DORMER PRAMET

ROUND TOOL CATALOG

DORMER

PRECISION

UNION BUTTERFIELD®

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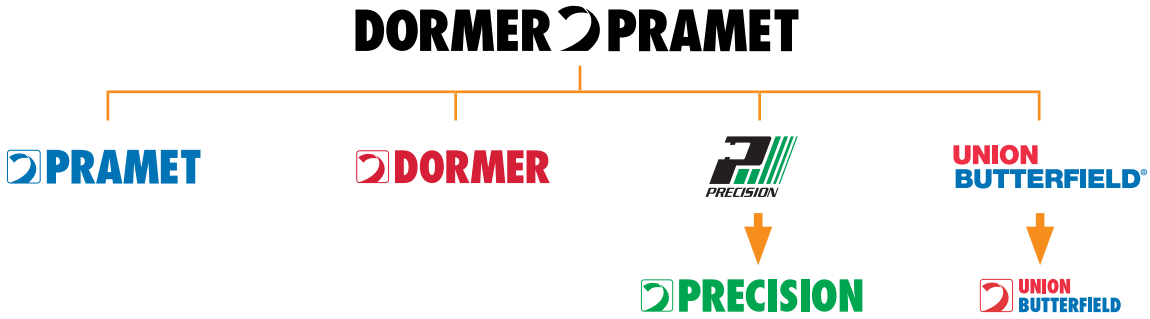
2020 VISION: CLARITY IN BRAND ALIGNMENT



We acknowledge a unified appearance of our product logos will show that Dormer Pramet manufactures all our product brands – Precision Twist Drill, Dormer, Union Butterfield and Pramet.

In 2020, we are educating on the evolution of the Precision Twist Drill and Union Butterfield logos. Beginning in 2021, these logos will adopt the chip - our unifying symbol across the company and product brands that communicates our promise of quality manufacturing, products and logistics.

The Union Butterfield and Precision Twist Drill brands are pioneer brands for the North American marketplace. Since launching in 1885 and 1952, respectively, they represent a legacy of local support and quality tooling. Adding the chip to these logos aligns all brands visually and confirms to customers that when they add any of our tools to their shop, they add our entire team, including quality production facilities, reliable delivery and nationwide support.

WORKPIECE MATERIAL GROUPS (WMG)

Available on our website www.dormerpramet.com or by downloading our NEW Machining Calculator App.

What is WMG?

Previous to 2019, we classified our tools according to WMG for indexable tools and AMG for round tools. We have begun to unify our technical data formats to only use WMG.

Workpiece material groups (“WMG”) are used to support easy and reliable selection of the right cutting tool and starting values for machining conditions in particular applications.

Dormer Pramet classifies workpiece materials into six different colored groups;

- **Blue**: Steel and cast steel (P-group)
- **Yellow**: Stainless steel (M-group)
- **Red**: Cast iron (K-group)
- **Green**: Non-ferrous metals (N-group)
- **Orange**: High-temperature alloys (S-group)
- **Grey**: Hardened materials (H-group)

Each of these are divided into subgroups based on their structure and/or composition. For example, P-group steel and cast steel is split into four subgroups, namely;

- P1 – **Free machining steel**
- P2 – **Plain carbon steel**
- P3 – **Alloy steel**
- P4 – **Tool steel**

A final division includes material properties, such as hardness and ultimate tensile strength. This is to provide our customers with a complete tool recommendation, including starting values for cutting speed and feed.

Speeds and feeds in the separate high performance catalogs are provided according to our new WMG groupings. The data in this catalog is still utilizing our traditional AMG groupings.

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DORMER

HYDRA DRILL

How to Use This Chart:

1) Determine your Workpiece Material from the Application Material Groups (AMG) below.
2) Use the icons to find Product Features.
3) Find the Surface Feet Per Minute (SFM) and Alpha Code.

example: 361 W

361 = SFM
W = Alpha Code used to find your Feed Rate (IPR)

4) To find Cutting Feed Rate, refer to chart below.

Fn	Ø						
	1/2"	19/32"	5/8"	3/4"	1"	1.3/16"	1.1/2"
S	0.004	0.005	0.005	0.006	0.007	0.007	0.009
T	0.005	0.006	0.007	0.007	0.008	0.009	0.010
U	0.008	0.009	0.009	0.009	0.011	0.012	0.014
V	0.011	0.012	0.013	0.013	0.016	0.017	0.020
W	0.015	0.016	0.017	0.018	0.019	0.019	0.020

Application Material Groups (AMG)			Hardness HRC
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38
6.Copper	6.1 Copper	Commercially Pure	<100 HB
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB
	6.4 High Strength Bronze	Ampco 18-25	<49
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---
	8.2 Thermosetting plastics	Bakelit, Pertinax	---
	8.3 Reinforced plastic materials	CFK, GFKAFK	---
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54
10.Graphite	10.1 Standard graphite		---

