



# BECKER

## PCD / CBN Inserts & Tooling



**Rani Tool Corp.**

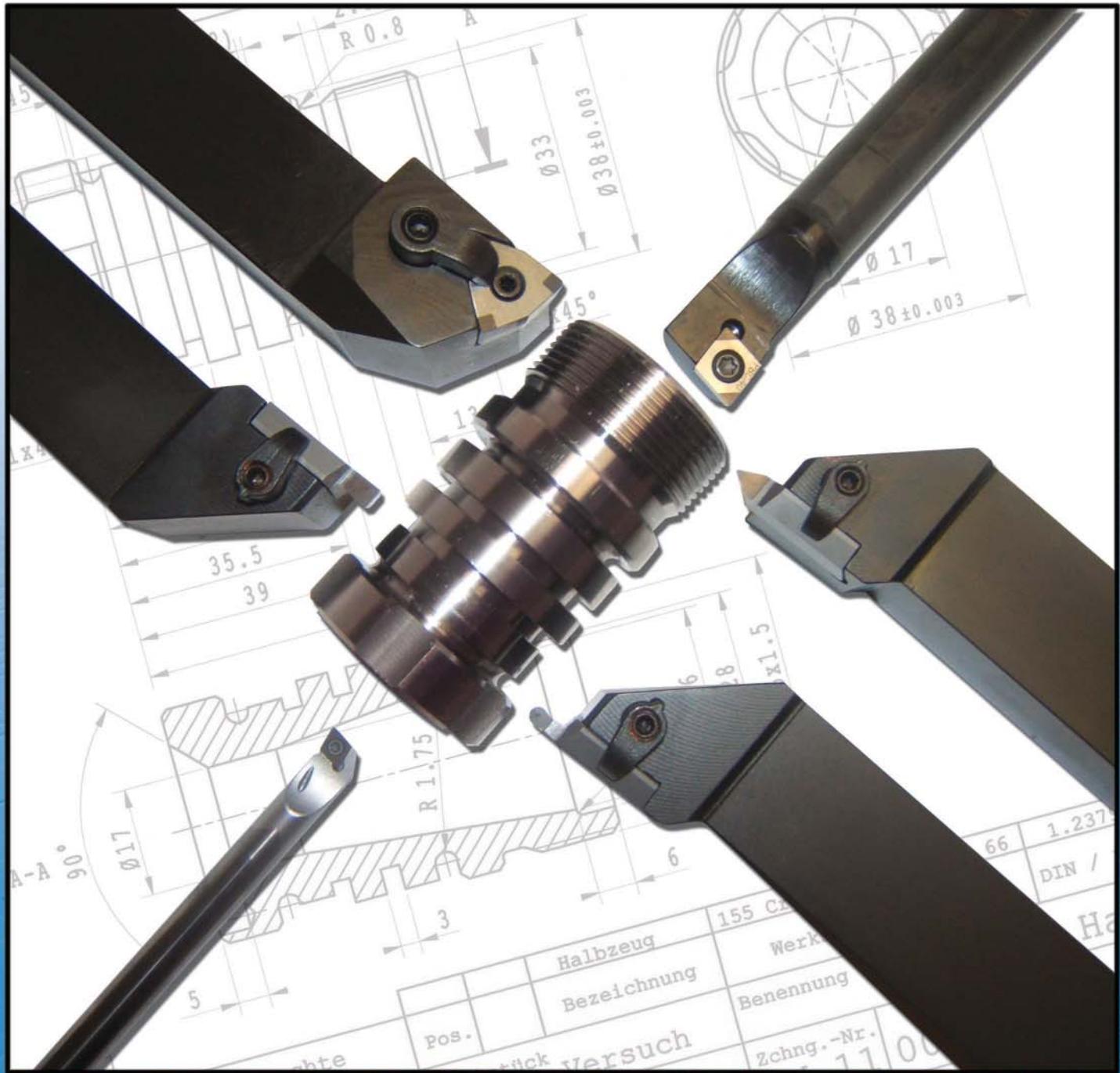
# Test Sample

Workpiece Material: D2

Workpiece Hardness:  $62 \pm 2$  HRc

Workpiece Tolerance:  $\pm .0008"$

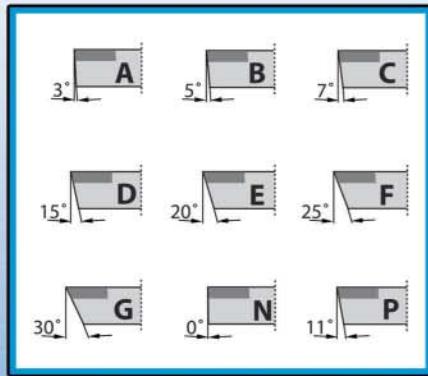
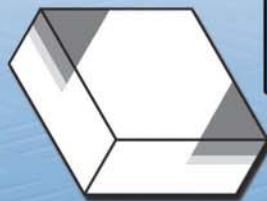
Surface Finish Tolerance: Ra 16  $\mu\text{m}$



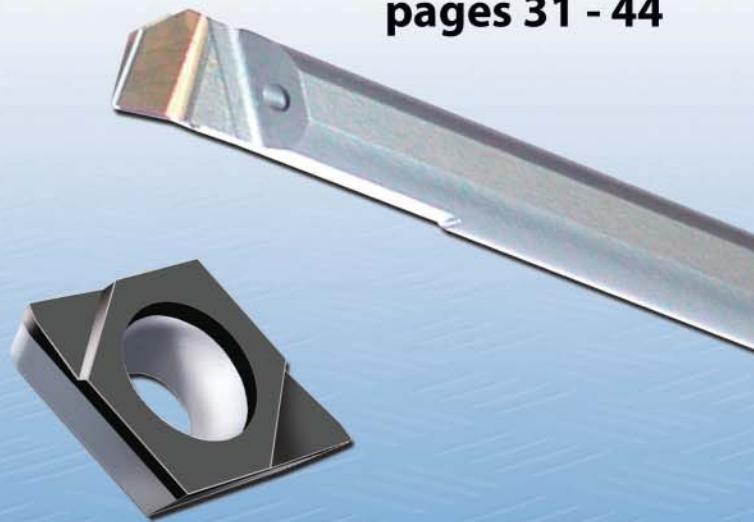
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**BECKER Diamond of Germany!**

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# Technical Info. - Index

**Welcome to the vast product offering from Becker Diamond of Germany.** To achieve optimum application success, closely follow the enclosed selection checklists. Maximum machining performance with Becker products is achieved through a calculated selection of required cutting materials, and proper macro-cutting edge geometries. Please be advised that machining with Becker tools will be significantly different from what you have become accustomed to with normal carbide tooling. Due to the physical properties of the Becker cutting materials, and the range of micro-cutting edge geometries, it is important that you completely rethink your machining approach when determining selection criteria.

When selecting the Becker grades from our comprehensive range, a complex performance profile of the machining result is required. Due to the different variations of tipped corner styles, macro and micro cutting edge geometries, careful pre-planning is required to ensure that the best tool is selected for the given application.

The overall machining system should also be reconsidered in order to achieve full performance from the Becker product. Use the most rigid and accurate tooling systems available. Machinery and equipment should be compatible with the machining tasks. Particular attention must be paid to the general rigidity, the slideways, spindles and work-holding systems. When all working parameters are optimized, you can achieve surface finishes in a nanometer range as a standard using Monocrystalline Diamond for non ferrous metals and with PCBN for hard cutting of hardened steel.

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# Using our Ultrahard Cutting Materials - Selection Criteria

## Check List for Determining the Cutting Materials Grades (i.e. Hard- Cutting)

- 1.) Determine the material group as per DIN ISO 513 ..... page 4
- 2.) Determine the range of application for your material group as per DIN ISO 513 ..... page 6
- 3.) Then determine the cutting data for your area of application based on the surface quality required, and machining application ..... page 18-28
- 4.) Check your selection of cutting material based on the grade description ..... page 16-17
- 5.) Determine the correct insert type including tipped corner style ..... page 8-9
- 6.) Based on nose radius and finish requirements, determine feed rate ..... page 15

**Example:** Turning case-hardened steel HRc 62 ap=0.01", continuous cut in stable circumstances, a surface quality of Ra=24μ" must be achieved (At Ra=24μ" the overall machining environment must be checked for suitability)

### 1st Step

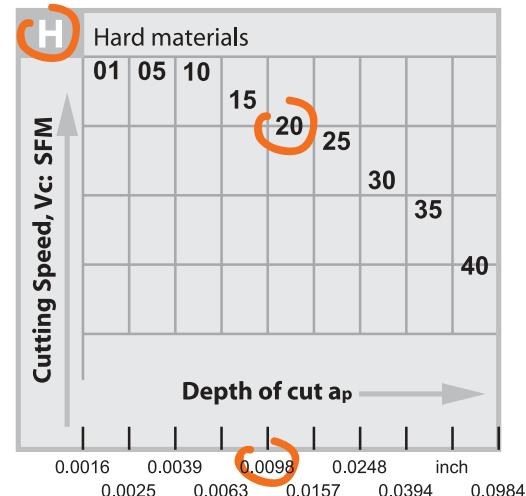
Material group H

Identification letter & colour	Main Materials	Range of applica
H	<b>Hard Materials:</b> Carburized or fully hardened steels from 48 to 65 HRc HSS, tool steel, cold and hot work steel, spring steel, ball-bearing steel, chilled cast iron, chilled cast iron rolls, chilled cast iron alloys, hardfacing alloys sintered carbide	H01 - H05 - H10 - H15 - H20 - H35 - H40

Choose material spec. and hardness on page 4

### 2nd Step

Range of application H-20



Based on depth of cut, choose your range of application on page 6

### 3rd Step

Cutting material: SB40 (T) at Vc=358-520 SFM ap=.01"

Materials	Conditions of chip removal	Range of application H01 - H40					
		H01 - H15			H05- H20		
		Ra μin		Ra μin		Ra μin	
<b>H</b> Hard materials hardened steel HRc 48-54 hard turning	Turning	8-32	32-63	63-126	8-32	32-63	63-126
				PBC-25 (F)			PB
	unstable (varied depth)			520-715			4
	continuous	SB40 (T)	PBC-17 (T)	PBC-25 (F)	SB40 (T)	PBC-17 (T)	PB
		390-520	423-585	520-715	358-520	423-553	4
	heavily + slightly interrupted	PBC-20 (T)	PBC-17 (T)	PBC-25 (T)	PBC-20 (T)	PBC-17 (T)	PB
		390-520	488-618	423-585	358-488	455-585	3

With application range and finish in mind, choose grade and specs. range on page 23

Theoretical Surface Roughness	Corner Radius					
	Feed Rate (f=inch/rev)					
Ra μin	Rt μin	r = .008	r = .016	r = .031	r = .047	r = .063
24	100	.002	.003	.004	.005	.006
63	250	.003	.004	.006	.007	.009
125	500	.005	.007	.009	.011	.014
250	1000	.006	.009	.012	.015	.018

With corner radius in mind, choose feed rate required on page 15

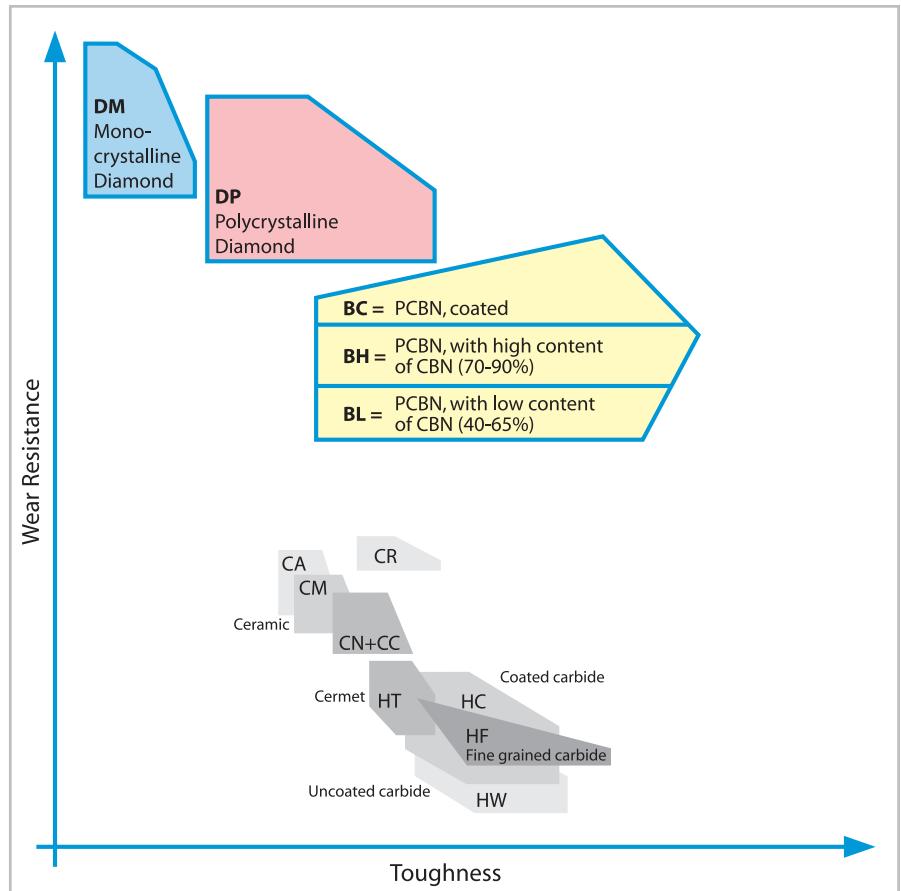
\* Please note that these recommendations are guidelines based on rigid part set-up, good machine rigidity, and general machining practices.

# Workpiece Material Groups (DIN ISO 513)

Identification letter & colour	Main Materials	Range of applications	ISO	BECKER Grade
P	Steel Sintered powdered alloys	P01 - P10	BH	PBC-17
		P05 - P15	BH	PBC-15
		P15 - P25	BH	SB10
		P20 - P40	BH	SBC1
M	Stainless Steel	**	CBN or PCD not suitable for this application range. For stainless steels above 48 HRc, refer to application range H	
K	Cast Iron Grey Cast Iron GG 10 - GG 35 Nodular Cast Iron GGG 40 - GGG 40.3 - GGG 50 GGG 60 - GGG 70	K01 - K25	BH	PBC-10
		K01 - K25	BH	PBC-15
		K05 - K20	BH	PBC-17
		K05 - K20	BL	PBC-25
		K05 - K40	BH	SB10
		K10 - K35	BL	SB25
		K15 - K40	BH	SBC1
N	Nonferrous Metals Nonmetallics Aluminum alloys, Low + High-Silicon Aluminum alloys, MMC's, Magnesium alloys, Copper-Copper alloys, Brass, Bronze, Precious metals, Plastics, GRP, CRP, Carbon and Graphite composites, Ceramics and other high-abrasive Nonmetallics	N01 - N35	DM	MDC
		N05 - N35	DP	PDC-L
		N05 - N40	DP	PDC
		N10 - N40	DP	PDC-S
S	Super-alloys and Titanium: Heat resistant special alloys based on Nickel or Cobalt, Titanium and Titanium alloys	S01 - S15	BH	PBC-10
		S01 - S15	BH	PBC-15
		S01 - S20	DM	MDC
		S01 - S30	BH	SB10
		S05 - S25	BL	PBC-25
		S15 - S40	BH	SBC1
H	Hard Materials: Carburized or fully hardened steels from 48 to 65 HRc HSS, tool steel, 300 & 400 series stainless cold and hot work steel, spring steel, ball-bearing steel, chilled cast iron, chilled cast iron rolls, chilled cast iron alloys, hardfacing alloys sintered carbide	H01 - H20	BL	PBC-40
		H01 - H25	BL	PBC-25
		H01 - H35	BL	SB40
		H01 - H40	BL	SB25
		H05 - H15	BH	PBC-17
		H05 - H25	BL	PBC-30
		H05 - H30	BL	PBC-20
		H20 - H40	BH	SBC1

As per DIN ISO 513 (2001) there are now additional identification letters for carbide (also cermet) and ceramic.

Furthermore new identification letters for the ultrahard cutting materials Polycrystalline Cubic Boron Nitride, Monocrystalline and Polycrystalline Diamond have been introduced.



### Groups of cutting materials (DIN ISO 513)

**HW**= Uncoated carbide

**HF**= Fine grained carbide

**HT**= Cermet, TiC, or TiN

**HC**= As above, but coated

**CA**= Ceramic, main content  $\text{Al}_2\text{O}_3$

**CM**= Mixed ceramic, main content  $\text{Al}_2\text{O}_3$ , plus components other than oxides

**CN**= Siliconnitride ceramic, main content  $\text{Si}_3\text{N}_4$

**CR**= Ceramic, main content  $\text{Al}_2\text{O}_3$ , reinforced

**CC**= Ceramics as above, but coated

**DM**= Monocrystalline Diamond

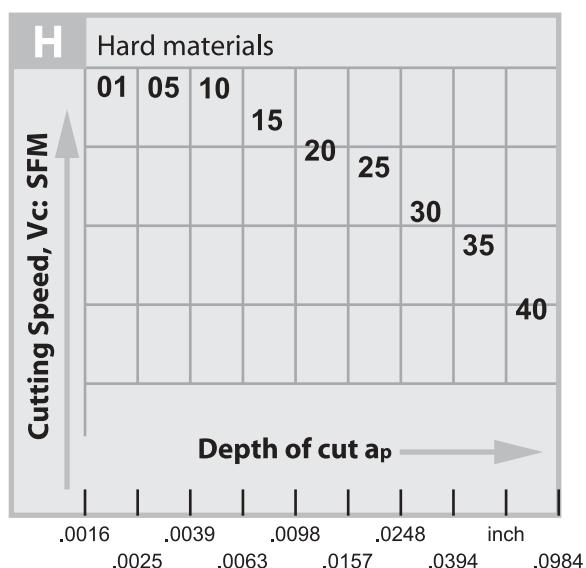
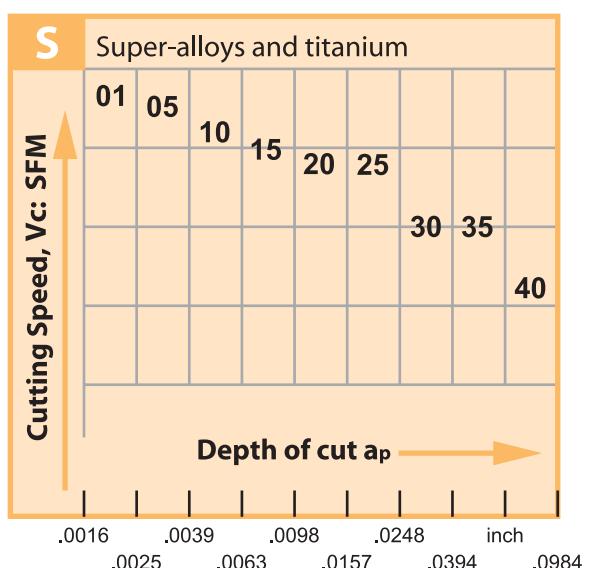
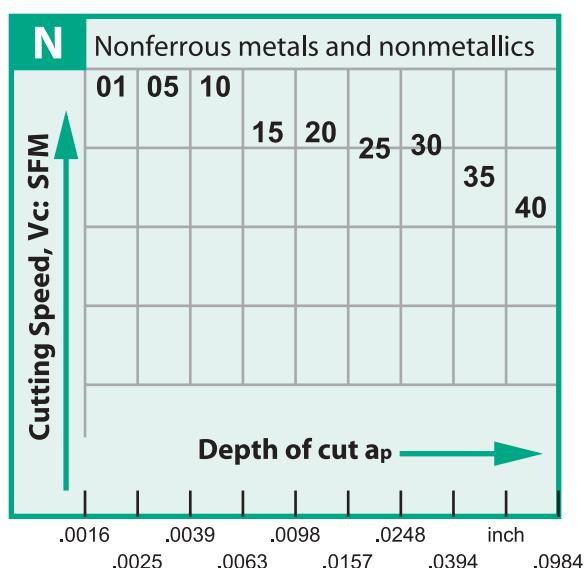
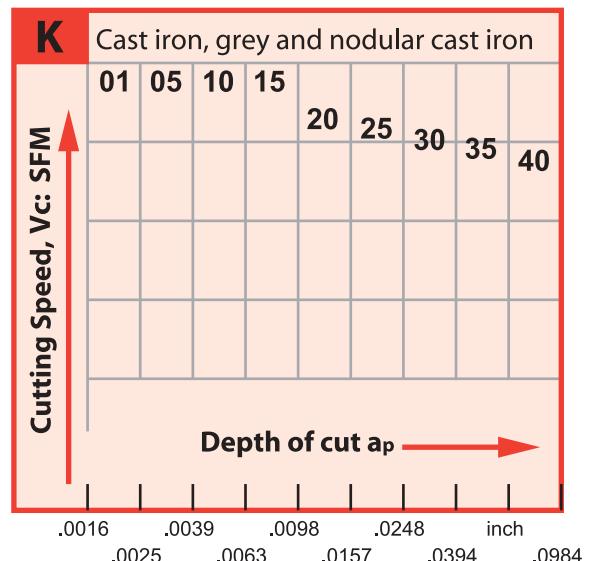
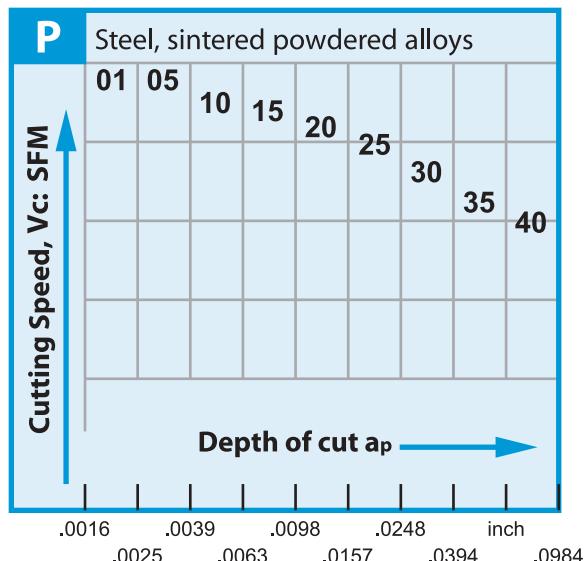
**DP**= Polycrystalline Diamond

**BL**= Polycrystalline Cubic Boron Nitride with low content CBN

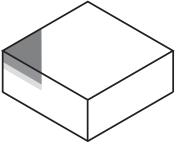
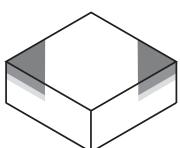
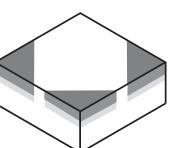
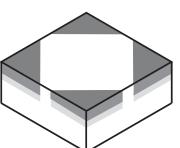
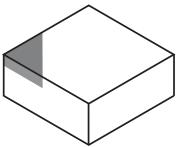
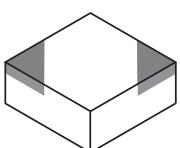
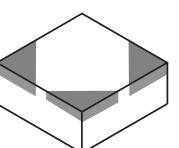
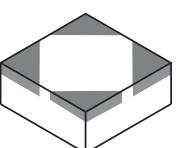
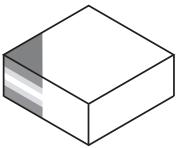
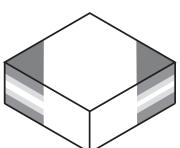
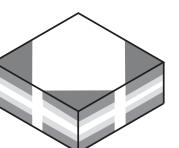
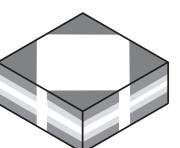
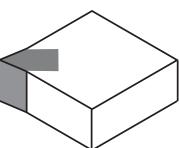
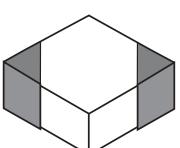
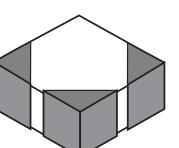
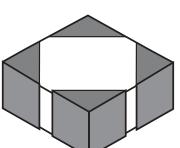
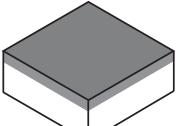
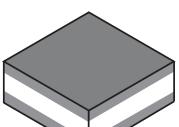
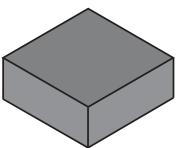
**BH**= Polycrystalline Cubic Boron Nitride with high content of CBN

**BC**= Polycrystalline Cubic Boron Nitride as above, but coated

## Range of Application (DIN ISO 513) for Material Groups P, K, N, S, H



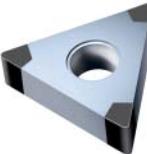
# Designation of tipped inserts ISO - BECKER Comparison

ISO	BECKER Designation	Design	Amount of tipped corners		
			2	3	4
A	EW MW MC PDC	 1 tipped corner, carbide reinforced			
A-S	EWS MC-S MDC	 1 tipped corner, solid grades			
C	***	 2 tipped corner, carbide reinforced			
D	PC-S PC-M	 1 tipped edge, solid grades			
F	VM	 Full face			
E	***	 Double sided full face			
S	SBC SB	 Solid			

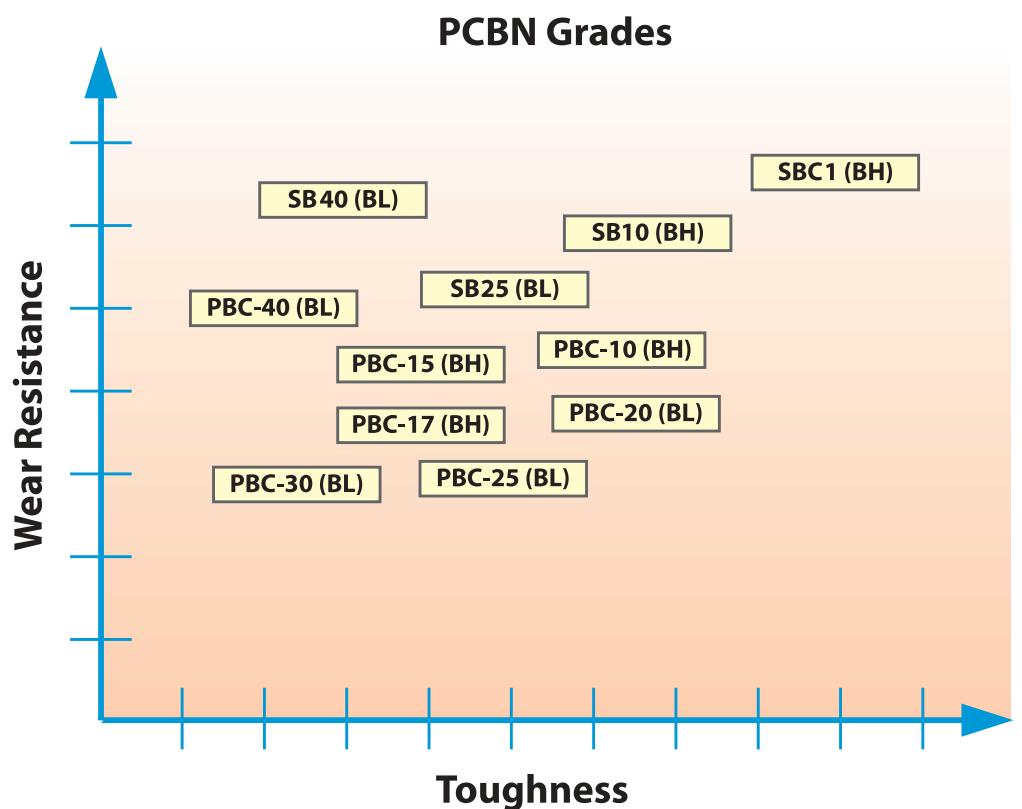
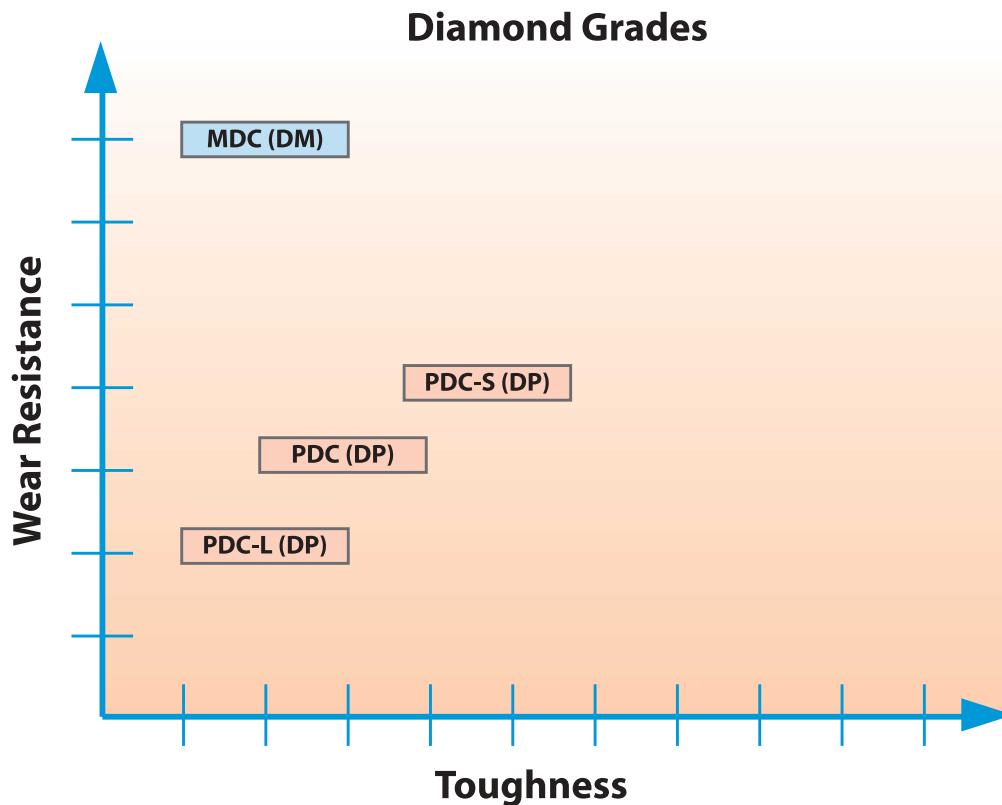
## Variations of Tipped Corners for all Ultrahard Cutting Materials

ISO	BECKER Designation	Design	Tip description	Grade	ISO
A	EW MW		Carbide reinforced PCBN - grades, thickness of PCBN layer = .024 - .039"	PBC-10, PBC-15, PBC-17 PBC-20, PBC-25 PBC-30, PBC-40	BH BH BL BL
A-2	MC		Carbide reinforced PCBN - grades, thickness of PCBN layer = .024 - .039"	PBC-10, PBC-15, PBC-17 PBC-20, PBC-25 PBC-30, PBC-40	BH BH BL BL
A-3	MC		Carbide reinforced PCBN - grades, thickness of PCBN layer = .024 - .039"	PBC-10, PBC-15, PBC-17 PBC-20, PBC-25 PBC-30, PBC-40	BH BH BL BL
A	PDC-L PDC PDC-S		Carbide reinforced PCD - grades	PDC-L, PDC PDC-S	DP DP
A-3	MC		Carbide reinforced PCD - grades	PDC-L, PDC PDC-S	DP DP
A-S	EWS		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
A-S2	MC-S		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
A-S	MDC		Solid Monocrystalline Diamond - grade without reinforcement	MDC	DM
D	PC-S		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL

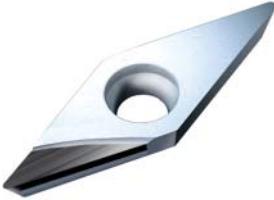
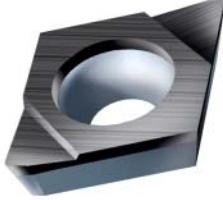
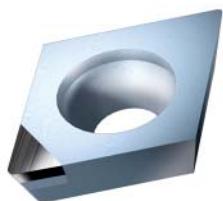
## Variations of Tipped Corners for all Ultrahard Cutting Materials

ISO	BECKER Designation	Design	Tip description	Grade	ISO
D-2	PC-M		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
D-3	PC-M		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
D-4	PC-M		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
F	VM		Carbide reinforced PCBN - grades, Fullface	PBC-10, PBC-15, PBC-17 PBC-20, PBC-25 PBC-30, PBC-40	BH BH BL BL
F	VM		Carbide reinforced PDC - grades Fullface	PDC, PDC-S	DP
S	SBC SB		Solid PCBN - grades without reinforcement	SBC1, SB10 SB25, SB40	BH BL
**	SBC-GS SB-GS		Solid PCBN - grades whole cutting edge without reinforcement	SBC1, SB10 SB25, SB40	BH BL
**	PBC-GS		Carbide reinforced PCBN - grades whole cutting edge	PBC-10, PBC-15, PBC-17 PBC-20, PBC-25 PBC-30, PBC-40	BH BH BL BL
**	PDC-GS PDC-S-GS		Carbide reinforced PDC - grades whole cutting edge	PDC, PDC-S	DP

# Wear Resistance and Toughness, Comparison of all our Ultrahard Cutting Materials

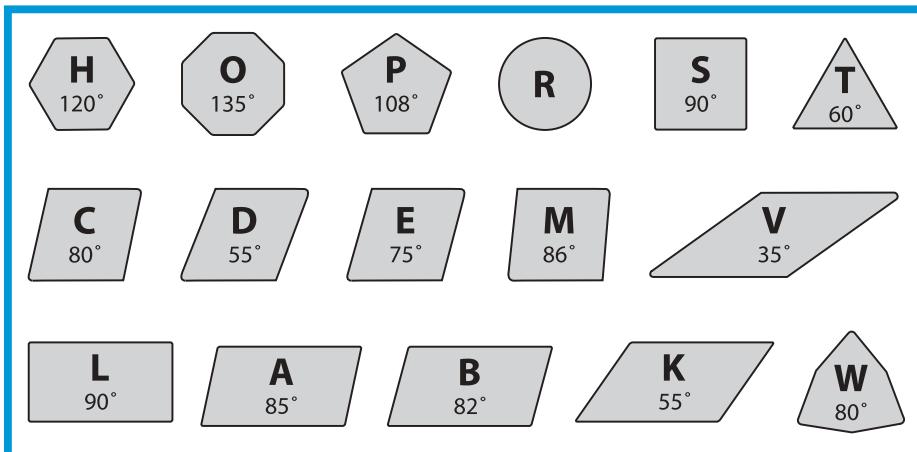


## Positive Top Rake Geometries

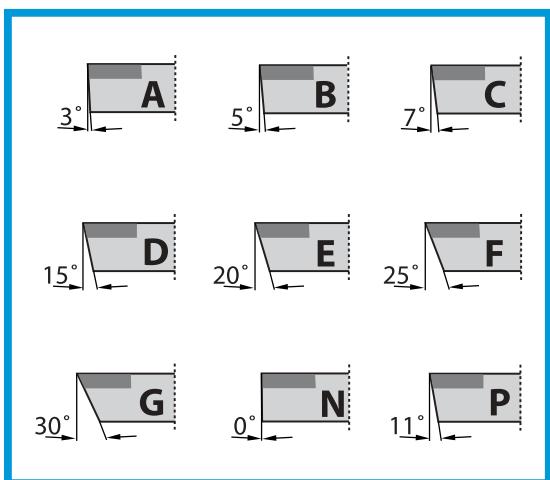
Top Rake		Advantages	Disadvantage
	1) negative insert 2) positive rake angle (R/L) 3) sharp cutting edge	<b>Cutting Materials:</b> <b>MDC</b> 1) very high cutting speed 2) large depth of cut 3) no cutting pressure 4) absolutely burr-free 5) very small tolerance limits 6) very high tool life	1) little reduction of surface finish caused by positive rake angle
	1) positive insert 2) positive rake angle (R/L) 3) sharp cutting edge	<b>Cutting Materials:</b> <b>PDC and PDC-S</b> 1) extremely large depth of cut 2) low cutting pressure 3) burr-free 4) small tolerance limits	1) little reduction of surface finish caused by positive rake angle
	1) positive insert 2) positive rake angle (N) 3) sharp cutting edge	<b>Cutting Materials:</b> <b>PBC and PDC for boring</b> 1) low cutting pressure 2) burr-free 3) small tolerance limits 4) high overhang 5) high cutting speed	1) little reduction of surface finish caused by positive rake angle
	1) positive insert 2) positive rake angle (N) 3) sharp cutting edge	<b>Cutting Materials:</b> <b>PDC, PDC-S, and PBC</b> 1) low cutting pressure 2) burr-free 3) small tolerance limits 4) high cutting speed	1) little reduction of surface finish caused by positive rake angle
	1) negative insert 2) positive rake angle (N) 3) sharp cutting edge	<b>Cutting Materials:</b> <b>SBC, SB</b> 1) great depth of cut 2) low cutting pressure 3) small tolerance limits 4) high cutting speed	1) little reduction of surface finish caused by positive rake angle

# ISO Insert Nomenclature

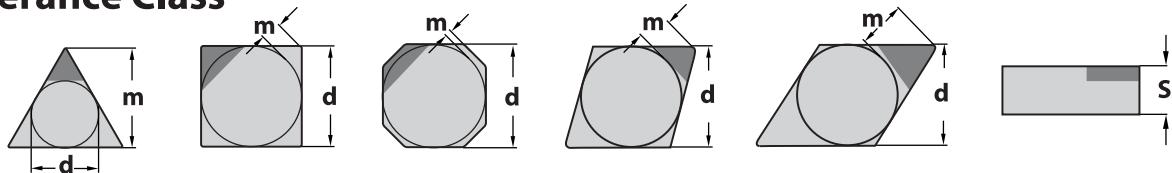
## 1. Shape



## 2. Clearance

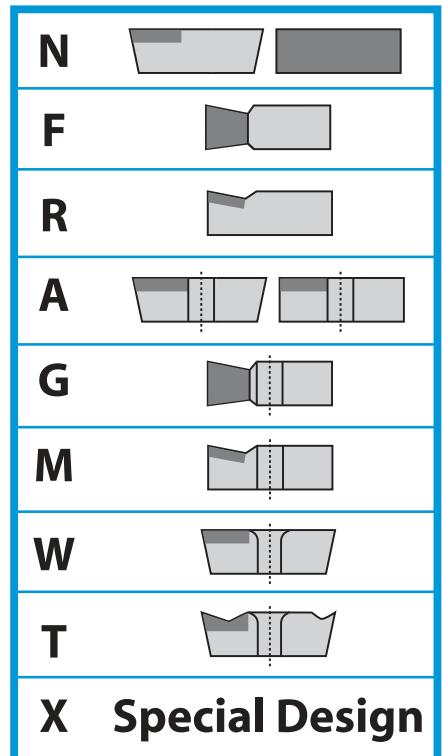


## 3. Tolerance Class

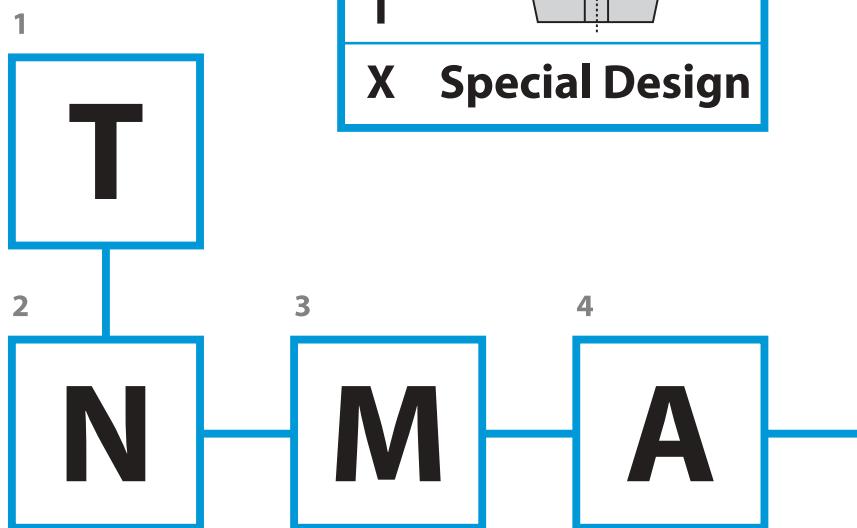


	<b>m</b>	<b>s</b>	<b>d</b>		<b>m</b>	<b>s</b>	<b>d<sup>1)</sup></b>
<b>A</b>	$\pm 0.0002$	$\pm 0.0010$	$\pm 0.0010$		<b>J</b>	$\pm 0.0002$	$\pm 0.0010$
<b>F</b>	$\pm 0.0002$	$\pm 0.0010$	$\pm 0.0005$		<b>K</b>	$\pm 0.0005$	$\pm 0.0010$
<b>C</b>	$\pm 0.0005$	$\pm 0.0010$	$\pm 0.0010$		<b>L</b>	$\pm 0.0010$	$\pm 0.0010$
<b>H</b>	$\pm 0.0005$	$\pm 0.0010$	$\pm 0.0005$		<b>M<sup>1)</sup></b>	$\pm 0.0031 - 0.0079$	$\pm 0.0051$
<b>E</b>	$\pm 0.0002$	$\pm 0.0010$	$\pm 0.0010$		<b>N<sup>1)</sup></b>	$\pm 0.0031 - 0.0079$	$\pm 0.0098$
<b>G</b>	$\pm 0.0010$	$\pm 0.0051$	$\pm 0.0010$		<b>U<sup>1)</sup></b>	$\pm 0.0051 - 0.0150$	$\pm 0.0051$

## 4. Insert type



ISO Designation Code  
Position 1 - 9

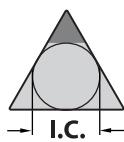


1) Exact tolerance is determined by size of insert

## 5. Insert I.C. Size

I.C. shown in 1/8 inch increments on inserts

1.2 = 3/32"	3 = 3/8"
1.5 = 3/16"	4 = 1/2"
1.8 = 7/32"	5 = 5/8"
2 = 1/4"	6 = 3/4"
2.5 = 5/16"	8 = 1.0"



## 6. Thickness

(T) shown in 1/16 inch increments on inserts

1 = 1/16"	3 = 3/16"
1.2 = 5/64"	3.5 = 7/32"
1.5 = 3/32"	4 = 1/4"
2 = 1/8"	5 = 5/16"
2.5 = 5/32"	



## 8. Cutting Edge Condition



5  
**3**

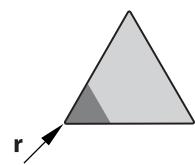
6  
**3**

7  
**2**      8      9  
**T**      **R**

## 7. Corner Configuration

1.) (R) shown in 1/64 inch increments

0 = .004"	4 = 1/16"
0.5 = .008"	5 = 5/64"
1 = 1/64"	6 = 3/32"
2 = 1/32"	8 = 1/8"
3 = 3/64"	



2.) For milling inserts

Major cutting edge angle:

A = 45°

D = 60°

E = 75°

F = 85°

P = 90°

ZZ = detailed explanations are necessary

Wiper edge clearance

A = 3°      F = 25°

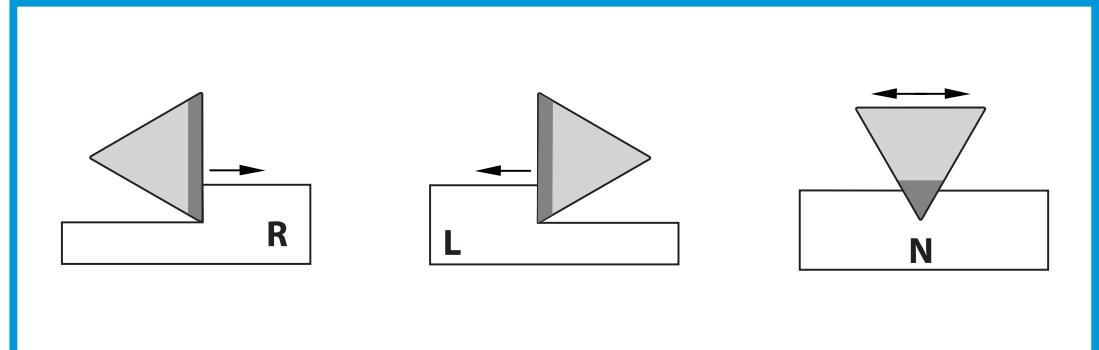
B = 5°      G = 30°

C = 7°      N = 0°

D = 15°      P = 11°

E = 20°

## 9. Cutting Direction



# Flank Wear Characteristics of our Ultrahard Cutting Materials

## 1) MDC - Monocrystalline Diamond (DM)

Monocrystalline diamond is the hardest known mineral. Its outstanding abrasive hardness and highest homogeneity enable the manufacture of ultra sharp and notch free micro-cutting edge qualities, (as it is ground from a single crystal) - not achievable using other cutting materials. The sharpness of the cutting edge produces a slight cutting pressure without any heat generated during machining. The unsurpassable wear resistance retains the perfect micro-cutting edge quality over an extremely long tool life. MDC cannot be used on aluminium with fillers.

