | 22 | 33 | 55 |
| DMX0400FS | 4 | ● | 22 | 33 | 55 |
| DMX0410FS | 4.1 | | 22 | 33 | 55 |
| DMX0420FS | 4.2 | | 22 | 33 | 55 |
| DMX0430FS | 4.3 | ● | 24 | 34 | 58 |
| DMX0440FS | 4.4 | | 24 | 34 | 58 |
| DMX0450FS | 4.5 | ● | 24 | 34 | 58 |
| DMX0460FS | 4.6 | | 24 | 34 | 58 |
| DMX0470FS | 4.7 | | 24 | 34 | 58 |
| DMX0480FS | 4.8 | | 26 | 34 | 62 |
| DMX0490FS | 4.9 | | 26 | 34 | 62 |
| DMX0500FS | 5 | ● | 26 | 34 | 62 |
| DMX0510FS | 5.1 | ● | 26 | 34 | 62 |
| DMX0520FS | 5.2 | | 26 | 34 | 62 |
| DMX0530FS | 5.3 | | 26 | 34 | 62 |
| DMX0540FS | 5.4 | | 28 | 38 | 66 |
| DMX0550FS | 5.5 | ● | 28 | 38 | 66 |
| DMX0560FS | 5.6 | | 28 | 38 | 66 |
| DMX0570FS | 5.7 | | 28 | 38 | 66 |
| DMX0580FS | 5.8 | | 28 | 38 | 66 |
| DMX0590FS | 5.9 | | 28 | 38 | 66 |
| DMX0600FS | 6 | ● | 28 | 38 | 66 |
| DMX0610FS | 6.1 | | 31 | 39 | 70 |
| DMX0620FS | 6.2 | | 31 | 39 | 70 |
| DMX0630FS | 6.3 | | 31 | 39 | 70 |
| DMX0640FS | 6.4 | | 31 | 39 | 70 |
| DMX0650FS | 6.5 | ● | 31 | 39 | 70 |
| DMX0660FS | 6.6 | | 31 | 39 | 70 |
| DMX0670FS | 6.7 | | 31 | 39 | 70 |
| DMX0680FS | 6.8 | ● | 34 | 40 | 74 |
| DMX0690FS | 6.9 | | 34 | 40 | 74 |
| DMX0700FS | 7 | ● | 34 | 40 | 74 |
| DMX0710FS | 7.1 | | 34 | 40 | 74 |
| DMX0720FS | 7.2 | | 34 | 40 | 74 |
| DMX0730FS | 7.3 | ● | 34 | 40 | 74 |
| DMX0740FS | 7.4 | | 34 | 40 | 74 |
| DMX0750FS | 7.5 | ● | 34 | 40 | 74 |
| DMX0760FS | 7.6 | | 37 | 42 | 79 |
| DMX0770FS | 7.7 | | 37 | 42 | 79 |
| DMX0780FS | 7.8 | | 37 | 42 | 79 |
| DMX0790FS | 7.9 | | 37 | 42 | 79 |
| DMX0800FS | 8 | ● | 37 | 42 | 79 |
| DMX0810FS | 8.1 | | 37 | 42 | 79 |
| DMX0820FS | 8.2 | | 37 | 42 | 79 |

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0830FS | 8.3 | | 37 | 42 | 79 |
| DMX0840FS | 8.4 | | 37 | 42 | 79 |
| DMX0850FS | 8.5 | ● | 37 | 42 | 79 |
| DMX0860FS | 8.6 | ● | 40 | 44 | 84 |
| DMX0870FS | 8.7 | | 40 | 44 | 84 |
| DMX0880FS | 8.8 | ● | 40 | 44 | 84 |
| DMX0890FS | 8.9 | | 40 | 44 | 84 |
| DMX0900FS | 9 | ● | 40 | 44 | 84 |
| DMX0910FS | 9.1 | | 40 | 44 | 84 |
| DMX0920FS | 9.2 | | 40 | 44 | 84 |
| DMX0930FS | 9.3 | | 40 | 44 | 84 |
| DMX0940FS | 9.4 | | 40 | 44 | 84 |
| DMX0950FS | 9.5 | ● | 40 | 44 | 84 |
| DMX0960FS | 9.6 | ● | 43 | 46 | 89 |
| DMX0970FS | 9.7 | | 43 | 46 | 89 |
| DMX0980FS | 9.8 | | 43 | 46 | 89 |
| DMX0990FS | 9.9 | | 43 | 46 | 89 |
| DMX1000FS | 10 | ● | 43 | 46 | 89 |
| DMX1010FS | 10.1 | | 43 | 46 | 89 |
| DMX1020FS | 10.2 | | 43 | 46 | 89 |
| DMX1030FS | 10.3 | ● | 43 | 46 | 89 |
| DMX1040FS | 10.4 | | 43 | 46 | 89 |
| DMX1050FS | 10.5 | ● | 43 | 46 | 89 |
| DMX1060FS | 10.6 | | 43 | 46 | 89 |
| DMX1070FS | 10.7 | | 47 | 48 | 95 |
| DMX1080FS | 10.8 | | 47 | 48 | 95 |
| DMX1090FS | 10.9 | | 47 | 48 | 95 |
| DMX1100FS | 11 | ● | 47 | 48 | 95 |
| DMX1110FS | 11.1 | | 47 | 48 | 95 |
| DMX1120FS | 11.2 | | 47 | 48 | 95 |
| DMX1130FS | 11.3 | | 47 | 48 | 95 |
| DMX1140FS | 11.4 | | 47 | 48 | 95 |
| DMX1150FS | 11.5 | ● | 47 | 48 | 95 |
| DMX1160FS | 11.6 | | 47 | 48 | 95 |
| DMX1170FS | 11.7 | | 47 | 48 | 95 |
| DMX1180FS | 11.8 | | 47 | 48 | 95 |
| DMX1190FS | 11.9 | | 51 | 51 | 102 |
| DMX1200FS | 12 | ● | 51 | 51 | 102 |
| DMX1210FS | 12.1 | | 51 | 51 | 102 |
| DMX1220FS | 12.2 | | 51 | 51 | 102 |
| DMX1230FS | 12.3 | | 51 | 51 | 102 |
| DMX1240FS | 12.4 | | 51 | 51 | 102 |
| DMX1250FS | 12.5 | ● | 51 | 51 | 102 |
| DMX1260FS | 12.6 | | 51 | 51 | 102 |
| DMX1270FS | 12.7 | | 51 | 51 | 102 |
| DMX1280FS | 12.8 | | 51 | 51 | 102 |
| DMX1290FS | 12.9 | | 51 | 51 | 102 |
| DMX1300FS | 13 | ● | 51 | 51 | 102 |
| DMX1310FS | 13.1 | | 51 | 51 | 102 |
| DMX1320FS | 13.2 | | 51 | 51 | 102 |
| DMX1330FS | 13.3 | | 54 | 53 | 107 |
| DMX1340FS | 13.4 | | 54 | 53 | 107 |
| DMX1350FS | 13.5 | ● | 54 | 53 | 107 |

● : Line up

## L/D = 2 (S type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX1360FS | 13.6 | | 54 | 53 | 107 |
| DMX1370FS | 13.7 | | 54 | 53 | 107 |
| DMX1380FS | 13.8 | | 54 | 53 | 107 |
| DMX1390FS | 13.9 | | 54 | 53 | 107 |
| DMX1400FS | 14 | ● | 54 | 53 | 107 |

| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.014 |
| 3 < øDc ≤ 6 | 0 ~ -0.018 |
| 6 < øDc ≤ 10 | 0 ~ -0.022 |
| 10 < øDc ≤ 18 | 0 ~ -0.027 |
| 18 < øDc ≤ 20 | 0 ~ -0.033 |

## L/D = 3 (M type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FM | 3 | ● | 21 | 39 | 60 |
| DMX0310FM | 3.1 | | 24 | 36 | 60 |
| DMX0320FM | 3.2 | | 24 | 36 | 60 |
| DMX0330FM | 3.3 | | 24 | 36 | 60 |
| DMX0340FM | 3.4 | ● | 24 | 36 | 60 |
| DMX0350FM | 3.5 | ● | 24 | 36 | 60 |
| DMX0360FM | 3.6 | | 27 | 33 | 60 |
| DMX0370FM | 3.7 | | 27 | 33 | 60 |
| DMX0380FM | 3.8 | | 27 | 33 | 60 |
| DMX0390FM | 3.9 | | 27 | 33 | 60 |
| DMX0400FM | 4 | ● | 27 | 33 | 60 |
| DMX0410FM | 4.1 | | 29 | 34 | 63 |
| DMX0420FM | 4.2 | | 29 | 34 | 63 |
| DMX0430FM | 4.3 | ● | 29 | 34 | 63 |
| DMX0440FM | 4.4 | | 29 | 34 | 63 |
| DMX0450FM | 4.5 | ● | 29 | 34 | 63 |
| DMX0460FM | 4.6 | | 32 | 36 | 68 |
| DMX0470FM | 4.7 | | 32 | 36 | 68 |
| DMX0480FM | 4.8 | | 32 | 36 | 68 |
| DMX0490FM | 4.9 | | 32 | 36 | 68 |
| DMX0500FM | 5 | ● | 32 | 36 | 68 |
| DMX0510FM | 5.1 | ● | 34 | 38 | 72 |
| DMX0520FM | 5.2 | | 34 | 38 | 72 |
| DMX0530FM | 5.3 | | 34 | 38 | 72 |
| DMX0540FM | 5.4 | | 34 | 38 | 72 |
| DMX0550FM | 5.5 | ● | 34 | 38 | 72 |
| DMX0560FM | 5.6 | | 36 | 38 | 74 |
| DMX0570FM | 5.7 | | 36 | 38 | 74 |
| DMX0580FM | 5.8 | | 36 | 38 | 74 |
| DMX0590FM | 5.9 | | 36 | 38 | 74 |
| DMX0600FM | 6 | ● | 41 | 40 | 81 |
| DMX0610FM | 6.1 | | 41 | 40 | 81 |
| DMX0620FM | 6.2 | | 41 | 40 | 81 |
| DMX0630FM | 6.3 | | 41 | 40 | 81 |
| DMX0640FM | 6.4 | | 41 | 40 | 81 |
| DMX0650FM | 6.5 | ● | 41 | 40 | 81 |
| DMX0660FM | 6.6 | | 43 | 40 | 83 |
| DMX0670FM | 6.7 | | 43 | 40 | 83 |
| DMX0680FM | 6.8 | ● | 43 | 40 | 83 |
| DMX0690FM | 6.9 | | 43 | 40 | 83 |
| DMX0700FM | 7 | ● | 43 | 40 | 83 |
| DMX0710FM | 7.1 | | 45 | 42 | 87 |
| DMX0720FM | 7.2 | | 45 | 42 | 87 |
| DMX0730FM | 7.3 | | 45 | 42 | 87 |
| DMX0740FM | 7.4 | | 45 | 42 | 87 |
| DMX0750FM | 7.5 | ● | 45 | 42 | 87 |
| DMX0760FM | 7.6 | | 48 | 42 | 90 |
| DMX0770FM | 7.7 | | 48 | 42 | 90 |
| DMX0780FM | 7.8 | | 48 | 42 | 90 |
| DMX0790FM | 7.9 | | 48 | 42 | 90 |
| DMX0800FM | 8 | ● | 48 | 42 | 90 |
| DMX0810FM | 8.1 | | 53 | 43 | 96 |
| DMX0820FM | 8.2 | | 53 | 43 | 96 |
| DMX0830FM | 8.3 | | 53 | 43 | 96 |
| DMX0840FM | 8.4 | | 53 | 43 | 96 |
| DMX0850FM | 8.5 | ● | 53 | 43 | 96 |
| DMX0860FM | 8.6 | ● | 55 | 43 | 98 |
| DMX0870FM | 8.7 | | 55 | 43 | 98 |
| DMX0880FM | 8.8 | | 55 | 43 | 98 |
| DMX0890FM | 8.9 | | 55 | 43 | 98 |
| DMX0900FM | 9 | ● | 55 | 43 | 98 |

● : Line up

# DMX-F

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0910FM | 9.1 | | 58 | 44 | 102 |
| DMX0920FM | 9.2 | | 58 | 44 | 102 |
| DMX0930FM | 9.3 | | 58 | 44 | 102 |
| DMX0940FM | 9.4 | | 58 | 44 | 102 |
| DMX0950FM | 9.5 | ● | 58 | 44 | 102 |
| DMX0960FM | 9.6 | | 60 | 45 | 105 |
| DMX0970FM | 9.7 | | 60 | 45 | 105 |
| DMX0980FM | 9.8 | | 60 | 45 | 105 |
| DMX0990FM | 9.9 | | 60 | 45 | 105 |
| DMX1000FM | 10 | ● | 60 | 45 | 105 |
| DMX1010FM | 10.1 | | 66 | 46 | 112 |
| DMX1020FM | 10.2 | | 66 | 46 | 112 |
| DMX1030FM | 10.3 | ● | 66 | 46 | 112 |
| DMX1040FM | 10.4 | | 66 | 46 | 112 |
| DMX1050FM | 10.5 | ● | 66 | 46 | 112 |
| DMX1060FM | 10.6 | | 68 | 46 | 114 |
| DMX1070FM | 10.7 | | 68 | 46 | 114 |
| DMX1080FM | 10.8 | | 68 | 46 | 114 |
| DMX1090FM | 10.9 | | 68 | 46 | 114 |
| DMX1100FM | 11 | ● | 68 | 46 | 114 |
| DMX1110FM | 11.1 | | 71 | 47 | 118 |
| DMX1120FM | 11.2 | | 71 | 47 | 118 |
| DMX1130FM | 11.3 | | 71 | 47 | 118 |
| DMX1140FM | 11.4 | | 71 | 47 | 118 |
| DMX1150FM | 11.5 | ● | 71 | 47 | 118 |
| DMX1160FM | 11.6 | | 73 | 48 | 121 |
| DMX1170FM | 11.7 | | 73 | 48 | 121 |
| DMX1180FM | 11.8 | | 73 | 48 | 121 |
| DMX1190FM | 11.9 | | 73 | 48 | 121 |
| DMX1200FM | 12 | ● | 73 | 48 | 121 |
| DMX1210FM | 12.1 | | 76 | 59 | 135 |
| DMX1220FM | 12.2 | | 76 | 59 | 135 |
| DMX1230FM | 12.3 | | 76 | 59 | 135 |
| DMX1240FM | 12.4 | | 76 | 59 | 135 |
| DMX1250FM | 12.5 | ● | 76 | 59 | 135 |
| DMX1260FM | 12.6 | | 78 | 59 | 137 |
| DMX1270FM | 12.7 | | 78 | 59 | 137 |
| DMX1280FM | 12.8 | | 78 | 59 | 137 |
| DMX1290FM | 12.9 | | 78 | 59 | 137 |
| DMX1300FM | 13 | ● | 78 | 59 | 137 |
| DMX1310FM | 13.1 | | 84 | 60 | 144 |
| DMX1320FM | 13.2 | | 84 | 60 | 144 |
| DMX1330FM | 13.3 | | 84 | 60 | 144 |
| DMX1340FM | 13.4 | | 84 | 60 | 144 |
| DMX1350FM | 13.5 | ● | 84 | 60 | 144 |
| DMX1360FM | 13.6 | | 86 | 61 | 147 |
| DMX1370FM | 13.7 | | 86 | 61 | 147 |
| DMX1380FM | 13.8 | | 86 | 61 | 147 |
| DMX1390FM | 13.9 | | 86 | 61 | 147 |
| DMX1400FM | 14 | ● | 86 | 61 | 147 |

| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.014 |
| 3 < øDc ≤ 6 | 0 ~ -0.018 |
| 6 < øDc ≤ 10 | 0 ~ -0.022 |
| 10 < øDc ≤ 18 | 0 ~ -0.027 |
| 18 < øDc ≤ 20 | 0 ~ -0.033 |

## L/D = 5 (L type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0300FL | 3 | ● | 27 | 39 | 66 |
| DMX0310FL | 3.1 | | 31 | 36 | 67 |
| DMX0320FL | 3.2 | | 31 | 36 | 67 |
| DMX0330FL | 3.3 | ● | 31 | 36 | 67 |
| DMX0340FL | 3.4 | ● | 31 | 36 | 67 |
| DMX0350FL | 3.5 | ● | 31 | 36 | 67 |
| DMX0360FL | 3.6 | | 35 | 33 | 68 |
| DMX0370FL | 3.7 | | 35 | 33 | 68 |
| DMX0380FL | 3.8 | | 35 | 33 | 68 |
| DMX0390FL | 3.9 | | 35 | 33 | 68 |
| DMX0400FL | 4 | ● | 35 | 33 | 68 |
| DMX0410FL | 4.1 | | 38 | 34 | 72 |
| DMX0420FL | 4.2 | ● | 38 | 34 | 72 |
| DMX0430FL | 4.3 | ● | 38 | 34 | 72 |
| DMX0440FL | 4.4 | | 38 | 34 | 72 |
| DMX0450FL | 4.5 | ● | 38 | 34 | 72 |
| DMX0460FL | 4.6 | | 42 | 36 | 78 |
| DMX0470FL | 4.7 | | 42 | 36 | 78 |
| DMX0480FL | 4.8 | | 42 | 36 | 78 |
| DMX0490FL | 4.9 | | 42 | 36 | 78 |
| DMX0500FL | 5 | ● | 42 | 36 | 78 |
| DMX0510FL | 5.1 | ● | 45 | 38 | 83 |
| DMX0520FL | 5.2 | | 45 | 38 | 83 |
| DMX0530FL | 5.3 | | 45 | 38 | 83 |
| DMX0540FL | 5.4 | | 45 | 38 | 83 |
| DMX0550FL | 5.5 | ● | 45 | 38 | 83 |
| DMX0560FL | 5.6 | | 48 | 38 | 86 |
| DMX0570FL | 5.7 | | 48 | 38 | 86 |
| DMX0580FL | 5.8 | | 48 | 38 | 86 |
| DMX0590FL | 5.9 | | 48 | 38 | 86 |
| DMX0600FL | 6 | ● | 54 | 40 | 94 |
| DMX0610FL | 6.1 | | 54 | 40 | 94 |
| DMX0620FL | 6.2 | | 54 | 40 | 94 |
| DMX0630FL | 6.3 | ● | 54 | 40 | 94 |
| DMX0640FL | 6.4 | | 54 | 40 | 94 |
| DMX0650FL | 6.5 | ● | 54 | 40 | 94 |
| DMX0660FL | 6.6 | | 57 | 40 | 97 |
| DMX0670FL | 6.7 | | 57 | 40 | 97 |
| DMX0680FL | 6.8 | ● | 57 | 40 | 97 |
| DMX0690FL | 6.9 | | 57 | 40 | 97 |
| DMX0700FL | 7 | ● | 57 | 40 | 97 |
| DMX0710FL | 7.1 | | 60 | 42 | 102 |
| DMX0720FL | 7.2 | | 60 | 42 | 102 |
| DMX0730FL | 7.3 | | 60 | 42 | 102 |
| DMX0740FL | 7.4 | | 60 | 42 | 102 |
| DMX0750FL | 7.5 | ● | 60 | 42 | 102 |
| DMX0760FL | 7.6 | | 64 | 42 | 106 |
| DMX0770FL | 7.7 | | 64 | 42 | 106 |
| DMX0780FL | 7.8 | | 64 | 42 | 106 |
| DMX0790FL | 7.9 | | 64 | 42 | 106 |
| DMX0800FL | 8 | ● | 64 | 42 | 106 |
| DMX0810FL | 8.1 | | 70 | 43 | 113 |
| DMX0820FL | 8.2 | | 70 | 43 | 113 |
| DMX0830FL | 8.3 | | 70 | 43 | 113 |
| DMX0840FL | 8.4 | | 70 | 43 | 113 |
| DMX0850FL | 8.5 | ● | 70 | 43 | 113 |
| DMX0860FL | 8.6 | ● | 73 | 43 | 116 |
| DMX0870FL | 8.7 | | 73 | 43 | 116 |
| DMX0880FL | 8.8 | | 73 | 43 | 116 |
| DMX0890FL | 8.9 | | 73 | 43 | 116 |
| DMX0900FL | 9 | ● | 73 | 43 | 116 |

● : Line up

## L/D = 5 (L type)

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX0910FL | 9.1 | | 77 | 44 | 121 |
| DMX0920FL | 9.2 | | 77 | 44 | 121 |
| DMX0930FL | 9.3 | | 77 | 44 | 121 |
| DMX0940FL | 9.4 | | 77 | 44 | 121 |
| DMX0950FL | 9.5 | ● | 77 | 44 | 121 |
| DMX0960FL | 9.6 | | 80 | 45 | 125 |
| DMX0970FL | 9.7 | ● | 80 | 45 | 125 |
| DMX0980FL | 9.8 | | 80 | 45 | 125 |
| DMX0990FL | 9.9 | | 80 | 45 | 125 |
| DMX1000FL | 10 | ● | 80 | 45 | 125 |
| DMX1010FL | 10.1 | | 87 | 46 | 133 |
| DMX1020FL | 10.2 | | 87 | 46 | 133 |
| DMX1030FL | 10.3 | ● | 87 | 46 | 133 |
| DMX1040FL | 10.4 | | 87 | 46 | 133 |
| DMX1050FL | 10.5 | ● | 87 | 46 | 133 |
| DMX1060FL | 10.6 | | 90 | 46 | 136 |
| DMX1070FL | 10.7 | | 90 | 46 | 136 |
| DMX1080FL | 10.8 | | 90 | 46 | 136 |
| DMX1090FL | 10.9 | | 90 | 46 | 136 |
| DMX1100FL | 11 | ● | 90 | 46 | 136 |
| DMX1110FL | 11.1 | | 94 | 47 | 141 |
| DMX1120FL | 11.2 | | 94 | 47 | 141 |
| DMX1130FL | 11.3 | | 94 | 47 | 141 |
| DMX1140FL | 11.4 | | 94 | 47 | 141 |
| DMX1150FL | 11.5 | ● | 94 | 47 | 141 |
| DMX1160FL | 11.6 | | 97 | 48 | 145 |
| DMX1170FL | 11.7 | | 97 | 48 | 145 |
| DMX1180FL | 11.8 | | 97 | 48 | 145 |
| DMX1190FL | 11.9 | | 97 | 48 | 145 |
| DMX1200FL | 12 | ● | 97 | 48 | 145 |
| DMX1210FL | 12.1 | | 101 | 59 | 160 |
| DMX1220FL | 12.2 | | 101 | 59 | 160 |
| DMX1230FL | 12.3 | | 101 | 59 | 160 |
| DMX1240FL | 12.4 | | 101 | 59 | 160 |
| DMX1250FL | 12.5 | ● | 101 | 59 | 160 |
| DMX1260FL | 12.6 | | 104 | 59 | 163 |
| DMX1270FL | 12.7 | | 104 | 59 | 163 |
| DMX1280FL | 12.8 | | 104 | 59 | 163 |
| DMX1290FL | 12.9 | | 104 | 59 | 163 |
| DMX1300FL | 13 | ● | 104 | 59 | 163 |
| DMX1310FL | 13.1 | | 111 | 60 | 171 |
| DMX1320FL | 13.2 | | 111 | 60 | 171 |
| DMX1330FL | 13.3 | | 111 | 60 | 171 |
| DMX1340FL | 13.4 | | 111 | 60 | 171 |
| DMX1350FL | 13.5 | ● | 111 | 60 | 171 |
| DMX1360FL | 13.6 | | 114 | 61 | 175 |
| DMX1370FL | 13.7 | | 114 | 61 | 175 |
| DMX1380FL | 13.8 | | 114 | 61 | 175 |
| DMX1390FL | 13.9 | | 114 | 61 | 175 |
| DMX1400FL | 14 | ● | 114 | 61 | 175 |
| DMX1410FL | 14.1 | | 118 | 62 | 180 |
| DMX1420FL | 14.2 | ● | 118 | 62 | 180 |
| DMX1430FL | 14.3 | | 118 | 62 | 180 |
| DMX1440FL | 14.4 | | 118 | 62 | 180 |
| DMX1450FL | 14.5 | | 118 | 62 | 180 |
| DMX1460FL | 14.6 | | 121 | 62 | 183 |
| DMX1470FL | 14.7 | | 121 | 62 | 183 |
| DMX1480FL | 14.8 | | 121 | 62 | 183 |
| DMX1490FL | 14.9 | | 121 | 62 | 183 |
| DMX1500FL | 15 | | 121 | 62 | 183 |

| Designation | øDc | MD20 | ℓ | ℓs | L |
|---|---|---|---|---|---|
| DMX1510FL | 15.1 | | 125 | 63 | 188 |
| DMX1520FL | 15.2 | | 125 | 63 | 188 |
| DMX1530FL | 15.3 | | 125 | 63 | 188 |
| DMX1540FL | 15.4 | | 125 | 63 | 188 |
| DMX1550FL | 15.5 | | 125 | 63 | 188 |
| DMX1560FL | 15.6 | | 128 | 64 | 192 |
| DMX1570FL | 15.7 | | 128 | 64 | 192 |
| DMX1580FL | 15.8 | | 128 | 64 | 192 |
| DMX1590FL | 15.9 | | 128 | 64 | 192 |
| DMX1600FL | 16 | | 128 | 64 | 192 |
| DMX1650FL | 16.5 | | 136 | 65 | 201 |
| DMX1700FL | 17 | | 136 | 65 | 201 |
| DMX1750FL | 17.5 | | 136 | 65 | 201 |
| DMX1800FL | 18 | | 136 | 65 | 201 |
| DMX1850FL | 18.5 | | 152 | 65 | 217 |
| DMX1900FL | 19 | | 152 | 65 | 217 |
| DMX1950FL | 19.5 | | 152 | 65 | 217 |
| DMX2000FL | 20 | | 152 | 65 | 217 |

● : Line up

| øDc | Tool diameter tolerance h8(mm) |
|---|---|
| $øD_c \leq 3$ | 0 ~ -0.014 |
| $3 < øD_c \leq 6$ | 0 ~ -0.018 |
| $6 < øD_c \leq 10$ | 0 ~ -0.022 |
| $10 < øD_c \leq 18$ | 0 ~ -0.027 |
| $18 < øD_c \leq 20$ | 0 ~ -0.033 |

## STANDARD DRILLING CONDITIONS

| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | Feed: *f* (mm/rev) ø3 ~ ø5 | ø5 ~ ø10 | ø10 ~ ø16 | ø16 ~ ø20 |
|---|---|---|---|---|---|---|
| N | Aluminium alloys | 60 - 120 | 0.2 - 0.4 | 0.3 - 0.5 | 0.4 - 0.6 | 0.5 - 0.7 |
| K | Grey cast irons | 40 - 80 | 0.15 - 0.35 | 0.25 - 0.45 | 0.3 - 0.6 | 0.35 - 0.65 |
| | Ductile cast irons | 30 - 70 | 0.15 - 0.3 | 0.2 - 0.4 | 0.25 - 0.5 | 0.3 - 0.6 |

Notes:
- The above table shows standard and typical cutting conditions for DMX - FM type drills.
- Because the cutting conditions may be changed depending on the material type, hardness, machinability, machine tool, and coolant, the most appropriate conditions must be decided whilst referring the chip control condition and tool failure mode.
- When using the smaller side of the diameter range, the feed rate should be set lower.
- When working with long overhang or using "L" type drills, the feed rate should be set lower.

| Low | Feed *f* | High |
|---|---|---|
| Small dia. L type (Long) | Drill dia. Overhang of drill | Large dia. S type (Short) |

## NOTE ON CUTTING FLUID

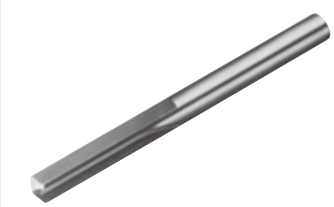
- Cutting fluid should be sufficiently supplied to the drill point and the entrance of the hole.
- Use a water soluble cutting fluid containing relatively high content of extreme pressure additive for heavy duty cutting or use a water insoluble cutting fluid.

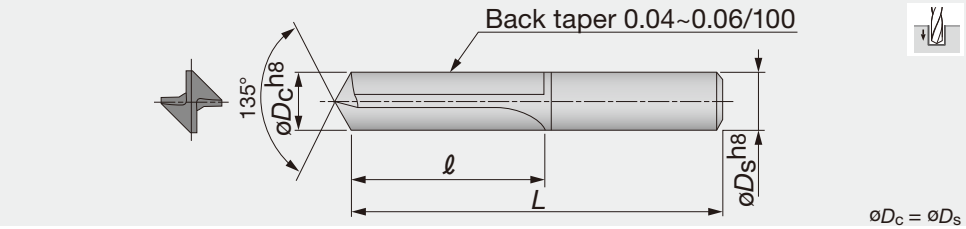
- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## FDS

Straight flute soliddrill for pre-tap hole drilling of aluminum, without oil hole

### L/D = 2 (S type)






### For tapped holes

| Designation | øDc | Tolerance | G1F | ℓ | L | Application |
|---|---|---|---|---|---|---|
| FDS0257 | 2.57 | 0 - 0.014 | ● | 18 | 60 | M3 |
| FDS0337 | 3.37 | 0 - 0.018 | ● | 18 | 60 | M4 |
| FDS0429 | 4.29 | 0 - 0.018 | ● | 23 | 70 | M5 |
| FDS0511 | 5.11 | 0 - 0.018 | ● | 28 | 80 | M6 |
| FDS0683 | 6.83 | 0 - 0.022 | ● | 36 | 90 | M8 |
| FDS0860 | 8.6 | 0 - 0.022 | ● | 46 | 110 | M10 |

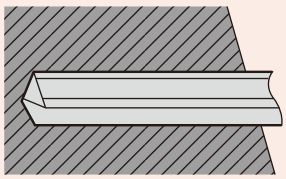
### For bolt holes

| Designation | øDc | Tolerance | G1F | ℓ | L | Application |
|---|---|---|---|---|---|---|
| FDS0340 | 3.4 | 0 - 0.018 | ● | 18 | 60 | M3 |
| FDS0450 | 4.5 | 0 - 0.018 | ● | 23 | 70 | M4 |
| FDS0550 | 5.5 | 0 - 0.018 | | 28 | 80 | M5 |
| FDS0660 | 6.6 | 0 - 0.022 | ● | 36 | 90 | M6 |
| FDS0900 | 9 | 0 - 0.022 | | 46 | 110 | M8 |
| FDS1100 | 11 | 0 - 0.027 | ● | 55 | 120 | M10 |

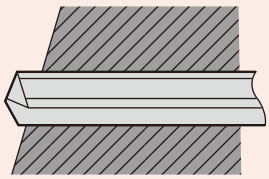
● : Line up

Notes:
- Other sized drills and step type drills can be made to order.
- When ordering, specify the diameter, overall length, shank specifications of the drill, the work material to be drilled, and the drilling depth.

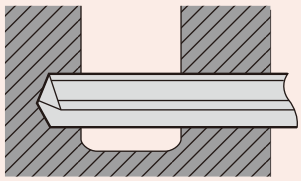
## APPLICATION EXAMPLES OF FD DRILLS (EFFECTIVE FOR FOLLOWING OPERATIONS)



Drilling into angled face



Drilling through angled face



Interrupted drilling

## STANDARD CUTTING CONDIOTIONS

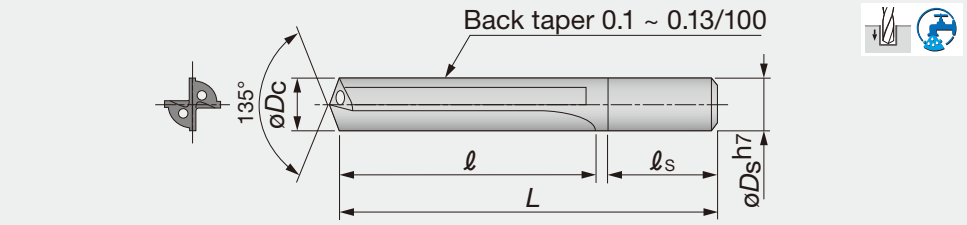
| ISO | Workpiece material | Cutting speed: Vc (m/min) | Feed: f (mm/rev) |
|---|---|---|---|
| N | Aluminium alloys (Brittle) | 50 - 80 | 0.1 - 0.3 |
| | Aluminium alloys (Sticky) | 40 - 60 | 0.1 - 0.2 |
| K | Grey cast irons | 40 - 60 | 0.1 - 0.3 |
| | Ductile cast irons | 30 - 50 | 0.08 - 0.2 |

Note : Use a water soluble emulsion type cutting fluid.
Excessive run out as mounted on the machine may affect drilled hole accuracies and tool life.
(Holding with a scroll chuck is not recommended.)

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## FDC

Straight flute soliddrill for high feed drilling of aluminum and cast iron, with oil hole




### L/D = 5 (S type)

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0500S | 5 | | 5 | 40 | 38 | 80 |
| FDC0510S | 5.1 | ● | 6 | 44 | 40 | 85 |
| FDC0520S | 5.2 | | 6 | 44 | 40 | 85 |
| FDC0530S | 5.3 | | 6 | 44 | 40 | 85 |
| FDC0540S | 5.4 | | 6 | 44 | 40 | 85 |
| FDC0550S | 5.5 | | 6 | 44 | 40 | 85 |
| FDC0560S | 5.6 | | 6 | 48 | 40 | 90 |
| FDC0570S | 5.7 | | 6 | 48 | 40 | 90 |
| FDC0580S | 5.8 | | 6 | 48 | 40 | 90 |
| FDC0590S | 5.9 | | 6 | 48 | 40 | 90 |
| FDC0600S | 6 | ● | 6 | 48 | 40 | 90 |
| FDC0610S | 6.1 | | 7 | 52 | 40 | 95 |
| FDC0620S | 6.2 | | 7 | 52 | 40 | 95 |
| FDC0630S | 6.3 | | 7 | 52 | 40 | 95 |
| FDC0640S | 6.4 | | 7 | 52 | 40 | 95 |
| FDC0650S | 6.5 | | 7 | 52 | 40 | 95 |
| FDC0660S | 6.6 | | 7 | 56 | 40 | 100 |
| FDC0670S | 6.7 | | 7 | 56 | 40 | 100 |
| FDC0680S | 6.8 | | 7 | 56 | 40 | 100 |
| FDC0690S | 6.9 | | 7 | 56 | 40 | 100 |
| FDC0700S | 7 | | 7 | 56 | 40 | 100 |
| FDC0710S | 7.1 | | 8 | 60 | 42 | 105 |
| FDC0720S | 7.2 | | 8 | 60 | 42 | 105 |
| FDC0730S | 7.3 | | 8 | 60 | 42 | 105 |
| FDC0740S | 7.4 | | 8 | 60 | 42 | 105 |
| FDC0750S | 7.5 | | 8 | 60 | 42 | 105 |
| FDC0760S | 7.6 | | 8 | 64 | 42 | 110 |
| FDC0770S | 7.7 | | 8 | 64 | 42 | 110 |
| FDC0780S | 7.8 | | 8 | 64 | 42 | 110 |
| FDC0790S | 7.9 | | 8 | 64 | 42 | 110 |
| FDC0800S | 8 | | 8 | 64 | 42 | 110 |
| FDC0810S | 8.1 | | 9 | 68 | 44 | 115 |
| FDC0820S | 8.2 | | 9 | 68 | 44 | 115 |
| FDC0830S | 8.3 | | 9 | 68 | 44 | 115 |
| FDC0840S | 8.4 | ● | 9 | 68 | 44 | 115 |
| FDC0850S | 8.5 | | 9 | 68 | 44 | 115 |
| FDC0860S | 8.6 | ● | 9 | 72 | 44 | 120 |
| FDC0870S | 8.7 | | 9 | 72 | 44 | 120 |
| FDC0880S | 8.8 | | 9 | 72 | 44 | 120 |
| FDC0890S | 8.9 | | 9 | 72 | 44 | 120 |
| FDC0900S | 9 | | 9 | 72 | 44 | 120 |
| FDC0910S | 9.1 | | 10 | 76 | 44 | 125 |
| FDC0920S | 9.2 | | 10 | 76 | 44 | 125 |
| FDC0930S | 9.3 | | 10 | 76 | 44 | 125 |
| FDC0940S | 9.4 | | 10 | 76 | 44 | 125 |
| FDC0950S | 9.5 | | 10 | 76 | 44 | 125 |
| FDC0960S | 9.6 | | 10 | 80 | 46 | 130 |
| FDC0970S | 9.7 | | 10 | 80 | 46 | 130 |
| FDC0980S | 9.8 | | 10 | 80 | 46 | 130 |
| FDC0990S | 9.9 | | 10 | 80 | 46 | 130 |
| FDC1000S | 10 | | 10 | 80 | 46 | 130 |

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC1050S | 10.5 | ● | 11 | 84 | 46 | 140 |
| FDC1100S | 11 | ● | 11 | 88 | 46 | 140 |
| FDC1150S | 11.5 | ● | 12 | 92 | 48 | 150 |
| FDC1200S | 12 | ● | 12 | 96 | 48 | 150 |
| FDC1250S | 12.5 | ● | 13 | 100 | 50 | 160 |
| FDC1300S | 13 | ● | 13 | 104 | 50 | 160 |
| FDC1350S | 13.5 | ● | 14 | 108 | 52 | 170 |
| FDC1400S | 14 | ● | 14 | 112 | 52 | 170 |
| FDC1450S | 14.5 | ● | 15 | 116 | 54 | 180 |
| FDC1500S | 15 | ● | 15 | 120 | 54 | 180 |
| FDC1550S | 15.5 | ● | 16 | 124 | 56 | 190 |
| FDC1600S | 16 | ● | 16 | 128 | 56 | 190 |

| øDc | Tool diameter tolerance(mm) |
|---|---|
| 5 ≤ øDc ≤ 6 | +0.02 ~ +0.01 |
| 6 < øDc ≤ 16 | +0.025 ~ +0.015 |

● : Line up

## FDC

### L/D = 8 (L type)

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0500L | 5 | ● | 5 | 55 | 38 | 95 |
| FDC0510L | 5.1 | | 6 | 61 | 40 | 105 |
| FDC0520L | 5.2 | | 6 | 61 | 40 | 105 |
| FDC0530L | 5.3 | | 6 | 61 | 40 | 105 |
| FDC0540L | 5.4 | | 6 | 61 | 40 | 105 |
| FDC0550L | 5.5 | ● | 6 | 61 | 40 | 105 |
| FDC0560L | 5.6 | | 6 | 66 | 40 | 110 |
| FDC0570L | 5.7 | | 6 | 66 | 40 | 110 |
| FDC0580L | 5.8 | | 6 | 66 | 40 | 110 |
| FDC0590L | 5.9 | | 6 | 66 | 40 | 110 |
| FDC0600L | 6 | ● | 6 | 66 | 40 | 110 |
| FDC0610L | 6.1 | | 7 | 72 | 40 | 115 |
| FDC0620L | 6.2 | ● | 7 | 72 | 40 | 115 |
| FDC0630L | 6.3 | | 7 | 72 | 40 | 115 |
| FDC0640L | 6.4 | | 7 | 72 | 40 | 115 |
| FDC0650L | 6.5 | ● | 7 | 72 | 40 | 115 |
| FDC0660L | 6.6 | | 7 | 77 | 40 | 120 |
| FDC0670L | 6.7 | | 7 | 77 | 40 | 120 |
| FDC0680L | 6.8 | ● | 7 | 77 | 40 | 120 |
| FDC0690L | 6.9 | | 7 | 77 | 40 | 120 |
| FDC0700L | 7 | ● | 7 | 77 | 40 | 120 |
| FDC0710L | 7.1 | | 8 | 83 | 42 | 125 |
| FDC0720L | 7.2 | | 8 | 83 | 42 | 125 |
| FDC0730L | 7.3 | | 8 | 83 | 42 | 125 |
| FDC0740L | 7.4 | | 8 | 83 | 42 | 125 |
| FDC0750L | 7.5 | ● | 8 | 83 | 42 | 125 |

| Designation | øDc | G1F | øDs | ℓ | ℓs | L |
|---|---|---|---|---|---|---|
| FDC0760L | 7.6 | | 8 | 88 | 42 | 130 |
| FDC0770L | 7.7 | | 8 | 88 | 42 | 130 |
| FDC0780L | 7.8 | ● | 8 | 88 | 42 | 130 |
| FDC0790L | 7.9 | | 8 | 88 | 42 | 130 |
| FDC0800L | 8 | ● | 8 | 88 | 42 | 130 |
| FDC0810L | 8.1 | | 9 | 94 | 44 | 140 |
| FDC0820L | 8.2 | | 9 | 94 | 44 | 140 |
| FDC0830L | 8.3 | | 9 | 94 | 44 | 140 |
| FDC0840L | 8.4 | | 9 | 94 | 44 | 140 |
| FDC0850L | 8.5 | ● | 9 | 94 | 44 | 140 |
| FDC0860L | 8.6 | ● | 9 | 99 | 44 | 145 |
| FDC0870L | 8.7 | | 9 | 99 | 44 | 145 |
| FDC0880L | 8.8 | | 9 | 99 | 44 | 145 |
| FDC0890L | 8.9 | | 9 | 99 | 44 | 145 |
| FDC0900L | 9 | ● | 9 | 99 | 44 | 145 |
| FDC0910L | 9.1 | | 10 | 105 | 44 | 150 |
| FDC0920L | 9.2 | | 10 | 105 | 44 | 150 |
| FDC0930L | 9.3 | | 10 | 105 | 44 | 150 |
| FDC0940L | 9.4 | | 10 | 105 | 44 | 150 |
| FDC0950L | 9.5 | ● | 10 | 105 | 44 | 150 |
| FDC0960L | 9.6 | | 10 | 110 | 46 | 160 |
| FDC0970L | 9.7 | | 10 | 110 | 46 | 160 |
| FDC0980L | 9.8 | | 10 | 110 | 46 | 160 |
| FDC0990L | 9.9 | | 10 | 110 | 46 | 160 |
| FDC1000L | 10 | ● | 10 | 110 | 46 | 160 |

● : Line up

| øDc | Tool diameter tolerance (mm) |
|---|---|
| 5 ≤ øDc ≤ 6 | +0.02 ~ +0.01 |
| 6 < øDc ≤ 10 | +0.025 ~ +0.015 |

### Cutting fluid

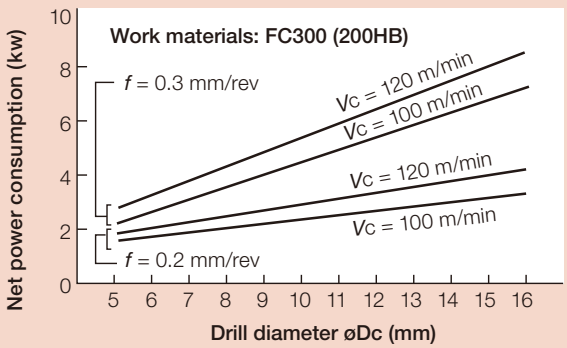
- Supply the cutting fluid through the drill.
- The required fluid pressure is 0.5 to 1.0 MPa
- Use a water soluble cutting fluid containing a large amount of extreme pressure additive.

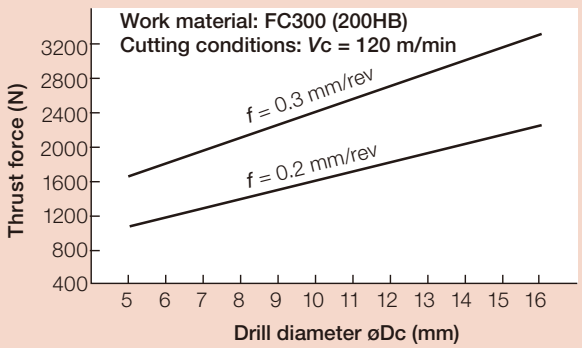
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed: *Vc* (m/min) | | | Feed: *f* (mm/rev) | | |
|---|---|---|---|---|---|---|---|
| | | ø5 ~ ø8 | ø8 ~ ø12 | ø12 ~ ø16 | ø5 ~ ø8 | ø8 ~ ø12 | ø12 ~ ø16 |
| N | Aluminium alloys | 100 - 140 | 120 - 160 | 140 - 180 | 0.1 - 0.25 | 0.15 - 0.3 | 0.15 - 0.3 |
| K | Grey Cast irons | 90 - 120 | 110 - 140 | 130 - 160 | 0.1 - 0.25 | 0.2 - 0.3 | 0.2 - 0.30 |
| | Ductile cast irons | 60 - 80 | 70 - 90 | 70 - 100 | 0.1 - 0.25 | 0.15 - 0.3 | 0.15 - 0.3 |

**Caution:**
When changing a tool, completely clean the chips which may be clogging in the collet or adapter.
Note:
The cutting conditions shown left may vary depending on the work material, coolant dilution ratio and coolant supply pressure used.

## CUTTING PERFORMANCE

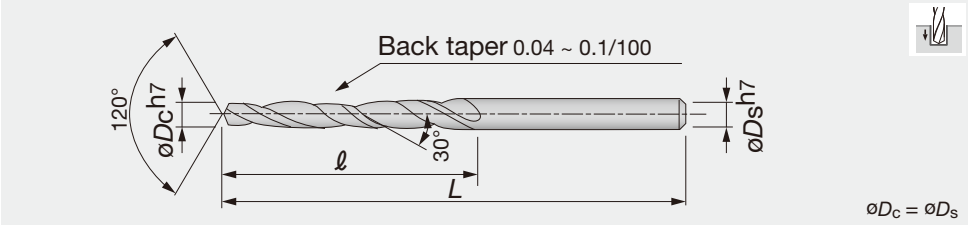



- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

## CDS

Soliddrill for aluminum and cast iron with 120° point angle, without oil hole and shank size as diameter for hole depths up to L/D 12




| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-004 | 0.4 | ● | 6 | 30 |
| CDS-0045 | 0.45 | | 6 | 30 |
| CDS-005 | 0.5 | ● | 6 | 30 |
| CDS-0055 | 0.55 | | 6 | 30 |
| CDS-006 | 0.6 | ● | 6 | 30 |
| CDS-0065 | 0.65 | | 6 | 30 |
| CDS-007 | 0.7 | ● | 6 | 30 |
| CDS-0075 | 0.75 | | 6 | 30 |
| CDS-008 | 0.8 | ● | 8 | 30 |
| CDS-0085 | 0.85 | | 8 | 30 |
| CDS-009 | 0.9 | ● | 8 | 30 |
| CDS-0095 | 0.95 | | 10 | 38 |
| CDS-010 | 1 | ● | 10 | 38 |
| CDS-0105 | 1.05 | | 10 | 38 |
| CDS-011 | 1.1 | ● | 10 | 38 |
| CDS-0115 | 1.15 | | 10 | 38 |
| CDS-012 | 1.2 | ● | 10 | 38 |
| CDS-0125 | 1.25 | | 10 | 38 |
| CDS-013 | 1.3 | ● | 10 | 38 |
| CDS-0135 | 1.35 | | 10 | 38 |
| CDS-014 | 1.4 | ● | 10 | 38 |
| CDS-0145 | 1.45 | | 10 | 38 |
| CDS-015 | 1.5 | ● | 10 | 38 |
| CDS-0155 | 1.55 | | 22 | 45 |
| CDS-016 | 1.6 | ● | 22 | 45 |
| CDS-0165 | 1.65 | | 22 | 45 |
| CDS-017 | 1.7 | ● | 22 | 45 |
| CDS-0175 | 1.75 | | 22 | 45 |
| CDS-018 | 1.8 | ● | 22 | 45 |
| CDS-0185 | 1.85 | | 22 | 45 |
| CDS-019 | 1.9 | ● | 22 | 45 |
| CDS-0195 | 1.95 | | 22 | 45 |
| CDS-020 | 2 | ● | 22 | 45 |
| CDS-0205 | 2.05 | | 22 | 45 |
| CDS-021 | 2.1 | ● | 22 | 45 |
| CDS-0215 | 2.15 | | 22 | 45 |
| CDS-022 | 2.2 | ● | 22 | 45 |
| CDS-0225 | 2.25 | | 22 | 45 |
| CDS-023 | 2.3 | ● | 22 | 45 |
| CDS-0235 | 2.35 | | 22 | 45 |
| CDS-024 | 2.4 | ● | 22 | 45 |
| CDS-0245 | 2.45 | | 22 | 45 |
| CDS-025 | 2.5 | ● | 22 | 45 |
| CDS-0255 | 2.55 | ● | 22 | 45 |
| CDS-026 | 2.6 | ● | 22 | 45 |
| CDS-0265 | 2.65 | | 25 | 45 |
| CDS-027 | 2.7 | ● | 25 | 45 |
| CDS-0275 | 2.75 | | 25 | 45 |
| CDS-028 | 2.8 | ● | 25 | 45 |
| CDS-0285 | 2.85 | | 25 | 45 |
| CDS-029 | 2.9 | ● | 25 | 45 |
| CDS-0295 | 2.95 | | 25 | 45 |
| CDS-030 | 3 | ● | 25 | 45 |

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-0305 | 3.05 | | 27 | 50 |
| CDS-031 | 3.1 | ● | 27 | 50 |
| CDS-0315 | 3.15 | | 27 | 50 |
| CDS-032 | 3.2 | ● | 27 | 50 |
| CDS-0325 | 3.25 | | 27 | 50 |
| CDS-033 | 3.3 | ● | 27 | 50 |
| CDS-0335 | 3.35 | | 27 | 50 |
| CDS-034 | 3.4 | ● | 27 | 50 |
| CDS-0345 | 3.45 | | 27 | 50 |
| CDS-035 | 3.5 | ● | 27 | 55 |
| CDS-0355 | 3.55 | | 30 | 55 |
| CDS-036 | 3.6 | ● | 30 | 55 |
| CDS-0365 | 3.65 | | 30 | 55 |
| CDS-037 | 3.7 | ● | 30 | 55 |
| CDS-0375 | 3.75 | | 30 | 55 |
| CDS-038 | 3.8 | ● | 30 | 55 |
| CDS-0385 | 3.85 | | 30 | 55 |
| CDS-039 | 3.9 | ● | 30 | 55 |
| CDS-0395 | 3.95 | | 30 | 55 |
| CDS-040 | 4 | ● | 30 | 55 |
| CDS-0405 | 4.05 | | 34 | 60 |
| CDS-041 | 4.1 | ● | 34 | 60 |
| CDS-0415 | 4.15 | | 34 | 60 |
| CDS-042 | 4.2 | ● | 34 | 60 |
| CDS-0425 | 4.25 | | 34 | 60 |
| CDS-043 | 4.3 | ● | 34 | 60 |
| CDS-0435 | 4.35 | | 34 | 60 |
| CDS-044 | 4.4 | ● | 34 | 60 |
| CDS-0445 | 4.45 | | 34 | 60 |
| CDS-045 | 4.5 | ● | 34 | 60 |
| CDS-0455 | 4.55 | | 34 | 60 |
| CDS-046 | 4.6 | ● | 34 | 60 |
| CDS-0465 | 4.65 | | 34 | 60 |
| CDS-047 | 4.7 | ● | 34 | 60 |
| CDS-0475 | 4.75 | | 34 | 60 |
| CDS-048 | 4.8 | ● | 34 | 60 |
| CDS-0485 | 4.85 | | 34 | 60 |
| CDS-049 | 4.9 | ● | 34 | 60 |
| CDS-0495 | 4.95 | | 34 | 60 |
| CDS-050 | 5 | ● | 34 | 60 |
| CDS-0505 | 5.05 | | 38 | 65 |
| CDS-051 | 5.1 | ● | 38 | 65 |
| CDS-0515 | 5.15 | | 38 | 65 |
| CDS-052 | 5.2 | ● | 38 | 65 |
| CDS-0525 | 5.25 | | 38 | 65 |
| CDS-053 | 5.3 | ● | 38 | 65 |
| CDS-0535 | 5.35 | | 38 | 65 |
| CDS-054 | 5.4 | ● | 38 | 65 |
| CDS-0545 | 5.45 | | 38 | 65 |
| CDS-055 | 5.5 | ● | 38 | 65 |
| CDS-0555 | 5.55 | | 40 | 70 |
| CDS-056 | 5.6 | ● | 40 | 70 |
| CDS-0565 | 5.65 | | 40 | 70 |

● : Line up

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-057 | 5.7 | ● | 40 | 70 |
| CDS-0575 | 5.75 | | 40 | 70 |
| CDS-058 | 5.8 | ● | 40 | 70 |
| CDS-0585 | 5.85 | | 40 | 70 |
| CDS-059 | 5.9 | ● | 40 | 70 |
| CDS-0595 | 5.95 | | 40 | 70 |
| CDS-060 | 6 | ● | 40 | 70 |
| CDS-0605 | 6.05 | | 43 | 75 |
| CDS-0610 | 6.1 | | 43 | 75 |
| CDS-0615 | 6.15 | | 43 | 75 |
| CDS-062 | 6.2 | ● | 43 | 75 |
| CDS-0625 | 6.25 | | 43 | 75 |
| CDS-0630 | 6.3 | | 43 | 75 |
| CDS-0635 | 6.35 | | 43 | 75 |
| CDS-064 | 6.4 | ● | 43 | 75 |
| CDS-0645 | 6.45 | | 43 | 75 |
| CDS-065 | 6.5 | ● | 43 | 75 |
| CDS-0655 | 6.55 | | 46 | 80 |
| CDS-066 | 6.6 | ● | 46 | 80 |
| CDS-0665 | 6.65 | | 46 | 80 |
| CDS-0670 | 6.7 | | 46 | 80 |
| CDS-0675 | 6.75 | | 46 | 80 |
| CDS-068 | 6.8 | ● | 46 | 80 |
| CDS-0685 | 6.85 | | 46 | 80 |
| CDS-0690 | 6.9 | | 46 | 80 |
| CDS-0695 | 6.95 | | 46 | 80 |
| CDS-070 | 7 | ● | 46 | 80 |
| CDS-0705 | 7.05 | | 46 | 80 |
| CDS-0710 | 7.1 | | 46 | 80 |
| CDS-0715 | 7.15 | | 46 | 80 |
| CDS-072 | 7.2 | ● | 46 | 80 |
| CDS-0725 | 7.25 | | 46 | 80 |
| CDS-0730 | 7.3 | | 46 | 80 |
| CDS-0735 | 7.35 | | 46 | 80 |
| CDS-074 | 7.4 | ● | 46 | 80 |
| CDS-0745 | 7.45 | | 46 | 80 |
| CDS-075 | 7.5 | ● | 46 | 80 |
| CDS-0755 | 7.55 | | 50 | 85 |
| CDS-076 | 7.6 | ● | 50 | 85 |
| CDS-0765 | 7.65 | | 50 | 85 |
| CDS-0770 | 7.7 | | 50 | 85 |
| CDS-0775 | 7.75 | | 50 | 85 |
| CDS-078 | 7.8 | ● | 50 | 85 |
| CDS-0785 | 7.85 | | 50 | 85 |
| CDS-0790 | 7.9 | | 50 | 85 |
| CDS-0795 | 7.95 | | 50 | 85 |
| CDS-080 | 8 | ● | 50 | 85 |
| CDS-0805 | 8.05 | | 53 | 85 |
| CDS-0810 | 8.1 | | 53 | 85 |
| CDS-0815 | 8.15 | | 53 | 85 |
| CDS-0820 | 8.2 | | 53 | 85 |
| CDS-0825 | 8.25 | | 53 | 85 |
| CDS-0830 | 8.3 | | 53 | 85 |
| CDS-0835 | 8.35 | | 53 | 85 |
| CDS-0840 | 8.4 | | 53 | 85 |
| CDS-0845 | 8.45 | | 53 | 85 |
| CDS-085 | 8.5 | ● | 53 | 85 |
| CDS-0855 | 8.55 | | 53 | 85 |
| CDS-0860 | 8.6 | | 53 | 85 |
| CDS-0865 | 8.65 | | 53 | 85 |
| CDS-0870 | 8.7 | | 53 | 85 |
| CDS-0875 | 8.75 | | 53 | 85 |
| CDS-0880 | 8.8 | | 53 | 85 |
| CDS-0885 | 8.85 | | 53 | 85 |

| Designation | øDc | UM | ℓ | L |
|---|---|---|---|---|
| CDS-0890 | 8.9 | | 53 | 85 |
| CDS-0895 | 8.95 | | 53 | 85 |
| CDS-090 | 9 | ● | 53 | 85 |
| CDS-0905 | 9.05 | | 60 | 90 |
| CDS-0910 | 9.1 | | 60 | 90 |
| CDS-0915 | 9.15 | | 60 | 90 |
| CDS-0920 | 9.2 | | 60 | 90 |
| CDS-0925 | 9.25 | | 60 | 90 |
| CDS-0930 | 9.3 | | 60 | 90 |
| CDS-0935 | 9.35 | | 60 | 90 |
| CDS-0940 | 9.4 | | 60 | 90 |
| CDS-0945 | 9.45 | | 60 | 90 |
| CDS-095 | 9.5 | ● | 60 | 90 |
| CDS-0955 | 9.55 | | 60 | 90 |
| CDS-0960 | 9.6 | | 60 | 90 |
| CDS-0965 | 9.65 | | 60 | 90 |
| CDS-0970 | 9.7 | | 60 | 90 |
| CDS-0975 | 9.75 | | 60 | 90 |
| CDS-0980 | 9.8 | | 60 | 90 |
| CDS-0985 | 9.85 | | 60 | 90 |
| CDS-0990 | 9.9 | | 60 | 90 |
| CDS-0995 | 9.95 | | 60 | 90 |
| CDS-100 | 10 | ● | 60 | 90 |
| CDS-1010 | 10.1 | | 80 | 120 |
| CDS-1020 | 10.2 | | 80 | 120 |
| CDS-1030 | 10.3 | | 80 | 120 |
| CDS-1040 | 10.4 | | 80 | 120 |
| CDS-1050 | 10.5 | | 80 | 120 |
| CDS-1060 | 10.6 | | 80 | 120 |
| CDS-1070 | 10.7 | | 80 | 120 |
| CDS-1080 | 10.8 | | 80 | 120 |
| CDS-1090 | 10.9 | | 80 | 120 |
| CDS-1100 | 11 | | 80 | 120 |
| CDS-1110 | 11.1 | | 80 | 120 |
| CDS-1120 | 11.2 | | 80 | 120 |
| CDS-1130 | 11.3 | | 80 | 120 |
| CDS-1140 | 11.4 | | 80 | 120 |
| CDS-1150 | 11.5 | | 80 | 120 |
| CDS-1160 | 11.6 | | 80 | 120 |
| CDS-1170 | 11.7 | | 80 | 120 |
| CDS-1180 | 11.8 | | 80 | 120 |
| CDS-1190 | 11.9 | | 80 | 120 |
| CDS-1200 | 12 | | 80 | 120 |
| CDS-1210 | 12.1 | | 80 | 120 |
| CDS-1220 | 12.2 | | 80 | 120 |
| CDS-1230 | 12.3 | | 80 | 120 |
| CDS-1240 | 12.4 | | 80 | 120 |
| CDS-1250 | 12.5 | | 80 | 120 |
| CDS-1260 | 12.6 | | 80 | 120 |
| CDS-1270 | 12.7 | | 80 | 120 |
| CDS-1280 | 12.8 | | 80 | 120 |
| CDS-1290 | 12.9 | | 80 | 120 |
| CDS-1300 | 13 | | 80 | 120 |

| øDc | Tool diameter tolerance h7(mm) |
|---|---|
| øDc ≤ 3 | 0 ~ -0.01 |
| 3 < øDc ≤ 6 | 0 ~ -0.012 |
| 6 < øDc ≤ 10 | 0 ~ -0.015 |
| 10 < øDc ≤ 13 | 0 ~ -0.018 |

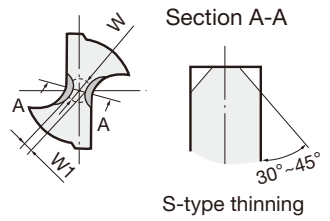
● : Line up

## CAUTIONARY NOTES

- To prevent edge chipping, hone cutting edges as follows: Honing width: 0.02 ~ 0.05 mm Honing angle: -20˚ to -30˚. Chipping is likely to occur on edges whilst drilling hard materials, a larger honing width is recommended.
- When drilling into an inclined surface, special care should be taken to prevent drill breakage. Use of drill bushing is recommended for such case.

## REGRINDING

- Carry out regrinding when corner wear reaches the margin width.
- Avoid using silicon carbide grinding wheels or hand grinding whenever possible.Use diamond grinding wheels of 200 to 400 mesh.
- Apply web thinning for the drill above ø6 mm. S-type thinning shown in figure at right is recommended. Preferable thinning width (W1) is about 1/2 to 1/3 of web thickness (W).



S-type thinning

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed: *Vc* (m/min) ø0.4 ~ ø2 | ø2 ~ ø13 | Feed: *f* (mm/rev) ø0.4 ~ ø1 | ø1 ~ ø2 | ø2 ~ ø3 | ø3 ~ ø5 | ø5 ~ ø13 |
|---|---|---|---|---|---|---|---|---|
| K | Grey cast irons (200HB) | 20 - 40 | 30 - 50 | 0.005 - 0.03 | 0.01 - 0.06 | 0.03 - 0.12 | 0.05 - 0.15 | 0.1 - 0.4 |
| K | Ductile cast irons (300HB) | 20 - 40 | 30 - 50 | 0.005 - 0.02 | 0.01 - 0.05 | 0.03 - 0.1 | 0.03 - 0.1 | 0.07 - 0.25 |
| N | Aluminium alloys | 20 - 50 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |
| N | Copper alloys | 20 - 50 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |
| N | Reinforced plastics | 20 - 40 | 30 - 50 | 0.01 - 0.05 | 0.04 - 0.15 | 0.06 - 0.2 | 0.1 - 0.25 | 0.15 - 0.5 |

- No. of revolutions ($min^{-1}$) = Cutting speed × 1000 ÷ 3.14 ÷ Tool diameter
- Table feed (mm/min) = No. of revolutions × Feed per revolution

MEMO

# DrillLine - Indexable Drill

## TUNGSIX-DRILL

E072

Indexable drill with 6-cutting-edged insert for high productivity

ø20 mm - ø54 mm / L/D = 2, 3, 4

## TUNGDRILLTWISTED

E080

Indexable drills with 4-cornered inserts for various drilling applications

ø12.5 mm - ø54 mm / L/D = 2, 3, 4, 5

## TUNGDRILLBIG

E092

Large-diameter drills with cartridges applicable for both the TungSix-Drill or TungDrill-Twisted inserts

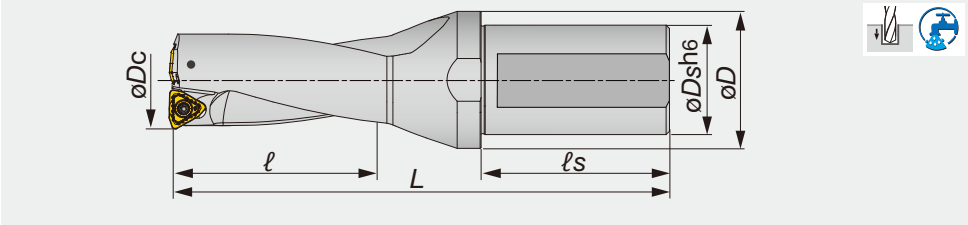
ø55 mm - ø80 mm / L/D = 2.5

TungSix-Drill

# TUNGSIX-DRILL

## TDS-F L/D=2 (Flat)

L/D = 2, Flat, Tool dia. ø20 - ø54 mm




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset** (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-2 | 20 | 25 | 32 | 40 | 54 | 115 | 1 | 0.3 | WWMU05X205R-D* |
| TDS205F25-2 | 20.5 | 25 | 32 | 41 | 54 | 116.5 | 0.9 | 0.3 | WWMU05X205R-D* |
| TDS210F25-2 | 21 | 25 | 32 | 42 | 54 | 118 | 0.8 | 0.3 | WWMU05X205R-D* |
| TDS215F25-2 | 21.5 | 25 | 32 | 43 | 54 | 119 | 0.6 | 0.3 | WWMU05X205R-D* |
| TDS220F25-2 | 22 | 25 | 32 | 44 | 54 | 120 | 0.5 | 0.3 | WWMU05X205R-D* |
| TDS225F25-2 | 22.5 | 25 | 37 | 45 | 54 | 121.5 | 0.4 | 0.3 | WWMU05X205R-D* |
| TDS230F25-2 | 23 | 25 | 37 | 46 | 54 | 123 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-2 | 23.5 | 25 | 37 | 47 | 54 | 124 | 0.2 | 0.4 | WWMU05X205R-D* |
| TDS240F25-2 | 24 | 25 | 37 | 48 | 54 | 125 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS245F25-2 | 24.5 | 25 | 37 | 49 | 54 | 126.5 | 1 | 0.4 | WWMU060306R-D* |
| TDS250F25-2 | 25 | 25 | 37 | 50 | 54 | 128 | 0.8 | 0.4 | WWMU060306R-D* |
| TDS255F25-2 | 25.5 | 25 | 37 | 51 | 54 | 129.5 | 0.6 | 0.4 | WWMU060306R-D* |
| TDS260F25-2 | 26 | 25 | 37 | 52 | 54 | 131 | 0.5 | 0.4 | WWMU060306R-D* |
| TDS270F32-2 | 27 | 32 | 40 | 54 | 59 | 138 | 0.3 | 0.6 | WWMU060306R-D* |
| TDS280F32-2 | 28 | 32 | 40 | 56 | 59 | 141 | 1.3 | 0.6 | WWMU08X408R-D* |
| TDS290F32-2 | 29 | 32 | 40 | 58 | 59 | 143 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS300F32-2 | 30 | 32 | 40 | 60 | 59 | 146 | 0.8 | 0.7 | WWMU08X408R-D* |
| TDS310F32-2 | 31 | 32 | 40 | 62 | 59 | 149 | 0.5 | 0.7 | WWMU08X408R-D* |
| TDS320F32-2 | 32 | 32 | 40 | 64 | 59 | 151 | 0.2 | 0.8 | WWMU08X408R-D* |
| TDS330F40-2 | 33 | 40 | 50 | 66 | 69 | 164 | 1.7 | 1.2 | WWMU09X510R-D* |
| TDS340F40-2 | 34 | 40 | 50 | 68 | 69 | 167 | 1.4 | 1.2 | WWMU09X510R-D* |
| TDS350F40-2 | 35 | 40 | 50 | 70 | 69 | 170 | 1.2 | 1.2 | WWMU09X510R-D* |
| TDS360F40-2 | 36 | 40 | 50 | 72 | 69 | 173 | 0.9 | 1.3 | WWMU09X510R-D* |
| TDS370F40-2 | 37 | 40 | 50 | 74 | 69 | 174 | 0.7 | 1.3 | WWMU09X510R-D* |
| TDS380F40-2 | 38 | 40 | 50 | 76 | 69 | 177 | 0.4 | 1.3 | WWMU09X510R-D* |
| TDS390F40-2 | 39 | 40 | 50 | 78 | 69 | 179 | 2.2 | 1.4 | WWMU11X512R-D* |
| TDS400F40-2 | 40 | 40 | 50 | 80 | 69 | 182 | 1.9 | 1.4 | WWMU11X512R-D* |
| TDS410F40-2 | 41 | 40 | 50 | 82 | 69 | 186 | 1.7 | 1.5 | WWMU11X512R-D* |
| TDS420F40-2 | 42 | 40 | 55 | 84 | 69 | 188 | 1.5 | 1.6 | WWMU11X512R-D* |
| TDS430F40-2 | 43 | 40 | 55 | 86 | 69 | 191 | 1.3 | 1.6 | WWMU11X512R-D* |
| TDS440F40-2 | 44 | 40 | 55 | 88 | 69 | 193 | 1 | 1.7 | WWMU11X512R-D* |
| TDS450F40-2 | 45 | 40 | 55 | 90 | 69 | 196 | 0.7 | 1.7 | WWMU11X512R-D* |
| TDS460F40-2 | 46 | 40 | 55 | 92 | 69 | 199 | 0.4 | 1.8 | WWMU11X512R-D* |
| TDS470F40-2 | 47 | 40 | 55 | 94 | 69 | 201 | 2.6 | 1.9 | WWMU13X512R-D* |
| TDS480F40-2 | 48 | 40 | 55 | 96 | 69 | 204 | 2.4 | 1.9 | WWMU13X512R-D* |
| TDS490F40-2 | 49 | 40 | 55 | 98 | 69 | 206 | 2.2 | 1.9 | WWMU13X512R-D* |
| TDS500F40-2 | 50 | 40 | 55 | 100 | 69 | 209 | 2 | 2 | WWMU13X512R-D* |
| TDS510F40-2 | 51 | 40 | 55 | 102 | 69 | 213 | 1.7 | 2.1 | WWMU13X512R-D* |
| TDS520F40-2 | 52 | 40 | 55 | 104 | 69 | 215 | 1.5 | 2.2 | WWMU13X512R-D* |
| TDS530F40-2 | 53 | 40 | 55 | 106 | 69 | 218 | 1.3 | 2.3 | WWMU13X512R-D* |
| TDS540F40-2 | 54 | 40 | 55 | 108 | 69 | 220 | 1 | 2.4 | WWMU13X512R-D* |

** For offsetting on lathe

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

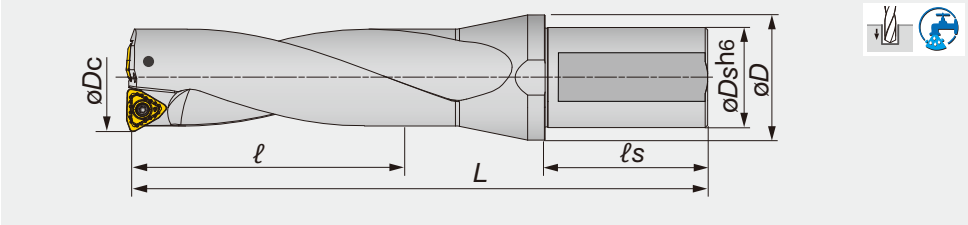
| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.25 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

*Just for reference

# TUNGSIX-DRILL

## TDS-F L/D=3 (Flat)

L/D = 3, Flat, Tool dia. ø20 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset** (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-3 | 20 | 25 | 32 | 60 | 54 | 135 | 1 | 0.3 | WWMU05X205R-D* |
| TDS205F25-3 | 20.5 | 25 | 32 | 61.5 | 54 | 136 | 0.9 | 0.3 | WWMU05X205R-D* |
| TDS209F25-3 (1) | 20.9 | 25 | 32 | 62.7 | 54 | 138 | 0.8 | 0.3 | WWMU05X205R-D* |
| TDS210F25-3 | 21 | 25 | 32 | 63 | 54 | 138 | 0.8 | 0.4 | WWMU05X205R-D* |
| TDS215F25-3 | 21.5 | 25 | 32 | 64.5 | 54 | 140 | 0.6 | 0.4 | WWMU05X205R-D* |
| TDS220F25-3 | 22 | 25 | 32 | 66 | 54 | 141 | 0.5 | 0.4 | WWMU05X205R-D* |
| TDSU0875F25-3 (2) | 22.2 | 25 | 32 | 66 | 54 | 141 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS225F25-3 | 22.5 | 25 | 37 | 67.5 | 54 | 144 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS230F25-3 | 23 | 25 | 37 | 69 | 54 | 145 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-3 | 23.5 | 25 | 37 | 70.5 | 54 | 147 | 0.2 | 0.4 | WWMU05X205R-D* |
| TDS239F25-3 (1) | 23.9 | 25 | 37 | 71.7 | 54 | 149 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS240F25-3 | 24 | 25 | 37 | 72 | 54 | 149 | 1.2 | 0.4 | WWMU060306R-D* |
| TDS245F25-3 | 24.5 | 25 | 37 | 73.5 | 54 | 151 | 1 | 0.5 | WWMU060306R-D* |
| TDS250F25-3 | 25 | 25 | 37 | 75 | 54 | 153 | 0.8 | 0.5 | WWMU060306R-D* |
| TDS255F25-3 | 25.5 | 25 | 37 | 76.5 | 54 | 154 | 0.6 | 0.5 | WWMU060306R-D* |
| TDS260F25-3 (1) | 26 | 25 | 37 | 78 | 54 | 156 | 0.5 | 0.5 | WWMU060306R-D* |
| TDS264F32-3 | 26.4 | 32 | 40 | 79.2 | 59 | 162.5 | 0.4 | 0.6 | WWMU060306R-D* |
| TDS265F32-3 | 26.5 | 32 | 40 | 79.5 | 59 | 162.5 | 0.4 | 0.6 | WWMU060306R-D* |
| TDS270F32-3 | 27 | 32 | 40 | 81 | 59 | 164 | 0.3 | 0.6 | WWMU060306R-D* |
| TDS275F32-3 | 27.5 | 32 | 40 | 82 | 59 | 167 | 0 | 0.6 | WWMU08X408R-D* |
| TDS280F32-3 | 28 | 32 | 40 | 84 | 59 | 168 | 1.3 | 0.7 | WWMU08X408R-D* |
| TDS285F32-3 | 28.5 | 32 | 40 | 85 | 59 | 170 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDSU1125F32-3 (2) | 28.6 | 32 | 40 | 86 | 59 | 171 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS290F32-3 | 29 | 32 | 40 | 87 | 59 | 171 | 1.1 | 0.7 | WWMU08X408R-D* |
| TDS295F32-3 | 29.5 | 32 | 40 | 88 | 59 | 175 | 0.8 | 0.7 | WWMU08X408R-D* |
| TDS300F32-3 | 30 | 32 | 40 | 90 | 59 | 176 | 0.8 | 0.8 | WWMU08X408R-D* |
| TDS305F32-3 | 30.5 | 32 | 40 | 91 | 59 | 180 | 0.5 | 0.8 | WWMU08X408R-D* |
| TDS310F32-3 | 31 | 32 | 40 | 93 | 59 | 180 | 0.5 | 0.8 | WWMU08X408R-D* |
| TDSU1250F32-3 (2) | 31.8 | 32 | 40 | 95 | 59 | 183 | 0.2 | 0.8 | WWMU08X408R-D* |
| TDS320F32-3 | 32 | 32 | 40 | 96 | 59 | 183 | 0.2 | 0.9 | WWMU08X408R-D* |
| TDS330F40-3 | 33 | 40 | 50 | 99 | 69 | 197 | 1.7 | 1.3 | WWMU09X510R-D* |
| TDS340F40-3 | 34 | 40 | 50 | 102 | 69 | 200 | 1.4 | 1.3 | WWMU09X510R-D* |
| TDS350F40-3 | 35 | 40 | 50 | 105 | 69 | 204 | 1.2 | 1.3 | WWMU09X510R-D* |
| TDS360F40-3 | 36 | 40 | 50 | 108 | 69 | 208 | 0.9 | 1.4 | WWMU09X510R-D* |
| TDS370F40-3 | 37 | 40 | 50 | 111 | 69 | 211 | 0.7 | 1.4 | WWMU09X510R-D* |
| TDS380F40-3 | 38 | 40 | 50 | 114 | 69 | 215 | 0.4 | 1.5 | WWMU09X510R-D* |
| TDS390F40-3 | 39 | 40 | 50 | 117 | 69 | 218 | 2.2 | 1.6 | WWMU11X512R-D* |
| TDS400F40-3 | 40 | 40 | 50 | 120 | 69 | 222 | 1.9 | 1.6 | WWMU11X512R-D* |
| TDS410F40-3 | 41 | 40 | 50 | 123 | 69 | 226 | 1.7 | 1.7 | WWMU11X512R-D* |
| TDS420F40-3 | 42 | 40 | 55 | 126 | 69 | 229 | 1.5 | 1.8 | WWMU11X512R-D* |
| TDS430F40-3 | 43 | 40 | 55 | 129 | 69 | 233 | 1.3 | 1.8 | WWMU11X512R-D* |
| TDS440F40-3 | 44 | 40 | 55 | 132 | 69 | 236 | 1 | 1.9 | WWMU11X512R-D* |
| TDS450F40-3 | 45 | 40 | 55 | 135 | 69 | 241 | 0.7 | 2 | WWMU11X512R-D* |
| TDS460F40-3 | 46 | 40 | 55 | 138 | 69 | 245 | 0.4 | 2.1 | WWMU11X512R-D* |
| TDS470F40-3 | 47 | 40 | 55 | 141 | 69 | 248 | 2.6 | 2.2 | WWMU13X512R-D* |
| TDS480F40-3 | 48 | 40 | 55 | 144 | 69 | 252 | 2.4 | 2.3 | WWMU13X512R-D* |
| TDS490F40-3 | 49 | 40 | 55 | 147 | 69 | 255 | 2.2 | 2.3 | WWMU13X512R-D* |
| TDS500F40-3 | 50 | 40 | 55 | 150 | 69 | 259 | 2 | 2.4 | WWMU13X512R-D* |
| TDS510F40-3 | 51 | 40 | 55 | 153 | 69 | 263 | 1.7 | 2.5 | WWMU13X512R-D* |
| TDS520F40-3 | 52 | 40 | 55 | 156 | 69 | 266 | 1.5 | 2.6 | WWMU13X512R-D* |
| TDS530F40-3 | 53 | 40 | 55 | 159 | 69 | 270 | 1.3 | 2.7 | WWMU13X512R-D* |
| TDS540F40-3 | 54 | 40 | 55 | 162 | 69 | 273 | 1 | 2.9 | WWMU13X512R-D* |

(1) For pre thread hole (mm): *øDc* = 20.9 mm: M24x3, *øDc* = 23.9 mm: M27x3, *øDc* = 26.4 mm: M30x3.5
(2) For inch size: *øDc*: 22.2 mm = 0.875", *øDc*: 28.6 mm = 1.125", *øDc*: 31.8 mm = 1.250"

** For offsetting on lathe

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

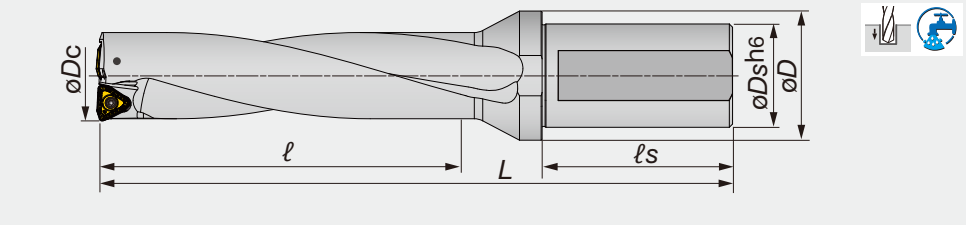
| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.25 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

*Just for reference

# TUNGSIX-DRILL

## TDS-F L/D=4 (Flat)

L/D = 4, Flat, Tool dia. ø20 - ø54 mm




| Designation | øDc | øDs | øD | ℓ | ℓs | L | Max. offset** (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TDS200F25-4 | 20 | 25 | 32 | 80 | 54 | 155 | 1 | 0.4 | WWMU05X205R-D* |
| TDS205F25-4 | 20.5 | 25 | 32 | 82 | 54 | 157 | 0.9 | 0.4 | WWMU05X205R-D* |
| TDS210F25-4 | 21 | 25 | 32 | 84 | 54 | 159 | 0.8 | 0.4 | WWMU05X205R-D* |
| TDS215F25-4 | 21.5 | 25 | 32 | 86 | 54 | 161 | 0.6 | 0.4 | WWMU05X205R-D* |
| TDS220F25-4 | 22 | 25 | 32 | 88 | 54 | 163 | 0.5 | 0.4 | WWMU05X205R-D* |
| TDS225F25-4 | 22.5 | 25 | 37 | 90 | 54 | 165.5 | 0.4 | 0.4 | WWMU05X205R-D* |
| TDS230F25-4 | 23 | 25 | 37 | 92 | 54 | 168 | 0.3 | 0.4 | WWMU05X205R-D* |
| TDS235F25-4 | 23.5 | 25 | 37 | 94 | 54 | 170.5 | 0.2 | 0.5 | WWMU05X205R-D* |
| TDS240F25-4 | 24 | 25 | 37 | 96 | 54 | 173 | 1.2 | 0.5 | WWMU060306R-D* |
| TDS245F25-4 | 24.5 | 25 | 37 | 98 | 54 | 175.5 | 1 | 0.5 | WWMU060306R-D* |
| TDS250F25-4 | 25 | 25 | 37 | 100 | 54 | 178 | 0.8 | 0.5 | WWMU060306R-D* |
| TDS255F25-4 | 25.5 | 25 | 37 | 102 | 54 | 180 | 0.6 | 0.6 | WWMU060306R-D* |
| TDS260F25-4 | 26 | 25 | 37 | 104 | 54 | 182 | 0.5 | 0.5 | WWMU060306R-D* |
| TDS270F32-4 | 27 | 32 | 40 | 108 | 59 | 191 | 0.3 | 0.7 | WWMU060306R-D* |
| TDS280F32-4 | 28 | 32 | 40 | 112 | 59 | 196 | 1.3 | 0.8 | WWMU08X408R-D* |
| TDS290F32-4 | 29 | 32 | 40 | 116 | 59 | 200 | 1.1 | 0.8 | WWMU08X408R-D* |
| TDS300F32-4 | 30 | 32 | 40 | 120 | 59 | 206 | 0.8 | 0.9 | WWMU08X408R-D* |
| TDS310F32-4 | 31 | 32 | 40 | 124 | 59 | 211 | 0.5 | 0.9 | WWMU08X408R-D* |
| TDS320F32-4 | 32 | 32 | 40 | 128 | 59 | 215 | 0.2 | 1 | WWMU08X408R-D* |
| TDS330F40-4 | 33 | 40 | 50 | 132 | 69 | 230 | 1.7 | 1.4 | WWMU09X510R-D* |
| TDS340F40-4 | 34 | 40 | 50 | 136 | 69 | 234 | 1.4 | 1.4 | WWMU09X510R-D* |
| TDS350F40-4 | 35 | 40 | 50 | 140 | 69 | 239 | 1.2 | 1.4 | WWMU09X510R-D* |
| TDS360F40-4 | 36 | 40 | 50 | 144 | 69 | 244 | 0.9 | 1.5 | WWMU09X510R-D* |
| TDS370F40-4 | 37 | 40 | 50 | 148 | 69 | 248 | 0.7 | 1.5 | WWMU09X510R-D* |
| TDS380F40-4 | 38 | 40 | 50 | 152 | 69 | 253 | 0.4 | 1.7 | WWMU09X510R-D* |
| TDS390F40-4 | 39 | 40 | 50 | 156 | 69 | 257.5 | 2.2 | 1.8 | WWMU11X512R-D* |
| TDS400F40-4 | 40 | 40 | 50 | 160 | 69 | 262.5 | 1.9 | 1.8 | WWMU11X512R-D* |
| TDS410F40-4 | 41 | 40 | 50 | 164 | 69 | 267.5 | 1.7 | 1.9 | WWMU11X512R-D* |
| TDS420F40-4 | 42 | 40 | 55 | 168 | 69 | 271.5 | 1.5 | 2 | WWMU11X512R-D* |
| TDS430F40-4 | 43 | 40 | 55 | 172 | 69 | 276.5 | 1.3 | 2 | WWMU11X512R-D* |
| TDS440F40-4 | 44 | 40 | 55 | 176 | 69 | 280.5 | 1 | 2.1 | WWMU11X512R-D* |
| TDS450F40-4 | 45 | 40 | 55 | 180 | 69 | 286.5 | 0.7 | 2.3 | WWMU11X512R-D* |
| TDS460F40-4 | 46 | 40 | 55 | 184 | 69 | 291.5 | 0.4 | 2.4 | WWMU11X512R-D* |
| TDS470F40-4 | 47 | 40 | 55 | 188 | 69 | 295.5 | 2.6 | 2.5 | WWMU13X512R-D* |
| TDS480F40-4 | 48 | 40 | 55 | 192 | 69 | 300.5 | 2.4 | 2.7 | WWMU13X512R-D* |
| TDS490F40-4 | 49 | 40 | 55 | 196 | 69 | 304.5 | 2.2 | 2.7 | WWMU13X512R-D* |
| TDS500F40-4 | 50 | 40 | 55 | 200 | 69 | 309.5 | 2 | 2.8 | WWMU13X512R-D* |
| TDS510F40-4 | 51 | 40 | 55 | 204 | 69 | 314.5 | 1.7 | 2.9 | WWMU13X512R-D* |
| TDS520F40-4 | 52 | 40 | 55 | 208 | 69 | 318.5 | 1.5 | 3 | WWMU13X512R-D* |
| TDS530F40-4 | 53 | 40 | 55 | 212 | 69 | 323.5 | 1.3 | 3.1 | WWMU13X512R-D* |
| TDS540F40-4 | 54 | 40 | 55 | 216 | 69 | 327.5 | 1 | 3.4 | WWMU13X512R-D* |

** For offsetting on lathe

### SPARE PARTS

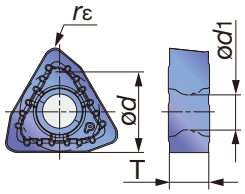
| Designation | Clamping screw | Wrench |
|---|---|---|
| TDS200... - TDS235... | CSPB-2.2 | IP-7D |
| TDS240... - TDS270... | CSPB-2.5 | IP-8D |
| TDS280... - TDS320... | CSTB-3 | T-9D |
| TDS330... - TDS380... | CSTB-4 | T-15D |
| TDS390... - TDS540... | CSTB-5 | T-20D |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance * |
|---|---|---|
| ø20 - ø27 | + 0.2 / 0 | + 0.3 / 0 |
| ø28 - ø54 | + 0.2 / 0 | + 0.35 / 0 |

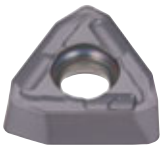
*Just for reference

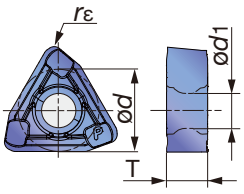
## INSERT

### DJ




### DS





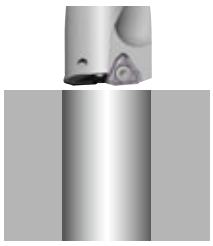
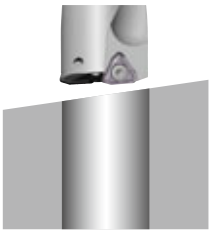
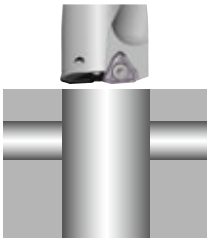
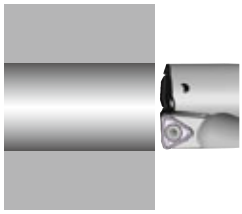
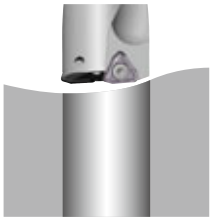
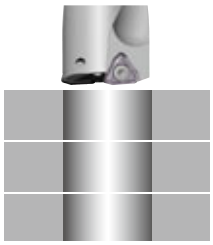

| Designation | Coated | | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | | | | | |
| WWMU05X205R-DJ | ● | | 5.8 | 2.4 | 2.5 | 0.5 | ø20 - ø23.5 |
| WWMU060306R-DJ | ● | | 6.7 | 2.9 | 3 | 0.6 | ø23.9 - ø27 |
| WWMU08X408R-DJ | ● | | 8 | 3.9 | 3.4 | 0.8 | ø28 - ø32 |
| WWMU09X510R-DJ | ● | | 9.7 | 4.9 | 4.4 | 1 | ø33 - ø38 |
| WWMU11X512R-DJ | ● | | 11.3 | 5.7 | 5.5 | 1.2 | ø39 - ø46 |
| WWMU13X512R-DJ | ● | | 13 | 5.7 | 5.5 | 1.2 | ø47 - ø54 |
| WWMU05X205R-DS | | ● | 5.8 | 2.4 | 2.5 | 0.5 | ø20 - ø23.5 |
| WWMU060306R-DS | | ● | 6.7 | 2.9 | 3 | 0.6 | ø23.9 - ø27 |
| WWMU08X408R-DS | | ● | 8 | 3.9 | 3.4 | 0.8 | ø28 - ø32 |
| WWMU09X510R-DS | | ● | 9.7 | 4.9 | 4.4 | 1 | ø33 - ø38 |
| WWMU11X512R-DS | | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø39 - ø46 |
| WWMU13X512R-DS | | ● | 13 | 5.7 | 5.5 | 1.2 | ø47 - ø54 |

● : Line up



## APPLICATION RANGE

*In case of Interrupted cutting, feed should be decreased.

| Feed f (mm/rev) | * | 0.05 | 0.05 | 0.05 |
|---|---|---|---|---|
| Application | OK Plane surface  | OK Slant surface  | OK Cross hole  | OK Plunging |
| Feed f (mm/rev) | 0.1 | 0.05 | Disapprove | Disapprove |
| Application | OK Boring  | OK Round surface  | ✕ Stacked plate  | ✕ Back boring |

*Please see the next page for cutting conditions.

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Selection criteria | Chip-breaker | Grades | Cutting speed *Vc* (m/min) |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3)<br>SS400, SM490, S25C, etc.<br>C15E4, E275A, E355D, etc. | First choice | DS | AH6030 | 160 - 250 |
| | | Priority on wear resistance | DJ | AH9030 | 160 - 320 |
| | Carbon steels (C > 0.3)<br>S45C, S55C etc.<br>C45, C55, etc. | First choice | DJ | AH9030 | 80 - 250 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 250 |
| | Low alloy steels<br>SCM415, etc.<br>18CrMo4, etc. | First choice | DS | AH6030 | 160 - 250 |
| | | Priority on wear resistance | DJ | AH9030 | 160 - 250 |
| | Alloy steels<br>SCM440, SCr420, etc.<br>42CrMo4, 20Cr4, etc. | First choice | DJ | AH9030 | 80 - 200 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 200 |
| M | Stainless steels (Austenitic)<br>SUS304, SUS316, etc.<br>X5CrNi18-9, X5CrNiMo17-12-2, etc. | First choice | DS | AH6030 | 100 - 200 |
| | | - | DJ | AH9030 | 100 - 200 |
| | Stainless steels (Martensitic and ferritic)<br>SUS430, SUS416, etc.<br>X6Cr17, X20Cr13, etc. | First choice | DS | AH6030 | 100 - 200 |
| | | - | DJ | AH9030 | 100 - 200 |
| | Stainless steels (Precipitation hardening)<br>SUS630, etc.<br>X5CrNiCuNb16-4, etc. | First choice | DS | AH6030 | 80 - 120 |
| | | - | DJ | AH9030 | 80 - 120 |
| K | Grey cast irons<br>FC250, etc.<br>250, etc. | First choice | DJ | AH9030 | 80 - 250 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 200 |
| | Ductile cast irons<br>FCD700, etc.<br>600-3, etc. | First choice | DJ | AH9030 | 80 - 200 |
| | | Priority on impact resistance | DS | AH6030 | 80 - 150 |
| N | Aluminium alloys | First choice | DS | AH6030 | 200 - 400 |
| | | - | DJ | AH9030 | 200 - 400 |
| S | High-resistant alloys<br>Inconel718, etc. | First choice | DS | AH6030 | 20 - 60 |
| | | - | DJ | AH9030 | 20 - 60 |
| | Titanium alloys<br>Ti-6Al-4V, etc. | First choice | DS | AH6030 | 40 - 120 |
| | | - | DJ | AH9030 | 40 - 120 |
| H | High hardened steels<br>Over 40HRC | First choice | DJ | AH9030 | 50 - 100 |
| | | Priority on impact resistance | DS | AH6030 | 40 - 80 |

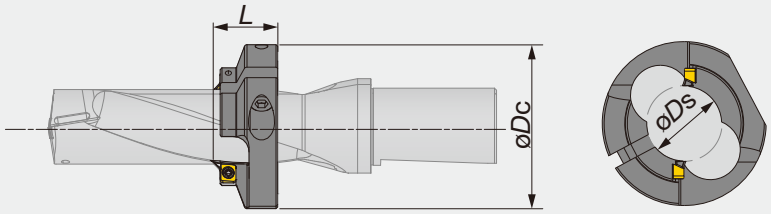
| Feed: *f* (mm/rev) | | | | | |
|---|---|---|---|---|---|
| L/D = 2, 3 | | | L/D = 4 | | |
| ø*Dc* (mm) | | | ø*Dc* (mm) | | |
| ø20 - ø27.5 | ø28 - ø38 | ø39 - ø54 | ø20 - ø27 | ø28 - ø38 | ø39 - ø54 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04- 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.15 | 0.06 - 0.15 | 0.08 - 0.17 |
| 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 |
| 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.15 | 0.06 - 0.15 | 0.08 - 0.17 |
| 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.12 | 0.04 - 0.13 | 0.04 - 0.15 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.1 | 0.04 - 0.10 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 | 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 | 0.06 - 0.15 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 | 0.06 - 0.13 | 0.06 - 0.16 | 0.08 - 0.18 |
| 0.10 - 0.18 | 0.1 - 0.2 | 0.1 - 0.25 | 0.1 - 0.18 | 0.1 - 0.2 | 0.1 - 0.2 |
| 0.10 - 0.18 | 0.1 - 0.2 | 0.1 - 0.25 | 0.1 - 0.18 | 0.1 - 0.2 | 0.1 - 0.2 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |
| 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |

# TDXCF chamfering tool

Chamfering tool for "TungDrillTwisted" & "TungSix-Drill"



## For flat cotter




| Designation | øDs | øDc | L | Drill | L/D = 2 | L/D = 3 | L/D = 4 |
|---|---|---|---|---|---|---|---|
| TDXCF200L25 | 19.1 | 49 | 25 | TDS200*25-* | 24.5 | 44.5 | 64.5 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDS205*25-* | 25.7 | 46.2 | 66.7 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDS210*25-* | 26.8 | 47.8 | 68.8 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDS215*25-* | 28 | 49.5 | 71 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDS220*25-* | 29.1 | 51.1 | 73.1 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDS225*25-* | 30.3 | 52.8 | 75.3 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDS230*25-* | 31.4 | 54.4 | 77.4 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDS235*25-* | 32.6 | 56.1 | 79.6 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDS240*25-* | 33.7 | 57.7 | 81.7 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDS245*25-* | 34.9 | 59.4 | 83.9 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDS250*25-* | 36 | 61 | 86 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDS255*25-* | 32.2 | 57.7 | 83.2 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDS260*25-* | 33.3 | 59.3 | 85.3 |
| TDXCF270L30 | 25.9 | 64 | 30 | TDS270*32-* | 35.6 | 62.6 | 89.6 |
| TDXCF280L30 | 26.9 | 64 | 30 | TDS280*32-* | 37.9 | 65.9 | 93.9 |
| TDXCF290L30 | 27.9 | 64 | 30 | TDS290*32-* | 40.2 | 69.2 | 98.2 |
| TDXCF300L30 | 28.9 | 64 | 30 | TDS300*32-* | 42.5 | 72.5 | 102.5 |
| TDXCF310L30 | 29.9 | 64 | 30 | TDS310*32-* | 44.8 | 75.8 | 106.8 |
| TDXCF320L30 | 30.9 | 64 | 30 | TDS320*32-* | 47.1 | 79.1 | 111.1 |

## SPARE PARTS

| Designation | Screw for insert | Screw for ring | Wrench for insert | Wrench for ring |
|---|---|---|---|---|
| TDXCF130 - 230 | CSPB-4S | CM6X16 | IP-15D | P-5 |
| TDXCF260 - 540 | CSPB-4S | CM8X1.25X20-A | IP-15D | P-6 |

## INSERT

### XHGX-45A

| Designation | GH130 | Torque (N·m) |
|---|---|---|
| XHGX090700R-45A | ● | 3.5 |

## Caution in mounting the chamfering tool on the drill body

① Place the ring on the drill body and match the positions of flutes on drill and ring. Temporarily clamp the ring with the ring screw tightened lightly.

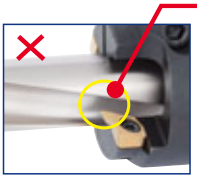
② Place the inserts, and tighten the insert screw lightly.

③ Adjust the ring position with a presetter, height gauge, or Vernier caliper, and securely tighten the ring screw, then the insert screw.

**Match the positions of flutes on drill and ring.**

(Inserts will be automatically set to the right positions.)

**The cutting edge of the insert is in the ring flute.**

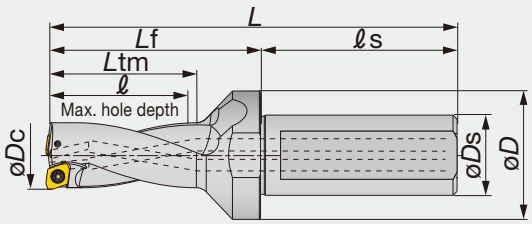


**The flutes on drill and ring do not match.**

MEMO

## TDX-F L/D=2

L/D = 2, Flat cotter, Tool dia. ø12.5 - ø54.0 mm




| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-2 | 12.5 | 20 | 25 | 25 | 49 | 28 | 41 | 90 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-2 | 13 | 20 | 25 | 26 | 49 | 29 | 42 | 91 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-2 | 13.5 | 20 | 25 | 27 | 49 | 30 | 43 | 92 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-2 | 14 | 20 | 25 | 28 | 49 | 31 | 44 | 93 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-2 | 14.5 | 20 | 25 | 29 | 49 | 32 | 46 | 95 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-2 | 15 | 20 | 25 | 30 | 49 | 33 | 47 | 96 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-2 | 15.5 | 20 | 32 | 31 | 49 | 34 | 49 | 98 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-2 | 16 | 20 | 32 | 32 | 49 | 35 | 51 | 100 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-2 | 16.5 | 20 | 32 | 33 | 49 | 36 | 52 | 101 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-2 | 17 | 20 | 32 | 34 | 49 | 37 | 53 | 102 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-2 | 17.5 | 25 | 32 | 35 | 54 | 38 | 55 | 109 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-2 | 18 | 25 | 32 | 36 | 54 | 39 | 56 | 110 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-2 | 18.5 | 25 | 32 | 37 | 54 | 40 | 57 | 111 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-2 | 19 | 25 | 32 | 38 | 54 | 41 | 58 | 112 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-2 | 19.5 | 25 | 32 | 39 | 54 | 42 | 60 | 114 | 0.7 | 0.3 | XPMT06X308R-D* |
| TDX200F25-2 | 20 | 25 | 32 | 40 | 54 | 45 | 61 | 115 | 0.5 | 0.3 | XPMT06X308R-D* |
| TDX205F25-2 | 20.5 | 25 | 32 | 41 | 54 | 46 | 62.5 | 116.5 | 0.4 | 0.3 | XPMT06X308R-D* |
| TDX210F25-2 | 21 | 25 | 32 | 42 | 54 | 47 | 64 | 118 | 0.3 | 0.3 | XPMT06X308R-D* |
| TDX215F25-2 | 21.5 | 25 | 32 | 43 | 54 | 48 | 65 | 119 | 0.2 | 0.3 | XPMT06X308R-D* |
| TDX220F25-2 | 22 | 25 | 32 | 44 | 54 | 49 | 66 | 120 | 1.2 | 0.3 | XPMT07H308R-D* |
| TDX225F25-2 | 22.5 | 25 | 37 | 45 | 54 | 50 | 67.5 | 121.5 | 1.1 | 0.3 | XPMT07H308R-D* |
| TDX230F25-2 | 23 | 25 | 37 | 46 | 54 | 51 | 69 | 123 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-2 | 23.5 | 25 | 37 | 47 | 54 | 52 | 70 | 124 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-2 | 24 | 25 | 37 | 48 | 54 | 53 | 71 | 125 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-2 | 24.5 | 25 | 37 | 49 | 54 | 54 | 72.5 | 126.5 | 0.5 | 0.4 | XPMT07H308R-D* |
| TDX250F25-2 | 25 | 25 | 37 | 50 | 54 | 55 | 74 | 128 | 0.4 | 0.4 | XPMT07H308R-D* |
| TDX255F25-2 | 25.5 | 25 | 37 | 51 | 54 | 56 | 75.5 | 129.5 | 0.3 | 0.4 | XPMT07H308R-D* |
| TDX260F25-2 | 26 | 25 | 37 | 52 | 54 | 57 | 77 | 131 | 0.2 | 0.4 | XPMT07H308R-D* |
| TDX270F32-2 | 27 | 32 | 40 | 54 | 59 | 59 | 79 | 138 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-2 | 28 | 32 | 40 | 56 | 59 | 60.3 | 82.3 | 141.3 | 1.2 | 0.6 | XPMT08T308R-D* |
| TDX290F32-2 | 29 | 32 | 40 | 58 | 59 | 62.3 | 84.3 | 143.3 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-2 | 30 | 32 | 40 | 60 | 59 | 64.3 | 87.3 | 146.3 | 0.7 | 0.7 | XPMT08T308R-D* |
| TDX310F32-2 | 31 | 32 | 40 | 62 | 59 | 66.3 | 90.3 | 149.3 | 0.4 | 0.7 | XPMT08T308R-D* |
| TDX320F32-2 | 32 | 32 | 40 | 64 | 59 | 68.3 | 92.3 | 151.3 | 0.2 | 0.8 | XPMT08T308R-D* |
| TDX330F40-2 | 33 | 40 | 50 | 66 | 69 | 70.6 | 95.6 | 164.6 | 2.3 | 1.2 | XPMT110412R-D* |
| TDX340F40-2 | 34 | 40 | 50 | 68 | 69 | 72.6 | 98.6 | 167.6 | 2.1 | 1.2 | XPMT110412R-D* |
| TDX350F40-2 | 35 | 40 | 50 | 70 | 69 | 74.6 | 101.6 | 170.6 | 1.8 | 1.2 | XPMT110412R-D* |
| TDX360F40-2 | 36 | 40 | 50 | 72 | 69 | 76.6 | 104.6 | 173.6 | 1.5 | 1.3 | XPMT110412R-D* |
| TDX370F40-2 | 37 | 40 | 50 | 74 | 69 | 78.6 | 105.6 | 174.6 | 1.3 | 1.3 | XPMT110412R-D* |
| TDX380F40-2 | 38 | 40 | 50 | 76 | 69 | 80.6 | 108.6 | 177.6 | 1 | 1.3 | XPMT110412R-D* |
| TDX390F40-2 | 39 | 40 | 50 | 78 | 69 | 82.6 | 110.6 | 179.6 | 0.7 | 1.4 | XPMT110412R-D* |
| TDX400F40-2 | 40 | 40 | 50 | 80 | 69 | 84.6 | 113.6 | 182.6 | 0.5 | 1.4 | XPMT110412R-D* |
| TDX410F40-2 | 41 | 40 | 50 | 82 | 69 | 86.6 | 117.6 | 186.6 | 0.2 | 1.5 | XPMT110412R-D* |
| TDX420F40-2 | 42 | 40 | 55 | 84 | 69 | 89 | 120 | 189 | 3.1 | 1.6 | XPMT150512R-D* |
| TDX430F40-2 | 43 | 40 | 55 | 86 | 69 | 91 | 123 | 192 | 2.9 | 1.6 | XPMT150512R-D* |
| TDX440F40-2 | 44 | 40 | 55 | 88 | 69 | 93 | 125 | 194 | 2.6 | 1.7 | XPMT150512R-D* |
| TDX450F40-2 | 45 | 40 | 55 | 90 | 69 | 95 | 128 | 197 | 2.3 | 1.7 | XPMT150512R-D* |
| TDX460F40-2 | 46 | 40 | 55 | 92 | 69 | 97 | 131 | 200 | 2.1 | 1.8 | XPMT150512R-D* |
| TDX470F40-2 | 47 | 40 | 55 | 94 | 69 | 99 | 133 | 202 | 1.8 | 1.9 | XPMT150512R-D* |
| TDX480F40-2 | 48 | 40 | 55 | 96 | 69 | 101 | 136 | 205 | 1.5 | 1.9 | XPMT150512R-D* |
| TDX490F40-2 | 49 | 40 | 55 | 98 | 69 | 103 | 138 | 207 | 1.3 | 1.9 | XPMT150512R-D* |
| TDX500F40-2 | 50 | 40 | 55 | 100 | 69 | 105 | 141 | 210 | 1 | 2 | XPMT150512R-D* |
| TDX510F40-2 | 51 | 40 | 55 | 102 | 69 | 107 | 145 | 214 | 0.7 | 2.1 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-2 | 52 | 40 | 55 | 104 | 69 | 109 | 147 | 216 | 0.5 | 2.2 | XPMT150512R-D* |
| TDX530F40-2 | 53 | 40 | 55 | 106 | 69 | 111 | 150 | 219 | - | 2.3 | XPMT150512R-D* |
| TDX540F40-2 | 54 | 40 | 55 | 108 | 69 | 113 | 152 | 221 | - | 2.4 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.25 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.3 / 0 |

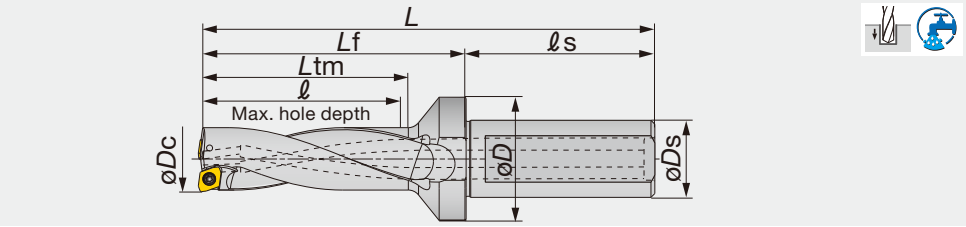
*Just for reference

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=3

L/D = 3, Flat cotter, Tool dia. ø12.5 - ø54 mm




| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-3 | 12.5 | 20 | 25 | 37.5 | 49 | 40.5 | 53 | 102 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-3 | 13 | 20 | 25 | 39 | 49 | 42 | 55 | 104 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-3 | 13.5 | 20 | 25 | 40.5 | 49 | 43.5 | 56 | 105 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-3 | 14 | 20 | 25 | 42 | 49 | 45 | 58 | 107 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-3 | 14.5 | 20 | 25 | 43.5 | 49 | 46.5 | 60 | 109 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-3 | 15 | 20 | 25 | 45 | 49 | 48 | 62 | 111 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-3 | 15.5 | 20 | 32 | 46.5 | 49 | 49.5 | 64 | 113 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-3 | 16 | 20 | 32 | 48 | 49 | 51 | 66 | 115 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-3 | 16.5 | 20 | 32 | 49.5 | 49 | 52.5 | 68 | 117 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-3 | 17 | 20 | 32 | 51 | 49 | 54 | 69 | 118 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-3 | 17.5 | 25 | 32 | 52.5 | 54 | 55.5 | 72 | 126 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-3 | 18 | 25 | 32 | 54 | 54 | 57 | 73 | 127 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-3 | 18.5 | 25 | 32 | 55.5 | 54 | 58.5 | 75 | 129 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-3 | 19 | 25 | 32 | 57 | 54 | 60 | 76 | 130 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-3 | 19.5 | 25 | 32 | 58.5 | 54 | 61.5 | 79 | 133 | 0.7 | 0.3 | XPMT06X308R-D* |
| TDX200F25-3 | 20 | 25 | 32 | 60 | 54 | 65 | 81 | 135 | 0.5 | 0.3 | XPMT06X308R-D* |
| TDX205F25-3 | 20.5 | 25 | 32 | 61.5 | 54 | 66.5 | 82 | 136 | 0.4 | 0.3 | XPMT06X308R-D* |
| TDX210F25-3 | 21 | 25 | 32 | 63 | 54 | 68 | 84 | 138 | 0.3 | 0.3 | XPMT06X308R-D* |
| TDX215F25-3 | 21.5 | 25 | 32 | 64.5 | 54 | 69.5 | 86 | 140 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-3 | 22 | 25 | 32 | 66 | 54 | 71 | 87 | 141 | 1.2 | 0.4 | XPMT07H308R-D* |
| TDX225F25-3 | 22.5 | 25 | 37 | 67.5 | 54 | 72.5 | 90 | 144 | 1.1 | 0.4 | XPMT07H308R-D* |
| TDX230F25-3 | 23 | 25 | 37 | 69 | 54 | 74 | 91 | 145 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-3 | 23.5 | 25 | 37 | 70.5 | 54 | 75.5 | 93 | 147 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-3 | 24 | 25 | 37 | 72 | 54 | 77 | 95 | 149 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-3 | 24.5 | 25 | 37 | 73.5 | 54 | 78.5 | 97 | 151 | 0.5 | 0.5 | XPMT07H308R-D* |
| TDX250F25-3 | 25 | 25 | 37 | 75 | 54 | 80 | 99 | 153 | 0.4 | 0.5 | XPMT07H308R-D* |
| TDX255F25-3 | 25.5 | 25 | 37 | 76.5 | 54 | 81.5 | 100 | 154 | 0.3 | 0.5 | XPMT07H308R-D* |
| TDX260F25-3 | 26 | 25 | 37 | 78 | 54 | 83 | 102 | 156 | 0.2 | 0.5 | XPMT07H308R-D* |
| TDX270F32-3 | 27 | 32 | 40 | 81 | 59 | 86 | 105 | 164 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-3 | 28 | 32 | 40 | 84 | 59 | 88.3 | 109.3 | 168.3 | 1.2 | 0.7 | XPMT08T308R-D* |
| TDX290F32-3 | 29 | 32 | 40 | 87 | 59 | 91.3 | 112.3 | 171.3 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-3 | 30 | 32 | 40 | 90 | 59 | 94.3 | 117.3 | 176.3 | 0.7 | 0.8 | XPMT08T308R-D* |
| TDX310F32-3 | 31 | 32 | 40 | 93 | 59 | 97.3 | 121.3 | 180.3 | 0.4 | 0.8 | XPMT08T308R-D* |
| TDX320F32-3 | 32 | 32 | 40 | 96 | 59 | 100.3 | 124.3 | 183.3 | 0.2 | 0.9 | XPMT08T308R-D* |
| TDX330F40-3 | 33 | 40 | 50 | 99 | 69 | 103.6 | 128.6 | 197.6 | 2.3 | 1.3 | XPMT110412R-D* |
| TDX340F40-3 | 34 | 40 | 50 | 102 | 69 | 106.6 | 131.6 | 200.6 | 2.1 | 1.3 | XPMT110412R-D* |
| TDX350F40-3 | 35 | 40 | 50 | 105 | 69 | 109.6 | 135.6 | 204.6 | 1.8 | 1.3 | XPMT110412R-D* |
| TDX360F40-3 | 36 | 40 | 50 | 108 | 69 | 112.6 | 139.6 | 208.6 | 1.5 | 1.4 | XPMT110412R-D* |
| TDX370F40-3 | 37 | 40 | 50 | 111 | 69 | 115.6 | 142.6 | 211.6 | 1.3 | 1.4 | XPMT110412R-D* |
| TDX380F40-3 | 38 | 40 | 50 | 114 | 69 | 118.6 | 146.6 | 215.6 | 1 | 1.5 | XPMT110412R-D* |
| TDX390F40-3 | 39 | 40 | 50 | 117 | 69 | 121.6 | 149.6 | 218.6 | 0.7 | 1.6 | XPMT110412R-D* |
| TDX400F40-3 | 40 | 40 | 50 | 120 | 69 | 124.6 | 153.6 | 222.6 | 0.5 | 1.6 | XPMT110412R-D* |
| TDX410F40-3 | 41 | 40 | 50 | 123 | 69 | 127.6 | 157.6 | 226.6 | 0.2 | 1.7 | XPMT110412R-D* |
| TDX420F40-3 | 42 | 40 | 55 | 126 | 69 | 131 | 161 | 230 | 3.1 | 1.8 | XPMT150512R-D* |
| TDX430F40-3 | 43 | 40 | 55 | 129 | 69 | 134 | 165 | 234 | 2.9 | 1.8 | XPMT150512R-D* |
| TDX440F40-3 | 44 | 40 | 55 | 132 | 69 | 137 | 168 | 237 | 2.6 | 1.9 | XPMT150512R-D* |
| TDX450F40-3 | 45 | 40 | 55 | 135 | 69 | 140 | 173 | 242 | 2.3 | 2 | XPMT150512R-D* |
| TDX460F40-3 | 46 | 40 | 55 | 138 | 69 | 143 | 177 | 246 | 2.1 | 2.1 | XPMT150512R-D* |
| TDX470F40-3 | 47 | 40 | 55 | 141 | 69 | 146 | 180 | 249 | 1.8 | 2.2 | XPMT150512R-D* |
| TDX480F40-3 | 48 | 40 | 55 | 144 | 69 | 149 | 184 | 253 | 1.5 | 2.3 | XPMT150512R-D* |
| TDX490F40-3 | 49 | 40 | 55 | 147 | 69 | 152 | 187 | 256 | 1.3 | 2.3 | XPMT150512R-D* |
| TDX500F40-3 | 50 | 40 | 55 | 150 | 69 | 155 | 191 | 260 | 1 | 2.4 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX510F40-3 | 51 | 40 | 55 | 153 | 69 | 158 | 195 | 264 | 0.7 | 2.5 | XPMT150512R-D* |
| TDX520F40-3 | 52 | 40 | 55 | 156 | 69 | 161 | 198 | 267 | 0.5 | 2.6 | XPMT150512R-D* |
| TDX530F40-3 | 53 | 40 | 55 | 159 | 69 | 164 | 202 | 271 | - | 2.7 | XPMT150512R-D* |
| TDX540F40-3 | 54 | 40 | 55 | 162 | 69 | 167 | 205 | 274 | - | 2.9 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17.0 | + 0.1 / 0 | + 0.25 / 0 |
| ø17.5 - ø54.0 | + 0.2 / 0 | + 0.3 / 0 |

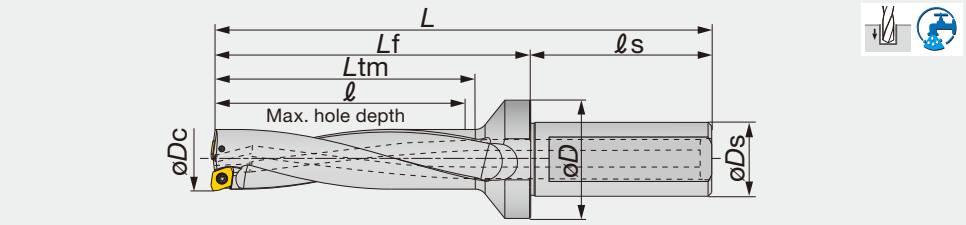
*Just for reference

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=4

L/D = 4, Flat cotter, Tool dia. ø12.5 - ø54 mm




| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-4 | 12.5 | 20 | 25 | 50 | 49 | 53 | 66 | 115 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-4 | 13 | 20 | 25 | 52 | 49 | 55 | 68 | 117 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-4 | 13.5 | 20 | 25 | 54 | 49 | 57 | 70 | 119 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-4 | 14 | 20 | 25 | 56 | 49 | 59 | 72 | 121 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-4 | 14.5 | 20 | 25 | 58 | 49 | 61 | 75 | 124 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-4 | 15 | 20 | 25 | 60 | 49 | 63 | 77 | 126 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-4 | 15.5 | 20 | 32 | 62 | 49 | 65 | 79 | 128 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-4 | 16 | 20 | 32 | 64 | 49 | 67 | 82 | 131 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-4 | 16.5 | 20 | 32 | 66 | 49 | 69 | 84 | 133 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-4 | 17 | 20 | 32 | 68 | 49 | 71 | 86 | 135 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-4 | 17.5 | 25 | 32 | 70 | 54 | 73 | 89 | 143 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-4 | 18 | 25 | 32 | 72 | 54 | 75 | 91 | 145 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-4 | 18.5 | 25 | 32 | 74 | 54 | 77 | 93 | 147 | 0.9 | 0.3 | XPMT06X308R-D* |
| TDX190F25-4 | 19 | 25 | 32 | 76 | 54 | 79 | 95 | 149 | 0.8 | 0.3 | XPMT06X308R-D* |
| TDX195F25-4 | 19.5 | 25 | 32 | 78 | 54 | 81 | 99 | 153 | 0.7 | 0.4 | XPMT06X308R-D* |
| TDX200F25-4 | 20 | 25 | 32 | 80 | 54 | 84 | 101 | 155 | 0.5 | 0.4 | XPMT06X308R-D* |
| TDX205F25-4 | 20.5 | 25 | 32 | 82 | 54 | 86 | 103 | 157 | 0.4 | 0.4 | XPMT06X308R-D* |
| TDX210F25-4 | 21 | 25 | 32 | 84 | 54 | 88 | 105 | 159 | 0.3 | 0.4 | XPMT06X308R-D* |
| TDX215F25-4 | 21.5 | 25 | 32 | 86 | 54 | 90 | 107 | 161 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-4 | 22 | 25 | 32 | 88 | 54 | 92 | 109 | 163 | 1.2 | 0.5 | XPMT07H308R-D* |
| TDX225F25-4 | 22.5 | 25 | 37 | 90 | 54 | 94 | 111.5 | 165.5 | 1.1 | 0.5 | XPMT07H308R-D* |
| TDX230F25-4 | 23 | 25 | 37 | 92 | 54 | 96 | 114 | 168 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-4 | 23.5 | 25 | 37 | 94 | 54 | 98 | 116.5 | 170.5 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-4 | 24 | 25 | 37 | 96 | 54 | 100 | 119 | 173 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-4 | 24.5 | 25 | 37 | 98 | 54 | 102 | 121.5 | 175.5 | 0.5 | 0.6 | XPMT07H308R-D* |
| TDX250F25-4 | 25 | 25 | 37 | 100 | 54 | 104 | 124 | 178 | 0.4 | 0.6 | XPMT07H308R-D* |
| TDX255F25-4 | 25.5 | 25 | 37 | 102 | 54 | 106 | 126 | 180 | 0.3 | 0.6 | XPMT07H308R-D* |
| TDX260F25-4 | 26 | 25 | 37 | 104 | 54 | 108 | 128 | 182 | 0.2 | 0.6 | XPMT07H308R-D* |
| TDX270F32-4 | 27 | 32 | 40 | 108 | 59 | 112 | 132 | 191 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-4 | 28 | 32 | 40 | 112 | 59 | 116 | 137 | 196 | 1.2 | 0.8 | XPMT08T308R-D* |
| TDX290F32-4 | 29 | 32 | 40 | 116 | 59 | 120 | 141 | 200 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-4 | 30 | 32 | 40 | 120 | 59 | 124 | 147 | 206 | 0.7 | 0.9 | XPMT08T308R-D* |
| TDX310F32-4 | 31 | 32 | 40 | 124 | 59 | 128 | 152 | 211 | 0.4 | 0.9 | XPMT08T308R-D* |
| TDX320F32-4 | 32 | 32 | 40 | 128 | 59 | 132 | 156 | 215 | 0.2 | 1 | XPMT08T308R-D* |
| TDX330F40-4 | 33 | 40 | 50 | 132 | 69 | 136 | 161 | 230 | 2.3 | 1.4 | XPMT110412R-D* |
| TDX340F40-4 | 34 | 40 | 50 | 136 | 69 | 140 | 165 | 234 | 2.1 | 1.4 | XPMT110412R-D* |
| TDX350F40-4 | 35 | 40 | 50 | 140 | 69 | 144 | 170 | 239 | 1.8 | 1.4 | XPMT110412R-D* |
| TDX360F40-4 | 36 | 40 | 50 | 144 | 69 | 148 | 175 | 244 | 1.5 | 1.5 | XPMT110412R-D* |
| TDX370F40-4 | 37 | 40 | 50 | 148 | 69 | 152 | 179 | 248 | 1.3 | 1.5 | XPMT110412R-D* |
| TDX380F40-4 | 38 | 40 | 50 | 152 | 69 | 156 | 184 | 253 | 1 | 1.7 | XPMT110412R-D* |
| TDX390F40-4 | 39 | 40 | 50 | 156 | 69 | 160 | 188 | 257 | 0.7 | 1.8 | XPMT110412R-D* |
| TDX400F40-4 | 40 | 40 | 50 | 160 | 69 | 164 | 193 | 262 | 0.5 | 1.8 | XPMT110412R-D* |
| TDX410F40-4 | 41 | 40 | 50 | 164 | 69 | 168 | 198 | 267 | 0.2 | 1.9 | XPMT110412R-D* |
| TDX420F40-4 | 42 | 40 | 55 | 168 | 69 | 172 | 202 | 271 | 3.1 | 2 | XPMT150512R-D* |
| TDX430F40-4 | 43 | 40 | 55 | 172 | 69 | 176 | 207 | 276 | 2.9 | 2 | XPMT150512R-D* |
| TDX440F40-4 | 44 | 40 | 55 | 176 | 69 | 180 | 211 | 280 | 2.6 | 2.1 | XPMT150512R-D* |
| TDX450F40-4 | 45 | 40 | 55 | 180 | 69 | 184 | 217 | 286 | 2.3 | 2.3 | XPMT150512R-D* |
| TDX460F40-4 | 46 | 40 | 55 | 184 | 69 | 188 | 222 | 291 | 2.1 | 2.4 | XPMT150512R-D* |
| TDX470F40-4 | 47 | 40 | 55 | 188 | 69 | 192 | 226 | 295 | 1.8 | 2.5 | XPMT150512R-D* |
| TDX480F40-4 | 48 | 40 | 55 | 192 | 69 | 196 | 231 | 300 | 1.5 | 2.7 | XPMT150512R-D* |
| TDX490F40-4 | 49 | 40 | 55 | 196 | 69 | 200 | 235 | 304 | 1.3 | 2.7 | XPMT150512R-D* |
| TDX500F40-4 | 50 | 40 | 55 | 200 | 69 | 204 | 240 | 309 | 1 | 2.8 | XPMT150512R-D* |
| TDX510F40-4 | 51 | 40 | 55 | 204 | 69 | 208 | 245 | 314 | 0.7 | 2.9 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-4 | 52 | 40 | 55 | 208 | 69 | 212 | 249 | 318 | 0.5 | 3 | XPMT150512R-D* |
| TDX530F40-4 | 53 | 40 | 55 | 212 | 69 | 216 | 254 | 323 | - | 3.1 | XPMT150512R-D* |
| TDX540F40-4 | 54 | 40 | 55 | 216 | 69 | 220 | 258 | 327 | - | 3.4 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.4 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.45 / 0 |

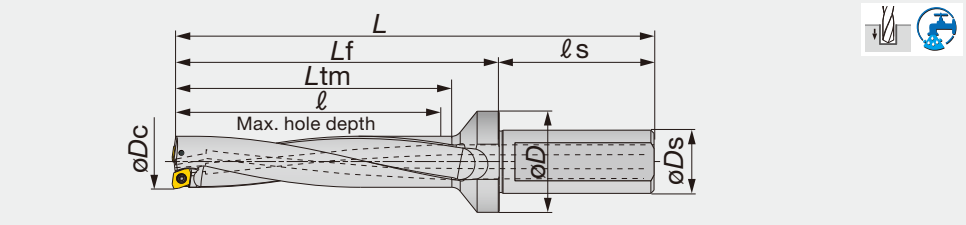
*Just for reference

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

## TDX-F L/D=5

L/D = 5, Flat cotter, Tool dia. ø12.5 - ø54 mm






| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX125F20-5 | 12.5 | 20 | 25 | 62.5 | 49 | 65.5 | 78.5 | 127.5 | 0.8 | 0.2 | XPMT040104R-D* |
| TDX130F20-5 | 13 | 20 | 25 | 65 | 49 | 68 | 81 | 130 | 0.7 | 0.2 | XPMT040104R-D* |
| TDX135F20-5 | 13.5 | 20 | 25 | 67.5 | 49 | 70.5 | 83.5 | 132.5 | 0.6 | 0.2 | XPMT040104R-D* |
| TDX140F20-5 | 14 | 20 | 25 | 70 | 49 | 73 | 86 | 135 | 0.5 | 0.2 | XPMT040104R-D* |
| TDX145F20-5 | 14.5 | 20 | 25 | 72.5 | 49 | 75.5 | 89.5 | 138.5 | 0.4 | 0.2 | XPMT040104R-D* |
| TDX150F20-5 | 15 | 20 | 25 | 75 | 49 | 78 | 92 | 141 | 0.9 | 0.2 | XPMT050204R-D* |
| TDX155F20-5 | 15.5 | 20 | 32 | 77.5 | 49 | 80.5 | 94.5 | 143.5 | 0.8 | 0.2 | XPMT050204R-D* |
| TDX160F20-5 | 16 | 20 | 32 | 80 | 49 | 83 | 98 | 147 | 0.6 | 0.2 | XPMT050204R-D* |
| TDX165F20-5 | 16.5 | 20 | 32 | 82.5 | 49 | 85.5 | 100.5 | 149.5 | 0.5 | 0.2 | XPMT050204R-D* |
| TDX170F20-5 | 17 | 20 | 32 | 85 | 49 | 88 | 103 | 152 | 0.4 | 0.2 | XPMT050204R-D* |
| TDX175F25-5 | 17.5 | 25 | 32 | 87.5 | 54 | 90.5 | 106.5 | 160.5 | 1.2 | 0.3 | XPMT06X308R-D* |
| TDX180F25-5 | 18 | 25 | 32 | 90 | 54 | 93 | 109 | 163 | 1.1 | 0.3 | XPMT06X308R-D* |
| TDX185F25-5 | 18.5 | 25 | 32 | 92.5 | 54 | 95.5 | 111.5 | 165.5 | 0.9 | 0.4 | XPMT06X308R-D* |
| TDX190F25-5 | 19 | 25 | 32 | 95 | 54 | 98 | 114 | 168 | 0.8 | 0.4 | XPMT06X308R-D* |
| TDX195F25-5 | 19.5 | 25 | 32 | 97.5 | 54 | 100.5 | 118.5 | 172.5 | 0.7 | 0.4 | XPMT06X308R-D* |
| TDX200F25-5 | 20 | 25 | 32 | 100 | 54 | 104 | 121 | 175 | 0.5 | 0.4 | XPMT06X308R-D* |
| TDX205F25-5 | 20.5 | 25 | 32 | 102.5 | 54 | 106.5 | 123.5 | 177.5 | 0.4 | 0.4 | XPMT06X308R-D* |
| TDX210F25-5 | 21 | 25 | 32 | 105 | 54 | 109 | 126 | 180 | 0.3 | 0.4 | XPMT06X308R-D* |
| TDX215F25-5 | 21.5 | 25 | 32 | 107.5 | 54 | 111.5 | 128.5 | 182.5 | 0.2 | 0.4 | XPMT06X308R-D* |
| TDX220F25-5 | 22 | 25 | 32 | 110 | 54 | 114 | 131 | 185 | 1.2 | 0.6 | XPMT07H308R-D* |
| TDX225F25-5 | 22.5 | 25 | 37 | 112.5 | 54 | 116.5 | 134 | 188 | 1.1 | 0.6 | XPMT07H308R-D* |
| TDX230F25-5 | 23 | 25 | 37 | 115 | 54 | 119 | 137 | 191 | 0.9 | 0.4 | XPMT07H308R-D* |
| TDX235F25-5 | 23.5 | 25 | 37 | 117.5 | 54 | 121.5 | 140 | 194 | 0.8 | 0.4 | XPMT07H308R-D* |
| TDX240F25-5 | 24 | 25 | 37 | 120 | 54 | 124 | 143 | 197 | 0.7 | 0.4 | XPMT07H308R-D* |
| TDX245F25-5 | 24.5 | 25 | 37 | 122.5 | 54 | 126.5 | 146 | 200 | 0.5 | 0.7 | XPMT07H308R-D* |
| TDX250F25-5 | 25 | 25 | 37 | 125 | 54 | 129 | 149 | 203 | 0.4 | 0.7 | XPMT07H308R-D* |
| TDX255F25-5 | 25.5 | 25 | 37 | 127.5 | 54 | 131.5 | 151.5 | 205.5 | 0.3 | 0.7 | XPMT07H308R-D* |
| TDX260F25-5 | 26 | 25 | 37 | 130 | 54 | 134 | 154 | 208 | 0.2 | 0.7 | XPMT07H308R-D* |
| TDX270F32-5 | 27 | 32 | 40 | 135 | 59 | 139 | 159 | 218 | 1.5 | 0.6 | XPMT08T308R-D* |
| TDX280F32-5 | 28 | 32 | 40 | 140 | 59 | 144 | 165 | 224 | 1.2 | 0.9 | XPMT08T308R-D* |
| TDX290F32-5 | 29 | 32 | 40 | 145 | 59 | 149 | 170 | 229 | 1 | 0.7 | XPMT08T308R-D* |
| TDX300F32-5 | 30 | 32 | 40 | 150 | 59 | 154 | 177 | 236 | 0.7 | 1 | XPMT08T308R-D* |
| TDX310F32-5 | 31 | 32 | 40 | 155 | 59 | 159 | 183 | 242 | 0.4 | 1 | XPMT08T308R-D* |
| TDX320F32-5 | 32 | 32 | 40 | 160 | 59 | 164 | 188 | 247 | 0.2 | 1.1 | XPMT08T308R-D* |
| TDX330F40-5 | 33 | 40 | 50 | 165 | 69 | 169 | 194 | 263 | 2.3 | 1.5 | XPMT110412R-D* |
| TDX340F40-5 | 34 | 40 | 50 | 170 | 69 | 174 | 199 | 268 | 2.1 | 1.5 | XPMT110412R-D* |
| TDX350F40-5 | 35 | 40 | 50 | 175 | 69 | 179 | 205 | 274 | 1.8 | 1.5 | XPMT110412R-D* |
| TDX360F40-5 | 36 | 40 | 50 | 180 | 69 | 184 | 211 | 280 | 1.5 | 1.6 | XPMT110412R-D* |
| TDX370F40-5 | 37 | 40 | 50 | 185 | 69 | 189 | 216 | 285 | 1.3 | 1.6 | XPMT110412R-D* |
| TDX380F40-5 | 38 | 40 | 50 | 190 | 69 | 194 | 222 | 291 | 1 | 1.9 | XPMT110412R-D* |
| TDX390F40-5 | 39 | 40 | 50 | 195 | 69 | 199 | 227 | 296 | 0.7 | 2 | XPMT110412R-D* |
| TDX400F40-5 | 40 | 40 | 50 | 200 | 69 | 204 | 233 | 302 | 0.5 | 2 | XPMT110412R-D* |
| TDX410F40-5 | 41 | 40 | 50 | 205 | 69 | 209 | 239 | 308 | 0.2 | 2.1 | XPMT110412R-D* |
| TDX420F40-5 | 42 | 40 | 55 | 210 | 69 | 214 | 244 | 313 | 3.1 | 2.2 | XPMT150512R-D* |
| TDX430F40-5 | 43 | 40 | 55 | 215 | 69 | 219 | 250 | 319 | 2.9 | 2.2 | XPMT150512R-D* |
| TDX440F40-5 | 44 | 40 | 55 | 220 | 69 | 224 | 255 | 324 | 2.6 | 2.3 | XPMT150512R-D* |
| TDX450F40-5 | 45 | 40 | 55 | 225 | 69 | 229 | 262 | 331 | 2.3 | 2.6 | XPMT150512R-D* |
| TDX460F40-5 | 46 | 40 | 55 | 230 | 69 | 234 | 268 | 337 | 2.1 | 2.7 | XPMT150512R-D* |
| TDX470F40-5 | 47 | 40 | 55 | 235 | 69 | 239 | 273 | 342 | 1.8 | 2.8 | XPMT150512R-D* |
| TDX480F40-5 | 48 | 40 | 55 | 240 | 69 | 244 | 279 | 348 | 1.5 | 3.1 | XPMT150512R-D* |
| TDX490F40-5 | 49 | 40 | 55 | 245 | 69 | 249 | 284 | 353 | 1.3 | 3.1 | XPMT150512R-D* |
| TDX500F40-5 | 50 | 40 | 55 | 250 | 69 | 254 | 290 | 359 | 1 | 3.2 | XPMT150512R-D* |
| TDX510F40-5 | 51 | 40 | 55 | 255 | 69 | 259 | 296 | 365 | 0.7 | 3.3 | XPMT150512R-D* |

| Designation | øDc | øDs | øD | ℓ | ℓs | Ltm | Lf | L | Max. offset (radial) | Kg | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDX520F40-5 | 52 | 40 | 55 | 260 | 69 | 264 | 301 | 370 | 0.5 | 3.4 | XPMT150512R-D* |
| TDX530F40-5 | 53 | 40 | 55 | 265 | 69 | 269 | 307 | 376 | - | 3.5 | XPMT150512R-D* |
| TDX540F40-5 | 54 | 40 | 55 | 270 | 69 | 274 | 312 | 381 | - | 3.9 | XPMT150512R-D* |

| Tool diameter | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø12.5 - ø17 | + 0.1 / 0 | + 0.4 / 0 |
| ø17.5 - ø54 | + 0.2 / 0 | + 0.45 / 0 |

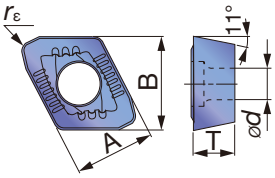
*Just for reference

## SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TDX125 - 145 | CSPB-2H | IP-6DB |
| TDX150 - 170 | CSPB-2L043 | IP-6DB |
| TDX175 - 215 | CSPB-2.2 | IP-7D |
| TDX220 - 260 | CSPB-2.5 | IP-8D |
| TDX270 - 320 | CSTB-3 | T-9D |
| TDX330 - 410 | CSTB-4 | T-15D |
| TDX420 - 540 | CSTB-5 | T-20D |

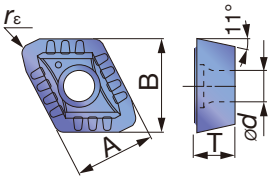
# INSERT

## DJ



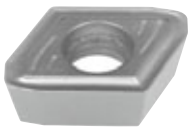

| Designation | Coated | | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | T1115 | | | | | | |
| XPMT040104R-DJ | ● | ● | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DJ | ● | ● | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DJ | ● | ● | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DJ | ● | ● | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DJ | ● | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DJ | ● | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DJ | ● | ● | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

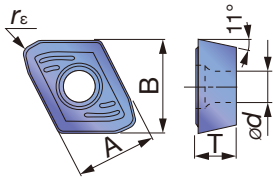
## DS




| Designation | Coated | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|
| | AH6030 | AH725 | | | | | | |
| XPMT040104R-DS | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DS | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DS | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DS | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DS | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DS | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DS | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

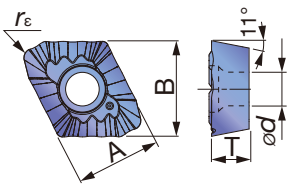
## DW






| Designation | Coated | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | | | | | | |
| XPMT040104R-DW | ● | ● | ● | 4.3 | 4.5 | 1.59 | 2.3 | 0.4 | ø12.5 - ø14.5 |
| XPMT050204R-DW | ● | ● | ● | 5.2 | 5.4 | 2.38 | 2.3 | 0.4 | ø15 - ø17 |
| XPMT06X308R-DW | ● | ● | ● | 6 | 7 | 3.15 | 2.5 | 0.8 | ø17.5 - ø21.5 |
| XPMT07H308R-DW | ● | ● | ● | 7 | 8.2 | 3.6 | 2.8 | 0.8 | ø22 - ø26 |
| XPMT08T308R-DW | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DW | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DW | ● | ● | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

## DG




| Designation | Coated | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH725 | | | | | | |
| XPMT08T308R-DG | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø27 - ø32 |
| XPMT110412R-DG | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø33 - ø41 |
| XPMT150512R-DG | ● | 15 | 16.1 | 5.56 | 5.5 | 1.2 | ø42 - ø54 |

● : Line up

## RECOMMENDED INSERT

| ISO | Workpiece material | First choice | High feed | High speed | Troubleshooting | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Chipping resistance | Wear resistance | Surface finish | Chip control |
| P | Low carbon steel (C ≤ 0.3%) | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| P | Carbon steel (C > 0.3%) Alloy steels | DJ, AH6030 | DW, AH6030 | DJ, AH9030 | DW, AH725 | DJ, AH9030 | DW, AH6030 | - |
| P | Low alloy steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | - |
| M | Stainless steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| K | Grey cast iron | DJ, AH9030 | DW, AH9030 | DJ, T1115 | DW, AH725 | - | DW, AH9030 | - |
| K | Ductile cast iron | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |
| N | Aluminium alloys | DJ, AH725 | DW, AH725 | DS, AH6030 | - | - | DW, AH725 | DG, AH725 |
| S | Titanium alloys Heat-resistant alloys | DS, AH6030 | - | - | DW, AH725 | - | DW, AH725 | DG, AH725 |
| H | Hardened steel | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | ø12.5 ~ ø14.5 | ø15 ~ ø17 | ø17.5 ~ ø26 | ø27 ~ ø32 | ø33 ~ ø54 |
| P | Low carbon steels (C < 0.3) SS400, SM490, S25C, etc. C15E4, E275A, E355D, etc. | 160 - 320 | 2D, 3D | 0.02 - 0.06 | 0.02 - 0.06 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | | 4D, 5D | 0.02 - 0.06 | 0.02 - 0.06 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| P | Carbon steels (C > 0.3) S45C, S55C, etc. C45, C55, etc. | 80 - 250 | 2D, 3D | 0.04 - 0.1 | 0.04 - 0.12 | 0.06 - 0.13 | 0.06 - 0.15 | 0.08 - 0.18 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04- 0.08 | 0.06 - 0.1 | 0.06 - 0.12 | 0.08 - 0.14 |
| P | Low alloy steels SCM415, etc. 18CrMo4, etc. | 160 - 250 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.14 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.14 |
| P | Alloy steels SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc. | 80 - 200 | 2D, 3D | 0.04 - 0.1 | 0.04 - 0.12 | 0.06 - 0.13 | 0.06 - 0.15 | 0.08 - 0.18 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.06 - 0.1 | 0.06 - 0.12 | 0.08 - 0.14 |
| M | Stainless steels (Austenitic) SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 2D, 3D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | | 4D, 5D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| M | Stainless steels (Martensitic and ferritic) SUS430, SUS416, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 220 | 2D, 3D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | | 4D, 5D | 0.02 - 0.08 | 0.02 - 0.08 | 0.04 - 0.1 | 0.04 - 0.12 | 0.04 - 0.12 |
| M | Stainless steels (Precipitation hardening) SUS630, etc. X5CrNiCuNb16-4, etc. | 80 - 120 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.06 - 0.1 |
| | | | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.06 - 0.1 |
| K | Grey cast irons FC250, etc. 250, etc. | 80 - 250 | 2D, 3D | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | | 4D, 5D | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.08 - 0.16 |
| K | Ductile cast irons FCD700, etc. 600-3, etc. | 80 - 200 | 2D, 3D | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.15 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | | 4D, 5D | 0.04 - 0.1 | 0.04 - 0.1 | 0.06 - 0.12 | 0.06 - 0.14 | 0.08 - 0.16 |
| N | Aluminium alloys A2017, ADC12, etc. AlCu4SiMg, AlSi11Cu3, etc. | 200 - 400 | 2D, 3D | 0.1 - 0.12 | 0.1 - 0.15 | 0.15 - 0.2 | 0.15 - 0.2 | 0.15 - 0.25 |
| | | | 4D, 5D | 0.08 - 0.12 | 0.08 - 0.12 | 0.12 - 0.16 | 0.12 - 0.16 | 0.12 - 0.2 |
| S | Heat-resistant alloys Inconel 718, etc. | 20 - 60 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | 20 - 60 | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| S | Titanium alloys Ti-6Al-4V, etc. | 40 - 120 | 2D, 3D | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.12 | 0.06 - 0.12 | 0.06 - 0.12 |
| | | 40 - 120 | 4D, 5D | 0.06 - 0.08 | 0.06 - 0.08 | 0.06 - 0.1 | 0.06 - 0.1 | 0.06 - 0.1 |
| H | Hardened steel ≥ 40HRC | 40 - 100 | 2D, 3D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | 40 - 100 | 4D, 5D | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 | 0.04 - 0.08 |

## Standard cutting conditions for DG type chipbreaker

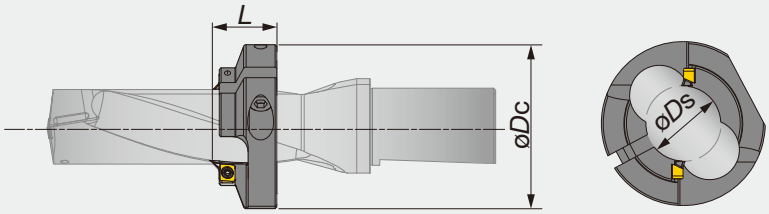
| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) | |
|---|---|---|---|---|---|
| | | | | ø27 ~ ø32 | ø33 ~ ø54 |
| P | Low carbon steels (C < 0.3) SS400, SM490, S25C, etc. C15E4, E275A, E355D, etc. | 60 - 180 | 2D, 3D | 0.04 - 0.1 | |
| | | | 4D, 5D | | |

- When using the smaller side of the diameter range, the feed rate should be set lower.
- When using DW insert for work materials of 40 HRC, the feed rate should be set below 50%.
- For difficult-to-cut materials (heat-resistant alloys, etc.), the cutting speed should be set 25% below that of carbon steels.
- For high-feed machining, apply a feed rate that is approximately 1.5 times the standard feed conditions.
- High speed machining means cutting speeds over 150 m/min.
- When using DW insert for troubleshooting, use it within the range of standard cutting conditions.
- DG type chipbreaker is suitable for heavy machines that have low-rpm spindles. If chatter occurs, a lower feed rate is recommended.

## TDXCF chamfering tool

Chamfering tool for "TungDrillTwisted" & "TungSix-Drill"






| Designation | øDs | øDc | L | Drill | L/D = 2 | | L/D = 3 | | L/D = 4 | | L/D = 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | TDX***F | TDX***W | TDX***F | TDX***W | TDX***F | TDX***W | TDX***F | TDX***W |
| TDXCF180L25 | 17.3 | 49 | 25 | TDX175*25-* | 13 | 18.8 | 30.5 | 36.3 | 48 | 53.8 | 65.5 | 71.3 |
| TDXCF180L25 | 17.3 | 49 | 25 | TDX180*25-* | 14 | 19.9 | 32 | 37.9 | 50 | 55.9 | 68 | 73.9 |
| TDXCF190L25 | 18.1 | 49 | 25 | TDX185*25-* | 15 | 21.1 | 33.5 | 39.6 | 52 | 58.1 | 70.5 | 76.6 |
| TDXCF190L25 | 18.1 | 49 | 25 | TDX190*25-* | 16 | 22.2 | 35 | 41.2 | 54 | 60.2 | 73 | 79.2 |
| TDXCF200L25 | 19.1 | 49 | 25 | TDX195*25-* | 17 | 23.4 | 36.5 | 42.9 | 56 | 62.4 | 75.5 | 81.9 |
| TDXCF200L25 | 19.1 | 49 | 25 | TDX200*25-* | 20 | 24.5 | 40 | 44.5 | 59 | 64.5 | 79 | 84.5 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDX205*25-* | 21 | 25.7 | 41.5 | 46.2 | 61 | 66.7 | 81.5 | 87.2 |
| TDXCF210L25 | 20.1 | 49 | 25 | TDX210*25-* | 22 | 26.8 | 43 | 47.8 | 63 | 68.8 | 84 | 89.8 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDX215*25-* | 23 | 28 | 44.5 | 49.5 | 65 | 71 | 86.5 | 92.5 |
| TDXCF220L25 | 21.1 | 49 | 25 | TDX220*25-* | 24 | 29.1 | 46 | 51.1 | 67 | 73.1 | 89 | 95.1 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDX225*25-* | 25 | 30.3 | 47.5 | 52.8 | 69 | 75.3 | 91.5 | 97.8 |
| TDXCF230L25 | 22.1 | 49 | 25 | TDX230*25-* | 26 | 31.4 | 49 | 54.4 | 71 | 77.4 | 94 | 100.4 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDX235*25-* | 27 | 32.6 | 50.5 | 56.1 | 73 | 79.6 | 96.5 | 103.1 |
| TDXCF240L25 | 23.1 | 49 | 25 | TDX240*25-* | 28 | 33.7 | 52 | 57.7 | 75 | 81.7 | 99 | 105.7 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDX245*25-* | 29 | 34.9 | 53.5 | 59.4 | 77 | 83.9 | 101.5 | 108.4 |
| TDXCF250L25 | 23.95 | 49 | 25 | TDX250*25-* | 30 | 36 | 55 | 61 | 79 | 86 | 104 | 111 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDX255*25-* | 26 | 32.2 | 51.5 | 57.7 | 76 | 83.2 | 101.5 | 108.7 |
| TDXCF260L30 | 24.95 | 64 | 30 | TDX260*25-* | 27 | 33.3 | 53 | 59.3 | 78 | 85.3 | 104 | 111.3 |
| TDXCF270L30 | 25.9 | 64 | 30 | TDX270*32-* | 29 | 35.6 | 56 | 62.6 | 82 | 89.6 | 109 | 116.6 |
| TDXCF280L30 | 26.9 | 64 | 30 | TDX280*32-* | 30.3 | 37.9 | 58.3 | 65.9 | 86 | 93.9 | 114 | 121.9 |
| TDXCF290L30 | 27.9 | 64 | 30 | TDX290*32-* | 32.3 | 40.2 | 61.3 | 69.2 | 90 | 98.2 | 119 | 127.2 |
| TDXCF300L30 | 28.9 | 64 | 30 | TDX300*32-* | 34.3 | 42.5 | 64.3 | 72.5 | 94 | 102.5 | 124 | 132.5 |
| TDXCF310L30 | 29.9 | 64 | 30 | TDX310*32-* | 36.3 | 44.8 | 67.3 | 75.8 | 98 | 106.8 | 129 | 137.8 |
| TDXCF320L30 | 30.9 | 64 | 30 | TDX320*32-* | 38.3 | 47.1 | 70.3 | 79.1 | 102 | 111.1 | 134 | 143.1 |

### SPARE PARTS

| Designation | Screw for insert | Screw for ring | Wrench for insert | Wrench for ring |
|---|---|---|---|---|
| TDXCF130 - 250 | CSPB-4S | CM6X16 | IP-15D | P-5 |
| TDXCF260 - 540 | CSPB-4S | CM8X1.25X20-A | IP-15D | P-6 |

## INSERT

### XHGX-45A

| Designation | GH130 | Torgue (N·m) |
|---|---|---|
| XHGX090700R-45A | ● | 3.5 |

## Caution in mounting the chamfering tool on the drill body

① Place the ring on the drill body and match the positions of flutes on drill and ring. Temporarily clamp the ring with the ring screw tightened lightly.

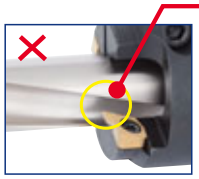
② Place the inserts, and tighten the insert screw lightly.

③ Adjust the ring position with a presetter, height gauge, or Vernier caliper, and securely tighten the ring screw, then the insert screw.

**Match the positions of flutes on drill and ring.**

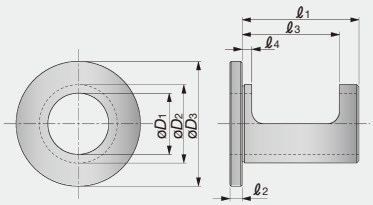
(Inserts will be automatically set to the right positions.)

**The cutting edge of the insert is in the ring flute.**



**The flutes on drill and ring do not match.**

Eccentric sleeves for "TungDrillTwisted" & "TungSix-Drill"




| Designation | øD1 | øD2 | øD3 | ℓ1 | ℓ2 | ℓ3 | ℓ4 |
|---|---|---|---|---|---|---|---|
| EZ2025 | 20 | 25 | 46 | 49 | 5 | 32.5 | 4 |
| EZ2532 | 25 | 32 | 51 | 52 | 5 | 38 | 4 |
| EZ3240 | 32 | 40 | 54 | 62 | 5 | 43 | 4 |
| EZ4050 | 40 | 50 | 69 | 63 | 5 | 55 | 4 |

SPARE PARTS

| Designation | Wrench |
|---|---|
| EZ... | P-2.5 |



# Use EZ sleeves for the following purposes

## Hole diameter adjustment on the milling machine

### Adjusting the finishing diameter when milling

Adjusting the finishing diameter in tool-rotating applications such as on machining centres and milling machines:

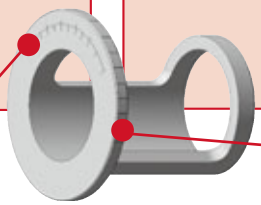
By using EZ sleeve, the finishing diameter can be adjusted in the range from +0.6 mm to -0.2 mm.

## Adjusting cutting edge height on lathe

### Lathe

Adjusting of the cutting edge height in work rotating applications such as on lathes:

By using EZ sleeve, the cutting edge height can be adjusted in the range from +0.3 mm to -0.2 mm. It results in eliminating troubles caused by improper cutting-edge height.



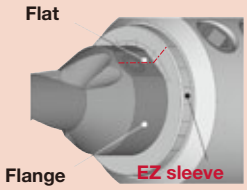
**Scale for adjusting finishing diameter in milling (Periphery of sleeve)**

**Scale for adjusting cutting edge height in turning (Front face of sleeve)**

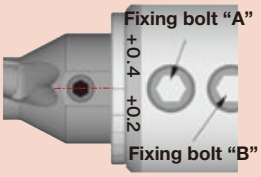
# Setting of EZ sleeve

## Adjusting finishing diameter in milling

As shown in the Figure below, set the EZ sleeve between the drill shank and the toolholder.



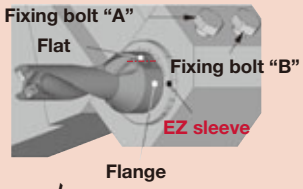

Align the graduated scale on the periphery of the EZ sleeve with the center of the flat of the drill flange.
In the Figure shown below, the sleeve is set so that the finishing diameter will be increased by 0.4 mm.



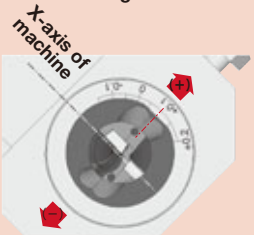

**When rotating the EZ sleeve, insert the wrench into the hole at the flange periphery and rotate the EZ sleeve.**
**Screws A + B have to be loosened.**
**Secure the drill by screw A. Secure the EZ sleeve by lightly tightening screw B.**
**Tighten screw B only lightly otherwise EZ sleeve can be damaged!**

## Adjusting cutting edge height on lathe

As shown in the Figure below, set the EZ sleeve between the drill shank and the toolblock.




Align the graduated scale on the front face of the Esleeve with the center of the flat of the drill flange.
In the Figure shown below, the sleeve is set so that the center of the drill will shift by 0.1 mm to the plus (+) direction.



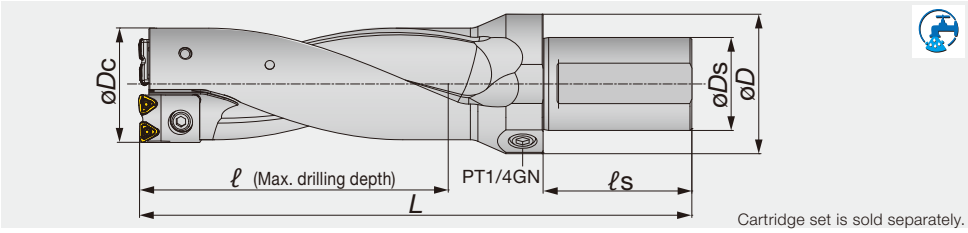

**Cautious points**

- Can not be used for collect chuck holders.
- Over L/D 4 or bigger adjustment, please reduce feed.
- For smaller adjustment, the drill itself will interfere with the hole diameter. It is recommended that hole diameter should be adjusted to a larger diameter than the drill diameter.

# TUNGDRILLBIG

## TDB, TDS cartridge set

L/D = 2.5, dia. ø55 - ø80mm, diameter adjustable with setting plate




Cartridge set is sold separately.

Indexable Drill

| Body Designation | Cartridge set Designation | øDc | øDs | øD | ℓ | ℓs | L | kg | Setting plate Designation | (mm) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | TDSCA55-56 | 55 | 50 | 75 | 140 | 80 | 262 | 3.2 | - | - | WWMU08X408R-D* |
| TDB55-56F50-2.5 | TDSCA55-56 | 56 | 50 | 75 | 140 | 80 | 262 | 3.2 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 57 | 50 | 75 | 155 | 80 | 282 | 3.6 | - | - | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 58 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 59 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0802 | 1 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 60 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0803 | 1.5 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 61 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0804 | 2 | WWMU08X408R-D* |
| TDB57-62F50-2.5 | TDSCA57-62 | 62 | 50 | 75 | 155 | 80 | 282 | 3.6 | AP0805 | 2.5 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 63 | 50 | 75 | 165 | 80 | 297 | 4.2 | - | - | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 64 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0801 | 0.5 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 65 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0802 | 1 | WWMU08X408R-D* |
| TDB63-66F50-2.5 | TDSCA63-66 | 66 | 50 | 75 | 165 | 80 | 297 | 4.2 | AP0803 | 1.5 | WWMU08X408R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 67 | 50 | 75 | 183 | 80 | 322 | 5 | - | - | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 68 | 50 | 75 | 183 | 80 | 322 | 5 | AP1101 | 0.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 69 | 50 | 75 | 183 | 80 | 322 | 5 | AP1102 | 1 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 70 | 50 | 75 | 183 | 80 | 322 | 5 | AP1103 | 1.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 71 | 50 | 75 | 183 | 80 | 322 | 5 | AP1104 | 2 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 72 | 50 | 75 | 183 | 80 | 322 | 5 | AP1105 | 2.5 | WWMU09X510R-D* |
| TDB67-73F50-2.5 | TDSCA67-73 | 73 | 50 | 75 | 183 | 80 | 322 | 5 | AP1106 | 3 | WWMU09X510R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 74 | 50 | 75 | 200 | 80 | 333 | 5.7 | - | - | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 75 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1101 | 0.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 76 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1102 | 1 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 77 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1103 | 1.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 78 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1104 | 2 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 79 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1105 | 2.5 | WWMU11X512R-D* |
| TDB74-80F50-2.5 | TDSCA74-80 | 80 | 50 | 75 | 200 | 80 | 333 | 5.7 | AP1106 | 3 | WWMU11X512R-D* |

## Body

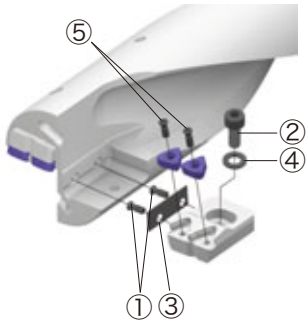
### SPARE PARTS

| Designation | ① Setting plate screw | Plug | ② Cartridge screw | ③ Setting plate | ③ Setting plate 1 | ③ Setting plate 2 | ③ Setting plate 3 | ③ Setting plate 4 | ③ Setting plate 5 | Wrench for setting plate | Wrench for cartridge | Wrench for plug | ④ Washer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | - | - | - | - | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB57-62F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | AP0802 | AP0803 | AP0804 | AP0805 | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB63-66F50-2.5 | CSTB-3 | PT1/4GN | CHHM6-15 | AP0801 | AP0802 | AP0803 | - | - | - | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB67-73F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB74-80F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |

## Cartridge set

### SPARE PARTS

| Designation | ⑤ Insert screw | Wrench |
|---|---|---|
| TDSCA55 - 56 | CSTB-3 | T-9F |
| TDSCA57 - 62 | CSTB-3 | T-9F |
| TDSCA63 - 66 | CSTB-3 | T-9F |
| TDSCA67 - 73 | CSTB-4 | T-15F |
| TDSCA74 - 80 | CSTB-5 | T-20F |




## Individual cartridge

### Inner catrtridge SPARE PARTS

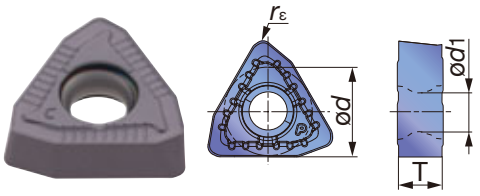
| Designation | Clamp screw for insert (X2) | Clamp screw for setting plate |
|---|---|---|
| TDS08CA-C-55-56 | CSTB-3 | - |
| TDS08CA-C-57-62 | CSTB-3 | - |
| TDS08CA-C-63-66 | CSTB-3 | - |
| TDS09CA-C-67-73 | CSTB-4 | - |
| TDS11CA-C-74-80 | CSTB-5 | - |

### Outer catrtridge SPARE PARTS

| Designation | Clamp screw for insert (X2) | Clamp screw for setting plate (X2) |
|---|---|---|
| TDS08CA-P-55-56 | CSTB-3 | CSTB-3 |
| TDS08CA-P-57-62 | CSTB-3 | CSTB-3 |
| TDS08CA-P-63-66 | CSTB-3 | CSTB-3 |
| TDS09CA-P-67-73 | CSTB-4 | CSTB-3 |
| TDS11CA-P-74-80 | CSTB-5 | CSTB-3 |

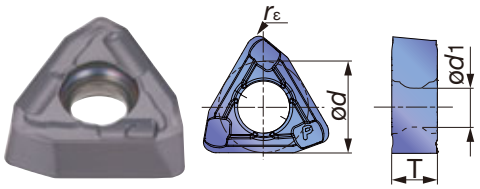
## INSERT

### DJ




| Designation | AH9030 | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|
| WWMU08X408R-DJ | ● | 8 | 3.9 | 3.4 | 0.8 | ø55 - ø66 |
| WWMU09X510R-DJ | ● | 9.7 | 4.9 | 4.4 | 1 | ø67 - ø73 |
| WWMU11X512R-DJ | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø74 - ø80 |

### DS




| Designation | AH6030 | ød | T | ød1 | rε | øDc |
|---|---|---|---|---|---|---|
| WWMU08X408R-DS | ● | 8 | 3.9 | 3.4 | 0.8 | ø55 - ø66 |
| WWMU09X510R-DS | ● | 9.7 | 4.9 | 4.4 | 1 | ø67 - ø73 |
| WWMU11X512R-DS | ● | 11.3 | 5.7 | 5.5 | 1.2 | ø74 - ø80 |



● : Line up

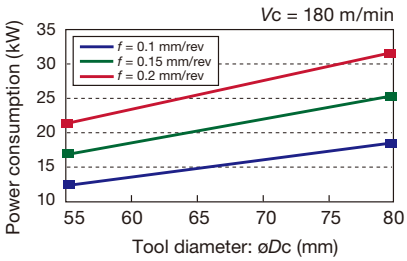
## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Selection criteria | Chip-breaker | Grade | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) øDc (mm) ø55 - 56 | ø57 - 73 | ø74 - 80 |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steels (C<0.3) SS400, SM490, S25C, etc. C15E4, E275A, E355D, etc. | First choice | DS | AH6030 | 160 - 250 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | For wear resistance | DJ | AH9030 | 160 - 320 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | Carbon steels (C>0.3) S45C, S55C, etc. C45, C55, etc. | First choice | DJ | AH9030 | 80 - 250 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 250 | 0.04 - 0.13 | 0.04 - 0.15 | 0.04 - 0.16 |
| | Low alloy steels SCM415, etc. 18CrMo4, etc. | First choice | DS | AH6030 | 160 - 250 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | For wear resistance | DJ | AH9030 | 160 -250 | 0.06 - 0.14 | 0.06 - 0.14 | 0.06 - 0.14 |
| | Alloy steels SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc. | First choice | DJ | AH9030 | 80 - 200 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 200 | 0.04 - 0.13 | 0.04 - 0.14 | 0.04 - 0.15 |
| M | Stainless steels (Austenitic) SUS304, SUS316, etc. X5CrNi189, X5CrNiMo17-12-2, etc. | First choice | DS | AH6030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | — | DJ | AH9030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | Stainless steels (Martensitic and ferritic) SUS430, etc. X6Cr17, X12CrS13, etc. | First choice | DS | AH6030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | | — | DJ | AH9030 | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.04 - 0.12 |
| | Stainless steels (Precipitation hardening) SUS630, etc. X5CrNiCuNb16-4, etc. | First choice | DS | AH6030 | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | — | DJ | AH9030 | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| K | Grey cast irons FC250, etc. 250, etc. | First choice | DJ | AH9030 | 80 - 250 | 0.06 - 0.18 | 0.08 - 0.2 | 0.08 - 0.22 |
| | | For impact resistance | DS | AH6030 | 80 - 200 | 0.06 - 0.15 | 0.08 - 0.16 | 0.08 - 0.18 |
| | Ductile cast irons FCD700, etc. 700-2, etc. | First choice | DJ | AH9030 | 80 - 200 | 0.06 - 0.16 | 0.06 - 0.18 | 0.08 - 0.2 |
| | | For impact resistance | DS | AH6030 | 80 - 150 | 0.06 - 0.15 | 0.08 - 0.16 | 0.08 - 0.18 |
| N | Aluminium alloys | First choice | DS | AH6030 | 200 - 400 | 0.1 - 0.2 | 0.1 - 0.23 | 0.1 - 0.25 |
| | | — | DJ | AH9030 | 200 - 400 | 0.1 - 0.2 | 0.1 - 0.23 | 0.1 - 0.25 |
| S | High temperature alloys Innconel718, etc. | First choice | DS | AH6030 | 20 - 60 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | — | DJ | AH9030 | 20 - 60 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | Titanium alloys Ti-6Al-4V, etc. | First choice | DS | AH6030 | 40 - 120 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| | | — | DJ | AH9030 | 40 - 120 | 0.06 - 0.12 | 0.06 - 0.14 | 0.06 - 0.14 |
| H | High hardened steels < 40HRC | First choice | DJ | AH9030 | 50 - 100 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |
| | | For impact resistance | DS | AH6030 | 40 - 80 | 0.04 - 0.08 | 0.04 - 0.1 | 0.04 - 0.1 |

## Caution

### Machine

- Use drills on a fully covered machine to maintain safety.
- Use drills on a high powered machine such as a BT50.
- Figure on right shows reference of required machine power.