Visual Index - Drills

DORMER

Head Style:	R950					R960					R970				
Head Range:	15/32 - 42.00	15/32 - 42.00	15/32 - 42.00	13.5 - 42.00	15/32 - 42.00	15/32 - 30.50	15/32 - 30.50	15/32 - 30.50	15/32 - 30.50	15/32 - 30.50	15/32 - 42.00	15/32 - 42.00	15/32 - 42.00	15/32 - 42.00	15/32 - 42.00
Body Style:	H851	H853	H855	H858	H8512	H851	H853	H855	H858	H8512	H851	H853	H855	H858	H8512
Tool Material:	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Standard:	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER
Depth of Cut:	1.5XD	3XD	5XD	8XD	12XD	1.5XD	3XD	5XD	8XD	12XD	1.5XD	3XD	5XD	8XD	12XD
Finsh/Coating:															
Shank:	DIN 6535HA DIN 6535HE	ISO 9766 DIN 6535HE	ISO 9766 DIN 6535HE	DIN 6535HE	DIN 6535 HA	DIN 6535HA DIN 6535HE	ISO 9766 DIN 6535HE	ISO 9766 DIN 6535HE	DIN 6535HE	DIN 6535 HA	DIN 6535HA DIN 6535HE	ISO 9766 DIN 6535HE	ISO 9766 DIN 6535HE	DIN 6535HE	DIN 6535 HA
Direction of Cut:															
Coolant:															
Range:	15/32 - 30.50	15/32 - 42.00	15/32 - 42.00	13.5 - 42.00	13.5 - 1.1/64	15/32 - 30.50	15/32 - 42.00	15/32 - 42.00	13.5 - 42.00	13.5 - 1.1/64	15/32 - 30.50	15/32 - 42.00	15/32 - 42.00	13.5 - 42.00	13.5 - 1.1/64
Page #	21,30	21,33	21,36	21,39	21,42	24,30	24,33	24,36	24,39	24,42	27,30	27,33	27,36	27,39	27,42
1.1						397W	361W	361V	328U	289U	397W	361W	361V	328U	289U
1.2						361W	328W	328V	295U	262U	361W	328W	328V	295U	262U
1.3	361W	328W	328V	295U	262U										
1.4	307W	279W	279V	246U	223U										
1.5	307W	279W	279V	246U	223U										
1.6	217T	197T	197T	197S	158S										
1.7															
1.8															
2.1						217V	197V	164V	148U	157U					
2.2						180T	164T	164S	131S	131S					
2.3						144T	131T	131S	115S	92S					
2.4	127T	115T	115T	98S	92S										
3.1						433V	394V	374V	346U	315U	433V	394V	374V	346U	315U
3.2						418V	380V	354V	328U	304U	418V	380V	354V	328U	304U
3.3	318U	289U	279V	262U	231U						318U	289U	279V	262U	231U
3.4	318U	289U	279V	262U	231U						318U	289U	279V	262U	231U
4.1						163T	148T	148T	115S	118S					
4.2						127T	115T	115T	98S	92S					
4.3						108S	98S	98S	82S	78S					
5.1						127T	115T	115T	98S	92S					
5.2						108S	98S	98S	82S	78S					
5.3						90S	82S	82S	66S	66S					
6.1															
6.2															
6.3															
6.4															
7.1															
7.2															
7.3															
7.4															
8.1															
8.2															
8.3															
9.1															
10.1															

ISO
P 1
P 1
P 2
P 3
P 4
H 1
H 3
H 4
M 1
M 3
M 2
S 2
K 1
K 2
K 3
K 4
S 1
S 2
S 3
S 1
S 2
S 3
N 3
N 4
N 3
N 4
N 1
N 1
N 1
N 2
O
O
O
H
O

Visual Index - Drills

Feed Rate Chart - Drills

Alpha Code	Feed in Inches per Revolution (IPR) ± 25% — Ø Diameter															
	1mm/ 1/32"	2mm/ 3/32"	3mm/ 1/8"	4mm/ 5/32"	5mm/ 3/16"	6mm/ 1/4"	8mm/ 5/16"	10mm/ 3/8"	12mm/ 1/2"	15mm/ 9/16"	16mm/ 5/8"	20mm/ 3/4"	25mm/ 1"	30mm/ 1.1/8"	40mm/ 1.5/8"	50mm/ 2"
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090	
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100	
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140	
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200	
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200	
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228				
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291				
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472				