## 2) PCD - Polycrystalline Diamond (DP)

The core structure (ultra-fine to coarse grain) of the Polycrystalline Diamond provides a higher toughness, yet lower wear resistance and reduced micro-cutting edge quality than with Monocrystalline Diamond. The reaction behaviour is identical, yet the higher toughness extends the application range considerably. Materials with a low to very high content (from 2% to 70%) of abrasives fillers can be machined with excellent tool life.

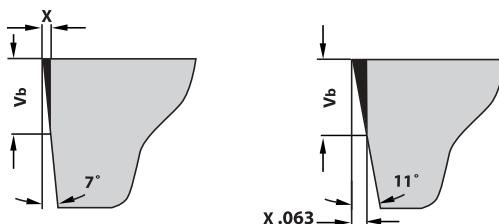
## 3) CBN - Polycrystalline Cubic Boron Nitride (BH and BL)

Polycrystalline Cubic Boron Nitride is the second hardest cutting material next to Diamond, however, it has far less in common with Diamond. Reaction resistance reaches 1,250°C which makes this cutting material have a very high wear resistance, toughness, compression strength and thermal hardness ideal for self-induced hot cutting mode of hardened steels.

## Flank Wear of Ultrahard Cutting Materials

Flank wear has a significant influence on the life of all cutting tools. Due to the excellent flank wear resistance of all Becker cutting materials, they are clearly superior to conventional cutting materials in many fields. Typically, the Becker product will exhibit negligible flank wear - if any at all, thereby resulting in extremely long tool life.

The following drawing shows the difference of tool life under the same machining conditions for inserts with a clearance angle of 7° respectively 11°. Tool life of the insert with 11° angle will be 1.6 times longer than that of 7° before they reach the same width of flank wear. The following aspects should be taken into account in order to choose the adequate cutting edge geometry.



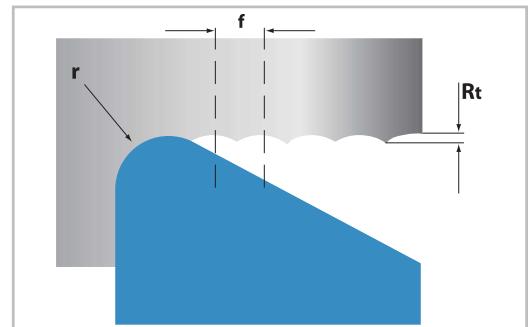
Under normal working conditions, abrasion will usually cause a certain degree of flank wear. Mono- and polycrystalline diamonds, however, are susceptible to abrasion caused by oxidation at a heat exceeding 650°C. The cause of flank wear is due to the extremely high thermal conductivity of diamonds. It is therefore recommended to select the smallest possible clearance angle for all diamond tools (if formation of burrs is of no importance). This selection will increase passive cutting pressure, leading to a better surface finish.

In contrast, CBN's low thermal conductivity flank wear is usually not only caused by abrasion, but also oxidation, diffusion, or adhesion, when applied for high speed cutting (HSC) and also self-induced hot cutting mode of hardened steel. With this point in mind, the correct clearance angle for external and internal turning is pivotal with regards to the friction between flank and the work piece. The passive cutting pressure and the temperature it is reaching can be controlled not only by the clearance angle, but also by the micro cutting edge geometry. In order to obtain maximum tool life, interaction of those facts must be considered.

One can simply calculate the theoretical surface roughness Rt- also known as R max and Rz. (In practice it usually runs up to four times the Ra value). The theoretical value, however, is again based on a perfect cutting edge geometry with a wide minor cutting edge angle. Using Becker MDC and PCD when machining nonferrous metals and non-metallics or CBN for grey cast iron results in hardly any flank wear or deformation of the cutting edge - due to the excellent flank wear resistance of our tools. It is therefore possible to complete the precise data for the required surface roughness, provided the cutting environment in itself will not hamper the machining as such.

In practice, the values of roughness will typically be less than the theoretical calculation when hard-cutting with CBN. This is due to a simple reason: the cutting process itself is influenced by self induced hot-cutting mode which can cause an extremely high passive cutting pressure.

Theoretical Surface Roughness		Corner Radius				
		Feed Rate (f=inch/rev)				
Ra µin	Rt µin	r = .008	r = .016	r = .031	r = .047	r = .063
24	100	.002	.003	.004	.005	.006
63	250	.003	.004	.006	.007	.009
125	500	.005	.007	.009	.011	.014
250	1000	.006	.009	.012	.015	.018

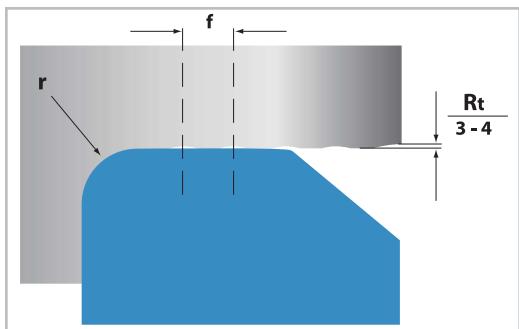


The practical application proves that the theoretically calculated value can hardly be achieved, since the environmental conditions tend to be imperfect. Unstable machining conditions, incorrect workholding, chucking, faulty or wrong tool system, wrong cutting speed and depth of cut etc. will impair the results. Conversely, working towards near perfect working conditions can result in an improved surface finish due to improved and optimized cutting edge geometries. In particular, the general reduction of the minor cutting edge angle, as well as the micro-geometries, with PCBN (for more cutting pressure) should be mentioned. In order to obtain the various stages of excellent surface finishes while hard-cutting, the T-land styles are of great influence. For a mirror-finish surface of nonferrous metals and nonmetallics, Becker is able to supply even MDC-inserts with a T-Land, if necessary.

With regards to high-performance cutting of all types, Becker has developed a variety of inserts with WIPER geometry for internal, external and milling processes. The WIPER edge replaces the above-mentioned minor cutting edge, reducing its angle to a minimum, thereby reducing the theoretically computed surface roughness by 2 to 4 times.

In practice this is the alternative for high-performance and high-tech cutting:

1) 2-4x higher feed rate = same surface finish      2) same feed rate = 2-4x improved surface finish



#### Wiper inserts are available for:

- FormCut
- MonoCut
- MiniCut
- ISO-HardCut

*In addition to the improvements gained in productivity by decreased flank wear, Becker products will result in significant gains in product quality.*

# Ultrahard Cutting Materials

## Grades - Materials - Performance

Grades	ISO	Composition - Performance	Application
<b>Mono - and Polycrystalline Diamond - PCD &amp; MDC</b>			
MDC	DM	Solid monocrystalline diamond with no structure. Cutting edge is extremely sharp and without microdamages, generating no cutting pressure, allowing burr-free results with tolerances close to zero. Extremely flank wear resistant and maximum thermal conductivity, low toughness.	Superfinishing of all pure nonferrous metals and nonmetallics with no abrasive reinforcement or silicon. (HSC - High Tech)
PDC-L	DP	Polycrystalline, carbide reinforced diamond of ultrafine grit size, high cutting edge sharpness, minimal cutting pressure allowing close tolerances. Good flank wear resistance and toughness.	Finishing of all pure nonferrous materials and nonmetallics with verylow content of abrasive reinforcement or silicon.
PDC	DP	Polycrystalline, carbide reinforced diamond of fine grit size, good cutting edge sharpness and low cutting pressure allowing close tolerances. Increased flank wear resistance and toughness.	Finishing and general purpose of all nonferrous metals and nonmetallics with low content of abrasive reinforcement or silicon.
PDC-S	DP	Polycrystalline carbide reinforced diamond of coarse grit size, good edge sharpness and low cutting pressure allowing close tolerances. Best performances for milling. High flank wear resistance and toughness.	Finishing, general purpose and milling of all nonmetallics with medium to high content of abrasive reinforcement or silicon.
<b>Polycrystalline Cubic Boron Nitride - High Content CBN</b>			
SBC1	BH	Solid polycrystalline Cubic Boron Nitride grade with high content of CBN and medium grit size. Designed with exceptional flank wear resistance, thermal stability, compression strength and toughness for roughing and finishing of grey cast iron. HSC and HPC.	Grey cast iron Chilled cast iron Ni-hard Super alloys Sintered powdered alloys
SB10	BH	Solid polycrystalline Cubic Boron Nitride grade with high content of CBN and fine grit size. HSC, HPC and superfinishing of grey cast iron (GG 25) causing excellent flankwear resistance and toughness.	Grey cast iron GG25 Super alloys Sintered powdered alloys
PBC-10	BH	Polycrystalline carbide reinforced Cubic Boron Nitride grade with high content of CBN and fine grit size, perfect flank wear resistance and toughness. HSC and superfinishing of grey cast iron (GG25) and finishing of super alloys.	Grey cast iron GG25 Super alloys Sintered powdered alloys
PBC-15	BH	Polycrystalline carbide reinforced Cubic Boron Nitride grade with high content of CBN and fine grit size. The favourable grade for sintered powdered alloys, very good flank wear resistance and toughness.	Grey cast iron Super alloys Sintered powdered alloys
PBC-17	BH	Polycrystalline carbide reinforced Cubic Boron Nitride grade with high content of CBN and fine grit size. This grade excels in two main fields of application: general purpose and finishing of nodular cast iron, and hard-cutting of hardened steel (HRc 48-54) using flood coolant.	Nodular cast iron (GGG40 - GGG70) Hard-cutting (HRc 48 - 54) Sintered powdered alloys

# Ultrahard Cutting Materials

## Grades - Materials - Performance

Grades	ISO	Composition - Performance	Application
<b>Polycrystalline Cubic Boron Nitride - Low Content CBN</b>			
PBC-20	BL	Polycrystalline carbide reinforced Cubic Boron Nitride grade with low content of CBN and fine grit size. Engineered for hard-cutting of hardened steel (HRc 56 - 65) when highest surface finish is crucial (Ra 8µin - 32µin). Good performance in heavy interruptions as well as continuous cutting.	Hardened steels (HRc 56 - 65) dry cutting for Ra 8µin - 32µin $ap = .006" - .020"$
SB25	BL	Solid Polycrystalline Cubic Boron Nitride with low content of CBN and fine grit size. Highest compression strength, toughness and flank wear resistance when hard-cutting (HRc 56-65) with high depth of cut. ( $ap = .012" - .079"$ ). Thermal conductivity is reduced and a soft cut attained. Suitable for continuous as well as heavy interrupted cutting. Also finishing of grey cast iron at a very low cutting speed.	Hardened steels (HRc 56 - 65) dry cutting for Ra 32µin - 125µin $ap = .012" - .079"$ Grey cast iron (Vc 800 - 1140 sfm)
PBC-25	BL	Polycrystalline carbide reinforced Cubic Boron Nitride with low content of CBN and fine grit size. Excellent wear resistance, compression strength and toughness for hard-cutting. (HRc 54-62) General purpose for continuous and slightly interrupted cutting at surface finish Ra 32µin - 125µin. Also, finishing of grey cast iron at a very low cutting speed.	Hardened steels (HRc 56 - 65) dry cutting for Ra 32µin - 125µin $ap = .003" - .016"$ Grey cast iron (Vc 975 - 1300 sfm)
PBC-30	BL	Polycrystalline carbide reinforced Cubic Boron Nitride with low content of CBN and fine grit size. Excellent wear resistance, compression strength and toughness for hard-cutting. (HRc 56 - 65 applying flood coolant) Suitable for continuous and heavily interrupted cutting at surface finish Ra 32µin - 63µin.	Hardened steels (HRc 56 - 65) with flood coolant for Ra 32µin - 63µin $ap = .003" - .016"$
SB40	BL	Solid Polycrystalline Cubic Boron Nitride with low content of CBN and ultrafine grit size. Extreme wear resistance, compression strength and toughness for dry hard-cutting (HRc 56 - 65) at higher feed rates with lower depth of cut. Very soft cut at continuous and slightly interrupted cutting.	Hardened steels (HRc 56 - 65) dry cutting for Ra 8µin - 32µin $ap = .012" - .060"$
PBC-40	BL	Solid Polycrystalline Cubic Boron Nitride with low content of CBN and ultrafine grit size. Perfect wear resistance for dry hard-cutting at higher feed rates with low depth of cut. Continuous and slightly interrupted cutting.	Hardened steels (HRc 56 - 62) dry cutting for Ra 32µin - 63µin $ap = .002" - .012"$

# Cutting Data for Turning

## P: Sintered Steel, Powdered alloys

### Turning

Materials	Conditions of chip removal	Range of application P01 - P40						P20 - P40 (HPC) see page 6	
		P01 - P15 see page 6			P10 - P25 see page 6				
Turning		Vc: SFM		Vc: SFM		Vc: SFM			
		1300-2275	813-1300	488-975	1300-2275	813-1300	488-975	1300-2275	
<b>P</b> Steel sintered powdered alloys	unstable (varied depth)	PBC-15 (T)	PBC-15 (T)	PBC-15 (T)	PBC-15 (T)	SBC-10 (T)	SBC1 (T)	SB10 (T)	
	continuous	PBC-15 (F)	PBC-15 (F)	PBC-15 (T)	SBC1 (T)	PBC-15 (T)	PBC-17 (T)	SBC1 (T)	
	heavily + slightly interrupted	PBC-17 (F)	PBC-17 (T)	PBC-10 (F)	PBC-15 (T)	PBC-15 (T)	PBC-17 (T)	SB10 (T)	
		PBC-15 (T)	PBC-15 (T)	PBC-15 (T)	SBC-1 (T)	PBC1 (T)	PBC-17 (T)	SBC1 (T)	
		PBC-10 (T)	PBC-10 (T)	PBC-17 (T)	SB10 (T)	SB10 (T)	SB10 (T)	SB10 (T)	

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice  
 T= (T-Land) for interrupted and continuous turning, F= (Sharp) continuous turning only

## Turning

Materials	Conditions of chip removal	Range of application K01 - K40				Vc
		K01 - K15 see page 6		K10 - K25 see page 6		
<b>K</b>	Turning	Vc: SFM		Vc: SFM		Vc: SFM
	Cast irons (grey cast iron)	2925-6500	1625-2925	1138-1625	2925-6500	1625-2925
	unstable (varied depth)	PBC-15 (T)	PBC-15 (T)	PBC-25 (T)	PBC-15 (T)	PBC-25 (T)
	PBC-10 (F)	PBC-10 (F)		PBC-10 (F)		SBC1 (T)
	GG10	PBC-15 (F)	PBC-15 (T)	PBC-25 (F)	PBC-10 (T)	PBC-25 (F)
	GG15	continuous	PBC-10 (F)	PBC-10 (F)	SB10 (T)	SB10 (T)
	GG20	heavily + slightly interrupted	PBC-15 (T)	PBC-25 (T)	PBC-10 (T)	PBC-25 (T)
	PBC-10 (T)	PBC-10 (T)		SB10 (T)		SBC1 (T)
	GG25	unstable (varied depth)	PBC-15 (T)	PBC-25 (T)	PBC-15 (T)	PBC-25 (T)
	GG30	GG35	PBC-10 (F)	PBC-10 (F)	PBC-10 (T)	PBC-10 (T)
<b>K</b>	Cast irons (grey cast iron)	PBC-10 (F)	PBC-10 (F)	PBC-25 (F)	PBC-10 (T)	PBC-25 (T)
	GG25	continuous	PBC-10 (F)	PBC-10 (F)	PBC-10 (F)	PBC-10 (T)
	GG30	heavily + slightly interrupted	PBC-10 (T)	PBC-25 (T)	PBC-10 (T)	PBC-25 (T)
	GG35	SB10 (T)				SB10 (T)
						SBC1 (T)
<b>K</b>	unstable (varied depth)			PBC-17 (T)	PBC-17 (T)	PBC-17 (T)
	Cast irons (nodular cast iron)					SBC1 (T)
	GG40	continuous	SBC1 (T)	PBC-17 (F)	SBC1 (T)	PBC-17 (T)
	GG50			PBC-17 (T)	PBC-17 (T)	SBC1 (T)
	GG60	heavily + slightly interrupted	SBC1 (T)	PBC-17 (T)	SBC1 (T)	PBC-17 (T)
	GG70			PBC-15 (T)	PBC-15 (T)	SBC1 (T)

Cutting Data for Turning  
K: Cast Iron, Grey & Nodular Cast Iron

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice  
T = (T-Land) for interrupted and continuous turning, F = (Sharp) continuous turning only

# Cutting Data for Turning

## N: Nonferrous Metals & Nonmetallics

### Turning

Materials	Conditions of chip removal	Range of application N01 - N40						Rt + Vc	
		N01 - N20 (HSC) see page 6			N20 - N30 (HSC) see page 6				
		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$	
<b>N</b> Nonferrous metals Aluminum alloys without silicon	Turning (high-speed)	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in
	unstable (varied depth)	MDC	PDC	MDC	PDC	PDC	MDC	PDC	PDC
	continuous	2925-9750	1300-8125	1300-8125	1950-8125	1300-6500	1300-6500	1625-6500	1300-5200
	heavily + slightly interrupted	MDC	PDC-L	PDC	MDC	PDC-L	PDC	MDC	PDC-L
	unstable (varied depth)	2925-13000	1300-8125	1300-8125	1950-9750	1300-6500	1300-6500	1625-8125	1300-5200
	continuous	2925-9750	1300-8125	1300-8125	1950-8125	1300-6500	1300-6500	1625-6500	1300-5200
	unstable (varied depth)	MDC	PDC-S						
	continuous	3900-4875	1300-6500	1300-7150	1950-7150	1950-5850	1950-6500	1950-4875	1950-5850
	heavily + slightly interrupted	3900-4875	1300-6500	1300-7150	1950-7150	1300-5850	1950-6500	1300-4875	1300-5850
	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)	unstable (varied depth)
<b>N</b> Nonferrous metals Aluminum alloys with more than 12% silicon	continuous	2600-3900	1300-5850	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
	heavily + slightly interrupted			PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
	unstable (varied depth)			1950-5850		1950-5850	1950-6500	1950-4875	
	unstable (varied depth)					1950-4875			1950-3900
Coolant: Air (plastics) or flood coolant (metals), it is tool life only that is reduced when cutting without cooling, the surface finish, however, is not affected.									

## Turning

Materials	Conditions of chip removal	Range of application N01 - N40										Rt + Vc
		N01 - N20 (HSC) see page 6				N20 - N30 (HSC) see page 6				N25 - N40 (HSC+HPC) see page 6		
Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		
<b>N</b> Nonferrous metals	Turning (high-speed)	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	Rt + Vc
Copper and copper alloys brass, bronze, precious metals	unstable (varied depth)	MDC	PDC-L	PDC	MDC	PDC	PDC-S	MDC	PDC	MDC	PDC	PDC-S
	continuous	1950-8125	1300-5850	975-4875	1950-6500	1300-5200	975-4875	1625-5850	1300-4875	1625-5850	1300-4875	975-4550
	heavily + slightly interrupted	MDC	PDC-L	PDC	MDC	PDC-L	PDC-S	MDC	PDC	MDC	PDC	PDC-S
	unstable (varied depth)	1950-9750	1300-7150	975-5850	1950-8125	1300-5850	975-5525	1625-6500	1300-5200	1625-5850	1300-5200	975-4225
	heavy + slightly interrupted	1950-9750	1300-5850	975-5200	1950-6500	1300-5200	975-5200	1625-5850	1300-4550	1625-5850	1300-4875	
<b>N</b> Non- metallics pure plastics without re- inforcement	unstable (varied depth)	MDC	PDC-L	PDC	MDC	PDC-L	PDC	MDC	PDC	MDC	PDC-L	PDC
	continuous	1950-9750	1625-5850	1300-3900	1950-5850	1300-3900	975-3250	1950-5850	975-2925	1950-5850	975-2925	650-3250
	heavily + slightly interrupted	1300-11375	975-5850	975-3900	1300-5850	975-3250	650-3250	1300-5850	650-2600	1300-5850	650-2600	650-2925
	heavy + slightly interrupted	MDC	PDC-L	PDC	MDC	PDC-L	PDC	MDC	PDC	MDC	PDC-L	PDC
	unstable (varied depth)	1950-9750	1625-5850	1300-3900	1950-5850	1300-3900	975-3250	1950-5850	975-2925	1950-5850	975-2925	650-3250
<b>N</b> Non- metallics plastics with re- inforcement (ie/ GRP, CRP)	unstable (varied depth)	MDC	PDC-S		MDC	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
	continuous	2600-3900	1625-3250		2275-2925	1300-2925	975-2925					975-2600
	heavily + slightly interrupted	MDC	PDC-S		MDC	PDC-S	PDC-S					PDC-S
	heavily + slightly interrupted	1300-4550	1300-2925		1950-3250	975-2600	650-2925					650-4550
	heavy + slightly interrupted	2925-3900	1625-3250		2275-2925	1300-2600	975-3250					975-2600

Cooolant: Air (plastics) or flood coolant (metals), it is tool life only that is reduced when cutting without cooling, the surface finish, however, is not affected.

# Cutting Data for Turning

## S: Super-Alloys & Titanium

### Turning

Materials	Conditions of chip removal	Range of application S01 - S40						Vc
		S01 - S15 see page 6			S15 - S25 see page 6			
		Vc: SFM		Vc: SFM		Vc: SFM		Vc: SFM
<b>S</b> Super-alloys heat resistant alloys nickel base alloys	Turning	1625-2925	975-1625	650-1138	1625-2925	975-1625	650-1138	1625-2925
Inconel 718, Nimonic, Hastelloy, Waspaly	unstable (varied depth)	PBC-15 (T)	PBC-25 (T)		PBC-15 (T)	PBC-25 (T)		PBC-15 (T)
	continuous	PBC-15 (F)	PBC-20 (F)		PBC-10 (F)	PBC-15 (T)		PBC-10 (T)
	heavily + slightly interrupted	PBC-15 (T)	PBC-10 (T)	SBC1 (T)	PBC-10 (T)	PBC-10 (T)	SBC1 (T)	SBC1 (T)
<b>S</b> Super-alloys titanium titanium alloys	unstable (varied depth)	PBC-15 (T)			PBC-15 (T)			
	continuous	MDC	MDC	PDC-S	MDC	MDC	PDC-S	SB25 (T)
	heavily + slightly interrupted			PBC-25 (T)		PBC-25 (T)		

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice  
 T= (T-Land) for interrupted and continuous turning, F= (Sharp) continuous turning only

## Turning

Materials	Conditions of chip removal	Range of application H01 - H40						Ra + Vc
		H01 - H15 see page 6			H05 - H20 see page 6			
Turning		Ra µin		Ra µin		Ra µin		
8-32	32-63	63-125	8-32	32-63	63-125	8-32	32-63	63-125
<b>H</b> Hard materials hardened steel HRC 48-54 hard turning	unstable (varied depth)	PBC-25 (F) 520-715		PBC-25 (F) 488-618		PBC-25 (F) 488-618		SB25 (F) 455-585
	continuous	SB40 (T) 390-520	PBC-17 (T) 423-585	PBC-25 (F) 520-715	SB40 (T) 358-520	PBC-17 (T) 423-553	PBC-25 (F) 325-455	SB25 (T) 423-553
	heavily + slightly interrupted	PBC-20 (T) 390-520	PBC-17 (T) 488-618	PBC-25 (T) 423-585	PBC-20 (T) 358-488	PBC-17 (T) 455-585	PBC-25 (T) 358-585	SB40 (T) 423-553
<b>H</b> Hard materials hardened steel HRC 54-60 hard turning	unstable (varied depth)	PBC-30 (T) 455-585	PBC-25 (F) 585-845	PBC-30 (T) 423-585	PBC-30 (T) 423-585	PBC-30 (T) 553-780	PBC-25 (F) 390-520	SB25 (T) 455-585
	continuous	SB40 (T) 423-585	PBC-40 (T) 488-650	SB40 (T) 553-780	SB40 (T) 423-585	SB25 (T) 520-780	PBC-40 (F) 390-585	SB25 (T) 390-585
	heavily + slightly interrupted	PBC-20 (T) 423-553	PBC-25 (T) 455-650	PBC-20 (T) 488-650	PBC-25 (T) 390-488	PBC-25 (T) 455-585	PBC-20 (T) 390-585	SB25 (T) 390-585
<b>H</b> Hard materials hardened steel HRC 58-65 hard turning	unstable (varied depth)	PBC-40 (T) 520-780	PBC-25 (T) 455-585	PBC-30 (T) 423-553	PBC-25 (T) 455-553	PBC-30 (T) 455-553	PBC-25 (T) 390-520	SB40 (T) 390-520
	continuous	SB40 (T) 455-520	PBC-40 (T) 520-780	SB40 (T) 455-585	SB40 (T) 390-585	SB40 (T) 390-553	PBC-25 (T) 358-520	SB40 (T) 390-520
	heavily + slightly interrupted	PBC-20 (T) 390-488	PBC-30 (T) 455-585	PBC-25 (T) 488-650	PBC-30 (T) 358-488	PBC-25 (T) 488-618	PBC-20 (T) 325-455	SB25 (T) 455-585

## Cutting Data for Turning H: Hard Materials

T= (T-Land) for interrupted and continuous turning, F= (Sharp) continuous turning only

# Cutting Data for Turning

## H: Hard Materials

### Turning

Materials	Conditions of chip removal	Range of application H01 - H40						Vc	
		H01 - H15 see page 6			H05 - H20 see page 6				
		Vc: SFM		Vc: SFM		Vc: SFM		Vc: SFM	
<b>H</b> Hard materials Chilled cast irons chilled cast iron rolls chilled cast iron alloys Ni-Hard	Turning	488-975	325-650	163-488	488-975	325-650	163-488	488-975	325-650
	unstable (varied depth)	SB10 (T)	SB10 (T)						
	continuous								
	heavily + slightly interrupted	SBC1 (T)	SBC1 (T)	SBC1 (T)	SBC1 (T)	SBC1 (T)	SBC1 (T)	SBC1 (T)	SBC1 (T)
	heavily + slightly interrupted	SB10 (T)	SB10 (T)						
	unstable (varied depth)								
<b>H</b> Hard materials hardfacing alloys	continuous								
	heavily + slightly interrupted	SBC1 (T)	SBC1 (T)	PBC-10 (T)	SB10 (T)	PBC-10 (T)	SB10 (T)	SBC1 (T)	SBC1 (T)
	unstable (varied depth)								
<b>H</b> Hard materials sintered carbide	continuous							PDC-S	SBC1 (T)
	heavily + slightly interrupted							SBC1 (T)	

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice

T= (T-land) for interrupted and continuous turning, F= (Sharp) continuous turning only

## High-Speed Milling

Materials	Conditions of chip removal	Range of application K01 - K40						Vc
		K01 - K15 (HSC) see page 6		K10 - K25 (HSC) see page 6		K20 - K40 (HSC+HPC) see page 6		
		Vc: SFM	Vc: SFM	Vc: SFM	Vc: SFM	Vc: SFM	Vc: SFM	
<b>K</b> Cast irons (grey cast iron) GG10 GG15 GG20	High-speed milling	3900-8125	1625-2925	1138-1625	3900-8125	1625-2925	1138-1625	PBC-25 (T)
	unstable (varied depth)	SBC1 (T)		SBC1 (T)		SBC1 (T)		PBC-10 (T)
	continuous	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	PBC-15 (T)
	heavily + slightly interrupted	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	SBC1 (T)	PBC-17 (T)	SBC1 (T)	PBC-15 (T)
	unstable (varied depth)	PBC-15 (T)		PBC-15 (T)		PBC-15 (T)		PBC-10 (T)
	continuous	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	PBC-10 (T)	PBC-17 (T)	SBC1 (T)	PBC-15 (T)
<b>K</b> Cast irons (grey cast iron) GG25 GG30 GG35	unstable (varied depth)	PBC-10 (T)		PBC-15 (T)		PBC-15 (T)		PBC-10 (T)
	continuous	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	PBC-10 (T)	PBC-17 (T)	PBC-10 (T)	PBC-15 (T)
	heavily + slightly interrupted	PBC-10 (T)	PBC-17 (T)	PBC-25 (T)	SBC1 (T)	PBC-17 (T)	SBC1 (T)	PBC-15 (T)
	unstable (varied depth)	PBC-15 (T)		PBC-15 (T)		PBC-15 (T)		PBC-10 (T)
	continuous	PBC-15 (T)		SBC1 (T)		PBC-10 (T)		PBC-10 (T)
	heavily + slightly interrupted	PBC-15 (T)		PBC-10 (T)		PBC-10 (T)		PBC-10 (T)
<b>K</b> Cast irons (nodular cast iron) GGG40 GGG50 GGG60 GGG70	unstable (varied depth)							
	continuous		PBC-25 (T)	SBC1 (T)	PBC-17 (T)	SBC1 (T)	PBC-17 (T)	PBC-10 (T)
	heavily + slightly interrupted		PBC-17 (T)		SBC1 (T)	PBC-17 (T)	SBC1 (T)	PBC-17 (T)

Cutting Data for Milling  
**K: Cast Iron, Grey & Nodular Cast Iron**

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice  
Milling: Without coolant, T-and version only

# Cutting Data for Milling

## N: Nonferrous Metals & Nonmetallics

### High-Speed Milling

Materials	Conditions of chip removal	Range of application N01 - N40						Rt + Vc	
		N01 - N20 (HSC) see page 6			N20 - N30 (HSC) see page 6				
		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$		Rt (Rz) $\mu$	
<b>N</b> Nonferrous metals	High-speed milling	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 400 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	100 $\mu$ in - 400 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 100 $\mu$ in	200 $\mu$ in - 400 $\mu$ in
	unstable (varied depth)	MDC	PDC-S	MDC	PDC-S	PDC-S	MDC	PDC-S	PDC-S
	Aluminum alloys without silicon	4875-19500	2600-14625	2600-13000	4875-16250	2600-13000	2600-9750	4875-11375	2600-8125
	continuous	MDC	PDC-S	MDC	PDC-S	PDC-S	MDC	PDC-S	PDC-S
<b>N</b> Nonferrous metals	heavily + slightly interrupted	4875-19500	2600-14625	2600-13000	4875-16250	2600-13000	2600-9750	4875-11375	2600-8125
	(varied depth)	MDC	PDC-S	MDC	PDC-S	PDC-S	MDC	PDC-S	PDC-S
	unstable	4875-19500	2600-14625	2600-13000	4875-16250	2600-13000	2600-9750	4875-11375	2600-8125
	continuous	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
<b>N</b> Nonferrous metals	Aluminum alloys with less than 12% silicon	2600-13000	2600-11375		2600-11375	2600-9750		2600-8775	1950-5850
	heavily + slightly interrupted	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
	(varied depth)	2600-13000	2600-11375		2600-11375	2600-9750		2600-8775	1950-5850
	unstable		PDC-S		PDC-S	PDC-S	PDC-S	PDC-S	PDC-S
<b>N</b> Nonferrous metals	continuous			2600-9750			2275-8125		1950-4875
	heavily + slightly interrupted			PDC-S		PDC-S	PDC-S	PDC-S	PDC-S
	(varied depth)			2600-9750			2275-8125		1950-4875
	more than 12% silicon								

Coolidant: Air (plastics) or flood coolant (metals), it is tool life only that is reduced when cutting without cooling, the surface finish, however, is not affected.

## High-Speed Milling

Materials	Conditions of chip removal	Range of application N01 - N40						Rt + Vc
		N01 - N20 (HSC) see page 6			N20 - N30 (HSC) see page 6			
		Rt (Rz) $\mu$	Rt (Rz) $\mu$	Rt (Rz) $\mu$	Rt (Rz) $\mu$	Rt (Rz) $\mu$	Rt (Rz) $\mu$	
<b>N</b> Nonferrous metals Copper and copper alloys brass, bronze, precious metals	High-speed milling	3.2 $\mu$ in - 80 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	200 $\mu$ in - 400 $\mu$ in	3.2 $\mu$ in - 80 $\mu$ in	100 $\mu$ in - 200 $\mu$ in	3.2 $\mu$ in - 80 $\mu$ in	200 $\mu$ in - 400 $\mu$ in
	unstable (varied depth)	MDC	PDC-S		MDC	PDC-S	MDC	PDC-S
	continuous	4875-16250	2600-9750		4875-11375	2600-8125	3900-9750	2275-7150
	heavily + slightly interrupted	4875-16250	2600-9750		4875-11375	2600-8125	3900-9750	2275-7150
	unstable (varied depth)	MDC	PDC-S		MDC	PDC-S	MDC	PDC-S
	continuous	4875-13000	2600-9750		2925-8125	1950-7150	2275-7150	1625-5200
<b>N</b> Non-metallics pure plastics without reinforcement (i.e. plexiglass)	heavy + slightly interrupted	4875-13000	2600-9750		2925-8125	1950-7150	2275-7150	1625-5200
	unstable (varied depth)	4875-13000	2600-9750		2925-8125	1950-7150	2275-7150	1625-5200
	continuous	4875-13000	2600-9750		2925-8125	1950-7150	2275-7150	1625-5200
	heavily + slightly interrupted	4875-13000	2600-9750		2925-8125	1950-7150	2275-7150	1625-5200
	unstable (varied depth)	1950-7150			1950-5200		1950-5200	1300-3900
	continuous		PDC-S		PDC-S		PDC-S	1300-3900
<b>N</b> Non-metallics plastics with reinforcement (i.e. GRP, CRP)	heavily + slightly interrupted		PDC-S		1950-5200		PDC-S	1300-3900
	unstable (varied depth)	1950-7150			1950-5200		1950-5200	1300-3900

Cutting Data for Milling  
**N: Nonferrous Metals & Nonmetallics**

Cooolant: Air (plastics) or flood coolant (metals), it is tool life only that is reduced when cutting without cooling, the surface finish, however, is not affected.