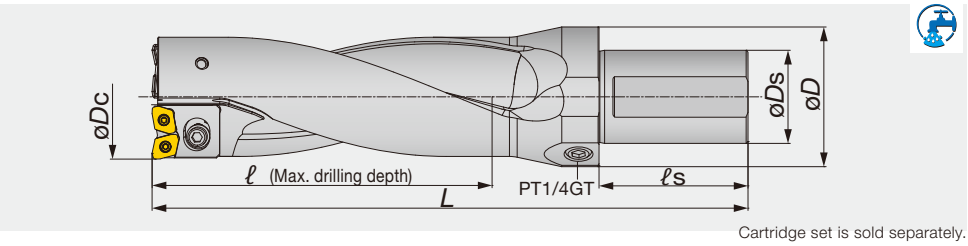

### Cutting coolant

- Use water soluble type coolant
- with internal supply.
- Coolant pressure higher than 1MPa is essential.

# TUNGDRILL BIG

## TDB, TDX cartridge set

L/D = 2.5, dia. ø55 - ø80 mm, diameter adjustable with setting plate




Cartridge set is sold separately.

| Body Designation | Cartridge set Designation | øDc | øDs | øD | ℓ | ℓs | L | kg | Setting plate Designation | Setting plate (mm) | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | TDXCA55-56 | 55 | 50 | 75 | 140 | 80 | 260 | 3.2 | - | - | XPMT08T308R-D* |
| TDB55-56F50-2.5 | TDXCA55-56 | 56 | 50 | 75 | 140 | 80 | 260 | 3.2 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 57 | 50 | 75 | 155 | 80 | 280 | 3.6 | - | - | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 58 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 59 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0802 | 1 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 60 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0803 | 1.5 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 61 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0804 | 2 | XPMT08T308R-D* |
| TDB57-62F50-2.5 | TDXCA57-62 | 62 | 50 | 75 | 155 | 80 | 280 | 3.6 | AP0805 | 2.5 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 63 | 50 | 75 | 165 | 80 | 295 | 4.2 | - | - | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 64 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0801 | 0.5 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 65 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0802 | 1 | XPMT08T308R-D* |
| TDB63-66F50-2.5 | TDXCA63-66 | 66 | 50 | 75 | 165 | 80 | 295 | 4.2 | AP0803 | 1.5 | XPMT08T308R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 67 | 50 | 75 | 183 | 80 | 320 | 5 | - | - | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 68 | 50 | 75 | 183 | 80 | 320 | 5 | AP1101 | 0.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 69 | 50 | 75 | 183 | 80 | 320 | 5 | AP1102 | 1 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 70 | 50 | 75 | 183 | 80 | 320 | 5 | AP1103 | 1.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 71 | 50 | 75 | 183 | 80 | 320 | 5 | AP1104 | 2 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 72 | 50 | 75 | 183 | 80 | 320 | 5 | AP1105 | 2.5 | XPMT110412R-D* |
| TDB67-73F50-2.5 | TDXCA67-73 | 73 | 50 | 75 | 183 | 80 | 320 | 5 | AP1106 | 3 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 74 | 50 | 75 | 200 | 80 | 330 | 5.7 | - | - | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 75 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1101 | 0.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 76 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1102 | 1 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 77 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1103 | 1.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 78 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1104 | 2 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 79 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1105 | 2.5 | XPMT110412R-D* |
| TDB74-80F50-2.5 | TDXCA74-80 | 80 | 50 | 75 | 200 | 80 | 330 | 5.7 | AP1106 | 3 | XPMT110412R-D* |

## Body

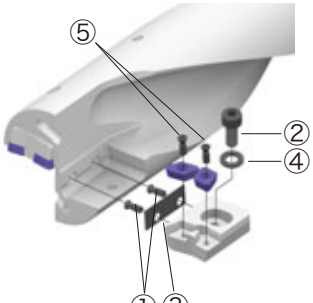
### SPARE PARTS

| Designation | ① Setting plate screw | Plug | ② Cartridge screw | ③ Setting plate | ③ Setting plate 1 | ③ Setting plate 2 | ③ Setting plate 3 | ③ Setting plate 4 | ③ Setting plate 5 | Wrench for setting plate | Wrench for cartridge | Wrench for plug | ④ Washer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TDB55-56F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | - | - | - | - | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB57-62F50-2.5 | CSTB-3 | PT1/4GN | CM5X0.8X12 | AP0801 | AP0802 | AP0803 | AP0804 | AP0805 | - | T-9D | P-4 | P-6 | 5.3X10X1 |
| TDB63-66F50-2.5 | CSTB-3 | PT1/4GN | CHHM6-15 | AP0801 | AP0802 | AP0803 | - | - | - | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB67-73F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |
| TDB74-80F50-2.5 | CSTB-3 | PT1/4GN | CM6X16 | AP1101 | AP1102 | AP1103 | AP1104 | AP1105 | AP1106 | T-9D | P-5 | P-6 | 6.4X12.5X1.6 |

## Cartridge set

### SPARE PARTS

| Designation | ⑤ Insert screw | Wrench |
|---|---|---|
| TDXCA55 - 56 | CSTB-3 | T-9F |
| TDXCA57 - 62 | CSTB-3 | T-9F |
| TDXCA63 - 66 | CSTB-3 | T-9F |
| TDXCA67 - 73 | CSTB-4 | T-15F |
| TDXCA74 - 80 | CSTB-4 | T-15F |




## Individual cartridge

### Inner catrtridge SPARE PARTS

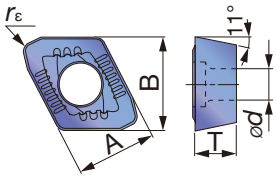
| Designation | Clamp screw for insert (X2) | Clamp screw for setting plate |
|---|---|---|
| TDX08CA-C0 | CSTB-3 | - |
| TDX08CA-C1 | CSTB-3 | - |
| TDX08CA-C2 | CSTB-3 | - |
| TDX11CA-C1 | CSTB-4 | - |
| TDX11CA-C2 | CSTB-4 | - |

### Outer catrtridge SPARE PARTS

| Designation | Clamp screw for insert (X2) | Clamp screw for setting plate (X2) |
|---|---|---|
| TDX08CA-P0 | CSTB-3 | CSTB-3 |
| TDX08CA-P1 | CSTB-3 | CSTB-3 |
| TDX08CA-P2 | CSTB-3 | CSTB-3 |
| TDX11CA-P1 | CSTB-4 | CSTB-3 |
| TDX11CA-P2 | CSTB-4 | CSTB-3 |

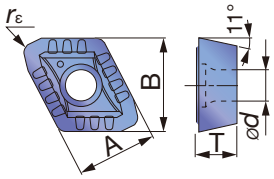
# INSERT

## DJ



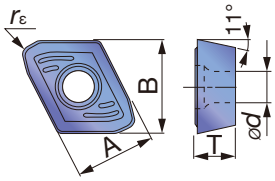

| Designation | Coated | | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | T1115 | | | | | | |
| XPMT08T308R-DJ | ● | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DJ | ● | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

## DS



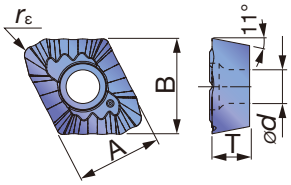

| Designation | Coated | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|
| | AH6030 | AH725 | | | | | | |
| XPMT08T308R-DS | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DS | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

## DW




| Designation | Coated | | | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|---|---|
| | AH9030 | AH6030 | AH725 | | | | | | |
| XPMT08T308R-DW | ● | ● | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DW | ● | ● | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

## DG




| Designation | Coated | A | B | T | ød | rε | øDc |
|---|---|---|---|---|---|---|---|
| | AH725 | | | | | | |
| XPMT08T308R-DG | ● | 8.5 | 9.9 | 3.97 | 3.4 | 0.8 | ø55 - ø66 |
| XPMT110412R-DG | ● | 11.2 | 12.5 | 4.76 | 4.4 | 1.2 | ø67 - ø80 |

● : Line up

## INSERTS RECOMMENDATION

| ISO | Workpiece material | First choice | High feed | High speed | Troubleshooting: Chipping resistance | Troubleshooting: Wear resistance | Troubleshooting: Surface finish | Troubleshooting: Chip control |
|---|---|---|---|---|---|---|---|---|
| P | Low carbon steel (C ≤ 0.3%) | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| | Carbon steel (C > 0.3%) Alloy steels | DJ, AH6030 | DW, AH6030 | DJ, AH9030 | DW, AH725 | DJ, AH9030 | DW, AH6030 | - |
| | Low alloy steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | - |
| M | Stainless steel | DS, AH6030 | - | - | DS, AH725 | - | DW, AH6030 | DG, AH725 |
| K | Grey cast iron | DJ, AH9030 | DW, AH9030 | DJ, T1115 | DW, AH725 | - | DW, AH9030 | - |
| | Ductile cast iron | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |
| N | Aluminium alloys | DJ, AH725 | DW, AH725 | DS, AH6030 | | - | DW, AH725 | DG, AH725 |
| S | Titanium alloys Heat-resistant alloys | DS, AH6030 | - | - | DW, AH725 | - | DW, AH725 | DG, AH725 |
| H | High hardened steels | DJ, AH9030 | DW, AH9030 | - | DW, AH725 | - | DW, AH9030 | - |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed: *f* (mm/rev) ø55 ~ ø62 | ø63 ~ ø73 | ø74 ~ ø80 |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3) SS400, SM490, S25C, etc. C15E4, E275A, E355D, etc. | 160 - 320 | 0.04 - 0.1 | 0.04 - 0.1 | 0.04 - 0.1 |
| | Carbon steels (C > 0.3) S45C, S55C, etc. C45, C55, etc. | 80 - 250 | 0.08 - 0.18 | 0.08 - 0.18 | 0.1 - 0.2 |
| | Low alloy steels SCM415 etc. 15CrMo5, etc. | 160 - 250 | 0.04 - 0.16 | 0.04 - 0.16 | 0.04 - 0.16 |
| | Alloy steels SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc. | 80 - 200 | 0.08 - 0.18 | 0.08 - 0.18 | 0.08 - 0.2 |
| M | Stainless steels (Austenitic) SUS430, SUS416, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.14 |
| | Stainless steels (Martensitic and ferritic) SUS430, etc. X5CrNi18-9, X5CrNiMo17-12-2, etc. | 100 - 200 | 0.04 - 0.12 | 0.04 - 0.12 | 0.06 - 0.14 |
| | Stainless steels (Precipitation hardening) SUS630 etc. X5CrNiCuNb16-4, etc. | 80 - 120 | 0.04 - 0.1 | 0.04 - 0.1 | 0.06 - 0.12 |
| K | Grey cast irons FC250, etc.250, etc. | 80 - 250 | 0.08 - 0.2 | 0.08 - 0.2 | 0.1 - 0.22 |
| | Ductile cast irons FCD600, etc. 600-3, etc. | 80 - 200 | 0.08 - 0.2 | 0.08 - 0.2 | 0.1 - 0.22 |
| N | Aluminium alloys AlCu4SiMg, AlSi11Cu3, etc. | 200 - 400 | 0.15 - 0.25 | 0.15 - 0.25 | 0.18 - 0.28 |

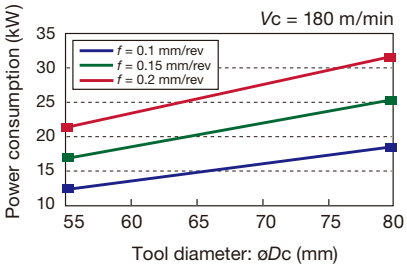
## STANDARD CUTTING CONDITIONS FOR DG CHIPBREAKER

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Series L/D | Feed: *f* (mm/rev) ø27 ~ ø32 | ø33 ~ ø54 |
|---|---|---|---|---|---|
| P | Low carbon steels (C < 0.3) SS400, SM490, S25C, etc. C15E4, E275A, E355D, etc. | 60 - 180 | 2D, 3D | 0.04 - 0.1 | |
| | | | 4D, 5D | | |

## ■ Caution

### Machine

- Use drills on a fully covered machine to maintain safety.
- Use drills on a high powered machine such as a BT50.
- Figure on right shows reference of required machine power.

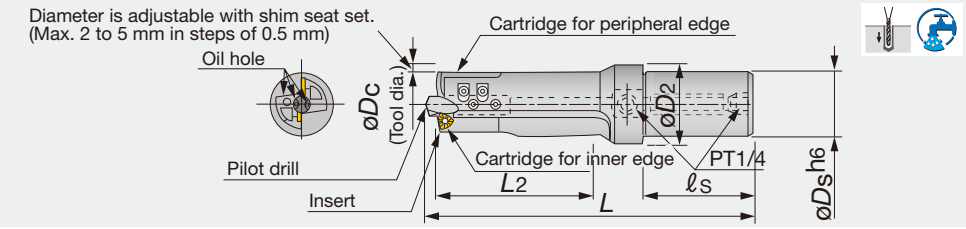



### Cutting coolant

- Use water soluble type coolant with internal supply.
- Coolant pressure higher than 1MPa is essential.

## TDP L/D=5

Indexable drills with pilot drill for deep hole drilling




| Designation | øDc | øDs | øD2 | L | L2 | ℓs | Insert | Pilot drill (included in the package) |
|---|---|---|---|---|---|---|---|---|
| TDP30-32 | 30 ~ 32 | 32 | 40 | 248 | 150 | 60 | WPMT040208-D3 | DP08 (ø8) |
| TDP37-40 | 37 ~ 40 | 40 | 50 | 295 | 185 | 70 | WPMT050308-D3 | DP10 (ø10) |
| TDP40-45 | 40 ~ 45 | 40 | 50 | 310 | 200 | 70 | WPMT050308-D3 | DP12 (ø12) |
| TDP45-50 | 45 ~ 50 | 40 | 50 | 347 | 225 | 70 | WPMT06T308-D3 | DP12 (ø12) |
| TDP60-65 | 60 ~ 65 | 50 | 58.5 | 470 | 300 | 120 | WPMT080412-D3 | DP12 (ø12) |

Note: Diameter is adjustable with shim seat set

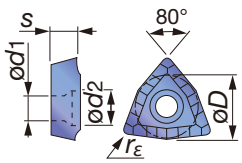
Note: L/D = Hole depth / Drill diameter

### SPARE PARTS

| Designation | Cartridge | | Clamping screw | | | Oil hole plug screw | Wrenches | | | | Shim seat set |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | For peripheral edge | For inner edge | For inserts | For Cartridge | For pilot drill | | For inserts | For Cartridge | For pilot drill | Oil hole plug screw | |
| TDP30-32 | CW04A | CW04B | CSTB-2.5S | BHM4-8 | SSHM5-10 | PT1/4GN | T-8D | P-2.5 | Same for cartridge | P-6 | SW04 |
| TDP37-40 | CW05A | CW05B | CSTB-3S | BHM4-10 | SSHM5-10 | PT1/4GN | T-9D | P-2.5 | Same for cartridge | P-6 | SW05 |
| TDP40-45 | CW05A | CW05B | CSTB-3S | BHM4-10 | SSHM6-12 | PT1/4GN | T-9D | P-2.5 | P-3 | P-6 | SW05 |
| TDP45-50 | CW06A | CW06B | CSTB-3.5D | BHM5-14 | SSHM6-12 | PT1/4GN | T-9D | P-3 | Same for cartridge | P-6 | SW06 |
| TDP60-65 | CW08A | CW08B | CSTB-4M | CHHM5-18 (CM5×0.8×18) | SSHM6-20 | PT1/4GN | T-15D | P-4 | P-3 | P-6 | SW08 |

## INSERT

### WPMT04/05/06/08-D3

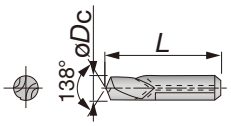



| Designation | T313W | øD | s | rε | ød1 | ød2 |
|---|---|---|---|---|---|---|
| WPMT040208-D3 | ● | 6.35 | 2.38 | 0.8 | 2.86 | 3.75 |
| WPMT050308-D3 | ● | 7.938 | 3.18 | 0.8 | 3.4 | 4.5 |
| WPMT06T308-D3 | ● | 9.525 | 3.97 | 0.8 | 3.9 | 5.1 |
| WPMT080412-D3 | ● | 12.7 | 4.76 | 1.2 | 4.4 | 6 |

Note: the appearance of WPMT040208-D3 type insert differs from the drawing above.

## PILOT DRILL

### DP08/10/12




| Designation | HSS | øDc | L |
|---|---|---|---|
| DP08 | ● | 8 | 42 |
| DP10 | ● | 10 | 48 |
| DP12 | ● | 12 | 55 |

Note : DP08 type drill does not have oil hole.

Package quantity: 1pc

● : Line up

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|
| P | Carbon steel | 60 - 70 | 0.07 - 0.17 |
| | Alloy steel | 60 - 70 | 0.07 - 0.17 |
| K | Cast iron | 70 - 100 | 0.1 - 0.2 |

Note: ø*Dc* ≦ ø37 mm, feed should be set less than 0.13 mm/rev for steel, 0.15 mm/rev for cast iron.

Number of revolutions *n* (min-1) = Cutting speed *Vc* ×1000×3.14÷Tool diameter ø*Dc*
Feed speed *Vf* (mm/min) = No. of revolutions *n* (min-1) ×Feed per revolution *f* (mm/rev)

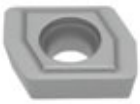
## Cautionary points in use

- When drilling steel, a water soluble coolant should be used. Coolant pressure of 1 MPa or higher and quantity of 10 litter/min or more are essential.
- For tool-rotating applications with TDP60-65 65-70, please check the availability of holders. Since its shank dia is 50mm.
- Drilling into stacked plates is not recommended.
- Not suitable for low carbon steels and stainless steels, because of chip control issues.

# Drilling Inserts



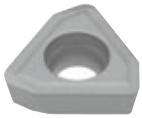
● LPMT03X206R-D4, LPMT05X204-D4

| Shape | Designation | Coated | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|
| | | T313W | | | | | | |
|  | LPMT03X206R-D4 | ● | | | | | ø14.0 ~ ø17.5 | TDJ (Former products) |
| | LPMT05X204-D4 | ● | | | | | ø14.0 ~ ø17.5 | |

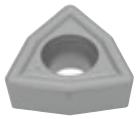
● SPMP831DS, SPMP/M**2ERD

| Shape | Designation | ISO Metric Designation | Coated | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|---|
| | | | T313W | | | | | | |
| | SPMP831DS | SPMT060204-DS | ● | | | | | ø18.0 ~ ø19.5 | TDR (Former products) |
| | SPMP042ERD | SPMP080308ER-D | ● | | | | | ø20.0 ~ ø28.5 | |
| | SPMM322ERD | SPMT090308ER-D | ● | | | | | ø29.0 ~ ø34.5 | |
| | SPMM432ERD | SPMT120408ER-D | ● | | | | | ø35.0 ~ ø49.0 | |

● TPMP**ZDS, TPMP**ZERD, TPMM**ZERD

| Shape | Designation | Coated | | | | | Applicable drill diameter | Applicable drill |
|---|---|---|---|---|---|---|---|---|
| | | T313W | | | | | | |
|  | TPMP83ZDS | ● | | | | | ø18.0 ~ ø19.5 | TDR (Former products) |
| | TPMP04ZERD | ● | | | | | ø20.0 ~ ø28.5 | |
| | TPMM32ZERD | ● | | | | | ø29.0 ~ ø34.5 | |
| | TPMM43ZERD | ● | | | | | ø35.0 ~ ø54.0 | |

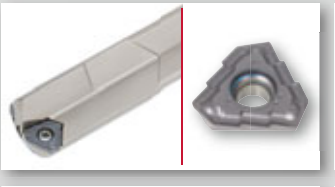
● WCMT**-D...

| Shape | Designation | Coated | | | | | | | | | | Applicable drill |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AH120 | AH140 | T313W | | | | | | | | |
|  | WCMT050308-DC | | | ● | | | | | | | | For boring and Drills (Former products) |
| | WCMT050308-D4 | ● | ● | ● | | | | | | | | |
| | WCMT06T308-DC | | | ● | | | | | | | | |
| | WCMT06T308-D4 | ● | ● | ● | | | | | | | | |
| | WCMT080412-DC | | | ● | | | | | | | | |
| | WCMT080412-D4 | | | ● | | | | | | | | |

● : Line up

MEMO

# DrillLine - Deep Hole Drill



## DEEPTDRILL

E104

Excellent productivity and stability in deep hole drilling

**ø16 mm - ø28 mm / L/D = 10, 15, 25: for Machining centers**
**OAL < 1500 mm: for Gundrill machines (Standard line-ups)**

## GUNDRILL

E114

Brazed gundrills suitable for small and deep hole drilling

**Tool dia.: ø3 mm - ø12.2 mm**
**OAL ≤ 1650 mm (Standard line-ups)**

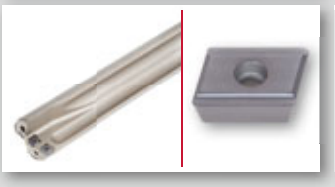
## BTA tools for deep hole drilling

E117

Single and Double tube type. New solution for deep hole drilling

**ø8 mm - ø249 mm**

TAILOREDTOOL



## HF drills for deep hole drilling

E119

Indexable deep hole drills for large diameter with high productivity drilling

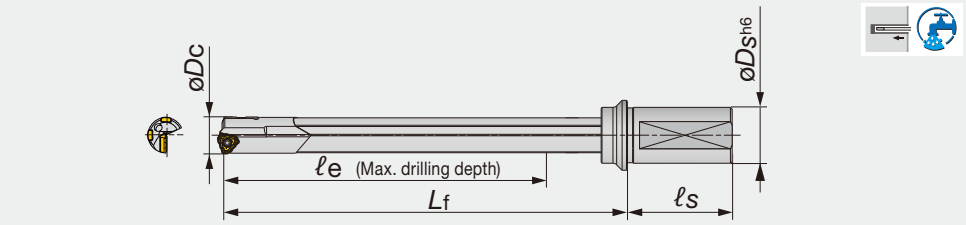
**ø30 mm - ø69 mm / Drilling depth: L/D ≤ 14**

TAILOREDTOOL

DeepTri-Drill

# MCTR L/D=10

Drill body for lathes and machining centers, L/D = 10, Tool dia. ø16 - ø28 mm




| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-10 | 16 | 25 | 170 | 56 | 209 | TOHT08... | GP06-075 |
| MCTR16.50XM25-10 | 16.5 | 25 | 170 | 56 | 209 | TOHT08... | GP06-075 |
| MCTR17.00XM25-10 | 17 | 25 | 180 | 56 | 220 | TOHT08... | GP06-075 |
| MCTR18.00XM25-10 | 18 | 25 | 190 | 56 | 232 | TOHT08... | GP06-075 |
| MCTR19.00XM25-10 | 19 | 25 | 200 | 56 | 243 | TOHT09... | GP06-085 |
| MCTR20.00XM32-10 | 20 | 32 | 210 | 60 | 255 | TOHT09... | GP06-085 |
| MCTR21.00XM32-10 | 21 | 32 | 220 | 60 | 266 | TOHT10... | GP06-085 |
| MCTR22.00XM32-10 | 22 | 32 | 230 | 60 | 278 | TOHT11... | GP06-100 |
| MCTR23.00XM32-10 | 23 | 32 | 240 | 60 | 289 | TOHT11... | GP06-100 |
| MCTR24.00XM32-10 | 24 | 32 | 250 | 60 | 301 | TOHT11... | GP06-100 |
| MCTR25.00XM32-10 | 25 | 32 | 260 | 60 | 312 | TOHT11... | GP06-100 |
| MCTR26.00XM40-10 | 26 | 40 | 270 | 70 | 324 | TOHT12... | GP06 |
| MCTR27.00XM40-10 | 27 | 40 | 280 | 70 | 335 | TOHT12... | GP06 |
| MCTR28.00XM40-10 | 28 | 40 | 280 | 70 | 337 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

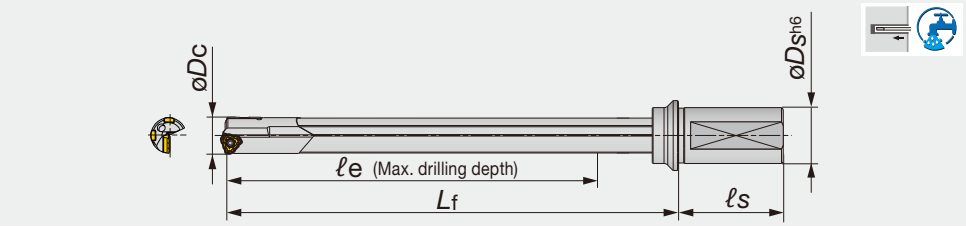
*Just for reference

## SPARE PARTS

| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR19... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

# MCTR L/D=15

Drill body for lathes and machining centers, L/D = 15, Tool dia. ø16 - ø28 mm




| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-15 | 16 | 25 | 255 | 56 | 294 | TOHT08... | GP06-075 |
| MCTR16.50XM25-15 | 16.5 | 25 | 255 | 56 | 294 | TOHT08... | GP06-075 |
| MCTR17.00XM25-15 | 17 | 25 | 270 | 56 | 310 | TOHT08... | GP06-075 |
| MCTR17.50XM25-15 | 17.5 | 25 | 270 | 56 | 310 | TOHT08... | GP06-075 |
| MCTR18.00XM25-15 | 18 | 25 | 285 | 56 | 327 | TOHT08... | GP06-075 |
| MCTR18.50XM25-15 | 18.5 | 25 | 285 | 56 | 327 | TOHT09... | GP06-085 |
| MCTR19.00XM25-15 | 19 | 25 | 300 | 56 | 343 | TOHT09... | GP06-085 |
| MCTR19.50XM25-15 | 19.5 | 25 | 300 | 56 | 343 | TOHT09... | GP06-085 |
| MCTR20.00XM32-15 | 20 | 32 | 315 | 60 | 360 | TOHT09... | GP06-085 |
| MCTR21.00XM32-15 | 21 | 32 | 330 | 60 | 376 | TOHT10... | GP06-085 |
| MCTR22.00XM32-15 | 22 | 32 | 345 | 60 | 393 | TOHT11... | GP06-100 |
| MCTR23.00XM32-15 | 23 | 32 | 360 | 60 | 409 | TOHT11... | GP06-100 |
| MCTR24.00XM32-15 | 24 | 32 | 375 | 60 | 426 | TOHT11... | GP06-100 |
| MCTR25.00XM32-15 | 25 | 32 | 390 | 60 | 442 | TOHT11... | GP06-100 |
| MCTR26.00XM40-15 | 26 | 40 | 405 | 70 | 459 | TOHT12... | GP06 |
| MCTR27.00XM40-15 | 27 | 40 | 420 | 70 | 475 | TOHT12... | GP06 |
| MCTR28.00XM40-15 | 28 | 40 | 420 | 70 | 477 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

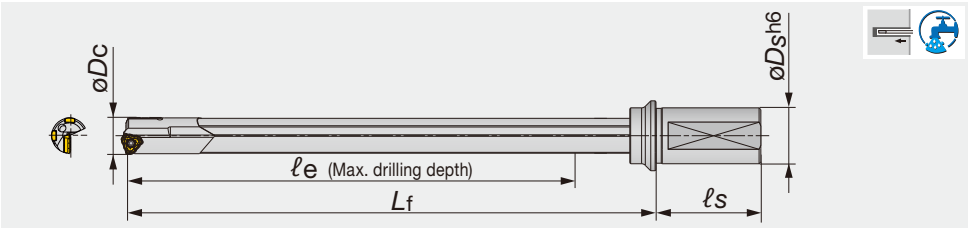
*Just for reference

## SPARE PARTS

| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18.0... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR18.5... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

# MCTR L/D=25

Drill body for lathes and machining centers, L/D = 25, Tool dia. ø16 - ø28 mm




| Designation | øDc | øDs | ℓe | ℓs | Lf | Insert | Guide pad |
|---|---|---|---|---|---|---|---|
| MCTR16.00XM25-25 | 16 | 25 | 425 | 56 | 464 | TOHT08... | GP06-075 |
| MCTR16.50XM25-25 | 16.5 | 25 | 425 | 56 | 464 | TOHT08... | GP06-075 |
| MCTR17.00XM25-25 | 17 | 25 | 450 | 56 | 490 | TOHT08... | GP06-075 |
| MCTR17.50XM25-25 | 17.5 | 25 | 450 | 56 | 490 | TOHT08... | GP06-075 |
| MCTR18.00XM25-25 | 18 | 25 | 475 | 56 | 517 | TOHT08... | GP06-075 |
| MCTR18.50XM25-25 | 18.5 | 25 | 475 | 56 | 517 | TOHT09... | GP06-085 |
| MCTR19.00XM25-25 | 19 | 25 | 500 | 56 | 543 | TOHT09... | GP06-085 |
| MCTR19.50XM25-25 | 19.5 | 25 | 500 | 56 | 543 | TOHT09... | GP06-085 |
| MCTR20.00XM32-25 | 20 | 32 | 525 | 60 | 570 | TOHT09... | GP06-085 |
| MCTR21.00XM32-25 | 21 | 32 | 550 | 60 | 596 | TOHT10... | GP06-085 |
| MCTR22.00XM32-25 | 22 | 32 | 575 | 60 | 623 | TOHT11... | GP06-100 |
| MCTR23.00XM32-25 | 23 | 32 | 600 | 60 | 649 | TOHT11... | GP06-100 |
| MCTR24.00XM32-25 | 24 | 32 | 625 | 60 | 676 | TOHT11... | GP06-100 |
| MCTR25.00XM32-25 | 25 | 32 | 650 | 60 | 702 | TOHT11... | GP06-100 |
| MCTR26.00XM40-25 | 26 | 40 | 675 | 70 | 729 | TOHT12... | GP06 |
| MCTR27.00XM40-25 | 27 | 40 | 700 | 70 | 755 | TOHT12... | GP06 |
| MCTR28.00XM40-25 | 28 | 40 | 700 | 70 | 757 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

## SPARE PARTS

| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| MCTR16... - MCTR18.0... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| MCTR18.5... - MCTR20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| MCTR21... | SR34-506 | T-9F | SR34-508 | T-7F |
| MCTR22... - MCTR25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| MCTR26... - MCTR28... | SR14-506 | T-15F | SR34-508 | T-7F |

## DESIGNATION FOR TAILOR MADE TOOLS

When a specially designed tool is needed, use the below guide line to make the designation (Cat. No).

| MCTR | 16.50 | XM | 25 | - | 22 |
|---|---|---|---|---|---|
| 1 | 2 | | 3 | | 4 |

| 1 Series | |
|---|---|
| MCTR | DeepTriDrill (For machining centers and lathes) |

| 2 Drill dia. øDc (mm) | |
|---|---|
| 16.50 | ø16.50 |

| 3 Driver dia. øDs (mm) | |
|---|---|
| 25 | ø25 |

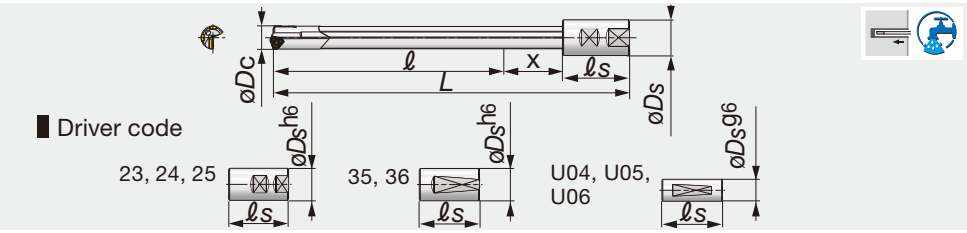
| 4 L/D ratio |
|---|

## AVAILABLE RANGE OF TAILOR MADE DRILL BODIES

| øDc | øDs | ℓe | ℓs | ℓ1 |
|---|---|---|---|---|
| 16 - 16.79 | 25 | 136 - 425 | 56 | 175 - 464 |
| 16.8 - 17.69 | 25 | 144 - 450 | 56 | 184 - 490 |
| 17.7 - 18.69 | 25 | 152 - 475 | 56 | 194 - 517 |
| 18.7 - 19.69 | 25 | 160 - 500 | 56 | 203 - 543 |
| 19.7 - 20.69 | 32 | 168 - 525 | 60 | 213 - 570 |
| 20.7 - 21.69 | 32 | 176 - 550 | 60 | 222 - 596 |
| 21.7 - 22.69 | 32 | 184 - 575 | 60 | 232 - 623 |
| 22.7 - 23.69 | 32 | 192 - 600 | 60 | 241 - 649 |
| 23.7 - 24.69 | 32 | 200 - 625 | 60 | 251 - 676 |
| 24.7 - 25.69 | 32 | 208 - 650 | 60 | 260 - 702 |
| 25.7 - 26.69 | 40 | 216 - 675 | 70 | 270 - 719 |
| 26.7 - 27.69 | 40 | 224 - 700 | 70 | 279 - 745 |
| 27.7 - 28 | 40 | 224 - 700 | 70 | 281 - 747 |

# TRLG

Drill body for gun drill machine, Tool dia. ø16 - ø28 mm




| Designation | øDc | L | øDs | ℓ | ℓs | x | Driver code | Insert | Guide pad |
|---|---|---|---|---|---|---|---|---|---|
| TRLG16.00X800-23 | 16 | 800 | 25 | 720 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG16.00X800-U04 | 16 | 800 | 25.4 | 706 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1000-23 | 16 | 1000 | 25 | 920 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG16.00X1000-U04 | 16 | 1000 | 25.4 | 906 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1500-U04 | 16 | 1500 | 25.4 | 1406 | 70 | 24 | U04 | TOHT08... | GP06-075 |
| TRLG16.00X1500-23 | 16 | 1500 | 25 | 1420 | 56 | 24 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X800-23 | 17 | 800 | 25 | 719 | 56 | 25 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X800-U04 | 17 | 800 | 25.4 | 705 | 70 | 25 | U04 | TOHT08... | GP06-075 |
| TRLG17.00X1000-23 | 17 | 1000 | 25 | 919 | 56 | 25 | 23 | TOHT08... | GP06-075 |
| TRLG17.00X1000-U04 | 17 | 1000 | 25.4 | 905 | 70 | 25 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X800-23 | 18 | 800 | 25 | 717 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.00X800-U04 | 18 | 800 | 25.4 | 703 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1000-23 | 18 | 1000 | 25 | 917 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.00X1000-U04 | 18 | 1000 | 25.4 | 903 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1500-U04 | 18 | 1500 | 25.4 | 1403 | 70 | 27 | U04 | TOHT08... | GP06-075 |
| TRLG18.00X1500-23 | 18 | 1500 | 25 | 1417 | 56 | 27 | 23 | TOHT08... | GP06-075 |
| TRLG18.50X1500-U04 | 18.5 | 1500 | 25.4 | 1417 | 70 | 27 | U04 | TOHT09... | GP06-085 |
| TRLG18.50X1500-23 | 18.5 | 1500 | 25 | 1417 | 56 | 27 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X800-23 | 19 | 800 | 25 | 716 | 56 | 28 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X800-U04 | 19 | 800 | 25.4 | 702 | 70 | 28 | U04 | TOHT09... | GP06-085 |
| TRLG19.00X1000-23 | 19 | 1000 | 25 | 916 | 56 | 28 | 23 | TOHT09... | GP06-085 |
| TRLG19.00X1000-U04 | 19 | 1000 | 25.4 | 902 | 70 | 28 | U04 | TOHT09... | GP06-085 |
| TRLG20.00X800-24 | 20 | 800 | 32 | 710 | 60 | 30 | 24 | TOHT09... | GP06-085 |
| TRLG20.00X800-U05 | 20 | 800 | 31.75 | 700 | 70 | 30 | U05 | TOHT09... | GP06-085 |
| TRLG20.00X1000-24 | 20 | 1000 | 32 | 910 | 60 | 30 | 24 | TOHT09... | GP06-085 |
| TRLG20.00X1000-U05 | 20 | 1000 | 31.75 | 900 | 70 | 30 | U05 | TOHT09... | GP06-085 |
| TRLG21.00X1000-24 | 21 | 1000 | 32 | 909 | 60 | 31 | 24 | TOHT10... | GP06-085 |
| TRLG21.00X1000-U05 | 21 | 1000 | 31.75 | 899 | 70 | 31 | U05 | TOHT10... | GP06-085 |
| TRLG22.00X1000-24 | 22 | 1000 | 32 | 907 | 60 | 33 | 24 | TOHT11... | GP06-100 |
| TRLG22.00X1000-U05 | 22 | 1000 | 31.75 | 897 | 70 | 33 | U05 | TOHT11... | GP06-100 |
| TRLG22.00X1500-24 | 22 | 1500 | 32 | 1407 | 60 | 33 | 24 | TOHT11... | GP06-100 |
| TRLG22.00X1500-U05 | 22 | 1500 | 31.75 | 1397 | 70 | 33 | U05 | TOHT11... | GP06-100 |
| TRLG23.00X1000-24 | 23 | 1000 | 32 | 906 | 60 | 34 | 24 | TOHT11... | GP06-100 |
| TRLG23.00X1000-U05 | 23 | 1000 | 31.75 | 896 | 70 | 34 | U05 | TOHT11... | GP06-100 |
| TRLG23.00X1500-24 | 23 | 1500 | 32 | 1406 | 60 | 34 | 24 | TOHT11... | GP06-100 |
| TRLG23.00X1500-U05 | 23 | 1500 | 31.75 | 1396 | 70 | 34 | U05 | TOHT11... | GP06-100 |
| TRLG24.00X1000-24 | 24 | 1000 | 32 | 904 | 60 | 36 | 24 | TOHT11... | GP06-100 |
| TRLG24.00X1000-U05 | 24 | 1000 | 31.75 | 894 | 70 | 36 | U05 | TOHT11... | GP06-100 |
| TRLG24.00X1500-24 | 24 | 1500 | 32 | 1404 | 60 | 36 | 24 | TOHT11... | GP06-100 |
| TRLG24.00X1500-U05 | 24 | 1500 | 31.75 | 1394 | 70 | 36 | U05 | TOHT11... | GP06-100 |
| TRLG25.00X1000-24 | 25 | 1000 | 32 | 903 | 60 | 37 | 24 | TOHT11... | GP06-100 |
| TRLG25.00X1000-U05 | 25 | 1000 | 31.75 | 893 | 70 | 37 | U05 | TOHT11... | GP06-100 |
| TRLG26.00X1000-25 | 26 | 1000 | 40 | 891 | 70 | 39 | 25 | TOHT12... | GP06 |
| TRLG26.00X1000-U06 | 26 | 1000 | 38.1 | 891 | 70 | 39 | U06 | TOHT12... | GP06 |
| TRLG27.00X1000-25 | 27 | 1000 | 40 | 890 | 70 | 40 | 25 | TOHT12... | GP06 |
| TRLG27.00X1000-U06 | 27 | 1000 | 38.1 | 890 | 70 | 40 | U06 | TOHT12... | GP06 |
| TRLG28.00X1000-25 | 28 | 1000 | 40 | 888 | 70 | 42 | 25 | TOHT12... | GP06 |
| TRLG28.00X1000-U06 | 28 | 1000 | 38.1 | 888 | 70 | 42 | U06 | TOHT12... | GP06 |

| øDc | Tool diameter tolerance | Hole diameter tolerance* |
|---|---|---|
| ø16 - ø28 | 0 / - 0.07 | + 0.05 / - 0.1 |

*Just for reference

## SPARE PARTS

| Designation | Insert | | Guide pad | |
|---|---|---|---|---|
| | Screw | Wrench | Screw | Wrench |
| TRLG16... - TRLG18... | CSTB2.5S | T-8F | SR34-508 | T-7F |
| TRLG18.5... - TRLG20... | SR14-560/S | T-8F | SR34-508 | T-7F |
| TRLG21... | SR34-506 | T-9F | SR34-508 | T-7F |
| TRLG22... - TRLG25... | SR14-571/S | T-10/5 | SR34-508 | T-7F |
| TRLG26... - TRLG28... | SR14-506 | T-15F | SR34-508 | T-7F |

# DEEP TRI DRILL

Tools for deep hole drilling on machining centers

## DESIGNATION FOR TAILOR MADE TOOLS

When a specially designed tool is needed, use the below guide line to make the designation (Cat. No).

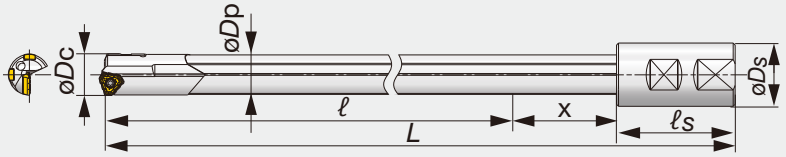
| TRLG | 16.50 | X | 900 | - | 23 |
|---|---|---|---|---|---|
| ① | ② | | ③ | | ④ |

| ① Series | |
|---|---|
| TRLG | DeepTriDrill (For gun drill machine) |

| ② Drill dia. *øDc* (mm) | |
|---|---|
| 16.50 | ø16.50 |

| ③ Overall length: *L* (mm) | |
|---|---|
| 900 | 900 |

| ④ Driver code | |
|---|---|
| 23 | 23 |




## AVAILABLE RANGE OF TAILOR MADE DRILL BODIES

| *øDc* | *L* | x |
|---|---|---|
| 16 - 16.79 | 400 - 2400 | 24 |
| 16.8 - 17.69 | 400 - 2400 | 25 |
| 17.7 - 18.69 | 400 - 2400 | 27 |
| 18.7 - 19.69 | 400 - 2400 | 28 |
| 19.7 - 20.69 | 400 - 2400 | 30 |
| 20.7 - 21.69 | 400 - 2400 | 31 |
| 21.7 - 22.69 | 400 - 2400 | 33 |

| *øDc* | *L* | x |
|---|---|---|
| 22.7 - 23.69 | 400 - 2400 | 34 |
| 23.7 - 24.69 | 400 - 2400 | 36 |
| 24.7 - 25.69 | 400 - 2400 | 37 |
| 25.7 - 26.69 | 400 - 2400 | 39 |
| 26.7 - 27.69 | 400 - 2400 | 40 |
| 27.7 - 28 | 400 - 2400 | 42 |

Please provide the driver shape depending on your request

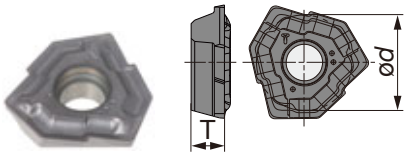
## TUBE DIAMETER

| *øDc* | *øDp* |
|---|---|
| 16 - 16.79 | 15.5 |
| 16.8 - 17.69 | 16.2 |
| 17.7 - 18.69 | 17.2 |
| 18.7 - 19.69 | 18.2 |
| 19.7 - 20.69 | 19 |
| 20.7 - 21.69 | 20 |
| 21.70 - 22.69 | 21 |

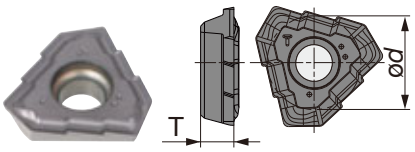
| *øDc* | *øDp* |
|---|---|
| 22.7 - 23.69 | 22 |
| 23.7 - 24.69 | 23 |
| 24.7 - 25.69 | 24 |
| 25.7 - 26.69 | 25 |
| 26.7 - 27.69 | 26 |
| 27.7 - 28 | 27 |

## INSERT

### TOHT-NDJ (080...)




### TOHT-NDJ (090... - 120...)




**NDJ chipbreaker**

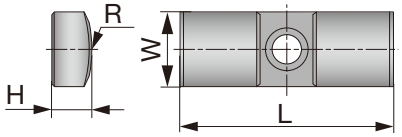
- Low cutting force
- For general purpose

| Designation | øDc | AH725 | ød | T |
|---|---|---|---|---|
| TOHT080305R-NDJ | 16 - 18 | ● | 8.55 | 2.8 |
| TOHT090305R-NDJ | 18.01 - 20 | ● | 8.32 | 3 |
| TOHT100305R-NDJ | 20.01 - 21.99 | ● | 9.23 | 3.3 |
| TOHT110405R-NDJ | 22 - 25 | ● | 10.4 | 3.8 |
| TOHT120405R-NDJ | 25.01 - 28 | ● | 11.59 | 4.3 |

● : Line up
Package quantity = 10 pcs.

## GUIDE PAD

### GP06



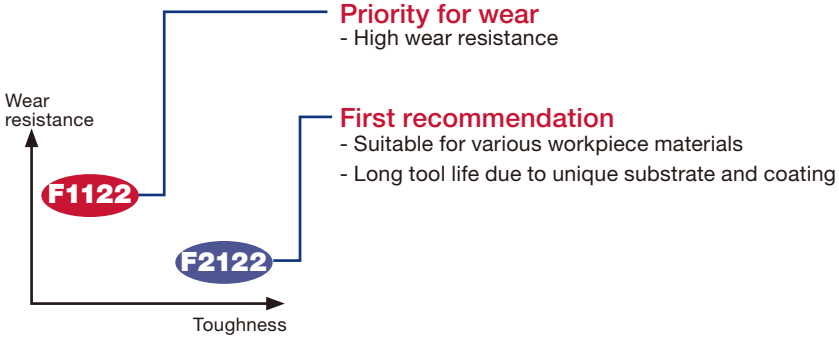

| Designation | øDc | F1122 | F2122 | W | L | H | R |
|---|---|---|---|---|---|---|---|
| GP06-075 | 16 - 18 | ● | ● | 6 | 20 | 3 | 7.5 |
| GP06-085 | 18.01 - 21 | ● | ● | 6 | 20 | 3 | 8.5 |
| GP06-100 | 21.01 - 25 | ● | ● | 6 | 20 | 3 | 10 |
| GP06 | 25.01 - 28 | ● | ● | 6 | 20 | 3 | 12 |

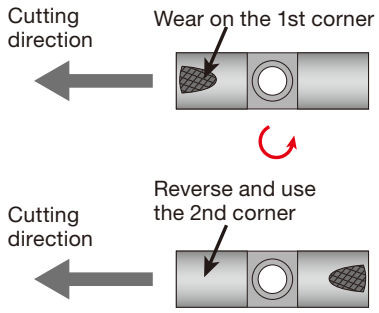
● : Line up
Package quantity = 5 pcs.

### Replacing guide pads

Guide pads are subject to wear, like inserts

- Each guide pad has 2 corners.
- When the width of wear on the 1st corner reaches 70% of the width of guide pad, reverse the guide pad and use the 2nd corner.
- Replace the guide pad with a new one when the 2nd corner shows the same wear as on the 1st corner.



## STANDARD CUTTING CONDITIONS

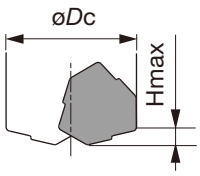
| ISO | Workpiece material | Cutting speed *Vc* (m/min) | Feed *f* (mm/rev) |
|---|---|---|---|
| P | Low carbon steel (C < 0.3)<br>SS400, SM490, S25C, etc. E275A, E355D, C25, etc. | 80 - 140 | 0.05 - 0.1 |
| | Carbon steel (C > 0.3)<br>S45C, S55C, etc. C45, C55, etc. | 80 - 140 | 0.05 - 0.2 |
| | Low alloy steel (C < 0.3)<br>SCM415, etc. 18CrMo4, etc. | 80 - 140 | 0.05 - 0.2 |
| | Alloy steel (C > 0.3)<br>SCM440, SCr420, etc. 42CrMo4, 20Cr4, etc. | 80 - 120 | 0.05 - 0.2 |
| M | Stainless steel (Austenitic)<br>SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc. | 60 - 100 | 0.05 - 0.1 |
| | Stainless steel (Martensitic, Ferritic)<br>SUS430, SUS416, etc.X6Cr17, X12CrS13, etc. | 60 - 100 | 0.05 - 0.1 |
| | Stainless steel (Precipitation hardening)<br>SUS630, etc. X5CrNiCuNb16-4, etc. | 60 - 100 | 0.05 - 0.1 |
| K | Grey cast iron<br>FC250, etc. 250, etc. | 80 - 140 | 0.05 - 0.3 |
| | Ductile cast iron<br>FCD700, etc. 600-3, etc. | 80 - 140 | 0.05 - 0.3 |
| N | Aluminium alloys | 100 - 200 | 0.05 - 0.2 |
| S | Heat-resistant alloys<br>Inconel 718, etc. | 20 - 50 | 0.04 - 0.1 |
| | Titanium alloys<br>Ti-6Al-4V, etc. | 30 - 60 | 0.05 - 0.15 |
| H | Hardened steel<br>≥ 40HRC | 50 - 100 | 0.04 - 0.1 |



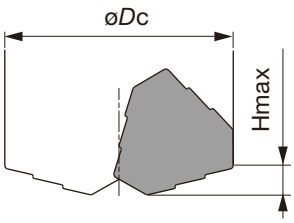
## SHAPES OF THE HOLE BOTTOM

| øDc | Insert | Maximum difference Hmax |
|---|---|---|
| 16 - 18 | TOHT08 | 2.166 |
| 18.01 - 20 | TOHT09 | 2.965 |
| 20.01 - 21.99 | TOHT10 | 3.158 |
| 22 - 25 | TOHT11 | 3.383 |
| 25.01 - 28 | TOHT12 | 3.63 |

**TOHT08...**

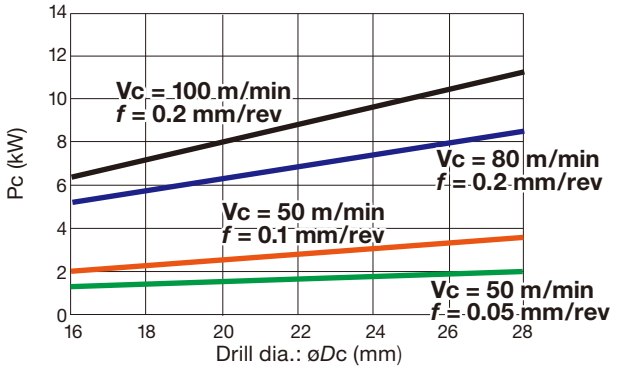



**TOHT09... - TOHT12...**

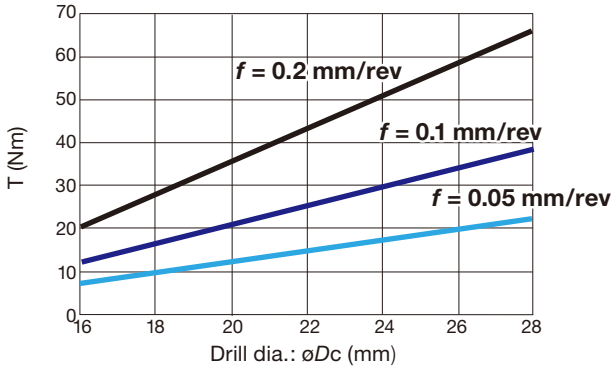


## REQUIRED SPINDLE POWER AND COOLANT PRESSURE

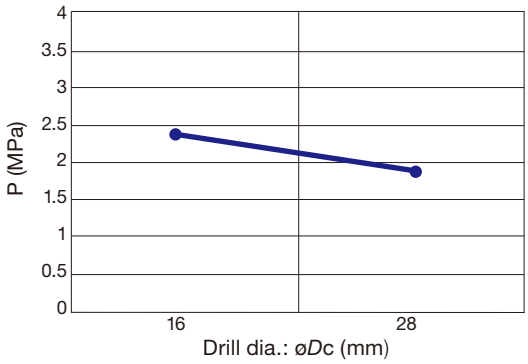
### Net power



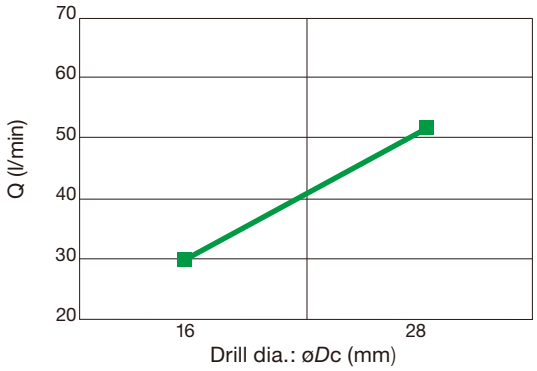

### Torque




### Coolant pressure (Recommended value)

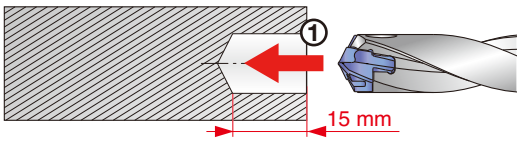



### Coolant flow rate (Recommended value)




## DRILLING PROCEDURE ON MACHINING CENTERS AND LATHES

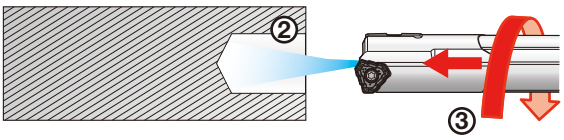
Proceed as instructed below in order to maximize the tool performance safely.




① Drill the guide hole

Hole diameter tolerance: +0.01 - +0.1 mm
Hole depth: H = 15 mm

Please use DrillMeister or TDX + EZ sleeve to make a guide hole

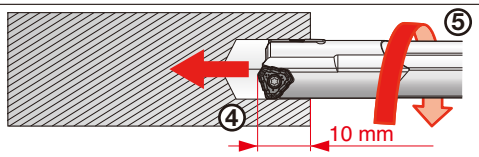



② Start coolant

③ Slowly insert DeepTriDrill into the guide hole

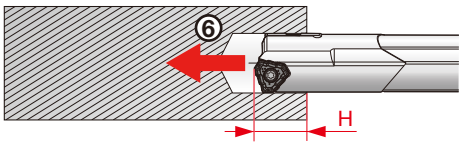
No. of revolution: $n$ = 50 - 100 $min^{-1}$
Feed speed: $Vf$ = 100 - 300 mm/min

**Caution: Do not rotate the drill at machining speed outside the hole**




④ Stop the drill at 10 mm depth

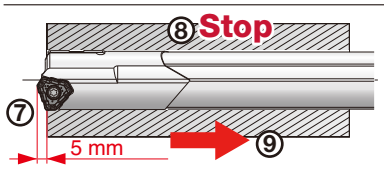
⑤ Start rotating at machining speed




⑥ Start feed

At the entrance (H = 10 - 15 mm)
→ Feed: $f$ = 80% of programmed feed

Hole depth: H ≥ 15 mm → Feed: $f$ = 100%



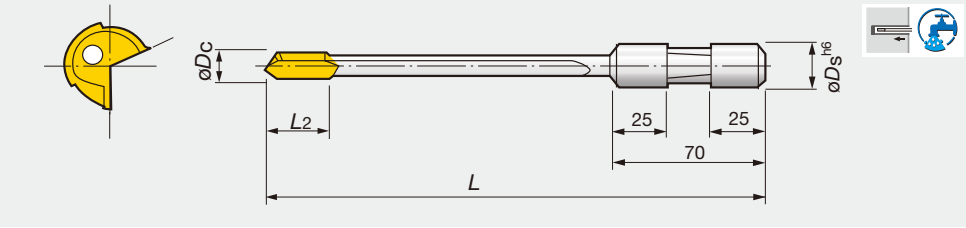

⑦ For through hole

Continue drilling until the drill head passes through the workpiece by 5 mm

⑧ Stop the rotation and coolant

⑨ Return the drill (Head back to the starting position)

MEMO




| Designation | øDc | øDs | L2 | L |
|---|---|---|---|---|
| SLJ0300L0400NA | 3 | 12.7 | 15 | 400 |
| SLJ0300L0600NA | 3 | 12.7 | 15 | 600 |
| SLJ0500L0600NA | 5 | 12.7 | 25 | 600 |
| SLJ0550L0600NA | 5.5 | 19.05 | 25 | 600 |
| SLJ0600L0600NA | 6 | 19.05 | 25 | 600 |
| SLJ0700L0600NA | 7 | 19.05 | 25 | 600 |
| SLJ0800L0600NA | 8 | 19.05 | 25 | 600 |
| SLJ1000L0600NA | 10 | 19.05 | 30 | 600 |
| SLJ0500L1000NA | 5 | 12.7 | 25 | 1000 |
| SLJ0600L1000NA | 6 | 19.05 | 25 | 1000 |
| SLJ0700L1000NA | 7 | 19.05 | 25 | 1000 |
| SLJ0800L1000NA | 8 | 19.05 | 25 | 1000 |
| SLJ1000L1000NA | 10 | 19.05 | 30 | 1000 |
| SLJ0600L1250NA | 6 | 19.05 | 25 | 1250 |
| SLJ0610L1250NA | 6.1 | 19.05 | 25 | 1250 |
| SLJ0620L1250NA | 6.2 | 19.05 | 25 | 1250 |
| SLJ0700L1250NA | 7 | 19.05 | 25 | 1250 |
| SLJ0800L1250NA | 8 | 19.05 | 25 | 1250 |
| SLJ0810L1250NA | 8.1 | 19.05 | 25 | 1250 |
| SLJ0820L1250NA | 8.2 | 19.05 | 25 | 1250 |
| SLJ1000L1250NA | 10 | 19.05 | 30 | 1250 |
| SLJ1010L1250NA | 10.1 | 19.05 | 30 | 1250 |
| SLJ1020L1250NA | 10.2 | 19.05 | 30 | 1250 |
| SLJ1200L1250NA | 12 | 19.05 | 30 | 1250 |
| SLJ1210L1250NA | 12.1 | 19.05 | 30 | 1250 |
| SLJ1220L1250NA | 12.2 | 19.05 | 30 | 1250 |
| SLJ0600L1650NA | 6 | 19.05 | 25 | 1650 |
| SLJ0610L1650NA | 6.1 | 19.05 | 25 | 1650 |
| SLJ0620L1650NA | 6.2 | 19.05 | 25 | 1650 |
| SLJ0700L1650NA | 7 | 19.05 | 25 | 1650 |
| SLJ0800L1650NA | 8 | 19.05 | 25 | 1650 |
| SLJ0810L1650NA | 8.1 | 19.05 | 25 | 1650 |
| SLJ0820L1650NA | 8.2 | 19.05 | 25 | 1650 |
| SLJ1000L1650NA | 10 | 19.05 | 30 | 1650 |
| SLJ1010L1650NA | 10.1 | 19.05 | 30 | 1650 |
| SLJ1020L1650NA | 10.2 | 19.05 | 30 | 1650 |
| SLJ1200L1650NA | 12 | 19.05 | 30 | 1650 |
| SLJ1210L1650NA | 12.1 | 19.05 | 30 | 1650 |
| SLJ1220L1650NA | 12.2 | 19.05 | 30 | 1650 |

## TUBE DIAMETER

| øDc | øDp | øDc | øDp | øDc | øDp |
|---|---|---|---|---|---|
| 3 - 3.19 | 2.9 | 5.2 - 5.49 | 5 | 8.7 - 9.19 | 8.5 |
| 3.2 - 3.39 | 3.1 | 5.5 - 5.79 | 5.3 | 9.2 - 9.69 | 9 |
| 3.4 - 3.59 | 3.3 | 5.8 - 5.99 | 5.6 | 9.7 - 10.39 | 9.5 |
| 3.6 - 3.89 | 3.5 | 6 - 6.19 | 5.8 | 10.4 - 10.89 | 10 |
| 3.9 - 4.09 | 3.7 | 6.2 - 6.59 | 5.9 | 10.9 - 11.39 | 10.6 |
| 4.1 - 4.29 | 3.9 | 6.6 - 7.09 | 6.4 | 11.4 - 11.99 | 11.1 |
| 4.3 - 4.49 | 4.1 | 7.1 - 7.59 | 6.9 | 12 - 12.2 | 11.7 |
| 4.5 - 4.89 | 4.3 | 7.6 - 8.09 | 7.4 | | |
| 4.9 - 5.19 | 4.7 | 8.1 - 8.69 | 7.9 | | |

## STANDARD CUTTING CONDITIONS

| ISO | Workpiece material | Heat treatment | Hardness HB | Hardness HRC | Cutting speed Vc (m/min) | Feed f (mm/rev) |
|---|---|---|---|---|---|---|
| P | Free-cutting carbon steels | | 160 - 190 | (5) - (11) | 130 | Refer to Fig. 1 |
| | C10C ~ C15<br>S10C ~ S15C | Cold drawn | | | | |
| | S30C ~ S50C<br>C30 ~ C50 | Cold drawn | 200 - 230 | (12) - 20 | 100 | |
| | S35C ~ S50C<br>C30 ~ C50 | Hardened and tempered | 250 - 300 | 25 - 32 | 80 | |
| | Carbon steels | | 110 ~ 120 | | 130 | |
| | S10C ~ S35C<br>C10 ~ C30 | Annealed | | | | |
| | S10C ~ S50C<br>C10 ~ C50 | Annealed | 120 ~ 185 | ~ (9) | 120 | |
| | S50C ~<br>C50 ~ | Annealed | 170 ~ 200 | (5) ~ (13) | 100 | |
| | S20C ~ S30C<br>C20 ~ C30 | Hardened and tempered | 210 ~ 250 | (16) ~ 24 | 90 | Refer to Fig. 2 |
| | S30C ~ S55C<br>C30 ~ C55 | Hardened and tempered | 260 ~ 310 | 26 ~ 33 | 70 | |
| | S50C ~<br>C50 ~ | Hardened and tempered | 320 ~ 375 | 34 ~ 40 | 50 | |
| | S50C ~<br>C55 ~ | Hardened and tempered | 380 ~ 440 | 41 ~ 47 | 40 | |
| | Alloy steels | Annealed | 150 ~ 230 | ~ (20) | 90 | Refer to Fig. 2 |
| | | Annealed or Hardened and tempered | 240 ~ 310 | 23 ~ 33 | 70 | Refer to Fig. 2 |
| | | | 315 ~ 370 | 34 ~ 40 | 50 | Refer to Fig. 3 |
| | | | 380 ~ 440 | 40 ~ 47 | 40 | |
| | | | 450 ~ 500 | 48 ~ 51 | 30 | |
| | Cast steels | Annealed | 140 ~ 180 | ~ (8) | 100 | Refer to Fig. 2 |
| | | Annealed | 190 ~ 240 | (11) ~ 22 | 90 | |
| | Tool steels | Annealed | 150 ~ 200 | ~ (13) | 70 | Refer to Fig. 3 |
| | | Annealed | 210 ~ 300 | (16) ~ 32 | 50 | |
| M | Stainless steels Ferritic<br>SUS405, 430<br>X6Cr17 | Annealed | 150 ~ 200 | ~ (13) | 70 | Refer to Fig. 3 |
| | Austenitic<br>SUS304, 305<br>X5CrNi18-9 | Annealed | 160 ~ 220 | ~ (18) | 50 | |
| | Martensitic<br>SUS403, 410<br>X12Cr13 | Hardened and tempered | 160 ~ 220 | ~ (18) | 70 | |
| | | | 300 ~ 350 | 32 ~ 38 | 50 | |
| K | Grey cast irons | | 110 ~ 180 | | 90 | Refer to Fig. 4 |
| | | | 190 ~ 220 | | 80 | |
| | | | 220 ~ 260 | | 70 | |
| | Ductile cast irons | | 120 ~ 170 | | 80 | Refer to Fig. 5 |
| | | | 180 ~ 240 | | 65 | |
| | | | 240 ~ 280 | | 55 | |
| | | | 260 ~ 320 | | 40 | |
| | Malleable cast irons | | 110 ~ 180 | | 90 | |
| | | | 190 ~ 220 | | 80 | |
| | | | 220 ~ 260 | | 70 | |
| N | Cast aluminium alloys<br>Aluminium die cast alloys | Annealed | 5000load<br>40 ~ 100 | | 180 | Refer to Fig. 4 |
| | Copper alloys | Annealed | 120 ~ 160 | | < 150 | Refer to Fig. 4 |
| | | | 160 ~ 205 | | < 150 | Refer to Fig. 5 |
| H | Bearing steels | | 150 ~ 210 | | 70 | Refer to Fig. 3 |
| | High-resistant steels | | | | 20 | |
| | High speed steels | | 210 ~ 285 | (16) ~ 30 | 50 | |

Fig. 1 Carbon steels

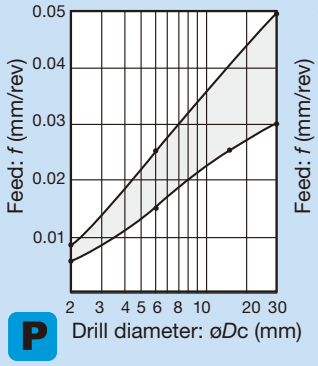



Fig. 2 Alloy steels

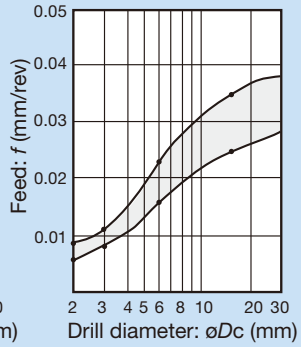



Fig. 3 Tool steels and other special steels

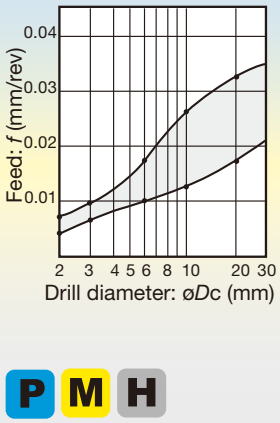



Fig. 4 Cast irons, aluminium alloys

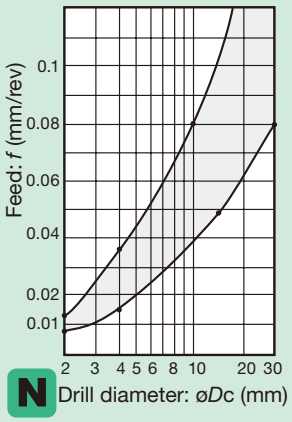
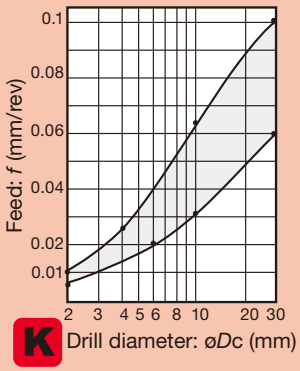
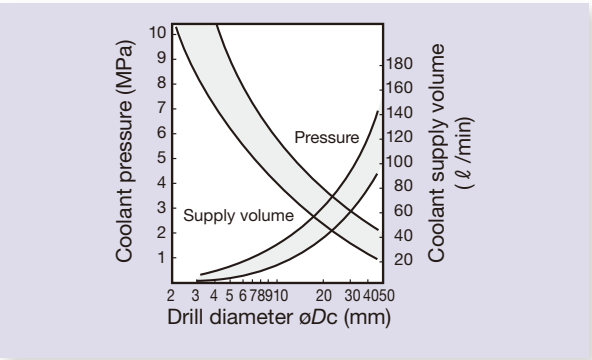



Fig. 5 Ductile and malleable cast irons




## Coolant supply pressure and volume




Deep Hole Drill

## Guidelines for attainable accuracies

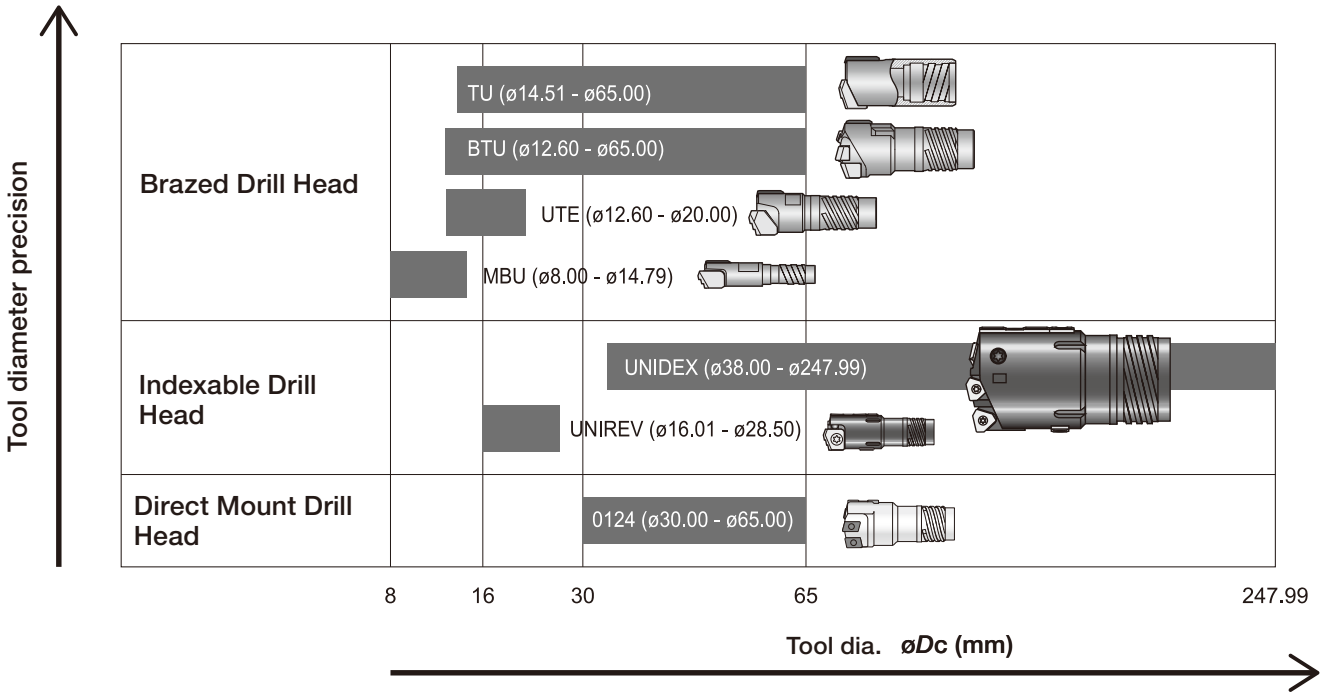
| Workpiece material | Surface roughness (µm) | Roundness (µm) | Cylindricity (µm) | Over size (µm) |
|---|---|---|---|---|
| Carbon and alloy steels | 6 ~ 25 | 5 ~ 10 | 10 ~ 15 | - 5 ~ 30 |
| Cast irons | 3 ~ 15 | 3 ~ 5 | 5 ~ 10 | - 5 ~ 15 |
| Aluminium alloys, Copper alloys | 0.3 ~ 6 | 3 ~ 5 | 5 ~ 10 | - 10 ~ 5 |

Note: Over size values given in the table are based on the drill diameter.

## Cutting fluid

A water-insoluble fluid is recommended when machining with gun drills. When using water soluble fluid, use the fluid for heavy duty cutting in higher concentration.

## BTA tool product map

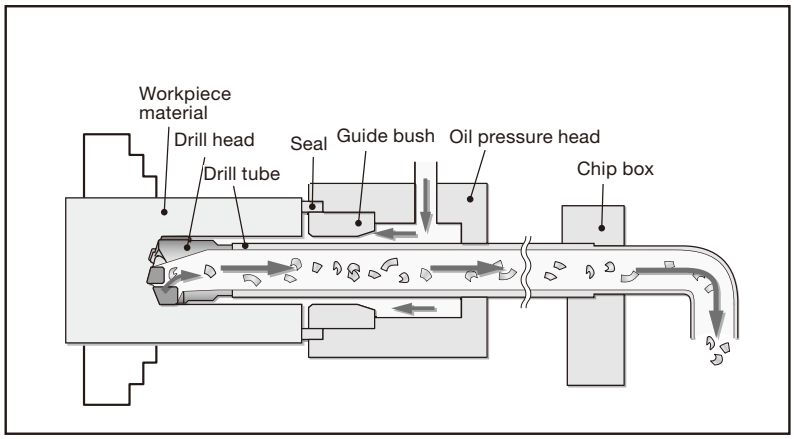





## Single Tube System (STS) and Double Tube System (DTS)

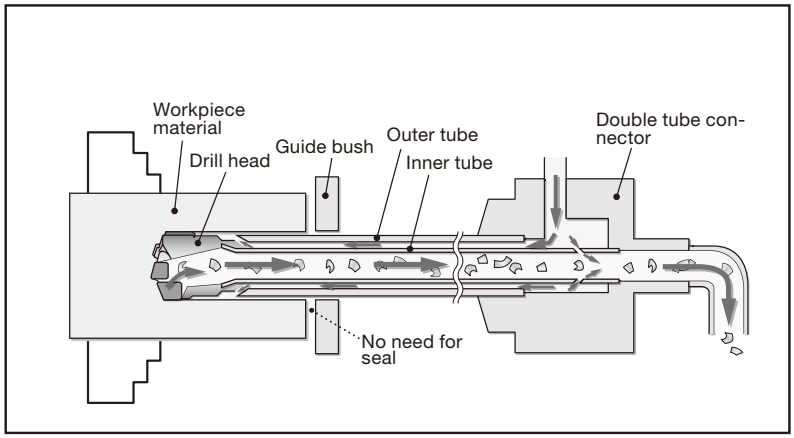
### Single Tube System (STS)

The STS may also be referred to as the BTA system in the deep hole drilling process.
A large volume of coolant is pumped under high pressure to the cutting area in the workpiece. Chips are then forced out through the drill tube at the back and they do not touch workpiece allowing super surface finish. STS is a very good method to obtain holes of high productivity and high accuracy by using a dedicated drilling machine and a sealing with the workpiece.




### Double Tube System (DTS)

The DTS is characterized by its two tube construction and is therefore known as the double tube system. A sealing system and pressure head, which is required in the Single Tube System (STS) is not necessary for the DTS and it is therefore suitable for conventional general purpose machines such as lathes or machining centers.
In general, because of less efficient chip evacuation than the STS the recommended max drilling depth is 1000mm. However, the unique DTC-R tube connector that is capable of supplying high pressure coolant can successfully achieve drilling depths of up to 2000mm.



# Single Tube System

## Solid Drilling Tools

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (μm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **MBU** | | 8 - 14.79 | IT9 | 2 | Brazed Drill Head | - Higher productivity and better surface finish than gundrill.<br>- Good chip breaking with 3 step cutting edge design. |
| | **UTE** | | 12.6 - 20 | IT9 | 2 | | - Higher productivity and better surface finish than gundrill.<br>- Good chip breaking with 3 step cutting edge design.<br>- First recommendation for dia. ø12.60 - 15.59. |
| | **BTU** | | 12.6 - 65 | IT9 | 2 | | - First recommendation for dia. ø15.60 or more.<br>- Good chip breaking with 3 cutting edges. (ø12.60 - 15.59mm has 2 cutting edges)<br>- Covers all materials with various carbide grade combinations. |
| | **KUSTS** | | 38 - 247.99 | IT10 | 3 | Indexable Drill Head | - Cartridge type - Diameter finely adjustable<br>- Multiple options to cover various cutting condition. |
| | **0124** | | 30 - 65 | IT11 | 3 | | - No diameter setting necessary.<br>- For highly efficient and stable deep hole drilling |
| Inner Thread | **KUSTS** | | 38 - 245.99 | IT10 | 3 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| | **0124** | | 30 - 65 | IT11 | 3 | | - No diameter setting necessary.<br>- For highly efficient and stable deep hole drilling |

## Counterboring Tools

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (μm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **KUSTR** | | 25 - 291.99 | IT10 | 1 - 2 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| Inner Thread | **KUSTR** | | 25 - 293.99 | IT10 | 1 - 2 | | - High productivity & High accuracy.<br>- Covers a wide application area with various options |

## Trepanning Tools

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (μm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **UTT** | | 100 - | IT10 | 1 - 2 | Indexable Drill Head | - High productivity & High accuracy.<br>- Covers a wide application area with various options |
| Inner Thread | **UTT** | | 100 - | IT10 | 1 - 2 | | - High productivity & High accuracy.<br>- Covers a wide application area with various options |

# Double Tube System

## Solid Drilling

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (μm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **ETU** | | 18.4 - 65 | IT9 | 2 | Brazed Drill Head | - Good chip breaking with 3-step cutting edges<br>- Covers all materials with various carbide grade combinations |
| | **KUDTS** | | 18.4 - 183.99 | IT10 | 3 | Indexable Drill Head | - Cartridge type with adjustable diameter<br>- Covers a wide application area with various options |
| | **0124** | | 30 - 65 | IT11 | 3 | | - Direct-mounting type avoid diameter setting<br>- For highly efficient and stable deep hole drilling |

## Counterboring

| Mounting screw type | Code | Appearance | Diameter range øDc (mm) | Hole tolerance | Surface finish Ra (μm) | Drill head type | Feature |
|---|---|---|---|---|---|---|---|
| Outer Thread | **KUDTR** | | 25 - 183.99 | IT10 | 1 - 2 | Indexable Drill Head | - Cartridge type with adjustable diameter<br>- Covers a wide application area with various options |

- The above values may change depending on the machining conditions, materials, etc.
* Special designed tools are available as Tailor-made.

## Economical for middle range deep hole drilling

- Diameter range 30 - 69 mm *
- Drilling depth 6xD - 14xD
- Shortened drilling time when using conventional machine

* Other diameters are available upon request.

## Effective machining on conventional machines

- Recommended for use on Horizontal M/C
- Can also be used on turning machine

## Good chip evacuation

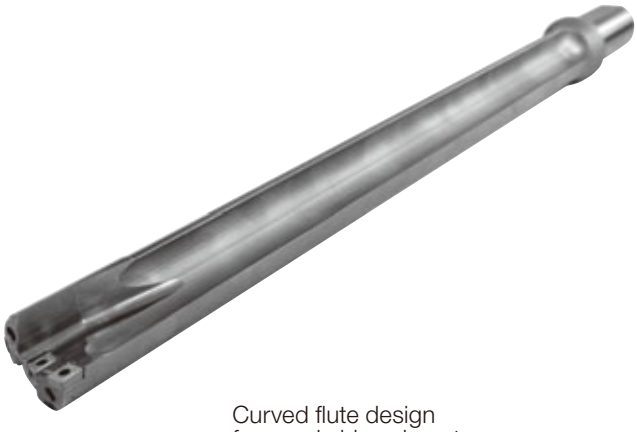
- Inserts enable best chip control
- Unique head design eliminates chip jamming
- Curved flute design ensures good chip evacuation

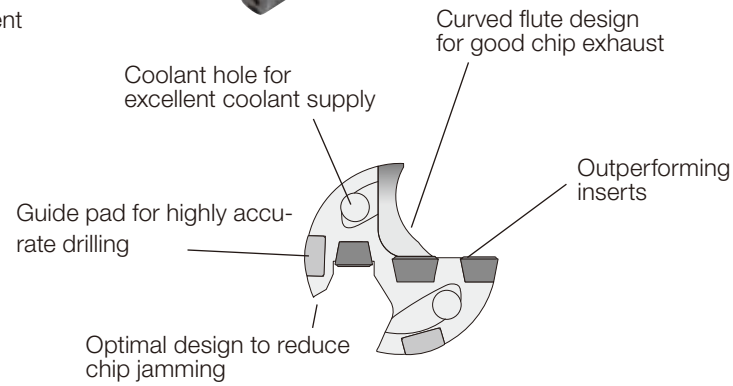
## Easy to use, rigid drill body

- Direct mount inserts, no diameter adjustment necessary
- Heat treated tool steel body

## High quality surface finish

- Burnishing effect improves surface finish
- Possible to eliminate finish process





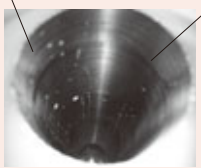

## Actual result

Cutting conditions

| | |
|---|---|
| Tool diameter *øDc* : | ø30 mm |
| Drilling depth : | 200 mm |
| Workpiece material : | C45 |
| Cutting speed *Vc* : | 100 m/min |
| Spindle speed *f* : | 0.1mm/rev |
| Machine : | BT50 M/C |

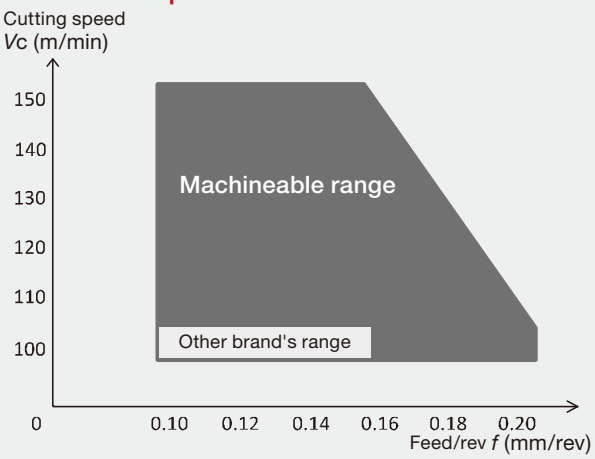
No spiral marks caused by chips

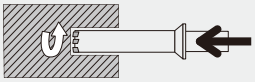
Guide pads burnishing effect improves surface finish



### BT50 M/C Machining data

**Excellent chip control ensures stable M/C machining**



Coolant
Type: Emulsion
Pressure: 1.5MPa
Supply: Through spindle
(for ISO50)

| | |
|---|---|
| Tool dia *øDc* : | ø30 mm |
| Drilling depth : | 200 mm |
| Material : | C45 |
| Cutting speed *Vc* : | 100 ~ 150 m/min |
| Feed/rev *f* : | 0.1 ~ 0.2 mm/rev |
| Machine : | ISO50 Horizontal M/C (Max 11 KW) |

## Note:

To start the tool, a pilot hole is required.
(torelance: + 0.1 to 0.15 mm)

| Tool dia. *øDc* (mm) | Pilot hole length Lp (mm) |
|---|---|
| ø30 ~ ø39 | over 10 |
| ø39.01 ~ ø45 | over 12.5 |
| ø45.01 ~ ø57 | over 15 |
| ø57.01 ~ ø69 | over 17.5 |

- The pilot hole should ideally have a flat bottom, but generally a throw-away drill is acceptable to create a pilot hole if the inner insert touches the bottom last.
- TDX drills are recommended for pre-hole drilling.

# ToolLine

www.tungaloy.com

# Tooling System

F002

# ToolLine - Tooling System

## TUNGCAP

F064

Quick change system with polygon PSC coupling tooling

## TUNGHOLD

F004

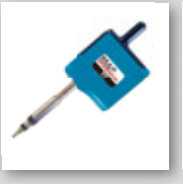
Tooling system for holders with unique functions in wide varieties


DIN69871 - F004
HSK A/E - F020
BT MAS - F040

## SPINJET

F146

Coolant-driven high-speed spindles for small-diameter tools



## BEAMWRENCH

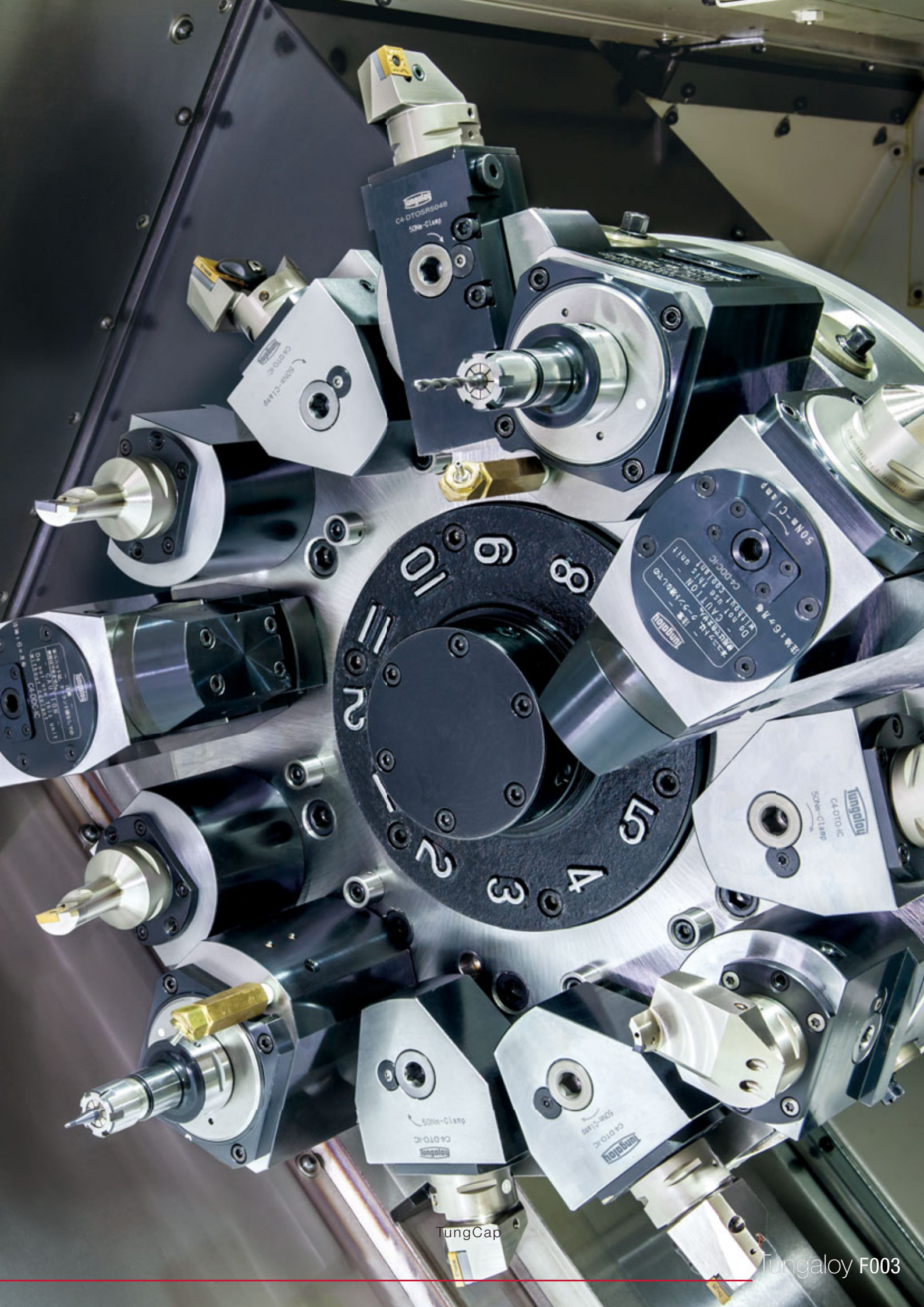
F152

Easy operation with correct clamping torque

## Other Tooling System

F154


Boring System - F154
Top Borer Tool - F192
Boring Bar Tool - F189
Cartridge - F171

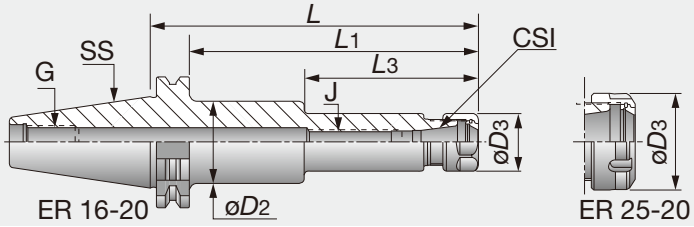

C4-DTOSR5048
50Nm-Clamp
C4-DTO-IC
50Nm-Clamp
C4-DDC-IC
50Nm-Clamp
C4-DTO-IC
50Nm-Clamp
C4-DTO-IC
50Nm-Clamp
C4-DTO-IC
50Nm-Clamp

TungCap

# TUNGHOLD

## DIN69871-ER (Collet chuck holder )

ER collet chucks with DIN69871 shank




| Designation | SS | CSI | Range | L | L1 | L3 | øD3 | øD2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987130ER16X63 (1) | 30 | ER16 | 0.5-10 | 63 | 43.9 | 28 | 28 | - | M10 | M12 |
| DIN6987140ER16X63 | 40 | ER16 | 0.5-10 | 63 | 43.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X63B | 40 | ER16 | 0.5-10 | 63 | 43.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X100 | 40 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X100B | 40 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M16 |
| DIN6987140ER16X160 | 40 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M16 |
| DIN6987140ER16X160B | 40 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M16 |
| DIN6987140ER20X63 | 40 | ER20 | 1-13 | 63 | 43.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X63B | 40 | ER20 | 1-13 | 63 | 43.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X100 | 40 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X100B | 40 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M16 |
| DIN6987140ER20X160 | 40 | ER20 | 1-13 | 160 | 140.9 | 91 | 34 | 44 | M12 | M16 |
| DIN6987150ER16X100 (1) | 50 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M24 |
| DIN6987150ER16X100B | 50 | ER16 | 0.5-10 | 100 | 80.9 | - | 28 | - | M12 | M24 |
| DIN6987150ER16X160 (1) | 50 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M24 |
| DIN6987150ER16X160B | 50 | ER16 | 0.5-10 | 160 | 140.9 | 85 | 28 | 40 | M12 | M24 |
| DIN6987150ER16X200 (1) | 50 | ER16 | 0.5-10 | 200 | 180.9 | 110 | 28 | 40 | M10 | M24 |
| DIN6987150ER16X200B | 50 | ER16 | 0.5-10 | 200 | 180.9 | 110 | 28 | 40 | M10 | M24 |
| DIN6987150ER20X100 (1) | 50 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M24 |
| DIN6987150ER20X100B | 50 | ER20 | 1-13 | 100 | 80.9 | - | 34 | - | M12 | M24 |
| DIN6987150ER20X160 (1) | 50 | ER20 | 1-13 | 160 | 140.9 | 86 | 34 | 45 | M12 | M24 |
| DIN6987150ER20X160B | 50 | ER20 | 1-13 | 160 | 140.9 | 86 | 34 | 45 | M12 | M24 |
| DIN6987130ER32X65 (1) | 30 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M18x1.5 | M12 |
| DIN6987140ER25X65 | 40 | ER25 | 1-16 | 65 | 45.9 | 28 | 42 | 32.4 | M16x2 | M16 |
| DIN6987140ER25X65B | 40 | ER25 | 1-16 | 65 | 45.9 | 28 | 42 | 32.4 | M16X2 | M16 |
| DIN6987140ER25X100 | 40 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16x2 | M16 |
| DIN6987140ER25X100B | 40 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16X2 | M16 |
| DIN6987140ER25X150 | 40 | ER25 | 1-16 | 150 | 130.9 | - | 42 | - | M16x2 | M16 |
| DIN6987140ER25X150B | 40 | ER25 | 1-16 | 150 | 130.9 | - | 42 | - | M16X2 | M16 |
| DIN6987140ER32X65 | 40 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M22x1.5 | M16 |
| DIN6987140ER32X65B | 40 | ER32 | 2-20 | 65 | 45.9 | 32 | 50 | 40.4 | M22X1.5 | M16 |
| DIN6987140ER32X100 | 40 | ER32 | 2-20 | 100 | 80.9 | 35 | 50 | 49 | M22x1.5 | M16 |
| DIN6987140ER32X100B | 40 | ER32 | 2-20 | 100 | 80.9 | 35 | 50 | 49 | M22X1.5 | M16 |
| DIN6987140ER32X150 | 40 | ER32 | 2-20 | 150 | 130.9 | 35 | 50 | 49 | M22x1.5 | M16 |
| DIN6987140ER32X150B | 40 | ER32 | 2-20 | 150 | 130.9 | 35 | 50 | 49 | M22X1.5 | M16 |
| DIN6987140ER40X70 | 40 | ER40 | 3-26 | 70 | 50.9 | 32 | 63 | 50.4 | M28x1.5 | M16 |
| DIN6987140ER40X70B | 40 | ER40 | 3-26 | 70 | 50.9 | 32 | 63 | 50.4 | M28X1.5 | M16 |
| DIN6987140ER40X100 | 40 | ER40 | 3-26 | 100 | 80.9 | 32 | 63 | 50.4 | M28x1.5 | M16 |
| DIN6987140ER40X100B | 40 | ER40 | 3-26 | 100 | 80.9 | 32 | 63 | 50.4 | M28X1.5 | M16 |
| DIN6987150ER25X100 (1) | 50 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16x2 | M24 |
| DIN6987150ER25X100B | 50 | ER25 | 1-16 | 100 | 80.9 | - | 42 | - | M16X2 | M24 |
| DIN6987150ER25X150 (1) | 50 | ER25 | 1-16 | 150 | 130.9 | 80.9 | 42 | 50 | M16x2 | M24 |
| DIN6987150ER25X150B | 50 | ER25 | 1-16 | 150 | 130.9 | 80.9 | 42 | 50 | M16X2 | M24 |
| DIN6987150ER25X200 (1) | 50 | ER25 | 1-16 | 200 | 180.9 | 85 | 42 | 55 | M16x2 | M24 |
| DIN6987150ER25X200B | 50 | ER25 | 1-16 | 200 | 180.9 | 85 | 42 | 55 | M16X2 | M24 |
| DIN6987150ER32X100 (1) | 50 | ER32 | 2-20 | 100 | 80.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X100B | 50 | ER32 | 2-20 | 100 | 80.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER32X150 (1) | 50 | ER32 | 2-20 | 150 | 130.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X150B | 50 | ER32 | 2-20 | 150 | 130.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER32X200 (1) | 50 | ER32 | 2-20 | 200 | 180.9 | - | 50 | - | M22x1.5 | M24 |
| DIN6987150ER32X200B | 50 | ER32 | 2-20 | 200 | 180.9 | - | 50 | - | M22X1.5 | M24 |
| DIN6987150ER40X100 (1) | 50 | ER40 | 3-26 | 100 | 80.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X100B | 50 | ER40 | 3-26 | 100 | 80.9 | - | 63 | - | M28X1.5 | M24 |
| DIN6987150ER40X150 (1) | 50 | ER40 | 3-26 | 150 | 130.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X200 (1) | 50 | ER40 | 3-26 | 200 | 180.9 | - | 63 | - | M28x1.5 | M24 |
| DIN6987150ER40X200B | 50 | ER40 | 3-26 | 200 | 180.9 | - | 63 | - | M28X1.5 | M24 |
| DIN6987150ER50X100 (1) | 50 | ER50 | 10-34 | 100 | 80.9 | - | 78 | - | M36x1.5 | M24 |
| DIN6987150ER50X100B | 50 | ER50 | 10-34 | 100 | 80.9 | - | 78 | - | M36X1.5 | M24 |
| DIN6987150ER50X150 (1) | 50 | ER50 | 10-34 | 150 | 130.9 | - | 78 | - | M36x1.5 | M24 |

- Applicable for 10 MPa pressure coolant
- Add B for coolant through the flange.

(1) Balanced to G6.3 12,000 $min^{-1}$.

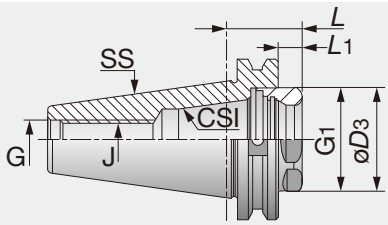
(Option:Wrench for ER collet)

ER Collet F113 | Nut F137 | Wrench F139 | Preset screws F140 | Pull stud F135

# TUNGBALANCE

## DIN69871-ER-SHORT (Collet chuck holder for short overhang)

TungShort collet chucks with DIN69871 shank




| Designation | SS | CSI | Range | *L* | *L*1 | ø*D*3 | J | G | G1 |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140ER32SHORT | 40 | ER32 | 2-20 | 25.1 | 6 | 40 | M16 | M16 | M40x1.5 |
| DIN6987150ER32SHORT | 50 | ER32 | 2-20 | 28.6 | 9.5 | 40 | M22x1.5 | M24 | M40x1.5 |
| DIN6987150ER40SHORT | 50 | ER40 | 3-26 | 28.6 | 9.5 | 50 | M28x1.5 | M24 | M50x1.5 |

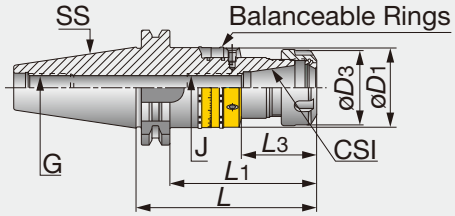
- Applicable for 10 MPa pressure coolant
- Add B for coolant through the flange.

(Option:Wrench for ER collet)

# TUNGBALANC

## DIN69871-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with DIN69871 shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*1 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140ER16X100BIN | 40 | ER16 | 0.5-10 | 100 | 80.9 | 44 | 28 | 44 | M10 | M16 |
| DIN6987140ER20X100BIN | 40 | ER20 | 1.0-13 | 100 | 80.9 | 51 | 34 | 44 | M12 | M16 |
| DIN6987140ER20X160BIN | 40 | ER20 | 1.0-13 | 160 | 140.9 | 87 | 34 | 44 | M12 | M16 |
| DIN6987140ER25X100BIN | 40 | ER25 | 1.0-16 | 100 | 80.9 | 51 | 42 | 44 | M16x1.5 | M16 |
| DIN6987140ER25X160BIN | 40 | ER25 | 1.0-16 | 160 | 140.9 | 88 | 42 | 44 | M16x1.5 | M16 |
| DIN6987140ER32X100BIN | 40 | ER32 | 2.0-20 | 100 | 80.9 | 36 | 50 | 60 | M22x1.5 | M16 |
| DIN6987140ER40X100BIN | 40 | ER40 | 3.0-26 | 100 | 80.9 | 36 | 63 | 60 | M28x1.5 | M16 |

- Applicable for 10 MPa pressure coolant
- Balanced to G2.5 20,000 $min^{-1}$.

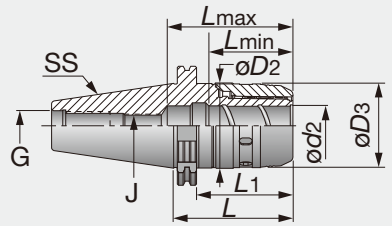
(Option:Wrench for ER collet)

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGMAX

## DIN69871-TUNGMAX (Power chuck holder)

TungMax endmill chuck holders with DIN69871 shank




| Designation | SS | ød2 | Range | L | L1 | Lmin | Lmax | øD3 | øD2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MAXIN20X95 | 40 | 20 | 6-20 | 95 | 76 | 56 | 69 | 51 | 53 | M16 | M16 |
| DIN6987140MAXIN32X106 | 40 | 32 | 6-32 | 106 | 87 | 70 | 83 | 69 | 70 | M16 | M16 |
| DIN6987150MAXIN20X105 (1) | 50 | 20 | 6-20 | 105 | 86 | 56 | 69 | 51 | 53 | M16 | M24 |
| DIN6987150MAXIN20X105B | 50 | 20 | 6-20 | 105 | 86 | 56 | 69 | 51 | 53 | M16 | M24 |
| DIN6987150MAXIN32X100 (1) | 50 | 32 | 6-32 | 100 | 81 | 70 | 84 | 69 | 70 | M20x2 | M24 |
| DIN6987150MAXIN32X100B | 50 | 32 | 6-32 | 100 | 81 | 70 | 84 | 69 | 70 | M20X2 | M24 |
| DIN6987150MAXIN32X135 (1) | 50 | 32 | 6-32 | 135 | 116 | 71 | 85 | 69 | 70 | M20x2 | M24 |

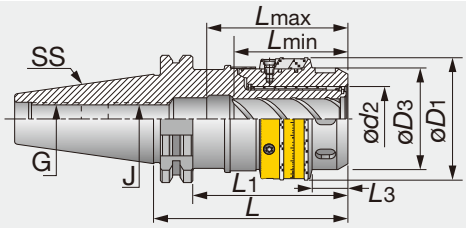
• Applicable for 10 MPa pressure coolant
• Add B for coolant through the flange.
(1) Balanced to G6.3 8,000 $min^{-1}$.

(Option:Wrench for TungMax collet)

# TUNGMAX

## DIN69871-TUNGMAX BIN (Power chuck holder)

TungMax balanceable endmill chuck holders with DIN69871 shank




| Designation | SS | ød2 | Range | øD3 | øD1 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MAXIN20X95BIN (1) | 40 | 20 | 6-20 | 50.5 | 60.8 | 95 | 76 | 17.5 | 56 | 69 | M16 | M16 |
| DIN6987140MAXI32X106BIN (1) | 40 | 32 | 6-32 | 68.5 | 79.8 | 106 | 87 | 24.9 | 70 | 83 | M16 | M16 |
| DIN6987150MAXIN20X105BIN (1) | 50 | 20 | 6-20 | 50.5 | 60.8 | 105 | 86 | 17.5 | 56 | 69 | M16 | M24 |
| DIN6987150MAXIN32X100BIN (2) | 50 | 32 | 6-32 | 68.5 | 79.8 | 100 | 81 | 24.9 | 70 | 84 | M20X2 | M24 |

• Applicable for 10 MPa pressure coolant
(1) Chucks with taper size 40 can be balanced by the balancing ring up to G2.5 at 20,000 $min^{-1}$.
(2) Chucks with taper size 50 can be balanced by the balancing ring up to G2.5 at 18,000 $min^{-1}$.

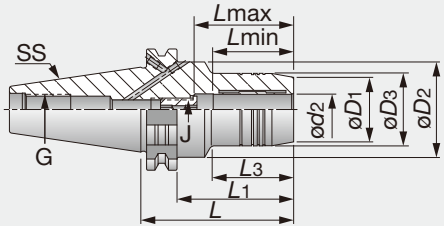
(Option:Wrench for TungMax collet)

Straight collet F122
Pull stud F135

# TUNGHYDRO

## DIN69871-HYDRO (Hydro chuck holder)

TungHydro hydraulic endmill chuck holders with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD3 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987130HYDRO6X60 | 30 | 6 | 23 | 26 | 45 | 60 | 41 | 25 | 27 | 37 | M5 | M12 |
| DIN6987130HYDRO16X90 | 30 | 16 | 34 | 38 | 45 | 90 | 71 | 43 | 42 | 52 | M12x1 | M12 |
| DIN6987130HYDRO20X90 | 30 | 20 | 38 | 42 | 42 | 90 | 71 | - | 42 | 52 | M12x1 | M12 |
| DIN6987140HYDRO6X68 | 40 | 6 | 23 | 26 | 50 | 68 | 49 | 33 | 27 | 37 | M5 | M16 |
| DIN6987140HYDRO8X68 | 40 | 8 | 25 | 28 | 50 | 68 | 49 | 33 | 27 | 37 | M6 | M16 |
| DIN6987140HYDRO10X72 | 40 | 10 | 27 | 30 | 50 | 72 | 53 | 37 | 32 | 42 | M8x1 | M16 |
| DIN6987140HYDRO12X77 | 40 | 12 | 29 | 32 | 50 | 77 | 58 | 42 | 37 | 47 | M10x1 | M16 |
| DIN6987140HYDRO14X77 | 40 | 14 | 30 | 34 | 50 | 77 | 58 | 42 | 37 | 47 | M10x1 | M16 |
| DIN6987140HYDRO16X80 | 40 | 16 | 34 | 38 | 50 | 80 | 61 | 43 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO18X80 | 40 | 18 | 36 | 40 | 50 | 80 | 61 | 43 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO20X82 | 40 | 20 | 38 | 42 | 50 | 82 | 63 | 47 | 42 | 52 | M12x1 | M16 |
| DIN6987140HYDRO25X117 | 40 | 25 | 46 | 50 | 63 | 117 | 98 | 51 | 48 | 58 | M16x1 | M16 |
| DIN6987140HYDRO32X117 | 40 | 32 | 56 | 60 | 63 | 117 | 98 | 56 | 52 | 62 | M16x1 | M16 |
| DIN6987150HYDRO6X68 | 50 | 6 | 23 | 26 | 80 | 68 | 49 | 33 | 27 | 37 | M5 | M24 |
| DIN6987150HYDRO8X68 | 50 | 8 | 25 | 28 | 80 | 68 | 49 | 33 | 27 | 37 | M6 | M24 |
| DIN6987150HYDRO10X72 | 50 | 10 | 27 | 30 | 80 | 72 | 53 | 37 | 32 | 42 | M8x1 | M24 |
| DIN6987150HYDRO12X77 | 50 | 12 | 29 | 32 | 80 | 77 | 58 | 42 | 37 | 47 | M10x1 | M24 |
| DIN6987150HYDRO14X77 | 50 | 14 | 30 | 34 | 80 | 77 | 58 | 42 | 37 | 47 | M10x1 | M24 |
| DIN6987150HYDRO16X80 | 50 | 16 | 34 | 38 | 80 | 80 | 61 | 45 | 42 | 52 | M12x1 | M24 |
| DIN6987150HYDRO18X80 | 50 | 18 | 36 | 40 | 80 | 80 | 61 | 45 | 42 | 52 | M12x1 | M24 |
| DIN6987150HYDRO20X82 | 50 | 20 | 38 | 42 | 80 | 82 | 63 | 47 | 42 | 52 | M16x1 | M24 |
| DIN6987150HYDRO25X87 | 50 | 25 | 46 | 50 | 80 | 87 | 68 | 52 | 48 | 58 | M16x1 | M24 |
| DIN6987150HYDRO32X91 | 50 | 32 | 56 | 60 | 80 | 91 | 72 | 56 | 54 | 64 | M16x1 | M24 |
| DIN6987140HYDRO20X64.5 (1) | 40 | 20 | 40 | 49.5 | - | 64.5 | 45 | - | 42 | 52 | M16x1 | M16 |
| DIN6987150HYDRO32X81 (1) | 50 | 32 | 56 | 72 | - | 81 | 62 | - | 54 | 64 | M16x1 | M24 |

- Applicable for 10 MPa pressure coolant
- Clamping wrench (WRENCH HYDRO HEX 4) should be ordered separately. • Note: Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
- Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

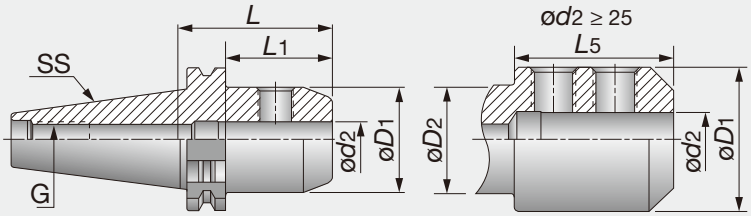
(1) Holders for heavy duty.

Straight collet F125
Pull stud F135

# TUNGHOLD

## DIN69871-EM (Endmill holder)

Screw locking endmill holders with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987130EM6X50 | 30 | 6 | 26 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM8X50 | 30 | 8 | 28 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM10X50 | 30 | 10 | 35 | - | 50 | 30.9 | - | M12 |
| DIN6987130EM14X63 | 30 | 14 | 44 | - | 63 | 43.9 | - | M12 |
| DIN6987130EM16X63 | 30 | 16 | 48 | 44.9 | 63 | 43.9 | 28 | M12 |
| DIN6987130EM18X72 | 30 | 18 | 50 | 44.9 | 72 | 52.9 | 37 | M12 |
| DIN6987130EM20X72 | 30 | 20 | 52 | 44 | 72 | 52.9 | 37 | M12 |
| DIN6987140EM6X50 | 40 | 6 | 25 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM6X50B | 40 | 6 | 25 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM8X50 | 40 | 8 | 28 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM8X50B | 40 | 8 | 28 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM10X50 | 40 | 10 | 35 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM12X50 | 40 | 12 | 42 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM12X50B | 40 | 12 | 42 | - | 50 | 30.9 | - | M16 |
| DIN6987140EM14X63 | 40 | 14 | 44 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM16X63 | 40 | 16 | 48 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM16X63B | 40 | 16 | 48 | - | 63 | 43.9 | - | M16 |
| DIN6987140EM18X63 | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM18X63B | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM20X63 | 40 | 20 | 52 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM20X63B | 40 | 20 | 52 | 49 | 63 | 43.9 | 28.5 | M16 |
| DIN6987140EM25X100 | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM25X100B | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM32X100 | 40 | 32 | 71 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987140EM32X100B | 40 | 32 | 71 | 49 | 100 | 80.9 | 65 | M16 |
| DIN6987150EM6X63 | 50 | 6 | 25 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM8X63 | 50 | 8 | 28 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM8X63B | 50 | 8 | 28 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM10X63 | 50 | 10 | 35 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM10X63B | 50 | 10 | 35 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM12X63 | 50 | 12 | 42 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM12X63B | 50 | 12 | 42 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM14X63 | 50 | 14 | 44 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM14X63B | 50 | 14 | 44 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM16X63 | 50 | 16 | 48 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM16X63B | 50 | 16 | 48 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM18X63 | 50 | 18 | 50 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM18X63B | 50 | 18 | 50 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM20X63 | 50 | 20 | 52 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM20X63B | 50 | 20 | 52 | - | 63 | 43.9 | - | M24 |
| DIN6987150EM25X80 | 50 | 25 | 65 | - | 80 | 60.9 | - | M24 |
| DIN6987150EM25X80B | 50 | 25 | 65 | - | 80 | 60.9 | - | M24 |
| DIN6987150EM32X100 | 50 | 32 | 72 | - | 100 | 80.9 | - | M24 |
| DIN6987150EM32X100B | 50 | 32 | 72 | - | 100 | 80.9 | - | M24 |
| DIN6987150EM40X100 | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | M24 |
| DIN6987150EM40X100B | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | M24 |
| DIN6987150EM50X125 | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 90 | M24 |
| DIN6987150EM50X125B | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 90 | M24 |
| DIN6987140EM10X45 (1) | 40 | 10 | 35 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM12X45 (1) | 40 | 12 | 42 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM14X45 (1) | 40 | 14 | 44 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM14X45B (1) | 40 | 14 | 44 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM16X45 (1) | 40 | 16 | 48 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM18X45 (1) | 40 | 18 | 49 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM20X45 (1) | 40 | 20 | 49 | - | 45 | 25.9 | - | M16 |
| DIN6987140EM25X45 (1) | 40 | 25 | 49 | - | 45 | 25.9 | - | M16 |

- Applicable for 10 MPa pressure coolant
- Add B for coolant through the flange.

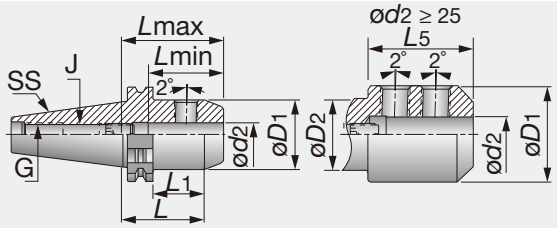
(1) Short emdmill holder.

Clamping screw F142
Pull stud F135

# TUNGHOLD

## DIN69871-EM E(Endmill holder with whistle notch)

Screw locking endmill holders for whistle notch with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | Lmin | Lmax | J(1) | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140EM8X50E | 40 | 8 | 28 | - | 50 | 30.9 | - | 35 | 45 | M6 | M16 | 3 |
| DIN6987140EM10X50E | 40 | 10 | 35 | - | 50 | 30.9 | - | 39 | 49 | M8 | M16 | 4 |
| DIN6987140EM12X50E | 40 | 12 | 42 | - | 50 | 30.9 | - | 44 | 54 | M10 | M16 | 5 |
| DIN6987140EM14X63E | 40 | 14 | 44 | - | 63 | 43.9 | - | 44 | 54 | M10 | M16 | 5 |
| DIN6987140EM16X63E | 40 | 16 | 48 | - | 63 | 43.9 | - | 47 | 57 | M12 | M16 | 6 |
| DIN6987140EM18X63E | 40 | 18 | 50 | 49 | 63 | 43.9 | 28.5 | 47 | 57 | M12 | M16 | 6 |
| DIN6987140EM20X63E | 40 | 20 | 52 | 49 | 63 | 43.9 | 29 | 49 | 59 | M16 | M16 | 8 |
| DIN6987140EM20X63EB | 40 | 20 | 52 | 49 | 63 | 43.9 | 29 | 49 | 59 | M16 | M16 | 8 |
| DIN6987140EM25X100E | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | 54 | 64 | M20X1.5 | M16 | 10 |
| DIN6987140EM25X100EB | 40 | 25 | 65 | 49 | 100 | 80.9 | 65 | 54 | 64 | M20X1.5 | M16 | 10 |
| DIN6987140EM32X100E | 40 | 32 | 72 | 49 | 100 | 80.9 | 65 | 58 | 68 | M20X1.5 | M16 | 10 |
| DIN6987150EM8X63E | 50 | 8 | 28 | - | 63 | 43.9 | - | 35 | 45 | M6 | M24 | 3 |
| DIN6987150EM10X63E | 50 | 10 | 35 | - | 63 | 43.9 | - | 39 | 49 | M8 | M24 | 4 |
| DIN6987150EM12X63E | 50 | 12 | 42 | - | 63 | 43.9 | - | 44 | 54 | M10 | M24 | 5 |
| DIN6987150EM14X63E | 50 | 14 | 44 | - | 63 | 43.9 | - | 44 | 54 | M10 | M24 | 5 |
| DIN6987150EM16X63E | 50 | 16 | 48 | - | 63 | 43.9 | - | 47 | 57 | M12 | M24 | 6 |
| DIN6987150EM18X63E | 50 | 18 | 50 | - | 63 | 43.9 | - | 47 | 57 | M12 | M24 | 6 |
| DIN6987150EM20X63E | 50 | 20 | 52 | - | 63 | 43.9 | - | 49 | 49 | M16 | M24 | 8 |
| DIN6987150EM20X63EB | 50 | 20 | 52 | - | 63 | 43.9 | - | 49 | 49 | M16 | M24 | 8 |
| DIN6987150EM25X80E | 50 | 25 | 65 | - | 80 | 60.9 | - | 54 | 64 | M20X1.5 | M24 | 10 |
| DIN6987150EM25X80EB | 50 | 25 | 65 | - | 80 | 60.9 | - | 54 | 64 | M20X1.5 | M24 | 10 |
| DIN6987150EM32X100E | 50 | 32 | 72 | - | 100 | 80.9 | - | 58 | 68 | M20X1.5 | M24 | 10 |
| DIN6987150EM32X100EB | 50 | 32 | 72 | - | 100 | 80.9 | - | 58 | 68 | M20X1.5 | M24 | 10 |
| DIN6987150EM40X100E | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | 68 | 78 | M20X1.5 | M24 | 10 |
| DIN6987150EM40X100EB | 50 | 40 | 90 | 79.9 | 100 | 80.9 | 43 | 68 | 78 | M20X1.5 | M24 | 10 |
| DIN6987150EM50X125EB | 50 | 50 | 98 | 79.9 | 125 | 105.9 | 68 | 78 | 88 | M20X1.5 | M24 | 10 |

- Applicable for 10 MPa pressure coolant
- Add B for coolant through the flange.

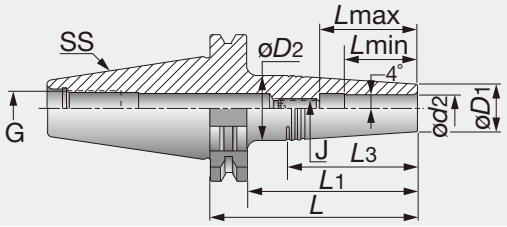
(1) The adjustment screw has an internal coolant hole.

Clamping screw F142
Pull stud F135

# TUNGSHRINK

## DIN69871-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140SRK3X50 | 40 | 3 | 10 | 15 | 69.1 | 50 | 35.55 | 10 | 16 | M6 | M16 | 3 |
| DIN6987140SRK3X85 | 40 | 3 | 10 | 19 | 104.1 | 85 | 64.15 | 10 | 16 | M6 | M16 | 3 |
| DIN6987140SRK4X50 | 40 | 4 | 10 | 15 | 69.1 | 50 | 35.55 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK4X85 | 40 | 4 | 10 | 19 | 104.1 | 85 | 64.15 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK5X50 | 40 | 5 | 10 | 15 | 69.1 | 50 | 35.55 | 15 | 21 | M6 | M16 | 3 |
| DIN6987140SRK5X85 | 40 | 5 | 10 | 19 | 104.1 | 85 | 64.15 | 12 | 18 | M6 | M16 | 3 |
| DIN6987140SRK6X50 | 40 | 6 | 11 | 16 | 69.1 | 50 | 35.55 | 18 | 24 | M8 | M16 | 4 |
| DIN6987140SRK6X85 | 40 | 6 | 11 | 20 | 104.1 | 85 | 64.1 | 18 | 24 | M8 | M16 | 4 |
| DIN6987140SRK8X50 | 40 | 8 | 14 | 20 | 69.1 | 50 | 42.5 | 25 | 31 | M10 | M16 | 5 |
| DIN6987140SRK8X85 | 40 | 8 | 14 | 23 | 104.1 | 85 | 63.95 | 25 | 31 | M10 | M16 | 5 |
| DIN6987140SRK10X50 | 40 | 10 | 16 | 22 | 69.1 | 50 | 42.4 | 30 | 36 | M12 | M16 | 6 |
| DIN6987140SRK10X85 | 40 | 10 | 16 | 24.5 | 104.1 | 85 | 60.28 | 30 | 36 | M12 | M16 | 6 |
| DIN6987140SRK12X50 | 40 | 12 | 20 | 26 | 69.1 | 50 | 42.3 | 32 | 42 | M10 | M16 | 5 |
| DIN6987140SRK12X85 | 40 | 12 | 20 | 28 | 104.1 | 85 | 56.6 | 32 | 42 | M10 | M16 | 5 |

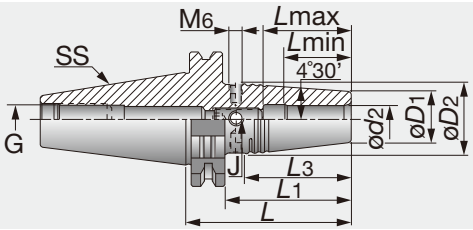
• Applicable for 10 MPa pressure coolant

Pull stud F135
Induction heating unit F131
Heating unit F131
Preset screws F142

# TUNGSHRINK

## DIN69871-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with DIN69871 shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN6987140SRKIN6X80 | 40 | 6 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M5 | M16 | 2.5 |
| DIN6987140SRKIN8X80 | 40 | 8 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M6 | M16 | 3 |
| DIN6987140SRKIN10X80 | 40 | 10 | 24 | 32 | 80 | 60.9 | 50.5 | 31 | 42 | M8 | M16 | 4 |
| DIN6987140SRKIN12X80 | 40 | 12 | 24 | 32 | 80 | 60.9 | 50.5 | 31 | 47 | M10 | M16 | 5 |
| DIN6987140SRKIN14X80 | 40 | 14 | 27 | 34 | 80 | 60.9 | 44.2 | 36 | 47 | M10 | M16 | 5 |
| DIN6987140SRKIN16X80 | 40 | 16 | 27 | 34 | 80 | 60.9 | 44.2 | 39 | 50 | M12 | M16 | 6 |
| DIN6987140SRKIN18X80 | 40 | 18 | 33 | 42 | 80 | 60.9 | 57 | 39 | 50 | M12 | M16 | 6 |
| DIN6987140SRKIN20X80 | 40 | 20 | 33 | 42 | 80 | 60.9 | 57 | 41 | 52 | M16 | M16 | 8 |
| DIN6987140SRKIN25X100 | 40 | 25 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M16 | 8 |
| DIN6987150SRKIN6X80 (1) | 50 | 6 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M5 | M24 | 2.5 |
| DIN6987150SRKIN8X80 (1) | 50 | 8 | 21 | 27 | 80 | 60.9 | 38 | 25 | 36 | M6 | M24 | 3 |
| DIN6987150SRKIN10X80 (1) | 50 | 10 | 24 | 32 | 80 | 60.9 | 51 | 31 | 42 | M8 | M24 | 4 |
| DIN6987150SRKIN12X80 (1) | 50 | 12 | 24 | 32 | 80 | 60.9 | 51 | 36 | 47 | M10 | M24 | 5 |
| DIN6987150SRKIN14X80 (1) | 50 | 14 | 27 | 34 | 80 | 60.9 | 44.5 | 36 | 47 | M10 | M24 | 5 |
| DIN6987150SRKIN16X80 (1) | 50 | 16 | 27 | 34 | 80 | 60.9 | 44.5 | 39 | 50 | M12 | M24 | 6 |
| DIN6987150SRKIN18X80 (1) | 50 | 18 | 33 | 42 | 80 | 60.9 | 57 | 39 | 50 | M12 | M24 | 6 |
| DIN6987150SRKIN20X80 (1) | 50 | 20 | 33 | 42 | 80 | 60.9 | 57 | 41 | 52 | M16 | M24 | 8 |
| DIN6987150SRKIN25X100 (1) | 50 | 25 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M24 | 8 |
| DIN6987150SRKIN32X100 (1) | 50 | 32 | 44 | 53 | 100 | 80.9 | 57 | 47 | 58 | M16 | M24 | 8 |

- Applicable for 10 MPa pressure coolant
- Use only inductive heating device for SRKIN holders.

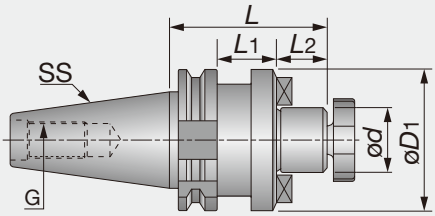
(1) Balanced to G2.5 20,000 $min^{-1}$

Pull stud F135
Induction heating unit F131
Heating unit F131
Preset screws F142

# TUNGHOLD

## DIN69871-SEM (Shell mill holder)

Shell mill holder with DIN69871 shank



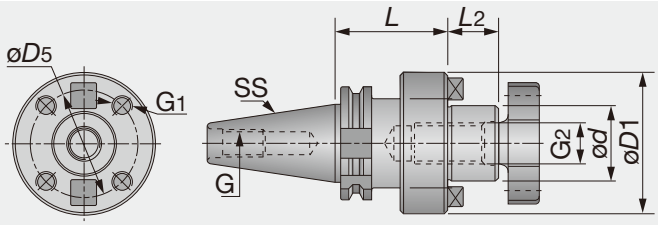

| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | G |
|---|---|---|---|---|---|---|---|
| DIN6987130SEM16X35 | 30 | 16 | 17 | 38 | 35 | 15.9 | M12 |
| DIN6987130SEM22X50 | 30 | 22 | 19 | 47 | 50 | 30.9 | M12 |
| DIN6987130SEM27X50 | 30 | 27 | 21 | 58 | 50 | 30.9 | M12 |
| DIN6987140SEM16X35 | 40 | 16 | 17 | 38 | 35 | 15.9 | M16 |
| DIN6987140SEM22X35 | 40 | 22 | 19 | 47 | 35 | 15.9 | M16 |
| DIN6987140SEM27X60 | 40 | 27 | 21 | 58 | 60 | 40.9 | M16 |
| DIN6987140SEM32X60 | 40 | 32 | 24 | 66 | 60 | 40.9 | M16 |
| DIN6987140SEM40X60 | 40 | 40 | 27 | 82 | 60 | 40.9 | M16 |
| DIN6987150SEM16X35 | 50 | 16 | 17 | 38 | 35 | 15.9 | M24 |
| DIN6987150SEM22X35 | 50 | 22 | 19 | 47 | 35 | 15.9 | M24 |
| DIN6987150SEM22X50X200 | 50 | 22 | 19 | 50 | 200 | 180.9 | M24 |
| DIN6987150SEM27X35 | 50 | 27 | 21 | 58 | 35 | 15.9 | M24 |
| DIN6987150SEM32X35 | 50 | 32 | 24 | 66 | 35 | 15.9 | M24 |
| DIN6987150SEM32X78X370 | 50 | 32 | 24 | 78 | 370 | 350.9 | M24 |
| DIN6987150SEM40X50 | 50 | 40 | 27 | 82 | 50 | 30.9 | M24 |
| DIN6987150SEM50X60 | 50 | 50 | 30 | 95 | 60 | 40.9 | M24 |

• (Option:Wrench for lock screw)

# TUNGHOLD

## DIN69871-FM (Face mill holder)

Face mill holder with DIN69871 shank



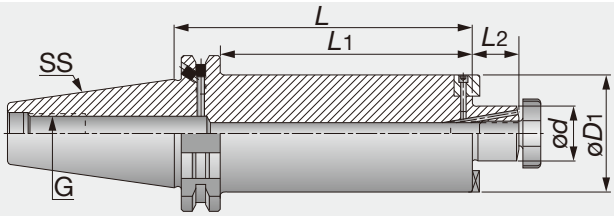

| Designation | SS | ød | $L_2$ | $øD_1$ | L | $G_2$ | $øD_5$ | $G_1$ | G |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140FM40 | 40 | 40 | 27 | 88 | 60 | M20 | 66.7 | M12 | M16 |
| DIN6987150FM40 | 50 | 40 | 27 | 88 | 70 | M20 | 66.7 | M12 | M24 |
| DIN6987150FM60 | 50 | 60 | 40 | 128 | 70 | - | 101.6 | M16 | M24 |

Pull stud F135
Clamping screw F141
Wrench F143

TUNGHOLD

## DIN69871-SEM (Shell mill holder with extra long)

Extra long type shell mill holder with coolant hole with DIN69871 shank




| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | G |
|---|---|---|---|---|---|---|---|
| DIN6987150SEM22X48X200C | 50 | 22 | 19 | 48 | 200 | 181 | M24 |
| DIN6987150SEM22X61X300C | 50 | 22 | 19 | 61 | 300 | 281 | M24 |
| DIN6987150SEM27X61X300C | 50 | 27 | 21 | 61 | 300 | 281 | M24 |
| DIN6987150SEM32X78X370C | 50 | 32 | 24 | 78 | 370 | 351 | M24 |

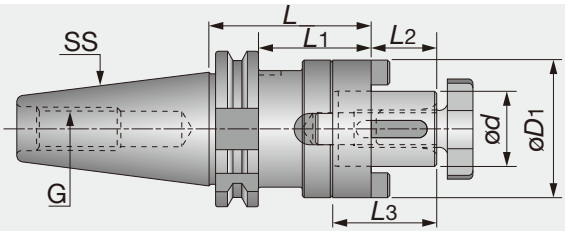
- Applicable for 10 MPa pressure coolant
- If the "B type" option is required, the plug screw must the removed from the flange cooling hole. (use a 2 mm hex key.)

(Option:Wrench for lock screw)

TUNGHOLD

## DIN69871-SEMC (Combination holder for slot mill & shell mill)

Combination holder with DIN69871 shank




| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | $L_3$ | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987130SEMC16X50 | 30 | 16 | 17 | 32 | 50 | 30.9 | 27 | M12 |
| DIN6987130SEMC22X50 | 30 | 22 | 19 | 40 | 50 | 30.9 | 31 | M12 |
| DIN6987130SEMC32X60 | 30 | 32 | 24 | 58 | 60 | 40.9 | 38 | M12 |
| DIN6987140SEMC16X55 | 40 | 16 | 17 | 32 | 55 | 35.9 | 27 | M16 |
| DIN6987140SEMC16X100 | 40 | 16 | 17 | 32 | 100 | 80.9 | 27 | M16 |
| DIN6987140SEMC22X55 | 40 | 22 | 19 | 40 | 55 | 35.9 | 31 | M16 |
| DIN6987140SEMC22X100 | 40 | 22 | 19 | 40 | 100 | 80.9 | 31 | M16 |
| DIN6987140SEMC27X55 | 40 | 27 | 21 | 48 | 55 | 35.9 | 33 | M16 |
| DIN6987140SEMC27X100 | 40 | 27 | 21 | 48 | 100 | 80.9 | 33 | M16 |
| DIN6987140SEMC32X60 | 40 | 32 | 24 | 58 | 60 | 45.9 | 38 | M16 |
| DIN6987140SEMC32X100 | 40 | 32 | 24 | 58 | 100 | 80.9 | 38 | M16 |
| DIN6987140SEMC40X60 | 40 | 40 | 27 | 70 | 60 | 40.9 | 41 | M16 |
| DIN6987150SEMC16X55 | 50 | 16 | 17 | 32 | 55 | 35.9 | 27 | M24 |
| DIN6987150SEMC16X100 | 50 | 16 | 17 | 32 | 100 | 80.9 | 27 | M24 |
| DIN6987150SEMC22X55 | 50 | 22 | 19 | 40 | 55 | 35.9 | 31 | M24 |
| DIN6987150SEMC22X100 | 50 | 22 | 19 | 40 | 100 | 80.9 | 31 | M24 |
| DIN6987150SEMC27X55 | 50 | 27 | 21 | 48 | 55 | 35.9 | 33 | M24 |
| DIN6987150SEMC27X100 | 50 | 27 | 21 | 48 | 100 | 80.9 | 33 | M24 |
| DIN6987150SEMC32X55 | 50 | 32 | 24 | 58 | 55 | 35.9 | 38 | M24 |
| DIN6987150SEMC32X100 | 50 | 32 | 24 | 58 | 100 | 80.9 | 38 | M24 |
| DIN6987150SEMC40X55 | 50 | 40 | 27 | 70 | 55 | 35.9 | 41 | M24 |
| DIN6987150SEMC40X100 | 50 | 40 | 27 | 70 | 100 | 80.9 | 41 | M24 |
| DIN6987150SEMC50X70 | 50 | 50 | 30 | 90 | 70 | 50.9 | 46 | M24 |

- If the "B type" option is required, the plug screw must the removed from the flange cooling hole. (use a 2 mm hex key.)

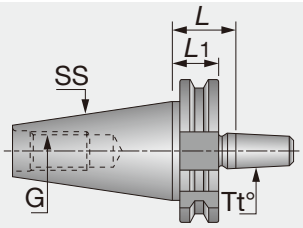
(Option:Wrench for lock screw)

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## DIN69871-DC (Jacobs taper holder)

Jacobs taper holder wih DIN69871 shank

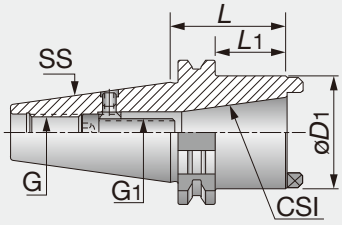



| Designation | SS | Tt° | L | L1 | G |
|---|---|---|---|---|---|
| DIN6987130DCB12X26 | 30 | B12 | 26 | 19.1 | M12 |
| DIN6987140DCB12X26 | 40 | B12 | 26 | 19.1 | M16 |
| DIN6987140DCB16X26 | 40 | B16 | 26 | 19.1 | M16 |
| DIN6987140DCB18X26 | 40 | B18 | 26 | 19.1 | M16 |
| DIN6987150DCB12X26 | 50 | B12 | 26 | 19.1 | M24 |
| DIN6987150DCB16X26 | 50 | B16 | 26 | 19.1 | M24 |
| DIN6987150DCB18X26 | 50 | B18 | 26 | 19.1 | M24 |

# TUNGHOLD

## DIN69871 AD(Conversion adaptor )

Conversion adaptor for DIN69871 system



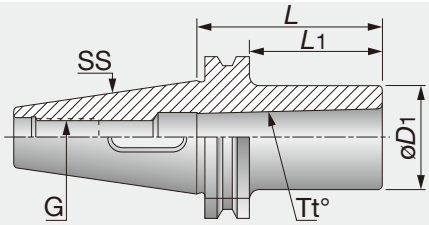

| Designation | SS | CSI | L | øD1 | L1 | G1 | G |
|---|---|---|---|---|---|---|---|
| DIN6987140ADDIN208030 | 40 | DIN2080 30 | 50 | 50 | 30.9 | M12 | M16 |
| DIN6987150ADBT/SK40 | 50 | BT/SK 40 | 70 | 66 | 50.9 | M16 | M24 |

Pull stud
F135

# TUNGHOLD

## DIN69871-MT(Holder for Morse taper)

Morse taper holder with DIN69871 shank

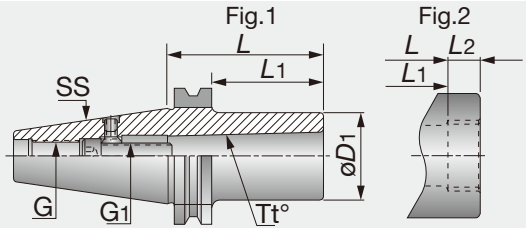



| Designation | SS | Tt° | L | øD1 | L1 | G |
|---|---|---|---|---|---|---|
| DIN6987130MT3X75 | 30 | MT3 | 75 | 40 | 55.9 | M12 |
| DIN6987140MT1X50 | 40 | MT1 | 50 | 25 | 30.9 | M16 |
| DIN6987140MT2X50 | 40 | MT2 | 50 | 32 | 30.9 | M16 |
| DIN6987140MT3X70 | 40 | MT3 | 70 | 40 | 50.9 | M16 |
| DIN6987140MT4X95 | 40 | MT4 | 95 | 48 | 75.9 | M16 |
| DIN6987150MT1X45 | 50 | MT1 | 45 | 25 | 25.9 | M24 |
| DIN6987150MT2X60 | 50 | MT2 | 60 | 32 | 40.9 | M24 |
| DIN6987150MT3X65 | 50 | MT3 | 65 | 40 | 45.9 | M24 |
| DIN6987150MT4X95 | 50 | MT4 | 95 | 48 | 75.9 | M24 |
| DIN6987150MT5X105 | 50 | MT5 | 105 | 63 | 85.9 | M24 |

# TUNGHOLD

## DIN69871-MT DRW (Holder for draw bar)

Morse taper holder with draw bar for DIN69871




| Designation | SS | Tt° | L | øD1 | L1 | L2 | G1 | G | Fig. |
|---|---|---|---|---|---|---|---|---|---|
| DIN6987140MT1DRW | 40 | MT1 | 50 | 25 | 30.9 | - | M6 | M16 | 1 |
| DIN6987140MT2DRW | 40 | MT2 | 50 | 32 | 30.9 | - | M10 | M16 | 1 |
| DIN6987140MT3DRW | 40 | MT3 | 70 | 40 | 50.9 | - | M12 | M16 | 1 |
| DIN6987140MT4DRW (1) | 40 | MT4 | 95 | 63 | 75.9 | 15 | M16 | M16 | 2 |
| DIN6987150MT1DRW | 50 | MT1 | 45 | 25 | 25.9 | - | M6 | M24 | 1 |
| DIN6987150MT2DRW | 50 | MT2 | 60 | 32 | 40.9 | - | M10 | M24 | 1 |
| DIN6987150MT3DRW | 50 | MT3 | 65 | 40 | 45.9 | - | M12 | M24 | 1 |
| DIN6987150MT4DRW (1) | 50 | MT4 | 70 | 63 | 50.9 | 15 | M16 | M24 | 2 |
| DIN6987150MT5DRW (1) | 50 | MT5 | 100 | 78 | 80.9 | 18 | M20 | M24 | 2 |

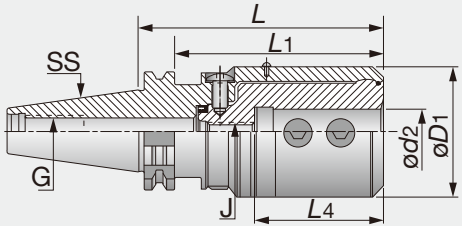
(1) DIN 2201.

Pull stud
F135

# TUNGBORE

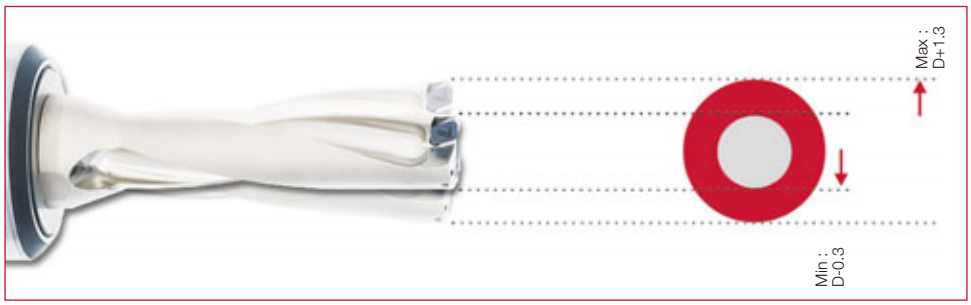
## TUNGBORE-DIN69871 (Adjustable holder for indexable drill)

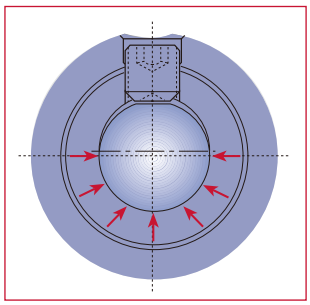
TungBore adjustable drilling dia. holder with DIN69871 shank




| Designation | SS | ød2 | øD1 | L | L1 | L4 | J | G |
|---|---|---|---|---|---|---|---|---|
| TUNGBORE-SKA40EM16ADB | 40 | 16 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM20ADB | 40 | 20 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM25ADB | 40 | 25 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM32ADB | 40 | 32 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA40EM40ADB | 40 | 40 | 72 | 135.6 | 116.5 | 71 | M10 | M16 |
| TUNGBORE-SKA50EM16ADB | 50 | 16 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM20ADB | 50 | 20 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM25ADB | 50 | 25 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM32ADB | 50 | 32 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-SKA50EM40ADB | 50 | 40 | 72 | 115.6 | 96.5 | 71 | M10 | M24 |

- Applicable for 10 MPa pressure coolant
- Compatible with internal coolant supply



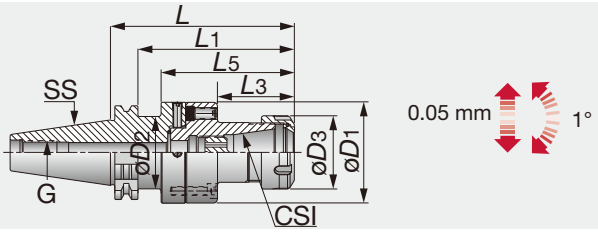



The bore's section is actually made from two shifted circular sections. The clamping screw pushes the drill shank through a narrowed opening, forcing elastic deformation of the holder. Contact is made around more than 180°, providing a high clamping force.

Pull stud
F135

# ADJ DIN69871-ER collet (Collet chuck holder)

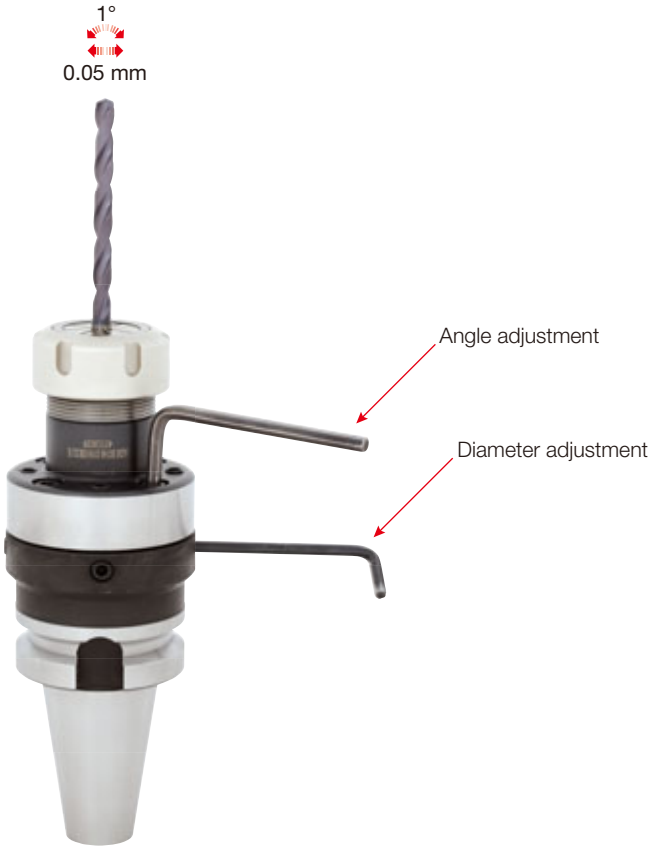
ER Collet chucks with center alignment and DIN69871 shanks




| Designation | SS | CSI | Range | *L* | *L*1 | *L*5 | *L*3 | ø*D*3 | ø*D*1 | ø*D*2 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADJDIN6987140D70ER32 | 40 | ER32 | 2-20 | 124.5 | 105.4 | 89.5 | 52.5 | 50 | 70 | 46 | M16 |
| ADJDIN6987150D70ER32 | 50 | ER32 | 2-20 | 124.5 | 105.4 | - | 52.5 | 50 | 70 | - | M24 |

• Applicable for 10 MPa pressure coolant

(Option:Wrench for ER collet)

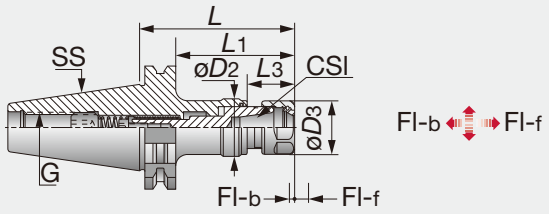



ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGGTI

## GTI-DIN69871-ER tapping (Tapping holder)

TungGTI tapping attachment with DIN69871 shank



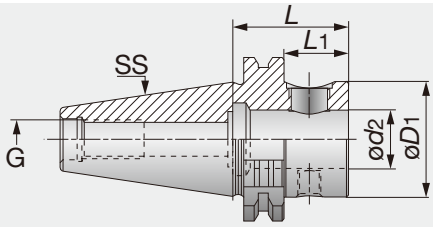

| Designation | SS | CSI | Tap min | Tap max | Range | L | L1 | L3 | øD3 | øD2 | Fl-f | Fl-b | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTIDIN6987140ER16 | 40 | ER16 | M3 | M10 | 0.5-10 | 81.2 | 62.1 | 24.6 | 28 | 29.5 | 8 | 3 | M16 |
| GTIDIN6987150ER16 | 50 | ER16 | M3 | M10 | 0.5-10 | 106.8 | 87.7 | 24.6 | 28 | 29.5 | 8 | 3 | M24 |
| GTIDIN6987140ER32 | 40 | ER32 | M6 | M20 | 2-20 | 112.6 | 93.5 | 33 | 50 | 56.5 | 9 | 4 | M16 |
| GTIDIN6987150ER32 | 50 | ER32 | M6 | M20 | 2-20 | 115.3 | 96.2 | 33 | 50 | 56.5 | 9 | 4 | M24 |
| GTIDIN6987140ER40 | 40 | ER40 | M6 | M28 | 3-26 | 130.6 | 111.5 | 51 | 63 | 56.5 | 9 | 4 | M16 |
| GTIDIN6987150ER40 | 50 | ER40 | M6 | M28 | 3-26 | 133.3 | 114.2 | 51 | 63 | 56.5 | 9 | 4 | M24 |

(Option : Wrench for ER Collet)

# TUNGFIT

## DIN69871-CF (Quick change holder)

TungFit quick change style modular tooling system with DIN69871 shank



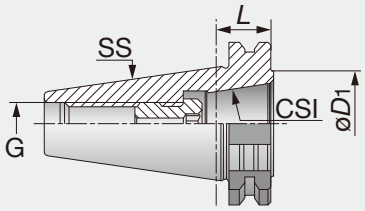

| Designation | SS | ød2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|
| DIN6987140CF4-S | 40 | 25 | 44.5 | 44.1 | 25 | M16 |
| DIN6987140CF4-SB | 40 | 25 | 44.5 | 44.1 | 25 | M16 |
| DIN6987140CF4-L | 40 | 25 | 44.5 | 100 | 80.9 | M16 |
| DIN6987150CF4-S | 50 | 25 | 44.5 | 44.1 | 25 | M24 |
| DIN6987150CF4-SB | 50 | 25 | 44.5 | 44.1 | 25 | M24 |
| DIN6987150CF4-L | 50 | 25 | 44.5 | 100 | 80.9 | M24 |
| DIN6987150CF4-LB | 50 | 25 | 44.5 | 100 | 80.9 | M24 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m. • Add B for coolant through the flange.

# TUNGCLICK

## DIN69871-ER-CLICK (Quick change holder)

TungClick quick change tooling system with DIN69871 shank




| Designation | SS | CSI | øD1 | L | G |
|---|---|---|---|---|---|
| DIN6987140ER32CLICK-IN | 40 | ER32 | 41 | 20.1 | M16 |
| DIN6987150ER32CLICK-IN | 50 | ER32 | 41 | 20.1 | M24 |

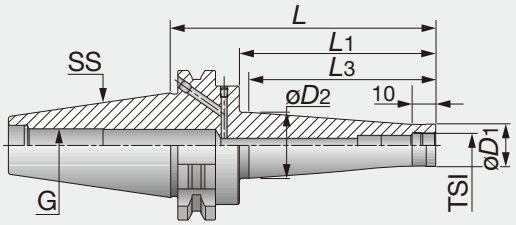
• Applicable for 10 MPa pressure coolant • Tightening torque: 235 N·m

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# DIN69871-ODP (Screw clamp holder for modular cutting heads)

TungFlex modular tooling system with DIN69871 shank






| Designation | SS | TSI | øD1 | øD2 | L | L1 | L3 | G |
|---|---|---|---|---|---|---|---|---|
| DIN6987140ODP6X58 | 40 | M6 | 9.8 | 13 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP6X98 | 40 | M6 | 9.8 | 23 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP8X58 | 40 | M8 | 13.1 | 15 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP8X98 | 40 | M8 | 13.1 | 23 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP10X58 | 40 | M10 | 18 | 20 | 58 | 38.9 | 32 | M16 |
| DIN6987140ODP10X98 | 40 | M10 | 18 | 28 | 98 | 78.9 | 74 | M16 |
| DIN6987140ODP12X58 | 40 | M12 | 21 | 24 | 58 | 38.9 | 34 | M16 |
| DIN6987140ODP12X98 | 40 | M12 | 21 | 31 | 98 | 78.9 | 75 | M16 |
| DIN6987140ODP16X58 | 40 | M16 | 29 | 28.6 | 58 | 38.9 | 33 | M16 |
| DIN6987140ODP16X98 | 40 | M16 | 29 | 34 | 98 | 78.9 | 75 | M16 |
| DIN6987150ODP12X78 (1) | 50 | M12 | 23 | 30 | 78 | 58.9 | 50 | M24 |
| DIN6987150ODP12X128 (1) | 50 | M12 | 23 | 40 | 128 | 108.9 | 100 | M24 |
| DIN6987150ODP12X178 (1) | 50 | M12 | 23 | 40 | 178 | 158.9 | 150 | M24 |
| DIN6987150ODP12X228 (1) | 50 | M12 | 23 | 46 | 228 | 208.9 | 200 | M24 |
| DIN6987150ODP16X78 (1) | 50 | M16 | 29 | 34 | 78 | 58.9 | 50 | M24 |
| DIN6987150ODP16X128 (1) | 50 | M16 | 29 | 40 | 128 | 108.9 | 100 | M24 |
| DIN6987150ODP16X178 (1) | 50 | M16 | 29 | 55 | 178 | 158.9 | 150 | M24 |
| DIN6987150ODP16X228 (1) | 50 | M16 | 29 | 55 | 228 | 208.9 | 200 | M24 |

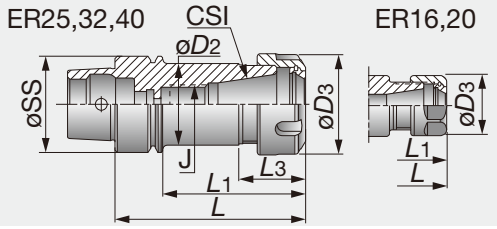
• Applicable for 10 MPa pressure coolant (1) Balanced to G6.3 12,000 $min^{-1}$.

Pull stud
F135

# TUNGHOLD

## HSK E-ER (Collet chuck holder)

ER collet chucks with HSK-E shank




| Designation | øSS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKE32ER16X60 | 32 | ER16 | 0.5-10 | 60 | 40 | 21.5 | 28 | 22.4 | - |
| HSKE32ER20X60 | 32 | ER20 | 1-13 | 6 | 40 | 26 | 34 | 25.4 | - |
| HSKE32ER25X65 | 32 | ER25 | 1-16 | 65 | 45 | 30 | 42 | 25.8 | - |
| HSKE40ER16X60 | 40 | ER16 | 0.5-10 | 60 | 40 | - | 28 | - | - |
| HSKE40ER16X80 | 40 | ER16 | 0.5-10 | 80 | 60 | - | 28 | - | M10 |
| HSKE40ER20X80 | 40 | ER20 | 1-13 | 80 | 60 | - | 34 | - | M12 |
| HSKE40ER25X80 | 40 | ER25 | 1-16 | 80 | 60 | 28 | 42 | 34 | M18X1.5 |
| HSKE40ER32X80 | 40 | ER32 | 2-20 | 80 | 60 | 31 | 50 | 40.1 | M22X1.5 |
| HSKE50ER16X100 (1) | 50 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 |
| HSKE50ER16X100M (1)(3) | 50 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKE50ER16X80 (1) | 50 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 |
| HSKE50ER20X80 (1) | 50 | ER20 | 1-13 | 80 | 54 | - | 34 | - | M10 |
| HSKE50ER25X80 (1) | 50 | ER25 | 1-16 | 80 | 54 | 28 | 42 | 32.4 | - |
| HSKE50ER32X80 (1) | 50 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | - |
| HSKE50ER32X100 (1) | 50 | ER32 | 2-20 | 100 | 74 | 31 | 50 | 40.4 | M22X1.5 |
| HSKE63ER16X80 (2) | 63 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 |
| HSKE63ER16X100 (2) | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 |
| HSKE63ER20X75 (2) | 63 | ER20 | 1-13 | 75 | 49 | - | 34 | - | - |
| HSKE63ER32X80 (2) | 63 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | - |
| HSKE63ER32X100 (2) | 63 | ER32 | 2-20 | 100 | 75 | - | 50 | - | M22X1.5 |
| HSKE63ER40X80 (2) | 63 | ER40 | 3-26 | 80 | 54 | 34 | 63 | - | - |

• Applicable for 10 MPa pressure coolant • Equipped with nut ER 16 MINI.
(1) Balanced to G2.5 35,000 $min^{-1}$. (2) Balanced to G2.5 35,000 $min^{-1}$. (3) Balanced to G2.5 30,000 $min^{-1}$.

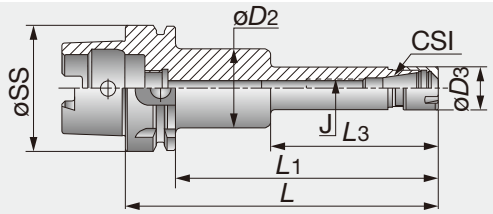
(Option:Wrench for ER collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143

# HSK A-ER M (Mini collet chuck holder)

## ER Mini-collet chucks with HSK-A shank






| Designation | øSS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKA50ER16X100M | 50 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKA50ER16X120M | 50 | ER16 | 0.5-10 | 120 | 94 | - | 22 | - | M10 |
| HSKA50ER20X100M | 50 | ER20 | 1-13 | 100 | 74 | - | 28 | - | M12 |
| HSKA50ER20X120M | 50 | ER20 | 1-13 | 120 | 94 | - | 28 | - | M12 |
| HSKA63ER16X100M | 63 | ER16 | 0.5-10 | 100 | 74 | - | 22 | - | M10 |
| HSKA63ER16X120M | 63 | ER16 | 0.5-10 | 120 | 94 | 78 | 22 | 40 | M10 |
| HSKA63ER16X160M | 63 | ER16 | 0.5-10 | 160 | 134 | 85 | 22 | 40 | M10 |
| HSKA63ER20X100M | 63 | ER20 | 1-13 | 100 | 74 | - | 28 | - | M12 |
| HSKA63ER20X120M | 63 | ER20 | 1-13 | 120 | 94 | - | 28 | - | M12 |
| HSKA63ER20X160M | 63 | ER20 | 1-13 | 160 | 134 | 85 | 28 | 45 | M12 |
| HSKA100ER16X100M (1) | 100 | ER16 | 0.5-10 | 100 | 71 | - | 22 | - | M10 |
| HSKA100ER16X160M (1) | 100 | ER16 | 0.5-10 | 160 | 131 | 85 | 22 | 40 | M10 |
| HSKA100ER20X100M (1) | 100 | ER20 | 1-13 | 100 | 71 | - | 28 | - | M12 |
| HSKA100ER20X160M (1) | 100 | ER20 | 1-13 | 160 | 131 | 85 | 28 | 45 | M12 |

• Applicable for 10 MPa pressure coolant. (1) Balance to G6.3 12,000 $min^{-1}$.

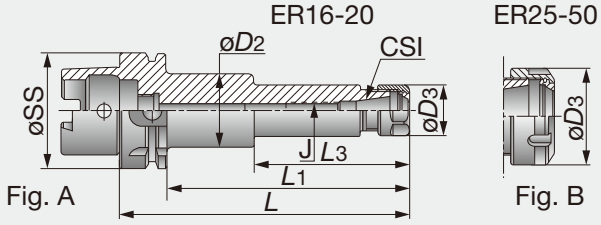
(Option:Wrench for ER collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143

# TUNGHOLD

## HSK A-ER (Collet chuck holder)

ER collet chucks with HSK-A shank




| Designation | øSS | CSI | Range | L | L1 | L3 | øD3 | øD2 | J | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKA40ER16X60 | 40 | ER16 | 0.5-10 | 60 | 40 | - | 28 | - | M10 | A |
| HSKA40ER16X80 | 40 | ER16 | 0.5-10 | 80 | 60 | - | 28 | - | M10 | A |
| HSKA40ER16X100 | 40 | ER16 | 0.5-10 | 100 | 80 | - | 28 | - | M10 | A |
| HSKA50ER16X100 | 50 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKA50ER16X120 | 50 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKA50ER20X100 | 50 | ER20 | 1-13 | 100 | 74 | - | 34 | - | M12 | A |
| HSKA50ER20X120 | 50 | ER20 | 1-13 | 120 | 94 | - | 34 | - | M12 | A |
| HSKA63ER16X100 | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKA63ER16X120 | 63 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKA63ER16X160 | 63 | ER16 | 0.5-10 | 160 | 134 | 85.6 | 28 | 40 | M10 | A |
| HSKA63ER20X100 | 63 | ER20 | 1-13 | 100 | 74 | - | 34 | - | M12 | A |
| HSKA63ER20X120 | 63 | ER20 | 1-13 | 120 | 94 | - | 34 | - | M12 | A |
| HSKA63ER20X160 | 63 | ER20 | 1-13 | 160 | 134 | 85.0 | 34 | 45 | M12 | A |
| HSKA100ER16X100 (1) | 100 | ER16 | 0.5-10 | 100 | 71 | - | 28 | - | M10 | A |
| HSKA100ER16X160 (1) | 100 | ER16 | 0.5-10 | 160 | 131 | 85 | 28 | 40 | M10 | A |
| HSKA100ER20X100 (1) | 100 | ER20 | 1-13 | 100 | 71 | - | 34 | - | M12 | A |
| HSKA100ER20X160 (1) | 100 | ER20 | 1-13 | 160 | 131 | 85 | 34 | 45 | M12 | A |
| HSKA40ER25X80 | 40 | ER25 | 1-16 | 80 | 60 | 28 | 42 | 32.4 | M18x1.5 | B |
| HSKA40ER25X100 | 40 | ER25 | 1-16 | 100 | 80 | 28 | 42 | 32.4 | M16 | B |
| HSKA40ER32X100 | 40 | ER32 | 2-20 | 100 | 80 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA50ER25X80 | 50 | ER25 | 1-16 | 80 | 54 | 28 | 42 | 32.4 | M16 | B |
| HSKA50ER25X100 | 50 | ER25 | 1-16 | 100 | 74 | 28.5 | 42 | 41.8 | M16 | B |
| HSKA50ER32X100 | 50 | ER32 | 2-20 | 100 | 74 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA50ER32X120 | 50 | ER32 | 2-20 | 120 | 94 | 35 | 50 | 41.8 | M22x1.5 | B |
| HSKA63ER25X80 | 63 | ER25 | 1-16 | 80 | 54 | - | 42 | - | M16 | B |
| HSKA63ER25X100 | 63 | ER25 | 1-16 | 100 | 74 | - | 42 | - | M16 | B |
| HSKA63ER25X120 | 63 | ER25 | 1-16 | 120 | 94 | - | 42 | - | M16 | B |
| HSKA63ER25X160 | 63 | ER25 | 1-16 | 160 | 134 | - | 42 | - | M16 | B |
| HSKA63ER32X80 | 63 | ER32 | 2-20 | 80 | 54 | 31 | 50 | 40.4 | M22x1.5 | B |
| HSKA63ER32X100 | 63 | ER32 | 2-20 | 100 | 74 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X120 | 63 | ER32 | 2-20 | 120 | 94 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X140 | 63 | ER32 | 2-20 | 140 | 114 | - | 50 | - | M22x1.5 | B |
| HSKA63ER32X160 | 63 | ER32 | 2-20 | 160 | 134 | - | 50 | - | M22x1.5 | B |
| HSKA63ER40X80 | 63 | ER40 | 3-26 | 80 | 54 | 34 | 63 | 50.4 | - | B |
| HSKA63ER40X100 | 63 | ER40 | 3-26 | 100 | 74 | 34 | 63 | 50.4 | M28x1.5 | B |
| HSKA63ER40X120 | 63 | ER40 | 3-26 | 120 | 94 | 34 | 63 | 50.4 | M28x1.5 | B |
| HSKA100ER25X100 | 100 | ER25 | 1-16 | 100 | 71 | - | 42 | - | M16 | B |
| HSKA100ER25X120 | 100 | ER25 | 1-16 | 120 | 91 | - | 42 | - | M16 | B |
| HSKA100ER25X160 | 100 | ER25 | 1-16 | 160 | 134 | - | 42 | - | M16 | B |
| HSKA100ER32X100 | 100 | ER32 | 2-20 | 100 | 71 | - | 50 | - | M22x1.5 | B |
| HSKA100ER32X120 | 100 | ER32 | 2-20 | 120 | 91 | - | 50 | - | M22x1.5 | B |
| HSKA100ER32X160 | 100 | ER32 | 2-20 | 160 | 131 | - | 50 | - | M22x1.5 | B |
| HSKA100ER40X100 | 100 | ER40 | 3-26 | 100 | 71 | - | 63 | - | M28x1.5 | B |
| HSKA100ER40X120 | 100 | ER40 | 3-26 | 120 | 91 | - | 63 | - | M28x1.5 | B |
| HSKA100ER40X160 | 100 | ER40 | 3-26 | 160 | 131 | - | 63 | - | M28x1.5 | B |
| HSKA100ER50X100 | 100 | ER50 | 10-34 | 100 | 71 | - | 78 | - | - | B |

• Applicable for 10 MPa pressure coolant (1) Balanced to G6.3 12,000 $min^{-1}$.