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Drills

Tool Material:		HM	HM	HM	HM	HM	HM	HM	HM	HM	HSS	HSS-E	HSS-E	HSS	HSS-E	HSS-E
Standard:		DIN 6539	DIN 6537 K	DIN 6537 K	DIN 6537 K	DIN 338	DIN 6537 L	DIN 6537 L	DIN 6537 L	DORMER	DIN 1897	DIN ANSI	DIN ANSI	DIN 338	DORMER	DIN ANSI
Depth of Cut:		2.5XD	3XD	3XD	3XD	4XD	5XD	5XD	5XD	8XD	2.5XD	3XD	3XD	4XD	5XD	6XD
Point Style:		130°	140°	140°	140°	130°	140°	140°	140°	140°	130°	130°	130°	130°	130°	130°
Finish/Coating:		TiN	TiAlN	TiAlN	TiAlN	TiN	TiAlN	TiAlN	TiAlN	TiAlN	TiN		Alcrona Top	TiN	TiAlN Top	
Shank:			DIN 6535HA	DIN 6535HA	DIN 6535HA		DIN 6535HA	DIN 6535HA	DIN 6535HA	DIN 6535HA					DIN 6535HA	
Flute Form:		N	CTW	CTW	CTW	N	CTW	CTW	CTW	CTW		W	W			W
Direction of Cut:																
Coolant Through:																
Style:		**R520**	**R458**	**R457**	**R467**	**R510**	**R454**	**R453**	**R463**	**R459**	**A520**	**A920**	**A921**	**A510**	**A553**	**A900**
Range:		3.00 - 16.50	3.00 - 20.00	3.00 - 20.00	3.00 - 16.00	3.00 - 14.25	3.00 - 20.00	3.00 - 20.00	3.00 - 16.00	3.00 - 16.00	3.00 - 13.00	1.00 - 20.00	2.50 - 16.00	3.00 - 14.00	5.00 - 20.00	1.00 - 20.00
Page #		**45**	**47**	**47**	**51**	**54**	**56**	**56**	**60**	**63**	**66**	**69**	**69**	**73**	**76**	**78**
	1.1	328X	510W	510W		328W	510V	510V		443V	187M	131J	197M	187M	279L	125H
	1.2	295X	440W	460W		295W	440V	460V		394V	154M	112J	171M	154M	230L	108H
	1.3	295X	360W	440W		295W	360V	440V		361U	131K	105I	174J	131K	197L	85H
	1.4	262X	330V	375V		262W	330V	375V		328U	105I	105I	174J	98H	148H	85H
	1.5	180X	245V	295V		180V	245V	295V		262U	69G	75E	125G	69F	92F	69E
	1.6	148W	164U	213U		148V	164U	213U		180T	36E	62E	98G	36D	49D	52E
	1.7	115U	98U	98U		115T	98U	98U								
	1.8	98T	82U	82U		98S	82U	82U								
	2.1	164W	148U	246V	279G	164V	148U	246V	279G	246V	98I	49F	56F	92G	131G	49E
	2.2		131T	115V	246G		131T	115V	246G	115V	52I	23F	30F	46I	62I	23E
	2.3		115T	98U	197F		115T	98U	197F	98U	66G	30D	36D	62G	89G	30C
	2.4		115T				115T									
	3.1	295Y	295W	394W		295X	295W	394W		394W	157M	112L	174L	138K	230K	79J
	3.2	295Y	295W	394W		295X	295W	394W		394W	121K	85L	138L	105J	164J	62J
	3.3	213X	230V	262V		213W	230V	262V		262V	98J	85L	138L	92J	148J	62J
	3.4	213X	230V	262V		213W	230V	262V		262V	85F	62J	118J	82F	138F	46I
	4.1	197W	164U	180V	180V	148V	164U	180V	180V		112I	98G	157I	105G	148G	72E
	4.2	148V	131U	148V	148V		131U	148V	148V		66G	59G	95I	66H	98E	49E
	4.3	115U	115T	131U	131U		115T	131U	131U		13B	33C	52E	13B	26C	20C
	5.1	164W			180U	164V			180U		56I	49I	79L	56I	82I	46G
	5.2				148U				148U		36G	30G	46I	30E	49E	23G
	5.3				131U				131U		23E	20E	33G	20E	33G	20C
	6.1		328V	410W			328V	410W		410V	131E	213H		131D	230G	213G
	6.2		656V	722W			656V	722W		722V	164I	216J		164I	279I	174I
	6.3		656V	722W			656V	722W		722V	148K	131J	233J	148I	262I	112H
	6.4		262U	328V			262U	328V		328U	66F	102G	164I	66F	115G	98G
	7.1	738Z	738W	820W		738Y	738W	820W		935W	180I	246L		164G	230H	197J
	7.2	738Z	738W	820W		738Y	738W	820W		935W	164M	148N		164M	328M	148N
	7.3	492Y	590V	656V		492X	590V	656V		623V	121K	131N		102I	180I	131N
	7.4	213Y	394V	492V		213X	394V	492V		312V	115I	118J	157J	108I	180J	92I
	8.1	246Z				246X					213G	180J		213G	295G	180I
	8.2	377V				377V					164G	131H		164G		131G
	8.3										115F			115F		
	9.1															
	10.1															