# Cutting Data for Milling

## H: Hard Materials

### High-Speed Milling

Materials	Conditions of chip removal	Range of application H01 - H40						Ra + Vc		
		H01 - H15 see page 6			H05 - H20 see page 6					
		Ra µin		Ra µin		Ra µin		Ra µin		
<b>H</b> Hard materials hardened steel HRC 54-60 hard milling	High-speed milling	8-32	32-63	63-125	8-32	32-63	63-125	8-32	32-63	63-125
	unstable (varied depth)									
	continuous	SB40 (T)	PBC-17 (T)	PBC-25 (T)	SB40 (T)	PBC-17 (T)	PBC-25 (T)	SB25 (T)	SB25 (T)	SB25 (T)
		1625-2925	1463-2600	1625-2925	1463-2925	1300-2600	1463-2925	1138-2600	975-2275	
	heavily + slightly interrupted	PBC-20 (T)	PBC-30 (T)	PBC-25 (T)	PBC-20 (T)	PBC-30 (T)	PBC-25 (T)	SB25 (T)	SB25 (T)	SB25 (T)
		1300-2275	1463-2925	1788-3900	1138-2113	1300-2925	1463-2925	1300-2600	1138-2275	
<b>H</b> Hard materials hardened steel HRC 58-65 hard milling	unstable (varied depth)									
	continuous	SB40 (T)	PBC-17 (T)	PBC-25 (T)	SB40 (T)	PBC-17 (T)	PBC-25 (T)	SB25 (T)	SB25 (T)	SB25 (T)
		1625-3088	1625-2925	1950-2925	1463-2925	1463-2925	1788-2925	1300-2600	1138-2275	
	heavily + slightly interrupted	PBC-20 (T)	PBC-30 (T)	PBC-25 (T)	PBC-20 (T)	PBC-30 (T)	PBC-25 (T)	SB25 (T)	SB25 (T)	SB25 (T)

PCBN Grades, Position 1: Primary Choice | Position 2: Alternate Choice

T = (T-Land) for interrupted and continuous turning, F = (Sharp) continuous turning only

## Trouble Shooting for PCD Applications

Trouble Shooting - PCD Applications		
Problem	Cause	Suggested Action
<b>Poor surface quality</b>	Vibration	1. Check rigidity of tool & set-up
	Too high feed rate	2. Lower feed rate, increase nose radius or change to wiper
	Wrong grade	3. Choose finer grain size
<b>Premature wear</b>	Wrong speed	1. Decrease speed (Check cutting data tables)
	Wrong grade	2. Choose coarser grain size
<b>Edge chipping</b>	Vibration	1. Check rigidity of tool & set-up
	Wrong cutting data	2. Check speeds & feeds in cutting data for your application
	Wrong grade	3. Choose coarser grain size
<b>Tip dislodging</b>	Excessive cutting temperature	1. Increase coolant to tip
		2. Decrease speed
		3. Reduce depth of cut
		4. Increase tip size
<b>In addition to the recommendations in this catalogue, the following general rules apply to PCD applications:</b> <ul style="list-style-type: none"> <li>- Rigid machines and set-ups</li> <li>- Minimum tool overhangs</li> <li>- Choose most positive cutting edge angle possible</li> <li>- Use coolant for metalics</li> <li>- Use air for non-metalics</li> </ul>		

# Trouble Shooting for CBN Applications

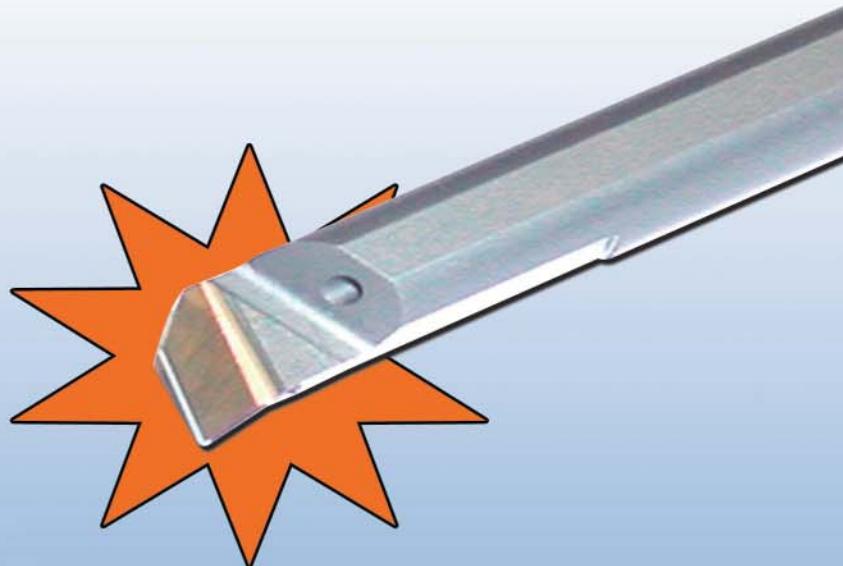
Trouble Shooting - CBN Applications		
Problem	Cause	Suggested Action
<b>Poor surface quality</b>	Vibration	1. Check rigidity of tool & set-up
	Too high feed	2. Lower feed rate, increase nose radius or change to wiper
	Too sharp insert	3. Increase chamfer angle
	Wrong grade	4. Choose finer grain size
<b>Premature wear</b>	Wrong speed	1. Increase speed (Check cutting data tables)
	Too sharp insert	2. Increase chamfer angle
	Wrong grade	3. Choose finer grain size
<b>Edge chipping</b>	Vibration	1. Check rigidity of tool & set-up
	Interruption	2. Increase chamfer angle and hone
	Wrong grade	3. Choose coarser grain size
<b>Vibration</b>	Poor set-up	1. Check rigidity of tool & set-up
	Too light feed	2. Increase feed / or D.O.C.
	Too much pressure	3. Choose more positive insert geometry / cutting edge angle
	Improper edge prep	4. Reduce chamfer angle
	Too much pressure	5. Reduce nose radius
<b>In addition to the recommendations in this catalogue, the following general rules apply to CBN applications:</b>		
<ul style="list-style-type: none"> <li>- Rigid machines and set-ups</li> <li>- Minimum tool overhangs</li> <li>- Choose largest cutting edge angle possible</li> <li>- Negative inserts wherever possible</li> </ul>		

# MiniCut



## Tipped carbide boring bars!

- Able to achieve depths of up to  $7 \times D$ !
- Solid tungsten carbide design!
- $75^\circ$  positive insert style produces excellent cutter performance!
- Featuring MAXICOOL™ through coolant technology!



**3/16" & 1/4" I.C. sizes  
available in PCD & CBN!**



# MiniCut - Index

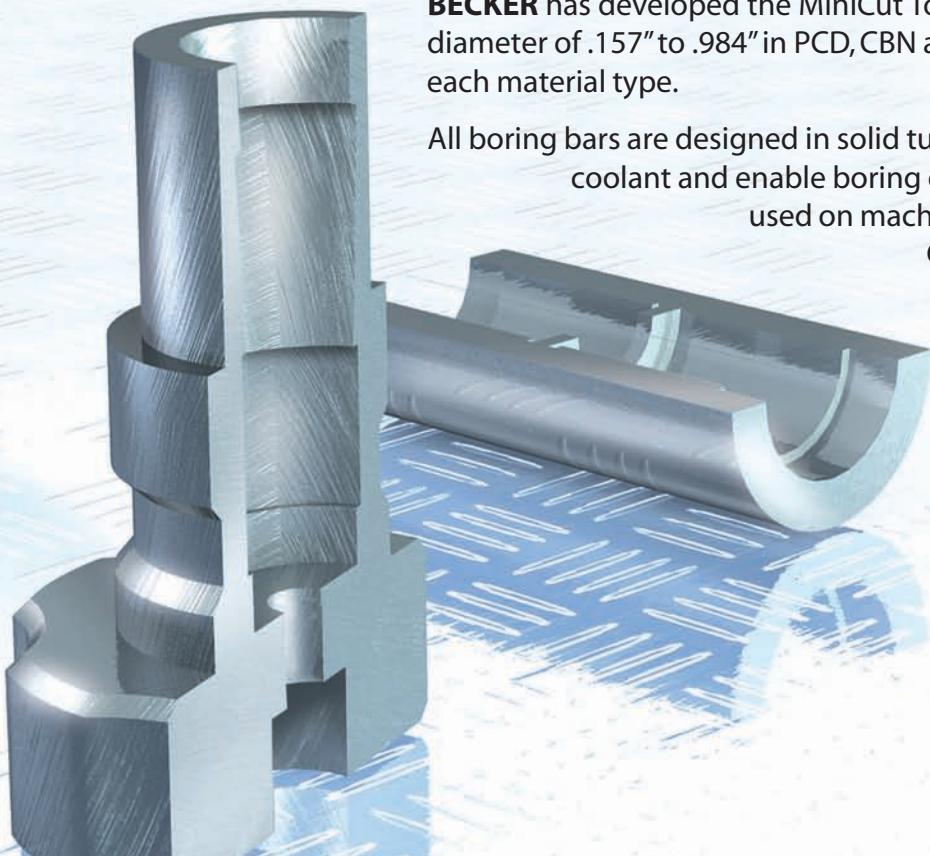
Tipped Carbide Boring Bars, PCD .....	page 33
Tipped Carbide Boring Bars, CBN .....	page 34 & 35
Adapter Sleeve for Boring Bars .....	page 35
Boring Bar, Solid Carbide, C...SWUC, Inch .....	page 36
Boring Bar, Solid Carbide, E...SEUP, Inch & Metric .....	page 36
EPHT Fullface, fullface wiper edge, PCD .....	page 37
EPHW Fullface, fullface wiper edge, PCD .....	page 37
EPHT wiper edge, MDC .....	page 38
EPHW wiper edge, MDC .....	page 38
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WCGW Fullface, PCD .....	page 39
EPHT Fullface, fullface wiper edge, CBN .....	page 40
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EPHT EW,EW wiper edge,CBN .....	page 41
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EPHW EWS wiper edge, CBN .....	page 42
WCGW Fullface, CBN .....	page 43

**BECKER** has developed the MiniCut Tool System especially for boring from a diameter of .157" to .984" in PCD, CBN and MDC optimizing the advantages of each material type.

All boring bars are designed in solid tungsten carbide with integrated through coolant and enable boring depths of up to 7xD. Our MiniCut tools are used on machining centers and turning machines.

Contrary to most conventional tool systems we use the positive indexable inserts type EPHW and EPHT. The advantages of the 75° insert style enables higher cutting performance and precision. The tipped boring bars have the identical shape for the full diameter range.

The Wiper-Indexable Inserts with neutral or positive rake angle and tipped Wiper- Boring Bars with neutral rake angle are used for high-tech machining with high productivity, also increasing the flexibility of the MiniCut-System considerably.



## PCD Tipped Carbide Boring Bars

Cylindrical solid carbide boring bar with one clamping surface, tipped cutting edge and internal coolant feed

For Adapter Sleeves, see page 35



**X-GE** Right or left hand

Designation Right hand	Designation Left hand	Dimensions						PDC-S	PDC	PDC-L	MDC
		dmin	l	d <sup>g7</sup>	f	l <sup>2</sup>	r				
X3.5F-GEUPR01	X3.5F-GEUPL01	.157	3.15	.138	.079	.47	.004	■			
X3.5F-GEUPR02	X3.5F-GEUPL02						.008	■			
X04F-GEUPR01	X04F-GEUPL01	.197	3.15	.157	.098	.55	.004	■			
X04F-GEUPR02	X04F-GEUPL02						.008	■			
X04F-GEUPR04	X04F-GEUPL04	.236	3.94	.197	.118	.71	.016	■			
X05H-GEUPR01	X05H-GEUPL01						.004	■			
X05H-GEUPR02	X05H-GEUPL02	.275	3.94	.236	.138	.79	.008	■			
X05H-GEUPR04	X05H-GEUPL04						.016	■			
X06H-GEUPR01	X06H-GEUPL01	.275	3.94	.236	.138	.79	.004	■			
X06H-GEUPR02	X06H-GEUPL02						.008	■			
X06H-GEUPR04	X06H-GEUPL04						.016	■			

## PCD / MDC Tipped Carbide Boring Bars, wiper edge

Cylindrical solid carbide boring bar with one clamping surface, tipped cutting edge and internal coolant feed

For Adapter Sleeves, see page 35



**X-GE** Right or left hand wiper edge

Designation Right hand	Designation Left hand	Dimensions						PDC-S	PDC	PDC-L	MDC
		dmin	l	d <sup>g7</sup>	f	l <sup>2</sup>	r				
X3.5F-GEUPRW01	X3.5F-GEUPLW01	.157	3.15	.138	.079	.47	.004	■			
X3.5F-GEUPRW02	X3.5F-GEUPLW02						.008	■			
X04F-GEUPRW01	X04F-GEUPLW01	.197	3.15	.157	.098	.55	.004	■			
X04F-GEUPRW02	X04F-GEUPLW02						.008	■			
X04F-GEUPRW04	X04F-GEUPLW04	.236	3.94	.197	.118	.71	.016	■			
X05H-GEUPRW01	X05H-GEUPLW01						.004	■			
X05H-GEUPRW02	X05H-GEUPLW02	.275	3.94	.236	.138	.79	.008	■			
X05H-GEUPRW04	X05H-GEUPLW04						.016	■			
X06H-GEUPRW01	X06H-GEUPLW01	.275	3.94	.236	.138	.79	.004	■			
X06H-GEUPRW02	X06H-GEUPLW02						.008	■			
X06H-GEUPRW04	X06H-GEUPLW04						.016	■			

# Tools - CBN

## CBN Tipped Carbide Boring Bars

Cylindrical solid carbide boring bar with one clamping surface, tipped cutting edge and internal coolant feed.

For Adapter Sleeves, see page 35



**X-GE** Right or left hand

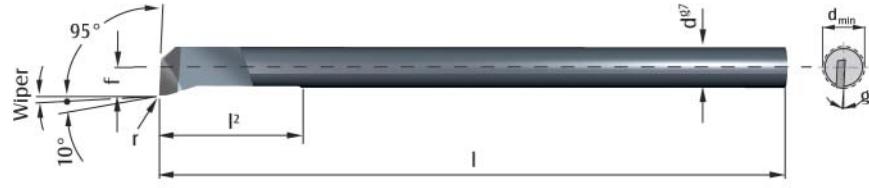
Designation Right hand	Designation Left hand	Right hand bar shown					SBC1	SB10	SB25	SB40
		dmin	l	d <sup>97</sup>	f	l <sup>2</sup>	r	BH	BL	
X3.5F-GEUPRT01	X3.5F-GEUPLT01	.157	3.15	.138	.079	.47	.004	■	■	■ ■
X3.5F-GEUPRF02	X3.5F-GEUPLF02						.008		■	■ ■
X3.5F-GEUPRT02	X3.5F-GEUPLT02						.008	■	■	■ ■
X04F-GEUPRT01	X04F-GEUPLT01	.197	3.15	.157	.098	.55	.004	■	■	■ ■
X04F-GEUPRF02	X04F-GEUPLF02						.008		■	■ ■
X04F-GEUPRT02	X04F-GEUPLT02						.008	■	■	■ ■
X04F-GEUPRF04	X04F-GEUPLF04						.016		■	■ ■
X04F-GEUPRT04	X04F-GEUPLT04						.016	■	■	■ ■
X05H-GEUPRT01	X05H-GEUPLT01	.236	3.94	.197	.118	.71	.004		■	■ ■
X05H-GEUPRF02	X05H-GEUPLF02						.008		■	■ ■
X05H-GEUPRT02	X05H-GEUPLT02						.008	■	■	■ ■
X05H-GEUPRF04	X05H-GEUPLF04						.016		■	■ ■
X05H-GEUPRT04	X05H-GEUPLT04						.016	■	■	■ ■
X06H-GEUPRT01	X06H-GEUPLT01	.275	3.94	.236	.138	.79	.004		■	■ ■
X06H-GEUPRF02	X06H-GEUPLF02						.008		■	■ ■
X06H-GEUPRT02	X06H-GEUPLT02						.008	■	■	■ ■
X06H-GEUPRF04	X06H-GEUPLF04						.016		■	■ ■
X06H-GEUPRT04	X06H-GEUPLT04						.016	■	■	■ ■

Note: X3.5T-GEUPLT01: F= sharp cutting edge, L= T-Land

## CBN Tipped Carbide Boring Bars, wiper edge

Cylindrical solid carbide boring bar with one clamping surface, tipped cutting edge and internal coolant feed.

For Adapter Sleeves, see below



### X-GE Right or left hand wiper edge

Designation Right hand	Designation Left hand	Dimensions						Right hand bar shown			
		d <sub>min</sub>	l <sup>1</sup>	d <sup>H7</sup>	f	l <sup>2</sup>	r	BH	BL	SB25	SB40
X3.5F-GEUPRTW01	X3.5F-GEUPLTW01						.004		■	■	
X3.5F-GEUPRFW02	X3.5F-GEUPLFW02	.157	3.15	.138	.079	.47	.008		■	■	
X3.5F-GEUPRTW02	X3.5F-GEUPLTW02						.008	■	■	■	■
X04F-GEUPRFW02	X04F-GEUPLFW02						.008		■	■	
X04F-GEUPRTW02	X04F-GEUPLTW02	.197	3.15	.157	.098	.55	.008	■	■	■	■
X04F-GEUPRTW03	X04F-GEUPLTW03						.012		■	■	
X05H-GEUPRFW02	X05H-GEUPLFW02						.008		■	■	
X05H-GEUPRTW02	X05H-GEUPLTW02	.236	3.94	.197	.118	.71	.008	■	■	■	■
X05H-GEUPRTW04	X05H-GEUPLTW04						.016		■	■	
X06H-GEUPRFW02	X06H-GEUPLFW02						.008		■	■	
X06H-GEUPRTW02	X06H-GEUPLTW02	.275	3.94	.236	.138	.79	.008	■	■	■	■
X06H-GEUPRFW04	X06H-GEUPLFW04						.016		■	■	
X06H-GEUPRTW04	X06H-GEUPLTW04						.016	■	■	■	■

## Adapter Sleeve for Boring Bars form X...GEUP

Adapter Sleeves enable versatile use of the boring bars in all areas

Coolant feed is provided through the adapter.

Only for BECKER - Form X...GE



### Inch

Designation	D	d	d <sup>H7</sup>	d <sup>H7</sup> mm	H	I	Boring Bar
ADAP-0.625-35	.625	.157	.138	3.5	.551	3.94	X 3.5 F - GEUP R/L
ADAP-0.625-40	.625	.197	.157	4	.551	3.94	X 04 F - GEUP R/L
ADAP-0.625-50	.625	.236	.197	5	.551	3.94	X 05 H - GEUP R/L
ADAP-0.625-60	.625	.315	.236	6	.551	3.94	X 06 H - GEUP R/L

### Metric

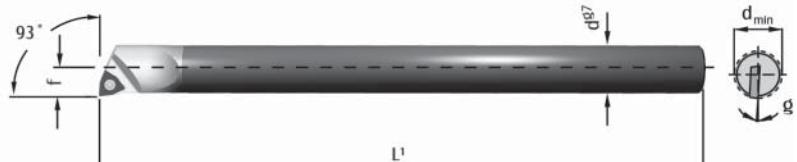
Designation	D	d	d <sup>H7</sup>	H	I	Boring Bar
ADAP-1635	16	4	3.5	14	100	X 3.5 F - GEUP R/L
ADAP-1640	16	5	4	14	100	X 04 F - GEUP R/L
ADAP-1650	16	6	5	14	100	X 05 H - GEUP R/L
ADAP-1660	16	6	6	14	100	X 06 H - GEUP R/L

Note: X3.5T-GEUPLI01: E= sharp cutting edge, I= T-Land

# Tools for PCD / CBN

## Boring Bar, Solid Carbide, Design C...SWUC, right or left hand

Boring bar with cylindrical solid carbide shank



### Inch

Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
C03A-SWUCR-12	C03A-SWUCL-12	.228	.188	4.78	.114	4.000	17°	WCGW-1.21..
C04A-SWUCR-12	C04A-SWUCL-12	.312	.250	6.35	.156	4.000	17°	WCGW-1.21..
*E04A-SWUCR-12	*E04A-SWUCL-12	.312	.250	6.35	.156	4.000	17°	WCGW-1.21..

\*This item is supplied with coolant

## Boring Bar, Solid Carbide, Design E...SEUP, right or left hand

Boring bar with cylindrical solid carbide shank,  
two clamping surfaces and internal coolant feed

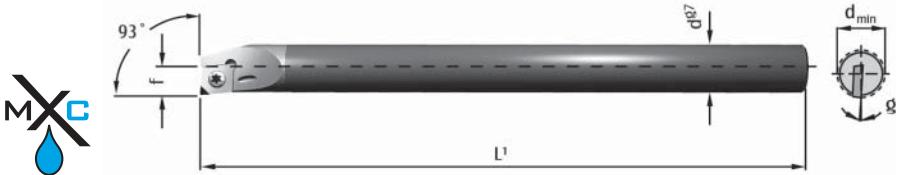


### Metric

Designation	d min	d	f	L <sup>1</sup>	L <sup>2</sup>	d <sup>g7</sup>	d <sup>g7</sup> mm	h	g	Insert
E0610H-SEUPR/L-04	.268	.236	.134	3.94	1.42	.394	10	.31	9°	EPH.. 1.51..
E0710K-SEUPR/L-04	.331	.276	.173	4.92	1.65	.394	10	.31	5°	EPH.. 1.51..
E0810K-SEUPR/L-04	.374	.315	.193	4.92	1.89	.394	10	.31	5°	EPH.. 1.51..

## Boring Bar, Solid Carbide, Design E...SEUP, right or left hand

Boring bar with cylindrical solid carbide shank  
and internal coolant feed



### Inch

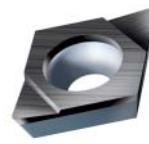
Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
E04H-SEUPR-15	E04H-SEUPL-15	.290	.250	6.35	.142	4	5°	EPH.. 1.51..
E05K-SEUPR-15	E05K-SEUPL-15	.350	.312	7.94	.173	5	5°	EPH.. 1.51..
E06M-SEUPR-2	E06M-SEUPL-2	.400	.375	9.53	.205	6	5°	EPH.. 21.2..

### Metric

Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
E06F-SEUPR-04	E06F-SEUPL-04	.268	.236	6	.134	3.15	9°	EPH.. 1.51..
E07H-SEUPR-04	E07H-SEUPL-04	.331	.276	7	.173	3.94	5°	EPH.. 1.51..
E08H-SEUPR-04	E08H-SEUPL-04	.374	.315	8	.193	3.94	5°	EPH.. 1.51..
E10K-SEUPR-06	E10K-SEUPL-06	.453	.394	10	.228	4.92	5°	EPH.. 21.2..
E12M-SEUPR-06	E12M-SEUPL-06	.531	.472	12	.272	5.91	3°	EPH.. 21.2..
E16R-SEUPR-06	E16R-SEUPL-06	.728	.630	16	.386	7.87	0°	EPH.. 21.2..

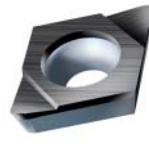
Note: for right hand boring bars use left hand wiper inserts, for left hand boring bars use right hand wiper inserts

# Inserts - PCD



## EPHT Fullface

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHT-1.510-VM	.187	.087	.062	.193	--	.004	■	■		
	EPHT-1.510.5-VM						.008	■	■		
	EPHT-1.511-VM						.016	■	■		

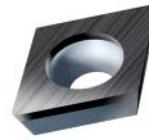


## EPHT Fullface right or left hand wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHT-1.510R/LW-VM	.187	.087	.062	.193	--	.004	■	■		
	EPHT-1.510.5R/LW-VM						.008	■	■		
	EPHT-1.511R/LW-VM						.016	■	■		

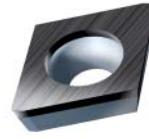
Left hand shown

Ordering Example: 10 pcs. EPHT-1.510RW-VM PDC (Right Hand)



## EPHW Fullface

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHW-1.510-VM	.187	.087	.062	.193	--	.004	■	■		
	EPHW-1.510.5-VM						.008	■	■		
	EPHW-1.511-VM						.016	■	■		



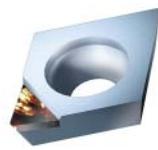
## EPHW Fullface right or left hand wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHW-1.510R/LW-VM	.187	.087	.062	.193	--	.004	■	■		
	EPHW-1.510.5R/LW-VM						.008	■	■		
	EPHW-1.511R/LW-VM						.016	■	■		

Left hand shown

Ordering Example: 10 pcs. EPHW-1.510RW-VM PDC (Right Hand)

# Inserts - PCD / MDC



## EPHT Right or left hand wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHT-1.510R/LW	.187	.087	.062	.193	.063	.004				
	EPHT-1.510.5R/LW					.059	.008				
	EPHT-1.511R/LW					.051	.016				
	EPHT-21.20R/LW	.250	.110	.078	.260	.102	.004				
	EPHT-21.20.5R/LW					.094	.008				
	EPHT-21.21R/LW					.086	.016				

Left hand shown

Ordering Example: 10 pcs. EPHT-1.510RW MDC (Right Hand)

## EPHW Right or left hand wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHW-1.510R/LW	.187	.087	.062	.193	.063	.004				
	EPHW-1.510.5R/LW					.059	.008				
	EPHW-1.511R/LW					.051	.016				
	EPHW-21.20R/LW	.250	.110	.078	.260	.102	.004				
	EPHW-21.20.5R/LW					.094	.008				
	EPHW-21.21R/LW					.086	.016				

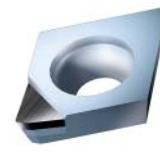
Left hand shown

Ordering Example: 10 pcs. EPHW-1.510RW MDC (Right Hand)

## EPHT

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHT-21.20	.250	.110	.078	.260	.122	.004		■	■	
	EPHT-21.20.5					.118	.008		■	■	
	EPHT-21.21					.110	.016		■	■	

# Inserts - PCD

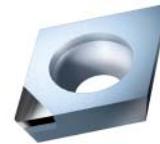


## EPHT Right or left hand wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHT-21.20R/LW				.122	.004		■	■		
	EPHT-21.20.5R/LW	.250	.110	.078	.260	.118	.008	■	■		
	EPHT-21.21R/LW					.110	.016	■	■		

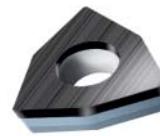
Left hand shown

Ordering Example: 10 pcs. EPHT-21.20RW PDC (Right Hand)



## EPHW

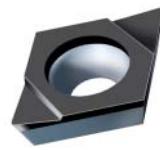
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPHW-21.20				.122	.004		■	■		
	EPHW-21.20.5	.250	.110	.078	.260	.118	.008	■	■		
	EPHW-21.21					.110	.016	■	■		



## WCGW Fullface

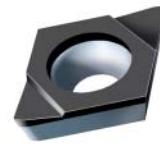
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	WCGW-1.210.5-VM				.106	.008		■			
	WCGW-1.211-VM	.156	.091	.062	--			■			

# Inserts - CBN



**EPHT** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHT-1.510.5F-VM	.187	.087	.062	.193	--	.008	■	■	■		■		■
	EPHT-1.510.7F-VM						.012	■				■		■
	EPHT-1.511F-VM						.016	■				■		■

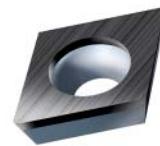


**EPHT** Fullface right or left hand wiper edge

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHT-1.510.5FR/LW-VM	.187	.087	.062	.193	--	.008	■	■	■		■		■
	EPHT-1.510.7FR/LW-VM						.012	■	■			■		■

Left hand shown

Ordering Example: 10 pcs. EPHT-1.510.5FRW-VM PBC-10 (Right Hand)

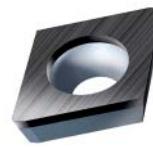


**EPHW** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHW-1.510F-VM	.187	.087	.062	.193	--	.004	■				■		■
	EPHW-1.510T-VM						.004	■				■	■	■
	EPHW-1.510.5F-VM						.008	■	■	■		■		■
	EPHW-1.510.5T-VM						.008	■	■	■		■		■
	EPHW-1.510.7F-VM						.012	■	■	■		■		■
	EPHW-1.510.7T-VM						.012	■	■	■		■		■
	EPHW-1.511F-VM						.016	■	■			■		■
	EPHW-1.511T-VM						.016	■		■		■		■

Note: EPHT-1.510.5F-VM: F= sharp cutting edge, T= T-Land

# Inserts - CBN

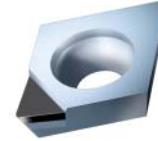


**EPHW** Fullface right or left hand wiper edge

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHW-1.510TR/LW-VM	.187	.087	.062	.193	--	.004	■			■	■	■	■
	EPHW-1.510.5FR/LW-VM						.008	■	■	■		■	■	■
	EPHW-1.510.5TR/LW-VM						.008	■	■	■	■	■	■	■
	EPHW-1.511TR/LW-VM						.016	■			■	■	■	■

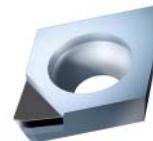
Left hand shown

Ordering Example: 10 pcs. EPHW-1.510TRW-VM PBC-10 (Right Hand)



**EPHT** EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHT-21.20.5F-EW	.250	.110	.078	.260	--	.118	.008	■	■	■		■	■
	EPHT-21.21F-EW						.110	.016	■	■	■		■	■



**EPHT** EW right or left hand wiper edge

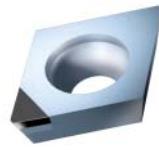
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPHT-21.20.5FR/LW-EW	.250	.110	.078	.260	--	.118	.008	■	■	■		■	■
	EPHT-21.21FR/LW-EW						.110	.016	■				■	■

Left hand shown

Ordering Example: 10 pcs. EPHT-21.20.5FRW-EW PBC-10 (Right Hand)

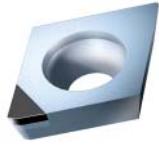
Note: EPHT-1.510.5F-VM: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## EPHW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	EPHW-21.20F-EW	.250	.110	.078	.260	.122	.004	■				■	■	■
	EPHW-21.20T-EW					.122	.004	■				■	■	■
	EPHW-21.20.5F-EW					.118	.008	■	■	■		■	■	■
	EPHW-21.20.5T-EW					.118	.008	■	■	■	■	■	■	■
	EPHW-21.21F-EW					.110	.016	■	■	■		■	■	■
	EPHW-21.22T-EW					.094	.031	■	■	■	■	■	■	■
	EPHW-21.22F-EW					.094	.031	■	■	■		■	■	■
	EPHW-21.22T-EW					.094	.031	■	■	■	■	■	■	■

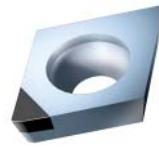


## EPHW EW right or left hand wiper edge

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	EPHW-21.20.5FR/LW-EW	.250	.110	.078	.260	.118	.008	■	■	■		■	■	■
	EPHW-21.20.5TR/LW-EW					.118	.008	■	■	■	■	■	■	■
	EPHW-21.21FR/LW-EW					.110	.016	■	■	■		■	■	■
	EPHW-21.21TR/LW-EW					.110	.016	■	■	■	■	■	■	■

Left hand shown

Ordering Example: 10 pcs. EPHW-21.20.5FRW-EW PBC-10 (Right Hand)



## EPHW EWS right or left hand wiper edge

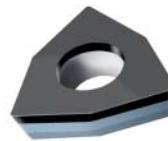
Insert	Designation	Dimensions						SB1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	EPHW-21.20TR/LW-EWS	.250	.110	.078	.260	.122	.004		■		■	■
	EPHW-21.20.5FR/LW-EWS					.118	.008		■		■	■
	EPHW-21.20.5TR/LW-EWS					.118	.008		■		■	■
	EPHW-21.21FR/LW-EWS					.110	.016		■		■	■
	EPHW-21.21TR/LW-EWS					.110	.016		■		■	■

Left hand shown

Ordering Example: 10 pcs. EPHW-21.20.5FRW-EWS SB10 (Right Hand)

Note: EPHT-1.510.5E-VM: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**WCGW** Fullface

Insert	Designation	Dimensions					PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	<sup>1</sup>							
	WCGW-1.210.5F-VM	.156	.091	.062	--	.106	.008	■	■	■	■	■	■
	WCGW-1.210.5T-VM					.106	.008	■			■	■	■
	WCGW-1.211F-VM					.106	.016	■			■	■	■
	WCGW-1.211T-VM					.106	.016	■	■	■	■	■	■

Note: EPHT-1.510.5F-VM: F= sharp cutting edge, T= T-Land

# Notes



# FormCut

Available in  
PCD & CBN!

threading



grooving



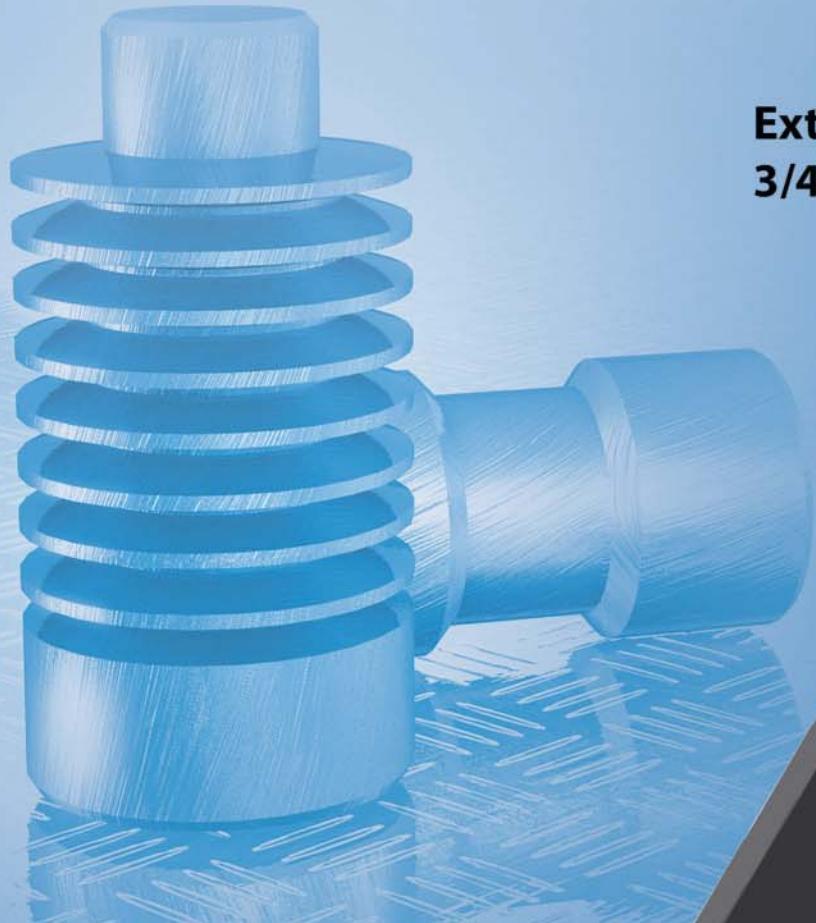
copying



profiling



External holders available in  
3/4", 1", & 1.25" sizes!



# FormCut - Index

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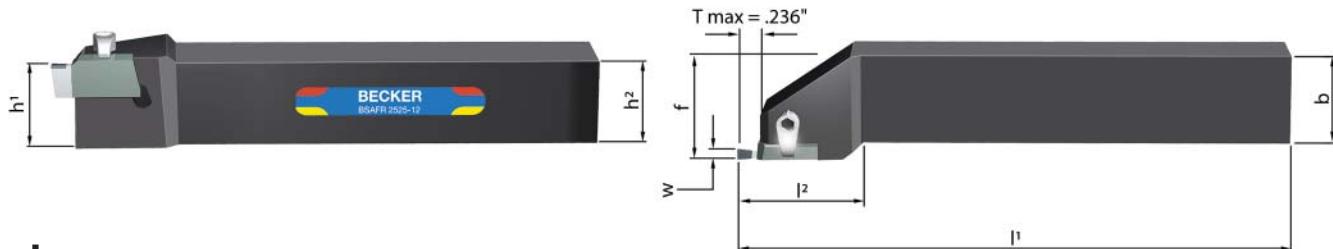
BECKER has developed the FormCut Grooving and Turning Tool System in PCD, CBN & MDC for High Precision Grooving, Groove and Turning, Profiling and Threading. The extremely rigid and precision machined insert pocket eliminates any micro-displacement and the tightest part tolerances can be achieved by using the full range precision ground FormCut- Indexable Inserts.

Using a special 6-axis CNC-grinding technique we achieve perfect reproducible macro and micro cutting edge geometries on all CBN FormCut Indexable Inserts.

Our absolutely rigid FormCut Tool System in conjunction with all ultrahard cutting materials is ideally suited for the highest precision in profiling, grooving, thread cutting. The cutting materials, MDC, PCD and CBN significantly extend the application possibilities for high tech machining in the HSC- and HPC- area.

Positive edges are offered in PCD and CBN. Only flat profiles are possible in MDC due to the highly complex and unusual polishing technology required.

## Toolholder, external radial grooving



### Inch

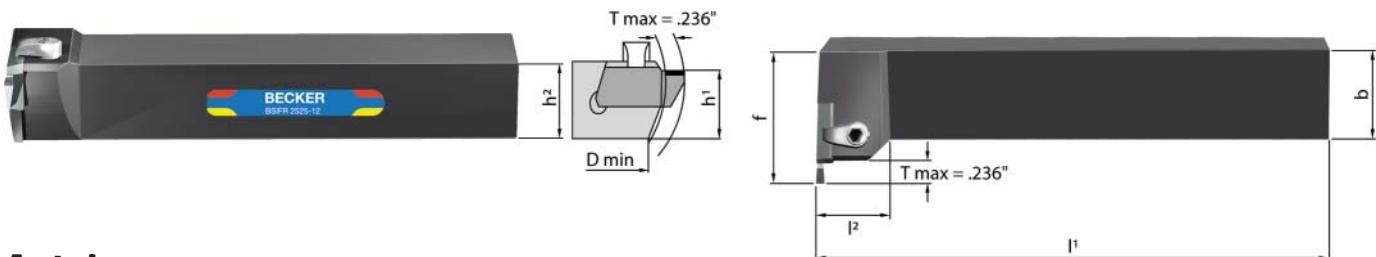
Designation Right hand	Designation Left hand	$h^1$	$h^2$	$b$	$f$	$l^1$	$l^2$
BSAFR-12-FC12	BSAFL-12-FC12	.750	.750	.750	1.000	5.00	1.250
BSAFR-16-FC12	BSAFL-16-FC12	1.000	1.000	1.000	1.250	6.00	1.250
BSAFR-20-FC12	BSAFL-20-FC12	1.250	1.250	1.250	1.500	6.00	1.250

Note: for "w" dimension, please refer to insert section

## Metric

Designation Right hand	Designation Left hand	$h^1$	$h^2$	$b$	$f$	$l^1$	$l^2$
BSAFR-1616-12	BSAFL-1616-12	16	16	16	20	106	31
BSAFR-2020-12	BSAFL-2020-12	20	20	20	24	131	31
BSAFR-2525-12	BSAFL-2525-12	25	25	25	30	156	31
BSAFR-3225-12	BSAFL-3225-12	32	32	25	30	176	31

## Toolholder, internal radial grooving



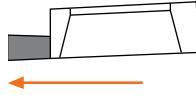
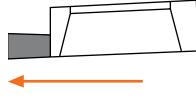
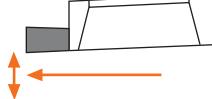
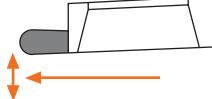
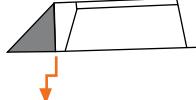
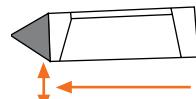
### Metric

Designation Right hand	Designation Left hand	$h^1$	$h^2$	$b$	$f$	$l^1$	$l^2$	$D \text{ min.}$
BSIFR-1616-12	BSIFL-1616-12	16	16	16	28	100	18	50
BSIFR-2020-12	BSIFL-2020-12	20	20	20	32	125	18	72
BSIFR-2525-12	BSIFL-2525-12	25	25	25	37	150	18	110
BSIFR-3225-12	BSIFL-3225-12	32	32	25	37	170	18	110

Note: for right hand toolholders use right hand inserts, for left hand toolholders use left hand inserts only

# Inserts

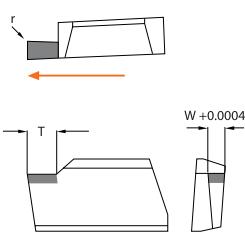
## Using our FormCut Geometries

Type	Insert Outline	Application
BFSP R/L		High precision grooving, developed to hold the tightest tolerances and produce superior finish surfaces on the groove flanks. An axial feed cannot be used. HSC and HPC.
BFSN R/L BFIN R/L		Normal grooving at the usual tolerances and with a good surface quality. Axial feed is possible in the HSC-range using MDC and PDC cutting materials
BFSV R/L BFIV R/L		Grooving and turning. Axial feeds with the usual feed rates.
BFRV R/L		Copying and profiling with an extraordinary surface quality and narrowest of tolerances.
BFDV R/L BFDV R/L-wiper		Profiling as well as side and face turning with the best surface quality.
BFTV R/L		Partial profile for American UN and ISO metric threads. MDC, PDC and CBN cutting materials are most suitable for high-tech threads.