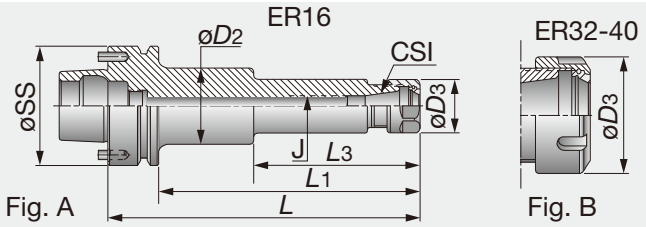
(Option:Wrench for ER collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143

# TUNGHOLD

## HSK FM-ER (Collet chuck holder)

ER collet chucks with HSK-FM shank



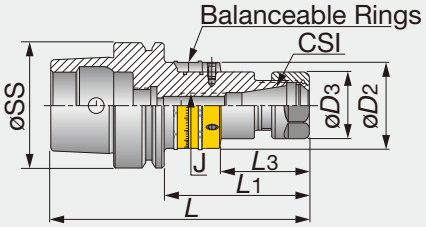

| Designation | øSS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKFM63ER16X80 | 63 | ER16 | 0.5-10 | 80 | 54 | - | 28 | - | M10 | A |
| HSKFM63ER16X100 | 63 | ER16 | 0.5-10 | 100 | 74 | - | 28 | - | M10 | A |
| HSKFM63ER16X120 | 63 | ER16 | 0.5-10 | 120 | 94 | - | 28 | - | M10 | A |
| HSKFM63ER16X160 | 63 | ER16 | 0.5-10 | 160 | 134 | 85.6 | 28 | 40 | M10 | A |
| HSKFM63ER32X80 | 63 | ER32 | 2-20 | 80 | 54 | - | 50 | - | - | B |
| HSKFM63ER32X100 | 63 | ER32 | 2-20 | 100 | 74 | - | 50 | - | M22x1.5 | B |
| HSKFM63ER40X80 | 63 | ER40 | 3-26 | 80 | 54 | 32 | 63 | 50 | - | B |
| HSKFM63ER40X100 | 63 | ER40 | 3-26 | 100 | 74 | 32 | 63 | 50 | M28x1.5 | B |

• Applicable for 10 MPa pressure coolant . • The driving pins can be removed, turning the toolholder into a standard HSK "F63" type. (Option:Wrench for ER collet)

# TUNGBALANCE

## HSK E-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with HSK-E shank




| Designation | øSS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKE63ER16X100BIN | 63 | ER16 | 0.5-10 | 100 | 74 | 45 | 28 | 44 | M10 |
| HSKE63ER20X100BIN | 63 | ER20 | 1-13 | 100 | 74 | 45.1 | 34 | 44 | M12 |
| HSKE63ER25X100BIN | 63 | ER25 | 1-16 | 100 | 74 | 45.2 | 42 | 44 | M16 |
| HSKE63ER32X120BIN | 63 | ER32 | 2-20 | 120 | 94 | 48 | 50 | 60 | M22x1.5 |

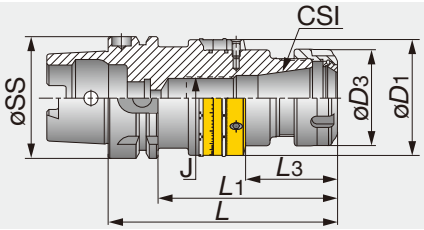
• Applicable for 10 MPa pressure coolant • Balanced to G2.5 20,000 $min^{-1}$. (Option:Wrench for ER collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143

# TUNGBALANCE

## HSK A-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with HSK-A shank




| Designation | øSS | CSI | Range | L | L1 | L3 | øD3 | øD1 | J |
|---|---|---|---|---|---|---|---|---|---|
| HSKA63ER16X100BIN | 63 | ER16 | 0.5-10 | 100 | 74 | 45 | 28 | 44 | M10 |
| HSKA63ER16X160BIN | 63 | ER16 | 0.5-10 | 160 | 134 | 75 | 28 | 44 | M10 |
| HSKA63ER20X100BIN | 63 | ER20 | 1-13 | 100 | 74 | 45.1 | 34 | 44 | M12 |
| HSKA63ER20X160BIN | 63 | ER20 | 1-13 | 160 | 134 | 86.1 | 34 | 44 | M12 |
| HSKA63ER25X100BIN | 63 | ER25 | 1-16 | 100 | 74 | 45.2 | 42 | 44 | M16 |
| HSKA63ER25X160BIN | 63 | ER25 | 1-16 | 160 | 134 | 86.2 | 42 | 44 | M16 |
| HSKA63ER32X120BIN | 63 | ER32 | 2-20 | 120 | 94 | 48 | 50 | 60 | M22x1.5 |
| HSKA63ER32X160BIN | 63 | ER32 | 2-20 | 160 | 134 | 85 | 50 | 60 | M22x1.5 |

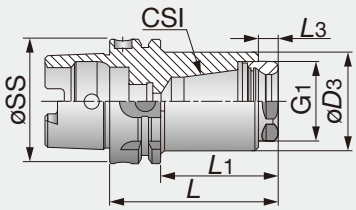
• Applicable for 10 MPa pressure coolant • Balanced to G2.5 20,000 $min^{-1}$.

(Option:Wrench for ER collet)

# TUNGSHORT

## HSK A-SHORT (Collet chuck holder for short overhang)

TungShort collet chucks with HSK-A shank




| Designation | øSS | CSI | Range | L | L1 | L3 | øD3 | G1 |
|---|---|---|---|---|---|---|---|---|
| HSKA63ER32SHORT | 63 | ER32 | 2-20 | 84.5 | 56.1 | 9.5 | 50 | M40x1.5 |
| HSKA100ER32SHORT | 100 | ER32 | 2-20 | 89.5 | 60.5 | 9.5 | 50 | M40x1.5 |
| HSKA100ER40SHORT | 100 | ER40 | 3-26 | 104.5 | 75.5 | 9.5 | 70 | M50x1.5 |

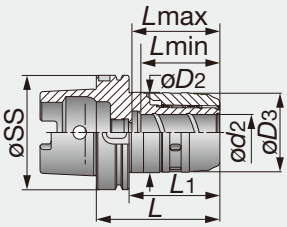
• Applicable for 10 MPa pressure coolant • Balanced to G6.3 8,000 $min^{-1}$.

(Option:Wrench for ER collet)

# TUNGMAX

## HSK A-TUNGMAX (Power chuck holder)

TungMax endmill chuck holders with HSK-A shank




| Designation | øSS | ød2 | Range | L | L1 | Lmin | Lmax | øD3 | øD2 |
|---|---|---|---|---|---|---|---|---|---|
| HSKA63MAXIN20X95 | 63 | 20 | 6-20 | 95 | 69 | 56 | 66 | 51 | 53 |
| HSKA63MAXIN32X113 | 63 | 32 | 6-32 | 113 | 87 | 70 | 85 | 69 | 70 |
| HSKA100MAXIN20X115 (1) | 100 | 20 | 6-20 | 115 | 86 | 56 | 69 | 51 | 53 |
| HSKA100MAXIN32X135 (1) | 100 | 32 | 6-32 | 135 | 106 | 71 | 87 | 69 | 70 |

• Applicable for 10 MPa pressure coolant . (1) Balanced to G6.3 8,000 $min^{-1}$.

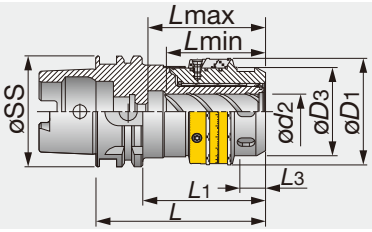
(Option:Wrench for TungMax collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143
Straight collet F122

# TUNGBALANCE

## HSK A-TUNGMAX BIN (Power chuck holder)

TungMax adjustable dynamic balanceable endmill chuck holders with HSK-A shank




| Designation | øSS | ød2 | Range | L | L1 | L3 | Lmin | Lmax | øD3 | øD1 |
|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63MAXIN20X95BIN (1) | 63 | 20 | 6-20 | 95 | 69 | 17.5 | 56 | 66 | 51 | 61 |
| HSKA63MAXIN32X113BIN (1) | 63 | 32 | 6-32 | 113 | 87 | 24.9 | 70 | 85 | 69 | 80 |
| HSKA100MAXIN20X115BIN (2) | 100 | 20 | 6-20 | 115 | 86 | 17.5 | 56 | 69 | 51 | 61 |
| HSKA100MAXIN32X110BIN (2) | 100 | 32 | 6-32 | 110 | 81 | 24.9 | 70 | 78 | 69 | 80 |

• Applicable for 10 MPa pressure coolant
(1) Chucks with taper size HSK A63 can be balanced by the balancing ring up to G2.5 at 20,000 $min^{-1}$.
(2) Chucks with taper size HSK A100 can be balanced by the balancing ring up to G2.5 at 18,000 $min^{-1}$.

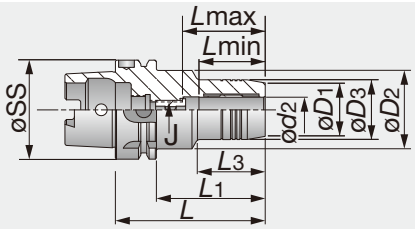
(Option:Wrench for TungMax collet)

Straight collet F122
Cooling tube F143
Wrench F139, F144

# TUNGHYDRO

## HSK A-HYDRO (Hydro chuck holder)

TungHydro hydraulic endmill chuck holders with HSK-A shank




| Designation | øSS | ød2 | øD3 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA50HYDRO6X80 | 50 | 6 | 26 | 23 | 42 | 80 | 54 | 35 | 27 | 37 | M5 |
| HSKA50HYDRO8X80 | 50 | 8 | 28 | 25 | 42 | 80 | 54 | 36 | 27 | 37 | M6 |
| HSKA50HYDRO16X95 | 50 | 16 | 38 | 34 | 42 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA50HYDRO20X100 | 50 | 20 | 42 | 38 | 42 | 100 | 74 | 74 | 42 | 52 | M16x1 |
| HSKA63HYDRO6X80 | 63 | 6 | 26 | 23 | 50 | 80 | 54 | 33 | 27 | 37 | M5 |
| HSKA63HYDRO8X80 | 63 | 8 | 28 | 25 | 50 | 80 | 54 | 33 | 27 | 37 | M6 |
| HSKA63HYDRO10X85 | 63 | 10 | 30 | 27 | 50 | 85 | 59 | 39 | 32 | 42 | M8x1 |
| HSKA63HYDRO12X90 | 63 | 12 | 32 | 29 | 50 | 90 | 64 | 44 | 37 | 47 | M10x1 |
| HSKA63HYDRO14X90 | 63 | 14 | 34 | 30 | 50 | 90 | 64 | 46 | 37 | 47 | M10x1 |
| HSKA63HYDRO16X95 | 63 | 16 | 38 | 34 | 50 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA63HYDRO18X95 | 63 | 18 | 40 | 36 | 50 | 95 | 69 | 52 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X100 | 63 | 20 | 42 | 38 | 50 | 100 | 74 | 58 | 42 | 52 | M16x1 |
| HSKA63HYDRO25X120 | 63 | 25 | 50 | 46 | 50 | 120 | 94 | 94 | 48 | 58 | M16x1 |
| HSKA63HYDRO32X125 | 63 | 32 | 60 | 56 | 50 | 125 | 99 | 83 | 52 | 62 | M16x1 |
| HSKA80HYDRO6X85 | 80 | 6 | 26 | 23 | 50 | 85 | 59 | 37 | 27 | 37 | M5 |
| HSKA80HYDRO10X90 | 80 | 10 | 30 | 27 | 50 | 90 | 64 | 42 | 32 | 42 | M8x1 |
| HSKA80HYDRO14X95 | 80 | 14 | 34 | 30 | 50 | 95 | 69 | 47 | 37 | 47 | M10x1 |
| HSKA80HYDRO16X100 | 80 | 16 | 38 | 34 | 50 | 100 | 74 | 52 | 42 | 52 | M12x1 |
| HSKA80HYDRO18X100 | 80 | 18 | 40 | 36 | 50 | 100 | 74 | 52 | 42 | 52 | M12x1 |
| HSKA80HYDRO20X105 | 80 | 20 | 42 | 38 | 50 | 105 | 79 | 52 | 42 | 52 | M16x1 |
| HSKA80HYDRO25X115 | 80 | 25 | 50 | 46 | 50 | 115 | 89 | 58 | 48 | 58 | M16x1 |
| HSKA100HYDRO6X85 | 100 | 6 | 26 | 23 | 63 | 85 | 56 | 29 | 27 | 37 | M5 |
| HSKA100HYDRO8X85 | 100 | 8 | 28 | 25 | 63 | 85 | 56 | 29 | 27 | 37 | M6 |
| HSKA100HYDRO10X90 | 100 | 10 | 30 | 27 | 63 | 90 | 61 | 35 | 32 | 42 | M8x1 |
| HSKA100HYDRO12X95 | 100 | 12 | 32 | 29 | 63 | 95 | 66 | 40 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X95 | 100 | 14 | 34 | 30 | 63 | 95 | 66 | 42 | 37 | 47 | M10x1 |
| HSKA100HYDRO16X100 | 100 | 16 | 38 | 34 | 63 | 100 | 71 | 47 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X100 | 100 | 18 | 40 | 36 | 63 | 100 | 71 | 48 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X105 | 100 | 20 | 42 | 38 | 63 | 105 | 76 | 54 | 42 | 52 | M16x1 |
| HSKA100HYDRO25X115 | 100 | 25 | 50 | 46 | 63 | 115 | 86 | 51 | 48 | 58 | M16x1 |
| HSKA100HYDRO32X120 | 100 | 32 | 60 | 56 | 63 | 120 | 91 | 59 | 52 | 62 | M16x1 |

- Applicable for 10 MPa pressure coolant
- Reduction sleeves are available for 12, 20, 25 and 32 mm bore diameters.
- Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

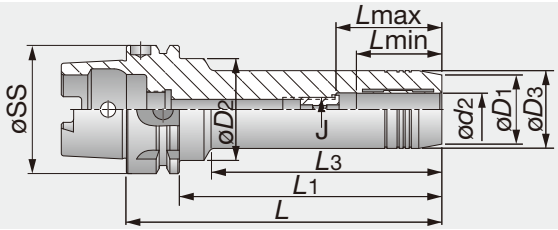
(Option:Wrench for TungHydro collet)

Straight collet F125
Cooling tube F143
Wrench F144

# TUNGHYDRO

## HSK A-HYDRO (Hydro chuck holder for long overhang)

TungHydro long projection hydraulic endmill chuck holders with HSK-A shank




| Designation | øSS | ød2 | øD3 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63HYDRO6X150 | 63 | 6 | 26 | 23 | 50 | 150 | 124 | 103 | 27 | 37 | M5 |
| HSKA63HYDRO6X200 | 63 | 6 | 26 | 23 | 50 | 200 | 174 | 153 | 27 | 37 | M5 |
| HSKA63HYDRO8X150 | 63 | 8 | 28 | 25 | 50 | 150 | 124 | 104 | 27 | 37 | M6 |
| HSKA63HYDRO10X150 | 63 | 10 | 30 | 27 | 50 | 150 | 124 | 104 | 32 | 42 | M8x1 |
| HSKA63HYDRO10X200 | 63 | 10 | 30 | 27 | 50 | 200 | 174 | 154 | 32 | 42 | M8x1 |
| HSKA63HYDRO12X150 | 63 | 12 | 32 | 29 | 50 | 150 | 124 | 105 | 37 | 47 | M10x1 |
| HSKA63HYDRO12X200 | 63 | 12 | 32 | 29 | 50 | 200 | 174 | 155 | 37 | 47 | M10x1 |
| HSKA63HYDRO14X150 | 63 | 14 | 34 | 30 | 50 | 150 | 124 | 105 | 37 | 47 | M10x1 |
| HSKA63HYDRO16X150 | 63 | 16 | 38 | 34 | 50 | 150 | 124 | 106.5 | 42 | 52 | M12x1 |
| HSKA63HYDRO16X200 | 63 | 16 | 38 | 34 | 50 | 200 | 174 | 156.5 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X150 | 63 | 20 | 42 | 38 | 50 | 150 | 124 | 108 | 42 | 52 | M12x1 |
| HSKA63HYDRO20X200 | 63 | 20 | 42 | 38 | 50 | 200 | 174 | 158 | 42 | 52 | M12x1 |
| HSKA63HYDRO25X150 | 63 | 25 | 50 | 46 | 50 | 150 | 124 | - | 48 | 58 | M16x1 |
| HSKA63HYDRO25X200 | 63 | 25 | 50 | 46 | 50 | 200 | 174 | - | 48 | 58 | M16x1 |
| HSKA100HYDRO6X150 | 100 | 6 | 26 | 23 | 50 | 150 | 124 | 94 | 27 | 37 | M6 |
| HSKA100HYDRO6X200 | 100 | 6 | 26 | 23 | 50 | 200 | 174 | 144 | 27 | 37 | M6 |
| HSKA100HYDRO8X150 | 100 | 8 | 28 | 25 | 50 | 150 | 124 | 94.5 | 27 | 37 | M6 |
| HSKA100HYDRO8X200 | 100 | 8 | 28 | 25 | 50 | 200 | 174 | 144.5 | 27 | 37 | M6 |
| HSKA100HYDRO10X150 | 100 | 10 | 30 | 27 | 50 | 150 | 124 | 95 | 32 | 42 | M8x1 |
| HSKA100HYDRO10X200 | 100 | 10 | 30 | 27 | 50 | 200 | 174 | 145 | 32 | 42 | M8x1 |
| HSKA100HYDRO12X150 | 100 | 12 | 32 | 29 | 50 | 150 | 124 | 95.5 | 37 | 47 | M10x1 |
| HSKA100HYDRO12X200 | 100 | 12 | 32 | 29 | 50 | 200 | 174 | 145.5 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X150 | 100 | 14 | 34 | 30 | 50 | 150 | 124 | 97 | 37 | 47 | M10x1 |
| HSKA100HYDRO14X200 | 100 | 14 | 34 | 30 | 50 | 200 | 174 | 147 | 37 | 47 | M10x1 |
| HSKA100HYDRO16X150 | 100 | 16 | 38 | 34 | 50 | 150 | 124 | 97.5 | 42 | 52 | M12x1 |
| HSKA100HYDRO16X200 | 100 | 16 | 38 | 34 | 50 | 200 | 174 | 147.5 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X150 | 100 | 18 | 40 | 36 | 50 | 150 | 124 | 98 | 42 | 52 | M12x1 |
| HSKA100HYDRO18X200 | 100 | 18 | 40 | 36 | 50 | 200 | 174 | 148 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X150 | 100 | 20 | 42 | 38 | 50 | 150 | 124 | 99 | 42 | 52 | M12x1 |
| HSKA100HYDRO20X200 | 100 | 20 | 42 | 38 | 50 | 200 | 174 | 149 | 42 | 52 | M12x1 |
| HSKA100HYDRO25X200 | 100 | 25 | 50 | 46 | 50 | 200 | 174 | - | 48 | 58 | M16x1 |
| HSKA100HYDRO32X200 | 100 | 32 | 60 | 56 | 60 | 200 | 174 | - | 52 | 62 | M16x1 |

• Applicable for 10 MPa pressure coolant • Reduction sleeves are available for 12, 20, 25 and 32 mm bore diameters.
• Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

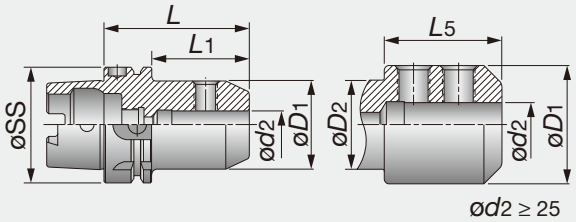
(Option:Wrench for TungHydro collet)

Straight collet F125
Cooling tube F143
Wrench F144

# TUNGHOLD

## HSK A-EM (Endmill holder)

Screw locking endmill holders with HSK-A shank




| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L5 |
|---|---|---|---|---|---|---|---|
| HSKA50EM6X65 | 50 | 6 | 25 | - | 65 | 39 | - |
| HSKA50EM8X65 | 50 | 8 | 28 | - | 65 | 39 | - |
| HSKA50EM10X65 | 50 | 10 | 35 | - | 65 | 39 | - |
| HSKA50EM14X80 | 50 | 14 | 44 | 41.8 | 80 | 54 | 38 |
| HSKA50EM16X80 | 50 | 16 | 48 | 41.8 | 80 | 54 | 38 |
| HSKA50EM18X80 | 50 | 18 | 50 | 41.8 | 80 | 54 | 38 |
| HSKA50EM20X80 | 50 | 20 | 52 | 41.8 | 80 | 54 | 38 |
| HSKA63EM6X65 | 63 | 6 | 25 | - | 65 | 39 | - |
| HSKA63EM8X65 | 63 | 8 | 28 | - | 65 | 39 | - |
| HSKA63EM10X65 | 63 | 10 | 35 | - | 65 | 39 | - |
| HSKA63EM12X80 | 63 | 12 | 42 | - | 80 | 54 | - |
| HSKA63EM14X80 | 63 | 14 | 44 | - | 80 | 54 | - |
| HSKA63EM16X80 | 63 | 16 | 48 | - | 80 | 54 | - |
| HSKA63EM18X80 | 63 | 18 | 50 | - | 80 | 54 | - |
| HSKA63EM20X80 | 63 | 20 | 52 | - | 80 | 54 | - |
| HSKA63EM25X110 | 63 | 25 | 65 | 52 | 110 | 84 | 65.5 |
| HSKA63EM32X110 | 63 | 32 | 72 | 52 | 110 | 84 | 65.5 |
| HSKA100EM6X80 | 100 | 6 | 25 | - | 80 | 51 | - |
| HSKA100EM8X80 | 100 | 8 | 28 | - | 80 | 51 | - |
| HSKA100EM10X80 | 100 | 10 | 35 | - | 80 | 51 | - |
| HSKA100EM12X80 | 100 | 12 | 42 | - | 80 | 51 | - |
| HSKA100EM14X80 | 100 | 14 | 44 | - | 80 | 51 | - |
| HSKA100EM16X100 | 100 | 16 | 48 | - | 100 | 71 | - |
| HSKA100EM18X100 | 100 | 18 | 50 | - | 100 | 71 | - |
| HSKA100EM20X100 | 100 | 20 | 52 | - | 100 | 71 | - |
| HSKA100EM25X100 | 100 | 25 | 65 | - | 100 | 71 | - |
| HSKA100EM32X100 | 100 | 32 | 72 | - | 100 | 71 | - |

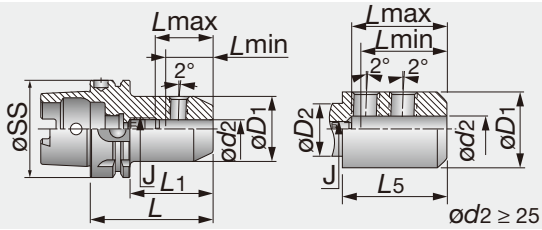
• Applicable for 10 MPa pressure coolant

Wrench F144
Cooling tube F143

# TUNGHOLD

## HSK A-EM E (Endmill holder with whistle notch)

Screw locking endmill holders for whistle notch with HSK-A shank




| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L5 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA50EM6X80E | 50 | 6 | 25 | - | 80 | 54 | - | 30 | 38 | M5 | 2.5 |
| HSKA50EM8X80E | 50 | 8 | 28 | - | 80 | 54 | - | 35 | 40 | M6 | 3 |
| HSKA50EM10X80E | 50 | 10 | 35 | - | 80 | 54 | - | 39 | 44 | M8 | 4 |
| HSKA50EM12X90E | 50 | 12 | 42 | 41.8 | 90 | 64 | 48 | 44 | 49 | M10 | 5 |
| HSKA50EM14X90E | 50 | 14 | 44 | 41.8 | 90 | 64 | 48 | 44 | 49 | M10 | 5 |
| HSKA50EM16X90E | 50 | 16 | 48 | 41.8 | 90 | 64 | 48 | 47 | 52 | M12 | 6 |
| HSKA50EM18X90E | 50 | 18 | 50 | 41.8 | 90 | 64 | 48 | 47 | 52 | M12 | 6 |
| HSKA50EM20X100E | 50 | 20 | 52 | 41.8 | 100 | 74 | 58 | 49 | 54 | M16 | 8 |
| HSKA63EM6X80E | 63 | 6 | 25 | - | 80 | 54 | - | 32 | 40 | M5 | 2 |
| HSKA63EM8X80E | 63 | 8 | 28 | - | 80 | 54 | - | 35 | 40 | M6 | 3 |
| HSKA63EM10X80E | 63 | 10 | 35 | - | 80 | 54 | - | 39 | 44 | M8 | 4 |
| HSKA63EM12X90E | 63 | 12 | 42 | - | 90 | 64 | - | 44 | 49 | M10 | 5 |
| HSKA63EM14X90E | 63 | 14 | 44 | - | 90 | 64 | - | 44 | 49 | M10 | 5 |
| HSKA63EM16X100E | 63 | 16 | 48 | - | 100 | 74 | - | 47 | 52 | M12 | 6 |
| HSKA63EM18X100E | 63 | 18 | 50 | - | 100 | 74 | - | 47 | 55 | M12 | 6 |
| HSKA63EM20X100E | 63 | 20 | 52 | - | 100 | 74 | - | 49 | 54 | M16 | 8 |
| HSKA63EM25X110E | 63 | 25 | 65 | 52 | 110 | 84 | 65.5 | 54 | 61 | M16 | 8 |
| HSKA63EM32X110E | 63 | 32 | 72 | 52 | 110 | 84 | 65.5 | 58 | 63 | M20X1.5 | 10 |
| HSKA100EM6X90E | 100 | 6 | 25 | - | 90 | 61 | - | 35 | 40 | M5 | 2.5 |
| HSKA100EM8X90E | 100 | 8 | 28 | - | 90 | 61 | - | 35 | 40 | M6 | 3 |
| HSKA100EM10X90E | 100 | 10 | 35 | - | 90 | 61 | - | 39 | 44 | M8 | 4 |
| HSKA100EM12X100E | 100 | 12 | 42 | - | 100 | 71 | - | 44 | 54 | M10 | 5 |
| HSKA100EM14X100E | 100 | 14 | 44 | - | 100 | 71 | - | 44 | 54 | M10 | 5 |
| HSKA100EM16X100E | 100 | 16 | 48 | - | 100 | 71 | - | 47 | 52 | M12 | 6 |
| HSKA100EM18X100E | 100 | 18 | 50 | - | 100 | 71 | - | 47 | 52 | M12 | 6 |
| HSKA100EM20X110E | 100 | 20 | 52 | - | 110 | 81 | - | 49 | 54 | M16 | 8 |
| HSKA100EM25X120E | 100 | 25 | 65 | - | 120 | 91 | - | 54 | 61 | M20X1.5 | 10 |
| HSKA100EM32X120E | 100 | 32 | 72 | - | 120 | 91 | - | 58 | 63 | M20X1.5 | 10 |

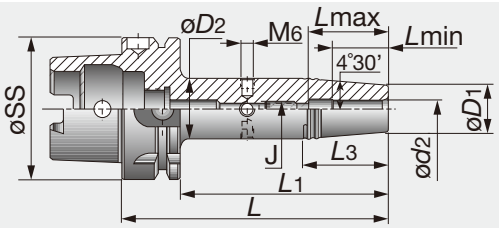
• Applicable for 10 MPa pressure coolant (1) The adjustment screw has an internal coolant hole.

Wrench F144
Cooling tube F143

# TUNGSHRINK

## HSK A-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with HSK-A shank




| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN6X120 | 63 | 6 | 21 | 27 | 120 | 94 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN6X160 | 63 | 6 | 21 | 27 | 160 | 134 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA63SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN8X120 | 63 | 8 | 21 | 27 | 120 | 94 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN8X160 | 63 | 8 | 21 | 27 | 160 | 134 | 38 | 25 | 36 | M6 | 3 |
| HSKA63SRKIN10X85 | 63 | 10 | 24 | 32 | 85 | 59 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN10X120 | 63 | 10 | 24 | 32 | 120 | 94 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN10X160 | 63 | 10 | 24 | 32 | 160 | 134 | 51 | 31 | 42 | M8 | 4 |
| HSKA63SRKIN12X90 | 63 | 12 | 24 | 32 | 90 | 64 | 51 | 36 | 42 | M8 | 4 |
| HSKA63SRKIN12X120 | 63 | 12 | 24 | 32 | 120 | 94 | 51 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN12X160 | 63 | 12 | 24 | 32 | 160 | 134 | 51 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X90 | 63 | 14 | 27 | 34 | 90 | 64 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X120 | 63 | 14 | 27 | 34 | 120 | 94 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN14X160 | 63 | 14 | 27 | 34 | 160 | 134 | 45 | 36 | 47 | M10 | 5 |
| HSKA63SRKIN16X75 | 63 | 16 | 27 | 34 | 75 | 49 | - | 39 | 50 | - | - |
| HSKA63SRKIN16X95 | 63 | 16 | 27 | 34 | 95 | 69 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN16X120 | 63 | 16 | 27 | 34 | 120 | 94 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN16X160 | 63 | 16 | 27 | 34 | 160 | 134 | 44 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X95 | 63 | 18 | 33 | 42 | 95 | 69 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X120 | 63 | 18 | 33 | 42 | 120 | 94 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN18X160 | 63 | 18 | 33 | 42 | 160 | 134 | 57 | 39 | 50 | M12 | 6 |
| HSKA63SRKIN20X75 | 63 | 20 | 33 | 41 | 75 | 49 | - | 41 | 50 | - | - |
| HSKA63SRKIN20X100 | 63 | 20 | 33 | 42 | 100 | 74 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN20X120 | 63 | 20 | 33 | 42 | 120 | 94 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN20X160 | 63 | 20 | 33 | 42 | 160 | 134 | 57 | 41 | 52 | M16 | 8 |
| HSKA63SRKIN25X85 | 63 | 25 | 44 | 53 | 85 | 59 | - | 47 | 58 | - | - |
| HSKA63SRKIN25X115 | 63 | 25 | 44 | 53 | 115 | 89 | 55 | 47 | 58 | M16 | 8 |
| HSKA63SRKIN32X85 | 63 | 32 | 44 | 53 | 85 | 59 | - | 47 | 58 | - | - |
| HSKA63SRKIN32X120 | 63 | 32 | 44 | 53 | 120 | 94 | 55 | 47 | 58 | M16 | 8 |
| HSKA100SRKIN6X85 | 100 | 6 | 21 | 27 | 85 | 56 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA100SRKIN6X120 | 100 | 6 | 21 | 27 | 120 | 91 | 38 | 25 | 36 | M5 | 2.5 |
| HSKA100SRKIN6X160 | 100 | 6 | 21 | 27 | 160 | 131 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X85 | 100 | 8 | 21 | 27 | 85 | 56 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X120 | 100 | 8 | 21 | 27 | 120 | 91 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN8X160 | 100 | 8 | 21 | 27 | 160 | 131 | 38 | 25 | 36 | M6 | 3 |
| HSKA100SRKIN10X90 | 100 | 10 | 24 | 32 | 90 | 61 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN10X120 | 100 | 10 | 24 | 32 | 120 | 91 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN10X160 | 100 | 10 | 24 | 32 | 160 | 131 | 51 | 31 | 42 | M8 | 4 |
| HSKA100SRKIN12X95 | 100 | 12 | 24 | 32 | 95 | 66 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN12X120 | 100 | 12 | 24 | 32 | 120 | 91 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN12X160 | 100 | 12 | 24 | 32 | 160 | 131 | 51 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X95 | 100 | 14 | 27 | 34 | 95 | 66 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X120 | 100 | 14 | 27 | 34 | 120 | 91 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN14X160 | 100 | 14 | 27 | 34 | 160 | 131 | 45 | 36 | 47 | M10 | 5 |
| HSKA100SRKIN16X100 | 100 | 16 | 27 | 34 | 100 | 71 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN16X120 | 100 | 16 | 27 | 34 | 120 | 91 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN16X160 | 100 | 16 | 27 | 34 | 160 | 131 | 45 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN18X100 | 100 | 18 | 33 | 42 | 100 | 71 | 57 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN18X160 | 100 | 18 | 33 | 42 | 160 | 131 | 57 | 39 | 50 | M12 | 6 |
| HSKA100SRKIN20X105 | 100 | 20 | 33 | 42 | 105 | 76 | 57 | 41 | 52 | M16 | 8 |
| HSKA100SRKIN20X160 | 100 | 20 | 33 | 42 | 160 | 131 | 57 | 41 | 52 | M16 | 8 |
| HSKA100SRKIN25X115 | 100 | 25 | 44 | 53 | 115 | 86 | 57 | 47 | 58 | M16 | 8 |
| HSKA100SRKIN32X120 | 100 | 32 | 44 | 53 | 120 | 91 | 57 | 47 | 58 | M16 | 8 |

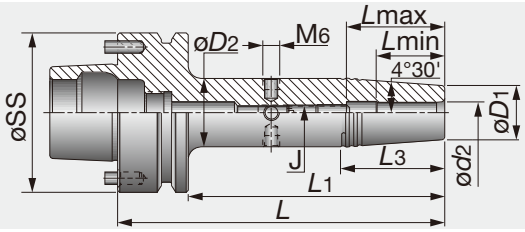
• Applicable for 10 MPa pressure coolant • Use only inductive heating device for SRKIN holders.

Induction heating unit F131
Heating unit F131
Preset screws F142
Wrench F144
Cooling tube F143

# TUNGSHRINK

## HSK FM-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with HSK-FM shank




| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKFM63SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M5 | 2.5 |
| HSKFM63SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 54 | 38 | 25 | 36 | M6 | 3 |
| HSKFM63SRKIN10X85 | 63 | 10 | 24 | 32 | 85 | 59 | 50.5 | 31 | 42 | M8 | 4 |
| HSKFM63SRKIN12X90 | 63 | 12 | 24 | 32 | 90 | 64 | 50.5 | 36 | 47 | M10 | 5 |
| HSKFM63SRKIN14X90 | 63 | 14 | 27 | 34 | 90 | 64 | 44.5 | 36 | 47 | M10 | 5 |
| HSKFM63SRKIN16X95 | 63 | 16 | 27 | 34 | 95 | 69 | 44.5 | 39 | 50 | M12 | 6 |
| HSKFM63SRKIN18X95 | 63 | 18 | 33 | 42 | 95 | 69 | 57 | 39 | 50 | M12 | 6 |
| HSKFM63SRKIN20X100 | 63 | 20 | 33 | 42 | 100 | 74 | 57 | 41 | 52 | M16 | 8 |
| HSKFM63SRKIN25X115 | 63 | 25 | 44 | 52.7 | 115 | 89 | 55 | 47 | 58 | M16 | 8 |
| HSKFM63SRKIN32X120 | 63 | 32 | 44 | 52.7 | 120 | 94 | 55 | 47 | 58 | M16 | 8 |

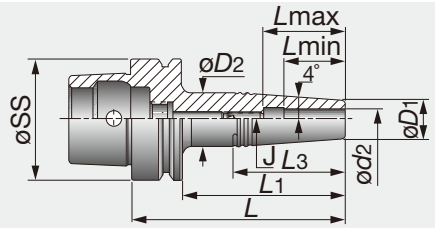
- Applicable for 10 MPa pressure coolant
- The driving pins can be removed, turning the toolholder into a standard HSKF63 type.
- Use only inductive heating device for SRKIN holders.

Induction heating unit F131
Heating unit F131
Preset screws F142
Wrench F144
Cooling tube F143

# TUNGSHRINK

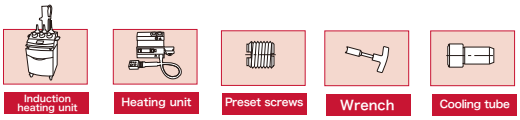
## HSK E-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with HSK-E shank




| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKE32SRK3X45 | 32 | 3 | 10 | 13 | 65 | 45 | 30 | 10 | 16 | M4 | 2 |
| HSKE32SRK4X45 | 32 | 4 | 10 | 15 | 65 | 45 | 35 | 12 | 18 | M4 | 2 |
| HSKE32SRK5X45 | 32 | 5 | 10 | 15 | 65 | 45 | 35 | 15 | 25 | M4 | 2 |
| HSKE32SRK6X45 | 32 | 6 | 11 | 16 | 65 | 45 | 35 | 18 | 28 | M4 | 2 |
| HSKE32SRK8X45 | 32 | 8 | 14 | 20 | 65 | 45 | 42 | 25 | 35 | M4 | 2 |
| HSKE32SRK10X45 | 32 | 10 | 16 | 22 | 65 | 45 | 42 | 30 | 40 | M4 | 2 |
| HSKE32SRK12X45 | 32 | 12 | 20 | 25 | 65 | 45 | 35.6 | 32 | 40 | M4 | 2 |
| HSKE40SRK3X45 | 40 | 3 | 10 | 13 | 65 | 45 | 30 | 10 | 16 | M5 | 2.5 |
| HSKE40SRK3X80 | 40 | 3 | 10 | 19 | 100 | 80 | 64 | 10 | 16 | M5 | 2.5 |
| HSKE40SRK4X45 | 40 | 4 | 10 | 15 | 65 | 45 | 35 | 12 | 18 | M5 | 2.5 |
| HSKE40SRK4X80 | 40 | 4 | 10 | 19 | 100 | 80 | 64 | 12 | 18 | M5 | 2.5 |
| HSKE40SRK5X45 | 40 | 5 | 10 | 15 | 65 | 45 | 35 | 15 | 25 | M4 | 2 |
| HSKE40SRK5X80 | 40 | 5 | 10 | 19 | 100 | 80 | 64 | 15 | 25 | M4 | 2 |
| HSKE40SRK6X45 | 40 | 6 | 11 | 16 | 65 | 45 | 35 | 18 | 28 | M5 | 2.5 |
| HSKE40SRK6X80 | 40 | 6 | 11 | 20 | 100 | 80 | 64 | 18 | 28 | M5 | 2.5 |
| HSKE40SRK8X45 | 40 | 8 | 14 | 20 | 65 | 45 | 42 | 25 | 35 | M5 | 2.5 |
| HSKE40SRK8X80 | 40 | 8 | 14 | 23 | 100 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE40SRK10X45 | 40 | 10 | 16 | 22 | 65 | 45 | 42 | 30 | 40 | M5 | 2.5 |
| HSKE40SRK10X80 | 40 | 10 | 16 | 24.5 | 100 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE40SRK12X45 | 40 | 12 | 20 | 26 | 65 | 45 | 42 | 32 | 42 | M5 | 2.5 |
| HSKE40SRK12X80 | 40 | 12 | 20 | 28 | 100 | 80 | 56 | 32 | 42 | M10 | 5 |
| HSKE50SRK3X45 (1) | 50 | 3 | 10 | 15 | 71 | 45 | 36 | 10 | 16 | M5 | 2.5 |
| HSKE50SRK3X80 (1) | 50 | 3 | 10 | 19 | 106 | 80 | 64 | 10 | 16 | M5 | 2.5 |
| HSKE50SRK4X45 (1) | 50 | 4 | 10 | 15 | 71 | 45 | 36 | 12 | 18 | M5 | 2.5 |
| HSKE50SRK4X80 (1) | 50 | 4 | 10 | 19 | 106 | 80 | 64 | 12 | 18 | M5 | 2.5 |
| HSKE50SRK5X45 (1) | 50 | 5 | 10 | 15 | 71 | 45 | 36 | 15 | 21 | M6 | 3 |
| HSKE50SRK5X80 | 50 | 5 | 10 | 19 | 106 | 80 | 64 | 15 | 21 | M6 | 3 |
| HSKE50SRK6X45 (1) | 50 | 6 | 11 | 16 | 71 | 45 | 36 | 18 | 28 | M5 | 2.5 |
| HSKE50SRK6X80 (1) | 50 | 6 | 11 | 20 | 106 | 80 | 64 | 18 | 28 | M5 | 2.5 |
| HSKE50SRK8X45 (1) | 50 | 8 | 14 | 20 | 71 | 45 | 43 | 25 | 35 | M6 | 3 |
| HSKE50SRK8X80 (1) | 50 | 8 | 14 | 23 | 106 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE50SRK10X45 (1) | 50 | 10 | 16 | 22 | 71 | 45 | 42 | 30 | 37 | M6 | 3 |
| HSKE50SRK10X80 (1) | 50 | 10 | 16 | 24.5 | 106 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE50SRK12X45 (1) | 50 | 12 | 20 | 26 | 71 | 45 | 42 | 32 | 39 | M6 | 3 |
| HSKE50SRK12X80 (1) | 50 | 12 | 20 | 28 | 106 | 80 | 57 | 32 | 42 | M10 | 5 |
| HSKE63SRK3X50 | 63 | 3 | 10 | 17 | 76 | 50 | 48 | 10 | 16 | M6 | 3 |
| HSKE63SRK3X80 | 63 | 3 | 10 | 19 | 106 | 80 | 64 | 10 | 16 | M6 | 3 |
| HSKE63SRK4X50 | 63 | 4 | 10 | 17 | 76 | 50 | 48 | 12 | 18 | M6 | 3 |
| HSKE63SRK4X80 | 63 | 4 | 10 | 19 | 106 | 80 | 64 | 12 | 18 | M6 | 3 |
| HSKE63SRK5X45 | 63 | 5 | 10 | 15 | 71 | 45 | 36 | 15 | 21 | M6 | 3 |
| HSKE63SRK5X80 | 63 | 5 | 10 | 19 | 106 | 80 | 64 | 15 | 21 | M6 | 3 |
| HSKE63SRK6X50 | 63 | 6 | 11 | 18 | 76 | 50 | 48 | 18 | 24 | M8 | 4 |
| HSKE63SRK6X80 | 63 | 6 | 11 | 20 | 106 | 80 | 64 | 18 | 24 | M8 | 4 |
| HSKE63SRK8X50 | 63 | 8 | 14 | 21 | 76 | 50 | 48 | 25 | 35 | M6 | 3 |
| HSKE63SRK8X80 | 63 | 8 | 14 | 23 | 106 | 80 | 64 | 25 | 35 | M6 | 3 |
| HSKE63SRK10X50 | 63 | 10 | 16 | 23 | 76 | 50 | 48 | 30 | 40 | M8 | 4 |
| HSKE63SRK10X80 | 63 | 10 | 16 | 24.5 | 106 | 80 | 60 | 30 | 40 | M8 | 4 |
| HSKE63SRK12X50 | 63 | 12 | 20 | 27 | 76 | 50 | 48 | 32 | 42 | M8 | 4 |
| HSKE63SRK12X80 | 63 | 12 | 20 | 28 | 106 | 80 | 57 | 32 | 42 | M10 | 5 |
| HSKE63SRK12X90 | 63 | 12 | 20 | 28 | 116 | 90 | 57 | 32 | 43 | M10 | 5 |

• Applicable for 10 MPa pressure coolant
(1) Balanced to G2.5 35,000 $min^{-1}$.

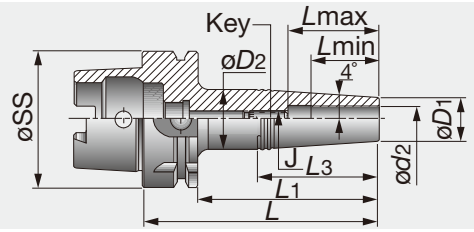



F131 F131 F142 F144 F143

# TUNGSHRINK

## HSK A-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with HSK-A shank



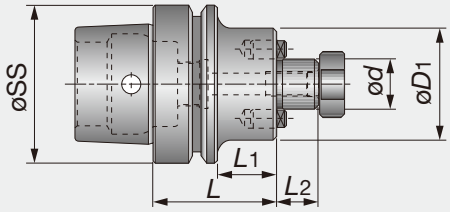

| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HSKA63SRK3X50 | 63 | 3 | 10 | 17 | 76 | 50 | - | 10 | 16 | M6 | 3 |
| HSKA63SRK3X85 | 63 | 3 | 10 | 21 | 111 | 85 | 79 | 10 | 16 | M6 | 3 |
| HSKA63SRK4X50 | 63 | 4 | 10 | 17 | 76 | 50 | - | 12 | 18 | M6 | 3 |
| HSKA63SRK4X85 | 63 | 4 | 10 | 21 | 111 | 85 | 79 | 12 | 18 | M6 | 3 |
| HSKA63SRK5X50 | 63 | 5 | 10 | 17 | 76 | 50 | - | 15 | 21 | M6 | 3 |
| HSKA63SRK5X85 | 63 | 5 | 10 | 21 | 111 | 85 | 79 | 15 | 21 | M6 | 3 |
| HSKA63SRK6X50 | 63 | 6 | 11 | 18 | 76 | 50 | - | 18 | 24 | M8 | 4 |
| HSKA63SRK6X85 | 63 | 6 | 11 | 22 | 111 | 85 | 79 | 18 | 24 | M8 | 4 |
| HSKA63SRK8X50 | 63 | 8 | 14 | 20 | 76 | 50 | 43 | 25 | 36 | M6 | 3 |
| HSKA63SRK8X85 | 63 | 8 | 14 | 23 | 111 | 85 | 64 | 25 | 36 | M6 | 3 |
| HSKA63SRK10X50 | 63 | 10 | 16 | 23 | 76 | 50 | - | 30 | 41 | M8 | 4 |
| HSKA63SRK10X85 | 63 | 10 | 16 | 26 | 111 | 85 | 72 | 30 | 41 | M8 | 4 |
| HSKA63SRK12X50 | 63 | 12 | 20 | 27 | 76 | 50 | - | 32 | 43 | M8 | 4 |
| HSKA63SRK12X85 | 63 | 12 | 20 | 30 | 111 | 85 | 72 | 32 | 43 | M8 | 4 |

• Applicable for 10 MPa pressure coolant

# TUNGHOLD

## HSK E-SEM (Shell mill holder)

Shell mill holder with HSK-E shank

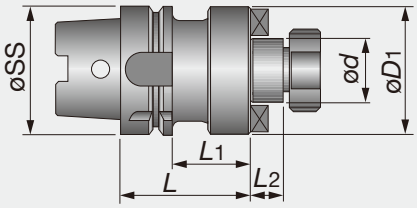



| Designation | øSS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKE40SEM16X50 | 40 | 16 | 17 | 38 | 50 | 30 |
| HSKE40SEM22X50 | 40 | 22 | 19 | 47 | 50 | 30 |
| HSKE50SEM22X60 | 50 | 22 | 19 | 47 | 60 | 34 |
| HSKE63SEM16X50 | 63 | 16 | 17 | 38 | 50 | 24 |
| HSKE63SEM22X50 | 63 | 22 | 19 | 47 | 50 | 24 |
| HSKE32SEM3/4X2 | 32 | 19.05 | 17 | 44.5 | 50.8 | 30.8 |
| HSKE40SEM3/4X2.000 | 40 | 19.05 | 17 | 45 | 50.8 | 30.8 |
| HSKE50SEM3/4X2.375 | 50 | 19.05 | 17 | 45 | 60.3 | 34.3 |
| HSKE63SEM3/4X2.375 | 63 | 19.05 | 17 | 45 | 60.3 | 34.3 |
| HSKE63SEM1X2.375 | 63 | 25.4 | 17 | 52.8 | 60.3 | 34.3 |

(Option:Wrench for lock screw)

Induction heating unit F131
Heating unit F131
Clamping screw F141
Preset screws F142
Wrench F143, F144
Cooling tube F143

# TUNGHOLD
## HSK A-SEM (Shell mill holder)
Shell mill holder with HSK-A shank

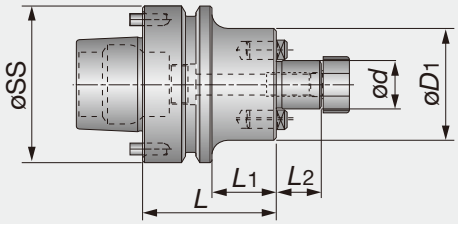



| Designation | øSS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKA40SEM22 | 40 | 22 | 30 | 47 | 50 | 19 |
| HSKA40SEM27 | 40 | 27 | 35 | 58 | 55 | 21 |
| HSKA50SEM16X50 | 50 | 16 | 24 | 50 | 38 | 17 |
| HSKA50SEM22X60 | 50 | 22 | 34 | 60 | 47 | 19 |
| HSKA50SEM27X60 | 50 | 27 | 34 | 60 | 58 | 21 |
| HSKA63SEM16X50 | 63 | 16 | 24 | 50 | 38 | 17 |
| HSKA63SEM22X50 | 63 | 22 | 24 | 50 | 47 | 19 |
| HSKA63SEM27X60 | 63 | 27 | 34 | 60 | 58 | 21 |
| HSKA63SEM32X60 | 63 | 32 | 34 | 60 | 66 | 24 |
| HSKA63SEM40X60 | 63 | 40 | 34 | 60 | 82 | 27 |
| HSKA100SEM22X50 (1) | 100 | 22 | 21 | 50 | 47 | 19 |
| HSKA100SEM27X50 (1) | 100 | 27 | 21 | 50 | 58 | 21 |
| HSKA100SEM32X50 (1) | 100 | 32 | 21 | 50 | 66 | 24 |
| HSKA100SEM40X60 (1) | 100 | 40 | 31 | 60 | 82 | 27 |
| HSKA100SEM50X70 (1) | 100 | 50 | 41 | 70 | 95 | 30 |

(1) Balanced to G6.3 12,000 $min^{-1}$.

(Option:Wrench for lock screw)

# TUNGHOLD
## HSK FM-SEM (Shell mill holder)
Shell mill holder with HSK-FM shank




| Designation | øSS | ød | L2 | øD1 | L | L1 |
|---|---|---|---|---|---|---|
| HSKFM63SEM22X60 | 63 | 22 | 19 | 47 | 60 | 34 |
| HSKFM63SEM27X60 | 63 | 27 | 21 | 58 | 60 | 34 |
| HSKFM63SEM32X60 | 63 | 32 | 24 | 66 | 60 | 34 |
| HSKFM63SEM3/4X3.00 | 63 | 19.05 | 17 | 45 | 76.2 | 50.2 |
| HSKFM63SEM3/4X4.50 | 63 | 19.05 | 17 | 45 | 114.3 | 88.3 |
| HSKFM63SEM1X2.375 | 63 | 25.4 | 17 | 52.8 | 60.3 | 34.3 |

• These tools are based on the HSK63F type. • With two drive pins which improve torque transmission.

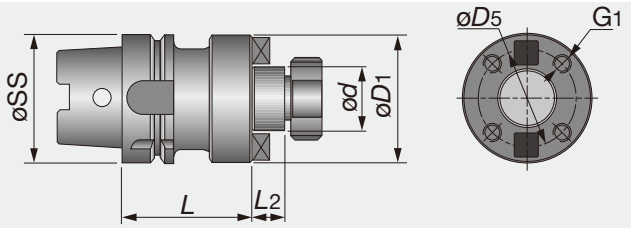
(Option:Wrench for lock screw)

Clamping screw F141
Wrench F143
Wrench F144
Cooling tube F143

# TUNGHOLD

## HSK A-FM (Face mill holder)

Face mill holder with HSK-A shank



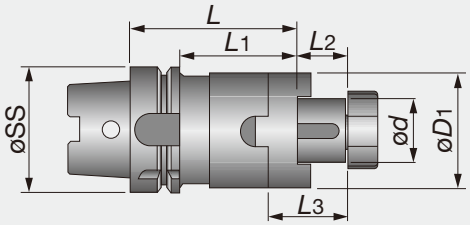

| Designation | øSS | ød | $L_2$ | $øD_1$ | L | $øD_5$ | $G_1$ |
|---|---|---|---|---|---|---|---|
| HSKA100FM60X70 | 100 | 60 | 40 | 128 | 70 | 101.6 | M16 |

(Option:Wrench for lock Screw)

# TUNGHOLD

## HSK A-SEMC (Combination holder for slot mill & shell mill)

Combination holder with HSK-A shank




| Designation | øSS | ød | $L_2$ | $øD_1$ | L | $L_1$ | $L_3$ |
|---|---|---|---|---|---|---|---|
| HSKA50SEMC16X50 | 50 | 16 | 17 | 32 | 50 | 24 | 27 |
| HSKA50SEMC27X65 | 50 | 27 | 21 | 48 | 65 | 39 | 33 |
| HSKA63SEMC16X60 | 63 | 16 | 17 | 32 | 60 | 34 | 21 |
| HSKA63SEMC22X60 | 63 | 22 | 19 | 40 | 60 | 34 | 31 |
| HSKA63SEMC27X60 | 63 | 27 | 21 | 48 | 60 | 34 | 33 |
| HSKA63SEMC32X60 | 63 | 32 | 24 | 58 | 60 | 34 | 38 |
| HSKA63SEMC40X70 | 63 | 40 | 27 | 70 | 70 | 44 | 41 |
| HSKA100SEMC16X60 | 100 | 16 | 17 | 32 | 60 | 31 | 27 |
| HSKA100SEMC22X60 | 100 | 22 | 19 | 40 | 60 | 31 | 31 |
| HSKA100SEMC27X60 | 100 | 27 | 21 | 48 | 60 | 31 | 33 |
| HSKA100SEMC32X60 | 100 | 32 | 24 | 58 | 60 | 31 | 38 |
| HSKA100SEMC40X70 | 100 | 40 | 27 | 70 | 70 | 41 | 41 |
| HSKA100SEMC50X80 | 100 | 50 | 30 | 90 | 80 | 51 | 46 |

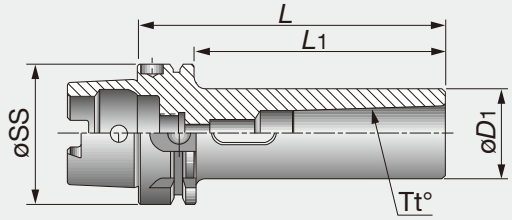
(Option:Wrench for lock Screw)

Clamping screw F141
Wrench F143
Wrench F143, F144
Cooling tube F143

# TUNGHOLD

## HSK A-MT (Holder for morse taper)

Morse taper holder with HSK-A shank

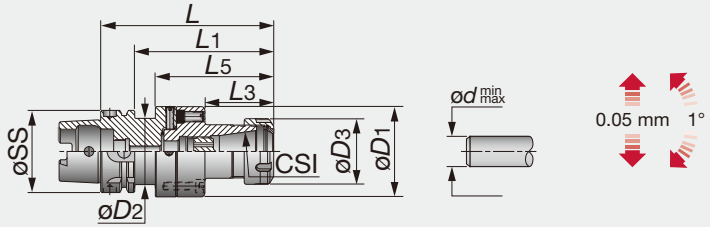



| Designation | øSS | Tt° | L | øD1 | L1 |
|---|---|---|---|---|---|
| HSKA50MT1X100 | 50 | MT1 | 100 | 25 | 74 |
| HSKA50MT2X120 | 50 | MT2 | 120 | 32 | 94 |
| HSKA50MT3X140 | 50 | MT3 | 140 | 40 | 114 |
| HSKA63MT1X110 | 63 | MT1 | 110 | 25 | 84 |
| HSKA63MT2X120 | 63 | MT2 | 120 | 32 | 94 |
| HSKA63MT3X140 | 63 | MT3 | 140 | 40 | 114 |
| HSKA63MT4X160 | 63 | MT4 | 160 | 48 | 134 |
| HSKA100MT1X110 | 100 | MT1 | 110 | 25 | 81 |
| HSKA100MT2X120 | 100 | MT2 | 120 | 32 | 91 |
| HSKA100MT3X150 | 100 | MT3 | 150 | 40 | 121 |
| HSKA100MT4X170 | 100 | MT4 | 170 | 48 | 141 |
| HSKA100MT5X200 | 100 | MT5 | 200 | 63 | 171 |

# TUNGHOLD

## ADJ HSK A-ER (Collet chuck holder)

ER Collet Chucks with Center Alignment for HSK-A Shanks




| Designation | øSS | CSI | Range | L | L1 | L5 | L3 | øD3 | øD1 | øD2 |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJHSKA63D70ER32 | 63 | ER32 | 2-20 | 134.5 | 108.5 | 92.5 | 52.5 | 50 | 70 | 46 |
| ADJHSKA100D70ER32 | 100 | ER32 | 2-20 | 129.5 | 100.5 | 82.5 | 52.5 | 50 | 70 | - |

• Applicable for 10 MPa pressure coolant

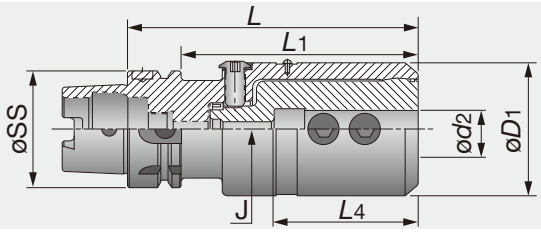
(Option:Wrench for ER Collet)

ER Collet F113
Nut F137
Preset screws F140
Wrench F139, F144
Cooling tube F143

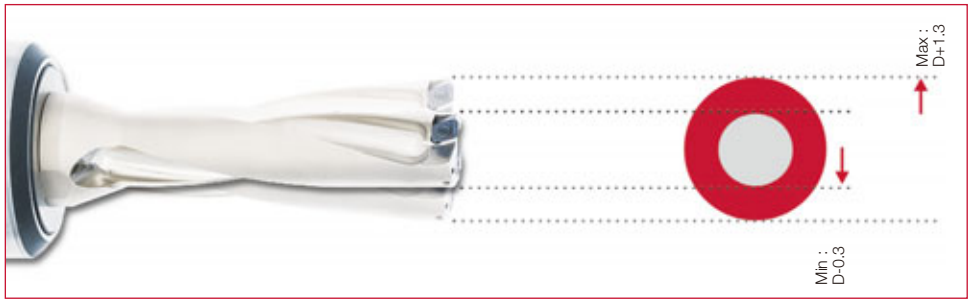
# TUNGBORE

## TUNGBORE-HSK A (Adjustable holder for indexable drill)

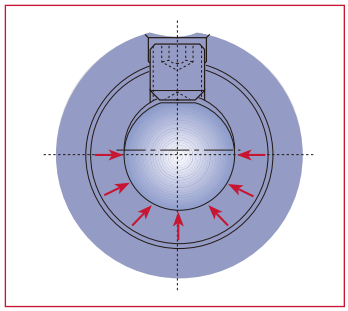
TungBore adjustable drilling dia. holder with HSK-A shank




| Designation | øSS | ød2 | øD1 | L | L1 | L4 | J |
|---|---|---|---|---|---|---|---|
| TUNGBOREHSKA63EM25 | 63 | 25 | 72 | 142 | 116 | 71 | M10 |
| TUNGBOREHSKA63EM32 | 63 | 32 | 72 | 142 | 116 | 71 | M10 |
| TUNGBOREHSKA63EM40 | 63 | 40 | 72 | 142 | 116 | 71 | M10 |




• Applicable for 10 MPa pressure coolant

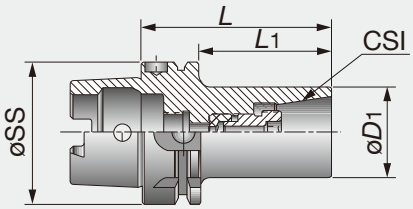


The bore's section is actually made from two shifted circular sections. The clamping screw pushes the drill shank through a narrowed opening, forcing elastic deformation of the holder. Contact is made around more than 180°, providing a high clamping force.

# TUNGCLICK

## HSK A-CLICKIN (Quick change holder)

TungClick quick change tooling system with HSK-A shank



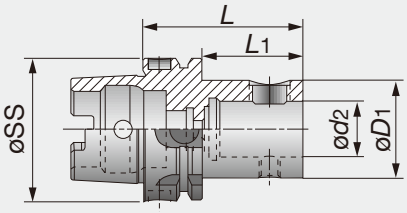

| Designation | øSS | CSI | øD1 | L | L1 |
|---|---|---|---|---|---|
| HSKA63ER32CLICK-IN | 63 | 32SRF | 41 | 85 | 59 |
| HSKA100ER32CLICK-IN | 100 | 32SRF | 41 | 90 | 61 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 235 N·m

# TUNGFIT

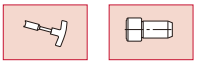
## HSK A-CF (Quick change holder)

TungFit quick change style modular tooling system with HSK-A shank




| Designation | øSS | ød2 | øD1 | L | L1 |
|---|---|---|---|---|---|
| HSKA63CF4-S | 63 | 25 | 44.5 | 70 | 44 |
| HSKA80CF4-S | 80 | 25 | 44.5 | 73 | 47 |
| HSKA100CF4-S | 100 | 25 | 44.5 | 76 | 47 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m



Wrench
F144

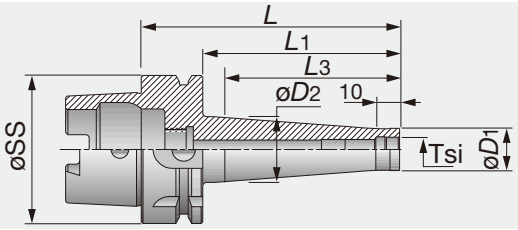


Cooling tube
F143

# TUNGFLEX

## HSK A-ODP (Screw clamping head holder)

TungFlex modular tooling system with HSK-A shank



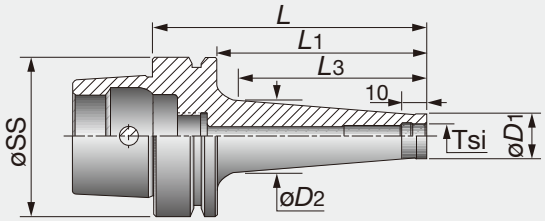

| Designation | øSS | Tsi | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| HSKA63ODP6X59 | 63 | M6 | 9.7 | 10 | 59 | 33 | 25 |
| HSKA63ODP6X109 | 63 | M6 | 9.8 | 23 | 109 | 83 | 75 |
| HSKA63ODP8X59 | 63 | M8 | 13.1 | 15 | 59 | 33 | 25 |
| HSKA63ODP8X109 | 63 | M8 | 13.1 | 23 | 109 | 83 | 75 |
| HSKA63ODP10X59 | 63 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKA63ODP10X109 | 63 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKA63ODP12X59 | 63 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKA63ODP12X109 | 63 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKA63ODP16X59 | 63 | M16 | 29 | 34 | 59 | 33 | 25 |
| HSKA63ODP16X109 | 63 | M16 | 29 | 34 | 109 | 83 | 75 |
| HSKA100ODP12X87 (1) | 100 | M12 | 23 | 30 | 87 | 58 | 50 |
| HSKA100ODP12X137 (1) | 100 | M12 | 23 | 30 | 137 | 108 | 100 |
| HSKA100ODP12X187 (1) | 100 | M12 | 23 | 40 | 187 | 158 | 150 |
| HSKA100ODP12X237 (1) | 100 | M12 | 23 | 46 | 237 | 208 | 200 |
| HSKA100ODP16X87 (1) | 100 | M12 | 29 | 31.5 | 87 | 58 | 50 |
| HSKA100ODP16X137 (1) | 100 | M12 | 29 | 41.5 | 137 | 108 | 100 |
| HSKA100ODP16X187 (1) | 100 | M12 | 29 | 55 | 187 | 158 | 150 |
| HSKA100ODP16X237 (1) | 100 | M12 | 29 | 55 | 237 | 208 | 200 |

• Applicable for 10 MPa pressure coolant (1) Balanced to G6.5 12,000 $min^{-1}$.

# TUNGFLEX

## HSK E-ODP (Screw clamping head holder)

TungFlex modular tooling system with HSK-E shank



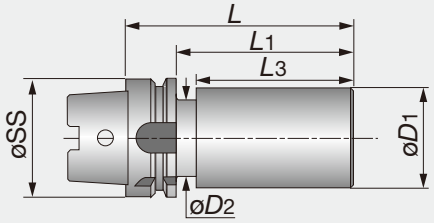

| Designation | øSS | Tsi | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|---|
| HSKE40ODP10X53 | 40 | M10 | 18 | 20 | 53 | 33 | 25 |
| HSKE40ODP10X103 | 40 | M10 | 18 | 28 | 103 | 83 | 75 |
| HSKE40ODP12X53 | 40 | M12 | 21 | 24 | 53 | 33 | 25 |
| HSKE40ODP12X103 | 40 | M12 | 21 | 31 | 103 | 83 | 75 |
| HSKE50ODP10X59 (1) | 50 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKE50ODP10X109 (1) | 50 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKE50ODP12X59 (1) | 50 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKE50ODP12X109 (1) | 50 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKE50ODP16X59 (1) | 50 | M16 | 29 | 34 | 59 | 33 | 25 |
| HSKE50ODP16X109 (1) | 50 | M16 | 29 | 34 | 109 | 83 | 75 |
| HSKE63ODP10X59 (2) | 63 | M10 | 18 | 20 | 59 | 33 | 25 |
| HSKE63ODP10X109 (2) | 63 | M10 | 18 | 28 | 109 | 83 | 75 |
| HSKE63ODP12X59 (2) | 63 | M12 | 21 | 24 | 59 | 33 | 25 |
| HSKE63ODP12X109 (2) | 63 | M12 | 21 | 31 | 109 | 83 | 75 |
| HSKE63ODP16X109 (2) | 63 | M16 | 29 | 34 | 109 | 83 | 75 |

• Applicable for 10 MPa pressure coolant (1) Balanced to G2.5 35,000 $min^{-1}$. (2) Balanced to G2.5 30,000 $min^{-1}$.

Wrench F144
Cooling tube F143

Blanks for holders with HSK shank






| Designation | øSS | øD1 | øD2 | L | L1 | L3 |
|---|---|---|---|---|---|---|
| HSKA50B16MN100 | 50 | 53 | 41.8 | 100 | 74 | 58 |
| HSKA50B16MN200 | 50 | 53 | 41.8 | 200 | 174 | 158 |
| HSKA63B16MN100 | 63 | 63 | 52.8 | 100 | 74 | 55.5 |
| HSKA63B16MN200 | 63 | 63 | 52.8 | 200 | 174 | 155.5 |
| HSKA100B16MN100 | 100 | 102 | 85 | 100 | 71 | 54.8 |
| HSKA100B16MN200 | 100 | 102 | 85 | 200 | 171 | 154.8 |

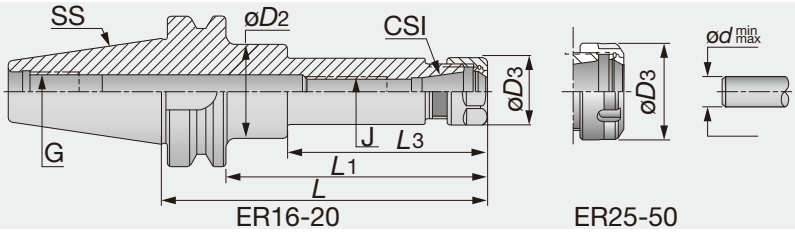
• Material: Case hardened alloy steel. • Shank hardness 58 HRc minimum. • Nose hardness 35-37 HRc.

Wrench F144
Cooling tube F143

# TUNGHOLD

## BT-ER collet chuck (Collet chuck holder)

ER collet chucks with BT shank




| Designation | SS | CSI | Range | L | L1 | L3 | øD3 | øD2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| BT30ER16X70 (1) | 30 | ER16 | 0.5-10 | 70 | 48 | - | 28 | - | M10 | M12 |
| BT30ER20X70 (1) | 30 | ER20 | 1-13 | 70 | 48 | - | 34 | - | M12 | M12 |
| BT40ER11X100M (2) | 40 | ER11 | 0.5-7 | 100 | 73 | - | 16 | - | M6 | M16 |
| BT40ER16X70 | 40 | ER16 | 0.5-10 | 70 | 43 | - | 28 | - | M12 | M16 |
| BT40ER16X70B | 40 | ER16 | 0.5-10 | 70 | 43 | - | 28 | - | M12 | M16 |
| BT40ER16X100 | 40 | ER16 | 0.5-10 | 100 | 73 | - | 28 | - | M12 | M16 |
| BT40ER16X150 | 40 | ER16 | 0.5-10 | 150 | 123 | 110 | 28 | 40 | M12 | M16 |
| BT40ER16X200 | 40 | ER16 | 0.5-10 | 200 | 173 | 85 | 28 | 40 | M10 | M16 |
| BT40ER20X70 | 40 | ER20 | 1-13 | 70 | 43 | - | 34 | - | M12 | M16 |
| BT40ER20X70B | 40 | ER20 | 1-13 | 70 | 43 | - | 34 | - | M12 | M16 |
| BT40ER20X100 | 40 | ER20 | 1-13 | 100 | 73 | - | 34 | - | M12 | M16 |
| BT40ER20X120 | 40 | ER20 | 1-13 | 120 | 93 | - | 34 | - | M12 | M16 |
| BT40ER20X150 | 40 | ER20 | 1-13 | 150 | 123 | - | 34 | - | M12 | M16 |
| BT50ER16X100 (1) | 50 | ER16 | 0.5-10 | 100 | 62 | - | 28 | - | M12 | M24 |
| BT50ER16X125 (1) | 50 | ER16 | 0.5-10 | 125 | 87 | - | 28 | - | M12 | M24 |
| BT50ER16X125B (1) | 50 | ER16 | 0.5-10 | 125 | 87 | - | 28 | - | M12 | M24 |
| BT50ER16X150 (1) | 50 | ER16 | 0.5-10 | 150 | 112 | - | 28 | - | M12 | M24 |
| BT50ER16X200 (1) | 50 | ER16 | 0.5-10 | 200 | 162 | 85 | 28 | 40 | M10 | M24 |
| BT50ER20X100 (1) | 50 | ER20 | 1-13 | 100 | 62 | - | 34 | - | M12 | M24 |
| BT50ER20X125 (1) | 50 | ER20 | 1-13 | 125 | 87 | - | 34 | - | M12 | M24 |
| BT50ER20X150 (1) | 50 | ER20 | 1-13 | 150 | 112 | - | 34 | - | M12 | M24 |
| BT50ER20X200 (1) | 50 | ER20 | 1-13 | 200 | 162 | 85 | 34 | 50 | M12 | M24 |
| BT30ER25X60 (1) | 30 | ER25 | 1-16 | 60 | 38 | - | 42 | - | M16 | M12 |
| BT30ER32X60 (1) | 30 | ER32 | 2-20 | 60 | 38 | - | 50 | - | M18x1.5 | M12 |
| BT30ER32X75 | 30 | ER32 | 2-20 | 75 | 38 | - | 50 | - | M18X1.5 | M12 |
| BT40ER25X60 | 40 | ER25 | 1-16 | 60 | 33 | - | 42 | - | M16 | M16 |
| BT40ER25X100 | 40 | ER25 | 1-16 | 100 | 73 | - | 42 | - | M16 | M16 |
| BT40ER25X150 | 40 | ER25 | 1-16 | 150 | 123 | - | 42 | - | M16 | M16 |
| BT40ER32X60 | 40 | ER32 | 2-20 | 60 | 33 | - | 50 | - | M22X1.5 | M16 |
| BT40ER32X100 | 40 | ER32 | 2-20 | 100 | 73 | - | 50 | - | M22X1.5 | M16 |
| BT40ER32X120 | 40 | ER32 | 2-20 | 120 | 93 | - | 50 | - | M22X1.5 | M16 |
| BT40ER32X150 | 40 | ER32 | 2-20 | 150 | 123 | - | 50 | - | M22X1.5 | M16 |
| BT40ER40X80 | 40 | ER40 | 3-26 | 80 | 53 | - | 63 | - | M28X1.5 | M16 |
| BT40ER40X80B | 40 | ER40 | 3-26 | 80 | 53 | - | 63 | - | M28X1.5 | M16 |
| BT40ER40X100 | 40 | ER40 | 3-26 | 100 | 73 | - | 63 | - | M28X1.5 | M16 |
| BT40ER40X150 | 40 | ER40 | 3-26 | 150 | 123 | - | 63 | - | M28X1.5 | M16 |
| BT40ER40X150B | 40 | ER40 | 3-26 | 150 | 123 | - | 63 | - | M28X1.5 | M16 |
| BT40ER50X90 | 40 | ER50 | 10-34 | 90 | 63 | - | 78 | - | M28X1.5 | M16 |
| BT50ER25X100 (1) | 50 | ER25 | 1-16 | 100 | 62 | - | 42 | - | M16 | M24 |
| BT50ER25X150 (1) | 50 | ER25 | 1-16 | 150 | 112 | - | 42 | - | M16 | M24 |
| BT50ER25X200 (1) | 50 | ER25 | 1-16 | 200 | 162 | 87 | 42 | 55 | M16 | M24 |
| BT50ER32X100 (1) | 50 | ER32 | 2-20 | 100 | 62 | - | 50 | - | M22X1.5 | M24 |
| BT50ER32X125 (1) | 50 | ER32 | 2-20 | 125 | 87 | - | 34 | - | M22X1.5 | M24 |
| BT50ER32X150 (1) | 50 | ER32 | 2-20 | 150 | 112 | - | 50 | - | M22X1.5 | M24 |
| BT50ER32X200 (1) | 50 | ER32 | 2-20 | 200 | 162 | 88 | 50 | 63 | M22X1.5 | M24 |
| BT50ER32X200B (1) | 50 | ER32 | 2-20 | 200 | 162 | 88 | 50 | 63 | M22X1.5 | M24 |
| BT50ER40X100 (1) | 50 | ER40 | 3-26 | 100 | 62 | - | 63 | - | M28X1.5 | M24 |
| BT50ER40X150 (1) | 50 | ER40 | 3-26 | 150 | 112 | - | 63 | - | M28X1.5 | M24 |
| BT50ER40X200 (1) | 50 | ER40 | 3-26 | 200 | 162 | - | 63 | - | M28X1.5 | M24 |
| BT50ER50X100 (1) | 50 | ER50 | 10-34 | 100 | 62 | - | 78 | - | M36X1.5 | M24 |
| BT50ER50X150 (1) | 50 | ER50 | 10-34 | 150 | 112 | - | 78 | - | M36X1.5 | M24 |

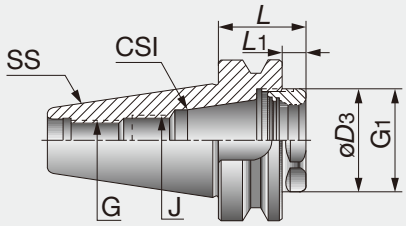
• Add B for coolant through the flange. • Wrench is not included. (1) Balanced to G6.3 at 12,000 $min^{-1}$. (2) ER11 MINI Collet Chuck Spec. (Option:Wrench for ER Collet)

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGSHORT

## BT-ER collet (Collet chuck holder for short overhang)

TungShort collet chucks with BT shank




| Designation | SS | CSI | Range | *L* | *L*1 | ø*D*3 | J | G | G1 |
|---|---|---|---|---|---|---|---|---|---|
| BT30ER20SHORT | 30 | ER20 | 1-13 | 27.2 | 5.2 | 25 | M12 | M12 | M25x1.5 |
| BT40ER32SHORT | 40 | ER32 | 2-20 | 36.5 | 9.5 | 40 | M12 | M16 | M40x1.5 |
| BT40ER32SHORTB | 40 | ER32 | 2-20 | 36.5 | 9.5 | 40 | M12 | M16 | M40X1.5 |
| BT40ER40SHORT | 40 | ER40 | 3-26 | 46.5 | 9.5 | 50 | M16 | M16 | M50x1.5 |
| BT50ER32SHORT | 50 | ER32 | 2-20 | 47.5 | 9.5 | 40 | M22x1.5 | M24 | M40x1.5 |
| BT50ER32SHORTB | 50 | ER32 | 2-20 | 47.5 | 9.5 | 40 | M22X1.5 | M24 | M40X1.5 |
| BT50ER40SHORT | 50 | ER40 | 3-26 | 47.5 | 9.5 | 50 | M28x1.5 | M24 | M50x1.5 |

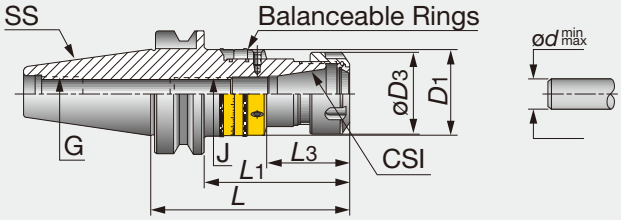
• Applicable for 10 MPa pressure coolant • Add B for coolant through the flange.

(Option:Wrench for ER Collet)

# TUNGBALANCE

## BT-ER BIN (Collet chuck holder)

TungBalance adjustable dynamic balance collet chuck holder with BT shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*1 | G | J |
|---|---|---|---|---|---|---|---|---|---|---|
| BT40ER16X100BIN | 40 | ER16 | 0.5-10 | 100 | 73 | 44 | 28 | 44 | M16 | M10 |
| BT40ER16X150BIN | 40 | ER16 | 0.5-10 | 150 | 123 | 78.7 | 28 | 44 | M16 | M10 |
| BT40ER20X100BIN | 40 | ER20 | 1-13 | 100 | 73 | 44.6 | 34 | 44 | M16 | M12 |
| BT40ER20X150BIN | 40 | ER20 | 1-13 | 150 | 123 | 79.6 | 34 | 44 | M16 | M12 |
| BT40ER25X100BIN | 40 | ER25 | 1-16 | 100 | 73 | 43 | 42 | 44 | M16 | M16 |
| BT40ER25X150BIN | 40 | ER25 | 1-16 | 150 | 123 | 79 | 42 | 44 | M16 | M16 |
| BT40ER32X100BIN | 40 | ER32 | 2-20 | 100 | 73 | 44 | 50 | 60 | M16 | M22x1.5 |
| BT40ER32X150BIN | 40 | ER32 | 2-20 | 150 | 123 | 94 | 50 | 60 | M16 | M22x1.5 |
| BT40ER40X100BIN | 40 | ER40 | 3-26 | 100 | 73 | 44 | 63 | 60 | M16 | M28x1.5 |

• Applicable for 10 MPa pressure coolant • Balanced to G2.5 20,000 min-1.

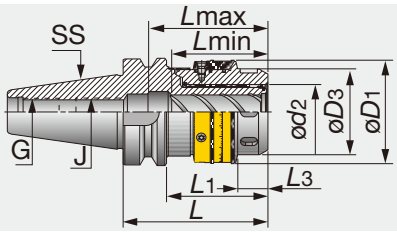
(Option:Wrench for ER Collet)

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGMAX

## BT-TUNGMAX BIN (Power chuck holder)

TungMax adjustable dynamic balanceable endmill chuck holders with BT shank




| Designation | SS | ød2 | Range | øD3 | øD1 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT40MAXIN20X85BIN (1) | 40 | 20 | 6-20 | 51 | 61 | 85 | 58 | 18 | 56 | 68 | M16 | M16 |
| BT40MAXIN32X108BIN (1) | 40 | 32 | 6-32 | 69 | 80 | 108 | 81 | 25 | 70 | 83 | M16 | M16 |
| BT50MAXIN20X105BIN (2) | 50 | 20 | 6-20 | 51 | 61 | 105 | 67 | 18 | 56 | 69 | M16 | M24 |
| BT50MAXIN32X106BIN (2) | 50 | 32 | 6-32 | 69 | 80 | 106 | 68 | 25 | 69 | 83 | M20x2 | M24 |

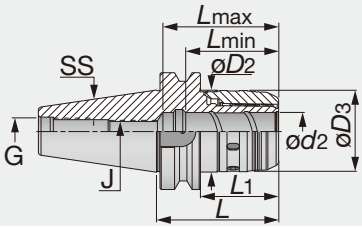
• Applicable for 10 MPa pressure coolant
(1) Chucks with taper size 40 can be balanced by the balancing ring up to G2.5 at 20,000 min-1.
(2) Chucks with taper size 50 can be balanced by the balancing ring up to G2.5 at 18,000 min-1.

(Option:Wrench for TungMax collet)

# TUNGMAX

## BT-TUNGMAX (Power chuck holder)

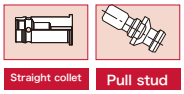
TungMax endmill chuck holders with BT shank




| Designation | SS | ød2 | Range | L | L1 | øD3 | øD2 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BT40MAXIN20X85 | 40 | 20 | 6-20 | 85 | 58 | 51 | 53 | 56 | 68 | M16 | M16 |
| BT40MAXIN32X108 | 40 | 32 | 6-32 | 108 | 81 | 69 | 70 | 70 | 83 | M16 | M16 |
| BT50MAXIN20X105 (1) | 50 | 20 | 6-20 | 105 | 67 | 51 | 53 | 56 | 69 | M16 | M24 |
| BT50MAXIN32X106 (1) | 50 | 32 | 6-32 | 106 | 68 | 69 | 70 | 69 | 83 | M20x2 | M24 |
| BT50MAXIN32X135 (1) | 50 | 32 | 6-32 | 135 | 97 | 69 | 70 | 69 | 84 | M20x2 | M24 |

• Applicable for 10 MPa pressure coolant • Add B for coolant through the flange.
(1) Balanced to G6.3 at 8,000 min-1.

(Option:Wrench for TungMax collet)

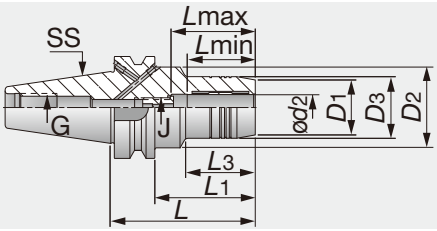


Straight collet F122 | Pull stud F135

# TUNGHYDRO

## BT-HYDRO (Hydro chuck holder)

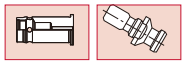
TungHydro hydraulic endmill chuck holders with BT shank




| Designation | SS | ød2 | øD1 | øD3 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT30HYDRO6X60 | 30 | 6 | 23 | 26 | 50 | 60 | 38 | 43 | 27 | 37 | M5 | M12 |
| BT30HYDRO8X64 | 30 | 8 | 25 | 28 | 50 | 64 | 42 | 43.5 | 27 | 37 | M6 | M12 |
| BT30HYDRO10X64 | 30 | 10 | 27 | 30 | 50 | 64 | 42 | 44 | 32 | 42 | M8x1 | M12 |
| BT30HYDRO12X72 | 30 | 12 | 29 | 32 | 50 | 72 | 50 | 44.5 | 37 | 47 | M10x1 | M12 |
| BT30HYDRO14X70 | 30 | 14 | 30 | 34 | 50 | 70 | 48 | 47.5 | 37 | 47 | M10x1 | M12 |
| BT30HYDRO16X90 | 30 | 16 | 34 | 38 | 50 | 90 | 68 | 47.5 | 42 | 52 | M12x1 | M12 |
| BT30HYDRO18X90 | 30 | 18 | 36 | 40 | 50 | 90 | 68 | 47.5 | 42 | 52 | M12x1 | M12 |
| BT30HYDRO20X90 | 30 | 20 | 38 | 42 | 50 | 90 | 68 | 47.5 | 42 | 52 | M12x1 | M12 |
| BT40HYDRO6X90 | 40 | 6 | 23 | 26 | 50 | 90 | 63 | 43 | 27 | 37 | M5 | M16 |
| BT40HYDRO8X90 | 40 | 8 | 25 | 28 | 50 | 90 | 63 | 43.5 | 27 | 37 | M6 | M16 |
| BT40HYDRO10X90 | 40 | 10 | 27 | 30 | 50 | 90 | 63 | 44 | 32 | 42 | M8x1 | M16 |
| BT40HYDRO12X90 | 40 | 12 | 29 | 32 | 50 | 90 | 63 | 44.5 | 37 | 47 | M10x1 | M16 |
| BT40HYDRO14X90 | 40 | 14 | 30 | 34 | 50 | 90 | 63 | 47.5 | 37 | 47 | M10x1 | M16 |
| BT40HYDRO16X90 | 40 | 16 | 34 | 38 | 50 | 90 | 63 | 47.5 | 42 | 52 | M12x1 | M16 |
| BT40HYDRO18X90 | 40 | 18 | 36 | 40 | 50 | 90 | 63 | 47.5 | 42 | 52 | M12x1 | M16 |
| BT40HYDRO20X90 | 40 | 20 | 38 | 42 | 50 | 90 | 63 | 47.5 | 42 | 52 | M12X1 | M16 |
| BT40HYDRO25X90 | 40 | 25 | 46 | 50 | 63 | 90 | 51 | 51 | 48 | 58 | M12x1 | M16 |
| BT40HYDRO32X110 | 40 | 32 | 56 | 60 | 60 | 110 | 81.5 | 81.5 | 52 | 62 | M16x1 | M16 |
| BT50HYDRO6X110 | 50 | 6 | 23 | 26 | 80 | 110 | 72 | 43 | 27 | 37 | M5 | M24 |
| BT50HYDRO8X100 | 50 | 8 | 25 | 28 | 80 | 110 | 72 | 43.5 | 27 | 37 | M6 | M24 |
| BT50HYDRO10X110 | 50 | 10 | 27 | 30 | 80 | 110 | 72 | 44 | 32 | 42 | M8x1 | M24 |
| BT50HYDRO12X110 | 50 | 12 | 29 | 32 | 80 | 110 | 72 | 42 | 37 | 47 | M10x1 | M24 |
| BT50HYDRO14X110 | 50 | 14 | 30 | 34 | 80 | 110 | 72 | 42 | 37 | 47 | M10x1 | M24 |
| BT50HYDRO16X110 | 50 | 16 | 34 | 38 | 80 | 110 | 72 | 45 | 42 | 52 | M12x1 | M24 |
| BT50HYDRO18X110 | 50 | 18 | 36 | 40 | 80 | 110 | 72 | 45 | 42 | 52 | M12x1 | M24 |
| BT50HYDRO20X110 | 50 | 20 | 38 | 42 | 80 | 110 | 72 | 47.5 | 42 | 52 | M12x1 | M24 |
| BT50HYDRO25X110 | 50 | 25 | 46 | 50 | 80 | 110 | 72 | 47.5 | 48 | 58 | M12x1 | M24 |
| BT50HYDRO32X110 | 50 | 32 | 56 | 60 | 80 | 110 | 72 | 47.5 | 54 | 64 | M12x1 | M24 |

- Applicable for 10 MPa pressure coolant
- Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
- Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

(Option:Wrench for TungHydro collet)

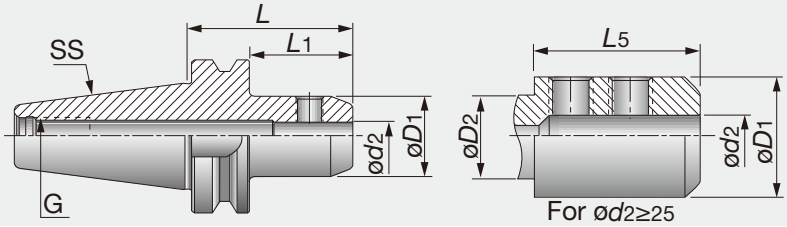


Straight collet F125 | Pull stud F135

# TUNGHOLD

## BT-EM (Endmill holder)

Screw locking endmill holders with BT shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | G |
|---|---|---|---|---|---|---|---|---|
| BT40EM10X45 | 40 | 10 | 35 | - | 45 | 18 | - | M16 |
| BT40EM12X45 | 40 | 12 | 42 | - | 45 | 18 | - | M16 |
| BT40EM14X45 | 40 | 14 | 44 | - | 45 | 18 | - | M16 |
| BT40EM16X45 | 40 | 16 | 48 | - | 45 | 18 | - | M16 |
| BT40EM18X45 | 40 | 18 | 50 | - | 45 | 18 | - | M16 |
| BT40EM20X45 | 40 | 20 | 52 | - | 45 | 18 | - | M16 |
| BT40EM25X45 | 40 | 25 | 63 | - | 45 | - | - | M16 |
| BT30EM6X50 | 30 | 6 | 25 | - | 50 | 28 | - | M12 |
| BT30EM8X60 | 30 | 8 | 28 | - | 60 | 38 | - | M12 |
| BT30EM10X60 | 30 | 10 | 35 | - | 60 | 38 | - | M12 |
| BT30EM12X60 | 30 | 12 | 42 | - | 60 | 38 | - | M12 |
| BT30EM14X60 | 30 | 14 | 44 | - | 60 | 38 | - | M12 |
| BT30EM16X60 | 30 | 16 | 48 | 44.4 | 60 | 38 | 37 | M12 |
| BT30EM18X60 | 30 | 18 | 50 | 44.4 | 60 | 38 | 28 | M12 |
| BT30EM20X80 | 30 | 20 | 52 | 44.4 | 80 | 53 | 43 | M12 |
| BT40EM6X50 | 40 | 6 | 25 | - | 50 | 23 | - | M16 |
| BT40EM6X50B | 40 | 6 | 25 | - | 50 | 23 | - | M16 |
| BT40EM8X50 | 40 | 8 | 28 | - | 50 | 23 | - | M16 |
| BT40EM10X65 | 40 | 10 | 35 | - | 65 | 38 | - | M16 |
| BT40EM12X65 | 40 | 12 | 42 | - | 65 | 38 | - | M16 |
| BT40EM14X65 | 40 | 14 | 44 | - | 65 | 38 | - | M16 |
| BT40EM16X65 | 40 | 16 | 48 | - | 65 | 38 | - | M16 |
| BT40EM18X65 | 40 | 18 | 50 | - | 65 | 38 | - | M16 |
| BT40EM20X75 | 40 | 20 | 52 | - | 75 | 48 | - | M16 |
| BT40EM20X75B | 40 | 20 | 52 | - | 75 | 48 | - | M16 |
| BT40EM25X105 | 40 | 25 | 65 | 61 | 105 | 78 | 68 | M16 |
| BT40EM25X105B | 40 | 25 | 65 | 61 | 105 | 78 | 68 | M16 |
| BT40EM32X110 | 40 | 32 | 71 | 61 | 110 | 83 | 73 | M16 |
| BT50EM6X70 | 50 | 6 | 25 | - | 70 | 32 | - | M24 |
| BT50EM8X70 | 50 | 8 | 28 | - | 70 | 32 | - | M24 |
| BT50EM10X70 | 50 | 10 | 35 | - | 70 | 32 | - | M24 |
| BT50EM12X100 | 50 | 12 | 42 | - | 100 | 62 | - | M24 |
| BT50EM14X100 | 50 | 14 | 44 | - | 100 | 62 | - | M24 |
| BT50EM16X100 | 50 | 16 | 48 | - | 100 | 62 | - | M24 |
| BT50EM18X100 | 50 | 18 | 50 | - | 100 | 62 | - | M24 |
| BT50EM20X100 | 50 | 20 | 52 | - | 100 | 62 | - | M24 |
| BT50EM25X115 | 50 | 25 | 65 | - | 115 | 77 | - | M24 |
| BT50EM25X115B | 50 | 25 | 65 | - | 115 | 77 | - | M24 |
| BT50EM32X115 | 50 | 32 | 72 | - | 115 | 77 | - | M24 |
| BT50EM40X115 | 50 | 40 | 90 | - | 115 | 77 | - | M24 |
| BT50EM40X115B | 50 | 40 | 90 | - | 115 | 77 | - | M24 |
| BT50EM50X125 | 50 | 50 | 98 | - | 125 | 87 | - | M24 |

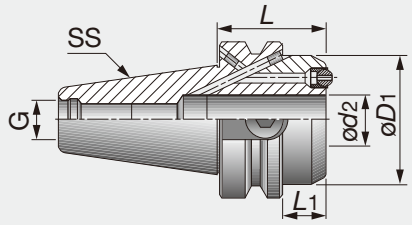
• Applicable for 10 MPa pressure coolant • Add B for coolant through the flange.

Pull stud
F135

# TUNGHOLD

## BT-EM C (End mill holder with nozzle)

Screw locking endmill holders with coolant nozzle with BT shank



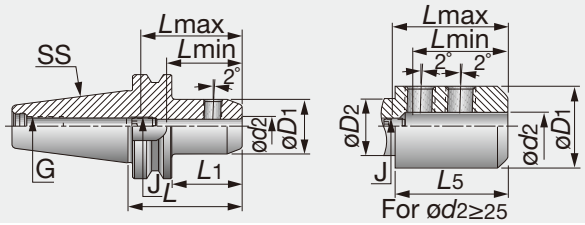

| Designation | SS | ød2 | L | L1 | øD1 | G |
|---|---|---|---|---|---|---|
| BT40EM12X45C | 40 | 12 | 45 | 18 | 42 | M16 |
| BT40EM16X45C | 40 | 16 | 45 | 18 | 48 | M16 |
| BT40EM20X45C | 40 | 20 | 45 | 18 | 52 | M16 |

• Applicable for 10 MPa pressure coolant

# TUNGHOLD

## BT-EM E (End mill holder with whistle notch)

Screw locking endmill holders for whistle notch with BT shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L5 | Lmin | Lmax | J (1) | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT40EM6X50E | 40 | 6 | 25 | - | 50 | 23 | - | 35 | 45 | M5 | M16 | 2.5 |
| BT40EM8X50E | 40 | 8 | 28 | - | 50 | 23 | - | 35 | 45 | M6 | M16 | 3 |
| BT40EM8X50EB | 40 | 8 | 28 | - | 50 | 23 | - | 35 | 45 | M6 | M16 | 3 |
| BT40EM10X65E | 40 | 10 | 35 | - | 65 | 38 | - | 39 | 49 | M8 | M16 | 4 |
| BT40EM12X65E | 40 | 12 | 42 | - | 65 | 38 | - | 44 | 54 | M10 | M16 | 5 |
| BT40EM14X65E | 40 | 14 | 44 | - | 65 | 38 | - | 44 | 54 | M10 | M16 | 5 |
| BT40EM14X65EB | 40 | 14 | 44 | - | 65 | 38 | - | 44 | 54 | M10 | M16 | 5 |
| BT40EM16X65E | 40 | 16 | 48 | - | 65 | 38 | - | 47 | 57 | M12 | M16 | 6 |
| BT40EM18X65E | 40 | 18 | 50 | - | 65 | 38 | - | 47 | 57 | M12 | M16 | 6 |
| BT40EM20X75E | 40 | 20 | 52 | - | 75 | 48 | - | 49 | 59 | M16 | M16 | 8 |
| BT40EM25X105E | 40 | 25 | 65 | 61 | 105 | 78 | 68 | 54 | 64 | M20X1.5 | M16 | 10 |
| BT40EM32X110E | 40 | 32 | 71 | 61 | 110 | 83 | 73 | 58 | 68 | M20X1.5 | M16 | 10 |
| BT50EM6X70E | 50 | 6 | 25 | - | 70 | 32 | - | 35 | 45 | M5 | M24 | 2.5 |
| BT50EM8X70E | 50 | 8 | 28 | - | 70 | 32 | - | 35 | 45 | M6 | M24 | 3 |
| BT50EM12X100E | 50 | 12 | 42 | - | 100 | 62 | - | 44 | 54 | M10 | M24 | 5 |
| BT50EM14X100E | 50 | 14 | 44 | - | 100 | 62 | - | 44 | 54 | M10 | M24 | 5 |
| BT50EM16X100E | 50 | 16 | 48 | - | 100 | 62 | - | 47 | 57 | M12 | M24 | 6 |
| BT50EM18X100E | 50 | 18 | 50 | - | 100 | 62 | - | 47 | 57 | M12 | M24 | 6 |
| BT50EM20X100E | 50 | 20 | 52 | - | 100 | 62 | - | 49 | 59 | M16 | M24 | 8 |
| BT50EM25X115E | 50 | 25 | 65 | - | 115 | 77 | - | 54 | 64 | M20X1.5 | M24 | 10 |
| BT50EM32X115E | 50 | 32 | 72 | - | 115 | 77 | - | 58 | 68 | M20X1.5 | M24 | 10 |
| BT50EM40X115E | 50 | 40 | 90 | - | 115 | 77 | - | 68 | 78 | M20X1.5 | M24 | 10 |
| BT50EM50X125E | 50 | 50 | 98 | - | 125 | 67 | - | 78 | 88 | M20X1.5 | M24 | 10 |
| BT50EM50X125EB | 50 | 50 | 98 | - | 125 | 67 | - | 78 | 88 | M20X1.5 | M24 | 10 |

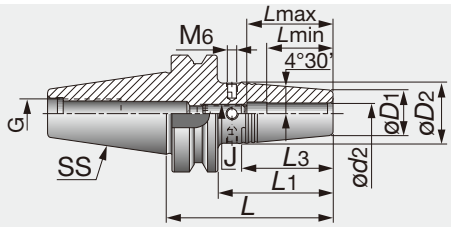
• Applicable for 10 MPa pressure coolant • Add B for coolant through the flange. (1) The adjustment screw has an internal coolant hole.

Pull stud
F135

# TUNGSHRINK

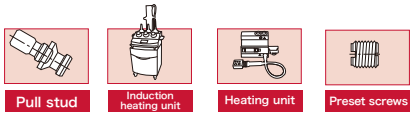
## BT-SRKIN (Shrink holder)

TungShrink thermal shrinking holder for carbide and HSS with BT shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT40SRKIN6X90 | 40 | 6 | 27 | 21 | 90 | 63 | 38 | 25 | 36 | M5 | M16 | 2.5 |
| BT40SRKIN8X90 | 40 | 8 | 27 | 21 | 90 | 63 | 38 | 25 | 36 | M6 | M16 | 3 |
| BT40SRKIN10X90 | 40 | 10 | 32 | 24 | 90 | 63 | 50 | 31 | 42 | M8 | M16 | 4 |
| BT40SRKIN12X90 | 40 | 12 | 32 | 24 | 90 | 63 | 50 | 36 | 47 | M10 | M16 | 5 |
| BT40SRKIN16X90 | 40 | 16 | 34 | 27 | 90 | 63 | 44 | 39 | 50 | M12 | M16 | 6 |
| BT40SRKIN18X90 | 40 | 18 | 42 | 33 | 90 | 63 | 57 | 39 | 50 | M12 | M16 | 6 |
| BT40SRKIN20X90 | 40 | 20 | 42 | 33 | 90 | 63 | 57 | 41 | 52 | M16 | M16 | 8 |
| BT40SRKIN25X110 | 40 | 25 | 53 | 44 | 110 | 83 | 57 | 47 | 58 | M16 | M16 | 8 |
| BT50SRKIN6X100 (1) | 50 | 6 | 26 | 21 | 100 | 62 | 32 | 25 | 36 | M5 | M24 | 2.5 |
| BT50SRKIN8X100 (1) | 50 | 8 | 27 | 21 | 100 | 62 | 38 | 25 | 36 | M6 | M24 | 3 |
| BT50SRKIN10X100 (1) | 50 | 10 | 32 | 24 | 100 | 62 | 51 | 31 | 42 | M8 | M24 | 4 |
| BT50SRKIN12X100 (1) | 50 | 12 | 32 | 24 | 100 | 62 | 51 | 36 | 47 | M10 | M24 | 5 |
| BT50SRKIN14X100 (1) | 50 | 14 | 34 | 27 | 100 | 62 | 44 | 36 | 47 | M10 | M24 | 5 |
| BT50SRKIN16X100 (1) | 50 | 16 | 34 | 27 | 100 | 62 | 44 | 39 | 50 | M12 | M24 | 6 |
| BT50SRKIN18X100 (1) | 50 | 18 | 42 | 33 | 100 | 62 | 57 | 39 | 50 | M12 | M24 | 6 |
| BT50SRKIN20X100 (1) | 50 | 20 | 42 | 33 | 100 | 62 | 57 | 41 | 52 | M16 | M24 | 8 |
| BT50SRKIN25X120 (1) | 50 | 25 | 53 | 44 | 120 | 82 | 57 | 47 | 58 | M16 | M24 | 8 |
| BT50SRKIN32X120 (1) | 50 | 32 | 53 | 44 | 120 | 82 | 57 | 47 | 58 | M16 | M24 | 8 |

• Applicable for 10 MPa pressure coolant • Use only inductive heating device for SRKIN holders.(1) Balanced to G2.5 20,000 $min^{-1}$.

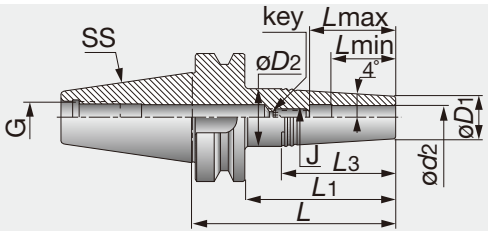



F135 F131 F131 F142

# TUNGSHRINK

## BT-SRK (Shrink holder)

TungShrink thermal shrinking holder for carbide shank with BT shank




| Designation | SS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J | G | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT40SRK3X50 | 40 | 3 | 10 | 15 | 77 | 50 | 35.5 | 10 | 16 | M6 | M16 | 3 |
| BT40SRK3X85 | 40 | 3 | 10 | 19 | 112 | 85 | 64.1 | 10 | 16 | M6 | M16 | 3 |
| BT40SRK4X50 | 40 | 4 | 10 | 15 | 77 | 50 | 35.5 | 12 | 18 | M6 | M16 | 3 |
| BT40SRK4X85 | 40 | 4 | 10 | 19 | 112 | 85 | 64.1 | 12 | 18 | M6 | M16 | 3 |
| BT40SRK5X50 | 40 | 5 | 10 | 15 | 77 | 50 | 35.5 | 15 | 21 | M6 | M16 | 3 |
| BT40SRK5X85 | 40 | 5 | 10 | 19 | 112 | 85 | 64.1 | 15 | 21 | M6 | M16 | 3 |
| BT40SRK6X50 | 40 | 6 | 11 | 16 | 77 | 50 | 35.5 | 18 | 24 | M8 | M16 | 4 |
| BT40SRK6X85 | 40 | 6 | 11 | 20 | 112 | 85 | 64.1 | 18 | 24 | M8 | M16 | 4 |
| BT40SRK8X50 | 40 | 8 | 14 | 20 | 77 | 50 | 42.5 | 25 | 31 | M10 | M16 | 5 |
| BT40SRK8X85 | 40 | 8 | 14 | 23 | 112 | 85 | 63.9 | 25 | 31 | M10 | M16 | 5 |
| BT40SRK10X50 | 40 | 10 | 16 | 22 | 77 | 50 | 42.4 | 30 | 36 | M12 | M16 | 6 |
| BT40SRK10X85 | 40 | 10 | 16 | 25 | 112 | 85 | 60.2 | 30 | 36 | M12 | M16 | 6 |
| BT40SRK12X50 | 40 | 12 | 20 | 26 | 77 | 50 | 42.3 | 32 | 42 | M10 | M16 | 5 |
| BT40SRK12X85 | 40 | 12 | 20 | 28 | 112 | 85 | 56.6 | 32 | 42 | M10 | M16 | 5 |

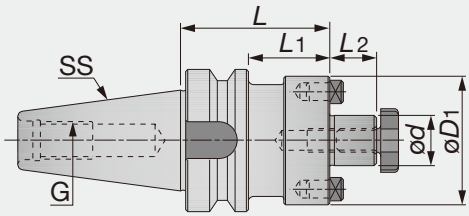
• Applicable for 10 MPa pressure coolant

Pull stud F135
Induction heating unit F131
Heating unit F131
Preset screws F142

# TUNGHOLD

## BT-SEM (Shell mill holder)

Shell mill holder with BT shank




| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | G |
|---|---|---|---|---|---|---|---|
| BT30SEM16X50 (1) | 30 | 16 | 17 | 38 | 50 | 28 | M12 |
| BT30SEM22X50 (1) | 30 | 22 | 19 | 47 | 50 | 18 | M12 |
| BT30SEM27X50 (1) | 30 | 27 | 21 | 58 | 50 | 18 | M12 |
| BT40SEM16X60 (1) | 40 | 16 | 17 | 38 | 60 | 33 | M16 |
| BT40SEM16X120 (1) | 40 | 16 | 17 | 38 | 120 | 93 | M16 |
| BT40SEM22X60 (1) | 40 | 22 | 19 | 47 | 60 | 33 | M16 |
| BT40SEM22X120 (1) | 40 | 22 | 19 | 47 | 120 | 93 | M16 |
| BT40SEM25.4X45V1 (1) | 40 | 25.4 | 22 | 50 | 45 | 18 | M16 |
| BT40SEM27X45 (1) | 40 | 27 | 21 | 58 | 45 | 18 | M16 |
| BT40SEM27X105 (1) | 40 | 27 | 21 | 58 | 105 | 78 | M16 |
| BT40SEM31.75X45V1 (1) | 40 | 31.75 | 30 | 64 | 45 | 20 | M16 |
| BT40SEM31.75X75V1 (1) | 40 | 31.75 | 30 | 64 | 75 | 48 | M16 |
| BT40SEM32X60 (1) | 40 | 32 | 24 | 65 | 60 | 23 | M16 |
| BT40SEM32X75 (1) | 40 | 32 | 24 | 65 | 75 | 36 | M16 |
| BT40SEM40X60 (1) | 40 | 40 | 27 | 82 | 60 | 23 | M16 |
| BT40SEM40X75 (1) | 40 | 40 | 27 | 82 | 75 | 38 | M16 |
| BT50SEM16X75 (1) | 50 | 16 | 17 | 38 | 75 | 37 | M24 |
| BT50SEM16X120 (1) | 50 | 16 | 17 | 38 | 120 | 82 | M24 |
| BT50SEM22X50X220 | 50 | 22 | 19 | 50 | 220 | 182 | M24 |
| BT50SEM22X64X320 | 50 | 22 | 19 | 64 | 320 | 282 | M24 |
| BT50SEM22X75 (1) | 50 | 22 | 19 | 47 | 75 | 37 | M24 |
| BT50SEM22X120 (1) | 50 | 22 | 19 | 47 | 120 | 82 | M24 |
| BT50SEM25.4X90V1 (1) | 50 | 25.4 | 22 | 50 | 90 | 52 | M24 |
| BT50SEM27X60 (1) | 50 | 27 | 21 | 58 | 60 | 22 | M24 |
| BT50SEM27X105 (1) | 50 | 27 | 21 | 58 | 105 | 67 | M24 |
| BT50SEM31.75X75V1 (1) | 50 | 31.75 | 30 | 64 | 75 | 26 | M24 |
| BT50SEM32X48 (1) | 50 | 32 | 24 | 66 | 48 | 10 | M24 |
| BT50SEM32X75 (1) | 50 | 32 | 24 | 66 | 75 | 37 | M24 |
| BT50SEM38.1X75V1 (1) | 50 | 38.1 | 34 | 80 | 75 | 37 | M24 |
| BT50SEM40X48 (1) | 50 | 40 | 27 | 82 | 48 | 10 | M24 |
| BT50SEM40X75 (1) | 50 | 40 | 27 | 82 | 75 | 37 | M24 |
| BT50SEM50.8X75V1 (1) | 50 | 50.8 | 36 | 100 | 75 | 37 | M24 |

(1) Applicable for internal coolant supply with the TMBA-**H or CM...H clamping screw.

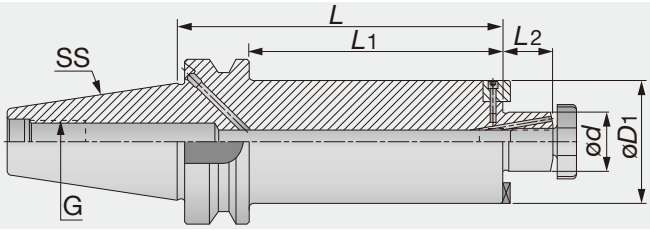
(Option:Wrench for lock screw)

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## BT-SEM-C (Shell mill holder)

Shell mill holder with coolant hole with BT shank (Extra long type)




| Designation | SS | ød | øD1 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|
| BT40SEM16X60C | 40 | 16 | 38 | 60 | 33 | 17 | M16 |
| BT40SEM16X100C | 40 | 16 | 38 | 100 | 73 | 17 | M16 |
| BT40SEM22X60C | 40 | 22 | 47 | 60 | 33 | 19 | M16 |
| BT40SEM22X100C | 40 | 22 | 47 | 100 | 73 | 19 | M16 |
| BT40SEM27X100C | 40 | 27 | 58 | 100 | 73 | 21 | M16 |
| BT40SEM32X60C | 40 | 32 | 66 | 60 | 33 | 24 | M16 |
| BT50SEM16X75C | 50 | 16 | 38 | 75 | 37 | 17 | M24 |
| BT50SEM16X100C | 50 | 16 | 38 | 100 | 62 | 17 | M24 |
| BT50SEM22X75C | 50 | 22 | 47 | 75 | 37 | 19 | M24 |
| BT50SEM22X48X220C | 50 | 22 | 48 | 220 | 182 | 19 | M24 |
| BT50SEM22X61X320C | 50 | 22 | 61 | 320 | 282 | 19 | M24 |
| BT50SEM25.4X60C | 50 | 25.4 | 50.4 | 60 | 22 | 22 | M24 |
| BT50SEM27X60C | 50 | 27 | 58 | 60 | 22 | 21 | M24 |
| BT50SEM27X100C | 50 | 27 | 58 | 100 | 62 | 21 | M24 |
| BT50SEM27X61X320C | 50 | 27 | 61 | 320 | 282 | 21 | M24 |
| BT50SEM32X75C | 50 | 32 | 66 | 75 | 37 | 24 | M24 |
| BT50SEM32X100C | 50 | 32 | 66 | 100 | 62 | 24 | M24 |
| BT50SEM32X78X390C | 50 | 32 | 78 | 390 | 352 | 24 | M24 |

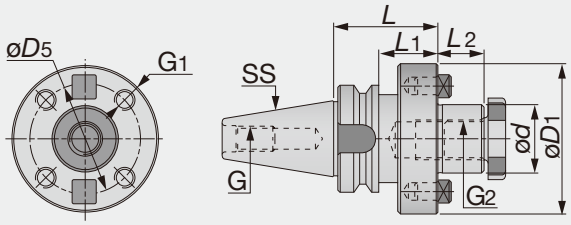
(Option:Wrench for lock screw)

- Applicable for 10 MPa pressure coolant
- If the "B type" option is required, the plug screw must be removed from the flange cooling hole (use a 2 mm hex key).

# TUNGHOLD

## BT-FM (Face mill holder)

Face mill holder with BT shank



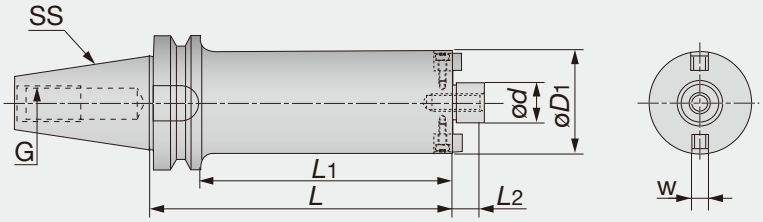

| Designation | SS | ød | L2 | L | L1 | øD1 | øD5 | G2 | G1 | G |
|---|---|---|---|---|---|---|---|---|---|---|
| BT40FM40 | 40 | 40 | 27 | 60 | 22 | 88 | 66.7 | M20 | M12 | M16 |
| BT50FM40 | 50 | 40 | 27 | 50 | 12 | 88 | 66.7 | M20 | M12 | M24 |
| BT50FM60 | 50 | 60 | 38 | 88 | 40 | 128 | 101.6 | - | M16 | M24 |
| BT50SEM47.625X75 | 50 | 47.625 | 38 | 75 | - | 128.6 | 101.6 | - | M16 | M24 |

(Option:Wrench for lock screw)

Pull stud F135
Clamping screw F141
Wrench F143

## BT50-FM (Shell mill holder for long overhang)

Face mill holder with BT shank




| Designation | SS | ød | øD1 | L2 | L | L1 | G | W | Kg |
|---|---|---|---|---|---|---|---|---|---|
| BT50-FMC22-138-47 | 50 | 22 | 47 | 18 | 138 | 100 | M24 | 10 | 5.2 |
| BT50-FMC22-188-47 | 50 | 22 | 47 | 18 | 188 | 150 | M24 | 10 | 5.9 |
| BT50-FMC22-243-47 | 50 | 22 | 47 | 18 | 243 | 205 | M24 | 10 | 6.5 |
| BT50-FMC22-293-47 | 50 | 22 | 47 | 18 | 293 | 255 | M24 | 10 | 7.2 |
| BT50-FMC22-178-59 | 50 | 22 | 59 | 18 | 178 | 140 | M24 | 10 | 6.8 |
| BT50-FMC22-238-59 | 50 | 22 | 59 | 18 | 238 | 200 | M24 | 10 | 8 |
| BT50-FMC22-308-59 | 50 | 22 | 59 | 18 | 308 | 270 | M24 | 10 | 9.5 |
| BT50-FMC22-373-59 | 50 | 22 | 59 | 18 | 373 | 335 | M24 | 10 | 10.9 |
| BT50-FMA31.75-215-76 | 50 | 31.75 | 76 | 30 | 215 | 177 | M24 | 12.7 | 10 |
| BT50-FMA31.75-295-76 | 50 | 31.75 | 76 | 30 | 295 | 257 | M24 | 12.7 | 12.9 |
| BT50-FMA31.75-375-76 | 50 | 31.75 | 76 | 30 | 375 | 337 | M24 | 12.7 | 15.8 |
| BT50-FMA31.75-275-96 | 50 | 31.75 | 96 | 30 | 275 | 237 | M24 | 12.7 | 16.8 |
| BT50-FMA31.75-375-96 | 50 | 31.75 | 96 | 30 | 375 | 337 | M24 | 12.7 | 23 |

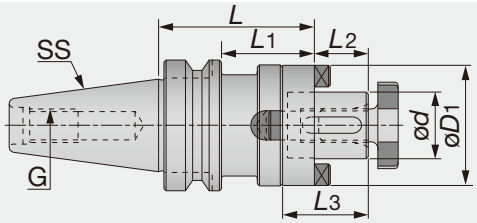
(Option:Wrench for lock screw)

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## BT-SEMC (Combination holder for slot mill & shell mill)

Combination holder with BT shank




| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | $L_3$ | G |
|---|---|---|---|---|---|---|---|---|
| BT40SEMC16X50 | 40 | 16 | 17 | 32 | 50 | 23 | 27 | M16 |
| BT40SEMC16X100 | 40 | 16 | 17 | 32 | 100 | 73 | 27 | M16 |
| BT40SEMC22X53 | 40 | 22 | 19 | 40 | 53 | 26 | 31 | M16 |
| BT40SEMC22X100 | 40 | 22 | 19 | 40 | 100 | 73 | 31 | M16 |
| BT40SEMC27X55 | 40 | 27 | 21 | 48 | 55 | 28 | 33 | M16 |
| BT40SEMC27X100 | 40 | 27 | 21 | 48 | 100 | 73 | 33 | M16 |
| BT40SEMC32X60 | 40 | 32 | 24 | 58 | 60 | 33 | 38 | M16 |
| BT40SEMC32X100 | 40 | 32 | 24 | 58 | 100 | 73 | 38 | M16 |
| BT40SEMC40X80 | 40 | 40 | 27 | 70 | 80 | 53 | 41 | M16 |
| BT50SEMC16X100 | 50 | 16 | 17 | 32 | 100 | 62 | 27 | M24 |
| BT50SEMC16X150 | 50 | 16 | 17 | 32 | 150 | 112 | 27 | M24 |
| BT50SEMC22X68 | 50 | 22 | 19 | 40 | 68 | 30 | 31 | M24 |
| BT50SEMC22X100 | 50 | 22 | 19 | 40 | 100 | 62 | 31 | M24 |
| BT50SEMC22X150 | 50 | 22 | 19 | 40 | 150 | 112 | 31 | M24 |
| BT50SEMC27X78 | 50 | 27 | 21 | 48 | 78 | 40 | 33 | M24 |
| BT50SEMC27X100 | 50 | 27 | 21 | 48 | 100 | 62 | 33 | M24 |
| BT50SEMC27X150 | 50 | 27 | 21 | 48 | 150 | 112 | 33 | M24 |
| BT50SEMC32X78 | 50 | 32 | 24 | 58 | 78 | 40 | 38 | M24 |
| BT50SEMC32X100 | 50 | 32 | 24 | 58 | 100 | 62 | 38 | M24 |
| BT50SEMC32X150 | 50 | 32 | 24 | 58 | 150 | 112 | 38 | M24 |
| BT50SEMC40X78 | 50 | 40 | 27 | 70 | 78 | 40 | 41 | M24 |
| BT50SEMC40X100 | 50 | 40 | 27 | 70 | 100 | 62 | 41 | M24 |
| BT50SEMC40X150 | 50 | 40 | 27 | 70 | 150 | 112 | 41 | M24 |
| BT50SEMC50X79 | 50 | 50 | 30 | 90 | 79 | 41 | 46 | M24 |
| BT50SEMC50X150 | 50 | 50 | 30 | 90 | 150 | 112 | 46 | M24 |

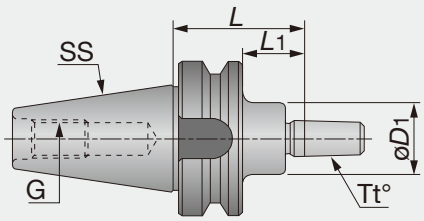
(Option:Wrench for lock screw)

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## BT-DC (Holder for jacobs taper)

Jacobs taper holder wih BT shank

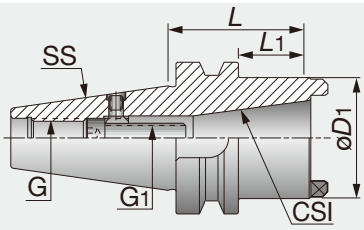



| Designation | SS | Tt° | L | øD1 | L1 | G |
|---|---|---|---|---|---|---|
| BT30DCB12X30 | 30 | B12 | 30 | - | 8 | M12 |
| BT30DCB16X30 | 30 | B16 | 30 | - | 8 | M12 |
| BT40DCB12X45 | 40 | B12 | 45 | 24 | 18 | M16 |
| BT40DCB12X90 | 40 | B12 | 90 | 24 | 63 | M16 |
| BT40DCB16X45 | 40 | B16 | 45 | 30 | 18 | M16 |
| BT40DCB16X90 | 40 | B16 | 90 | 30 | 63 | M16 |
| BT40DCB18X45 | 40 | B18 | 45 | 30 | 18 | M16 |
| BT40DCB18X90 | 40 | B18 | 90 | 30 | 63 | M16 |
| BT50DCB12X45 | 50 | B12 | 45 | - | 6.7 | M24 |
| BT50DCB12X105 | 50 | B12 | 105 | 24 | 67 | M24 |
| BT50DCB16X45 | 50 | B16 | 45 | - | 7 | M24 |
| BT50DCB16X105 | 50 | B16 | 105 | 50 | 67 | M24 |
| BT50DCB18X45 | 50 | B18 | 45 | - | 7 | M24 |
| BT50DCB18X105 | 50 | B18 | 105 | 30 | 67 | M24 |

# TUNGHOLD

## BT-AD (Conversion adaptor)

Conversion adaptor for BT system



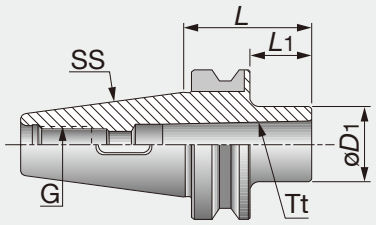

| Designation | SS | CSI | L | øD1 | L1 | G1 | G |
|---|---|---|---|---|---|---|---|
| BT50ADBT/SK40 | 50 | DIN69871/A, BT MAS - 403 | 75 | 37 | 66 | M16 | M24 |
| BT50AD40 | 50 | DIN2080 | 70 | 32 | 63 | M16 | M24 |

Pull stud
F135

# TUNGHOLD

## BT-MT (Holder for morse taper)

Morse taper holder with BT shank

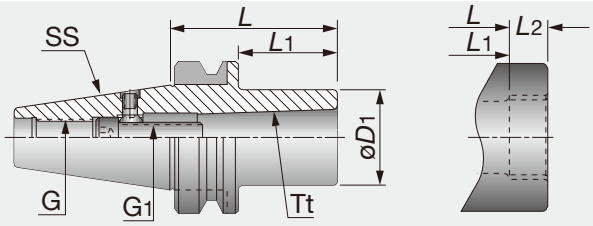



| Designation | SS | Tt | L | L1 | øD1 | G |
|---|---|---|---|---|---|---|
| BT30MT1X45 | 30 | MT1 | 45 | 23 | 25 | M12 |
| BT30MT2X60 | 30 | MT2 | 60 | 38 | 32 | M12 |
| BT40MT1X45 | 40 | MT1 | 45 | 18 | 25 | M16 |
| BT40MT1X120 | 40 | MT1 | 120 | 93 | 25 | M16 |
| BT40MT2X60 | 40 | MT2 | 60 | 33 | 32 | M16 |
| BT40MT2X120 | 40 | MT2 | 120 | 93 | 32 | M16 |
| BT40MT3X75 | 40 | MT3 | 75 | 48 | 40 | M16 |
| BT40MT3X139 | 40 | MT3 | 139 | 112 | 40 | M16 |
| BT40MT4X95 | 40 | MT4 | 95 | 68 | 50 | M16 |
| BT50MT1X45 | 50 | MT1 | 45 | 7 | 25 | M24 |
| BT50MT1X120 | 50 | MT1 | 120 | 82 | 25 | M24 |
| BT50MT1X180 | 50 | MT1 | 180 | 142 | 25 | M24 |
| BT50MT2X45 | 50 | MT2 | 45 | 7 | 32 | M24 |
| BT50MT2X135 | 50 | MT2 | 135 | 97 | 32 | M24 |
| BT50MT2X180 | 50 | MT2 | 180 | 142 | 32 | M24 |
| BT50MT3X45 | 50 | MT3 | 45 | 7 | 40 | M24 |
| BT50MT3X150 | 50 | MT3 | 150 | 112 | 40 | M24 |
| BT50MT3X180 | 50 | MT3 | 180 | 142 | 40 | M24 |
| BT50MT4X75 | 50 | MT4 | 75 | 37 | 50 | M24 |
| BT50MT4X180 | 50 | MT4 | 180 | 142 | 50 | M24 |
| BT50MT5X105 | 50 | MT5 | 105 | 67 | 70 | M24 |

# TUNGHOLD

## BT-MT DRW (Holder with draw bar)

Morse taper holder with draw bar type for BT shank




| Designation | SS | Tt | L | L1 | L2 | øD1 | G1 | G |
|---|---|---|---|---|---|---|---|---|
| BT40MT1DRW | 40 | MT1 | 50 | 23 | - | 25 | M6 | M16 |
| BT40MT2DRW | 40 | MT2 | 50 | 23 | - | 32 | M10 | M16 |
| BT40MT3DRW | 40 | MT3 | 70 | 43 | - | 40 | M12 | M16 |
| BT40MT4DRW (1) | 40 | MT4 | 95 | 68 | 15 | 63 | M16 | M16 |
| BT50MT1DRW | 50 | MT1 | 45 | 7 | - | 25 | M6 | M24 |
| BT50MT2DRW | 50 | MT2 | 60 | 22 | - | 32 | M10 | M24 |
| BT50MT3DRW | 50 | MT3 | 65 | 27 | - | 40 | M12 | M24 |
| BT50MT4DRW (1) | 50 | MT4 | 70 | 32 | 15 | 63 | M16 | M24 |
| BT50MT5DRW (1) | 50 | MT5 | 100 | 62 | 18 | 78 | M20 | M24 |

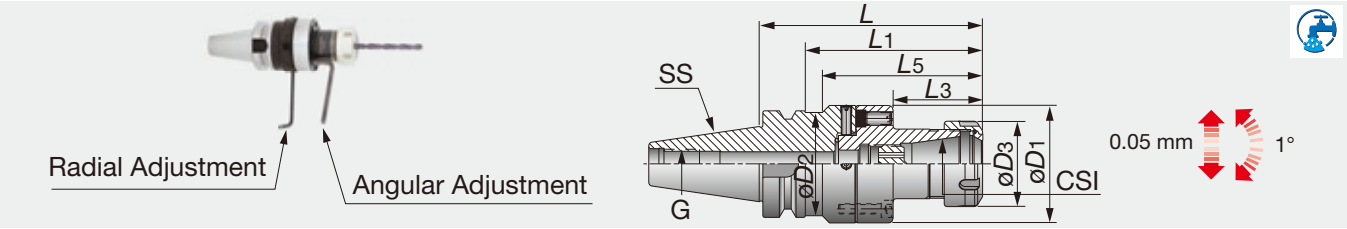
(1) DIN2201.

Pull stud
F135

# TUNGFINE

## ADJ BT-ER collet chuck(Collet chuck holder)

ER Collet chucks with center alignment and BT Shanks




| Designation | SS | CSI | Range | L | L1 | L5 | L3 | øD3 | øD1 | øD2 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADJBT40D70ER32 | 40 | ER32 | 2-20 | 129.5 | 52.5 | 102.5 | 92 | 50 | 70 | 62.5 | M16 |
| ADJBT50D70ER32 | 50 | ER32 | 2-20 | 144.5 | 52.5 | 106.5 | - | 50 | 70 | - | M24 |

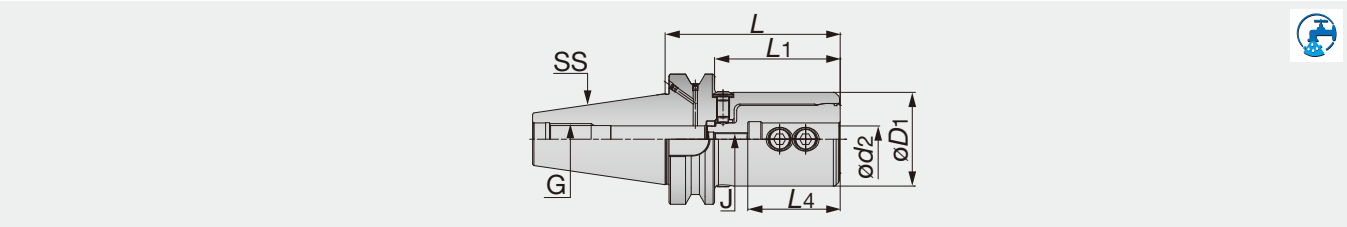
• Applicable for 10 MPa pressure coolant

(Option：Wrench for ER collet)

# TUNGBORE

## TUNGBORE-BT (Adjustable holder for indexable drill)

TungBore adjustable drilling dia. holder with BT shank




| Designation | SS | ød2 | øD1 | L | L1 | L4 | J | G |
|---|---|---|---|---|---|---|---|---|
| TUNGBORE-BT40EM16ADB | 40 | 16 | 72 | 123.5 | 96.5 | 71 | M10 | M16 |
| TUNGBORE-BT40EM20ADB | 40 | 20 | 72 | 123.5 | 96.5 | 71 | M10 | M16 |
| TUNGBORE-BT40EM25ADB | 40 | 25 | 72 | 123.5 | 96.5 | 71 | M10 | M16 |
| TUNGBORE-BT40EM32ADB | 40 | 32 | 72 | 123.5 | 96.5 | 71 | M10 | M16 |
| TUNGBORE-BT40EM40ADB | 40 | 40 | 72 | 123.5 | 96.5 | 71 | M10 | M16 |
| TUNGBORE-BT50EM16ADB | 50 | 16 | 72 | 134.5 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-BT50EM20ADB | 50 | 20 | 72 | 134.5 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-BT50EM25ADB | 50 | 25 | 72 | 134.5 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-BT50EM32ADB | 50 | 32 | 72 | 134.5 | 96.5 | 71 | M10 | M24 |
| TUNGBORE-BT50EM40ADB | 50 | 40 | 72 | 134.5 | 96.5 | 71 | M10 | M24 |

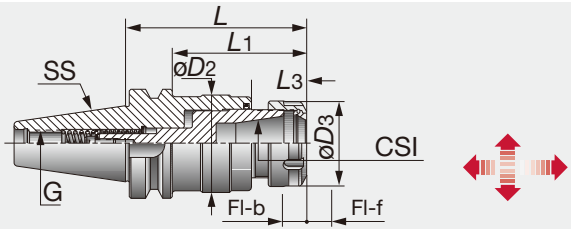
• Applicable for 10 MPa pressure coolant • These items are coolant through spindle & flange type.

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGGTI

## GTI-BT(Tapping holder)

TungGTI tapping attachment with BT shank



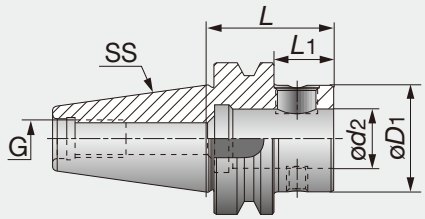

| Designation | SS | CSI | Tap min | Tap max | Range | L | L1 | L3 | øD3 | øD2 | Fl-f | Fl-b | G |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTIBT40ER16 | 40 | ER16 | M3 | M10 | 0.5-10 | 84.2 | 52.7 | 24.6 | 28 | 29.5 | 8 | 3 | M16 |
| GTIBT40ER32 | 40 | ER32 | M6 | M20 | 2-20 | 106.8 | 79.8 | 33 | 50 | 56.5 | 9 | 4 | M16 |
| GTIBT40ER40 | 40 | ER40 | M6 | M28 | 3-26 | 124.8 | 97.8 | 51 | 63 | 56.5 | 9 | 4 | M16 |
| GTIBT50ER16 | 50 | ER16 | M3 | M10 | 0.5-10 | 106.8 | 68.8 | 24.6 | 28 | 29.5 | 8 | 3 | M24 |
| GTIBT50ER32 | 50 | ER32 | M6 | M20 | 2-20 | 115.2 | 77.2 | 33 | 50 | 56.5 | 9 | 4 | M24 |
| GTIBT50ER40 | 50 | ER40 | M6 | M28 | 3-26 | 133.2 | 95.2 | 51 | 63 | 56.5 | 9 | 4 | M24 |

(Option：Wrench for ER collet)

# TUNGFIT

## BT-CF (Quick change holder)

TungFit quick change style modular tooling system with BT shank



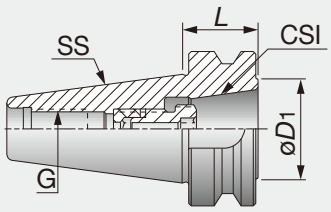

| Designation | SS | L | L1 | øD1 | ød2 | G |
|---|---|---|---|---|---|---|
| BT40CF4-L | 40 | 110 | 83 | 44.5 | 25 | M16 |
| BT40CF4-S | 40 | 52 | 25 | 44.5 | 25 | M16 |
| BT50CF4-L | 50 | 115 | 77 | 44.5 | 25 | M24 |
| BT50CF4-S | 50 | 63 | 25 | 44.5 | 25 | M24 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m

# TUNGCLICK

## BT-CLICKIN (Quick change holder)

TungFit quick change style modular tooling system with BT shank




| Designation | SS | CSI | øD1 | L | G |
|---|---|---|---|---|---|
| BT40ER32CLICK-IN | 40 | 32SRF | 41 | 28 | M16 |
| BT50ER32CLICK-IN | 50 | 32SRF | 41 | 39 | M24 |

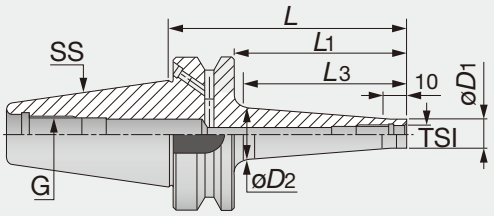
• Applicable for 10 MPa pressure coolant • Tightening torque: 235 N·m

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGFLEX

## BT-ODP (Screw clamping head holder)

TungFlex modular tooling system with BT shank




| Designation | SS | TSI | øD1 | øD2 | L | L1 | L3 | G |
|---|---|---|---|---|---|---|---|---|
| BT40ODP6X66 | 40 | M6 | 9.8 | 13 | 66 | 39 | 30 | M16 |
| BT40ODP6X106 | 40 | M6 | 9.8 | 23 | 106 | 79 | 70 | M16 |
| BT40ODP8X66 | 40 | M8 | 13 | 15 | 66 | 39 | 30 | M16 |
| BT40ODP8X106 | 40 | M8 | 13 | 23 | 106 | 79 | 70 | M16 |
| BT40ODP10X66 | 40 | M10 | 18 | 20 | 66 | 39 | 30 | M16 |
| BT40ODP10X106 | 40 | M10 | 18 | 28 | 106 | 79 | 70 | M16 |
| BT40ODP12X66 | 40 | M12 | 21 | 24 | 66 | 39 | 30 | M16 |
| BT40ODP12X106 | 40 | M12 | 21 | 31 | 106 | 79 | 70 | M16 |
| BT40ODP16X66 | 40 | M16 | 29 | 28.6 | 66 | 39 | - | M16 |
| BT40ODP16X106 | 40 | M16 | 29 | 34 | 106 | 79 | 70 | M16 |
| BT50ODP12X94 | 50 | M12 | 23 | 30 | 94 | 56 | 50 | M24 |
| BT50ODP12X144 (1) | 50 | M12 | 23 | 40 | 144 | 106 | 100 | M24 |
| BT50ODP12X194 (1) | 50 | M12 | 23 | 40 | 194 | 156 | 150 | M24 |
| BT50ODP12X244 (1) | 50 | M12 | 23 | 46 | 244 | 206 | 200 | M24 |
| BT50ODP16X94 (1) | 50 | M16 | 29 | 34 | 94 | 56 | 50 | M24 |
| BT50ODP16X144 (1) | 50 | M16 | 29 | 40 | 144 | 106 | 100 | M24 |
| BT50ODP16X194 (1) | 50 | M16 | 29 | 55 | 194 | 156 | 150 | M24 |
| BT50ODP16X244 (1) | 50 | M16 | 29 | 60 | 244 | 206 | 200 | M24 |

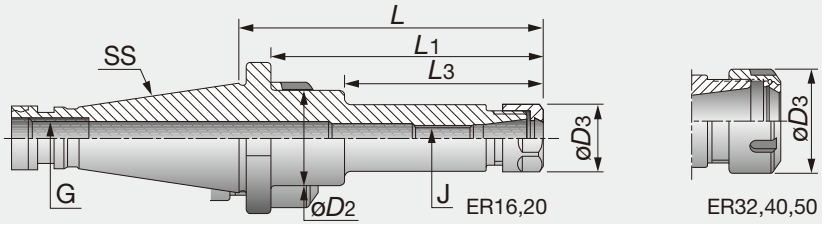
• Applicable for 10 MPa pressure coolant (1) Balanced to G6.3 at 12,000 $min^{-1}$

Pull stud
F135

# TUNGHOLD

## DIN2080-ER (Collet chuck holder)

ER collet chucks with DIN2080 shank




| Designation | SS | CSI | Range | *L* | *L*1 | *L*3 | ø*D*3 | ø*D*2 | J | G |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN208030ER16X75 | 30 | ER16 | 0.5-10 | 75 | 65.4 | - | 28 | - | M10 | M12 |
| DIN208030ER32X55 | 30 | ER32 | 2-20 | 55 | 45.4 | - | 50 | - | M18X1.5 | M12 |
| DIN208030ER40X83 | 30 | ER40 | 3-26 | 83 | 69.4 | - | 63 | - | M22X1.5 | M12 |
| DIN208040ER16X63 | 40 | ER16 | 0.5-10 | 63 | 51.4 | - | 28 | - | M12 | M16 |
| DIN208040ER16X100 | 40 | ER16 | 0.5-10 | 100 | 88.4 | - | 28 | - | M12 | M16 |
| DIN208040ER25X50 | 40 | ER25 | 1-16 | 50 | 38.4 | - | 42 | - | M16X1.5 | M16 |
| DIN208040ER32X50 | 40 | ER32 | 2-20 | 50 | 38.4 | - | 50 | - | M22X1.5 | M16 |
| DIN208040ER40X55 | 40 | ER40 | 3-26 | 55 | 43.4 | - | 63 | - | M22X1.5 | M16 |
| DIN208040ER20X63 | 40 | ER20 | 1-13 | 63 | 51.4 | - | 34 | - | M12 | M16 |
| DIN208040ER20X100 | 40 | ER20 | 1-13 | 100 | 88.4 | - | 34 | - | M12 | M16 |
| DIN208050ER16X100 | 50 | ER16 | 0.5-10 | 100 | 84.8 | - | 28 | - | M12 | M24 |
| DIN208050ER16X160 | 50 | ER16 | 0.5-10 | 160 | 144.8 | 95 | 28 | 40 | M12 | M24 |
| DIN208050ER20X100 | 50 | ER20 | 1-13 | 100 | 84.8 | - | 34 | - | M16 | M24 |
| DIN208050ER20X160 | 50 | ER20 | 1-13 | 160 | 144.8 | - | 34 | - | M12 | M24 |
| DIN208050ER40X58 | 50 | ER40 | 3-26 | 58 | 42.8 | - | 63 | - | M28X1.5 | M24 |
| DIN208050ER50X63 | 50 | ER50 | 10-34 | 63 | 47.8 | - | 78 | - | M36X1.5 | M24 |

• Applicable for 10 MPa pressure coolant

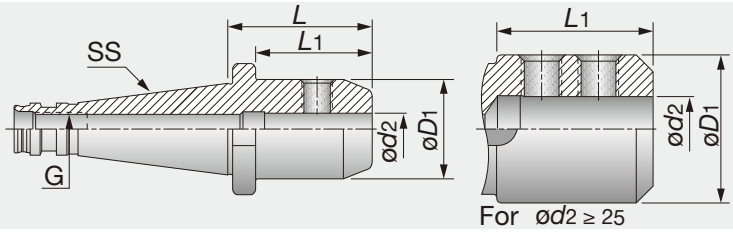
(Option：wrench for ER collet)

ER Collet F113
Nut F137
Wrench F139
Preset screws F140
Pull stud F135

# TUNGHOLD

## DIN2080-EM (Endmill holder)

Screw locking endmill holders with DIN2080 shank



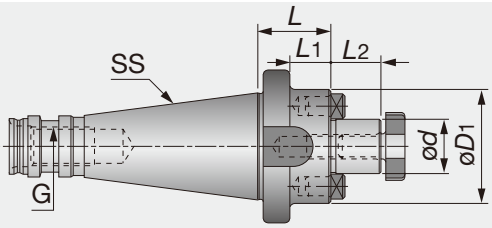

| Designation | SS | ød2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|
| DIN208030EM6X40 | 30 | 6 | 25 | 40 | 30.4 | M12 |
| DIN208030EM8X40 | 30 | 8 | 28 | 40 | 30.4 | M12 |
| DIN208030EM10X40 | 30 | 10 | 35 | 40 | 30.4 | M12 |
| DIN208030EM20X63 | 30 | 20 | 52 | 63 | 53.4 | M12 |
| DIN208040EM6X50 | 40 | 6 | 25 | 50 | 38.4 | M16 |
| DIN208040EM8X50 | 40 | 8 | 28 | 50 | 38.4 | M16 |
| DIN208040EM10X50 | 40 | 10 | 35 | 50 | 38.4 | M16 |
| DIN208040EM12X50 | 40 | 12 | 42 | 50 | 38.4 | M16 |
| DIN208040EM16X63 | 40 | 16 | 48 | 63 | 51.4 | M16 |
| DIN208040EM20X63 | 40 | 20 | 52 | 63 | 51.4 | M16 |
| DIN208040EM25X80 | 40 | 25 | 65 | 80 | 68.4 | M16 |
| DIN208040EM32X80 | 40 | 32 | 71 | 80 | 68.4 | M16 |
| DIN208050EM6X63 | 50 | 6 | 25 | 63 | 47.8 | M24 |
| DIN208050EM8X63 | 50 | 8 | 28 | 63 | 47.8 | M24 |
| DIN208050EM10X63 | 50 | 10 | 35 | 63 | 47.8 | M24 |
| DIN208050EM12X63 | 50 | 12 | 42 | 63 | 47.8 | M24 |
| DIN208050EM16X63 | 50 | 16 | 48 | 63 | 47.8 | M24 |
| DIN208050EM20X63 | 50 | 20 | 52 | 63 | 47.8 | M24 |
| DIN208050EM25X80 | 50 | 25 | 65 | 80 | 64.8 | M24 |
| DIN208050EM32X80 | 50 | 32 | 72 | 80 | 64.8 | M24 |
| DIN208050EM40X90 | 50 | 40 | 90 | 90 | 74.8 | M24 |
| DIN208050EM50X100 | 50 | 50 | 100 | 100 | 84.8 | M24 |

• Applicable for 10 MPa pressure coolant

Pull stud
F135

# TUNGHOLD
## DIN2080-SEM (Shell mill holder)

Shell mill holder with DIN2080 shank

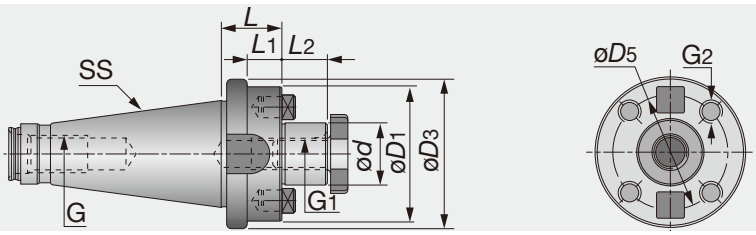



| Designation | SS | ød | L2 | øD1 | L | L1 | G |
|---|---|---|---|---|---|---|---|
| DIN208030SEM16X28 | 30 | 16 | 17 | 38 | 28 | 18.4 | M12 |
| DIN208030SEM22X28 | 30 | 22 | 19 | 47 | 28 | 18.4 | M12 |
| DIN208030SEM27X32 | 30 | 27 | 21 | 58 | 32 | 22.4 | M12 |
| DIN208030SEM32X32 | 30 | 32 | 24 | 66 | 32 | 22.4 | M12 |
| DIN208040SEM16X28 | 40 | 16 | 17 | 38 | 28 | 16.4 | M16 |
| DIN208040SEM22X27 | 40 | 22 | 19 | 47 | 27 | 15.4 | M16 |
| DIN208040SEM27X26 | 40 | 27 | 21 | 58 | 26 | 14.4 | M16 |
| DIN208040SEM32X23 | 40 | 32 | 24 | 66 | 23 | 11.4 | M16 |
| DIN208040SEM40X34 | 40 | 40 | 27 | 82 | 34 | 22.4 | M16 |
| DIN208050SEM16X38 | 50 | 16 | 17 | 38 | 38 | 22.8 | M24 |
| DIN208050SEM22X38 | 50 | 22 | 19 | 47 | 38 | 22.8 | M24 |
| DIN208050SEM27X38 | 50 | 27 | 21 | 58 | 38 | 22.8 | M24 |
| DIN208050SEM32X36 | 50 | 32 | 24 | 66 | 36 | 20.8 | M24 |
| DIN208050SEM40X40 | 50 | 40 | 27 | 82 | 40 | 24.8 | M24 |

(Option:Wrench for lock Screw)

# TUNGHOLD
## DIN2080-FM (Face mill holder)

Face mill holder with DIN2080 shank




| Designation | SS | ød | L2 | øD1 | øD3 | L1 | L | G2 | øD5 | G1 | G |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIN208040FM40 | 40 | 40 | 27 | 88 | - | - | 20 | M12 | 66.7 | M20 | M16 |
| DIN208050FM40 | 50 | 40 | 27 | 97.5 | 88 | 20.8 | 36 | M12 | 66.7 | M20 | M24 |
| DIN208050FM60 | 50 | 60 | 40 | 128 | - | - | 35.8 | M16 | 101.6 | - | M24 |

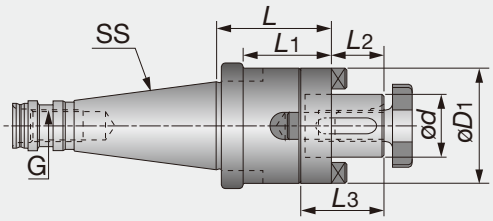
(Option:Wrench for lock Screw)

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## DIN2080-SEMC (Combination holder for slot mill & shell mill)

Combination holder with DIN2080 shank

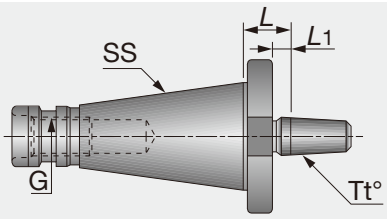



| Designation | SS | ød | $L_2$ | $øD_1$ | L | $L_1$ | $L_3$ | G |
|---|---|---|---|---|---|---|---|---|
| DIN208030SEMC16X35 | 30 | 16 | 17 | 32 | 35 | 25.4 | 27 | M12 |
| DIN208030SEMC22X35 | 30 | 22 | 19 | 40 | 35 | 25.4 | 31 | M12 |
| DIN208030SEMC27X35 | 30 | 27 | 21 | 48 | 35 | 25.4 | 33 | M12 |
| DIN208030SEMC32X50 | 30 | 32 | 24 | 58 | 50 | 40.4 | 38 | M12 |
| DIN208040SEMC22X52 | 40 | 22 | 19 | 40 | 52 | 40.4 | 31 | M16 |
| DIN208040SEMC27X52 | 40 | 27 | 21 | 48 | 52 | 40.4 | 33 | M16 |
| DIN208040SEMC32X52 | 40 | 32 | 24 | 58 | 52 | 40.4 | 38 | M16 |
| DIN208040SEMC40X52 | 40 | 40 | 27 | 70 | 52 | 40.4 | 41 | M16 |
| DIN208050SEMC16X55 | 50 | 16 | 17 | 32 | 55 | 39.8 | 27 | M24 |
| DIN208050SEMC22X55 | 50 | 22 | 19 | 40 | 55 | 39.8 | 31 | M24 |
| DIN208050SEMC27X55 | 50 | 27 | 21 | 48 | 55 | 39.8 | 33 | M24 |
| DIN208050SEMC32X55 | 50 | 32 | 24 | 58 | 55 | 39.8 | 38 | M24 |
| DIN208050SEMC40X55 | 50 | 40 | 27 | 70 | 55 | 39.8 | 41 | M24 |
| DIN208050SEMC50X55 | 50 | 50 | 30 | 90 | 55 | 39.8 | 46 | M24 |

# TUNGHOLD

## DIN2080-DC (Jacobs taper holder)

Jacobs taper holder with DIN2080 shank



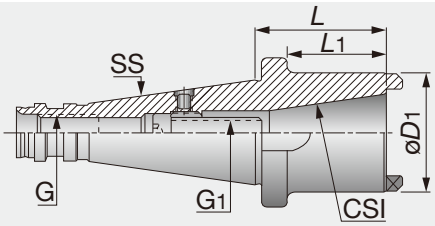

| Designation | SS | Tt° | L | $L_1$ | G |
|---|---|---|---|---|---|
| DIN208030DCB16X20 | 30 | B16 | 20 | 5.4 | M12 |
| DIN208040DCB16X22 | 40 | B16 | 22 | 10.4 | M16 |
| DIN208040DCB18X25 | 40 | B18 | 25 | 13.4 | M16 |
| DIN208050DCB16X25 | 50 | B16 | 25 | 9.8 | M24 |
| DIN208050DCB18X25 | 50 | B18 | 25 | 9.8 | M24 |

Pull stud F135
Clamping screw F141
Wrench F143

# TUNGHOLD

## DIN2080 AD (Conversion adaptor)

Conversion adaptor for DIN2080 system




| Designation | SS | CSI | *L* | ø*D*1 | *L*1 | G1 | G |
|---|---|---|---|---|---|---|---|
| DIN208050AD40 | 50 | DIN2080 | 50 | 63 | 34.8 | M16 | M24 |

# TUNGHOLD

## DIN2080-MT DRW (Hoder for draw bar)

Morse taper holder with draw bar for DIN2080

Fig. 1

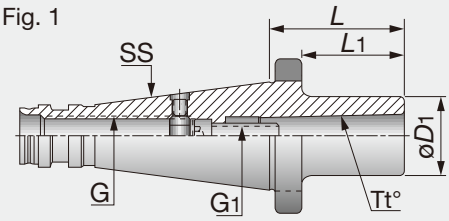
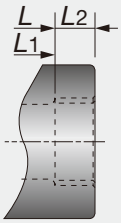



Fig. 2(1)




| Designation | SS | Tt° | *L* | ø*D*1 | *L*1 | *L*2 | G1 | G | Fig. |
|---|---|---|---|---|---|---|---|---|---|
| DIN208040MT1DRW | 40 | MT1 | 50 | 25 | 38.4 | - | M6 | M16 | 1 |
| DIN208040MT2DRW | 40 | MT2 | 50 | 32 | 38.4 | - | M10 | M16 | 1 |
| DIN208040MT3DRW | 40 | MT3 | 65 | 40 | 53.4 | - | M12 | M16 | 1 |
| DIN208040MT4DRW | 40 | MT4 | 95 | 63 | - | 15 | M16 | M16 | 2 |
| DIN208050MT1DRW | 50 | MT1 | 60 | 25 | 44.8 | - | M6 | M24 | 1 |
| DIN208050MT2DRW | 50 | MT2 | 60 | 32 | 44.8 | - | M10 | M24 | 1 |
| DIN208050MT3DRW | 50 | MT3 | 65 | 40 | 49.8 | - | M12 | M24 | 1 |
| DIN208050MT4DRW | 50 | MT4 | 65 | 63 | 49.8 | 15 | M16 | M24 | 2 |
| DIN208050MT5DRW | 50 | MT5 | 100 | 78 | 84.4 | 18 | M20 | M24 | 2 |

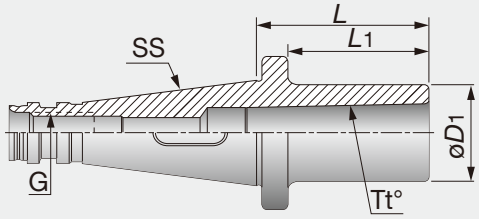
(1) DIN2201.

Pull stud
F135

# TUNGHOLD

## DIN2080-MT (Holder for morse taper)

Morse taper holder with DIN2080 shank

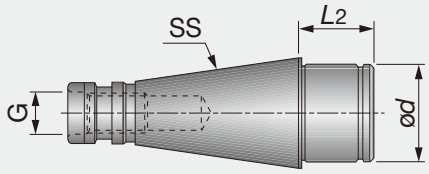



| Designation | SS | Tt° | L | øD1 | L1 | G |
|---|---|---|---|---|---|---|
| DIN208030MT2X50 | 30 | MT2 | 50 | 32 | 40.4 | M12 |
| DIN208030MT3X70 | 30 | MT3 | 70 | 40 | 60.4 | M12 |
| DIN208040MT1X50 | 40 | MT1 | 50 | 25 | 38.4 | M16 |
| DIN208040MT2X50 | 40 | MT2 | 50 | 32 | 38.4 | M16 |
| DIN208040MT3X65 | 40 | MT3 | 65 | 40 | 53.4 | M16 |
| DIN208040MT4X95 | 40 | MT4 | 95 | 48 | 83.4 | M16 |
| DIN208050MT1X45 | 50 | MT1 | 45 | 25 | 29.8 | M24 |
| DIN208050MT2X60 | 50 | MT2 | 60 | 32 | 44.8 | M24 |
| DIN208050MT3X65 | 50 | MT3 | 65 | 40 | 49.8 | M24 |
| DIN208050MT4X70 | 50 | MT4 | 70 | 48 | 54.8 | M24 |
| DIN208050MT5X105 | 50 | MT5 | 105 | 63.5 | 89.2 | M24 |

# TUNGHOLD

## DIN2080-CP(Center plug holder)

Center plugs for DIN2080 shank




| Designation | SS | ød | L2 | G |
|---|---|---|---|---|
| DIN208040CP40 | 40 | 40 | 29 | M16 |
| DIN208050CP60 | 50 | 60 | 39 | M24 |

Pull stud
F135

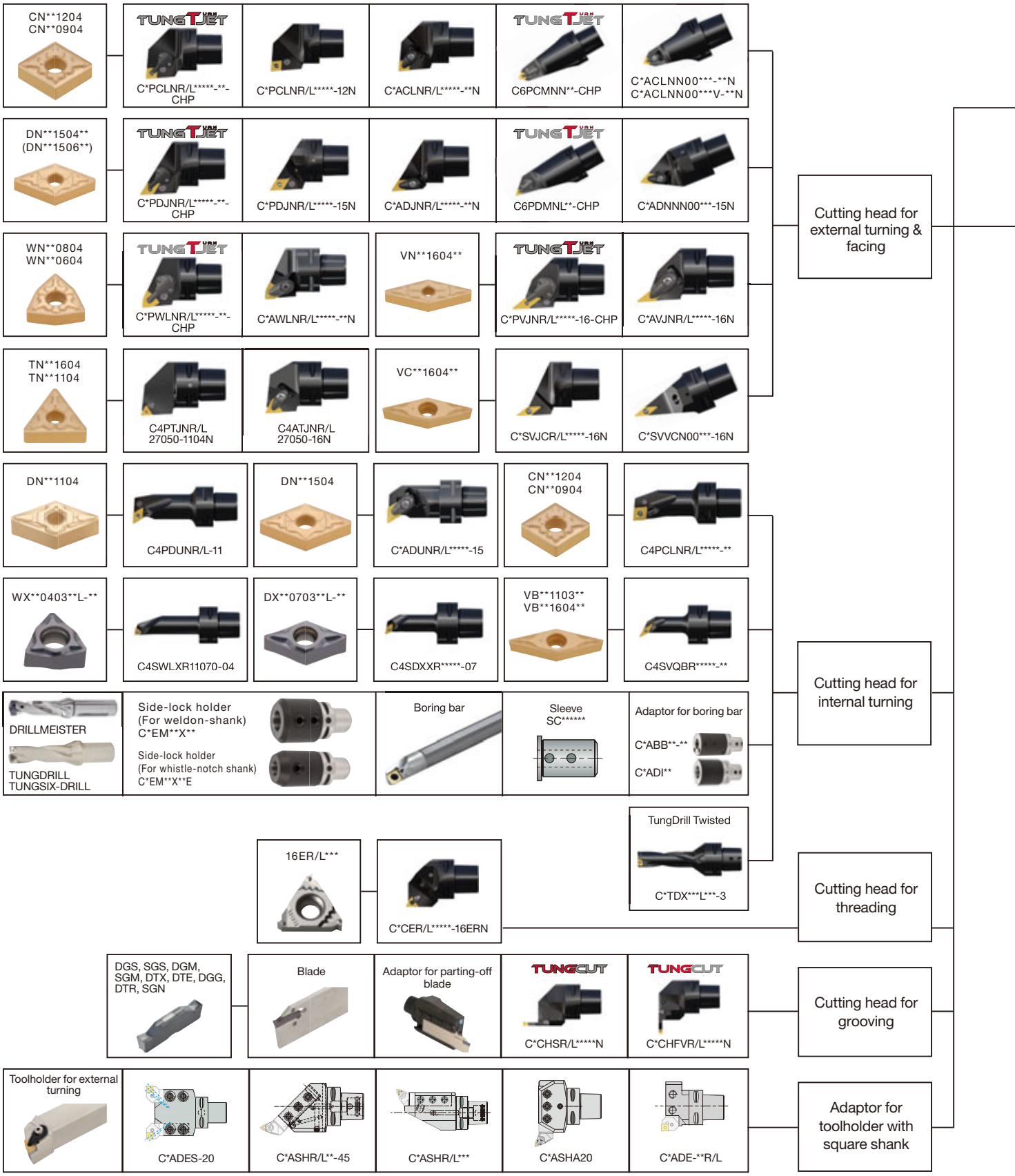
MEMO

TUNGCAP
TUNGALOY

# TungCap Tooling

TUNGCAP

## Turning tool



# System for Multi - Tasking Machine



## TOOLING SYSTEM

### Tool spindle

Extension adaptor

C*EX-**

Reduction adaptor

C*-C*RE-***

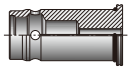
Adaptor for C4 or C5 coupling

### Tool spindle

Endmill holder

C*MAXIN**X***

Straight collet for endmill holder



SC*******

Side-lock holder (For weldon-shank)

C*EM**X**

Side-lock holder (For whistle-notch shank)

C*EM**X**E

ER-collet chuck holder

C*ER**X***
C*ER**X***M

ER-collet

ER******

Collet chuck holder with adjusting alignment

TUNGFINE

ADJC*ER32

ER-collet

ER******

Shrink holder

TUNGSHRINK

C*SRKIN*X**

Arbor for face mill

C*SEM**X**C

Arbor for slot mill

C*FM**X**

Holder for modular tool

TUNGFIX

C*ODP**X**

High speed spindle

SPINJET

TJS**KC*L/R



Tung-Tri shoulder cutter

C*EPA**M***R**L***

Tung-Tri shoulder cutter

C6TLA15M***R**L***

TungDrillTwisted drill

C*TDX***L***-3

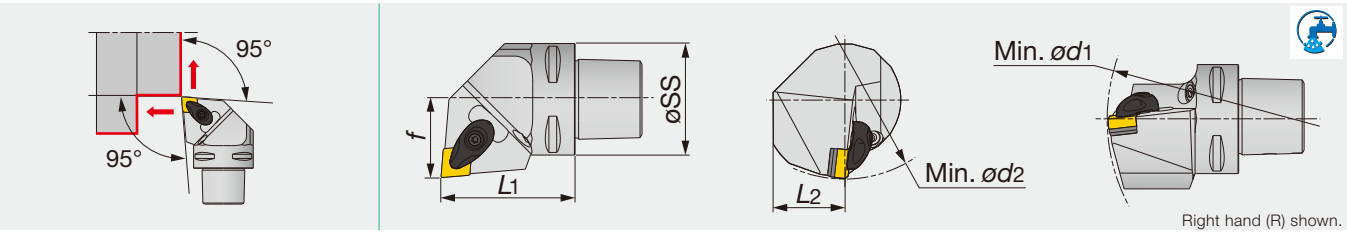
Tool clamp

MULTICLAMPC*

TUNGCAP

## C-ACLNR/L

TurningA double-clamping toolholder with 95° approach angle, for negative 80° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ACLNR/L27050-12N | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5ACLNR/L35060-12N | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6ACLNR/L45065-12N | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |
| C6ACLNR/L45065-16N | 63 | 65 | 41 | 45 | 190 | 125 | 1.2 | CN**1604... |

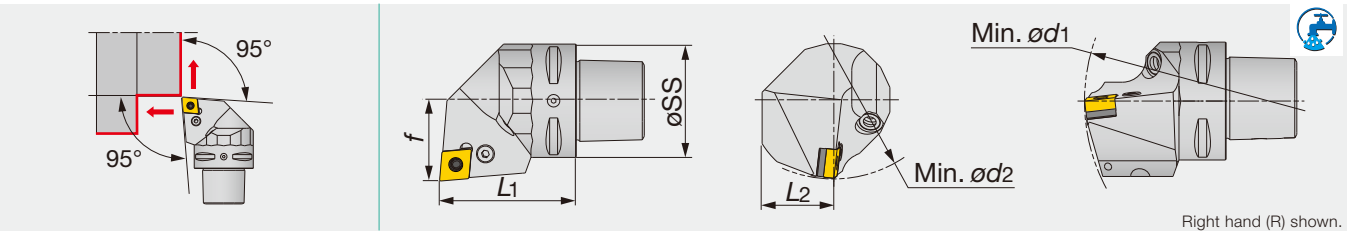
Applicable for 7 MPa pressure coolant

### SPARE PARTS

| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|
| C4ACLN*27050-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C5ACLN*35060-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C6ACLN*45065-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | - | T-15F |
| C6ACLN*45065-16N | ACP5S | ACS-6W | SATZ-M8X1-M3 | ASC533 | CSTB-5 | BP-8.8 | SP-2.5 | KEYV-T20 | - |

## C-PCLNR/L

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C5PCLNR/L35060-12(1) | 50 | 60 | 32 | 35 | - | - | 0.8 | CN**1204... |
| C5PCLNR/L35060-12N(2) | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-12N(2) | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

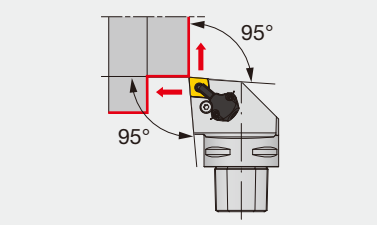
| Designation | Coolant parts | Lever | Clamping screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|---|
| C5PCLN*35060-12 | EZ104 | LCL4 | LCS4 | LSC42 | LSP4 | P-3 |
| C*PCLN**506*-12N | SATZ-M10X1-M5 | LCL4 | LCS4 | LSC42 | LSP4 | P-3 |

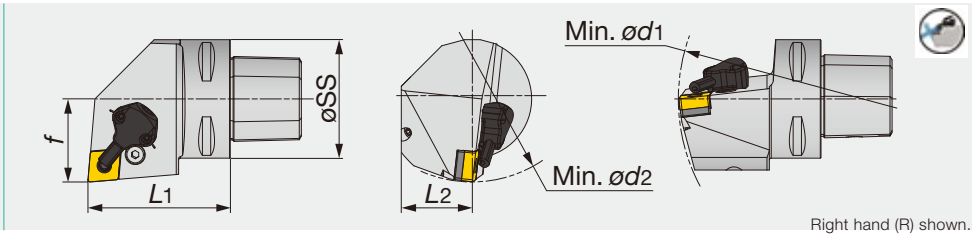
C-ACLNR/L, C-PCLNR/L: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

# TUNGCAP

## C-PCLNR/L-CHP

Lever lock type toolholder with 95° approach angle, for negative 80° rhombic inserts




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L27050-0904-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**0904... |
| C4PCLNR/L27050-12-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | CN**1204... |
| C5PCLNR/L35060-12-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | CN**1204... |
| C6PCLNR/L45065-0904-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**0904... |
| C6PCLNR/L45065-12-CHP | 63 | 65 | 41 | 45 | 190 | 125 | 0.8 | CN**1204... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

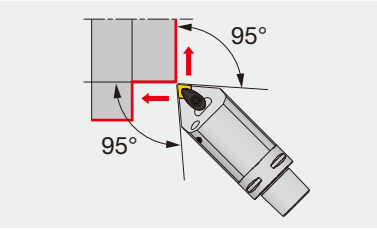
| Designation | Shim | Clamping screw | Spring pin | Lever | Wrench 1 |
|---|---|---|---|---|---|
| C*PCLNR/L**-12-CHP | LSC42 | LCS4 | LSP4 | LCL4 | P-3 |
| C*PCLNR/L**0904-CHP | LSC317 | LCS3 | LSP3 | LCL33 | P-2.5 |

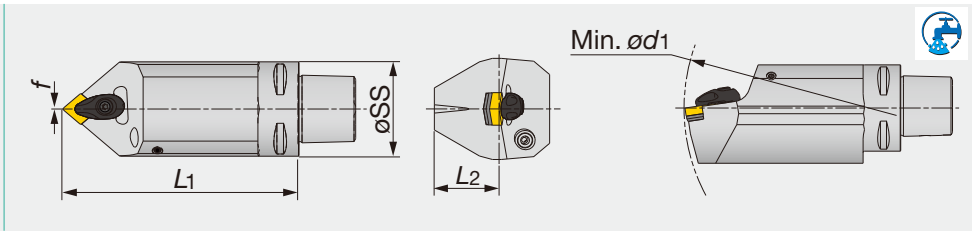
### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PCLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-ACLNN

TurningA double-clamping toolholder with 95° approach angle, for negative 80° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | rε | Insert |
|---|---|---|---|---|---|---|---|
| C5ACLNN00090-12(1) | 50 | 90 | 32 | 0 | - | 0.8 | CN**1204... |
| C5ACLNN00090-12N(2) | 50 | 90 | 32 | 0 | 165 | 0.8 | CN**1204... |
| C5ACLNN00125-12(1) | 50 | 125 | 32 | 0 | - | 0.8 | CN**1204... |
| C5ACLNN00125-12N(2) | 50 | 125 | 32 | 0 | 165 | 0.8 | CN**1204... |
| C6ACLNN00100-12N(2) | 63 | 100 | 37.5 | 0 | 190 | 0.8 | CN**1204... |
| C6ACLNN00140-12N(2) | 63 | 140 | 37.5 | 0 | 190 | 0.8 | CN**1204... |

• "-" in Min ød1: not suitable for internal boring
(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

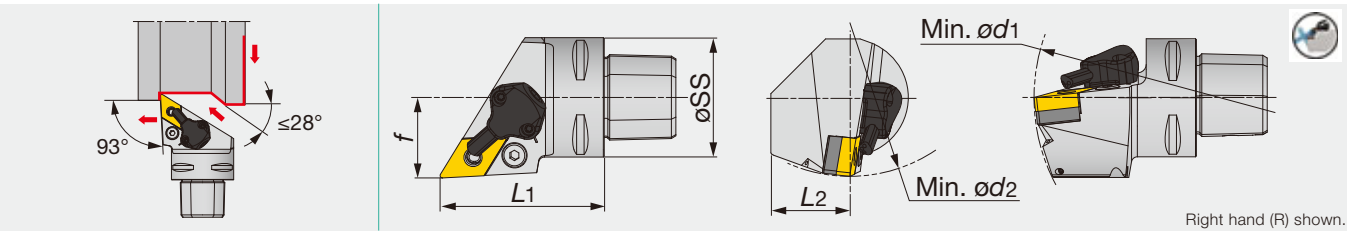
| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C5ACLNN00090-12 | ACP4S | ACS-5W | EZ83 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ACLNN00090-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ACLNN00125-12 | ACP4S | ACS-5W | EZ83 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C*ACLNN001**-12N | ACP4S | ACS-5W | SATZ-M8X1-M3 | ASC422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

C-PCLNR/L-CHP, C-ACLNN: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

# TUNGCAP

## C-PDJNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, 55° rhombic with channels for high pressure coolant




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDJNR/L27050-1104-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1104... |
| C4PDJNR/L27050-15-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | DN**1504(06)... |
| C5PDJNR/L35060-15-CHP | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**1504(06)... |
| C6PDJNR/L45065-1104-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1104... |
| C6PDJNR/L45065-15-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**1504(06)... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

| Designation | Shim | Clamping screw | Spring pin | Lever | Wrench 1 |
|---|---|---|---|---|---|
| C*PDJNR/L**-15-CHP | LSD43A | LCS4 | LSP4 | LCL4 | P-3 |
| C*PDJNR/L**1104-CHP | ELSD32 | LCS3 | LSP3 | LCL33L | P-2.5 |

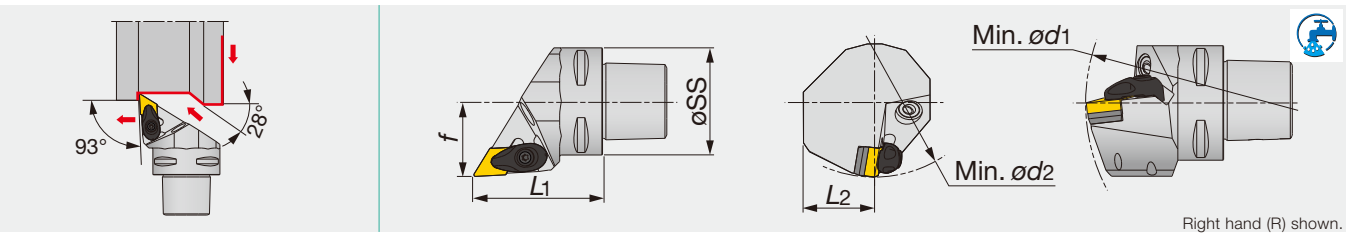
Option: LSD42A (Shim for DN**1506...), LSP4S (Spring pin for DN**1506...)

### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PDJLNR/L**-CHP | CU-D-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-ADJNR/L

TurningA double-clamping toolholder with 93° approach angle, for negative 55° rhombic inserts




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ADJNR/L27050-15N(2) | 40 | 50 | 25 | 27 | 145 | 110 | 0.8 | DN**15... |
| C5ADJNR/L35060-15N(2) | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**15... |
| C6ADJNR/L45065-15(1) | 63 | 65 | 41 | 45 | - | - | 0.8 | DN**15... |
| C6ADJNR/L45065-15N(2) | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | DN**15... |
| C6ADJNR/L45135-15N(2) | 63 | 135 | 41 | 45 | 190 | 110 | 0.8 | DN**15... |

• "-" in Min ød1 and ød2: not suitable for internal boring
(1) Applicable for 3 MPa pressure coolant (2) Applicable for 7 MPa pressure coolant

### SPARE PARTS

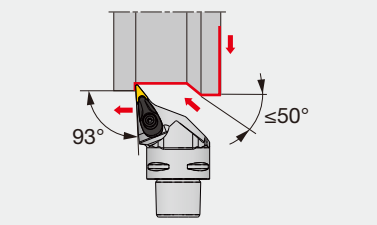
| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C4ADJN*27050-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADJN*35060-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJNL45065-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJN*45065-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADJN*45135-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

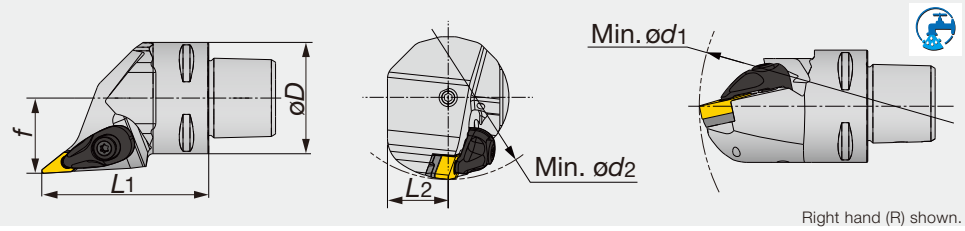
Option: ASD423 (Shim for DN**1506**)

C-ADJNR/L, C-PDJNR/L-CHP: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

# TUNGCAP
## C-AVJNR/L

TurningA double-clamp toolholder with 93° approach angle. For negative 35° rhombic insert.




Right hand (R) shown.

| Designation | øD | L1 | L2 | f | ød1 | ød2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| C4AVJNR/L27060-1204N | 40 | 60 | 20 | 27 | 140 | 55 | 0.8 | VN**1204... |
| C4AVJNR/L27060-16N | 40 | 60 | 25 | 27 | 140 | 110 | 0.8 | VN**1604... |
| C6AVJNR/L45065-1204N | 63 | 65 | 31.5 | 45 | 190 | 81 | 0.8 | VN**1204... |
| C6AVJNR/L45065-16N | 63 | 65 | 35 | 45 | 190 | 81 | 0.8 | VN**1604... |

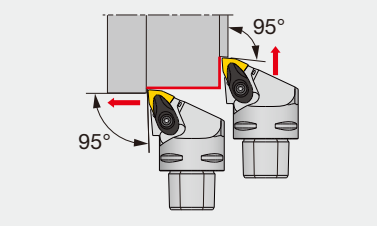
Applicable for 7 MPa pressure coolant.

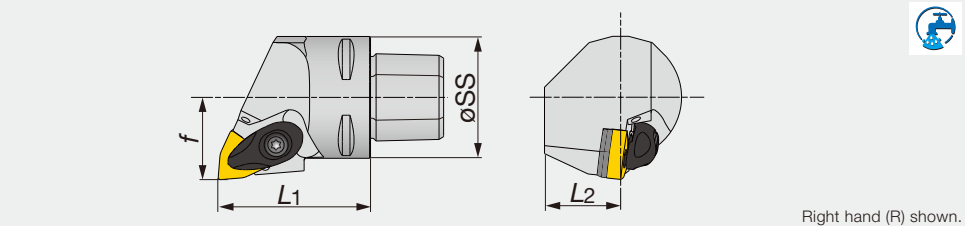
### SPARE PARTS

| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|---|---|
| C4AVJNR/L... | ACP3L-E | ACS-5W | - | ASV222 | CSTB-3 | BP-7 | SP-2.5 | T-9F | T-15F |
| C6AVJNR/L... | ACP3L-E | ACS-5W | SATZ-M10X1-M5 | ASV222 | CSTB-3 | BP-7 | SP-2.5 | T-9F | T-15F |

# TUNGCAP
## C-AWLNR/L

TurningA double-clamping toolholder with 95° approach angle, for negative trigon inserts




Right hand (R) shown.

| Designation | øSS | L1 | L2 | f | rε | Insert |
|---|---|---|---|---|---|---|
| C4AWLNR/L27050-08N | 40 | 50 | 25 | 27 | 0.8 | WN**0804... |

Applicable for 7 MPa pressure coolant.

### SPARE PARTS

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Spring pin | Wrench |
|---|---|---|---|---|---|---|---|
| C4AWLNR/L27050-08N | ACP4S | ACS-5W | ASW422 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

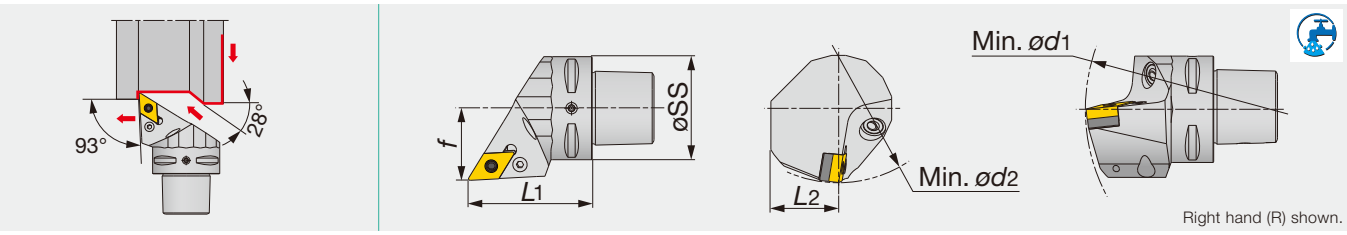
C-AVJNR/L: Inserts → **B091 -**, CBN → **B165 -**, PCD → **B176**

C-AWLNR/L: Inserts → **B095 -**, CBN → **B165**

# TUNGCAP

## C-PDJNR/L

Lever lock type toolholder with 93° approach angle, for negative 55° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min $ød_1$ | Min $ød_2$ | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|---|---|
| C5PDJNR/L35060-15N | 50 | 60 | 32 | 35 | 165 | 110 | 0.8 | DN**1504(06) |
| C6PDJNR/L45065-15N | 63 | 65 | 41 | 45 | 195 | 95 | 0.8 | DN**1504(06) |

Applicable for 7 MPa pressure coolant.

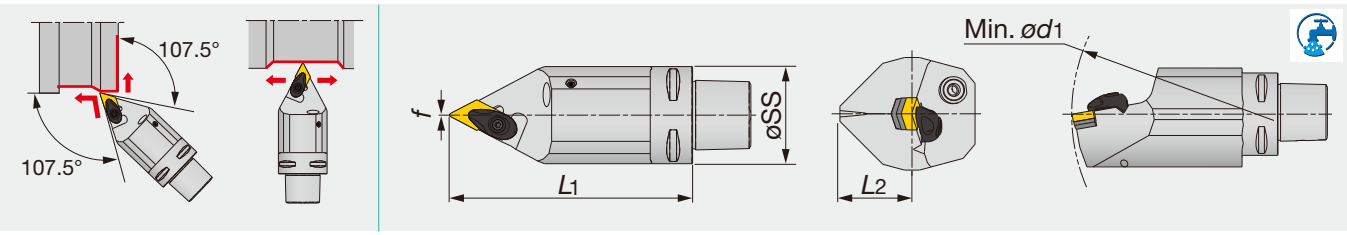
### SPARE PARTS

| Designation | Coolant parts | Shim | Lever | Clamping screw | Spring | Wrench |
|---|---|---|---|---|---|---|
| C5PDJN*35060-15N | SATZ-M10X1-M5 | LSD43A | LCL4 | LCS4 | LSP4 | P-3 |
| C6PDJN*45065-15N | SATZ-M10X1-M5 | LSD43A | LCL4 | LCS4 | LSP4S | P-3 |

Option: LSD42A (Shim for DN**1506...), LSP4S (Spring pin for DN**1506...)

## C-ADNNN

TurningA double-clamping toolholder with 63° approach angle, for negative 55° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min $ød_1$ | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|---|
| C5ADNNN00090-15(1) | 50 | 90 | 32 | 0 | - | 0.8 | DN**1504(06) |
| C5ADNNN00090-15N(2) | 50 | 90 | 32 | 0 | 165 | 0.8 | DN**1504(06) |
| C5ADNNN00125-15(1) | 50 | 125 | 32 | 0 | - | 0.8 | DN**1504(06) |
| C5ADNNN00125-15N(2) | 50 | 125 | 32 | 0 | 165 | 0.8 | DN**1504(06) |
| C6ADNNN00100-15(1) | 63 | 100 | 37.5 | 0 | - | 0.8 | DN**1504(06) |
| C6ADNNN00100-15N(2) | 63 | 100 | 37.5 | 0 | 190 | 0.8 | DN**1504(06) |
| C6ADNNN00140-15(1) | 63 | 140 | 37.5 | 0 | - | 0.8 | DN**1504(06) |
| C6ADNNN00140-15N(2) | 63 | 140 | 37.5 | 0 | 190 | 0.8 | DN**1504(06) |

• "-" in Min $ød_1$: not suitable for internal boring
(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

| Designation | Clamp | Clamping screw | Coolant parts | Shim | Shim screw | Spring | Spring 1 | Wrench |
|---|---|---|---|---|---|---|---|---|
| C5ADNNN00090-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00090-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00125-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C5ADNNN00125-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00100-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00100-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00140-15 | ACP4S | ACS-5W | EZ104 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |
| C6ADNNN00140-15N | ACP4S | ACS-5W | SATZ-M10X1-M5 | ASD432 | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

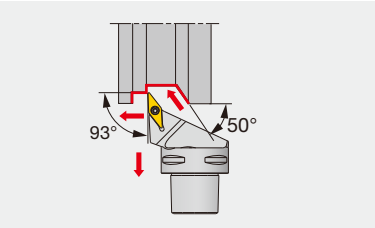
option: ASD423 (Shim for DN**1506**)

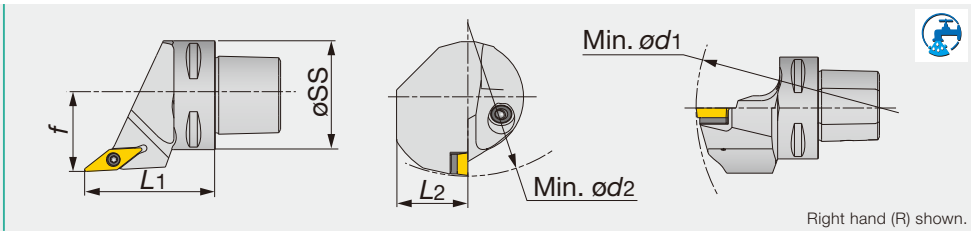
C-PDJNR/L, C-ADNNN: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

# TUNGCAP

## C-SVJCR/L

Screw-on clamp toolholder with 93° approach angle, for positive 35° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | Min $ød_1$ | Min $ød_2$ | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|---|---|
| C5SVJCR/L35060-16(1) | 50 | 60 | 32 | 35 | - | - | 0.8 | VC**1604... |
| C5SVJCR/L35060-16N(2) | 50 | 60 | 32 | 35 | 170 | 160 | 0.8 | VC**1604... |
| C6SVJCR/L45065-16(1) | 63 | 65 | 41 | 45 | - | - | 0.8 | VC**1604... |
| C6SVJCR/L45065-16N(2) | 63 | 65 | 41 | 45 | 170 | 190 | 0.8 | VC**1604... |

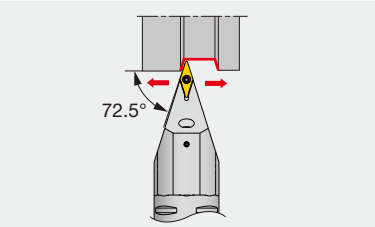
• "-" in Min $ød_1$: not suitable for internal boring
(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

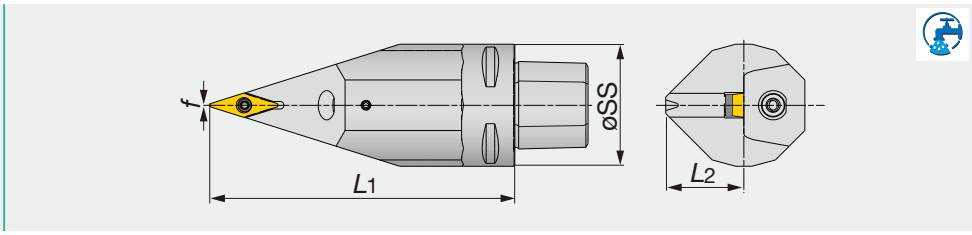
### SPARE PARTS

| Designation | Clamping screw | Coolant parts | Shim | Shim screw | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| C5SVJC*35060-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C5SVJC*35060-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVJC*45065-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVJC*45065-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |

## C-SVVCN

Screw-on clamp toolholder with 72.5° approach angle, for positive 35° rhombic inserts




| Designation | øSS | $L_1$ | $L_2$ | f | $r_\varepsilon$ | Insert |
|---|---|---|---|---|---|---|
| C5SVVCN00090-16(1) | 50 | 90 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00090-16N(2) | 50 | 90 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00125-16(1) | 50 | 125 | 32 | 0 | 0.8 | VC**1604... |
| C5SVVCN00125-16N(2) | 50 | 125 | 32 | 0 | 0.8 | VC**1604... |
| C6SVVCN00100-16(1) | 63 | 100 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00100-16N(2) | 63 | 100 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00140-16(1) | 63 | 140 | 37.5 | 0 | 0.8 | VC**1604... |
| C6SVVCN00140-16N(2) | 63 | 140 | 37.5 | 0 | 0.8 | VC**1604... |

(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

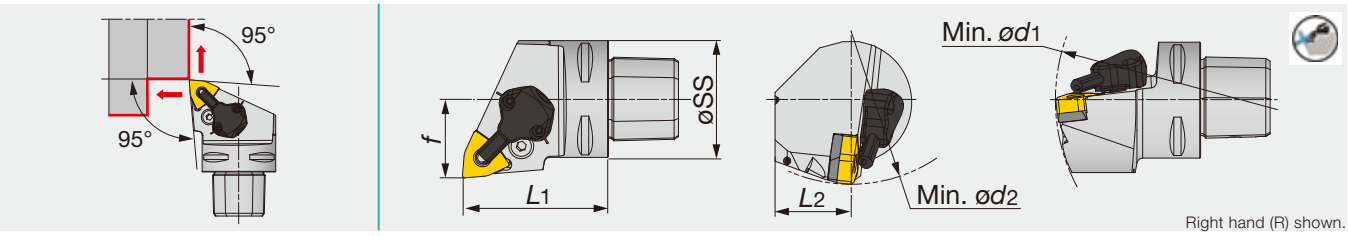
| Designation | Clamping screw | Coolant parts | Shim | Shim screw | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|
| C5SVVCN00090-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C5SVVCN00090-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C5SVVCN00125-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C5SVVCN00125-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVVCN00100-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVVCN00100-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVVCN00140-16 | CSTB-3.5L | EZ104 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |
| C6SVVCN00140-16N | CSTB-3.5L | SATZ-M10X1-M5 | SSV32 | DTS5-3.5 | P-3.5 | T-15F |

C-SVJCR/L, C-SVVCN: Inserts → **B147 -**, CBN → **B169 -**, PCD → **B177 -**

# TUNGCAP

## C-PWLNR/L-CHP

Lever lock type toolholder with TungCap connection, for negative inserts, W 80° trigon with channels for high pressure coolant




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_2$ | f | Min ød1 | Min ød2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PWLNR/L27050-0604-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0604... |
| C4PWLNR/L27050-08-CHP | 40 | 50 | 25 | 27 | 140 | 110 | 0.8 | WN**0804... |
| C6PWLNR/L45065-08-CHP | 63 | 65 | 41 | 45 | 190 | 110 | 0.8 | WN**0804... |

Applicable for 14 MPa pressure coolant

### SPARE PARTS FOR P-TYPE

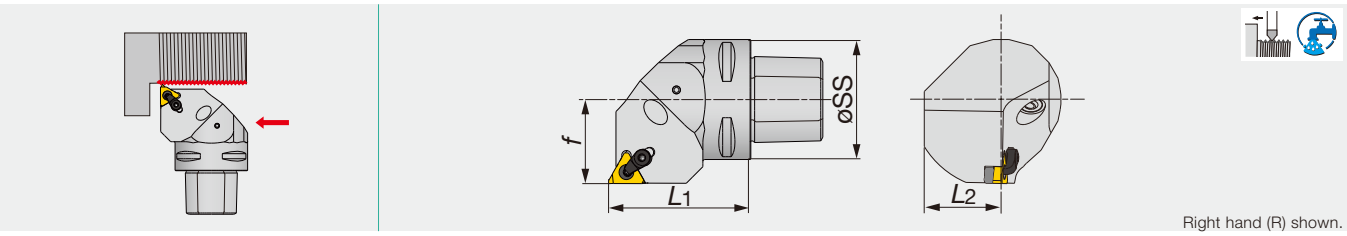
| Designation | Shim | Clamping screw | Spring pin | Lever | Wrench 1 |
|---|---|---|---|---|---|
| C*PWLNR/L**-08-CHP | LSW42BL | LCS4 | LSP4 | LCL4 | P-3 |
| C*PWLNR/L**0604-CHP | LSW312 | LCS3 | LSP3 | LCL3 | P-2.5 |

### COOLANT SET

| Designation | Coolant unit | Mounting screw | Wrench 2 | O-ring |
|---|---|---|---|---|
| C*PWLNR/L**-CHP | CU-CW-CHP | SRM3 | T-8F | OR6.4X0.9N |

## C-CER/L

TungThread external threading toolholders, alternative clamping of screw-on or clamp-on




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_2$ | f | rε | Insert |
|---|---|---|---|---|---|---|
| C4CER/L27050-16ERN(2) | 40 | 50 | 25 | 27 | 0.8 | 16ER/L... |
| C5CER/L35060-16ER(1) | 50 | 60 | 32 | 35 | 0.8 | 16ER/L... |
| C5CER/L35060-16ERN(2) | 50 | 60 | 32 | 35 | 0.8 | 16ER/L... |
| C6CER/L45065-16ER(1) | 63 | 65 | 41 | 45 | 0.8 | 16ER/L... |
| C6CER/L45065-16ERN(2) | 63 | 65 | 41 | 45 | 0.8 | 16ER/L... |

(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.

### SPARE PARTS

| Designation | Clamp set | Clamping screw | Coolant parts | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|---|---|
| C5CE*35060-16ER | CSP16 | CSTB-3.5ST | EZ104 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C5CE*35060-16ERN | CSP16 | CSTB-3.5ST | SATZ-M10X1-M5 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C6CE*45065-16ER | CSP16 | CSTB-3.5ST | EZ104 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |
| C6CE*45065-16ERN | CSP16 | CSTB-3.5ST | SATZ-M10X1-M5 | DTS5-3.5 | A16-1DT | P-3.5 | T-15F |

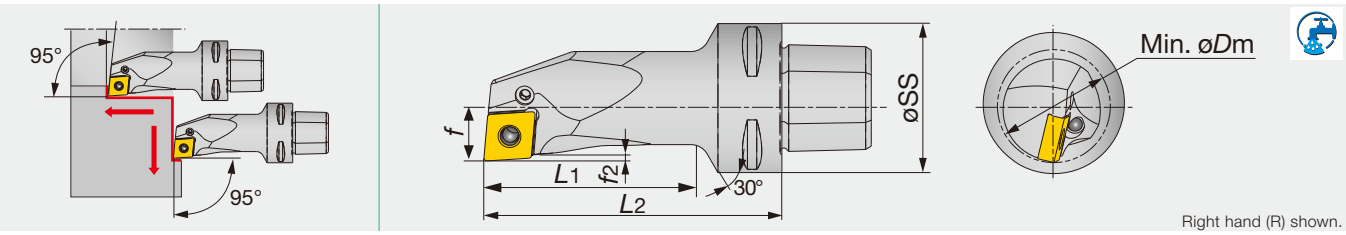
C-PWLNR/L-CHP: Inserts → **B095 -**, CBN → **B165**

C-CER/L: Inserts → **B384 -**

# TUNGCAP

## C-PCLNR/L-IN

Lever lock type boring bar, for negative 80° rhombic inserts




| Designation | Min. øDm | øSS | L2 | L1 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PCLNR/L17080-12 | 32 | 40 | 80 | 58.5 | 17 | 1.6 | 0.8 | CN**1204... |

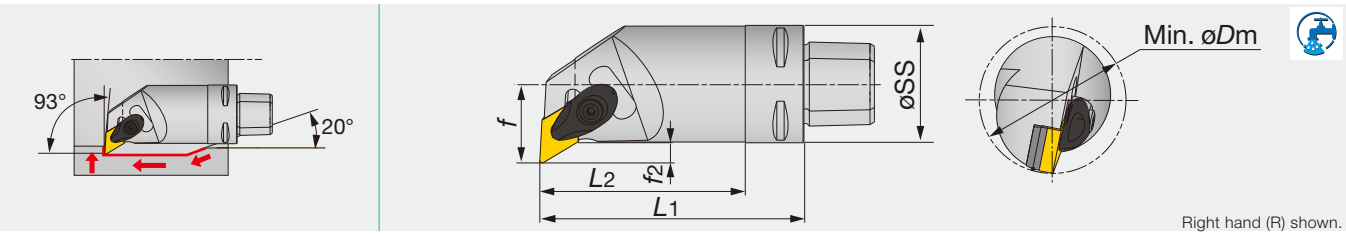
• Applicable for 10 MPa pressure coolant

SPARE PARTS

| Designation | Lever | Clamping screw | Wrench |
|---|---|---|---|
| C-PCLNR/L-IN | LCL43N | LCS43 | P-2.5 |

## C-ADUNR/L

TurningA double-clamp boring bar, for negative 55° rhombic inserts




| Designation | Min. øDm | øSS | L1 | L2 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4ADUNR20070-15 | 38 | 40 | 70 | 50 | 20 | 5 | 0.8 | DN**1504... |
| C4ADUNR27090-15 | 50 | 40 | 90 | - | 27 | 7 | 0.8 | DN**1504... |

• Applicable for 10 MPa pressure coolant

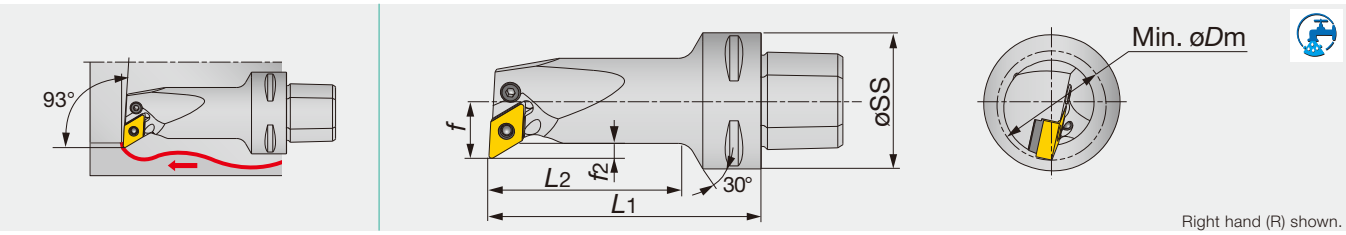
SPARE PARTS

| Designation | Clamp | Clamp screw | Shim | Shim screw | Spring | Spring pin | Wrench |
|---|---|---|---|---|---|---|---|
| C-ADUNR/L | ACP4S | ACS-5W | ASD423(04) | CSTB-3.5 | BP-7 | SP-2.5 | T-15F |

option : ASD423 (Shim for DN**1506**)

## C-PDUNR/L

Lever lock type boring bar, for negative 55° rhombic inserts




| Designation | Min. øDm | øSS | L1 | L2 | f | f2 | rε | Insert |
|---|---|---|---|---|---|---|---|---|
| C4PDUNR/L17080-11 | 32 | 40 | 80 | 58.5 | 17 | 4.4 | 0.8 | DN**1104... |

• Applicable for 10 MPa pressure coolant

SPARE PARTS

| Designation | Lever | Clamping screw | Shim | Spring | Wrench |
|---|---|---|---|---|---|
| C4PDUNR17080-11 | LCL33L | LCS3 | ELSD317BR | LSP3 | P-2.5 |
| C4PDUNL17080-11 | LCL33L | LCS3 | ELSD317BL | LSP3 | P-2.5 |

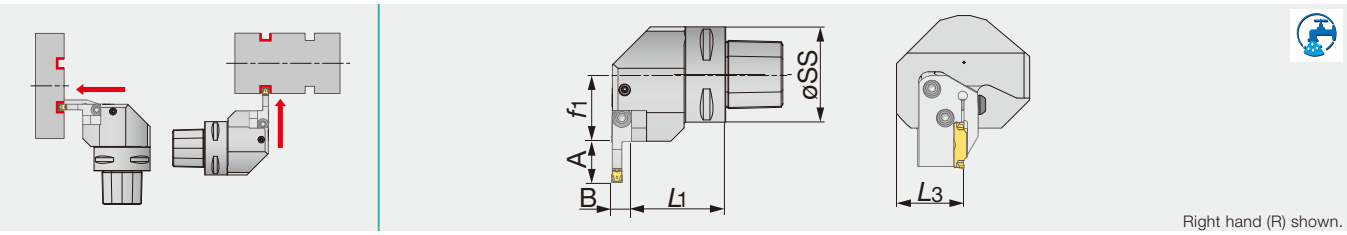
C-PCLNR/L-IN: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

C-ADUNR/L: Inserts → **B061 -**, CBN → **B163 -**, PCD → **B176**

C-PDUNR/L: Inserts → **B061 -**

# TUNGCAP
## C-CHFVR/L

TungCap shank for perpendicular toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_3$ | $f_1$ | A | B |
|---|---|---|---|---|---|---|
| C4CHFVR/L27050N(2) | 40 | 42.5 | 36 | 27 | Table* | Table* |
| C5CHFVR/L35060N(2) | 50 | 49.5 | 36 | 35 | Table* | Table* |
| C6CHFVR/L45065(1) | 63 | 54.5 | 41 | 45 | Table* | Table* |
| C6CHFVR/L45065N(2) | 63 | 54.5 | 41 | 45 | Table* | Table* |

(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.
*See the table below for offset dimensions

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C5CHFV*35060N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |
| C6CHFV*45065 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C6CHFV*45065N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

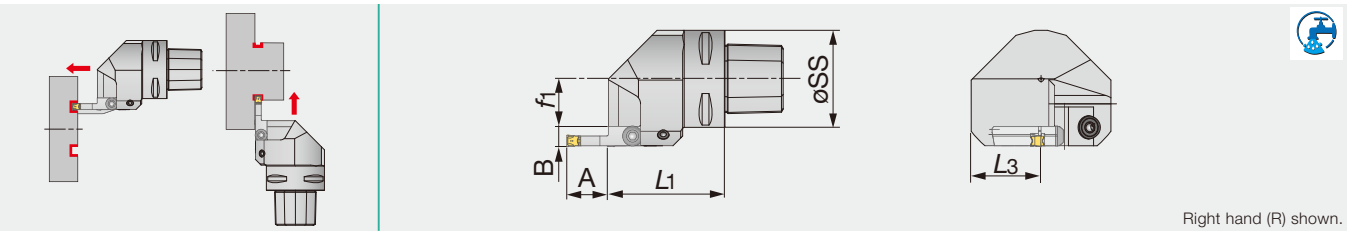
### Combination of blade and toolholder

| Toolholder | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHFVR... | | ● | ● | |
| CHFVL... | ● | | | ● |

● : Correspondence

# TUNGCAP
## C-CHSR/L

TungCap shank for toolholders for CAER/L & CAFR/L blades




Right hand (R) shown.

| Designation | øSS | $L_1$ | $L_3$ | $f_1$ | A | B |
|---|---|---|---|---|---|---|
| C4CHSR/L27050N(2) | 40 | 50 | 36 | 16.5 | Table* | Table* |
| C5CHSR/L35060(1) | 50 | 60 | 36 | 24.5 | Table* | Table* |
| C5CHSR/L35060N(2) | 50 | 60 | 36 | 24.5 | Table* | Table* |
| C6CHSR/L45065N(2) | 63 | 65 | 41 | 34.5 | Table* | Table* |

(1) Applicable for 3 MPa pressure coolant. (2) Applicable for 7 MPa pressure coolant.
*See the table below for offset dimensions

### SPARE PARTS

| Designation | Coolant parts | Coolant parts 1 | Clamping screw | Wrench |
|---|---|---|---|---|
| C4CHS*27050N | SATZ-M8X1-M3 | - | CSHB-6-A | P-4 |
| C5CHS*35060 | CNZ125 | PNZ5 | CSHB-6-A | P-4 |
| C*CHS**506*N | SATZ-M10X1-M5 | - | CSHB-6-A | P-4 |

### Combination of blade and toolholder

| Toolholder | Blade | | | |
|---|---|---|---|---|
| | CAER... | CAEL... | CAFR... | CAFL... |
| CHSR... | ● | | | ● |
| CHSL... | | ● | ● | |

● : Correspondence

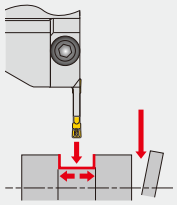
### *Table: Offset dimensions for blade

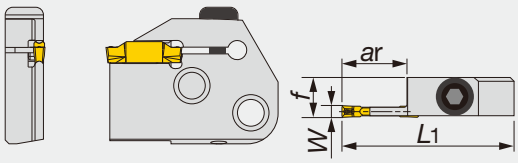
| Application | Blade | A | B |
|---|---|---|---|
| For external grooving | CAER/L-3T16 | 16 | 10.4 |
| | CAER/L-4T16 | 16 | 10.5 |
| | CAER/L-5T20 | 20 | 10.5 |
| | CAER/L-6T20 | 20 | 10.5 |
| For face grooving | CAFR/L-3T12-* | 12 | 10.4 |
| | CAFR/L-4T16-* | 16 | 10.5 |
| | CAFR/L-5T20-* | 20 | 10.5 |
| | CAFR/L-6T20-* | 25 | 10.5 |

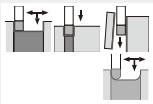
# TUNGCUT

## CAER/L

Blades for external grooving & turning





Inserts:
DGS, SGS, DGM, SGM, DTX, DTE, DGG, DTR, SGN

Right hand (R) shown.

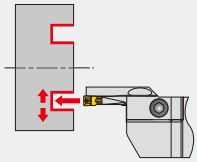
| Designation | Seat size | *ar* | *W* | *L*1 | *f* | Shank |
|---|---|---|---|---|---|---|
| CAER/L-3T16 | 3 | 16 | 3 | 45 | 10.4 | CHSR/L, CHRVL/R |
| CAER/L-4T16 | 4 | 16 | 4 | 45 | 10.5 | CHSR/L, CHRVL/R |
| CAER/L-5T20 | 5 | 20 | 5 | 49 | 10.5 | CHSR/L, CHRVL/R |
| CAER/L-6T20 | 6 | 20 | 6 | 49 | 10.5 | CHSR/L, CHRVL/R |

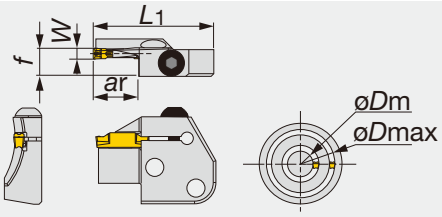
### SPARE PARTS

| Designation | Screw | Wrench |
|---|---|---|
| CAER/L | BHM6-20-A | P-4 |

## CAFR/L

Blades for face grooving & turning





Inserts[5]
CAFR/L-3T12-040055: DTF
Shanks: CHFVR/L, CHSR/L

Right hand (R) shown.

| Designation | Seat size | *øDm* | *øDmax* | *ar* | *W* | *L*1 | *f* |
|---|---|---|---|---|---|---|---|
| CAFR/L-3T12-040055 | 3 | 40 | 55 | 12 | 3 | 45 | 10.4 |
| CAFR/L-3T12-055075 | 3 | 55 | 75 | 12 | 3 | 45 | 10.4 |
| CAFR/L-3T12-075100 | 3 | 75 | 100 | 12 | 3 | 45 | 10.4 |
| CAFR/L-3T12-100140 | 3 | 100 | 140 | 12 | 3 | 45 | 10.4 |
| CAFR/L-3T12-140200 | 3 | 140 | 200 | 12 | 3 | 45 | 10.4 |
| CAFR/L-4T16-050070 | 4 | 50 | 70 | 16 | 4 | 45 | 10.5 |
| CAFR/L-4T16-070100 | 4 | 70 | 100 | 16 | 4 | 45 | 10.5 |
| CAFR/L-4T16-100150 | 4 | 100 | 150 | 16 | 4 | 45 | 10.5 |
| CAFR/L-4T16-150250 | 4 | 150 | 250 | 16 | 4 | 45 | 10.5 |
| CAFR/L-5T20-055080 | 5 | 55 | 80 | 20 | 5 | 49 | 10.5 |
| CAFR/L-5T20-080120 | 5 | 80 | 120 | 20 | 5 | 49 | 10.5 |
| CAFR/L-5T20-120180 | 5 | 120 | 180 | 20 | 5 | 49 | 10.5 |
| CAFR/L-5T20-180300 | 5 | 180 | 300 | 20 | 5 | 49 | 10.5 |
| CAFR/L-5T20-300000 | 5 | 300 | ∞ | 20 | 5 | 49 | 10.5 |
| CAFR/L-6T25-060090 | 6 | 60 | 90 | 25[1] | 6 | 55 | 10.5 |
| CAFR/L-6T25-090150 | 6 | 90 | 150 | 25[1] | 6 | 55 | 10.5 |
| CAFR/L-6T25-150250 | 6 | 150 | 250 | 25[1] | 6 | 55 | 10.5 |
| CAFR/L-6T25-250400 | 6 | 250 | 400 | 25[1] | 6 | 55 | 10.5 |

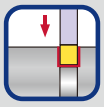
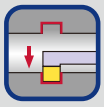
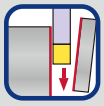
(1) When groove depth is beyond the value of insert full length -1.5 mm, single sided insert is recommended.
(2) The value "*f*" is the dimension when the insert with groove width (W) in the above table is attached.
(3) Not applicable for CAFR/L-3T12-040055.
(4) Seat sizes of DTF are only 3 and 4.
(5) Min. diameter ø*D*m of DTE, DGS and DGM insert.

### SPARE PARTS

| Designation | Screw | Wrench |
|---|---|---|
| CAFR/L | BHM6-20-A | P-4 |

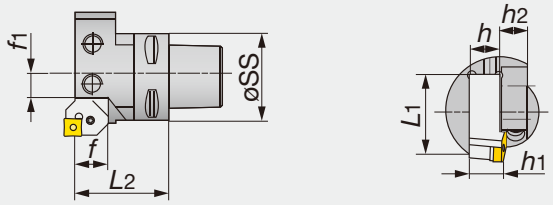
CAER/L, CAFR/L: Inserts → **C077 -**

## INSERT APPLICATION

| Insert | Application | | | | | | |
|---|---|---|---|---|---|---|---|
| | Grooving | | | Parting | Turning | | |
| | External | Internal | Face | | External | Internal | Face |
| |  |  | |  | | | |
| DGM / SGM | ● | | ● | ● | | | |
| DGS / SGS | ● | | ● | ● | | | |
| DTE | ● | | ● | | ● | | ● |
| DGG | ● | | ● | | | | |
| DGE | ● | | | | | | |
| DTX | ● | ● | ● | ● | ● | ● | ● |
| DTI | | ● | | | | ● | |
| DGIM / DGIS | | ● | | | | | |
| DTF | | | ● | | | | ● |
| DTR | ● | | ● | | ● | | ● |
| DTIU | ● Undercutting | ● Undercutting | | | | | |
| DTA | | | | | ● Al wheel machining | ● Al wheel machining | |
| SGN | ● | | | | | | |

# TUNGCAP
## C-ADER/L

Adapter for square shank toolholders



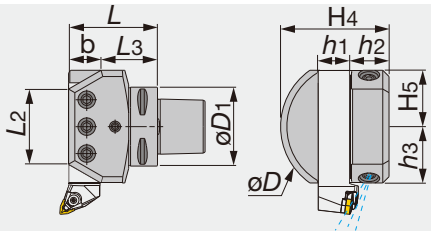

Left hand (L) shown.

| Designation | øSS | $f_1$ | $L_2$ | $f$ | $h_1$ | $h_2$ | $h$ | $L_1$ |
|---|---|---|---|---|---|---|---|---|
| C3ADE-16R/L | 32 | 17 | 45 | 16 | 16 | 26 | 16 | 45 |
| C4ADE-20R/L | 40 | 8 | 49.2 | 20 | 20 | 26 | 20 | 57 |
| C5ADE-20R/L | 50 | 8 | 55.2 | 20 | 20 | 20 | 20 | 57 |

Regular shank should be shortened.
Applicable for 10 MPa pressure coolant

## C-ASHA

Adapters for square shank toolholders

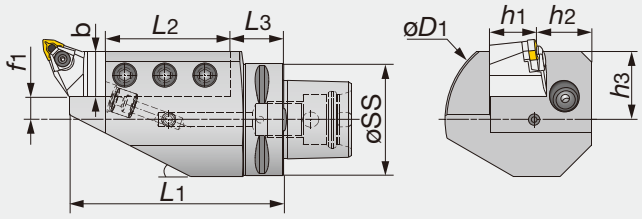



| Designation | $øD_1$ | $h_1$ | $b$ | $L$ | $L_2$ | $L_3$ | $h_3$ | $H_5$ | $h_2$ | $H_4$ | $øD$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHA20 | 50 | 20 | 20 | 58 | 46 | 38 | 38 | 38 | 31.5 | 76.5 | 90 |
| C6ASHA20 | 63 | 20 | 20 | 60 | 46 | 40 | 38 | 38 | 31.5 | 76.5 | 90 |
| C6ASHA25 | 63 | 25 | 25 | 71 | 61 | 46 | 45 | 45 | 31.6 | 86.5 | 110 |

Applicable for 10 MPa pressure coolant

# TUNGCAP
## C-ASHR/L

Adapter for square shank toolholders




Left hand (L) shown.

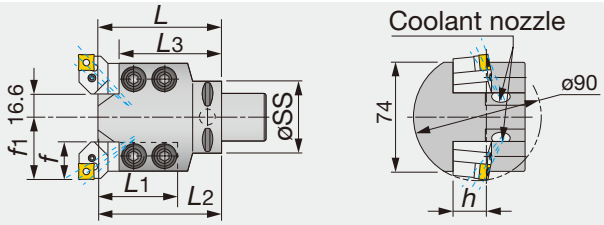
| Designation | øSS | $L_1$ | $L_2$ | $L_3$ | $f_1$ | $h_1$ | $b$ | $h_2$ | $h_3$ | $øD_1$ |
|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHR/L201 | 50 | 98 | 63.5 | 24.5 | 10 | 20 | 20 | 33 | 30 | 90 |
| C6ASHR251-J | 63 | 120 | 82 | 38 | 4.5 | 25 | 25 | 31.5 | 29.5 | 90 |
| C6ASHL251 | 63 | 120 | 70 | 30 | 13 | 25 | 25 | 32 | 38 | 100 |
| C8ASHR/L32-1 | 80 | 140 | 95 | 35 | 8 | 32 | 32 | 32 | 40 | 110 |

Regular shank should be shortened.
Applicable for 10 MPa pressure coolant

TUNGCAP

## C-ADES

Adapters for square shank toolholders

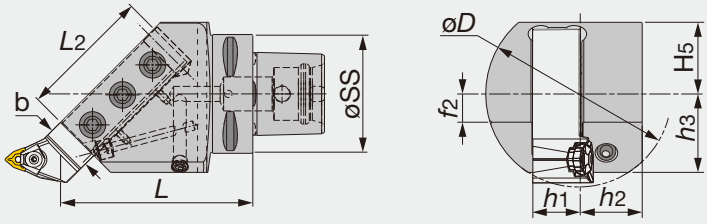



| Designation | øSS | $f_1$ | $L_2$ | L | $L_3$ | h | f | $L_1$ |
|---|---|---|---|---|---|---|---|---|
| C4ADES-20 | 40 | 41.6 | 98 | 85 | 71 | 20 | 25 | 67 |
| C5ADES-20 | 50 | 41.6 | 98 | 85 | 71 | 20 | 25 | 67 |

Regular shank should be shortened.
Applicable for 10 MPa pressure coolant

## C-ASHR/L-45

Adapters for square shank toolholder with 45° angle




Left hand (L) shown.

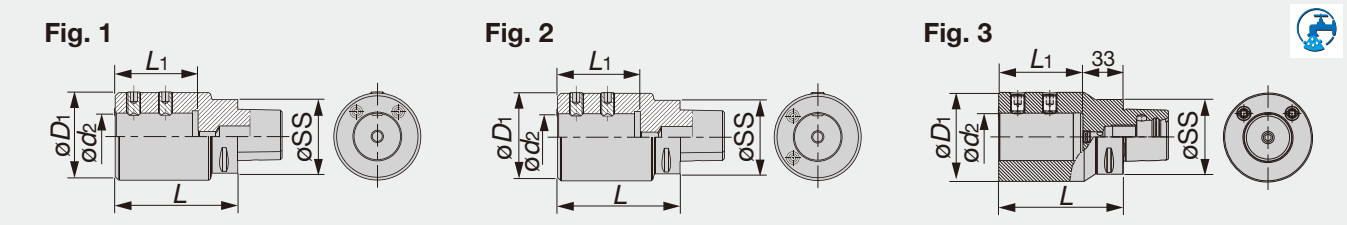
| Designation | øSS | $h_1$ | b | $L_2$ | L | $h_2$ | $h_3$ | $H_5$ | $f_2$ | øD |
|---|---|---|---|---|---|---|---|---|---|---|
| C5ASHR/L20-45 | 50 | 20 | 20 | - | 96.3 | 26 | 36 | 31.5 | 15 | 72 |
| C6ASHR/L20-45 | 63 | 20 | 20 | 70 | 98.3 | 26 | 36 | 31.5 | 15 | 72 |
| C6ASHR/L25-45 | 63 | 25 | 25 | 70 | 101.3 | 33 | 41.6 | 38 | 15 | 100 |

Regular shank should be shortened.
Applicable for 10 MPa pressure coolant

## C-ABB

Adaptors for boring bars with sleeves






| Designation | øSS | ød2 | øD1 | L | L1 | Fig. |
|---|---|---|---|---|---|---|
| C5ABB-25-60 | 50 | 25 | 63 | 100 | 60 | 2 |
| C6ABB-25-60C* | 63 | 25 | 63 | 95 | 60 | 1 |
| C6ABB-40-70C* | 63 | 40 | 75 | 105 | 71 | 3 |
| C8ABB25-60 | 80 | 25 | 63 | 100 | 60 | 2 |
| C8ABB40-72 | 80 | 40 | 75 | 105 | 71 | 2 |

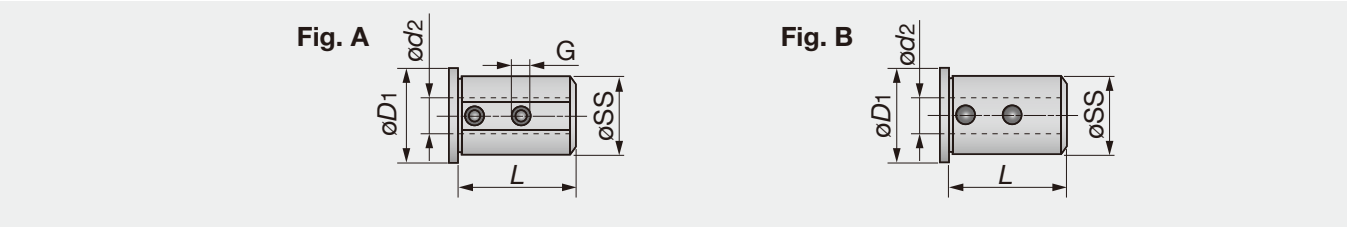
* Use the appropriate outlet screw according to the tool setup.
Applicable for 7 MPa pressure coolant

### SPARE PARTS

| Designation | Clamp screw | | Coolant outlet screw for internal supply | Coolant outlet screw for external supply |
|---|---|---|---|---|
| | Used on A-type sleeves | Used on B-type sleeves | | |
| C…ABB-25-60/C | SRM10X20DIN915 | SRM10X12DIN1835-B | SRM10X6DIN913 | SRM6X8DIN913 |
| C6ABB-40-70/C | SRM12X20DIN915 | SRM12X16DIN1835-B | SRM10X6DIN913 | SRM6X8DIN913 |
| C8ABB25-60 | SRM10X20DIN915 | SRM10X12DIN1835-B | SRM10X6DIN913 | - |
| C8ABB40-72 | SRM12X20DIN915 | SRM12X16DIN1835-B | SRM10X6DIN913 | - |

## SC

Sleeves for C-ABB adaptors

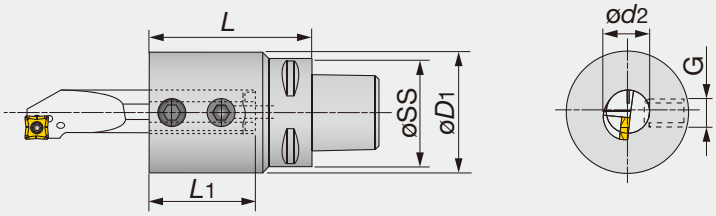



| Designation | øSS | ød2 | øD1 | L | G | Fig. |
|---|---|---|---|---|---|---|
| SC25T6A | 25 | 6 | 31 | 56 | M6 | A |
| SC25T8A | 25 | 8 | 31 | 56 | M8 | A |
| SC25T10A | 25 | 10 | 31 | 56 | M8 | A |
| SC25T12A | 25 | 12 | 31 | 56 | M8 | A |
| SC25T16B | 25 | 16 | 31 | 56 | - | B |
| SC25T20B | 25 | 20 | 31 | 56 | - | B |
| SC40T6A | 40 | 6 | 46 | 58 | M6 | A |
| SC40T8A | 40 | 8 | 46 | 58 | M6 | A |
| SC40T10A | 40 | 10 | 46 | 58 | M8 | A |
| SC40T12A | 40 | 12 | 46 | 58 | M8 | A |
| SC40T16B | 40 | 16 | 46 | 58 | - | B |
| SC40T20B | 40 | 20 | 46 | 58 | - | B |
| SC40T25B | 40 | 25 | 46 | 58 | - | B |
| SC40T32B | 40 | 32 | 46 | 58 | - | B |

TUNGCAP

## C-ADI

Adaptors for boring bars

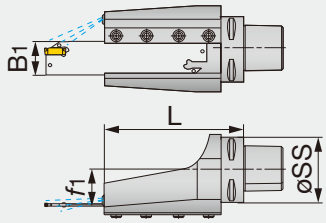



| Designation | øSS | L | L1 | ød2 | øD1 | G |
|---|---|---|---|---|---|---|
| C4ADI10 | 40 | 50 | 20 | 10 | 36 | M6 |
| C4ADI12 | 40 | 50 | 24 | 12 | 36 | M8 |
| C4ADI16 | 40 | 50 | 32 | 16 | 36 | M8 |
| C4ADI20 | 40 | 60 | 35 | 20 | 36 | M10 |
| C4ADI25 | 40 | 70 | 45 | 25 | 54 | M12 |
| C5ADI10 | 50 | 60 | 26 | 10 | 36 | M6 |
| C5ADI12 | 50 | 60 | 26 | 12 | 36 | M8 |
| C5ADI16 | 50 | 60 | 32 | 16 | 36 | M8 |
| C5ADI20 | 50 | 60 | 40 | 20 | 36 | M10 |
| C5ADI25 | 50 | 70 | 50 | 25 | 54 | M12 |
| C5ADI32 | 50 | 100 | 76 | 32 | 68 | M12 |
| C6ADI12 | 60 | 65 | 36 | 12 | 36 | M8 |
| C6ADI16 | 60 | 65 | 36 | 16 | 36 | M8 |
| C6ADI20 | 60 | 65 | 40 | 20 | 36 | M10 |
| C6ADI25 | 60 | 76 | 51 | 25 | 54 | M12 |
| C6ADI32 | 60 | 100 | 76 | 32 | 68 | M12 |
| C6ADI40 | 60 | 100 | 76 | 40 | 98 | M12 |
| C6ADI50 | 60 | 115 | 76 | 50 | 98 | M12 |
| C8ADI12 | 80 | 70 | 36 | 12 | 36 | M8 |
| C8ADI16 | 80 | 70 | 36 | 16 | 36 | M8 |
| C8ADI20 | 80 | 70 | 40 | 20 | 36 | M10 |
| C8ADI25 | 80 | 80 | 51 | 25 | 54 | M12 |
| C8ADI32 | 80 | 110 | 86 | 32 | 68 | M12 |
| C8ADI40 | 80 | 115 | 86 | 40 | 98 | M12 |
| C8ADI50 | 80 | 115 | 86 | 50 | 98 | M12 |

Applicable for 7 MPa pressure coolant

## C-TBK-R/L

Adaptors for parting and grooving blades

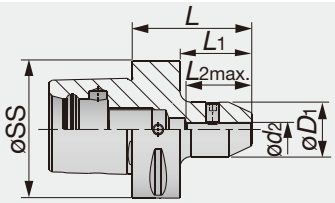


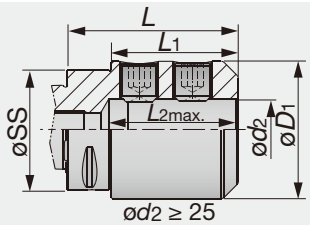

| Designation | øSS | f1 | L | B1 |
|---|---|---|---|---|
| C6TBK-32R/L | 63 | 32 | 138 | 32 |
| C8TBK-32R | 80 | 40.5 | 147 | 32 |
| C8TBK-52R | 80 | 40.5 | 161 | 52 |

Applicable for 3 MPa pressure coolant

## Weldon endmill holders (DIN1835 Form B)





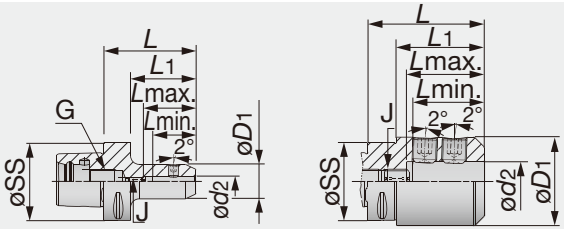

| Designation | øSS | ød2 | øD1 | L | L1 | L2max. | Designation | øSS | ød2 | øD1 | L | L1 | L2max. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3EM6X45 | 32 | 6 | 25 | 45 | 25 | 29 | C6EM10X60 | 63 | 10 | 35 | 60 | 38 | 39 |
| C3EM8X45 | 32 | 8 | 28 | 45 | 25 | 35 | C6EM12X60 | 63 | 12 | 42 | 60 | 38 | 43 |
| C3EM10X50 | 32 | 10 | 35 | 50 | 30 | 39 | C6EM14X60 | 63 | 14 | 44 | 60 | 38 | 43 |
| C3EM12X55 | 32 | 12 | 42 | 55 | 35 | 43 | C6EM16X65 | 63 | 16 | 48 | 65 | 43 | 47 |
| C4EM06X50 | 40 | 6 | 25 | 50 | 30 | 29 | C6EM18X65 | 63 | 18 | 50 | 65 | 43 | 47 |
| C4EM08X50 | 40 | 8 | 28 | 50 | 30 | 35 | C6EM20X65 | 63 | 20 | 52 | 65 | 43 | 49 |
| C4EM10X50 | 40 | 10 | 35 | 50 | 30 | 39 | C6EM25X80 | 63 | 25 | 65 | 80 | 58 | 68 |
| C4EM12X55 | 40 | 12 | 42 | 55 | 35 | 43 | C6EM32X90 | 63 | 32 | 72 | 90 | 68 | 68 |
| C4EM14X55 | 40 | 14 | 44 | 55 | 35 | 43 | C6EM40X100 | 63 | 40 | 90 | 100 | 78 | 78 |
| C4EM16X60 | 40 | 16 | 48 | 60 | 40 | 47 | C8EM06X70 | 80 | 6 | 25 | 70 | 40 | 30 |
| C5EM06X50 | 50 | 6 | 25 | 50 | 30 | 29 | C8EM08X70 | 80 | 8 | 28 | 70 | 40 | 35 |
| C5EM08X50 | 50 | 8 | 28 | 50 | 30 | 35 | C8EM10X70 | 80 | 10 | 35 | 70 | 40 | 39 |
| C5EM10X55 | 50 | 10 | 35 | 55 | 35 | 39 | C8EM12X70 | 80 | 12 | 42 | 70 | 40 | 43 |
| C5EM12X60 | 50 | 12 | 42 | 60 | 40 | 43 | C8EM14X70 | 80 | 14 | 44 | 70 | 40 | 43 |
| C5EM14X60 | 50 | 14 | 44 | 60 | 40 | 43 | C8EM16X70 | 80 | 16 | 48 | 70 | 40 | 47 |
| C5EM16X60 | 50 | 16 | 48 | 60 | 40 | 47 | C8EM18X70 | 80 | 18 | 50 | 70 | 40 | 47 |
| C5EM18X60 | 50 | 18 | 50 | 60 | 40 | 47 | C8EM20X70 | 80 | 20 | 52 | 70 | 40 | 49 |
| C5EM20X60 | 50 | 20 | 52 | 60 | 40 | 49 | C8EM25X90 | 80 | 25 | 65 | 90 | 60 | 68 |
| C5EM25X85 | 50 | 25 | 65 | 85 | 65 | 64 | C8EM32X95 | 80 | 32 | 72 | 95 | 65 | 68 |
| C6EM6X55 | 63 | 6 | 25 | 55 | 33 | 29 | C8EM40X110 | 80 | 40 | 90 | 110 | 80 | 68 |
| C6EM8X55 | 63 | 8 | 28 | 55 | 33 | 35 | C8EM50X120 | 80 | 50 | 98 | 120 | 90 | 90 |

Applicable for 7 MPa pressure coolant

# TUNGCAP

## C-EM-E

Drill holders (DIN1835 Form E - whistle notch)

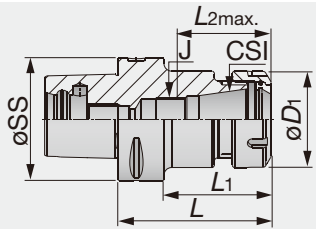



| Designation | øSS | ød2 | øD1 | L | Lmin | Lmax | L1 | J | G |
|---|---|---|---|---|---|---|---|---|---|
| C4EM06X70E | 40 | 6 | 25 | 70 | 30 | 35 | 50 | M5 | M14 |
| C4EM08X70E | 40 | 8 | 28 | 70 | 35 | 43 | 50 | M6 | M14 |
| C4EM10X70E | 40 | 10 | 35 | 70 | 39 | 45 | 50 | M8 | M14 |
| C4EM12X75E | 40 | 12 | 42 | 75 | 44 | 49 | 55 | M10 | M14 |
| C4EM14X75E | 40 | 14 | 44 | 75 | 44 | 49 | 55 | M10 | M14 |
| C5EM06X70E | 50 | 6 | 25 | 70 | 30 | 35 | 50 | M5 | M16 |
| C5EM08X70E | 50 | 8 | 28 | 70 | 35 | 43 | 50 | M6 | M16 |
| C5EM10X70E | 50 | 10 | 35 | 70 | 39 | 45 | 50 | M8 | M16 |
| C5EM12X75E | 50 | 12 | 42 | 75 | 44 | 49 | 55 | M10 | M16 |
| C5EM14X75E | 50 | 14 | 44 | 75 | 44 | 49 | 55 | M10 | M16 |
| C5EM16X80E | 50 | 16 | 48 | 80 | 47 | 52 | 60 | M12 | M16 |
| C5EM18X80E | 50 | 18 | 50 | 80 | 47 | 52 | 60 | M12 | M16 |
| C5EM20X85E | 50 | 20 | 52 | 85 | 49 | 55 | 65 | M16 | M16 |
| C6EM06X75E | 63 | 6 | 25 | 75 | 30 | 36 | 53 | M5 | M20 |
| C6EM08X75E | 63 | 8 | 28 | 75 | 35 | 43 | 53 | M6 | M20 |
| C6EM10X75E | 63 | 10 | 35 | 75 | 39 | 46 | 53 | M8 | M20 |
| C6EM12X80E | 63 | 12 | 42 | 80 | 44 | 49 | 58 | M10 | M20 |
| C6EM14X80E | 63 | 14 | 44 | 80 | 44 | 49 | 58 | M10 | M20 |
| C6EM16X85E | 63 | 16 | 48 | 85 | 47 | 52 | 63 | M12 | M20 |
| C6EM18X85E | 63 | 18 | 50 | 85 | 47 | 52 | 63 | M12 | M20 |
| C6EM20X85E | 63 | 20 | 52 | 85 | 49 | 55 | 63 | M16 | M20 |
| C6EM25X90E | 63 | 25 | 65 | 90 | 54 | 60 | 68 | M20 | M20 |
| C6EM32X95E | 63 | 32 | 72 | 95 | 58 | 63 | 73 | M20 | M20 |
| C8EM06X65E | 80 | 6 | 25 | 65 | 30 | 36 | 35 | M5 | M20 |
| C8EM08X65E | 80 | 8 | 28 | 65 | 35 | 43 | 35 | M6 | M20 |
| C8EM10X65E | 80 | 10 | 35 | 65 | 39 | 46 | 35 | M8 | M20 |
| C8EM12X70E | 80 | 12 | 42 | 70 | 44 | 49 | 40 | M10 | M20 |
| C8EM14X70E | 80 | 14 | 44 | 70 | 44 | 49 | 40 | M10 | M20 |
| C8EM16X75E | 80 | 16 | 48 | 75 | 47 | 52 | 45 | M12 | M20 |
| C8EM18X75E | 80 | 18 | 50 | 75 | 47 | 52 | 45 | M12 | M20 |
| C8EM20X80E | 80 | 20 | 52 | 80 | 49 | 57 | 50 | M16 | M20 |
| C8EM25X90E | 80 | 25 | 65 | 90 | 54 | 60 | 60 | M20 | M20 |
| C8EM32X95E | 80 | 32 | 72 | 95 | 58 | 64 | 65 | M20 | M20 |

Applicable for 7 MPa pressure coolant

# ER collet chucks holders (DIN 6499)






| Designation | Range min. | Range max. | øSS | CSI | øD1 | L | L1 | J | L2max. |
|---|---|---|---|---|---|---|---|---|---|
| C3 ER16X45 | 1 | 10 | 32 | ER16 | 28 | 45 | 25 | - | 39 |
| C3 ER20X45 | 1 | 13 | 32 | ER20 | 34 | 45 | 30 | - | 39.8 |
| C4ER16X70 | 1 | 10 | 40 | ER16 | 28 | 70 | 50 | M10 | 41.6 |
| C4ER20X35* | 1 | 13 | 40 | ER20 | 34 | 35 | 27 | - | 39.8 |
| C4ER20X52 | 1 | 13 | 40 | ER20 | 34 | 52 | 32 | - | 39.1 |
| C4ER25X38* | 1 | 16 | 40 | ER25 | 42 | 38 | 30 | - | 43.3 |
| C4ER25X52 | 1 | 16 | 40 | ER25 | 42 | 52 | 32 | - | 40.8 |
| C4ER32X54 | 2 | 20 | 40 | ER32 | 50 | 54 | 34 | - | 46.7 |
| C5ER16X100 | 1 | 10 | 50 | ER16 | 28 | 100 | 80 | M10 | 61.6 |
| C5ER16X130 | 1 | 10 | 50 | ER16 | 28 | 130 | 110 | M10 | 71.6 |
| C5ER20X055 | 1 | 13 | 50 | ER20 | 34 | 55 | 35 | - | 39.3 |
| C5ER20X100 | 1 | 13 | 50 | ER20 | 34 | 100 | 80 | M12 | 52.5 |
| C5ER20X130 | 1 | 13 | 50 | ER20 | 34 | 130 | 110 | M12 | 52.5 |
| C5ER25X055 | 1 | 16 | 50 | ER25 | 42 | 55 | 35 | - | 40.5 |
| C5ER25X100 | 1 | 16 | 50 | ER25 | 42 | 100 | 80 | M16 | 65 |
| C5ER32X057 | 2 | 20 | 50 | ER32 | 50 | 57 | 36 | - | 47.2 |
| C5ER32X100 | 2 | 20 | 50 | ER32 | 50 | 100 | 36 | M22X1.5 | 59.4 |
| C6ER16X100 | 1 | 10 | 63 | ER16 | 28 | 100 | 78 | M10 | 61.6 |
| C6ER16X130 | 1 | 10 | 63 | ER16 | 28 | 130 | 108 | M10 | 71.6 |
| C6ER16X160 | 1 | 10 | 63 | ER16 | 28 | 160 | 138 | M10 | 71.6 |
| C6ER20X060 | 1 | 13 | 63 | ER20 | 34 | 60 | 38 | - | 39.5 |

| Designation | Range min. | Range max. | øSS | CSI | øD1 | L | L1 | J | L2max. |
|---|---|---|---|---|---|---|---|---|---|
| C6ER20X100 | 1 | 13 | 63 | ER20 | 34 | 100 | 78 | M12 | 52.5 |
| C6ER20X130 | 1 | 13 | 63 | ER20 | 34 | 130 | 108 | M12 | 52.5 |
| C6ER20X160 | 1 | 13 | 63 | ER20 | 34 | 160 | 138 | M12 | 52.5 |
| C6ER25X060 | 1 | 16 | 63 | ER25 | 42 | 60 | 38 | - | 40.4 |
| C6ER25X100 | 1 | 16 | 63 | ER25 | 42 | 100 | 78 | M16 | 65 |
| C6ER25X130 | 1 | 16 | 63 | ER25 | 42 | 130 | 108 | M16 | 73 |
| C6ER25X160 | 1 | 16 | 63 | ER25 | 42 | 160 | 138 | M16 | 73 |
| C6ER32X060 | 2 | 20 | 63 | ER32 | 50 | 60 | 36 | - | 47.8 |
| C6ER32X100 | 2 | 20 | 63 | ER32 | 50 | 100 | 78 | M22X1.5 | 59.4 |
| C6ER32X130 | 2 | 20 | 63 | ER32 | 50 | 130 | 108 | M22X1.5 | 69.4 |
| C6ER32X160 | 2 | 20 | 63 | ER32 | 50 | 160 | 138 | M22X1.5 | 69.4 |
| C6ER40X065 | 3 | 26 | 63 | ER40 | 63 | 65 | 37 | - | 55 |
| C6ER40X100 | 3 | 26 | 63 | ER40 | 63 | 100 | 78 | M28X1.5 | 60 |
| C6ER40X130 | 3 | 26 | 63 | ER40 | 63 | 130 | 108 | M28X1.5 | 70 |
| C8ER32X70 | 2 | 20 | 80 | ER32 | 50 | 70 | 40 | - | 47.8 |
| C8ER32X100 | 2 | 20 | 80 | ER32 | 50 | 100 | 70 | M22x1.5 | 60.4 |
| C8ER32X160 | 2 | 20 | 80 | ER32 | 50 | 160 | 130 | M22x1.5 | 65.4 |
| C8ER40X70 | 3 | 26 | 80 | ER40 | 63 | 70 | 40 | - | 54.8 |
| C8ER40X100 | 3 | 26 | 80 | ER40 | 63 | 100 | 70 | M28x1.5 | 60 |
| C8ER40X160 | 3 | 26 | 80 | ER40 | 63 | 160 | 130 | M28x1.5 | 71 |

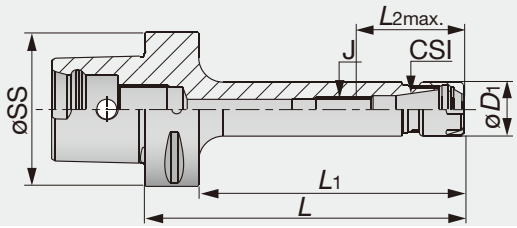
*Without V grooves, for manual use only.
Applicable for 10 MPa pressure coolant

(Option: Wrench for ER collet)

# TUNGCAP

## C-ER-M

Mini ER collet chucks holders (DIN 6499)




| Designation | Range min. | Range max. | øSS | CSI | øD1 | L | L1 | J | L2max. |
|---|---|---|---|---|---|---|---|---|---|
| C4ER16X70M | 0.5 | 10 | 40 | ER16 | 22 | 70 | 50 | M10 | 41 |
| C5ER16X100M | 0.5 | 10 | 50 | ER16 | 22 | 100 | 80 | M10 | 46 |
| C5ER16X130M | 0.5 | 10 | 50 | ER16 | 22 | 130 | 110 | M10 | 46 |
| C6ER16X100M | 0.5 | 10 | 63 | ER16 | 22 | 100 | 78 | M10 | 46 |
| C6ER16X130M | 0.5 | 10 | 63 | ER16 | 22 | 130 | 108 | M10 | 46 |
| C6ER16X160M | 0.5 | 10 | 63 | ER16 | 22 | 160 | 138 | M10 | 46 |

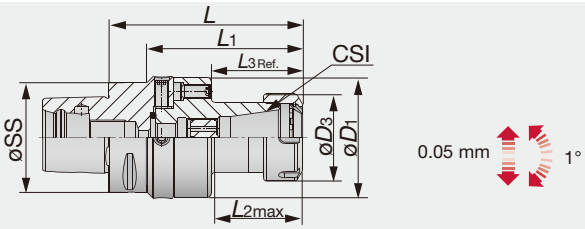
Applicable for 10 MPa pressure coolant

(Option:Wrench for ER collet)

# TUNGCAP

## ADJ C-ER

ER collet chucks with center alignment




| Designation | øSS | CSI | Range min. | Range max. | øD1 | øD3 | L | L1 | L3 | L2max. |
|---|---|---|---|---|---|---|---|---|---|---|
| ADJC5ER32 | 50 | ER32 | 2 | 20 | 70 | 50 | 115 | 95 | 52.5 | 57 |
| ADJC6ER32 | 63 | ER32 | 2 | 20 | 70 | 50 | 111.5 | 89.5 | 52.5 | 57 |

Applicable for 10 MPa pressure coolant

(Option:Wrench for ER collet)

## WRENCH-ER / ER DIN 6499

**Fig. 1**

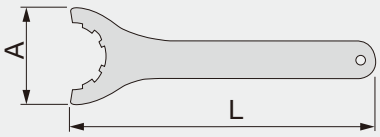



**Fig. 2**

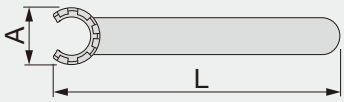
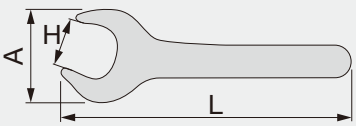



**Fig. 3**




| Designation | A | H | L | Fig. |
|---|---|---|---|---|
| WRENCHER11MINI | 16.8 | - | 95 | 2 |
| WRENCHER11 | 32 | 17 | 95 | 3 |
| WRENCHER16MINI | 22.5 | - | 117 | 2 |
| WRENCHER16 | 42.8 | 25 | 143 | 3 |
| WRENCHER20MINI | 28 | - | 128 | 2 |
| WRENCHER20 | 53.5 | 30 | 172 | 3 |
| WRENCHER25MINI | 29 | - | 120 | 2 |
| WRENCHER25 | 70 | - | 207 | 1 |
| WRENCHER32 | 78 | - | 255 | 1 |
| WRENCHER40 | 95 | - | 285 | 1 |
| WRENCHER50 | 110 | - | 350 | 1 |
| WRENCHER20SHORTRING22 | 48 | 22 | 260 | 3 |
| WRENCHER32SHORT | 75 | 36 | 303 | 3 |
| WRENCHER40SHORT | 94 | 46 | 378 | 3 |

## PRESET ER-JET (Preset screws)

**Fig. 1**

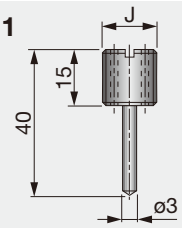
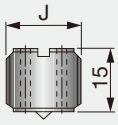



**Fig. 2**

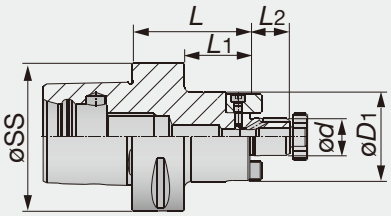



| Designation | J | Fig. |
|---|---|---|
| PRESETER-JET8X1 | M8X1.0 | 2 |
| PRESETER-JET8X1.25 | M8X1.25 | 2 |
| PRESETER-JET10X1.5 | M10X1.5 | 2 |
| PRESETER-JET12X1 | M12X1.0 | 2 |
| PRESETER-JET12X1.75L | M12X1.75 | 1 |
| PRESETER-JET12X1.75 | M12X1.75 | 2 |
| PRESETER-JET14X1 | M14X1.0 | 2 |
| PRESETER-JET16X2 | M16X2 | 2 |
| PRESETER-JET16X2L | M16X2 | 1 |
| PRESETER-JET18X1 | M18X1.0 | 2 |
| PRESETER-JET18X1.5 | M18X1.5 | 2 |
| PRESETER-JET18X1.5L | M18X1.5 | 1 |
| PRESETER-JET22X1.5 | M22X1.5 | 2 |
| PRESETER-JET22X1.5L | M22X1.5 | 1 |
| PRESETER-JET28X1.5 | M28X1.5 | 2 |

# TUNGCAP

## C-SEM

Shell mill holders (with coolant nozzle)



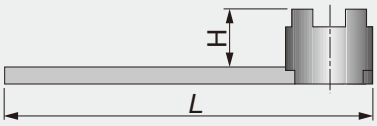

| Designation | øSS | ød | øD1 | L | L2 | L1 | Width of key | Hight of key |
|---|---|---|---|---|---|---|---|---|
| C4SEM16X32C | 40 | 16 | 38 | 32 | 12 | 17 | 8 | 5 |
| C4SEM16X55C | 40 | 16 | 38 | 55 | 35 | 17 | 8 | 5 |
| C4SEM22X40C | 40 | 22 | 47 | 40 | 20 | 19 | 10 | 5.4 |
| C4SEM22X55C | 40 | 22 | 47 | 55 | 35 | 19 | 10 | 5.4 |
| C5SEM16X35C | 50 | 16 | 38 | 35 | 17 | 15 | 8 | 5 |
| C5SEM16X70C | 50 | 16 | 38 | 70 | 17 | 50 | 8 | 5 |
| C5SEM22X35C | 50 | 22 | 47 | 35 | 19 | 15 | 10 | 5.4 |
| C5SEM22X70C | 50 | 22 | 47 | 70 | 19 | 50 | 10 | 5.4 |
| C5SEM25.4X37C | 50 | 25.4 | 55 | 37 | 22 | - | 9.525 | 4.6 |
| C5SEM27X40C | 50 | 27 | 58 | 40 | 21 | 20 | 12 | 6.3 |
| C5SEM31.75X60C | 50 | 31.75 | 64 | 60 | 30 | - | 12.7 | 6 |
| C5SEM32X40C | 50 | 32 | 63 | 40 | 24 | 20 | 14 | 7 |
| C6SEM16X50C | 63 | 16 | 38 | 50 | 17 | 28 | 8 | 5 |
| C6SEM16X100C | 63 | 16 | 38 | 100 | 17 | 78 | 8 | 5 |
| C6SEM22X50C | 63 | 22 | 47 | 50 | 19 | 28 | 10 | 5.4 |
| C6SEM22X100C | 63 | 22 | 47 | 100 | 19 | 78 | 10 | 5.4 |
| C6SEM25.4X37C | 63 | 25.4 | 55 | 37 | 22 | 15 | 9.525 | 4.6 |
| C6SEM27X60C | 63 | 27 | 58 | 60 | 21 | 38 | 12 | 6.3 |

| Designation | øSS | ød | øD1 | L | L2 | L1 | Width of key | Hight of key |
|---|---|---|---|---|---|---|---|---|
| C6SEM27X100C | 63 | 27 | 58 | 100 | 21 | 78 | 12 | 6.3 |
| C6SEM31.75X60C | 63 | 31.75 | 64 | 60 | 30 | - | 12.7 | 6 |
| C6SEM32X60C | 63 | 32 | 66 | 60 | 24 | 38 | 14 | 7 |
| C6SEM38.1X60C | 63 | 38.1 | 78 | 60 | 34 | - | 15.875 | 8 |
| C6SEM40X60C | 63 | 40 | 82 | 60 | 27 | 38 | 16 | 8 |
| C8SEM16X50C | 80 | 16 | 38 | 50 | 20 | 17 | 8 | 5 |
| C8SEM16X100C | 80 | 16 | 38 | 100 | 70 | 17 | 8 | 5 |
| C8SEM22X50C | 80 | 22 | 47 | 50 | 20 | 19 | 10 | 5.4 |
| C8SEM22X100C | 80 | 22 | 47 | 100 | 70 | 19 | 10 | 5.4 |
| C8SEM25.4X50C | 80 | 25.4 | 50 | 50 | 22 | 20 | 9.525 | 4.6 |
| C8SEM27X50C | 80 | 27 | 58 | 50 | 20 | 21 | 12 | 6.3 |
| C8SEM27X100C | 80 | 27 | 58 | 100 | 70 | 21 | 12 | 6.3 |
| C8SEM31.75X50C | 80 | 31.75 | 64 | 50 | 30 | 20 | 12.7 | 6 |
| C8SEM32X50C | 80 | 32 | 66 | 50 | 20 | 24 | 14 | 7 |
| C8SEM32X100C | 80 | 32 | 66 | 100 | 70 | 24 | 14 | 7 |
| C8SEM38.1X50C | 80 | 38.1 | 80 | 50 | 34 | - | 15.875 | 8 |
| C8SEM40X60C | 80 | 40 | 82 | 60 | 30 | 27 | 16 | 8 |

Applicable for 7 MPa pressure coolant

(Option:Wrench for lock Screw)

## WRENCH SEMC / DIN6368

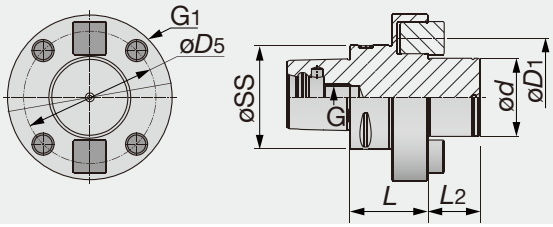



| Designation | Inner diameter of cutter body ø | Screw size | H | L |
|---|---|---|---|---|
| WRENCHM8SEMC16 | 16 | M8 | 20 | 180 |
| WRENCHM10SEMC22 | 22 | M10 | 25 | 200 |
| WRENCHM12SEMC27 | 25.4 / 27 | M12 | 32 | 225 |
| WRENCHM16SEMC32 | 31.75 / 32 | M16 | 36 | 250 |
| WRENCHM20SEMC40 | 38.1 / 40 | M20 | 40 | 280 |
| WRENCHM24SEMC50 | 50 | M24 | 50 | 315 |

# TUNGCAP

## C-FM

Face mill holders

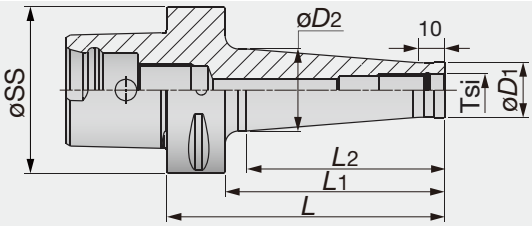



| Designation | øSS | ød | L2 | L | øD1 | øD5 | G1 | G | Width of key | Hight of key |
|---|---|---|---|---|---|---|---|---|---|---|
| C8FM60X60 | 80 | 60 | 20 | 40 | 128 | 101.6 | M16 | M20 | 25.4 | 12.4 |

# TUNGFLEX

## C-ODP

TungFlex modular tooling system (Screw clamping head holder)



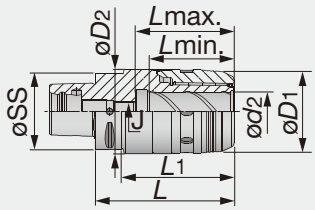

| Designation | Tsi | øSS | øD1 | øD2 | L | L1 | L2 |
|---|---|---|---|---|---|---|---|
| C4ODP10X53 | M10 | 40 | 18 | 23 | 53 | 33 | 23 |
| C4ODP12X53 | M12 | 40 | 21 | 26 | 53 | 33 | 23 |
| C4ODP16X53 | M16 | 40 | 29 | 34 | 53 | 33 | 23 |
| C5ODP10X53 | M10 | 50 | 18 | 19.5 | 53 | 33 | 25 |
| C5ODP10X103 | M10 | 50 | 18 | 28 | 103 | 83 | 75 |
| C5ODP12X53 | M12 | 50 | 21 | 23.5 | 53 | 33 | 25 |
| C5ODP12X103 | M12 | 50 | 21 | 31 | 103 | 83 | 75 |
| C5ODP16X53 | M16 | 50 | 29 | 34 | 53 | 33 | 25 |
| C5ODP16X103 | M16 | 50 | 29 | 36 | 103 | 83 | 75 |
| C6ODP10X55 | M10 | 63 | 18 | 19.5 | 55 | 33 | 25 |
| C6ODP10X105 | M10 | 63 | 18 | 28 | 105 | 83 | 75 |
| C6ODP10X130 | M10 | 63 | 18 | 32 | 130 | 108 | 100 |
| C6ODP12X55 | M12 | 63 | 21 | 23.5 | 55 | 33 | 25 |
| C6ODP12X105 | M12 | 63 | 21 | 31 | 105 | 83 | 75 |
| C6ODP12X130 | M12 | 63 | 21 | 36 | 130 | 108 | 100 |
| C6ODP16X55 | M16 | 63 | 29 | 34 | 55 | 33 | 25 |
| C6ODP16X105 | M16 | 63 | 29 | 34 | 105 | 83 | 75 |
| C6ODP16X130 | M16 | 63 | 29 | 41 | 130 | 108 | 100 |

Applicable for 10 MPa pressure coolant

TUNGCAP

## C-TUNGMAX

Power chuck holders



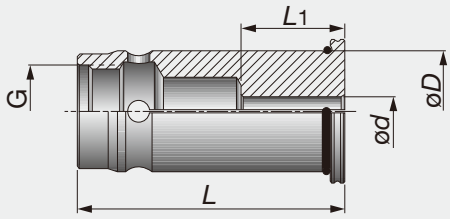

| Designation | øSS | Range | ød2 | øD1 | øD2 | L | L1 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|
| C5MAXIN20X100 | 50 | 6-20 | 20 | 51 | 53 | 95.5 | 75 | 55 | 67 | M16 |
| C6MAXIN20X95 | 63 | 6-20 | 20 | 51 | 53 | 95 | 73 | 55 | 67 | M16 |
| C6MAXIN32X115 | 63 | 6-32 | 32 | 69 | 70 | 115 | 93 | 70 | 82 | M16 |
| C8MAXIN20X95 | 80 | 6-20 | 20 | 51 | 53 | 95 | 65 | 55 | 67 | M16 |
| C8MAXIN32X115 | 80 | 6-32 | 32 | 69 | 70 | 115 | 85 | 70 | 82 | M16 |

Applicable for 10 MPa pressure coolant

(Option : Wrench for TungMax collet)

## SC-SEAL

SC sealed straight collets - metric

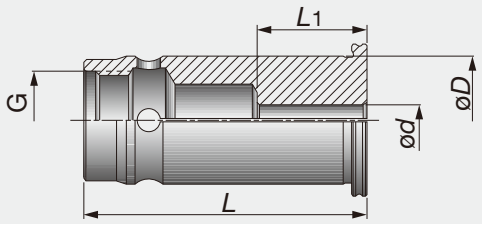



| Designation | ød | øD | L | L1 | G |
|---|---|---|---|---|---|
| SC20SEAL6 | 6 | 20 | 60 | 28 | M16 |
| SC20SEAL8 | 8 | 20 | 60 | 28 | M16 |
| SC20SEAL10 | 10 | 20 | 60 | 35 | M16 |
| SC20SEAL12 | 12 | 20 | 60 | 40 | M16 |
| SC20SEAL14 | 14 | 20 | 60 | 40 | M16 |
| SC20SEAL15 | 15 | 20 | 60 | 40 | M16 |
| SC20SEAL16 | 16 | 20 | 60 | 39 | M16 |
| SC32SEAL6 | 6 | 32 | 72 | 28 | M24x1.5 |
| SC32SEAL8 | 8 | 32 | 72 | 28 | M24x1.5 |
| SC32SEAL10 | 10 | 32 | 72 | 35 | M24x1.5 |
| SC32SEAL12 | 12 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL14 | 14 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL15 | 15 | 32 | 72 | 40 | M24x1.5 |
| SC32SEAL16 | 16 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL18 | 18 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL19 | 19 | 32 | 72 | 44 | M24x1.5 |
| SC32SEAL20 | 20 | 32 | 72 | 46 | M24x1.5 |
| SC32SEAL24 | 24 | 32 | 72 | 46 | M24x1.5 |
| SC32SEAL25 | 25 | 32 | 72 | 51 | M24x1.5 |

Applicable for 10 MPa pressure coolant

## SC-SPR

SC straight collets - metric




| Designation | ød | øD | L | L1 | G |
|---|---|---|---|---|---|
| SC20SPR6 | 6 | 20 | 60 | 28 | M16 |
| SC20SPR8 | 8 | 20 | 60 | 28 | M16 |
| SC20SPR10 | 10 | 20 | 60 | 35 | M16 |
| SC20SPR12 | 12 | 20 | 60 | 40 | M16 |
| SC20SPR14 | 14 | 20 | 60 | 40 | M16 |
| SC20SPR15 | 15 | 20 | 60 | 40 | M16 |
| SC20SPR16 | 16 | 20 | 60 | 39 | M16 |
| SC32SPR6 | 6 | 32 | 72 | 28 | M24x1.5 |
| SC32SPR8 | 8 | 32 | 72 | 28 | M24x1.5 |
| SC32SPR10 | 10 | 32 | 72 | 35 | M24x1.5 |
| SC32SPR12 | 12 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR14 | 14 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR15 | 15 | 32 | 72 | 40 | M24x1.5 |
| SC32SPR16 | 16 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR18 | 18 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR19 | 19 | 32 | 72 | 44 | M24x1.5 |
| SC32SPR20 | 20 | 32 | 72 | 46 | M24x1.5 |
| SC32SPR24 | 84 | 32 | 72 | 45 | M24x1.5 |
| SC32SPR25 | 25 | 32 | 72 | 51 | M24x1.5 |

## PRESET SC CAP

Preset screw for SC collets

Fig. 1

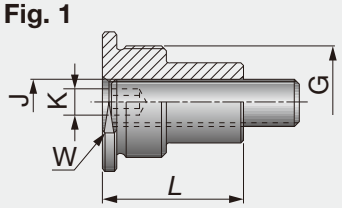
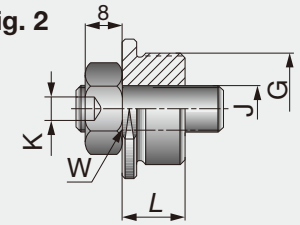
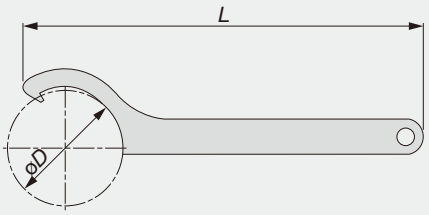



Fig. 2



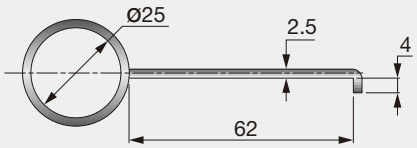

| Designation | L | W | J | G | Range | key | CSI | Fig |
|---|---|---|---|---|---|---|---|---|
| PRESETSCCAP8x1.25L | 28 | 16 | M8X25 | M16 | 6-8 | 4 | SC20 | 1 |
| PRESETSCCAP8x1.25 | 15 | 16 | M8X25 | M16 | 10-16 | 4 | SC20 | 2 |
| PRESETSCCAP10x1.5L | 30 | 27 | M10X30 | M24X1.5 | 6-14 | 5 | SC32 | 1 |
| PRESETSCCAP10x1.5 | 13.5 | 27 | M10X30 | M24X1.5 | 16-25 | 5 | SC32 | 2 |

## Wrench



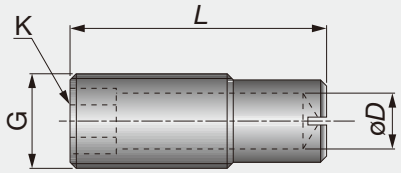

| Designation | øD | L |
|---|---|---|
| WRENCHMAXIN20HOOK | 26 | 205 |
| WRENCHMAXIN32HOOK | 68 | 240 |

## SC collet extracting hook




| Designation | Collet |
|---|---|
| EXTRACTORSCCOLLETS | SC straight collets |

## Preset screws

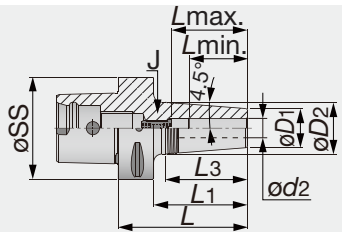



| Designation | G | L | øD | K |
|---|---|---|---|---|
| PRESETMAXIN16X30 | M16 | 30 | 8 | 8 |
| PRESETMAXIN16X44 | M16 | 44 | 8 | 8 |
| PRESETMAXIN20X55 | M20 | 55 | 12 | 12 |

# TUNGSHRINK

## C-SRKIN

### Thermal shrinking holders



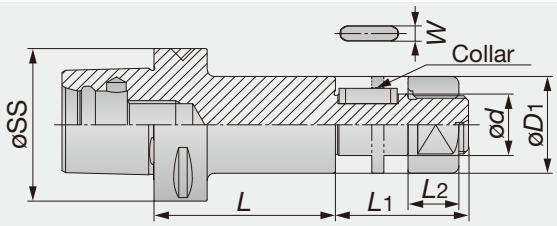

| Designation | øSS | ød2 | øD1 | øD2 | L | L1 | L3 | Lmin | Lmax | J |
|---|---|---|---|---|---|---|---|---|---|---|
| C4SRKIN6X75 | 40 | 6 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M5 |
| C4SRKIN8X75 | 40 | 8 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M6 |
| C4SRKIN10X75 | 40 | 10 | 24 | 32 | 75 | 55 | 50.8 | 31 | 42 | M8 |
| C4SRKIN12X75 | 40 | 12 | 24 | 32 | 75 | 55 | 50.8 | 36 | 47 | M10 |
| C4SRKIN14X80 | 40 | 14 | 27 | 34 | 80 | 60 | 44.5 | 36 | 47 | M10 |
| C4SRKIN16X80 | 40 | 16 | 27 | 34 | 80 | 60 | 44.5 | 39 | 50 | M12 |
| C4SRKIN18X80 | 40 | 18 | 33 | 42 | 80 | 60 | 57.2 | 39 | 50 | M12 |
| C4SRKIN20X85 | 40 | 20 | 33 | 42 | 85 | 65 | 57.2 | 41 | 52 | M16 |
| C5SRKIN6X75 | 50 | 6 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M5 |
| C5SRKIN8X75 | 50 | 8 | 21 | 27 | 75 | 55 | 38.1 | 25 | 36 | M6 |
| C5SRKIN10X75 | 50 | 10 | 24 | 32 | 75 | 55 | 51.3 | 31 | 42 | M8 |
| C5SRKIN12X75 | 50 | 12 | 24 | 32 | 75 | 55 | 51.3 | 36 | 47 | M10 |
| C5SRKIN14X80 | 50 | 14 | 27 | 34 | 80 | 60 | 44.5 | 36 | 47 | M10 |
| C5SRKIN16X80 | 50 | 16 | 27 | 34 | 80 | 60 | 44.5 | 39 | 50 | M12 |
| C5SRKIN18X80 | 50 | 18 | 33 | 42 | 80 | 60 | 57.2 | 39 | 50 | M12 |
| C5SRKIN20X85 | 50 | 20 | 33 | 42 | 85 | 65 | 57.2 | 41 | 52 | M16 |
| C5SRKIN25X90 | 50 | 25 | 44 | 53 | 90 | 70 | 57.2 | 47 | 58 | M16 |
| C6SRKIN6X80 | 63 | 6 | 21 | 27 | 80 | 58 | 38.1 | 25 | 36 | M5 |
| C6SRKIN8X80 | 63 | 8 | 21 | 27 | 80 | 58 | 38.1 | 25 | 36 | M6 |
| C6SRKIN10X80 | 63 | 10 | 24 | 32 | 80 | 58 | 50.8 | 31 | 42 | M8 |
| C6SRKIN12X80 | 63 | 12 | 24 | 32 | 80 | 58 | 50.8 | 36 | 47 | M10 |
| C6SRKIN14X85 | 63 | 14 | 27 | 34 | 85 | 63 | 44.5 | 36 | 47 | M10 |
| C6SRKIN16X85 | 63 | 16 | 27 | 34 | 85 | 63 | 44.5 | 39 | 50 | M12 |
| C6SRKIN18X85 | 63 | 18 | 33 | 42 | 85 | 63 | 57.2 | 39 | 50 | M12 |
| C6SRKIN20X85 | 63 | 20 | 33 | 42 | 85 | 63 | 57.2 | 41 | 52 | M16 |
| C6SRKIN25X90 | 63 | 25 | 44 | 53 | 90 | 68 | 57.2 | 47 | 58 | M16 |
| C6SRKIN32X95 | 63 | 32 | 44 | 53 | 95 | 73 | 57.2 | 47 | 58 | M16 |

Applicable for 10 MPa pressure coolant

## C-SCA

### Slot milling holders



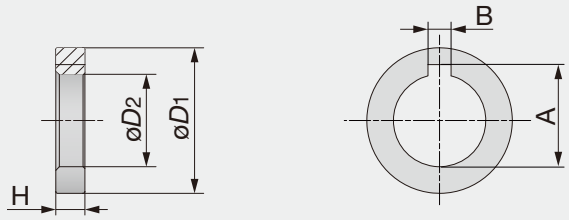



| Designation | øSS | ød | L | øD1 | L1 | L2 | Width of key W | Height of key |
|---|---|---|---|---|---|---|---|---|
| C6SCA25.4-075 | 63 | 25.4 | 75 | 40 | 55 | 21 | 6.35 | 2.38 |
| C6SCA31.75-075 | 63 | 31.75 | 75 | 46 | 60 | 26 | 7.92 | 3.17 |
| C8SCA25.4-090 | 80 | 25.4 | 90 | 40 | 55 | 21 | 6.35 | 2.38 |
| C8SCA31.75-090 | 80 | 31.75 | 90 | 46 | 60 | 26 | 7.92 | 3.17 |

Collars for slot mills are not included.

## SCA

### Collar for slot milling holder

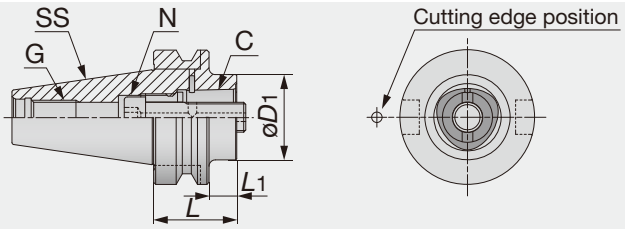



| Designation | øD1 | øD2 | A | B | H |
|---|---|---|---|---|---|
| SCA25.4-02 | 40 | 25.4 | 28.1 | 6.35 | 3, 5, 7, 8, 10, 12, 14 |
| SCA31.75-02 | 46 | 31.75 | 35.2 | 7.92 | 3, 5, 7, 8, 10, 12, 14 |

TUNGCAP

## BT-FC

Basic holders BT shank with dual contact



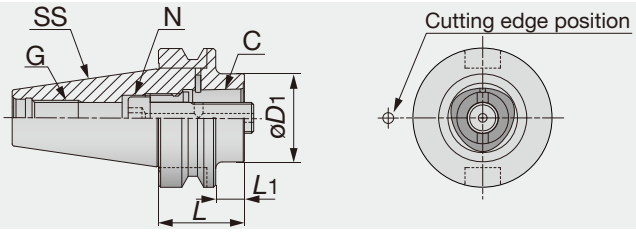

| Designation | CSI | SS | øD1 | L | L1 | G | N* | key |
|---|---|---|---|---|---|---|---|---|
| BT40FC-C4-040 | C4 | 40 | 40 | 40 | 13 | M16 | 55 | 8 |
| BT40FC-C5-050 | C5 | 40 | 50 | 50 | 23 | M16 | 95 | 10 |
| BT40FC-C6-075 | C6 | 40 | 63 | 75 | 48 | M16 | 170 | 10 |
| BT50FC-C4-040 | C4 | 50 | 40 | 40 | 2 | M24 | 55 | 8 |
| BT50FC-C4-070 | C4 | 50 | 40 | 70 | 32 | M24 | 55 | 8 |
| BT50FC-C5-040 | C5 | 50 | 50 | 40 | 2 | M24 | 95 | 10 |
| BT50FC-C5-080 | C5 | 50 | 50 | 80 | 42 | M24 | 95 | 10 |
| BT50FC-C6-050 | C6 | 50 | 63 | 50 | 12 | M24 | 170 | 14 |
| BT50FC-C6-100 | C6 | 50 | 63 | 100 | 62 | M24 | 170 | 14 |
| BT50FC-C8-070 | C8 | 50 | 80 | 70 | 32 | M24 | 170 | 14 |
| BT50FC-C8-120 | C8 | 50 | 80 | 120 | 82 | M24 | 170 | 14 |

Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## BT-FC-T

Basic holders BT shank with dual contact (For turning on multi task machine)




| Designation | CSI | SS | øD1 | L | L1 | G | N* | key |
|---|---|---|---|---|---|---|---|---|
| BT40FC-C4-040T | C4 | 40 | 40 | 40 | 13 | M16 | 55 | 8 |
| BT40FC-C5-050T | C5 | 40 | 50 | 50 | 23 | M16 | 95 | 10 |
| BT50FC-C6-050T | C6 | 50 | 63 | 50 | 12 | M24 | 170 | 14 |
| BT50FC-C8-070T | C8 | 50 | 80 | 70 | 32 | M24 | 170 | 14 |

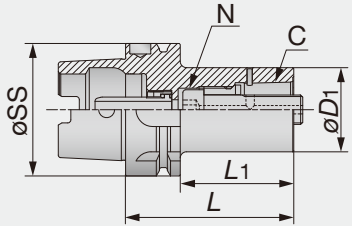
Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## HSK-A-C/-T

Basic holders HSK shank





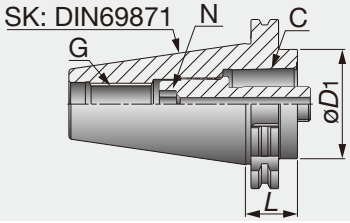

| Designation | øSS | C | øD1 | L | L1 | N* | key |
|---|---|---|---|---|---|---|---|
| HSK63A-C4-080T | 63 | C4 | 40 | 80 | 54 | 55 | 8 |
| HSK63A-C5-090T | 63 | C5 | 50 | 90 | 64 | 95 | 10 |
| HSK63A-C6-110T | 63 | C6 | 63 | 110 | 74 | 170 | 14 |
| HSK100A-C6-110 | 100 | C6 | 63 | 110 | 81 | 170 | 14 |
| HSK100A-C8-120 | 100 | C8 | 80 | 120 | 91 | 170 | 14 |

Applicable for 7 MPa pressure coolant
Option: Cooling tube wrench

*Recommended torque (N·m) for clamping

## C-ADSKA

Basic holders for DIN 69871 form AD / ADB tapered shanks



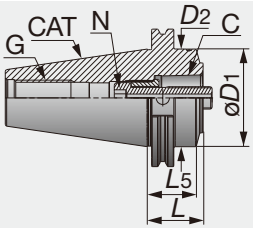

| Designation | C | SK | øD1 | L | G | N* | key |
|---|---|---|---|---|---|---|---|
| C4ADSKA40X30 | C4 | 40 | 40 | 30 | M16 | 55 | 8 |
| C5ADSKA40X30 | C5 | 40 | 50 | 30 | M16 | 95 | 10 |
| C5ADSKA50X30ADB | C5 | 50 | 50 | 30 | M24 | 95 | 10 |
| C6ADSKA50X30 | C6 | 50 | 63 | 30 | M24 | 170 | 14 |
| C8ADSKA50X70ADB | C8 | 50 | 80 | 70 | M24 | 170 | 14 |

Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## C-ADCAT

Basic holders for caterpillar AD / ADB tapered shanks



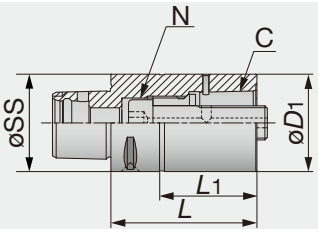

| Designation | C | CAT | øD1 | D2 | L | L5 | G | N* | key |
|---|---|---|---|---|---|---|---|---|---|
| C4ADCATI40X40ADB | C4 | 40 | 40 | 44.5 | 40 | 35 | 5/8X11 | 55 | 8 |
| C5ADCATI40X90ADB | C5 | 40 | 50 | 45.2 | 90 | 35 | 5/8X11 | 95 | 10 |
| C5ADCATI50X40ADB | C5 | 50 | 50 | 69.9 | 40 | 35 | 1-8 | 95 | 10 |
| C6ADCATI50X50 | C6 | 50 | 63 | 69.85 | 50 | 37 | 1-8 | 170 | 14 |
| C8ADCATI50X100ADB | C8 | 50 | 80 | 70.1 | 100 | 35 | 1-8 | 170 | 14 |

Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## C-EX

### Extension adapters



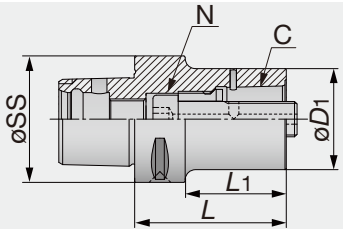

| Designation | C | øSS | øD1 | L | L1 | N* | key |
|---|---|---|---|---|---|---|---|
| C4EX-060 | C4 | 40 | 40 | 60 | 80 | 65 | 8 |
| C4EX-080 | C4 | 40 | 40 | 80 | 60 | 65 | 8 |
| C5EX-080 | C5 | 50 | 50 | 80 | 60 | 95 | 10 |
| C5EX-100 | C5 | 50 | 50 | 100 | 80 | 95 | 10 |
| C6EX-100 | C6 | 63 | 63 | 100 | 78 | 170 | 14 |
| C6EX-140 | C6 | 63 | 63 | 140 | 118 | 170 | 14 |
| C8EX-100 | C8 | 80 | 80 | 100 | 70 | 170 | 14 |
| C8EX-160 | C8 | 80 | 80 | 160 | 130 | 170 | 14 |

Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## Reduction adapters





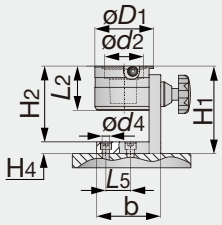

| Designation | C | øSS | øD1 | L | L1 | N* | key |
|---|---|---|---|---|---|---|---|
| C5-C4RE-060 | C4 | 50 | 40 | 60 | 40 | 55 | 8 |
| C5-C4RE-080 | C4 | 50 | 40 | 80 | 60 | 55 | 8 |
| C6-C4RE-080 | C4 | 63 | 40 | 80 | 58 | 55 | 8 |
| C6-C5RE-080 | C5 | 63 | 50 | 80 | 58 | 95 | 10 |
| C6-C5RE-120 | C5 | 63 | 50 | 120 | 98 | 95 | 10 |
| C8-C4RE-070 | C4 | 80 | 40 | 70 | 40 | 55 | 8 |
| C8-C5RE-080 | C5 | 80 | 50 | 80 | 50 | 95 | 10 |
| C8-C6RE-080 | C6 | 80 | 63 | 80 | 50 | 170 | 14 |
| C8-C6RE-120 | C6 | 80 | 63 | 120 | 90 | 170 | 14 |

Applicable for 7 MPa pressure coolant

*Recommended torque (N·m) for clamping

## MULTI CLAMP (TungCap)

### Multi-clamp fixture for TungCap




| Designation | CSI | ød2 | øD1 | L2 | H1 | H2 | H4 | b | L5 | ød4 |
|---|---|---|---|---|---|---|---|---|---|---|
| MULTICLAMPC4 | 40 | 40.4 | 78 | 67 | 137.5 | 118.5 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC5 | 50 | 50 | 85 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC6 | 60 | 63 | 95 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMPC8 | 80 | 80 | 130 | 90 | 178 | 159 | 19 | 144 | 85 | 12.5 |

# Designation for clamping units

## Fixed-type clamping unit

| | For external (Tool setting direction cross X) | For internal (Tool setting direction straight Z) |
|---|---|---|
| Turning Unit | C□-DTO-□C-****-R/L | C□-DTI-□C-****-R/L |
| | | |
| Driving Unit | C□-DDC-□C-**** | C□-DDS-□C-**** |
| | | |

### Description of clamping unit for turning

**C3 - D T I - IC - ***** - R**

| ❶ PSC size | ❷ Device | ❸ Turning | ❹ Application | | ❺ Coolant | | ❻ Unit number | ❼ Hand | |
|---|---|---|---|---|---|---|---|---|---|
| C* | D | T | O | External | IC | Internal | Manufacturer's optional symbol | R | Right |
| | | | I | Internal | OC | External | | L | Left |
| | | | S | Other | | | | | |

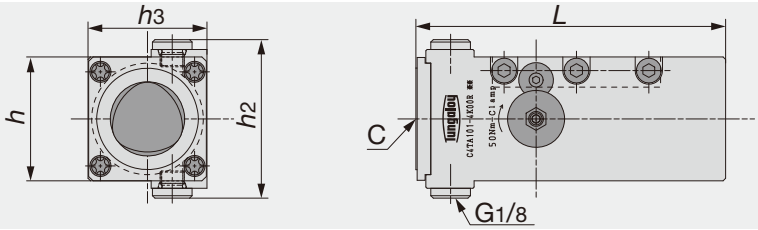
### Description of clamping unit for driving

**C6 - D D C - OC - *****

| ❶ PSC size | ❷ Device | ❸ For rotating tools | ❹ Tool setting direction | | ❺ Coolant | | ❻ Unit number |
|---|---|---|---|---|---|---|---|
| C* | D | D | S | Straight: Z | IC | Internal | Manufacturer's optional symbol |
| | | | C | Cross: X | OC | External | |
| | | | X | Other | WC | Double | |

## C-DTOSR/L

### Manual clamping unit; Square shank



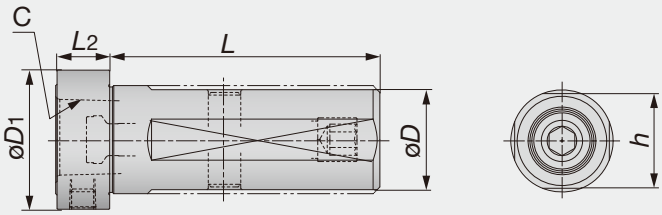

| Designation | C | Turret size h | h3 | h2 | L | N*(N·m) |
|---|---|---|---|---|---|---|
| C3-DTOS4038R/L | C3 | 40 | 38 | 62 | 95 | 35 |
| C4-DTOS5048R/L | C4 | 50 | 48 | 64 | 125 | 50 |
| C5-DTOS6464R/L | C5 | 60 | 64 | 68 | 145 | 70 |

Applicable for 7 MPa pressure coolant

* Recommend clamping torque.

## C-DTIR

### Manual clamping unit; Round shank



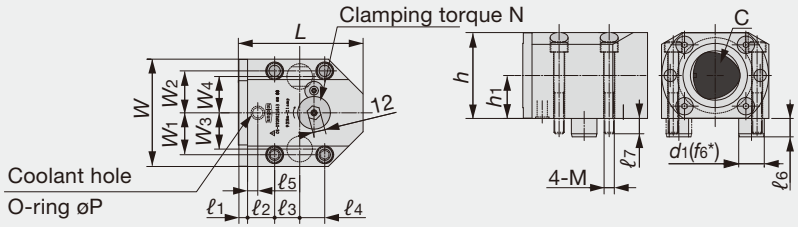

| Designation | C | øD | øD1 | h | L | L2 | N*(N·m) |
|---|---|---|---|---|---|---|---|
| C3-DTIR-08018-D32 | C3 | 32 | 46 | 30 | 80 | 18 | 35 |
| C4-DTIR-10020-D40 | C4 | 40 | 52 | 38 | 100 | 20 | 50 |
| C4-DTIR-12020-D50 | C4 | 50 | 52 | 48 | 120 | 20 | 50 |
| C5-DTIR-12024-D50 | C5 | 50 | 62 | 48 | 120 | 24 | 70 |

Applicable for 7 MPa pressure coolant

* Recommend clamping torque.

## C-DTOFR/L

### Manual clamping unit; Fixed type



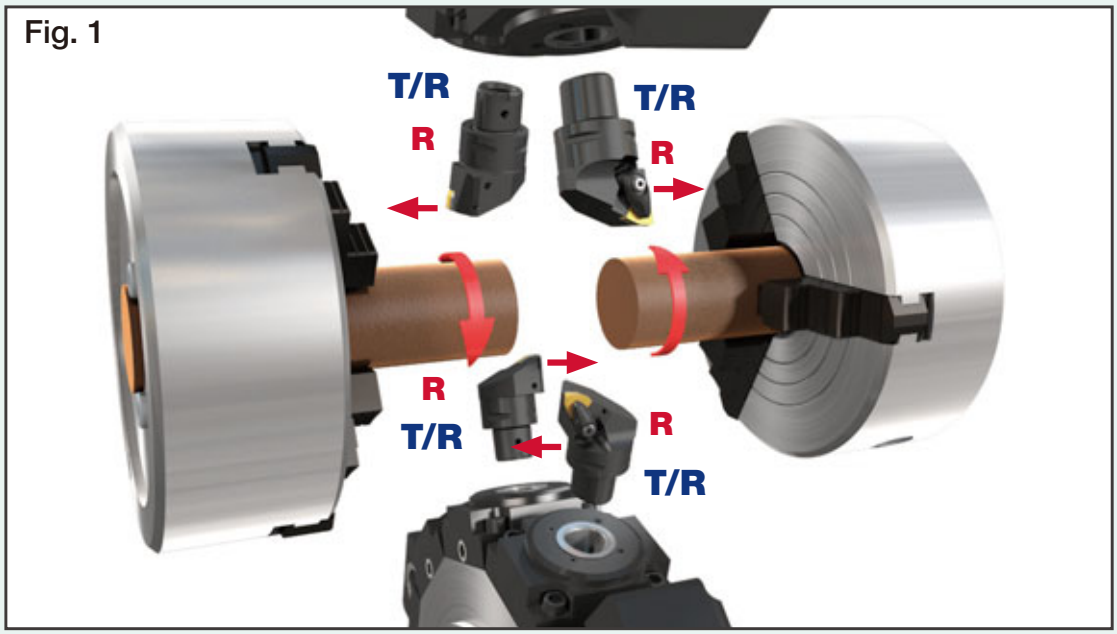

| Designation | C | h | h1 | L | W | W1 | W2 | W3 | W4 | ℓ1 | ℓ2 | ℓ3 | ℓ4 | ℓ5 | ℓ6 | ℓ7 | d1(f6*) | P | M | N* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C5-DTOFR/L32048 | C5 | 64 | 32 | 100 | 92 | 35 | 31 | | | 8 | 19 | 21 | | 7 | 11 | 15 | 20 | P8 | M10 | 70 |
| C6-DTOFR/L42060 | C6 | 84 | 42 | 122 | 105 | 41 | 35.5 | | | 9 | 26.5 | 24.5 | | 10 | 18 | 15 | 25 | P10 | M10 | 90 |
| C8-DTOFR/L50088 | C8 | 100 | 50 | 146 | 133 | 55 | 46 | | | 12 | 33 | 43 | | 13 | 19 | 20 | 32 | P11 | M12 | 130 |

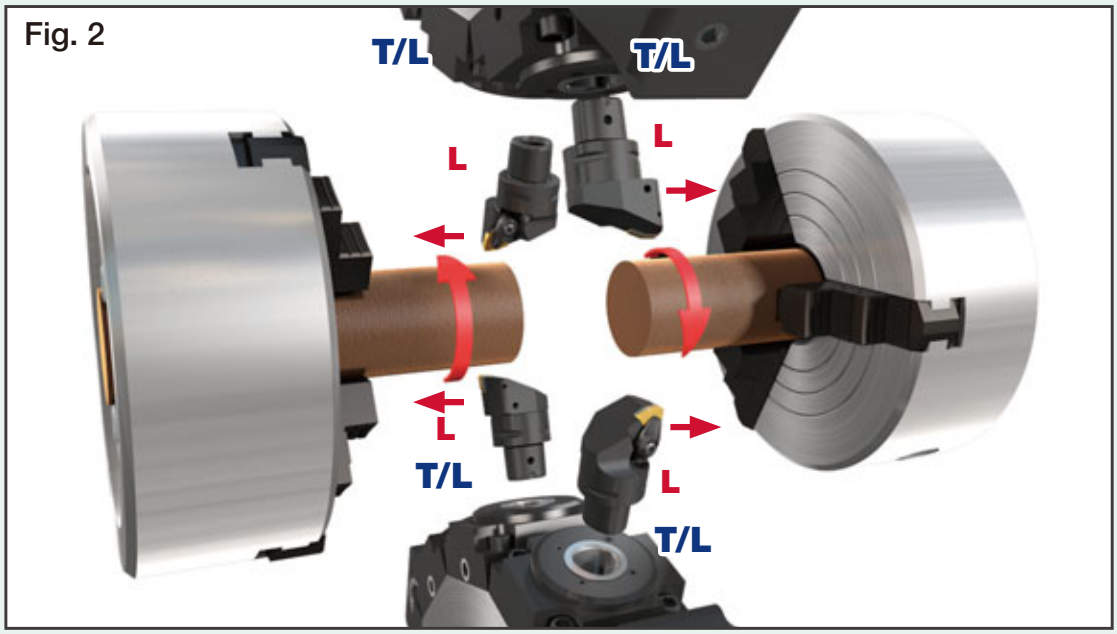
Applicable for 7 MPa pressure coolant

* f6 tolerance: d20 & 25 = -0.022 / -0.033, d32 = -0.025 / -0.041
*Recommended torque (N·m) for clamping

# Clamping units & tools for CNC lathes

## Selection for External turning



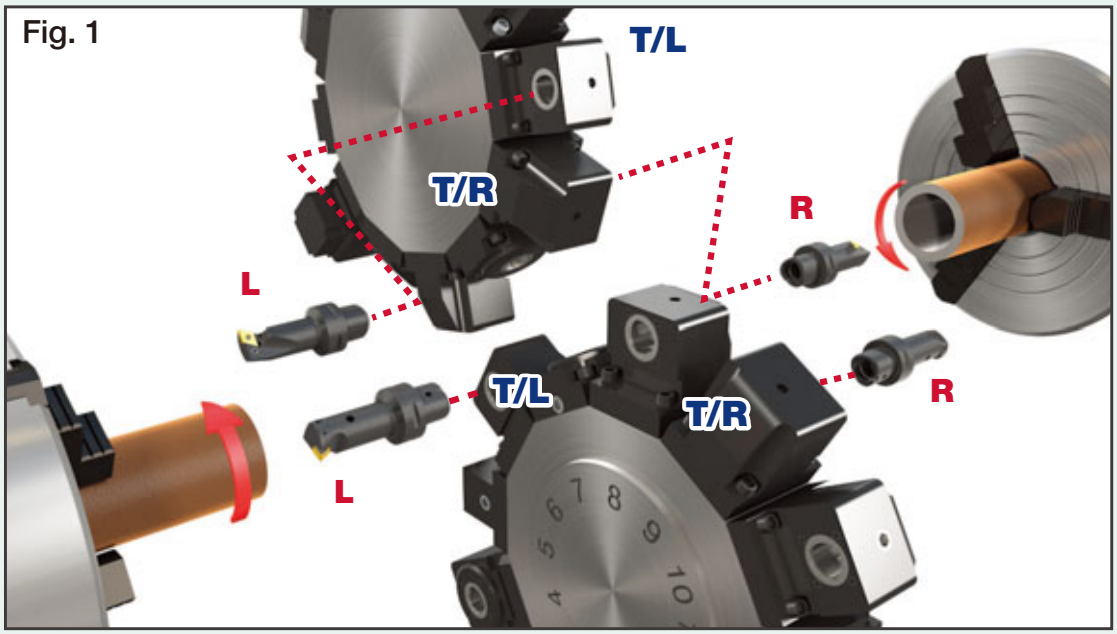



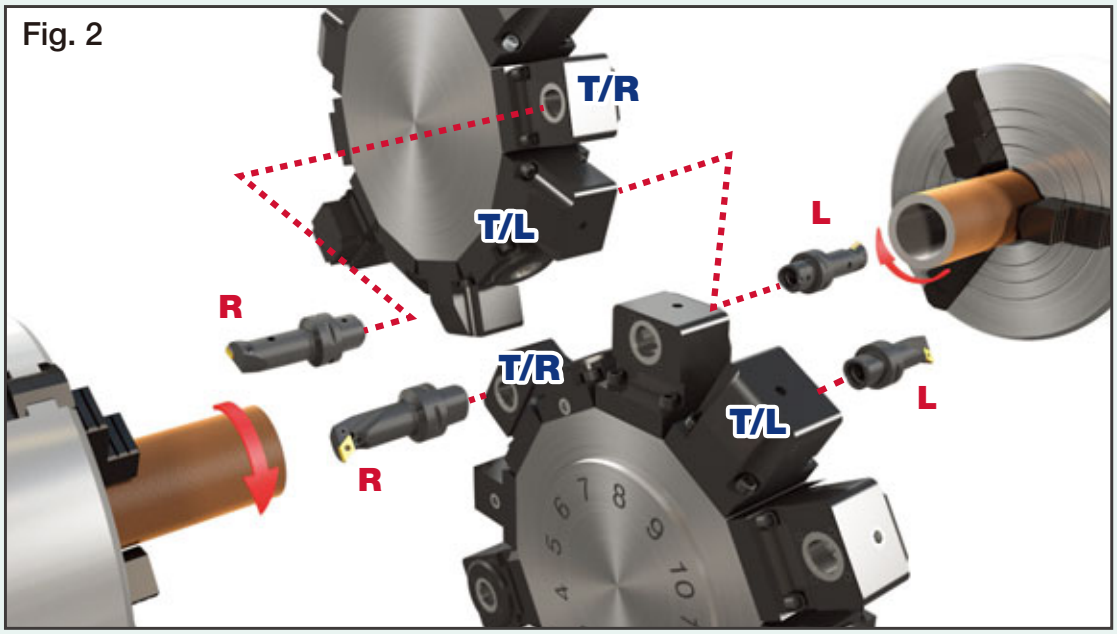

**R:** Right hand cutting tool, **L:** Left hand cutting tool
**T/R:** Right hand clamping unit, **T/L:** Left hand clamping unit

# **Clamping** units & tools for CNC lathes



## Selection for Internal turning



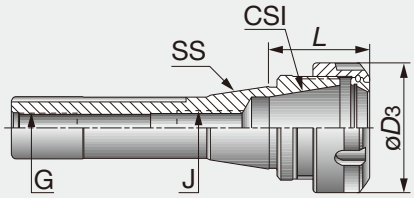




**R:** Right hand cutting tool, **L:** Left hand cutting tool
**T/R:** Right hand clamping unit, **T/L:** Left hand clamping unit

TUNGHOLD

## R-8 ER (Collet chuck)

ER collet chucks with R-8 Bridgeport shank




| Designation | SS | CSI | Range | *L* | ø*D*3 | J | G |
|---|---|---|---|---|---|---|---|
| R-8ER16X38 | R-8 | ER16 | 0.5-10 | 38 | 28 | M10 | 7/16-20 |
| R-8ER32X40 | R-8 | ER32 | 2-20 | 40 | 50 | M12 | 7/16-20 |
| R-8ER40X72 | R-8 | ER40 | 3-26 | 72 | 63 | M12 | 7/16-20 |

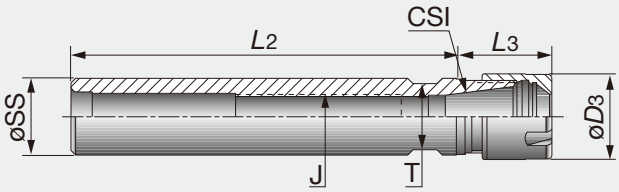
• Applicable for 10 MPa pressure coolant

(Option:Wrench for ER collet)

TUNGHOLD

## ST-ER-M (Mini collet)

ER Mini-collet chucks with Straight shank




| Designation | øSS | CSI | Range | *L*2 | *L*3 | J | ø*D*3 | T |
|---|---|---|---|---|---|---|---|---|
| ST12X80ER11M | 12 | ER11 | 0.5-7 | 80 | 26.5 | - | 16 | 11 |
| ST16X50ER11MF | 16 | ER11 | 0.5-7 | 50 | 18.5 | M8 | 16 | 13 |
| ST16X100ER11M | 16 | ER11 | 0.5-7 | 100 | 18.5 | M8 | 16 | 13 |
| ST16X150ER11M | 16 | ER11 | 0.5-7 | 150 | 18.5 | M8 | 16 | 13 |
| ST12X80ER16M | 12 | ER16 | 0.5-10 | 80 | 36.5 | - | 22 | 17 |
| ST20X100ER16M | 20 | ER16 | 0.5-10 | 100 | 25 | M12 | 22 | 17 |
| ST20X150ER16M | 20 | ER16 | 0.5-10 | 150 | 25 | M12 | 22 | 17 |
| ST20X100ER20M | 20 | ER20 | 1-13 | 100 | 40 | M12 | 28 | 21 |
| ST20X150ER20M | 20 | ER20 | 1-13 | 150 | 40 | M12 | 28 | 21 |

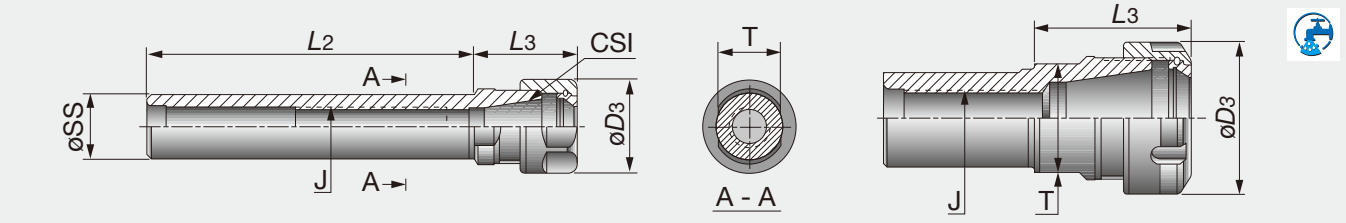
• Applicable for 10 MPa pressure coolant • F indicates a flat on the shank.

(Option:Wrench for ER collet)

# ST-ER (Collet chuck)

## ER collet chucks with Straight shank






| Designation | øSS | CSI | Range | $L_2$ | $L_3$ | J | $øD_3$ | T |
|---|---|---|---|---|---|---|---|---|
| ST16X50ER11F | 16 | ER11 | 0.5-7 | 50 | 18.5 | M8 | 19 | 13 |
| ST20X50ER11F | 20 | ER11 | 0.5-7 | 50 | 18.5 | M10 | 19 | 17 |
| ST20X100ER11 | 20 | ER11 | 0.5-7 | 100 | 18.5 | M10 | 19 | 17 |
| ST20X150ER11 | 20 | ER11 | 0.5-7 | 150 | 18.5 | M10 | 19 | 17 |
| ST20X50ER16F | 20 | ER16 | 0.5-10 | 50 | 32.3 | M12 | 28 | 19 |
| ST20X100ER16 | 20 | ER16 | 0.5-10 | 100 | 30 | M12 | 28 | 19 |
| ST20X150ER16 | 20 | ER16 | 0.5-10 | 150 | 30 | M12 | 28 | 19 |
| ST20X50ER20F | 20 | ER20 | 1-13 | 50 | 42.5 | M12 | 34 | 22 |
| ST25X100ER20 | 25 | ER20 | 1-13 | 100 | 36 | M16 | 34 | 22 |
| ST25X150ER20 | 25 | ER20 | 1-13 | 150 | 36 | M16 | 34 | 22 |
| ST20X50ER25F | 20 | ER25 | 1-16 | 50 | 46 | M12 | 42 | 28 |
| ST20X100ER25 | 20 | ER25 | 1-16 | 100 | 46 | M12 | 42 | 28 |
| ST20X50ER32F | 20 | ER32 | 2-20 | 50 | 54 | M12 | 50 | 36 |
| ST20X100ER32 | 20 | ER32 | 2-20 | 100 | 54 | M12 | 50 | 36 |
| ST25X50ER25F | 25 | ER25 | 1-16 | 50 | 46 | M16 | 42 | 28 |
| ST25X100ER25 | 25 | ER25 | 1-16 | 100 | 46 | M16 | 42 | 28 |
| ST25X50ER32F | 25 | ER32 | 2-20 | 50 | 52 | M16x2 | 50 | 36 |
| ST25X50ER40F | 25 | ER40 | 3-26 | 50 | 60 | M16x2 | 63 | 45 |
| ST30X50ER32F | 30 | ER32 | 2-20 | 50 | 52 | M18x1.5 | 50 | 36 |
| ST30X50ER40F | 30 | ER40 | 3-26 | 50 | 60 | M18x1.5 | 63 | 45 |
| ST32X50ER32F | 32 | ER32 | 2-20 | 50 | 52 | M18x1.5 | 50 | 36 |
| ST32X150ER32 | 32 | ER32 | 2-20 | 150 | 52 | M18x1.5 | 50 | 36 |
| ST32X50ER40F | 32 | ER40 | 3-26 | 50 | 60 | M18x1.5 | 63 | 45 |
| ST40X75ER32F | 40 | ER32 | 2-20 | 75 | 46 | M22x1.5 | 50 | 44 |
| ST40X75ER40F | 40 | ER40 | 3-26 | 75 | 55 | M22x1.5 | 63 | 45 |
| ST50X80ER40F | 50 | ER40 | 3-26 | 80 | 60 | M28x1.5 | 63 | 54 |
| ST50X80ER50F | 50 | ER50 | 10-34 | 80 | 77 | M36x1.5 | 78 | 58 |

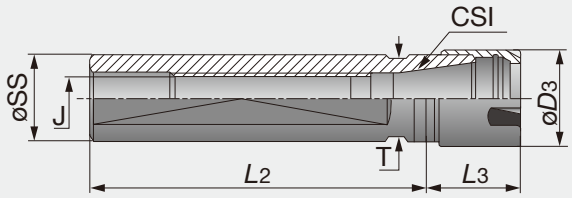
• Applicable for 10 MPa pressure coolant • F indicates a flat on the shank.

(Option:Wrench for ER collet)

# TUNGHOLD

## ST-ER-MF

ER Mini-collet chucks with flat for SWISS type machines




| Designation | øSS | CSI | Range | L2 | L3 | J | øD3 | T | Machine |
|---|---|---|---|---|---|---|---|---|---|
| ST16X35ER16MF | 16 | ER16 | 0.5-10 | 35 | 36 | M8X1 | 22 | 17 | Star |
| ST16X38ER11MF | 16 | ER11 | 0.5-7 | 38 | 18.5 | M8X1 | 16 | 14 | Star |
| ST16X140ER11MF | 16 | ER11 | 0.5-7 | 140 | 18.5 | M8X1 | 16 | 14 | - |
| ST20X70ER16MF | 20 | ER16 | 0.5-10 | 70 | 26 | M12X1 | 22 | 17 | Citizen |
| ST20X120ER16MF | 20 | ER16 | 0.5-10 | 120 | 26 | M12X1 | 22 | 17 | Citizen |
| ST20X140ER16MF | 20 | ER16 | 0.5-10 | 140 | 26 | M12X1 | 22 | 17 | Citizen |
| ST22X38ER16MF | 22 | ER16 | 0.5-10 | 38 | 26 | M12X1 | 22 | 19 | Citizen |
| ST22X70ER16MF | 22 | ER16 | 0.5-10 | 70 | 26 | M12X1 | 22 | 19 | Star |
| ST22X70ER25MF | 22 | ER25 | 1-16 | 70 | 47 | M12X1 | 35 | 27 | Star |
| ST22X80ER20MF | 22 | ER20 | 1-13 | 80 | 39 | M12X1 | 28 | 21 | Star |
| ST22X100ER16MF | 22 | ER16 | 0.5-10 | 100 | 28 | M12X1 | 22 | 19 | Star |
| ST25X65ER16MF | 25 | ER16 | 0.5-10 | 65 | 28 | M12X1 | 22 | 22 | - |
| ST25X75ER25MF | 25 | ER25 | 1-16 | 75 | 48 | M14X1 | 35 | 27 | Manurhin |
| ST25X100ER20MF | 25 | ER20 | 1-13 | 100 | 28 | M14X1 | 28 | 22 | Tornos |
| ST25X145ER25MF | 25 | ER25 | 1-16 | 145 | 36 | M14X1 | 35 | 27 | Tornos |
| ST25X154ER20MF | 25 | ER20 | 1-13 | 154 | 28 | M14X1 | 28 | 22 | Tornos |
| ST32X70ER25MF | 32 | ER25 | 1-16 | 70 | 30 | M18X1 | 35 | 27 | Schuette |

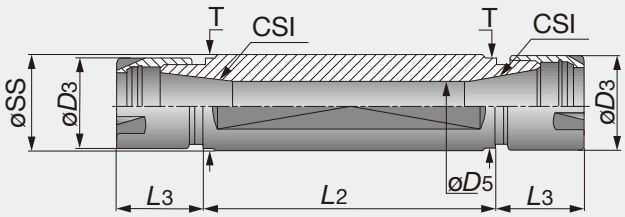
• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGHOLD

## ST-ER-MF-D

Double ended Mini-collet chucks with flat




| Designation | øSS | CSI | Range | L2 | L3 | øD3 | øD5 | T | Machine |
|---|---|---|---|---|---|---|---|---|---|
| ST16X50ER11MFD | 16 | ER11 | 0.5-7 | 50 | 18.5 | 16 | 7.5 | 14 | - |
| ST20X30ER11MFD | 20 | ER11 | 0.5-7 | 30 | 18.5 | 16 | 7.5 | 17 | Citizen |
| ST20X50ER11MFD | 20 | ER11 | 0.5-7 | 50 | 18.5 | 16 | 7.5 | 17 | Citizen |
| ST20X55ER16MFD | 20 | ER16 | 0.5-10 | 55 | 25 | 22 | 10.5 | 17 | Citizen |
| ST22X55ER16MFD | 22 | ER16 | 0.5-10 | 55 | 28 | 22 | 10.5 | 19 | Star |
| ST22X75ER16MFD | 22 | ER16 | 0.5-10 | 75 | 28 | 22 | 10.5 | 19 | Star |
| ST25X62ER16MFD | 25 | ER16 | 0.5-10 | 62 | 28 | 22 | 10.5 | 22 | - |
| ST32X55ER20MFD | 32 | ER20 | 1-13 | 55 | 28 | 28 | 13.5 | 27 | Star |
| ST32X75ER20MFD | 32 | ER20 | 1-13 | 75 | 28 | 28 | 13.5 | 27 | Star |

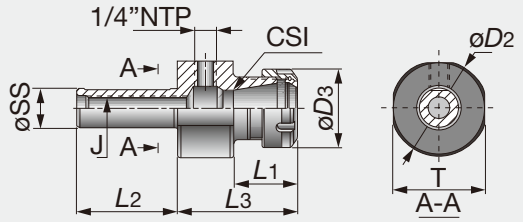
• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGHOLD

## ST-ER-S

ER collet chucks with internal coolant




| Designation | øSS | CSI | Range | $L_2$ | $L_3$ | $L_1$ | J | $øD_3$ | $øD_2$ | T |
|---|---|---|---|---|---|---|---|---|---|---|
| ST20X65ER16S | 20 | ER16 | 0.5-10 | 65 | 54 | 29.6 | M12 | 28 | 40 | 34 |
| ST20X65ER20S | 20 | ER20 | 1-13 | 65 | 63 | 31 | M12 | 34 | 40 | 34 |
| ST20X65ER25S | 20 | ER25 | 1-16 | 65 | 72 | 32 | M12 | 42 | 54 | 51 |
| ST20X65ER32S | 20 | ER32 | 2-20 | 65 | 77 | 41 | M12 | 50 | 63 | 59 |
| ST25X65ER25S | 25 | ER25 | 1-16 | 65 | 72 | 32 | M12 | 42 | 54 | 50 |
| ST25X65ER32S | 25 | ER32 | 2-20 | 65 | 77 | 41 | M16 | 50 | 63 | 59 |
| ST32X65ER32S | 32 | ER32 | 2-20 | 65 | 77 | 41 | M18x1.5 | 50 | 63 | 59 |
| ST40X75ER32S | 40 | ER32 | 2-20 | 75 | 77 | 41 | M22x1.5 | 50 | 63 | 59 |

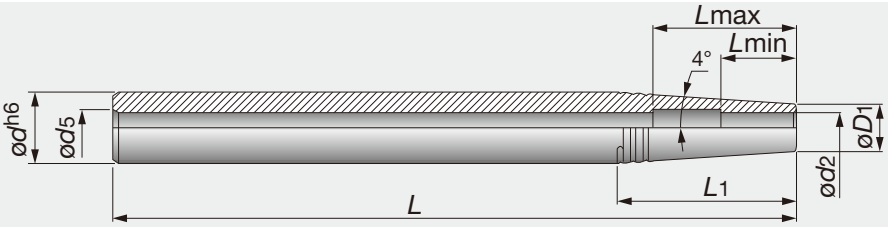
• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGSHRINK

## ST-SRK

TungShrink thermal shrinking holder for carbide shank with Straight shank




| Designation | ød | $ød_2$ | $øD_1$ | $ød_5$ | L | $L_1$ | $L_{min}$ | $L_{max}$ |
|---|---|---|---|---|---|---|---|---|
| ST12X160SRK3 | 12 | 3 | 10 | 4 | 160 | 14.3 | 10 | - |
| ST12X160SRK4 | 12 | 4 | 10 | 4 | 160 | 14.3 | 12 | 27 |
| ST16X160SRK3 | 16 | 3 | 10 | 6 | 160 | 43 | 10 | - |
| ST16X160SRK4 | 16 | 4 | 10 | 6 | 160 | 43 | 12 | - |
| ST16X160SRK5 | 16 | 5 | 10 | 6 | 160 | 43 | 15 | - |
| ST16X160SRK6 | 16 | 6 | 11 | 6 | 160 | 35.5 | 18 | 35 |
| ST20X200SRK5 | 20 | 5 | 10 | 6 | 200 | 71.5 | 15 | - |
| ST20X200SRK6 | 20 | 6 | 11 | 6 | 200 | 64.5 | 18 | 40 |
| ST20X200SRK8 | 20 | 8 | 14 | 6 | 200 | 43 | 25 | 40 |
| ST25X200SRK6 | 25 | 6 | 11 | 8 | 200 | 100 | 18 | 35 |
| ST25X200SRK8 | 25 | 8 | 14 | 8 | 200 | 78.6 | 25 | 40 |
| ST25X200SRK10 | 25 | 10 | 16 | 8 | 200 | 64.3 | 30 | 50 |
| ST25X200SRK12 | 25 | 12 | 20 | 8 | 200 | 35.7 | 32 | 52 |

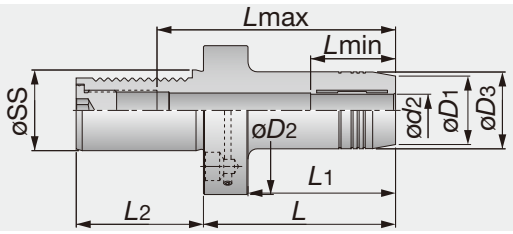
• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGHYDRO

## DIN69880-HYDRO

Hydraulic chuck hodlers with DIN698880 shank




(Unit: mm)

| Designation | øSS | øD1 | øD3 | øD2 | ød2 | L2 | L | L1 | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|
| DIN69880 30 HYDRO 20X89 | 20 | 38 | 42 | 68 | 30 | 55 | 89 | 73 | 48 | 85 |
| DIN69880 30 HYDRO 25X100 | 25 | 46 | 50 | 68 | 30 | 55 | 100 | 78 | 54 | 85 |
| DIN69880 30 HYDRO 32X100 | 32 | 56 | 60 | 68 | 30 | 55 | 100 | 78 | 58 | 90 |
| DIN69880 40 HYDRO 20X95 | 20 | 38 | 42 | 83 | 40 | 63 | 95 | 73 | 48 | 130 |
| DIN69880 40 HYDRO 25X95 | 25 | 46 | 50 | 83 | 40 | 63 | 95 | 73 | 54 | 130 |
| DIN69880 40 HYDRO 32X95 | 32 | 56 | 60 | 83 | 40 | 63 | 95 | 78 | 58 | 90 |

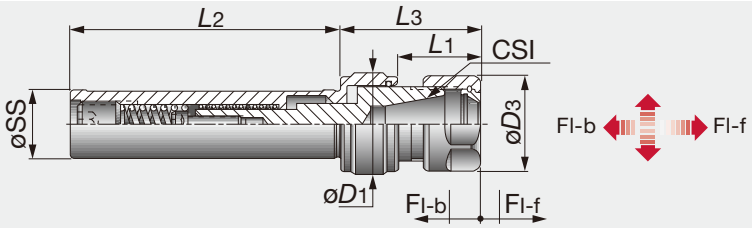
Applicable for 10 MPa pressure coolant
Available are reduction sleeves for 12, 20, 25 and 32 mm bore diameters.
Chucking forces will significantly reduce if reduction sleeves are used (ordered separately).

(Option = Wrench for TungHydro collet)

# TUNGGTI

## GTI-ER-ST

TungGTI tapping attachment with straight shank

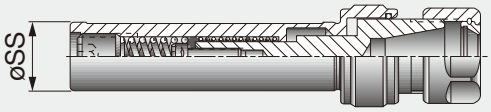



| Designation | øSS | CSI | Tap min | Tap max | Range | øD3 | øD1 | L1 | L3 | L2 | Fl-f | Fl-b |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GTIER11ST16X150M | 16 | ER11 | M2 | M7 | 0.5-7 | 16 | - | 19 | - | 150 | 6 | 3 |
| GTIER16ST20X80 | 20 | ER16 | M3 | M10 | 0.5-10 | 28 | 29.5 | 24.6 | 41.6 | 80 | 8 | 3 |
| GTIER20ST20X80 | 20 | ER20 | M4 | M14 | 1-13 | 34 | 33.5 | 28 | 49 | 80 | 8 | 3 |
| GTIER25ST25X80 | 25 | ER25 | M5 | M16 | 1-16 | 42 | 40.5 | 32 | 53 | 80 | 9 | 4 |
| GTIER32ST25X80 | 25 | ER32 | M6 | M20 | 1-16 | 50 | 56.5 | 32 | 77.2 | 80 | 9 | 4 |
| GTIER40ST32X80 | 32 | ER40 | M6 | M27 | 2-20 | 63 | 56.5 | 51 | 95.2 | 80 | 9 | 4 |

(Option = Wrench for ER collet)

## KIT GTI-ER-ST

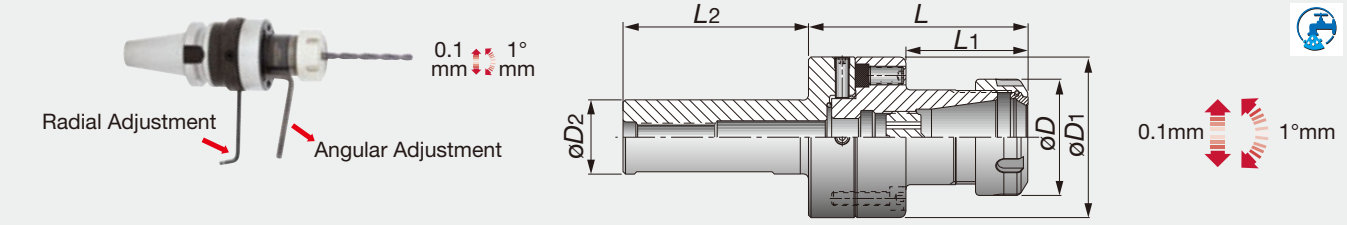
The Kit contains a DIN 6499 ER tapping attachment with straight shank and a set of spring collets in various bore sizes



| Designation | Collet size | øSS | Qty | Range |
|---|---|---|---|---|
| KITGTIER11ST16X1504M | ER11 | 16 | 4 | 3,4,5,6 |
| KITGTIER16ST20X804 | ER16 | 20 | 4 | 4,5,6,7 |
| KITGTIER20ST20X804 | ER20 | 20 | 4 | 5,6,7,8 |
| KITGTIER25ST25X805 | ER25 | 25 | 5 | 6,7,9,11,12 |
| KITGTIER32ST25X806 | ER32 | 25 | 6 | 6,7,9,11,12,16 |
| KITGTIER40ST32X806 | ER40 | 32 | 6 | 9,11,14,16,18,20 |

• Includes GTI, collets & wrench

# TUNGHOLD
## ADJ ST-ER
ER collet chuck with center alignment

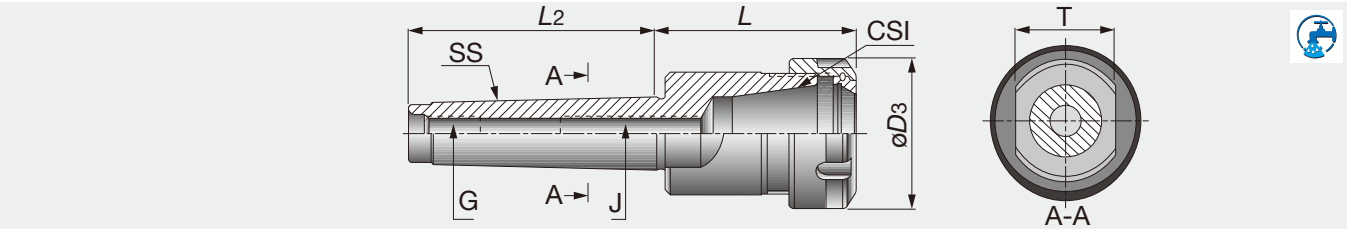



| Designation | Range | L | L1 | L2 | øD | øD1 | øD2 |
|---|---|---|---|---|---|---|---|
| ADJST25D70ER32 | 2-20 | 94.5 | 52.5 | 80 | 50 | 70 | 25 |
| ADJST32D70ER32 | 2-20 | 94.5 | 52.5 | 80 | 50 | 70 | 32 |

• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGHOLD
## MT-ER
ER collet chucks with morse taper

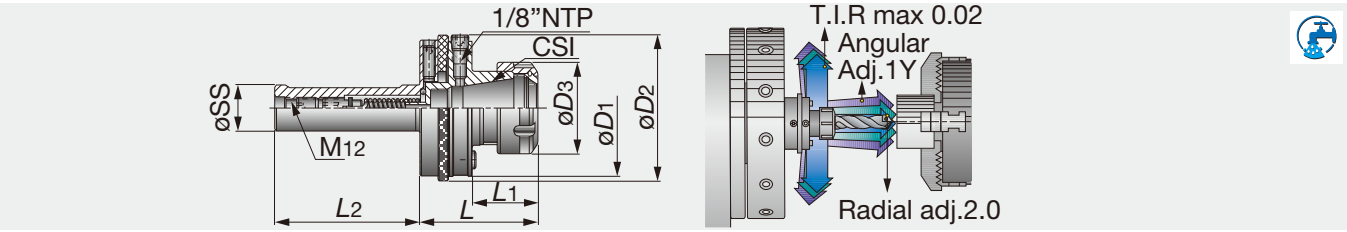



| Designation | SS | CSI | Range | L | L2 | øD3 | J | G | T |
|---|---|---|---|---|---|---|---|---|---|
| MT2ER20X48.5 | MT 2 | ER20 | 1-13 | 48.5 | 64 | 34 | M10 | M10 | 22 |
| MT2ER25X52 | MT 2 | ER25 | 1-16 | 52 | 64 | 42 | M10 | M10 | 28 |
| MT3ER32X69 | MT 3 | ER32 | 2-20 | 69 | 81 | 50 | M12 | M12 | 24 |
| MT3ER40X79 | MT 3 | ER40 | 3-26 | 79 | 81 | 63 | M12 | M12 | 24 |
| MT4ER32X61 | MT 4 | ER32 | 2-20 | 60.5 | 102.5 | 50 | M16 | M16 | 32 |
| MT4ER40X82 | MT 4 | ER40 | 3-26 | 81.5 | 102.5 | 63 | M16 | M16 | 32 |
| MT4ER50X108 | MT 4 | ER50 | 10-34 | 107.5 | 102.5 | 78 | M16 | M16 | 32 |
| MT5ER40X82 | MT 5 | ER40 | 3-26 | 82 | 129.5 | 63 | M28x1.5 | M20 | 45 |
| MT5ER50X85 | MT 5 | ER50 | 10-34 | 85 | 129.5 | 78 | M28x1.5 | M20 | 45 |

• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGGYRO
## GYRO ST-ER TungGYRO
Center alignment collet chuck holder for lathe




| Designation | øSS | CSI | Range | L | L1 | L2 | øD3 | øD1 | øD2 |
|---|---|---|---|---|---|---|---|---|---|
| GYROST20ER20 | 20 | ER20 | 1-13 | 58.8 | 28.5 | 80 | 34 | 57 | 63 |
| GYROST20ER25 | 20 | ER25 | 1-16 | 58.8 | 28.5 | 80 | 34 | 57 | 63 |
| GYROST25ER25 | 25 | ER25 | 1-16 | 65.65 | 35.5 | 80 | 42 | 74 | 79 |
| GYROST25ER32 | 25 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |
| GYROST32ER32 | 32 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |
| GYROST40ER32 | 40 | ER32 | 2-20 | 66.65 | 36.5 | 80 | 50 | 74 | 79 |

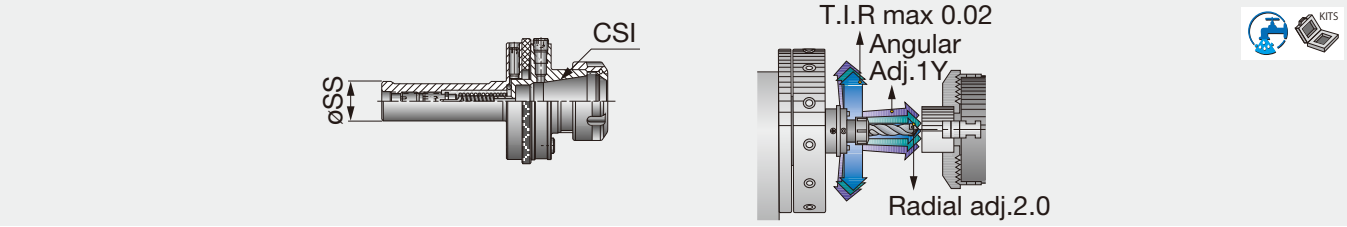
• Applicable for 10 MPa pressure coolant
• First-time users should buy a GYRO kit which includes a test bar and a bushing for performing the alignment procedure.

(Option = Wrench for ER collet)

# TUNGGYRO

## KIT GYRO-ST-ER

The Kit contains 1 center alignment collet chuck and a centering bushing




| Designation | øSS | CSI | Range |
|---|---|---|---|
| KITGYROST20ER20 | 20 | ER20 | 1-13 |
| KITGYROST20ER25 | 20 | ER25 | 1-16 |
| KITGYROST25ER25 | 25 | ER25 | 1-16 |
| KITGYROST25ER32 | 25 | ER32 | 2-20 |
| KITGYROST32ER32 | 32 | ER32 | 2-20 |
| KITGYROST40ER32 | 40 | ER32 | 2-20 |

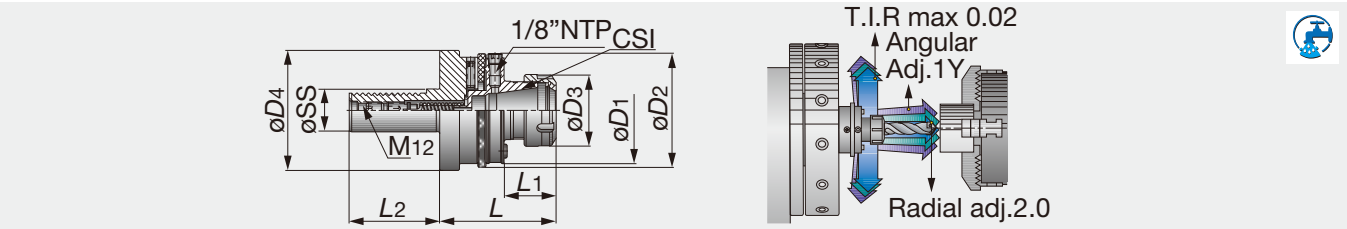
• Applicable for 10 MPa pressure coolant • Kit includes: GYRO, test bar and bushing.

(Option = Wrench for ER collet)

# TUNGGYRO

## GYRO DIN69880-ER

Center alignment collet chuck holder for lathe




| Designation | øSS | CSI | Range | *L* | *L*1 | *L*2 | ø*D*3 | ø*D*1 | ø*D*2 | ø*D*4 |
|---|---|---|---|---|---|---|---|---|---|---|
| GYRODIN6988030ER25 | 30 | ER25 | 1-16 | 80.65 | 35.5 | 55 | 42 | 74 | 79 | 68 |
| GYRODIN6988030ER32 | 30 | ER32 | 2-20 | 81.65 | 36.5 | 55 | 50 | 74 | 79 | 68 |
| GYRODIN6988040ER32 | 40 | ER32 | 2-20 | 81.65 | 36.5 | 63 | 50 | 74 | 79 | 83.2 |
| GYRODIN6988050ER32 | 50 | ER32 | 2-20 | 81.65 | 36.5 | 78 | 50 | 74 | 79 | 98 |

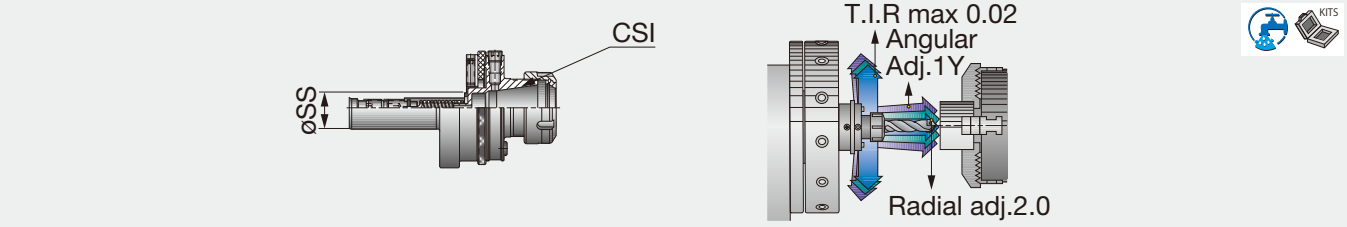
• Applicable for 10 MPa pressure coolant
• First-time users should buy a GYRO kit which includes a test bar and a bushing for performing the alignment procedure.