# Inserts - PCD



## BFSP Right or left hand, external, high precision grooving

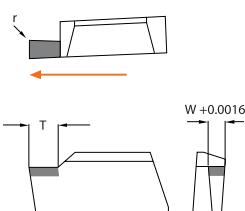
Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Right hand external shown	BFSP2.5-02R/L	.098	.157	.008			■	
	BFSP3.0-02R/L	.118	.197	.008			■	
	BFSP3.0-04R/L	.118	.197	.016			■	
	BFSP3.5-02R/L	.138	.197	.008			■	
	BFSP3.5-04R/L	.138	.197	.016			■	
	BFSP4.0-03R/L	.157	.236	.012			■	
	BFSP4.0-05R/L	.157	.236	.020			■	
	BFSP4.5-03R/L	.177	.236	.012			■	
	BFSP4.5-05R/L	.177	.236	.020			■	
	BFSP5.0-03R/L	.197	.236	.012			■	
	BFSP5.0-05R/L	.197	.236	.020			■	

Tolerance on "W" = +.0004"

Ordering Example: 10 pcs. BFSP2.5-02R PDC (Right Hand)



## BFSN Right or left hand, external, grooving

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Right hand external shown	BFSN2.5-02R/L	.098	.157	.008			■	
	BFSN3.0-02R/L	.118	.236	.008			■	
	BFSN3.0-04R/L	.118	.236	.016			■	
	BFSN3.5-02R/L	.138	.236	.008			■	
	BFSN4.0-02R/L	.157	.236	.008			■	
	BFSN4.0-04R/L	.157	.236	.016			■	
	BFSN4.5-02R/L	.177	.236	.008			■	
	BFSN5.0-02R/L	.197	.236	.008			■	
	BFSN5.0-04R/L	.197	.236	.016			■	

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFSN2.5-02R PDC (Right Hand)

# Inserts



## BFSV Right or left hand, external, grooving & turning

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Right hand external shown	BFSV3.0-02R/L	.118	.236	.008			■	
	BFSV3.0-04R/L	.118	.236	.016			■	
	BFSV3.5-02R/L	.138	.236	.008			■	
	BFSV3.5-04R/L	.138	.236	.016			■	
	BFSV4.0-02R/L	.157	.236	.008			■	
	BFSV4.0-05R/L	.157	.236	.020			■	
	BFSV4.5-02R/L	.177	.236	.008			■	
	BFSV4.5-05R/L	.177	.236	.020			■	
	BFSV5.0-02R/L	.197	.236	.008			■	
	BFSV5.0-06R/L	.197	.236	.024			■	

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFSV3.0-02R PDC (Right Hand)



## BFIN Right or left hand, internal, grooving

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Left hand internal shown	BFIN2.5-02R/L	.098	.157	.008			■	
	BFIN3.0-02R/L	.118	.236	.008			■	
	BFIN3.0-04R/L	.118	.236	.016			■	
	BFIN3.5-02R/L	.138	.236	.008			■	
	BFIN4.0-02R/L	.157	.236	.008			■	
	BFIN4.0-04R/L	.157	.236	.016			■	
	BFIN4.5-02R/L	.177	.236	.008			■	
	BFIN5.0-02R/L	.197	.236	.008			■	
	BFIN5.0-04R/L	.197	.236	.016			■	

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIN2.5-02R PDC (Right Hand)

# Inserts - PCD



## BFIV Right or left hand, internal, grooving & turning

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Left hand internal shown	BFIV3.0-02R/L	.118	.236	.008			■	
	BFIV3.0-04R/L	.118	.236	.016			■	
	BFIV3.5-02R/L	.138	.236	.008			■	
	BFIV3.5-04R/L	.138	.236	.016			■	
	BFIV4.0-02R/L	.157	.236	.008			■	
	BFIV4.0-05R/L	.157	.236	.020			■	
	BFIV4.5-02R/L	.177	.236	.008			■	
	BFIV4.5-05R/L	.177	.236	.020			■	
	BFIV5.0-02R/L	.197	.236	.008			■	
	BFIV5.0-06R/L	.197	.236	.024			■	

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIV3.0-02R PDC (Right Hand)



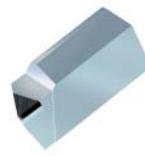
## BFRV Right or left hand, external, copying

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC
		W	T	r				
 Right hand external shown	BFRV 3.0- /L	.118	.236	.059			■	
	BFRV3.5R/L	.138	.236	.069			■	
	BFRV4.0R/L	.157	.236	.079			■	
	BFRV4.5R/L	.177	.236	.089			■	
	BFRV5.0R/L	.197	.236	.098			■	

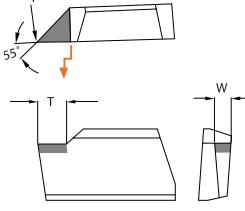
Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIV3.0-02R PDC (Right Hand)

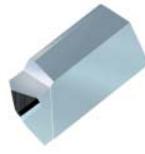
# Inserts - PCD



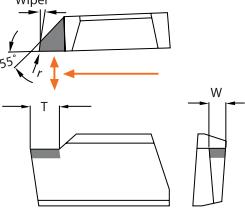
## BFDV Right or left hand, external, profiling

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC		
		W	T	r			DP		DM	
 Right hand external shown	BFDV0.2R/L	.197	.197	.008			■			
	BFDV0.4R/L	.197	.197	.016			■			
	BFDV0.8R/L	.197	.197	.031			■			
	BFDV1.2R/L	.197	.197	.047			■			

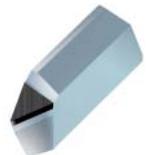
Ordering Example: 10 pcs. BFDV0.2R PDC (Right Hand)



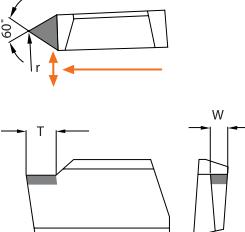
## BFDV Right or left hand, external, side & face turning, wiper edge

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC		
		W	T	r			DP		DM	
 Right hand external shown	BFDV0.2R/LW	.197	.197	.008			■			
	BFDV0.4R/LW	.197	.197	.016			■			
	BFDV0.8R/LW	.197	.197	.031			■			

Ordering Example: 10 pcs. BFDV0.2RW PDC (Right Hand)



## BFTV Right or left hand, external, threading, partial profile

Insert	Designation	Dimensions			PDC-S	PDC	PDC-L	MDC		
		W	T	r			DP		DM	
 Right hand external shown	BFTV0.10R/L	.197	.197	.0040			■			
	BFTV0.14R/L	.197	.197	.0055			■			
	BFTV0.18R/L	.197	.197	.0071			■			
	BFTV0.21R/L	.197	.197	.0083			■			
	BFTV0.25R/L	.197	.197	.0098			■			
	BFTV0.28R/L	.197	.197	.0110			■			
	BFTV0.36R/L	.197	.197	.0142			■			
	BFTV0.43R/L	.197	.197	.0169			■			

Ordering Example: 10 pcs. BFTV0.10R PDC (Right Hand)

# Inserts - CBN



## BFSN Right or left hand, external, grooving

Insert	Designation	Dimensions			PBC-10		PBC-15		PBC-17		PBC-20		PBC-25		PBC-30		PBC-40	
		W	T	r	BH		BL											
 Right hand external shown	BFSN2.5-02R/LF	.098	.118	.008	■				■				■			■		
	BFSN2.5-02R/LT	.098	.118	.008	■				■				■			■		
	BFSN3.0-02R/LF	.118	.236	.008	■				■				■			■		
	BFSN3.0-02R/LT	.118	.236	.008	■	■	■	■	■				■			■		
	BFSN3.5-02R/LF	.138	.236	.008	■				■				■			■		
	BFSN3.5-02R/LT	.138	.236	.008	■				■				■			■		
	BFSN4.0-02R/LF	.157	.236	.008	■				■				■			■		
	BFSN4.0-04R/LF	.157	.236	.016	■				■				■			■		
	BFSN4.0-02R/LT	.157	.236	.008	■	■	■	■	■				■			■		
	BFSN4.0-04R/LT	.157	.236	.016	■	■	■	■	■				■			■		
	BFSN4.5-02R/LT	.177	.236	.008	■				■				■			■		
	BFSN5.0-02R/LT	.197	.236	.008	■				■				■			■		
	BFSN5.0-04R/LT	.197	.236	.016	■	■	■	■	■				■			■		

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFSN2.5-02RF PBC-10 (Right Hand)

## BFSN Right or left hand, external, grooving

Insert	Designation	Dimensions			SBC1		SB10				SB25		SB40		
		W	T	r	BH		BL								
 Right hand external shown	BFSN2.5-02R/LF	.098	.157	.008					■				■		
	BFSN2.5-04R/LF	.098	.157	.016					■				■		
	BFSN3.0-02R/LF	.118	.236	.008					■				■		
	BFSN3.0-04R/LF	.118	.236	.016					■				■		
	BFSN3.0-02R/LT	.118	.236	.008		■		■				■		■	
	BFSN3.0-04R/LT	.118	.236	.016		■		■				■		■	
	BFSN3.5-02R/LF	.138	.236	.008					■				■		
	BFSN3.5-04R/LF	.138	.236	.016					■				■		
	BFSN3.5-02R/LT	.138	.236	.008					■				■		
	BFSN3.5-04R/LT	.138	.236	.016					■				■		
	BFSN4.0-04R/LT	.157	.236	.016		■		■				■		■	
	BFSN4.5-04R/LT	.177	.236	.016					■				■		

Tolerance on "W" = +.0016"

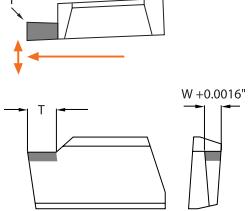
Ordering Example: 10 pcs. BFSN2.5-02RF SBC1 (Right Hand)

Note: BFSN-2.5-02RF: F= sharp cutting edge, T= T-Land

# Inserts - CBN



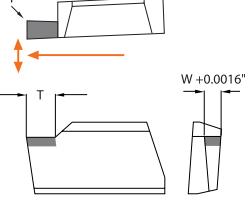
## BFSV Right or left hand, external, grooving & turning

Insert	Designation	Dimensions			PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40	
		W	T	r					BH		BL	
 Right hand external shown	BFSV3.0-02R/LF	.118	.236	.008	■				■	■	■	■
	BFSV3.0-04R/LF	.118	.236	.016	■				■	■	■	■
	BFSV3.0-02R/LT	.118	.236	.008	■	■	■	■	■	■	■	■
	BFSV3.0-04R/LT	.118	.236	.016	■	■	■	■	■	■	■	■
	BFSV3.5-02R/LF	.138	.236	.008					■	■	■	■
	BFSV3.5-04R/LF	.138	.236	.016					■	■	■	■
	BFSV3.5-02R/LT	.138	.236	.008	■				■	■	■	■
	BFSV3.5-04R/LT	.138	.236	.016	■				■	■	■	■
	BFSV4.0-02R/LF	.157	.236	.008	■				■	■	■	■
	BFSV4.0-05R/LF	.157	.236	.020	■				■	■	■	■
	BFSV4.0-02R/LT	.157	.236	.008	■	■	■	■	■	■	■	■
	BFSV4.0-05R/LT	.157	.236	.020	■	■	■	■	■	■	■	■
	BFSV4.5-02R/LT	.177	.236	.008	■				■	■	■	■
	BFSV4.5-05R/LT	.177	.236	.020	■				■	■	■	■
	BFSV5.0-02R/LF	.197	.236	.008	■							
	BFSV5.0-06R/LF	.197	.236	.024	■							
	BFSV5.0-02R/LT	.197	.236	.008	■	■	■	■	■	■	■	■
	BFSV5.0-06R/LT	.197	.236	.024	■	■	■	■	■	■	■	■

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFSV3.0-02RF PBC-10 (Right Hand)

## BFSV Right or left hand, external, grooving & turning

Insert	Designation	Dimensions			SBC1	SB10	SB25	SB40	
		W	T	r					
 Right hand external shown	BFSV3.0-04R/LF	.118	.236	.016				■	
	BFSV3.0-06R/LF	.118	.236	.024				■	
	BFSV3.0-04R/LT	.118	.236	.016	■	■		■	■
	BFSV3.0-06R/LT	.118	.236	.024	■	■		■	■
	BFSV3.5-04R/LF	.138	.236	.016				■	
	BFSV3.5-06R/LF	.138	.236	.024				■	
	BFSV3.5-04R/LT	.138	.236	.016				■	■
	BFSV3.5-06R/LT	.138	.236	.024				■	■
	BFSV4.0-04R/LT	.157	.236	.016	■	■		■	■
	BFSV4.0-08R/LT	.157	.236	.031	■	■		■	■
	BFSV4.5-04R/LT	.177	.236	.016				■	■
	BFSV4.5-08R/LT	.177	.236	.031				■	■
	BFSV5.0-04R/LT	.197	.236	.016	■	■		■	■
	BFSV5.0-08R/LT	.197	.236	.031	■	■		■	■

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFSV3.0-04RF SBC1 (Right Hand)

Note: BFSN-2.5-02RF: E= sharp cutting edge, T= T-Land

# Inserts - CBN

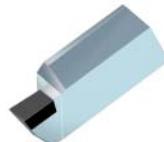


## BFIN Right or left hand, internal, grooving

Insert	Designation	Dimensions			PBC-10		PBC-15		PBC-17		PBC-20		PBC-25		PBC-30		PBC-40	
		W	T	r	BH		BL											
 Left hand internal shown	BFIN2.5-02R/LF	.098	.118	.008	■				■				■			■		
	BFIN2.5-02R/LT	.098	.118	.008	■				■				■			■		
	BFIN3.0-02R/LF	.118	.236	.008	■				■				■			■		
	BFIN3.0-02R/LT	.118	.236	.008	■	■	■	■	■				■			■		
	BFIN3.5-02R/LF	.138	.236	.008	■				■				■			■		
	BFIN3.5-02R/LT	.138	.236	.008	■				■				■			■		
	BFIN4.0-02R/LF	.157	.236	.008	■	■							■			■		
	BFIN4.0-04R/LF	.157	.236	.016	■	■							■			■		
	BFIN4.0-02R/LT	.157	.236	.008	■				■				■			■		
	BFIN4.0-04R/LT	.157	.236	.016	■				■				■			■		
	BFIN4.5-02R/LT	.177	.236	.008	■				■				■			■		
	BFIN5.0-02R/LF	.197	.236	.008	■				■				■			■		
	BFIN5.0-04R/LT	.197	.236	.016	■				■				■			■		

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIN2.5-02RF PBC-10 (Right Hand)



## BFIN Right or left hand, internal, grooving

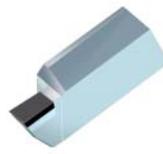
Insert	Designation	Dimensions			SBC1		SB10				SB25		SB40				
		W	T	r	BH		BL										
 Left hand internal shown	BFIN2.5-02R/LF	.098	.157	.008					■				■				
	BFIN2.5-04R/LF	.098	.157	.016					■				■				
	BFIN3.0-02R/LF	.118	.236	.008					■				■				
	BFIN3.0-04R/LF	.118	.236	.016					■				■				
	BFIN3.0-02R/LT	.118	.236	.008					■	■			■			■	
	BFIN3.0-04R/LT	.118	.236	.016					■	■			■			■	
	BFIN3.5-02R/LF	.138	.236	.008					■				■			■	
	BFIN3.5-04R/LF	.138	.236	.016					■				■			■	
	BFIN3.5-02R/LT	.138	.236	.008					■				■			■	
	BFIN3.5-04R/LT	.138	.236	.016					■				■			■	
	BFIN4.0-04R/LT	.157	.236	.016					■	■			■			■	
	BFIN4.5-04R/LT	.177	.236	.016					■				■			■	
	BFIN5.0-04R/LT	.197	.236	.016					■	■			■			■	

Tolerance on "W" = +.0016"

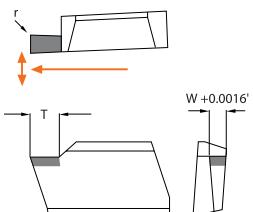
Ordering Example: 10 pcs. BFIN2.5-02RF SBC1 (Right Hand)

Note: BFIN-2.5-02RF: F= sharp cutting edge, T= T-Land

# Inserts - CBN



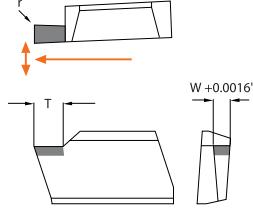
## BFIV Right or left hand, internal, grooving & turning

Insert	Designation	Dimensions			BH		BL		
		W	T	r					
 Left hand internal shown	BFIV3.0-02R/LF	.118	.236	.008	■			■	■
	BFIV3.0-04R/LF	.118	.236	.016	■			■	■
	BFIV3.0-02R/LT	.118	.236	.008	■	■	■	■	■
	BFIV3.0-04R/LT	.118	.236	.016	■	■	■	■	■
	BFIV3.5-02R/LF	.138	.236	.008				■	■
	BFIV3.5-04R/LF	.138	.236	.016				■	■
	BFIV3.5-02R/LT	.138	.236	.008	■			■	■
	BFIV3.5-04R/LT	.138	.236	.016	■			■	■
	BFIV4.0-02R/LF	.157	.236	.008	■	■		■	■
	BFIV4.0-05R/LF	.157	.236	.020	■	■		■	■
	BFIV4.0-02R/LT	.157	.236	.008	■		■	■	■
	BFIV4.0-05R/LT	.157	.236	.020	■		■	■	■
	BFIV4.5-02R/LT	.177	.236	.008	■			■	■
	BFIV4.5-05R/LT	.177	.236	.020	■			■	■
	BFIV5.0-02R/LF	.197	.236	.008	■				
	BFIV5.0-06R/LF	.197	.236	.024	■				
	BFIV5.0-02R/LT	.197	.236	.008	■	■	■	■	■
	BFIV5.0-06R/LT	.197	.236	.024	■	■	■	■	■

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIV3.0-02RF PBC-10 (Right Hand)

## BFIV Right or left hand, internal, grooving & turning

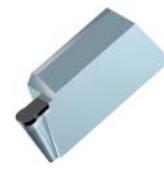
Insert	Designation	Dimensions			SBC1		SB10		SB25		SB40	
		W	T	r	BH		BL					
 Left hand internal shown	BFIV3.0-04R/LF	.118	.236	.016					■			
	BFIV3.0-06R/LF	.118	.236	.024								
	BFIV3.0-04R/LT	.118	.236	.016	■	■			■	■		
	BFIV3.0-06R/LT	.118	.236	.024								
	BFIV3.5-04R/LF	.138	.236	.016					■			
	BFIV3.5-06R/LF	.138	.236	.024								
	BFIV3.5-04R/LT	.138	.236	.016					■	■		
	BFIV3.5-06R/LT	.138	.236	.024								
	BFIV4.0-04R/LT	.157	.236	.016	■	■			■	■		
	BFIV4.0-08R/LT	.157	.236	.031								
	BFIV4.5-04R/LT	.177	.236	.016					■	■		
	BFIV4.5-08R/LT	.177	.236	.031								
	BFIV5.0-04R/LT	.197	.236	.016	■	■			■	■		
	BFIV5.0-08R/LT	.197	.236	.031								

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFIV3.0-04RF SBC1 (Right Hand)

Note: BFSN-2.5-02RF: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## BFRV Right or left hand, external, copying

Insert	Designation	Dimensions			BH		BL			
		W	T	r						
 Right hand external shown	BFRV3.0R/LF	.118	.236	.059	■			■	■	■
	BFRV3.0R/LT	.118	.236	.059	■	■	■	■	■	■
	BFRV3.5R/LF	.138	.236	.069				■	■	■
	BFRV3.5R/LT	.138	.236	.069	■			■	■	■
	BFRV4.0R/LF	.157	.236	.079	■			■	■	■
	BFRV4.0R/LT	.157	.236	.079	■	■	■	■	■	■
	BFRV4.5R/LF	.177	.236	.089						■
	BFRV4.5R/LT	.177	.236	.089	■					■
	BFRV5.0R/LF	.197	.236	.098	■					■
	BFRV5.0R/LT	.197	.236	.098	■	■	■	■	■	■

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFRV3.0RF PBC-10 (Right Hand)



## BFRV Right or left hand, external, copying

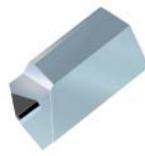
Insert	Designation	Dimensions			BH		BL			
		W	T	r						
 Right hand external shown	BFRV3.0R/LF	.118	.236	.059				■		
	BFRV3.0R/LT	.118	.236	.059		■	■	■		■
	BFRV3.5R/LT	.138	.236	.069		■	■	■		■
	BFRV4.0R/LF	.157	.236	.079				■		
	BFRV4.0R/LT	.157	.236	.079		■	■	■		■
	BFRV4.5R/LT	.177	.236	.089		■	■	■		■
	BFRV5.0R/LF	.197	.236	.098				■		
	BFRV5.0R/LT	.197	.236	.098		■	■	■		■

Tolerance on "W" = +.0016"

Ordering Example: 10 pcs. BFRV3.0RF SBC1 (Right Hand)

Note: BFSN-2.5-02RF: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## BFDV Right or left hand, external, profiling

Insert	Designation	Dimensions			PBC-10		PBC-15		PBC-17		PBC-20		PBC-25		PBC-30		PBC-40	
		W	T	r	BH		BL											
 Right hand external shown	BFDV0.2R/LF	.197	.197	.008	■				■				■			■		■
	BFDV0.2R/LT	.197	.197	.008	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	BFDV0.4R/LF	.197	.197	.016	■								■			■		■
	BFDV0.4R/LT	.197	.197	.016	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	BFDV0.8R/LF	.197	.197	.031	■								■			■		■
	BFDV0.8R/LT	.197	.197	.031	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	BFDV1.2R/LF	.197	.197	.047	■								■			■		■
	BFDV1.2R/LT	.197	.197	.047	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Ordering Example: 10 pcs. BFDV0.2RF PBC-10 (Right Hand)



## BFDV Right or left hand, external, side & face turning wiper edge

Insert	Designation	Dimensions			PBC-10		PBC-15		PBC-17		PBC-20		PBC-25		PBC-30		PBC-40	
		W	T	r	BH		BL											
 Right hand external shown	BFDV0.2R/LWF	.197	.197	.008	■				■				■			■		■
	BFDV0.2R/LWT	.197	.197	.008	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	BFDV0.4R/LWF	.197	.197	.016	■								■			■		■
	BFDV0.4R/LWT	.197	.197	.016	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	BFDV0.8R/LWF	.197	.197	.031	■								■			■		■
	BFDV0.8R/LWT	.197	.197	.031	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Ordering Example: 10 pcs. BFDV0.2RWF PBC-10 (Right Hand)



## BFDV Right or left hand, external, profiling

Insert	Designation	Dimensions			SBC1		SB10		SB25		SB40							
		W	T	r	BH		BL											
 Right hand external shown	BFDV0.2R/LF	.197	.197	.008							■							
	BFDV0.2R/LT	.197	.197	.008		■	■											
	BFDV0.4R/LF	.197	.197	.016									■					
	BFDV0.4R/LT	.197	.197	.016		■	■											
	BFDV0.8R/LF	.197	.197	.031							■							
	BFDV0.8R/LT	.197	.197	.031		■	■											
	BFDV1.2R/LF	.197	.197	.047							■							
	BFDV1.2R/LT	.197	.197	.047		■	■											

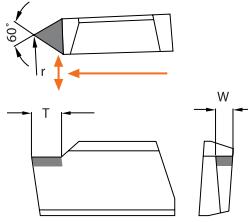
Ordering Example: 10 pcs. BFDV0.2RF SBC1 (Right Hand)

Note: BFSN-2.5-02RF: F= sharp cutting edge, T= T-Land

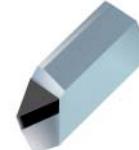
# Inserts - CBN



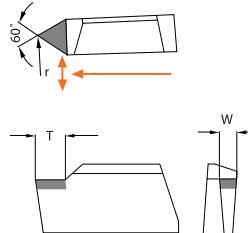
**BFTV** Right or left hand, external, threading, partial profile

Insert	Designation	Dimensions			BH		BL			
		W	T	r						
 Right hand external shown	BFTV0.10R/LT	.197	.197	.0040						
	BFTV0.14R/LT	.197	.197	.0055						
	BFTV0.18R/LF	.197	.197	.0071						
	BFTV0.18R/LT	.197	.197	.0071						
	BFTV0.21R/LF	.197	.197	.0083						
	BFTV0.21R/LT	.197	.197	.0083						
	BFTV0.25R/LF	.197	.197	.0098						
	BFTV0.25R/LT	.197	.197	.0098						
	BFTV0.28R/LF	.197	.197	.0110						
	BFTV0.28R/LT	.197	.197	.0110						
	BFTV0.36R/LT	.197	.197	.0142						
	BFTV0.43R/LT	.197	.197	.0169						

Ordering Example: 10 pcs. BFTV0.10RT PBC-10 (Right Hand)



**BFTV** Right or left hand, external, threading, partial profile

Insert	Designation	Dimensions			BH		BL			
		W	T	r						
 Right hand external shown	BFTV0.10R/LT	.197	.197	.0040						
	BFTV0.14R/LT	.197	.197	.0055						
	BFTV0.18R/LF	.197	.197	.0071						
	BFTV0.18R/LT	.197	.197	.0071						
	BFTV0.21R/LF	.197	.197	.0083						
	BFTV0.21R/LT	.197	.197	.0083						
	BFTV0.25R/LF	.197	.197	.0098						
	BFTV0.25R/LT	.197	.197	.0098						
	BFTV0.28R/LF	.197	.197	.0110						
	BFTV0.28R/LT	.197	.197	.0110						
	BFTV0.36R/LT	.197	.197	.0142						
	BFTV0.43R/LT	.197	.197	.0169						

Ordering Example: 10 pcs. BFTV0.10RT SBC1 (Right Hand)

Note: BFSN-2.5-02RF: F = sharp cutting edge, T = T-Land

# Threading Profile Ranges

Size of radius for American UN & metric ISO-threads

size of radius	UN TPI Metric Pitch (max.)	UN TPI Metric Pitch (min.)	UN TPI Metric Pitch (average.)
r = .0040	32 TPI P = .80	36 TPI P = .69	34 TPI P = .75
r = .0055	22 TPI P = 1.12	27 TPI P = .97	24 TPI P = 1.00
r = .0071	18 TPI P = 1.44	20 TPI P = 1.25	19 TPI P = 1.35
r = .0083	15 TPI P = 1.68	17 TPI P = 1.46	16 TPI P = 1.55
r = .0098	12.7 TPI P = 2.00	14.6 TPI P = 1.74	13 TPI P = 1.87
r = .0110	11.33 TPI P = 2.24	13 TPI P = 1.95	12 TPI P = 2.10
r = .0142	8.5 TPI P = 2.99	10.16 TPI P = 2.50	9.5 TPI P = 2.70
r = .0169	7.4 TPI P = 3.44	8.5 TPI P = 2.99	8 TPI P = 3.20

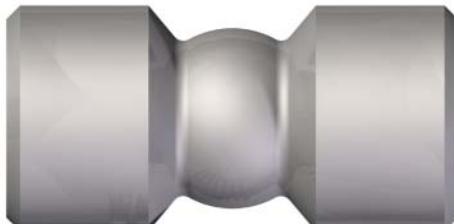
Profiling



Threading



Copying



Grooving





# ISO-HardCut



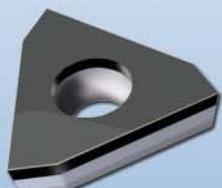
Solid



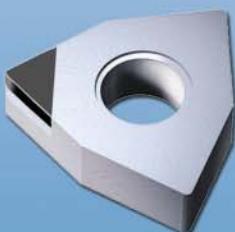
Whole Edge  
Positive Neutral



MultiCut  
(2 corners)

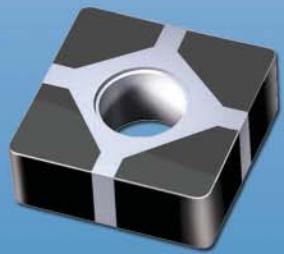


Full Face  
(PCD & CBN)

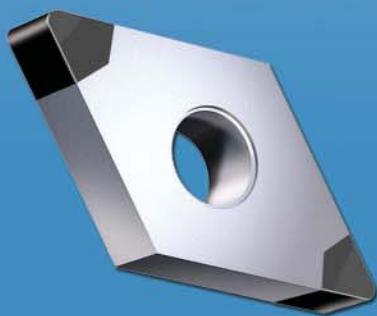


MW  
(1 corner)

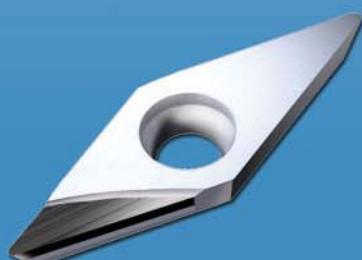
Some of the  
many insert  
configurations!



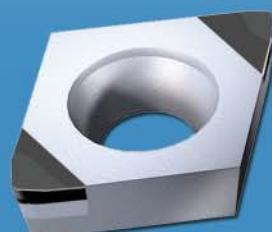
PolyCut  
(8 corners)



PolyCut-M  
(4 corners)



Positive PCD  
(right & left hand)



Positive Neutral  
(with Wiper Edge)

# Inserts - PCD & MDC

## Turning Inserts - PDC & MDC grades

CCMT Positive neutral, PDC, MDC .....	page 65
CCMT Positive neutral wiper edge, PDC, MDC .....	page 65
CCMT Whole edge positive, PDC, MDC .....	page 65
CCMW Neutral, PDC, MDC .....	page 66
CCMW Neutral wiper edge, PDC, MDC .....	page 66
CCMW Whole edge, PDC, MDC .....	page 66
CNMN MW, PDC, MDC .....	page 67
CNMA MW, PDC, MDC .....	page 67
CNMN MW, PDC, MDC .....	page 67
CPMT Positive neutral, PDC, MDC .....	page 68
CPMT Positive neutral wiper edge, PDC, MDC .....	page 68
CPMT Whole edge positive, PDC, MDC .....	page 68
CPMW Neutral, PDC, MDC .....	page 69
CPMW Neutral wiper edge, PDC, MDC .....	page 69
CPMW Whole edge, PDC, MDC .....	page 70
DCMT Positive neutral, PDC, MDC .....	page 70
DCMT Wiper edge, 93° positive, PDC, MDC .....	page 70
DCMT Positive, PDC, MDC .....	page 71
DCMW Neutral, PDC, MDC .....	page 71
DCMW wiper edge 93°, PDC, MDC .....	page 71
DNMA MW, PDC, MDC .....	page 72
DNMM MW, PDC, MDC .....	page 72
DPMW Neutral, PDC, MDC .....	page 72
EPMT Positive neutral, PDC, MDC .....	page 73
EPMW Neutral, PDC, MDC .....	page 73
RCMW Fullface, PDC, MDC .....	page 73
RPMW Fullface, PDC, MDC .....	page 74
SCMT Positive Neutral, PDC, MDC .....	page 74
SCMT Whole edge positive neutral, PDC, MDC .....	page 74
SCMW Neutral, PDC, MDC .....	page 75
SCMW Whole edge neutral, PDC, MDC .....	page 75
SNMN MW, PDC, MDC .....	page 75
SNMR Whole edge tipped, positive , PDC, MDC .....	page 76
SNMA MW, PDC, MDC .....	page 76
SNMN Whole edge tipped, positive, PDC, MDC .....	page 76
SPGN Neutral, PDC, MDC .....	page 77
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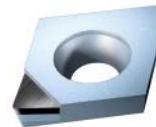
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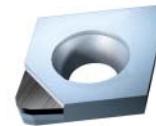
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# Inserts - PCD & MDC



**CCMT** Positive neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC	l'	r				
	CCMT-21.50				.138	.102	.004		■	■		
	CCMT-21.50.5	.250	.110	.094	.254	.134	.094	.008		■	■	
	CCMT-21.51					.126	.087	.016			■	
	CCMT-21.52					.118	.079	.031		■	■	
	CCMT-32.50.5					.177	--	.008		■	■	
	CCMT-32.51	.375	.173	.156	.382	.169	--	.016			■	
	CCMT-32.52					.161	--	.031			■	
	CCMT-431	.500	.217	.187	.508	.169	--	.016		■	■	
	CCMT-432					.161	--	.031		■		



**CCMT** Positive neutral wiper edge

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC	l'	r				
	CCMT-21.50W				.134	.102	.004		■	■		
	CCMT-21.50.5W	.250	.110	.094	.254	.130	.094	.008		■	■	
	CCMT-21.51W					.122	.083	.016			■	
	CCMT-32.50W					.177	.102	.004		■	■	
	CCMT-32.50.5W	.375	.173	.156	.382	.173	.094	.008		■	■	
	CCMT-32.51W					.165	.087	.016			■	
	CCMT-430.5W	.500	.217	.187	.508	.173	--	.008		■	■	
	CCMT-431W					.165	--	.016		■	■	



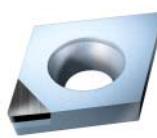
**CCMT** Right or left hand, whole edge positive

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l'	r	DP				
	CCMT-21.51R/L-GS	.250	.110	.094	--	.254	.016		■			
	CCMT-21.52R/L-GS					.254	.031		■			
	CCMT-32.52R/L-GS	.375	.173	.156	--	.382	.031		■			
	CCMT-32.53R/L-GS					.382	.047		■			
	CCMT-433R/L-GS	.500	.217	.187	--	.508	.047		■			

Right hand shown

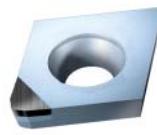
Ordering Example: 10 pcs. CCMT-21.51R-GS PDC-S (Right Hand)

# Inserts - PCD & MDC



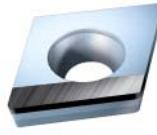
**CCMW** Neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	MDC	r				
	CCMW-21.50.5					.134	.094	.008		■	■	
	CCMW-21.51	.250	.110	.094	.254	.126	.087	.016		■	■	
	CCMW-21.52					.118	.079	.031			■	
	CCMW-32.50.5					.177	.000	.008		■	■	
	CCMW-32.51	.375	.173	.156	.382	.169	.087	.016		■	■	
	CCMW-32.52					.161	.079	.031		■	■	
	CCMW-431	.500	.217	.187	.508	.169	.087	.016		■	■	
	CCMW-432					.161	.000	.031		■	■	



**CCMW** Neutral wiper edge

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	MDC	r				
	CCMW-21.50W					.134	.098	.004		■	■	
	CCMW-21.50.5W	.250	.110	.094	.254	.130	.091	.008		■	■	
	CCMW-21.51W					.122	.083	.016			■	
	CCMW-32.50W					.177	.098	.004		■	■	
	CCMW-32.50.5W	.375	.173	.156	.382	.173	.091	.008		■	■	
	CCMW-32.51W					.165	.083	.016			■	
	CCMW-430.5W	.500	.217	.187	.508	.173	.091	.008		■	■	
	CCMW-431W					.165	.083	.016		■	■	



**CCMW** Right or left hand, whole edge

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r	DP				
	CCMW-21.51R/L-GS	.250	.110	.094	--	.254	.016			■		
	CCMW-21.52R/L-GS					.254	.031			■		
	CCMW-32.52R/L-GS	.375	.173	.156	--	.382	.031			■		
	CCMW-32.53R/L-GS					.382	.047			■		
	CCMW-432R/L-GS	.500	.217	.187	--	.508	.031			■		

Right hand shown

Ordering Example: 10 pcs. CCMW-21.51R-GS PDC (Right Hand)

# Inserts - PCD & MDC



**CNMN** MW

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	t	t <sup>1</sup>	r	DP	DM		
	CNMN-431-MW	.500	.202	.187	.508	.248	.016	■			
	CNMN-432-MW					.236	.031	■			
	CNMN-433-MW					.224	.047	■			



**CNMA** MW

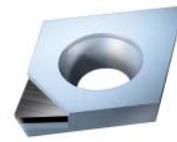
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	t	t <sup>1</sup>	r	DP	DM		
	CNMA-431-MW	.500	.202	.187	.508	.248	.016	■	■		
	CNMA-432-MW					.236	.031	■	■		
	CNMA-433-MW					.224	.047	■	■		



**CNMM** MW

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	t	t <sup>1</sup>	r	DP	DM		
	CNMM-431-MW	.500	.202	.187	.508	.248	.016	■			
	CNMM-432-MW					.236	.031	■			
	CNMM-433-MW					.224	.047	■			

# Inserts - PCD & MDC



## CPMT Positive neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	CPMT-1.51.20.5	.187	.083	.078	.189	.087	.008		■	■		
	CPMT-1.51.21					.079	.016			■	■	
	CPMT-1.81.20.5	.219	.098	.078	.220	.094	.008		■	■		
	CPMT-1.81.21					.087	.016			■	■	
	CPMT-1.81.50.5	.219	.098	.094	.220	.094	.008		■	■		
	CPMT-1.81.51					.087	.016			■	■	
	CPMT-21.50.5					.134	.008		■	■		
	CPMT-21.51	.250	.110	.094	.254	.126	.016			■	■	
	CPMT-21.52					.118	.031		■	■		

## CPMT Positive neutral wiper edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	CPMT-1.51.20.5W	.187	.083	.078	.189	.079	.008		■	■		
	CPMT-1.51.21W					.075	.016			■	■	
	CPMT-1.81.20.5W	.219	.098	.078	.220	.091	.008		■	■		
	CPMT-1.81.21W					.083	.016			■	■	
	CPMT-1.81.50.5W	.219	.098	.094	.220	.091	.008		■	■		
	CPMT-1.81.51W					.083	.016			■	■	
	CPMT-21.50.5W	.250	.110	.094	.254	.130	.008		■	■		
	CPMT-21.51W					.122	.016			■	■	

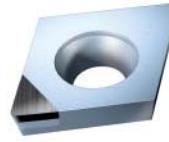
## CPMT Right or left hand, whole edge positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	CPMT-1.81.21R/L-GS	.219	.098	.078	--	.220	.016		■			
	CPMT-1.81.22R/L-GS					.220	.031		■			
	CPMT-1.81.51R/L-GS	.219	.098	.094	--	.220	.016		■			
	CPMT-1.81.52R/L-GS					.220	.031		■			
	CPMT-21.52R/L-GS	.250	.110	.094	--	.254	.031		■			
	CPMT-32.53R/L-GS	.375	.173	.156	--	.382	.047		■			
	CPMT-433R/L-GS	.500	.217	.187	--	.508	.047		■			

Right hand shown

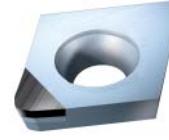
Ordering Example: 10 pcs. CPMT-1.81.21R-GS PDC-S (Right Hand)

# Inserts - PCD & MDC



**CPMW** Neutral

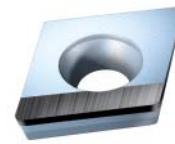
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC   1	MDC   1	r				
	CPMW-1.51.20.5	.187	.083	.078	.189	.087	--	.008	■	■		
	CPMW-1.51.21					.079	--	.016		■	■	
	CPMW-1.81.20.5	.219	.085	.078	.220	.094	--	.008	■	■		
	CPMW-1.81.21					.087	.087	.016		■	■	■
	CPMW-1.81.50.5	.219	.085	.094	.220	.094	--	.008	■	■		
	CPMW-1.81.51					.087	.087	.016		■	■	■
	CPMW-21.50.5					.134	--	.008	■	■		
	CPMW-21.51	.250	.110	.094	.254	.126	--	.016		■	■	
	CPMW-21.52					.118	.079	.031	■	■	■	■
	CPMW-32.51	.375	.173	.156	.382	.169	--	.016		■	■	
	CPMW-32.52					.161	--	.031		■	■	
	CPMW-431	.500	.217	.187	.508	.169	--	.016		■	■	
	CPMW-432					.161	--	.031		■	■	



**CPMW** Neutral wiper edge

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC   1	MDC   1	r				
	CPMW-1.51.20.5W	.187	.083	.078	.191	.087	--	.008	■	■		
	CPMW-1.51.21W					.079	--	.016		■	■	■
	CPMW-1.81.20.5W	.219	.085	.078	.217	.094	.087	.008	■	■		■
	CPMW-1.81.21W					.083	--	.016		■	■	
	CPMW-1.81.50.5W	.219	.085	.094	.217	.094	.087	.008	■	■		■
	CPMW-1.81.51W					.083	--	.016		■	■	
	CPMW-21.50.5W	.250	.110	.094	.254	.130	.091	.008	■	■		■
	CPMW-21.51W					.122	--	.016		■	■	
	CPMW-32.50.5W	.375	.173	.156	.382	.173	--	.008	■	■		
	CPMW-32.51W					.165	--	.016		■	■	
	CPMW-430.5W	.500	.217	.187	.508	.173	--	.008	■	■		
	CPMW-431W					.165	--	.016		■	■	

# Inserts - PCD & MDC

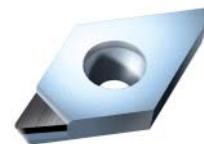


**CPMW** Right or left hand, whole edge

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r				
	CPMW-1.81.21R/L-GS	.219	.098	.078	--	.220	.016		■		
	CPMW-1.81.51R/L-GS	.219	.098	.094	--	.220	.016		■		
	CPMW-21.51R/L-GS	.250	.110	.094	--	.254	.016		■		
	CPMW-21.52R/L-GS									■	
	CPMW-32.52R/L-GS	.375	.173	.156	--	.382	.031			■	
	CPMW-432R/L-GS	.500	.217	.187	--	.508	.031			■	

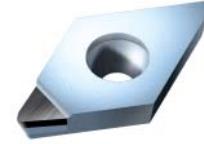
Right hand shown

Ordering Example: 10 pcs. CPMW-1.81.21R-GS PDC (Right Hand)



**DCMT** Positive neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC   <sup>1</sup>	MDC   <sup>1</sup>	r	DP	DM	
	DCMT-21.50								■		
	DCMT-21.50.5								■	■	■
	DCMT-21.51	.250	.110	.094	.305	.146	.102	.008			■
	DCMT-21.52								■		■
	DCMT-32.50								■		
	DCMT-32.50.5								■	■	■
	DCMT-32.51	.375	.173	.156	.457	.134	.091	.016			■
	DCMT-32.52								■		■
	DCMT-32.53								■		■