(Option = Wrench for ER collet)

# TUNGGYRO

## KIT GYRO-DIN69880-ER

The Kit contains 1 center alignment ER collet chuck with VDI DIN69880 shank and a centering bushing

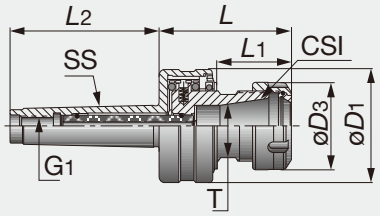



| Designation | øSS | CSI | Range |
|---|---|---|---|
| KITGYRO30D69880ER25 | 30 | ER25 | 1-16 |
| KITGYRO30D69880ER32 | 30 | ER32 | 2-20 |
| KITGYRO40D69880ER32 | 40 | ER32 | 2-20 |
| KITGYRO50D69880ER32 | 50 | ER32 | 2-20 |

• Applicable for 10 MPa pressure coolant • Kit includes: GYRO, test bar and bushing.

(Option = Wrench for ER collet)

# TUNGGFI
## GFI-MT-ER
Floating reamer collet chuck

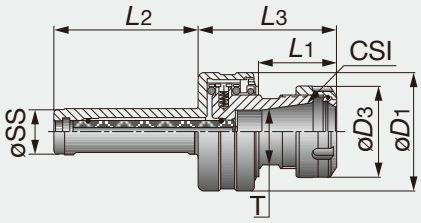



| Designation | SS | CSI | Range | $L_2$ | $L$ | $L_1$ | $øD_3$ | $øD_1$ | Radial Float | T | $G_1$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GFIMT2ER20 | MT 2 | ER20 | 1-13 | 64 | 60.5 | 34.5 | 34 | 50 | 1 | 22 | M10 |
| GFIMT3ER32 | MT 3 | ER32 | 2-20 | 81 | 81.9 | 45.9 | 50 | 65 | 1.6 | 36 | M12 |

• Applicable for 10 MPa pressure coolant • Maximum 2000 $min^{-1}$.

(Option = Wrench for ER collet)

# TUNGGFI
## GFI-ST-ER
Floating reamer collet chuck




| Designation | øSS | CSI | Range | $L_2$ | $L_3$ | $L_1$ | $øD_3$ | $øD_1$ | Radial Float | T |
|---|---|---|---|---|---|---|---|---|---|---|
| GFIST20ER20 | 20 | ER20 | 1-13 | 65 | 55.5 | 34.5 | 34 | 50 | 1 | 22 |
| GFIST25ER32 | 25 | ER32 | 2-20 | 80 | 76.9 | 45.9 | 50 | 65 | 1.6 | 36 |

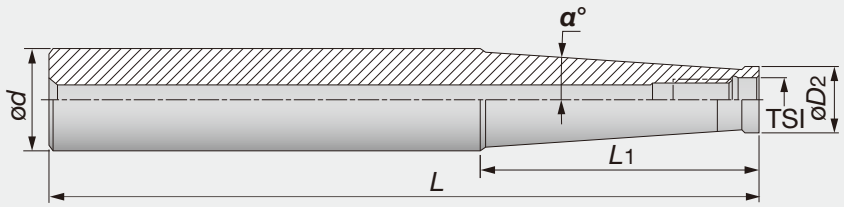
• Applicable for 10 MPa pressure coolant • Maximum 2000 $min^{-1}$.

(Option = Wrench for ER collet)

# TUNGFLEX

## S M TungFlex-straight shank

TungFlex modular tooling system with straight shank (Screw clamp holder for modular cutting heads)



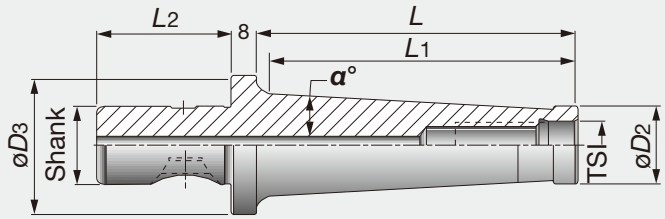

| Designation | ød | øD2 | L | L1 | α° | TSI |
|---|---|---|---|---|---|---|
| SM06-L60C10 | 10 | 9.7 | 60 | 20 | 0 | M6 |
| SM06-L105-C12 | 12 | 9.7 | 105 | 60 | 1.2 | M6 |
| SM06-L125-C16 | 16 | 9.7 | 125 | 60 | 3.3 | M6 |
| SM08-L73C16 | 16 | 13 | 73 | 25 | 0 | M8 |
| SM08-L128-C16 | 16 | 13 | 128 | 80 | 0.9 | M8 |
| SM08-L170-C20 | 20 | 13 | 170 | 66.8 | 3.3 | M8 |
| SM10-L80C20 | 20 | 18 | 80 | 30 | 0 | M10 |
| SM10-L130-C20 | 20 | 18 | 130 | 80 | 0.6 | M10 |
| SM10-L200-C25 | 25 | 19 | 200 | 57.2 | 3.3 | M10 |
| SM12-L86-C25 | 25 | 21 | 86 | 30 | 5.1 | M12 |
| SM12-L200-C32 | 32 | 21 | 200 | 78 | 4.4 | M12 |
| SM16-L95-C32 | 32 | 29 | 95 | 35 | 1.7 | M16 |
| SM16-L230-C32 | 32 | 29 | 230 | 50 | 1.8 | M16 |

• Applicable for 10 MPa pressure coolant • All of the shanks have a coolant holes.

# TUNGFIT TUNGFLEX

## S M-CF4 TungFit adaptor

TungFlex conversion adaptor with TungFit

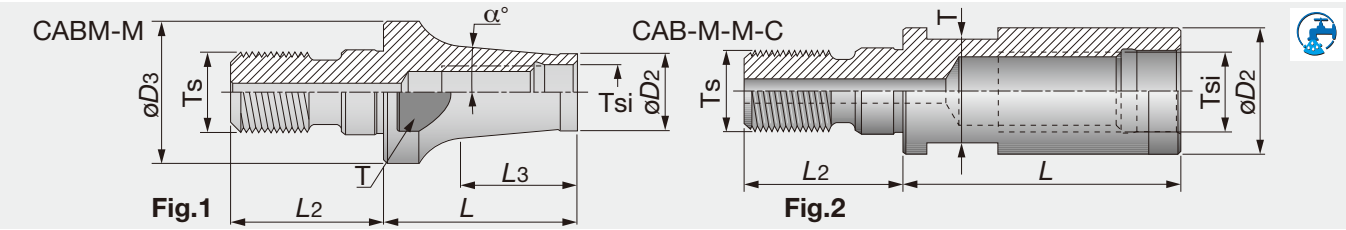



| Designation | øD2 | L | L1 | α° | shank | øD3 | L2 | TSI |
|---|---|---|---|---|---|---|---|---|
| SM12-L85/3.30-CF4 | 21 | 93 | 81.3 | 4.4 | CF4 | 44 | 42 | M12 |
| SM16-L130/5.11-CF4 | 29 | 138 | 126.8 | 2.6 | CF4 | 44 | 42 | M16 |
| SM12-L140/5.50-CF4 | 21 | 148 | 139.1 | 4.4 | CF4 | 44 | 42 | M12 |
| SM16-L170/6.70-CF4 | 29 | 178 | 168.6 | 2 | CF4 | 44 | 42 | M16 |

• Applicable for 10 MPa pressure coolant

# TUNGFLEX
## CAB M-M

TungFlex reducer and extensions

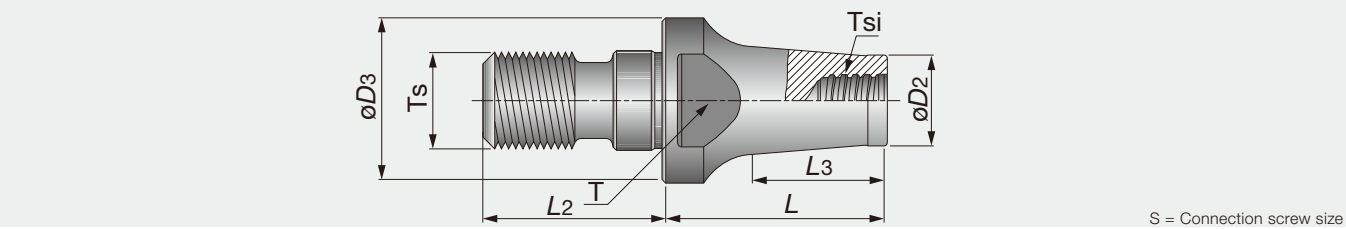



| Designation | Ts | α° | øD2 | L | L3 | øD3 | L2 | T | Tsi |
|---|---|---|---|---|---|---|---|---|---|
| CABM06M08 | M8 | 5.7 | 9.7 | 30 | 24.8 | 13 | 17.5 | 9.5 | M6 |
| CABM08M08-C (1) | M8 | 0 | 13 | 30 | - | - | 17.5 | 9.6 | M8 |
| CABM08M10 | M10 | 5.2 | 13 | 40 | 33.4 | 18 | 20 | 15 | M8 |
| CABM10M10-C (1) | M10 | 0 | 18 | 35 | - | - | 20 | 15 | M10 |
| CABM10M12 | M12 | 2.5 | 18 | 45 | 36.4 | 21 | 22 | 17 | M10 |
| CABM12M12-C (1) | M12 | 0 | 21 | 40 | - | - | 22 | 17 | M12 |
| CABM12M16 | M16 | 6.3 | 21 | 50 | 42.5 | 29 | 25 | 25 | M12 |
| CABM16M16-C (1) | M16 | 0 | 29 | 40 | - | - | 25 | 25 | M16 |

• Applicable for 10 MPa pressure coolant (1) With coolant holes

# TUNGFLEX
## VAD**-M

TungFlex conversion adaptor



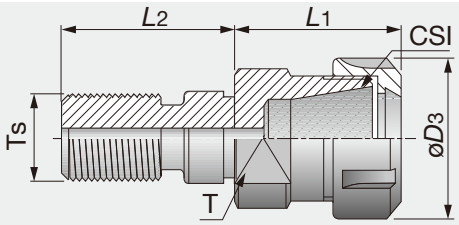

S = Connection screw size

| Designation | øD2 | øD3 | L | L2 | L3 | Tsi | Ts | T |
|---|---|---|---|---|---|---|---|---|
| VAD130L016S08-S-M8 | 11.7 | 13 | 16 | 17.5 | 6 | S08 | M8 | 11 |
| VAD130L025S08-S-M8 | 11.7 | 13 | 25 | 17.5 | 20 | S08 | M8 | 11 |
| VAD180L020S08-S-M10 | 11.7 | 18 | 20 | 20 | 12 | S08 | M10 | 13 |
| VAD180L025S08-S-M10 | 11.7 | 18 | 25 | 20 | 15 | S08 | M10 | 11 |
| VAD210L020S08-S-M12 | 11.7 | 21 | 20 | 20 | 10 | S08 | M12 | 12.75 |
| VAD210L025S08-S-M12 | 11.7 | 21 | 25 | 20 | 13 | S08 | M12 | 12.75 |

• Wrench size, used on flats for tightening (sold separately). • Do not apply lubricant to the threaded connection.

# TUNGFLEX
## CDP-ER-M

TungFlex adaptor with ER collet chucks



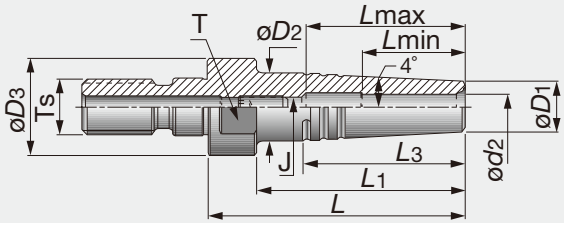

| Designation | Ts | CSI | Range | $L_1$ | $L_2$ | $øD_3$ | T |
|---|---|---|---|---|---|---|---|
| CDPER11M10M | M10 | ER11 | 0.5-7 | 27 | 20 | 16 | 15 |
| CDPER16M10M | M10 | ER16 | 0.5-10 | 38.1 | 20 | 22 | 17 |
| CDPER11M12M | M12 | ER11 | 0.5-7 | 27 | 22 | 16 | 17 |
| CDPER16M12M | M12 | ER16 | 0.5-10 | 37.1 | 22 | 22 | 17 |
| CDPER16M16 | M16 | ER16 | 0.5-10 | 36.6 | 25 | 28 | 25 |
| CDPER20M16 | M16 | ER20 | 1-13 | 45.5 | 25 | 34 | 25 |
| CDPER25M16 | M16 | ER25 | 1-16 | 44.5 | 25 | 42 | 28 |

• Applicable for 10 MPa pressure coolant

(Option = Wrench for ER collet)

# TUNGFLEX
## CDP-M-SRK

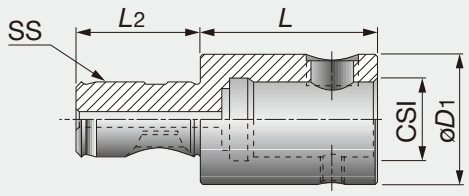
TungFlex adaptor with shrinking holder for carbide shank




| Designation | Ts | $øD_3$ | $ød_2$ | $øD_1$ | $øD_2$ | L | $L_1$ | $L_3$ | Lmin | Lmax | J | T | Key |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CDPM10SRK3X40 | M10 | 18 | 3 | 10 | 14 | 40 | 31.5 | 28.4 | 10 | 16 | M4 | 15 | 2 |
| CDPM10SRK4X40 | M10 | 18 | 4 | 10 | 14 | 40 | 31.5 | 28.4 | 12 | 19 | M4 | 15 | 2 |
| CDPM10SRK5X40 | M10 | 18 | 5 | 10 | 14 | 40 | 31.5 | 28.4 | 15 | 25 | M4 | 15 | 2 |
| CDPM12SRK3X45 | M12 | 21 | 3 | 10 | 14 | 45 | 36.5 | 28.8 | 10 | 16 | M5 | 18 | 2.5 |
| CDPM12SRK4X45 | M12 | 21 | 4 | 10 | 14 | 45 | 36.5 | 28.8 | 12 | 18 | M5 | 18 | 2.5 |
| CDPM12SRK5X45 | M12 | 21 | 5 | 10 | 14 | 45 | 36.5 | 28.8 | 15 | 25 | M5 | 18 | 2.5 |
| CDPM12SRK6X45 | M12 | 21 | 6 | 11 | 15 | 45 | 36.5 | 28.4 | 18 | 28 | M5 | 18 | 2.5 |
| CDPM12SRK8X45 | M12 | 21 | 8 | 14 | 18 | 45 | 36.5 | 28.8 | 25 | 35 | M5 | 18 | 2.5 |
| CDPM12SRK10X45 | M12 | 21 | 10 | 16 | 21 | 45 | - | 35.6 | 30 | 40 | M5 | 18 | 2.5 |
| CDPM12SRK12X45 | M12 | 21 | 12 | 20 | 25 | 45 | - | 36.0 | 32 | 42 | M5 | 18 | 2.5 |

• Applicable for 10 MPa pressure coolant

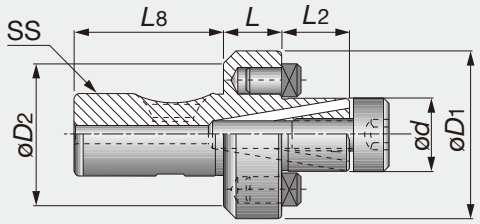
# TUNGFIT
## EX-CF
TungFit extension adaptor




| Designation | SS | $L_2$ | L | CSI | $øD_1$ |
|---|---|---|---|---|---|
| EXCF4-S | CF4 | 42 | 60 | CF4 | 44 |
| EXCF4-L | CF4 | 42 | 100 | CF4 | 44 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m.

# TUNGFIT
## SEM-CF
TungFit shell mill adaptor

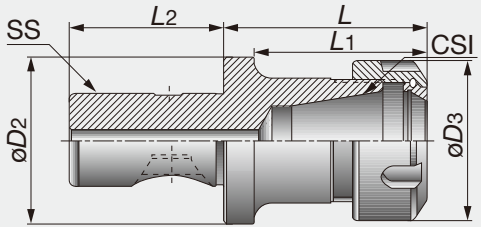



| Designation | SS | ød | $øD_2$ | $øD_1$ | L | $L_2$ | $L_8$ |
|---|---|---|---|---|---|---|---|
| SEM22CF4C | CF4 | 22 | 44 | 47 | 16 | 19 | 42 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m.

(Option = Wrench for Lock Screw)

# TUNGFIT
## ER-CF
TungFit collet chuck adaptor




| Designation | SS | CSI | Range | L | $L_1$ | $L_2$ | $øD_3$ | $øD_2$ |
|---|---|---|---|---|---|---|---|---|
| ER11CF4-S | CF4 | ER11 | 0.5-7 | 55 | 47 | 42 | 19 | 44 |
| ER16CF4-L | CF4 | ER16 | 0.5-10 | 100 | 92 | 42 | 28 | 44 |
| ER16CF4-S | CF4 | ER16 | 0.5-10 | 55 | 47 | 42 | 28 | 44 |
| ER20CF4-S | CF4 | ER20 | 1-13 | 55 | 92 | 42 | 34 | 44 |
| ER25CF4-S | CF4 | ER25 | 1-16 | 55 | 47 | 42 | 42 | 44 |
| ER32CF4-L | CF4 | ER32 | 2-20 | 100 | 92 | 42 | 50 | 44 |
| ER32CF4-S | CF4 | ER32 | 2-20 | 55 | 47 | 42 | 50 | 44 |

• Applicable for 10 MPa pressure coolant • Tightening torque: 58.8 N·m.

(Option = Wrench for ER collet)

# TUNGHOLD ER Collet Chucking System

## Shanks

**BT MAS-403, DIN69871**

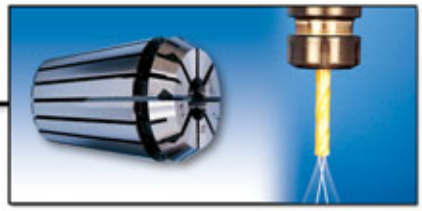
**ST Straight Shank**

**MT Morse Taper**

## Collet Options

**ER-SPR (ER Spring Collet)**

**ER-SEAL**
**(ER SEAL Collet for Internal coolant)**

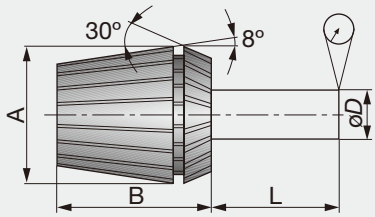


**ER-SEAL JET2**
**(ER SEAL Collet for External coolant)**

**ER-SRK**
**(ER Collet with SHRINK Holder)**

**ER32 GTIN**
**(ER Collet with Tapping Holder)**

**ER32 ODP**
**(ER Collet with Indexable Modular System)**




| Designation | A | B | L | øD | T.I.R Precision Standard type | T.I.R Precision "AA" Ultra Precision type |
|---|---|---|---|---|---|---|
| ER-11 | 11.5 | 18 | 6 | 1-1.6 | 0.01 | 0.005 |
| ER-16 | 17 | 27 | 10 | 1.6-3 | 0.01 | 0.005 |
| ER-20 | 21 | 31 | 16 | 3-6 | 0.01 | 0.005 |
| ER-25 | 26 | 35 | 25 | 6-10 | 0.01 | 0.005 |
| ER-32 | 33 | 40 | 40 | 10-18 | 0.01 | 0.005 |
| ER-40 | 41 | 46 | 50 | 18-26 | 0.01 | 0.005 |
| ER-50 | 52 | 60 | 60 | 26-34 | 0.01 | - |

ER 50 DIN6499

## ER - Coolit Sealed Collet

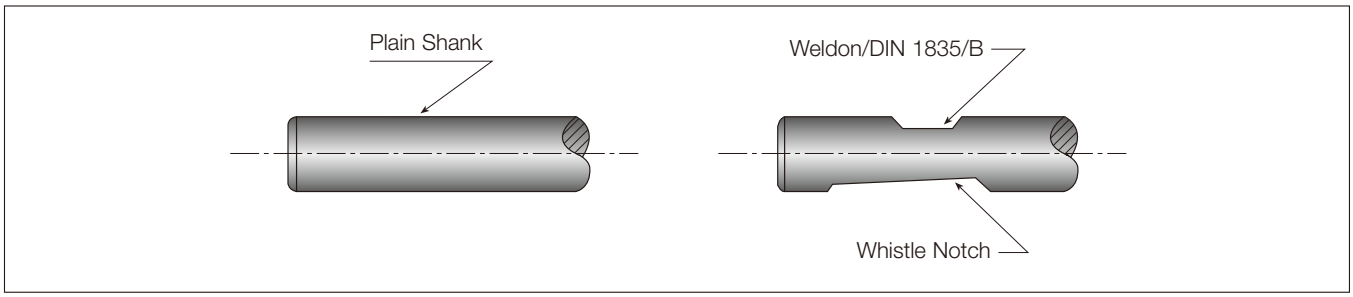
### Sealed Collet Jet

For straight shank cutting tools with internal coolant supply.

### Sealed Collet JET2

With angular double nozzles. Coolant flow is direct to the cutting edge - for use with standard straight shank cutting tools (without coolant hole).

## Standard Shank which can be used in Sealed Collets

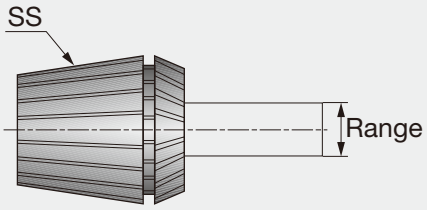



Note: The front end of the sealed collet should be located beyond weldon or the whistle notch.

# TUNGHOLD

## ER-SPR

DIN 6499 ER Spring Collets




| Designation | SS | Range |
|---|---|---|
| ER11SPR0.5-1 | ER11 | 0.5-1 |
| ER11SPR1-2 | ER11 | 1-2 |
| ER11SPR2-3 | ER11 | 2-3 |
| ER11SPR3-4 | ER11 | 3-4 |
| ER11SPR4-5 | ER11 | 4-5 |
| ER11SPR5-6 | ER11 | 5-6 |
| ER11SPR6-7 | ER11 | 6-7 |
| ER16SPR0.5-1 | ER16 | 0.5-1 |
| ER16SPR1-2 | ER16 | 1-2 |
| ER16SPR2-3 | ER16 | 2-3 |
| ER16SPR3-4 | ER16 | 3 |
| ER16SPR4-5 | ER16 | 4-5 |
| ER16SPR5-6 | ER16 | 5-6 |
| ER16SPR6-7 | ER16 | 6-7 |
| ER16SPR7-8 | ER16 | 7-8 |
| ER16SPR8-9 | ER16 | 8-9 |
| ER16SPR9-10 | ER16 | 9-10 |
| ER20SPR1-2 | ER20 | 1-2 |
| ER20SPR2-3 | ER20 | 2-3 |
| ER20SPR3-4 | ER20 | 3-4 |
| ER20SPR4-5 | ER20 | 4-5 |
| ER20SPR5-6 | ER20 | 5-6 |
| ER20SPR6-7 | ER20 | 6-7 |
| ER20SPR7-8 | ER20 | 7-8 |
| ER20SPR8-9 | ER20 | 8-9 |
| ER20SPR9-10 | ER20 | 9-10 |
| ER20SPR10-11 | ER20 | 10-11 |
| ER20SPR11-12 | ER20 | 11-12 |
| ER20SPR12-13 | ER20 | 12-13 |
| ER25SPR1-2 | ER25 | 1-2 |
| ER25SPR2-3 | ER25 | 2-3 |
| ER25SPR3-4 | ER25 | 3-4 |
| ER25SPR4-5 | ER25 | 4-5 |
| ER25SPR5-6 | ER25 | 5-6 |
| ER25SPR6-7 | ER25 | 6-7 |
| ER25SPR7-8 | ER25 | 7-8 |
| ER25SPR8-9 | ER25 | 8-9 |
| ER25SPR9-10 | ER25 | 9-10 |
| ER25SPR10-11 | ER25 | 10-11 |
| ER25SPR11-12 | ER25 | 11-12 |
| ER25SPR12-13 | ER25 | 12-13 |
| ER25SPR13-14 | ER25 | 13-14 |
| ER25SPR14-15 | ER25 | 14-15 |
| ER25SPR15-16 | ER25 | 15-16 |
| ER32SPR2-3 | ER32 | 2-3 |
| ER32SPR3-4 | ER32 | 3-4 |
| ER32SPR4-5 | ER32 | 4-5 |
| ER32SPR5-6 | ER32 | 5-6 |
| ER32SPR6-7 | ER32 | 6-7 |
| ER32SPR7-8 | ER32 | 7-8 |
| ER32SPR8-9 | ER32 | 8-9 |
| ER32SPR9-10 | ER32 | 9-10 |
| ER32SPR10-11 | ER32 | 10-11 |

| Designation | SS | Range |
|---|---|---|
| ER32SPR11-12 | ER32 | 11-12 |
| ER32SPR12-13 | ER32 | 12-13 |
| ER32SPR13-14 | ER32 | 13-14 |
| ER32SPR14-15 | ER32 | 14-15 |
| ER32SPR15-16 | ER32 | 15-16 |
| ER32SPR16-17 | ER32 | 16-17 |
| ER32SPR17-18 | ER32 | 17-18 |
| ER32SPR18-19 | ER32 | 18-19 |
| ER32SPR19-20 | ER32 | 19-20 |
| ER40SPR3-4 | ER40 | 3-4 |
| ER40SPR4-5 | ER40 | 4-5 |
| ER40SPR5-6 | ER40 | 5-6 |
| ER40SPR6-7 | ER40 | 6-7 |
| ER40SPR7-8 | ER40 | 7-8 |
| ER40SPR8-9 | ER40 | 8-9 |
| ER40SPR9-10 | ER40 | 9-10 |
| ER40SPR10-11 | ER40 | 10-11 |
| ER40SPR11-12 | ER40 | 11-12 |
| ER40SPR12-13 | ER40 | 12-13 |
| ER40SPR13-14 | ER40 | 13-14 |
| ER40SPR14-15 | ER40 | 14-15 |
| ER40SPR15-16 | ER40 | 15-16 |
| ER40SPR16-17 | ER40 | 16-17 |
| ER40SPR17-18 | ER40 | 17-18 |
| ER40SPR18-19 | ER40 | 18-19 |
| ER40SPR19-20 | ER40 | 19-20 |
| ER40SPR20-21 | ER40 | 20-21 |
| ER40SPR21-22 | ER40 | 21-22 |
| ER40SPR22-23 | ER40 | 22-23 |
| ER40SPR23-24 | ER40 | 23-24 |
| ER40SPR24-25 | ER40 | 24-25 |
| ER40SPR25-26 | ER40 | 25-26 |
| ER50SPR10-12 | ER50 | 10-12 |
| ER50SPR12-14 | ER50 | 12-14 |
| ER50SPR14-16 | ER50 | 14-16 |
| ER50SPR16-18 | ER50 | 16-18 |
| ER50SPR18-20 | ER50 | 18-20 |
| ER50SPR20-22 | ER50 | 20-22 |
| ER50SPR22-24 | ER50 | 22-24 |
| ER50SPR24-26 | ER50 | 24-26 |
| ER50SPR26-28 | ER50 | 26-28 |
| ER50SPR28-30 | ER50 | 28-30 |
| ER50SPR30-32 | ER50 | 30-32 |
| ER50SPR32-34 | ER50 | 32-34 |

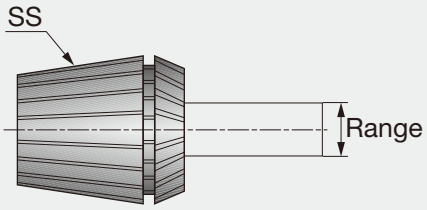
# ER-SPR-AA

## DIN 6499 'AA' Ultra Precise ER Spring Collets



0.005

ULTRA PRECISION AA



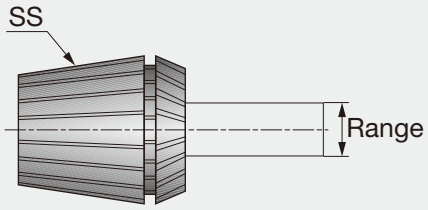

| Designation | SS | Range |
|---|---|---|
| ER11SPR0.5-1AA | ER11 | 0.5-1 |
| ER11SPR1-2AA | ER11 | 1-2 |
| ER11SPR2-3AA | ER11 | 2-3 |
| ER11SPR3-4AA | ER11 | 3-4 |
| ER11SPR4-5AA | ER11 | 4-5 |
| ER11SPR5-6AA | ER11 | 5-6 |
| ER11SPR6-7AA | ER11 | 6-7 |
| ER16SPR0.5-1AA | ER16 | 0.5-1 |
| ER16SPR1-2AA | ER16 | 1-2 |
| ER16SPR2-3AA | ER16 | 2-3 |
| ER16SPR3-4AA | ER16 | 3-4 |
| ER16SPR4-5AA | ER16 | 4-5 |
| ER16SPR5-6AA | ER16 | 5-6 |
| ER16SPR6-7AA | ER16 | 6-7 |
| ER16SPR7-8AA | ER16 | 7-8 |
| ER16SPR8-9AA | ER16 | 8-9 |
| ER16SPR9-10AA | ER16 | 9-10 |
| ER20SPR12-13AA | ER20 | 12-13 |
| ER20SPR2-3AA | ER20 | 2-3 |
| ER20SPR3-4AA | ER20 | 3-4 |
| ER20SPR4-5AA | ER20 | 4-5 |
| ER20SPR5-6AA | ER20 | 5-6 |
| ER20SPR6-7AA | ER20 | 6-7 |
| ER20SPR7-8AA | ER20 | 7-8 |
| ER20SPR8-9AA | ER20 | 8-9 |
| ER20SPR9-10AA | ER20 | 9-10 |
| ER20SPR1-2AA | ER20 | 1-2 |
| ER20SPR10-11AA | ER20 | 10-11 |
| ER20SPR11-12AA | ER20 | 11-12 |
| ER25SPR12-13AA | ER25 | 12-13 |
| ER25SPR2-3AA | ER25 | 2-3 |
| ER25SPR3-4AA | ER25 | 3-4 |
| ER25SPR4-5AA | ER25 | 4-5 |
| ER25SPR5-6AA | ER25 | 5-6 |
| ER25SPR6-7AA | ER25 | 6-7 |
| ER25SPR7-8AA | ER25 | 7-8 |
| ER25SPR8-9AA | ER25 | 8-9 |
| ER25SPR9-10AA | ER25 | 9-10 |
| ER25SPR1-2AA | ER25 | 1-2 |
| ER25SPR10-11AA | ER25 | 10-11 |
| ER25SPR11-12AA | ER25 | 11-12 |
| ER25SPR13-14AA | ER25 | 13-14 |
| ER25SPR14-15AA | ER25 | 14-15 |
| ER25SPR15-16AA | ER25 | 15-16 |
| ER32SPR2-3AA | ER32 | 2-3 |
| ER32SPR3-4AA | ER32 | 3-4 |
| ER32SPR4-5AA | ER32 | 4-5 |
| ER32SPR5-6AA | ER32 | 5-6 |
| ER32SPR6-7AA | ER32 | 6-7 |
| ER32SPR7-8AA | ER32 | 7-8 |
| ER32SPR8-9AA | ER32 | 8-9 |
| ER32SPR9-10AA | ER32 | 9-10 |
| ER32SPR10-11AA | ER32 | 10-11 |

| Designation | SS | Range |
|---|---|---|
| ER32SPR11-12AA | ER32 | 11-12 |
| ER32SPR12-13AA | ER32 | 12-13 |
| ER32SPR13-14AA | ER32 | 13-14 |
| ER32SPR14-15AA | ER32 | 14-15 |
| ER32SPR15-16AA | ER32 | 15-16 |
| ER32SPR16-17AA | ER32 | 16-17 |
| ER32SPR17-18AA | ER32 | 17-18 |
| ER32SPR18-19AA | ER32 | 18-19 |
| ER32SPR19-20AA | ER32 | 19-20 |
| ER40SPR3-4AA | ER40 | 3-4 |
| ER40SPR4-5AA | ER40 | 4-5 |
| ER40SPR5-6AA | ER40 | 5-6 |
| ER40SPR6-7AA | ER40 | 6-7 |
| ER40SPR7-8AA | ER40 | 7-8 |
| ER40SPR8-9AA | ER40 | 8-9 |
| ER40SPR9-10AA | ER40 | 9-10 |
| ER40SPR10-11AA | ER40 | 10-11 |
| ER40SPR11-12AA | ER40 | 11-12 |
| ER40SPR12-13AA | ER40 | 12-13 |
| ER40SPR13-14AA | ER40 | 13-14 |
| ER40SPR14-15AA | ER40 | 14-15 |
| ER40SPR15-16AA | ER40 | 15-16 |
| ER40SPR16-17AA | ER40 | 16-17 |
| ER40SPR17-18AA | ER40 | 17-18 |
| ER40SPR18-19AA | ER40 | 18-19 |
| ER40SPR19-20AA | ER40 | 19-20 |
| ER40SPR20-21AA | ER40 | 20-21 |
| ER40SPR21-22AA | ER40 | 21-22 |
| ER40SPR22-23AA | ER40 | 22-23 |
| ER40SPR23-24AA | ER40 | 23-24 |
| ER40SPR24-25AA | ER40 | 24-25 |
| ER40SPR25-26AA | ER40 | 25-26 |

# TUNGHOLD

## ER-SEAL

DIN 6499 ER COOLIT, Sealed Spring Collets

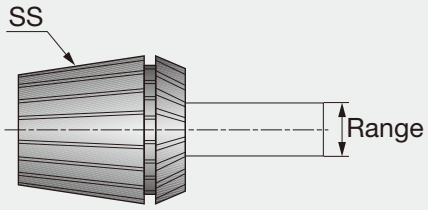



| Designation | SS | Range |
|---|---|---|
| ER16SEAL3-4 | ER16 | 3-4 |
| ER16SEAL4-5 | ER16 | 4-5 |
| ER16SEAL5-6 | ER16 | 5-6 |
| ER16SEAL6-7 | ER16 | 6-7 |
| ER16SEAL7-8 | ER16 | 7-8 |
| ER16SEAL8-9 | ER16 | 8-9 |
| ER16SEAL9-10 | ER16 | 9-10 |
| ER20SEAL3-4 | ER20 | 3-4 |
| ER20SEAL4-5 | ER20 | 4-5 |
| ER20SEAL5-6 | ER20 | 5-6 |
| ER20SEAL6-7 | ER20 | 6-7 |
| ER20SEAL7-8 | ER20 | 7-8 |
| ER20SEAL8-9 | ER20 | 8-9 |
| ER20SEAL9-10 | ER20 | 9-10 |
| ER20SEAL10-11 | ER20 | 10-11 |
| ER20SEAL11-12 | ER20 | 11-12 |
| ER20SEAL12-13 | ER20 | 12-13 |
| ER25SEAL3-4 | ER25 | 3-4 |
| ER25SEAL4-5 | ER25 | 4-5 |
| ER25SEAL5-6 | ER25 | 5-6 |
| ER25SEAL6-7 | ER25 | 6-7 |
| ER25SEAL7-8 | ER25 | 7-8 |
| ER25SEAL8-9 | ER25 | 8-9 |
| ER25SEAL9-10 | ER25 | 9-10 |
| ER25SEAL10-11 | ER25 | 10-11 |
| ER25SEAL11-12 | ER25 | 11-12 |
| ER25SEAL12-13 | ER25 | 12-13 |
| ER25SEAL13-14 | ER25 | 13-14 |
| ER25SEAL14-15 | ER25 | 14-15 |
| ER25SEAL15-16 | ER25 | 15-16 |
| ER32SEAL3-4 | ER32 | 3-4 |
| ER32SEAL4-5 | ER32 | 4-5 |
| ER32SEAL5-6 | ER32 | 5-6 |
| ER32SEAL6-7 | ER32 | 6-7 |
| ER32SEAL7-8 | ER32 | 7-8 |
| ER32SEAL8-9 | ER32 | 8-9 |
| ER32SEAL9-10 | ER32 | 9-10 |
| ER32SEAL10-11 | ER32 | 10-11 |
| ER32SEAL11-12 | ER32 | 11-12 |
| ER32SEAL12-13 | ER32 | 12-13 |
| ER32SEAL13-14 | ER32 | 13-14 |
| ER32SEAL14-15 | ER32 | 14-15 |
| ER32SEAL15-16 | ER32 | 15-16 |
| ER32SEAL16-17 | ER32 | 16-17 |
| ER32SEAL17-18 | ER32 | 17-18 |
| ER32SEAL18-19 | ER32 | 18-19 |
| ER32SEAL19-20 | ER32 | 19-20 |
| ER40SEAL3-4 | ER40 | 3-4 |
| ER40SEAL4-5 | ER40 | 4-5 |
| ER40SEAL5-6 | ER40 | 5-6 |
| ER40SEAL6-7 | ER40 | 6-7 |
| ER40SEAL7-8 | ER40 | 7-8 |
| ER40SEAL8-9 | ER40 | 8-9 |

| Designation | SS | Range |
|---|---|---|
| ER40SEAL9-10 | ER40 | 9-10 |
| ER40SEAL10-11 | ER40 | 10-11 |
| ER40SEAL11-12 | ER40 | 11-12 |
| ER40SEAL12-13 | ER40 | 12-13 |
| ER40SEAL13-14 | ER40 | 13-14 |
| ER40SEAL14-15 | ER40 | 14-15 |
| ER40SEAL15-16 | ER40 | 15-16 |
| ER40SEAL16-17 | ER40 | 16-17 |
| ER40SEAL17-18 | ER40 | 17-18 |
| ER40SEAL18-19 | ER40 | 18-19 |
| ER40SEAL19-20 | ER40 | 19-20 |
| ER40SEAL20-21 | ER40 | 20-21 |
| ER40SEAL21-22 | ER40 | 21-22 |
| ER40SEAL22-23 | ER40 | 22-23 |
| ER40SEAL23-24 | ER40 | 23-24 |
| ER40SEAL24-25 | ER40 | 24-25 |
| ER40SEAL25-26 | ER40 | 25-26 |

# ER-SEAL-JET2

## DIN 6499 ER COOLIT, Sealed Collets with Cooling Jets




| Designation | SS | Range |
|---|---|---|
| ER16SEAL3-4JET2 | ER16 | 3-4 |
| ER16SEAL4-5JET2 | ER16 | 4-5 |
| ER16SEAL5-6JET2 | ER16 | 5-6 |
| ER16SEAL6-7JET2 | ER16 | 6-7 |
| ER16SEAL7-8JET2 | ER16 | 7-8 |
| ER16SEAL8-9JET2 | ER16 | 8-9 |
| ER16SEAL9-10JET2 | ER16 | 9-10 |
| ER20SEAL3-4JET2 | ER20 | 3-4 |
| ER20SEAL4-5JET2 | ER20 | 4-5 |
| ER20SEAL5-6JET2 | ER20 | 5-6 |
| ER20SEAL6-7JET2 | ER20 | 6-7 |
| ER20SEAL7-8JET2 | ER20 | 7-8 |
| ER20SEAL8-9JET2 | ER20 | 8-9 |
| ER20SEAL9-10JET2 | ER20 | 9-10 |
| ER20SEAL10-11JET2 | ER20 | 10-11 |
| ER20SEAL11-12JET2 | ER20 | 11-12 |
| ER20SEAL12-13JET2 | ER20 | 12-13 |
| ER25SEAL3-4JET2 | ER25 | 3-4 |
| ER25SEAL4-5JET2 | ER25 | 4-5 |
| ER25SEAL5-6JET2 | ER25 | 5-6 |
| ER25SEAL6-7JET2 | ER25 | 6-7 |
| ER25SEAL7-8JET2 | ER25 | 7-8 |
| ER25SEAL8-9JET2 | ER25 | 8-9 |
| ER25SEAL9-10JET2 | ER25 | 9-10 |
| ER25SEAL10-11JET2 | ER25 | 10-11 |
| ER25SEAL11-12JET2 | ER25 | 11-12 |
| ER25SEAL12-13JET2 | ER25 | 12-13 |
| ER25SEAL13-14JET2 | ER25 | 13-14 |
| ER25SEAL14-15JET2 | ER25 | 14-15 |
| ER25SEAL15-16JET2 | ER25 | 15-16 |
| ER32SEAL3-4JET2 | ER32 | 3-4 |
| ER32SEAL4-5JET2 | ER32 | 4-5 |
| ER32SEAL5-6JET2 | ER32 | 5-6 |
| ER32SEAL6-7JET2 | ER32 | 6-7 |
| ER32SEAL7-8JET2 | ER32 | 7-8 |
| ER32SEAL8-9JET2 | ER32 | 8-9 |
| ER32SEAL9-10JET2 | ER32 | 9-10 |
| ER32SEAL10-11JET2 | ER32 | 10-11 |
| ER32SEAL11-12JET2 | ER32 | 11-12 |
| ER32SEAL12-13JET2 | ER32 | 12-13 |
| ER32SEAL13-14JET2 | ER32 | 13-14 |
| ER32SEAL14-15JET2 | ER32 | 14-15 |
| ER32SEAL15-16JET2 | ER32 | 15-16 |
| ER32SEAL16-17JET2 | ER32 | 16-17 |
| ER32SEAL17-18JET2 | ER32 | 17-18 |
| ER32SEAL18-19JET2 | ER32 | 18-19 |
| ER32SEAL19-20JET2 | ER32 | 19-20 |
| ER40SEAL3-4JET2 | ER40 | 3-4 |
| ER40SEAL4-5JET2 | ER40 | 4-5 |
| ER40SEAL5-6JET2 | ER40 | 5-6 |
| ER40SEAL6-7JET2 | ER40 | 6-7 |
| ER40SEAL7-8JET2 | ER40 | 7-8 |
| ER40SEAL8-9JET2 | ER40 | 8-9 |

| Designation | SS | Range |
|---|---|---|
| ER40SEAL9-10JET2 | ER40 | 9-10 |
| ER40SEAL10-11JET2 | ER40 | 10-11 |
| ER40SEAL11-12JET2 | ER40 | 11-12 |
| ER40SEAL12-13JET2 | ER40 | 12-13 |
| ER40SEAL13-14JET2 | ER40 | 13-14 |
| ER40SEAL14-15JET2 | ER40 | 14-15 |
| ER40SEAL15-16JET2 | ER40 | 15-16 |
| ER40SEAL16-17JET2 | ER40 | 16-17 |
| ER40SEAL17-18JET2 | ER40 | 17-18 |
| ER40SEAL18-19JET2 | ER40 | 18-19 |
| ER40SEAL19-20JET2 | ER40 | 19-20 |
| ER40SEAL20-21JET2 | ER40 | 20-21 |
| ER40SEAL21-22JET2 | ER40 | 21-22 |
| ER40SEAL22-23JET2 | ER40 | 22-23 |
| ER40SEAL23-24JET2 | ER40 | 23-24 |
| ER40SEAL24-25JET2 | ER40 | 24-25 |
| ER40SEAL25-26JET2 | ER40 | 25-26 |

# TUNGHOLD
## SET ER-SPR

Sets of DIN 6499 ER spring collets with hard touch coating

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER11SPR7 | ER11 | 7 | 0.5-7 |
| SETER16SPR10 | ER16 | 10 | 0.5-10 |
| SETER20SPR12 | ER20 | 12 | 1-13 |
| SETER25SPR15 | ER25 | 15 | 1-16 |
| SETER32SPR18 | ER32 | 18 | 2-20 |
| SETER40SPR23 | ER40 | 23 | 3-26 |
| SETER50SPR12 | ER50 | 12 | 10-34 |

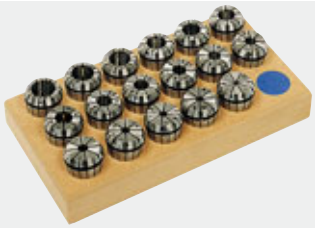
# TUNGHOLD
## SET ER-SPR-AA

Sets of DIN 6499 ER 'AA' ultra precise spring collets with hard touch coating

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER11SPR7AA | ER11 | 7 | 0.5-7 |
| SETER16SPR10AA | ER16 | 10 | 0.5-10 |
| SETER20SPR12AA | ER20 | 12 | 1-13 |
| SETER25SPR15AA | ER25 | 15 | 1-16 |
| SETER32SPR18AA | ER32 | 18 | 2-20 |
| SETER40SPR23AA | ER40 | 23 | 3-26 |

# TUNGHOLD
## SET ER-SEAL

Sets of DIN 6499 ER coolit collets with hard touch coating, sealed for 100 bar



| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER16SEAL7 | ER16 | 7 | 3-10 |
| SETER20SEAL10 | ER20 | 10 | 3-13 |
| SETER25SEAL13 | ER25 | 13 | 3-16 |
| SETER32SEAL17 | ER32 | 17 | 3-20 |
| SETER40SEAL23 | ER40 | 23 | 3-26 |

# TUNGHOLD
## SET ER-SEAL-JET2

Sets of ER collet, sealed for 1450 PSI collets with hard touch coating. sealed for 100 bar

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER16SEAL7JET2 | ER16 | 7 | 3-13 |
| SETER25SEAL13JET2 | ER25 | 13 | 3-20 |
| SETER32SEAL17JET2 | ER32 | 17 | 3-26 |
| SETER40SEAL23JET2 | ER40 | 23 | 3-26 |

# TUNGHOLD
## SET ER SPR-EM(1)

Sets of ER spring collets DIN 6499 with hard touch coating

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER16SPR8EM | ER16 | 8 | 3,4,5,6,7,8,9,10 |
| SETER20SPR5EM | ER20 | 5 | 4,6,8,10,12 |
| SETER25SPR6EM | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SPR6EM | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SPR7EM | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

# TUNGHOLD
## SET-ER SEAL-EM(1)

A Set of ER collet, JET collets, sealed for up to 100 bap.the hard touch coating, sealed for 100 bar

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER16SEAL5EM | ER16 | 5 | 4,5,6,8,10 |
| SETER20SEAL5EM | ER20 | 5 | 4,6,8,10,12 |
| SETER25SEAL6EM | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SEAL6EM | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SEAL7EM | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

# TUNGHOLD
## SET ER-SEAL-EM JET2(1)

A set of ER collet, JET2 collets, sealed for up to 100 bar

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER25SEAL6EMJET2 | ER25 | 6 | 4,6,8,10,12,16 |
| SETER32SEAL6EMJET2 | ER32 | 6 | 6,8,10,12,16,20 |
| SETER40SEAL7EMJET2 | ER40 | 7 | 6,8,10,12,16,20,25 |

(1) Contains popular endmill sizes only.

# TUNGHOLD
## KIT R-8-ER

The Kit contains ER collet chuck with a bridgeport shank and a set of collets in various bore sizes

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| KITR-810ER16 | ER16 | 10 | 0.5-10 |
| KITR-818ER32 | ER32 | 18 | 2-20 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

# TUNGHOLD
## KIT DIN2080-ER

The Kit contains 1 DIN 2080 taper shank with ER collet chuck and a set of ER spring collets

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| KITDIN20803018ER32 | ER32 | 18 | 2-20 |
| KITDIN20804018ER32 | ER32 | 18 | 2-20 |
| KITDIN20804023ER40 | ER40 | 23 | 3-26 |
| KITDIN20805023ER40 | ER40 | 23 | 3-26 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

# TUNGHOLD
## KIT MT-ER

The Kits contain ER collet chuck with a morse taper shank and a set of collets in various bore sizes

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| KITMT318ER32 | ER32 | 18 | 2-20 |
| KITMT423ER40 | ER40 | 23 | 3-26 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench.

# TUNGHOLD
## KIT ST-ER-Mini

The Kits contain ER Mini collet chuck with a cylindrical shank and a set of collets in various bore sizes

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| KITST12X807ER11M | ER11 | 7 | 0.5-7 |
| KITST12X8010ER16M | ER16 | 10 | 0.5-10 |
| KITST16X507ER11MF | ER11 | 7 | 0.5-7 |
| KITST16X1007ER11M | ER11 | 7 | 0.5-7 |
| KITST16X1507ER11M | ER11 | 7 | 0.5-7 |
| KITST20X10010ER16M | ER16 | 10 | 0.5-10 |
| KITST20X15010ER16M | ER16 | 10 | 0.5-10 |
| KITST20X10012ER20M | ER20 | 12 | 1-12 |
| KITST20X15012ER20M | ER20 | 12 | 1-12 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench. • F indicates a flat on the shank.

# TUNGHOLD

## KIT ST-ER

Contains 1 ER collet chuck with a cylindrical shank and a set of collets in various bore sizes

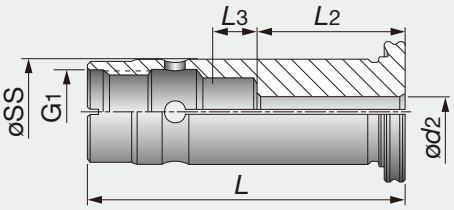
| Designation | Collet size | Qty | Range |
|---|---|---|---|
| KITST16X507ER11F | ER11 | 7 | 0.5-7 |
| KITST20X1007ER11 | ER11 | 7 | 0.5-7 |
| KITST20X1507ER11 | ER11 | 7 | 0.5-7 |
| KITST20X5010ER16F | ER16 | 10 | 0.5-10 |
| KITST20X10010ER16 | ER16 | 10 | 0.5-10 |
| KITST20X15010ER16 | ER16 | 10 | 0.5-10 |
| KITST20X5012ER20F | ER20 | 12 | 1-12 |
| KITST25X10012ER20 | ER20 | 12 | 1-12 |

• Each kit contains one collet chuck, a full set of ER collets and a Wrench. • F indicates a flat on the shank.

# TUNGMAX

## SC-SPR

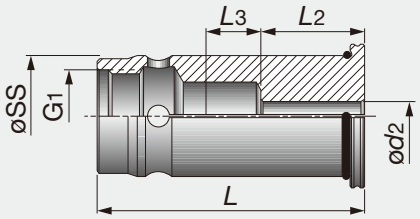
SC straight collets for TungMax power chucks




| Designation | ød2 | øSS | L | L2 | L3 | G1 |
|---|---|---|---|---|---|---|
| SC20SPR6 | 6 | 20 | 60 | 28 | 7 | M16 |
| SC20SPR8 | 8 | 20 | 60 | 28 | 7 | M16 |
| SC20SPR10 | 10 | 20 | 60 | 35 | 13 | M16 |
| SC20SPR12 | 12 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR14 | 14 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR15 | 15 | 20 | 60 | 40 | 8 | M16 |
| SC20SPR16 | 16 | 20 | 60 | 39 | 9 | M16 |
| SC32SPR6 | 6 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SPR8 | 8 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SPR10 | 10 | 32 | 72 | 35 | 13 | M24X1.5 |
| SC32SPR12 | 12 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SPR14 | 14 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SPR15 | 15 | 32 | 72 | 40 | 19.5 | M24X1.5 |
| SC32SPR16 | 16 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR18 | 18 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR19 | 19 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SPR20 | 20 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SPR24 | 24 | 32 | 72 | 45 | 10.5 | M24X1.5 |
| SC32SPR25 | 25 | 32 | 72 | 51 | 10.5 | M24X1.5 |

# TUNGMAX
## SC-SEAL

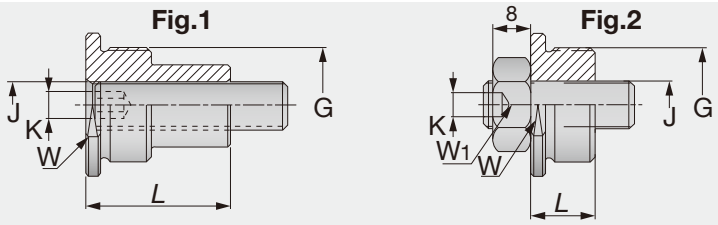
Sealed collets for TungMax power chucks




| Designation | ød2 | øSS | L | L2 | L3 | G1 |
|---|---|---|---|---|---|---|
| SC20SEAL6 | 6 | 20 | 60 | 28 | 7 | M16 |
| SC20SEAL8 | 8 | 20 | 60 | 28 | 7 | M16 |
| SC20SEAL10 | 10 | 20 | 60 | 35 | 13 | M16 |
| SC20SEAL12 | 12 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL14 | 14 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL15 | 15 | 20 | 60 | 40 | 8 | M16 |
| SC20SEAL16 | 16 | 20 | 60 | 39 | 9 | M16 |
| SC32SEAL6 | 6 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SEAL8 | 8 | 32 | 72 | 28 | 17 | M24X1.5 |
| SC32SEAL10 | 10 | 32 | 72 | 35 | 13 | M24X1.5 |
| SC32SEAL12 | 12 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL14 | 14 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL15 | 15 | 32 | 72 | 40 | 5 | M24X1.5 |
| SC32SEAL16 | 16 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL18 | 18 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL19 | 19 | 32 | 72 | 44 | 17.5 | M24X1.5 |
| SC32SEAL20 | 20 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SEAL24 | 24 | 32 | 72 | 46 | 15.5 | M24X1.5 |
| SC32SEAL25 | 25 | 32 | 72 | 51 | 10.5 | M24X1.5 |

# TUNGMAX
## PRESET SC-CAP

Preset screw housing for SC-SPR TungMax collets




| Designation | L | W | J | G | Fig | Range | Key | CSI |
|---|---|---|---|---|---|---|---|---|
| PRESETSCCAP8x1.25L | 28 | 16 | M8X25 | M16 | 1 | 6-8 | 4 | SC20 |
| PRESETSCCAP8x1.25 | 15 | 16 | M8X25 | M16 | 2 | 10-16 | 4 | SC20 |
| PRESETSCCAP10x1.5L | 30 | 27 | M10X30 | M24X1.5 | 1 | 6-14 | 5 | SC32 |
| PRESETSCCAP10x1.5 | 13.5 | 27 | M10X30 | M24X1.5 | 2 | 16-25 | 5 | SC32 |

# TUNGHYDRO

## KIT BT-HYDRO

Hydraulic chuck kits with MAS-BT Form A/B Shanks

| Designation | BT size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITBT40HYDRO20X73 | 40 | 20 | 5 | 8,10,12,14,16 |
| KITBT40HYDRO32X110 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

# TUNGHYDRO

## KIT DIN69871-HYDRO

Contains a hydraulic chuck with a DIN69781 tapered shank and a set of collets in various bore sizes

| Designation | SK size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITDIN6987140HYDRO20X65 | 40 | 20 | 5 | 8,10,12,14,16 |
| KITDIN6987140HYDRO32X117 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

# TUNGHYDRO

## KIT HSK A-HYDRO

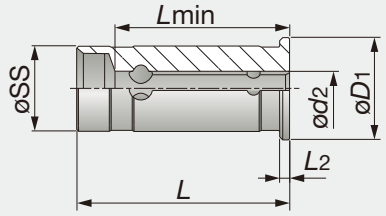
Contains a hydraulic chuck with HSK tapered shank and a set of collets in various bore sizes

| Designation | HSK size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITHSKA63HYDRO20X100 | 63 | 20 | 5 | 8,10,12,14,16 |
| KITHSKA63HYDRO32X125 | 63 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one HYDROFIT chuck, a set of SC...HYDRO sealed reducers and a clamping wrench.

Sealed reduction sleeves for hydraulic chucks

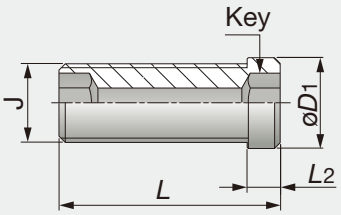





| Designation | øSS | ød2 | Lmin | L | øD1 | L2 |
|---|---|---|---|---|---|---|
| SC12SHYDRO3 | 12 | 3 | 19 | 46.5 | 16 | 2 |
| SC12SHYDRO4 | 12 | 4 | 24 | 46.5 | 16 | 2 |
| SC12SHYDRO5 | 12 | 5 | 28 | 46.5 | 16 | 2 |
| SC12SHYDRO6 | 12 | 6 | 33 | 46.5 | 16 | 2 |
| SC12SHYDRO8 | 12 | 8 | 39 | 46.5 | 16 | 2 |
| SC20SHYDRO3 | 20 | 3 | 20 | 53 | 24 | 2 |
| SC20SHYDRO4 | 20 | 4 | 25 | 53 | 24 | 2 |
| SC20SHYDRO5 | 20 | 5 | 27 | 53 | 24 | 2 |
| SC20SHYDRO6 | 20 | 6 | 34 | 53 | 24 | 2 |
| SC20SHYDRO8 | 20 | 8 | 39 | 53 | 24 | 2 |
| SC20SHYDRO10 | 20 | 10 | 40 | 53 | 24 | 2 |
| SC20SHYDRO12 | 20 | 12 | 41 | 53 | 24 | 2 |
| SC20SHYDRO14 | 20 | 14 | 44 | 53 | 24 | 2 |
| SC20SHYDRO16 | 20 | 16 | 44 | 53 | 24 | 2 |
| SC25SHYDRO6 | 25 | 6 | 37 | 60 | 30 | 4 |
| SC25SHYDRO8 | 25 | 8 | 37 | 60 | 30 | 4 |
| SC25SHYDRO10 | 25 | 10 | 40 | 60 | 30 | 4 |
| SC25SHYDRO12 | 25 | 12 | 44 | 60 | 30 | 4 |
| SC25SHYDRO14 | 25 | 14 | 46 | 60 | 30 | 4 |
| SC25SHYDRO16 | 25 | 16 | 48 | 60 | 30 | 4 |
| SC25SHYDRO18 | 25 | 18 | 50 | 60 | 30 | 4 |
| SC25SHYDRO20 | 25 | 20 | 50 | 60 | 30 | 4 |
| SC32SHYDRO6 | 32 | 6 | 33 | 66 | 40 | 4 |
| SC32SHYDRO8 | 32 | 8 | 38 | 66 | 40 | 4 |
| SC32SHYDRO10 | 32 | 10 | 39 | 66 | 40 | 4 |
| SC32SHYDRO12 | 32 | 12 | 42 | 66 | 40 | 4 |
| SC32SHYDRO14 | 32 | 14 | 44 | 66 | 40 | 4 |
| SC32SHYDRO16 | 32 | 16 | 44 | 66 | 40 | 4 |
| SC32SHYDRO18 | 32 | 18 | 44 | 66 | 40 | 4 |
| SC32SHYDRO20 | 32 | 20 | 49 | 66 | 40 | 4 |
| SC32SHYDRO25 | 32 | 25 | 66 | 66 | 40 | 4 |

# TUNGHYDRO
## PRESET SCREW HYDRO

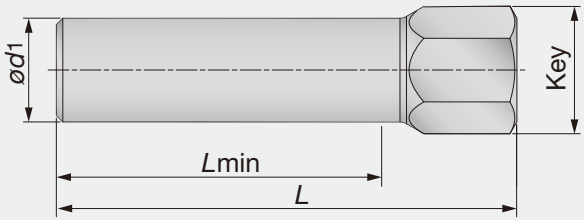
Tool stopper preset screws for the HYDRO collet chucks




| Designation | øD1 | J | L | L2 | Key |
|---|---|---|---|---|---|
| PRESETSCREWHYDROM5 | 5 | M5 | 14 | 1 | 2.5 |
| PRESETSCREWHYDROM6 | 6 | M6 | 14 | 1.5 | 3 |
| PRESETSCREWHYDROM8 | 8 | M8X1 | 14 | 2 | 4 |
| PRESETSCREWHYDROM10 | 10 | M10X1 | 17 | 2 | 5 |
| PRESETSCREWHYDROM16 | 14 | M16X1 | 20 | 2 | 8 |

# TUNGHYDRO
## TEST BAR HYDRO

Torque test bars for hydraulic chucks




| Designation | ød1 | L | Key | Lmin(1) | Torque* |
|---|---|---|---|---|---|
| TESTBARHYDRO6 | 6 | 53 | 10 | 27 | 15 |
| TESTBARHYDRO8 | 8 | 53 | 10 | 27 | 25 |
| TESTBARHYDRO10 | 10 | 56 | 10 | 32 | 50 |
| TESTBARHYDRO12 | 12 | 62 | 10 | 37 | 110 |
| TESTBARHYDRO14 | 14 | 62 | 10 | 37 | 120 |
| TESTBARHYDRO16 | 16 | 71 | 17 | 37 | 180 |
| TESTBARHYDRO18 | 18 | 71 | 17 | 42 | 230 |
| TESTBARHYDRO20 | 20 | 71 | 17 | 42 | 250 |
| TESTBARHYDRO25 | 25 | 79 | 17 | 48 | 310 |
| TESTBARHYDRO32 | 32 | 87 | 17 | 52 | 450 |

*Torque: Recommended torque (Nm) for clamping. (1) Minimum holding length.

# TUNGMAX
## KIT SK-TUNGMAX

Contains a DIN 69871 holder with TUNGMAX power chuck and a set of collets with various bore sizes

| Designation | SK size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITSK40MAXIN20X956 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITSK40MAXIN32X1067 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |
| KITSK50MAXIN32X1007 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

# TUNGMAX
## KIT HSK A-TUNGMAX

Contains a power chuck with an HSK taper shank and a set of collets in various bore sizes

| Designation | HSK size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITHSKA100MAXIN20X1156 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITHSKA63MAXIN20X956 | 50 | 20 | 6 | 6,8,10,12,14,16 |
| KITHSKA63MAXIN32X1137 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

# TUNGMAX
## KIT BT-TUNGMAX

Contains a power chuck with a BT tapered shank and a set of collets in various bore sizes

| Designation | BT size | ød2 | Qty | Range |
|---|---|---|---|---|
| KITBT40MAXIN20X856 | 40 | 20 | 6 | 6,8,10,12,14,16 |
| KITBT40MAXIN32X1087 | 40 | 32 | 7 | 6,8,10,12,16,20,25 |
| KITBT50MAXIN20X1056 | 50 | 20 | 6 | 6,8,10,12,14,16 |
| KITBT50MAXIN32X1067 | 50 | 32 | 7 | 6,8,10,12,16,20,25 |

• Each kit contains one power chuck, a set of SC-SPR collets, extraction hookand wrench.

# TUNGMAX
## SET SC-SPR

Sets of SC straight collets for TUNGMAX power chucks

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETSC20SPR6 | 20 | 6 | 6,8,10,12,14,16 |
| SETSC32SPR9 | 32 | 9 | 6,8,10,12,14,16,18,20,25 |

# TUNGMAX

## SET SC-SEAL

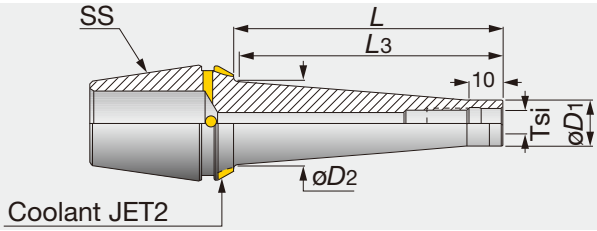
Sets of SC straight collets with coolant holes for TUNGMAX power chuck

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETSC20SEAL6 | 20 | 6 | 6,8,10,12,14,16 |
| SETSC32SEAL9 | 32 | 9 | 6,8,10,12,14,16,18,20,25 |

# TUNGFLEX

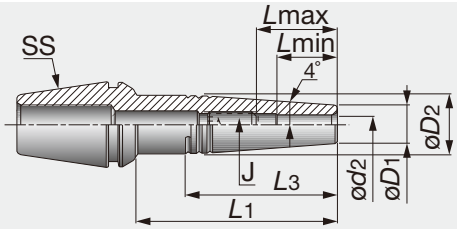
## ER-ODP

TungFlex threaded connector with integral ER collet for ER collet chucks




| Designation | Tsi | SS | øD1 | øD2 | L | L3 |
|---|---|---|---|---|---|---|
| ER32ODPM6X25 | M6 | ER32 | 9.8 | 14 | 25 | 22 |
| ER32ODPM6X50 | M6 | ER32 | 9.8 | 20 | 50 | 48 |
| ER32ODPM6X75 | M6 | ER32 | 9.8 | 23 | 75 | 74 |
| ER32ODPM8X25 | M8 | ER32 | 13.1 | 15 | 25 | 22 |
| ER32ODPM8X50 | M8 | ER32 | 13.1 | 23 | 50 | 49 |
| ER32ODPM8X75 | M8 | ER32 | 13.1 | 23 | 75 | 74 |
| ER32ODPM10X25 | M10 | ER32 | 18 | 20 | 25 | 23 |
| ER32ODPM10X50 | M10 | ER32 | 18 | 24 | 50 | 49 |
| ER32ODPM12X25 | M12 | ER32 | 21 | 24 | 25 | 24 |
| ER32ODPM12X50 | M12 | ER32 | 21 | 24 | 50 | 49 |

# TUNGSHRINK
## ER-SRK
TungShrink ER collet type



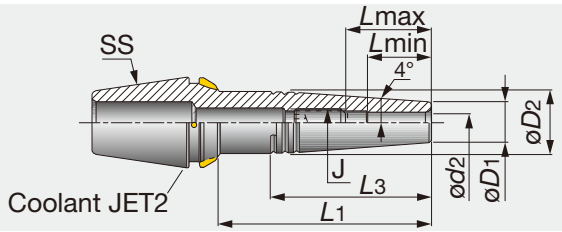

| Designation | SS | ød2 | øD1 | øD2 | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|
| ER11SRK3X10 (1) | ER11 | 3 | 7.6 | 8.5 | 10 | - | 9.5 | - | - | - |
| ER11SRK3X25 (1) | ER11 | 3 | 7.6 | 8.5 | 25 | - | 11.5 | - | - | - |
| ER11SRK4X10 (1) | ER11 | 4 | 7.6 | 8.5 | 10 | - | 9.5 | - | - | - |
| ER11SRK4X25 (1) | ER11 | 4 | 7.6 | 8.5 | 25 | - | 11.5 | - | - | - |
| ER20SRK3X35 | ER20 | 3 | 10 | 13.5 | 35 | 24 | 10 | 16 | M6 | 3 |
| ER20SRK3X60 | ER20 | 3 | 10 | 13.5 | 60 | 24 | 10 | 16 | M6 | 3 |
| ER20SRK4X35 | ER20 | 4 | 10 | 13.5 | 35 | 24 | 12 | 18 | M6 | 3 |
| ER20SRK4X60 | ER20 | 4 | 10 | 13.5 | 60 | 24 | 12 | 18 | M6 | 3 |
| ER20SRK5X35 | ER20 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER20SRK5X60 | ER20 | 5 | 10 | 13.5 | 60 | 24 | 15 | 21 | M6 | 3 |
| ER20SRK6X35 | ER20 | 6 | 11 | 14.7 | 35 | 25 | 18 | 24 | M8 | 4 |
| ER20SRK6X60 | ER20 | 6 | 11 | 15.2 | 60 | 29 | 18 | 24 | M8 | 4 |
| ER25SRK3X35 | ER25 | 3 | 10 | 13.5 | 35 | 24 | 10 | 16 | M6 | 3 |
| ER25SRK3X60 | ER25 | 3 | 10 | 16.3 | 60 | 44 | 10 | 16 | M6 | 3 |
| ER25SRK4X35 | ER25 | 4 | 10 | 13.5 | 35 | 24 | 12 | 18 | M6 | 3 |
| ER25SRK4X60 | ER25 | 4 | 10 | 16.3 | 60 | 44 | 12 | 18 | M6 | 3 |
| ER25SRK5X35 | ER25 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER25SRK5X60 | ER25 | 5 | 10 | 16.3 | 60 | 44 | 15 | 21 | M6 | 3 |
| ER25SRK6X35 | ER25 | 6 | 11 | 14.7 | 35 | 26 | 18 | 24 | M8 | 4 |
| ER25SRK6X60 | ER25 | 6 | 11 | 17.3 | 60 | 44 | 18 | 24 | M8 | 4 |
| ER25SRK8X35 | ER25 | 8 | 14 | 17.8 | 35 | 26 | 25 | 30 | M10 | 5 |
| ER25SRK8X60 | ER25 | 8 | 14 | 19.7 | 60 | 39 | 25 | 31 | M10 | 5 |
| ER32SRK3X35 | ER32 | 3 | 10 | 13.2 | 35 | 22 | 10 | 16 | M6 | 3 |
| ER32SRK3X60 | ER32 | 3 | 10 | 16.3 | 60 | 44 | 10 | 16 | M6 | 3 |
| ER32SRK3X85 | ER32 | 3 | 10 | 19.8 | 85 | 70 | 10 | 16 | M6 | 3 |
| ER32SRK4X35 | ER32 | 4 | 10 | 13.4 | 35 | 23 | 12 | 18 | M6 | 3 |
| ER32SRK4X60 | ER32 | 4 | 10 | 16.3 | 60 | 44 | 12 | 18 | M6 | 3 |
| ER32SRK4X85 | ER32 | 4 | 10 | 19.8 | 85 | 70 | 12 | 18 | M6 | 3 |
| ER32SRK5X35 | ER32 | 5 | 10 | 13.5 | 35 | 24 | 15 | 21 | M6 | 3 |
| ER32SRK5X60 | ER32 | 5 | 10 | 16.3 | 60 | 44 | 15 | 21 | M6 | 3 |
| ER32SRK5X85 | ER32 | 5 | 10 | 19.8 | 85 | 70 | 15 | 21 | M6 | 3 |
| ER32SRK6X35 | ER32 | 6 | 11 | 14.7 | 35 | 25 | 18 | 24 | M8 | 4 |
| ER32SRK6X60 | ER32 | 6 | 11 | 17.3 | 60 | 45 | 18 | 24 | M8 | 4 |
| ER32SRK6X85 | ER32 | 6 | 11 | 20.8 | 85 | 69 | 18 | 26 | M8 | 4 |
| ER32SRK8X35 | ER32 | 8 | 14 | 18.8 | 35 | 33 | 25 | 31 | M10 | 5 |
| ER32SRK8X60 | ER32 | 8 | 14 | 20.4 | 60 | 45 | 25 | 31 | M10 | 5 |
| ER32SRK8X85 | ER32 | 8 | 14 | 23.2 | 85 | 65 | 25 | 31 | M10 | 5 |
| ER32SRK10X35 | ER32 | 10 | 16 | 20.8 | 35 | 34 | 30 | 35 | M12 | 6 |
| ER32SRK10X60 | ER32 | 10 | 16 | 22.4 | 60 | 44 | 30 | 36 | M12 | 6 |
| ER32SRK10X85 | ER32 | 10 | 16 | 23 | 85 | 49 | 30 | 36 | M12 | 6 |
| ER32SRK12X35 | ER32 | 12 | 20 | 24 | 35 | 28 | 32 | - | - | - |
| ER32SRK12X60 | ER32 | 12 | 20 | 24 | 60 | 28 | 32 | 38 | M14 | 6 |
| ER32SRK12X85 | ER32 | 12 | 20 | 24 | 85 | 28 | 32 | 38 | M14 | 6 |

(1) To be used only for SpinJet spindles

# TUNGSHRINK

## ER-SRK JET2

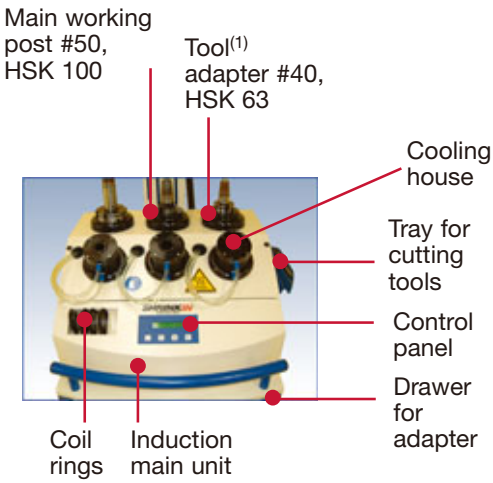
TungShrink ER collet type with JET2 external coolant supply system




| Designation | SS | ød2 | øD1 | øD2 | L1 | L3 | Lmin | Lmax | J | Key |
|---|---|---|---|---|---|---|---|---|---|---|
| ER20SRK3X35JET2 | ER20 | 3 | 10 | 13.5 | 35 | 24.5 | 10 | 16 | M6 | 3 |
| ER20SRK5X35JET2 | ER20 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER20SRK6X35JET2 | ER20 | 6 | 11 | 14.7 | 35 | 25.5 | 18 | 24 | M8 | 4 |
| ER20SRK6X60JET2 | ER20 | 6 | 11 | 15.2 | 60 | 29.5 | 18 | 24 | M8 | 4 |
| ER25SRK3X35JET2 | ER25 | 3 | 10 | 13.5 | 35 | 24.5 | 10 | 16 | M6 | 3 |
| ER25SRK3X60JET2 | ER25 | 3 | 10 | 16.3 | 60 | 44.5 | 10 | 16 | M6 | 3 |
| ER25SRK4X35JET2 | ER25 | 4 | 10 | 13.5 | 35 | 24.5 | 12 | 18 | M6 | 3 |
| ER25SRK4X60JET2 | ER25 | 4 | 10 | 16.3 | 60 | 44.5 | 12 | 18 | M6 | 3 |
| ER25SRK5X35JET2 | ER25 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER25SRK5X60JET2 | ER25 | 5 | 10 | 16.3 | 60 | 44.5 | 15 | 21 | M6 | 3 |
| ER25SRK6X35JET2 | ER25 | 6 | 11 | 14.7 | 35 | 26 | 18 | 24 | M8 | 4 |
| ER25SRK6X60JET2 | ER25 | 6 | 11 | 17.3 | 60 | 44.5 | 18 | 24 | M8 | 4 |
| ER25SRK8X35JET2 | ER25 | 8 | 14 | 17.8 | 35 | 26.5 | 25 | 30 | M10 | 5 |
| ER25SRK8X60JET2 | ER25 | 8 | 14 | 19.7 | 60 | 39.5 | 25 | 31 | M10 | 5 |
| ER32SRK3X35JET2 | ER32 | 3 | 10 | 13.2 | 35 | 22.5 | 10 | 16 | M6 | 3 |
| ER32SRK3X60JET2 | ER32 | 3 | 10 | 16.3 | 60 | 44.5 | 10 | 16 | M6 | 3 |
| ER32SRK3X85JET2 | ER32 | 3 | 10 | 19.8 | 85 | 70 | 10 | 16 | M6 | 3 |
| ER32SRK4X35JET2 | ER32 | 4 | 10 | 13.4 | 35 | 23.5 | 12 | 18 | M6 | 3 |
| ER32SRK4X60JET2 | ER32 | 4 | 10 | 16.3 | 60 | 44.5 | 12 | 18 | M6 | 3 |
| ER32SRK4X85JET2 | ER32 | 4 | 10 | 19.8 | 85 | 70 | 12 | 18 | M6 | 3 |
| ER32SRK5X35JET2 | ER32 | 5 | 10 | 13.5 | 35 | 24.5 | 15 | 21 | M6 | 3 |
| ER32SRK5X60JET2 | ER32 | 5 | 10 | 16.3 | 60 | 44.5 | 15 | 21 | M6 | 3 |
| ER32SRK5X85JET2 | ER32 | 5 | 10 | 19.8 | 85 | 70 | 15 | 21 | M6 | 3 |
| ER32SRK6X35JET2 | ER32 | 6 | 11 | 14.7 | 35 | 25.5 | 18 | 24 | M8 | 4 |
| ER32SRK6X60JET2 | ER32 | 6 | 11 | 17.3 | 60 | 45 | 18 | 24 | M8 | 4 |
| ER32SRK6X85JET2 | ER32 | 6 | 11 | 20.8 | 85 | 69.5 | 18 | 26 | M8 | 4 |
| ER32SRK8X35JET2 | ER32 | 8 | 14 | 18.8 | 35 | 33 | 25 | 31 | M10 | 5 |
| ER32SRK8X60JET2 | ER32 | 8 | 14 | 20.4 | 60 | 45 | 25 | 31 | M10 | 5 |
| ER32SRK8X85JET2 | ER32 | 8 | 14 | 23.2 | 85 | 65 | 25 | 31 | M10 | 5 |
| ER32SRK10X35JET2 | ER32 | 10 | 16 | 20.8 | 35 | 34 | 30 | 35 | M12 | 6 |
| ER32SRK10X60JET2 | ER32 | 10 | 16 | 22.4 | 60 | 44.5 | 30 | 36 | M12 | 6 |
| ER32SRK10X85JET2 | ER32 | 10 | 16 | 23 | 85 | 49.5 | 30 | 36 | M12 | 6 |
| ER32SRK12X35JET2 | ER32 | 12 | 20 | 24 | 35 | 28 | 32 | - | - | - |
| ER32SRK12X60JET2 | ER32 | 12 | 20 | 24 | 60 | 28 | 32 | 38 | M14 | 6 |
| ER32SRK12X85JET2 | ER32 | 12 | 20 | 24 | 85 | 28 | 32 | 38 | M14 | 6 |

# TUNGSHRINK
## IND SHRINKIN UNIT

SHRINKIN Induction heating unit for shrink tool chucking




| Designation | Machine |
|---|---|
| IND SHRINK IN UNIT EUR | 3-380-500V 50/60HZ |

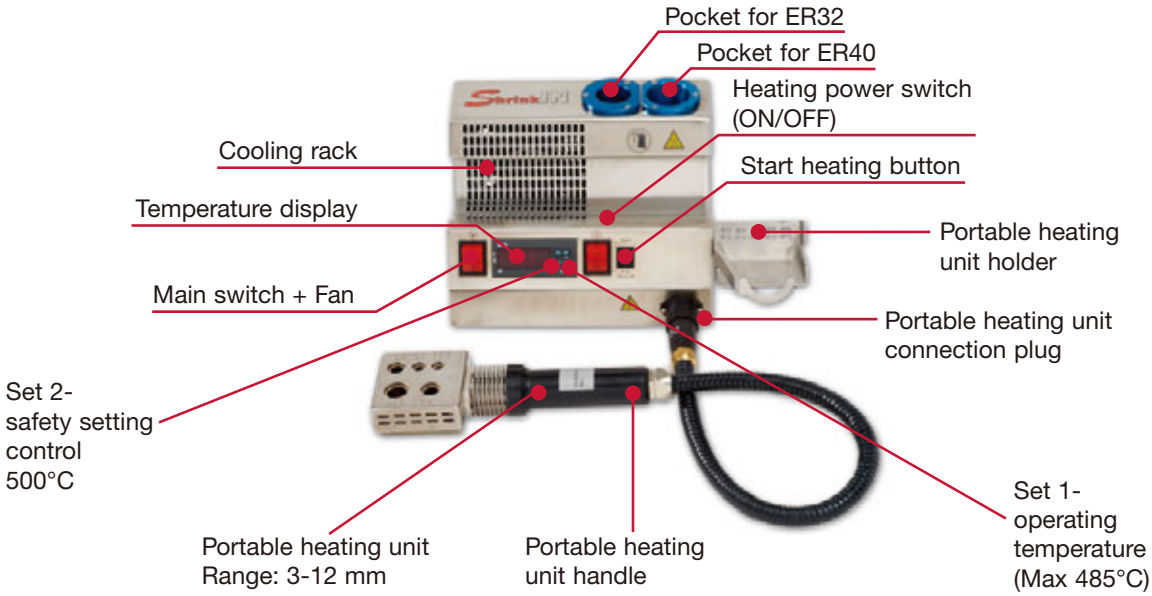
# TUNGSHRINK
## IND SHRINK START UNIT

SHRINKIN Induction heating unit for shrink tool chucking

| Designation | Machine |
|---|---|
| IND SHRINK START UNIT EUR | 3-380-500V 50/60HZ |

# TUNGSHRINK
## SHRINKIN UNIT V2

SHRINKIN Thermal shrink heating unit for shrink tool chucking




| Designation | Machine |
|---|---|
| SHRINKIN UNIT V2 EUR | 220V 50/60HZ |

# TUNGSHRINK

## SET ER-SRK

A set of ER collets with thermal shrink chucks and various bore sizes

| Designation | Collet size | Qty | Range |
|---|---|---|---|
| SETER32SRKL6EUR | 32 | 6 | 4,5,6,8,10,12 |
| SETER32SRKM6EUR | 32 | 6 | 4,5,6,8,10,12 |
| SETER32SRKS6EUR | 32 | 6 | 4,5,6,8,10,12 |

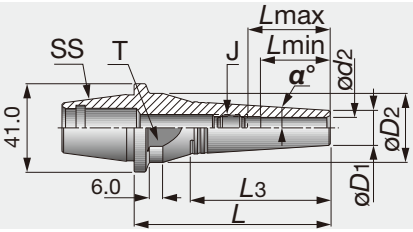
## KIT SHRINKIN-V2 EUR

The KIT includes a thermal shrink heating unit and 6 ER32 SRK thermal collets

| Designation | Unit | Set of collet | Qty | Range |
|---|---|---|---|---|
| KITSHRINKINMV2EUR | SHRINKIN UNIT V2 | SET ER32 SRK M 6EUR | 6 | 4,5,6,8,10,12 |
| KITSHRINKINSV2EUR | SHRINKIN UNIT V2 | SET ER32 SRK S 6EUR | 6 | 4,5,6,8,10,12 |

# TUNGCLICK
## ER-SRF

TungShrink quick change collet type

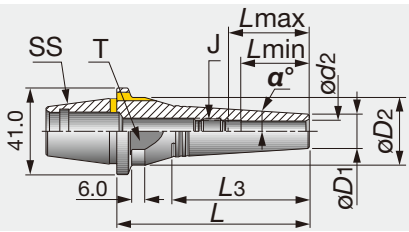



| Designation | SS | ød2 | øD1 | øD2 | L | L3 | J | Key | α° | T | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER32SRF3X50 | 32 SRF | 3 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF3X85 | 32 SRF | 3 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF4X50 | 32 SRF | 4 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF4X85 | 32 SRF | 4 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF5X50 | 32 SRF | 5 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF5X85 | 32 SRF | 5 | 10 | 32 | 85 | 60.5 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF6X50 | 32 SRF | 6 | 11 | 32 | 50 | 31 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF6X85 | 32 SRF | 6 | 11 | 32 | 85 | 60.5 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF8X50 | 32 SRF | 8 | 14 | 32 | 50 | 33 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF8X85 | 32 SRF | 8 | 14 | 32 | 85 | 60.5 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF10X50 | 32 SRF | 10 | 16 | 32 | 50 | 35 | M12 | 6 | 4 | 27 | 30 | 35 |
| ER32SRF10X85 | 32 SRF | 10 | 16 | 32 | 85 | 60.5 | M12 | 6 | 4 | 27 | 30 | 36 |
| ER32SRF12X50 | 32 SRF | 12 | 20 | 32 | 50 | 35 | M14 | 6 | 4 | 27 | 32 | 37 |
| ER32SRF12X85 | 32 SRF | 12 | 20 | 32 | 85 | 50 | M14 | 6 | 4 | 27 | 32 | 38 |

- Tightening torque: 235 N·m.

# TUNGCLICK
## ER-SRF JET2

TungClick quick change system with coolant supply and TungShrink thermal shrink holder



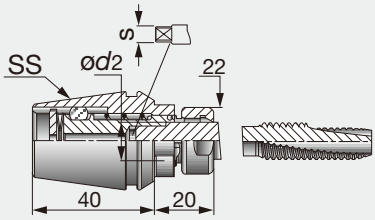

| Designation | SS | ød2 | øD1 | øD2 | L | L3 | J | Key | α° | T | Lmin | Lmax |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER32SRF3X50JET2 | 32 SRF | 3 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF3X85JET2 | 32 SRF | 3 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 10 | 16 |
| ER32SRF4X50JET2 | 32 SRF | 4 | 10 | 32 | 50 | 31 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF4X85JET2 | 32 SRF | 4 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 12 | 18 |
| ER32SRF5X85JET2 | 32 SRF | 5 | 10 | 32 | 85 | 60 | M6 | 3 | 4 | 27 | 15 | 21 |
| ER32SRF6X50JET2 | 32 SRF | 6 | 11 | 32 | 50 | 31 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF6X85JET2 | 32 SRF | 6 | 11 | 32 | 85 | 60 | M8 | 4 | 4 | 27 | 18 | 24 |
| ER32SRF8X50JET2 | 32 SRF | 8 | 14 | 32 | 50 | 33 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF8X85JET2 | 32 SRF | 8 | 14 | 32 | 85 | 60 | M10 | 5 | 4 | 27 | 25 | 31 |
| ER32SRF10X50JET2 | 32 SRF | 10 | 16 | 32 | 50 | 35 | M12 | 6 | 4 | 27 | 30 | 35 |
| ER32SRF10X85JET2 | 32 SRF | 10 | 16 | 32 | 85 | 60 | M12 | 6 | 4 | 27 | 30 | 36 |
| ER32SRF12X50JET2 | 32 SRF | 12 | 20 | 32 | 50 | 35 | M14 | 6 | 4 | 27 | 32 | 37 |
| ER32SRF12X85JET2 | 32 SRF | 12 | 20 | 32 | 85 | 50 | M14 | 6 | 4 | 27 | 32 | 38 |

- Tightening torque : 235 N·m.

# TUNGGTI

## GTIN ER-ISO

ER collet tapping attachments, tension and compression ISO type used for CNC milling and turret lathe machines.




0.1 mm
0.8 mm ↔ 4 mm
0.1 mm

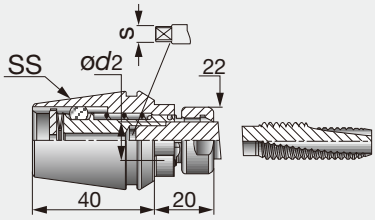
| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32ISO2.24X1.80 | ER32 | 2.24 | 1.8 | M3 | M3 | 20 |
| GTINER32ISO2.50X2.00 | ER32 | 2.5 | 2 | M3.5 | M3.5 | 20 |
| GTINER32ISO2.80X2.24 | ER32 | 2.80 | 2.24 | M2.2 | M2.5 | 20 |
| GTINER32ISO3.15X2.50 | ER32 | 3.15 | 2.5 | M3 | M4 | 20 |
| GTINER32ISO3.55X2.80 | ER32 | 3.55 | 2.8 | M3.5 | M4.5 | 20 |
| GTINER32ISO4.00X3.15 | ER32 | 4 | 3.15 | M4 | M5 | 20 |
| GTINER32ISO4.50X3.55 | ER32 | 4.5 | 3.55 | M6 | M6 | 20 |
| GTINER32ISO5.00X4.00 | ER32 | 5 | 4 | M5 | M5 | 20 |
| GTINER32ISO5.60X4.50 | ER32 | 5.6 | 4.5 | UNC#12-24 | UNC#12-24 | 20 |
| GTINER32ISO6.30X5.00 | ER32 | 6.3 | 5 | M6 | M8 | 20 |
| GTINER32ISO7.10X5.60 | ER32 | 7.1 | 5.6 | UNC#-3/8-16 | UNC#-3/8-16 | 20 |
| GTINER32ISO8.00X6.30 | ER32 | 8 | 6.3 | M8 | M10 | 20 |
| GTINER32ISO9.00X7.10 | ER32 | 9 | 7.1 | M12 | M12 | 20 |
| GTINER32ISO10.00X8.00 | ER32 | 10 | 8 | M10 | M10 | 20 |
| GTINER32ISO11.20X9.00 | ER32 | 11.2 | 9 | M14 | M14 | 20 |
| GTINER32ISO12.50X10.00 | ER32 | 12.5 | 10 | M16 | M16 | 20 |

No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

# TUNGGTI

## GTIN ER-DIN

ER collet tapping attachments, tension and compression DIN type used for CNC milling and turret lathe machines.




0.1 mm
0.8 mm ↔ 4 mm
0.1 mm

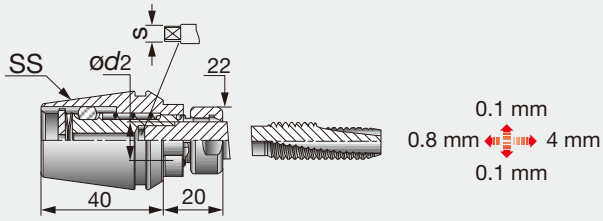
| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32DIN2.50X2.10 | ER32 | 2.5 | 2.1 | M1 | M1.8 | 20 |
| GTINER32DIN2.80X2.10 | ER32 | 2.8 | 2.1 | M2 | M4 | 20 |
| GTINER32DIN3.50X2.70 | ER32 | 3.5 | 2.7 | M3 | M5 | 20 |
| GTINER32DIN4.00X3.00 | ER32 | 4 | 3 | M3 | M5 | 20 |
| GTINER32DIN4.50X3.40 | ER32 | 4.5 | 3.4 | M4 | M6 | 20 |
| GTINER32DIN6.00X4.90 | ER32 | 6 | 4.9 | M5 | M8 | 20 |
| GTINER32DIN7.00X5.50 | ER32 | 7 | 5.5 | M10 | M10 | 20 |
| GTINER32DIN8.00X6.20 | ER32 | 8 | 6.2 | M8 | M8 | 20 |
| GTINER32DIN9.00X7.00 | ER32 | 9 | 7 | M12 | M12 | 20 |
| GTINER32DIN10.00X8.00 | ER32 | 10 | 8 | M10 | M10 | 20 |
| GTINER32DIN11.00X9.00 | ER32 | 11 | 9 | M14 | M14 | 20 |
| GTINER32DIN12.00X9.00 | ER32 | 12 | 9 | M16 | M16 | 20 |

No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

# TUNGGTI

## GTIN ER-JIS

ER collet tapping attachments, tension and compression JIS type used for CNC milling and turret lathe machines.



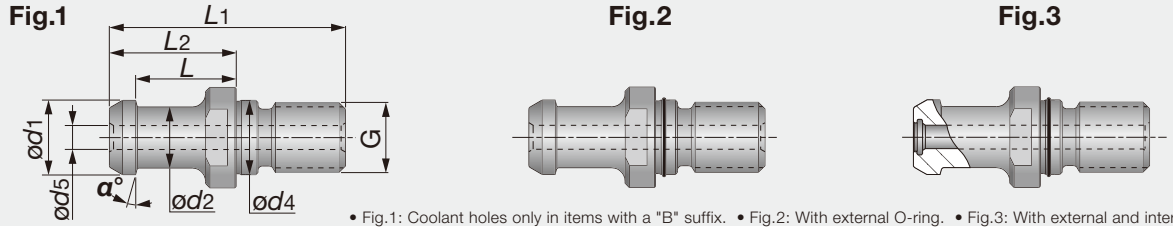

| Designation | SS | ød2 | S | Tap min | Tap max | T |
|---|---|---|---|---|---|---|
| GTINER32JIS3.00X2.50 | ER32 | 3 | 2.5 | M1 | M2.6 | 20 |
| GTINER32JIS4.00X3.20 | ER32 | 4 | 3.2 | M3 | M3.5 | 20 |
| GTINER32JIS5.00X4.00 | ER32 | 5 | 4 | M4 | M4 | 20 |
| GTINER32JIS6.00X4.50 | ER32 | 6 | 4.5 | M6 | M6 | 20 |
| GTINER32JIS6.20X5.00 | ER32 | 6.2 | 5 | M8 | M8 | 20 |
| GTINER32JIS7.00X5.50 | ER32 | 7 | 5.5 | M10 | M10 | 20 |
| GTINER32JIS8.50X6.50 | ER32 | 8.5 | 6.5 | M12 | M12 | 20 |
| GTINER32JIS10.50X8.00 | ER32 | 10.5 | 8 | M14 | M14 | 20 |
| GTINER32JIS12.50X10.00 | ER32 | 12.5 | 10 | M16 | M16 | 20 |

• No coolant should be induced through the tapping collet, as it will cause malfunctioning of the mechanism.

# TUNGHOLD

## PS BT-JIS/MAZAK

DIN 69872 Pull Stud with JIS 63398 Retention Knob / BT Pull Stud with ANSI Retention Knob, for MAZAK Machines



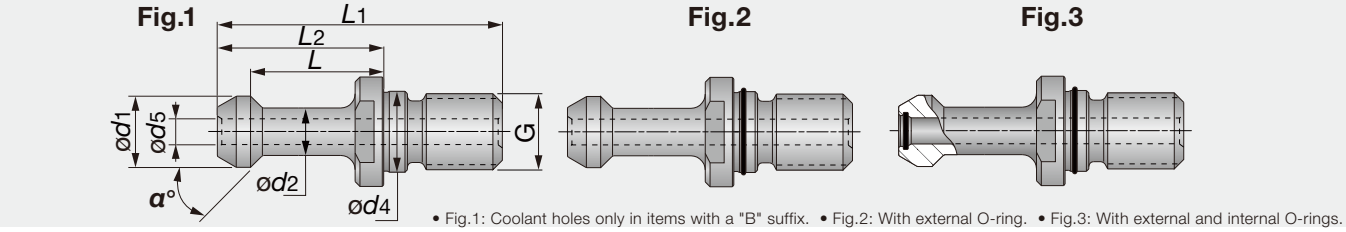

• Fig.1: Coolant holes only in items with a "B" suffix. • Fig.2: With external O-ring. • Fig.3: With external and internal O-rings.

| Designation | BT size | G | ød1 | ød2 | ød4 | ød5 | L | L1 | L2 | α° | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSBT3015M12JISB | 30 | M12 | 12 | 8 | 13 | 4 | 18.4 | 43 | 23.4 | 15 | 1 |
| PSBT4015M16JISB | 40 | M16 | 19 | 14 | 17 | 5.5 | 23 | 54 | 29 | 15 | 1 |
| PSBT4015M16JISOB | 40 | M16 | 19 | 14 | 17 | 5.5 | 23 | 54 | 29 | 15 | 2 |
| PSBT4015M16JISOBO | 40 | M16 | 19 | 14 | 17 | 5.5 | 23 | 54 | 29 | 15 | 3 |
| PSBT5015M24JISB | 50 | M24 | 28 | 21 | 25 | 8 | 25 | 74 | 34 | 15 | 1 |
| PSBT5015M24JISOB | 50 | M24 | 28 | 21 | 25 | 8 | 25 | 74 | 34 | 15 | 2 |
| PSBT5015M24JISOBO | 50 | M24 | 28 | 21 | 25 | 8 | 25 | 74 | 34 | 15 | 3 |
| PSBT4045M16MAZAKB | 40 | M16 | 18.79 | 12.4 | 17 | 7 | 14.026 | 44.1 | 19.1 | 45 | 1 |
| PSBT5045M24MAZAKB | 50 | M24 | 28.95 | 20.8 | 25 | 8 | 17.58 | 65.2 | 25.2 | 45 | 1 |

# TUNGHOLD

## PS BT-MAS

BT Pull Stud with MAS Retention Knob



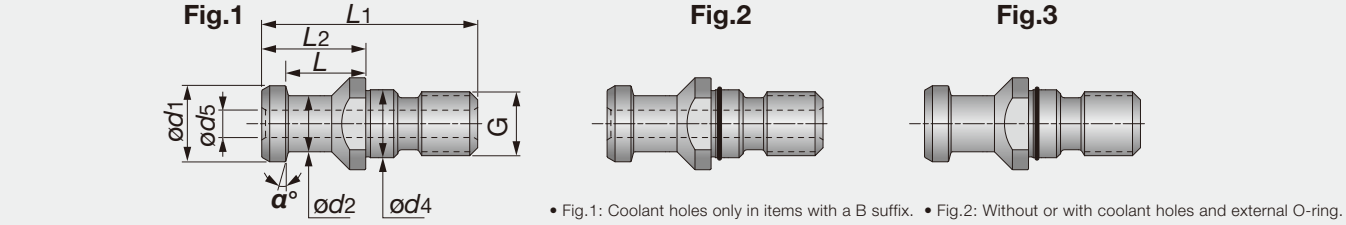

• Fig.1: Coolant holes only in items with a "B" suffix. • Fig.2: With external O-ring. • Fig.3: With external and internal O-rings.

| Designation | BT size | G | ød1 | ød2 | ød4 | ød5 | L | L1 | L2 | α° | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSBT3045M12MAS1 | 30 | M12 | 11 | 7 | 12.5 | - | 18 | 43 | 23 | 45 | 1 |
| PSBT3045M12MAS1B | 30 | M12 | 11 | 7 | 12.5 | 3 | 18 | 43 | 23 | 45 | 1 |
| PSBT3060M12MAS2 | 30 | M12 | 11 | 7 | 12.5 | - | 18 | 43 | 23 | 60 | 1 |
| PSBT4045M16MAS1 | 40 | M16 | 15 | 10 | 17 | - | 28 | 60 | 35 | 45 | 1 |
| PSBT4045M16MAS1B | 40 | M16 | 15 | 10 | 17 | 5.5 | 28 | 60 | 35 | 45 | 1 |
| PSBT4060M16MAS2 | 40 | M16 | 15 | 10 | 17 | - | 28 | 60 | 35 | 60 | 1 |
| PSBT4060M16MAS2B | 40 | M16 | 15 | 10 | 17 | 5.5 | 28 | 60 | 35 | 60 | 1 |
| PSBT4090M16MAS3 | 40 | M16 | 15 | 10 | 17 | - | 28 | 60 | 35 | 90 | 1 |
| PSBT4090M16MAS3B | 40 | M16 | 15 | 10 | 17 | 5.5 | 28 | 60 | 35 | 90 | 1 |
| PSBT5045M24MAS1 | 50 | M24 | 23 | 17 | 25 | - | 35 | 85 | 45 | 45 | 1 |
| PSBT5045M24MAS1B | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 45 | 1 |
| PSBT5045M24MAS1OB | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 45 | 2 |
| PSBT5045M24MAS1OBO | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 45 | 3 |
| PSBT5060M24MAS2 | 50 | M24 | 23 | 17 | 25 | - | 35 | 85 | 45 | 60 | 1 |
| PSBT5060M24MAS2B | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 60 | 1 |
| PSBT5060M24MAS2OB | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 60 | 2 |
| PSBT5090M24MAS3 | 50 | M24 | 23 | 17 | 25 | - | 35 | 85 | 45 | 90 | 1 |
| PSBT5090M24MAS3B | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 90 | 1 |
| PSBT5090M24MAS3OB | 50 | M24 | 23 | 17 | 25 | 6 | 35 | 85 | 45 | 90 | 2 |

# TUNGHOLD

## PS SK-DIN

DIN 69872 Pull Stud with JIS 63398 Retention Knob

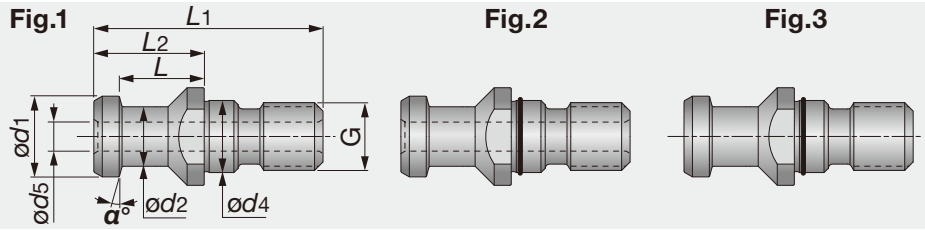



• Fig.1: Coolant holes only in items with a B suffix. • Fig.2: Without or with coolant holes and external O-ring.

| Designation | SK size | G | ød1 | ød2 | ød4 | ød5 | L | L1 | L2 | α° | Fig. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PSSK3015M12DIN | 30 | M12 | 13 | 9 | 13 | - | 19 | 44 | 24 | 15 | 1 |
| PSSK4015M16DIN | 40 | M16 | 19 | 14 | 17 | - | 20 | 54 | 26 | 15 | 1 |
| PSSK4015M16DINO | 40 | M16 | 19 | 14 | 17 | - | 20 | 54 | 26 | 15 | 3 |
| PSSK4015M16DINB | 40 | M16 | 19 | 14 | 17 | 7 | 20 | 54 | 26 | 15 | 1 |
| PSSK4015M16DINOB | 40 | M16 | 19 | 14 | 17 | 7 | 20 | 54 | 26 | 15 | 2 |
| PSSK5015M24DIN | 50 | M24 | 28 | 21 | 25 | - | 25 | 74 | 34 | 15 | 1 |
| PSSK5015M24DINO | 50 | M24 | 28 | 21 | 25 | - | 25 | 74 | 34 | 15 | 3 |
| PSSK5015M24DINB | 50 | M24 | 28 | 21 | 25 | 11.5 | 25 | 74 | 34 | 15 | 1 |

# TUNGHOLD
## PS CAT-ISO

Pull Studs CAT-MAS G-mm, Extension Knob with Coolant Holes

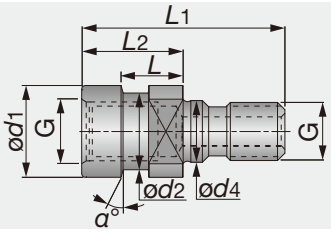



| Designation | CAT size | G | ød1 | ød2 | ød4 | ød5 | L | L1 | L2 | α° |
|---|---|---|---|---|---|---|---|---|---|---|
| PSCAT3045M12ISOB | 30 | M12 | 13.35 | 9.3 | 13 | 4.75 | 8.1 | 34 | 11.8 | 45 |
| PSCAT4045M16ISOB | 40 | M16 | 18.95 | 12.9 | 17 | 7.35 | 11.2 | 44.5 | 16.4 | 45 |
| PSCAT5045M24ISOB | 50 | M24 | 29.1 | 19.6 | 25 | 8 | 17.9 | 65.5 | 25.55 | 45 |

• Coolant holes in items with a B suffix.

# TUNGHOLD
## PS OTT-BT

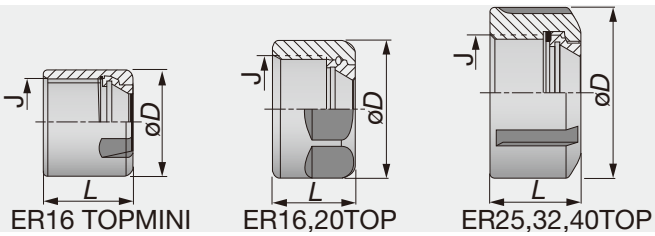
BT Pull Stud with OTT System Retention Knob




| Designation | BT size | G | ød1 | ød2 | ød4 | L | L1 | L2 | α° |
|---|---|---|---|---|---|---|---|---|---|
| PSOTTBT40M16 | 40 | M16 | 25 | 21.1 | 17 | 16.6 | 56 | 28 | 15 |
| PSOTTBT50M24 | 50 | M24 | 39.3 | 32 | 25 | 13.4 | 65 | 25 | 15 |

# TUNGHOLD
## NUT ER-TOP

DIN 6499 Nut for ER collet



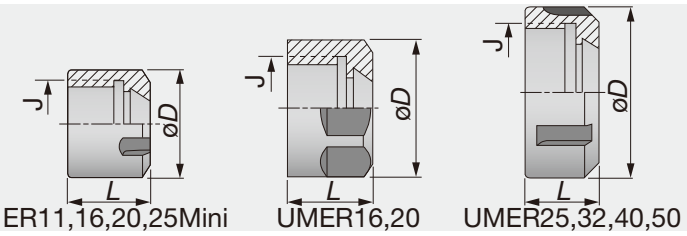

| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER16TOP | 28 | 17 | M22X1.5 | 68.7 |
| NUTER20TOP | 34 | 19 | M25X1.5 | 117.7 |
| NUTER25TOP | 42 | 20 | M32X1.5 | 196.1 |
| NUTER32TOP | 50 | 22 | M40X1.5 | 215.7 |
| NUTER40TOP | 63 | 25 | M50X1.5 | 245.1 |

*Torque: Recommended torque (Nm) for clamping

# TUNGHOLD

## NUT ER-UM/MINI

Clamping Nuts for DIN 6499 ER Collet Chucks



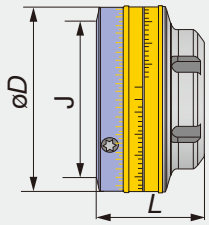

| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER11GHS (1) | 16 | 11.5 | M13X0.75 | - |
| NUTER11MINI | 16 | 10.8 | M13X0.75 | 29.4 |
| NUTER11UM | 19 | 11.3 | M14X0.75 | 49 |
| NUTER16MINI | 22 | 18 | M19X1.0 | 39.2 |
| NUTER16UM | 28 | 17 | M22X1.5 | 68.7 |
| NUTER20MINI | 28 | 19 | M24X1.0 | 78.5 |
| NUTER20UM | 34 | 19 | M25X1.5 | 117.7 |
| NUTER25MINI | 35 | 20 | M30X10 | 98 |
| NUTER25UM | 42 | 20 | M32X1.5 | 196.1 |
| NUTER32UM | 50 | 22 | M40X1.5 | 215.7 |
| NUTER40UM | 63 | 25 | M50X1.5 | 245.1 |
| NUTER50UM | 78 | 35 | M64X2.0 | 343.2 |

*Torque: Recommended torque (Nm) for clamping(1) To be used only for SpinJet spindles

# TUNGBALANCE

## NUT ER-BALANCE

BALANCIN Balanceable ER TOP DIN 6499 Nuts



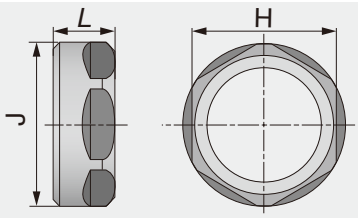

| Designation | øD | L | J | Torque* |
|---|---|---|---|---|
| NUTER16TOPBIN | 36 | 44 | M22X1.5 | 68.7 |
| NUTER25TOPBIN | 37.5 | 58 | M32X1.5 | 196.1 |
| NUTER32TOPBIN | 38 | 66 | M40X1.5 | 215.7 |

*Torque: Recommended torque (Nm) for clamping

# TUNGSHORT

## NUT ER-SHORT

Nuts for TungShort ER Collet Chucks

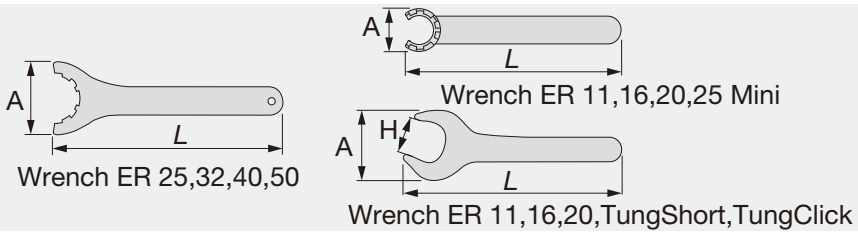



| Designation | H | L | J | Torque* |
|---|---|---|---|---|
| NUTER20SHORT | 22 | 10.7 | M25X1.5 | 117.7 |
| NUTER32SHORT | 36 | 15 | M40X1.5 | 215.7 |
| NUTER40SHORT | 46 | 16 | M50X1.5 | 245.1 |

*Torque: Recommended torque (Nm) for clamping

# TUNGHOLD
## WRENCH ER

Wrench for ER DIN 6499 Clamping Nut

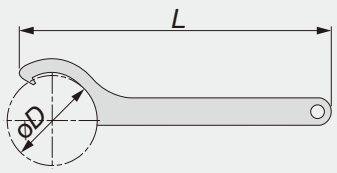



| Designation | A | H | *L* |
|---|---|---|---|
| WRENCHER11SMS (1) | 16 | - | 95 |
| WRENCHER11MINI | 16.8 | - | 95 |
| WRENCHER11 | 32 | 17 | 95 |
| WRENCHER16MINI | 22.5 | - | 117 |
| WRENCHER16 | 42.5 | 25 | 143 |
| WRENCHER20MINI | 28 | - | 128 |
| WRENCHER20 | 53.5 | 30 | 172 |
| WRENCHER25MINI | 29 | - | 120 |
| WRENCHER25 | 70 | - | 207 |
| WRENCHER32 | 78 | - | 255 |
| WRENCHER40 | 95 | - | 285 |
| WRENCHER50 | 110 | - | 350 |
| WRENCHER20SHORTRING22 | 48 | 22 | 260 |
| WRENCHER32SHORT | 75 | 36 | 303 |
| WRENCHER40SHORT | 94 | 46 | 378 |
| WRENCHER32CLICKIN27 | 57 | 27 | 239 |
| WRENCHER32CLICKIN32 | 67 | 32 | 273 |

(1) To be used only for SpinJet spindles

# TUNGMAX
## WRENCH

Wrench for TungMax collets

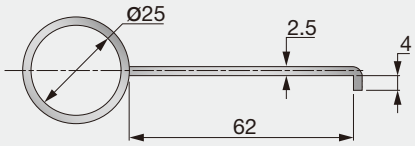



| Designation | *øD* | *L* |
|---|---|---|
| WRENCHMAXIN20HOOK | 26 | 205 |
| WRENCHMAXIN32HOOK | 68 | 240 |

TUNGHOLD

## SC

### SC Collet Extraction Hook

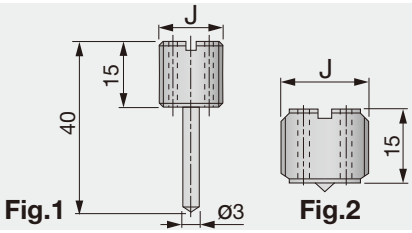



| Designation | Collet |
|---|---|
| EXTRACTOR SC COLLETS | SC straight collets |

TUNGHOLD

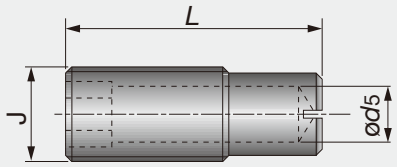
## PRESET ER-JET

### Preset Screws with Oil Holes for ER Sealed Collets



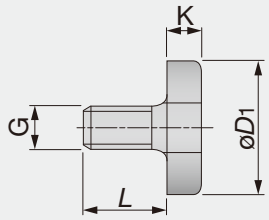

| Designation | J | Fig |
|---|---|---|
| PRESETER-JET8X1 | M8X1.0 | 2 |
| PRESETER-JET8X1.25 | M8X1.25 | 2 |
| PRESETER-JET10X1.5 | M10X1.5 | 2 |
| PRESETER-JET12X1 | M12X1.0 | 2 |
| PRESETER-JET12X1.75L | M12X1.75 | 1 |
| PRESETER-JET12X1.75 | M12X1.75 | 2 |
| PRESETER-JET14X1 | M14X1.0 | 2 |
| PRESETER-JET16X2 | M16X2 | 2 |
| PRESETER-JET16X2L | M16X2 | 1 |
| PRESETER-JET18X1 | M18X1.0 | 2 |
| PRESETER-JET18X1.5 | M18X1.5 | 2 |
| PRESETER-JET18X1.5L | M18X1.5 | 1 |
| PRESETER-JET22X1.5 | M22X1.5 | 2 |
| PRESETER-JET22X1.5L | M22X1.5 | 1 |
| PRESETER-JET28X1.5 | M28X1.5 | 2 |

# TUNGMAX
## Preset Screw
Preset Screw for TungMax chuck



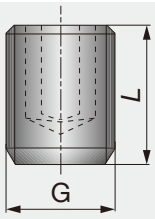

| Designation | J | L | ød5 | Key |
|---|---|---|---|---|
| PRESETMAXIN16X30 | M16 | 30 | 8 | 8 |
| PRESETMAXIN16X44 | M16 | 44 | 8 | 8 |
| PRESETMAXIN20X55 | M20 | 55 | 12 | 12 |

# TUNGHOLD
## SCREW-SEM
Lock Screw for Shell Mill Holder



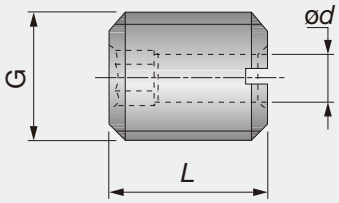

| Designation | G | øD1 | K | L |
|---|---|---|---|---|
| M8CLAMPSCREWSEM16 | M8 | 20 | 6 | 16 |
| M10CLAMPSCREWSEM22 | M10 | 28 | 7 | 18 |
| M12CLAMPSCREWSEM27 | M12 | 35 | 8 | 22 |
| M16CLAMPSCREWSEM32 | M16 | 42 | 9 | 26 |
| M20CLAMPSCREWSEM40 | M20 | 52 | 10 | 30 |
| M24CLAMPSCREWSEM50 | M24 | 63 | 12 | 36 |

# TUNGHOLD
## SCREW-EM
Lock Screw for Endmill Holder




| Designation | G | L | For dia |
|---|---|---|---|
| SRM6X10DIN1835B | M6 | 10 | 6 |
| SRM8X10DIN1835-B | M8 | 10 | 8 |
| SRM10X12DIN1835-B | M10 | 12 | 10 |
| SRM12X16DIN1835-B | M12 | 16 | 12,14 |
| SRM14X16DIN1835-B | M14 | 16 | 14,16 |
| SRM16X16DIN1835-B | M16 | 16 | 20 |
| SRM18X2X20DIN1835-B | M18X2 | 20 | 25,32 |
| SRM20X2X20DIN1835-B | M20X2 | 20 | 40 |
| SRM24X2X25DIN1835-B | M24X2 | 25 | 50 |
| SRM16X10.3EMSHORT | M16 | 10.3 | 20 |
| SRM18X2X10EMSHORT | M18X2 | 10 | 2 |

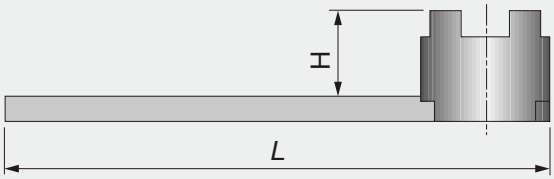
# TUNGHOLD
## PRESET SCREW
Preset Screw for EME/SRKIN Holder with coolant hole




| Designation | G | L | ød | For Shanks | Key |
|---|---|---|---|---|---|
| PRESETSCREWM6X20B | M6X1 | 20 | 2.5 | EME/SRKIN | 3 |
| PRESETSCREWM8X20B | M8X1.25 | 20 | 3.5 | EME/SRKIN | 4 |
| PRESETSCREWM10X18B | M10X1.5 | 18 | 4.5 | EME/SRKIN | 5 |
| PRESETSCREWM12X18B | M12X1.75 | 18 | 5.5 | EME/SRKIN | 6 |
| PRESETSCREWM16X20B | M16X2 | 20 | 7.5 | EME/SRKIN | 6 |
| PRESETSCREWM16X25B | M16X2 | 25 | 7.5 | SRKIN | 6 |

# TUNGHOLD
## WRENCH SEMC

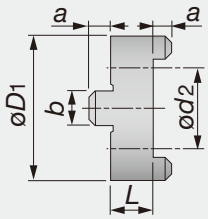
Wrench DIN 6368 for Face and COMBI Shell Endmill Holders




| Designation | Clamping bore dia. | G | H | L |
|---|---|---|---|---|
| WRENCHM8SEMC16 | 16 | M8 | 20 | 180 |
| WRENCHM10SEMC22 | 22 | M10 | 25 | 200 |
| WRENCHM12SEMC27 | 25.4,27 | M12 | 32 | 225 |
| WRENCHM16SEMC32 | 31.75,32 | M16 | 36 | 250 |
| WRENCHM20SEMC40 | 38.1,40 | M20 | 40 | 280 |
| WRENCHM24SEMC50 | 50,50.8 | M24 | 50 | 315 |

# TUNGHOLD
## DRIVING RING SEMC

Driving Ring DIN 6366/1 for COMBI Shell and Mill Holder

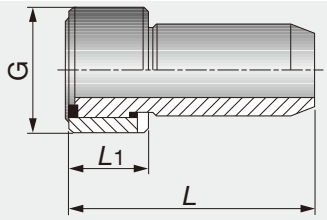



| Designation | ød2 | øD1 | L | a | b |
|---|---|---|---|---|---|
| 16D.RINGSEMC | 16 | 32 | 10 | 8 | 5 |
| 22D.RINGSEMC | 22 | 40 | 12 | 10 | 6 |
| 27D.RINGSEMC | 27 | 48 | 12 | 12 | 6.3 |
| 32D.RINGSEMC | 32 | 58 | 14 | 14 | 7 |
| 40D.RINGSEMC | 40 | 70 | 14 | 16 | 8 |
| 50D.RINGSEMC | 50 | 90 | 16 | 18 | 9 |

• Use's with "WRENCH SEMC"

# TUNGHOLD
## COOLING TUBE-HSK

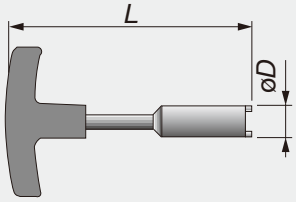
Cooling Tube for HSK




| Designation | HSK size | L | L1 | G |
|---|---|---|---|---|
| COOLINGTUBEHSKA40 | 40 | 29.1 | 7.5 | M12X1 |
| COOLINGTUBEHSKA50 | 50 | 32.7 | 9.5 | M16X1 |
| COOLINGTUBEHSKA63 | 63 | 36 | 11.5 | M18X1 |
| COOLINGTUBEHSKA80 | 80 | 36.6 | 13.5 | M20X1.5 |
| COOLINGTUBEHSKA100 | 100 | 43.6 | 15.5 | M24X1.5 |

# TUNGHOLD
## WRENCH

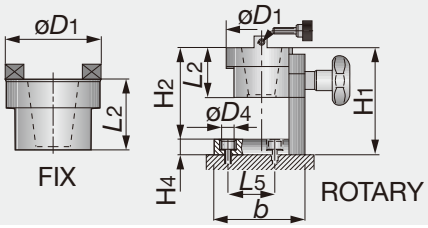
Wrench for HSK cooling tube




| Designation | HSK size | øD | L |
|---|---|---|---|
| WRENCHCOOLTUBEHSK40 | 40 | 11 | 120 |
| WRENCHCOOLTUBEHSK50 | 50 | 15 | 120 |
| WRENCHCOOLTUBEHSK63 | 63 | 17 | 122 |
| WRENCHCOOLTUBEHSK80 | 80 | 18.5 | 186 |
| WRENCHCOOLTUBEHSK100 | 100 | 22 | 141 |

# TUNGHOLD
## TOOL CLAMP

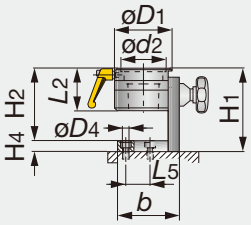
Tool clamp fixture for ISO, DIN 69871 and BT MAS-403 tool shanks




| Designation | CSI | øD1 | L2 | H1 | H2 | H4 | b | L5 | øD4 |
|---|---|---|---|---|---|---|---|---|---|
| TOOLCLAMP30ROTARY | ROTARY | 70 | 56 | 128 | 109 | 19 | 104 | 40 | 12.5 |
| TOOLCLAMP40ROTARY | ROTARY | 82 | 56 | 128 | 109 | 19 | 104 | 40 | 12.5 |
| TOOLCLAMP50ROTARY | ROTARY | 103 | 71 | 170 | 151 | 19 | 144 | 85 | 12.5 |
| TOOLCLAMP30FIX | FIX | 82 | 58 | - | - | - | - | - | - |
| TOOLCLAMP40FIX | FIX | 82 | 58 | - | - | - | - | - | - |
| TOOLCLAMP50FIX | FIX | 103 | 71 | - | - | - | - | - | - |

# TUNGHOLD
## MULTI CLAMP (HSK)

Multi-clamp rotary fixture for HSK shanks




| Designation | CSI | ød2 | øD1 | L2 | H1 | H2 | H4 | b | L5 | øD4 |
|---|---|---|---|---|---|---|---|---|---|---|
| MULTICLAMP32E/F | HSK A/C50 | 32 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP40E/F | HSK A/C63 | 40 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP50E/F | HSK A/C100 | 50 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP63E/F | HSK E/F32 | 63 | 113.2 | 70 | 133 | 114 | 19 | 144 | 40 | 12.5 |
| MULTICLAMP50A/C | HSK E/F40 | 50 | 82 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMP63A/C | HSK E/F50 | 63 | 95 | 72 | 142 | 123 | 19 | 104 | 40 | 12.5 |
| MULTICLAMP100A/C | HSK E/F63 | 100 | 130 | 90 | 178 | 159 | 19 | 144 | 85 | 12.5 |

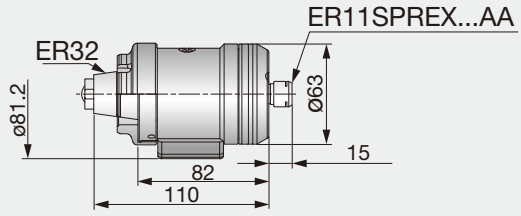
**Note:** Assemble the collet and cutting tool.
By hand, place the nut onto the collet chuck.

| Designation | Machine |
|---|---|
| EASYLOCKT.CEU | 200/240V 50/60 HZ |

# SPINJET

## TJS-ER32

Coolant driven high speed compact spindles for ER32 collet chuck




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

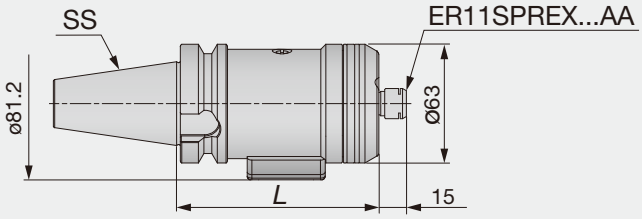
*Option

| Designation | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KER32L | 3.5 | 1.1 | L |
| TJS20KER32R | 3.5 | 1.1 | R |
| TJS30KER32L | 2.5 | 1.1 | L |
| TJS30KER32R | 2.5 | 1.1 | R |
| TJS40KER32L | 1.5 | 1.1 | L |
| TJS40KER32R | 1.5 | 1.1 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

## TJS-BT

Coolant driven high speed compact spindles with BT shanks




| Descriptions | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

*Option

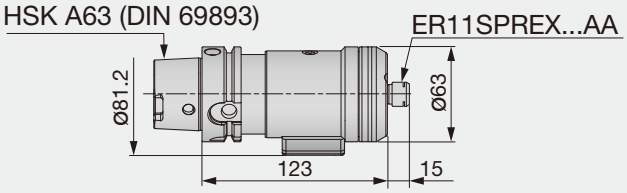
| Designation | SS | *L* | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|---|---|
| TJS20KBT30L | BT30 | 116 | 3.5 | 1.5 | L |
| TJS20KBT30R | BT30 | 116 | 3.5 | 1.5 | R |
| TJS30KBT30L | BT30 | 116 | 2.5 | 1.5 | L |
| TJS30KBT30R | BT30 | 116 | 2.5 | 1.5 | R |
| TJS40KBT30L | BT30 | 116 | 1.5 | 1.5 | L |
| TJS40KBT30R | BT30 | 116 | 1.5 | 1.5 | R |
| TJS20KBT40L | BT40 | 105 | 3.5 | 1.9 | L |
| TJS20KBT40R | BT40 | 105 | 3.5 | 1.9 | R |
| TJS30KBT40L | BT40 | 105 | 2.5 | 1.9 | L |
| TJS30KBT40R | BT40 | 105 | 2.5 | 1.9 | R |
| TJS40KBT40L | BT40 | 105 | 1.5 | 1.9 | L |
| TJS40KBT40R | BT40 | 105 | 1.5 | 1.9 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

# SPINJET

## TJS-HSK A63

Coolant driven high speed compact spindles with HSK A63 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

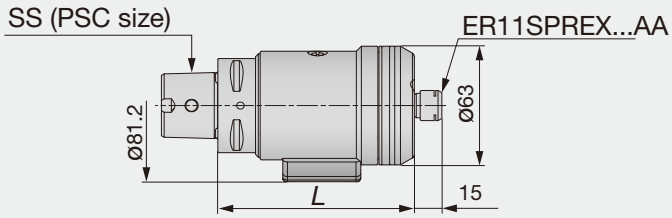
*Option

| Designation | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KHSKA63L | 3.5 | 1.6 | L |
| TJS20KHSKA63R | 3.5 | 1.6 | R |
| TJS30KHSKA63L | 2.5 | 1.6 | L |
| TJS30KHSKA63R | 2.5 | 1.6 | R |
| TJS40KHSKA63L | 1.5 | 1.6 | L |
| TJS40KHSKA63R | 1.5 | 1.6 | R |

- Max. tool shank diameter: ø6.0 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

## TJS-C

Coolant driven high speed compact spindles with TungCap PSC ISO 26623-1 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

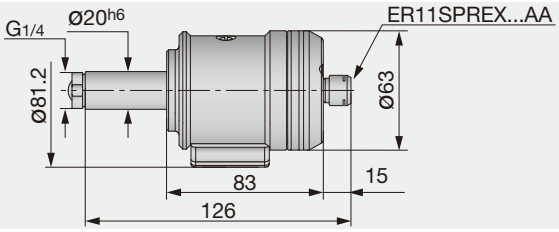
*Option

| Designation | SS | *L* | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|---|---|
| TJS20KC5L | C5 | 104 | 3.5 | 1.5 | L |
| TJS20KC5R | C5 | 104 | 3.5 | 1.5 | R |
| TJS30KC5L | C5 | 104 | 2.5 | 1.5 | L |
| TJS30KC5R | C5 | 104 | 2.5 | 1.5 | R |
| TJS40KC5L | C5 | 104 | 1.5 | 1.5 | L |
| TJS40KC5R | C5 | 104 | 1.5 | 1.5 | R |
| TJS20KC6L | C6 | 106 | 3.5 | 1.65 | L |
| TJS20KC6R | C6 | 106 | 3.5 | 1.65 | R |
| TJS30KC6L | C6 | 106 | 2.5 | 1.65 | L |
| TJS30KC6R | C6 | 106 | 2.5 | 1.65 | R |
| TJS40KC6L | C6 | 106 | 1.5 | 1.65 | L |
| TJS40KC6R | C6 | 106 | 1.5 | 1.65 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

# SPINJET
## TJS-ST

Coolant driven high speed compact spindles with straight (Cylindrical) shanks




| Descriptions | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

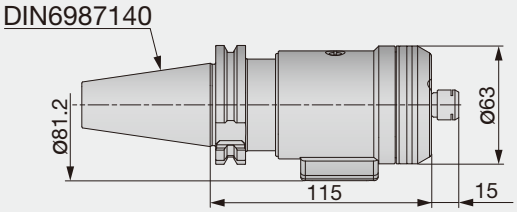
*Option

| Designation | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KST20L | 3.5 | 1.1 | L |
| TJS20KST20R | 3.5 | 1.1 | R |
| TJS30KST20L | 2.5 | 1.1 | L |
| TJS30KST20R | 2.5 | 1.1 | R |
| TJS40KST20L | 1.5 | 1.1 | L |
| TJS40KST20R | 1.5 | 1.1 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

# SPINJET
## TJS-DIN69871

Coolant driven high speed compact spindles with DIN69871 shanks




| Description | Designation |
|---|---|
| Display* | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

*Option

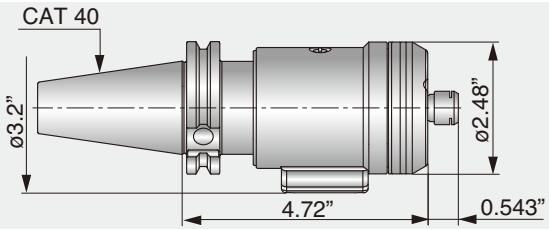
| Designation | Max. tool diameter | Weight (kg) | Direction of tool rotation |
|---|---|---|---|
| TJS20KDIN6987140L | ø3.5 | 1.6 | L |
| TJS20KDIN6987140R | ø3.5 | 1.6 | R |
| TJS30KDIN6987140L | ø2.5 | 1.6 | L |
| TJS30KDIN6987140R | ø2.5 | 1.6 | R |
| TJS40KDIN6987140L | ø1.5 | 1.6 | L |
| TJS40KDIN6987140R | ø1.5 | 1.6 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

# SPINJET

## TJS-CAT

Coolant driven high speed compact spindles with CAT shanks




| Descriptions | Designation |
|---|---|
| Display | TJSTSDDISPLAY |
| Nut | NUTER11GHS |
| Wrench for nut | WRENCHER11SMS |
| Wrench for setting | WRENCHDIA3.2X45 |

*Option

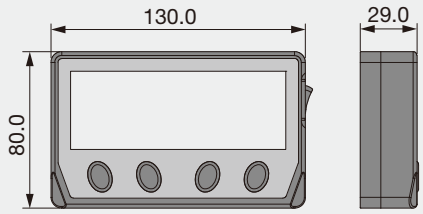
| Designation | Max. tool diameter | Weight (Lbs) | Direction of tool rotation R/L |
|---|---|---|---|
| TJS-20K-CAT40L | ø0.138 | 3.528 | L |
| TJS-20K-CAT40R | ø0.138 | 3.528 | R |
| TJS-30K-CAT40L | ø0.1 | 3.528 | L |
| TJS-30K-CAT40R | ø0.1 | 3.528 | R |
| TJS-40K-CAT40L | ø0.06 | 3.528 | L |
| TJS-40K-CAT40R | ø0.06 | 3.528 | R |

- Max. tool shank diameter: ø6 mm
- Coolant pressure through machine spindle: Min. 2 MPa / Max. 4 MPa
- Min. flow rate: 12 l/min

# SPINJET

## Wireless RPM speed display

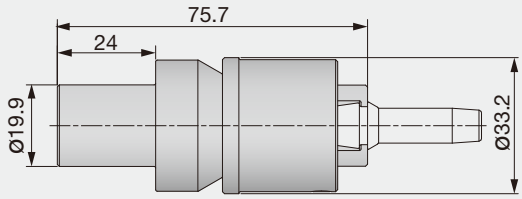
RPM speed display for SPINJET high speed spindles




| Designation | Machine |
|---|---|
| TJSTSDDISPLAY | TJS spindles |

## ER-SRK Shrink collet adapter

ER 11 shrink collet adapter for induction heating device

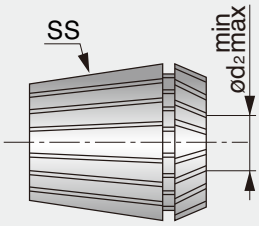


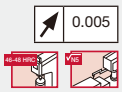

| Designation | Machine |
|---|---|
| INDER11TOOLADAPTER | TJS spindles |

# SPINJET

## ER-SPR-AA

ER 11 AA collet



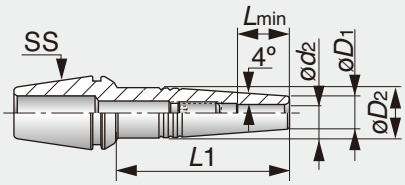




| Designation | SS | ø*d*2 min | ø*d*2 max |
|---|---|---|---|
| ER11SPR0.5-1AA | ER11 | 0.5 | 1 |
| ER11SPR1-2AA | ER11 | 1 | 2 |
| ER11SPR2-3AA | ER11 | 2 | 3 |
| ER11SPR3-4AA | ER11 | 3 | 4 |
| ER11SPR4-5AA | ER11 | 4 | 5 |
| ER11SPR5-6AA | ER11 | 5 | 6 |
| ER11SPR6-7AA | ER11 | 6 | 7 |

AA collet run-out: 0.005 mm

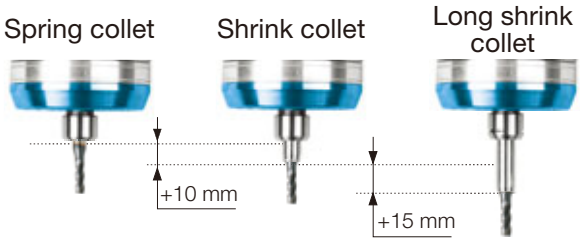
# SPINJET
## ER-SRK Shrink collet

ER 11 shrink collet for induction heating device

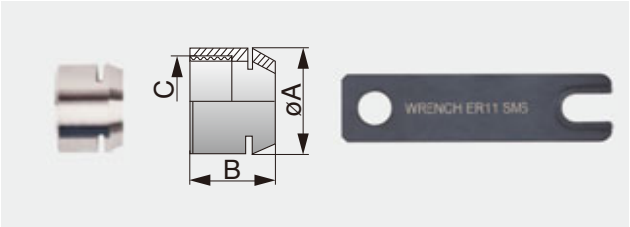



| Designation | SS | ød2 | L1 | Lmin | øD2 | øD1 |
|---|---|---|---|---|---|---|
| ER11SRK3X10 | ER11 | 3 | 10 | 9.5 | 8.5 | 7.6 |
| ER11SRK3X25 | ER11 | 3 | 25 | 11.5 | 8.5 | 7.6 |
| ER11SRK4X10 | ER11 | 4 | 10 | 9.5 | 8.5 | 7.6 |
| ER11SRK4X25 | ER11 | 4 | 25 | 11.5 | 8.5 | 7.6 |

• For carbide tools only

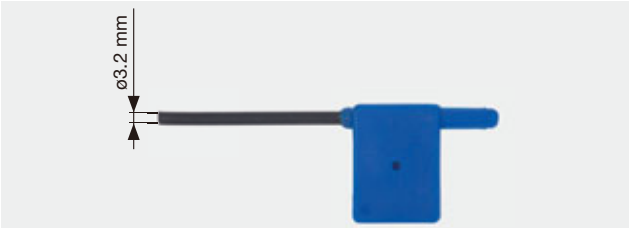



## Nut and wrench for collets




| Designation | øA | B | C | Wrench |
|---|---|---|---|---|
| NUTER11GHS | 16 | 11.5 | M13X0.75 | WRENCHER11SMS |

## Wrench for setting




| Designation |
|---|
| WRENCHDIA3.2x45 |

| Ring color | Blue | Red | Yellow |
|---|---|---|---|
| Shape | | | |
| No. of revolutions: n (min-1) | **40,000** | **30,000** | **20,000** |
| Designation | TJS40K... | TJS30K | TJS20K |
| Coolant pressure: (MPa) | 2 | 2 | 2 |
| Min. flow rate: (l/min) | 12 | 12 | 12 |
| Max. shank dia: øDs (mm) | 6 | 6 | 6 |
| Tool dia: øDc (mm) | 0.2 - 1.5 | 1.6 - 2.5 | 2.6 - 3.5 |

## Speed vs. pressure

| Jet spindle type / n (min-1) | Coolant pressure | | |
|---|---|---|---|
| | 2 MPa | 3 MPa | 4 MPa |
| TJS20K-ER32 | 20000 | 30000 | 40000 |
| TJS30K-ER32 | 30000 | 40000 | 50000 |
| TJS40K-ER32 | 40000 | 50000 | 60000 |

These are approximate RPM values, and they depend on coolant pressure, flow rate, and type.

Torque Wrench with LED

# BEAMWRENCH

## Complete Tightening & Rigid Clamping

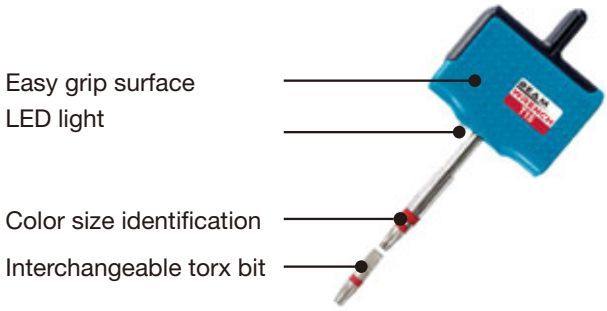
## Features

### LED illuminates at correct torque!

- When reaching the required clamping force, the LED will be activated.
- Enables the operator to set the insert correctly.
- Provides stable and correct clamping forces in any position.

### Available in various torque sizes!

- 5 Torx sizes are available.
- Hardened steel enhances the life of bit.



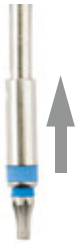

### How to exchange a bit.

**Unlock the used bit**

- Pull the sleeve to loosen the bit

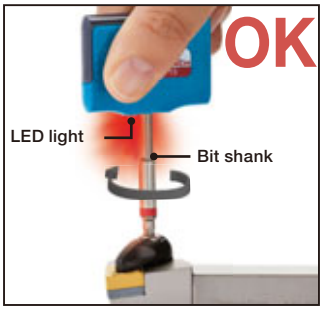
**Lock the new bit**

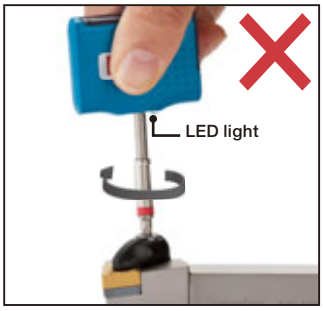
- After placing the bit in the correct position, push the sleeve to lock the bit.



### Attention when tightening:

- Hold the grip in a position, so the LED can be seen on the left side of bit shank. (See the picture below) Tighten the screw clockwise.



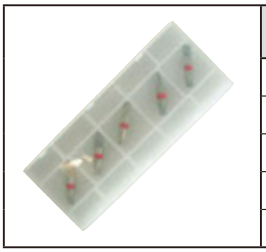




## BEAMWRENCH set

| Shape | Designation | Torx Size | Torque (N·m) | Color |
|---|---|---|---|---|
| Single flag | **BW-SF6** | T 6 | 0.6 | White |
| | **BW-SF7** | T 7 | 0.9 | Black |
| | **BW-SF8** | T 8 | 1.2 | Green |
| | **BW-SF9** | T 9 | 1.4 | Blue |

| Shape | Designation | Torx Size | Torque (N·m) | Color |
|---|---|---|---|---|
| Double flag | **BW-DF8** | T 8 | 1.2 | Green |
| | **BW-DF9** | T 9 | 1.4 | Blue |
| | **BW-DF15** | T 15 | 3.0 | Red |

## BEAMWRENCH torx bits set



| Bit Designation | Torx Size | Torque (N·m) | Color |
|---|---|---|---|
| **BW-TX6SET5** | T 6 | 0.6 | White |
| **BW-TX7SET5** | T 7 | 0.9 | Black |
| **BW-TX8SET5** | T 8 | 1.2 | Green |
| **BW-TX9SET5** | T 9 | 1.4 | Blue |
| **BW-TX15SET5** | T 15 | 3.0 | Red |

Purchase the Torx bit set with same color of your BeamWrench. Torx bits set: Packing Quantity = 5 pcs.

MEMO

# PINZBOHR® Boring System

## Features

### ● Highly economical modular tool system

Tools are functionally classified and combined with arbor heads available in a wide variety of shapes and sizes to make up various boring tools. When used in diversified machining processes, this will help reduce the tooling costs considerably.

### ● Applicable to a wide range of bore diameters from minimum ø5.5 to maximum ø500 mm

The head, for small diameter finish and applicable down to ø5.5 mm. The heads for roughing and finishing can cope with wide-ranging diameters from ø24 ~ ø500 mm when the head is changed and combined with fine adjustment function.

### ● High rigidity and accuracy

The head and arbor are connected firmly with two tapered threads and drive key, ensuring high rigidity and superior repetition accuracy.

### ● One action adjustment

The heads for rough boring can be adjusted in terms of two edge dimensions quickly in one action. The adjusting screw is protected with the damage prevention function.

### ● Abundant insert variation

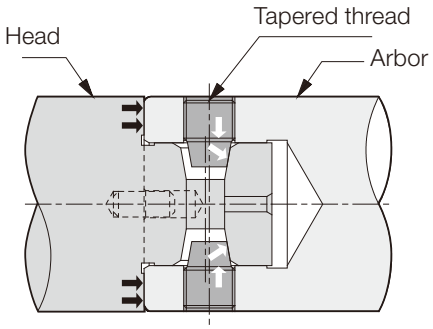
The inserts used are standard products complying with ISO. Insert grades and chipbreakers applied to various work materials and machining conditions are available in a wide range of shapes and sizes.

### ● Variety of cartridges

The rough boring heads of ø80 mm or more in diameter are available with various inserts and step machining cartridges.

## Part assembly

### Coupling System




Strong rigid connection between Boring Head and Arbor.

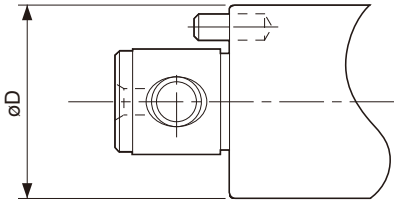
### Adjusting of Finishing Heads

Adjusting Accuracy ø0.002 mm

### Connection diameter

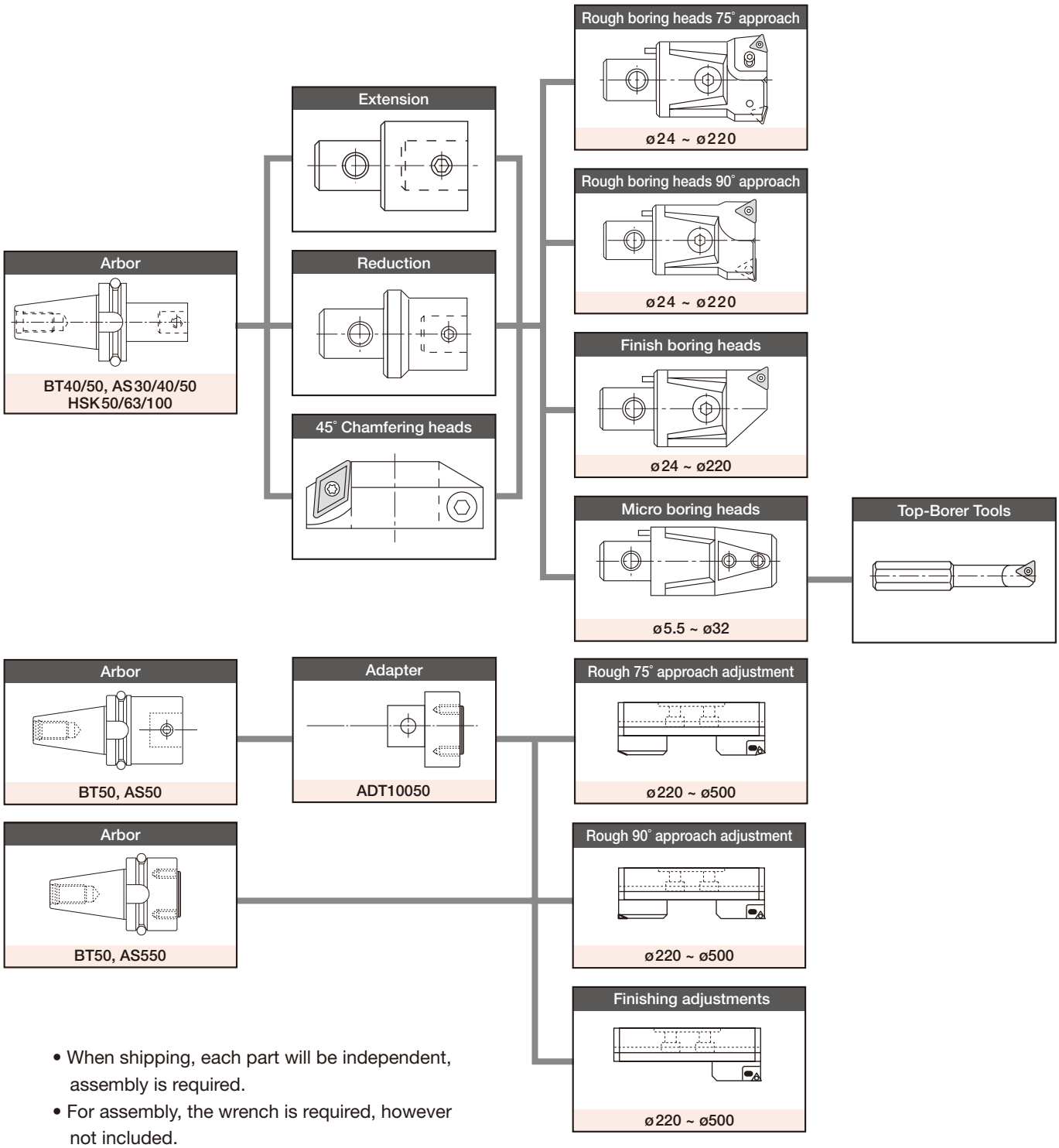
Arbor Designation

Ex) BT35042160
└øD




PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# System




- When shipping, each part will be independent, assembly is required.
- For assembly, the wrench is required, however not included.
- Pull-stud bolt is not included.
- The insert is not included and should be purchased separately.

PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# Designation System for PINZBOHR®

## Boring Heads

| | |
|---|---|
| A | Finish boring heads |
| D | Rough boring heads |

① For use

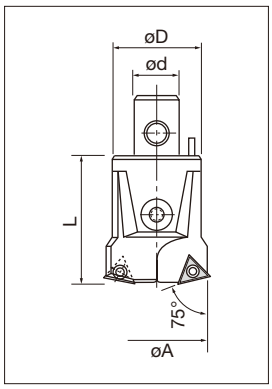
75° / 90°
③ Approach angle

2CT / 3CT
④ Cartridge Size
(When cartridge required)

Example ① **A** ② **85** ③ **90** ④ **3CT** ⑤ **300**

| ② Head Size (øD) | | | |
|---|---|---|---|
| øD | Dia. øA | øD | Dia. øA |
| 22 | ø24 ~ 30 | 85 | ø100 ~ 125 |
| 27 | ø29 ~ 40 | 100 | ø125 ~ 160 |
| 32 | ø39 ~ 50 | 200 | ø160 ~ 220 |
| 42 | ø49 ~ 65 | 300 | ø220 ~ 320 |
| 54 | ø63 ~ 82 | 400 | ø290 ~ 400 |
| 68 | ø80 ~ 102 | 500 | ø370 ~ 500 |

| ⑤ Insert Size | |
|---|---|
| 300 | TC□□16T3□□ |
| 400 | CC□□0602□□ |
| 402N | CN□□1204□□ |
| 409 | CC□□09T3□□ |



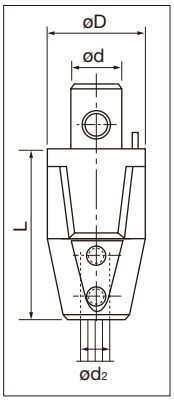

## Micro Boring Heads

Example ① **A** ② **32** ③ **010**

| ① For use | |
|---|---|
| A | Finish boring heads |

② Head Size: øD

③ Diameter of setting Boring Bars: ød2




## Arbors

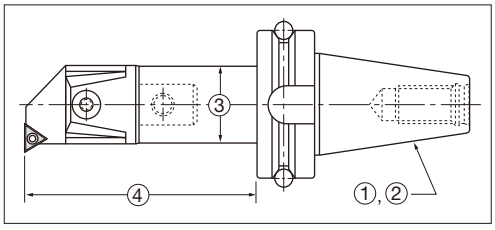
Example ① **BT** ② **340** ③ **22** ④ **50**

① Shank type: BT ( MAS BT 403 )

| ② Taper size | |
|---|---|
| 340 | BT40 |
| 350 | BT50 |
| 550 | BT50 (For large boring head) |

③ Shank: øD

| ④ Effective boring depth | |
|---|---|
| 50 | 130 |
| 55 | 160 |
| 60 | 200 |
| 75 | 260 |
| 80 | 320 |
| 100 | – |



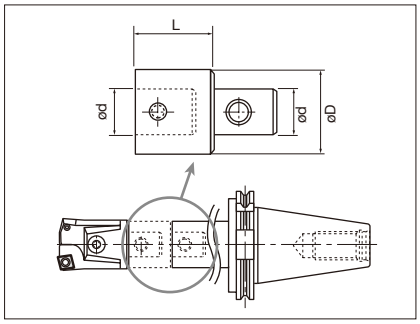

## Extensions

Example ① **P** ② **22** ③ **20**

① Extension

② Shank ø: øD

③ Extension length: L




## Reductions

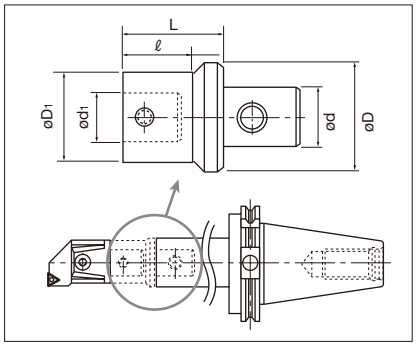
Example ① **R** ② **27** ③ **22** ④ **36**

① Reduction

② Shank ø: Connection øD

③ Shank ø: Reduction øD1

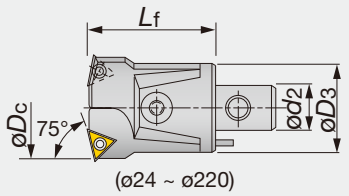
④ Reduction length: L

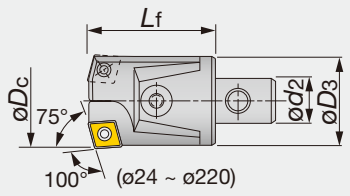



PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

## D##75

Roughing-Head with 75° approach for dia 24 - 82mm



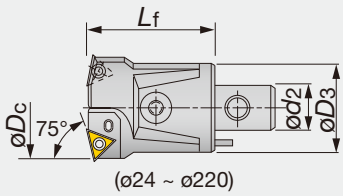



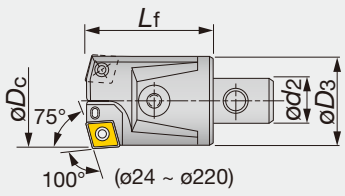

| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D2275400 | 24 | 30 | 22 | 12 | 34 | 0.1 | CC**0602... |
| D2775409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| D3275409 | 39 | 50 | 32 | 20 | 45 | 0.26 | CC**09T3... |
| D4275300 | 49 | 65 | 42 | 24 | 56 | 0.6 | TC**16T3... |
| D4275402N | 53 | 65 | 42 | 24 | 56 | 0.6 | CN**1204... |
| D5475300 | 63 | 82 | 54 | 28 | 66 | 1.1 | TC**16T3... |
| D5475402N | 63 | 82 | 54 | 28 | 66 | 1.1 | CN**1204... |

• 100° corner of CC**0602, CC**09T3 and CN**1204 are used.

## D##75_CT

Roughing-Head with 75° approach for dia 80 - 220mm, with cartridge



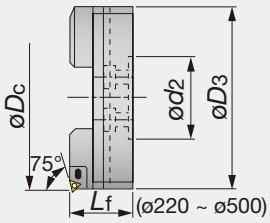




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D68752CT300 | 80 | 102 | 68 | 36 | 86 | 2.3 | TC**16T3... |
| D68752CT402N | 80 | 102 | 68 | 36 | 86 | 2.3 | CN**1204... |
| D85753CT300 | 100 | 125 | 85 | 50 | 100 | 4.3 | TC**16T3... |
| D85753CT402N | 100 | 125 | 85 | 50 | 100 | 4.3 | CN**1204... |
| D100753CT300 | 125 | 160 | 110 | 60 | 100 | 6.8 | TC**16T3... |
| D100753CT402N | 125 | 160 | 110 | 60 | 100 | 6.8 | CN**1204... |
| D200753CT300 | 160 | 220 | 145 | 60 | 100 | 9 | TC**16T3... |
| D200753CT402N | 160 | 220 | 145 | 60 | 100 | 9 | CN**1204... |

• 100° corner of CN**1204 is used.

## D##75_CT-Large

Roughing-Head with 75° approach for dia 220 - 320mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D300753CT300 | 220 | 320 | 202 | 60 | 90 | 10.1 | TC**16T3... |
| D300753CT402N | 220 | 320 | 202 | 60 | 90 | 10.1 | CN**1204... |

D##75: Inserts → **B104 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

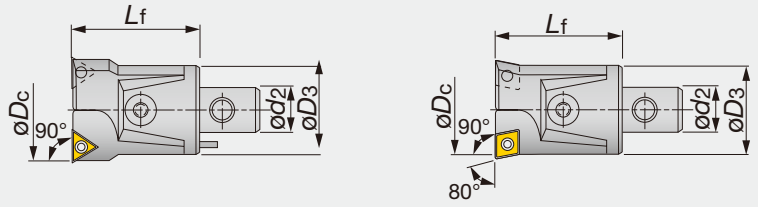
D##75_CT: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

D##75_CT-Large: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

PINZBORE® Boring System is a product of MYFHE, S. A.

## D##90

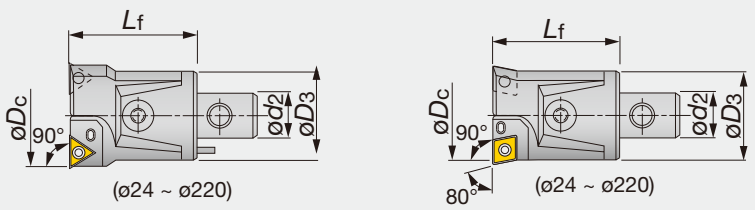
Roughing-Head with 90° approach for dia 24 - 82mm




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D2290400 | 24 | 30 | 22 | 12 | 34 | 0.1 | CC**0602... |
| D2790409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| D3290409 | 39 | 50 | 32 | 20 | 45 | 0.26 | CC**09T3... |
| D4290300 | 49 | 65 | 42 | 24 | 56 | 0.6 | TC**16T3... |
| D4290402N | 53 | 65 | 42 | 24 | 56 | 0.6 | CN**1204... |
| D5490300 | 63 | 82 | 54 | 28 | 66 | 1.1 | TC**16T3... |
| D5490402N | 63 | 82 | 54 | 28 | 66 | 1.1 | CN**1204... |

## D##90_CT

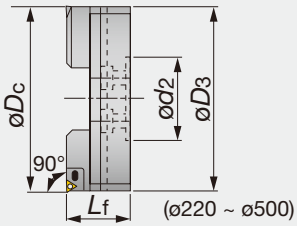
Roughing-Head with 90° approach for dia 80 - 220mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D68902CT300 | 80 | 102 | 68 | 36 | 86 | 2.3 | TC**16T3... |
| D68902CT402N | 80 | 102 | 68 | 36 | 86 | 2.3 | CN**1204... |
| D85903CT300 | 100 | 125 | 85 | 50 | 100 | 4.3 | TC**16T3... |
| D85903CT402N | 100 | 125 | 85 | 50 | 100 | 4.3 | CN**1204... |
| D100903CT300 | 125 | 160 | 110 | 60 | 100 | 6.8 | TC**16T3... |
| D100903CT402N | 125 | 160 | 110 | 60 | 100 | 6.8 | CN**1204... |
| D200903CT300 | 160 | 220 | 145 | 60 | 100 | 9 | TC**16T3... |
| D200903CT402N | 160 | 220 | 145 | 60 | 100 | 9 | CN**1204... |

## D##90_CT-Large

Roughing-Head with 90° approach for dia 220 - 320mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| D300903CT300 | 220 | 320 | 202 | 60 | 90 | 10.1 | TC**16T3... |
| D300903CT402N | 220 | 320 | 202 | 60 | 90 | 10.1 | CN**1204... |

D##90: Inserts → **B104 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

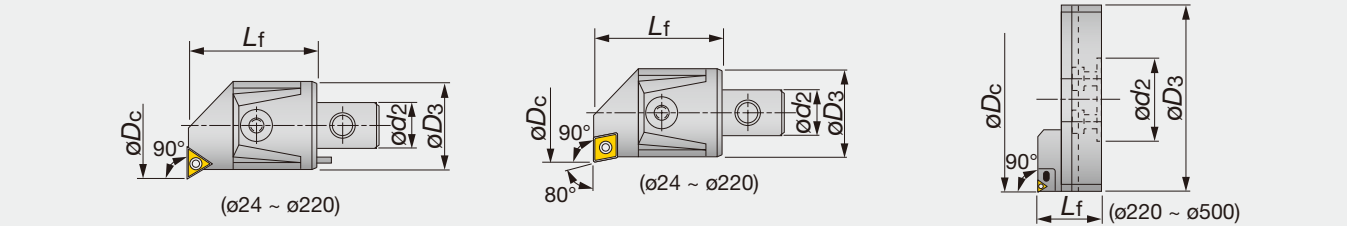
D##90_CT: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

D##90_CT-Large: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

PINZBORE® Boring System is a product of MYFHE, S. A.

## A##90

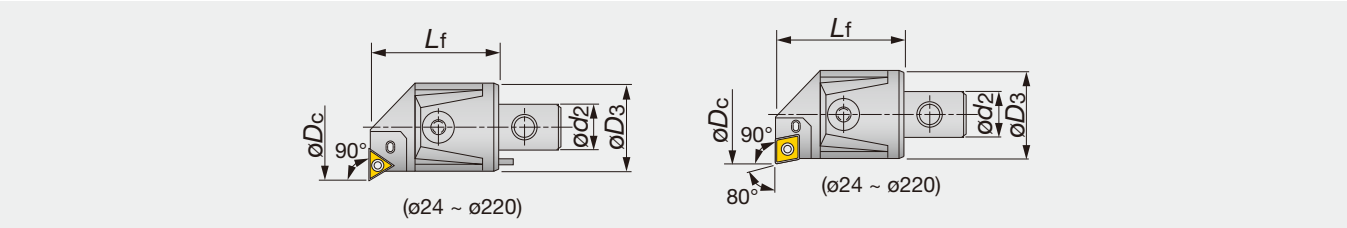
Finishing-Head with 90° approach for dia 24 - 82mm




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A2290400 | 24 | 30 | 22 | 12 | 34 | 0.08 | CC**0602... |
| A2790409 | 29 | 40 | 27 | 15 | 42 | 0.18 | CC**09T3... |
| A3290409 | 39 | 50 | 32 | 20 | 45 | 0.25 | CC**09T3... |
| A4290300 | 49 | 65 | 42 | 24 | 56 | 0.58 | TC**16T3... |
| A4290402N | 53 | 65 | 42 | 24 | 56 | 0.58 | CN**1204... |
| A5490300 | 63 | 82 | 54 | 28 | 66 | 1.05 | TC**16T3... |
| A5490402N | 63 | 82 | 54 | 28 | 66 | 1.05 | CN**1204... |

## A##90_CT

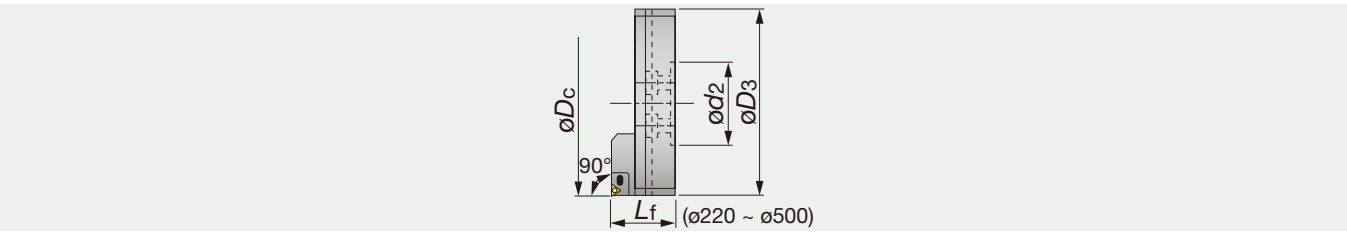
Finishing-Head with 90° approach for dia 80 - 220mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A68902CT300 | 80 | 102 | 68 | 36 | 86 | 2.18 | TC**16T3... |
| A68902CT402N | 80 | 102 | 68 | 36 | 86 | 2.18 | CN**1204... |
| A85903CT300 | 100 | 125 | 85 | 50 | 100 | 4.2 | TC**16T3... |
| A85903CT402N | 100 | 125 | 85 | 50 | 100 | 4.2 | CN**1204... |
| A100903CT300 | 125 | 160 | 110 | 60 | 100 | 6.6 | TC**16T3... |
| A100903CT402N | 125 | 160 | 110 | 60 | 100 | 6.6 | CN**1204... |
| A200903CT300 | 160 | 220 | 145 | 60 | 100 | 8.96 | TC**16T3... |
| A200903CT402N | 160 | 220 | 145 | 60 | 100 | 8.96 | CN**1204... |

## A##90_CT-Large

Finishing-Head with 90° approach for dia 220 - 320mm, with cartridge




| Designation | øDc min | øDc max | øD3 | ød2 | Lf | Weight (kg) | Insert |
|---|---|---|---|---|---|---|---|
| A300903CT300 | 220 | 320 | 202 | 60 | 90 | 9.3 | TC**16T3... |
| A300903CT402N | 220 | 320 | 202 | 60 | 90 | 9.3 | CN**1204... |

A##90: Inserts → **B104 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

A##90_CT: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

A##90_CT-Large: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

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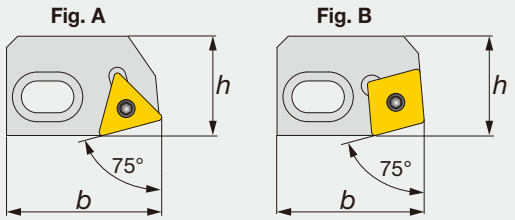
## #CT75

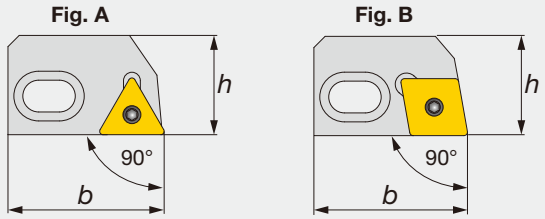
Cartridges with 75° approach




| Designation | b | h | Insert | Fig |
|---|---|---|---|---|
| 2CT75300 | 35 | 22.5 | TC**16T3... | A |
| 2CT75402N | 35 | 22.5 | CN**1204... | B |
| 3CT75300 | 39 | 28 | TC**16T3... | A |
| 3CT75402N | 39 | 28 | CN**1204... | B |

## #CT90

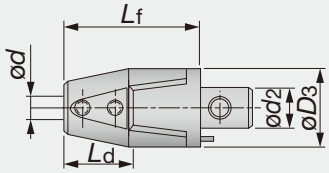
Cartridges with 90° approach




| Designation | b | h | Insert | Fig |
|---|---|---|---|---|
| 2CT90300 | 35 | 22.5 | TC**16T3... | A |
| 2CT90402N | 35 | 22.5 | CN**1204... | B |
| 3CT90300 | 39 | 28 | TC**16T3... | A |
| 3CT90402N | 39 | 28 | CN**1204... | B |

## A##_Small

Finishing-Head for dia 5.5 - 38mm, with Top-Borer boring bars




| Designation | øDc min | øDc max | ød | Ld | øD3 | ød2 | Lf | Weight (kg) |
|---|---|---|---|---|---|---|---|---|
| A27008 | 5.5 | 21 | 8 | 24 | 27 | 15 | 50 | 0.18 |
| A32010 | 5.5 | 24 | 10 | 29 | 32 | 20 | 58 | 0.37 |
| A42012 | 5.5 | 32 | 12 | 37 | 42 | 24 | 70 | 0.69 |
| A42016 | 5.5 | 38 | 16 | 37 | 42 | 24 | 70 | 0.69 |

#CT75: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

#CT90: Inserts → **B050 -**, **B131 -**, CBN → **B163 -**, PCD → **B176 -**

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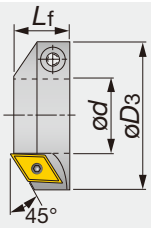
## CH##

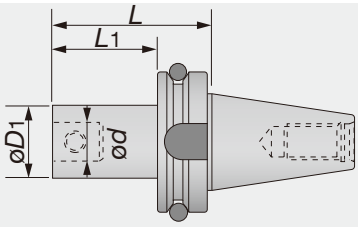
Chamfering tools




| Designation | øD3 | ød | Lf | Weight (kg) | Parts | | | | Insert |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Screw for inserts | Driver | Wrench | Clamping Screw | |
| CH22 | 43 | 22 | 24 | 0.1 | CSTB-4 | T15 | P-4 | M5×20 | DC**11T3... |
| CH27 | 48 | 27 | 24 | 0.18 | CSTB-4 | T15 | P-4 | M5×20 | DC**11T3... |
| CH32 | 62 | 32 | 30 | 0.26 | CSTB-4 | T15 | P-5 | M6×30 | DC**11T3... |
| CH42 | 72 | 42 | 30 | 0.33 | CSTB-4 | T15 | P-5 | M6×35 | DC**11T3... |
| CH54 | 94 | 54 | 40 | 0.77 | CSTB-5 | T20 | P-6 | M8×45 | DC**1504... |
| CH68 | 110 | 68 | 40 | 1.02 | CSTB-5 | T20 | P-8 | M10×50 | DC**1504... |
| CH85 | 145 | 85 | 55 | 2.34 | CSTB-5 | T20 | P-10 | M12×70 | DC**1504... |

## BT340

Arbor with BT40 taper




| Designation | øD1 | ød | L1 | L | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| BT3402250 | 22 | 12 | 16 | 46 | 1.2 | 22 68 |
| BT3402280 | 22 | 12 | 46 | 76 | 1.3 | 22 68 |
| BT34022100 | 22 | 12 | 66 | 96 | 1.39 | 22 68 |
| BT3402755 | 27 | 15 | 13 | 40 | 1.2 | 27 610 |
| BT34027100 | 27 | 15 | 58 | 88 | 1.45 | 27 610 |
| BT34027130 | 27 | 15 | 88 | 118 | 1.6 | 27 610 |
| BT3403260 | 32 | 20 | 15 | 43 | 1.2 | 32 810 |
| BT34032100 | 32 | 20 | 55 | 85 | 1.47 | 32 810 |
| BT34032130 | 32 | 20 | 85 | 115 | 1.7 | 32 810 |
| BT3404275 | 42 | 24 | 19 | 48 | 1.3 | 42 1014 |
| BT34042160 | 42 | 24 | 104 | 134 | 2.25 | 42 1014 |
| BT34042200 | 42 | 24 | 144 | 174 | 2.75 | 42 1014 |
| BT3405490 | 54 | 28 | 24 | 54 | 1.8 | 54 1220 |
| BT34054160 | 54 | 28 | 94 | 124 | 2.8 | 54 1220 |
| BT34054200 | 54 | 28 | 134 | 164 | 3.55 | 54 1220 |
| BT34068160 | 68 | 36 | 74 | 95 | 2.8 | 68 1624 |

CH##: Inserts → **B114 -**, CBN → **B168 -**, PCD → **B177**

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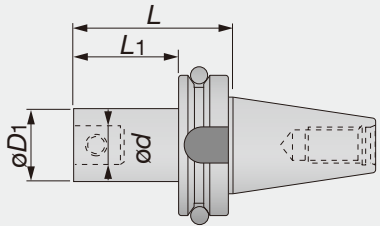
## BT350

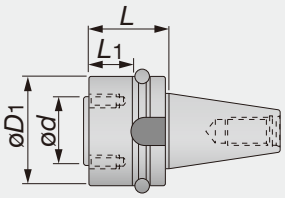
Arbor with BT50 taper




| Designation | øD1 | ød | L1 | L | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| BT3502280 | 22 | 12 | 46 | 87 | 4.2 | 22 68 |
| BT35022100 | 22 | 12 | 66 | 107 | 4.35 | 22 68 |
| BT3502755 | 27 | 15 | 13 | 51 | 4.05 | 27 610 |
| BT35027100 | 27 | 15 | 58 | 99 | 4.4 | 27 610 |
| BT35027130 | 27 | 15 | 88 | 129 | 4.5 | 27 610 |
| BT3503260 | 32 | 20 | 15 | 54 | 3.95 | 32 810 |
| BT35032130 | 32 | 20 | 85 | 126 | 4.6 | 32 810 |
| BT35032160 | 32 | 20 | 115 | 156 | 4.8 | 32 810 |
| BT3504275 | 42 | 24 | 19 | 59 | 4.15 | 42 1014 |
| BT35042160 | 42 | 24 | 104 | 145 | 5.2 | 42 1014 |
| BT35042200 | 42 | 24 | 144 | 185 | 5.8 | 42 1014 |
| BT3505490 | 54 | 28 | 24 | 65 | 4.8 | 54 1220 |
| BT35054160 | 54 | 28 | 94 | 135 | 5.8 | 54 1220 |
| BT35054200 | 54 | 28 | 134 | 175 | 6.5 | 54 1220 |
| BT35068115 | 68 | 36 | 29 | 68 | 4.45 | 68 1624 |
| BT35068200 | 68 | 36 | 114 | 156 | 7.2 | 68 1624 |
| BT35068260 | 68 | 36 | 174 | 216 | 8.85 | 68 1624 |
| BT35085200 | 85 | 50 | 100 | 142 | 7.85 | 85 1630 |
| BT35085260 | 85 | 50 | 160 | 202 | 10.65 | 85 1630 |
| BT35085320 | 85 | 50 | 220 | 262 | 13.4 | 85 1630 |
| BT350100170 | 100 | 60 | 70 | 95 | 6.15 | 100 2035 |
| BT350100260 | 100 | 60 | 160 | 202 | 12.85 | 100 2035 |
| BT350100320 | 100 | 60 | 220 | 262 | 16.5 | 100 2035 |

## BT550

Arbor with BT40 for large diameter




| Designation | øD1 | ød | L1 | L | Weight (kg) |
|---|---|---|---|---|---|
| BT550160 | 100 | 60 | 35 | 70 | 6.25 |

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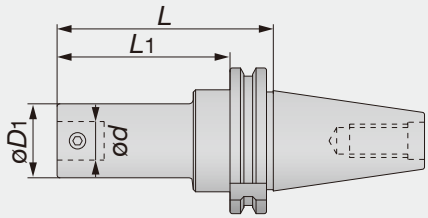
## AS30

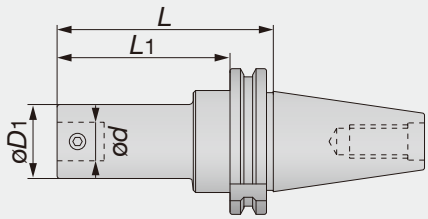
Arbor with DIN69871 taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 330 022 100 | 22 | 12 | 104 | 66 | 0.7 | 2268 |
| AS 330 027 055 | 27 | 15 | 48 | 13 | 0.6 | 27610 |
| AS 330 027 100 | 27 | 15 | 96 | 58 | 0.7 | 27610 |
| AS 330 032 060 | 32 | 20 | 51 | 15 | 0.6 | 32810 |
| AS 330 032 100 | 32 | 20 | 93 | 55 | 0.8 | 32810 |

## AS40

Arbor with DIN69871 taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 340 022 080 | 22 | 12 | 84 | 46 | 1.23 | 2268 |
| AS 340 022 100 | 22 | 12 | 104 | 66 | 1.3 | 2268 |
| AS 340 027 055 | 27 | 15 | 48 | 13 | 1.13 | 27610 |
| AS 340 027 100 | 27 | 15 | 96 | 58 | 1.35 | 27610 |
| AS 340 027 130 | 27 | 15 | 126 | 88 | 1.49 | 27610 |
| AS 340 032 060 | 32 | 20 | 51 | 15 | 1.14 | 32810 |
| AS 340 032 100 | 32 | 20 | 93 | 55 | 1.4 | 32810 |
| AS 340 032 130 | 32 | 20 | 123 | 85 | 1.59 | 32810 |
| AS 340 042 075 | 42 | 24 | 56 | 19 | 1.2 | 421014 |
| AS 340 042 160 | 42 | 24 | 126 | 104 | 1.98 | 421014 |
| AS 340 042 200 | 42 | 24 | 166 | 144 | 2.46 | 421014 |
| AS 340 054 120 | 54 | 28 | 76 | 54 | 1.63 | 541220 |
| AS 340 054 160 | 54 | 28 | 116 | 94 | 2.36 | 541220 |
| AS 340 054 200 | 54 | 28 | 156 | 134 | 3.11 | 541220 |
| AS 340 068 160 | 68 | 36 | 97 | 74 | 2.48 | 681624 |
| AS 340 068 200 | 68 | 36 | 137 | 114 | 3.63 | 681624 |
| AS 340 085 200 | 85 | 50 | 124 | 100 | 4.24 | 851630 |
| AS 340 100 200 | 100 | 60 | 124 | 100 | 5.16 | 1002035 |

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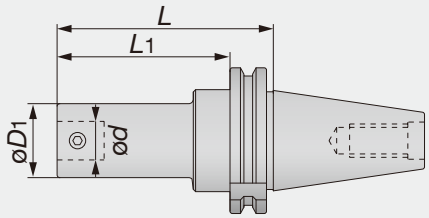
## AS50

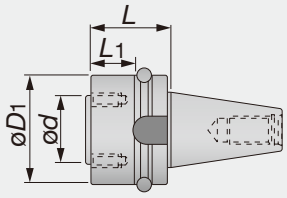
Arbor with DIN69871 taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 350 022 080 | 22 | 12 | 84 | 46 | 3.45 | 2268 |
| AS 350 022 100 | 22 | 12 | 104 | 66 | 3.5 | 2268 |
| AS 350 027 055 | 27 | 15 | 48 | 13 | 3.3 | 27610 |
| AS 350 027 100 | 27 | 15 | 96 | 58 | 3.55 | 27610 |
| AS 350 027 130 | 27 | 15 | 126 | 88 | 3.68 | 27610 |
| AS 350 032 060 | 32 | 20 | 51 | 15 | 3.31 | 32810 |
| AS 350 032 130 | 32 | 20 | 123 | 85 | 3.79 | 32810 |
| AS 350 032 160 | 32 | 20 | 153 | 115 | 3.98 | 32810 |
| AS 350 042 075 | 42 | 24 | 56 | 19 | 3.39 | 421014 |
| AS 350 042 160 | 42 | 24 | 142 | 104 | 4.36 | 421014 |
| AS 350 042 200 | 42 | 24 | 182 | 144 | 4.86 | 421014 |
| AS 350 054 090 | 54 | 28 | 62 | 24 | 3.57 | 541220 |
| AS 350 054 160 | 54 | 28 | 132 | 94 | 4.85 | 541220 |
| AS 350 054 200 | 54 | 28 | 172 | 134 | 5.57 | 541220 |
| AS 350 068 115 | 68 | 36 | 65 | 29 | 3.74 | 681624 |
| AS 350 068 200 | 68 | 36 | 137 | 114 | 5.8 | 681624 |
| AS 350 068 260 | 68 | 36 | 197 | 174 | 7.6 | 681624 |
| AS 350 085 200 | 85 | 50 | 124 | 100 | 6.3 | 851630 |
| AS 350 085 260 | 85 | 50 | 184 | 160 | 9.04 | 851630 |
| AS 350 085 320 | 85 | 50 | 244 | 220 | 11.7 | 851630 |
| AS 350 100 190 | 100 | 60 | 114 | 90 | 6.6 | 1002035 |
| AS 350 100 260 | 100 | 60 | 184 | 160 | 11 | 1002035 |
| AS 350 100 320 | 100 | 60 | 244 | 220 | 14.66 | 1002035 |

## AS550

Arbor with DIN69871 for large diameter




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| AS 550 160 | 100 | 60 | 70 | 35 | 5.65 | M12×40 |

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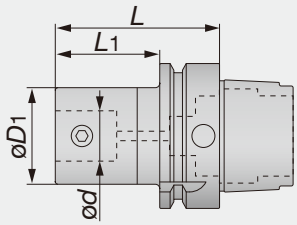
## HSK50

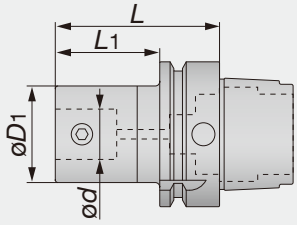
Arbor with HSK A taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 050A 022 055 | 22 | 12 | 47 | 21 | 0.49 | 2268 |
| HSK 050A 027 065 | 27 | 15 | 49 | 23 | 0.57 | 27610 |
| HSK 050A 032 075 | 32 | 20 | 56 | 30 | 0.66 | 32810 |
| HSK 050A 042 090 | 42 | 24 | 60 | 34 | 0.73 | 421014 |

## HSK63

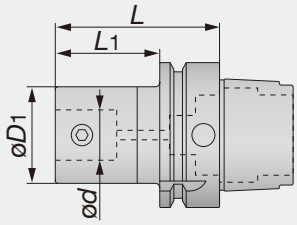
Arbor with HSK A taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 063A 022 055 | 22 | 12 | 47 | 21 | 0.75 | 2268 |
| HSK 063A 027 065 | 27 | 15 | 49 | 23 | 0.78 | 27610 |
| HSK 063A 032 075 | 32 | 20 | 56 | 30 | 0.84 | 32810 |
| HSK 063A 042 090 | 42 | 24 | 60 | 34 | 0.98 | 421014 |
| HSK 063A 054 110 | 54 | 28 | 70 | 44 | 1.3 | 541220 |
| HSK 063A 068 145 | 68 | 36 | 85 | 59 | 1.85 | 681624 |

## HSK100

Arbor with HSK A taper




| Designation | øD1 | ød | L | L1 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| HSK 100A 022 055 | 22 | 12 | 55 | 21 | 2.28 | 2268 |
| HSK 100A 027 065 | 27 | 15 | 57 | 23 | 2.35 | 27610 |
| HSK 100A 032 075 | 32 | 20 | 59 | 30 | 2.33 | 32810 |
| HSK 100A 042 090 | 42 | 24 | 63 | 34 | 2.47 | 421014 |
| HSK 100A 054 110 | 54 | 28 | 73 | 44 | 2.8 | 541220 |
| HSK 100A 068 145 | 68 | 36 | 88 | 59 | 3.51 | 681624 |
| HSK 100A 085 165 | 85 | 50 | 94 | 65 | 4.15 | 851630 |
| HSK 100A 100 185 | 100 | 60 | 114 | 85 | 5.67 | 1002035 |
| HSK 550 160 | 100 | 60 | 80 | 50 | 5.24 | M12×40 |

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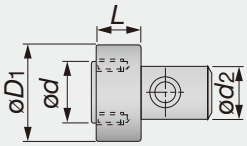
## ADT

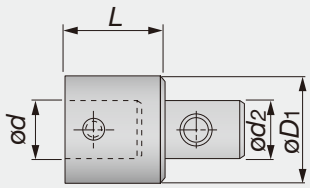
Adaptors for Large dia head




| Designation | øD1 | ød | ød2 | L | Weight (kg) |
|---|---|---|---|---|---|
| ADT10050 | 100 | 60 | 60 | 50 | 4.6 |

## P##

Adaptors / Extension For extending overhang length




| Designation | øD1 | ød | ød2 | L | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|
| P2220 | 22 | 12 | 12 | 20 | 0.1 | 22 68 |
| P2230 | 22 | 12 | 12 | 30 | 0.14 | 22 68 |
| P2730 | 27 | 15 | 15 | 30 | 0.18 | 27 610 |
| P2745 | 27 | 15 | 15 | 45 | 0.25 | 27 610 |
| P3235 | 32 | 20 | 20 | 35 | 0.26 | 32 810 |
| P3252 | 32 | 20 | 20 | 52 | 0.38 | 32 810 |
| P4240 | 42 | 24 | 24 | 40 | 0.48 | 42 1014 |
| P4260 | 42 | 24 | 24 | 60 | 0.7 | 42 1014 |
| P5450 | 54 | 28 | 28 | 50 | 0.95 | 54 1220 |
| P5475 | 54 | 28 | 28 | 75 | 1.4 | 54 1220 |
| P6860 | 68 | 36 | 36 | 60 | 1.8 | 68 1624 |
| P6890 | 68 | 36 | 36 | 90 | 2.6 | 68 1624 |
| P8570 | 85 | 50 | 50 | 70 | 3.05 | 85 1630 |
| P85105 | 85 | 50 | 50 | 105 | 4.45 | 85 1630 |
| P10080 | 100 | 60 | 60 | 80 | 4.6 | 100 2035 |
| P100120 | 100 | 60 | 60 | 120 | 7.1 | 100 2035 |

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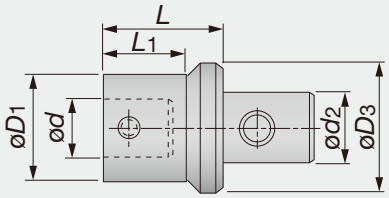
## R##

Adaptors / Reducer For using small dia head on large size arbor.




| Designation | øD1 | ød | ød2 | L | L1 | øD3 | Weight (kg) | Parts Taper Screw |
|---|---|---|---|---|---|---|---|---|
| R272236 | 22 | 12 | 15 | 36 | 26 | 27 | 0.2 | 22 68 |
| R322240 | 22 | 12 | 20 | 40 | 30 | 32 | 0.25 | 22 68 |
| R422258 | 22 | 12 | 24 | 58 | 48 | 42 | 0.35 | 22 68 |
| R542286 | 22 | 12 | 28 | 86 | 76 | 54 | 0.65 | 22 68 |
| R6822102 | 22 | 12 | 36 | 102 | 90 | 68 | 1.05 | 22 68 |
| R322734 | 27 | 15 | 20 | 34 | 24 | 32 | 0.25 | 27 610 |
| R422750 | 27 | 15 | 24 | 50 | 40 | 42 | 0.4 | 27 610 |
| R542780 | 27 | 15 | 28 | 80 | 70 | 54 | 0.7 | 27 610 |
| R682795 | 27 | 15 | 36 | 95 | 83 | 68 | 1.05 | 27 610 |
| R423246 | 32 | 20 | 24 | 46 | 36 | 42 | 0.45 | 32 810 |
| R543276 | 32 | 20 | 28 | 76 | 66 | 54 | 0.75 | 32 810 |
| R683290 | 32 | 20 | 36 | 90 | 78 | 68 | 1.2 | 32 810 |
| R544270 | 42 | 24 | 28 | 70 | 60 | 54 | 0.95 | 42 1014 |
| R684282 | 42 | 24 | 36 | 82 | 70 | 68 | 1.4 | 42 1014 |
| R854295 | 42 | 24 | 50 | 95 | 83 | 85 | 2.05 | 42 1014 |
| R685472 | 54 | 28 | 36 | 72 | 60 | 68 | 1.65 | 54 1220 |
| R855490 | 54 | 28 | 50 | 90 | 78 | 85 | 2.5 | 54 1220 |
| R8568100 | 68 | 36 | 50 | 100 | 88 | 85 | 3.35 | 68 1624 |

PINZBORE® Boring System is a product of MYFHE, S. A.

## SPARE PARTS

### Roughing boring heads 75° approach

(Designation is written with spaces.)

| Shape | Designation | Screw for insert | Driver | Wrench | Clamping screw | Cartridge | Adjusting screw | Clamping screw | Washer |
|---|---|---|---|---|---|---|---|---|---|
| | D22 75 400 | CSTB-2.5 | T8 | P-3, P-2 | D22 21 | – | – | – | – |
| | D27 75 409 | CSTB-4M | T15 | P-4, P-2 | D27 21 | – | | | |
| | D32 75 409 | CSTB-4M | T15 | P-4, P-2.5 | D32 21 | – | | | |
| | D42 75 300 | CSTB-4M | T15 | P-5, P-3 | D42 21 | – | | | |
| | D42 75 402N | MLP44 | P-2.5 | P-5, P-3 | D42 21 | – | | | |
| | D54 75 300 | CSTB-4M | T15 | P-6, P-3 | D54 21 | – | | | |
| | D54 75 402N | MLP44 | P-2.5 | P-6, P-3 | D54 21 | – | | | |
| | D68 75 2CT 300 | CSTB-4M | T15 | P-8, P-5, 4, 2 | D68 21 | 2CT 75 300 | D68 29 | D68 27 | D68 28 |
| | D68 75 2CT 402N | MLP44 | P-2.5 | P-8, P-5, 4, 2 | D68 21 | 2CT 75 402N | | | |
| | D85 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D85 21 | 3CT 75 300 | D85 29 | D68 27 | D85 28 |
| | D85 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D85 21 | 3CT 75 402N | | | |
| | D100 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 75 300 | | | |
| | D100 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 75 402N | | | |
| | D200 75 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 75 300 | | | |
| | D200 75 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 75 402N | | | |
| | D300 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D300 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |
| | D400 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D400 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |
| | D500 75 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 75 300 | | | |
| | D500 75 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 75 402N | | | |

### Roughing boring heads 90° approach

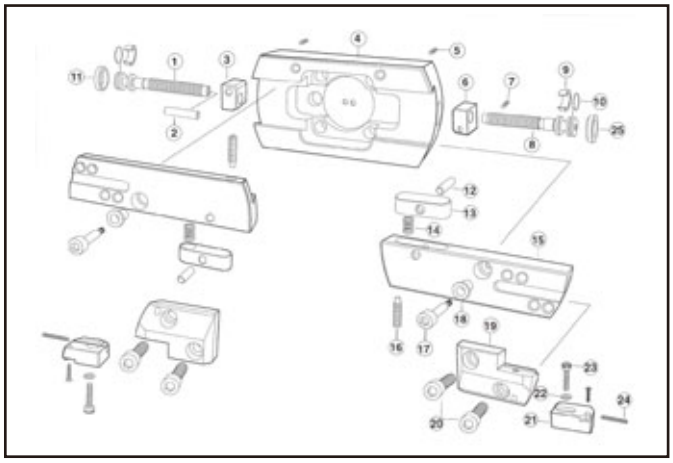
(Designation is written with spaces.)

| Shape | Designation | Screw for insert | Driver | Wrench | Clamping screw | Cartridge | Adjusting screw | Clamping screw | Washer |
|---|---|---|---|---|---|---|---|---|---|
| | D22 90 400 | CSTB-2.5 | T8 | P-3, P-2 | D22 21 | – | – | – | – |
| | D27 90 409 | CSTB-4M | T15 | P-4, P-2 | D27 21 | – | | | |
| | D32 90 409 | CSTB-4M | T15 | P-4, P-2.5 | D32 21 | – | | | |
| | D42 90 300 | CSTB-4M | T15 | P-5, P-3 | D42 21 | – | | | |
| | D42 90 402N | MLP44 | P-2.5 | P-5, P-3 | D42 21 | – | | | |
| | D54 90 300 | CSTB-4M | T15 | P-6, P-3 | D54 21 | – | | | |
| | D54 90 402N | MLP44 | P-2.5 | P-6, P-3 | D54 21 | – | | | |
| | D68 90 2CT 300 | CSTB-4M | T15 | P-8, P-5, 4, 2 | D68 21 | 2CT 90 300 | D68 29 | D68 27 | D68 28 |
| | D68 90 2CT 402N | MLP44 | P-2.5 | P-8, P-5, 4, 2 | D68 21 | 2CT 90 402N | | | |
| | D85 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D85 21 | 3CT 90 300 | D85 29 | D68 27 | D85 28 |
| | D85 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D85 21 | 3CT 90 402N | | | |
| | D100 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 90 300 | | | |
| | D100 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 90 402N | | | |
| | D200 90 3CT 300 | CSTB-4 | T15 | P-8, P-5, 3 | D100 21 | 3CT 90 300 | | | |
| | D200 90 3CT 402N | MLP44 | P-2.5 | P-8, P-5, 3 | D100 21 | 3CT 90 402N | | | |
| | D300 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D300 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |
| | D400 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D400 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |
| | D500 90 3CT 300 | CSTB-4 | T15 | P-5, P-4, 3 | D300 58 | 3CT 90 300 | | | |
| | D500 90 3CT 402N | MLP44 | P-2.5 | P-5, P-4, 3 | D300 58 | 3CT 90 402N | | | |

PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

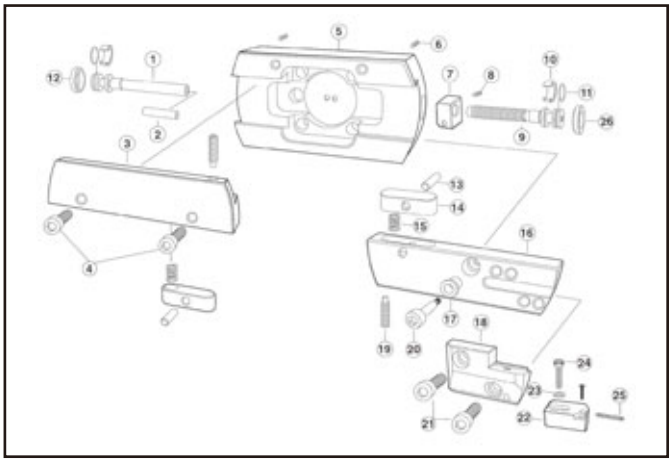
## SPARE PARTS

### Large boring heads (Roughing)



| size | D300□□ □□□ □□□ | D400□□ □□□ □□□ | D500□□ □□□ □□□ |
|---|---|---|---|
| ① | D300 51 | D400 51 | D500 51 |
| ② | D300 66 | D300 66 | D300 66 |
| ③ | D300 55 | D300 55 | D300 55 |
| ④ | D300 03 | D400 03 | D500 03 |
| ⑤ | D68 23 | D68 23 | D68 23 |
| ⑥ | D300 54 | D300 54 | D300 54 |
| ⑦ | D300 65 | D300 65 | D300 65 |
| ⑧ | D300 50 | D400 50 | D500 50 |
| ⑨ | A68 16 | A68 16 | A68 16 |
| ⑩ | A68 25 | A68 25 | A68 25 |
| ⑪ | A68 15 | A68 15 | A68 15 |
| ⑫ | D300 60 | D300 60 | D300 60 |
| ⑬ | D300 56 | D300 56 | D300 56 |
| ⑭ | D300 59 | D300 59 | D300 59 |
| ⑮ | D300 01 | D400 01 | D500 01 |
| ⑯ | D300 58 | D300 58 | D300 58 |
| ⑰ | D300 57 | D300 57 | D300 57 |
| ⑱ | D300 62 | D300 62 | D300 62 |
| ⑲ | D300 49 | D300 49 | D300 49 |
| ⑳ | D300 61 | D300 61 | D300 61 |
| ㉑ | 3CT□□ □□□ | 3CT□□ □□□ | 3CT□□ □□□ |
| ㉒ | D68 28 | D68 28 | D68 28 |
| ㉓ | D85 27 | D85 27 | D85 27 |
| ㉔ | D85 29 | D85 29 | D85 29 |
| ㉕ | D300 15 | D300 15 | D300 15 |

### Large boring heads (Finishing)



| size | D300□□ □□□ □□□ | D400□□ □□□ □□□ | D500□□ □□□ □□□ |
|---|---|---|---|
| ① | A300 52 | A400 52 | A500 52 |
| ② | D300 66 | D300 66 | D300 66 |
| ③ | A300 02 | A400 02 | A500 02 |
| ④ | A300 63 | A300 63 | A300 63 |
| ⑤ | D300 03 | D400 03 | D500 03 |
| ⑥ | D68 23 | D68 23 | D68 23 |
| ⑦ | D300 54 | D300 54 | D300 54 |
| ⑧ | D300 65 | D300 65 | D300 65 |
| ⑨ | D300 50 | D400 50 | D500 50 |
| ⑩ | A68 16 | A68 16 | A68 16 |
| ⑪ | A68 25 | A68 25 | A68 25 |
| ⑫ | A68 15 | A68 15 | A68 15 |
| ⑬ | D300 60 | D300 60 | D300 60 |
| ⑭ | D300 56 | D300 56 | D300 56 |
| ⑮ | D300 59 | D300 59 | D300 59 |
| ⑯ | D300 01 | D400 01 | D500 01 |
| ⑰ | D300 62 | D300 62 | D300 62 |
| ⑱ | D300 49 | D300 49 | D300 49 |
| ⑲ | D300 58 | D300 58 | D300 58 |
| ⑳ | D300 57 | D300 57 | D300 57 |
| ㉑ | D300 61 | D300 61 | D300 61 |
| ㉒ | 3CT□□ □□□ | 3CT□□ □□□ | 3CT□□ □□□ |
| ㉓ | D68 28 | D68 28 | D68 28 |
| ㉔ | D85 27 | D85 27 | D85 27 |
| ㉕ | D85 29 | D85 29 | D85 29 |
| ㉖ | D300 15 | D300 15 | D300 15 |

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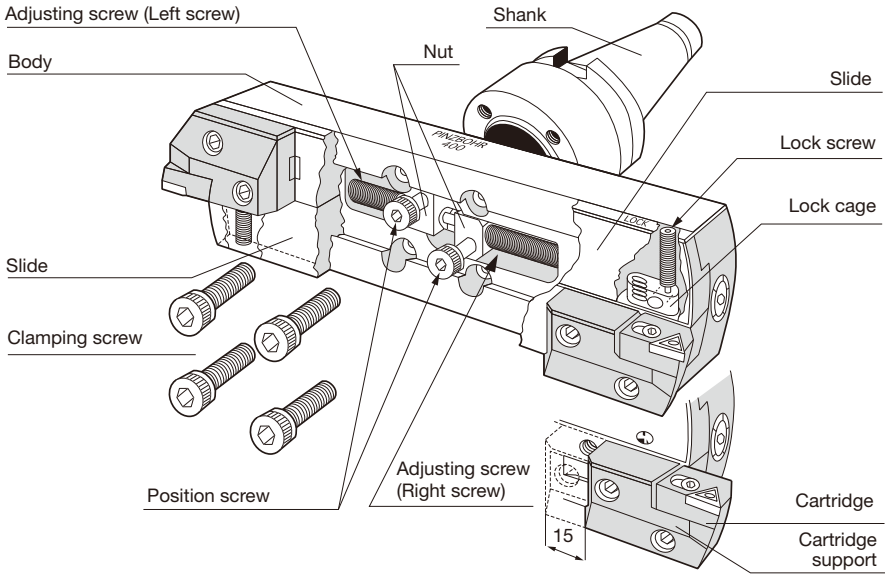
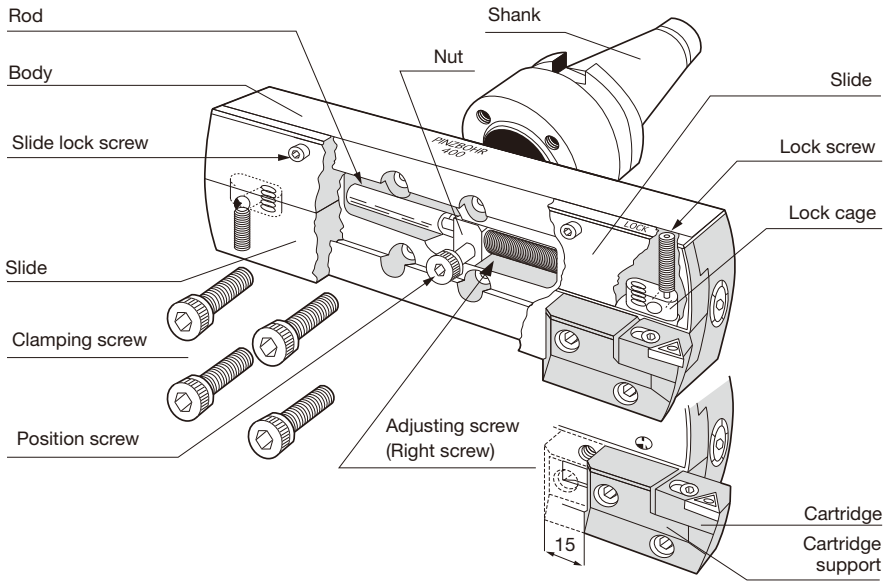
## LARGE BORING HEADS

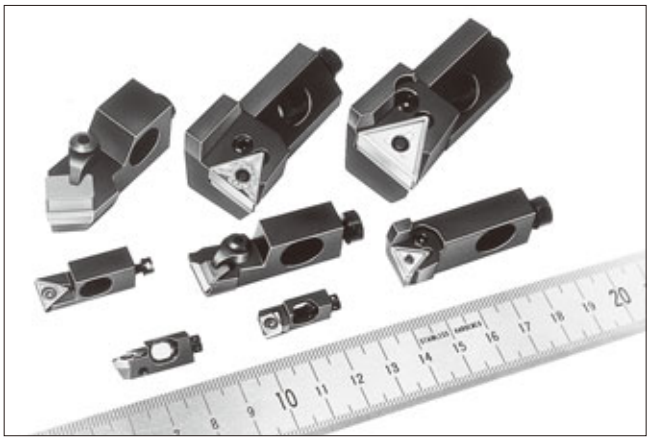



PINZBOHR® Boring System is a tie-up product with MYFHE, S. A.

# Cartridge

## Features of Cartridges



- Available in a wide range of shank sizes. (06CA ~ 20CA)
- Variety of types and sizes for a wide range of boring operations.

**PN** Pin-lock type, negative rake cartridges excel in tooling economy.

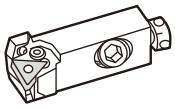
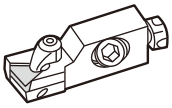
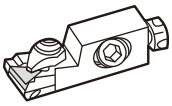
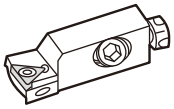
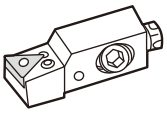
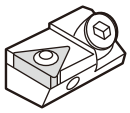
**SP** Screw-on type, positive rake cartridges featuring more free cutting action and machining accuracy.

**CP** Clamp-on type, positive rake cartridges featuring a variety of styles and sizes.

**CE** Clamp-on type, highly positive rake cartridges provide free cutting action and used for machining non-ferrous metals.

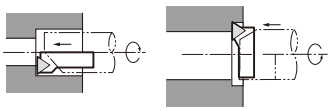
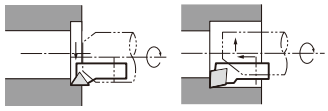
**PNE** Pin-lock type, negative rake cartridges used only for external machining.

## List of Cartridges

| Type | Appearance | Size | Min. bore dia ø (mm) | Cutting edge height (mm) | Rake angle | Applicable Insert: Relief angle | Applicable Insert: Hole | Clamping mechanism | No. of items | Features and notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **PN** |  | 10CA | 40 | 10 | Negative | 0° | With ISO hole | Pin-lock | 12 | • Excellent in economy |
| | | 12CA | 50 | 12 | | | | | 14 | |
| | | 16CA | 60 | 16 | | | | | 14 | |
| | | 20CA | 70 | 20 | | | | | 10 | |
| **CP** |  | 10CA | 40 | 10 | Positive | 11° | Without | Clamp-on | 16 | • Tough insert<br>• Variety of styles and sizes |
| | | 12CA | 50 | 12 | | | | | 16 | |
| | | 16CA | 60 | 16 | | | | | 16 | |
| | | 20CA | 70 | 20 | | | | | 2 | |
| **CE** |  | 10CA | 40 | 10 | Positive | 20° | Without | Clamp-on | 16 | • More free cutting action<br>• Best suitable for machining non-ferrous metals |
| | | 12CA | 50 | 12 | | | | | 16 | |
| **SP** |  | 06CA | 20 | 6 | Positive | 11° | With ISO hole | Screw-on | 10 | • Provides free cutting action<br>• Good chip control |
| | | 08CA | 25 | 8 | | | | | 10 | |
| | | 10CA | 40 | 10 | | | | | 16 | |
| | | 12CA | 50 | 12 | | | | | 16 | |
| **PNE** |  | 10CA | – | 10 | Negative | 0° | With ISO hole | Pin-lock | 8 | • For external use<br>• Made to order |
| | | 12CA | – | 12 | | | | | 10 | |
| **A** |  | (09CA) (Corresponds to 09CA) | 32 | 9 | Positive | 11° | With Tungaloy's standard hole | Screw-on | 12 | • Mini-cartridge |

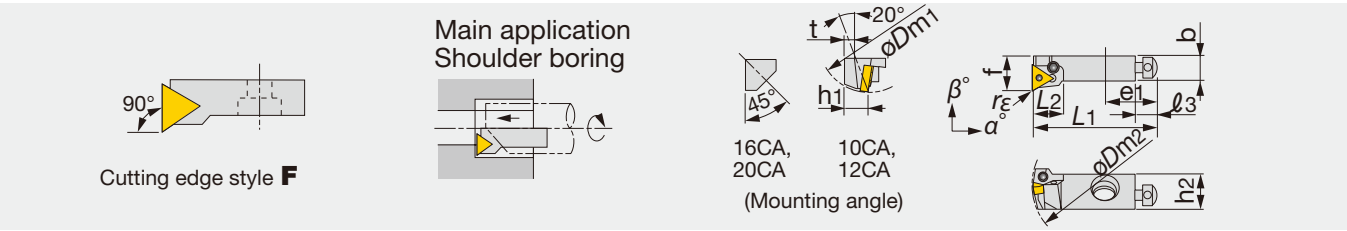
Note: Min. bore diameters shown above are for axial mounting.

# List of ISO Standard Cartridges by Application

| Type | Boring | | Chamfering and boring | | | Facing and boring | |
|---|---|---|---|---|---|---|---|
| |  | | External and internal 45-chamfering<br>Note: PSSN type can not be used for external chamfering.<br> | | |  | |
| **PN** | Cutting edge angle 85°<br>Style Y<br>85°<br>**PSYN** F186 | Cutting edge angle 75°<br>Style K<br>75°<br>**PSKN** F177 | Cutting edge angle 30°<br>Style T<br>30°<br>**PTTN** F184 | Cutting edge angle 45°<br>Style S<br>45°<br>**PSSN** F181 | | Cutting edge angle 0°<br>Style G<br>90°<br>**PTGN** F175 | Cutting edge angle 5°<br>5° Style L<br>5°<br>**PCLN** F179 |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**PTFN** F173 | Cutting edge angle 0°<br>Style G<br>90°<br>**PTGN** F175 | | | | | |
| **CP** | Cutting edge angle 85°<br>Style Y<br>85°<br>**CSYP** F187 | Cutting edge angle 75°<br>Style K<br>75°<br>**CSKP** F177 | Cutting edge angle 30°<br>Style T<br>30°<br>**CTTP** F185 | Cutting edge angle 45°<br>Style S (Square insert)<br>45°<br>**CSSP** F181<br>**CTSP** F183 | Cutting edge angle 60°<br>Style W<br>60°<br>**CTWP** F180 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGP** F175 | |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**CTFP** F173 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGP** F175 | | | | | |
| **CE** | Cutting edge angle 75°<br>Style K<br>75°<br>**CSKE** F178 | | Cutting edge angle 30°<br>Style T<br>30°<br>**CTTE** F185 | Cutting edge angle 45°<br>Style S (Square insert)<br>45°<br>**CSSE** F182<br>**CTSE** F183 | | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGE** F176 | |
| | Cutting edge angle 90°<br>Style F<br>90°<br>**CTFE** F174 | Cutting edge angle 0°<br>Style G<br>90°<br>**CTGE** F176 | | | | | |
| **SP** | Cutting edge angle 85°<br>Style Y<br>85°<br>**SSYP** F187 | Cutting edge angle 75°<br>Style K<br>75°<br>**SSKP** F178 | Cutting edge angle 30°<br>Style T<br>(80° rhombic only for 06CA)<br>30°<br>**STTP** F186<br>**SCTP** F186<br>(06CA) | Cutting edge angle 45°<br>Style S (Square insert)<br>(80° rhombic only for 06CA)<br>45°<br>**SSSP** F182<br>**STSP** F184<br>**SCSP** F184<br>(06CA) | Cutting edge angle 60°<br>Style W<br>60°<br>**STWP** F180 | Cutting edge angle 0°<br>Style G<br>90°<br>**STGP** F176 | Cutting edge angle 5°<br>5° Style L<br>5°<br>**SCLP** F179<br>(06CA) |
| | Cutting edge angle 90°<br>Style F<br>(80° rhombic only for 06CA)<br>90°<br>**STFP** F174<br>**SCFP** F174<br>(06CA) | Cutting edge angle 0°<br>Style G<br>90°<br>**STGP** F176 | | | | | |

## PN PTFN-CA

Lever lock cartridge with 90° approach angle for negative triangule insert




Right hand (R) shown. 80° rhombic insert used for 06CA.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | TN**1103... |
| PTFNR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | TN**1604... |
| PTFNR/L16CA | 55 | - | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | TN**1604... |
| PTFNR/L20CA | 70 | - | 0.8 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | TN**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand toolholders and the left hand insert is used for right hand toolholders.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

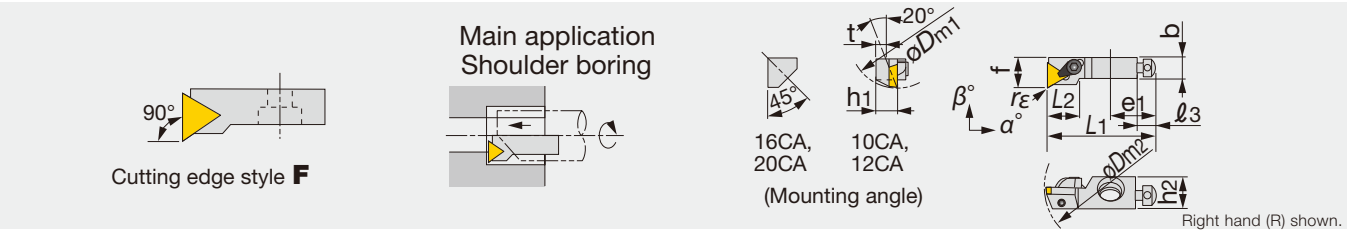
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate | Sizing plate ass'y |
|---|---|---|---|---|---|---|---|---|---|---|
| PTFNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | CHHM6-15 | P-2F,P-5 | - | - | PSTR/L10 |
| PTFNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | CHHM6-25 | P-2F,P-5 | - | - | PSTR/L12 |
| PTFNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-5 | LSP3 | S0816B/S1016B | - |
| PTFNR/L20CA | LST42CA | LCL4 | LCS4 | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP4 | S0820B/S1020B | - |

(1) Optional

## CP CTFP-CA

Clamp on cartridge with 90° approach angle for 11° clearance triangle insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTFPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | TP**1603... |
| CTFPR/L16CA | 55 | - | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | TP**1603... |
| CTFPR/L20CA | 70 | - | 0.8 | 25 | 70 | 22 | 20 | 20 | 19 | 30 | 10 | 5 | 0 | 0 | TP**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Shim screw | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer | Sizing plate ass'y |
|---|---|---|---|---|---|---|---|---|---|---|
| CTFPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | - | PSTR/L10 |
| CTFPR/L12CA-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | - | PSTR/L12 |
| CTFPR/L16CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | S0816B/S1016B | - |
| CTFPR/L20CA | PAT-42 | SM3X0.5X8 | CSG-8 | ASM6 | SSHM6-16 | BHM8-30U | P-3,P-4 | - | S0820B/S1020B | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

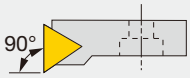
(1) Optional

PN PTFN-CA: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

CP CTFP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

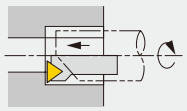
## CE CTFE-CA

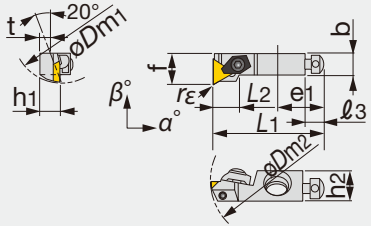
Clamp on cartridge with 90° approach angle for 20° clearance triangle insert




Cutting edge style **F**

Main application
Shoulder boring






Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTFER/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 10 | 5 | 5 | TE**1103... |
| CTFER12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | 10 | 5 | 6 | TE**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

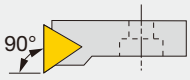
| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CTFER/L10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | PSTR/L10 |
| CTFER/L12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | PSTR/L12 |

(1) Optional

## SP STFP-CA / SCFP-CA

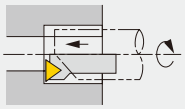
Screw on cartridge with 90° approach angle for 11° clearance triangle insert / rhombic insert

80° rhombic for 06CA only

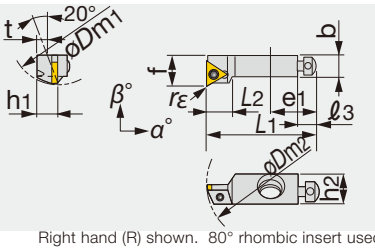



Cutting edge style **F**

Main application
Shoulder boring



Above figure shows 06CA type.




Right hand (R) shown. 80° rhombic insert used for 06CA.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCFPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 25 | 8.5 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STFPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 32 | 10 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 4.5 | TP**0902... |
| STFPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1102... |
| STFPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| SCFPR/L06CA-05 | CSTB-2.2S | ASM34S | SSHM3-6 | CHHM3.5-10 | P-1.5,P-3 | T-7F | PT06 |
| STFPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STFPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |
| STFPR/L12CA-16 | CSTB-4S | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-5 | T-15F | PSTR/L12 |

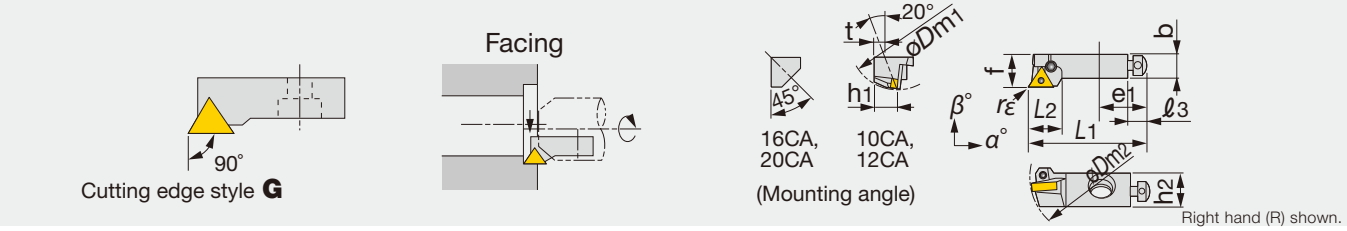
(1) Optional

CE CTFE-CA: Inserts → **Special**

SP STFP-CA: Inserts → **B112** (CP**), **B136 -** (TP**), CBN → **B168 -**, PCD → **B178**

## PN PTGN-CA

Lever lock cartridge with 90° approach angle for negative triangule inserts




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | TN**1103... |
| PTGNR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 20 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 5 | TN**1604... |
| PTGNR/L16CA | 60 | 75 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -10 | 0 | TN**1604... |
| PTGNR20CA | 70 | 90 | 0.8 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -8 | 0 | TN**2204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• **rε: Standard corner radius

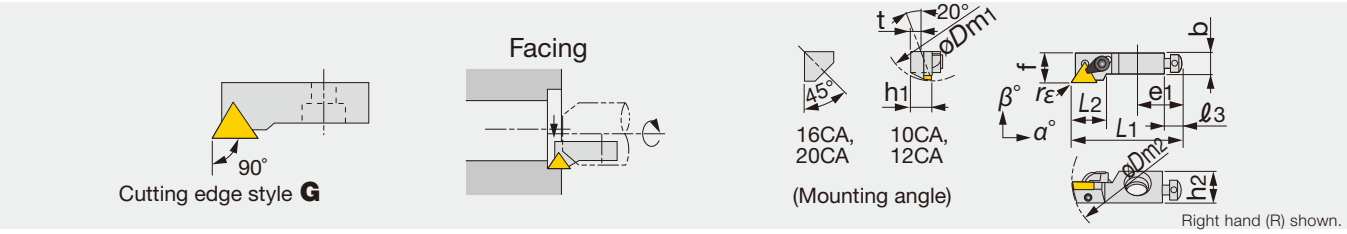
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PTGNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | CHHM6-15 | P-2F,P-5 | - | - | PSTR/L10 |
| PTGNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | CHHM6-25 | P-2F,P-5 | - | - | PSTR/L12 |
| PTGNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-5 | LSP3 | S0816B/S1016B | - |
| PTGNR/L20CA | LST42CA | LCL4 | LCS4 | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP4 | S0820B/S1020B | - |

(1) Optional

## CP CTGP-CA

Clamp on cartridge with 90° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTGPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 16 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTGPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 21 | 12 | 19.5 | 15 | 20 | 8 | 3 | 2 | 5 | TP**1603... |
| CTGPL16CA | 55 | 75 | 0.8 | 25 | 63 | 25 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| CTGPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | - | PSTR/L10 |
| CTGPR/L12CA-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | - | PSTR/L12 |
| CTGPR/L16CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | S0816B/S1016B | - |

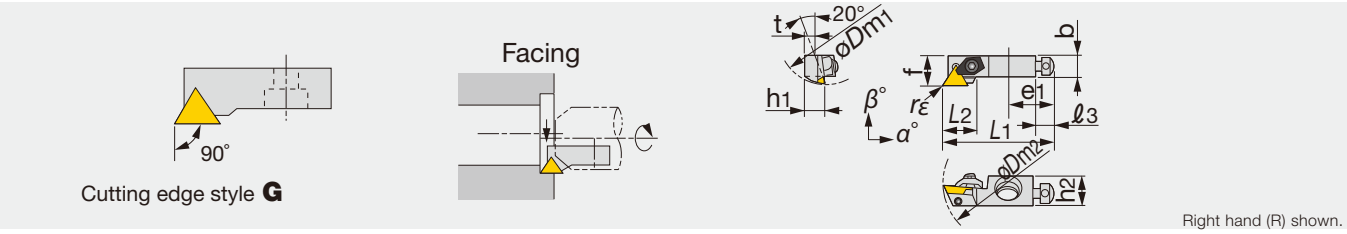
(1) Optional

PN PTGN-CA: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

CP CTGP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

## CE CTGE-CA

Clamp on cartridge with 90° approach angle for 20° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTGER/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 10 | 5 | TE**1103... |
| CTGER/L12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 20 | 12 | 19.5 | 15 | 20 | 8 | 5 | 10 | 6 | TE**1603... |

**rε: Standard corner radius

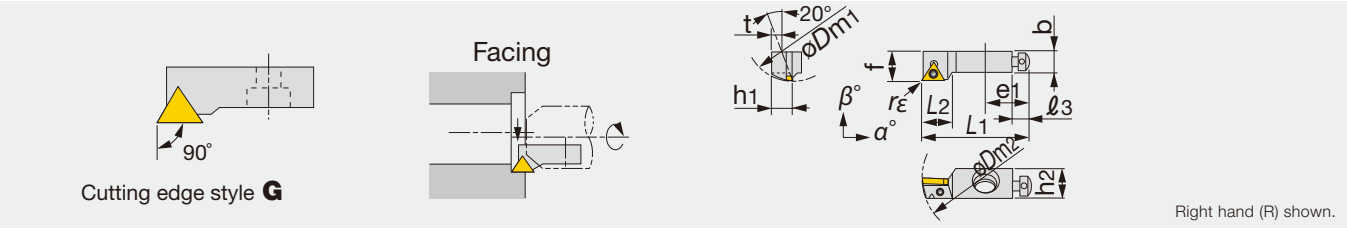
### SPARE PARTS

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CTGER/L10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CHHM6-15 | P-2,P-2.5,P-5 | CBT-2M | PSTR/L10 |
| CTGER/L12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBT-3M | PSTR/L12 |

(1) Optional

## SP STGP-CA

Screw on cartridge with 90° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STGPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 32 | 10.9 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 6 | TP**0902... |
| STGPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 8 | TP**1102... |
| STGPL12CA-16 | 50 | 75 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 8 | TP**16T3... |

**rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| STGPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STGPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |
| STGPR/L12CA-16 | CSTB-4S | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-5 | T-15F | PSTR/L12 |

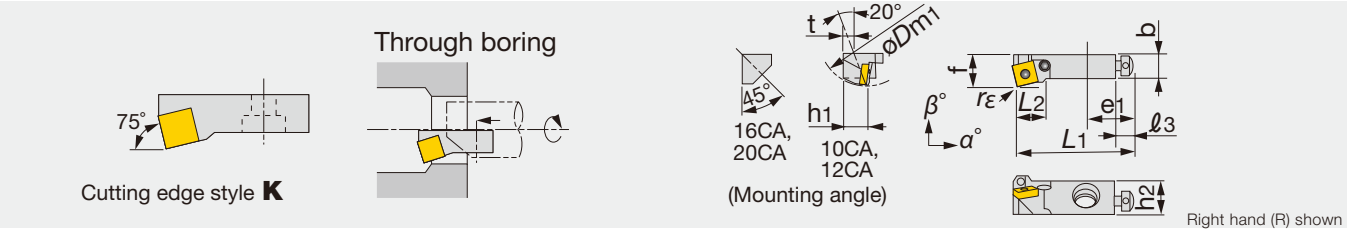
(1) Optional

CE CTGE-CA: Inserts → **Special**

CP STGP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

## PN PSKN-CA

Lever lock cartridge with 75° approach angle for negative square insert




| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSKNR10CA-09 | 40 | 0.8 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | SN**0903... |
| PSKNR/L12CA-12 | 50 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 5 | SN**1204... |
| PSKNR/L16CA | 55 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | SN**1204... |
| PSKNR20CA | 70 | 1.2 | 25 | 70 | 28 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | SN**1506... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

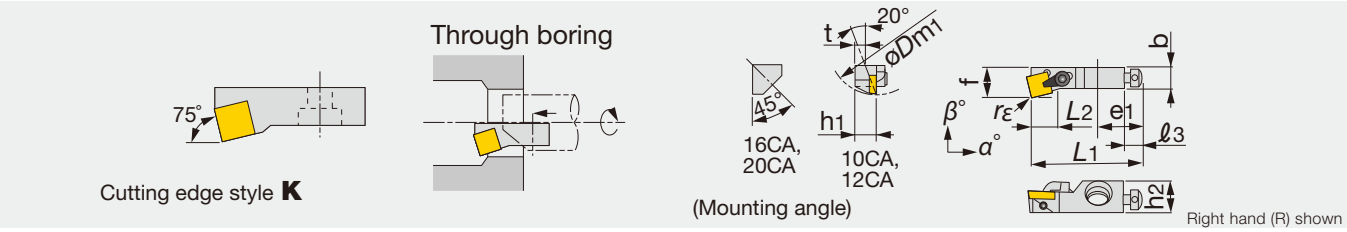
### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PSKNR/L10CA-09 | - | LCL32N | LCS22 | ASM54 | SSHM4-4 | CHHM4-4 | P-2F,P-5 | - | - | PSTR/L10 |
| PSKNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | CHHM6-25 | P-2,P-2.5,P-5 | - | - | PSTR/L12 |
| PSKNR/L16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-3,P-5 | LSP4 | S0816B/S1016B | - |
| PSKNR/L20CA | LSS53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP5 | S0820B/S1020B | - |

(1) Optional

## CP CSKP-CA

Clamp on cartridge with 75° approach angle for 11° clearance square insert




| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSKPR/L10CA-09 | 40 | 0.8 | 14 | 50 | 12 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |
| CSKPR/L12CA-12 | 50 | 0.8 | 20 | 55 | 17 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | SP**1203... |
| CSKPR/L16CA | 55 | 0.8 | 25 | 63 | 22 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Chipbreaker piece | Shim retainer (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| CSKPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-2.5,P-5 | CBS-3M | - | PSTR/L10 |
| CSKPR/L12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CHHM6-25 | P-2,P-3,P-5 | CBS-4M | - | PSTR/L12 |
| CSKPR/L16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | BHM8-25U | P-2.5,P-4 | - | * | - |

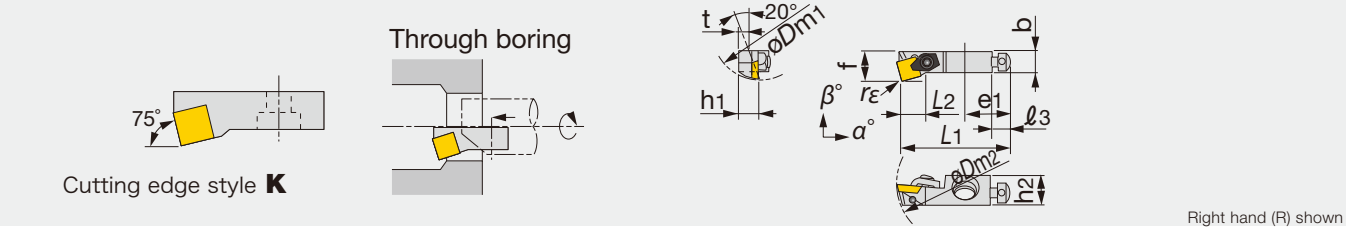
(1) Optional

PN PSKN-CA: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

CP CSKP-CA: Inserts → **B128 -**, CBN → **B168 -**, PCD → **B177**

## CE CSKE-CA

Clamp on cartridge with 75° approach angle for 20° clearance square insert




Right hand (R) shown

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSKER10CA-09 | 40 | 55 | 0.8 | 14 | 50 | 11.3 | 10 | 14.5 | 10 | 20 | 8 | 10 | 5 | 8 | SE**0903... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

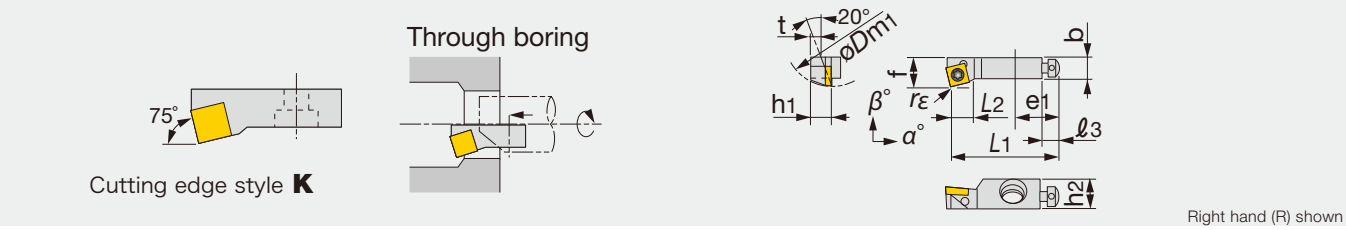
| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CSKER10CA-09 | CHHM6-15 | P-2 | P-2.5 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CSKER10CA-09 | CSW-40 | ASM54 | SSHM4-8 | CBS-3M | PSTR/L10 |

(1) Optional

## SP SSKP-CA

Screw on cartridge with 75° approach angle for 11° clearance square insert




Right hand (R) shown

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSKPR10CA-09 | 40 | 0.8 | 14 | 50 | 12.7 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 8 | SP**0903... |
| SSKPR12CA-12 | 50 | 0.8 | 20 | 55 | 16 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 8 | SP**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSKPR10CA-09 | CSTB-4S | CHHM6-15 | P-2 | T-15F | P-5 |
| SSKPR12CA-12 | CSTB-5S | CHHM6-25 | P-2 | T-20F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SSKPR10CA-09 | ASM54 | SSHM4-10 | PSTR/L10 |
| SSKPR12CA-12 | ASM54 | SSHM4-14 | PSTR/L12 |

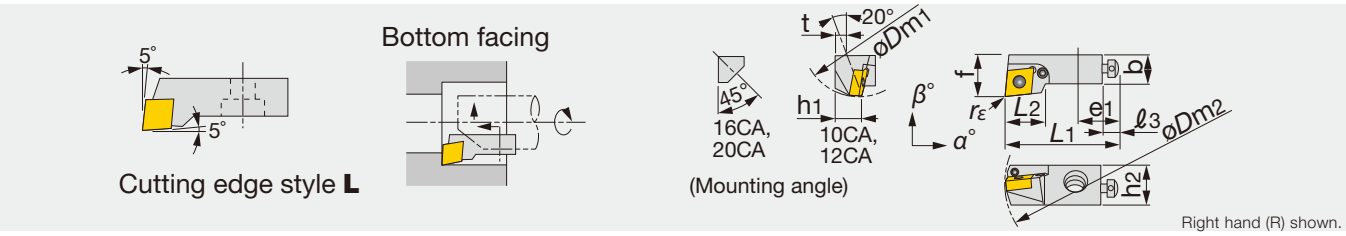
(1) Optional

CE CSKE-CA: Inserts → **Special**

SP SSKP-CA: Inserts → **B128 -**, CBN → **B168**

## PN PCLN-CA

Lever lock cartridge with 95° approach angle for negative rhombic insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | 50 | 75 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | CN**1204... |
| PCLNR/L16CA | 55 | 75 | 0.8 | 25 | 63 | 28 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | CN**1204... |
| PCLNR/L20CA | 70 | 90 | 1.2 | 25 | 70 | 31 | 20 | 20 | 19 | 30 | 10 | -6 | -8 | 0 | CN**1606... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

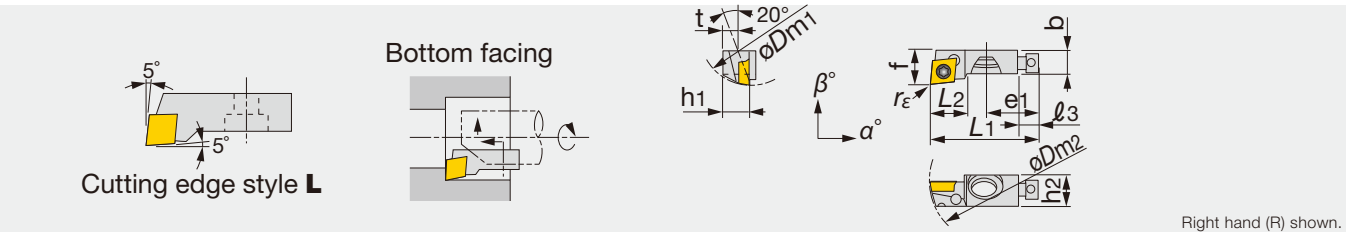
| Designation | Cartridge setting screw | Cartridge setting screw 1 | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | - | CHHM6-25 | - | - | P-2 | P-2.5 | P-5 |
| PCLNR/L16CA | BHM8-25U | - | S0816B | S1016B | P-2.5 | P-3 | P-5 |
| PCLNR/L20CA | - | - | - | - | P-2.5 | P-3 | P-5 |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Shim retainer | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PCLNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | - | PSTR/L12 |
| PCLNR/L16CA | LSC 42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | LSP4 | - |
| PCLNR/L20CA | LSC 53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | LSP5 | - |

(1) Optional

## SP SCLP-CA

Screw on cartridge with 95° approach angle for 11° clearance rhombic insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCLPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 25 | 8.5 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCLPR/L06CA-05 | CSTB-2.2S | CHHM3.5-10 | P-1.5 | T-7F | P-3 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SCLPR/L06CA-05 | ASM34S | SSHM3-6 | PT06 |

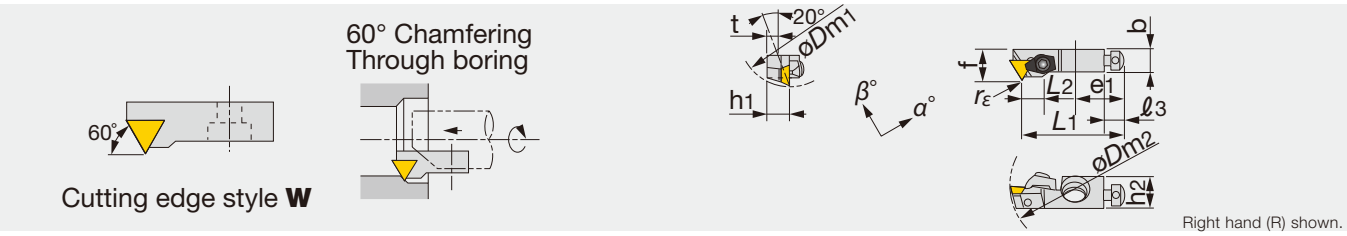
(1) Optional

PN PCLN-CA: Inserts → **B050 -**, CBN → **B163 -**, PCD → **B176**

SP SCLP-CA: Inserts → **B112**

## CP CTWP-CA

Clamp on cartridge with 60° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTWPR10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 13 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 5 | TP**1103... |
| CTWPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

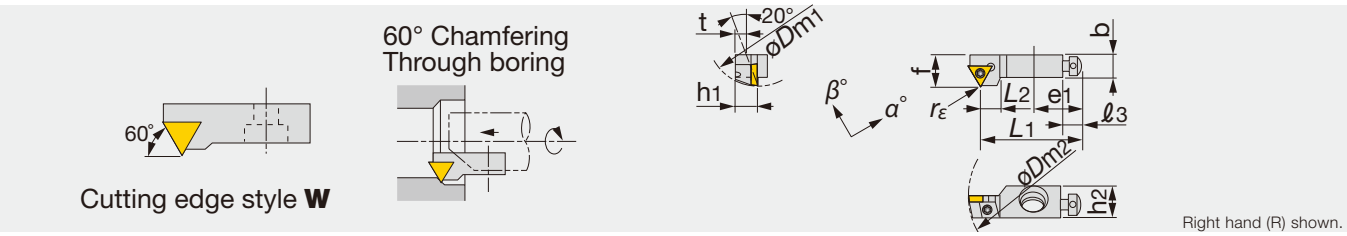
| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTWPR10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTWPR/L12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y |
|---|---|---|---|---|---|
| CTWPR/L10CA-11 | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBT-2M | PSTR/L10 |
| CTWPR/L12CA-16 | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBT-3M | PSTR/L12 |

Notes : • Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
• When not using Chipbreaker piece, clamping screw in ( ) should be used.
• Hand of the insert should be selected according to the application.

## SP STWP-CA

Screw on cartridge with 60° approach angle for 11° clearance triangle insert




| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STWPR08CA-09 | 25 | 0.4 | 10 | 28 | 6 | 8 | 11.5 | 7.5 | 17 | 6 | 4 | 0 | 6 | TP**0902... |
| STWPR/L10CA-11 | 40 | 0.4 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 4 | 0 | 8 | TP**1102... |
| STWPR12CA-16 | 50 | 0.8 | 20 | 47 | 9 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 8 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| STWPR08CA-09 | CSTB-2.2S | CHHM4-10 | P-1.5 | T-7F | P-3 |
| STWPR/L10CA-11 | CSTB-2.5 | CHHM6-15 | P-2 | T-8F | P-5 |
| STWPR12CA-16 | CSTB-4S | CHHM6-25 | P-2 | T-15F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| STWPR08CA-09 | ASM34L | SSHM3-6 | PSTR/L08 |
| STWPR/L10CA-11 | ASM54 | SSHM4-10 | PSTR/L10 |
| STWPR12CA-16 | ASM54 | SSHM4-14 | PSTR/L12 |

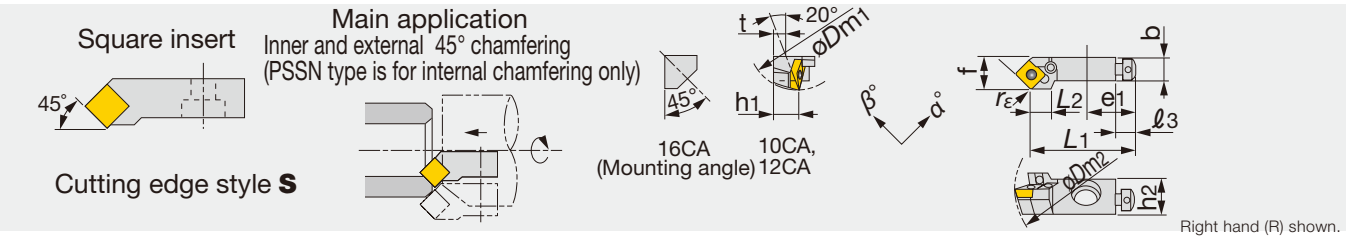
(1) Optional

CP CTWP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

SP STWP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

## PN PSSN-CA

Lever lock cartridge with 45° approach angle for negative square insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 10 | 10 | 14.5 | 10 | 20 | 8 | -12 | 0 | 5 | SN**0903... |
| PSSNR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 12 | 12 | 19.5 | 15 | 20 | 8 | -12 | 0 | 6 | SN**1204... |
| PSSNR/L16CA | 55 | 75 | 0.8 | 25 | 53 | 28 | 16 | 16 | 17 | 25 | 8 | -11 | 0 | 0 | SN**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Cartridge setting screw 1 | Wrench | Wrench 1 | Wrench 2 | Radial adjusting screw |
|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | - | CHHM4-4 | P-5 | P-2F | - | SSHM4-4 |
| PSSNR/L12CA-12 | - | CHHM6-25 | P-2 | P-2.5 | P-5 | SSHM4-4 |
| PSSNR/L16CA | BHM8-25U | CHHM6-25 | P-2.5 | P-3 | P-5 | SSHM5-6 |

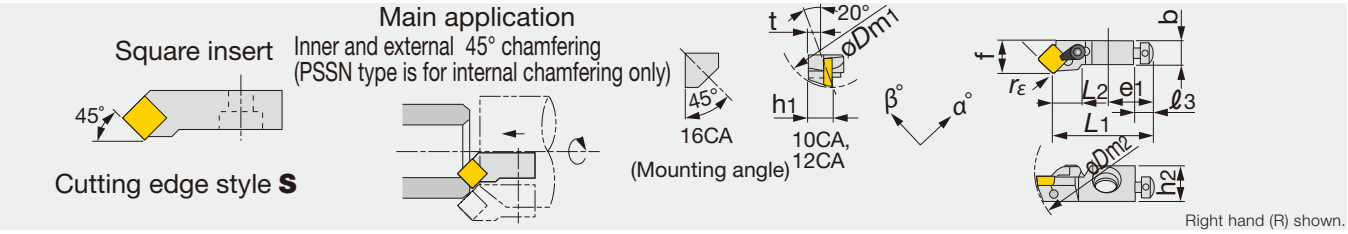
| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Shim retainer | Sizing plate (1) | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PSSNR/L10CA-09 | - | LCL32N | LCS22 | ASM54 | - | - | PSTR/L10 |
| PSSNR/L12CA-12 | - | LCL43N | LCS43 | ASM54 | - | - | PSTR/L12 |
| PSSNR/L16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | LSP4 | S0816B/S1016B | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).

(1) Optional

## CP CSSP-CA

Clamp on cartridge with 45° approach angle for 11° clearance square insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 11 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | SP**0903... |
| CSSPR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 13 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | SP**1203... |
| CSSPR16CA | 55 | 75 | 0.8 | 25 | 53 | 15 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Cartridge setting screw 1 | Wrench | Wrench 1 | Wrench 2 | Radial adjusting screw |
|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | - | CHHM6-15 | P-2 | P-2.5 | P-5 | SSHM4-10 |
| CSSPR/L12CA-12 | - | CHHM6-25 | P-2 | P-3 | P-5 | SSHM4-14 |
| CSSPR16CA | BHM8-25U | | P-2.5 | P-4 | - | SSHM5-16 |

| Designation | Shim | Shim screw | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CSSPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBS-3M | PSTR/L10 |
| CSSPR/L12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |
| CSSPR16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

(1) Optional

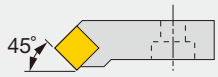
PN PSSN-CA: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

CP CSSP-CA: Inserts → **B128 -**, CBN → **B168 -**, PCD → **B177**

## CE CSSE-CA

Clamp on cartridge with 45° approach angle for 20° clearance square insert

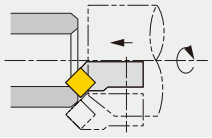
Square insert

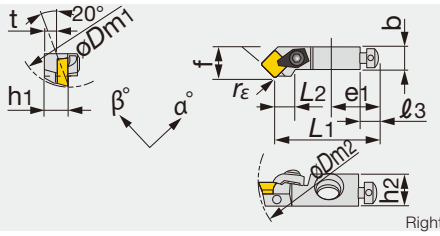



Cutting edge style **S**

Main application

Inner and external 45° chamfering
(PSSN type is for internal chamfering only)






Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSSER12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 12 | 12 | 19.5 | 15 | 20 | 8 | 10 | 0 | 6 | SE**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CSSER12CA-12 | CHHM6-25 | P-2 | P-3 | P-5 |

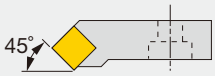
| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CSSER12CA-12 | CSW-50 | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |

(1) Optional

## SP SSSP-CA

Screw on cartridge with 45° approach angle for 11° clearance square insert

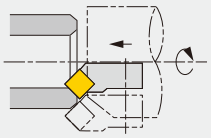
Square insert

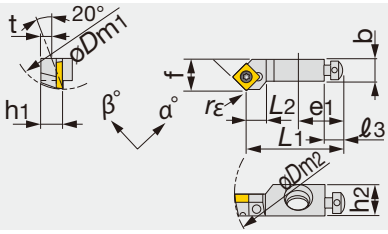



Cutting edge style **S**

Main application

Inner and external 45° chamfering
(PSSN type is for internal chamfering only)






Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSSPR/L10CA-09 | 40 | 55 | 0.8 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 8 | SP**0903... |
| SSSPR/L12CA-12 | 50 | 75 | 0.8 | 20 | 47 | 13 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 8 | SP**1204... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• Hand of the insert to be used should be selected depending on the application.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SSSPR/L10CA-09 | CSTB-4S | CHHM6-15 | P-2 | T-15F | P-5 |
| SSSPR/L12CA-12 | CSTB-5S | CHHM6-25 | P-2 | T-20F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SSSPR/L10CA-09 | ASM54 | SSHM4-10 | PSTR/L10 |
| SSSPR/L12CA-12 | ASM54 | SSHM4-14 | PSTR/L12 |

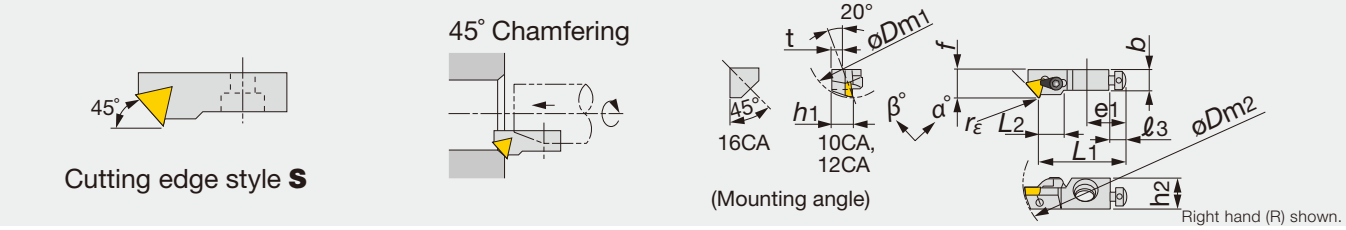
(1) Optional

CE CSSE-CA: Inserts → **Special**

SP SSSP-CA: Inserts → **B128 -**, CBN → **B168 -**, PCD → **B177**

## CP CTSP-CA

Clamp on cartridge with 45° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTSPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 12 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | TP**1103... |
| CTSPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTSPR/L10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTSPR/L12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

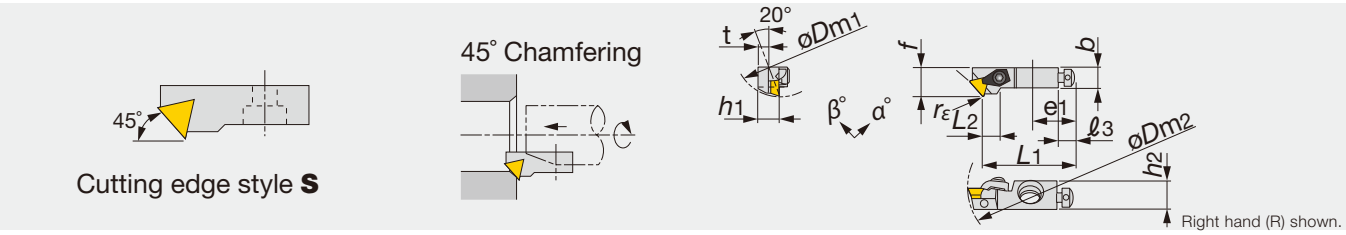
| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTSPR/L10CA-11 | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBT-2M | PSTR/L10 |
| CTSPR/L12CA-16 | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBT-3M | PSTR/L12 |

(1) Optional

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked). When not using Chipbreaker piece, clamping screw in ( ) should be used.

## CE CTSE-CA

Clamp on cartridge with 45° approach angle for 20° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTSER10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 8 | 10 | 14.5 | 10 | 20 | 8 | 10 | 0 | 5 | TE**1103... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTSER10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTSER10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CBT-2M | PSTR/L10 |

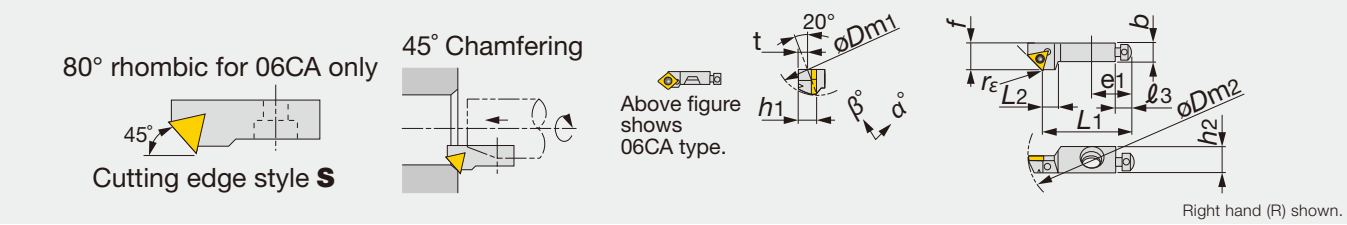
(1) Optional

CP CTSP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

CE CTSE-CA: Inserts → **Special**

## SP STSP-CA / SCSP-CA

Screw on cartridge with 45° approach angle for 11° clearance triangle insert / rhombic insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCSPR/L06CA-05 | 20 | 30 | 0.4 | 8 | 22 | 6 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STSPR/L08CA-09 | 25 | 35 | 0.4 | 10 | 28 | 5.2 | 8 | 11.5 | 7.5 | 17 | 6 | 0 | 0 | 4.5 | TP**0902... |
| STSPR/L10CA-11 | 40 | 55 | 0.4 | 14 | 44 | 9 | 10 | 14.5 | 10 | 20 | 8 | 3 | 0 | 5 | TP**1102... |
| STSPR/L12CA-16 | 50 | 75 | 0.8 | 20 | 47 | 11 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**16T3... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

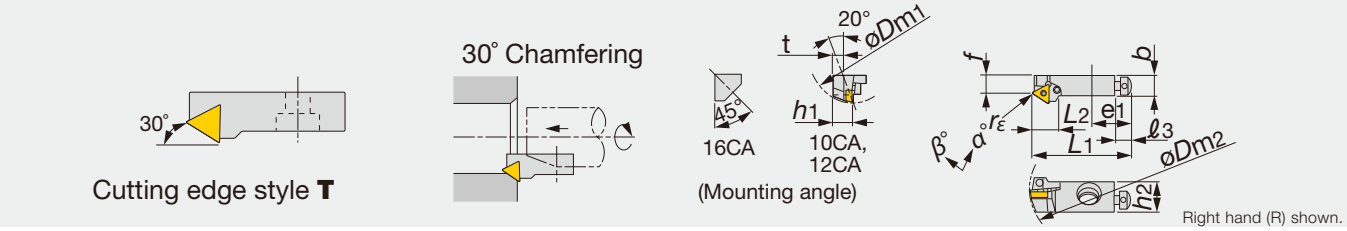
| Designation | Clamping screw | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|
| SCSPR/L06CA-05 | CSTB-2.2S | CHHM3.5-10 | P-1.5 | T-7F | P-3 |
| STSPR/L08CA-09 | CSTB-2.2S | CHHM4-10 | P-1.5 | T-7F | P-3 |
| STSPR/L10CA-11 | CSTB-2.5 | CHHM6-15 | P-2 | T-8F | P-5 |
| STSPR/L12CA-16 | CSTB-4S | CHHM6-25 | P-2 | T-15F | P-5 |

| Designation | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) |
|---|---|---|---|
| SCSPR/L06CA-05 | ASM34S | SSHM3-6 | PT06 |
| STSPR/L08CA-09 | ASM34L | SSHM3-6 | PSTR/L08 |
| STSPR/L10CA-11 | ASM54 | SSHM4-10 | PSTR/L10 |
| STSPR/L12CA-16 | ASM54 | SSHM4-14 | PSTR/L12 |

(1) Optional

## PN PTTN-CA

Lever lock cartridge with 30° approach angle for negative triangule insert




Right hand (R) shown.

| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTTNR/L10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 13 | 10 | 14.5 | 10 | 20 | 8 | -10 | 0 | 5 | TN**1103... |
| PTTNR/L12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | -10 | 0 | 6 | TN**1604... |
| PTTNR/L16CA | 60 | 75 | 0.8 | 15 | 63 | 22 | 16 | 16 | 17 | 25 | 8 | -10 | -2 | 0 | TN**1604... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| PTTNR/L10CA-11 | CHHM6-15 | - | - | P-5 | P-2F |
| PTTNR/L12CA-16 | CHHM6-25 | - | - | P-5 | P-2F |
| PTTNR/L16CA | BHM8-25U | S0816B | S1016B | P-2.5 | P-5 |

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Shim retainer | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| PTTNR/L10CA-11 | - | LCL22N | LCS22 | ASM54 | SSHM4-4 | - | PSTR/L10 |
| PTTNR/L12CA-16 | - | LCL33N | LCS33 | ASM54 | SSHM4-4 | - | PSTR/L12 |
| PTTNR/L16CA | LST317CA | LCL3 | LCS3 | ASM6 | SSHM5-6 | LSP3 | - |

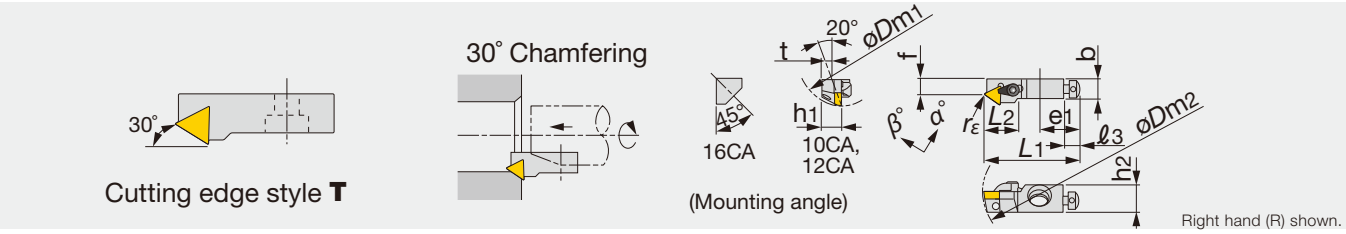
(1) Optional

SP STSP-CA: Inserts → **B112** (CP**), **B136 -** (TP**), CBN → **B168 -**, PCD → **B178**

PN PTTN-CA: Inserts → **B080 -**, CBN → **B164 -**, PCD → **B176**

## CP CTTP-CA

Clamp on cartridge with 30° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTTPR/L10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 18 | 10 | 14.5 | 10 | 20 | 8 | 0 | 0 | 5 | TP**1103... |
| CTTPR12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 22 | 12 | 19.5 | 15 | 20 | 8 | 4 | 0 | 6 | TP**1603... |
| CTTPL16CA | 55 | 75 | 0.8 | 15 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 0 | 0 | 0 | TP**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

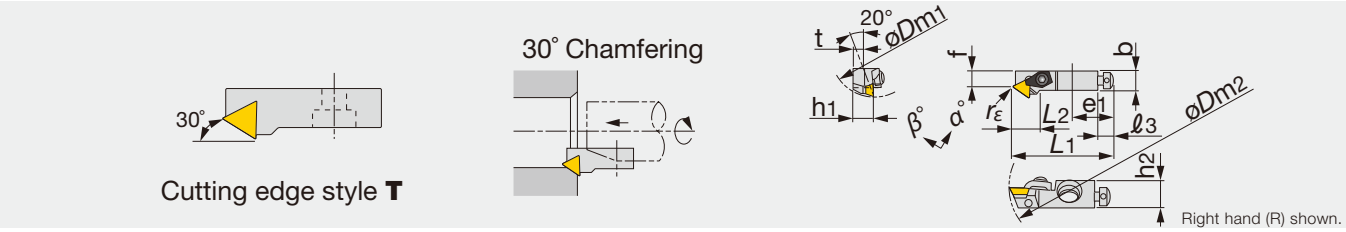
| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| CTTPL10CA-11 | CHHM6-15 | - | - | P-2 | P-2.5 | P-5 |
| CTTPR/L12CA-16 | CHHM6-25 | - | - | P-2 | P-3 | P-5 |
| CTTPL16CA | BHM8-25U | S0816B | S1016B | P-2.5 | P-4 | - |

| Designation | Shim | Shim screw | Clamping screw | Axial adjusting screw | Radial adjusting screw | Sizing plate ass'y (1) | Chipbreaker piece |
|---|---|---|---|---|---|---|---|
| CTTPR/L10CA-11 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | PSTR/L10 | CBT-2M |
| CTTPR12-16 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | PSTR12 | CBT-3M |
| CTTPL10CA | PAT-32 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

(1) Optional

## CE CTTE-CA

Clamp on cartridge with 30° approach angle for 20° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CTTER10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | 10 | 0 | 5 | TE**1103... |
| CTTER12CA-16 | 50 | 75 | 0.8 | 13 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | 10 | 0 | 6 | TE**1603... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Cartridge setting screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| CTTER10CA-11 | CHHM6-15 | P-2 | P-2.5 | P-5 |
| CTTER12CA-16 | CHHM6-25 | P-2 | P-3 | P-5 |

| Designation | Clamp set | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|
| CTTER10CA-11 | CSW-40 | ASM54 | SSHM4-8 | CBT-2M | PSTR10 |
| CTTER12CA-16 | CSW-50 | ASM54 | SSHM4-14 | CBT-3M | PSTR12 |

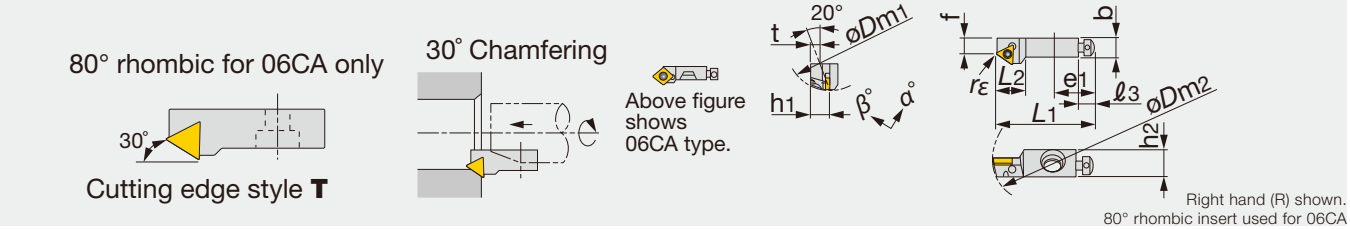
(1) Optional

CP CTTP-CA: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

CE CTTE-CA: Inserts → **Special**

## SP STTP-CA / SCTP-CA

Screw on cartridge with 30° approach angle for 11° clearance triangle insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SCTPR06CA-05 | 20 | 30 | 0.4 | 5.4 | 25 | 9 | 6 | 7.5 | 5.5 | 12 | 4.5 | 0 | 0 | 3.5 | CP**0502... |
| STTPR/L08CA-09 | 25 | 35 | 0.4 | 6 | 32 | 10 | 8 | 11.5 | 7.5 | 17 | 6 | 0 | 0 | 4.5 | TP**0902... |
| STTPR10CA-11 | 40 | 55 | 0.4 | 9 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 0 | 0 | 5 | TP**1102... |

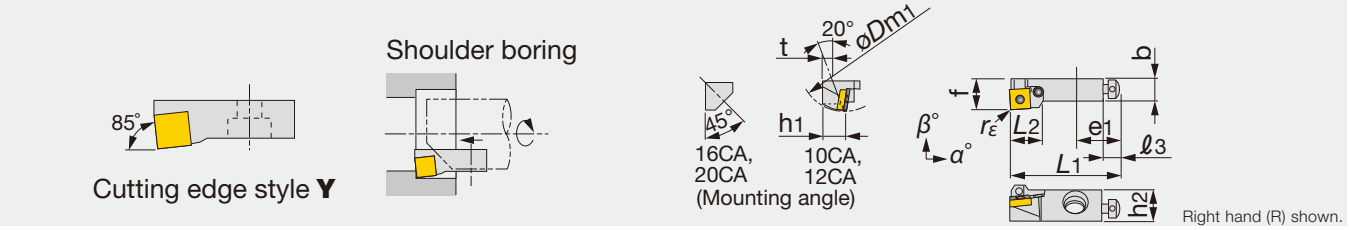
### SPARE PARTS

| Designation | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Torx wrench | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| SCTPR/L06CA-05 | CSTB-2.2S | ASM34S | SSHM3-6 | CHHM3.5-10 | P-1.5,P-3 | T-7F | PT06 |
| STTPR/L08CA-09 | CSTB-2.2S | ASM34L | SSHM3-6 | CHHM4-10 | P-1.5,P-3 | T-7F | PSTR/L08 |
| STTPR/L10CA-11 | CSTB-2.5 | ASM54 | SSHM4-10 | CHHM6-15 | P-2,P-5 | T-8F | PSTR/L10 |

(1) Optional

## PN PSYN-CA

Lever lock cartridge with 85° approach angle for negative square insert




| Designation | øDm1 | øDm2 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSYNR10CA-09 | 40 | - | 0.8 | 14 | 50 | 14 | 10 | 14.5 | 10 | 20 | 8 | -6 | -8 | 5 | SN**0903... |
| PSYNR12CA-12 | 50 | - | 0.8 | 20 | 55 | 18 | 12 | 19.5 | 15 | 20 | 8 | -6 | -8 | 6 | SN**1204... |
| PSYNR16CA | 55 | - | 0.8 | 25 | 63 | 26 | 16 | 16 | 17 | 25 | 8 | -6 | -8 | 0 | SN**1204... |
| PSYNR20CA | 70 | - | 1.2 | 25 | 70 | 30 | 20 | 20 | 19 | 30 | 10 | -6 | -7 | 0 | SN**1506... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.
• The left hand insert is used for the right hand cartridge and right hand insert is used for left hand cartridge.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Shim | Lever | Clamping screw | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Wrench | Shim retainer | Sizing plate | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| PSYNR10CA-09 | - | LCL32N | LCS22 | ASM54 | SSHM4-4 | CHHM4-4 | P-2F,P-5 | - | - | PSTR/L10 |
| PSYNR12CA-12 | - | LCL43N | LCS43 | ASM54 | SSHM4-4 | CHHM6-25 | P-2,P-2.5,P-5 | - | - | PSTR/L12 |
| PSYNR16CA | LSS42CA | LCL4 | LCS4CA | ASM6 | SSHM5-6 | BHM8-25U | P-2.5,P-3,P-5 | LSP4 | S0816B/S1016B | - |
| PSYNR20CA | LSS53CA | LCL5 | LCS5CA | ASM6 | SSHM5-6 | BHM8-30U | P-2.5,P-3,P-5 | LSP5 | S0820B/S1020B | - |

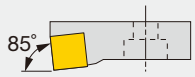
(1) Optional

SP STTP-CA: Inserts → **B112** (CP**), **B136 -** (TP**), CBN → **B168 -**, PCD → **B178**

PN PSYN-CA: Inserts → **B071 -**, CBN → **B164 -**, PCD → **B176**

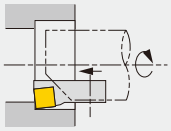
## CP CSYP-CA

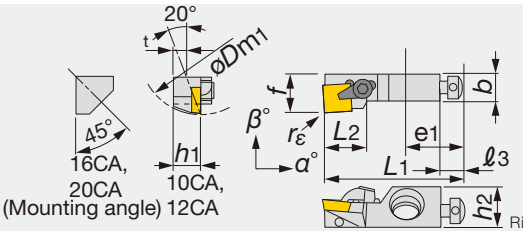
Clamp on cartridge with 85° approach angle for 11° clearance square insert




Cutting edge style **Y**

Shoulder boring






Right hand (R) shown.

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | 40 | 0.8 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |
| CSYPR12CA-12 | 50 | 0.8 | 20 | 55 | 19 | 12 | 19.5 | 15 | 20 | 8 | 5 | 2 | 6 | SP**1203... |
| CSYPR16CA | 55 | 0.8 | 25 | 63 | 23 | 16 | 16 | 17 | 25 | 8 | 5 | 0 | 0 | SP**1203... |

Note: • In above table, øDm1 is min. bore dia. for axial mounting and øDm2 is for radial mounting.
• When using a right or left hand insert, the right hand insert is used for left hand cartridge and the left hand insert is used for right hand cartridge.

### SPARE PARTS

| Designation | Cartridge setting screw | Sizing plate | Sizing plate 1 | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | CHHM6-15 | - | - | P-2 | P-2.5 | P-5 |
| CSYPR12CA-12 | CHHM6-25 | - | - | P-2 | P-3 | P-5 |
| CSYPR16CA | BHM8-25U | - | - | P-2.5 | P-4 | - |

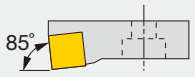
| Designation | Shim | Shim screw | Clamping screw | Axial adjusting screw | Radial adjusting screw | Chipbreaker piece | Sizing plate ass'y (1) |
|---|---|---|---|---|---|---|---|
| CSYPR/L10CA-09 | - | - | CSG-5 (CSG-5S) | ASM54 | SSHM4-10 | CBS-3M | PSTR/L10 |
| CSYPR12CA-12 | - | - | CSG-6 (CSG-6S) | ASM54 | SSHM4-14 | CBS-4M | PSTR/L12 |
| CSYPR16CA | PAS-42 | SM3X0.5X8 | CSG-8S | ASM6 | SSHM5-16 | - | - |

Notes : Cartridges of K-style cutting edge uses S0816A or S1016A,whilst ones of S-style uses S0816C or S1016B (*marked).
When not using Chipbreaker piece, clamping screw in ( ) should be used.

(1) Optional

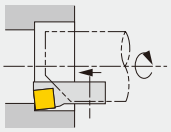
## SP SSYP-CA

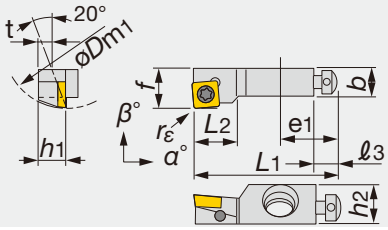
Screw on cartridge with 85° approach angle for 11° clearance square insert




Cutting edge style **Y**

Shoulder boring






Right hand (R) shown.

| Designation | øDm1 | rε** | f | L1 | L2 | h1 | h2 | b | e1 | ℓ3 | β° | α° | t | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSYPR10CA-09 | 40 | 0.8 | 14 | 50 | 15 | 10 | 14.5 | 10 | 20 | 8 | 5 | 0 | 5 | SP**0903... |

• The left hand insert is used for the right hand cartridge and right hand insertis used for left hand cartridge
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench | Wrench 1 | Wrench 2 |
|---|---|---|---|---|
| SSYPR10CA-09 | CSTB-4S | P-2 | T-15F | P-5 |

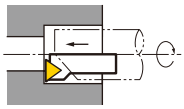
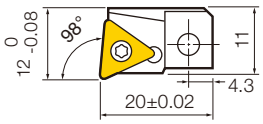
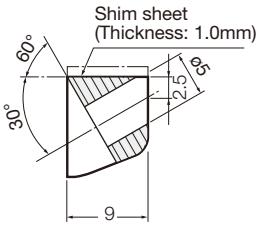
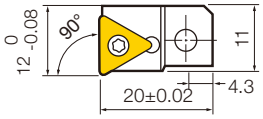
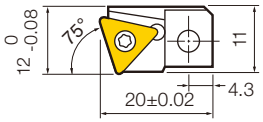
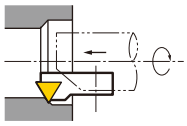
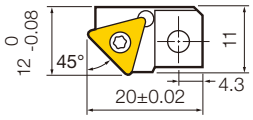
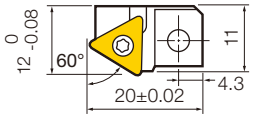
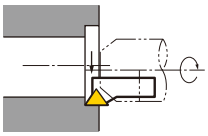
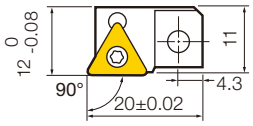
| Designation | Axial adjusting screw | Radial adjusting screw | Cartridge setting screw | Sizing plate ass'y (1) |
|---|---|---|---|---|
| SSYPR10CA-09 | ASM54 | SSHM4-10 | CHHM6-15 | PSTR/L10 |

(1) Optional

CP CSYP-CA: Inserts → **B128 -**, CBN → **B168 -**, PCD → **B177**

SP SSYP-CA: Inserts → **B128 -**, CBN → **B168**

# A-type (Positive rake, compact type)

| Application | | Shape | Designation | Specification |
|---|---|---|---|---|
| Boring |  |  | **ATX-0 R/L** | ●Applicable inserts<br>TP□□1103□□<br>(With Tungaloy's standard hole)<br>**B136 -, B168**<br><br>●Min. bore diameter<br>ø32<br><br>●Cutting edge height<br>9 mm<br><br>●Dimension for mounting<br>  |
| | |  | **ATF-0 R/L** | |
| | |  | **ATK-0 R/L** | |
| Chamfering |  |  | **ATS-0 R/L** | |
| | |  | **ATT-0 R/L** | |
| Facing |  |  | **ATG-0 L** | |

Note: Right hand (R) shown.

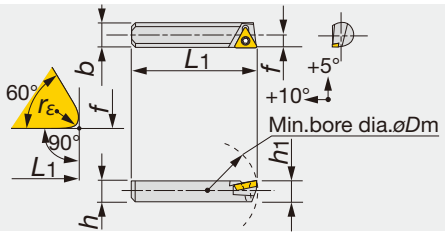
## SPARE PARTS

| Designation | Mounting screw | Adjusting screw (axial direction) | Insert clamping screw | Shim sheet | Wrench |
|---|---|---|---|---|---|
| For all products | M4×15 | M3×0.5×8 | CSTA-NO2L | SM-00 | P-1.5, T-8F |

# Boring bar tool

## TBS1

90° approarch angle with square shank




TBS1**T** shown.

| Designation | øDm | f | $h_1$ | $L_2$ | b | h | $L_1$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS108T08 | 25 | 7.8 | 7.8 | 9 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS110T09 | 38 | 9.8 | 9.8 | 10 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS113T11 | 50 | 12.8 | 12.8 | 12 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS116C12 | 62 | 15.8 | 15.8 | 18 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS119C12 | 72 | 18.8 | 18.8 | 18 | 19 | 19 | 95 | 0.8 | CP**1204... |
| TBS125C16 | 82 | 24.8 | 24.8 | 22 | 25 | 25 | 125 | 1.2 | CP**1605... |

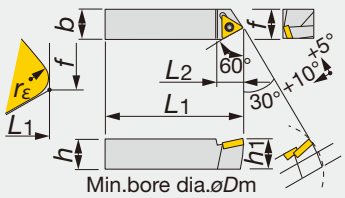
Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **$r_\varepsilon$: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS108T08 | CSTB-2L | - | - | - | T-6F |
| TBS110T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS113T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS116C12 | CSTB-5 | - | - | - | T-20F |
| TBS119C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |
| TBS125C16 | CSTB-4F | DTS6-4 | SSC54-P | P-4 | T-15F |

## TBS3

30° approarch angle with square shank




TBS3**T** shown.

| Designation | øDm | f | $h_1$ | $L_2$ | b | h | $L_1$ | $r_\varepsilon$** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS308T08 | 25 | 4.7 | 7.8 | 8 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS310T09 | 38 | 6 | 9.8 | 11 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS313T11 | 50 | 8.3 | 12.8 | 12 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS316C12 | 62 | 9.7 | 15.8 | 21 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS319C12 | 72 | 12.7 | 18.8 | 21 | 19 | 19 | 95 | 0.8 | CP**1204... |

Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **$r_\varepsilon$: Standard corner radius

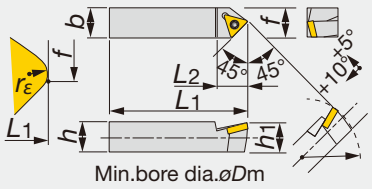
### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS308T08 | CSTB-2L | - | - | - | T-6F |
| TBS310T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS313T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS316C12 | CSTB-5 | - | - | - | T-20F |
| TBS319C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |

TBS1, TBS3: Inserts → **B136 -** (TP**), **B112** (CP**), CBN → **B168 -**, PCD → **B178**

## TBS4

45° approarch angle with square shank




TBS4**T** shown.

| Designation | øDm | f | h1 | L2 | b | h | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| TBS408T08 | 25 | 3.2 | 7.8 | 9 | 8 | 8 | 40 | 0.4 | TP**0802... |
| TBS410T09 | 38 | 4.2 | 9.8 | 10 | 10 | 10 | 50 | 0.4 | TP**0902... |
| TBS413T11 | 50 | 6.2 | 12.8 | 14 | 13 | 13 | 60 | 0.4 | TP**1102... |
| TBS416C12 | 62 | 7.3 | 15.8 | 22 | 16 | 16 | 80 | 0.8 | CP**1204... |
| TBS419C12 | 72 | 10.3 | 18.8 | 22 | 19 | 19 | 95 | 0.8 | CP**1204... |
| TBS425C16 | 82 | 14.2 | 24.8 | 26 | 25 | 25 | 125 | 1.2 | CP**1605... |

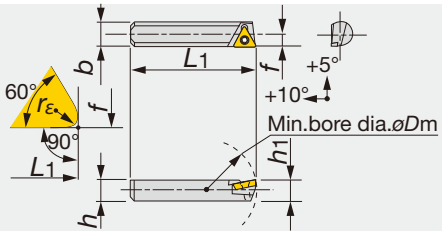
Note: • Figures shown above are of 16 mm or larger square shank types used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBS308T08H)
• TBS116C12 TBS316C12 and TBS416C12 are without-shim types.
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Shim screw | Shim | Wrench | Wrench 1 |
|---|---|---|---|---|---|
| TBS408T08 | CSTB-2L | - | - | - | T-6F |
| TBS410T09 | CSTB-2.2 | - | - | - | T-7F |
| TBS413T11 | CSTB-2.5 | - | - | - | T-8F |
| TBS416C12 | CSTB-5 | - | - | - | T-20F |
| TBS419C12 | CSTB-4F | DTS6-4 | SSC4T3-P | P-4 | T-15F |
| TBS425C16 | CSTB-4F | DTS6-4 | SSC54-P | P-4 | T-15F |

## TBR1

90° approarch angle with round shank




TBR1**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR108T08 | 30 | 4 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR110T09 | 40 | 5 | 8.5 | 8.5 | 10 | 50 | 0.2 | TP**0902... |
| TBR112T11 | 50 | 6 | 10.5 | 10.5 | 12 | 60 | 0.2 | TP**1102... |

Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

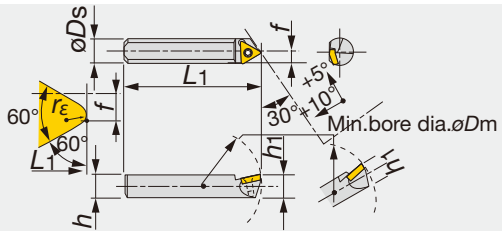
### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR108T08 | CSTB-2L | T-6F |
| TBR110T09 | CSTB-2.2 | T-7F |
| TBR112T11 | CSTB-2.5 | T-8F |

TBS4, TBR1: Inserts → **B136 -** (TP**), **B112** (CP**), CBN → **B168 -**, PCD → **B178**

## TBR3

30° approarch angle with round shank




TBR3**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR305E04 | 19 | 0.5 | 4 | 4 | 5 | 20 | 0.2 | EP**0401... |
| TBR308T08 | 30 | 0.5 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR312T11 | 50 | 1 | 10.5 | 10.5 | 12 | 60 | 0.4 | TP**1102... |
| TBR316T16 | 60 | 1.5 | 14 | 14 | 16 | 80 | 0.8 | TP**16T3... |

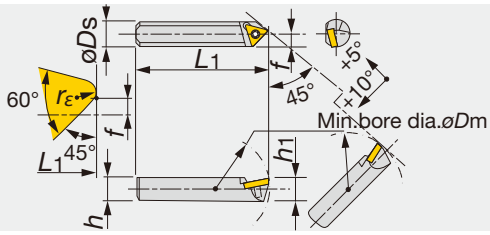
Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR305E04 | CSTB-2 | T-6F |
| TBR308T08 | CSTB-2L | T-6F |
| TBR312T11 | CSTB-2.5 | T-8F |
| TBR316T16 | CSTB-4 | T-15F |

## TBR4

45° approarch angle with round shank




TBR4**T** shown.

| Designation | øDm | f | h1 | h | øDs | L1 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|
| TBR406E04 | 24 | 0 | 5 | 5 | 6 | 25 | 0.2 | EP**0401... |
| TBR408T08 | 30 | 0.5 | 7 | 7 | 8 | 35 | 0.2 | TP**0802... |
| TBR410T09 | 40 | 1 | 8.5 | 8.5 | 10 | 50 | 0.2 | TP**0902... |
| TBR412T11 | 50 | 1 | 10.5 | 10.5 | 12 | 60 | 0.4 | TP**1102... |
| TBR416T16 | 60 | 1.5 | 14 | 14 | 16 | 80 | 0.8 | TP**16T3... |

Note: • Figures shown above are of 6 mm or smaller diameter shank used for normal direction of rotation.
• For the tools used for reverse direction of rotation, letter "H" is added in the last position of the Cat. No. (Example: TBR105E04H)
• For the tools for normal direction of rotation, use a left hand insert, and for reverse direction of rotation, use a right hand insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| TBR406E04 | CSTB-2 | T-6F |
| TBR408T08 | CSTB-2L | T-6F |
| TBR410T09 | CSTB-2.2 | T-7F |
| TBR412T11 | CSTB-2.5 | T-8F |
| TBR416T16 | CSTB-4 | T-15F |

TBR3, TBR4: Inserts → **B122 -** (EP**), **B136 -** (TP**), CBN → **B168 -**, PCD → **B178**

# Top-Borer Tool

## Features

- Indexable insert jig boring tools usable for commercially available adjustable boring heads.
- Minimum bore diameter ø5.5 mm.
- Available in three types of SEXP, SWUB and STUP.

**Applicable for PINZBOHR small diameter finish boring heads.**
(F160)

## Applications by Type

| | |
|---|---|
| SEXP | • Minimum bore diameter: ø5.5 mm.<br>• A 75° rhombic insert is used. Stable insert holding assures precision boring. |
| SWUB | • Available in two sizes of minimum bore diameters of ø7 and ø8 mm.<br>• Uses an economical trigon insert. |
| STUP | • Available in five sizes of minimum bore diameters of ø10, ø12, ø14, ø16 and ø18 mm.<br>• Many standard items make them applicable for a wide range of applications. |

## Designation system for Top-Borer Tools

| Symbol | Material |
|---|---|
| S | Steel |
| C | Carbide |

① Shank material

| Symbol | Min. bore diameter ø$D_m$ |
|---|---|
| 055 | 5.5 |
| 07 | 7 |
| 08 | 8 |
| 10 | 10 |

③ Min. bore dia.

| Symbol | Insert type |
|---|---|
| 04 | EPGT0401□□ |
| 03 | WBGT0301□□ |
| 08 | TPGT0802□□ |
| 11 | TPGT1102□□ |

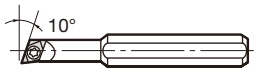
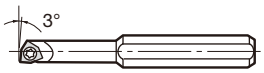
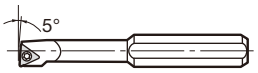
⑥ Applicable insert

| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| S | 08 | 055 | SEXP | R | 04 |

② Shank size

| Symbol | Shank diameter (mm) |
|---|---|
| 08 | 8 |
| 10 | 10 |
| 12 | 12 |
| 16 | 16 |

④ Tool shape

| Symbol | Shape |
|---|---|
| SEXP |   |
| SWUB |   |
| STUP |   |

⑤ Hand of cartridge

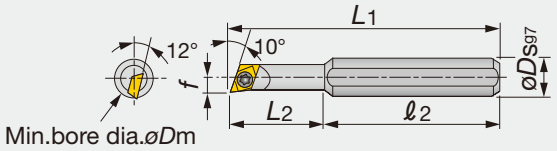
| Symbol | Hand |
|---|---|
| R | Right |
| L | Left |
| N | Neutral |

**Avilable holders are supplied from tooling manufactures.**

# Top-borer tool

## S/C-SEXPR/L

Top-Borer Tools, for posi 75° rhombic insert with 11° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S08055-SEXPR04 | STEEL | 5.5 | 8 | 2.8 | 45 | 19 | 26 | 0.4 | EP**0401... |
| S10055-SEXPR04 | STEEL | 5.5 | 10 | 2.8 | 51 | 19 | 32 | 0.4 | EP**0401... |
| S12055-SEXPR04 | STEEL | 5.5 | 12 | 2.8 | 51 | 19 | 32 | 0.4 | EP**0401... |
| C10055-SEXPR04 | CARBIDE | 5.5 | 10 | 2.8 | 62 | 30 | 32 | 0.4 | EP**0401... |
| C12055-SEXPR04 | CARBIDE | 5.5 | 12 | 2.8 | 62 | 30 | 32 | 0.4 | EP**0401... |

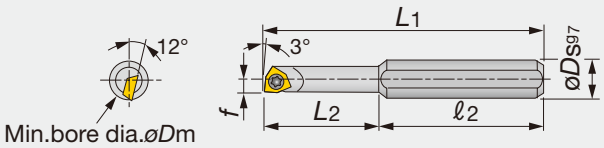
Note: • When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S/C-SEXPR | CSTB-2 | T-6F |

## S/C-SWUBR

Top-Borer Tools, for posi trigon insert with 5° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S1008-SWUBR03 | STEEL | 8 | 10 | 4.1 | 60 | 28 | 32 | 0.4 | WBGT0301... |
| S1208-SWUBR03 | STEEL | 8 | 12 | 4.1 | 60 | 28 | 32 | 0.4 | WBGT0301... |
| C1008-SWUBR03 | CARBIDE | 8 | 10 | 4.1 | 76 | 44 | 32 | 0.4 | WBGT0301... |
| C1208-SWUBR03 | CARBIDE | 8 | 12 | 4.1 | 76 | 44 | 32 | 0.4 | WBGT0301... |

Note: • The hole of inserts conforms to ISO standard. When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

### SPARE PARTS

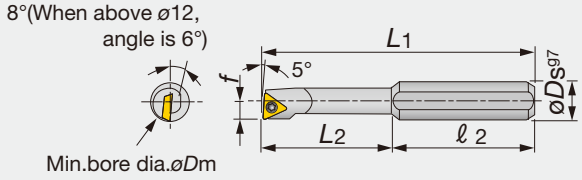
| Designation | Clamping screw | Wrench |
|---|---|---|
| S/C-SWUBR | CSTB-2 | T-6F |

S/C-SEXPR/L: Inserts → **B122 -,** CBN → **B171,** PCD → **B178**

S/C-SWUBR/L: Inserts → **B151**

## S/C-STUPR/L

Top-Borer Tools, for posi triangle insert with 11° clearance




Right hand (R) shown.

| Designation | Material | øDm | øDs | f | L1 | L2 | ℓ2 | rε** | Insert |
|---|---|---|---|---|---|---|---|---|---|
| S0810-STUPR08 | STEEL | 10 | 8 | 5 | 61 | - | - | 0.4 | TPGT0802... |
| S1010-STUPR08 | STEEL | 10 | 10 | 5 | 67 | 35 | 32 | 0.4 | TPGT0802... |
| S1210-STUPR08 | STEEL | 10 | 12 | 5 | 67 | 35 | 32 | 0.4 | TPGT0802... |
| S1212-STUPR08 | STEEL | 12 | 12 | 6 | 74 | 42 | 32 | 0.4 | TPGT0802... |
| S1212-STUPR11 | STEEL | 12 | 12 | 6 | 74 | 42 | 32 | 0.4 | TP*T1102... |
| S1214-STUPR11 | STEEL | 14 | 12 | 7 | 81 | - | - | 0.4 | TP*T1102... |
| C1010-STUPR08 | CARBIDE | 10 | 10 | 5 | 87 | 55 | 32 | 0.4 | TP*T0802... |
| C1210-STUPR08 | CARBIDE | 10 | 12 | 5 | 87 | 55 | 32 | 0.4 | TP*T0802... |
| C1212-STUPR11 | CARBIDE | 12 | 12 | 6 | 98 | 66 | 32 | 0.4 | TP*T1102... |
| C1214-STUPR11 | CARBIDE | 14 | 12 | 7 | 109 | 84 | 25 | 0.4 | TP*T1102... |

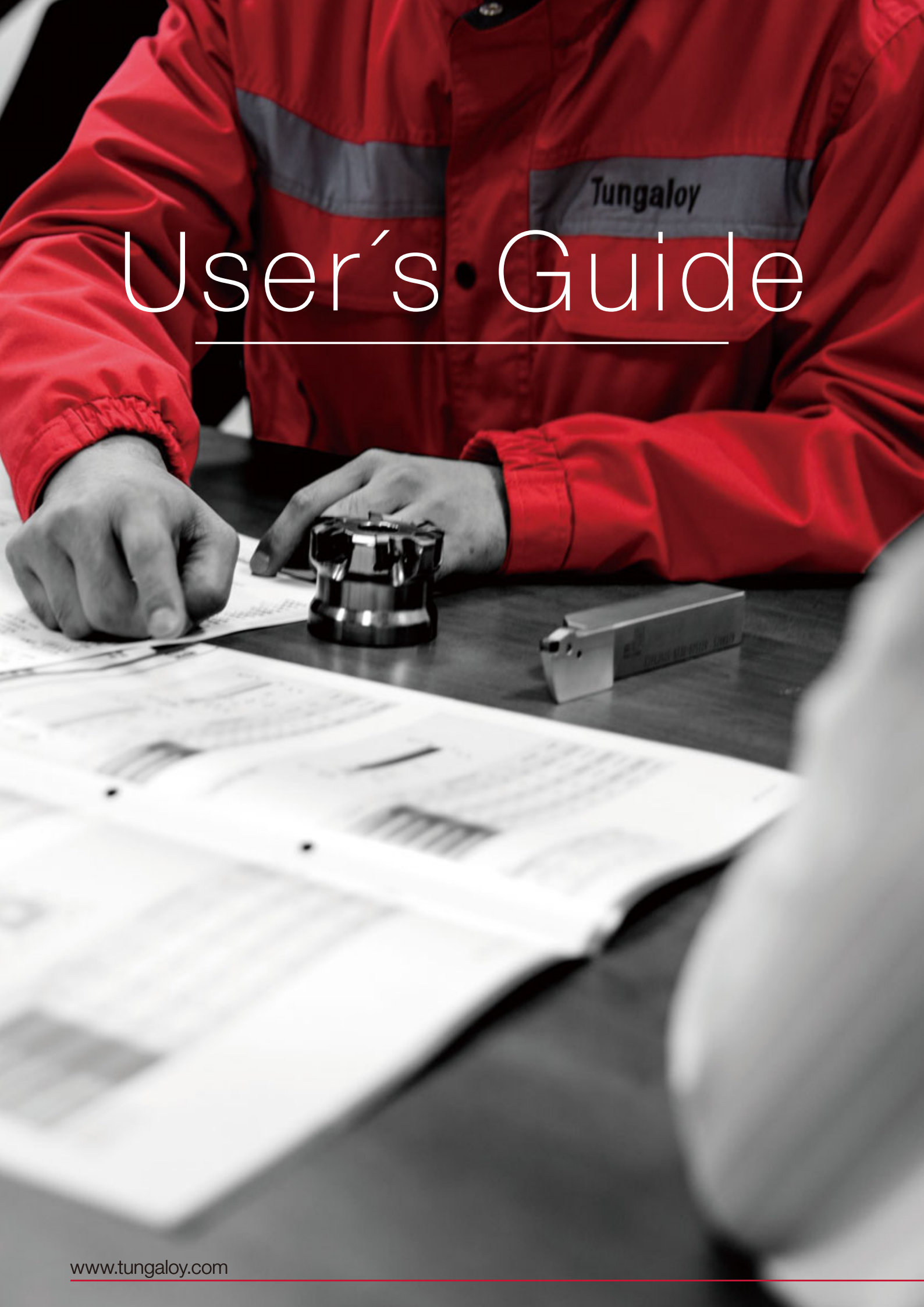
Note: • When using an insert with hand, right hand (R) holders use a left hand (L) insert.
• Left hand (L) holders use a right hand (R) insert.
• **rε: Standard corner radius

### SPARE PARTS

| Designation | Clamping screw | Wrench |
|---|---|---|
| S**10-STUPR08 | CSTB-2L040 | T-6F |
| S1212-STUPR08 | CSTB-2L | T-6F |
| S121*-STUPR11 | CSTB-2.5 | T-8F |
| C1*10-STUPR08 | CSTB-2L040 | T-6F |
| C121*-STUPR11 | CSTB-2.5 | T-8F |

S/C-STUPR/L: Inserts → **B136 -**, CBN → **B168 -**, PCD → **B178**

MEMO




# User´s Guide

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# USER´S GUIDE

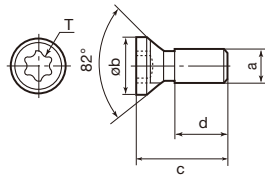
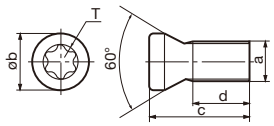
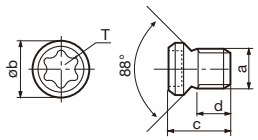
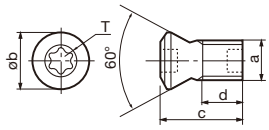
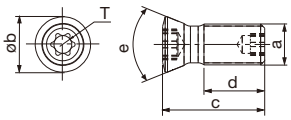

Parts for Tools G002

Technical Reference G029

Alphanumeric Index G084

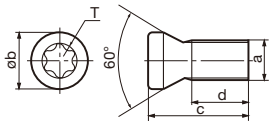
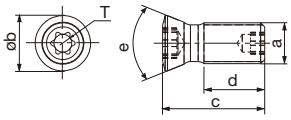
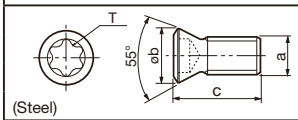
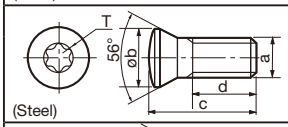
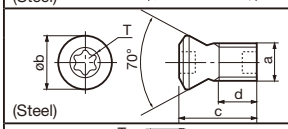
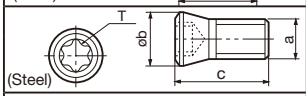
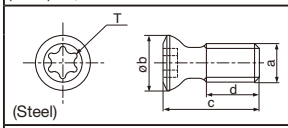
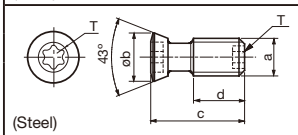
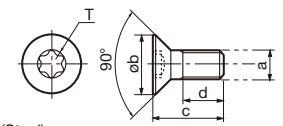
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | T / f | |
|  | CSTA-NO2 | #2-56UNC | 4 | 6 | 4 | 82 | T8 | 1.3 |
| | CSTA-NO2S | | | 5 | 3 | | | |
| | CSTA-NO2L | | | 8 | 6 | | | |
| | CSTA-NO3 | #3-48UNC | 4.3 | 7 | 4 | | T9 | 2.3 |
| | CSTA-NO5 | #5-40UNC | 5 | 8 | 5 | | | |
| | CSTA-1.6 | M1.6x0.35 | 2.5 | 3.1 | 0.9 | | T6 | 0.6 |
| | CSTA-4 | M4x0.7 | 7 | 10 | 7.7 | | T15 | 3.5 |
| | CSTA-5 | M5x0.8 | 7.2 | 15 | 11 | | | |
| | CSTA-5S | | | 12 | 8 | | | |
| | CSTA-5SS | | | 9.5 | 5.5 | | | |
| | CSTA-5ST25 | | | 12 | 8 | | T25 | 5 |
| | CSPA-5IP15 | | 7.1 | 15 | 11 | | 15IP | 3.5 |
| | CSPA-5SIP15 | | | 12 | 8 | | | |
| | CSPA-5IP20 | | | 15 | 11 | | 20IP | 5 |
| (Steel) | CSPA-5SIP20 | | | 12 | 8 | | | |
|  | CSP-2L033 | M2x0.4 | 2.6 | 3.3 | 1.9 | 88 | 6IP | 0.7 |
| | CSTB-2 | | 2.7 | 3.3 | 1.4 | 60 | T6 | 0.7 |
| | CSTB-2L | | | 5.2 | 3.3 | | | |
| | CSTB-2L040 | | | 4 | 2.1 | | | |
| | CSTB-2.2 | M2.2x0.45 | 3.5 | 6.1 | 3.5 | | T7 | 1 |
| | CSTB-2.2L038 | | | 3.8 | 2.2 | | | |
| | CSTB-2.2S | | | 4.6 | 2 | | | |
| | CSTB-2.2R | | 3.1 | 6.1 | 3.7 | | | |
| | CSTB-2.5 | M2.5x0.45 | 3.5 | 6 | 3.4 | | T8 | 1.3 |
| | CSTB-2.5L080 | | | 8 | 5.4 | | | |
| | CSTB-2.5B | | | 5.5 | 2.6 | | | |
| | CSTB-2.5S | | | 4.8 | 2.2 | | | |
|  CSP-2L033 type shown | CSTB-3 | M3x0.5 | 4.1 | 8 | 4.5 | | T9 | 2.3 |
| | CSTB-3L042 | | | 4.2 | 0.7 | | | |
| | CSTB-3L050 | | | 5 | 2 | | | |
| | CSTB-3L081 | | 4.2 | 8.1 | 4.7 | | T8 | 1.3 |
| | CSTB-3S | | 4.1 | 6 | 2.5 | | T9 | 2.3 |
| | CSTB-3.5ST | M3.5x0.6 | 5.5 | 12.5 | 4 | | T15 | 3.5 |
| | CSTB-3.5H | | 5.2 | 6.5 | 3.1 | | | |
| | CSTB-3.5 | | 5.5 | 8.4 | 4.3 | | | |
| | CSTB-3.5T | | 6.5 | 10 | 5.5 | | T20 | 5 |
| | CSTB-3.5TS | | | 8.5 | 4 | | | |
|  CSTB-4SD type shown | CSTB-3.5D | | 4.7 | 8.4 | 4.9 | | T9 | 2.3 |
| | CSTB-3.5L110 | | 5.5 | 11 | 7.5 | | T15 | 3.5 |
| | CSTB-3.5L115 | | 4.8 | 11.5 | 7 | | T10 | 2.5 |
| | CSTB-3.5L115-S | | 4.8 | 11.5 | 6.5 | | | 3.5 |
| | CSTB-3.5L | | 5.5 | 12.5 | 8.4 | | T15 | 3.5 |
| | CSTB-4 | M4x0.7 | | 11.4 | 7.4 | | | |
| | CSTB-4L060 | | | 6 | 2 | | | |
| | CSTB-4L085 | | | 8.48 | 3.48 | | | |
|  CSTC-4L type shown | CSTB-4L090 | | 5.7 | 9 | 5.5 | | | |
| | CSTB-4L115-S | | 5.5 | 11.5 | 6.5 | | | 5.5 |
| | CSTB-4S | | 5.5 | 8 | 4 | | | 3.5 |
| | CSTB-4ST | M4x0.5 | 6.4 | 14.7 | | | | |
| | CSTB-4SD | M4x0.7 | 5.5 | 8 | | | T8 | 1.3 |
| | CSTB-4M | | | 9.5 | 5.5 | | T15 | 3.5 |
| | CSTB-4F | M4x0.5 | 7 | 14.7 | 8.7 | | | |
| | CSTB-4TS | M4x0.7 | 6.5 | 9 | 4.5 | | T20 | 5 |
| | CSTB-5 | M5x0.8 | 7 | 12 | 7.5 | | | |
| | CSTB-5S | | | 9.5 | 5 | | | |
| | CSTB-5L105 | | | 10.5 | 6.1 | | | |
| | CSTB-5L120 | | | 12 | 6.5 | | | |
| | CSTB-5L159 | | 7.2 | 15.9 | 11.2 | | | |
| | CSTB-5L163-S | | 6.9 | 16.3 | 11.3 | | | 6 |
| | CSTC-4L055DR | M4x0.5 | 5.42 | 5.5 | 2 | 44 | T8/T10 | 1.3/2.5 |
| | CSTC-4L055DL | M4x0.5 | 5.42 | 5.5 | 2 | | T8/T10 | 1.3/2.5 |
| | CSTC-4L100DR | M4x0.7 | 5.42 | 10 | 5.95 | | T8/T10 | 1.3/2.5 |
| | CSTC-4L100DL | M4x0.7 | 5.42 | 10 | 5.95 | | T8/T10 | 1.3/2.5 |
| | CSPB-2L043 | M2x0.4 | 2.7 | 4.3 | 2.5 | 60 | 6IP | 0.7 |
| (Steel) | CSPB-2H | | 2.6 | 3.4 | 1.6 | | | |

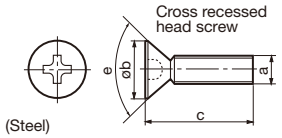
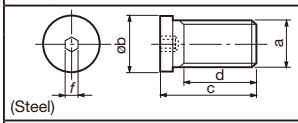
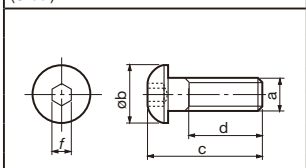
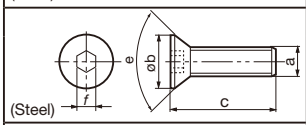
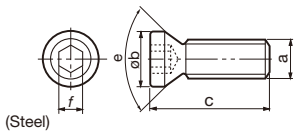
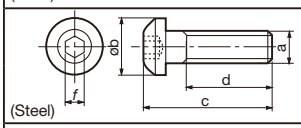
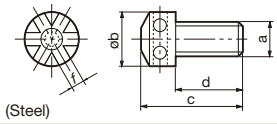
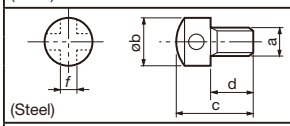
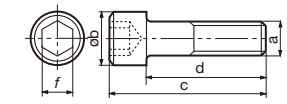
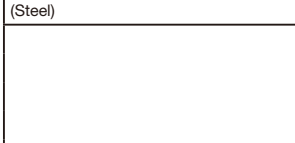
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | T / f | |
|  | CSPB-2.2 | M2.2x0.45 | 3 | 6 | 3.9 | 60 | 7IP | 1 |
| | CSPB-2.2SH | | | 4 | 2 | | | 1.1 |
| | CSPB-2.5 | M2.5x0.45 | 3.5 | 6 | 3.5 | | 8IP | 1.3 |
| | CSPB-2.5S | | | 4.2 | 1.7 | | | |
| | CSPB-2.5SH | | 3.3 | 5.2 | 3.3 | | 7IP | 1.1 |
| | CSPB-3.5 | M3.5x0.6 | 5.2 | 9 | 5.6 | | 15IP | 3.5 |
| | CSPB-3.5S | | | 6.5 | 3.1 | | | |
| | CSPB-4 | M4x0.7 | 5.5 | 11.6 | 7.4 | | | |
| | CSPB-4S | | | 8.2 | 4 | | | |
| | CSPB-5 | M5x0.8 | 7 | 12 | 7.5 | | 20IP | 5 |
| | VX040024A | M4 | 5.45 | 9 | 6 | 60 | T15 | 4.5 |
| | VX040028A | M4 | 5.2 | 9.7 | 4.7 | 44 | T15 | 4.5 |
|  | SR14-500/L5.1 | M4 | 5.5 | 5.1 | 2.3 | 60 | T15 | 3.5 |
| | SR14-500-L7.0 | M4 | 5.5 | 7 | 4.2 | | T15 | 3.5 |
| | SR14-562 | M3.5 | 4.8 | 8.75 | 5.55 | | T10 | 3.5 |
| | SR14-562/S | M3.5 | 4.8 | 6.5 | 3.3 | | T10 | 3.5 |
| | SR14-591 | M5x0.8 | 6.6 | 13.5 | 7.6 | | T20 | 5 |
| | SR34-508 | M2.2x0.45 | 3.15 | 4.6 | 2.67 | | T7 | 0.9 |
| | SR34-514 | M2.5x0.45 | 3.3 | 5.2 | 3.2 | | T7 | 0.9 |
| | SR76-943 | M6 | 9.6 | 20 | 10 | 90 | T20 | 5 |
| SCREW TORX M4 L=9.5MM type shown | SR76-961 | M5 | 6.6 | 13.5 | 7.35 | 61 | T15 | 3.5 |
| | SR76-963 | M5 | 8.6 | 20 | 9.6 | 91 | T15 | 3.5 |
| | SR114-018-L3.40 | M2.5 | 3.6 | 3.35 | 2 | 56 | T6 | 0.7 |
| | SM40-143-H0 | M4X0.7 | 5.6 | 14.3 | 8.4 | 61 | T15 | 3.5 |
| | TS25F080A | M2.25X0.35 | 3.7 | 6.9 | 2.1 | 60 | T8 | 1.3 |
| | TS30F100A | M3X0.35 | 4.6 | 8.3 | 2.2 | | T10 | 2.5 |
| | TS40085I/HG | M4 | 5.7 | 8.5 | 4.5 | | T15 | 3.5 |
| | TS40093I/HG | M4 | 5.7 | 9.3 | 4.3 | | T15 | 3.5 |
| | TS40B100I | M4 | 6 | 10 | 6 | R3.0 | T15 | 3.5 |
| | TS40F120A | M4X0.5 | 6 | 10.6 | 3 | 60 | T15 | 3.5 |
| | TS45120I | M4.5 | 6.9 | 12 | 7.5 | R3.5 | T20 | 5 |
| | TS50115I | M5 | 7 | 11.35 | 6.4 | 60 | T20 | 5 |
| | TS50F160A | M5X0.5 | 7 | 13.9 | 3.5 | | T20 | 5 |
| | TS60F200A | M6X0.75 | 8.2 | 16.7 | 4.5 | | T20 | 7 |
| | TS70F250A | M7X0.75 | 10 | 21 | 5.6 | | T25 | 7 |
| (Steel) | TS80F300A | M8X1.0 | 12 | 25 | 7.3 | | T30 | 10 |
|  | CSPD-1.8S | M1.8x0.35 | 2.4 | 3.3 | 1.4 | 55 | 6IP | 0.7 |
| | CSTD-3T | M3x0.5 | 4.3 | 7 | 4.5 | | T10 | 2.5 |
| | CSPD-3 | | | | 4.2 | | 10IP | 2.5 |
| (Steel) | | | | | | | | |
|  | CSTB-4.5L110P | M4.5X0.75 | 6.6 | 11.7 | 7 | 56 | T15 | 3.5 |
| (Steel) | | | | | | | | |
|  | SRM5X0.8IP20X+ACROLYTE | M5X0.8 | 9.2 | 15 | 9.8 | 70 | 20IP | 7.5 |
| (Steel) | | | | | | | | |
|  | CSTC-2 | M2x0.4 | 3.1 | 5.1 | - | | T6 | 0.7 |
| (Steel) | | | | | | | | |
|  | CSTR-4L100 | M4x0.7 | 5.7 | 10 | 5.5 | - | T15 | 3.5 |
| (Steel) | | | | | | | | |
|  | SR16-212-01397 | M5x0.8 | 6.4 | 12.5 | 6.8 | 43 | T20/T10 | 2.5 |
| | SR16-212-01397L | | | | | | | |
| (Steel) | | | | | | | | |
|  | CST-3.5 | M3.5X0.6 | 6 | 4.8 | - | 90 | T9 | 2.3 |
| | CST-3.5S | | | 3.5 | - | | | |
| | CST-5 | M5x0.8 | 10 | 18 | 13 | | T25 | 5 |
| | CST-5S | | | 12 | 7 | | | |
| (Steel) | CSTF-2L055-S | M2x0.4 | 2.7 | 5.5 | 3.8 | | T6 | 0.7 |

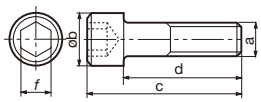
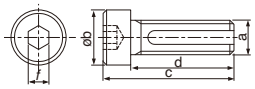
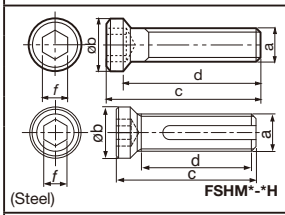
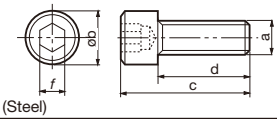
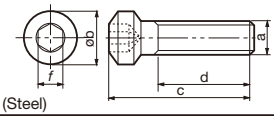
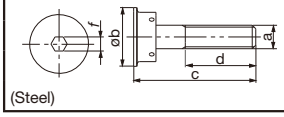
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | T / f | e | |
|  Cross recessed head screw (Steel) | **SM2.5×0.45×8** | M2.5x0.45 | 5 | 8 | - | - | 90° | - |
| | **SM2.5×0.5×8** | M2.5x0.5 | 5 | 8 | - | - | 90° | - |
| | **SM3×0.5×6** | M3x0.5 | 6 | 6 | - | - | 90° | - |
| | **SM3×0.5×8** | | | 8 | - | - | 90° | - |
| | **SM3×0.5×10** | | | 10 | - | - | 90° | - |
|  (Steel) | **MSP-5** | M5x0.8 | 6.1 | 7.9 | 4.9 | 2 | | 1.5 |
| | **MSP-6.3** | M6.3x1 | 7.7 | 12.7 | 9.9 | 2.5 | | 3 |
|  (Steel) | **BHM3-8** | M3x0.5 | 5.5 | 10 | 8 | 2 | | 1.5 |
| | **BHM4-8** | M4x0.7 | 7 | 10.6 | | 2.5 | | 2.2 |
| | **BHM4-10** | | | 12.6 | 10 | | | |
| | **BHM5-14** | M5x0.8 | 9 | 17.6 | 14 | 3 | | 3 |
| | **BHM6-20-A** | M6x1.0 | 10.5 | 24 | 20 | 4 | | 5 |
| | **BHM8-25U** | M8 | 14 | 29.3 | 25 | 5 | | 8.5 |
| | **BHM8-30U** | | | 34.3 | 30 | | | |
|  (Steel) | **CSHM-3-8** | M3 | 6 | 8 | - | 2 | 90° | 1.5 |
|  (Steel) | **CSHB-4-A** | M4 | 5.5 | 11 | | T15 | 60° | 2 |
| | **CSHB-6** | M6 | 8.5 | 19 | - | 4 | 60° | 5 |
| | **CSHB-6-A** | M6 | 8.5 | 19 | | | | 5 |
|  (Steel) | **RT-1** | M6 | 10 | 22.5 | 14 | 4 | | 5 |
| | **RT-2** | M8 | 13 | 31 | 20 | 5 | | 8.5 |
|  (Steel) | **ASM6** | M6 | 10 | 18 | 12 | 3 | | - |
| | **AJM5F** | M5x0.5 | 9 | 13 | 8 | 2 | | - |
| | **AJM5** | M5x0.8 | 9 | 13 | 8 | 2 | | - |
|  (Steel) | **ASM34S** | M3 | 4.8 | 8 | 5 | 2 | | - |
| | **ASM34L** | | | 11 | 8 | | | - |
| | **ASM54** | M5x0.8 | 9 | 14 | 9 | 3 | | - |
|  (Steel) | **CHHM3.5-10** | M3.5x0.6 | 6 | 13.5 | 10 | 3 | | 3 |
| | **CHHM4-10** | M4x0.7 | 7 | 14 | | | | |
| | **CHHM5-14** | M5x0.8 | 8.5 | 19 | 14 | 4 | | 5 |
| | **CHHM5-18** | | | 23 | 18 | | | |
| | **CHHM6-15** | M6 | 10 | 21 | 15 | 5 | | 8.5 |
| | **CHHM6-20** | | | – | 20 | | | |
| | **CHHM6-25** | | | 31 | 25 | | | |
|  Hex. socket head screw (JISB1176) (Steel) | **CM3X0.5X6** | M3x0.5 | 5.5 | 9 | 6 | 2.5 | | 2.2 |
| | **CM3X0.5X10** | | | 13 | 10 | | | |
| | **CM4X0.7X10** | M4x0.7 | 7 | 14 | | 3 | | 3 |
| | **CM4X0.7X12** | | | 16 | 12 | | | |
| | **CM4X0.7X14** | | | 18 | 14 | | | |
| | **CM4X0.7X15** | | | 19 | 15 | | | |
| | **CM4X0.7X20** | | | 24 | 20 | | | |
| | **CM4X0.7X20-M0-A** | | 6 | 24 | 20 | | | |
| | **CM5X0.8X8** | M5x0.8 | 8.5 | 13 | 8 | 4 | | 5 |
| | **CM5X0.8X10-A** | | | 15 | 10 | | | |
| | **CM5X0.8X12** | | | 17 | 12 | | | |
| | **CM5X0.8X12-A** | | | 17 | 12 | | | |
| | **CM5X0.8X14** | | | 18 | 14 | | | |
| | **CM5X0.8X16** | | | 21 | 16 | | | |
| | **CM5X0.8X16-A** | | | 21 | 16 | | | |
| | **CM5X0.8X18** | | | 23 | 18 | | | |
| | **CM5X0.8X20-A** | | | 25 | 20 | | | |
| | **CM5X0.8X25-A** | | | 30 | 25 | | | |
| | **CM5X15** | M5 | | 20 | 15 | | | |

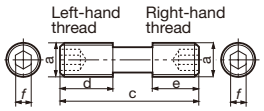
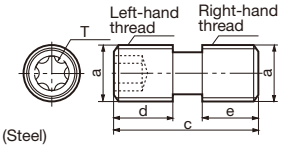
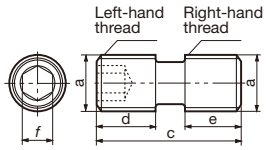
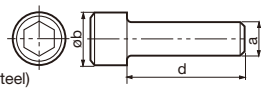
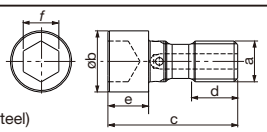
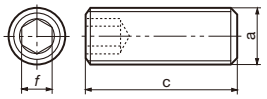
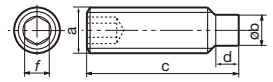
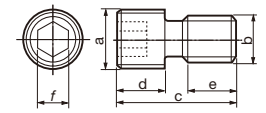
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) | | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|---|
| | | a | øb | c | d | e | f | g | |
|  Hex. socket head screw (JISB1176) | CM6X1X16-A | M6x1.0 | 10 | 22 | 16 | | 5 | | 8.5 |
| | CM6X1X20-A | | | 26 | 20 | | | | |
| | CM6X1X25-A | | | 31 | 25 | | | | |
| | CM6X1.0X40-A | | | 46 | 40 | | | | |
| | CM6X10 | M6 | | 16 | 10 | | | | |
| | CM6X15 | | | 21 | 15 | | | | |
| | CM6X16 | | | 22 | 16 | | | | |
| | CM6X20 | | | 26 | 20 | | | | |
| | CM6X25 | | | 31 | 25 | | | | |
| | CM6X30-S | M6x1.0 | 10 | 35.7 | 28 | | | | |
| | CM8X1.25X20-A | M8x1.25 | 13 | 28 | 20 | | 6 | | 25 |
| | CM8X1.25X25-A | | | 33 | 25 | | | | |
| | CM8X30H | | | 36 | 30 | | 5 | | |
| | CM10X30 | M10x1.5 | 16 | 30 | 20 | | 8 | | 40 |
| | CM10X30H | | 16 | 38 | 30 | | 6 | | 40 |
| | CM12X30H | M12x1.75 | 18 | 40 | | | 8 | | 70 |
| | CM16X40H | M16x2 | 24 | 54 | 40 | | 10 | | 100 |
| | CM16x75 | M16 | 24 | 75 | 51 | | 14 | | 100 |
| | CM16x120 | M16 | 24 | 120 | 96 | | 14 | | 100 |
| | CM16x140 | M16 | 24 | 140 | 116 | | 14 | | 100 |
|  CM***H | CM20x80 | M20 | 30 | 80 | 50 | | 17 | | 150 |
| | CM20x120 | M20 | 30 | 120 | 90 | | 17 | | 150 |
| | CM20x150 | M20 | 30 | 150 | 120 | | 17 | | 150 |
| | CAP-CM12x1.75x50 | M12 | 18 | 50 | 38 | | 10 | | 70 |
| | CAP-CM16X2.0X55 | M16 | 24 | 55 | 39 | | 14 | | 40 |
| | CAP-CM20X2.5X50 | M20 | 30 | 50 | 30 | | 17 | | 100 |
| | C0.375X1.125H | 3/8-24UNF | 14.27 | 38.11 | 28.58 | | 5.55 | | 35 |
| | C0.500X1.375H | 1/2-20UNF | 19.05 | 47.63 | 34.93 | | 7.94 | | 70 |
| | SD06-A3 | M10x1.5 | 16 | 70 | 60 | | 8 | | 40 |
| | SRM6X16DIN912-12.9 | M6x1 | 10 | 22 | 14.1 | | 5 | | |
| | VC00TEDI12040F | M12 | 26 | 51 | 40 | | 8 | | 60 |
| | VC00TEDI20040F | M20 | 49 | 50 | 34.5 | | 12 | | 150 |
| | VC00TANG16040F | M16 | 46 | 46.5 | 33 | | 10 | | 60 |
| | SD08-98 | M12x1.75 | 18 | 77 | 65 | | 10 | | 70 |
| | LHM12x1.75x30-C | M12 | 18 | 36.9 | 30 | | 8 | | 70 |
| | VC004762I10035F | M10 | 16 | 45 | 34.5 | | 8 | | 60 |
| | FCS3 | M3x0.5 | 5.5 | 16 | 12 | | 2.5 | | |
| (Steel) | FCS6 | M6x1 | 10 | 26 | 20 | | 5 | | |
|  (Steel) FSHM*-*H | FSHM8-30 | M8x1.25 | 11 | 30 | 27 | | 5 | | 25 |
| | FSHM8-30H | | | | | | | | 25 |
| | FSHM10-40 | M10 | 14 | 40 | 36.5 | | 6 | | 40 |
| | FSHM10-40H | | | | | | | | 40 |
|  (Steel) | SHCM4-10 | M4x0.7 | 6 | 14 | 10 | | 3 | | 3 |
| | SHCM4-12 | | | 16 | 12 | | | | |
| | SHCM4-16 | | | 20 | 16 | | | | |
|  (Steel) | CTS-M6 | M6x1 | 10 | 25 | 16.4 | | 4 | | 5 |
|  (Steel) | RSFTS-050M | M10 | 25 | 52 | 42.5 | | 6 | | |

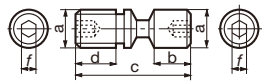
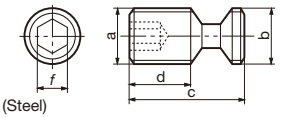
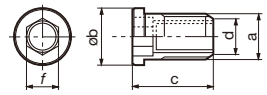
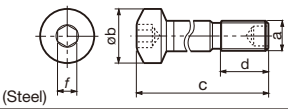
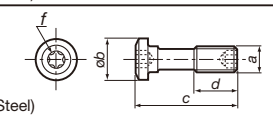
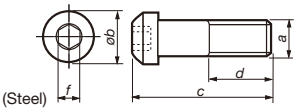
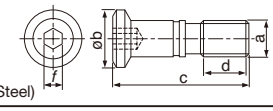
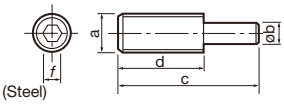
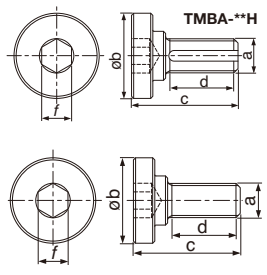
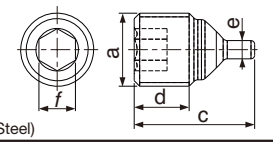
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) a | øb | c | d | e | T / f | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
|   (Steel) | **MCS520-2.5** | M5×0.8 | | 20 | 7 | 6 | 2.5 | 3 |
| | **MCS620-3** | M6×1 | | | | 7 | 3 | 6 |
| | **MCS625-3** | | | 25 | 10 | 8 | | |
| | **MCS825-4** | M8×1 | | | 12.5 | 6.5 | 4 | 8 |
| | **MCS828-4** | | | 28.5 | 12 | 10.5 | | |
| | **NDS-8A** | | | 30 | 11.5 | 11.5 | | |
| | **NDS-8S** | M8×1.25 | | 20 | 8 | 8 | | |
| | **RSRGR5M40** | M4 | | 9 | 3.67 | 4.17 | T8 | |
| | **SR PS 118-0273** | M10 | | 40 | 16.5 | 15 | 5 | 40 |
|   (Steel) | **DS-6T** | M6 | | 15 | 6 | 6 | | 3.5 |
| | **DS-6P** | M6×1 | | 21 | 7 | 7 | 15IP | 6 |
| | **FDS-8ST** | M8×1 | | 20 | 8 | 8 | T27 | 10 |
| | **FDS-8ST-18** | | | 18 | | 6 | | |
| | | | | | | | | |
|   (Steel) | **DS-6** | M6×1 | | 15 | 6 | 6 | 3 | 6 |
| | **DS-8** | M8×1.25 | | 16 | 7 | 7 | 4 | 8 |
| | **DS-8S** | | | 13 | 5.5 | 5.5 | | |
| | **DS-10** | M10×1.5 | | 26 | 10 | 12 | 5 | 8 |
| | **FDS-6Z** | M6×0.75 | | 20.5 | | 5.5 | 3 | 6 |
| | **FDS-8** | M8×1 | | 26 | | 10 | 4 | 8 |
| | **FDS-8S** | | | 20 | 8 | 8 | | |
| | **FDS-8SS** | | | 18.5 | | 6.5 | | |
|   (Steel) | **SS100** | 1/4-20UNC | | | 19.05 | | | |
| | **S-412** | 10-32UNF | | | 19.05 | | | |
| | | | | | | | | |
|   (Steel) | **SHM8x1.25x35-C** | M8 | 13 | 43 | 23 | 8 | 6 | 25 |
| | **SHM10x1.5x30-C** | M10 | 16 | 40 | 17 | 10 | 8 | 40 |
| | **SHM16x2x35-C** | M16 | 24 | 51 | 18 | 16 | 14 | 100 |
| | **SHM20x2.5x40-C** | M20 | 30 | 58 | 20 | 18 | 17 | 150 |
| Hex. socket screw (Flat end)(JISB1177)   | **SSHM2.5-3** | M2.5 | | 3 | | | | |
| | **SSHM3-3** | M3 | | 3 | | | 1.5 | 1 |
| | **SSHM3-4** | | | 4 | | | | |
| | **SSHM3-6** | | | 6 | | | | |
| | **SSHM4-4** | M4 | | 4 | | | 2 | 1.5 |
| | **SSHM4-5** | | | 5 | | | | |
| | **SSHM4-6** | | | 6 | | | | |
| | **SSHM4-8** | | | 8 | | | | |
| | **SSHM4-10** | | | 10 | | | | |
| | **SSHM4-14** | | | 14 | | | | |
| | **SSHM5-6** | M5 | | 6 | | | 2.5 | 2 |
| | **SSHM5-10** | | | 10 | | | | |
| | **SSHM5-16** | | | 16 | | | | |
| | **SSHM6-12** | M6 | | 12 | | | 3 | 3 |
| | **SSHM6-16** | | | 16 | | | | |
| | **SSHM6-18** | | | 18 | | | | |
| | **SSHM6-20** | | | 20 | | | | |
| | **SSHM8-8** | M8 | | 8 | | | 4 | 5 |
| | **SSHM8-10** | | | 10 | | | | |
| | **SSHM8-12** | | | 12 | | | | |
| | **SSHM8-14** | | | 14 | | | | |
| | **SSHM8-16** | | | 16 | | | | |
| (Steel) | **SSHM8-18** | | | 18 | | | | |
|   Hex. socket screw (Cylindrical end) (JISB1177) (Steel) | **M5×7** | M5 | 3.5 | 7 | 1.25 | - | 2.5 | 2 |
| | **M5×8** | | | 8 | | - | | |
| | **M5×10** | | | 10 | | - | | |
| | **M6×30** | M6 | 4 | 30 | 1.5 | - | 3 | 3 |
|   (Steel) | **JDS-3525** | M3.5x0.35 | M2.5 x0.45 | 7.5 | 3 | 2.5 | 2 | 1 |
| | **JDS-5040** | M5x0.5 | M4 x0.7 | 10 | 4 | 4 | 2.5 | 1 |
| | | | | | | | | |

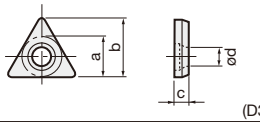
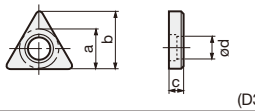
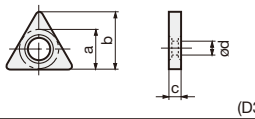
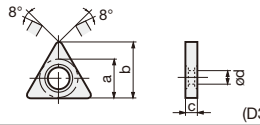
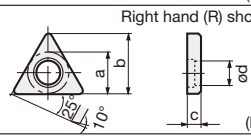
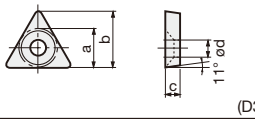
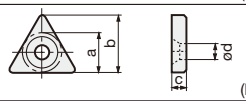
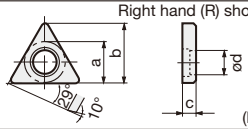
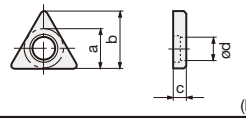
# User's Guide- Parts for Tools

## Screws

| Shape | Designation | Dimension (mm) | | | | | | Torque (N·m) |
|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | T / f | |
|  LCS2 has a hex. socket in threaded end only. (Steel) | **LCS2** | M5 | 5 | 14 | 6.5 | | 2 | 1.5 |
| | **LCS3** | M6 | 6 | 17 | | | 2.5 | 2 |
| | **LCS3B** | | | 15 | | | | |
| | **LCS4** | M8 | 8 | 21 | | | 3 | 3 |
| | **LCS4K** | | | | 9.6 | | | |
| | **LCS4CA** | | | 17.5 | 6.5 | | | |
| | **LCS5** | | | 25 | 8.5 | | | |
| | **LCS5CA** | | | 20.5 | | | | |
| | **LCS6** | M10 | 9.8 | 27.2 | 9.9 | | 4 | 5 |
| | **LCS8** | M12 | 11.8 | 36 | 12.8 | | 5 | 8 |
| | **LCS8C** | M10 | 9.8 | 30.2 | 13.3 | | 4 | 5 |
|  (Steel) | **LCS22** | M5 | M5 | 10 | 4.7 | | 2 | 1.5 |
| | **LCS22A** | M6 | M6 | 10.7 | | | | |
| | **LCS23A** | M5 | M5 | 13.1 | 5.1 | | 2.5 | 2 |
| | **LCS33** | M5 | M5 | 12 | 6.2 | | 2 | 1.5 |
| | **LCS43** | M6 | M6 | 13.5 | 7.3 | | 2.5 | 2 |
|  (Steel) | **DTS5-3.5** | M5 | 6.3 | 8.65 | M3.5 | | 3.5 | 4 |
| | **DTS5-3.5SS** | | | 6.8 | | | | |
| | **DTS5-3.5S** | | | 7 | | | | |
| | **DTS6-4** | M6 | 7.7 | 10.2 | M4 | | 4 | 5 |
| | **DTS6-4.5** | | 7.5 | 10 | M4.5 | | 4.5 | 5 |
|  (Steel) | **DLCS33** | M5 | 9 | 31.5 | 10 | | 3 | 3 |
| | **DLCS43** | M6 | 12 | 34 | 9.5 | | 4 | 5 |
| | **DLCS54** | M8x1 | 14 | 41 | 11 | | | 7 |
| | **DLCS64** | M10x1 | 16 | 50 | 15 | | 5 | 8 |
|  (Steel) | **ACS-5W** | M5 | 8 | 20 | 8.5 | | T15 | 4 |
| | **ACS-6W** | M6 | 10 | 26 | 12.1 | | T20 | 6.4 |
|  (Steel) | **ACS3** | M5x0.8 | 7.5 | 25.6 | 12-15 | | 3 | 4 |
| | **ACS4** | M6x1 | 9 | 27.7 | 14-17 | | 4 | 7 |
|  (Steel) | **WCS3** | M6 | 9.5 | 22.5 | 8 | | 3 | 3 |
| (Steel) | **PT1/4GN** | | 13.175 | 10 | - | | 6 | 9.5 |
| | **1/8-28** | | 9.728 | 7 | - | | 5 | 8 |
|  (Steel) | **LS-8** | M8 | 6 | 33 | 20 | | 4 | 5 |
| (Steel) | **CCS4-A** | | | | | | | |
| | **BH5-10-A** | | | | | | | |
| | **BH4-10-A** | | | | | | | |
| | **BH-40050-A** | | | | | | | |
|  (Steel) | **TMBA-M10** | M10x1.5 | 27 | 30 | 21 | | 8 | 40 |
| | **TMBA-M12** | M12x1.75 | 33 | 36 | 26 | | 10 | 70 |
| | **TMBA-M12H** | M12x1.75 | | 34.5 | | | 8 | |
| | **TMBA-M16** | M16x2 | 40 | 50 | 40 | | 14 | 100 |
| | **TMBA-M16H** | M16x2 | | | | | | |
| | **TMBA-M20** | M20x2.5 | 50 | 56 | 42 | | 17 | 150 |
| | **TMBA-M20H** | M20x2.5 | | | | | | |
| | **TMBA-M24** | M24x3 | 65 | 69 | 55 | | 19 | 150 |
| | **TMBA-M24H** | M24x3 | | | | | | |
| | **TMBA-0.500H** | 1/2-20UNF | 33 | 33.9 | 25.4 | | 7.94 | 70 |
| | **TMBA-0.750H** | 3/4-16UNF | 50 | 58.28 | 47.28 | | 12.7 | 150 |
|  (Steel) | **SR-10400611** | M4X0.5 | | 6.6 | 3 | 1 | 2 | |

# User's Guide- Parts for Tools

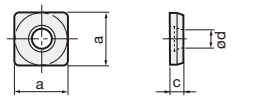
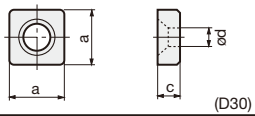
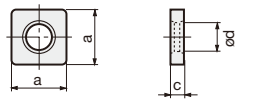
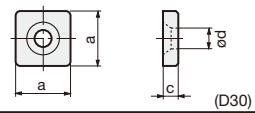
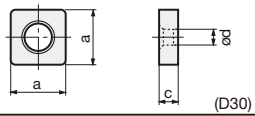
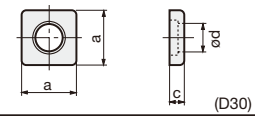
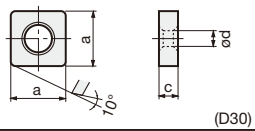
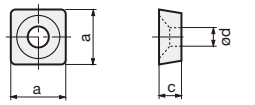
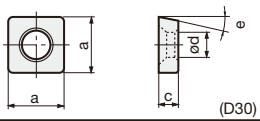
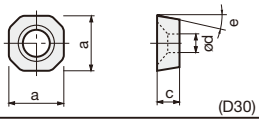
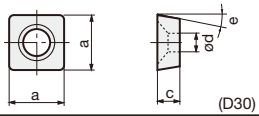
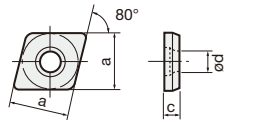
## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | |
|  (D30) | **AST322** | 9.3 | 13.2 | 3.2 | 4.4 | |
| | **AST422** | 12.5 | 18 | 3.2 | 4.4 | |
| | | | | | | |
|  (D30) | **MST-322** | 9.1 | 12.9 | 3.24 | 5.8 | |
| | **MST-432** | 12.5 | 17.9 | 4.8 | 7.3 | |
| | **MST-533** | 15.6 | 22.2 | | 9.7 | |
| | **MST-644** | 18.8 | 26.6 | 6.4 | 11.3 | |
|  (D30) | **LST317** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST42** | 12.5 | 18 | 3.2 | 6.7 | |
| | **LST53** | 15.7 | 22.3 | 4.8 | 7.7 | |
| | **LST42K** | 10.9 | 15.6 | 3.2 | 6.7 | |
|  (D30) | **LST317CA** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST42CA** | 12.5 | 18 | 3.2 | 6.7 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **ELST42** | 11.5 | 16.5 | 3.2 | 6.5 | |
| | **ELST317** | 8.5 | 12 | 2.7 | 4.9 | |
| | **ELST317BR** | | | | | |
| | **ELST317BL** | | | | | |
|  (D30) | **PAT-32** | 8.2 | 11.7 | 3.2 | 3.5 | |
| | **PAT-53*** | 13.4 | 19.8 | 4.8 | 5 | |
| | | | | | | |
|  (D30) | **NAT-32** | 9.5 | 13.4 | 3.2 | 3.5 | |
| | **NAT-42E** | 12.4 | 17.8 | 3.2 | 3.1 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **LST317BR** | 9.3 | 13.2 | 2.7 | 5 | |
| | **LST317BL** | | | | | |
| | | | | | | |
|  (D30) | **SST32** | 8.5 | 11.9 | 3.2 | 5.4 | |
| | | | | | | |

Note: * marked shims are made of steel.