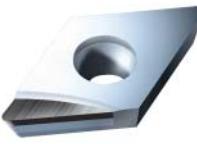


**DCMT** Right or left hand wiper edge 93° positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC   <sup>1</sup>	MDC   <sup>1</sup>	r	DP	DM	
	DCMT-21.50R/LW								■		■
	DCMT-21.50.5R/LW	.250	.110	.094	.305	.118	.079	.008			■
	DCMT-21.51R/LW								■		■
	DCMT-32.50R/LW								■		■
	DCMT-32.50.5R/LW	.375	.173	.156	.457	.157	.079	.008			■
	DCMT-32.51R/LW								■		■

Ordering Example: 10 pcs. CPMT-1.81.21R-GS PDC-S (Right Hand)

# Inserts - PCD & MDC

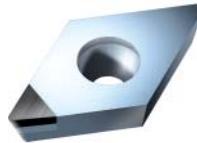


## DCMT Right or left hand positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	DCMT-21.51R/L	.250	.110	.094	.305	.217	.016	■	■		
	DCMT-21.52R/L					.197	.031	■	■		
	DCMT-32.51R/L	.375				.295	.016	■	■		
	DCMT-32.52R/L		.173	.156	.457	.276	.031	■	■		
	DCMT-32.53R/L					.256	.047	■	■		

Right hand shown

Ordering Example: 10 pcs. DCMT-21.51R PDC-S (Right Hand)



## DCMW Neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	PDC  l	MDC  l	r	DP	DM		
	DCMW-21.50	.250				.150	.106	.004	■			■
	DCMW-21.50.5					.146	.102	.008	■	■		■
	DCMW-21.51		.110	.094	.305	.134	.091	.016	■	■		■
	DCMW-21.52					.118	.079	.031	■	■		■
	DCMW-32.05	.375				.185	--	.008		■		
	DCMW-321		.173	.125	.457	.169	--	.016		■		
	DCMW-322					.157	--	.031		■		
	DCMW-32.50					.189	.106	.004	■			■
	DCMW-32.50.5	.375				.185	.102	.008	■	■		■
	DCMW-32.51		.173	.156	.457	.169	.091	.016	■	■		■
	DCMW-32.52					.157	.079	.031	■	■		■
	DCMW-32.53					.142	.071	.047	■	■		■
	DCMW-431	.500	.217	.187	.610	.169	--	.016		■		
	DCMW-432					.157	--	.031		■		

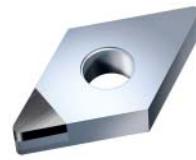
## DCMW Right or left hand wiper edge 93°

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	PDC  l	MDC  l	r	DP	DM		
	DCMW-21.50R/LW	.250				.118	.079	.004	■			■
	DCMW-21.50.5R/LW		.110	.094	.305	.118	.079	.008	■			■
	DCMW-21.51R/LW					.118	.079	.016	■			■
	DCMW-32.50R/LW	.375				.157	.079	.004	■			■
	DCMW-32.50.5R/LW		.173	.156	.457	.157	.079	.008	■			■
	DCMW-32.51R/LW					.157	.079	.016	■			■

Right hand shown

Ordering Example: 10 pcs. DCMW-21.50R PDC-S (Right Hand)

# Inserts - PCD & MDC



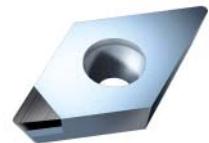
**DNMA MW**

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	DNMA-431-MW	.500	.202	.187	.610	.252	.016		■	■		
	DNMA-432-MW					.236	.031		■	■		
	DNMA-433-MW					.220	.047		■	■		
	DNMA-441-MW	.500	.202	.250	.610	.252	.016		■	■		
	DNMA-442-MW					.236	.031		■	■		
	DNMA-443-MW					.220	.047		■	■		



**DNMM MW**

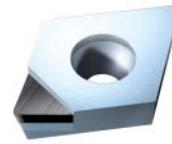
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	DNMM-431-MW	.500	.202	.187	.610	.252	.016		■			
	DNMM-432-MW					.236	.031		■			
	DNMM-433-MW					.220	.047		■			
	DNMM-441-MW	.500	.202	.250	.610	.252	.016		■			
	DNMM-442-MW					.236	.031		■			
	DNMM-443-MW					.220	.047		■			



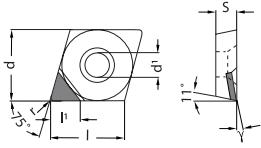
**DPMW Neutral**

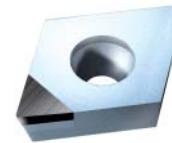
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	DPMW-21.50.5	.250	.110	.094	.305	.146	.008		■			
	DPMW-21.51					.134	.016		■			
	DPMW-21.52					.118	.031		■			
	DPMW-32.50.5	.375	.173	.156	.457	.185	.008		■			
	DPMW-32.51					.169	.016		■			
	DPMW-32.52					.157	.031		■			

# Inserts - PCD & MDC

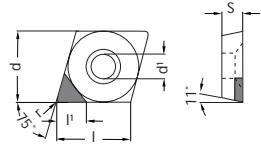


## EPMT Positive neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EPMT-1.51.50.5	.187	.085	.094	.189	.094	.008			■	
	EPMT-1.51.51					.087	.016			■	
	EPMT-1.81.50.5	.219	.094	.094	.224	.118	.008			■	
	EPMT-1.81.51					.102	.016			■	
	EPMT-21.50.5	.250	.110	.094	.256	.134	.008			■	
	EPMT-21.51					.126	.016			■	
	EPMT-2.520.5					.134	.008			■	
	EPMT-2.521	.313	.134	.125	.327	.126	.016			■	
	EPMT-2.522					.118	.031			■	

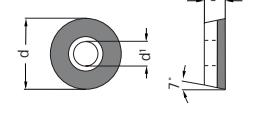


## EMPW Neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	EMPW-1.51.50.5	.187	.085	.094	.189	.094	.008			■	
	EMPW-1.51.51					.087	.016			■	
	EMPW-1.81.50.5	.219	.094	.094	.224	.118	.008			■	
	EMPW-1.81.51					.102	.016			■	
	EMPW-21.50.5	.250	.110	.094	.256	.134	.008			■	
	EMPW-21.51					.126	.016			■	
	EMPW-2.520.5					.134	.008			■	
	EMPW-2.521	.313	.134	.125	.327	.126	.016			■	
	EMPW-2.522					.118	.031			■	



## RCMW Fullface

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	RCMW-0602M0-VM	.236	.110	.094	--	--	--	■	■		
	RCMW-0803M0-VM	.315	.134	.125	--	--	--	■	■		
	RCMW-1003M0-VM	.394	.173	.125	--	--	--		■		
	RCMW-10T3M0-VM	.394	.173	.156	--	--	--		■		
	RCMW-1204M0-VM	.472	.173	.187	--	--	--		■		

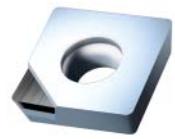
# Inserts - PCD & MDC

## RPMW Fullface



Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	RPMW-0802M0-VM	.315	.134	.094	--	--	--		■		
	RPMW-1003M0-VM	.394	.173	.125	--	--	--		■		
	RPMW-1204M0-VM	.472	.173	.187	--	--	--		■		
	RPMW-43-VM	.500	.217	.187	--	--	--		■		

## SCMT Positive neutral



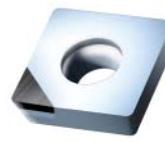
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SCMT-32.51						.173 .016		■		
	SCMT-32.52	.375	.173	.156	.375		.169 .031		■		
	SCMT-32.53						.165 .047		■		
	SCMT-432	.500	.217	.187	.500		.169 .031		■		
	SCMT-433						.165 .047		■		

## SCMT Whole edge positive neutral



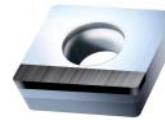
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SCMT-32.52-GS	.375	.173	.156	--		.375 .031		■		
	SCMT-32.53-GS						.375 .047		■		
	SCMT-432-GS	.500	.217	.187	--		.500 .031		■		
	SCMT-433-GS						.500 .047		■		

# Inserts - PCD & MDC



**SCMW** Neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC   l	MDC   l	r				
	SCMW-32.51					.173	--	.016	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SCMW-32.52	.375	.173	.156	.375	.169	.102	.031		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-32.53					.165	.098	.047		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-431					.173	--	.016	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SCMW-432	.500	.217	.187	.500	.169	.102	.031		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-433					.165	.098	.047		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



**SCMW** Whole edge neutral

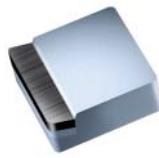
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	SCMW-32.51-GS					.375	.016			<input checked="" type="checkbox"/>		
	SCMW-32.52-GS	.375	.173	.156	--	.375	.031			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-32.53-GS					.375	.047			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-431-GS					.500	.016			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-432-GS	.500	.217	.187	--	.500	.031			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	SCMW-433-GS					.500	.047			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



**SNMN** MW

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	SNMN-431-MW					.248	.016		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SNMN-432-MW	.500	--	.187	.500	.244	.031		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SNMN-433-MW					.236	.047		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

# Inserts - PCD & MDC



**SNMR** Whole edge tipped, positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 	SNMR-432-GS	.500	--	.187	--	.500	.031		■			
	SNMR-433-GS					.500	.047		■			
	SNMR-434-GS					.500	.063		■			



**SNMA** MW

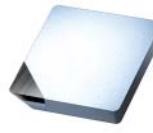
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 	SNMA-431-MW	.500	.202	.187	.500	.248	.016		■	■		
	SNMA-432-MW					.244	.031		■	■		
	SNMA-433-MW					.236	.047		■	■		



**SNMM** Whole edge tipped, positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 	SNMM-432-GS	.500	.202	.187	--	.500	.031		■			
	SNMM-433-GS					.500	.047		■			
	SNMM-434-GS					.500	.063		■			

# Inserts - PCD & MDC



**SPGN** Neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	l	MDC	l	r	DP	DM
	SPGN-321	.375	--	.125	.375	.173	--	.016	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SPGN-322		--			.169	.102	.031		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	SPGN-421					.173	--	.016	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	SPGN-422	.500	--	.125	.500	.169	.102	.031		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	SPGN-423		--			.165	--	.047		<input checked="" type="checkbox"/>		



**SPGN** Whole edge neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		l	r	DP	DM	DM	DM	DM
	SPGN-321-GS	.375	--	.125	--	.375	.016			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	SPGN-322-GS		--			.375	.031			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	SPGN-422-GS	.500	--	.125	--	.500	.031			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	SPGN-423-GS		--			.500	.047			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



**SPMT** Positive neutral

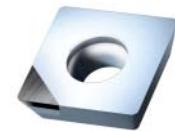
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		l	r	DP	DM	DM	DM	DM
	SPMT-32.51	.375				.173	.016		<input checked="" type="checkbox"/>			
	SPMT-32.52		.173	.156	.375	.169	.031		<input checked="" type="checkbox"/>			
	SPMT-32.53					.165	.047		<input checked="" type="checkbox"/>			
	SPMT-432	.500	.217	.187	.500	.169	.031		<input checked="" type="checkbox"/>			
	SPMT-433					.165	.047		<input checked="" type="checkbox"/>			

# Inserts - PCD & MDC



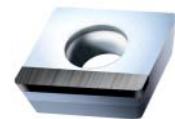
**SPMT** Whole edge positive neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		l	r					
	SPMT-32.52-GS	.375	.173	.156	--	.375	.031		■			
	SPMT-32.53-GS					.375	.047		■			
	SPMT-432-GS	.500	.217	.187	--	.500	.031		■			
	SPMT-433-GS					.500	.047		■			



**SPMW** Neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		PDC  l	MDC  l	r	DP	DM		
	SPMW-32.51	.375				.173	--	.016		■	■	
	SPMW-32.52		.173	.156	.375	.169	.102	.031		■		■
	SPMW-32.53					.165	--	.047		■		
	SPMW-431	.500				.173	--	.016		■	■	
	SPMW-432		.217	.187	.500	.169	.102	.031		■		■
	SPMW-433					.165	--	.047		■		



**SPMW** Whole edge neutral

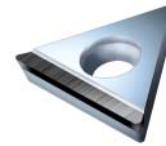
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		l	r					
	SPMW-32.51-GS	.375				.375	.016			■		
	SPMW-32.52-GS		.173	.156	--	.375	.031			■		
	SPMW-32.53-GS					.375	.047			■		
	SPMW-431-GS	.500				.500	.016			■		
	SPMW-432-GS		.217	.187	--	.500	.031			■		
	SPMW-433-GS					.500	.047			■		

# Inserts - PCD & MDC



**TCMT** Positive neutral

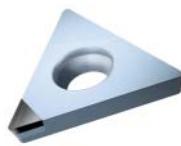
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	PDC   l	MDC   l	r					
	TCMT-1.81.50.5					.146	.102	.008		■	■		
	TCMT-1.81.51	.219	.098	.094	.378	.134	.091	.016		■	■		
	TCMT-1.81.52					.118	.079	.031			■		
	TCMT-21.50.5					.146	.102	.008		■	■		
	TCMT-21.51	.250	.110	.094	.433	.134	.091	.016		■	■		
	TCMT-21.52					.118	.079	.031			■		
	TCMT-32.51	.375	.173	.156	.650	.181	--	.016		■	■		
	TCMT-32.52					.165	--	.031			■		



**TCMT** Whole edge positive neutral

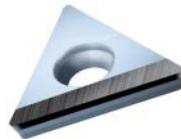
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP					
	TCMT-1.81.51-GS					.378	.016		■				
	TCMT-1.81.52-GS	.219	.098	.094	--	.378	.031		■				
	TCMT-21.51-GS					.433	.016		■				
	TCMT-21.52-GS	.250	.110	.094	--	.433	.031		■				
	TCMT-21.53-GS					.433	.047		■				
	TCMT-32.51-GS	.375	.173	.156	--	.650	.016		■				
	TCMT-32.52-GS					.650	.031		■				
	TCMT-32.53-GS					.650	.047		■				

# Inserts - PCD & MDC



**TCMW** Neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	MDC	r			
	TCMW-1.81.50.5					.146	.102	.008		■ ■	
	TCMW-1.81.51	.219	.098	.094	.378	.134	.091	.016		■ ■	
	TCMW-1.81.52					.118	.079	.031		■	
	TCMW-21.50.5					.146	.102	.008		■ ■	
	TCMW-21.51	.250	.110	.094	.433	.134	.091	.016		■ ■	
	TCMW-21.52					.118	.079	.031		■	
	TCMW-32.51					.181	.091	.016		■	
	TCMW-32.52	.375	.173	.156	.650	.165	.079	.031		■	
	TCMW-32.53					.150	.071	.047		■	



**TCMW** Whole edge neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r				
	TCMW-1.81.51-GS					.378	.016			■	
	TCMW-1.81.52-GS	.219	.098	.094	--	.378	.031			■	
	TCMW-21.51-GS					.433	.016			■	
	TCMW-21.52-GS	.250	.110	.094	--	.433	.031			■	
	TCMW-21.53-GS					.433	.047			■	
	TCMW-32.51-GS					.650	.016			■	
	TCMW-32.52-GS	.375	.173	.156	--	.650	.031			■	
	TCMW-32.53-GS					.650	.047			■	



**TCMW** Fullface

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r				
	TCMW-21.50.5-VM					.433	.008		■ ■		
	TCMW-21.51-VM	.250	.110	.094	--	.433	.016		■ ■		
	TCMW-21.52-VM					.433	.031		■ ■		

# Inserts - PCD & MDC



## TPGA Neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	DM
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	TPGA-220.5				.146	.008			■			
	TPGA-221	.250	.134	.125	.433	.134	.016		■			
	TPGA-222					.118	.031		■			



## TNMA MW

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	DM
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	TNMA-331-MW				.244	.016		■	■			
	TNMA-332-MW	.375	.150	.187	.650	.228	.031		■	■		
	TNMA-333-MW					.213	.047		■	■		
	TNMA-432-MW	.500	.202	.187	.866	.228	.031		■	■		
	TNMA-433-MW					.213	.047		■	■		



## TNMM MW

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	DM
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	TNMM-331-MW				.244	.016		■				
	TNMM-332-MW	.375	.150	.187	.650	.228	.031		■			
	TNMM-333-MW					.213	.047		■			
	TNMM-432-MW	.500	.202	.187	.866	.228	.031		■			
	TNMM-433-MW					.213	.047		■			

# Inserts - PCD & MDC



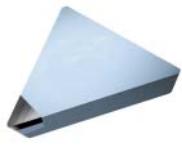
**TNMM** Whole edge tipped

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		<sup>1</sup>	r					
	TNMM-332-GS						.650	.031		■		
	TNMM-333-GS	.375	.150	.187	--		.650	.047		■		
	TNMM-334-GS						.650	.063		■		
	TNMM-432-GS		.500	.202	.187	--	.866	.031		■		
	TNMM-433-GS						.866	.047		■		



**TNMR** Whole edge tipped

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		<sup>1</sup>	r					
	TNMR-332-GS						.650	.031		■		
	TNMR-333-GS	.375	--	.187	--					■		



**TPGN** Neutral

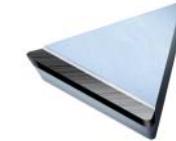
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s		PDC   <sup>1</sup>	MDC   <sup>1</sup>					
	TPGN-1.81.51					.134	--	.016		■		
	TPGN-1.81.52	.219	--	.094	.378					■		
	TPGN-21.51					.118	--	.031		■		
	TPGN-21.52	.250	--	.094	.433					■		
	TPGN-220.5					.134	--	.016		■		
	TPGN-221									■		
	TPGN-222	.250	--	.125	.433					■		
	TPGN-321					.134	.091	.016		■		
	TPGN-322									■		
	TPGN-323	.375	--	.125	.650					■		

# Inserts - PCD & MDC



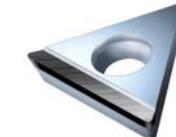
**TPGN** Whole edge neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM			
	TPGN-221-GS	.250	--	.125	--	.433	.016			■		
	TPGN-222-GS					.433	.031			■		
	TPGN-223-GS					.433	.047			■		
	TPGN-321-GS	.375	--	.125	--	.650	.016			■		
	TPGN-322-GS					.650	.031			■		
	TPGN-323-GS					.650	.047			■		



**TPMR** Whole edge positive neutral

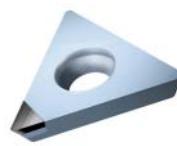
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM			
	TPMR-221-GS	.250	--	.125	--	.433	.016		■			
	TPMR-222-GS					.433	.031		■			
	TPMR-223-GS					.433	.047		■			
	TPMR-321-GS	.375	--	.125	--	.650	.016		■			
	TPMR-322-GS					.650	.031		■			
	TPMR-323-GS					.650	.047		■			



**TPMT** Whole edge positive neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM			
	TPMT-1.51.51-GS	.187	.087	.094	--	.323	.016		■			
	TPMT-1.51.52-GS					.323	.031		■			
	TPMT-1.81.51-GS	.219	.098	.094	--	.378	.016		■			
	TPMT-1.81.52-GS					.378	.031		■			
	TPMT-21.51-GS	.250	.110	.094	--	.433	.016		■			
	TPMT-21.52-GS					.433	.031		■			
	TPMT-221-GS	.250	.110	.125	--	.433	.016		■			
	TPMT-222-GS					.433	.031		■			
	TPMT-332-GS	.375	.173	.187	--	.650	.031		■			

# Inserts - PCD & MDC



**TPMW** Neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC   1	MDC   1	r				
	TPMW-1.51.51	.187	.087	.094	.323	.106	--	.016			■	
	TPMW-1.81.51	.219	.098	.094	.378	.134	--	.016			■	
	TPMW-1.81.52					.118	--	.031			■	
	TPMW-21.50.5					.146	.102	.008			■	■
	TPMW-21.51	.250	.110	.094	.433	.134	.091	.016			■	■
	TPMW-21.52					.118	.079	.031			■	■
	TPMW-220.5					.146	.102	.008			■	■
	TPMW-221	.250	.110	.125	.433	.134	.091	.016			■	■
	TPMW-222					.118	.079	.031			■	■



**TPMW** Whole edge neutral

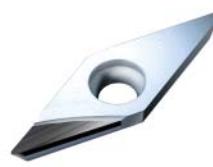
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r	DP				
	TPMW-1.51.51	.187	.087	.094	--	.323	.016				■	
	TPMW-1.81.51	.219	.098	.094	--	.378	.016				■	
	TPMW-21.51	.250	.110	.094	--	.433	.016				■	
	TPMW-21.52					.433	.031				■	
	TPMW-221	.250	.110	.125	--	.433	.016				■	



**VBMT** Positive neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC   1	MDC   1	r				
	VBMT-21.50					.213	--	.004			■	
	VBMT-21.50.5					.181	.138	.008			■	■
	VBMT-21.51	.250	.114	.094	.437	.154	.118	.016			■	■
	VBMT-21.52					.130	--	.031			■	
	VBMT-330.5					.232	--	.008			■	■
	VBMT-331	.375	.173	.187	.654	.217	.118	.016			■	■
	VBMT-332					.197	--	.031			■	

# Inserts - PCD & MDC



## VBMT Right or left hand positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	VBMT-21.51R/L	.250	.114	.094	.437	.256	.016	■	■	■	
	VBMT-21.52R/L					.236	.031	■	■	■	
	VBMT-331R/L	.375	.173	.187	.654	.295	.016	■	■	■	
	VBMT-332R/L					.276	.031	■	■	■	
	VBMT-333R/L					.276	.047	■	■	■	

Right hand shown

Ordering Example: 10 pcs. VBMT-21.51 R PDC-S (Right Hand)



## VBMW Neutral

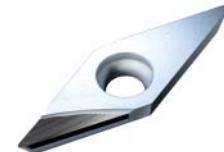
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	PDC  l	MDC  l	r				
	VBMW-21.50.5	.250	.114	.094	.437	.181	--	.008	■	■	■	
	VBMW-21.51					.154	.118	.016		■		■
	VBMW-21.52					.130	--	.031		■		
	VBMW-330.5	.375	.173	.187	.654	.232	--	.008	■	■	■	
	VBMW-331					.217	.118	.016		■		■
	VBMW-332					.197	--	.031		■		
	VBMW-333					.173	--	.047		■		

# Inserts - PCD & MDC



**VCMT** Positive neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	MDC	r				
	VCMT-1.21.50					.150	--	.004				
	VCMT-1.21.50.5	.156	.087	.094	.272	.142	.118	.008		■	■	
	VCMT-1.21.51					.126	.110	.016		■	■	
	VCMT-220					.213	--	.004		■	■	
	VCMT-220.5	.250	.114	.125	.437	.181	.138	.008		■	■	
	VCMT-221					.154	.118	.016		■	■	
	VCMT-222					.130	.118	.031		■		
	VCMT-2.520.5	.313	.134	.125	.524	.232	--	.008		■	■	
	VCMT-2.521					.217	--	.016		■		
	VCMT-330					.236	--	.004		■	■	
	VCMT-330.5					.232	.138	.008		■	■	
	VCMT-331	.375	.173	.187	.654	.217	.118	.016		■	■	
	VCMT-332					.197	.118	.031		■		
	VCMT-333					.177	--	.047		■		



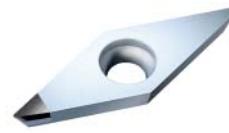
**VCMT** Right or left hand positive

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r				
	VCMT-221R/L	.250	.114	.125	.437	.256	.016		■	■	
	VCMT-222R/L					.236	.031		■	■	
	VCMT-331R/L					.295	.016		■	■	
	VCMT-332R/L	.375	.173	.187	.654	.276	.031		■	■	
	VCMT-333R/L					.276	.047		■	■	

Right hand shown

Ordering Example: 10 pcs. VCMT-221R PDC-S (Right Hand)

# Inserts - PCD & MDC



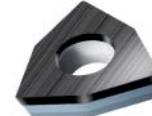
**VCMW** Neutral

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		PDC	MDC	r				
 $d = 0.156$ , $d^1 = 0.091$ , $s = 0.062$ , $  = 0.189$ , $PDC   = 0.008$ , $MDC   = 0.016$ , $r = 0.047$	VCMW-1.21.50				.150	--	.004		■			
	VCMW-1.21.50.5	.156	.087	.094	.272	.142	.118	.008		■	■	
	VCMW-1.21.51					.126	.110	.016		■	■	
	VCMW-220					.213	--	.004		■		
	VCMW-220.5					.181	.138	.008		■	■	
	VCMW-221	.250	.114	.125	.437	.154	.118	.016		■	■	
	VCMW-222					.130	.118	.031		■		
	VCMW-2.520.5					.232	--	.008		■	■	
	VCMW-2.521	.313	.134	.125	.524	.217	--	.016		■		
	VCMW-330					.236	--	.004		■		
	VCMW-330.5					.232	.138	.008		■	■	
	VCMW-331					.217	.118	.016		■	■	
	VCMW-332	.375	.173	.187	.654	.197	.118	.031		■	■	
	VCMW-333					.177	.118	.047		■	■	
	VCMW-334					.157	--	.063		■		



**WBGW** Fullface left hand

Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r	DP				
 $d = 0.156$ , $d^1 = 0.091$ , $s = 0.062$ , $  = 0.189$ , $ ^1 = 0.008$ , $r = 0.016$	WBGW-1.210.5L-VM					.189	.008			■		
	WBGW-1.211L-VM	.156	.091	.062	--					■		



**WCGW** Fullface

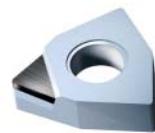
Insert	Designation	Dimensions							PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s		<sup>1</sup>	r	DP				
 $d = 0.156$ , $d^1 = 0.091$ , $s = 0.062$ , $  = 0.106$ , $ ^1 = 0.008$ , $r = 0.016$	WCGW-1.210.5-VM					.106	.008			■		
	WCGW-1.211-VM	.156	.091	.062	--					■		

# Inserts - PCD & MDC



**WNMA MW**

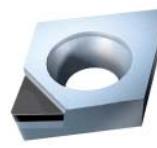
Insert	Designation	Dimensions						DP	DM	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r			
	WNMA-431-MW	.500	.202	.187	.335	.248	.016		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	WNMA-432-MW					.236	.031		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	WNMA-433-MW					.224	.047		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



**WNMM MW**

Insert	Designation	Dimensions						DP	DM	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r			
	WNMM-431-MW	.500	.202	.187	.335	.248	.016		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	WNMM-432-MW					.236	.031		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	WNMM-433-MW					.224	.047		<input checked="" type="checkbox"/>	<input type="checkbox"/>

# Inserts - CBN



**CCMT** EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	CCMT-21.50.5F-EW	.250	.110	.094	.254	.134	.008	■	■	■		■		■
	CCMT-21.51F-EW					.122	.016	■	■	■		■		■
	CCMT-21.52F-EW					.110	.031	■	■	■		■		■
	CCMT-32.50.5F-EW					.134	.008	■	■	■		■		■
	CCMT-32.51F-EW					.375	.173	.156	.382	.122	.016	■	■	■
	CCMT-32.52F-EW					.110	.031	■	■	■		■		■



**CCMW** EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	CCMW-21.50.5F-EW	.250	.110	.094	.254	.134	.008	■	■	■		■		■
	CCMW-21.50.5T-EW					.134	.008	■	■	■		■		■
	CCMW-21.51F-EW					.122	.016	■	■	■		■		■
	CCMW-21.51T-EW					.122	.016	■	■	■		■		■
	CCMW-21.52F-EW					.110	.031	■	■	■		■		■
	CCMW-21.52T-EW					.110	.031	■	■	■		■		■
	CCMW-321F-EW					.122	.016	■				■		■
	CCMW-321T-EW					.122	.016	■				■		■
	CCMW-322F-EW					.110	.031	■				■		■
	CCMW-322T-EW					.110	.031	■				■		■
	CCMW-32.50.5F-EW					.134	.008	■	■	■		■		■
	CCMW-32.50.5T-EW					.134	.008	■	■	■		■		■
	CCMW-32.51F-EW					.122	.016	■	■	■		■		■
	CCMW-32.51T-EW					.122	.016	■	■	■		■		■
	CCMW-32.52F-EW					.110	.031	■	■	■		■		■
	CCMW-32.52T-EW					.110	.031	■	■	■		■		■
	CCMW-32.53F-EW					.098	.047	■				■		■
	CCMW-32.53T-EW					.098	.047	■	■	■		■		■
	CCMW-431F-EW					.122	.016	■				■		■
	CCMW-431T-EW					.122	.016	■	■	■		■		■
	CCMW-432F-EW					.110	.031	■	■	■		■		■
	CCMW-432T-EW					.110	.031	■	■	■		■		■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**CCMW** EWS

Insert	Designation	Dimensions					BH	BL			
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CCMW-21.50.5F-EWS	.250	.110	.094	.254	.134	.008			■	
	CCMW-21.50.5T-EWS					.134	.008	■	■	■	■
	CCMW-21.51F-EWS					.122	.016		■	■	■
	CCMW-21.51T-EWS					.122	.016	■	■	■	■
	CCMW-21.52F-EWS					.110	.031		■	■	■
	CCMW-21.52T-EWS					.110	.031	■	■	■	■
	CCMW-32.50.5F-EWS					.134	.008		■	■	■
	CCMW-32.50.5T-EWS					.134	.008	■	■	■	■
	CCMW-32.51F-EWS					.122	.016		■	■	■
	CCMW-32.51T-EWS					.122	.016	■	■	■	■
	CCMW-32.52F-EWS					.110	.031		■	■	■
	CCMW-32.52T-EWS					.110	.031	■	■	■	■
	CCMW-32.53F-EWS					.098	.047		■	■	■
	CCMW-32.53T-EWS					.098	.047	■	■	■	■

**CCMW** EWS wiper edge neutral

Insert	Designation	Dimensions					BH	BL			
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CCMW-21.50.5FW-EWS	.250	.110	.094	.254	.130	.008			■	
	CCMW-21.50.5TW-EWS					.130	.008	■	■	■	■
	CCMW-21.51FW-EWS					.118	.016		■	■	■
	CCMW-21.51TW-EWS					.118	.016	■	■	■	■
	CCMW-32.50.5FW-EWS					.130	.008		■	■	■
	CCMW-32.50.5TW-EWS					.130	.008	■	■	■	■
	CCMW-32.51FW-EWS					.118	.016		■	■	■
	CCMW-32.51TW-EWS					.118	.016	■	■	■	■
	CCMW-32.52FW-EWS					.106	.031		■	■	■
	CCMW-32.52TW-EWS					.106	.031	■	■	■	■

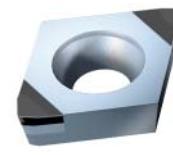
Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

# Inserts - CBN



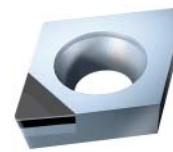
**CCMW** MultiCut

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CCMW-32.50.5F-MC	.375	.173	.156	.382	.134	.008	■				■		■
	CCMW-32.50.5T-MC					.134	.008	■	■	■	■	■	■	■
	CCMW-32.51F-MC					.122	.016	■				■		■
	CCMW-32.51T-MC					.122	.016	■	■	■	■	■	■	■
	CCMW-32.52F-MC					.110	.031	■				■		■
	CCMW-32.52T-MC					.110	.031	■	■	■	■	■	■	■



**CCMW** MultiCut wiper edge neutral

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CCMW-32.50.5FW-MC	.375	.173	.156	.382	.130	.008	■	■	■		■		■
	CCMW-32.50.5TW-MC					.130	.008	■	■	■	■	■	■	■
	CCMW-32.51FW-MC					.118	.016	■	■	■		■		■
	CCMW-32.51TW-MC					.118	.016	■	■	■	■	■	■	■
	CCMW-32.52FW-MC					.106	.031	■	■	■		■		■
	CCMW-32.52TW-MC					.106	.031	■	■	■	■	■	■	■



**CCMW** MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CCMW-431F-MW	.500	.217	.187	.508	.209	.016	■				■		■
	CCMW-431T-MW					.209	.016	■		■	■	■	■	■
	CCMW-432F-MW					.197	.031	■				■		■
	CCMW-432T-MW					.197	.031	■		■	■	■	■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## CCMW Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CCMW-21.51FR/L-GS	.250	.110	.094	--	.254	.016	■				■		■
	CCMW-21.51TR/L-GS					.254	.016	■	■	■	■	■	■	■
	CCMW-21.52FR/L-GS					.254	.031	■				■		■
	CCMW-21.52TR/L-GS					.254	.031	■	■	■	■	■	■	■
	CCMW-32.51FR/L-GS	.375	.173	.156	--	.382	.016	■				■		■
	CCMW-32.51TR/L-GS					.382	.016	■	■	■	■	■	■	■
	CCMW-32.52FR/L-GS					.382	.031	■				■		■
	CCMW-32.52TR/L-GS					.382	.031	■	■	■	■	■	■	■

Right hand shown

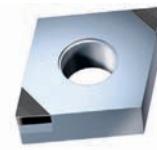
Ordering Example: 10 pcs. CCMW-21.51FR -GS PBC-10 (Right Hand)

## CNMA EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CNMA-321F-EW	.375	.150	.125	.382	.122	.016	■				■		
	CNMA-321T-EW					.122	.016	■				■		
	CNMA-322F-EW					.110	.031	■				■		
	CNMA-322T-EW					.110	.031	■				■		
	CNMA-430.5F-EW	.500	.202	.187	.508	.134	.008	■	■	■		■		■
	CNMA-430.5T-EW					.134	.008	■	■	■		■		■
	CNMA-431F-EW					.122	.016	■	■	■		■		■
	CNMA-431T-EW					.122	.016	■	■	■		■		■
	CNMA-432F-EW					.110	.031	■	■	■		■		■
	CNMA-432T-EW					.110	.031	■	■	■		■		■
	CNMA-433F-EW					.098	.047	■	■	■		■		■
	CNMA-433T-EW					.098	.047	■	■	■		■		■

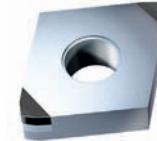
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**CNMA** MultiCut

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	CNMA-431F-MC	.500	.202	.187	.508	.118	.016	■	■	■		■		■
	CNMA-431T-MC					.118	.016	■	■	■	■	■	■	■
	CNMA-432F-MC					.106	.031	■	■	■		■		■
	CNMA-432T-MC					.106	.031	■	■	■	■	■	■	■
	CNMA-433T-MC					.094	.047	■	■	■	■	■		■



**CNMA** MultiCut wiper edge neutral

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	CNMA-430.5FW-MC	.500	.202	.187	.508	.130	.008	■	■	■		■		■
	CNMA-430.5TW-MC					.130	.008	■	■	■	■	■	■	■
	CNMA-431FW-MC					.118	.016	■	■	■		■		■
	CNMA-431TW-MC					.118	.016	■	■	■	■	■	■	■
	CNMA-432FW-MC					.106	.031	■	■	■		■		■
	CNMA-432TW-MC					.106	.031	■	■	■	■	■	■	■



**CNMA** PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	CNMA-430.5F-PC-S	.500	.202	.187	.508	.114	.008		■	■	■
	CNMA-430.5T-PC-S					.114	.008		■	■	■
	CNMA-431F-PC-S					.110	.016		■	■	■
	CNMA-431T-PC-S					.110	.016		■	■	■
	CNMA-432F-PC-S					.098	.031		■	■	■
	CNMA-432T-PC-S					.098	.031		■	■	■
	CNMA-433F-PC-S					.087	.047		■	■	■
	CNMA-433T-PC-S					.087	.047		■	■	■

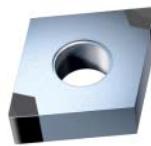
Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**CNMA** PolyCut-S wiper edge neutral

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	CNMA-430.5FW-PC-S	.500	.202	.187	.508	.114	.008			■	■
	CNMA-430.5TW-PC-S					.114	.008	■	■	■	■
	CNMA-431FW-PC-S					.110	.016		■	■	■
	CNMA-431TW-PC-S					.110	.016	■	■	■	■
	CNMA-432FW-PC-S					.098	.031		■	■	■
	CNMA-432TW-PC-S					.098	.031	■	■	■	■



**CNMA** PolyCut-M

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	CNMA-431T-PC-M	.500	.202	.187	.508	.110	.016		■	■	■
	CNMA-432T-PC-M					.102	.031	■	■	■	■
	CNMA-433T-PC-M					.094	.047	■	■	■	■



**CNMA** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	CNMA-431T-PC-M4	.500	.202	.187	.508	.177	.016		■		
	CNMA-432T-PC-M4					.165	.031	■			
	CNMA-433T-PC-M4					.157	.047	■			
	CNMA-434T-PC-M4					.150	.063	■			

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## CNMA MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	CNMA-431F-MW	 .500    .202    .187    .508	.209	.016										
	CNMA-431T-MW		.209	.016										
	CNMA-432F-MW		.197	.031										
	CNMA-432T-MW		.197	.031										
	CNMA-433F-MW		.185	.047										
	CNMA-433T-MW		.185	.047										
	CNMA-434T-MW		.173	.063										



## CNMF PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	CNMF-321F-PC-S	 .375    --    .125    .382	.110	.016								
	CNMF-322F-PC-S		.102	.031								
	CNMF-323F-PC-S		.094	.047								
	CNMF-431F-PC-S		.110	.016								
	CNMF-432F-PC-S		.102	.031								
	CNMF-433F-PC-S		.094	.047								

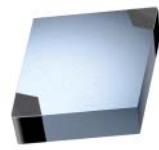


## CNMG PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	CNMG-431F-PC-S	 .500    .202    .187    .508	.110	.016								
	CNMG-432F-PC-S		.102	.031								
	CNMG-433F-PC-S		.094	.047								

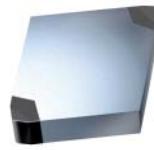
Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**CNMN** PolyCut-M

Insert	Designation	Dimensions					SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l				
	CNMN-321F-PC-M	.375	--	.125	.382	.110	.016			
	CNMN-321T-PC-M					.110	.016	■	■	■ ■
	CNMN-322F-PC-M					.102	.031		■	
	CNMN-322T-PC-M					.102	.031	■	■	■ ■
	CNMN-323F-PC-M					.094	.047		■	
	CNMN-323T-PC-M					.094	.047	■	■	■ ■
	CNMN-431F-PC-M					.110	.016		■	
	CNMN-431T-PC-M					.110	.016	■	■	■ ■
	CNMN-432F-PC-M					.102	.031		■	
	CNMN-432T-PC-M					.102	.031	■	■	■ ■
	CNMN-433F-PC-M	.500	--	.187	.508	.110	.016			
	CNMN-433T-PC-M					.094	.047		■	
	CNMN-433T-PC-M					.094	.047	■	■	■ ■



**CNMN** PolyCut-M wiper edge neutral

Insert	Designation	Dimensions					SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l				
	CNMN-320.5FW-PC-M	.375	--	.125	.382	.114	.008		■	
	CNMN-320.5TW-PC-M					.114	.008	■	■	■ ■
	CNMN-321FW-PC-M					.110	.016		■	
	CNMN-321TW-PC-M					.110	.016	■	■	■ ■
	CNMN-322FW-PC-M					.102	.031		■	
	CNMN-322TW-PC-M					.102	.031	■	■	■ ■
	CNMN-430.5FW-PC-M					.114	.008		■	
	CNMN-430.5TW-PC-M					.114	.008	■	■	■ ■
	CNMN-431FW-PC-M					.110	.016		■	
	CNMN-431TW-PC-M					.110	.016	■	■	■ ■
	CNMN-432FW-PC-M	.500	--	.187	.508	.102	.031		■	
	CNMN-432TW-PC-M					.102	.031	■	■	■ ■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



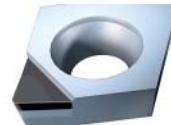
**CNMN** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CNMN-431T-PC-M4	.500	--	.187	.508	.177	.016	■			
	CNMN-432T-PC-M4					.165	.031	■			
	CNMN-433T-PC-M4					.157	.040	■			
	CNMN-434T-PC-M4					.150	.063	■			



**CNMN** PolyCut-S/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CNMN-321T-PC-S4	.375	--	.125	.382	.177	.016	■			
	CNMN-322T-PC-S4					.165	.031	■			
	CNMN-323T-PC-S4					.157	.047	■			
	CNMN-324T-PC-S4					.150	.063	■			