# User's Guide- Parts for Tools

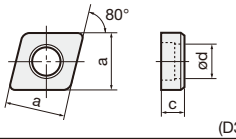
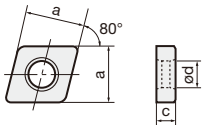
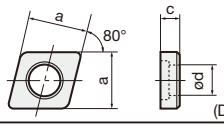
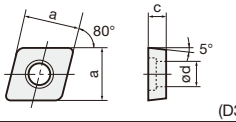
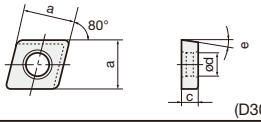
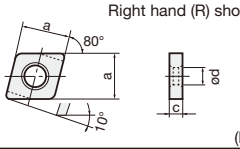
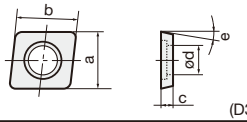
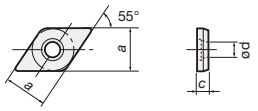
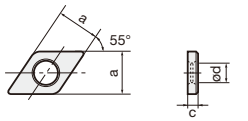
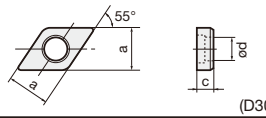
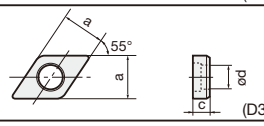
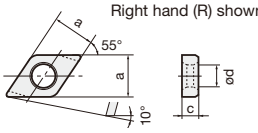
## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | e |
|  (D30) | **ASS422** | 12.5 | | 3.2 | 4.4 | |
| | **CS44-A** | 12.5 | | 4.7 | | |
|  (D30) | **ASS533** | 15.7 | | 4.8 | 5.5 | |
| | **ASS634** | 18.9 | | | | |
|  (D30) | **ELSS32** | 8.5 | | 3.2 | 4.9 | |
| | **LSS33** | 9.3 | | 4.3 | 5 | |
| | **ELSS42** | 11.7 | | 3.2 | 6.5 | |
| | **LSS42** | 12.5 | | 3.2 | 6.7 | |
| | **ELSS53** | 14.7 | | 4.8 | 8 | |
| | **LSS53** | 15.7 | | | 7.7 | |
| | **ELSS63** | 17.9 | | | 9.7 | |
| | **LSS63** | 18.9 | | | | |
| | **ELSS84** | 24.2 | | 6.4 | 12.9 | |
| | **LSS84** | 25.2 | | 6.4 | 13.1 | |
|  (D30) | **NAS-42** | 12.7 | | 3.2 | 3.5 | |
| | **NAS-04** | 31.5 | | 6.4 | 9.1 | |
|  (D30) | **MSS-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSS-442** | | | 6.4 | | |
|  (D30) | **SSS32** | 8.5 | | 3.2 | 5.4 | |
| Right hand (R) shown  (D30) | **LSS42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSS42BL** | | | | | |
|  (D30) | **PAS-32** | 8.2 | | 3.2 | 3 | |
| | **PAS-42** | 11.4 | | | 3.5 | |
| | **PAS-63*** | 17 | | 4.8 | 5 | |
|  (D30) | **LSS42CA** | 12.5 | | 3.2 | 6.7 | 8° |
| | **LSS53CA** | 15.7 | | 4.8 | 7.7 | 10° |
|  (D30) | **FSSA1102** | 11.6 | | 2 | 5.5 | 13° |
|  (D30) | **FSSP1102** | 11 | | 2 | 5.5 | 17° |
|  (D30) | **ASC322** | 9.3 | | 3.2 | 4.4 | |
| | **ASC422** | 12.5 | | 3.2 | 4.4 | |
| | **ASC533** | 15.7 | | 4.8 | 5.5 | |
| | **ASC634** | 18.9 | | | | |
| | **CC44-A** | 12.5 | | 4.7 | | |

Note: * marked shims are made of steel.

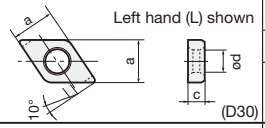
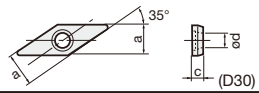
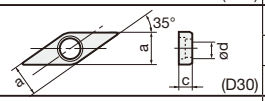
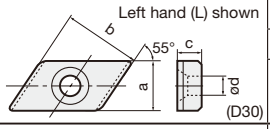
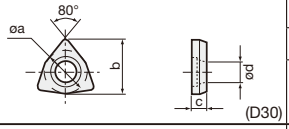
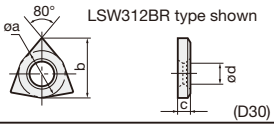
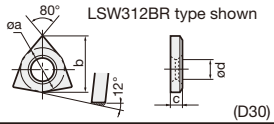
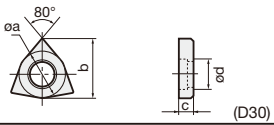
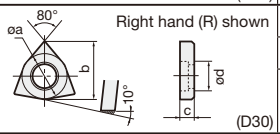
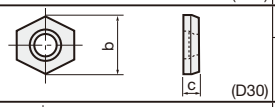
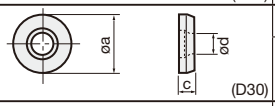
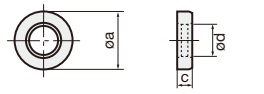
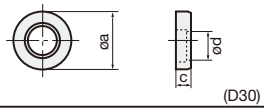
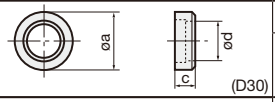
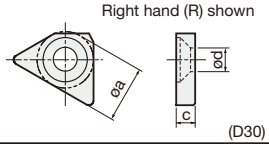
# User's Guide- Parts for Tools

## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | ød | e |
|  (D30) | **MSC-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSC-442** | | | 6.4 | | |
| | **MSC-533** | 15.6 | | 4.8 | 9.7 | |
| | **MSC-543** | | | 6.4 | | |
| | **MSC-634** | 18.8 | | | 11.3 | |
|  (D30) | **ELSC32** | 8.5 | | 3.2 | 6.2 | |
| | **LSC42** | 12.5 | | | 6.5 | |
| | **ELSC42** | 11.7 | | | | |
| | **LSC53** | 15.7 | | 4.8 | 7.7 | |
| | **ELSC53** | 14.7 | | | 8.1 | |
| | **ELSC63** | 17.9 | | | 9.7 | |
| | **LSC63** | 18.9 | | | | |
| | **LSC317** | 9.3 | | 2.7 | 5 | |
|  (D30) | **SSC32** | 8.5 | | 3.2 | 5.4 | |
| | **SSC4T3** | 11.4 | | 4 | 6.6 | |
| | | | | | | |
|  (D30) | **SSC4T3-P** | 11.4 | | 4 | 6.6 | 5° |
| | **SSC54-P** | 13.4 | | | | 5° |
| | | | | | | |
|  (D30) | **LSC42CA** | 12.5 | | 3.2 | 6.7 | 8° |
| | **LSC53CA** | 15.7 | | 4.8 | 7.7 | 10° |
| | | | | | | |
| Right hand (R) shown  (D30) | **LSC42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSC42BL** | | | | | |
| | | | | | | |
|  (D30) | **ZSA1102** | 10.5 | 11 | 2 | 5.475 | 11° |
| | **ZSA1502** | 15.6 | 12.4 | | 6 | 11° |
| | | | | | | |
|  (D30) | **ASD322** | 9.3 | | 3.2 | 4.4 | |
| | **ASD423** | 12.5 | | 3.2 | 4.4 | |
| | **ASD432** | 12.5 | | 4.8 | 4.4 | |
| | **CD44-A** | 12.5 | | 4.7 | | |
| | | | | | | |
|  (D30) | **ELSD32** | 8.5 | | 3.2 | 4.9 | |
| | **ELSD42** | 11.7 | | | 6.5 | |
| | **LSD42** | 12.5 | | | 6.7 | |
| | **LSD42A** | | | | | |
| | **LSD43** | | | 4.8 | | |
| | **LSD43A** | | | | | |
|  (D30) | **MSD-322** | 9.3 | | 3.2 | 5.8 | |
| | **MSD-432** | 12.5 | | 4.8 | 7.3 | |
| | **MSD-442** | | | 6.4 | | |
| | | | | | | |
|  (D30) | **SSD32** | 8.5 | | 3.2 | 5.4 | |
| | | | | | | |
| Right hand (R) shown  (D30) | **ELSD317BR** | 8.5 | | 2.7 | 4.9 | |
| | **ELSD317BL** | | | | | |
| | **LSD42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSD42BL** | | | | | |
| | | | | | | |

# User's Guide- Parts for Tools

## Shims

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | øa | b | c | ød | |
|  Left hand (L) shown (D30) | **LSZ42BR** | 12.5 | | 3.2 | 6.7 | |
| | **LSZ42BL** | | | | | |
|  (D30) | **ASV322** | 9.3 | | 3.2 | 4.4 | |
| | **CV34-A** | 9.3 | | 4.7 | | |
|  (D30) | **MSV-322** | 9.26 | | 3.2 | 5.8 | |
| | **SSV32** | 8.4 | | | 5.4 | |
| | **SSV42** | 11 | | | 6.3 | |
|  Left hand (L) shown (D30) | **CSK54R** | 9.4 | 14.8 | 4.8 | 3.5 | |
| | **CSK54L** | | | | | |
|  (D30) | **ASW322** | 9.33 | 11.5 | 3.2 | 4.4 | |
| | **ASW422** | 12.5 | 15.2 | | | |
|  LSW312BR type shown (D30) | **LSW312** | 9.33 | 11.5 | 2.7 | 5 | |
| | **LSW42** | 12.5 | 15.5 | 3.2 | 6.7 | |
|  LSW312BR type shown (D30) | **LSW312BR** | 9.33 | 11.5 | 2.7 | 5 | |
| | **LSW312BL** | | | | | |
|  (D30) | **MSW-432** | 12.8 | 15.8 | 4.8 | 7.3 | |
| | **MSW-533** | 16 | 19.7 | | 9.7 | |
| | **MSW-633** | 19.2 | 23.7 | | 11.3 | |
|  Right hand (R) shown (D30) | **MSW-432BR** | 12.8 | 15.8 | 4.8 | 7.3 | |
| | **MSW-432BL** | | | | | |
|  (D30) | **CH44-A** | | 12.5 | 4.7 | | |
|  (D30) | **ASR420** | 12.5 | | 3.2 | 4.4 | |
|  (D30) | **LSR32** | 8.9 | | 3.2 | 5 | |
| | **LSR32C** | 8.4 | | | | |
| | **LSR42** | 12.1 | | | 6.7 | |
| | **LSR42C** | 9.9 | | | 5 | |
| | **LSR53C** | 14 | | 4.8 | 6.7 | |
| | **LSR63C** | 17.2 | | | 8.2 | |
| | **LSR84C** | 21.9 | | 6.4 | 9.7 | |
|  (D30) | **MSR-43** | 12.5 | | 4.8 | 7.3 | |
| | **MSR-44** | | | 6.4 | | |
|  (D30) | **SSR32** | 8.7 | | 3.18 | 5.2 | |
|  Right hand (R) shown (D30) | **G16EL/IR** | 9.5 | - | 3.2 | 4 | |
| | **G16ER/IL** | | | 3.2 | | |
| | **G16EL/IR-DT** | | | 3.97 | 5.4 | |
| | **G16ER/IL-DT** | | | 3.97 | | |

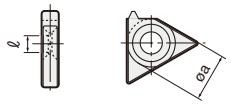
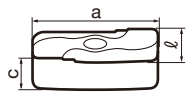
# User's Guide- Parts for Tools

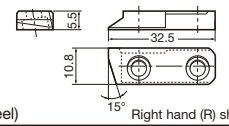
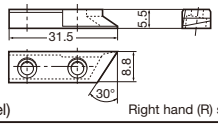
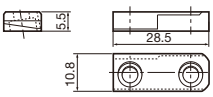
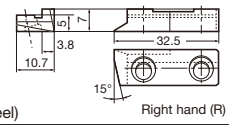
## Shims

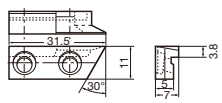
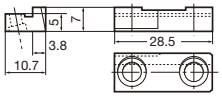
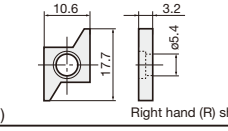
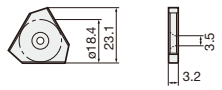
| Shape | Designation | Dimension (mm) | | |
|---|---|---|---|---|
| | | øa | ℓ | Lead angle |
| | AE16-4DT | 9.5 | 5.4 | 4° |
| | AE16-3DT | | 5.4 | 3° |
| | AE16-2DT | | 5.4 | 2° |
| | A16-1DT | | 5.4 | 1° |
| | AE16-0DT | | 5.4 | 0° |
| | AE16-99DT | | 5.4 | -1° |
| | AE16-98DT | | 5.4 | -2° |
| | AE16-4 | | 4 | 4° |
| | AE16-3 | | 4 | 3° |
| | AE16-2 | | 4 | 2° |
| | A16-1 | | 4.3 | 1° |
| | AE16-0 | | 4 | 0° |
| | AE16-99 | | 4 | -1° |
| | AE16-98 | | 4 | -2° |
| | AN16-4DT | 9.5 | 5.4 | 4° |
| | AN16-3DT | | 5.4 | 3° |
| | AN16-2DT | | 5.4 | 2° |
| | AN16-0DT | | 5.4 | 0° |
| | AN16-99DT | | 5.4 | -1° |
| | AN16-98DT | | 5.4 | -2° |
| | AN16-4 | | 4 | 4° |
| | AN16-3 | | 4 | 3° |
| | AN16-2 | | 4 | 2° |
| | AN16-0 | | 4 | 0° |
| | AN16-99 | | 4 | -1° |
| | AN16-98 | | 4 | -2° |
| | GXE16-98 | 9.5 | 4 | -2° |
| | GXE16-98DT | | 5.4 | -2° |
| | GXE16-99 | | 4 | -1° |
| | GXE16-99DT | | 5.4 | -1° |
| | GXE16-0 | | 4 | 0° |
| | GXE16-0DT | | 5.4 | 0° |
| | GXE16-1 | | 4.3 | 1° |
| | GX16-1DT | | 5.4 | 1° |
| | GXE16-2 | | 4 | 2° |
| | GXE16-2DT | | 5.4 | 2° |
| | GXE16-3 | | 4 | 3° |
| | GXE16-3DT | | 5.4 | 3° |
| | GXE16-4 | | 4 | 4° |
| | GXE16-4DT | | 5.4 | 4° |
| | GXE22-98DT | 12.7 | 6.6 | -2° |
| | GXE22-99DT | | | -1° |
| | GXE22-0DT | | | 0° |
| | GX22-1DT | | | 1° |
| | GXE22-2DT | | | 2° |
| | GXE22-3DT | | | 3° |
| | GXE22-4DT | | | 4° |
| | GXN16-98 | 9.5 | 4 | -2° |
| | GXN16-98DT | | 5.4 | -2° |
| | GXN16-99 | | 4 | -1° |
| | GXN16-99DT | | 5.4 | -1° |
| | GXN16-0 | | 4 | 0° |
| | GXN16-0DT | | 5.4 | 0° |
| | GXN16-1 | | 4.3 | 1° |
| | GXN16-2 | | 4 | 2° |
| | GXN16-2DT | | 5.4 | 2° |
| | GXN16-3 | | 4 | 3° |
| | GXN16-3DT | | 5.4 | 3° |
| | GXN16-4 | | 4 | 4° |
| | GXN16-4DT | | 5.4 | 4° |
| | GXN22-98DT | 12.7 | 6.6 | -2° |
| | GXN22-99DT | | | -1° |
| | GXN22-0DT | | | 0° |
| | GXN22-2DT | | | 2° |
| | GXN22-3DT | | | 3° |
| (D30) | GXN22-4DT | | | 4° |

# User's Guide- Parts for Tools

## Shims

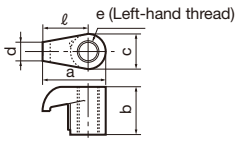
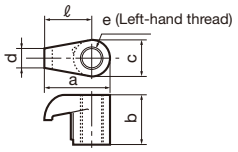
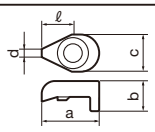
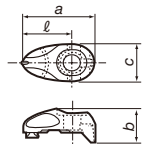
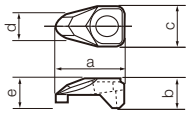
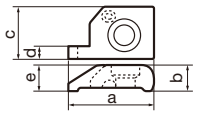
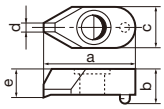
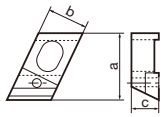
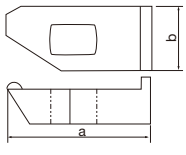
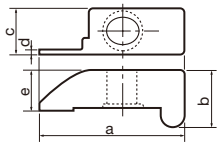
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øa | ℓ | c | Lead angle |
|  | NXE22-98 | | 12.7 | 4 | | -2° |
| | NXE22-99 | | | | | -1° |
| | NXE22-0 | | | | | 0° |
| | NXE22-1 | | | 4.5 | | 1° |
| | NXE22-2 | | | 4 | | 2° |
| | NXE22-3 | | | | | 3° |
| | NXE22-4 | | | | | 4° |
| | NXE27-98 | | 15.9 | 4 | | -2° |
| | NXE27-99 | | | | | -1° |
| | NXE27-0 | | | | | 0° |
| | NXE27-1 | | | 4.5 | | 1° |
| | NXE27-2 | | | 4 | | 2° |
| | NXE27-3 | | | | | 3° |
| | NXE27-4 | | | | | 4° |
| | NXN22-98 | | 12.7 | 4 | | -2° |
| | NXN22-99 | | | | | -1° |
| | NXN22-0 | | | | | 0° |
| | NXN22-1 | | | 4.5 | | 1° |
| | NXN22-2 | | | 4 | | 2° |
| | NXN22-3 | | | | | 3° |
| | NXN22-4 | | | | | 4° |
| | NXN27-98 | | 15.9 | 4 | | -2° |
| | NXN27-99 | | | | | -1° |
| | NXN27-0 | | | | | 0° |
| | NXN27-1 | | | 4.5 | | 1° |
| | NXN27-2 | | | 4 | | 2° |
| | NXN27-3 | | | | | 3° |
| (D30) | NXN27-4 | | | | | 4° |
|  | TSL12R | 12 | | 4.7 | 4.5 | 4.5° |
| | TSL12L | 12 | | 4.7 | 4.5 | 4.5° |
| | TSL16R | 15.9 | | 6.4 | 5 | 5° |
| | TSL16L | 15.9 | | 6.4 | 5 | 5° |
| | TSL24R | 23.8 | | 9.4 | 7.1 | 7° |
| | TSL24L | 23.8 | | 9.4 | 7.1 | 7° |
| | TSL12RI | 10.7 | | 4.7 | 4.5 | 4.5° |
| | TSL12LI | 10.7 | | 4.7 | 4.5 | 4.5° |
| | TSL16RI | 18.8 | | 6.4 | 5 | 5° |
| (D30) | TSL16LI | 18.8 | | 6.4 | 5 | 5° |

| Shape | Designation |
|---|---|
|  (Steel) Right hand (R) shown | SL-1R |
| | SL-1L |
|  (Steel) Right hand (R) shown | SL-2R |
| | SL-2L |
|  (Steel) Right hand (R) shown | SL-3R |
| | SL-3L |
|  (Steel) Right hand (R) shown | SL-6R |
| | SL-6L |

| Shape | Designation |
|---|---|
|  (Steel) Right hand (R) shown | SL-7R |
| | SL-7L |
|  (Steel) Right hand (R) shown | SL-8R |
| | SL-8L |
|  (D30) Right hand (R) shown | SGSR151 |
| | SGSL151 |
|  (D30) Right hand (R) shown | STN62R |
| | STN62L |

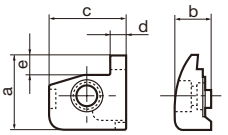
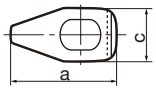
# User's Guide- Parts for Tools

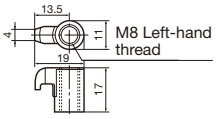
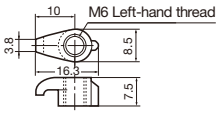
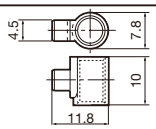
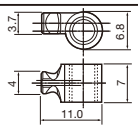
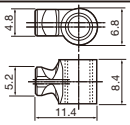
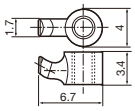
## Clamps

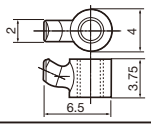
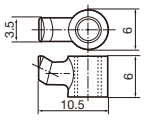
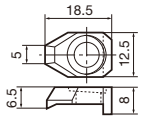
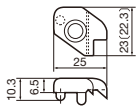
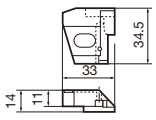
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | ℓ |
|   (Steel) | MCL-5M | 14.7 | 11 | 7.8 | 4 | M5 | 10.8 |
| | MCL-6 | 18.6 | 11.5 | 9.5 | | M6 | 13.8 |
| | MCL-8S | 19.1 | 13.5 | 10.9 | 5 | M8 | 13.6 |
| | MCL-8M | 22.5 | | | | | 17 |
| | MCL-8L | 25.5 | 14.5 | | 4 | | 20 |
|   (Steel) | MCPM-6 | 14.7 | 11.2 | 7.9 | 4 | M5 | 10.8 |
| | MCPM-9 | 19.1 | 16.8 | 10.9 | 5 | M8×1 | 13.6 |
| | MCPM-12 | 22.5 | | | | | 17 |
| | MCPM-20 | 18.6 | 9.5 | 9.5 | 4 | M6 | 13.8 |
| | MCPM-21 | | 12.2 | | | | |
| | MCPM-22 | 21.5 | 13.2 | | | | 16.7 |
| | MCPM-30 | 25.5 | 16.8 | 10.9 | 5 | M8×1 | 20 |
|   (Steel) | DCPM-33 | 16 | 9.3 | 10.5 | 2.4 | | 8.5 |
| | DCPM-43 | 21.2 | 11.5 | 13.5 | 3 | | 13.2 |
| | DCPM-54 | 25.8 | 15.25 | 14 | 3.5 | | |
| | DCPM-64 | 28.4 | 15.5 | 16 | 4 | | |
|   (Steel) | ACP3S | 22.8 | 9.5 | 10 | | | 15 |
| | ACP3S-E | 21.7 | 9.5 | 10 | | | 13.9 |
| | | | | | | | |
| | ACP4S | 25.7 | 12 | 13 | | | 17.7 |
| | ACP5S | 30.1 | 12.9 | 15 | - | - | 20.7 |
| | ACP6S | 33.4 | 12.8 | 16.5 | - | - | 24 |
|   (Steel) | ACP3 | 17.9 | 10 | 10 | 6.5 | 6.3 | |
| | ACP4 | 25.9 | 13.9 | 12 | 7 | 10.8 | |
| | | | | | | | |
|   Right hand (R) shown (Steel) | CTC-3R | 29 | 8.8 | 16 | 2.2 | 8 | |
| | CTC-3L | | | | | | |
| | CTC-4R | | | 17 | 3.2 | | |
| | CTC-4L | | | | | | |
| | CTC-5R | | | 18 | 4.2 | | |
| | CTC-5L | | | | | | |
|   (Steel) | CP81A | 28 | 10.5 | 12 | 3.5 | 8 | |
| | CP81B | | | | | | |
| | | | | | | | |
|   TC-3 type shown, TC-4 : Left-hand thread (Steel) | TC-3 | 19 | 12.5 | 8.3 | – | – | – |
| | TC-4 | 21.6 | | 8 | | | |
| | | | | | | | |
|   (Steel) | TF-72 | 22 | 11.3 | | | | |
| | TF-73 | 22 | 11.3 | | | | |
| | TF-184 | 22 | 11.3 | | | | |
| | TF-185 | 22 | 11.3 | | | | |
| | | | | | | | |
|   (Steel) | CCR2 | 34.7 | 14.9 | 10.7 | 1.2 | 10.5 | |
| | CCL2 | | | | | | |
| | CCR3 | | | | 2.2 | | |
| | CCL3 | | | | | | |
| | CCR4 | | | | 2.8 | | |
| | CCL4 | | | | | | |
| | CCR5 | | | | 3.2 | | |
| | CCL5 | | | | | | |
| | CCR6 | | | | 3.9 | | |
| | CCL6 | | | | | | |
| | CCR8 | | | | 4.9 | | |
| | CCL8 | | | | | | |

# User's Guide- Parts for Tools

## Clamps

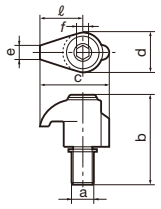
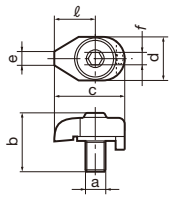
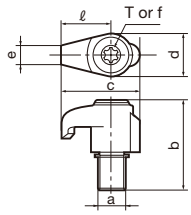
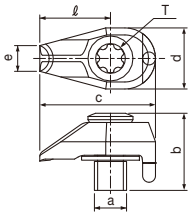
| Shape | Designation | Dimension (mm) a | b | c | d | e | |
|---|---|---|---|---|---|---|---|
|  Right hand (R) shown (Steel) | CFG-3SR | 22 | 11 | 23.1 | 2 | 6 | |
| | CFG-3SL | | | | | | |
| | CFG-4SR | | | | 3 | | |
| | CFG-4SL | | | | | | |
| | CFG-4DR | 32 | | | | 16 | |
| | CFG-4DL | | | | | | |
| | CFG-5SR | 22 | | | 4 | 6 | |
| | CFG-5SL | | | | | | |
| | CFG-5DR | 32 | | | | 16 | |
| | CFG-5DL | | | | | | |
| | CFG-6SR | 23 | | | 5 | 7 | |
| | CFG-6SL | | | | | | |
| | CFG-6DR | 33 | | | | 17 | |
| | CFG-6DL | | | | | | |
| | CFG-8SR | 28 | | 27.1 | 7 | 8 | |
| | CFG-8SL | | | | | | |
| | CFG-8DR | 38 | | | | 18 | |
| | CFG-8DL | | | | | | |
|  (Steel) | CCP4-A | 29.1 | | 14 | | | |
| | | | | | | | |

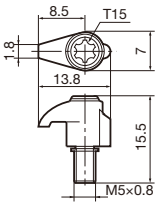
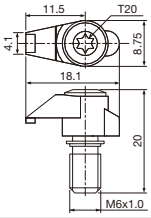
| Shape | Designation |
|---|---|
|  (Steel) | NF-84A |
|  (Steel) | CP536 |
|  (Steel) | CP91 |
|  (Steel) | CP900 |
|  (Steel) | CP910 |
|  (Steel) | JCP-1 |

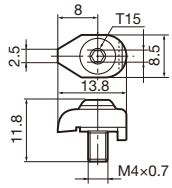
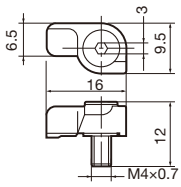
| Shape | Designation |
|---|---|
|  (Steel) | JCP-2 |
|  (Steel) | JCP-3<br>JCP-3N |
|  (Steel) | CQ-1 |
|  Right hand (R) shown (Steel) | CPK5R<br>CPK5L |
|  Right hand (R) shown (Steel) | C11R-5<br>C11L-5 |

# User's Guide- Parts for Tools

## Clamp Sets

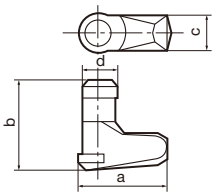
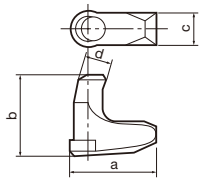
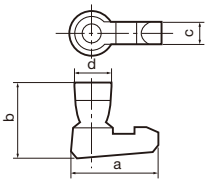
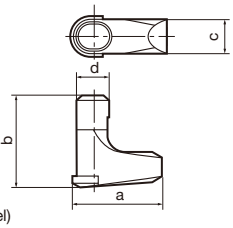
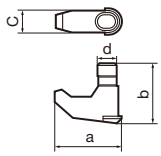
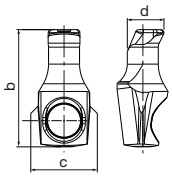
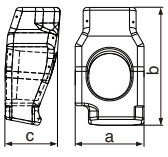
| Shape | Designation | Dimension (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | a | b | c | d | e | ℓ | T / f |
|  (Steel) | **CSG-5S** | M5×0.8 | 13.5 | 13.8 | 7 | 1.8 | 8.5 | 2.5 |
| | **CSG-5** | | 15.5 | | | | | |
| | **CSG-6S** | M6×1 | | 16.3 | 8.5 | 2.5 | 10 | 3 |
| | **CSG-6** | | 18 | | | | | |
| | **CSG-6L** | | 21.5 | | | | | |
| | **CSG-8S** | M8×1 | 21 | 20.5 | 11 | 3.5 | 12.5 | 4 |
| | **CSG-8** | | 23.5 | | | | | |
|  (Steel) | **CSW-00** | M4×0.7 | 11.5 | 12 | 8 | 2 | 7.5 | 2.5 |
| | **CSW-1** | M5×0.8 | 16.5 | 16.5 | 9.5 | 4 | 10 | 3 |
| | **CSW-0** | M4×0.7 | 11.5 | 13.8 | 8.5 | 2.5 | 8 | 2.5 |
| | **CSW-2** | M6×1 | 20 | 20.5 | 11 | 6 | 13 | 4 |
| | **CSW-40** | M4×0.7 | 12 | 13.2 | 8 | 2 | 7.5 | 2.5 |
| | **CSW-50** | M5×0.8 | 15 | 16.9 | 10 | | 9.5 | 3 |
| | | | | | | | | |
|  (Steel) | **CSP16** | M5×0.8 | 15.5 | 14.4 | 6.9 | 3.2 | 9.1 | T15 |
| | **CSP22** | M6×1 | 20 | 18.1 | 8.9 | 4.2 | 11.5 | T20 |
| | **CSP27** | M8×1.25 | 23.5 | 24.4 | 11.9 | 3.9 | 15.6 | 4 |
| | | | | | | | | |
|  (Steel) | **CSY-15** | M4×0.7 | 11.6 | 11.5 | 7 | 3 | 6 | 15IP |
| | **CSY-20** | M5×0.8 | 12 | 18 | 9.5 | 4 | 11 | 20IP |
| | | | | | | | | |

| Shape | Designation |
|---|---|
|  (Steel) | **CSG-5T** |
|  (Steel) | **CSX20** |

| Shape | Designation |
|---|---|
|  (Steel) | **CSW-0T** |
|  (Steel) | **CSL-4** |

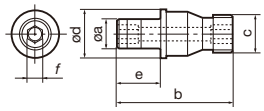
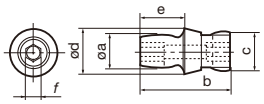
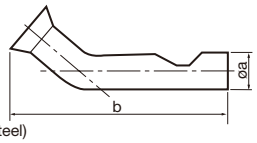
# User's Guide- Parts for Tools

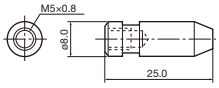
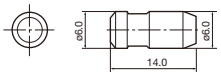
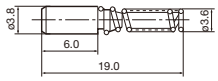
## Levers

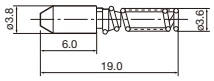
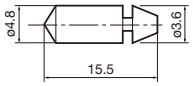
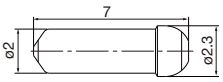
| Shape | Designation | Dimensions (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | d | |
|  (Steel) | **LCL3** | 10 | 12 | 3.7 | 3.6 | |
| | **LCL4** | 14.6 | 14 | 4.7 | 4.7 | |
| | **LCL5** | 17.1 | 17 | 6 | 6 | |
| | **LCL6** | 20.5 | 21 | 7.5 | 7.5 | |
| | **LCL8** | 25.4 | 25.4 | 8.6 | 8.6 | |
|  (Steel) | **LCL3C** | 10.8 | 11.8 | 3.4 | 3 | |
| | **LCL4C** | 13 | 13.4 | 3.7 | 3.4 | |
| | **LCL5C** | 18.6 | 17.7 | 4.7 | 4.5 | |
| | **LCL6C** | 20.5 | 19 | 6 | 5.7 | |
| | **LCL8C** | 24.2 | 23.5 | 7.5 | 6.2 | |
|  (Steel) | **LCL22N** | 7.5 | 6.5 | 2.6 | 2.06 | |
| | **LCL32N** | 10 | 7.8 | 3.2 | 3.2 | |
| | **LCL33NL** | 11.5 | 9.5 | 3.1 | 3.6 | |
| | **LCL33N** | 10 | 9.4 | 3.2 | 3.2 | |
| | **LCL43N** | 13.4 | 10 | 4.7 | 4.7 | |
|  (Steel) | **LCL23** | 7.8 | 8.5 | 2.6 | 2.1 | |
| | **LCL33** | 10.1 | 12.1 | 3.6 | 3.7 | |
| | **LCL33L** | 12 | 11.5 | 3.1 | 3.6 | |
| | **LCL43S** | 13.5 | 13.2 | 4.7 | 4.7 | |
| | **LCL43M** | | | | | |
| | **LCL44** | 16.1 | 14.6 | 4.7 | 4.7 | |
| | **LCL54** | 16.5 | 17.2 | 6.1 | 6 | |
|  (Steel) | **DLCL43** | 15.55 | 14 | 5 | 4.7 | |
| | **DLCL54** | 19.1 | 19.1 | 6.1 | 6 | |
| | **DLCL64** | 21.5 | 21 | 7.5 | 7.5 | |
|  (Steel) | **SLLV-1** | | 7.75 | 3.4 | 2.43 | |
| | **SLLV-2** | | 7.75 | 3.4 | 2.75 | |
|  (Steel) | **FCL4** | 5 | 7.78 | 3.81 | | |
| | **FCL8** | 10 | 14.3 | 5.39 | | |

# User's Guide- Parts for Tools

## Pins

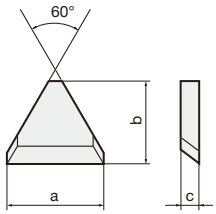
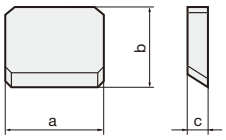
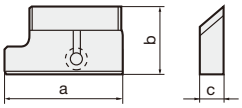
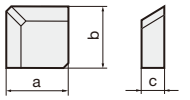
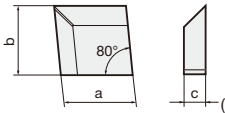
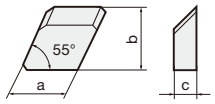
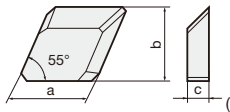
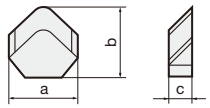
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | øa | b | øc | ød | e | f |
|  (Steel) | **MLP32L** | 3.9 | 8.8 | M5×0.8 | 5.6 | 3.5 | 2 |
| | **MLP33** | 3.7 | | | | | |
| | **MLP34L** | 3.7 | 13.1 | | 6.2 | 5 | |
| | **MLP46** | 5 | 17.2 | M6.3×1 | 7.8 | 5.5 | 2.5 |
| | **MLP46L** | | 18.6 | | | 6.9 | |
| | **MLP58** | 6.2 | 21.9 | M8×1 | 10.3 | | 3 |
| | **MLP68** | 7.8 | | M10×1 | 11.9 | | 4 |
| | **MLP68L** | | 24.1 | | | 9.1 | |
|  (Steel) | **MLP44** | 5 | 13.2 | M6.3×1 | 7.1 | 5.5 | 2.5 |
| | **MLP33L** | 3.7 | 10.4 | M5×0.8 | 5.6 | 5.1 | 2 |
| | | | | | | | |
|  (Steel) | **SW99** | 8 | 47.5 | | | | |
| | | | | | | | |

| Shape | Designation |
|---|---|
|  (Steel) | **SP-8** |
|  (Steel) | **SP-6** |
|  (Steel) | **BP-3** |

| Shape | Designation |
|---|---|
|  (Steel) | **BP-360** |
|  (Steel) | **BP-490** |
|  (Steel) | **SL-PI-2** |

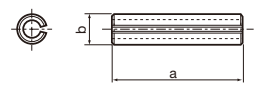
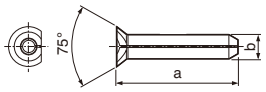
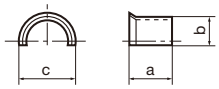
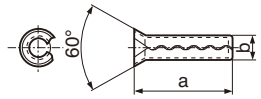
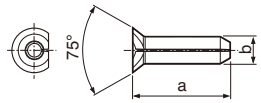
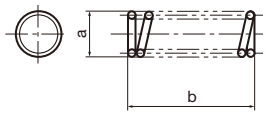
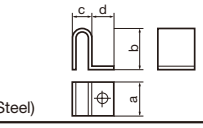
# User's Guide- Parts for Tools

## Chipbreaker Pieces

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | b | c | | |
|   (TX30) | **CBT-2S** | 8.8 | 7.6 | 2 | | |
| | **CBT-2M** | 7.4 | 6.6 | | | |
| | **CBT-3S** | 13.3 | 12.1 | 2.5 | | |
| | **CBT-3M** | 12.3 | 11.1 | | | |
| | **CBT-3L** | 11.3 | 10.1 | | | |
| | **CBT-4S** | 18.8 | 16.9 | | | |
| | **CBT-4M** | 17.8 | 15.9 | | | |
| | **CBT-4L** | 16.8 | 14.4 | | | |
| | **NCT-2S** | 14.2 | 11.8 | | | |
| | **NCT-2M** | 13 | 10.8 | | | |
| | **NCT-2L** | 11.9 | 9.8 | | | |
|   (TX30) | **CBS-3S** | 9.5 | 8.3 | 2 | | |
| | **CBS-3M** | | 7.3 | | | |
| | **CBS-4S** | 12.7 | 11.6 | 2.5 | | |
| | **CBS-4SN** | | | | | |
| | **CBS-4M** | | 10.6 | | | |
| | **CBS-4L** | | 9.1 | | | |
| | **NCS-3S** | | 11.2 | | | |
| | **NCS-3M** | | 10.2 | | | |
| | **NCS-3L** | | 8.7 | | | |
|   Right hand (R) shown (TX30) | **B11 R-5** | 24 | 13 | 5 | | |
| | **B11 L-5** | | | | | |
|   (TX30) | **CBS-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBS-4MN** | 10.5 | 10.5 | | | |
| | **CBS-4LN** | 9 | 9 | | | |
| | **NCS-3SN** | 11.2 | 11.2 | | | |
| | **NCS-3MN** | 10.2 | 10.2 | | | |
| | **NCS-3LN** | 8.7 | 8.7 | | | |
|   (TX30) | **CBC-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBC-4MN** | 10.5 | 10.5 | | | |
| | **CBC-4LN** | 9.5 | 9.5 | | | |
| | | | | | | |
|   Right hand (R) shown (TX30) | **CBD-4SR** | 12.7 | 11.5 | 2.5 | | |
| | **CBD-4MR** | | 10.5 | | | |
| | **CBD-4ML** | | | | | |
| | **CBD-4LR** | | 9.5 | | | |
| | | | | | | |
|   (TX30) | **CBD-4SN** | 11.5 | 11.5 | 2.5 | | |
| | **CBD-4MN** | 10.5 | 10.5 | | | |
| | | | | | | |
|   (TX30) | **CBR-4SN** | 12.7 | 11.9 | 2.5 | | |
| | **CBR-4MN** | | 10.9 | | | |
| | | | | | | |

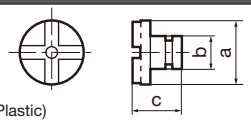
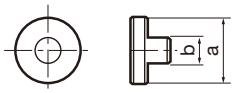
# User's Guide- Parts for Tools

## Springs (Springs for Shims)

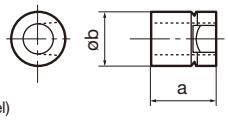
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
|  (Steel) | **SP-2.5** | 12 | 2.7 | | | | |
|  (Steel) | **SP-16-L14** | 13.6 | 2.85 | | | | |
|  (Steel) | **LSP3** | 5.5 | 3 | 5.9 | | | |
| | **LSP3L** | 7 | | | | | |
| | **LSP4** | | 4 | 7.6 | | | |
| | **LSP4S** | 6 | | | | | |
| | **LSP5** | 8.5 | 4.5 | 8.8 | | | |
| | **LSP6** | 11 | 5.9 | 10.9 | | | |
| | **LSP6C** | 8.5 | 4.8 | 9.3 | | | |
| | **LSP8** | 12 | 10 | 15.4 | | | |
|  (Steel) | **PSP-2.5** | 10 | 2.7 | | | | |
| | **PSP-4.0** | 16 | 4.2 | | | | |
| | **PSP301** | 7.6 | 3 | | | | |
| | | | | | | | |
|  (Steel) | **PSP-16** | 9.75 | 2.85 | | | | |
|  (Steel) | **BP-0** | 3.6 | 13 | | | | |
| | **BP-5-A** | | | | | | |
| | **BP-7** | 7 | 11 | | | | |
| | **BP-8.8** | 8.8 | 10 | | | | |
| | **BP-9** | 8.3 | | | | | |
| | **BP-10** | 9.1 | | | | | |
| | **SP913** | 9 | 13 | | | | |
| | | | | | | | |
|  (Steel) | **BSP-1** | 7.8 | 7.5 | 4.8 | 6 | | |

# User's Guide- Parts for Tools

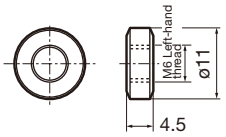
## Coolant Supply Attachment

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | Thread | | |
|  (Plastic) | **EA-20** | 20 | 10 | 15 | | | |
| | **EA-25** | 25 | | | | | |
| | **EA-32** | 32 | 16 | | | | |
| | | | | | | | |
|  (Plastic) | **CA-16** | 16 | 8 | | M6 | | |
| | **CA-20** | 20 | 8.5 | | M6 | | |
| | **CA-25** | 25 | 11.5 | | R1/8 | | |
| | **CA-32** | 32 | 11.5 | | R1/8 | | |
| | **CA-40** | 40 | 11.5 | | R1/8 | | |

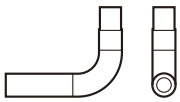
## Pistons

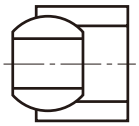
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | | | |
|  (Steel) | **DPIS33** | 12.6 | 9 | | | |
| | **DPIS43** | 11.8 | 10 | | | |
| | **DPIS44** | 13.4 | 10 | | | |
| | **DPIS54** | 16 | 13 | | | |
| | **DPIS64** | | 15 | | | |

## Nuts

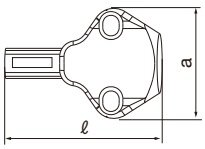
| Shape | Designation |
|---|---|
|  | **SRW11** |

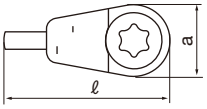
## Coolant Pipe & Nozzle

| Shape | Designation |
|---|---|
|  | **PNZ5** |

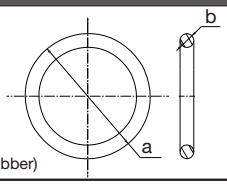
| Shape | Designation |
|---|---|
|  | **CNZ125** |

## Coolant unit

| Shape | Designation | Dimension (mm) | |
|---|---|---|---|
| | | a | ℓ |
|  | **CU-CW-CHP** | 20.8 | 29.7 |
| | **CU-D-CHP** | 20.8 | 29.6 |
| | **CU-V-CHP** | 20.8 | 30 |
| | | | |

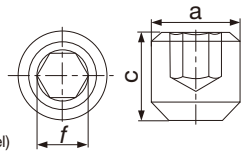
| Shape | Designation | Dimension (mm) | |
|---|---|---|---|
| | | a | ℓ |
|  | **S-CU-CHP** | 7 | 16.2 |
| | | | |

## O-ring for TungTurn-Jet

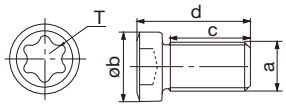
| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | | | |
|  (Rubber) | **OR6.4X0.9N** | 8.2 | 0.9 | | | |
| | **OR14X2.5NN** | 19 | 2.5 | | | |
| | | | | | | |

# User's Guide- Parts for Tools

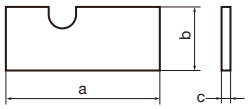
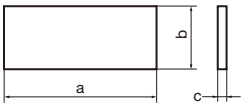
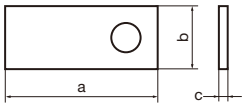
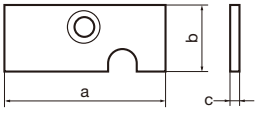
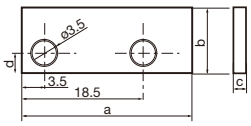
## Coolant screw for TungTurn-Jet

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | c | | | T / f |
|  (Steel) | SRM4X4 TL360 | M4 | 4 | | | 2 |

## Mounting screw for TungTurn-Jet

| Shape | Designation | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|
| | | a | øb | c | d | T / f |
|  (Steel) | SRM3 | M3X0.5 | 4.2 | 7 | 4.9 | T8 |

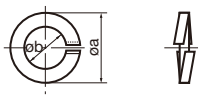
## Sizing Plates

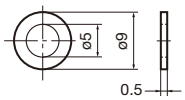
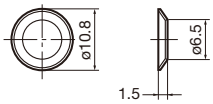
| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | | |
|  (Steel) | S0816A | 55 | 15.5 | 0.8 | | | |
| | S1016A | | | 1 | | | |
| | S0816B | 50 | | 0.8 | | | |
| | S1016B | | | 1 | | | |
| | S0816C | 45 | | 0.8 | | | |
| | S1016C | | | 1 | | | |
| | S0820A | 61 | 19.5 | 0.8 | | | |
| | S1020A | | | 1 | | | |
| | S0820B | 54.5 | | 0.8 | | | |
| | S1020B | | | 1 | | | |
| | SM-00 | 18 | 8 | 1 | | | |
|  (Steel) | SW04 | 25.5 | 5.8 | 0.25 | | | |
| | | | | 0.5 | | | |
| | | | | 1 | | | |
| | SW05 | 37 | 8.3 | 0.25 | | | |
| | SW06 | 36 | 10.8 | 0.5 | | | |
| | | | | 1 | | | |
| | SW08 | 35.5 | 12.3 | 2 | | | |
|  (Steel) | S0810 | 40 | 11 | 0.8 | | | |
| | S1010 | | | 1 | | | |
|  Attached with fix screw and wrench. (Steel) | PSTR08 | 24 | 11 | 1.5 | | | |
| | PSTL08 | | | | | | |
| | PSTR10 | 42 | 16.5 | 2 | | | |
| | PSTL10 | | | | | | |
| | PSTR12 | 47 | 19 | 2 | | | |
| | PSTL12 | | | | | | |
|  (Steel) | AP0801 | 26 | 9.5 | 0.5 | 3 | | |
| | AP0802 | | | 1 | | | |
| | AP0803 | | | 1.5 | | | |
| | AP0804 | | | 2 | | | |
| | AP0805 | | | 2.5 | | | |
| | AP1101 | 30 | 11.5 | 0.5 | 5 | | |
| | AP1102 | | | 1 | | | |
| | AP1103 | | | 1.5 | | | |
| | AP1104 | | | 2 | | | |
| | AP1105 | | | 2.5 | | | |
| | AP1106 | | | 3 | | | |

SW04 is composed of three plates and SW05 to SW08 are composed of four plates.
Note on fixing screws: PSTR/L08 is attached with CSSM2-4 and other types are attached with CSHM3-8.

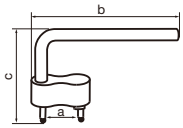
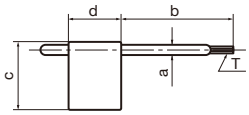
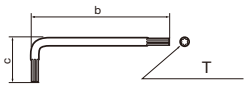
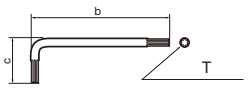
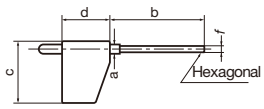
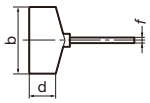
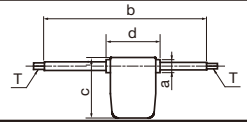
# User's Guide- Parts for Tools

## Washers

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | øa | øb | | | | |
|  | VA4 | 7.6 | 4.1 | | | | |
| | VA5 | 9.2 | 5.1 | | | | |
| | VA6 | 10.5 | 6.1 | | | | |
| | | | | | | | |

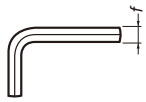
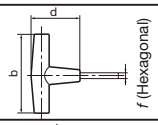
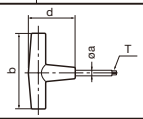
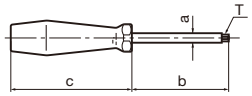
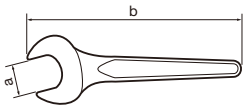
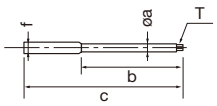
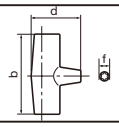
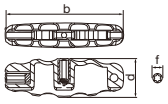
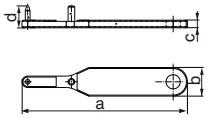
| Shape | Designation |
|---|---|
|  | CPW5 |
| | |
|  | CDW6 |
| | |

## Wrenches and Drivers

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|  | CRW23 | 9.7 | 78.5 | 55.0 | | | |
| | CRW33 | 9.3 | 78.5 | 55.0 | | | |
| | | | | | | | |
|  | T-6F | 2 | 35 | 14.5 | 15 | | T6 |
| | T-7F | 2 | 35 | 19 | 19 | | T7 |
| | T-8F | 2.5 | 40 | 19 | 19 | | T8 |
| | T-9F | 3 | 40 | 23.5 | 20 | | T9 |
| | T-15F | 3.5 | 45 | 28 | 21 | | T15 |
| | T-20F | 4 | 45 | 28 | 21 | | T20 |
| | IP-6F | 2 | 35 | 14.8 | 14.9 | | 6IP |
| | SET T-15/5 | 3.5 | 45 | 28 | 21 | | T15 |
| | T-20TORX | 3.9 | 49 | 30 | 22 | | T20 |
|  | T-6L | | 48 | 16 | | | T6 |
| | T-8L | | 48 | 16 | | | T8 |
| | T-9L | | 48 | 16 | | | T9 |
| | T-15L | | 59 | 22 | | | T15 |
| | T-25TORX | | 66 | 23.3 | | | T25 |
|  | KEYV-T20 | | 60 | 22 | | | T20 |
| | KEYV-T25 | | 65 | 23 | | | T25 |
| | KEYV-T30L | | 190 | 37 | | | T30 |
| | KEYV-T40L | | 208 | 43 | | | T40 |
| | KEYV-T50L | | 232 | 48 | | | T50 |
|  | P-2F | 4 | 44 | 20 | 12.5 | 2 | |
| | P-2.5F | 5 | 45 | 25 | 20 | 2.5 | |
| | HW2.0/5RED | 3 | 38 | 15 | 15 | 2 | |
| | | | | | | | |
|  | P-2.5T | | 42 | | 15 | 2.5 | |
| | | | | | | | |
|  | T-1008/5 | 6.5 | 85 | 28 | 25 | - | T10/T8 |
| | T-2010/5 | 6.5 | 85 | 28 | 25 | - | T10/ T20 |

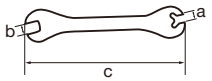
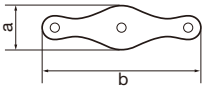
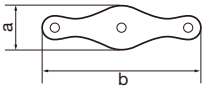
# User's Guide- Parts for Tools

## Wrenches, Drivers and Lubricant

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|  | **1/4HEX** | | | | | 6.35 | |
| | **5/32HEX** | | | | | 3.97 | |
| | **1/8HEX** | | | | | 3.18 | |
| | **3/32HEX** | | | | | 2.38 | |
| | **P-2** | | | | | 2 | |
| | **P-2.5** | | | | | 2.5 | |
| | **P-3** | | | | | 3 | |
| | **P-3.5** | | | | | 3.5 | |
| | **P-4** | | | | | 4 | |
| | **P-4.5** | | | | | 4.5 | |
| | **P-5** | | | | | 5 | |
| | **P-6** | | | | | 6 | |
|  | **TP-3A** | | 70 | | 45.5 | 3 | |
| | **TP-4** | | 85 | | 53 | 4 | |
| | **TP-5** | | | | | 5 | |
| | | | | | | | |
|  | **T-15T** | 5 | 65 | | 45 | | T15 |
| | **T-20T** | | | | | | T20 |
| | **T-27T** | | 85 | | 42 | | T27 |
| | **IP-20T** | 4 | 100 | | 32 | | 20IP |
|  Handle shape somewhat varies depending on the type number from the above figure. | **T-6D** | 2.5 | 45 | 70 | | | T6 |
| | **T-7D** | 2 | | | | | T7 |
| | **T-8D** | 2.6 | 61 | 67.5 | | | T8 |
| | **T-9D** | 3 | 65 | 80 | | | T9 |
| | **T-10D** | 3.3 | 70 | 90 | | | T10 |
| | **T-15D** | 3.65 | 71 | 100 | | | T15 |
| | **T-20D** | 4.6 | 90 | | | | T20 |
| | **T-25D** | 4.4 | 87 | 86 | | | T25 |
| | **IP-6DB** | | 45 | 70 | | | 6IP |
| | **IP-7D** | 2.5 | 45 | 75 | | | 7IP |
| | **IP-8D** | 3 | 55 | 80 | | | 8IP |
| | **IP-10D** | 3.3 | 71 | 89 | | | 10IP |
| | **IP-15D** | 4 | 80 | 100 | | | 15IP |
| | **IP-20D** | 4 | 90 | 100 | | | 20IP |
|  | **KS-21** | 21 | 195 | | | | |
| | **KS-24** | 24 | 215 | | | | |
| | **KS-27** | 27 | 235 | | | | |
| | **KS-32** | 32 | 275 | | | | |
| | **KS-36** | 36 | 305 | | | | |
| | **M-1000** | | | | | | |
| | | | | | | | |
|  | **BT15S** | 3.9 | 50 | 90 | | 6 | T15 |
| | **BT15M** | 3.9 | 50 | 118 | | 6 | T15 |
| | **BT20S** | 4.6 | 50 | 90 | | 6 | T20 |
| | **BT20M** | 4.6 | 50 | 118 | | 6 | T20 |
| | **BLD IP15/S7** | 3.9 | 50 | 90 | | 6 | 15IP |
| | **BLD IP15/M7** | 3.9 | 50 | 118 | | 6 | 15IP |
| | **BLD IP20/S7** | 4.6 | 50 | 90 | | 6 | 20IP |
| | **BLD IP20/M7** | 4.6 | 50 | 118 | | 6 | 20IP |
| | **BLD T10/S7** | | | | | | |
|  | **H-TB** | | 100 | | 37 | 6 | |
| | **H-TBS** | | 75 | | 37 | 6 | |
| | | | | | | | |
|  | **H-TB2W** | | 95 | | 31.4 | 6 | |
| | | | | | | | |
|  | **ECW-456EF** | 87 | 15 | 4 | 11.5 | | |
| | **ECW-456I** | 80.5 | 22 | 4 | 10.5 | | |
| | | | | | | | |

# User's Guide- Parts for Tools

## Wrenches and Drivers

| Shape | Designation | Dimension (mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | a | b | c | d | *f* | T |
|   | **KEYV-S05** | 4 | 5.5 | 100 | | | |
| | **KEYV-S06** | 5.4 | 8 | 125 | | | |
| | **KEYV-S08** | 6.6 | 10 | 150 | | | |
| | **KEYV-S10** | 7.7 | 13 | 175 | | | |
| | **KEYV-S12** | 9.4 | 16 | 250 | | | |
| | **KEYV-W20** | | | | | | |
|   | **KEYV-177** | 29 | 110 | | | | |
| | **KEYV-217** | 29 | 110 | | | | |
| | | | | | | | |
|   | **KGDT-100** | 32 | 108.5 | | | | |
| | **KGDT-110** | 32 | 108.5 | | | | |
| | **KGDT-120** | 32 | 108.5 | | | | |
| | **KGDT-130** | 32 | 108.5 | | | | |
| | **KGDT-140** | 32 | 108.5 | | | | |
| | **KGDT-150** | 32 | 108.5 | | | | |

# User's Guide- Parts for Tools

## Locators

| Designation | Applicable Tool |
|---|---|
| **LD150R** | TXD15125R ~ TXD15315R |
| **LD440R/L** | TMD44<br>TGD4400R/L-A<br>TFD44 |
| **LD442R/L** | EGD4400R |
| **LD540R/L** | TMD54 |
| **LE302R** | ESE3050R (RS**) ~ 3063R (RS**) |
| **LE303R/L** | TSE3003R/LIA ~ 3006R/LIA |
| **LE402AR** | ESE4050RA<br>ESE4063RA |
| **LE403R/L** | TSE4003R/LIA<br>TSE4004R/LIA<br>ESE4003RIA-S32 |
| **LE405R/L** | TSE4005R/LIA ~ 4012R/LIA |
| **LE413R/L** | THE40 |
| **LE444R/L** | TME4403R/LI ~ 4405R/LI<br>TME4403R/LB ~ 4405R/LB<br>EME4405R ~ 4404RI |
| **LE446R/L** | TME4406R/LI ~ 4412R/LI<br>TME4406R/LB ~ 4412R/LB |
| **LE540R/L** | TME54 |
| **LF440R/L** | THF44 |
| **LF540R/L** | THF54 |
| **LF602R** | ERF6050R ~ ERF6063R |
| **LF602R/L** | TRF6003R/LI ~ TRF6006R/LI<br>TRF6008R/LI ~ TRF6012R/LI |
| **LMS56R/L** | MS08R/L ~ MS12R/L |
| **LN423R/L** | TGN42 |
| **LN645R/L** | TPN64 |
| **LP403R/L** | TSP4003R/LIA ~ TSP4004R/LIA<br>TFP4004R/LIA |
| **LP405R/L** | TSP4005R/LIA ~ TSP4012R/LIA<br>TFP4005R/LIA ~ TFP4012R/LIA |
| **LP413R/L** | TGP41<br>TGP42 |
| **LP514R/L** | TGP51 |
| **LPP16R** | TPP16 |
| **LR602R/L** | ERD6050RA ~ ERD6063RA |
| **LR603R/L** | TRD6003R/L<br>TRD6004R/L ~ TRD6008R/L |
| **LV525R/L** | VSN 1 |
| **LV530R/L** | VSN 2 |
| **LV556R/L** | VSN60 |
| **LW400R** | EFP4063R |
| **LW400R/L** | TFD44<br>TFP4000<br>SFP4000 |
| **LW402R** | EFP4050R |

# User's Guide- Parts for Tools

## Insert locking wedges

| Designation | Applicable Tool |
|---|---|
| **FDS-8SST** | EDPD09063R<br>EDPD09063RB |
| **FDS-8ST-18** | EDP09080R<br>EDPD09080RB<br>DPD09100R~DPD09160R<br>DPD09100RB~DPD09160RB |
| **FW-242R/L** | ø63 |
| **FW-243R/L** | ø80~100 |
| **FW-245R/L** | ø125 ~ |
| **FW304R/L-D** | DAD15<br>DPD15<br>EDPD15<br>QPP15 |
| **LE302R** | ESE3050R (RS**) ~ 3063R (RS**) |
| **WF150R** | TXD15125R ~ TXD15315R |
| **WF310R/L** | TGP4100BA<br>TGP4103R/LIA |
| **WF330N** | TSE4003R/LIA<br>TSE4004R/LIA<br>ESE4003RIA-S32<br>TSP4003R/LIA ~ TSP4004R/LIA<br>TFP4004R/LIA |
| **WF330R/L** | TSE3003R/LIA ~ 3006R/LIA |
| **WF444R/L** | TME4403R/LI ~ 4405R/LI<br>TME4403R/LB ~ 4405R/LB<br>EME4405R ~ 4404RI<br>TME4406R/LI ~ 4412R/LI<br>TME4406R/LB ~ 4412R/LB |
| **WF500R** | TSE4005R/LIA ~ 4012R/LIA<br>TSP4005R/LIA ~ TSP4012R/LIA<br>TFP4005R/LIA ~ TFP4012R/LIA |
| **WF500R/L** | TMD54<br>TGP51<br>THF54 |
| **WF50R/L** | TME54 |
| **WF602R** | ERF6050R ~ ERF6063R |
| **WF603R/L** | TRF6003R/LI ~ TRF600R/LI |
| **WF608R/L** | TRF6008R/LI ~ TRF6012R/LI |
| **WN645R/L** | TPN64 |
| **WP193TR/L** | EGD4400R |
| **WP440R/L** | TMD44<br>TGD4400R/L-A<br>TFD44<br>TGP4100IA ~ TGP4112R/LIA<br>TGP42<br>THF44<br>THE40 |
| **WR602R/LW** | ERD6050RA ~ ERD6063RA |
| **WR603R/L** | TRD6003R/L<br>TRD6004R/L ~ TRD6008R/L |
| **WT402R** | ESE4050RA<br>ESE4063RA |
| **WT402R/L** | EME4450RB ~ 4404RB |

# User's Guide- Parts for Tools

## Locator adjusting wedges

| Designation | Applicable Tool |
|---|---|
| **FW-305** | TFD44<br>TFP40<br>SFP4000<br>EFP4063 |
| **FW325R/L-D** | DAD15<br>QPP15<br>DPD15<br>EDPD15 |

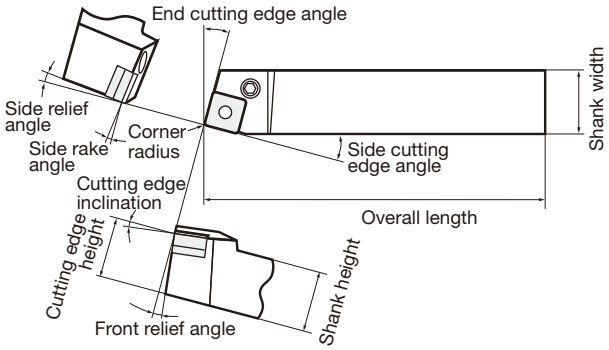
## Fine adjusting screws

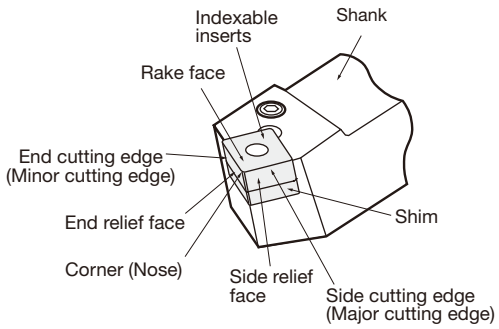
| Designation | Applicable Tool |
|---|---|
| **AJM5** | DPD09<br>EDPD09 |
| **ASM34L** | DPD24 |

# User's Guide- Technical Reference

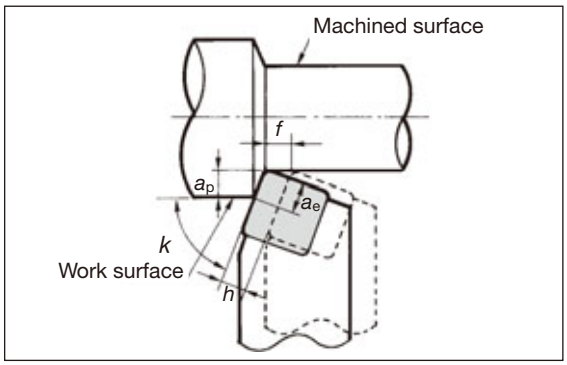
## Turning Tools

### Name of tools parts




### Relating angles between tool and workpiece




$a_p$ … Depth of cut (Distance between work surface and machined surface)

$a_e$ … Length of cutting edge engaging in cutting.

$\kappa$ … Cutting edge angle (Angle to be made by cutting edge and work surface)

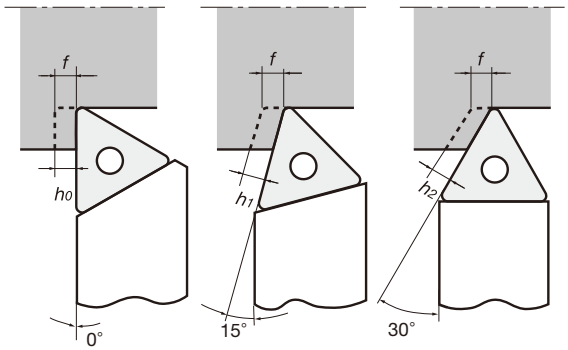
$f$ … Feed per revolution

$h$ … Thickness to be cut per revolution

Machined surface … Workpiece surface after having machined.

Work surface … Workpiece surface to be cut.

### ●Effect of side cutting edge angle




In the cutting of same feed, as the side cutting edge angle increases, the chip thickness decreases.

$h_0 > h_1 > h_2$

### ●Honing

TAC indexable inserts of steel cutting grades are honed. Honing specifications are shown in the following table.

| Edge condition | Shape |
|---|---|
| Sharp edge | |
| Round honing | |
| Chamfered honing | |

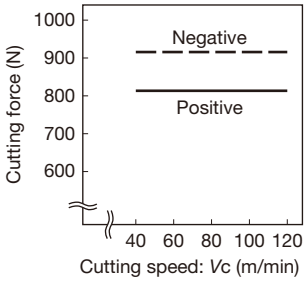
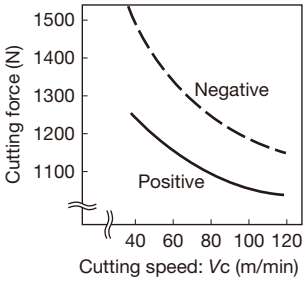
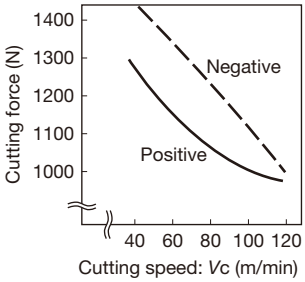
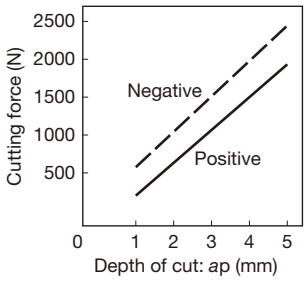
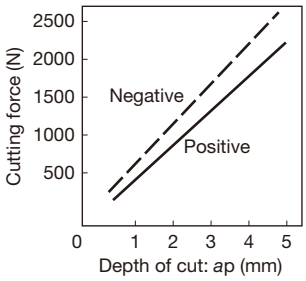
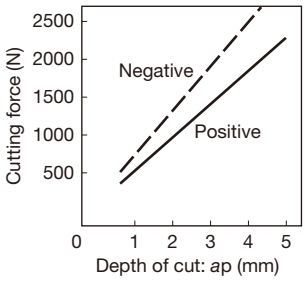
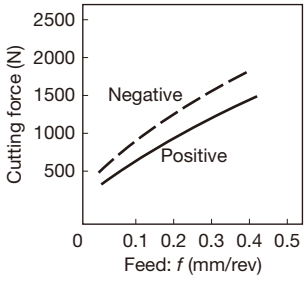
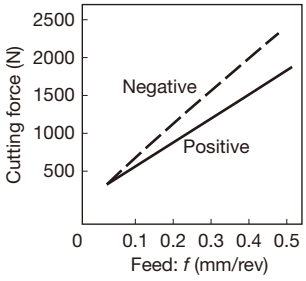
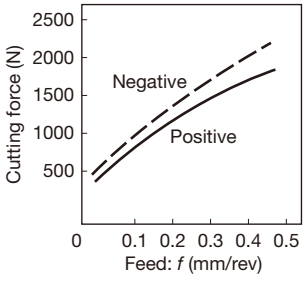
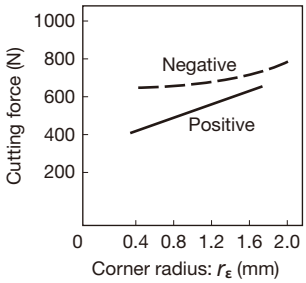
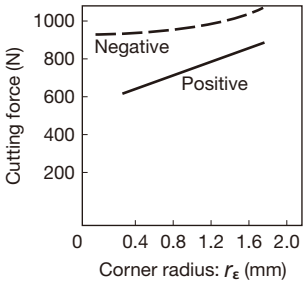
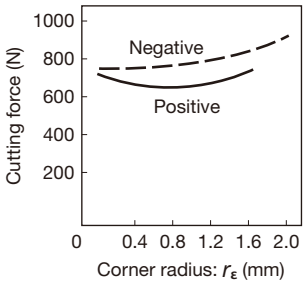
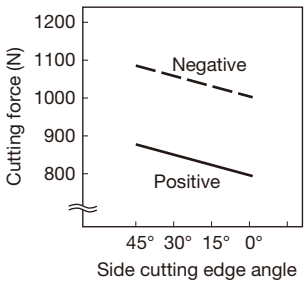
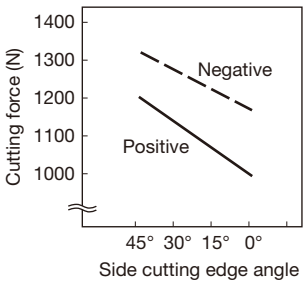
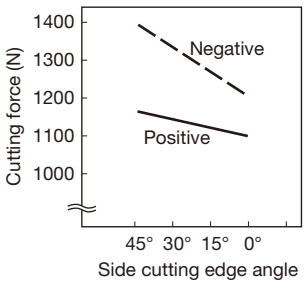
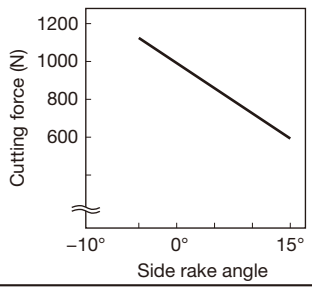
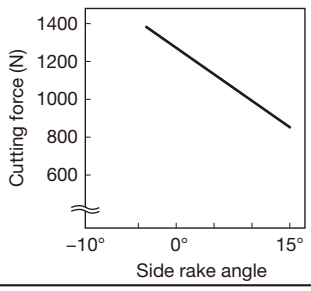
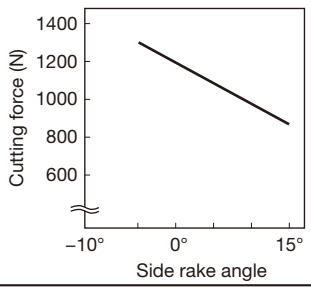
### ●Effects of tool geometry on cutting phenomena

| Increasing \ Phenomena | Flank wear | Crater wear | Edge strength | Cutting force | Surface finish | Chattering | Cutting edge temperature | Chip shape and flow |
|---|---|---|---|---|---|---|---|---|
| Cutting edge inclination | – | Decrease | Lower | Radial force decrease | – | Less tendency | Lower | Effect on flow direction |
| Side rake angle | – | Decrease | Lower | Decrease | – | – | Lower | Effect on shape |
| Relief angle | Decrease | – | Lower | Decrease | – | Likely to occur | Lower | – |
| End cutting edge angle | Decrease | – | Lower | Radial force decrease | Roughen | Less tendency | Lower | – |
| Side cutting edge angle | Decrease | Decrease | Increase | Radial force decrease | – | Likely to occur | Increase | Decrease thickness |
| Nose radius | Decrease to some level | | Increase | Increase | Improve | Likely to occur | Increase | Effect on flow direction |
| Honing width | Increase | – | Increase | Increase | – | Likely to occur | Increase | – |

# User's Guide- Technical Reference

## Turning Tools

### Relations between cutting force and cutting conditions or cutting phenomena

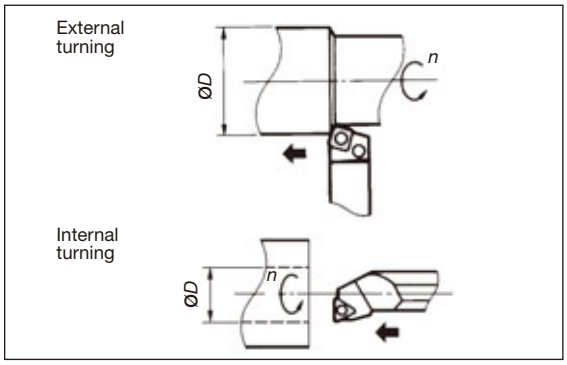
| Condition | Grey cast iron (HB130) | Stainless steel (HB145) | Carbon steel (HB230) |
|---|---|---|---|
| Cutting speed and cutting force<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Depth of cut and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Feed and cutting force<br>$V_c$ = 100 m/min<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Corner radius and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 1.2 mm<br>Side cutting edge angle 0° |  |  |  |
| Side cutting edge angle and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Corner radius $r_\varepsilon$ 0.4 |  |  |  |
| Side rake angle and cutting force<br>$V_c$ = 100 m/min<br>$f$ = 0.2 mm/rev<br>$a_p$ = 2 mm<br>Side cutting edge angle 0°<br>Corner radius $r_\varepsilon$ 0.2 |  |  |  |

* 9.8N = 1kgf

## Turning Tools

### Calculation formulas for turning

#### ●Cutting speed




When calculating cutting speed from number of revolutions:

$$Vc = \frac{\pi \times øD \times n}{1000}$$

$V_c$ : Cutting speed (m/min)
$n$ : Number of revolution ($min^{-1}$)
$øD$ : Diameter of workpiece (mm)
$\pi \approx 3.14$

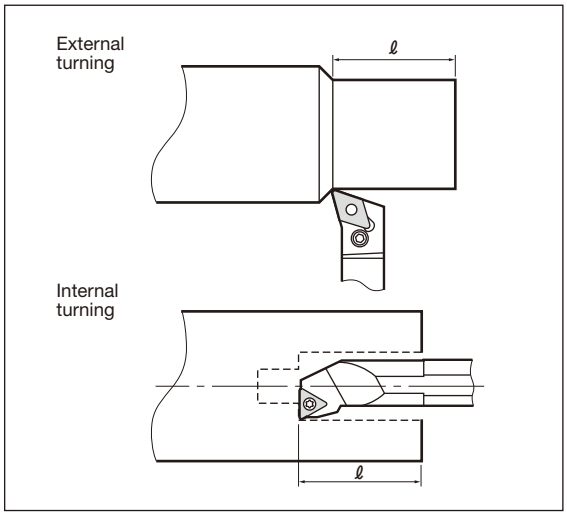
When calculating required number of revolutions from cutting speed:

$$n = \frac{Vc \times 1000}{\pi \times øD}$$

Example : Calculating the cutting speed when turning a ø150 mm-diameter workpiece at 250 $min^{-1}$

$$V_c = \frac{3.14 \times 150 \times 250}{1000} = 117 \text{ m/min}$$

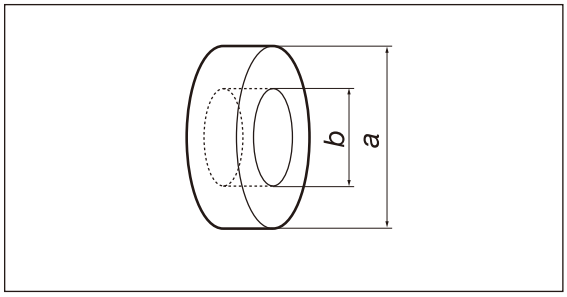
#### ●Cutting time on external and internal turning




$$T_{(min)} = \frac{\ell}{f \times n}$$

T : Cutting time (min)
$\ell$ : Cutting length (mm)
$f$ : Feed (mm/rev)
$n$ : Number of revolution ($min^{-1}$)

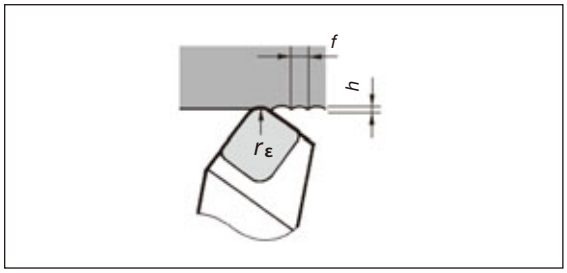
#### ●Cutting time on face turning




$$T_{(min)} = \frac{\pi \times (a^2 - b^2)}{4000 \times v_c \times f}$$

$V_c$ : Cutting speed (m/min)
$f$ : Feed (mm/rev)
T : Cutting Time (min)

#### ●Theoretical surface roughness




$$h_{(\mu m)} = \frac{f^2}{8 r_\varepsilon} \times 1000$$

$h$ : Surface roughness (μm)
$f$ : Feed (mm/rev)
$r_\varepsilon$ : Nose radius (mm)

#### ●Calculation of power consumption (kW)

$$P_{c\,(kW)} = \frac{F \times v_c}{60000}$$

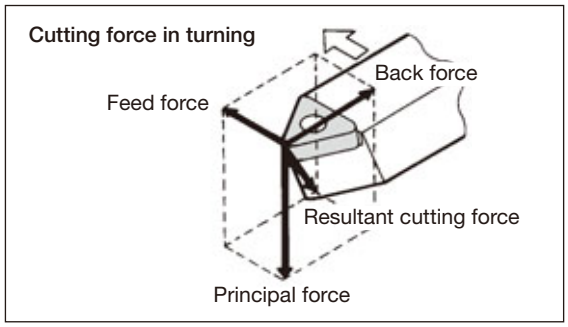
$P_c$ : Power requirement (kW)
$F$ : Cutting force (N)
$V_c$ : Cutting speed (m/min)

# User's Guide- Technical Reference

## Turning Tools

### ●Cutting forces

(1) Finding from the diagram based on experimental data.
(2) In case determining by simplified equation:




$$F = k_c \times a_p \times f \quad \text{(N)}$$

$F$ : Cutting force (N)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$a_p$ : Depth of cut (mm)
$f$ : Feed (mm/rev)

Example :
Calculating the cutting force when cutting a high carbon steel (ISO C55) at $f$ = 0.2 mm/rev and $ap$ = 3 mm.
$F$ = 3430 × 3 × 0.2 = 2058N

### ●Calculating power requirement

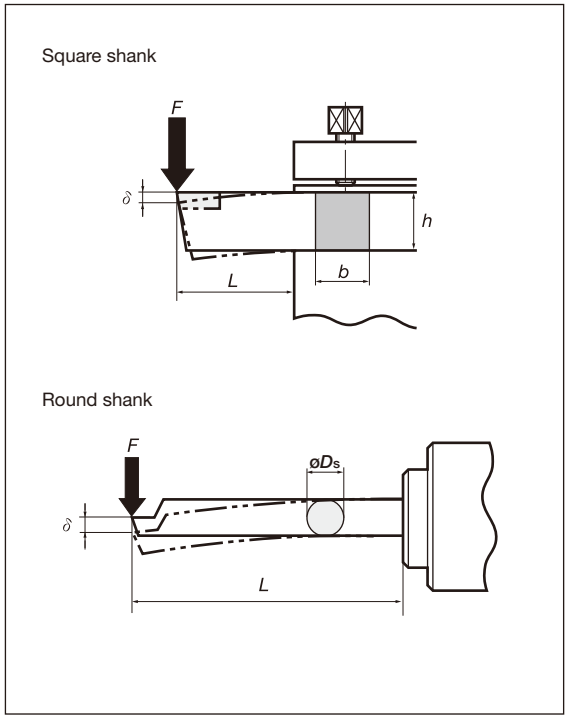
$$P_c = \frac{k_c \times a_p \times v_c \times f}{60 \times 1000} \quad \text{(kW)}$$

$P_c$ : Net power requirement (kW)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$v_c$ : Cutting speed (m/min)
$a_p$ : Depth of cutting (mm)
$f$ : Feed (mm/rev)

### Value of specific cutting force ($k_c$)

| Workpiece material (JIS) | Tensile strength (MPa) | Hardness (HB) | Value of specific cutting force on feed $k_c$ (N/mm²) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0.04 (mm/rev) | 0.1 (mm/rev) | 0.2 (mm/rev) | 0.4 (mm/rev) | 1.0 (mm/rev) |
| SS400, S15C | 390 | 100 | 3430 | 2840 | 2450 | 2080 | 1700 |
| S35C, S40C | 590 | 170 | 4220 | 3490 | 2940 | 2500 | 2080 |
| S50C, SCr430 | 785 | 230 | 4900 | 4020 | 3430 | 2940 | 2400 |
| SCM440, SNCM439 | 980 | 300 | 5390 | 4410 | 3780 | 3240 | 2650 |
| SDK | 1765 ( 56HRC ) | 56HRC | 8390 | 6870 | 5880 | 5000 | 4120 |
| FC200 | ( 160HB ) | 160 | 2550 | 1960 | 1630 | 1340 | 1030 |
| FCD600 | ( 200HB ) | 200 | 3330 | 2550 | 2110 | 1750 | 1340 |
| Aluminium alloy | ( 89HB ) | 89 | 1350 | 1130 | 950 | 810 | 670 |
| Aluminium | | | 1050 | 870 | 740 | 640 | 520 |
| Magnesium alloy | | | 390 | 390 | 390 | 390 | 390 |
| Brass | | | 1080 | 1080 | 1080 | 1080 | 1080 |

### ●Bending stress and tool deflection




**Bending stress**

(1) Square shank

$$S = \frac{6 \times F \times L}{b \times h^2} \quad \text{( MPa )}$$

(2) Round shank

$$S = \frac{32 \times F \times L}{\pi \times \varnothing D_s^3} \quad \text{( MPa )}$$

$S$ : Bending stress in shank (MPa)
$F$ : Cutting force (N)
$L$ : Overhang length of tool (mm)
$b$ : Shank width (mm)
$h$ : Shank height (mm)
$\varnothing D_s$ : Shank diameter (mm)
$E$ : Modulus of elasticity of shank material (MPa)

**Tool deflection (mm)**

(1) Square shank

$$\delta = \frac{4 \times F \times L^3}{E \times b \times h^3} \quad \text{( mm )}$$

(2) Round shank

$$\delta = \frac{64 \times F \times L^3}{3 \times \pi \times E \times \varnothing D_s^4} \quad \text{( mm )}$$

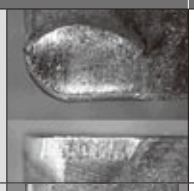
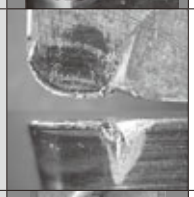
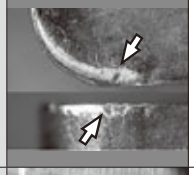
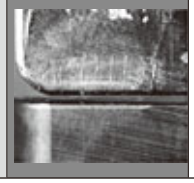
(Ref.) Values of E

| Material | MPa (N/mm²) | {kgf/mm²} |
|---|---|---|
| Steel | 210,000 | 21,000 |
| Cemented Carbide | 560,000~620,000 | 56,000~62,000 |

# User's Guide- Technical Reference

## Turning Tools

### Troubleshooting in turning

| Typical tool failure | | Countermeasure | | |
|---|---|---|---|---|
| | | Tool grade | Cutting conditions | Tool geometry |
| Flank wear |  | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Change to appropriate feed<br>• Change to wet cutting | • Decrease honing width<br>• Increase relief angle<br>• Increase end cutting edge angle<br>• Increase corner radius<br>• Select free-cutting chipbreaker<br>• Increase rake angle |
| Crater wear | | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Reduce feed<br>• Reduce depth of cut<br>• Change to wet cutting | • Increase rake angle<br>• Select an appropriate chipbreaker<br>• Increase side cutting edge angle<br>• Increase corner radius |
| Notch wear |  | • Change to more wear resistant grades<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Reduce feed | • Increase rake angle<br>• Increase side cutting edge angle |
| Fracture | | • Change to tougher grades<br>• Change to thermal-shock resistant grades<br>**P, M, K10 → 20 → 30** | • Reduce feed<br>• Reduce depth of cut<br>• Improve holding rigidity of work and tool<br>• Reduce overhang length of toolholder<br>• Improve looseness in machine | • Reduce rake angle<br>• Select a chipbreaker with high edge strength<br>• Increase honing width<br>• Increase side cutting edge angle<br>• Select larger shank size<br>• Increase corner radius |
| Chipping |  | • Change to tougher grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed<br>• Reduce depth of cut<br>• Improve holding rigidity of work and tool<br>• Reduce overhang length of toolholder<br>• Improve looseness in machine | • Reduce rake angle<br>• Select a chipbreaker with high edge strength<br>• Increase honing width<br>• Increase side cutting edge angle<br>• Select larger shank size |
| Flaking | | • Change to tougher grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed | • Reduce rake angle<br>• Increase corner radius<br>• Increase honing width |
| Plastic deformation | | • Change to more wear resistant grade<br>**P, M, K30 → 20 → 10** | • Reduce cutting speed<br>• Change to appropriate feed<br>• Reduce depth of cut<br>• Supply cutting fluid in adequate volume | • Increase relief angle<br>• Increase rake angle<br>• Reduce corner radius<br>• Reduce side cutting edge angle<br>• Select a free-cutting chipbreaker |
| Chip welding | | • Use a grade which has a low tendency to adhere to Workpiece material<br>**Cemented carbide → Coated carbide or cermet** | • Increase cutting speed<br>• Increase feed<br>• Change to water-insoluble cutting fluid<br>• Change to wet cutting | • Increase rake angle<br>• Select a free-cutting chipbreaker<br>• Decrease honing width |
| Built-up edge | | | | |
| Thermal cracking |  | • Change to tougher grades<br>• Change to thermal-shock resistant grades<br>**P, M, K10 → 20 → 30** | • Reduce cutting speed<br>• Reduce feed<br>• Change to dry cutting<br>• Supply cutting fluid in adequate volume<br>• Reduce depth of cut<br>• Change to water-insoluble cutting fluid | • Increase rake angle<br>• Select a free-cutting chipbreaker<br>• Decrease honing width |

# User's Guide- Technical Reference

## Turning Tools

| Problem | Cause | Countermeasure | |
|---|---|---|---|
| | | Tool | Cutting conditions and others |
| Deteriorated surface roughness | • Increased tool wear | • Select a more wear resistant grade<br>• Use an insert with a larger rake angle<br>• Use an insert with a larger nose radius<br>• Use a more lightly honed insert<br>• Use an insert of closer tolerance (from M class to G class) | • Select a proper feed<br>• Decrease the cutting speed<br>• Select a freer-cutting chipbreaker type<br>• Use a cutting fluid |
| | • Edge chipping | • Use a tougher grade<br>• Select a chipbreaker with strong cutting edges<br>• Use a largely honed insert<br>• Increase the side cutting edge angle<br>• Use a larger shank size | • Decrease the depth of cut<br>• Decrease the feed<br>• Use a more rigid machine<br>• Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| | • Chip welding<br>• Built-up-edge | • Select a grade with less affinity with the Workpiece material<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use a more lightly honed insert<br>• Use an insert of closer tolerance (from M class to G class) | • Increase the cutting speed<br>• Increase the feed<br>• Use a water-insoluble cutting fluid<br>• Use a cutting fluid |
| | • Vibration and chatter | • Use a tougher grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use an insert with a smaller nose radius<br>• Decrease the side cutting edge angle<br>• Use a more lightly honed insert<br>• Use a larger shank size | • Use a proper cutting speed<br>• Decrease the feed<br>• Decrease the depth of cut<br>• Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Deteriorated dimensional accuracy | • Improper insert accuracy | • Use an insert of closer tolerance (from M class to G class) | |
| | • Incomplete engagement of tool and workpiece | • Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use an insert with a smaller nose radius<br>• Use a more lightly honed insert | • Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Burr occurrence | • Unsuitable cutting speed | | • Decrease the cutting speed<br>• Increase the feed<br>• Use a cutting fluid |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Increase the relief angle<br>• Use an insert with a smaller nose radius<br>• Decrease the side cutting edge angle<br>• Use a more lightly honed insert | |
| Edge breakout | • Improper cutting speed | | • Decrease the feed<br>• Decrease the depth of cut |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Increase the side cutting edge angle<br>• Use an insert with a larger nose radius<br>• Use a more lightly honed insert<br>• Use a larger shank size | • Improve the holding rigidity of the tool and workpiece<br>• Shorten the overhang of the toolholder<br>• Improve the machine looseness |
| Fuzzy surface finish | • Improper cutting conditions | | • Increase the cutting speed<br>• Select a proper feed<br>• Use a water-insoluble cutting fluid<br>• Use a cutting fluid |
| | • Worn tool or improper cutting edge geometry | • Use a harder grade.<br>• Select a grade with less affinity with the Workpiece material<br>• Use an insert with a larger rake angle<br>• Select a freer-cutting chipbreaker type<br>• Use a more lightly honed insert | |

# User's Guide- Technical Reference

## Chipbreakers

### Chip controllability

**Necessity of chip control**

①Why is chip control needed?
②Effect of improper chip control

**Necessity of chip control (Problems and effects)**

| Problems | Effects |
|---|---|
| 1. Scattering of chips and coolant.<br>2. Wrapping around the workpiece and the tool.<br>3. Accumulation on the tool, jig, and machining facilities. | 1. Disturbs unmanned and automated machining.<br>2. Disturbs high-speed and high-efficiency machining.<br>3. Degrades finished surface.<br>4. Threatens operator's safety.<br>5. Reduced operation rate. |

Additional problems when chips are not properly controlled

**①Why is chip control needed?**

What is chip?

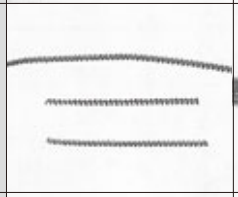
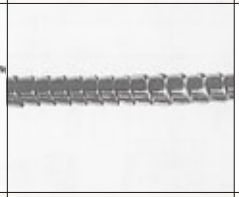
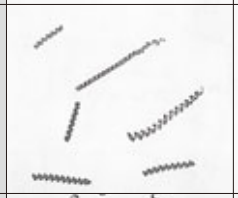
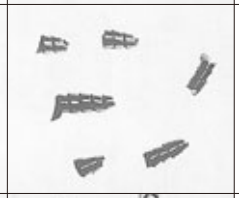
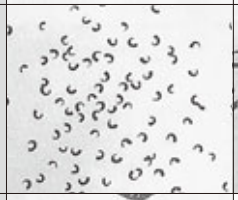
For making a product from a workpiece, removed objects produced by a tool which is set to cut to a specified depth with the relative motion of the tool and the workpiece.

Problems when chips are not properly controlled

**②Effect of improper chip control**

- Effects on quality → • Defective work. • Defective surface finish • Chip entangling
- Effects on operation → • Increased number of man-hours for handling. • Increased tool costs. • Troublesome chip handling. • Machine stoppage and reduced operation rate.
- Effect on safety and health. → • Stain and damage on machine caused from improper carrying-out of chips. • Dangerous effects on the human body. (Injury and burns on hand, etc.)

Effective measures → **"Chipbreaker"**

| Classification | Chip shape: Depth of cut: small | Chip shape: Depth of cut: large | Description of chip shape | Acceptability | Effect |
|---|---|---|---|---|---|
| Shape A | | | Chips irregularly entangled | Not acceptable | • Wrapping around the tool or workpiece or accumulation around the cutting point, hindering cutting<br>• Possible damage to the machined surface |
| Shape B |  |  | Long continuous spiral chips<br>$\ell > 50$ mm | Acceptable | • Bulky during transport in the automatic line<br>• May be preferred when one operator handles one machine |
| Shape C |  |  | Short spiral chips<br>$\ell < 50$ mm | Acceptable | • Smooth chip flow<br>• Difficult to scatter<br>• Favorable shape |
| Shape D |  | | "C" or "9" shaped chips (Around one coiling) | Acceptable | • Favorable shape if not scattering<br>• Not bulky and easy to transport |
| Shape E | | | Excessively broken chips. Thin pieces or connected in a form of wave as shown in the figure left | Not acceptable | • Readily scattering. If scattering is the only trouble, it may be acceptable because the chip cover, etc. may be used.<br>• Tend to cause chatter, causing harm on the finished surface roughness or tool life. |

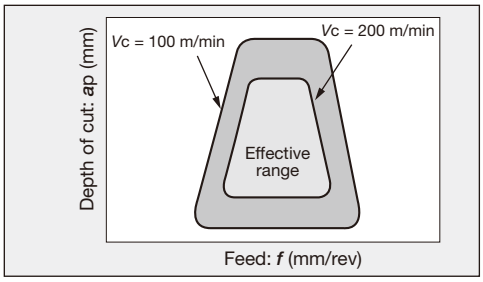
# User's Guide- Technical Reference

## Chipbreakers

### Factors affecting chip control

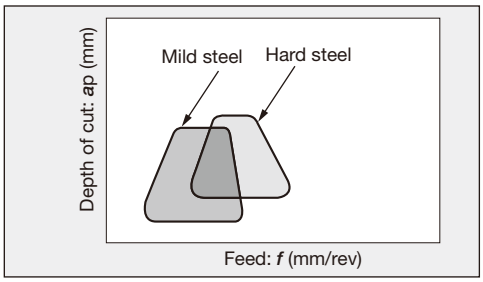
**(1) Cutting conditions**
1 Feed
2 Depth of cut
3 Cutting speed

- Of these, feed has the greatest effect followed by depth of cut and cutting speed in order listed.
- Feed is proportionate to the thickness of chips.
- Depth of cut is proportionate to the width of chips.
- There are optimum values (effective range) in feed and depth of cut.
- Cutting speed is in inverse proportion to chip thickness. Effective range becomes narrow at high speed.



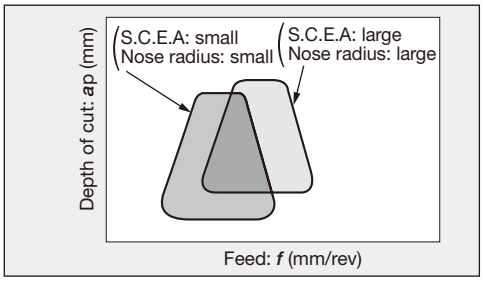

**(2) Workpiece material**
1 Alloy element
2 Hardness
3 Heat treatment condition

- These are related to thickness of chips and ease of curling.
- Mild steel chips are thicker than those of hard steel.
- Hard steel chips are liable to curl more than those of mild steel.
- Chips that do not curl are thin. As an exception, in case of mild steel even if thick, may not curl.



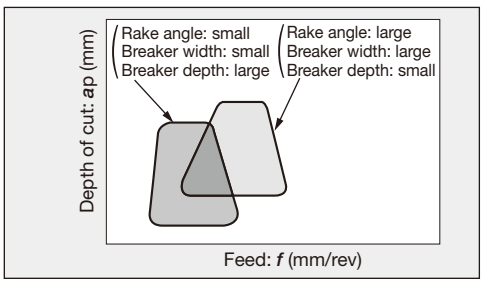

**(3) Tool geometry**
1 Side cutting edge angle
2 Nose radius

- Side cutting edge angle is relative to chip thickness and width
- Side cutting edge angle is preferably small.
- Nose radius is relative to thickness and width and the direction of flowing out.
- In finishing, small nose radius, whilst for rough cutting, large nose radius is better.



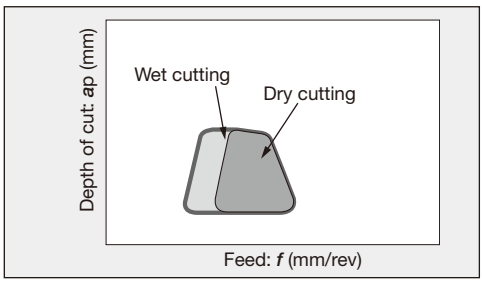

**(4) Shape of chipbreaker**
1 Rake angle
2 Chipbreaker width
3 Chipbreaker depth

- Rake angle is in inverse proportion to chip thickness.
- Depending on the Workpiece material, there is an optimum value.
- Chipbreaker width is selected proportionately to feed.
- Narrow at low feed and wide at high feed.
- Chipbreaker depth is to be selected so as to be inversely proportionate to feed.
- Deep at low feed and shallow at high feed.




**(5) Coolant**

- Effective range is wider with wet cutting.
- Especially at low feed range is liable to curl.



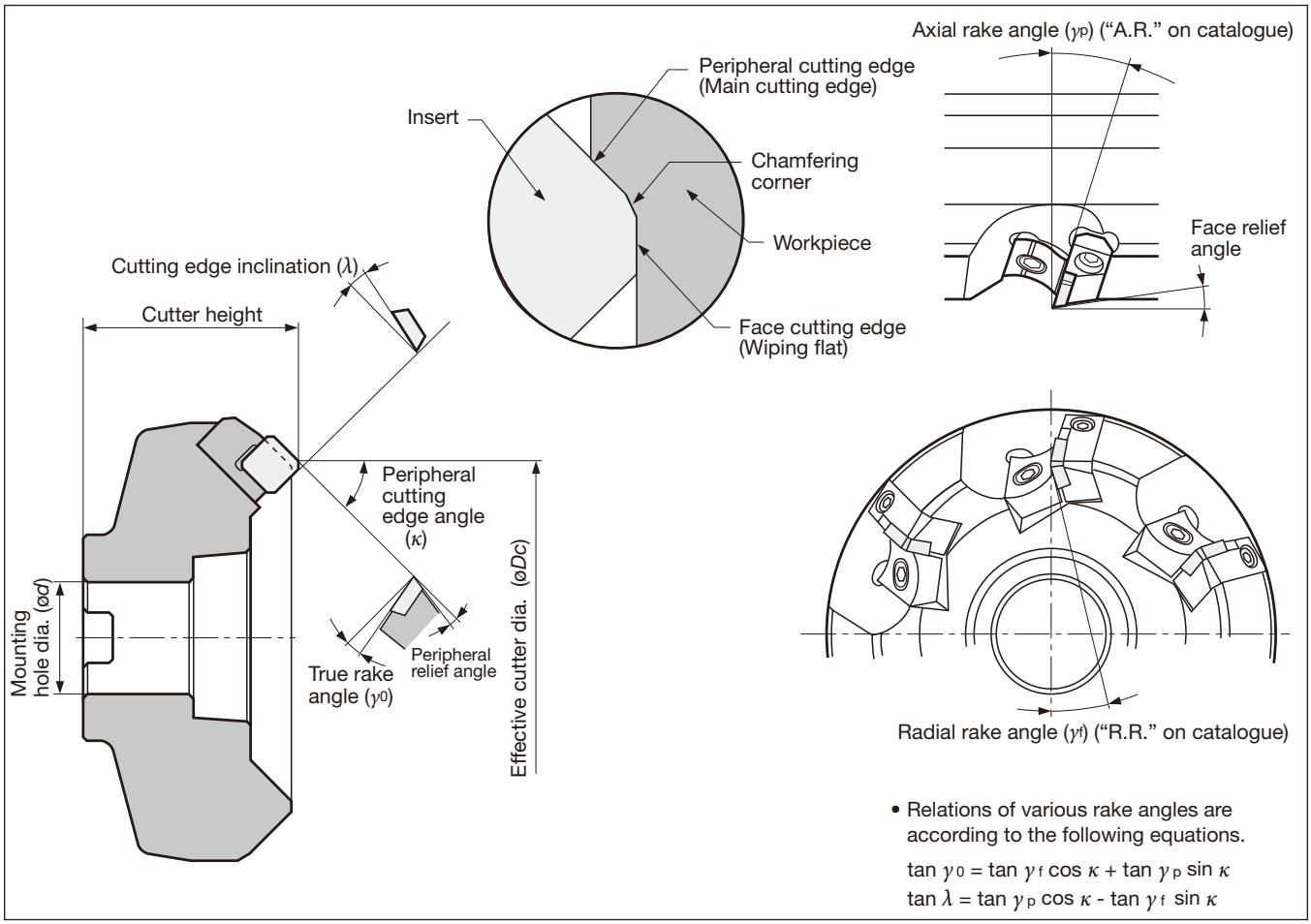

**(6) Machine**
1 Rigidity
2 Power limit

- The machine has enough power and mechanical strength.
- Select the machine consistent with the size of Workpiece material to be used.

# User's Guide- Technical Reference

## Milling tools

### Nomenclature for face milling cutter




- Relations of various rake angles are according to the following equations.

$\tan \gamma_0 = \tan \gamma_f \cos \kappa + \tan \gamma_p \sin \kappa$

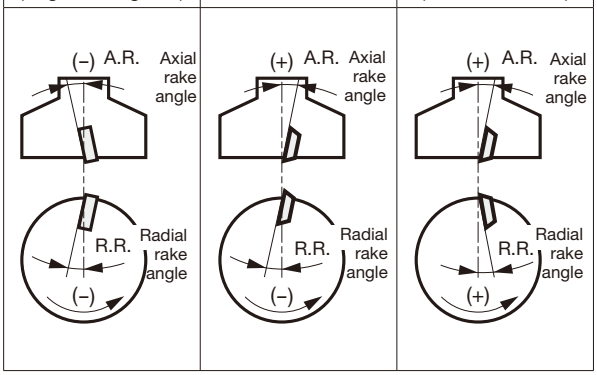
$\tan \lambda = \tan \gamma_p \cos \kappa - \tan \gamma_f \sin \kappa$

### Cutter geometry and applications

| Condition | | Rake angle combination and applicability | | |
|---|---|---|---|---|
| | | Negative-Negative | Negative-Positive | Positive-Positive |
| Shapes of cutting edge | γp (A.R.) | - | + | + |
| | γf (R.R.) | - | - | + |
| | γo | - | + | + |
| Workpiece material | Carbon steels, alloy steels (< 300HB) | △ | ◎ | ◎ |
| | Stainless steels (< 300HB) | × | ◎ | ○ |
| | Die steels (< 300HB) | △ | ◎ | ○ |
| | Cast irons Ductile cast irons | ◎ | ○ | ○ |
| | Aluminium alloys | × | ○ | ◎ |
| | Copper and its alloys | × | ○ | ◎ |
| | Titanium and its alloys | × | ○ | ○ |
| | Hardened steels (40 ~ 55HRC) | ○ | ○ | × |
| Features | | · Higher cutting edge strength<br>· Many usable corners of inserts | · Excellent chip removal<br>· Higher cutting edge strength and Freer cutting action | · Most excellent cutting action |
| Typical examples of mills | | TGN4200<br>DoPent | TAW13<br>TME4400<br>TMD4400 | THF4000<br>THE4000 |

Rake angle combination

| Negative type (Negative-Negative) | Negative-Positive type | Positive type (Positive-Positive) |
|---|---|---|

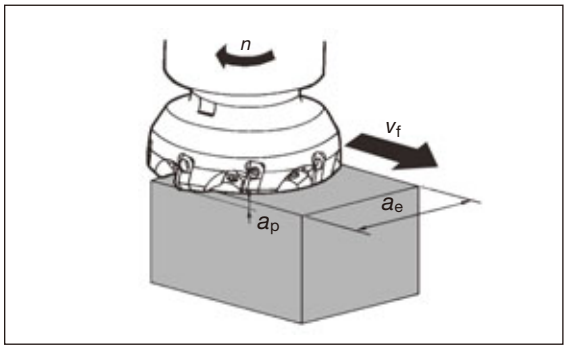


# User's Guide- Technical Reference

## Milling tools

### Calculation formulas for milling

#### ●Cutting speed



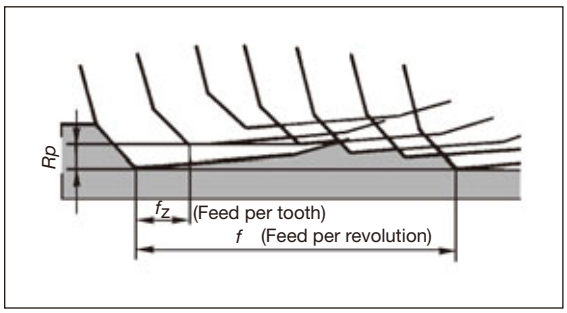

●**Cutting speed** (Calculated from number of revolutions)

$$v_c = \frac{\pi \times \varnothing D_c \times n}{1000} \quad \text{(m/min)}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$: Effective diameter (mm)
$n$ : Number of revolutions ($min^{-1}$)
$\pi \approx 3.14$

●**Number of revolution** (Calculated from cutting speed)

$$n = \frac{1000 \times v_c}{\pi \times \varnothing D_c} \quad (min^{-1})$$



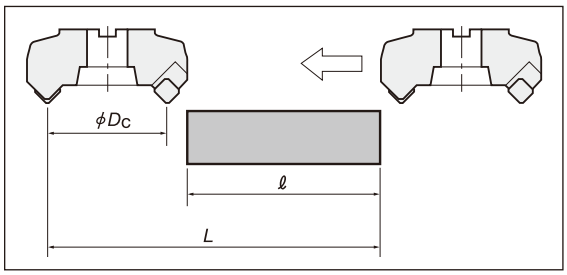

●**Feed speed and feed per tooth**

$$v_f = f_z \times z \times n \quad \text{(mm/min)}$$

$v_f$ : Feed speed (mm/min)
$f_z$ : Feed per tooth (mm/t)
z : No. of teeth of the cutter
$n$ : Number of revolutions ($min^{-1}$)

Feed speed is relative speed of cutter and Workpiece material and in the normal milling machine, it is the table speed.
In milling, the feed per tooth is very important. The recommended cutting condition is expressed by $v_c$ and $f_z$ and using the above equation calculate $n$ and $v_f$ and input in the machine.

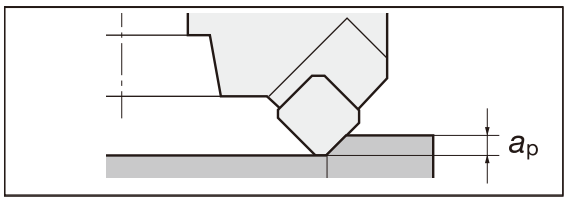
#### ●Cutting time on face milling




$$T = \frac{L}{v_f} \quad \text{(min)}$$

T : Cutting time (min)
L : Total table feed length.
($\ell$ : Workpieces length (mm) + $\varnothing D_c$: Effective cutter diameter (mm))
$v_f$ : Feed speed (mm/min)

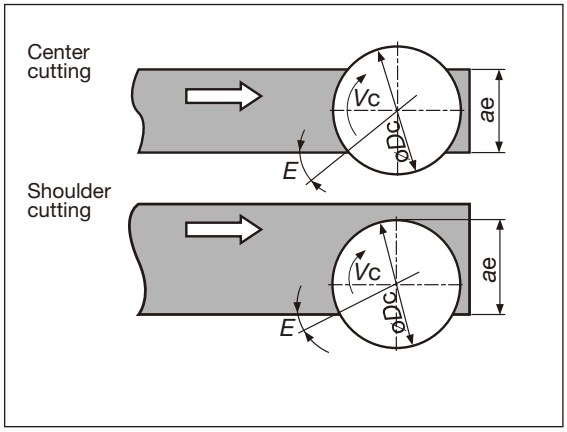
### Depth of cut and width of cut




●**Depth of cut**

Determine by required allowance for machining and capacity of the machine. In case of mill, there are cutting limits according to shape and size of the insert. Please see spec in the catalogue.

$a_p$ : Depth of cut (mm)




●**Width of cut and engagement angle**

There is an appropriate engage angle depending on the cutter diameter, cutting position, Workpiece material, etc., and ordinarily the values in the table below are used as a guide.

$\varnothing D_c$: Cutter diameter (mm)
$E$: Engage angle
$a_e$: Width of cut (mm)

Center cutting

| Workpiece material | Appropriate E | Cutter dia. and ae |
|---|---|---|
| Steel | ~ 42° | $a_e \approx \frac{2}{3} \varnothing D_c$ |
| Cast iron | ~ 53° | $a_e \approx \frac{4}{5} \varnothing D_c$ |

Shoulder cutting

| Workpiece material | Appropriate E | Cutter dia. and ae |
|---|---|---|
| Steel | ~ 30° | $a_e \approx \frac{3}{5} \varnothing D_c$ |
| Cast iron | ~ 40° | $a_e \approx \frac{3}{4} \varnothing D_c$ |

## Milling tools

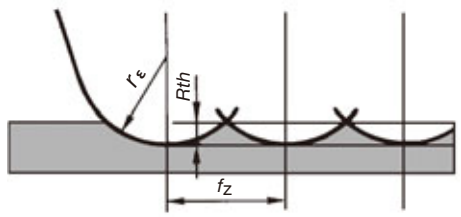
### Roughness of finished surface

**(1) Theoretical surface roughness**

Theoretical roughness as shown below, is the same as for single point turning

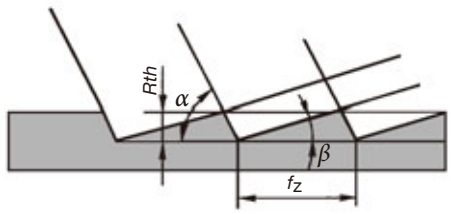
●With corner radius $r_\varepsilon$

$$Rth = \frac{fz^2}{8r_\varepsilon} \times 1000$$

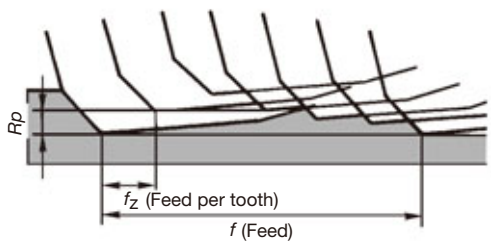



●Without corner radius $r_\varepsilon$

$$Rth = fz\left(\frac{\tan\alpha \cdot \tan\beta}{\tan\alpha + \tan\beta}\right) \times 1000$$



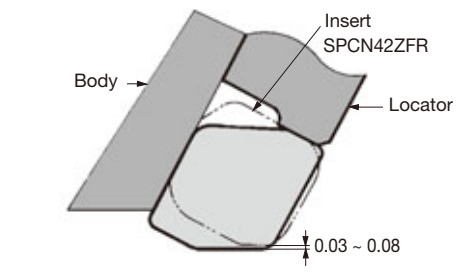

*Rth* : Theoretical roughness (μm)
$f_z$ : Feed per tooth (mm/t)
$r_\varepsilon$ : Corner radius (mm)
$\alpha$ : Corner angle
$\beta$ : Face cutting edge angle




**(2) Actual surface roughness**

A facemill cutter in practice is composed of multiple point cutting edges and is prone to create uneven peaks, or an axial runout error (*Rp*) on cutting edges. One or two cutting edges being non-coplanar to the rest invariably create the dominant mark on a face-milled surface, producing periodic patterns corresponding to the feed per revolution *f* (mm/rev) superimposing on the feed per tooth *fz* (mm/t).

### Improving surface roughness




Face run out must be minimized and a low feed and high speed should be used. Also, in order to attain good finished surface at high efficiency, there are the following methods:

(1) In case of ordinary mill
Use wiper insert as shown in the figure at left.

(2) Use of super finish mill for finishing.
- Use of combination mills with finishing insert such as TFD4400-A and TFP4000IA ($a_p$ < 1.0 mm).
- Use of super finish mill for finishing such as NMS cutters and SFP4000 etc.

# User's Guide- Technical Reference

## Milling Tools

### Calculating power requirement

$$P_c = \frac{k_c \times a_p \times a_e \times v_f}{60 \times 1000 \times 1000}$$
(kW)

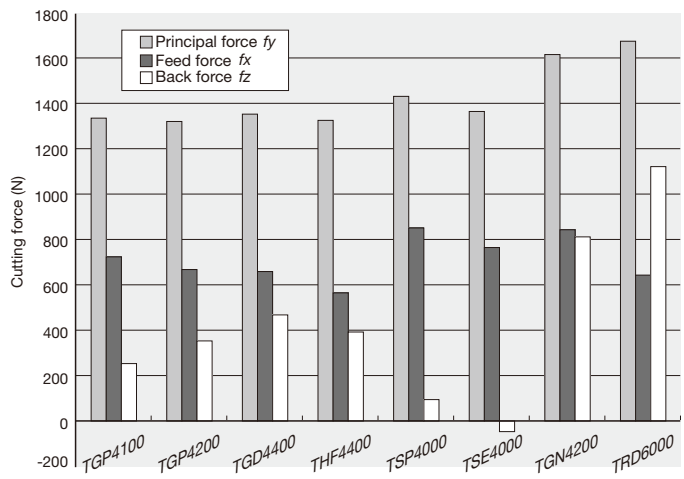
$P_c$ : Net power requirement (kW)
$k_c$ : Specific cutting force (N/mm²)
[Refer to the Table below]
$a_p$ : Depth of cut (mm)
$a_e$ : Width of cut (mm)
$v_f$ : Feed speed (mm/min)

Because practical power requirements depend on the type of mill (proportional to the true rake angle) and the motor efficiency of the machine used, the result calculated from the above formula should be considered as a rough guide.

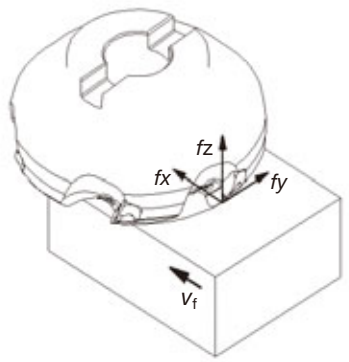
●Values of specific cutting force ($k_c$)

| Workpiece material (JIS) | Tensile strength | Value of specific cutting force on feed per tooth $k_c$ (N/mm²) | | | | |
|---|---|---|---|---|---|---|
| | MPa | 0.1 (mm/t) | 0.15 (mm/t) | 0.2 (mm/t) | 0.3 (mm/t) | 0.4 (mm/t) |
| SS400 | 520 | 2150 | 2000 | 1900 | 1750 | 1650 |
| S55C | 770 | 1970 | 1860 | 1800 | 1760 | 1620 |
| SCM435 | 730 | 2450 | 2350 | 2200 | 1980 | 1710 |
| SKT4 | (HB352) | 2030 | 2010 | 1810 | 1680 | 1590 |
| SC450 | 520 | 2710 | 2530 | 2410 | 2240 | 2120 |
| FC250 | (HB200) | 1660 | 1450 | 1320 | 1150 | 1030 |
| Al (Si) | 200 | 660 | 580 | 522 | 460 | 410 |
| Brass | 500 | 1090 | 960 | 877 | 760 | 680 |

●Values of cutting force ($k_c$)




Workpiece material : S50C (210HB), Diameter of mill : ø160 mm
Cutting speed : $V_c$ = 150 m/min, Feed per tooth: $f_z$ = 0.20 mm/t
Depth of cut: $a_p$ = 3 mm, Cutting by a single edge, dry




●Conversion from cutting speed to number of revolutions

(unit : min⁻¹)

| Cutter diameter ØDc (mm) | Cutting speed ($v_c$) m/min | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 30 | 50 | 100 | 125 | 150 | 200 | 300 | 500 | 800 | 1,000 | 2,000 | 4,000 |
| 10 | 318 | 955 | 1,592 | 3,184 | 3,980 | 4,777 | 6,369 | 9,554 | 15,923 | 25,477 | 31,847 | 63,694 | 127,388 |
| 12 | 265 | 796 | 1,326 | 2,653 | 3,317 | 3,980 | 5,307 | 7,961 | 13,269 | 21,231 | 26,539 | 53,078 | 106,157 |
| 16 | 199 | 597 | 995 | 1,990 | 2,488 | 2,985 | 3,980 | 5,971 | 9,952 | 15,923 | 19,904 | 39,808 | 79,617 |
| 20 | 159 | 477 | 796 | 1,592 | 1,990 | 2,388 | 3,184 | 4,777 | 7,961 | 12,738 | 15,923 | 31,847 | 63,694 |
| 25 | 127 | 382 | 636 | 1,273 | 1,592 | 1,910 | 2,547 | 3,821 | 6,369 | 10,191 | 12,738 | 25,477 | 50,955 |
| 30 | 106 | 318 | 530 | 1,061 | 1,326 | 1,592 | 2,123 | 3,184 | 5,307 | 8,492 | 10,615 | 21,231 | 42,462 |
| 32 | 99 | 298 | 497 | 995 | 1,244 | 1,492 | 1,990 | 2,985 | 4,976 | 7,961 | 9,952 | 19,904 | 39,808 |
| 35 | 90 | 272 | 454 | 909 | 1,137 | 1,364 | 1,819 | 2,729 | 4,549 | 7,279 | 9,099 | 18,198 | 36,396 |
| 40 | 79 | 238 | 398 | 796 | 995 | 1,194 | 1,592 | 2,388 | 3,980 | 6,369 | 7,961 | 15,923 | 31,847 |
| 50 | 63 | 191 | 318 | 636 | 796 | 955 | 1,273 | 1,910 | 3,184 | 5,095 | 6,369 | 12,738 | 25,477 |
| 63 | 50 | 151 | 252 | 505 | 631 | 758 | 1,011 | 1,516 | 2,527 | 4,044 | 5,055 | 10,110 | 20,220 |
| 80 | 39 | 119 | 199 | 398 | 497 | 597 | 796 | 1,194 | 1,990 | 3,184 | 3,980 | 7,961 | 15,923 |
| 100 | 31 | 95 | 159 | 318 | 398 | 477 | 636 | 955 | 1,592 | 2,547 | 3,184 | 6,369 | 12,738 |
| 125 | 25 | 76 | 127 | 254 | 318 | 382 | 509 | 764 | 1,273 | 2,038 | 2,547 | 5,095 | 10,191 |
| 160 | 19 | 59 | 99 | 199 | 248 | 298 | 398 | 597 | 995 | 1,592 | 1,990 | 3,980 | 7,961 |
| 200 | 15 | 47 | 79 | 159 | 199 | 238 | 318 | 477 | 796 | 1,273 | 1,592 | 3,184 | 6,369 |
| 250 | 12 | 38 | 63 | 127 | 159 | 191 | 254 | 382 | 636 | 1,019 | 1,273 | 2,547 | 5,095 |
| 315 | 10 | 30 | 50 | 101 | 126 | 151 | 202 | 303 | 505 | 808 | 1,011 | 2,022 | 4,044 |

Note: In this table, the effects of centrifugal force on the rotating balance of the tool and the toolholder, flying risk of cutter parts, and limited value of toolholder destruction are not considered. Therefore, when using the tool at high speeds, be sure to observe the specified condition range.

# User's Guide- Technical Reference

## Milling Tools

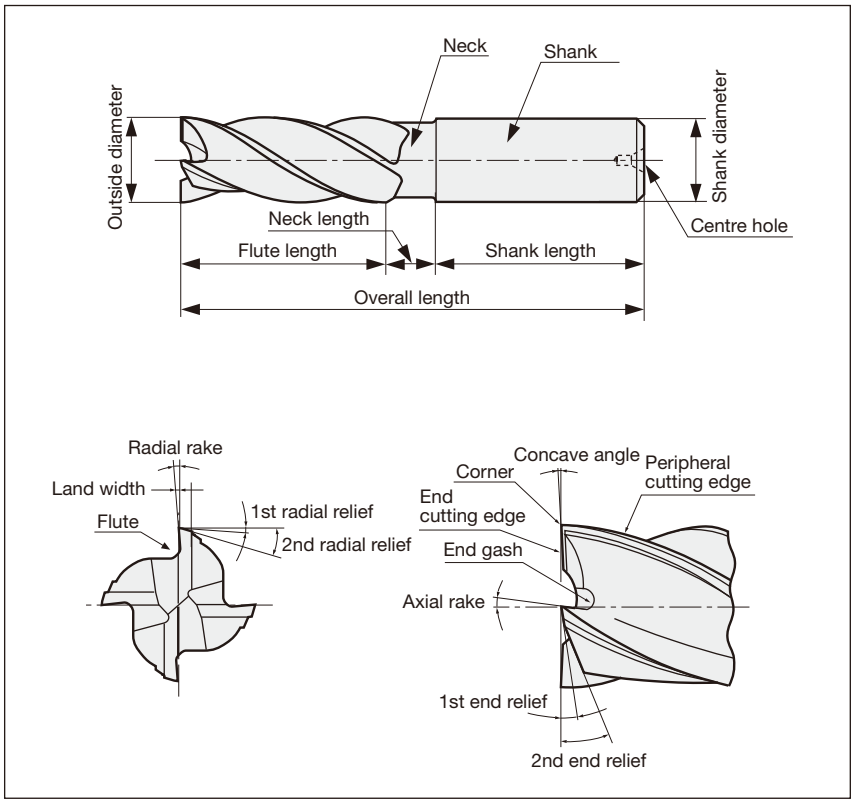
### Trouble shooting in face milling

| Trouble | Possible causes | Countermeasures |
|---|---|---|
| Rapid wear of cutting edge | • Improper insert grade selection (Insufficient wear resistance) | • P30 (Cemented carbide) → Cermet, coated grade (For steels)<br>• K10 (Cemented carbide) → Coated grade (For cast irons) |
| | • Excessive cutting speed | • Select cutting speed suited for Workpiece material and insert grade |
| | • Inadequate feed | • Use standard cutting condition in catalog as guide |
| Rapid chipping of cutting edge | • Improper Insert grade selection (Insufficient toughness) | • Cermet → P30 (For steels), K10 → K20 (For cast irons) |
| | • Cutting hard material and unfavorable surface condition | • Decrease cutting speed<br>• Use cutter with strong cutting edge |
| | • Excessive feed | • Proper selection of feed conditions, using recommended cutting conditions in catalog as guide |
| | • Excessive pressure applied on cutting edge | • Proper selection of engaging angle |
| | • Machining superalloys | • Use a negative-positive type cutter with large corner angle |
| Fracturing | • Cracking due to thermal shock | • Select insert grade of stronger thermal shock resistance<br>• Decrease cutting speed |
| | • Continuous use of excessively worn insert | • Shorten replacement standard time of insert |
| | • Cutting hard material | • Use cutter with stronger cutting edge<br>• Use cutter of larger corner angle |
| | • Obstruction to chip flow<br>• Recutting of chips after chip welding | • Use cutter with better chip expulsion<br>• Select insert grades difficult for chips to adhere<br>Cemented carbides → cermets, coated grades<br>• Use air blow |
| | • Excessively slow cutting, too fine feed | • Select cutting speed and feed optimized for insert grade and Workpiece material |
| Excessive chip welding or build-up on cutting edge | • Cutting soft material such as aluminium, copper, mild steel | • Use cutter with large rake angle |
| | • Cutting stainless steel | • P30 → coated grades (AH130、AH3135) |
| | • Use of cutter with negative rake or too small rake angle | • Use cutter with large rake angle |
| Rough finish | • Effect of built-up edge | • Increase cutting speed<br>• Appropriate cutting depth (finish allowance)<br>• Change insert grade For steels : P → coated → cermet<br>For cast irons : K → coated |
| | • Effect of face cutting edge run out | • Proper installing of inserts<br>• Use insert of high dimensional accuracy<br>• Cleaning of insert pocket |
| | • Continuous use of excessively worn insert | • Shorten replacement standard time of insert |
| | • Remarkable feed marks | • Feed per revolution to be set within flatland width<br>• Use wiper insert type cutter such as T/EAW13<br>• Use cutter exclusively for finishing |
| Chattering | • Unstable clamping of workpiece | • Check clamping method of workpiece |
| | • Cutting of welded construction of thin steel plate | • Use cutter of large rake angle and small corner angle |
| | • Excessive cutting condition | • Re-examine allowable chip removal rate according to motor HP |
| | • Face milling of narrow width workpiece | • Use cutter of small cutter diameter and with many teeth |
| | • Too many simultaneous cutting teeth engagement | • Reduce No. of teeth or use irregular pitch cutter |

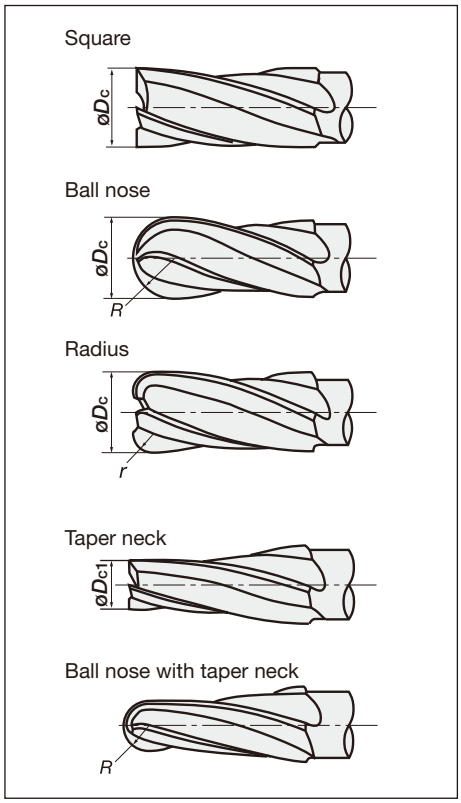
# User's Guide- Technical Reference

## Solid Carbide Endmills

### Part details

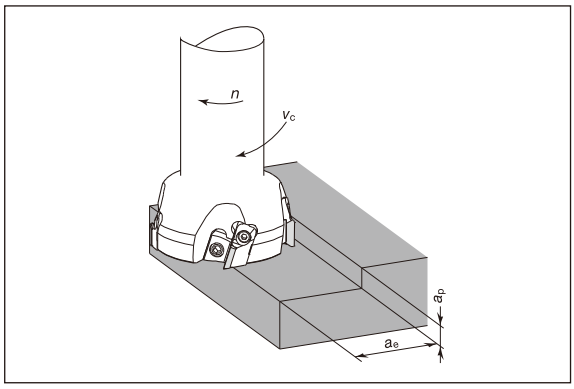


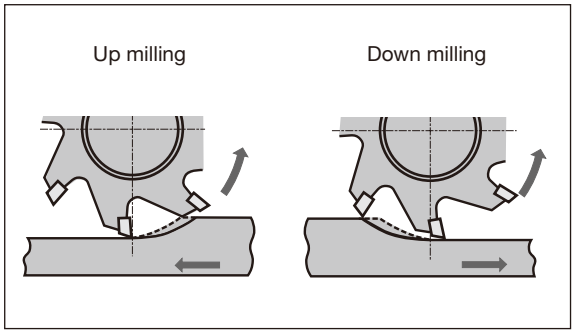

### Types




### Cutting condition of Endmills

**● Cutting speed**




**● Cutting speed** (Calculated from number of revolutions)

$$v_c = \frac{\pi \times øD_c \times n}{1000} \quad \text{(m/min)}$$

$v_c$ : Cutting speed (m/min)
$øD_c$ : Effective diameter (mm)
$n$ : Number of revolutions ($min^{-1}$)
$\pi \approx 3.14$

**● Number of revolution** (Calculated from cutting speed)

$$n = \frac{1000 \times v_c}{\pi \times øD_c} \quad (min^{-1})$$

**● Feed speed and feed per tooth**

$$v_f = f_z \times z \times n \quad \text{(mm/min)}$$

$v_f$ : Feed speed (mm/min)
$f_z$ : Feed per tooth (mm/t)
$z$ : No. of teeth of the endmills
$n$ : Number of revolutions ($min^{-1}$)

**● Cutting**

The necessary capacity of the machine is limited by the length of cut edge of the endmill.

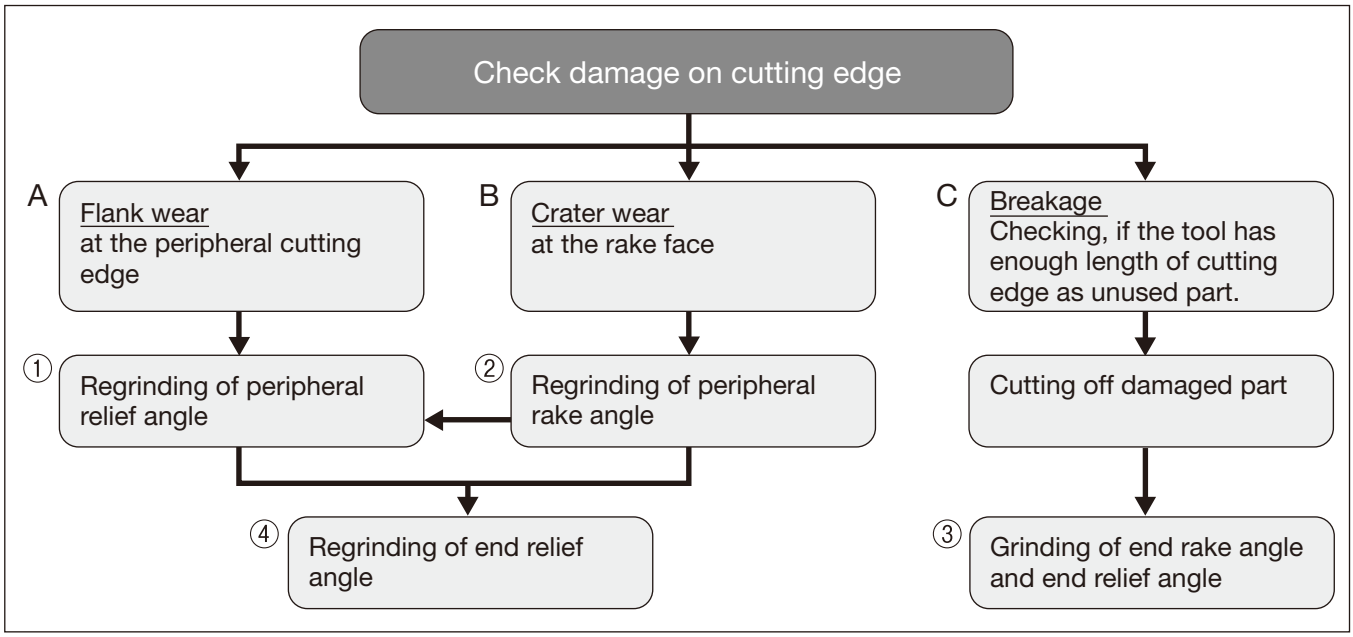
**● Up milling and down milling**

Down milling generally produces better tool life and surface roughness.
In case of cast iron sand inclusion or welding surface, up milling is recommended.

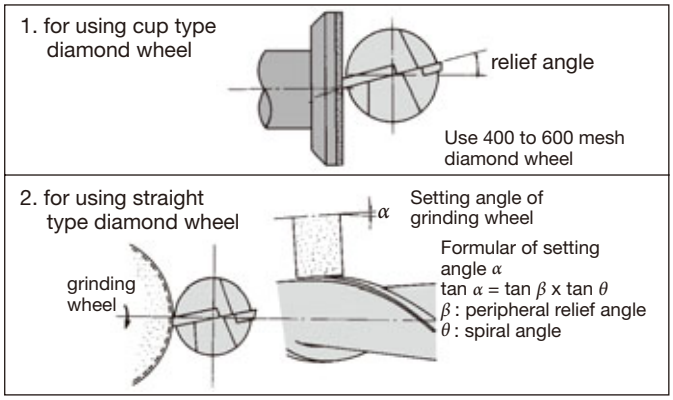
# User's Guide- Technical Reference

## Solid Carbide Endmills

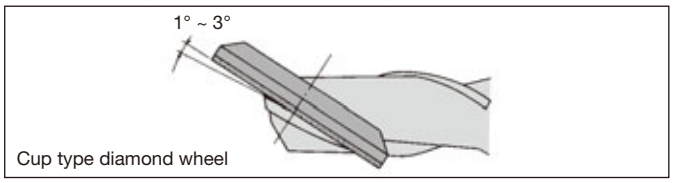
### Regrinding procedures of solid carbide endmill



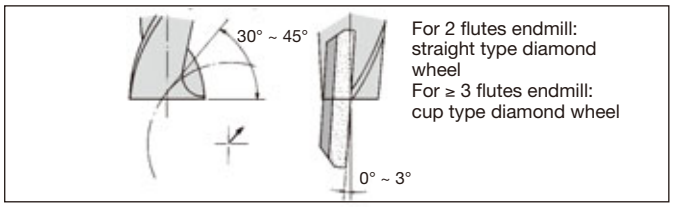

1 Regrinding of end relief angle



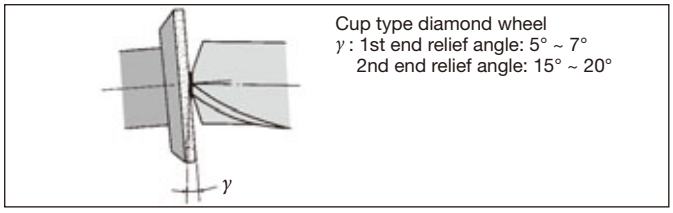

2 Regrinding of peripheral rake angle




3 Regrinding of end rake angle (End gash)




4 Regrinding of end relief angle




Notice of regrinding

(1) If, after checking the damage of the cutting edge, the damage is as case "A" or "B" of the flow chart, the tool must be reground.
Too much damage of the cutting edge requires too much stock removal and thus reduces tool life.

(2) Please use diamond grinding wheel.

(3) Peripheral relief angle must be ground between 18° and 10°.
Relief angle of small diameter cutters for aluminium machining must be a large degree.

(4) First check if "C" in flow chart can be adapted for the case of coated endmill or not.
If procedure "C" can be adapted for regrinding, tool life after the grinding would be more improved than new one. The reason is remaining coated layer of cutting edge and shorter tool length will keep much higher rigidity of the tool than before regrinding.

(5) Please check run out of peripheral cutting edge, face cutting edge, with Vee block after regrinding.
The value of the run out must be controlled within 0.01 mm.

Notice for regrinding of ball nose endmill

- Regrinding of relief angle only is available. The dimension of nose radius will be smaller after grinding.
- Honing of cutting edge is necessary after regrinding.

# User's Guide- Technical Reference

## Solid Carbide Endmills

### Trouble shooting in Endmilling

| Trouble | Possible causes | Countermeasures |
|---|---|---|
| **Breakage**<br>(In case of solid carbide endmill and brazed endmill with small diameter) | ● At the start of machining<br>● At the end of machining | ● Reduce feed.<br>● Reduce tool overhang length.<br>● Exchange to short cutting edge tool. |
| | When usual machining | ● Reduce feed.<br>● Managing tool life → Exchange in shorter time.<br>● Replace chuck or collet to new one.<br>● Reduce tool overhang length.<br>● Make optimum honing on the edge.<br>● Reduce flutes. E.g. 4 flutes → 3flutes, or 2flutes.<br>● Use enough coolant. Change direction of supplying coolant. |
| | When change the direction of feed | ● Use the circular interpolation in NC machine. Stop feed shortly before changing.<br>● Lower feed around changing part.<br>● Replace chuck or collet to new one. |
| **Fracture on cutting edge** | Chipping on corner edge | ● Chamfer the corner with hand-stick grinder.<br>● Down cutting ⇒ Upward milling. |
| | Chipping on boundary part | ● Change cutting direction, Down cutting → Upward milling.<br>● Reduce cutting speed. |
| | Chipping on central part or all edges. | ● Make slight honing on the edge. Or make honing bigger.<br>● Change spindle revolution number.<br>● Increase cutting speed.<br>● If chattering, increase feed.<br>● Use coolant or air blast.<br>● Replace chuck or collet to new one.<br>● Decrease cutting speed. |
| | Fracture on cutting edge | ● Decrease feed.<br>● Reduce flutes. E.g. 4 flutes → 3flutes, or 2flutes.<br>● Make slight honing on the edge. Or make honing bigger.<br>● Replace chuck or collet to new one.<br>**【For Solid carbide endmill】**<br>● Decrease cutting speed.<br>● Use enough coolant. Change direction of supplying coolant. |
| **Large wear in short time** | | ● Decrease cutting speed.<br>● Change cutting direction, Upward milling → down cutting.<br>● Increase feed.<br>● Use coolant or air blast.<br>● In reground tool, grind flank face with FINER wheel. |

(Continued on next page)

# User's Guide- Technical Reference

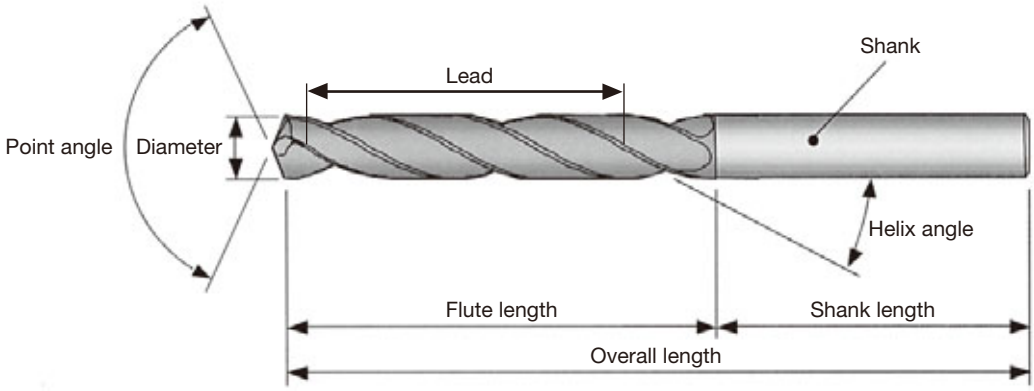
## Solid Carbide Endmills

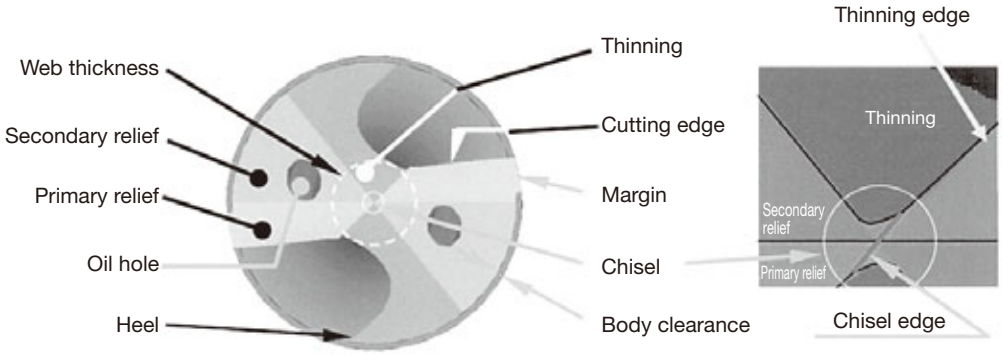
| Trouble | Possible causes | Countermeasures |
|---|---|---|
| Poor surface finish | Bright, but Wavy surface | ● Reduce feed per tooth.<br>● Increase flutes; E.g. 2 flutes → 3flutes, or 4flutes. |
| | Small chips are welded on surface. | ● Increase cutting speed.<br>● Use coolant or air blast, or increase coolant.<br>● Make slight honing on the edge.<br>● Upward milling → Down cutting.<br>● Increase feed per tooth. Increase Depth of Cut. |
| | Scratches on the surface | ● Make slight honing on the edge.<br>● Use non-water soluble coolant.<br>● Down cutting → Upward milling. |
| | Poor surface by over cutting | ● Reduce depth of cut.<br>● Increase cutting speed.<br>● Reduce feed per tooth. |
| Poor accuracy | Finish size becomes a minus tendency. | ● Upward milling → Down cutting.<br>● Reduce depth of cut.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Increase cutting speed. |
| | Poor straightness | ● Reduce depth of cut.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Increase cutting speed.<br>● Increase flutes; E.g. 2 flutes → 4flutes.<br>● Reduce feed per tooth.<br>● Check the edge. Change tool, when needed. |
| Chattering | | ● Increase feed per tooth.<br>Reduce feed per tooth, when current feed is more than 0.07 mm/t.<br>● Change cutting speed.<br>● Replace chuck or collet to new one.<br>● Reduce overhang length.<br>● Use 2 flutes tool in roughing. Use 4 flutes tool in finishing.<br>● Down cutting → Upward milling. |

# User's Guide- Technical Reference

## Drilling Tools

### Nomenclature for solid carbide drills




### Cutting forces and power requirement

● **Twist drill**

**Power requirement**

$$P_c = K \varnothing D_c^2 n \quad (0.647 + 17.29f) \times 10^{-6} \text{ (kW)}$$

**Thrust force**

$$T_c = 570 K \varnothing D_c f^{0.85} \text{ (N)}$$

**Torque**

$$M_c = \frac{K \varnothing D_c^2 (0.630 + 16.84f)}{100} \text{ (N·m)}$$

$P_c$ : Power requirement (kW)
$T_c$ : Thrust force (N)
$M_c$ : Torque (N·m)
$\varnothing D_c$ : Drill diameter (mm)
$f$ : Feed (mm/rev)
$n$ : No. of revolutions ($min^{-1}$)
$K$ : Material constant···· Refer to the Table at right

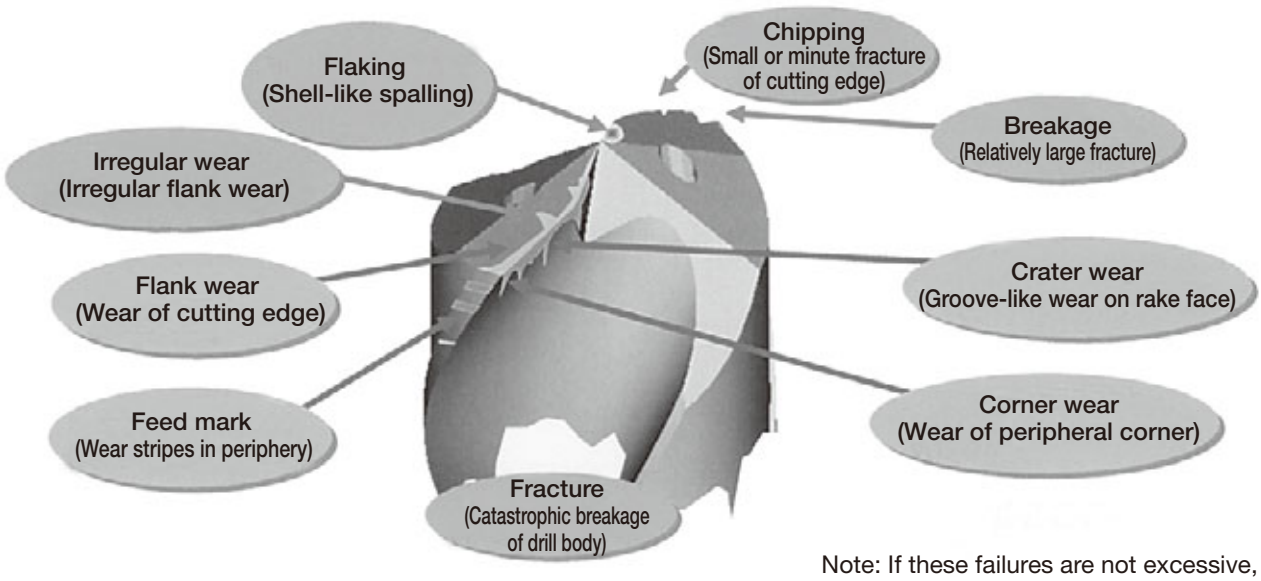
●Material constant compensating for power requirement and thrust force

| Workpiece material | Tensile strength | | Brinell hardness (HB) | Material constant (K) |
|---|---|---|---|---|
| | MPa (N/mm²) | Kgf/mm² | | |
| Cast iron | 210 | 21 | 177 | 1.00 |
| Cast iron | 280 | 28 | 198 | 1.39 |
| Cast iron | 350 | 35 | 224 | 1.88 |
| Aluminium | 250 | 25 | 100 | 1.01 |
| Low carbon steel (JIS S20C) | 550 | 55 | 160 | 2.22 |
| Free cutting steel (JIS SUM32) | 620 | 62 | 183 | 1.42 |
| Manganese steel (JIS SMn438) | 630 | 63 | 197 | 1.45 |
| Nickel chromium steel (JIS SNC236) | 690 | 69 | 174 | 2.02 |
| 4115 steel Cr0.5, Mo0.11, Mn0.8 | 630 | 63 | 167 | 1.62 |
| Chromium molybdenum steel (JIS SCM430) | 770 | 77 | 229 | 2.10 |
| Chromium molybdenum steel (JIS SCM440) | 940 | 94 | 269 | 2.41 |
| Nickel chromium molybdenum steel (JIS SNCM420) | 750 | 75 | 212 | 2.12 |
| Nickel chromium molybdenum steel (JIS SNCM625) | 1,400 | 140 | 390 | 3.44 |
| Chromium vanadium steel | | | | |
| Cr0.6, Mn0.6, V0.12 | 580 | 58 | 174 | 2.08 |
| Cr0.8, Mn0.8, V0.1 | 800 | 80 | 255 | 2.22 |

# User's Guide- Technical Reference

## Drilling Tools

### Cutting edge failure of solid carbide drills



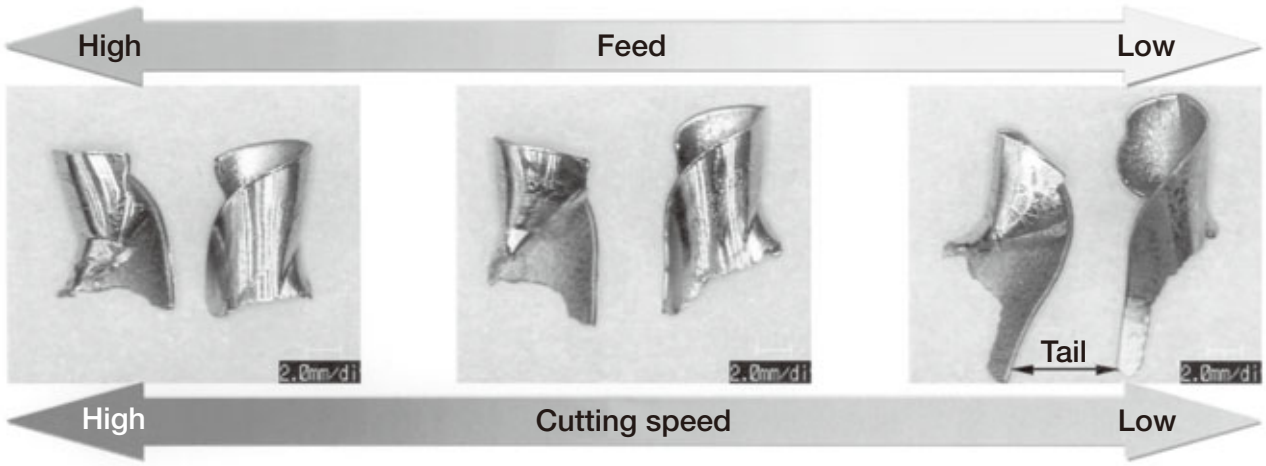

Note: If these failures are not excessive, the tool is in a normal condition.

### Change of chip shapes in drilling

**● Change of chip shapes relating to cutting conditions**

Photographs below show the change of chip shapes relating to change of the feed and the cutting speed. These chip shapes are all well controlled in a proper condition range.

When the speed and feed are low, the chip shows whitish color and the tail of the chip tends to lengthen gradually. In contrast, as the speed or the feed increases, the chip tends to increase in brightness and becomes a compact shape with a short tail. These changes in the shape depend on the cutting temperature. As the temperature increases, chips tend to be broken.



# User's Guide- Technical Reference

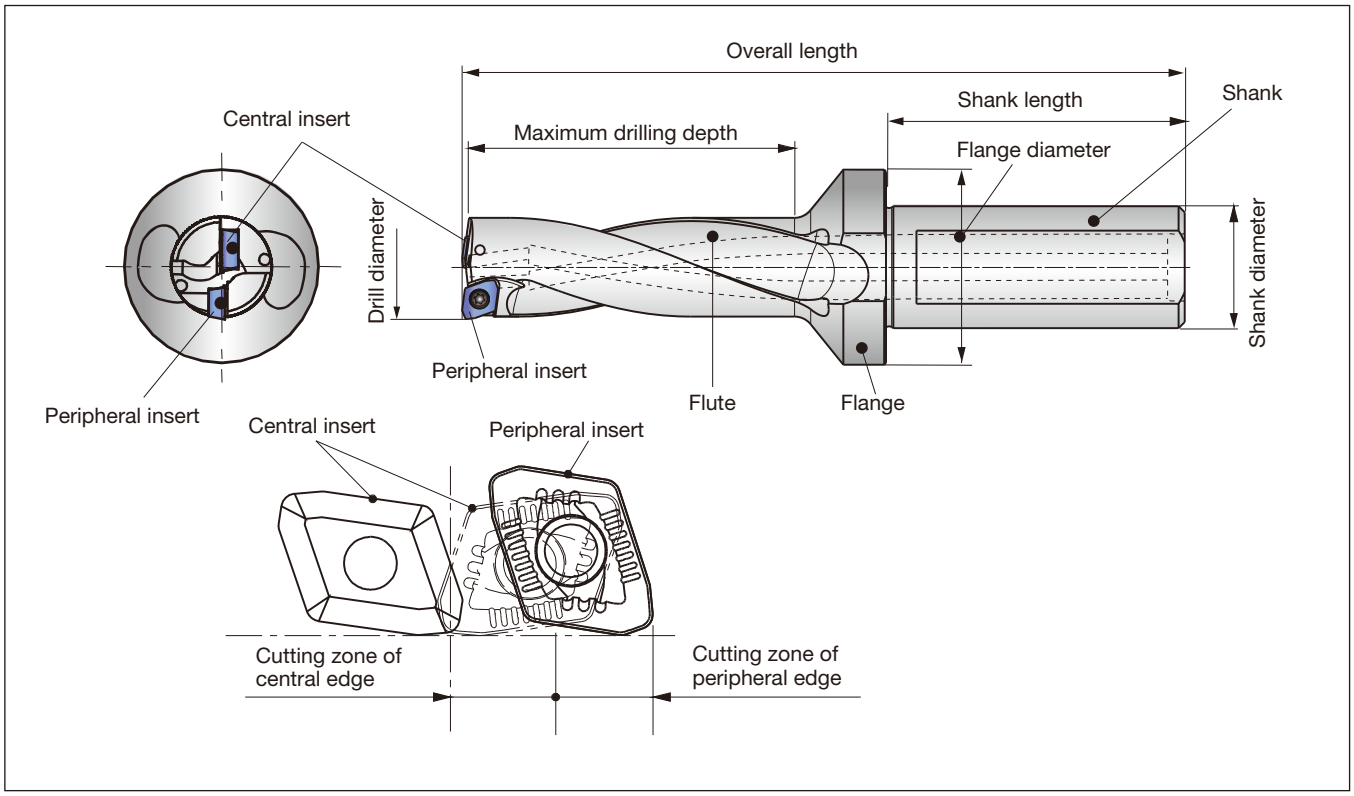
## Drilling Tools

### Troubleshooting for solid carbide drills

| Problem | | Cause | Countermeasure |
|---|---|---|---|
| Abnormal wear | Relief surface | Inappropriate cutting speed | •Increase the cutting speed by 10 % within standard conditions if abnormal wear is around center.<br>•Lower the cutting speed by 10 % within standard conditions if abnormal wear is on the periphery. |
| | | Inappropriate cutting fluid | •Check the filter.<br>•Use the cutting fluid superior in lubricity. (Increase the dilution rate) |
| | Margin | Inappropriate cutting speed | •Lower the cutting speed by 10 %. |
| | | Regrinding timing, insufficient reground amount | •Shorten the regrinding timing. |
| | | Insufficient rigidity of the machine and workpiece | •Change the clamp method to the one with rigidity. |
| | | Insufficient drill rigidity | •Use smallest possible overhang. |
| | | Inappropriate cutting fluid | •Check the filter.<br>•Use the cutting fluid superior in lubricity. (increase the dilution rate) |
| | | Intermittent cutting when entering | •Avoid interruption at entry and exit.<br>•Lower the feed by about 50 % during entering into and leaving from the workpiece. |
| Chipping and fracture | Chisel section (center of drill cutting edge) | Insufficient rigidity of the drill | •Reduce the drill overhang as much as possible.<br>•Increase the feed at entry when the low speed feed is selected in standard cutting condition range.<br>•Use a bushing or a center drill. |
| | | Insufficient rigidity of the machine and workpiece | •Change the clamp method to the one with rigidity. |
| | | Inappropriate entry into the workpiece | •Avoid interruption at entry into the workpiece.<br>•Lower the feed by 10 % at entry. |
| | | High workpiece hardness | •Lower the feed by 10 %. |
| | | Inappropriate honing | •Check if honing has been made to the center of cutting edge. |
| | Peripheral cutting edge | Insufficient drill rigidity | •Lower the cutting speed by 10 %.<br>•Increase the feed at entry when the low speed feed is selected in standard cutting condition range. |
| | | Inappropriate drill mounting accuracy | •Check the run out accuracy after drill installation. (0.03 mm or less) |
| | | Insufficient machinery and workpiece rigidity | •Change the clamp method to the one with rigidity.<br>•Lower the feed during entering into and leaving from the workpiece. |
| | | Inappropriate honing | •Check if honing has been made to the cutting edge periphery. |
| | Margin | Insufficient machine and workpiece rigidity | •Change the clamp method to the one with rigidity. |
| | | Insufficient drill rigidity | •Use smallest possible overhang.<br>•Use a bushing or center drill. |
| | | Regrinding timing and insufficient amount of reground stock | •Shorten the regrinding timing. |
| | | Intermittent cutting when entering or exiting the cut | •Avoid interruption at entry and exit.<br>•Lower the feed by about 50 % during entering into and leaving from the workpiece. |
| Breakage | | Tendency to cause chipping or develop abnormal wear | •Check the failure mode condition before breakage and find out the wear and chip countermeasures. |
| | | Chip packing in the drill flutes | •Review the cutting conditions.<br>•For internal coolant supply, raise the supply pressure of cutting fluid.<br>•Use peck feed for deep holes. |
| | | Insufficient machine output | •Review the cutting conditions.<br>•Use the machine with high power. |
| Insufficient hole accuracy | | Insufficient rigidity of the machinery and workpiece | •Change to the clamp method with rigidity |
| | | Inappropriate drill installation accuracy | •Check the run out accuracy of drill mounting. (0.03 mm or less) |
| | | Chip packing in the flutes. | •Review the cutting conditions.<br>•Raise the cutting oil supply pressure.<br>•Use peck-feed for deep holes. |
| | | Inappropriate edge sharpening accuracy | •Check the edge shape accuracy. |
| Prolonged chips | | Inappropriate cutting conditions | •Increase the feed by 10 % within standard conditions. |
| | | Inappropriate honing | •Provide the appropriate honing. |
| | | Cutting edge with chipping or breakage | •Lower the cutting speed by 10 %. |

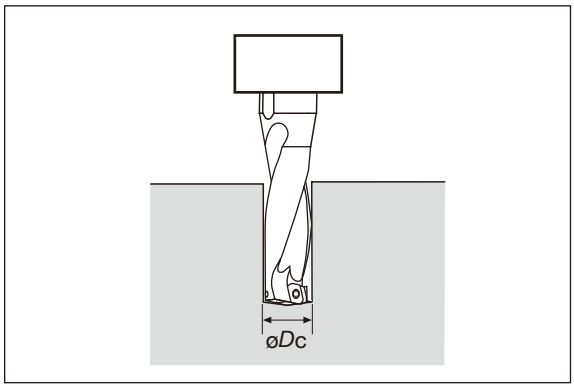
## Drilling Tools

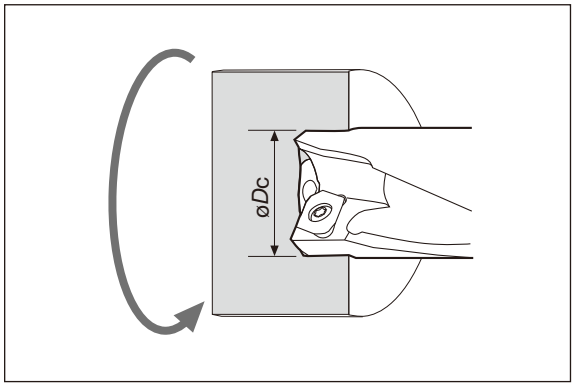
### Nomenclature for Indexable drill




### Calculation formulas for Indexable drill

**●Cutting speed**




**●When calculating cutting speed from number of revolutions: (Drilling formulas)**

$$v_c = \frac{\pi \times \varnothing D_c \times n}{1000} \quad \text{(m/min)}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$ : Drill diameter (mm)
$n$ : Number of revolution ($min^{-1}$)
$\pi \approx 3.14$

**●When calculating required number of revolutions from cutting speed: (Drilling formulas)**

$$n = \frac{1000 \times v_c}{\pi \times \varnothing D_c} \quad (min^{-1})$$

**●When calculating cutting speed from number of revolutions: (Where the workpiece rotates.)**

$$v_c = \frac{\pi \times \varnothing D_c \times n}{1000} \quad \text{(m/min)}$$

$v_c$ : Cutting speed (m/min)
$\varnothing D_c$ : Drilling diameter (mm)
$n$ : Number of revolution ($min^{-1}$)
$\pi \approx 3.14$

**●When calculating required number of revolutions from cutting speed: (Where the workpiece rotates.)**

$$n = \frac{1000 \times v_c}{\pi \times \varnothing D_c} \quad (min^{-1})$$

**●Calculation of feed speed**

$$v_f = f \times n \quad \text{(mm/min)}$$

$v_f$ : Feed speed (mm/min)
$f$ : Feed (mm/rev)
$n$ : Number of revolution ($min^{-1}$)

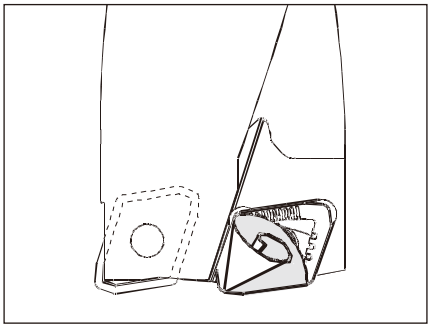
# User's Guide- Technical Reference

## Drilling Tools

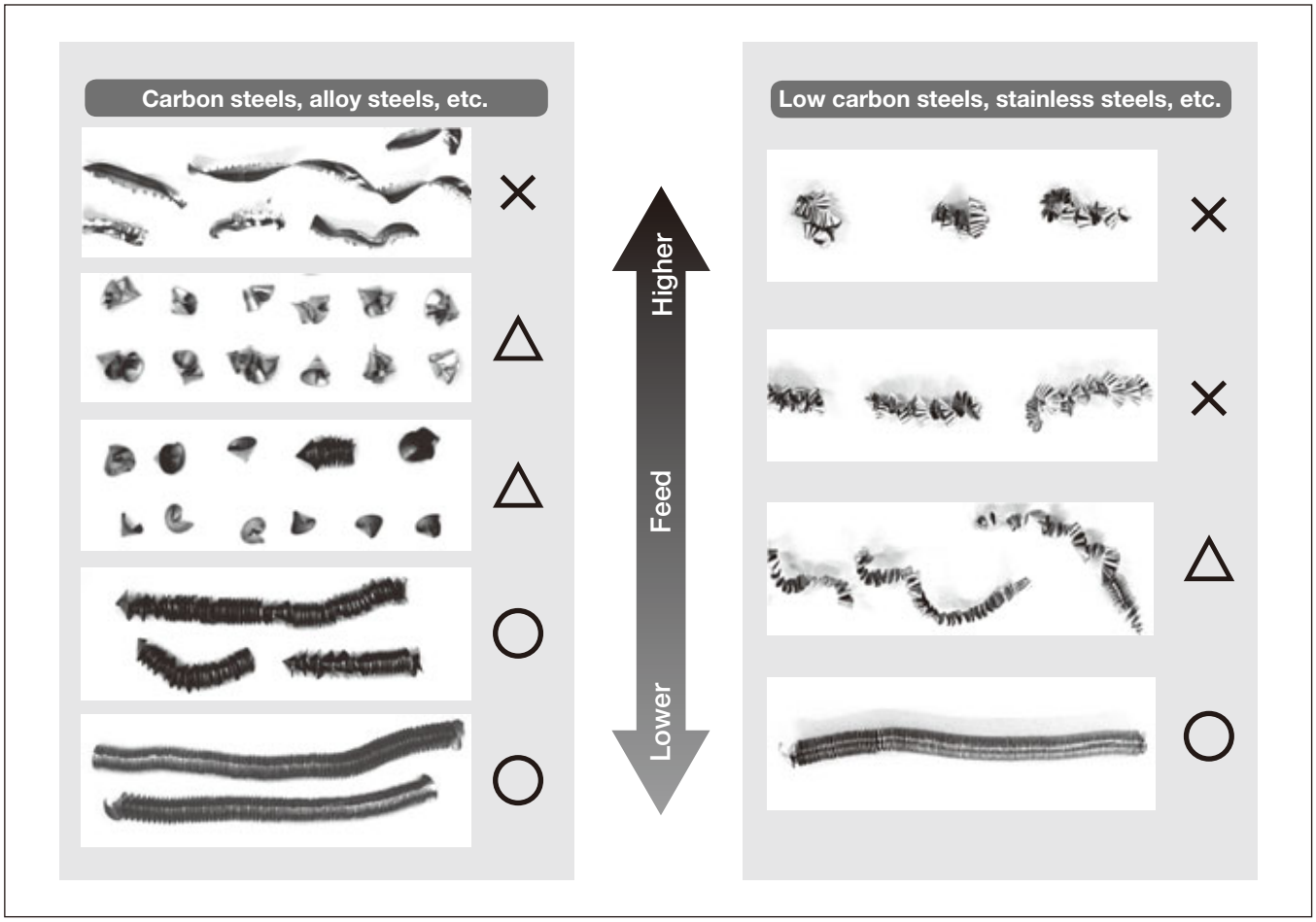
### Chip shapes

**● Chip shape produced with central insert**

- A conical coil shape whose apex point coincides with the rotating center of the drill is the basic shape. The chips are broken into small sections with increases in feed. However, excessively high feed causes the chip to increase in thickness and develops vibration which disturbs stable machining.
- In TDX drills, ○ marked chips shown below are the most preferable shapes. This type of chip is broken into adequate lengths by centrifugal forces when used in tool-rotating condition. On the other hand, when used in work-rotating condition such as on a lathe, a continuously long chip is often produced without entangling.

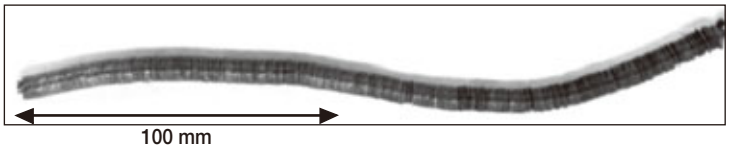


**● Relation between chip shapes and feeds** (In the case of central insert)




**● Example of chip shape in work-rotating applications** (In the case of central insert)

(ø26, JIS S45C, $V_c$ = 100 m/min, $f$ = 0.1 mm/rev)

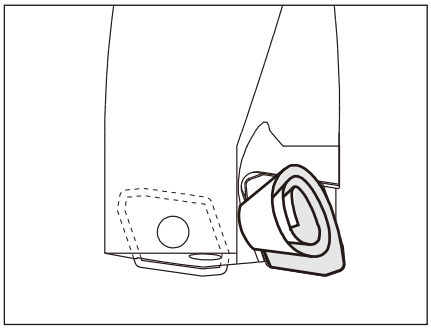


# User's Guide- Technical Reference

## Drilling Tools

### ● Chip shape produced with peripheral insert

- Chip problems such as entangling are mainly caused by chips produced with the peripheral insert. These problems are dependent on the types of Workpiece material and the cutting conditions.
- As shown below, when the feed is extremely low, the chips jump over the chipbreaker groove and the continuously long chips may wrap around the drill body.
- When the feed is too high, the chips increase in thickness and can not be curled.
- Therefore, it is important to select proper cutting conditions to suit the machining so that well controlled chips will be formed.



**Medium to high carbon steels, alloy steels, etc.**

As shown below, several turns of coil are an ideal shape.
As the feed increases, the curl radius and the number of turns tend to decrease.

### ● Typical chip shapes of general steels

### ● Variation of chip shapes relating to feeds

*f* = 0.07 mm/rev → *f* = 0.1 mm/rev → *f* = 0.13 mm/rev

**Stainless steels, low-carbon steels, low-alloy steels, etc.**

- When machining long-chip materials such as stainless steels and mild steels, the wrong selection of cutting conditions results in chip entangling and tool breakage at worst. Therefore, cutting conditions should be carefully selected.
- "C" shaped, continuous coils of several to ten turns having adequately divided lengths are the ideal shape.

### ● Ideal chip shapes

| | Stainless steel (JIS SUS 304) ( ø22, *Vc* = 100 m/min, *f* = 0.1 mm/rev ) | Mild steel (JIS SS400) ( ø22, *Vc* = 160 m/min, *f* = 0.08 mm/rev ) |
|---|---|---|
| DS chipbreaker | | |
| DJ chipbreaker | | |

For machining stainless steels or low carbon steels, DS chipbreaker is recommended.
When using a TDX drill in tool-rotating condition, DS chipbreaker produces compact chips and allows more stable machining than DJ chipbreaker. When using it in work-rotating condition, DS chipbreaker provides outstanding affect on chip control.

# User's Guide- Technical Reference

## Drilling Tools

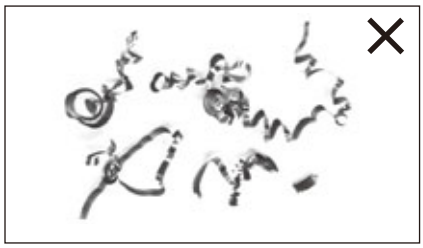
### ● Chip shapes which tend to entangle and remedies against them

**① Apple-peel-like chips**

These chips are often produced in machining mild steels or low-carbon steels at low-speeds and low-feeds.

**Remedies**

Increase the cutting speed in stages by 20% within the range of standard cutting conditions. If there is no effect, increase the feed by about 10 % as the cutting speed is raised by 20%.



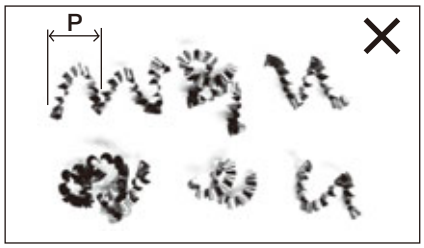
Apple-peel-like chips (Without curling)

**② Short-lead chips**

These chips are often produced in machining stainless steels at low-feeds and tend to entangle to the tool in spite of short length.

**Remedies**

Increase the feed by about 10 %. If there is no effect, increase the cutting speed in stages by 10% within the range of standard cutting conditions.



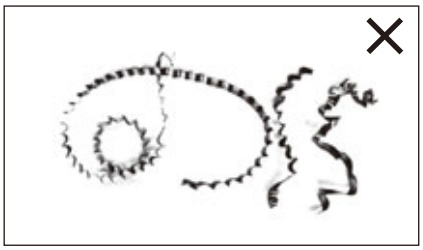

Continuously curled "C" shape chips with short lead (P).

**③ Very long chips**

Often produced in machining mild steels or low-carbon steels under improper cutting conditions.

**Remedies**

Increase the cutting speed in stages by 20% within the range of standard cutting conditions. If there is no effect, decrease the feed by about 10 % as the cutting speed is raised by 20%.

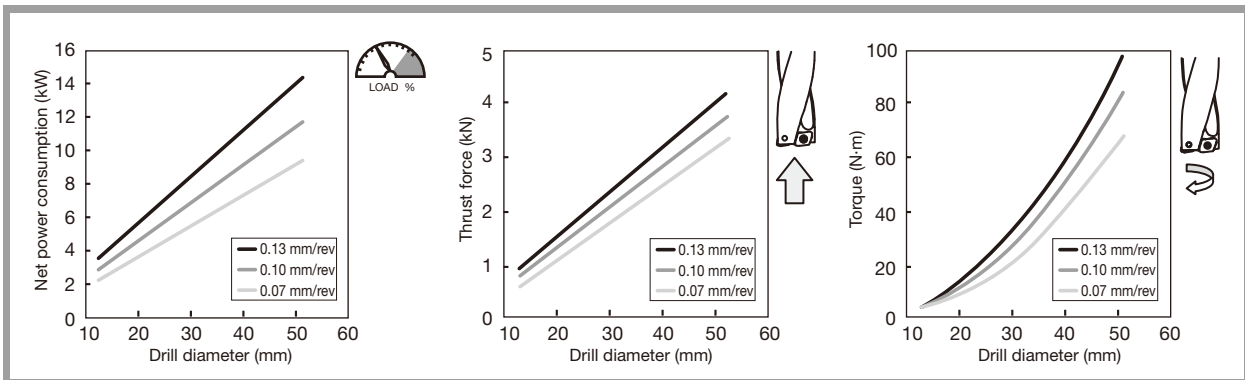


Continuously coiled long chips

## Cutting forces

The charts below show a guideline for cutting forces. Use TDX drills on a machine with ample power and sufficient rigidity.

### ● Guidelines for cutting forces




Cutting speed: $v_c$ = 100 m/min
Workpiece material: Alloy steel (JIS SCM440), 240HB
Cutting fluid: Used

## Drilling Tools

### Troubleshooting for indexable drills

| Problem | | | Cause | Countermeasure |
|---|---|---|---|---|
| Abnormal wear | Central cutting edge | Relief surface | Inappropriate cutting conditions | ● Increase the cutting speed by 10 % within standard conditions.<br>● Lower the feed by 10 %. |
| Abnormal wear | Peripheral cutting edge | Relief surface | Inappropriate cutting conditions | ● Increase the cutting speed by 10 % within standard conditions.<br>● When the feed is extremely low or high, set up it within standard conditions. |
| Abnormal wear | Common | Relief surface | Varieties and supply of cutting fluid | ● Confirm that the cutting fluid flow is higher than 7 liter/min.<br>● The concentration of cutting fluid must be higher than 5 %.<br>● Use the cutting fluid superior in lubricity.<br>● Change to internal cutting fluid supply from external one. |
| Abnormal wear | Common | Relief surface | Vibration in drilling | ● Change to the machine with higher torque.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| Abnormal wear | Common | Relief surface | Unsuitable for selection of grade | ● Change the grade to high wear resistant. |
| Abnormal wear | Common | Relief surface | Looseness of screws | ● Tighten the screw. |
| Abnormal wear | Common | Crater | Cutting heat is too high | ● Change to internal cutting fluid supply from external one.<br>● Increase the supply rate of the cutting fluid. (Higher than 10 liter/min.)<br>● Lower the feed by 20 % within standard conditions.<br>● Lower the cutting speed by 20 % within standard conditions. |
| Abnormal wear | Common | Crater | Excessive chip welding | ● Lower the feed by 20 % within standard conditions.<br>● Lower the cutting speed by 20 % within standard conditions. |
| Abnormal wear | Common | Chipbreaker | Chip packing | ● Increase the cutting speed by 20% and lower the feed by 20% within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| Chipping and fracture | Central cutting edge | The rotation center of drill | Misalignment for workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| Chipping and fracture | Central cutting edge | The rotation center of drill | Large offset | ● Check the manual and use the tool in the allowable offset range. |
| Chipping and fracture | Central cutting edge | The rotation center of drill | No flatness of machined surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev in rough surface area. |
| Chipping and fracture | Central cutting edge | The rotation center of drill | High feed | ● Lower the feed by 20 ~ 50 % within standard conditions. |
| Chipping and fracture | Central cutting edge | The rotation center of drill | Using a chipping corner | ● Confirm the corner when exchanging inserts. |
| Chipping and fracture | Peripheral cutting edge | Peripheral corner area | Using inserts in excess of tool-life | ● Exchange the corner or the insert before the nose wear reaches 0.3 mm. |
| Chipping and fracture | Peripheral cutting edge | Peripheral corner area | No flatness of machined surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev at rough surface area. |
| Chipping and fracture | Peripheral cutting edge | Peripheral corner area | The existence of interrupted area | ● Set the feed for lower than 0.05 mm/rev in interrupted area. |
| Chipping and fracture | Peripheral cutting edge | Peripheral corner area | Using a chipped corner | ● Confirm the corner when exchanging inserts. |
| Chipping and fracture | Common | The unused corner area and cutting edge | High hardness of workpiece | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| Chipping and fracture | Common | The unused corner area and cutting edge | Chip packing | ● Lower the feed by 20 % within standard conditions. |
| Chipping and fracture | Common | The unused corner area and cutting edge | Machinery impact | ● Change to continuous feed in case of pick feeding. |
| Chipping and fracture | Common | Contact boundary | Using inserts in excess of tool-life | ● Exchange the corner or the insert before the nose wear reaches 0.3 mm. |
| Chipping and fracture | Common | Contact boundary | Vibration in drilling | ● Change to the machine with higher rigidity.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| Chipping and fracture | Common | Flaking | High hardness of workpiece | ● Set the feed for lower than 0.05 mm/rev. |
| Chipping and fracture | Common | Flaking | Thermal impact | ● Change to internal cutting fluid supply from external one.<br>● Lower the feed by 20 % within standard conditions. |
| Chipping and fracture | Common | Common | Unsuitable for selection of grade | ● Change the grade to toughness. |
| Chipping and fracture | Common | Common | Looseness of screws | ● Tighten the screw. |

# User's Guide- Technical Reference

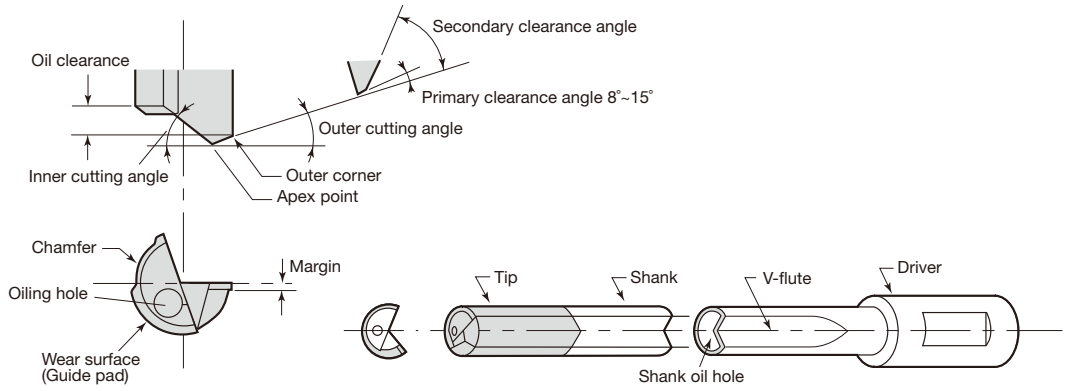
## Drilling Tools

| Problem | | Cause | Countermeasure |
|---|---|---|---|
| Scratch marks on the tool | The tool periphery | Misalignment of workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| | | Offset machining in excess of allowable range | ● Use the tool in the allowable offset range. |
| | | Offset direction reduced diameter of workpiece | ● Set offset direction extended diameter of workpiece |
| | | No flatness of the entry surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev in rough surface area. |
| | | Chipping of peripheral cutting edge | ● Exchange the insert. |
| | | Bend of workpiece | ● Change to the clamp method with rigidity. |
| | | Chip packing | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| Inappropriate hole accuracy | Hole diameter | Misalignment for workpiece rotation | ● Set the misalignment to 0 ~ 0.2 mm. |
| | | Inappropriate offset contents | ● Adjust offset contents. |
| | | No flatness of the entry surface | ● Flatten the entry surface in pre-machining.<br>● Set the feed for lower than 0.05 mm/rev at rough surface area. |
| | | Bend of workpiece | ● Change to the clamp method with rigidity. |
| | Roughness | Varieties and supply of cutting fluid | ● The concentration of cutting fluid must be higher than 5 %.<br>● Use the cutting fluid superior in lubricity.<br>● Change to internal cutting fluid supply from external one. |
| | | Inappropriate cutting conditions | ● Increase the cutting speed by 20 % within standard conditions.<br>● Lower the feed by 20 % within standard conditions. |
| | Common | Failures of inserts | ● Exchange the insert. |
| | | Chip packing | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | | Looseness of screws | ● Tighten the screw. |
| Chip control | Prolonged and twisted of chips | Inappropriate cutting conditions | ● Work within standard conditions.<br>● Increase the cutting speed by 10 % within standard conditions.<br>● Increase the feed by 10 % within standard conditions. |
| | | Failures of inserts | ● Exchange inserts. |
| | | Machining by external fluid supply | ● Change to internal cutting fluid supply from external one.<br>● Work by step feed.<br>● Use dwell function for 0.1 sec approximately. |
| | | Chips around the central cutting edge | ● There is a tendency to shorten the chips when shifting to higher speed and feed. |
| | Chip packing | Fluid supply | ● Change to internal cutting fluid supply from external one.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | | Inappropriate cutting conditions | ● Increase the cutting speed by 20 % and lower the feed by 20 % within standard conditions.<br>● Raise the fluid pressure (for higher than 1.5 MPa). |
| | Common | Large failure of drill holders | ● Exchange the drill holder. |
| | | Looseness of screws | ● Tighten the screw. |
| Others | Chatter | Inappropriate cutting conditions | ● Lower the cutting speed by 20 % within standard conditions.<br>● Increase the feed by 10 % within standard conditions. |
| | | Large wear of inserts | ● Exchange the insert. |
| | | Vibration in drilling | ● Change to the machine with higher torque rigidity.<br>● Change to the clamp method with rigidity.<br>● Change the drill setting method. |
| | | Looseness of screws | ● Tighten the screw. |
| | Machine stop | Insufficient machine power and torque | ● Use the range of number of revolutions suited machine spec. Lower the feed by 20 ~ 50%. |
| | | Burned inserts | ● Exchange inserts before the failure becomes larger.<br>● Check the oil-hole plug screw is tightly screwed in place.<br>● Check that the fluid flows powerfully from the drill.<br>● Lower the cutting speed and the feed by 20 % within standard conditions. |
| | Large burr | Failures of inserts | ● Exchange the insert. |
| | | Inappropriate cutting conditions | ● Lower the feed by 20 ~ 50% just before leaving from the workpiece. |

# User's Guide- Technical Reference

## Drilling Tools

### Nomenclature for gun drill




### Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Breaking of drill | At entry into workpiece | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The machine's rapid feed is used. | Use cutting feed. |
| | | | Whipping effect occurs. | Place a whip guide at the appropriate position. |
| | | | The shape of the guide bush is not suitable. | Use the guide bush in the shape suitable for the workpiece. |
| | | Drill | The drill is not set properly. | Set the drill with an appropriate torque, hydraulic pressure, etc. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Use low feed. |
| | | Workpiece | The workpiece surface is slanted. | Use low feed. |
| | During drilling | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The shape of the guide bush is not suitable. | Modify the shape of the guide bush. See “Chip packing” for the details. |
| | | | The feed speed (*V*f) varies. | Use mechanical feed. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | Drill | Abnormal damage occurs. | See “Short tool life” for the details. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | Others | Chip packing occurs. | See “Chip packing” for the details. |
| | At exit from workpiece | Drill | The tip is too long. | Make the tip length short. |
| | | | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | The clearance of the coolant hole is too large. | Reduce the clearance of the coolant hole. |
| | | Cutting condition | The feed (*f*) is too high. | Use low feed. |
| | | Workpiece | The workpiece surface is slanted. | Use low feed. |
| | During retracting | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | Cutting condition | Burnishing torque (cutting power) is increased due to reduced hole diameter. | Reduce cutting speed (*V*c). |

# User's Guide- Technical Reference

## Drilling Tools

### Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Hole accuracy | Rough surface finish | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | Foreign material is in the coolant. | Thoroughly filtrate the coolant (Use a filter with the filtration accuracy in 10μm or less). |
| | | | The run-out of the spindle is too large. | Minimize the run-out of the spindle. |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | The feed speed (*Vf*) varies. | Use mechanical feed. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | Drill | Abnormal damage occurs. | See "Short tool life" for the details. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Reduce the feed. |
| | | Others | Chip packing occurs. | See "Chip packing" for the details. |
| | Unacceptable circularity, cyndricity, and oversize | Machine | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | Drill | Abnormal damage occurs. | See "Short tool life" for the details. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | Others | Chip packing occurs. | See "Chip packing" for the details. |
| | Bending of hole | Machine | Clamping the workpiece is unstable. | Clamp the workpiece firmly. |
| | | | The guide bush is apart from the workpiece surface at the entry. | Contact the guide bush closely with the workpiece. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | Drill | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | Cutting condition | The feed (*f*) is too high. | Reduce the feed. |
| | | Workpiece | The workpiece has blow holes or unevenness. | Use the workpiece without defect. |
| | | | The workpiece surface is slanted at the entry. | Use low feed. |
| | | | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |

## Drilling Tools

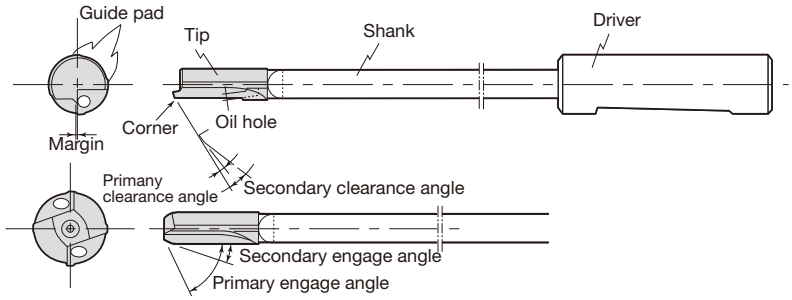
### Troubleshooting in gun drilling

| Problem | | Cause | | Countermeasure |
|---|---|---|---|---|
| Short tool life | Abnormal wear | Machine | The type of coolant is not appropriate. | Use water-insoluble coolant. |
| | | | Foreign material is in the coolant. | Thoroughly filtrate the coolant (Use a filter with the filtration accuracy in 10μm or less). |
| | | | The clearance between the guide bush and the drill is not appropriate. | Replace the guide bush (The clearance should be between +0.003 and +0.008). |
| | | | Whipping effect occurs. | Place a whip guide at the appropriate position. |
| | | | The concentricity of the guide bush and the spindle is too large. | Decrease the concentricity of the guide bush and the spindle. |
| | | | The coolant temperature is too high. | Increase the capacity of the tank. |
| | | Drill | The selection of the guide pads is not suitable. | Use 2 guide pads instead of 3. |
| | | | Regrinding is in poor quality. | Make sure no damage is left on the drill and that the cutting edge geometry is not changed. |
| | | | The drill's overall length is excessive. | Reduce the drill's overall length. |
| | | | Excessive wear occurs and the chip shape changes. | Regrind the gundrill (ease the tool life criteria). |
| | | Cutting condition | The cutting speed (*Vc*) is too high. | Reduce the cutting speed. |
| | | | The feed (*f*) is too high. | Reduce the feed. |
| | | | The coolant pressure is not high enough. | Increase the coolant pressure. |
| | | Workpiece | The material quality varies. | Reduce the cutting speed (*Vc*). |
| Chip control | Chip packing | Machine | The shape of the guide bush is not suitable. | Modify the tip of the guide bush to match the shape of the workpiece surface at the entry. |
| | | | The number of revolutions varies (decreases). | Increase the machine power or adjust the cutting conditions. |
| | | | The chip box is too small for smooth chip evacuation. | Enlarge the chip box. |
| | | Cutting condition | The feed (*f*) is not suitable. | Use an appropriate feed. |
| | | | The coolant pressure is not high enough. | Increase the coolant pressure. |
| | | Workpiece | Interrupted or cross drilling is required. | Change the tool to a standard gundrill. |
| | | | The operation is for stacked plates. | Change the cutting edge shape so that the cores become small. |
| | | | The material quality varies. | Increase the feed. |
| | Chip entanglement | Drill | The cutting edge is fractured or chipped. | See "Breakage" for the details. |
| | | | Wear on the outer corner is excessive. | Regrind the gundrill (ease the tool life criteria). |
| | | Cutting condition | The feed (*f*) is too low. | Increase the feed. |
| | | Workpiece | Drilling a center hole is required. | Make the center hole as small as the drill diameter and increase the coolant pressure. |

# User's Guide- Technical Reference

## Drilling Tools

### Nomenclature for gun reamer




### Troubleshooting in gun reaming

| Trouble | | Possible cause | | Countermeasure |
|---|---|---|---|---|
| Breaking of reamer | | Increased burnishing torque due to excessively small stock allowance | ● Chamfer angle small | ● Enlarge chamfer angle and increase stock allowance |
| | | | ● Excessive wear in peripheral cutting edge. | ● Reduce cutting speed to prevent peripheral wear of edge<br>● Increase lubricity of cutting fluid |
| | | Sticking | ● Faulty filtering of cutting fluid<br>● Incorrect selection of cutting fluid<br>● Insufficient cutting fluid pressure | ● Improve filtering accuracy<br>● Change to fluid with higher lubricity<br>● Increase fluid pressure |
| | | Mechanical trouble | | ● Repair electrical system<br>● Improve clamping method of workpiece |
| Faulty machining accuracy | Unacceptable surface roughness<br>Too large and inconsistent over size | Excessive feed rate per tooth | | ● Reduce fluid pressure<br>● Increase number of teeth |
| | | Improper tool specifications | ● Excessive chamfer angle<br>● Excessive back taper<br>● Peripheral run out excessive | ● Reduce chamfer angle<br>● Reduce back taper<br>● Improve run out accuracy |
| | | Faulty regrinding | ● Cutting edge run out is large<br>● Residual damage of preceding process | ● Improve run out accuracy<br>● Remove residual damage completely |
| | | Improper cutting fluid | ● Excessive fluid pressure<br>● Improper selection of cutting fluid | ● Reduce fluid pressure<br>● Increase activity and lubricity of the fluid |
| | | Faulty machine accuracy | | ● Correct spindle run out and bushing clearance and alignment |
| | | Faulty clamping of workpiece | ● Clamping position wrong<br>● Clamping force inadequate | ● Improper clamping position<br>● Increase clamping force |
| | Defective out-of-roundness | Faulty machine accuracy | ● Excessive bushing clearance<br>● Faulty spindle run out and alignment | ● Correct bushing clearance<br>● Correct spindle run out and alignment |
| | | Improper tool specifications | ● Outer run out of reamer large<br>● Insufficient reamer rigidity | ● Correct peripheral run out<br>● Increase reamer rigidity |
| | | Faulty clamping position of workpiece | | ● Change clamping position |
| | | Unevenness in wall thickness of workpiece | | ● Reduce reamer guide width (margin width) |
| | Insufficient oversize allowance | Chamfer angle small | | ● Increase chamfer angle |
| | | Excessive wear in peripheral cutting edge | ● Too high cutting speed<br>● Faulty lubricity of cutting fluid | ● Decrease cutting speed<br>● Increase lubricating capacity |
| | | Faulty regrinding (residual damage) | | ● Increase regrinding stock amount |

# User's Guide- Technical Reference

## International Tolerance (IT Grade)

### International Tolerance (IT Grade)

IT grades shows a tolerance allowable for difference of the diameters of a hole and a shaft. As the number added after IT increases, the tolerance becomes rough. Depending on the basic size, the tolerance value in each grade varies.
In the catalog, IT grades are shown as a guide of dimensional dispersion in the diameters of holes machined with the drill. For information, H8 tolerance for a ø8.0 hole is 0 to + 0.022 mm, the width of the value is the same as that of IT 8.
In the Table shown below, tolerance areas attainable with typical drilling tools are distinguished by using different colors. Solid drills are generally used for machining holes of IT 9 to 12. For machining a hole of better than IT 8, finishing process such as reaming is required. For a hole better than IT 5, high-precision finishing is required. Above description is based on machining of general steel. In practice, the IT grade attained with the tool varies widely depending on the hardness and the composition of the work material.

### ● IT (International Tolerance) Grades

| Basic size (mm) | | International tolerance grade | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | IT1 | IT2 | IT3 | IT4 | IT5 | IT6 | IT7 | IT8 | IT9 | IT10 | IT11 | IT12 | IT13 | IT14 | IT15 | IT16 | IT17 | IT18 |
| > | ≤ | | | | | | (μm) | | | | | | | | | (mm) | | | |
| - | 3 | 0.8 | 1.2 | 2 | 3 | 4 | 6 | 10 | 14 | 25 | 40 | 60 | 0.1 | 0.14 | 0.25 | 0.4 | 0.6 | 1 | 1.4 |
| 3 | 6 | 1 | 1.5 | 2.5 | 4 | 5 | 8 | 12 | 18 | 30 | 48 | 75 | 0.12 | 0.18 | 0.3 | 0.48 | 0.75 | 1.2 | 1.8 |
| 6 | 10 | 1 | 1.5 | 2.5 | 4 | 6 | 9 | 15 | 22 | 36 | 58 | 90 | 0.15 | 0.22 | 0.36 | 0.58 | 0.9 | 1.5 | 2.2 |
| 10 | 18 | 1.2 | 2 | 3 | 5 | 8 | 11 | 18 | 27 | 43 | 70 | 110 | 0.18 | 0.27 | 0.43 | 0.7 | 1.1 | 1.8 | 2.7 |
| 18 | 30 | 1.5 | 2.5 | 4 | 6 | 9 | 13 | 21 | 33 | 52 | 84 | 130 | 0.21 | 0.33 | 0.52 | 0.84 | 1.3 | 2.1 | 3.3 |
| 30 | 50 | 1.5 | 2.5 | 4 | 7 | 11 | 16 | 25 | 39 | 62 | 100 | 160 | 0.25 | 0.39 | 0.62 | 1 | 1.6 | 2.5 | 3.9 |
| 50 | 80 | 2 | 3 | 5 | 8 | 13 | 19 | 30 | 46 | 74 | 120 | 190 | 0.3 | 0.46 | 0.74 | 1.2 | 1.9 | 3 | 4.6 |
| 80 | 120 | 2.5 | 4 | 6 | 10 | 15 | 22 | 35 | 54 | 87 | 140 | 220 | 0.35 | 0.54 | 0.87 | 1.4 | 2.2 | 3.5 | 5.4 |
| 120 | 180 | 3.5 | 5 | 8 | 12 | 18 | 25 | 40 | 63 | 100 | 160 | 250 | 0.4 | 0.63 | 1 | 1.6 | 2.5 | 4 | 6.3 |
| 180 | 250 | 4.5 | 7 | 10 | 14 | 20 | 29 | 46 | 72 | 115 | 185 | 290 | 0.46 | 0.72 | 1.15 | 1.85 | 2.9 | 4.6 | 7.2 |
| 250 | 315 | 6 | 8 | 12 | 16 | 23 | 32 | 52 | 81 | 130 | 210 | 320 | 0.52 | 0.81 | 1.3 | 2.1 | 3.2 | 5.2 | 8.1 |
| 315 | 400 | 7 | 9 | 13 | 18 | 25 | 36 | 57 | 89 | 140 | 230 | 360 | 0.57 | 0.89 | 1.4 | 2.3 | 3.6 | 5.7 | 8.9 |
| 400 | 500 | 8 | 10 | 15 | 20 | 27 | 40 | 63 | 97 | 155 | 250 | 400 | 0.63 | 0.97 | 1.55 | 2.5 | 4 | 6.3 | 9.7 |
| 500 | 630 | 9 | 11 | 16 | 22 | 32 | 44 | 70 | 110 | 175 | 280 | 440 | 0.7 | 1.1 | 1.75 | 2.8 | 4.4 | 7 | 11 |
| 630 | 800 | 10 | 13 | 18 | 25 | 36 | 50 | 80 | 125 | 200 | 320 | 500 | 0.8 | 1.25 | 2 | 3.2 | 5 | 8 | 12.5 |
| 800 | 1000 | 11 | 15 | 21 | 28 | 40 | 56 | 90 | 140 | 230 | 360 | 560 | 0.9 | 1.4 | 2.3 | 3.6 | 5.6 | 9 | 14 |
| 1000 | 1250 | 13 | 18 | 24 | 33 | 47 | 66 | 105 | 165 | 260 | 420 | 660 | 1.05 | 1.65 | 2.6 | 4.2 | 6.6 | 10.5 | 16.5 |
| 1250 | 1600 | 15 | 21 | 29 | 39 | 55 | 73 | 125 | 195 | 310 | 500 | 780 | 1.25 | 1.95 | 3.1 | 5 | 7.8 | 12.5 | 19.5 |
| 1600 | 2000 | 18 | 25 | 35 | 46 | 65 | 92 | 150 | 230 | 370 | 600 | 920 | 1.5 | 2.3 | 3.7 | 6 | 9.2 | 15 | 23 |
| 2000 | 2500 | 22 | 30 | 41 | 55 | 78 | 110 | 175 | 280 | 440 | 700 | 1100 | 1.75 | 2.8 | 4.4 | 7 | 11 | 17.5 | 28 |
| 2500 | 3150 | 26 | 36 | 50 | 68 | 96 | 135 | 210 | 330 | 540 | 860 | 1350 | 2.1 | 3.3 | 5.4 | 8.6 | 13.5 | 21 | 33 |

Tolerance area requiring finishing process such as with a reamer.

Tolerance area attainable with a solid drill.

Tolerance area attainable with an indexable drill.

# User's Guide- Technical Reference

## Deviations of Shafts to be Used in Commonly Used Fits

### Deviations of Shafts to be Used in Commonly Used Fits (JIS B0401 extrac)

| Basic size step (mm) | | Tolerance zone class of shaft (μm) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| > | ≤ | e9 | f6 | f7 | f8 | g5 | g6 | h5 | h6 | h7 | h8 | h9 | js5 | js6 | js7 | k5 | k6 |
| – | 3 | −14<br>−39 | −6<br>−12 | −6<br>−16 | −6<br>−20 | −2<br>−6 | −2<br>−8 | 0<br>−4 | 0<br>−6 | 0<br>−10 | 0<br>−14 | 0<br>−25 | ±2 | ±3 | ±5 | +4<br>0 | +6<br>0 |
| 3 | 6 | −20<br>−50 | −10<br>−18 | −10<br>−22 | −10<br>−28 | −4<br>−9 | −4<br>−12 | 0<br>−5 | 0<br>−8 | 0<br>−12 | 0<br>−18 | 0<br>−30 | ±2.5 | ±4 | ±6 | +6<br>+1 | +9<br>+1 |
| 6 | 10 | −25<br>−61 | −13<br>−22 | −13<br>−28 | −13<br>−35 | −5<br>−11 | −5<br>−14 | 0<br>−6 | 0<br>−9 | 0<br>−15 | 0<br>−22 | 0<br>−36 | ±3 | ±4.5 | ±7 | +7<br>+1 | +10<br>+1 |
| 10 | 14 | −32<br>−75 | −16<br>−27 | −16<br>−34 | −16<br>−43 | −6<br>−14 | −6<br>−17 | 0<br>−8 | 0<br>−11 | 0<br>−18 | 0<br>−27 | 0<br>−43 | ±4 | ±5.5 | ±9 | +9<br>+1 | +12<br>+1 |
| 14 | 18 | | | | | | | | | | | | | | | | |
| 18 | 24 | −40<br>−92 | −20<br>−33 | −20<br>−41 | −20<br>−53 | −7<br>−16 | −7<br>−20 | 0<br>−9 | 0<br>−13 | 0<br>−21 | 0<br>−33 | 0<br>−52 | ±4.5 | ±6.5 | ±10 | +11<br>+2 | +15<br>+2 |
| 24 | 30 | | | | | | | | | | | | | | | | |
| 30 | 40 | −50<br>−112 | −25<br>−41 | −25<br>−50 | −25<br>−64 | −9<br>−20 | −9<br>−25 | 0<br>−11 | 0<br>−16 | 0<br>−25 | 0<br>−39 | 0<br>−62 | ±5.5 | ±8 | ±12 | +13<br>+2 | +18<br>+2 |
| 40 | 50 | | | | | | | | | | | | | | | | |
| 50 | 65 | −60<br>−134 | −30<br>−49 | −30<br>−60 | −30<br>−76 | −10<br>−23 | −10<br>−29 | 0<br>−13 | 0<br>−19 | 0<br>−30 | 0<br>−46 | 0<br>−74 | ±6.5 | ±9.5 | ±15 | +15<br>+2 | +21<br>+2 |
| 65 | 80 | | | | | | | | | | | | | | | | |
| 80 | 100 | −72<br>−159 | −36<br>−58 | −36<br>−71 | −36<br>−90 | −12<br>−27 | −12<br>−34 | 0<br>−15 | 0<br>−22 | 0<br>−35 | 0<br>−54 | 0<br>−87 | ±7.5 | ±11 | ±17 | +18<br>+3 | +25<br>+3 |
| 100 | 120 | | | | | | | | | | | | | | | | |

In every step given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

### Deviations of Holes to be Used in Commonly Used Fits. (JIS B0401 extrac)

| Basic size step (mm) | | Tolerance zone class of hole (μm) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| > | ≤ | E7 | E8 | E9 | F6 | F7 | F8 | G6 | G7 | H6 | H7 | H8 | H9 | H10 | JS6 | JS7 | K6 | K7 |
| – | 3 | +24<br>+14 | +28<br>+14 | +39<br>+14 | +12<br>+6 | +16<br>+6 | +20<br>+6 | +8<br>+2 | +12<br>+2 | +6<br>0 | +10<br>0 | +14<br>0 | +25<br>0 | +40<br>0 | ±3 | ±5 | 0<br>−6 | 0<br>−10 |
| 3 | 6 | +32<br>+20 | +38<br>+20 | +50<br>+20 | +18<br>+10 | +22<br>+10 | +28<br>+10 | +12<br>+4 | +16<br>+4 | +8<br>0 | +12<br>0 | +18<br>0 | +30<br>0 | +48<br>0 | ±4 | ±6 | +2<br>−6 | +3<br>−9 |
| 6 | 10 | +40<br>+25 | +47<br>+25 | +61<br>+25 | +22<br>+13 | +28<br>+13 | +35<br>+13 | +14<br>+5 | +20<br>+5 | +9<br>0 | +15<br>0 | +22<br>0 | +36<br>0 | +58<br>0 | ±4.5 | ±7 | +2<br>−7 | +5<br>−10 |
| 10 | 14 | +50<br>+32 | +59<br>+32 | +75<br>+32 | +27<br>+16 | +34<br>+16 | +43<br>+16 | +17<br>+6 | +24<br>+6 | +11<br>0 | +18<br>0 | +27<br>0 | +43<br>0 | +70<br>0 | ±5.5 | ±9 | +2<br>−9 | +6<br>−12 |
| 14 | 18 | | | | | | | | | | | | | | | | | |
| 18 | 24 | +61<br>+40 | +73<br>+40 | +92<br>+40 | +33<br>+20 | +41<br>+20 | +53<br>+20 | +20<br>+7 | +28<br>+7 | +13<br>0 | +21<br>0 | +33<br>0 | +52<br>0 | +84<br>0 | ±6.5 | ±10 | +2<br>−11 | +6<br>−15 |
| 24 | 30 | | | | | | | | | | | | | | | | | |
| 30 | 40 | +75<br>+50 | +89<br>+50 | +112<br>+50 | +41<br>+25 | +50<br>+25 | +64<br>+25 | +25<br>+9 | +34<br>+9 | +16<br>0 | +25<br>0 | +39<br>0 | +62<br>0 | +100<br>0 | ±8 | ±12 | +3<br>−13 | +7<br>−18 |
| 40 | 50 | | | | | | | | | | | | | | | | | |
| 50 | 65 | +90<br>+60 | +106<br>+60 | +134<br>+60 | +49<br>+30 | +60<br>+30 | +76<br>+30 | +29<br>+10 | +40<br>+10 | +19<br>0 | +30<br>0 | +46<br>0 | +74<br>0 | +120<br>0 | ±9.5 | ±15 | +4<br>−15 | +9<br>−21 |
| 65 | 80 | | | | | | | | | | | | | | | | | |
| 80 | 100 | +107<br>+72 | +126<br>+72 | +159<br>+72 | +58<br>+36 | +71<br>+36 | +90<br>+36 | +34<br>+12 | +47<br>+12 | +22<br>0 | +35<br>0 | +54<br>0 | +87<br>0 | +140<br>0 | ±11 | ±17 | +4<br>−18 | +10<br>−25 |
| 100 | 120 | | | | | | | | | | | | | | | | | |

In every step given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

# User's Guide- Technical Reference

## Symbols of Metals

● Carbon steel and alloy steel for structural use

| Type | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|
| | | | U.S.A. | Great Britain | Germany | France | Russia |
| | JIS | ISO | AISI<br>SAE | BS<br>BS/EN | DIN<br>DIN/EN | NF<br>NF/EN | ГОСТ |
| Carbon steel | S10C | C10 | 1010 | C10<br>C10E<br>C10R | C10E<br>C10R | C10E<br>C10R | – |
| | S15C | C15E4<br>C15M2 | 1015 | C15<br>C15E<br>C15R | C15E<br>C15R | C15E<br>C15R | – |
| | S20C | – | 1020 | C22, C22E<br>C22R | C22<br>C22E<br>C22R | C22<br>C22E<br>C22R | – |
| | S25C | C25<br>C25E4<br>C25M2 | 1025 | C25<br>C25E<br>C25R | C25<br>C25E<br>C25R | C25<br>C25E<br>C25R | – |
| | S30C | C30<br>C30E4<br>C30M2 | 1030 | C30<br>C30E<br>C30R | C30<br>C30E<br>C30R | C30<br>C30E<br>C30R | 30Г |
| | S35C | C35<br>C35E4<br>C35M2 | 1035 | C35<br>C35E<br>C35R | C35<br>C35E<br>C35R | C35<br>C35E<br>C35R | 35Г |
| | S40C | C40<br>C40E4<br>C40M2 | 1039<br>1040 | C40<br>C40E<br>C40R | C40<br>C40E<br>C40R | C40<br>C40E<br>C40R | 40Г |
| | S43C | – | 1042<br>1043 | 080A42 | – | – | 40Г |
| | S45C | C45<br>C45E4<br>C45M2 | 1045<br>1046 | C45<br>C45E<br>C45R | C45<br>C45E<br>C45R | C45<br>C45E<br>C45R | 45Г |
| | S48C | – | – | – | – | – | 45Г |
| | S50C | C50<br>C50E4<br>C50M2 | 1049 | C50<br>C50E<br>C50R | C50<br>C50E<br>C50R | C50<br>C50E<br>C50R | 50Г |
| | S53C | – | 1050<br>1053 | – | – | – | 50Г |
| | S55C | C55<br>C55E4<br>C55M2 | 1055 | C55<br>C55E<br>C55R | C55<br>C55E<br>C55R | C55<br>C55E<br>C55R | – |
| | S58C | C60<br>C60E4<br>C60M2 | 1059<br>1060 | C60<br>C60E<br>C60R | C60<br>C60E<br>C60R | C60<br>C60E<br>C60R | 60Г |

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI<br>SAE | BS<br>BS/EN | DIN<br>DIN/EN | NF<br>NF/EN | ГОСТ |
| Alloy steel | Nickel chromium steel | SNC236 | – | – | – | – | – | 40XH |
| | | SNC415(H) | – | – | – | – | – | – |
| | | SNC631(H) | – | – | – | – | – | 30XH3A |
| | | SNC815(H) | 15NiCr13 | – | 15NiCr13 | 15NiCr13 | 15NiCr13 | – |
| | | SNC836 | – | – | – | – | – | – |
| | Nickel chromium molybdenum steel | SNCM220 | 20NiCrMo2<br>20NiCrMoS2 | 8615<br>8617(H)<br>8620(H)<br>8622(H) | 20NiCrMo2-2<br>20NiCrMoS2-2 | 20NiCrMo2-2<br>20NiCrMoS2-2 | 20NiCrMo2-2<br>20NiCrMoS2-2 | – |
| | | SNCM240 | 41CrNiMo2<br>41CrNiMoS2 | 8637<br>8640 | – | – | – | – |
| | | SNCM415 | – | – | – | – | – | – |
| | | SNCM420(H) | – | 4320(H) | – | – | – | 20XH2M(20XHM) |
| | | SNCM431 | – | – | – | – | – | – |
| | | SNCM439 | – | 4340 | – | – | – | – |
| | | SNCM447 | – | – | – | – | – | – |
| | | SNCM616 | – | – | – | – | – | – |
| | | SNCM625 | – | – | – | – | – | – |
| | | SNCM630 | – | – | – | – | – | – |
| | | SNCM815 | – | – | – | – | – | – |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Symbols of Metals

### ● Alloy steel

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Alloy steel | Chromium steel | SCr415(H) | – | – | 17Cr3<br>17CrS3 | 17Cr3<br>17CrS3 | 17Cr3<br>17CrS3 | 15X<br>15XA |
| | | SCr420(H) | 20Cr4(H)<br>20CrS4 | 5120(H) | – | – | – | 20X |
| | | SCr430(H) | 34Cr4<br>34CrS4 | 5130(H)<br>5132(H) | 34Cr4<br>34CrS4 | 34Cr4<br>34CrS4 | 34Cr4<br>34CrS4 | 30X |
| | | SCr435(H) | 34Cr4<br>34CrS4<br>37Cr4<br>37CrS4 | 5132 | 37Cr4<br>37CrS4 | 37Cr4<br>37CrS4 | 37Cr4<br>37CrS4 | 35X |
| | | SCr440(H) | 37Cr4<br>37CrS4<br>41Cr4<br>41CrS4 | 5140(H) | 530M40<br>41Cr4<br>41CrS4 | 41Cr4<br>41CrS4 | 41Cr4<br>41CrS4 | 40X |
| | | SCr445(H) | – | – | – | – | – | 45X |
| | Chromium molybdenum steel | SCM415(H) | – | – | – | – | – | – |
| | | SCM418(H) | 18CrMo4<br>18CrMoS4 | – | 18CrMo4<br>18CrMoS4 | 18CrMo4<br>18CrMoS4 | 18CrMo4<br>18CrMoS4 | 20XM |
| | | SCM420(H) | – | – | 708M20(708H20) | – | – | 20XM |
| | | SCM430 | – | 4130 | – | – | – | 30XM<br>30XMA |
| | | SCM432 | – | – | – | – | – | – |
| | | SCM435(H) | 34CrMo4<br>34CrMoS4 | 4137(H) | 34CrMo4<br>34CrMoS4 | 34CrMo4<br>34CrMoS4 | 34CrMo4<br>34CrMoS4 | 35XM |
| | | SCM440(H) | 42CrMo4<br>42CrMoS4 | 4140(H)<br>4142(H) | 42CrMo4<br>42CrMoS4 | 42CrMo4<br>42CrMoS4 | 42CrMo4<br>42CrMoS4 | – |
| | | SCM445(H) | – | 4145(H)<br>4147(H) | – | – | – | – |
| | Manganese steel and manganese chromium steel | SMn420(H) | 22Mn6(H) | 1522(H) | | – | – | – |
| | | SMn433(H) | – | 1534 | – | – | – | 30Г2<br>35Г2 |
| | | SMn438(H) | 36Mn6(H) | 1541(H) | – | – | – | 35Г2<br>40Г2 |
| | | SMn443(H) | 42Mn6(H) | 1541(H) | – | – | – | 40Г2<br>45Г2 |
| | | SMnC420(H) | – | – | – | – | – | – |
| | | SMnC443(H) | – | – | – | – | – | – |
| | Aluminium chromium molybdenum steel | SACM645 | 41CrAlMo74 | – | – | – | – | – |

### ● Stainless steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Stainless steel | Austenitic | SUS201 | X12CrMnNiN17-7-5 | S20100 | 201 | | | Z12CMN17-07Az | |
| | | SUS202 | X12CrMnNiN18-9-5 | S20200 | 202 | 284S16 | | | 12X17Г9AH4 |
| | | SUS301 | X10CrNi18-8 | S30100 | 301 | 301S21 | X12CrNi17-7 | Z11CN17-08 | 07X16H6 |
| | | SUS301L | X2CrNiN18-7 | | | | X2CrNiN18-7 | | |
| | | SUS301J1 | | | | | X12CrNi17-7 | | |
| | | SUS302 | | S30200 | 302 | 302S25 | | Z12CN18-09 | 12X18H9 |
| | | SUS302B | X12CrNiSi18-9-3 | S30215 | 302B | | | | |
| | | SUS303 | X10CrNiS18-9 | S30300 | 303 | 303S21 | X10CrNiS18-9 | Z8CNF18-09 | |
| | | SUS303Se | | S30323 | 303Se | 303S41 | | | 12X18H10E |
| | | SUS303Cu | | | | | | | |
| | | SUS304 | X5CrNi18-9 | S30400 | 304 | 304S31 | X5CrNi18-10 | Z7CN18-09 | 08X18H10 |
| | | SUS304L | X2CrNi18-9 | S30403 | 304L | 304S11 | X2CrNi19-11 | Z3CN19-11 | 03X18H11 |
| | | SUS304N1 | X5CrNiN18-8 | S30451 | 304N | | | Z6CN19-09Az | |
| | | SUS304N2 | | S30452 | | | | | |
| | | SUS304LN | X2CrNiN18-9 | S30453 | 304LN | | X2CrNiN18-10 | Z3CN18-10Az | |
| | | SUS304J1 | | | | | | | |
| | | SUS304J2 | | | | | | | |
| | | SUS304J3 | | S30431 | S30431 | | | | |
| | | SUS305 | X6CrNi18-12 | S30500 | 305 | 305S19 | X5CrNi18-12 | Z8CN18-12 | 06X18H11 |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Symbols of Metals

● Stainless steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Stainless steel | Austenitic | SUS305J1 | | | | | | | |
| | | SUS309S | | S30908 | 309S | | | Z10CN24-13 | |
| | | SUS310S | X6CrNi25-21 | S31008 | 310S | 310S31 | | Z8CN25-20 | 10X23H18 |
| | | SUS315J1 | | | | | | | |
| | | SUS315J2 | | | | | | | |
| | | SUS316 | X5CrNiMo17-12-2<br>X3CrNiMo17-12-3 | S31600 | 316 | 316S31 | X5CrNiMo17-12-2<br>X5CrNiMo17-13-3 | Z7CND17-12-02<br>Z6CND18-12-03 | |
| | | SUS316F | | | | | | | |
| | | SUS316L | X2CrNiMo17-12-2<br>X2CrNiMo17-12-3<br>X2CrNiMo18-14-3 | S31603 | 316L | 316S11 | X2CrNiMo17-13-2<br>X2CrNiMo17-14-3 | Z3CND17-12-02<br>Z3CND17-12-03 | 03X17H14M3 |
| | | SUS316N | | S31651 | 316N | | | | |
| | | SUS316LN | X2CrNiMoN17-11-2<br>X2CrNiMoN17-12-3 | S31653 | 316LN | | X2CrNiMoN17-12-2<br>X2CrNiMoN17-13-3 | Z3CND17-11Az<br>Z3CND17-12Az | |
| | | SUS316Ti | X6CrNiMoTi17-12-2 | S31635 | | | X6CrNiMoTi17-12-2 | Z6CNDT17-12 | 08X17H13M2T |
| | | SUS316J1 | | | | | | | |
| | | SUS316J1L | | | | | | | |
| | | SUS317 | | S31700 | 317 | 317S16 | | | |
| | | SUS317L | X2CrNiMo19-14-4 | S31703 | 317L | 317S12 | X2CrNiMo18-16-4 | Z3CND19-15-04 | |
| | | SUS317LN | X2CrNiMoN18-12-4 | S31753 | | | | Z3CND19-14Az | |
| | | SUS317J1 | | | | | | | |
| | | SUS317J2 | | | | | | | |
| | | SUS317J3L | | | | | | | |
| | | SUS836L | | N08367 | | | | | |
| | | SUS890L | X1CrNiMoCu25-20-5 | N08904 | N08904 | 904S14 | | Z2NCDU25-20 | |
| | | SUS321 | X6CrNiTi18-10 | S32100 | 321 | 321S31 | X6CrNiTi18-10 | Z6CNT18-10 | 08X18H10T |
| | | SUS347 | X6CrNiNb18-10 | S34700 | 347 | 347S31 | X6CrNiNb18-10 | Z6CNNb18-10 | 08X18H12Б |
| | | SUS384 | X3NiCr18-16 | S38400 | 384 | | | Z6CN18-16 | |
| | | SUSXM7 | X3CrNiCu18-9-4 | S30430 | 304Cu | 394S17 | | Z2CNU18-10 | |
| | | SUSXM15J1 | | S38100 | | | | Z15CNS20-12 | |
| | Austenitic Ferritic | SUS329J1 | | S32900 | 329 | | | | |
| | | SUS329J3L | X2CrNiMoN22-5-3 | S31803 | 31803 | | | Z3CNDU22-05Az | 08X21H6M2T |
| | | SUS329J4L | X2CrNiMoCuN25-6-3 | S32250 | 32250 | | | Z3CNDU25-07Az | |
| | Ferritic | SUS405 | X6CrAl13 | S40500 | 405 | 405S17 | X6CrAl13 | Z8CA12 | |
| | | SUS410L | | | | | | Z3C14 | |
| | | SUS429 | | S42900 | 429 | | | | |
| | | SUS430 | X6Cr17 | S43000 | 430 | 430S17 | X6Cr17 | Z8C17 | 12X17 |
| | | SUS430F | X7CrS17 | S43020 | 430F | | X7CrS18 | Z8CF17 | |
| | | SUS430LX | X3CrTi17<br>X3CrNb17 | S43035 | | | X6CrTi17 | Z4CT17 | |
| | | SUS430J1L | X2CrTi17 | | | | X6CrNb17 | Z4CNb17 | |
| | | SUS434 | X6CrMo17-1 | S43400 | 434 | 434S17 | X6CrMo17-1 | Z8CD17-01 | |
| | | SUS436L | X1CrMoTi16-1 | S43600 | 436 | | | | |
| | | SUS436J1L | | | | | | | |
| | | SUS444 | X2CrMoTi18-2 | S44400 | 444 | | | Z3CDT18-02 | |
| | | SUS445J1 | | | | | | | |
| | | SUS445J2 | | | | | | | |
| | | SUS447J1 | | S44700 | | | | | |
| | | SUSXM27 | | S44627 | | | | Z1CD26-01 | |
| | Martensitic | SUS403 | | S40300 | 403 | | | | |
| | | SUS410 | X12Cr13 | S41000 | 410 | 410S21 | X10Cr13 | Z13C13 | |
| | | SUS410S | X6Cr13 | S41008 | 410S | 403S17 | X6Cr13 | Z8C12 | 08X13 |
| | | SUS410F2 | | | | | | | |
| | | SUS410J1 | | S41025 | | | | | |
| | | SUS416 | X12CrS13 | S41600 | 416 | 416S21 | | Z11CF13 | |
| | | SUS420J1 | X20Cr13 | S42000 | 420 | 420S29 | X20Cr13 | Z20C13 | 20X13 |
| | | SUS420J2 | X30Cr13 | S42000 | 420 | 420S37 | X30Cr13 | Z33C13 | 30X13 |
| | | SUS420F | X29CrS13 | S42020 | 420F | | | Z30CF13 | |
| | | SUS420F2 | | | | | | | |
| | | SUS429J1 | | | | | | | |
| | | SUS431 | X19CrNi16-2 | S43100 | 431 | 431S29 | X20CrNi17-2 | Z15CN16-02 | 20X17H2 |
| | | SUS440A | X70CrMo15 | S44002 | 440A | | | Z70C15 | |
| | | SUS440B | | S44003 | 440B | | | | |
| | | SUS440C | X105CrMo17 | S44004 | 440C | | | Z100CD17 | 95X18 |
| | | SUS440F | | S44020 | S44020 | | | | |
| | Precipitation hardening type | SUS630 | X5CrNiCuNb16-4 | S17400 | S17400 | | | Z6CNU17-04 | |
| | | SUS631 | X7CrNiAl17-7 | S17700 | S17700 | | X7CrNiAl17-7 | Z9CNA17-07 | 09X17H7Ю |
| | | SUS631J1 | | | | | | | |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Symbols of Metals

### ● Heat resistant steel

| Type | | Japan | International | Other countries | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany | France | Russia |
| | | JIS | ISO | UNS | AISI SAE | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Heat resistant steel | Austenitic | SUH31 | | | | 331S42 | | Z35CNWS14-14 | 45X14H14B2M |
| | | SUH35 | | S63008 | | 349S52 | | Z52CMN21-09Az | |
| | | SUH36 | | | | 349S54 | X53CrMnNi21-9 | Z55CMN21-09Az | 55X20Г9 AH4 |
| | | SUH37 | | S63017 | | 381S34 | | | |
| | | SUH38 | | | | | | | |
| | | SUH309 | | S30900 | 309 | 309S24 | | Z15CN24-13 | |
| | | SUH310 | | S31000 | 310 | 310S24 | CrNi2520 | Z15CN25-20 | 20X25H20C2 |
| | | SUH330 | | N08330 | N08330 | | | Z12NCS35-16 | |
| | | SUH660 | | S66286 | | | | Z6NCTV25-20 | |
| | | SUH661 | | R30155 | | | | | |
| | Ferritic | SUH21 | | | | | CrAl1205 | | |
| | | SUH409 | X6CrTi12 | S40900 | 409 | 409S19 | X6CrTi12 | Z6CT12 | |
| | | SUH409L | X2CrTi12 | | | | | Z3CT12 | |
| | | SUH446 | | S44600 | 446 | | | Z12C25 | 15X28 |
| | Martensitic | SUH1 | | S65007 | | 401S45 | X45CrSi9-3 | Z45CS9 | |
| | | SUH3 | | | | | | Z40CSD10 | 40X10C2M |
| | | SUH4 | | | | 443S65 | | Z80CSN20-02 | |
| | | SUH11 | | | | | | | 40X9C2 |
| | | SUH600 | | | | | | | 20X12BHMБФP |
| | | SUH616 | | S42200 | | | | | |

### ● Tool steel

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Carbon tool steel | SK140 | – | – |
| | SK120 | C120U | W1-11 1/2 |
| | SK105 | C105U | W1-10 |
| | SK95 | – | W1-9 |
| | SK90 | C90U | – |
| | SK85 | – | W1-8 |
| | SK80 | C80U | – |
| | SK75 | – | – |
| | SK70 | C70U | – |
| | SK65 | – | – |
| | SK60 | – | – |
| High speed steel | SKH2 | HS18-0-1 | T1 |
| | SKH3 | – | T4 |
| | SKH4 | – | T5 |
| | SKH10 | – | T15 |
| | SKH40 | HS6-5-3-8 | – |
| | SKH50 | HS1-8-1 | – |
| | SKH51 | HS6-5-2 | M2 |
| | SKH52 | HS6-6-2 | M3-1 |
| | SKH53 | HS6-5-3 | M3-2 |
| | SKH54 | HS6-5-4 | M4 |
| | SKH55 | HS6-5-2-5 | – |
| | SKH56 | – | M36 |
| | SKH57 | HS10-4-3-10 | – |
| | SKH58 | HS2-9-2 | M7 |
| | SKH59 | HS2-9-1-8 | M42 |
| Alloy tool steel | SKS11 | – | F2 |
| | SKS2 | – | – |
| | SKS21 | – | – |

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Alloy tool steel | SKS5 | – | – |
| | SKS51 | – | L6 |
| | SKS7 | – | – |
| | SKS81 | – | – |
| | SKS8 | – | – |
| | SKS4 | – | – |
| | SKS41 | – | – |
| | SKS43 | 105V | W2-9 1/2 |
| | SKS44 | – | W2-8 1/2 |
| | SKS3 | – | – |
| | SKS31 | – | – |
| | SKS93 | – | – |
| | SKS94 | – | – |
| | SKS95 | – | – |
| | SKD1 | X210Cr12 | D3 |
| | SKD2 | X210CrW12 | – |
| | SKD10 | X153CrMoV12 | – |
| | SKD11 | – | D2 |
| | SKD12 | X100CrMoV5 | A2 |
| | SKD4 | – | – |
| | SKD5 | X30WCrV9-3 | H21 |
| | SKD6 | – | H11 |
| | SKD61 | X40CrMoV5-1 | H13 |
| | SKD62 | X35CrWMoV5 | H12 |
| | SKD7 | 32CrMoV12-28 | H10 |
| | SKD8 | 38CrCoWV18-17-17 | H19 |
| | SKT3 | – | – |
| | SKT4 | 55NiCrMoV7 | – |
| | SKT6 | 45NiCrMo16 | – |

### ● Special use steel

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Free cutting carbon steels | SUM11 | – | 1110 |
| | SUM12 | – | 1109 |
| | SUM21 | 9S20 | 1212 |
| | SUM22 | 11SMn28 | 1213 |
| | SUM22L | 11SMnPb28 | – |
| | SUM23 | – | 1215 |
| | SUM23L | – | – |
| | SUM24L | 11SMnPb28 | 12L14 |
| | SUM25 | 12SMn35 | – |
| | SUM31 | – | 1117 |
| | SUM31L | – | – |

| Type | Japan | International | U.S.A. |
|---|---|---|---|
| | JIS | ISO | AISI ASTM |
| Free cutting carbon steels | SUM32 | – | – |
| | SUM41 | – | 1137 |
| | SUM42 | – | 1141 |
| | SUM43 | 44SMn28 | 1144 |
| High carbon chromium | SUJ1 | – | – |
| | SUJ2 | B1 | 52100 |
| | SUJ3 | B2 | ASTM A 485 Grade 1 |
| | SUJ4 | – | – |
| | SUJ5 | – | – |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Symbols of Metals

### ● Casting or forging steel

| Type | | Japan | International | Other countries | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France | Russia |
| | | JIS | ISO | AISI ASTM | BS BS/EN | DIN DIN/EN | NF NF/EN | ГОСТ |
| Casting steel | Carbon steel casting | SC | 200-400, 230-450, 270-480 | U- | A1, A2 | GS- | GE230, GE280, GE320 | – |
| | Steel casting for welded structure | SCW | 200-400W, 230-450W, 270-480W, 340-550W | WCA, WCB, WCC | A4 | – | GE230, GE280 | – |
| | Heat resisting steel casting | SCH | GX40CrSi24, GX40CrNiSi22-10, GX40NiCrSi38-19 | Grade HC, HD, HF | 309C30, 310C45, 330C12 | – | GX40NiCrNb45-35, GX50NiCrCoW35-25-15-5 | – |
| | Steel casting for high temperature and high pressure service | SCPH | – | Grade WC1, WC6, WC9 | A1, A2, B1, B2, B3, B4, B5, B7 | G20Mo5, G17CrMo5-5, G17CrMo5-10 | G17CrMo9-10, GX15CrMo5, GP240GH, GP280GH | – |
| | Steel casting for low temperature and high pressure service | SCPL | – | Grade LCB, LC1, LC2, LC3 | AL1, BL2 | – | FB-M, FC1-M, FC2-M,FC3-M | – |
| Casting iron | Grey iron casting | FC | 100,150,200,250, 300,350 | No.20,25,30,35, 40,45,50 | EN-GJL- | EN-GJL- | EN-GJL- | – |
| | Spheroidal graphite iron casting | FCD | 700-2, 600-3, 500-7, 450-10, 400-15, 400-18, 350-22 | 60-40-18, 65-45-12, 8-55-06, 100-70-03, 120-90-02 | EN-GJS- | EN-GJS- | EN-GJS- | ВЧ |
| | Austempered spheroidal graphite iron casting | FCAD | – | – | EN-GJS- | EN-GJS- | EN-GJS- | – |
| | Austenitic iron casting | FCA- FCDA- | L-, S- | Type 1, 2, Type D-2, D-3A Class 1, 2 | F1, F2, S2W, S5S | GGL-, GGG- | L-, S- | – |
| Forging steel | Carbon steel forging for general use | SF | – | Class A, B, C, D, E, F | C22, C25, C30, C35, C40, C45, C50, C55, C60 | P285, P355 | P245, P280, P305 | – |
| | Chromium molybdenum steel forgings for general use | SFCM | – | Class E, F, G, I Grade 3A, 4 Class G, J, K, L, M | – | – | – | – |
| | Nickel Chromium molybdenum steel forgings for general use | SFNCM | – | Class G, H, I, J Class 3A, 4, 5, 6 Class K, L, M | – | – | – | – |

### ● Non-ferrous alloy

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | | Great Britain | Germany |
| | | JIS | ISO | ASTM SAE | | BS BS/EN | DIN DIN/EN |
| Copper alloy, Nickel alloy | Copper alloy casting | CAC101 | – | – | – | – | |
| | | CAC102 | – | – | – | Cu-C(CC040AgrodeC) | |
| | | CAC103 | – | – | – | Cu-C(CC040AgrodeA,B) | |
| | Brass casting | CAC201 | – | – | – | CuZn15As-C(CC760S) | |
| | | CAC202 | – | C85400 | – | CuZn33Pb2-C(CC750S) | |
| | | CAC203 | – | C85700 | – | CuZn39Pb1-C(CC754S) | |
| | High strength brass casting | CAC301 | – | C86500 | – | CuZn35Mn2Al1Fe-C(CC765S) | |
| | | CAC302 | – | C86400 | – | CuZn34Mn3Al2Fe1-C(CC764S) | |
| | | CAC303 | – | C86200 | – | CuZn25Al5Mn4Fe3-C(CC762S) | |
| | | CAC304 | – | C86300 | – | CuZn25Al5Mn4Fe3-C(CC762S) | |
| | Bronze casting | CAC401 | – | C84400 | – | CuSn3Zn8Pb5-C(CC490K) | |
| | | CAC402 | – | C90300 | – | – | |
| | | CAC403 | – | C90500 | – | – | |
| | | CAC406 | – | C83600 | – | CuSn5Zn5Pb5-C(CC490K) | |
| | | CAC407 | – | C92200 | – | – | |
| | Phosphor bronze casting | CAC502A | – | C90700 C90800 | – | CuSn10-C(CC480K) CuSn12-C(CC483K) | |
| | | CAC502B | – | | – | | |
| | | CAC503A | – | | – | | |
| | | CAC503B | – | | – | | |
| | Aluminium bronze casting | CAC701 | – | C95200 | – | CuAl10Fe2-C(CC331G) | |
| | | CAC702 | – | C95400 | – | CuAl10Ni3Fe2-C(CC332G) | |
| | | | – | C95410 | – | | |
| | | CAC703 | – | C95800 | – | CuAl10Fe5Ni5-C(CC333G) | |
| | | CAC704 | – | C95700 | – | – | |
| | Silicon bronze castings | CAC801 | – | – | – | – | |
| | | CAC802 | – | C87500 | – | – | |
| | | CAC803 | – | C87400 | – | CuZn16Si4-C(CC761S) | |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Symbols of Metals

● Non-ferrous alloy

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France |
| | | JIS | ISO | ASTM SAE | BS BS/EN | DIN DIN/EN | NF NF/EN |
| Aluminium alloy | Aluminium alloy ingots for casting | AC1B | Al-Cu4MgTi | 204.0 | EN AC-2100 | | |
| | | AC2A | – | – | – | | |
| | | AC2B | – | 319.0 | – | | |
| | | AC3A | – | – | EN AC-44100 | | |
| | | AC4A | – | – | – | | |
| | | AC4B | Al-Si8Cu3 | 333.0 | EN AC-46200 | | |
| | | AC4C | Al-Si7Mg(Fe) | 356.0 | EN AC-42000 | | |
| | | AC4CH | Al-Si7Mg0.3 | A356.0 | EN AC-42100 | | |
| | | AC4D | – | 355.0 | EN AC-45300 | | |
| | | AC5A | Al-Cu4Ni2Mg2 | 242.0 | – | | |
| | | AC7A | – | 514.0 | – | | |
| | | AC8A | Al-Si12CuNiMg | – | EN AC-48000 | | |
| | | AC8B | – | – | – | | |
| | | AC8C | – | 332.0 | – | | |
| | | AC9A | – | – | – | | |
| | | AC9B | – | – | – | | |
| | Aluminium alloy die casting | ADC1 | – | A413.0 | – | | |
| | | ADC3 | – | A360.0 | – | | |
| | | ADC5 | – | 518.0 | – | | |
| | | ADC6 | – | – | – | | |
| | | ADC10 | – | – | – | | |
| | | ADC10Z | – | A380.0 | – | | |
| | | ADC12 | – | – | – | | |
| | | ADC12Z | – | 383.0 | – | | |
| | | ADC14 | – | B390.0 | – | | |
| Magnesium alloy | Magnesium alloy casting | MC5 | – | AM100A | – | | |
| | | MC6 | – | ZK51A | – | | |
| | | MC7 | – | ZK61A | – | | |
| | | MC8 | MgRE3Zn2Zr | EZ33A | EN MC65120 | | |
| | | MC9 | MgAg3RE2Zr | QE22A | EN MC65210 | | |
| | | MC10 | MgZn4RE1Zr | ZE41A | EN MC35110 | | |
| | Magnesium alloy die casting | MD1A | – | AZ91A | G-A9Z1Y4 | | |
| | | MDC1B | – | AZ91B | – | | |
| | | MDC1D | MgAl9Zn1(A) | AZ91D | EN MC21120 | | |
| | | MDC2B | MgAl6Mn | AM60B | EN MC21320 | | |

| Type | | Japan | International | Other countries | | | |
|---|---|---|---|---|---|---|---|
| | | | | U.S.A. | Great Britain | Germany | France |
| | | JIS | ISO | ASTM AA | BS BS/EN | DIN DIN/EN | NF NF/EN |
| Aluminium alloy | Aluminium alloy extruded shapes | A5052S | – | 5052 | EN AW-5052 | | |
| | | A5454S | – | 5454 | EN AW-5454 | | |
| | | A5083S | AlMg4.5Mn0.7 | 5083 | EN AW-5083 | | |
| | | A5086S | – | 5086 | EN AW-5086 | | |
| | | A6061S | AlMg1SiCu | 6061 | EN AW-6061 | | |
| | | A6063S | AlMg0.7Si | 6063 | EN AW-6063 | | |
| | | A7003S | – | – | EN AW-7003 | | |
| | | A7N01S | – | – | – | | |
| | | A7075S | AlZn5.5MgCu | 7075 | EN AW-7075 | | |

Note: The above chart is based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Approximate Conversion Table of Hardness

### ● Approximate conversion value for Brinell hardness. *1

(The source: JIS HB Ferrous Materials and Metallurgy I -2005)

| HB | | HV | Rockwell *3 | | | | HS | Approx. tensile strength (MPa) *2 |
|---|---|---|---|---|---|---|---|---|
| Brinell, 10mm ball, Load 3000kg | | Vickers | HRA | HRB | HRC | HRD | Shore | |
| Standard ball | Tungsten carbide ball | | A Scale, Load 60kg, Brale Diamond | B Scale, Load 100kg, Diameter 1/16 in. Steel ball | C Scale, Load 150kg, brale diamond | D Scale, Load 100kg, Brale Diamond | | |
| – | – | 940 | 85.6 | – | 68.0 | 76.9 | 97 | – |
| – | – | 920 | 85.3 | – | 67.5 | 76.5 | 96 | – |
| – | – | 900 | 85.0 | – | 67.0 | 76.1 | 95 | – |
| – | (767) | 880 | 84.7 | – | 66.4 | 75.7 | 93 | – |
| – | (757) | 860 | 84.4 | – | 65.9 | 75.3 | 92 | – |
| – | (745) | 840 | 84.1 | – | 65.3 | 74.8 | 91 | – |
| – | (733) | 820 | 83.8 | – | 64.7 | 74.3 | 90 | – |
| – | (722) | 800 | 83.4 | – | 64.0 | 73.8 | 88 | – |
| – | (712) | – | – | – | – | – | – | – |
| – | (710) | 780 | 83.0 | – | 63.3 | 73.3 | 87 | – |
| – | (698) | 760 | 82.6 | – | 62.5 | 72.6 | 86 | – |
| – | (684) | 740 | 82.2 | – | 61.8 | 72.1 | – | – |
| – | (682) | 737 | 82.2 | – | 61.7 | 72.0 | 84 | – |
| – | (670) | 720 | 81.8 | – | 61.0 | 71.5 | 83 | – |
| – | (656) | 700 | 81.3 | – | 60.1 | 70.8 | – | – |
| – | (653) | 697 | 81.2 | – | 60.0 | 70.7 | 81 | – |
| – | (647) | 690 | 81.1 | – | 59.7 | 70.5 | – | – |
| – | (638) | 680 | 80.8 | – | 59.2 | 70.1 | 80 | – |
| – | 630 | 670 | 80.6 | – | 58.8 | 69.8 | – | – |
| – | 627 | 667 | 80.5 | – | 58.7 | 69.7 | 79 | – |
| – | – | 677 | 80.7 | – | 59.1 | 70.0 | – | – |
| – | 601 | 640 | 79.8 | – | 57.3 | 68.7 | 77 | – |
| – | – | 640 | 79.8 | – | 57.3 | 68.7 | – | – |
| – | 578 | 615 | 79.1 | – | 56.0 | 67.7 | 75 | – |
| – | – | 607 | 78.8 | – | 55.6 | 67.4 | – | – |
| – | 555 | 591 | 78.4 | – | 54.7 | 66.7 | 73 | 2055 |
| – | – | 579 | 78.0 | – | 54.0 | 66.1 | – | 2015 |
| – | 534 | 569 | 77.8 | – | 53.5 | 65.8 | 71 | 1985 |
| – | – | 553 | 77.1 | – | 52.5 | 65.0 | – | 1915 |
| – | 514 | 547 | 76.9 | – | 52.1 | 64.7 | 70 | 1890 |
| (495) | – | 539 | 76.7 | – | 51.6 | 64.3 | – | 1855 |
| – | – | 530 | 76.4 | – | 51.1 | 63.9 | – | 1825 |
| – | 495 | 528 | 76.3 | – | 51.0 | 63.8 | 68 | 1820 |
| (477) | – | 516 | 75.9 | – | 50.3 | 63.2 | – | 1780 |
| – | – | 508 | 75.6 | – | 49.6 | 62.7 | – | 1740 |
| – | 477 | 508 | 75.6 | – | 49.6 | 62.7 | 66 | 1740 |
| (461) | – | 495 | 75.1 | – | 48.8 | 61.9 | – | 1680 |
| – | – | 491 | 74.9 | – | 48.5 | 61.7 | – | 1670 |
| – | 461 | 491 | 74.9 | – | 48.5 | 61.7 | 65 | 1670 |
| 444 | – | 474 | 74.3 | – | 47.2 | 61.0 | – | 1595 |
| – | – | 472 | 74.2 | – | 47.1 | 60.8 | – | 1585 |
| – | 444 | 472 | 74.2 | – | 47.1 | 60.8 | 63 | 1585 |

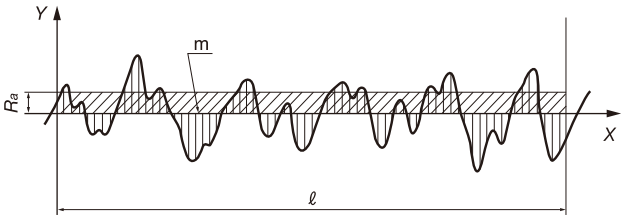
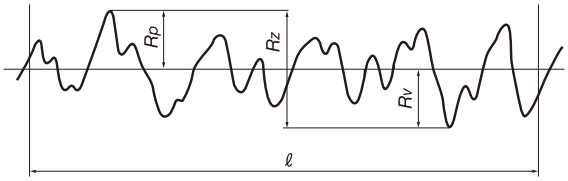
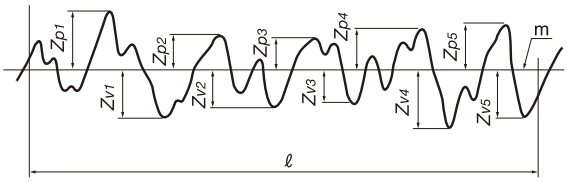
| HB | | HV | Rockwell *3 | | | | HS | Approx. tensile strength (MPa) *2 |
|---|---|---|---|---|---|---|---|---|
| Brinell, 10mm ball, Load 3000kg | | Vickers | HRA | HRB | HRC | HRD | Shore | |
| Standard ball | Tungsten carbide ball | | A Scale, Load 60kg, Brale Diamond | B Scale, Load 100kg, Diameter 1/16 in. Steel ball | C Scale, Load 150kg, brale diamond | D Scale, Load 100kg, Brale Diamond | | |
| 429 | 429 | 455 | 73.4 | – | 45.7 | 59.7 | 61 | 1510 |
| 415 | 415 | 440 | 72.8 | – | 44.5 | 58.8 | 59 | 1460 |
| 401 | 401 | 425 | 72.0 | – | 43.1 | 57.8 | 58 | 1390 |
| 388 | 388 | 410 | 71.4 | – | 41.8 | 56.8 | 56 | 1330 |
| 375 | 375 | 396 | 70.6 | – | 40.4 | 55.7 | 54 | 1270 |
| 363 | 363 | 383 | 70.0 | – | 39.1 | 54.6 | 52 | 1220 |
| 352 | 352 | 372 | 69.3 | (110.0) | 37.9 | 53.8 | 51 | 1180 |
| 341 | 341 | 360 | 68.7 | (109.0) | 36.6 | 52.8 | 50 | 1130 |
| 331 | 331 | 350 | 68.1 | (108.5) | 35.5 | 51.9 | 48 | 1095 |
| 321 | 321 | 339 | 67.5 | (108.0) | 34.3 | 51.0 | 47 | 1060 |
| 311 | 311 | 328 | 66.9 | (107.5) | 33.1 | 50.0 | 46 | 1025 |
| 302 | 302 | 319 | 66.3 | (107.0) | 32.1 | 49.3 | 45 | 1005 |
| 293 | 293 | 309 | 65.7 | (106.0) | 30.9 | 48.3 | 43 | 970 |
| 285 | 285 | 301 | 65.3 | (105.5) | 29.9 | 47.6 | – | 950 |
| 277 | 277 | 292 | 64.6 | (104.5) | 28.8 | 46.7 | 41 | 925 |
| 269 | 269 | 284 | 64.1 | (104.0) | 27.6 | 45.9 | 40 | 895 |
| 262 | 262 | 276 | 63.6 | (103.0) | 26.6 | 45.0 | 39 | 875 |
| 255 | 255 | 269 | 63.0 | (102.0) | 25.4 | 44.2 | 38 | 850 |
| 248 | 248 | 261 | 62.5 | (101.0) | 24.2 | 43.2 | 37 | 825 |
| 241 | 241 | 253 | 61.8 | 100.0 | 22.8 | 42.0 | 36 | 800 |
| 235 | 235 | 247 | 61.4 | 99.0 | 21.7 | 41.4 | 35 | 785 |
| 229 | 229 | 241 | 60.8 | 98.2 | 20.5 | 40.5 | 34 | 765 |
| 223 | 223 | 234 | – | 97.3 | (18.8) | – | – | – |
| 217 | 217 | 228 | – | 96.4 | (17.5) | – | 33 | 725 |
| 212 | 212 | 222 | – | 95.5 | (16.0) | – | – | 705 |
| 207 | 207 | 218 | – | 94.6 | (15.2) | – | 32 | 690 |
| 201 | 201 | 212 | – | 93.8 | (13.8) | – | 31 | 675 |
| 197 | 197 | 207 | – | 92.8 | (12.7) | – | 30 | 655 |
| 192 | 192 | 202 | – | 91.9 | (11.5) | – | 29 | 640 |
| 187 | 187 | 196 | – | 90.7 | (10.0) | – | – | 620 |
| 183 | 183 | 192 | – | 90.0 | (9.0) | – | 28 | 615 |
| 179 | 179 | 188 | – | 89.0 | (8.0) | – | 27 | 600 |
| 174 | 174 | 182 | – | 87.8 | (6.4) | – | – | 585 |
| 170 | 170 | 178 | – | 86.8 | (5.4) | – | 26 | 570 |
| 167 | 167 | 175 | – | 86.0 | (4.4) | – | – | 560 |
| 163 | 163 | 171 | – | 85.0 | (3.3) | – | 25 | 545 |
| 156 | 156 | 163 | – | 82.9 | (0.9) | – | – | 525 |
| 149 | 149 | 156 | – | 80.8 | – | – | 23 | 505 |
| 143 | 143 | 150 | – | 78.7 | – | – | 22 | 490 |
| 137 | 137 | 143 | – | 76.4 | – | – | 21 | 460 |
| 131 | 131 | 137 | – | 74.0 | – | – | – | 450 |
| 126 | 126 | 132 | – | 72.0 | – | – | 20 | 435 |
| 121 | 121 | 127 | – | 69.8 | – | – | 19 | 415 |
| 116 | 116 | 122 | – | 67.6 | – | – | 18 | 400 |
| 111 | 111 | 117 | – | 65.7 | – | – | 15 | 385 |

Note :
*1: This table is based on AMS Metals Handbook, the 8th Edition, Volume 1, and includes some information added to "Approx. tensile strength (MPa)," such as the values calculated in metric; and Brinell hardness that exceeds recommended values.
*2: 1 MPa = 1 N/mm$^2$
*3: Figures in ( ) are not commonly used. It's just reference.

# User's Guide- Technical Reference

## Surface Roughness

(According to JIS B 0601, 2001 and its explanation.)

| Type | Symbol | How to determine | Example (Fig.) |
|---|---|---|---|
| Arithmetic mean roughness | *Ra* | *Ra* means the value obtained by the following formula and expressed in micrometer (μm) when sampling only the reference length from the roughness curve in the direction of mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by *y- f (x)*: $Ra=\frac{1}{\ell}\int_0^1 \lvert f(x)\rvert dx$ where, $\ell$ : reference length |   |
| Maximum height | *Rz* | *Rz* shall be that only the reference length is sampled from the roughness curve in the direction of mean line, the distance between the top of profile peak line and the bottom of profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (μm). $Rz=Rp+Rv$ |   |
| Ten point mean roughness | *RzJIS* | *RzJIS* shall be that only the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (*Zp*) and the depths of five deepest profile valleys (*Zv*) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (μm) $Rz_{JIS}=\frac{\lvert Zp1+Zp2+Zp3+Zp4+Zp5\rvert+\lvert Zv1+Zv2+Zv3+Zv4+Zv5\rvert}{5}$ |   where, $Z_{p1}, Z_{p2}, Z_{p3}, Z_{p4}, Z_{p5}$ : altitudes of the heights of five highest profile peaks of the sampled portion corresponding to the reference length $\ell$ where, $Z_{v1}, Z_{v2}, Z_{v3}, Z_{v4}, Z_{v5}$ : altitudes of the depths of five deepest profile valleys of the sampled portion corresponding to the reference length $\ell$ |

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●CVD Coated Grades for Turning

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | **T9105** | UE6105 | AC810P | GC4205<br>GC4305 | CA5505<br>CA510 | HG8010 | JC110V | | TP0500<br>TP0501 | KC9105<br>KCP05 | IC8150<br>IC9150<br>IC9015 | TT8115 | TN10P<br>TN20K | WPP01<br>WPP05<br>WPP05S | |
| | P10 | **T9105**<br>**T9115** | UE6105<br>UE6110 | AC810P<br>AC820P | GC4205<br>GC4215<br>GC4305<br>GC4315 | CA5515<br>CA515 | HG8010<br>GM8020 | JC110V<br>JC215V | CP7<br>CP5 | TP0500<br>TP1500<br>TP0501<br>TP1501 | KC9110<br>KC9105<br>KCP10 | IC8150<br>IC9150<br>IC8080<br>IC9080<br>IC9015 | TT8115 | TN10P<br>TN20K<br>WP15CT | WPP05<br>WPP10<br>WAK20<br>WPP05S<br>WPP10S | CTC3110<br>CTCK120 |
| | P20 | **T9115**<br>**T9125** | UE6110<br>UE6020<br>MC6025 | AC820P<br>AC830P<br>AC8025P | GC4215<br>GC4315<br>GC4225<br>GC4325 | CA5515<br>CA515<br>CA5525<br>CA525 | HG8025<br>GM8020<br>GM25 | JC110V<br>JC215V | CP7<br>CP5 | TP1500<br>TP2500<br>TP1501<br>TP2501 | KC9215<br>KC9225<br>KC9325<br>KCP25 | IC8150<br>IC9150<br>IC9015<br>IC8250<br>IC9250 | TT8125<br>TT5100 | TN10P<br>TN15M<br>WP25CT | WPP20<br>WPP20S | CTCP115<br>CTCP125<br>CTC1425 |
| | P30 | **T9125**<br>**T9135**<br>**T6130** | MC6025<br>UE6035 | AC8025P<br>AC830P | GC4225<br>GC4235<br>GC4325 | CA5525<br>CA5535<br>CA530 | HG8025<br>GM8035<br>GM25 | JC215V<br>JC325V | | TP2500<br>TP3500<br>TP2501 | KC9140<br>KC9240<br>KCP30 | IC8080<br>IC656<br>IC9350 | TT8125<br>TT5100<br>TT8135 | TN30P<br>TN30M<br>WP35CT | WPP30<br>WAK30<br>WPP30S | CTCP125<br>CTC1425<br>CTC1135<br>CTC1435<br>CTC2135 |
| | P40 | **T9135**<br>**T6130** | UE6035<br>UH6400 | AC830P<br>AC630M | GC4235 | CA5535<br>CA530 | GM8035<br>GX30 | JC325V | | TP3500 | KC9140<br>KC9240<br>KCP40 | IC9350<br>IC635 | TT8135<br>TT7100 | TN30P<br>TN30M | WPP30<br>WAK30<br>WPP30S | CTC1135<br>CTC1435<br>CTC2135 |
| M | M10 | **T9115** | MC7015 | AC610M | GC2015 | CA6515 | | JC110V | | | KCM15 | IC9250<br>IC520M | TT9215 | TN15M<br>WM15CT | | CTCP115 |
| | M20 | **T6120**<br>**T9125** | MC7015<br>US7020<br>MC7025 | AC6030M | GC2015<br>GC2025 | CA6525 | HG8025<br>GM25 | JC110V | | TM2000 | KCM15<br>KCM25 | IC9025<br>IC9350<br>IC4050 | TT9215<br>TT9225 | TN15M<br>WM25CT | | CTC1425<br>CTCP125<br>CTC1135 |
| | M30 | **T6130** | MC7025<br>US735 | AC6030M<br>AC630M | GC2025<br>GC235 | | GM8035<br>GM25<br>GX30 | JC215V | | TM2000<br>TM4000 | KCM25<br>KCM35 | IC9350<br>IC4050<br>IC635 | TT9225<br>TT9235 | TN30M<br>WM35CT | | CTC1435<br>CTC2135 |
| | M40 | | US735 | | GC235 | | GX30 | | | TM4000 | KCM35<br>KCP40 | IC635 | TT9235 | | | |
| K | K01 | **T5105** | MC5005<br>UC5105 | AC405K | GC3205 | CA4505 | HX3505 | JC050W<br>JC105V | CP1 | TK1001<br>TK1000 | KCK05 | IC8080 | | WK05CT | WAK10<br>WPP01 | |
| | K10 | **T515**<br>**T5105**<br>**T5115** | MC5015<br>UC5115 | AC415K | GC3210 | CA4515 | HX3515<br>GM10<br>HG8010 | JC105V<br>JC110V | CP1 | TK1001<br>TK1000 | KCK05<br>KCK15 | IC9150<br>IC5100<br>IC4100 | TT7005 | WK05CT | WAK10<br>WPP10<br>WKK10S | CTC3110<br>CTC1425 |
| | K20 | **T515**<br>**T5115**<br>**T5125** | MC5015<br>UC5115 | AC420K | GC3215 | CA4515 | HX3515<br>GM8020 | JC110V<br>JC215V | CP1 | TK2000<br>TK2001 | KCK15<br>KCK20 | IC9150<br>IC5100<br>IC4100<br>IC9080 | TT7310 | WK20CT | WAK20<br>WPP20<br>WKK20S | CTC1435<br>CTCK120<br>CTCP115 |
| | K30 | **T5125**<br>**T9115** | | | | | HG8025 | JC215V | | | KCP25 | IC520M<br>IC4050 | | | WAK30<br>WKP30S | CTCP125 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●PVD Coated Grade for Turning

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | | | | | PR1005 | | | | | | | | | WXN10 | |
| | P10 | **AH710** | VP10RT | | GC1525 | PR930<br>PR1005<br>PR1115<br>PR1215<br>PR1425 | IP2000 | JC5003<br>JC5030 | VM1<br>DT4<br>DM4 | TS2000<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC507<br>IC807<br>IC907 | | WS10PT | WSM10<br>WSM21 | |
| | P20 | **AH120<br>AH725<br>AH730<br>SH725<br>SH730<br>J740** | VP10RT<br>VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC520U | GC1525<br>GC1125 | PR930<br>PR1025<br>PR1115<br>PR1215<br>PR1425<br>PR1225 | IP2000<br>IP3000 | JC5030<br>JC5040 | VM1<br>DT4<br>DM4 | TS2500<br>CP200 | KC5025<br>KC5525<br>KCU25 | IC507<br>IC807<br>IC907 | TT9030 | WS10PT<br>WS25PT | WSM20<br>WSM21 | |
| | P30 | **AH120<br>AH725<br>SH725<br>AH730<br>SH730<br>GH730<br>GH330<br>J740** | VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC530U | GC1125 | PR1025<br>PR1225 | IP3000 | JC5040 | DT4<br>DM4<br>QM3 | CP500 | KC5025<br>KC5525<br>KCU25 | IC328<br>IC928<br>IC3028 | TT9030<br>TT8020 | WS25PT | WSM30 | CTP1235<br>CTP1625<br>CTP2235 |
| | P40 | **AH120<br>AH725<br>AH645** | | AC530U | | | | | | CP500 | | IC328<br>IC3028 | TT8020 | | | CTP1235<br>CTP2235 |
| M | M01 | | | | | | | | | | | IC520 | | | WXM10 | |
| | M10 | **AH630** | VP10RT | | GC1105<br>GC1115<br>GC1525 | PR1025<br>PR1215 | IP100S<br>IP050S | JC5003<br>JC8015 | TM4<br>ZM3 | TS2000<br>TS2500<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC520<br>IC507<br>IC807<br>IC907 | | WS10PT | WSM10<br>WSM10S | |
| | M20 | **AH630<br>AH120<br>AH725<br>SH725<br>SH730** | VP10RT<br>VP15TF<br>VP20MF<br>VP20RT<br>UP20M | AC520U | GC1115<br>GC1125<br>GC1525 | PR930<br>PR1025<br>PR1125<br>PR1215<br>PR1425<br>PR1225 | IP100S<br>IP050S | JC5015<br>JC5030<br>JC8015 | TM4<br>ZM3<br>DT4<br>DM4 | TS2500<br>CP200<br>CP500 | KC5025<br>KC5525<br>KCU25 | IC520<br>IC507<br>IC807<br>IC907<br>IC308<br>IC3028 | TT9030<br>TT8010 | WS10PT<br>WS25PT | WSM20<br>WSM21<br>WSM20S | CTP1235<br>CTP2120 |
| | M30 | **AH645<br>AH120<br>AH725<br>SH725<br>SH730<br>J740** | VP15TF<br>VP20MF<br>VP20RT<br>UP20M<br>MP7035 | AC530U<br>AC6040M | GC1125<br>GC2035 | PR1125 | IP100S | JC5015<br>JC5030<br>JC5040 | TM4<br>ZM3<br>DT4<br>DM4 | CP500 | KC5025<br>KC5525<br>KCU25 | IC3028<br>IC308<br>IC908<br>IC928 | TT8020 | WS25PT | WSM30<br>WSM30S | CTP1235<br>CTP2120<br>CTP2235<br>CTP1625 |
| | M40 | **AH645** | MP7035 | AC530U<br>AC6040M | GC2035 | | | | | | | IC228<br>IC328 | | | | |
| K | K01 | **AH110** | | | | | | | | | | IC910 | | | | |
| | K10 | **GH110<br>AH110** | VP10RT | AC510U | | PR905<br>PR1215 | | JC5003<br>JC5015 | | TS2000<br>CP200 | KC5010<br>KC5510<br>KCU10 | IC910<br>IC308<br>IC508 | TT9030 | WS10PT | | CTP6215 |
| | K20 | **AH120** | VP10RT<br>VP20RT<br>VP15TF | | | PR905<br>PR1215 | | JC5015 | | TS2500<br>CP200<br>CP250 | KC5025<br>KC5525<br>KCU25 | IC910<br>IC308<br>IC508<br>IC928<br>IC1008 | TT9030 | WS10PT<br>WS25PT | | CTP6215 |
| | K30 | **AH120<br>GH130** | VP20RT<br>VP15TF | | | | | | | CP500 | | IC928<br>IC1008 | TT9030 | WS25PT | | CTP1625 |
| S | S01 | **AH8005** | VP05RT<br>MP9005 | | | | | JC8003 | | | | | | | WSM10 | |
| | S10 | **AH8005<br>AH8015** | VP10RT<br>MP9015 | AC510U<br>AC520U | GC1105 | PR1305<br>PR1310 | | JC8015<br>JC5015 | DT4<br>DM4 | TS2000<br>TS2500<br>CP200<br>CP500 | KC5010<br>KC5510<br>KCU10 | IC507<br>IC807<br>IC808<br>IC907<br>IC908 | TT8010 | WS10PT | WSM10<br>WSM10S | CTP2235 |
| | S20 | **AH8015** | VP15TF<br>MP9015<br>VP20RT | AC520U | GC1115<br>GC1125 | PR1310 | | JC8015<br>JC5015 | DT4<br>DM4 | TS2000<br>TS2500<br>CP200<br>CP500 | KC5025<br>KC5525<br>KCU25 | IC507<br>IC807<br>IC808<br>IC907<br>IC908 | TT8020 | WS10PT<br>WS25PT | WSM20<br>WSM21<br>WSM20S | CTP2235 |
| | S30 | **AH630<br>AH7025** | VP15TF<br>VP20RT | AC520U | GC1125 | PR1325 | | | | | | IC830<br>IC928 | | WS25PT | WSM30<br>WSM30S | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●Cermet for Turning

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | **NS520** | AP25N<br>VP25N | T110A<br>T1000A | | TN30<br>PV30<br>TN6010<br>PV7010 | | LN10 | Q15<br>C7Z | | KT1120 | | PV3010<br>CT3000 | | | |
| | P10 | **GT9530**<br>**J9530** | AP25N<br>VP25N<br>NX2525 | T1500Z<br>T2000Z<br>T1200A<br>T1500A | CT5015 | TN60<br>TN6010<br>PV7010<br>TN610<br>PV710 | CZ25 | CX50<br>PX75 | C7Z<br>Z15 | TP1020<br>C15M | KT315 | IC30N<br>IC530N | PV3010<br>CT3000 | TTI15 | WCE10 | TCC410<br>TCM10<br>TCM407 |
| | P20 | **GT9530**<br>**NS9530**<br>**J9530** | AP25N<br>VP25N<br>VP45N<br>NX2525<br>NX3025 | T1200A<br>T1500A<br>T1500Z<br>T2000Z | CT5015<br>GC1525 | TN90<br>TN6020<br>PV7020<br>PV7025<br>TN620<br>PV720 | CZ25<br>CH550 | CX75<br>PX75<br>PX90 | C7Z<br>T15 | TP1020<br>TP1030<br>C15M | KT5020 | IC30N<br>IC530N | PV3010<br>CT3000 | TTI15 | WCE10 | TCC410<br>TCM10 |
| | P30 | **NS9530** | VP45N<br>NX4545 | T3000Z | GC1525 | | | PX90 | N40<br>C7X | | | | | | | |
| M | M10 | **NS520** | AP25N<br>VP25N<br>NX2525 | T1000A<br>T2000Z | CT5015 | TN60<br>TN6020<br>PV7020<br>PV7025 | | LN10<br>CX50 | C7Z<br>C7X | TP1020<br>TP1030 | KT315<br>KT5020 | | PV3010<br>CT3000 | TTI15 | | TCC410<br>TCM10<br>TCM407 |
| | M20 | **GT9530**<br>**NS9530**<br>**J9530** | NX2525<br>AP25N<br>VP25N | T1500A<br>T2000Z | GC1525 | TN90<br>TN6020<br>PV7020<br>PV7025 | CZ25<br>CH550 | CX75 | C7Z<br>C7X | C15M | KT5020 | IC30N<br>IC530N | PV3010<br>CT3000 | | | |
| | M30 | **NS9530** | NX4545 | T3000Z | | | | | | | | | | | | |
| K | K01 | **NS520** | AP25N<br>VP25N | T1000A | | TN30<br>PV30<br>PV7005 | | LN10 | | | | | PV3010<br>CT3000 | | | TCC410 |
| | K10 | **GT9530**<br>**NS9530**<br>**J9530** | AP25N<br>VP25N<br>NX2525 | T1500A<br>T2000Z | CT5015 | TN60<br>TN6010<br>PV7005<br>PV7010 | CZ25<br>CH550 | LN10<br>CX75 | | | KT315<br>KT5020 | IC30N<br>IC530N | CT3000 | TTI15 | | TCC410<br>TCM10<br>TCM407 |
| | K20 | **NS9530** | AP25N<br>VP25N<br>NX2525 | T3000Z | | | | CX75 | | | KT5020 | | | | | TCM407 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●Cemented Carbide for Turning

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | | | | | | | | | | | | | | | | |
| | P10 | **TH10** | | ST10P | | | WS10 | SRT | | | P10 | IC70 | | P10 | TN15U | | |
| | P20 | **KS20** | UTi20T | ST20E | SMA<br>H10F | | EX35 | SRT<br>SR20 | KM1 | S10M | K125M<br>TTM | IC70 | P40 | P20 | TN15U | | |
| | P30 | **KS15F**<br>**UX30** | UTi20T | A30<br>A30N | SM30<br>H10F | PW30 | EX40 | DX30<br>SR30 | KM3 | S25M | GK<br>K600<br>TTR | IC28<br>IC54 | P40 | P30 | | | S40T |
| | P40 | **TX40** | | ST40E | | | EX45 | SR30 | | S60M | G13 | IC28<br>IC54 | | P40 | | | S40T |
| M | M01 | | | | | | | | | | | | | | | | |
| | M10 | **TH10** | | U10E<br>EH510 | H10A | | WA10B | UMN | KM1 | 890 | K313 | IC20 | | M10 | TN15U<br>WU10HT | | |
| | M20 | **KS20** | UTi20T | U2<br>EH520 | H13A | | EX35 | DX25<br>UMS | | HX<br>883 | K68<br>KMF<br>K125M<br>TTM | IC20 | IN30M | M20 | TN15U<br>WU10HT | | CTW7120<br>H210T |
| | M30 | **UX30** | UTi20T | A30<br>A30N | H10F<br>SM30 | | EX45 | UMS | | | GK<br>K600<br>TTR | IC28 | IN30M | | | | |
| | M40 | **TU40** | | | | | | UM40 | | | G13 | IC28 | IN30M | M40 | | | S40T |
| K | K01 | **KS05F** | HTi05T | H2<br>H1 | | | WH01<br>WH05 | KG03 | | | K605 | | | UF1 | TN15U<br>WU10HT | | |
| | K10 | **TH10** | HTi10 | H1<br>EH10<br>EH510 | H10 | KW10 | WH10 | KG10<br>KT9<br>CR1 | KM1 | 890 | K313<br>K110M<br>THM<br>THM-U | IC20<br>IC09T | IN05S | K10 | TN15U<br>WU10HT | | H210T<br>H216T<br>H10T |
| | K20 | **KS15F**<br>**KS20** | UTi20T | G10E<br>EH20<br>EH520 | H13A<br>H10F | KW10<br>GW15 | WH20 | KT9<br>CR1<br>KG20<br>FB15 | | 890<br>HX<br>883 | K715<br>KMF<br>K600 | IC20<br>IC09T | IN05S<br>IN10K<br>IN15K<br>IN30M | K20 | TN15U<br>WU10HT | | CTW7120<br>H210T<br>H216T<br>H10T |
| | K30 | | UTi20T | G10E | H13A<br>H10F | GW25 | | KG30 | | 883 | THR | IC28 | IN10K<br>IN15K<br>IN30M | K30 | | | |
| | K40 | | | | | | | | | | G13 | | IN30M | | | | |
| N | N01 | **KS05F** | | H1 | H10 | KW10 | | | | | K605 | IC20 | | | | | |
| | N10 | **TH10** | HTi10 | H1 | H10<br>H10F | GW15 | WH10 | KT9<br>CR1 | KM1 | 890<br>HX<br>KX<br>H15 | K313<br>K110M<br>THM<br>THM-U | IC20<br>IC28 | IN05S<br>IN10K | K10 | TN15U<br>WU10HT | WK1<br>WK10 | H210T<br>H216T<br>H10T |
| | N20 | **KS15F** | | | H10F<br>H13A | | WH20 | KT9<br>CR1 | KM1 | 890<br>HX<br>KX<br>883 | K715<br>KMF<br>K600 | IC20<br>IC28 | IN10K<br>IN15K | K20 | TN15U<br>WU10HT | WK1<br>WK10 | CTW7120<br>H210T<br>H216T<br>H10T |
| | N30 | | | | | | | | | 883<br>H25 | G13<br>THR | | IN15K<br>IN30M | | | WK40<br>WMG40 | |
| S | S01 | | RT9005 | | | | | | | | | IC20 | | | | | |
| | S10 | **KS05F**<br>**TH10** | RT9005<br>RT9010 | EH510 | H10<br>H10A | KW10 | WH10 | KG10 | KM1 | 890<br>883 | K10<br>K313<br>THM | IC20 | IN05S<br>IN10K | K10 | TN15U<br>WU10HT | WK1 | H210T<br>H216T<br>H10T |
| | S20 | **KS15F**<br>**KS20** | RT9010<br>TF15 | EH520 | H10F<br>H13A | GW25 | WH20 | KG20 | KM1 | 890<br>883<br>H25 | K715<br>KMF | IC20<br>IC28 | IN10K<br>IN15K | K20 | TN15U<br>WU10HT | WK1<br>WMG40 | CTW7120<br>H210T<br>H216T<br>H10T |
| | S30 | | TF15 | | | | | | | 883 | G13<br>K600<br>THR | | IN15K<br>IN30M | | | WMG40 | |
| H | H01 | | | | | | | KG03 | | | | IC20 | | | | | |
| | H10 | **TH10** | | | H13A | | | FZ05 | | | | IC20 | IN10K | K10 | | | |
| | H20 | | | | | | | FZ15 | | 890<br>HX<br>883 | | | IN15K | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●PCBN and PCD for Turning

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K | K01 | **BX930<br>BX910<br>BX870** | MB710<br>MB730<br>MB5015 | BN500<br>BNC500 | CB7525<br>CB7050<br>CB50 | KBN60M | | B52 | | KB9610<br>KD120<br>KB1630 | IB10K | | KB90 | WBH10C | WCB80 | TA100<br>CTL3215 |
| | K10 | **BX470<br>BX480<br>BX950** | MB710<br>MB730 | BN7000<br>BN7500<br>BN500<br>BNC500 | CB7050<br>CB7925<br>CB50 | KBN60M | JBN795 | B23<br>B30<br>B52 | CBN200<br>CBN300<br>CBN400C<br>CBN010 | KB9640<br>KD120<br>KB1630 | IB05S<br>IB10S | | KB90A | WBK40U | WCB80<br>WCB50 | TA120<br>TA201<br>CTL3215 |
| | K20 | **BXC90<br>BX90S** | MB730<br>MBS140 | BNS800 | CB7050 | KBN900 | | B23<br>B30<br>B52 | CBN300<br>CBN500<br>CBN600<br>CBN010 | KB1340<br>KB1345 | IB90<br>IB25KD | | | WBK45U | WCB80 | CTL3215 |
| | K30 | **BXC90<br>BX90S** | MBS140 | BNS800 | | KBN900 | | B16 | CBN500<br>CBN600 | KB1340<br>KB1345 | | | | | | |
| S | S01 | **M714B** | MB730 | BN350 | | | JBN795 | JP2 | CBN170 | | | | KB90 | | | |
| | S10 | **BX470<br>BX480<br>BX950** | MB4020 | BN7500 | CB7050 | KBN65B<br>KBN65M | | B23<br>B30 | CBN200 | KB1630 | IB05S<br>IB10S | | KB90A | WBK45U | WCB80 | TA201 |
| H | H01 | **BXM10<br>BX310** | BC8110<br>MBC010<br>MB810 | BNC100<br>BNC160<br>BNC2010<br>BNX10<br>BN1000 | CB20 | KBN510<br>KBN10C<br>KBN05M<br>KBN10M | | B52<br>B5K | CBN10<br>CBN100<br>CBN160C<br>CBN050C | KB1610<br>KB5610 | IB05H<br>IB10HC | | KB50 | WBH10C | WCB30 | |
| | H10 | **BXM10<br>BX330<br>BX530** | BC8110<br>MBC020<br>MB8025 | BNC160<br>BNC200<br>BNC2020<br>BN250<br>BN1000 | CB7015<br>CB7025<br>CB20<br>CB50 | KBN525<br>KBN05M<br>KBN10M<br>KBN25M | JBN245 | B36<br>B52<br>B6K | CBN150<br>CBN200<br>CBN300<br>CBN060K<br>CBN050C<br>CBN160C<br>CBN300P<br>CBN400C | KB9610<br>KB1610<br>KB5610 | IB50<br>IB55<br>IB10H<br>IB10HC<br>IB20H<br>IB25HA | | KB50<br>TB650 | WBH10C<br>WBH10P<br>WBH10U | WCB30<br>WCB50 | CTL3215<br>TA100 |
| | H20 | **BXM20<br>BXA20<br>BX360** | MBC020<br>BC8120<br>MB8025<br>MB825 | BNC200<br>BNC2020<br>BN250<br>BNX20<br>BNX25<br>BN2000 | CB7025<br>CB20<br>CB7035 | KBN525<br>KBN05M<br>KBN10M<br>KBN25M | JBN300<br>JBN330 | B22<br>B36<br>B40<br>B6K | CBN150<br>CBN200<br>CBN300<br>CBN060K<br>CBN160C<br>CBN300P<br>CBN400C | KB5625<br>KB1625 | IB20H<br>IB20HC<br>IB25HA<br>IB25HC | | TB650 | WBH25P | WCB50<br>WCB80 | CTL3215<br>TA120 |
| | H30 | **BXC50<br>BX380** | MB835 | BNC300<br>BN350<br>BNX25 | CB7525 | KBN35M<br>KBN900 | JBN300<br>JBN330 | B22<br>B40 | CBN500 | KB1630<br>KB9640 | IB25HC | | | WBH40C | | TA201 |
| N | N01 | **DX160<br>DX180** | MD205 | DA90 | CD10 | KPD001 | JDA30<br>JDA735 | | | KD1400<br>KD1405<br>KD100 | ID5 | | | | WCD10 | CTD4125 |
| | N10 | **DX140** | MD205<br>MD220 | DA150 | CD10 | KPD001<br>KPD010<br>KPD230 | JDA715 | PD1 | PCD05<br>PCD10 | KD100<br>KD1400<br>KD1425 | ID5 | IN90D | KP500 | WDN25U | WCD10 | CTD4125<br>CTD4110 |
| | N20 | **DX120** | MD220<br>MD230 | DA2200<br>DA1000 | CD10 | KPD001<br>KPD010<br>KPD230 | JDA715 | PD1 | PCD05<br>PCD20 | KD1425 | | IN90D | KP300 | WDN25U | WCD10 | CTD4205 |
| | N30 | **DX110** | MD230 | DA2200<br>DA1000 | | | JDA10 | | OVD20<br>PCD30<br>PCD30M | | | | KP100 | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●Ceramics for Turning

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| K | K01 | **LX11**<br>**LX21** | | NB90S<br>NB90M | CC6190<br>CC650 | KA30<br>A65<br>KT66<br>PT600M | | | HC1<br>HW2<br>SE1<br>HC2 | | KY1310<br>KY1615 | | | AW20<br>AB30<br>AS10 | CW2015 | | CTN3105<br>CTS3105 |
| | K10 | **CX710**<br>**FX105** | | | CC6190<br>CC650 | A65<br>KT66<br>A66N<br>PT600M | | | HC1<br>HW2<br>SE1<br>WA1<br>WA5 | | KY1310<br>KY1320<br>KY1615<br>KY3400 | | IN70N | AB30<br>AS10 | CW2015<br>CW5025 | WSN10 | CTN3105<br>CTM3110<br>CTI3105<br>CTN3110<br>CTS3105 |
| | K20 | **FX105**<br>**CX710** | | | CC6190 | KS6000 | | | SP9<br>SX1<br>SX8<br>SX9 | | KY1320<br>KY3400<br>KY3500<br>KY4300 | | IN70N | AS10 | CW5025 | WSN10 | CTM3110<br>CTN3110 |
| H | H01 | **LX11** | | NB100C | CC6050<br>CC650 | A65<br>KT66<br>A66N<br>PT600M | | | ZC4<br>ZC7 | | KY4300 | | | AW20 | CW2015 | | CTS3105 |

Note: The above table is selected from a publication. We have not obtained approval from each company.

## Grade Comparison Chart

### ●CVD Coated Grade for Milling

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | | | | | | | | | | | IC9015<br>IC5400<br>IC8080<br>IC9080 | | | TN2510 | | |
| | P10 | | FH7020 | ACP100 | GC4220<br>GC4230 | | | JC730U | | MP1500 | KCPM20 | IC9015<br>IC5400<br>IC8080<br>IC9080<br>IC4100<br>IC5100 | | | TN2510<br>TN7525 | WKP25 | GM226+ |
| | P20 | **T3225** | FH7020<br>F7030 | ACP100 | GC4220<br>GC4230 | | GX2140<br>GX2160 | JC730U | | MP1500<br>MP2500<br>T25M | KCPM20<br>KCPK30<br>KCPM30<br>KC927M | IC8080<br>IC9080<br>IC4100<br>IC5100<br>IC9250<br>IC520M | IN6530 | TT7800 | TN7525<br>TN7535 | WKP25<br>WKP35<br>WKP35S | GM226+ |
| | P30 | **T3130**<br>**T3225** | F7030 | ACP100 | GC4230<br>GC4240<br>GC2040 | | GX2140<br>GX2160 | | | MP1500<br>MP2500<br>T350M<br>T25M | KCPK30<br>KCPM30<br>KC927M | IC9250<br>IC520M<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | WKP25<br>WKP35<br>WKP35S | GM226+<br>GM246<br>GM43+ |
| | P40 | | | | GC4230<br>GC4240<br>GC2040 | | GX2160 | | | MM4500<br>T350M | KCPK30<br>KCPM30 | IC4050<br>IC635 | IN6530 | TT7800 | TN7535 | WKP35<br>WKP35S | GM246<br>GM43+ |
| M | M10 | | | ACM200 | GC2015 | | | JC730U | | | KCPM20 | IC9250<br>IC520M<br>IC9350 | | | TN7525 | | |
| | M20 | **T3225** | F7030 | ACM200 | GC4230 | CA6535 | | JC730U | | MP2500<br>T350M<br>T25M | KCPM20<br>KCPM30<br>KC927M | IC9250<br>IC520M<br>IC9350<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | | CTC5235<br>GM226+ |
| | M30 | **T3225**<br>**T3130** | F7030 | ACM200 | GC2040<br>GC4230<br>GC4240<br>S40T | CA6535 | GX2160 | JC730U | | MP2500<br>T350M<br>T25M | KCPM30<br>KC927M | IC9350<br>IC4050<br>IC635 | IN6530 | TT7800 | TN7525<br>TN7535 | | CTC5235<br>CTC5240<br>GM226+<br>GM246<br>GM43+ |
| | M40 | | | | GC2040<br>GC4240<br>S40T | CA6535 | GX2160 | | | MM4500<br>T350M | | IC635 | IN6530 | | TN7535 | | CTC5235<br>CTC5240<br>GM246<br>GM43+ |
| K | K01 | | MC5020 | ACK200 | | CA420M | | JC605W | | | KC907M | IC8080<br>IC4100<br>IC5100<br>IC9150 | | | TN2510<br>TN5505 | WKP15 | CTC3215 |
| | K10 | **T1215**<br>**T1115** | MC5020 | ACK200 | GC3220 | CA420M | GX2120 | JC605W<br>JC608X<br>JC610 | | MK1500 | KC907M<br>KC914M<br>KC917M<br>KC924M<br>KCK15 | IC8080<br>IC4100<br>IC5100<br>IC9150<br>IC9080<br>IC520M | | TT6800 | TN2510<br>TN5505<br>TN5515<br>TN5520 | WKP15<br>WKP25 | CTC3215<br>SR216<br>SR226+ |
| | K20 | **T1215** | MC5020 | ACK200 | GC3220<br>GC3330<br>GC3040<br>GC4220<br>GC4230 | CA420M | GX2120<br>GX2140 | JC605W<br>JC608X<br>JC610 | | MK1500<br>MP1500 | KC917M<br>KC924M<br>KCK15<br>KCPM20<br>KCPK30<br>KC927M | IC5100<br>IC9150<br>IC9080<br>IC520M<br>IC4050 | IN6515<br>IN6530 | TT6800 | TN5515<br>TN5520 | WKP15<br>WKP25<br>WKP35<br>WKP35S | SR216<br>SR226+ |
| | K30 | | MC5020 | | GC3330<br>GC3040<br>GC4220<br>GC4230<br>GC4240 | | GX2140 | JC610 | | MK1500<br>MP1500 | KCPM20<br>KCPK30<br>KC927M | IC520M<br>IC4050 | IN6515<br>IN6530 | | | WKP25<br>WKP35<br>WKP35S | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●PVD Coated Grade for Milling

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | **AH710**<br>**AH110** | | | GC1010 | | ATH80D<br>JP4105 | JC8003 | | | KC505M<br>KC510M<br>KC515M | IC903 | | TT2510<br>TT5505 | TN2505<br>TN6505 | | |
| | P10 | **AH120**<br>**AH725** | MP6120<br>VP15TF | ACP200 | GC1010<br>GC1025 | PR830<br>PR1225<br>PR1230<br>PR1525 | ATH80D<br>PN08M<br>ATH10E<br>PN15M<br>JP4105<br>JP4115<br>JP4120 | JC8003<br>JC8015<br>JC5015<br>JC5118 | DM4 | | KC505M<br>KC510M<br>KC515M<br>KC610M<br>KC715M | IC903<br>IC907<br>IC950<br>IC908<br>IC910<br>IC380<br>IC900 | IN2505 | TT2510<br>TT5505<br>TT5515<br>TT7080 | TN2505<br>TN2525<br>TN6425<br>TN6505 | WHH15<br>WXM15 | |
| | P20 | **AH120**<br>**AH725**<br>**AH3135**<br>**AH9030** | MP6120<br>VP15TF<br>MP6130<br>UP20M<br>VP20RT | ACP200<br>ACP300 | GC1025<br>GC1030<br>GC2030 | PR830<br>PR1225<br>PR1230<br>PR1525 | JP4120<br>JS4045<br>CY250 | JC8015<br>JC5015<br>JC5118<br>JC5040 | | MP3000<br>F25M | KC522M<br>KC525M<br>KC527M<br>KC530M<br>KC610M<br>KC620M<br>KC635M<br>KC715M<br>KC720M<br>KC730M | IC907<br>IC950<br>IC908<br>IC910<br>IC380<br>IC900<br>IC830<br>IC928<br>IC1008 | IN2040<br>IN2505<br>IN4005<br>IN4030 | TT2510<br>TT5505<br>TT5525<br>TT7080<br>TT9030<br>TT9080 | TN2525<br>TN6425<br>TN6430<br>TN6525 | WHH15<br>WXM15 | CTP1235<br>CTP1625 |
| | P30 | **AH120**<br>**AH725**<br>**AH3135**<br>**AH130**<br>**AH6030** | MP6120<br>VP15TF<br>MP6130<br>UP20M<br>VP20RT<br>VP30RT | ACP200<br>ACP300 | GC1025<br>GC1030<br>GC2030 | PR830<br>PR1225<br>PR1230<br>PR1525 | JS4045<br>CY250<br>JM4160 | JC5118<br>JC5040<br>JC8050<br>JC7560 | | MP3000<br>F25M<br>F30M<br>F40M | KC525M<br>KC527M<br>KC530M<br>KC537M<br>KC610M<br>KC620M<br>KC720M<br>KC725M<br>KC730M<br>KC735M | IC907<br>IC950<br>IC908<br>IC910<br>IC380<br>IC900<br>IC830<br>IC928<br>IC1008 | IN2040<br>IN2505<br>IN2530<br>IN4005<br>IN4030 | TT5525<br>TT7080<br>TT8020<br>TT8080<br>TT9030<br>TT9080 | TN6430<br>TN6525<br>TN6540 | WSP45<br>WSP46 | CTP1235<br>CTP1625<br>CTP2235 |
| | P40 | **AH140** | VP30RT | ACP300 | GC1030<br>GC2030 | | JM4160 | JC5118<br>JC5040<br>JC8050<br>JC7560 | | MP3000<br>F40M<br>T60M | KC537M<br>KC720M<br>KC725M<br>KC735M | IC830<br>IC928<br>IC1008 | IN2040<br>IN2530<br>IN4005<br>IN4030 | TT8020 | TN6540 | WSP45<br>WSP46 | CTP1235<br>CTP2235 |
| M | M01 | | | ACM100<br>ACK300 | GC1010 | | PCS08M | | DM4 | | | IC907<br>IC903 | | | | | |
| | M10 | **AH725** | VP15TF | ACM100<br>ACK300<br>ACP300 | GC1010<br>GC1025<br>GC1030<br>GC2030 | PR830<br>PR1225<br>PR1525<br>PR1535 | PCS08M<br>CY150 | | DM4 | | KC515M<br>KC610M<br>KC635M<br>KC720M | IC907<br>IC903 | IN2505 | TT5525<br>TT9030<br>TT9080 | TN6425<br>TN6525 | WXM15 | |
| | M20 | **AH725**<br>**AH3135**<br>**AH130**<br>**AH6030** | VP15TF<br>MP7130<br>MP7030<br>UP20M<br>VP20RT | ACM300<br>ACP300 | GC1025<br>GC1030<br>GC1040<br>GC2030 | PR830<br>PR1225<br>PR1525<br>PR1535 | CY150<br>CY250 | JC8015<br>JC5015<br>JC5118 | DM4 | MP3000<br>MS2050<br>F25M<br>F30M | KC522M<br>KC525M<br>KC530M<br>KC610M<br>KC635M<br>KC720M<br>KC730M | IC380<br>IC900<br>IC908<br>IC928<br>IC1008 | IN2005<br>IN2505<br>IN2530<br>IN4005 | TT8020<br>TT8080 | TN6425<br>TN6525 | WXM15<br>WSM35<br>WSM36 | CTP1235<br>CTP1625 |
| | M30 | **AH3135**<br>**AH130** | VP15TF<br>MP7130<br>MP7030<br>UP20M<br>VP20RT<br>MP7140<br>VP30RT | ACM300 | GC1040<br>GC2030 | PR830<br>PR1225<br>PR1525<br>PR1535 | CY250<br>JM4160 | JC8015<br>JC5015<br>JC5118<br>JC8050<br>JC7560 | | MP3000<br>MS2050<br>F30M<br>F40M | KC522M<br>KC525M<br>KC530M<br>KC537M<br>KC725M<br>KC730M<br>KC735M | IC380<br>IC900<br>IC908<br>IC928<br>IC1008<br>IC328<br>IC330 | IN2005<br>IN2505<br>IN2530<br>IN4005<br>IN4030 | TT8020<br>TT8080 | TN6540 | WSM35<br>WSM36<br>WSP45<br>WSP46 | CTP1235<br>CTP2235 |
| | M40 | **AH140** | MP7140<br>VP30RT | ACM300 | GC1040 | PR1225<br>PR1525<br>PR1535 | JM4160 | JC5015<br>JC5118<br>JC8050<br>JC7560 | | MS2050<br>F40M | KC725M | IC1008<br>IC328<br>IC330 | IN2005<br>IN2530<br>IN4005<br>IN4030 | TT8020 | TN6540 | WSM35<br>WSM36<br>WSP45<br>WSP46 | CTP2235 |
| K | K01 | **AH110** | MP8010 | | GC1010 | PR1510 | ATH80D<br>JP4105 | JC8003 | | | | IC380<br>IC900 | | TT6080 | TN2505<br>TN6405<br>TN6505 | | AMZ |
| | K10 | **AH110**<br>**AH120** | MP8010<br>VP15TF | | GC1010<br>GC1020 | PR1210<br>PR1510 | ATH80D<br>JP4105<br>JP4120<br>CY150 | JC8015 | | MK2050 | KC514M<br>KC515M<br>KC520M<br>KC620M | IC380<br>IC900<br>IC810<br>IC910 | IN2015<br>IN2505<br>IN4015 | TT6080 | TN2505<br>TN6405<br>TN6505<br>TN6510 | WHH15<br>WXM15<br>WKK25 | AMZ<br>CTP3220<br>CTP6215 |
| | K20 | **AH120**<br>**AH9030** | MP8010<br>VP15TF<br>VP20RT | ACK300 | GC1020 | PR1210<br>PR1510 | JP4120<br>CY150<br>CY250 | JC8015<br>JC5015 | | MK2050 | KC514M<br>KC520M<br>KC522M<br>KC524M<br>KC527M<br>KC610M<br>KC620M<br>KC635M | IC810<br>IC910<br>IC950<br>IC350<br>IC830<br>IC928 | IN2015<br>IN2505<br>IN4015<br>IN4030 | | TN2525<br>TN6510<br>TN6520<br>TN6525 | WHH15<br>WXM15<br>WKK25 | CTP3220<br>CTP1625 |
| | K30 | **AH120** | VP15TF<br>VP20RT | ACK300 | | PR1510 | CY250 | JC8015<br>JC5015 | | MK2050 | KC522M<br>KC524M<br>KC527M<br>KC537M<br>KC610M<br>KC620M<br>KC635M | IC830<br>IC928<br>IC1008<br>IC808<br>IC908 | IN2015<br>IN2505<br>IN4015<br>IN4030 | | TN6430<br>TN6525<br>TN6540 | WKK25 | |

## ●PVD Coated Grade for Milling

| ISO | | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classifi-cation | Symbol | | | | | | | | | | | | | | | | |
| N | N01 | | | | | | | | | | KC410M<br>KC510M<br>KC5410 | | | TT6080 | TN6501 | | AMZ |
| | N10 | **DS1100** | | DL1000 | GC1025<br>GC1030 | | SD5010<br>HD7010 | | | | KC410M<br>KC510M<br>KC5410<br>KC620M | | | TT6080<br>TT8020 | TN6501<br>TN6502 | WXN15 | AMZ |
| | N20 | **DS1200** | LC15TF | DL1000 | GC1025<br>GC1030 | | SD5010<br>HD7010 | | | F15M | KC422M<br>KC620M | | | TT8020 | | WXN15 | |
| S | S01 | **AH110**<br>**AH710** | | ACM100<br>ACK300 | GC1010 | PR905<br>PR1210<br>PR1535 | | JC8003<br>JC8015 | | | KC510M | IC808<br>IC907<br>IC908 | | | TN6405 | | AMZ |
| | S10 | **AH120**<br>**AH725** | MP9120<br>VP15TF<br>MP9130<br>MP9030 | ACM100<br>ACK300 | S30T<br>GC1010<br>GC1030<br>GC2030 | PR905<br>PR1210<br>PR1535 | PTH13S<br>JS1025 | JC8003<br>JC8015<br>JC5015<br>JC5118 | | MS2050 | KC510M<br>KC610M | IC808<br>IC907<br>IC908<br>IC903 | IN2505<br>IN2530 | TT9030<br>TT9080<br>TT8080 | TN6405<br>TN6425 | | AMZ<br>CTP1625 |
| | S20 | **AH725**<br>**AH130**<br>**AH6030** | MP9120<br>VP15TF<br>MP9130<br>MP9030 | ACM300 | S30T<br>GC1030<br>GC1040<br>GC2030<br>GC2040 | PR905<br>PR1210<br>PR1535 | PTH13S<br>JS1025 | JC8015<br>JC5015<br>JC5118<br>JC8050<br>JC7560 | | MS2050<br>F40M | KC522M<br>KC525M<br>KC610M | IC300<br>IC900<br>IC830<br>IC928 | IN2505<br>IN2530 | TT8080<br>TT8020 | TN6425 | WSM35<br>WSM36 | CTP1235<br>CTP1625 |
| | S30 | **AH130** | MP9130<br>MP9030 | ACM300 | S30T<br>GC1040<br>GC2040 | PR1535 | | JC5118<br>JC8050<br>JC7560 | | MS2050<br>F40M | KC522M<br>KC525M<br>KC725M | IC830<br>IC928 | IN2530 | TT8020 | TN6540 | WSM35<br>WSM36<br>WSP45<br>WSP46 | CTP1235<br>CTP2235 |
| H | H01 | **AH110** | MP8010 | | GC1010 | | | DH102<br>JC6102<br>JC8003<br>JC8008 | | | KC510M | IC903 | | TT2510<br>TT5505 | TN2505 | | |
| | H10 | **AH110**<br>**AH120** | MP8010<br>VP15TF | | GC1010<br>GC1025<br>GC1030 | | PTH08M<br>JP4105 | JC6102<br>JC8003<br>JC8008<br>JC8015<br>JC5118 | | MH1000<br>F15M | KC505M<br>KC510M<br>KC635M | IC903<br>IC808<br>IC907<br>IC908 | | TT5515<br>TT6080 | TN2505<br>TN2525 | WHH15 | CTP6215 |
| | H20 | **AH120**<br>**AH725**<br>**AH9030** | VP15TF | | GC1025<br>GC1030 | | JP4105 | JC8015<br>JC5118 | | F15M | KC635M | IC808<br>IC907<br>IC908<br>IC380<br>IC900 | | TT5515<br>TT6080 | TN2525 | WHH15 | CTP6215 |
| | H30 | | | | | | | | | MP3000<br>F30M | | IC380<br>IC900<br>IC1008 | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●Cermet for Milling

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | | | T250A | CT530 | TN60<br>TN100M | MZ1000 | | | | | | IN0560 | CT3000 | | | TCC410 |
| | P10 | **NS740** | NX2525 | T250A | CT530 | TN60<br>TN100M<br>TC60M | MZ1000<br>MZ2000<br>CH550 | NIT<br>CX75<br>CX90 | | MP1020 | KTPK20 | IC30N | IN0560<br>IN60C | CT3000<br>CT7000 | TTI25 | | TCC410<br>TCM10 |
| | P20 | **NS740** | NX2525<br>NX4545 | T250A<br>T4500A | | TN60<br>TN100M<br>TC60M | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75<br>CX90<br>SC30 | | MP1020 | KTPK20 | IC30N | IN60C | CT3000<br>CT7000 | TTI25 | | TCM10 |
| | P30 | | NX4545 | T4500A | | | MZ3000<br>CH7035 | | C7X | | | IC30N | IN0545 | CT7000 | | | |
| M | M10 | **NS740** | NX2525 | T250A | CT530 | TN60<br>TN100M<br>TC60M | MZ1000<br>CH550 | NIT<br>CX75 | | | KTPK20 | IC30N | IN0560 | CT3000<br>CT7000 | TTI25 | | TCC410 |
| | M20 | **NS740** | NX2525<br>NX4545 | T250A<br>T4500A | | TN60<br>TN100M<br>TC60M | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75<br>SC30 | C7X | MP1020 | KTPK20 | IC30N | | CT7000 | TTI25 | | TCC410<br>TCM10 |
| | M30 | | NX4545 | T4500A | | | MZ3000<br>CH7035 | SC30 | | | | | | | | | |
| K | K01 | | | | | | MZ1000<br>CH550 | NIT | | | | | | | | | TCC410 |
| | K10 | **NS740** | NX2525 | | | | MZ2000<br>MZ3000<br>CH500<br>CH7030 | NIT<br>CX75 | | | KTPK20 | | | CT7000 | | | TCC410<br>TCM10 |
| | K20 | | | | | | MZ2000<br>MZ3000<br>CH500<br>CH7030<br>CH7035 | CX75 | | | KTPK20 | | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Grade Comparison Chart

### ●Cemented Carbide for Milling

| ISO Classification | ISO Symbol | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Sandvik | Kyocera | Mitsubishi Hitachi Tool | Dijet | NTK | Seco Tools | Kennametal | Iscar | Ingersoll | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P01 | | | | | | | | | | | | | | | | |
| | P10 | | | | | | | | | | | | | | | | S26T |
| | P20 | | UTi20T | A30N | | | EX35 | | | | K125M | IC50M | | P30 | TTM | | S26T |
| | P30 | **UX30** | UTi20T | A30N | SM30 | | EX40 | | | | K125M | IC50M<br>IC28 | | P30 | TTM<br>TTR | | S26T |
| | P40 | | | | SM30 | | | | | | | IC28 | | | TTR | | |
| M | M01 | | | | | | | | | | | | | | | | |
| | M10 | | | | | | | | | | | IC20<br>IC07<br>IC08 | | | | | S26T |
| | M20 | | UTi20T | | SM30 | | | | | | | IC07<br>IC08 | | | TTM | | S26T |
| | M30 | | UTi20T | A30N | SM30 | | | | | | | IC28 | | | TTM<br>TTR | | S26T |
| | M40 | | | A30N | | | | | | | | IC28 | | | TTR | | |
| K | K01 | | | | | KW10 | | | | | K115M<br>K313 | | | K10 | THM-F | | |
| | K10 | **TH10** | HTi10 | G10E | H13A | KW10<br>GW25 | WH10 | | | | K115M<br>K313<br>K110M | IC20 | | K10 | THM-F<br>THM | | CTW4615<br>H216T |
| | K20 | | HTi10<br>UTi20T | G10E | H13A | KW10<br>GW25 | | | | HX | KMF | IC20 | IN10K | | THM<br>THR | | CTW4615<br>H216T |
| | K30 | | UTi20T | | | | | | | | KMF | | IN10K | | THR | | |
| | K40 | | | | | | | | | | | | IN10K | | | | |
| N | N01 | **KS05F** | HTi10 | | H10 | KW10 | | | | | K115M | | | | THM-U | WK10 | |
| | N10 | **TH10** | HTi10 | | H10<br>H13A<br>H10F | KW10<br>GW25 | WH10 | | | H15 | K115M<br>K313<br>K110M | IC20<br>IC08 | | K10<br>UF10 | THM-U<br>THM-F<br>THR-S | WK10 | CTW4615<br>H216T |
| | N20 | **KS15F** | HTi10<br>TF15 | H1 | H13A<br>H10F | KW10<br>GW25 | | | | HX<br>H15<br>H25 | KMF<br>K313<br>K110M | IC20<br>IC08<br>IC28 | | K10<br>UF10 | THM-F<br>THR-S<br>THM | WMG40 | CTW4615<br>H216T |
| | N30 | | TF15 | H1 | | | | | | H25 | KMF | IC28 | | | | WMG40 | |
| S | S01 | | | | | KW10 | | | | | K313 | IC20 | | | | | |
| | S10 | | | EH520 | H13A | KW10<br>GW25 | | FZ15 | | | K313<br>K110M | IC20<br>IC07<br>IC08 | | | THM-F | | |
| | S20 | **KS20** | | EH520 | H10F<br>H13A | KW10<br>GW25 | | FZ15 | | HX<br>H25 | KMF | IC20<br>IC07<br>IC08<br>IC28 | | | THM | | |
| | S30 | | | | H10F | | | | | | | IC07<br>IC08 | | | | | |
| H | H01 | | | | H1P | | | FZ05 | | | | | | | | | |
| | H10 | | | | H1P | | | FZ05<br>FZ15 | | | | IC20 | | | THM-F | | |
| | H20 | | | | | | | FZ15 | | | | | | | | | |

Note: The above table is selected from a publication. We have not obtained approval from each company.

# User's Guide- Technical Reference

## Chipbreaker Comparison Chart

### ●Negative insert type

| ISO Classification | Cutting Mode | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Kyocera | Sandvik | Mitsubishi Hitachi Tool | Kennametal | Dijet | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | **01**<br>**TF** | PK<br>FH | FA | DP | QF | FE | FS , LF | PF | SF , PP , TF | FA | | | |
| | Finishing and light cutting | **TS , TSF**<br>**ZF**<br>**11 , NS**<br>**AS**<br>**TQ**<br>**NM**<br>**CB**<br>**C** | SA<br>FY<br>C<br>SH<br>MP | SU<br>FL<br>SE , SX | PQ , VF<br>CJ<br>PQ<br>GP , PP<br>HQ<br>GS<br>CQ | PF , QF<br>LC<br>MF<br>R/L-K | BE , BH<br>AB , CT<br>CE | FF , FN | UA , FT<br>UR , UT | F3P<br>NF , SF | FG<br>VF , EA<br>FC<br>MC<br>ML , MP | 4<br>AP | NF3<br>NS6 | CF , TF |
| | Finishing and light cutting (With Wiper) | **AFW , FW**<br>**ASW , SW** | SW | LUW<br>SEW<br>GUW | WP<br>WQ | WL , WF<br>WMX<br>WM , WR | | FW<br>MW<br>RW | | WF<br>WG | WS<br>WT | FW<br>MW | NF<br>NM | TFQ<br>TMQ |
| | Medium cutting | **TM , AM**<br>**DM , ZM**<br>**All-round** | MA<br>MH , MP | GU<br>GE , UX | HS , PT , GT<br>CS , PS | PM , QM<br>XM , XRM | AH<br>AE , AY , B | P<br>MN | PG , UB<br>GN<br>GNP | M3P , M3M<br>PP , TF , GN | PC , MT<br>MC , MG- | 48 | NMT , NM4 | TMF , TMM<br>M50 |
| | Medium to heavy cutting | **TH**<br>**THS** | RP , GH<br>HZ , HL | MU , ME<br>HG | PH<br>All-round | HM , PR<br>MR | RE | RN , RP<br>MR | GG , UD | NR<br>MR | RT | 49 | NM5 , NM6<br>NM9 | TM<br>TRM |
| | Heavy cutting | **TU**<br>**TRS**<br>**TUS** | HM , HX<br>HV | HG , HP<br>HU , HW<br>HF | PX | PR , MR<br>HR , QR | TE , UE<br>HX , HE<br>H | RM<br>RH | UC | R3P<br>NM | HT , HD<br>RX , RH<br>HY , HZ | | NR6<br>NRF<br>NRR | TRR , TR<br>R28 , R58<br>R88 |
| M | Finishing and light cutting | **SF , SA**<br>**SS** | GM , MS<br>SH , LM | EX , EG<br>SU , EF | GU<br>MQ | MF , XF<br>LC , R/L-K | MP<br>BH , AB | FP | SF | TF , VL | EA , SF , SU<br>FG | | NF4<br>NMS | CF , F30 , M34<br>F32 , TF |
| | Medium cutting | **SM**<br>**S** | MM , MA<br>ES | GU<br>HM | TK<br>MU | MM , QM<br>XM , XRM | PV , SE<br>DE | MP , P | SZ | M3M , PP | EM , ET | | NM4 | TMF , M42<br>M30 , M52 |
| | Heavy cutting | **TH , SH**<br>**TU** | GH , RM , HZ | EM , MU | MS | MR<br>HM , PR | AH , AE | UP , RP | SG | MR , MH | | SR | NR4<br>NRT , NRS | TM , M60<br>TRM , TMR , TRR<br>R80 |
| K | Finishing | **CF** | LK, MA | UZ | C | KF , XF | Y , AH | FN | | GN | FG | | | CF |
| | Medium cutting | **CM**<br>**All-round** | MK<br>GK | GZ | ZS<br>All-round | KM , QM<br>XM , XRM | V, AE<br>VA | RP , UN | PG | | MT<br>MG | | NM5 | M50 |
| | Heavy cutting | **CH**<br>**Without chipbreaker** | RK<br>Without chipbreaker | Without chipbreaker | GC<br>Without chipbreaker | KR<br>Without chipbreaker | RE<br>Without chipbreaker | Without chipbreaker | GG , UD<br>Without chipbreaker | | RT | | Without chipbreaker | TMR , TR<br>R28<br>R58 , R88 |
| N | Cutting of non-ferrous metals | **P** | | AX | AH , A3 | MF<br>QM | Without chipbreaker | MS , MP<br>MG | | PP | ML | | | F32 |
| S | Finishing | **HRF** | FJ , LS | EF<br>EX | MQ | SF<br>01 | | FS , LS<br>MS | | | SF | | NFT<br>NF4 | |
| | Medium cutting | **HRM**<br>**HMM**<br>**SA** | MS<br>RS , GJ | EG<br>MU | TK , MS , MU | MM , QM<br>SMR | | UP , P , NGP<br>RP | | PP | SU | SM | NMS<br>NM4 , NRS , NR4 | M34 , M52 |

Note: Above charts are based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Chipbreaker Comparison Chart

### ●Positive insert type

| ISO Classification | Cutting Mode | Tungaloy | Mitsubishi Carbide | Sumitomo Electric | Kyocera | Sandvik | Mitsubishi Hitachi Tool | Kennametal | Dijet | Iscar | TaeguTec | Widia | Walter | Ceratizit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Precision finishing | 01 | FV , SMG | FC , FW | CF<br>CK | | No sign<br>MP | UF | | SF | | 2 | PF2 | F32 |
| | Finishing and light cutting | PSF , PF , SS<br>PS , PSS , TS<br><br>TSW<br>W08~20 | FP , FV , SV<br>LP<br><br>SW , MW<br>R/L , R/L-FD<br>R/L-FS<br>R/L-MV<br><br>R/L-F , R/L-L | FP , FZ , LU<br>FK , SS , SC<br>SU , SK , SF<br>US<br>LUW , SDW<br>W , SD<br>FX , FY | GQ , GK<br>GP , HQ<br>XP , XQ | R/L-K<br>PF , XF<br>UF , PM<br><br>WF , WK , WM | JQ | 11 , GM<br>LF | FT | PF<br>SM , 14 , 17<br>19 , XL<br><br>R/L<br>RF , LF<br><br>No sign | FA<br>FG<br><br>GF | 41 | PF5<br>PF4<br>PS5<br><br>PF , PM | SF<br>SMF<br><br>SMQ , 25Q |
| | Medium cutting | PM<br><br>23<br>24<br><br>All-round<br>RS | MP<br><br>MV<br>No sign | SU , MU<br><br>UJ<br>SC<br>(except for G-class inserts)<br><br>RP | All-round<br><br>VF , MF | PM , XM<br>UM , PR , XR<br>UR | JE | GM , MP , MR | <br><br><br><br><br><br>GG | DT , HQ | MT<br><br><br><br><br><br>MT | <br><br><br><br><br><br>43 | PM5 | SM |
| | High-feed, small depth of cut cutting | 61 | No sign | | | No mark | WE | | | No sign<br>14 | No sign | No sign | | |
| M | Finishing | PSF , SS | FM , FV , SV | FC | | R/L-K<br>UF , MF | MP | GM , LF | | | FG | 41 | | |
| | Finishing to Medium cutting | PSS<br>PS | LM<br>SV | | MQ | MM , XM<br>UM | JQ | MF | | | | | PF4 | SF , SMF |
| | Medium cutting | PM | MM , MV | MU | | MR , XR<br>UR | JE | | | | | | PM5 | F23 , F43<br>SM |
| K | Cutting of cast irons | CM<br>Flat-top | MK<br>Flat-top | Flat-top | Flat-top | KF , XF<br>KM , XM<br>UM , KR , XR | JQ , JE | Flat-top | Flat-top | 19 | MT<br>Flat-top | | PS5 , PM5<br>Flat-top | SF<br>25P<br>27 , 29 |
| N | Cutting of non-ferrous metals | AL<br>PP<br><br>Ground | AZ<br><br><br>R/L-F<br>R/L | AG<br>AX , AY | AH , A3 | AL | | GT-HP | | AS | FL | AL1,<br>AL2 , AL3 | PF2<br>PM2 | 23P<br>25P<br>27 , 29 |
| S | Finishing | PSF | FJ | FC | MQ | MF , UF , R/L-K | | | | | | | | SF |
| | Finishing to Medium cutting | PSS<br>PS | | FX , FY | | MM , XM | | | | | | | | F23 |
| | Medium cutting | All-round | | SI | | UM , MR , UR , XR | | | | | FG | | PF2 , PF4 | SM , 25P , 29 |
| P<br>M<br>N<br>S | Turning on small lathes | 01<br>W08 , W15 , W20<br>J10<br><br>JRP , JSP , JPP<br>TS , JTS<br>TSW<br>SS , JSS<br><br>JS | R/L-SR<br>R/L-SN<br>R/L-SS<br>FS , F<br><br><br><br>SW , MW<br><br><br>SMG | W , SD<br><br><br>FX , FY<br><br><br><br>LUW , SDW<br><br>LU , FP , FK , SU<br>FB , LB<br>FC , SI , SC | R/L-F , R/L-FSF<br>ER/L-U<br>FR/L-U<br>R/L-U<br>FR/L-U , R/L-USF<br><br>MF , R/L-FSF<br><br><br><br><br>GK<br>E-GK | F , M | No sign | | MF , MM<br><br>ALU , MM1<br><br>ASF<br>FT , ACB | | GF , GW | | PM5 | |

Note: Above charts are based on published data and not authorized by each manufacturer.

# User's Guide- Technical Reference

## Unified symbols for cutting conditions and tool dimensions

Standardized symbols for cutting conditions and tool specifications are used in order to avoid confusion caused by each manufacturer's using its own symbols.

### (Quantity symbols of cutting conditions ) Symbol / Unit

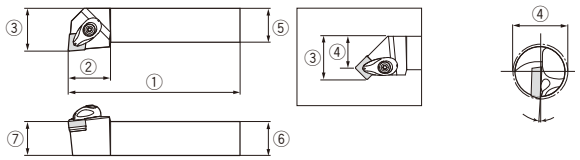
| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Turning | Cutting speed | | Feed | | Depth of cut | | Cutting edge width | | Min. bore diameter | |
| | *Vc* | m/min | *f* | mm/rev | *ap* | mm | *W* | mm | *øDm* | mm |
| | Power consumption | | Specific cutting force | | Theoretical surface roughness | | Corner radius | | Number of revolutions | |
| | *Pc* | kW | *kc* | MPa | *h* | μm | *rε* | mm | *n* | $min^{-1}$ |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Milling | Cutting speed | | Feed speed | | Feed per tooth | | Feed | | Number of teeth | |
| | *Vc* | m/min | *Vf* | mm/min | *fz* | mm/t | *f* | mm/rev | z | |
| | Axial depth of cut | | Radial depth of cut | | Pick feed | | Power consumption | | Specific cutting force | |
| | *ap* | mm | *ae* | mm | *Pf* | mm | *Pc* | kW | *kc* | MPa |
| | Chip removal rate | | Number of revolutions | | | | | | | |
| | *Q* | $cm^3$/min | *n* | $min^{-1}$ | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Drilling | Cutting speed | | Feed speed | | Feed | | Tool diameter | | Power consumption | |
| | *Vc* | m/min | *Vf* | mm/min | *f* | mm/rev | *øDc* | mm | *Pc* | kW |
| | Torque | | Thrust force | | Specific cutting force | | Drilling depth | | Number of revolutions | |
| | *Mc* | N·m | *Tc* | N | *Kc* | MPa | *H* | mm | *n* | $min^{-1}$ |

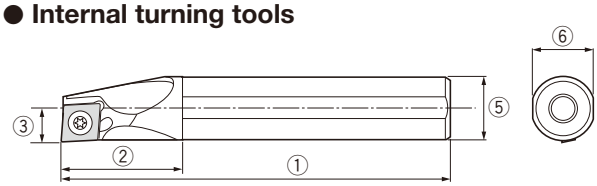
## Dimensional symbols of turning tools

### ● External turning tools



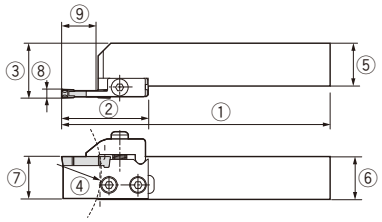
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Distance to cutting edge | Shank width | Shank height | Cutting edge height |
| $L_1$ | $L_2$ | *f* | $f_1$ | *b* | *h* | $h_1$ |

### ● Internal turning tools



| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Minimum bore diameter | Shank diameter | Shank height |
| $L_1$ | $L_2$ | *f* | *øDm* | *øDs* | *h* |

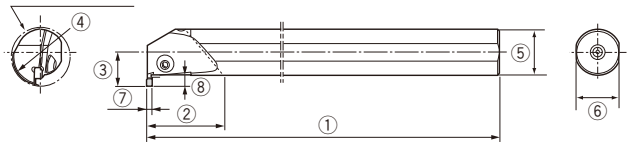
### ● External and face grooving tools



| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter | Shank width |
| $L_1$ | $L_2$ | *f* | *øDm* | *b* |
| ⑥ | ⑦ | ⑧ | ⑨ | |
| Shank height | Cutting edge height | Cutting edge width | Maximum grooving depth | |
| *h* | $h_1$ | *w* | *ar* | |

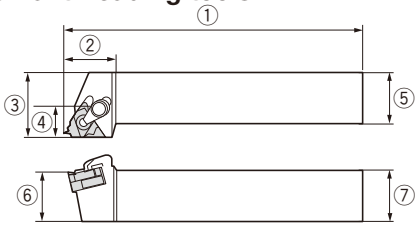
### ● Internal grooving tools

Min. bore diameter *øDm*



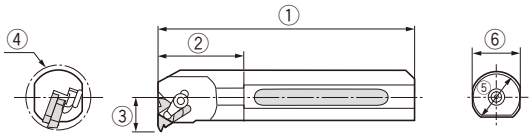
| ① | ② | ③ | ④ |
|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter |
| $L_1$ | $L_2$ | *f* | *øDm* |
| ⑤ | ⑥ | ⑦ | ⑧ |
| Shank diameter | Shank height | Cutting edge width | Maximum grooving depth |
| *øDs* | *h* | *w* | *ar* |

### ● External threading tools



| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
|---|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Shoulder width | Shank width | Shank height | Cutting edge height |
| $L_1$ | $L_2$ | *f* | - | *b* | *h* | $h_1$ |

### ● Internal threading tools



| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Head length | Distance to cutting edge | Maximum grooving diameter | Shank diameter | Shank height |
| $L_1$ | $L_2$ | *f* | *øDm* | *øDs* | *h* |

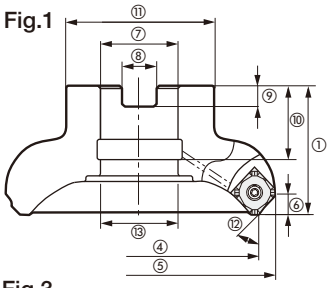
# User's Guide- Technical Reference

## Dimensional symbols of milling tools

### ● Bore type milling tools

Square shoulder cutter

Fig.1



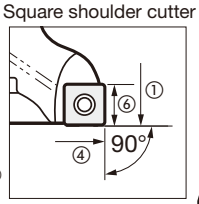



Fig.2

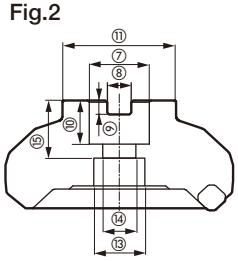


Fig.3

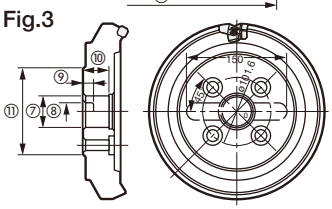
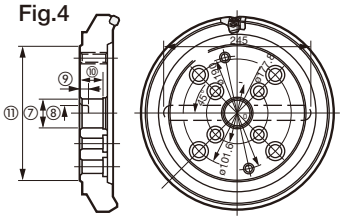
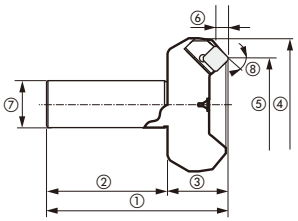


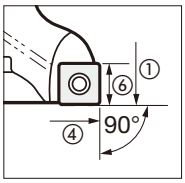
Fig.4



### ● Shank type milling tools

Square shoulder cutter



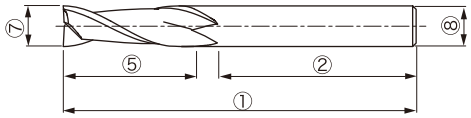



| ① | ② | ③ | ④ |
|---|---|---|---|
| Overall length | Shank length | Cutter height | Cutter diameter |
| $L$ | $\ell_s$ | $L_f$ | $\varnothing D_c$ |
| ⑤ | ⑥ | ⑦ | ⑧ |
| Maximum outer diameter | Maximum depth of cut | Shank diameter | Corner angle |
| $\varnothing D_1$ | ap | $\varnothing D_s$ | $\kappa$ |

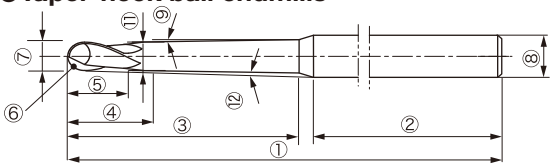
| ① | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cutter height | Cutter diameter | Maximum outer diameter | Maximum depth of cut | Hole diameter | Keyway width | Keyway depth | Mounting hole depth | Mounting flat diameter | Corner angle | Mounting bolt counter bore dia. | Mounting bolt hole diameter | Mounting bolt hole depth |
| $L_f$ | $\varnothing D_c$ | $\varnothing D_1$ | ap | $d$ | $a$ | $b$ | $\ell$ | $\varnothing D_b$ | $\kappa$ | $\varnothing d_1$ | $\varnothing d_2$ | $\ell_1$ |

## Dimensional symbols of endmills

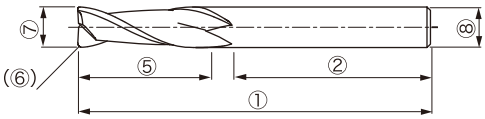
### ● Square endmills



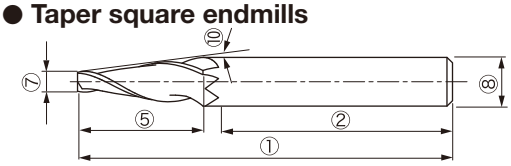
### ●Taper-neck ball endmills



### ● Radius endmills

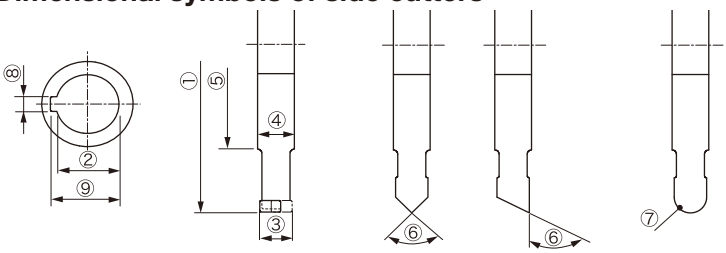


### ● Taper square endmills



| ① | ② | ③ | ④ | ⑤ | ⑥ Ball end | ⑥ Radius end | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall length | Shank length | Neck length | Length of parallel portion | Cutting edge length | Ball radius | Corner radius | Tool diameter | Shank diameter | Half angle of neck taper | Half angle of cutting edge taper | Neck diameter | Inter-ference angle | Helix angle |
| $L$ | $\ell_s$ | $\ell_2$ | $\ell_1$ | $\ell$ | $R$ | $r$ | $\varnothing D_c$ | $\varnothing D_s$ | $\theta_n$ | $\theta_c$ | $\varnothing D_1$ | $\theta\kappa$ | $\lambda$ |

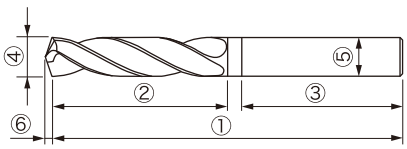
## Dimensional symbols of side cutters



| ① | ② | ③ | ④ | ⑤ |
|---|---|---|---|---|
| Cutter diameter | Bore diameter | Cutting edge width | Boss thickness | Boss diameter |
| $\varnothing D_c$ | $\varnothing d$ | $\ell$ | $T$ | $\varnothing D_b$ |
| ⑥ | ⑦ | ⑧ | ⑨ | ⑩ |
| Cutting edge angle | Corner radius | Keyway width | Keyway depth | Number of teeth |
| $\alpha$ | $R$ | $a$ | $b$ | $z$ |

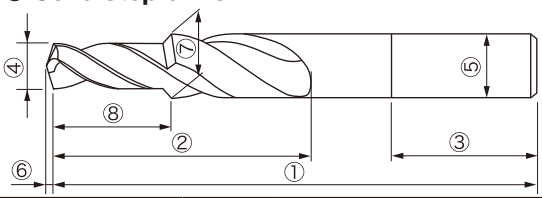
## Dimensional symbols of drills

### ● Solid straight drills



| ① | ② | ③ | ④ | ⑤ | ⑥ |
|---|---|---|---|---|---|
| Overall length | Flute length | Shank length | Drill diameter | Shank diameter | Point length |
| $L$ | $\ell$ | $\ell_s$ | $\varnothing D_c$ | $\varnothing D_s$ | $L_p$ |

### ● Solid step drills



| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
|---|---|---|---|---|---|---|---|
| Overall length | Flute length | Shank length | First step drill diameter | Shank diameter | Point length | Second step drill diameter | Step length |
| $L$ | $\ell$ | $\ell_s$ | $\varnothing D_c$ | $\varnothing D_s$ | $L_p$ | $\varnothing D_{c2}$ | $\ell_1$ |

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