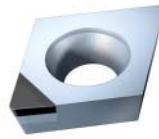


**CPMT** EW

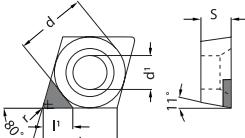
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CPMT-1.51.20.5F-EW	.187	.083	.078	.189	.087	.008	■	■	■				
	CPMT-1.51.21F-EW					.079	.016	■	■	■				
	CPMT-1.81.20.5F-EW	.219	.098	.078	.220	.094	.008	■	■	■				
	CPMT-1.81.21F-EW					.087	.016	■	■	■				
	CPMT-1.81.50.5F-EW	.219	.098	.094	.220	.094	.008	■	■	■				
	CPMT-1.81.51F-EW					.087	.016	■	■	■				
	CPMT-21.50.5F-EW	.250	.110	.094	.254	.134	.008	■	■	■				
	CPMT-21.51F-EW					.122	.016	■	■	■				
	CPMT-21.52F-EW					.110	.031	■	■	■				

Note: CCMT-21.50.5F-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN

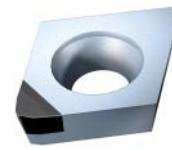


## CPMW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CPMW-1.51.20.5F-EW	.187	.083	.078	.189	.087	.008	■	■	■		■		■
	CPMW-1.51.20.5T-EW					.087	.008	■	■	■	■	■	■	■
	CPMW-1.51.21F-EW					.079	.016	■	■	■		■		■
	CPMW-1.51.21T-EW					.079	.016	■	■	■	■	■	■	■
	CPMW-1.81.20.5F-EW	.219	.098	.078	.220	.094	.008	■	■	■		■		■
	CPMW-1.81.20.5T-EW					.094	.008	■	■	■	■	■	■	■
	CPMW-1.81.21F-EW					.087	.016	■	■	■		■		■
	CPMW-1.81.21T-EW					.087	.016	■	■	■	■	■	■	■
	CPMW-1.81.50.5F-EW	.219	.098	.094	.220	.094	.008	■	■	■	■	■	■	■
	CPMW-1.81.50.5T-EW					.094	.008	■	■	■	■	■	■	■
	CPMW-1.81.51F-EW					.087	.016	■	■	■		■		■
	CPMW-1.81.51T-EW					.087	.016	■	■	■	■	■	■	■
	CPMW-21.50.5F-EW	.250	.110	.094	.254	.134	.008	■	■	■		■		■
	CPMW-21.50.5T-EW					.134	.008	■	■	■	■	■	■	■
	CPMW-21.51F-EW					.122	.016	■	■	■		■		■
	CPMW-21.51T-EW					.122	.016	■	■	■	■	■	■	■
	CPMW-21.52F-EW					.110	.031	■	■	■		■		■
	CPMW-21.52T-EW					.110	.031	■	■	■	■	■	■	■
	CPMW-32.50.5F-EW	.375	.173	.156	.382	.134	.008	■	■	■		■		■
	CPMW-32.50.5T-EW					.134	.008	■	■	■	■	■	■	■
	CPMW-32.51F-EW					.122	.016	■	■	■		■		■
	CPMW-32.51T-EW					.122	.016	■	■	■	■	■	■	■
	CPMW-32.52F-EW					.110	.031	■	■	■		■		■
	CPMW-32.52T-EW					.110	.031	■	■	■	■	■	■	■

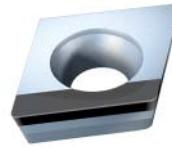
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**CPMW** EWS wiper edge neutral

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	CPMW-1.81.20.5FW-EWS	.219	.098	.078	.220	.094	.008			■	■	■
	CPMW-1.81.20.5TW-EWS					.094	.008		■	■	■	■
	CPMW-1.81.21FW-EWS					.087	.016		■	■	■	■
	CPMW-1.81.21TW-EWS					.087	.016		■	■	■	■
	CPMW-1.81.50.5FW-EWS	.219	.098	.094	.220	.094	.008			■	■	■
	CPMW-1.81.50.5TW-EWS					.094	.008		■	■	■	■
	CPMW-1.81.51FW-EWS					.087	.016		■	■	■	■
	CPMW-1.81.51TW-EWS					.087	.016		■	■	■	■
	CPMW-21.50.5FW-EWS	.250	.110	.094	.254	.130	.008			■	■	■
	CPMW-21.50.5TW-EWS					.130	.008		■	■	■	■
	CPMW-21.51FW-EWS					.118	.016		■	■	■	■
	CPMW-21.51TW-EWS					.118	.016		■	■	■	■



**CPMW** Whole edge tipped

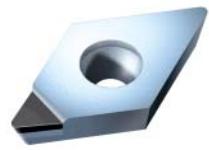
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	CPMW-1.81.51FR/L-GS	.219	.098	.094	--	.220	.016	■			■	■	■	■
	CPMW-1.81.51TR/L-GS					.220	.016	■	■	■	■	■	■	■
	CPMW-21.51FR/L-GS					.254	.016	■				■	■	■
	CPMW-21.51TR/L-GS					.254	.016	■	■	■	■	■	■	■
	CPMW-21.52FR/L-GS	.250	.110	.094	--	.254	.031	■			■	■	■	■
	CPMW-21.52TR/L-GS					.254	.031	■	■	■	■	■	■	■

Right hand shown

Ordering Example: 10 pcs. CPMW-1.81.51FR -GS PBC-10 (Right Hand)

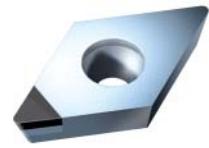
Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## DCMT EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	DCMT-21.50.5F-EW	.250	.110	.094	.305	.154	.008	■	■	■		■		■
	DCMT-21.51F-EW					.138	.016	■	■	■		■		■
	DCMT-21.52F-EW					.118	.031	■	■	■		■		■
	DCMT-32.50.5F-EW					.154	.008	■	■	■		■		■
	DCMT-31.51F-EW					.375	.173	.156	.457	.138	.016	■	■	■
	DCMT-32.52F-EW					.118	.031	■	■	■		■		■

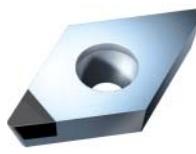


## DCMW EW

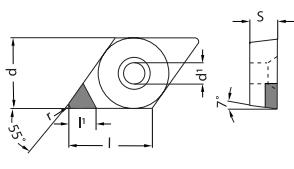
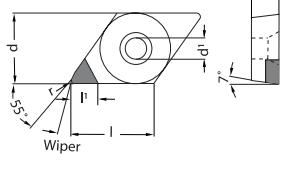
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	DCMW-21.50.5F-EW	.250	.110	.094	.305	.154	.008	■	■	■		■		■
	DCMW-21.50.5T-EW					.154	.008	■	■	■		■		■
	DCMW-21.51F-EW					.138	.016	■	■	■		■		■
	DCMW-21.51T-EW					.138	.016	■	■	■		■		■
	DCMW-21.52F-EW					.118	.031	■	■	■		■		■
	DCMW-21.52T-EW					.118	.031	■	■	■		■		■
	DCMW-320.5F-EW	.375	.173	.125	.457	.154	.008	■				■		
	DCMW-320.5T-EW					.154	.008	■				■		
	DCMW-321F-EW					.138	.016	■				■		
	DCMW-321T-EW					.138	.016	■				■		
	DCMW-322F-EW					.118	.031	■				■		
	DCMW-322T-EW					.118	.031	■				■		
	DCMW-32.50.5F-EW	.375	.173	.156	.457	.154	.008	■	■	■		■		■
	DCMW-32.50.5T-EW					.154	.008	■	■	■		■		■
	DCMW-32.51F-EW					.138	.016	■	■	■		■		■
	DCMW-32.51T-EW					.138	.016	■	■	■		■		■
	DCMW-32.52F-EW					.118	.031	■	■	■		■		■
	DCMW-32.52T-EW					.118	.031	■	■	■		■		■
	DCMW-431F-EW	.500	.217	.187	.610	.138	.016	■				■		■
	DCMW-431T-EW					.138	.016	■				■		■
	DCMW-432F-EW					.118	.031	■				■		■
	DCMW-432T-EW					.118	.031	■				■		■

Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

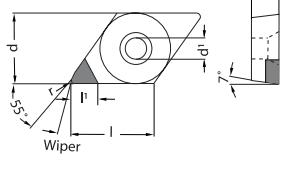
# Inserts - CBN



## DCMW EWS

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	DCMW-21.50F-EWS	.250	.110	.094	.305	.154	.004			■	■ ■
	DCMW-21.50T-EWS					.154	.004			■	■ ■
	DCMW-21.50.5F-EWS					.154	.008			■	■ ■
	DCMW-21.50.5T-EWS					.154	.008		■	■ ■	■ ■
	DCMW-21.51F-EWS					.138	.016			■	■ ■
	DCMW-21.51T-EWS					.138	.016		■	■ ■	■ ■
	DCMW-21.52F-EWS					.118	.031			■	■ ■
	DCMW-21.52T-EWS					.118	.031		■	■ ■	■ ■
	DCMW-32.50F-EWS					.154	.004			■	■ ■
	DCMW-32.50T-EWS					.154	.004			■	■ ■
	DCMW-32.50.5F-EWS					.154	.008			■	■ ■
	DCMW-32.50.5T-EWS					.154	.008		■	■ ■	■ ■
	DCMW-32.51F-EWS					.138	.016			■	■ ■
	DCMW-32.51T-EWS					.138	.016		■	■ ■	■ ■
	DCMW-32.52F-EWS	.375	.173	.156	.457	.118	.031			■	■ ■
	DCMW-32.52T-EWS					.118	.031		■	■ ■	■ ■
	DCMW-32.53F-EWS					.102	.047			■	■ ■
	DCMW-32.53T-EWS					.102	.047		■	■ ■	■ ■

## DCMW EWS wiper edge 93° right or left hand

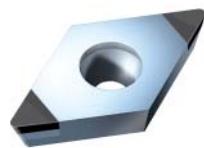
Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	DCMW-21.50FR/LW-EWS	.250	.110	.094	.305	.118	.004			■	■ ■
	DCMW-21.50TR/LW-EWS					.118	.004			■	■ ■
	DCMW-21.50.5FR/LW-EWS					.118	.008			■	■ ■
	DCMW-21.50.5TR/LW-EWS					.118	.008		■	■ ■	■ ■
	DCMW-21.51FR/LW-EWS					.118	.016			■	■ ■
	DCMW-21.51TR/LW-EWS					.118	.016		■	■ ■	■ ■
	DCMW-32.50FR/LW-EWS					.118	.004			■	■ ■
	DCMW-32.50TR/LW-EWS					.118	.004			■	■ ■
	DCMW-32.50.5FR/LW-EWS					.118	.008			■	■ ■
	DCMW-32.50.5TR/LW-EWS					.118	.008		■	■ ■	■ ■
	DCMW-32.51FR/LW-EWS					.118	.016			■	■ ■
	DCMW-32.51TR/LW-EWS					.118	.016		■	■ ■	■ ■
	DCMW-32.52FR/LW-EWS					.118	.031			■	■ ■
	DCMW-32.52TR/LW-EWS					.118	.031		■	■ ■	■ ■

Right hand shown

Ordering Example: 10 pcs. DCMW-21.50FR SBC1 (Right Hand)

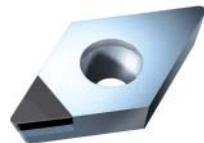
Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## DCMW MultiCut

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	DCMW-21.50.5T-MC	.250	.110	.094	.305	.154	.008	■		■	■	■	■	■
	DCMW-21.51T-MC					.138	.016	■	■	■	■	■	■	■
	DCMW-21.52T-MC					.118	.031	■		■	■	■	■	■
	DCMW-32.50.5F-MC	.375	.173	.156	.457	.154	.008	■			■		■	■
	DCMW-32.50.5T-MC					.154	.008	■			■	■	■	■
	DCMW-32.51F-MC					.138	.016	■			■	■	■	■
	DCMW-32.51T-MC					.138	.016	■	■	■	■	■	■	■
	DCMW-32.52F-MC					.118	.031	■			■	■	■	■
	DCMW-32.52T-MC					.118	.031	■	■	■	■	■	■	■

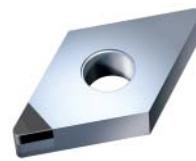


## DCMW MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	DCMW-32.50.5F-MW	.375	.173	.156	.457	.220	.008	■			■		■	■
	DCMW-32.50.5T-MW					.220	.008	■	■	■	■	■	■	■
	DCMW-32.51F-MW					.217	.016	■			■	■	■	■
	DCMW-32.51T-MW					.217	.016	■	■	■	■	■	■	■
	DCMW-32.52F-MW					.197	.031	■			■	■	■	■
	DCMW-32.52T-MW					.197	.031	■	■	■	■	■	■	■
	DCMW-431T-MW					.217	.016	■			■			■
	DCMW-432T-MW					.197	.031	■			■			■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## DNMA EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	DNMA-330.5F-EW	.375	.150	.187	.457	.154	.008							
	DNMA-330.5T-EW					.154	.008							
	DNMA-331F-EW					.138	.016							
	DNMA-331T-EW					.138	.016							
	DNMA-332F-EW					.118	.031							
	DNMA-332T-EW					.118	.031							
	DNMA-430.5F-EW					.154	.008							
	DNMA-430.5T-EW					.154	.008							
	DNMA-431F-EW					.138	.016							
	DNMA-431T-EW					.138	.016							
	DNMA-432F-EW					.118	.031							
	DNMA-432T-EW					.118	.031							
	DNMA-441F-EW	.500	.202	.187	.610	.154	.008							
	DNMA-441T-EW					.154	.008							
	DNMA-442F-EW					.138	.016							
	DNMA-442T-EW					.138	.016							
	DNMA-441F-PC-S	.500	.202	.187	.610	.138	.016							
	DNMA-441T-PC-S					.138	.016							
	DNMA-442F-PC-S					.102	.031							
	DNMA-442T-PC-S					.102	.031							
	DNMA-443F-PC-S					.094	.047							
	DNMA-443T-PC-S					.094	.047							
	DNMA-440.5F-PC-S					.118	.008							
	DNMA-440.5T-PC-S					.118	.008							
	DNMA-441F-PC-S					.110	.016							
	DNMA-441T-PC-S					.110	.016							
	DNMA-442F-PC-S					.102	.031							
	DNMA-442T-PC-S					.102	.031							
	DNMA-443F-PC-S					.094	.047							
	DNMA-443T-PC-S					.094	.047							



## DNMA PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	DNMA-431F-PC-S	.500	.202	.187	.610	.110	.016				
	DNMA-431T-PC-S					.110	.016				
	DNMA-432F-PC-S					.102	.031				
	DNMA-432T-PC-S					.102	.031				
	DNMA-433F-PC-S					.094	.047				
	DNMA-433T-PC-S					.094	.047				
	DNMA-440.5F-PC-S					.118	.008				
	DNMA-440.5T-PC-S					.118	.008				
	DNMA-441F-PC-S					.110	.016				
	DNMA-441T-PC-S					.110	.016				
	DNMA-442F-PC-S					.102	.031				
	DNMA-442T-PC-S					.102	.031				
	DNMA-443F-PC-S					.094	.047				
	DNMA-443T-PC-S					.094	.047				

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## DNMA PolyCut-S/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	DNMA-330.5-PC-S4					.177	.008				
	DNMA-331-PC-S4					.157	.016				
	DNMA-332-PC-S4	.375	.150	.187	.457						
	DNMA-333-PC-S4					.142	.031				
						.126	.047				
	DNMA-431-PC-S4					.157	.016				
	DNMA-432-PC-S4	.500	.202	.187	.610						
	DNMA-433-PC-S4					.142	.031				
	DNMA-441-PC-S4					.126	.047				
	DNMA-442-PC-S4					.157	.016				
	DNMA-443-PC-S4	.500	.202	.250	.610						
	DNMA-444-PC-S4					.142	.031				
						.126	.047				
						.118	.063				



## DNMA PolyCut-M

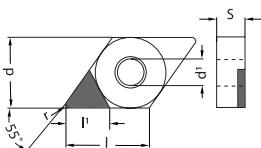
Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l	r				
	DNMA-431T-PC-M					.110	.016				
	DNMA-432T-PC-M	.500	.202	.187	.610						
	DNMA-433T-PC-M					.102	.031				
						.094	.047				
	DNMA-441T-PC-M					.110	.016				
	DNMA-442T-PC-M	.500	.202	.250	.610						
	DNMA-443T-PC-M					.102	.031				
						.094	.047				

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

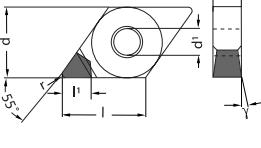
# Inserts - CBN



## DNMA MW

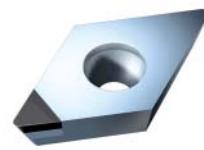
Insert	Designation	Dimensions						BH	BL									
		d	d <sup>1</sup>	s	l	l	r		PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40			
	DNMA-432T-MW	.500	.202	.187	.610	.197	.031	■	■	■	■	■	■	■				
	DNMA-433T-MW					.177	.047	■	■	■	■	■	■	■				
	DNMA-441F-MW						.217	.016	■				■		■			
	DNMA-441T-MW	.217				.016	■				■		■					
	DNMA-442F-MW	.197				.031	■				■		■					
	DNMA-442T-MW	.197				.031	■	■	■	■	■	■	■					
	DNMA-443F-MW	.177				.047	■				■		■					
	DNMA-443T-MW	.177				.047	■	■	■	■	■	■	■					
	DNMA-444F-MW	.157				.063	■											
	DNMA-444T-MW	.157				.063			■	■	■	■	■					

## DNMG PolyCut-S

Insert	Designation	Dimensions						BH	BL				
		d	d <sup>1</sup>	s	l	l	r		SBC1	SB10		SB25	SB40
	DNMG-431F-PC-S	.500	.202	.187	.610	.110	.016			■		■	■
	DNMG-432F-PC-S					.102	.031			■		■	■
	DNMG-433F-PC-S					.094	.047			■		■	■
	DNMG-441F-PC-S	.500	.202	.250	.610	.110	.016			■		■	■
	DNMG-442F-PC-S					.102	.031			■		■	■
	DNMG-443F-PC-S					.094	.047			■		■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



## DPMW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	DPMW-21.50.5F-EW	.250	.110	.094	.305	.154	.008							
	DPMW-21.50.5T-EW					.154	.008							
	DPMW-21.51F-EW					.138	.016							
	DPMW-21.51T-EW					.138	.016							
	DPMW-21.52F-EW					.118	.031							
	DPMW-21.52T-EW					.118	.031							
	DPMW-32.50.5F-EW					.154	.008							
	DPMW-32.50.5T-EW					.154	.008							
	DPMW-32.51F-EW					.138	.016							
	DPMW-32.51T-EW					.138	.016							
	DPMW-32.52F-EW					.118	.031							
	DPMW-32.52T-EW					.118	.031							

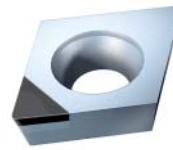


## EPMT EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	EPMT-1.51.50.5F-EW	.187	.085	.094	.189	.098	.008							
	EPMT-1.51.51F-EW					.087	.016							
	EPMT-1.81.50.5F-EW					.106	.008							
	EPMT-1.81.51F-EW					.094	.016							
	EPMT-21.50.5F-EW					.134	.008							
	EPMT-21.51F-EW					.122	.016							

Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

# Inserts - CBN



**EPMW EW**

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	EPMW-1.51.50.5F-EW	.187	.085	.094	.189	.098	.008	■				■		■
	EPMW-1.51.50.5T-EW					.098	.008	■				■	■	■
	EPMW-1.51.51F-EW					.087	.016	■				■		■
	EPMW-1.51.51T-EW					.087	.016	■	■	■	■	■		■
	EPMW-1.81.50.5F-EW	.219	.094	.094	.224	.106	.008	■				■		■
	EPMW-1.81.50.5T-EW					.106	.008	■				■		■
	EPMW-1.81.51F-EW					.094	.016	■				■		■
	EPMW-1.81.51T-EW					.094	.016	■	■	■	■	■		■
	EPMW-21.50.5F-EW	.250	.110	.094	.256	.134	.008	■				■		■
	EPMW-21.50.5T-EW					.134	.008	■				■		■
	EPMW-21.51F-EW					.122	.016	■				■		■
	EPMW-21.51T-EW					.122	.016	■	■	■	■	■		■
	EPMW-2.520.5F-EW	.313	.134	.125	.327	.134	.008	■				■		■
	EPMW-2.520.5T-EW					.134	.008	■				■		■
	EPMW-2.521F-EW					.122	.016	■				■		■
	EPMW-2.521T-EW					.122	.016	■	■	■	■	■		■
	EPMW-2.522F-EW					.110	.031	■				■		
	EPMW-2.522T-EW					.110	.031	■				■		



**RCMW Fullface**

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	RCMW-0602M0F-VM	.236	.110	.094	--	--	--	■				■		■
	RCMW-0602M0T-VM							■	■	■	■	■	■	■
	RCMW-0803M0F-VM							■				■		■
	RCMW-0803M0T-VM							■	■	■	■	■	■	■
	RCMW-1003M0T-VM							■				■		■
	RCMW-10T3M0T-VM							■				■		■
	RCMW-1204M0T-VM							■				■		■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**RCGX** Fullface

Insert	Designation	Dimensions						SBC1	SB10	PBC-10	PBC-15	PBC-17	PBC-20	SB25	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r										
	RCGX-24F-VM	.250	--	.250	--	--	--			■					■	■	■
	RCGX-24T-VM	.250	--	.250	--	--	--	■	■	■	■	■	■	■	■	■	■
	RCGX-35T-VM	.375	--	.313	--	--	--	■		■	■	■	■		■	■	■
	RCGX-45T-VM	.500	--	.313	--	--	--	■		■	■	■	■		■		



**RNGN** Solid

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	RNGN-32T	.375	--	.125	--	--	--		■	■		
	RNGN-42T	.500	--	.125	--	--	--		■	■	■	
	RNGN-43T	.500	--	.187	--	--	--	■				



**RNGN** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	RNGN-32F-VM	.375	--	.125	--	--	--	■						
	RNGN-32T-VM	.375	--	.125	--	--	--	■		■	■	■	■	■
	RNGN-43F-VM	.500	--	.187	--	--	--	■						
	RNGN-43T-VM	.500	--	.187	--	--	--	■		■	■	■	■	■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**RNMA** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s		<sup>1</sup>	r							
	RNMA-32F-VM	.375	.150	.125	--	--	--	■				■		
	RNMA-32T-VM	.375	.150	.125	--	--	--	■				■		
	RNMA-43F-VM	.500	.202	.187	--	--	--	■				■		
	RNMA-43T-VM	.500	.202	.187	--	--	--	■				■		



**RPMW** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s		<sup>1</sup>	r							
	RPMW-1204MOT-VM	.472	.173	.187	--	--	--	■				■		
	RPMW-43T-VM	.500	.217	.187	--	--	--	■				■		



**SCMW** EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s		<sup>1</sup>	r							
	SCMW-32.51F-EW	.375	.173	.156	.375		.138	.016	■	■	■		■	■
	SCMW-32.51T-EW						.138	.016	■	■	■	■	■	■
	SCMW-32.52F-EW						.134	.031	■				■	
	SCMW-32.52T-EW						.134	.031	■	■	■	■	■	■
	SCMW-431F-EW	.500	.217	.187	.500		.138	.016	■				■	
	SCMW-431T-EW						.138	.016	■	■		■	■	■
	SCMW-432F-EW						.134	.031	■			■		
	SCMW-432T-EW						.134	.031	■		■	■	■	■
	SCMW-433F-EW						.126	.047	■			■	■	■
	SCMW-433T-EW						.126	.047	■		■	■	■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, T= T-Land

# Inserts - CBN



**SCMW** Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	SCMW-32.51F-GS	.375	.173	.156	--	.375	.016	■	■					
	SCMW-32.51T-GS					.375	.016	■	■	■	■	■	■	■
	SCMW-32.52F-GS					.375	.031	■	■					
	SCMW-32.52T-GS					.375	.031	■	■	■	■	■	■	■



**SNGN** PolyCut-M

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SNGN-321F-PC-M	.375	--	.125	.375	.118	.016				
	SNGN-321T-PC-M					.118	.016	■	■	■	■
	SNGN-322F-PC-M					.110	.031		■	■	■
	SNGN-322T-PC-M					.110	.031	■	■	■	■
	SNGN-323F-PC-M					.102	.047				
	SNGN-323T-PC-M					.102	.047	■	■	■	■
	SNGN-431F-PC-M					.118	.016				
	SNGN-431T-PC-M					.118	.016	■	■	■	■
	SNGN-432F-PC-M					.110	.031		■	■	■
	SNGN-432T-PC-M					.110	.031	■	■	■	■
	SNGN-433F-PC-M	.500	--	.187	.500	.102	.047				
	SNGN-433T-PC-M					.102	.047	■	■	■	■



**SNGN** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SNGN-431T-PC-M4	.500	--	.187	.500	.177	.016		■		
	SNGN-432T-PC-M4					.173	.031	■	■		
	SNGN-433T-PC-M4					.165	.047	■	■		
	SNGN-434T-PC-M4					.157	.063	■	■		

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**SNGN** PolyCut-M whole edge

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	BH	BL		
	SNGN-322T-MGS	.375	--	.125	--	.375	.031	■	■	■	■
	SNGN-323T-MGS					.375	.047	■	■	■	■
	SNGN-324T-MGS					.375	.063	■	■	■	■
	SNGN-432T-MGS	.500	--	.187	--	.500	.031	■	■	■	■
	SNGN-433T-MGS					.500	.047	■	■	■	■
	SNGN-434T-MGS					.500	.063	■	■	■	■



**SNGN** PolyCut-S/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	BH	BL		
	SNGN-321T-PC-S4	.375	--	.125	.375	.177	.016	■			
	SNGN-322T-PC-S4					.173	.031	■			
	SNGN-323T-PC-S4					.165	.047	■			
	SNGN-324T-PC-S4					.157	.063	■			



**SNGN** Solid

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	BH	BL		
	SNGN-321F-SBC	.375	--	.125	--	.375	.016	■			
	SNGN-321T-SBC					.375	.016	■	■	■	■
	SNGN-322F-SBC					.375	.031	■			
	SNGN-322T-SBC					.375	.031	■	■	■	■
	SNGN-323F-SBC					.375	.047	■			
	SNGN-323T-SBC					.375	.047	■	■	■	■
	SNGN-324F-SBC					.375	.063	■			
	SNGN-324T-SBC					.375	.063	■	■	■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**SNMA** EW

Insert	Designation	Dimensions						BH	BL						
		d	d <sup>1</sup>	s	l	l	r		PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
 $d = .500$ , $d^1 = .202$ , $s = .187$ , $l = .500$ , $ l  = .138$ , $r = .016$	SNMA-431F-EW							.138	.016	■			■	■	■
	SNMA-431T-EW							.138	.016	■	■	■	■	■	■
	SNMA-432F-EW							.134	.031	■	■	■	■	■	■
	SNMA-432T-EW							.134	.031	■	■	■	■	■	■
	SNMA-433F-EW							.126	.047	■			■	■	■
	SNMA-433T-EW							.126	.047	■	■	■	■	■	■



**SNMA** PolyCut-M

Insert	Designation	Dimensions						BH	BL						
		d	d <sup>1</sup>	s	l	l	r		SBC1	SB10	SB25	SB40			
 $d = .500$ , $d^1 = .202$ , $s = .187$ , $l = .500$ , $ l  = .118$ , $r = .016$	SNMA-431T-PC-M							.118	.016	■	■	■	■	■	■
	SNMA-432T-PC-M							.110	.031	■	■	■	■	■	■
	SNMA-433T-PC-M							.102	.047	■	■	■	■	■	■



**SNMA** PolyCut-M/4

Insert	Designation	Dimensions						BH	BL						
		d	d <sup>1</sup>	s	l	l	r		SBC1	SB10	SB25	SB40			
 $d = .500$ , $d^1 = .202$ , $s = .187$ , $l = .500$ , $ l  = .173$ , $r = .031$	SNMA-432T-PC-M4							.173	.031	■					
	SNMA-433T-PC-M4							.165	.047	■					
	SNMA-434T-PC-M4							.158	.063	■					

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**SNMA** PolyCut-M whole edge

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SNMA-432F-PC-MGS	.500	.202	.187	--	.500	.031			■	
	SNMA-432T-PC-MGS					.500	.031	■	■	■	■
	SNMA-433F-PC-MGS					.500	.047		■		
	SNMA-433T-PC-MGS					.500	.047	■	■	■	■



**SNMA** PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SNMA-431F-PC-S	.500	.202	.187	.500	.118	.016			■	
	SNMA-431T-PC-S					.118	.016	■	■	■	■
	SNMA-432F-PC-S					.110	.031		■	■	■
	SNMA-432T-PC-S					.110	.031	■	■	■	■
	SNMA-433F-PC-S					.102	.047		■	■	■
	SNMA-433T-PC-S					.102	.047	■	■	■	■



**SNMG** PolyCut-S

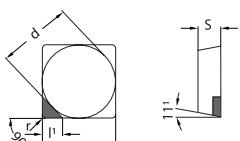
Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SNMG-431F-PC-S	.500	.202	.187	.500	.118	.016			■	
	SNMG-432F-PC-S					.110	.031	■	■	■	■
	SNMG-433F-PC-S					.102	.047	■	■	■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

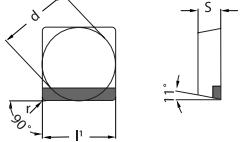
# Inserts - CBN



## SPGN EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l'	r							
	SPGN-321F-EW	.375	--	.125	.375	.138	.016							
	SPGN-321T-EW					.138	.016							
	SPGN-322F-EW					.134	.031							
	SPGN-322T-EW					.134	.031							
	SPGN-421F-EW					.138	.016							
	SPGN-421T-EW					.138	.016							
	SPGN-422F-EW					.134	.031							
	SPGN-422T-EW					.134	.031							
	SPGN-423F-EW					.126	.047							
	SPGN-423T-EW					.126	.047							

## SPGN Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l'	r							
	SPGN-321F-GS	.375	--	.125	--	.375	.016							
	SPGN-321T-GS					.375	.016							
	SPGN-322F-GS					.375	.031							
	SPGN-322T-GS					.375	.031							

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## SPMW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	SPMW-32.51F-EW	.375	.173	.156	.375	.138	.016	■	■			■		
	SPMW-32.51T-EW					.138	.016	■			■	■		■
	SPMW-32.52F-EW					.134	.031	■		■				
	SPMW-32.52T-EW					.134	.031	■	■	■	■	■	■	■
	SPMW-431F-EW	.500	.217	.187	.500	.138	.016	■				■		
	SPMW-431T-EW					.138	.016	■			■			■
	SPMW-432F-EW					.134	.031	■						
	SPMW-432T-EW					.134	.031	■		■	■	■		■
	SPMW-433F-EW					.126	.047	■						
	SPMW-433T-EW					.126	.047	■	■		■	■		■



## SPMW Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	SPMW-32.51F-GS	.375	.173	.156	--	.375	.016	■						
	SPMW-32.51T-GS					.375	.016	■	■	■	■	■		■
	SPMW-32.52F-GS					.375	.031	■						
	SPMW-32.52T-GS					.375	.031	■	■	■	■	■		■



## TBGN Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TBGN-1.210.5F-VM	.156	--	.062	--	.256	.008	■				■		
	TBGN-1.210.5T-VM					.256	.008	■		■	■	■	■	■
	TBGN-1.211F-VM					.256	.016	■				■		
	TBGN-1.211T-VM					.256	.016	■		■	■	■	■	■
	TBGN-1.212F-VM					.256	.031	■				■		
	TBGN-1.212T-VM					.256	.031	■	■	■	■	■	■	■

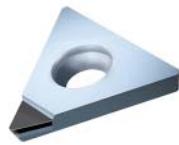
Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**TBGW** Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TBGW-1.210.5F-VM	.156	.091	.062	--	.256	.008	■				■		
	TBGW-1.210.5T-VM					.256	.008	■		■	■	■	■	■
	TBGW-1.211F-VM					.256	.016	■			■	■		
	TBGW-1.211T-VM					.256	.016	■		■	■	■	■	■
	TBGW-1.212F-VM					.256	.031	■			■			
	TBGW-1.212T-VM					.256	.031	■		■	■	■	■	■



**TCMT** EW

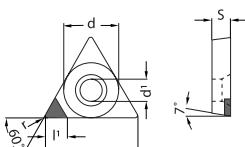
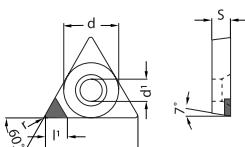
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TCMT-1.81.50.5F-EW	.219	.098	.094	.378	.150	.008	■	■			■		■
	TCMT-1.81.51F-EW					.138	.016	■	■	■	■	■		■
	TCMT-21.50.5F-EW					.150	.008	■	■			■		■
	TCMT-21.51F-EW					.138	.016	■	■	■	■	■		■

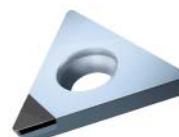
Note: CCMT-21.50.5F-EW: F = sharp cutting edge, L = T-Land

# Inserts - CBN

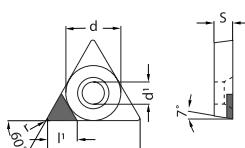


## TCMW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TCMW-1.81.50.5F-EW	.219	.098	.094	.378	.150	.008							
	TCMW-1.81.50.5T-EW					.150	.008							
	TCMW-1.81.51F-EW					.138	.016							
	TCMW-1.81.51T-EW					.138	.016							
	TCMW-1.81.52F-EW					.118	.031							
	TCMW-1.81.52T-EW					.118	.031							
	TCMW-21.50.5F-EW					.150	.008							
	TCMW-21.50.5T-EW					.150	.008							
	TCMW-21.51F-EW					.138	.016							
	TCMW-21.51T-EW					.138	.016							
	TCMW-21.52F-EW					.118	.031							
	TCMW-21.52T-EW					.118	.031							
	TCMW-21.53F-EW					.102	.047							
	TCMW-21.53T-EW					.102	.047							
	TCMW-32.51F-EW	.375	.173	.156	.650	.138	.016							
	TCMW-32.51T-EW					.138	.016							
	TCMW-32.52F-EW					.118	.031							
	TCMW-32.52T-EW					.118	.031							
	TCMW-32.53F-EW					.118	.031							
	TCMW-32.53T-EW					.118	.031							



## TCMW MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TCMW-32.51F-MW	.375	.173	.156	.650	.217	.016							
	TCMW-32.51T-MW					.217	.016							
	TCMW-32.52F-MW					.197	.031							
	TCMW-32.52T-MW					.197	.031							
	TCMW-32.53F-MW					.177	.047							
	TCMW-32.53T-MW					.177	.047							

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**TCMW** Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	TCMW-1.81.51F-GS	.219	.098	.094	--	.378	.016	■	■			■		■
	TCMW-1.81.51T-GS					.378	.016	■	■	■	■	■	■	■
	TCMW-21.51F-GS	.256	.110	.094	--	.433	.016	■	■			■		■
	TCMW-21.51T-GS					.433	.016	■	■	■	■	■	■	■
	TCMW-21.52T-GS					.433	.031	■		■	■	■		■
	TCMW-32.51T-GS	.375	.173	.156	--	.650	.016	■		■	■	■		■
	TCMW-32.52T-GS					.650	.031	■	■	■	■	■		■



**TNMA** EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	TNMA-221F-EW	.250	.089	.125	.433	.138	.016	■				■		■
	TNMA-221T-EW					.138	.016	■	■	■	■	■	■	■
	TNMA-222F-EW					.118	.031	■				■		■
	TNMA-222T-EW					.118	.031	■	■	■	■	■	■	■
	TNMA-331F-EW	.375	.150	.187	.650	.138	.016	■				■		■
	TNMA-331T-EW					.138	.016	■		■	■	■	■	■
	TNMA-332F-EW					.118	.031	■	■	■				■
	TNMA-332T-EW					.118	.031	■	■	■	■	■	■	■
	TNMA-333F-EW					.102	.047	■				■		■
	TNMA-333T-EW					.102	.047	■				■		■

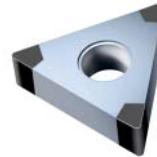
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



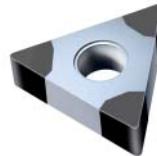
**TNMA** PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	BL	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 $d = .375$ , $d^1 = .150$ , $s = .187$ , $l = .650$	TNMA-330.5F-PC-S				.118	.008			■	■	■	■
	TNMA-330.5T-PC-S				.118	.008		■	■		■	■
	TNMA-331F-PC-S				.118	.016			■		■	■
	TNMA-331T-PC-S				.118	.016		■	■		■	■
	TNMA-332F-PC-S				.102	.031			■		■	■
	TNMA-332T-PC-S				.102	.031		■	■		■	■
	TNMA-333F-PC-S				.094	.047			■		■	■
	TNMA-333T-PC-S				.094	.047		■	■		■	■
	TNMA-431F-PC-S				.118	.016			■		■	■
	TNMA-431T-PC-S				.118	.016		■	■		■	■
 $d = .500$ , $d^1 = .202$ , $s = .187$ , $l = .866$	TNMA-432F-PC-S				.102	.031			■		■	■
	TNMA-432T-PC-S				.102	.031		■	■		■	■
	TNMA-433T-PC-S				.102	.031		■	■		■	■



**TNMA** PolyCut-M

Insert	Designation	Dimensions						SBC1	SB10	BL	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 $d = .375$ , $d^1 = .150$ , $s = .187$ , $l = .650$	TNMA-331T-PC-M				.118	.016			■	■	■	■
	TNMA-332T-PC-M				.102	.031		■	■		■	■
	TNMA-333T-PC-M				.094	.047		■	■		■	■



**TNMA** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	BL	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
 $d = .375$ , $d^1 = .150$ , $s = .187$ , $l = .650$	TNMA-331T-PC-M4				.177	.016		■				
	TNMA-332T-PC-M4				.165	.031		■				
	TNMA-333T-PC-M4				.157	.047		■				
	TNMA-432T-PC-M4				.165	.031		■				
	TNMA-433T-PC-M4				.157	.047		■				
 $d = .500$ , $d^1 = .202$ , $s = .187$ , $l = .866$												

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



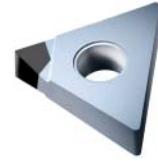
## TNMA MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TNMA-331F-MW	.375	.150	.187	.650	.217	.016	■				■		■
	TNMA-331T-MW					.217	.016	■				■		■
	TNMA-332F-MW					.197	.031	■	■	■		■		■
	TNMA-332T-MW					.197	.031	■	■	■		■		■
	TNMA-333F-MW					.177	.047	■				■		■
	TNMA-333T-MW					.177	.047	■				■	■	■



## TNMA Whole edge

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TNMA-332T-GS	.375	.150	.187	--	.650	.031	■		■	■	■		
	TNMA-333T-GS					.650	.047	■		■	■	■		

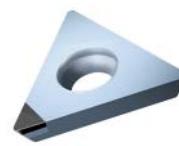


## TNMG PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	TNMG-331F-PC-S	.375	.150	.187	.650	.118	.016		■	■	■	■
	TNMG-332F-PC-S					.102	.031		■	■	■	■
	TNMG-333F-PC-S					.094	.047		■	■	■	■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



## TPGA EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TPGA-220.5F-EW	.250	.134	.125	.433	.150	.008					■		
	TPGA-220.5T-EW					.150	.008	■				■		■
	TPGA-221F-EW					.138	.016	■				■		
	TPGA-221T-EW					.138	.016	■	■	■	■	■	■	■
	TPGA-222F-EW					.118	.031					■		
	TPGA-222T-EW					.118	.031	■				■		■



## TPGN EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TPGN-1.81.51F-EW	.219	--	.094	.378	.138	.016	■				■		■
	TPGN-1.81.51T-EW					.138	.016	■				■		■
	TPGN-21.51F-EW	.250	--	.094	.433	.138	.016	■				■		■
	TPGN-21.51T-EW					.138	.016	■				■		■
	TPGN-220.5F-EW	.250	--	.125	.433	.150	.008	■				■		■
	TPGN-220.5T-EW					.150	.008	■		■	■	■	■	■
	TPGN-221F-EW					.138	.016	■	■	■	■	■		■
	TPGN-221T-EW					.138	.016	■	■	■	■	■		■
	TPGN-222F-EW					.118	.031	■				■		■
	TPGN-222T-EW					.118	.031	■		■	■	■	■	■
	TPGN-321F-EW					.138	.016	■	■	■		■		■
	TPGN-321T-EW					.138	.016	■	■	■	■	■	■	■
	TPGN-322F-EW					.118	.031	■				■		■
	TPGN-322T-EW					.118	.031	■		■	■	■	■	■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN

## TPGN Whole edge tipped

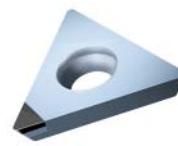
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	TPGN-1.81.51T-GS	.219	--	.094	--	.378	.016	■				■		■
	TPGN-21.51T-GS	.250	--	.094	--	.378	.016	■				■		■
	TPGN-221T-GS	.250	--	.125	--	.433	.016	■	■	■	■	■		■
	TPGN-222T-GS	.250	--	.125	--	.433	.031	■	■	■	■	■		■
	TPGN-321T-GS	.375	--	.125	--	.650	.016	■	■	■	■	■		■
	TPGN-322T-GS	.375	--	.125	--	.650	.031	■				■		■

## TPGN Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	TPGN-221T-VM	.250	--	.125	--	.433	.016	■	■	■	■	■	■	■
	TPGN-222T-VM	.250	--	.125	--	.433	.031	■				■	■	■

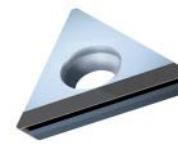
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, I= T-Land

# Inserts - CBN



## TPMW EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TPMW-1.51.50.5F-EW	.187	.087	.094	.323	.150	.008					■		
	TPMW-1.51.50.5T-EW					.150	.008	■				■		■
	TPMW-1.51.51F-EW					.138	.016	■				■		■
	TPMW-1.51.51T-EW					.138	.016	■	■	■	■	■	■	■
	TPMW-1.81.50.5F-EW	.219	.098	.094	.378	.150	.008					■		
	TPMW-1.81.50.5T-EW					.150	.008	■				■		■
	TPMW-1.81.51F-EW					.138	.016	■				■		■
	TPMW-1.81.51T-EW					.138	.016	■	■	■	■	■	■	■
	TPMW-21.50.5F-EW	.250	.110	.094	.433	.150	.008					■		
	TPMW-21.50.5T-EW					.150	.008	■				■		■
	TPMW-21.51F-EW					.138	.016	■				■		■
	TPMW-21.51T-EW					.138	.016	■				■		■
	TPMW-220.5F-EW	.250	.110	.125	.433	.150	.008	■				■		■
	TPMW-220.5T-EW					.150	.008	■				■		■
	TPMW-221F-EW					.138	.016	■	■	■	■	■		■
	TPMW-221T-EW					.138	.016	■	■	■	■	■		■
	TPMW-222F-EW	.375	.173	.187	.650	.118	.031	■				■		■
	TPMW-222T-EW					.118	.031	■				■		■
	TPMW-331F-EW					.138	.016	■				■		■
	TPMW-331T-EW					.138	.016	■	■	■	■	■	■	■
	TPMW-332F-EW	.375	.173	.187	.650	.118	.031	■				■		■
	TPMW-332T-EW					.118	.031	■				■		■



## TPMW Whole edge tipped

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l	r							
	TPMW-1.51.51T-GS	.187	.087	.094	--	.323	.016	■		■	■	■	■	■
	TPMW-1.81.51T-GS					.378	.016	■	■	■	■	■	■	■
	TPMW-21.52T-GS					.433	.031	■				■		■
	TPMW-221F-GS					.433	.016	■	■	■	■		■	■
	TPMW-221T-GS					.433	.016	■	■	■	■	■	■	■
	TPMW-222F-GS					.433	.031	■				■		■
	TPMW-222T-GS					.433	.031	■	■	■	■	■	■	■
	TPMW-332T-GS					.650	.031	■	■	■	■	■	■	■

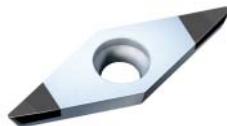
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**VBMW** EWS

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	VBMW-21.50.5F-EWS	.250	.114	.094	.437	.138	.008			■	■	■
	VBMW-21.50.5T-EWS					.138	.008		■	■	■	■
	VBMW-21.51F-EWS					.122	.016		■	■	■	■
	VBMW-21.51T-EWS					.122	.016		■	■	■	■
	VBMW-330.5F-EWS	.375	.173	.187	.654	.138	.008		■	■	■	■
	VBMW-330.5T-EWS					.138	.008		■	■	■	■
	VBMW-331F-EWS					.122	.016		■	■	■	■
	VBMW-331T-EWS					.122	.016		■	■	■	■
	VBMW-332F-EWS					.110	.031		■	■	■	■
	VBMW-332T-EWS					.110	.031		■	■	■	■



**VBMW** MultiCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	VBMW-330.5F-MC-S	.375	.173	.187	.654	.138	.008		■	■	■	■
	VBMW-330.5T-MC-S					.138	.008		■	■	■	■
	VBMW-331F-MC-S					.122	.016		■	■	■	■
	VBMW-331T-MC-S					.122	.016		■	■	■	■
	VBMW-332F-MC-S					.110	.031		■	■	■	■
	VBMW-332T-MC-S					.110	.031		■	■	■	■

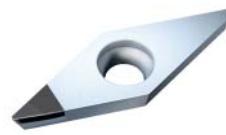


**VBMW** MultiCut-S/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l	r					
	VBMW-331T-MC-S4	.375	.173	.187	.654	.173	.016		■			
	VBMW-332T-MC-S4					.165	.031		■			
	VBMW-333T-MC-S4					.157	.047		■			
	VBMW-334T-MC-S4					.142	.063		■			

Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

# Inserts - CBN



**VBMW MW**

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s		<sup>1</sup>	r							
	VBMW-21.50.5F-MW	.250	.114	.094	.437	.185	.008							
	VBMW-21.50.5T-MW					.185	.008							
	VBMW-21.51F-MW					.177	.016							
	VBMW-21.51T-MW					.177	.016							
	VBMW-21.52F-MW					.165	.031							
	VBMW-21.52T-MW					.165	.031							
	VBMW-330.5F-MW					.209	.008							
	VBMW-330.5T-MW					.209	.008							
	VBMW-331F-MW					.197	.016							
	VBMW-331T-MW					.197	.016							
	VBMW-332F-MW	.375	.173	.187	.654	.173	.031							
	VBMW-332T-MW					.173	.031							
	VBMW-333T-MW					.173	.031							
	VBMW-334T-MW					.154	.047							
						.138	.063							

**VCMT EWS**

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40		
		d	d <sup>1</sup>	s		<sup>1</sup>	r						
	VCMT-1.21.50.5F-EWS	.156	.087	.094	.272	.138	.008						
	VCMT-1.21.51F-EWS					.126	.016						
	VCMT-220.5F-EWS					.250	.114	.125	.437	.138	.008		
	VCMT-221F-EWS					.122	.016						
	VCMT-2.520.5F-EWS					.313	.134	.125	.524	.138	.008		
	VCMT-2.521F-EWS					.122	.016						
	VCMT-330.5F-EWS					.375	.173	.187	.654	.138	.008		
	VCMT-331F-EWS					.122	.016						
	VCMT-332F-EWS					.110	.031						

Note: CCMT-21.50.5F-EWS: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**VCMW** EWS

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	VCMW-1.21.50.5F-EWS	.156	.087	.094	.272	.138	.008			■	■	
	VCMW-1.21.50.5T-EWS					.138	.008		■	■	■	■
	VCMW-1.21.51F-EWS					.126	.016		■	■	■	■
	VCMW-1.21.51T-EWS					.126	.016		■	■	■	■
	VCMW-220.5F-EWS	.250	.114	.125	.437	.138	.008		■	■	■	■
	VCMW-220.5T-EWS					.138	.008		■	■	■	■
	VCMW-221F-EWS					.122	.016		■	■	■	■
	VCMW-221T-EWS					.122	.016		■	■	■	■
	VCMW-2.520.5F-EWS	.313	.134	.125	.524	.138	.008		■	■	■	■
	VCMW-2.520.5T-EWS					.138	.008		■	■	■	■
	VCMW-2.521F-EWS					.122	.016		■	■	■	■
	VCMW-2.521T-EWS					.122	.016		■	■	■	■
	VCMW-330.5F-EWS	.375	.173	.187	.654	.138	.008		■	■	■	■
	VCMW-330.5T-EWS					.138	.008		■	■	■	■
	VCMW-331F-EWS					.122	.016		■	■	■	■
	VCMW-331T-EWS					.122	.016		■	■	■	■
	VCMW-332F-EWS					.110	.031		■	■	■	■
	VCMW-332T-EWS					.110	.031		■	■	■	■

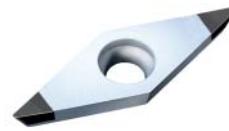


**VCMW** MultiCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	VCMW-220.5F-MC-S	.250	.114	.125	.437	.138	.008			■	■	
	VCMW-220.5T-MC-S					.138	.008		■	■	■	■
	VCMW-221F-MC-S					.122	.016		■	■	■	■
	VCMW-221T-MC-S					.122	.016		■	■	■	■
	VCMW-222T-MC-S					.110	.031				■	
	VCMW-330.5F-MC-S	.375	.173	.187	.654	.138	.008		■	■	■	■
	VCMW-330.5T-MC-S					.138	.008		■	■	■	■
	VCMW-331F-MC-S					.122	.016		■	■	■	■
	VCMW-331T-MC-S					.122	.016		■	■	■	■
	VCMW-332F-MC-S					.110	.031		■	■	■	■
	VCMW-332T-MC-S					.110	.031		■	■	■	■

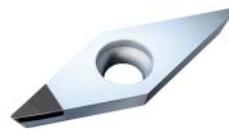
Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

# Inserts - CBN



**VCMW** MultiCut-S/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	VCMW-331T-MC-S4	.375	.173	.187	.654	.173	.016	■			
	VCMW-332T-MC-S4					.165	.031	■			
	VCMW-333T-MC-S4					.157	.047	■			
	VCMW-334T-MC-S4					.142	.063	■			



**VCMW** MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	VCMW-1.21.50.5F-MW	.156	.087	.094	.272	.150	.008	■				■		■
	VCMW-1.21.50.5T-MW					.150	.008	■	■		■	■	■	■
	VCMW-1.21.51F-MW					.138	.016	■	■	■	■		■	■
	VCMW-1.21.51T-MW					.138	.016	■	■	■	■	■	■	■
	VCMW-220.5F-MW	.250	.114	.125	.437	.185	.008	■				■		■
	VCMW-220.5T-MW					.185	.008	■	■		■	■	■	■
	VCMW-221F-MW					.177	.016	■	■	■	■		■	■
	VCMW-221T-MW					.177	.016	■	■	■	■	■	■	■
	VCMW-222F-MW					.165	.031	■			■		■	■
	VCMW-222T-MW					.165	.031	■			■	■	■	■
	VCMW-2.520.5F-MW	.313	.134	.125	.524	.209	.008	■				■		■
	VCMW-2.520.5T-MW					.209	.008	■	■	■	■	■	■	■
	VCMW-2.521F-MW					.197	.016	■	■	■	■		■	■
	VCMW-2.521T-MW					.197	.016	■			■	■	■	■
	VCMW-330.5F-MW	.375	.173	.187	.654	.209	.008	■	■	■	■		■	■
	VCMW-330.5T-MW					.209	.008	■	■	■	■	■	■	■
	VCMW-331F-MW					.197	.016	■	■	■	■		■	■
	VCMW-331T-MW					.197	.016	■	■	■	■	■	■	■
	VCMW-332F-MW					.173	.031	■	■	■	■		■	■
	VCMW-332T-MW					.173	.031	■	■	■	■	■	■	■
	VCMW-333F-MW					.154	.047	■			■		■	■
	VCMW-333T-MW					.154	.047	■	■	■	■	■	■	■

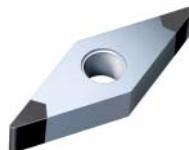
Note: CCMT-21.50.5F-EW: E= sharp cutting edge, T= T-Land

# Inserts - CBN



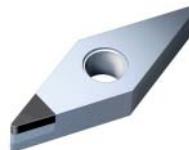
**VNMA** PolyCut-M

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	VNMA-331T-PC-M	.375	.150	.187	.654	.110	.016		■	■	■	■
	VNMA-332T-PC-M					.094	.031		■	■	■	■
	VNMA-333T-PC-M					.087	.047		■	■	■	■



**VNMA** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	VNMA-331T-PC-M4	.375	.150	.187	.654	.173	.016		■			
	VNMA-332T-PC-M4					.165	.031		■			
	VNMA-333T-PC-M4					.157	.047		■			
	VNMA-334T-PC-M4					.142	.063		■			



**VNMA** MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	VNMA-331F-MW	.375	.150	.187	.654	.197	.016	■	■	■		■	■	■
	VNMA-331T-MW					.197	.016	■	■	■	■	■	■	■
	VNMA-332F-MW					.173	.031	■	■	■		■		■
	VNMA-332T-MW					.173	.031	■	■	■	■	■	■	■
	VNMA-333F-MW					.154	.047		■	■	■	■	■	■
	VNMA-333T-MW					.154	.047	■		■	■			■
	VNMA-334F-MW					.138	.063			■	■			
	VNMA-334T-MW					.138	.063			■	■			■

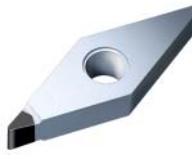
Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

# Inserts - CBN



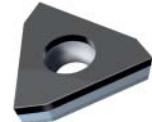
**VNMA** PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	VNMA-330.5F-PC-S	.375	.150	.187	.654	.118	.008				
	VNMA-330.5T-PC-S					.118	.008				
	VNMA-331F-PC-S					.110	.016				
	VNMA-331T-PC-S					.110	.016				
	VNMA-332F-PC-S					.094	.031				
	VNMA-332T-PC-S					.094	.031				
	VNMA-333F-PC-S					.087	.047				
	VNMA-333T-PC-S					.087	.047				



**VNMG** PolyCut-S

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	VNMG-331F-PC-S	.375	.150	.187	.654	.110	.016				
	VNMG-332F-PC-S					.094	.031				
	VNMG-333F-PC-S					.087	.047				



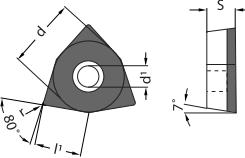
**WBGW/L** Fullface

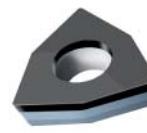
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	WBGW-1.210.5LF-VM	.156	.091	.062	--	.189	.008							
	WBGW-1.210.5LT-VM					.189	.008							
	WBGW-1.211LF-VM					.189	.016							
	WBGW-1.211LT-VM					.189	.016							

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

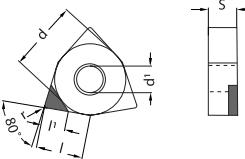
# Inserts - CBN

## WCGW Fullface

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	WCGW-1.210.5F-VM	.156	.091	.062	--	.106	.008	■	■	■		■		■
	WCGW-1.210.5T-VM					.106	.008	■				■	■	■
	WCGW-1.211F-VM					.106	.016	■				■		■
	WCGW-1.211T-VM					.106	.016	■	■	■	■	■	■	■

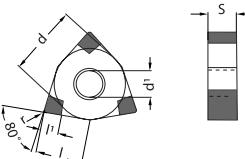


## WNMA EW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	WNMA-431F-EW	.500	.202	.187	.335	.122	.016	■				■		■
	WNMA-431T-EW					.122	.016	■	■	■	■	■	■	■
	WNMA-432F-EW					.110	.031	■	■	■		■		■
	WNMA-432T-EW					.110	.031	■	■	■	■	■	■	■
	WNMA-433F-EW					.098	.047	■				■		■
	WNMA-433T-EW					.098	.047	■				■		■



## WNMA PolyCut-M

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	WNMA-431T-PC-M	.500	.202	.187	.335	.110	.016		■	■	■	
	WNMA-432T-PC-M					.102	.031		■	■	■	■
	WNMA-433T-PC-M					.094	.047		■	■	■	■



Note: CCMT-21.50.5F-EW: F = sharp cutting edge, T = T-Land

# Inserts - CBN



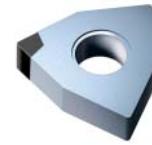
**WNMA** PolyCut-M/4

Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	WNMA-431T-PC-M4	.500	.202	.187	.335	.177	.016	■			
	WNMA-432T-PC-M4					.165	.031	■			
	WNMA-433T-PC-M4					.157	.047	■			
	WNMA-434T-PC-M4					.150	.063	■			



**WNMA** MW

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	WNMA-431F-MW	.500	.202	.187	.335	.209	.016	■				■		■
	WNMA-431T-MW					.209	.016	■				■		■
	WNMA-432F-MW					.197	.031	■				■		■
	WNMA-432T-MW					.197	.031	■	■	■	■	■	■	■
	WNMA-433F-MW					.185	.047	■				■		■
	WNMA-433T-MW					.185	.047	■				■		■

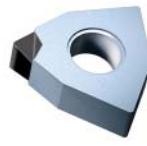


**WNMA** PolyCut-S

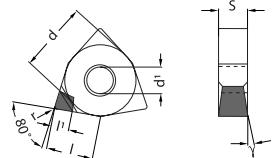
Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40		
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r						
	WNMA-431F-PC-S	.500	.202	.187	.335	.110	.016			■		■	■
	WNMA-431T-PC-S					.110	.016	■	■	■		■	■
	WNMA-432F-PC-S					.102	.031			■		■	■
	WNMA-432T-PC-S					.102	.031	■	■	■		■	■
	WNMA-433F-PC-S					.094	.047			■		■	■
	WNMA-433T-PC-S					.094	.047	■	■	■		■	■

Note: CCMT-21.50.5E-EW: E= sharp cutting edge, I= T-Land

# Inserts - CBN



**WNMG** PolyCut-S

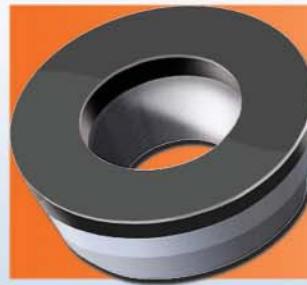
Insert	Designation	Dimensions						SBC1	SB10	SB25	SB40	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	WNMG-431F-PC-S				.110	.016			■	■	■	■
	WNMG-432F-PC-S	.500	.202	.187	.335	.102	.031		■	■	■	■
	WNMG-433F-PC-S					.094	.047		■	■	■	■

Note: CCMT-21.50.5F-EW: F= sharp cutting edge, T= T-Land

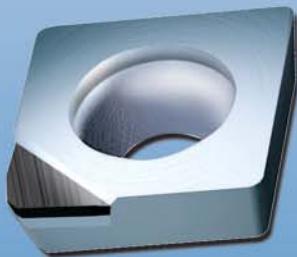
# Milling



**TPKN-32-PD**  
**TPKN-43-PD**  
(PCD, CBN, MDC)



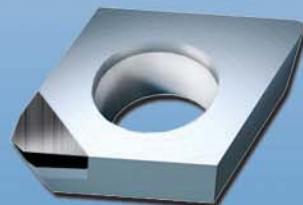
**RDHX-0702MO**  
**RDHX-1003MO**  
**RDHX-12T3MO**  
(full face PCD & CBN)



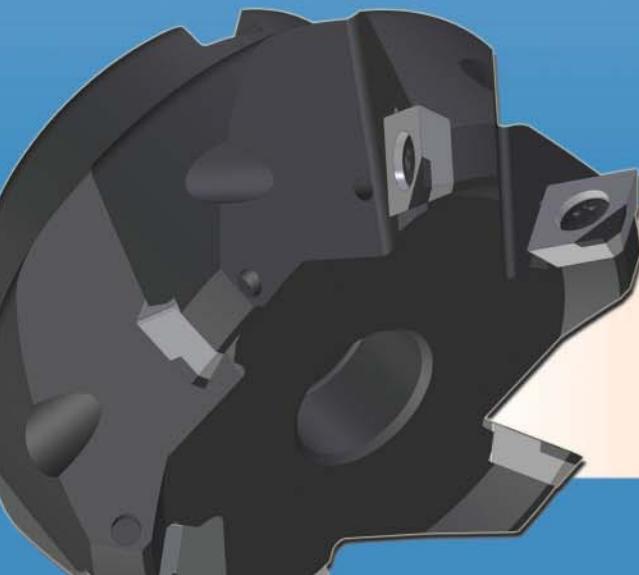
**SPGT-43-ED**  
(positive right hand)



**SPKN-42-ED**  
(PCD, CBN, MDC)



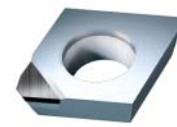
**CPGW-43-PD**  
(PCD & MDC)



**SEHW-43-AF**  
**SDHW-43-AE**  
(neutral - PCD & CBN)

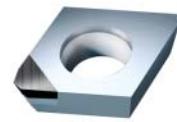


# Inserts - PCD & MDC



**CPGT..PD R** Milling insert positive right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CPGT-43PDR-4					.177	--		■		
	CPGT-43PDR-6	.500	.217	.187	.500	.295	--		■		
	CPGT-43PDR-8					.354	--		■		



**CPGW..PD R** Milling insert neutral

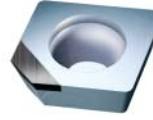
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	CPGW-43PDR-2					.079	--				
	CPGW-43PDR-4	.500	.217	.187	.500	.177	--		■		
	CPGW-43PDR-6					.295	--		■		



**RDHX** Milling insert fullface

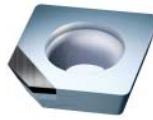
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	RDHX-0501M0	.197	.079	.059	--	--	--		■		
	RDHX-0702M0	.276	.106	.094	--	--	--		■		
	RDHX-1003M0	.394	.150	.125	--	--	--		■		
	RDHX-12T3M0	.472	.150	.156	--	--	--		■		

# Inserts - PCD & MDC



**SDHW..AE N** Milling insert neutral

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM		
	SDHW-43AEN-4	.500	.217	.187	.500	.157	--	■			
	SDHW-43AEN-6							■			



**SEHW..AF N** Milling insert neutral

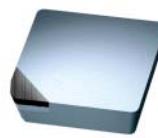
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM		
	SEHW-43AFN-4	.500	.217	.187	.500	.157	--	■			
	SEHW-43AFN-6							■			



**SEKN..AF N** Milling insert neutral

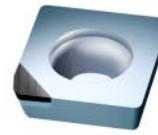
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r	DP	DM		
	SEKN-42AFN-4	.500	--	.125	.500	.157	--	■			
	SEKN-42AFN-6							■			

# Inserts - PCD & MDC



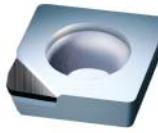
**SPKN..ED R** Milling insert right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	SPKN-42EDR-2	.500	--	.125	.500	.177	--				■	
	SPKN-42EDR-4											■
	SPKN-42EDR-6											■



**SPGW..ED R** Milling insert right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	SPGW-43EDR-2	.500	.217	.187	.500	.177	--				■	
	SPGW-43EDR-4											
	SPGW-43EDR-6											



**SPGT..ED R** Milling insert positive, right hand

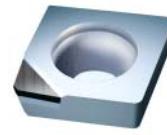
Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC	
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r					
	SPGT-43EDR-8	.500	.217	.187	.500	.335	--		■			

# Inserts - PCD & MDC



**SPGW..PD R** Milling insert right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SPGW-43PDR-2	.500	.217	.187	.500	.079	--				
	SPGW-43PDR-4					.177	--		■		
	SPGW-43PDR-6					.295	--		■		



**SPGT..PD R** Milling insert positive, right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	SPGT-43PDR-8	.500	.217	.187	.500	.335	--		■		



**TPKN..PD R** Milling insert right hand

Insert	Designation	Dimensions						PDC-S	PDC	PDC-L	MDC
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r				
	TPKN-32PDR-2	.375	--	.125	.650	.079	--				
	TPKN-32PDR-4					.157	--		■		

# Inserts - CBN

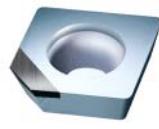
## RDHX Fullface milling insert

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	RDHX-0702MOT-VM	.276	.106	.094	--	--	--	■	■	■	■	■	■	■
	RDHX-1003MOT-VM	.394	.150	.125	--	--	--	■	■	■	■	■	■	■
	RDHX-12T3MOT-VM	.472	.150	.156	--	--	--	■	■	■	■	■	■	■



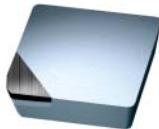
## SDHW..AE N MW milling insert

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	SDHW-43AENT-MW	.500	.217	.187	.500	.157	--	■	■	■	■	■	■	■



## SPKN..ED R MW milling insert

Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	SPKN-42EDRT-MW	.500	--	.125	.500	.157	--	■	■	■	■	■	■	■



## TPKN..PD R MW milling insert

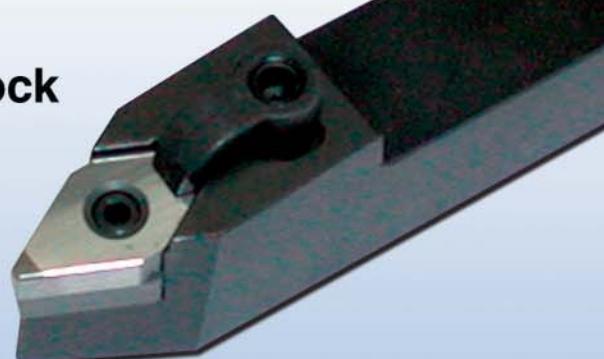
Insert	Designation	Dimensions						PBC-10	PBC-15	PBC-17	PBC-20	PBC-25	PBC-30	PBC-40
		d	d <sup>1</sup>	s	l	l <sup>1</sup>	r							
	TPKN-32PDRT-MW	.375	--	.125	.650	.157	--	■	■	■	■	■	■	■
	TPKN-43PDRT-MW	.500	--	.187	.866	.157	--	■	■	■	■	■	■	■



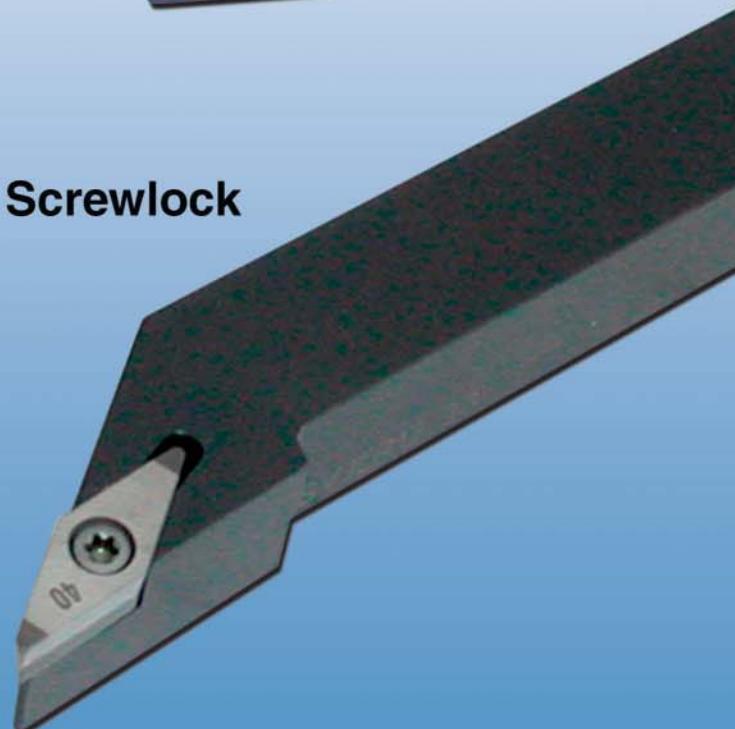
Note: RDHX-0702MOT-VM: E= sharp cutting edge, T= T-Land

# Tools

**External Pinlock**



**External Screwlock**

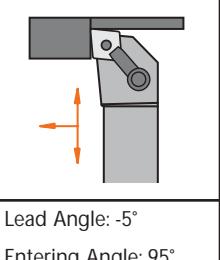
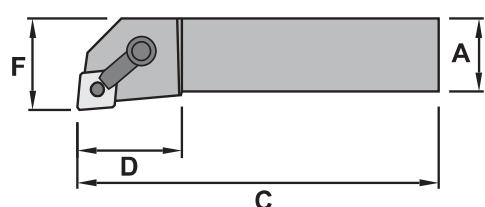
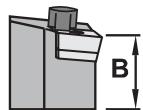


**Internal Screwlock  
Carbide Shank**



# External Pinlock

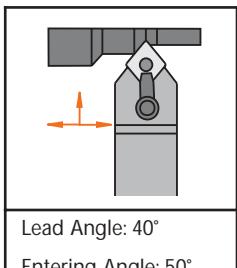
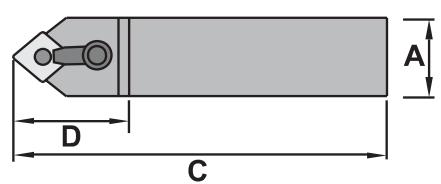
## MCLNR/L



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MCLNR/L 12-4B	.750	.750	4.5	1.13	1.000	CNM_-43_-	ICSN-432	NL-46	CL-20	XNS-48
MCLNR/L 16-4D	1.000	1.000	6.0	1.13	1.250					
MCLNR/L 20-4D	1.250	1.250	6.0	1.13	1.500					
MCLNR/L 85-4D	1.000	1.250	6.0	1.13	1.250					

R/L= please choose right or left hand designation

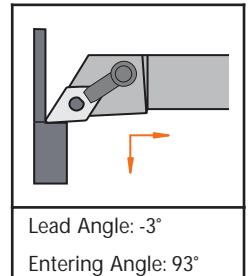
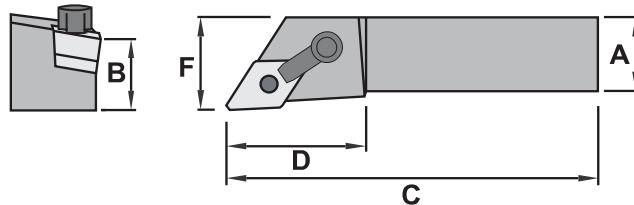
## MCMNN



Designation	A	B	C	D	Insert	shim	pin	clamp	clamp screw
MCMNN 12-4B	.750	.750	4.5	1.28	CNM_-43_-	ICSN-432	NL-46	CL-20	XNS-48
MCMNN 16-4D	1.000	1.000	6.0	1.28					
MCMNN 20-4D	1.250	1.250	6.0	1.39					
MCMNN 85-4D	1.000	1.250	6.0	1.28					

# External Pinlock

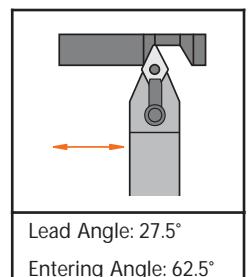
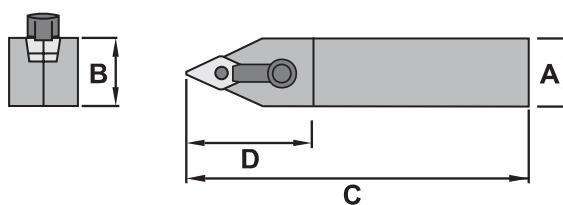
## MDJNR/L



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MDJNR/L 12-4B	.750	.750	4.5	1.25	1.000					
MDJNR/L 16-4D	1.000	1.000	6.0	1.25	1.250					
MDJNR/L 20-4D	1.250	1.250	6.0	1.25	1.500					
MDJNR/L 24-4D	1.500	1.500	6.0	1.25	2.000					
MDJNR/L 85-4D	1.000	1.250	6.0	1.25	1.250					
MDJNR/L 12-44B	.750	.750	4.5	1.44	1.000					
MDJNR/L 16-44D	1.000	1.000	6.0	1.50	1.250					
MDJNR/L 20-44E	1.250	1.250	7.0	1.62	1.500					

R/L= please choose right or left hand designation

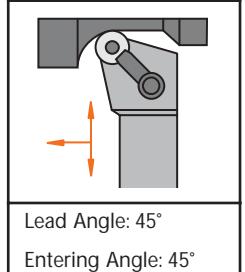
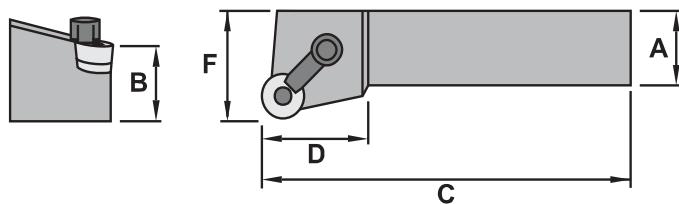
## MDPNN



Designation	A	B	C	D	Insert	shim	pin	clamp	clamp screw
MDPNN 12-4B	.750	.750	4.5	1.62					
MDPNN 16-4D	1.000	1.000	6.0	1.62					
MDPNN 20-4D	1.250	1.250	6.0	1.62					
MDPNN 12-44B	.750	.750	4.5	1.62					
MDPNN 16-44D	1.000	1.000	6.0	1.62					
MDPNN 20-44E	1.250	1.250	7.0	1.62					

# External Pinlock

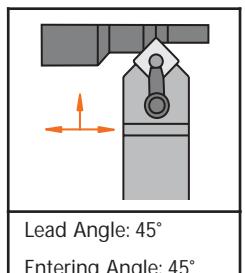
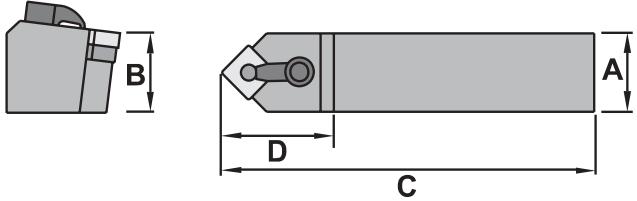
## MRGNR/L



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MRGNR/L 12-3B	.750	.750	4.5	.81	1.000	RNMG-32	--	NL-33	CL-6	XNS-36
MRGNR/L 12-4B	.750	.750	4.5	1.06	1.000	RNMG-43	IRSN-43	NL-46	CL-20	XNS-48
MRGNR/L 16-4D	1.000	1.000	6.0	1.06	1.250					
MRGNR/L 20-4D	1.250	1.250	6.0	1.06	1.500					
MRGNR/L 85-4D	1.000	1.250	6.0	1.06	1.250					
MRGNR/L 86-4D	1.000	1.500	6.0	1.06	1.250					

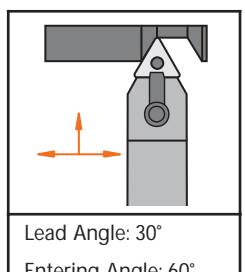
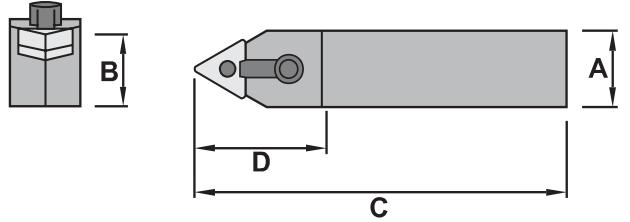
R/L= please choose right or left hand designation

## MSDNN



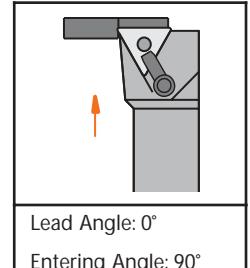
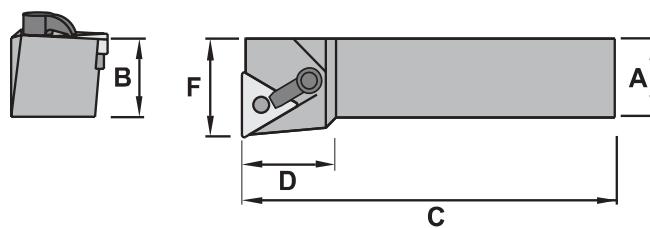
Designation	A	B	C	D	Insert	shim	pin	clamp	clamp screw
MSDNN 12-4B	.750	.750	4.5	1.30	SNM_-43_-	ISSN-432	NL-46	CL-20	XNS-48
MSDNN 16-4D	1.000	1.000	6.0	1.30					
MSDNN 85-4D	1.000	1.250	6.0	1.30					

## MTENN



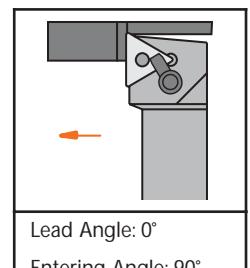
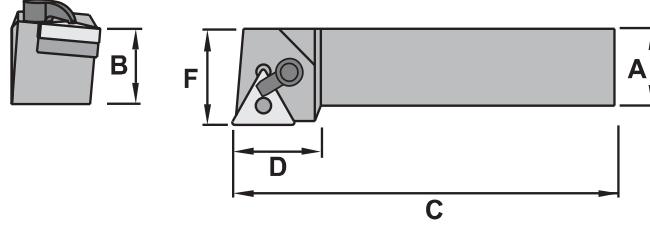
Designation	A	B	C	D	Insert	shim	pin	clamp	clamp screw
MTENN 12-3B	.750	.750	4.5	1.15	TNM_-33_-	ITSN-322	NL-34L	CL-20	XNS-48
MTENN 16-3D	1.000	1.000	6.0	1.15					
MTENN 16-4D	1.000	1.000	6.0	1.50					

# External Pinlock



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MTFNR/L 12-3B	.750	.750	4.5	1.00	1.000	TNM_-33_-	ITSN-322	NL-34L	CL-20	XNS-48
MTFNR/L 16-3D	1.000	1.000	6.0	1.00	1.250					
MTFNR/L 16-4D	1.000	1.000	6.0	1.00	1.250					
MTFNR/L 20-4D	1.250	1.250	6.0	1.00	1.500					
MTFNR/L 85-4D	1.000	1.250	6.0	1.00	1.250	TNM_-43_-	ITSN-433	NL-46	CL-20	XNS-48
MTFNR/L 86-4D	1.000	1.500	6.0	1.00	1.250					

R/L= please choose right or left hand designation

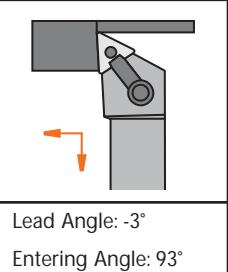
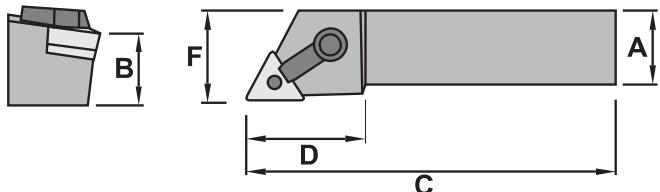


Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MTGNR/L 12-3B	.750	.750	4.5	1.06	1.000	TNM_-33_-	ITSN-322	NL-34L	CL-20	XNS-48
MTGNR/L 16-3D	1.000	1.000	6.0	1.06	1.250					
MTGNR/L 16-4D	1.000	1.000	6.0	1.22	1.250					
MTGNR/L 20-4D	1.250	1.250	6.0	1.22	1.500					
MTGNR/L 85-4D	1.000	1.250	6.0	1.22	1.250	TNM_-43_-	ITSN-433	NL-46	CL-20	XNS-48
MTGNR/L 86-4D	1.000	1.500	6.0	1.22	1.250					

R/L= please choose right or left hand designation

# External Pinlock

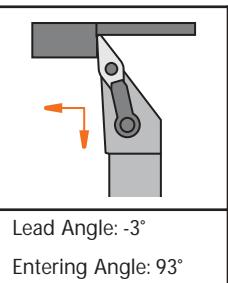
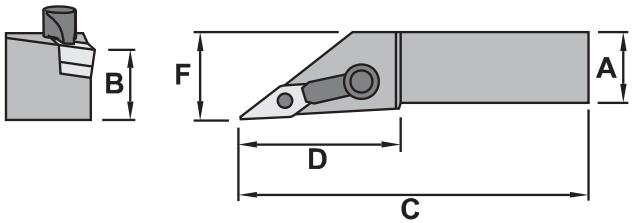
## MTJNR/L



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MTJNR/L 12-3B	.750	.750	4.5	1.03	1.000	TNM_-33_-	ITSN-322	NL-34L	CL-20	XNS-48
MTJNR/L 16-3D	1.000	1.000	6.0	1.03	1.250					
MTJNR/L 16-4D	1.000	1.000	6.0	1.25	1.250	TNM_-43_-	ITSN-433	NL-46	CL-20	XNS-48
MTJNR/L 20-4D	1.250	1.250	6.0	1.25	1.500					

R/L= please choose right or left hand designation

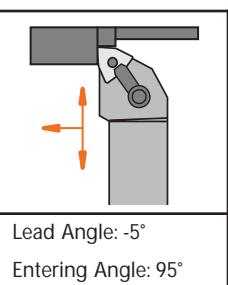
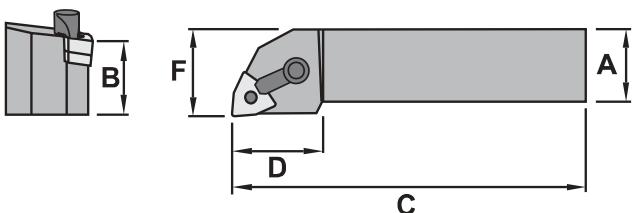
## MVJNR/L



Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MVJNR/L 12-3B	.750	.750	4.5	1.62	1.000	VNM_-33_-	IVSN-322	NL-34L	CL-22	XNS-48
MVJNR/L 16-3D	1.000	1.000	6.0	1.62	1.250					
MVJNR/L 20-3D	1.250	1.250	6.0	1.62	1.500					

R/L= please choose right or left hand designation

## MWLNR/L

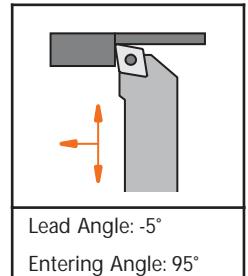
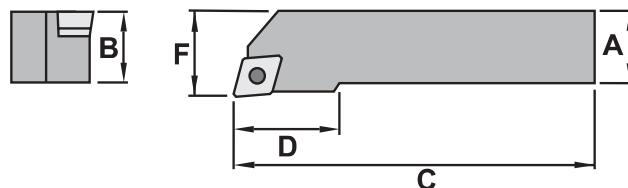


Designation	A	B	C	D	F	Insert	shim	pin	clamp	clamp screw
MWLNR/L 12-4B	.750	.750	4.5	1.07	1.000	WNM_-43_-	IWSN-432	NL-46	CL-20	XNS-48
MWLNR/L 16-4D	1.000	1.000	6.0	1.07	1.250					
MWLNR/L 20-4D	1.250	1.250	6.0	1.07	1.500					
MWLNR/L 24-4E	1.500	1.500	7.0	1.07	2.000					

R/L= please choose right or left hand designation

# External Screwlock

## SCLCR/L

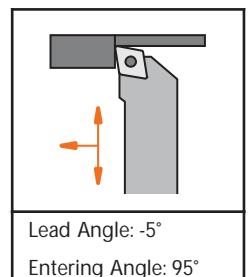
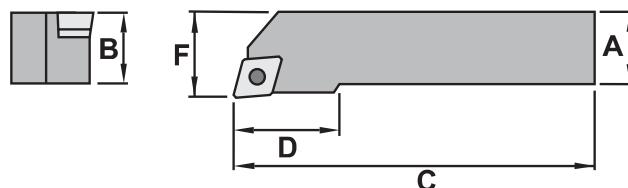


Lead Angle: -5°  
Entering Angle: 95°

Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SCLCR/L 6-2I	.375	.375	2.5	.39	.500	CC__-21.5_	C-1425	C-5507	--	--
SCLCR/L 8-3J	.500	.500	3.5	.39	.625	CC__-32.5_	C-1440	C-5515	--	--
SCLCR/L 10-3A	.625	.625	4.0	.63	.750					
SCLCR/L 12-3B	.750	.750	4.5	.63	1.000		C-1240	C-5515	--	--
SCLCR/L 16-3D	1.000	1.000	6.0	.63	1.250	CC__-43_				
SCLCR/L 12-4B	.750	.750	4.5	1.00	1.000					
SCLCR/L 16-4D	1.000	1.000	6.0	1.00	1.250		C-1540	C-5517	C-3614	C-1760
SCLCR/L 20-4D	1.250	1.250	6.0	1.00	1.500					

R/L= please choose right or left hand designation

## SCLPR/L

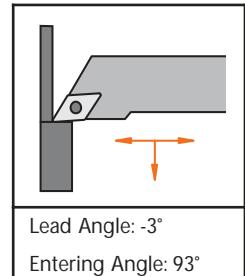
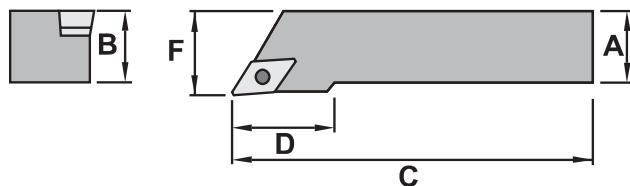


Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SCLPR/L 6-2I	.375	.375	2.5	.500	.500	CP__-21.5_				
SCLPR/L 8-2J	.500	.500	3.5	.500	.625					
SCLPR/L 10-2A	.625	.625	4.0	.500	.750		C-1425	C-5507	--	--
SCLPR/L 12-2B	.750	.750	4.5	.500	.875	CP__-32.5_				
SCLPR/L 10-3A	.625	.625	4.0	.625	.750		C-1240	C-5515	--	--
SCLPR/L 12-3B	.750	.750	4.5	.625	1.000					

R/L= please choose right or left hand designation

# External Screwlock

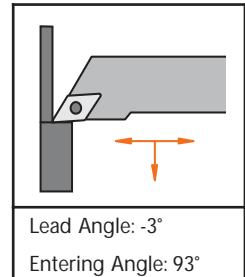
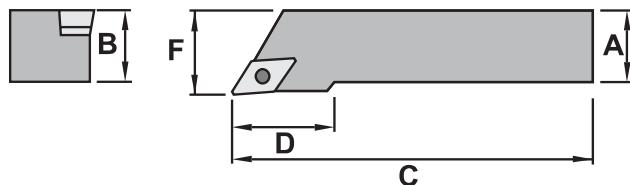
## SDJCR/L



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SDJCR/L 6-2I	.375	.375	2.5	.59	.500					
SDJCR/L 8-2J	.500	.500	3.5	.67	.625					
SDJCR/L 10-2A	.625	.625	4.0	.67	.750	DC__-21.5_	C-1225	C-5507	--	--
SDJCR/L 12-2B	.750	.750	4.5	.70	1.000					
SDJCR/L 12-3B	.750	.750	4.5	.940	1.000	DC__-32.5_	C-1335	C-5516	C-3714	C-1750
SDJCR/L 16-3D	1.000	1.000	6.0	1.10	1.250					

R/L= please choose right or left hand designation

## SDJPR/L

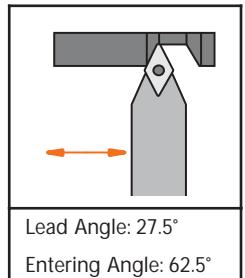
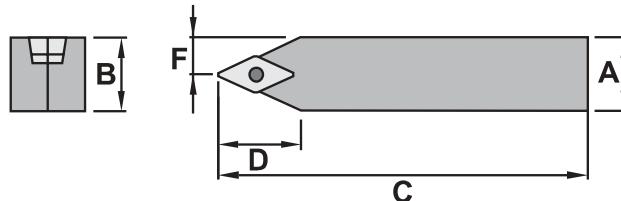


Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SDJPR/L 6-2I	.375	.375	2.5	.625	.500					
SDJPR/L 8-2J	.500	.500	3.5	.625	.625	DP__-21.5_	C-1425	C-5507	--	--
SDJPR/L 10-2A	.625	.625	4.0	.625	.750					
SDJPR/L 12-3B	.750	.750	4.5	.875	.875	DP__-32.5_	C-1335	C-5516	C-3714	C-1750

R/L= please choose right or left hand designation

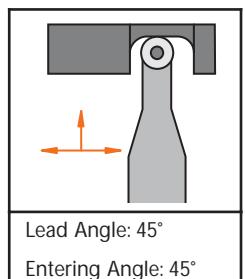
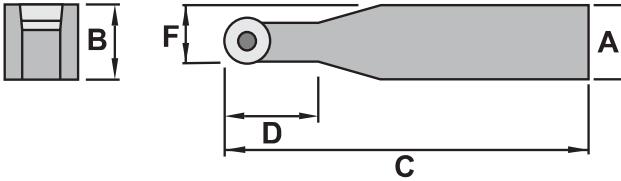
# External Screwlock

## SDNCN



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SDNCN 6-2I	.375	.375	2.5	.37	.197	DC__-21.5_	C-1225	C-5507	--	--
SDNCN 8-2J	.500	.500	3.5	.49	.260				--	--
SDNCN 10-3A	.625	.625	4.0	.63	.323	DC__-32.5_	C-1335	C-5516	C-3714	C-1750
SDNCN 12-3B	.750	.750	4.5	.74	.382					
SDNCN 16-3D	1.000	1.000	6.0	.98	.520					

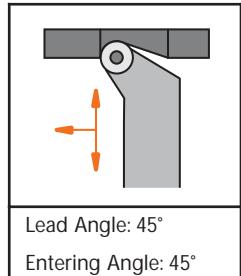
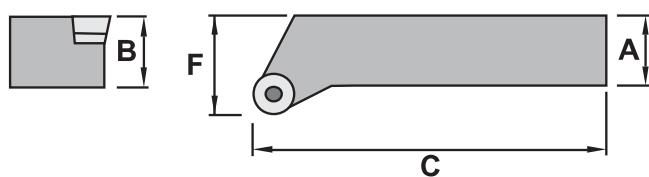
## SRDCN



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SRDCN 8-08J	.500	.500	3.5	.50	.407	RCMT-0803MO	C-1230	C-5508	--	--
SRDCN 10-10A	.625	.625	4.0	.63	.510	RCMT-10T3MO	C-1335	C-5516	C-3811	C-1750
SRDCN 12-10B	.750	.750	4.5	1.00	.570					
SRDCN 16-12D	1.000	1.000	6.0	1.00	.756	RCMT-1204MO	C-1335	C-5516	C-3814	C-1750
SRDCN 20-12D	1.250	1.250	6.0	1.00	.861					

# External Screwlock

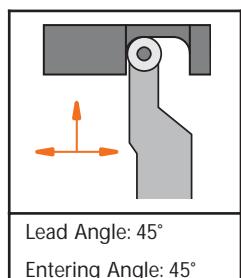
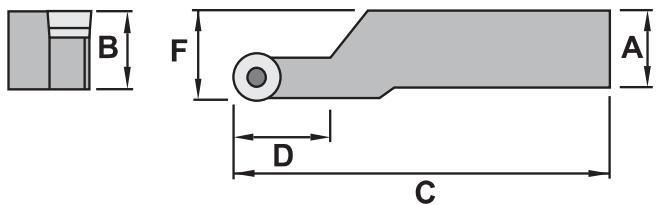
## SRGCR/L



Designation	A	B	C	F	Insert	insert screw	wrench	shim	shim screw
SRGCR/L 12-10B	.750	.750	4.5	1.000					
SRGCR/L 16-10D	1.000	1.000	6.0	1.250	RCMT-10T3MO	C-1335	C-5516	C-3811	C-1750
SRGCR/L 16-12D	1.000	1.000	6.0	1.250					
SRGCR/L 85-12D	1.000	1.250	6.0	1.250	RCMT-1204MO	C-1335	C-5516	C-3814	C-1750
SRGCR/L 20-12D	1.250	1.250	6.0	1.500					

R/L= please choose right or left hand designation

## SRSCR/L

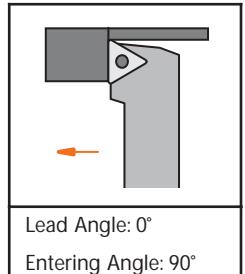
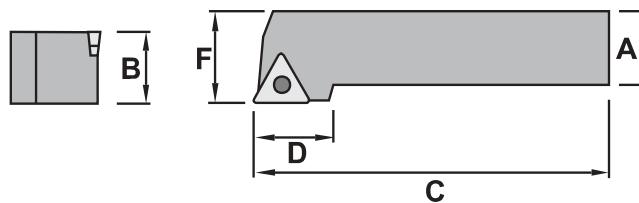


Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SRSCR/L 16-10D	1.000	1.000	6.0	.750	1.250					
SRSCR/L 20-10D	1.250	1.250	6.0	.750	1.500	RCMT-10T3MO	C-1335	C-5516	C-3811	C-1750
SRSCR/L 12-12B	.750	.750	4.5	.750	1.000					
SRSCR/L 16-12D	1.000	1.000	6.0	1.00	1.250	RCMT-1204MO	C-1335	C-5516	C-3814	C-1750
SRSCR/L 20-12D	1.250	1.250	6.0	1.00	1.500					

R/L= please choose right or left hand designation

# External Screwlock

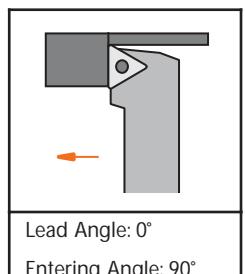
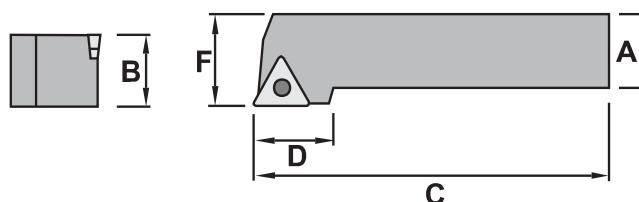
## STGCR/L



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
STGCR/L 6-2I	.375	.375	2.5	.50	.500	TC__-21.5_	C-1225	C-5507	--	--
STGCR/L 8-2J	.500	.500	3.5	.56	.625					
STGCR/L 10-3A	.625	.625	4.0	1.00	.750	TC__-32.5_	C-1335	C-5516	C-3414	C-1750
STGCR/L 12-3B	.750	.750	4.5	1.00	1.000					
STGCR/L 16-3D	1.000	1.000	6.0	1.00	1.250					

R/L= please choose right or left hand designation

## STGPR/L

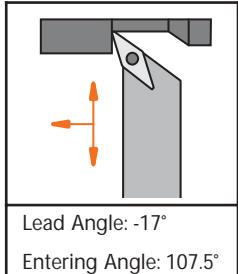
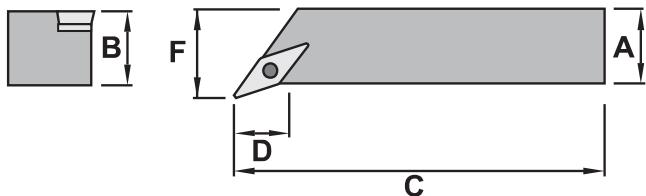


Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
STGPR/L 6-2I	.375	.375	2.5	.625	.500	TP__-21.5_	C-1425	C-5507	--	--
STGPR/L 8-2J	.500	.500	3.5	.625	.625					
STGPR/L 10-2A	.625	.625	4.0	.625	.750					
STGPR/L 12-2B	.750	.750	4.5	.625	1.000	TP__-32.5_	C-1440	C-5515	--	--
STGPR/L 10-3A	.625	.625	4.0	.750	.750					
STGPR/L 12-3B	.750	.750	4.5	.750	1.000					

R/L= please choose right or left hand designation

# External Screwlock

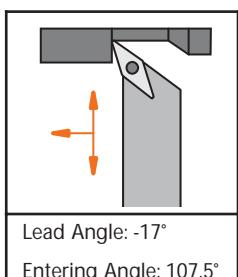
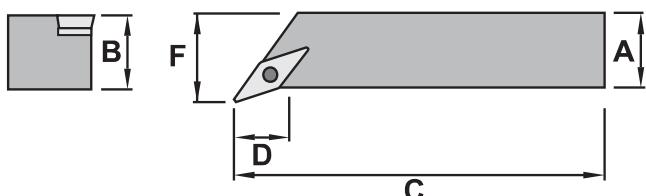
## SVHBR/L



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVHBR/L 12-3B	.750	.750	4.5	1.000	1.000	VB__-33_	C-1440	C-5516	C-3718	C-1750
SVHBR/L 16-3D	1.000	1.000	6.0	1.000	1.250					

R/L= please choose right or left hand designation

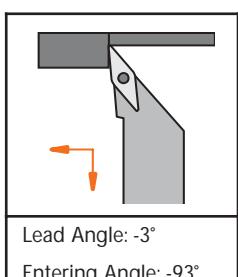
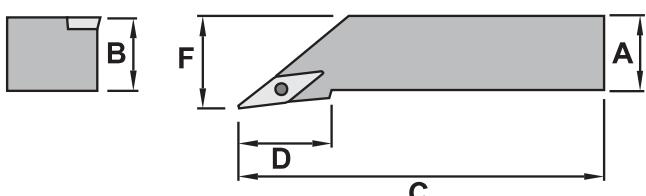
## SVHCR/L



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVHCR/L 12-3B	.750	.750	4.5	.740	1.000	VC__-33_	C-1335	C-5516	C-3718	C-1750
SVHCR/L 16-3D	1.000	1.000	6.0	.740	1.250					

R/L= please choose right or left hand designation

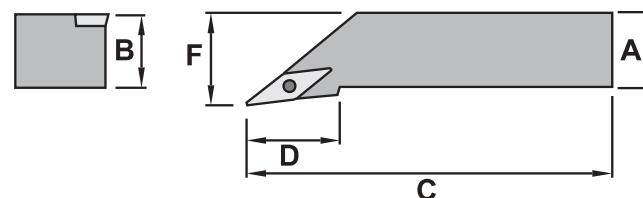
## SVJBR/L



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVJBR/L 12-3B	.750	.750	4.5	1.61	1.00	VB__-33_	C-1335	C-5516	C-3718	C-1750
SVJBR/L 16-3D	1.000	1.000	6.0	1.61	1.25					

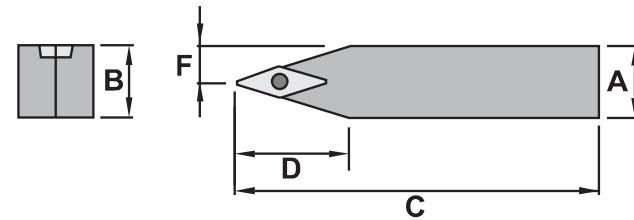
R/L= please choose right or left hand designation

# External Screwlock

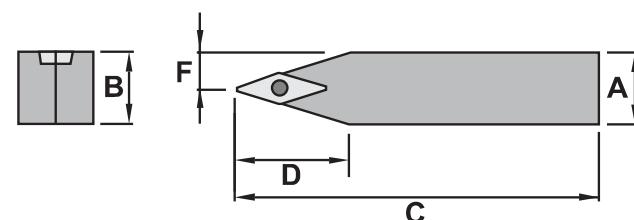


Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVJCR/L 6-2	.375	.375	3.0	.875	.500					
SVJCR/L 8-2J	.500	.500	3.5	.875	.625					
SVJCR/L 10-2A	.625	.625	4.0	.875	.750					
SVJCR/L 12-2B	.750	.750	4.5	.875	.875					
SVJCR/L 12-3B	.750	.750	4.5	1.61	1.000					
SVJCR/L 16-3D	1.000	1.000	6.0	1.61	1.250					
SVJCR/L 20-3D	1.250	1.250	6.0	1.61	1.500					

R/L= please choose right or left hand designation



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVVBN 12-3B	.750	.750	4.5	1.21	.398					
SVVBN 20-3D	1.250	1.250	6.0	1.61	.648					



Designation	A	B	C	D	F	Insert	insert screw	wrench	shim	shim screw
SVVCN 12-3B	.750	.750	4.5	1.63	.398					
SVVCN 16-3D	1.000	1.000	6.0	1.63	.523					
SVVCN 20-3D	1.250	1.250	6.0	1.63	.648					

# Internal Screwlock

## Boring Bar, Solid Carbide, Design C...SWUC, right or left hand

Boring bar with cylindrical solid carbide shank



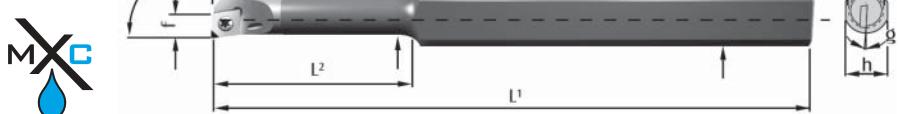
### Inch

Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
C03A-SWUCR-12	C03A-SWUCL-12	.228	.188	4.78	.114	4.000	17°	WCGW-1.21..
C04A-SWUCR-12	C04A-SWUCL-12	.312	.250	6.35	.156	4.000	17°	WCGW-1.21..
*E04A-SWUCR-12	*E04A-SWUCL-12	.312	.250	6.35	.156	4.000	17°	WCGW-1.21..

\*This item is supplied with coolant

## Boring Bar, Solid Carbide, Design E...SEUP, right or left hand

Boring bar with cylindrical solid carbide shank,  
two clamping surfaces and internal coolant feed

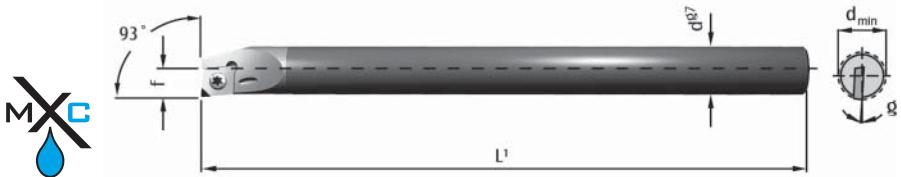


### Metric

Designation	d min	d	f	L <sup>1</sup>	L <sup>2</sup>	d <sup>g7</sup>	d <sup>g7</sup> mm	h	g	Insert
E0610H-SEUPR/L-04	.268	.236	.134	3.94	1.42	.394	10	.31	9°	EPH.. 1.51..
E0710K-SEUPR/L-04	.331	.276	.173	4.92	1.65	.394	10	.31	5°	EPH.. 1.51..
E0810K-SEUPR/L-04	.374	.315	.193	4.92	1.89	.394	10	.31	5°	EPH.. 1.51..

## Boring Bar, Solid Carbide, Design E...SEUP, right or left hand

Boring bar with cylindrical solid carbide shank  
and internal coolant feed



### Inch

Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
E04H-SEUPR-15	E04H-SEUPL-15	.290	.250	6.35	.142	4	5°	EPH.. 1.51..
E05K-SEUPR-15	E05K-SEUPL-15	.350	.312	7.94	.173	5	5°	EPH.. 1.51..
E06M-SEUPR-2	E06M-SEUPL-2	.400	.375	9.53	.205	6	5°	EPH.. 21.2..

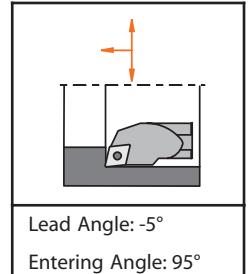
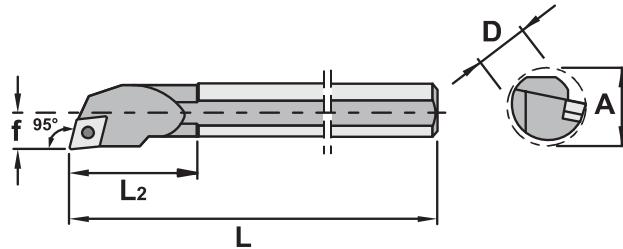
### Metric

Designation Right hand	Designation Left hand	d min	d <sup>g7</sup>	d <sup>g7</sup> mm	f	L <sup>1</sup>	g	Insert
E06F-SEUPR-04	E06F-SEUPL-04	.268	.236	6	.134	3.15	9°	EPH.. 1.51..
E07H-SEUPR-04	E07H-SEUPL-04	.331	.276	7	.173	3.94	5°	EPH.. 1.51..
E08H-SEUPR-04	E08H-SEUPL-04	.374	.315	8	.193	3.94	5°	EPH.. 1.51..
E10K-SEUPR-06	E10K-SEUPL-06	.453	.394	10	.228	4.92	5°	EPH.. 21.2..
E12M-SEUPR-06	E12M-SEUPL-06	.531	.472	12	.272	5.91	3°	EPH.. 21.2..
E16R-SEUPR-06	E16R-SEUPL-06	.728	.630	16	.386	7.87	0°	EPH.. 21.2..

Note: for right hand boring bars use left hand wiper inserts, for left hand boring bars use right hand wiper inserts

# Internal Screwlock

## Boring Bar, Solid Carbide Shank, Design C\_-SCLCR/L

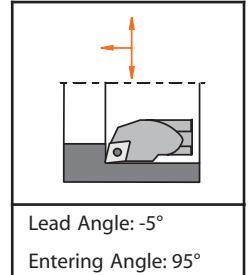
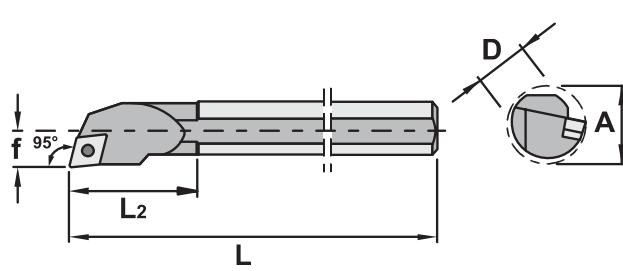


Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C06M-SCLCR/L 2	.500	.375	6.00	.550	.250	CC_-21.5_	C-1425	C-5507
C08M-SCLCR/L 2	.625	.500	6.00	.650	.312			
C10R-SCLCR/L 3	.750	.625	8.00	.740	.406	CC_-32.5_	C-1440	C-5515
C12S-SCLCR/L 3	1.000	.750	10.00	.740	.500			
C16T-SCLCR/L 3	1.280	1.000	12.00	.740	.640	CC_-43_	C-1550	C-5525
C16T-SCLCR/L 4	1.280	1.000	12.00	.850	.640			

R/L= please choose right or left hand designation

These bars are also available with coolant through

## Boring Bar, Solid Carbide Shank, Design C\_-SCLPR/L



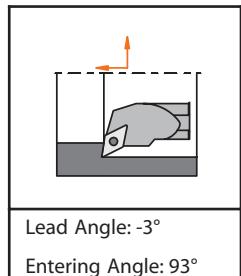
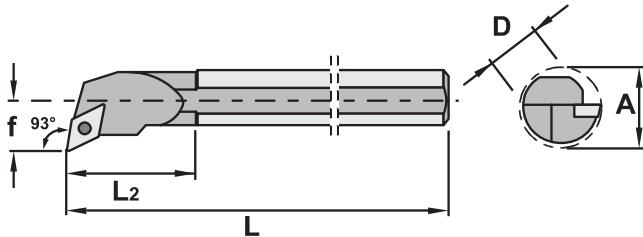
Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C06M-SCLPR/L 2	.500	.375	6.00	.550	.250	CP_-21.5_	C-1425	C-5507
C08R-SCLPR/L 2	.625	.500	8.00	.650	.312			
C10S-SCLPR/L 2	.750	.625	10.00	.740	.406	CP_-32.5_	C-1440	C-5515
C12S-SCLPR/L 3	1.000	.750	10.00	.740	.500			
C16T-SCLPR/L 3	1.280	1.000	12.00	.740	.640			

R/L= please choose right or left hand designation

These bars are also available with coolant through

# Internal Screwlock

## Boring Bar, Solid Carbide Shank, Design C\_-SDUCR/L



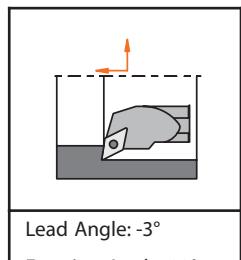
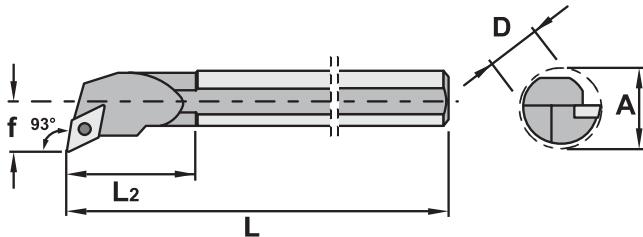
Lead Angle: -3°  
Entering Angle: 93°

Designation	Min. Bore A	D	L	L <sup>2</sup>	F	Insert	insert screw	wrench
C06M-SDUCR/L 2	.624	.375	6.00	.650	.375	DC__-21.5_	C-1425	C-5507
C08M-SDUCR/L 2	.750	.500	6.00	.650	.437			
C10R-SDUCR/L 2	.937	.625	8.00	.650	.500	DC__-32.5_	C-1440	C-5515
C12S-SDUCR/L 3	1.000	.750	10.00	.900	.562			
C16T-SDUCR/L 3	1.250	1.000	12.00	.900	.750			

R/L= please choose right or left hand designation

These bars are also available with coolant through

## Boring Bar, Solid Carbide Shank, Design C\_-SDUPR/L



Lead Angle: -3°  
Entering Angle: 93°

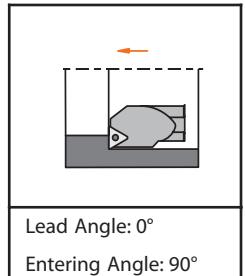
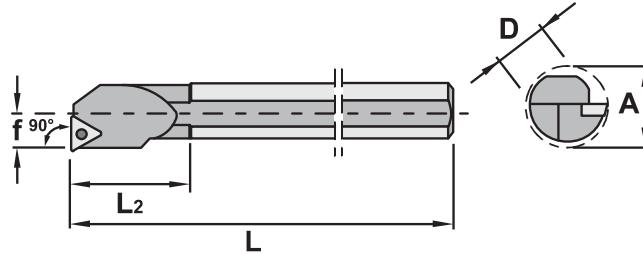
Designation	Min. Bore A	D	L	L <sup>2</sup>	F	Insert	insert screw	wrench
C06M-SDUPR/L 2	.600	.375	6.00	.650	.375	DP__-21.5_	C-1425	C-5507
C08R-SDUPR/L 2	.730	.500	8.00	.650	.437			
C10S-SDUPR/L 2	.850	.625	10.00	.650	.500	DP__-32.5_	C-1440	C-5515
C12S-SDUPR/L 3	.980	.750	10.00	.740	.562			
C16T-SDUPR/L 3	1.300	1.000	12.00	.740	.750			

R/L= please choose right or left hand designation

These bars are also available with coolant through

# Internal Screwlock

## Boring Bar, Solid Carbide Shank, Design C\_-STFCR/L

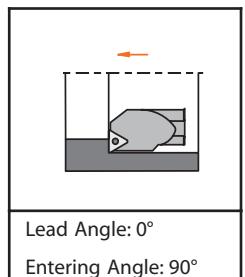
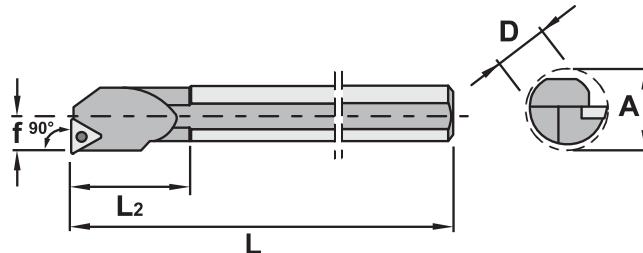


Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C06M-STFCR/L 2	.500	.375	6.00	.550	.250	TC_-21.5_	C-1425	C-5507
C08M-STFCR/L 2	.625	.500	6.00	.650	.312			
C10R-STFCR/L 2	.750	.625	8.00	.740	.406	TC_-32.5_	C-1440	C-5515
C12S-STFCR/L 3	1.000	.750	10.00	.740	.500			
C16T-STFCR/L 3	1.280	1.000	12.00	.740	.640			
C20U-STFCR/L 3	1.530	1.250	14.00	.850	.765			

R/L= please choose right or left hand designation

These bars are also available with coolant through

## Boring Bar, Solid Carbide Shank, Design C\_-STFPR/L



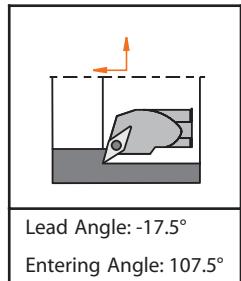
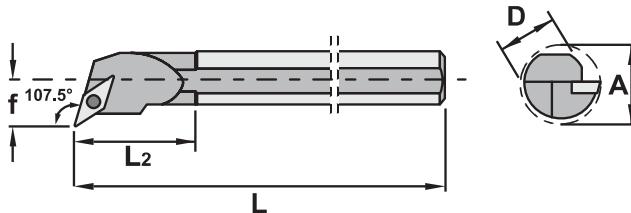
Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C05K-STFPR/L 18	.415	.312	5.00	.550	.219	TP_-1.8_	C-1425	C-5507
C06M-STFPR/L 2	.480	.375	6.00	.550	.250	TP_-21.5_	C-1425	C-5507
C08R-STFPR/L 2	.600	.500	8.00	.650	.312			
C10S-STFPR/L 3	.770	.625	10.00	.740	.406	TP_-32.5_	C-1440	C-5515
C12S-STFPR/L 3	.930	.750	10.00	.740	.500			
C16T-STFPR/L 3	1.200	1.000	12.00	.740	.640			

R/L= please choose right or left hand designation

These bars are also available with coolant through

# Internal Screwlock

## Boring Bar, Solid Carbide Shank, Design C\_-SVQCR/L



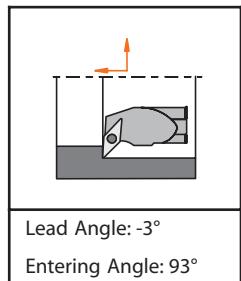
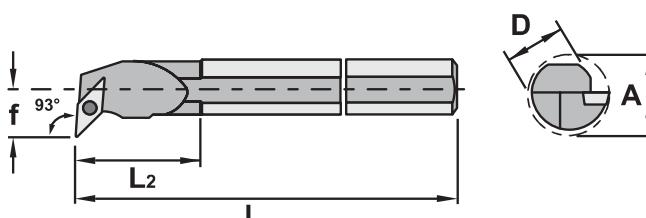
Lead Angle: -17.5°  
Entering Angle: 107.5°

Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C10R-SVQCR/L 2	.750	.625	8.00	.740	.406	VC_-22_-	C-1425	C-5507
C12S-SVQCR/L 2	.875	.750	10.00	.740	.500			
C16T-SVQCR/L 3	1.150	1.000	12.00	.840	.640	VC_-33_-	C-1440	C-5515

R/L= please choose right or left hand designation

These bars are also available with coolant through

## Boring Bar, Solid Carbide Shank, Design C\_-SVUCR/L



Lead Angle: -3°  
Entering Angle: 93°

Designation	Min. Bore A	D	L	$L^2$	F	Insert	insert screw	wrench
C12S-SVUCR/L 2	.875	.750	10.00	.740	.500	VC_-22_-	C-1425	C-5507
C16T-SVUCR/L 3	1.140	1.000	12.00	.740	.640	VC_-33_-	C-1440	C-5515

R/L= please choose right or left hand designation

These bars are also available with coolant through

## External Grooving

10 grades CBN,  
2 grades - PCD & MDC  
2.5 - 5mm widths



## Internal Grooving

10 grades CBN,  
2 grades - PCD & MDC  
1.5 - 2.5mm widths



## External Copying

10 grades CBN,  
2 grades - PCD & MDC  
8 different 60° partial profile



## External Threading

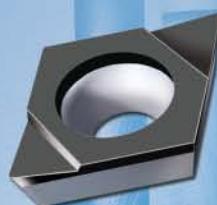
10 grades CBN,  
2 grades - PCD & MDC



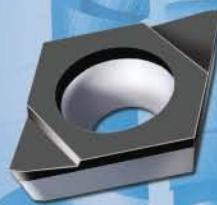
MDC= Monocrystalline Diamond  
(Natural Diamond)

# MiniCut

3/16" & 1/4" I.C. sizes  
available in PCD & CBN!



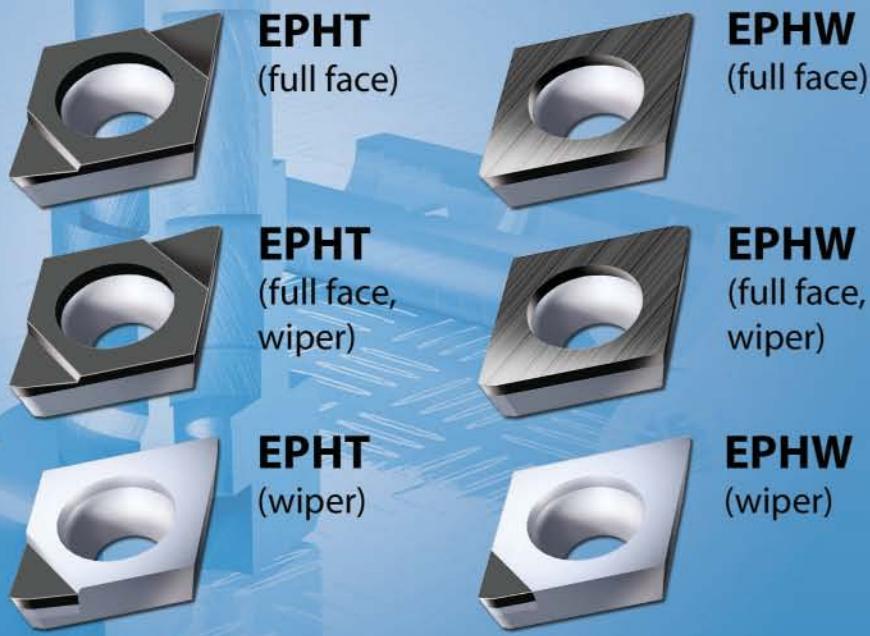
**EPHT**  
(full face)



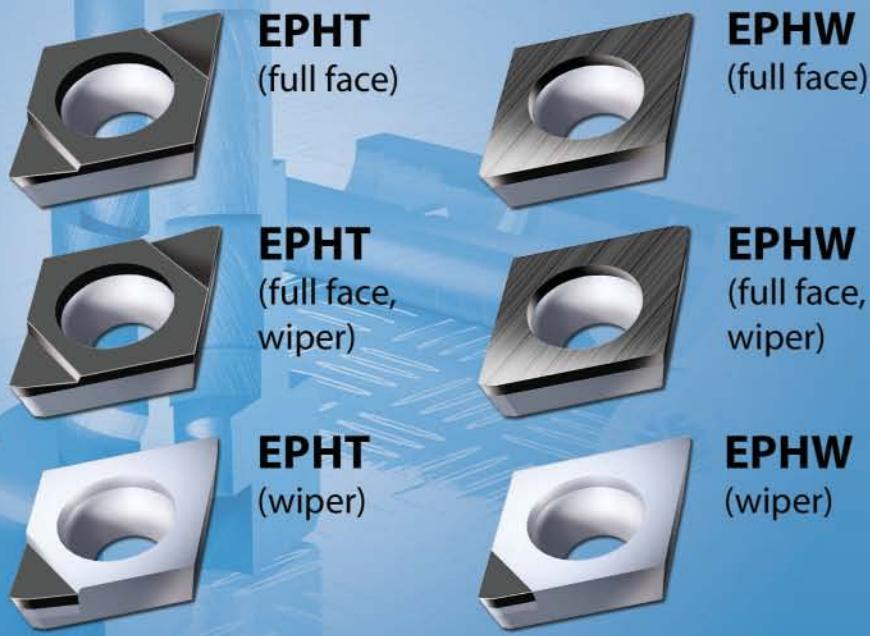
**EPHT**  
(full face,  
wiper)



**EPHT**  
(wiper)



**EPHW**  
(full face)



**EPHW**  
(full face,  
wiper)

**EPHW**  
(wiper)



## External Profiling

10 grades CBN,  
2 grades - PCD & MDC  
different radii and wipers avail.



Internal holders available in  
5/8", 3/4" & 1" sizes



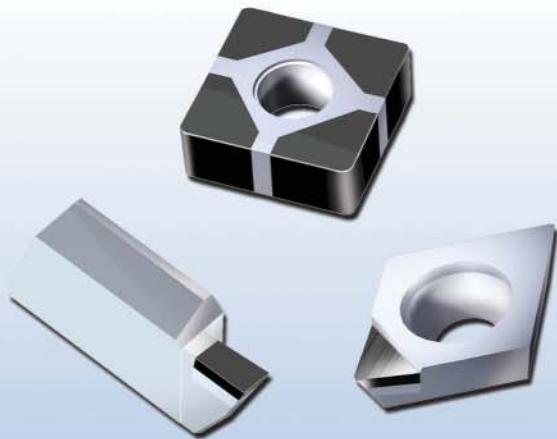
**pages  
45 - 60**

External holders available in  
3/4", 1", & 1.25" sizes

## Tipped carbide boring bars!

- able to achieve depths of up to 7 x D!
- solid tungsten carbide design
- 75° positive insert style produces excellent cutter performance!
- featuring MAXICOOL™ through coolant technology!

Available corner radii:  
.004", .008", .016", & .031"



**Rani Tool Corp.**

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