Visual Index - Drills

	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
	DIN ANSI	DIN ANSI	DIN ANSI	DIN 1869/1	DIN 1869/2	DIN 1869/3	ANSI	ANSI	ANSI	ANSI	DIN 338	DIN 338	DIN 338	DIN 338	DIN 338	ANSI
	6XD	10XD	10XD	15XD	20XD	25XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD
	130°	130°	130°	130°	130°	130°	118°	118°	118°	118°	118°	118°	118°	118°	118°	118°
	Alorna Top		Alorna Top					ST	TiN	TiN		ST	ST	TiN	TiN	
	W	W	W	W	W	W			N	N	N	N	N	N	N	
	A901	A940	A941	A976	A977	A978	R10P R15P R18P	R10 R15 R18	A012	A012S	2A	2AB	A100	A002	A002S	L10
	1.50 - 16.00	1.00 - 20.00	1.00 - 16.00	1.50 - 14.00	1.50 - 14.00	3.00 - 10.00	N97 - 11/16	N80 - 11/16	N80 - 3/4	1/16 - 1/2	0.15 - 15.00	1.00 - 17.50	0.20 - 20.00	1.00 - 16.00	2.00 - 13.00	1/32 - 1/2
	78	81	81	84	84	84	87	87	91	91	95	95	95	95	95	102
1.1	197J	125F	174G	102C	102B	102A	115H	115H	154J	154J	115H	115H	115H	154J	154J	115H
1.2	164J	108F	151G	85C	85B	85A	98H	98H	131J	131J	98H	98H	98H	131J	131J	98H
1.3	144I	72G	118G	72C	72B	72A	82F	82F	115F	115F	82F	82F	82F	115F	115F	82F
1.4	144I	72G	118G	72C	72B	72A	66F	66F	98F	98F	66F	66F	66F	98F	98F	66F
1.5	108G	56C	75D	39A	39A	39A	43E	43E	59F	59F	43E	43E	43E	59F	59F	43E
1.6	85G	39C	56D	33A	33A	33A	30D	30D	33E	33E	30D	30D	30D	33E	33E	30D
1.7																
1.8																
2.1	56E	49C	56C	39B	39B	39A	49E	49E	66F	66F	49E	49E	49E	66F	66F	49E
2.2	30E	23E	30E	23C	23B	23A	26G	26G	39G	39G	26G	26G	26G	39G	39G	26G
2.3	36C	30B	36B	26A	26A	26A	30C	30C	52C	52C	30C	30C	30C	52C	52C	30C
2.4																
3.1	190I		118I				98H	98H	131J	131J	98H	98H	98H	131J	131J	98H
3.2	154I	52I	98I	75C	75B	75A	79F	79F	98E	98E	79F	79F	79F	98E	98E	79F
3.3	112J	52I	98I	52C	52B	52A	66E	66E	92E	92E	66E	66E	66E	92E	92E	66E
3.4	92I	39H	79H	36A	36A	36A	46E	46E	85E	85E	46E	46E	46E	85E	85E	46E
4.1	115G	59E	82F	49C	49B	49A	75E	75E	75F	75F	75E	75E	75E	75F	75F	75E
4.2	79G	43C	59D	36A	36A	36A	39D	39D	43D	43D	39D	39D	39D	43D	43D	39D
4.3	33E	20C	26D	16A	16A	16A	20B	20B	23B	23B	20B	20B	20B	23B	23B	20B
5.1	72I						33G	33G	43G	43G	33G	33G	33G	43G	43G	33G
5.2	36I						20E	20E	23E	23E	20E	20E	20E	23E	23E	20E
5.3	33E						10A	10A	10A	10A	10A	10A	10A	10A	10A	10A
6.1		213F					108G	108G	164G	164G	108G	108G	108G	164G	164G	108G
6.2		230F					115I	115I	108I	108I	115I	115I	115I	108I	108I	115I
6.3	184I	112G	157H	98D	98C	98B	89H	89H	128H	128H	89H	89H	89H	128H	128H	89H
6.4	157I	98G	138H	89D	89C	89B	52G	52G	98G	98G	52G	52G	52G	98G	98G	52G
7.1		174H					108J	108J	134K	134K	108J	108J	108J	134K	134K	108J
7.2		148N					98I	98I	125J	125J	98I	98I	98I	125J	125J	98I
7.3		131N					89H	89H	108I	108I	89H	89H	89H	108I	108I	89H
7.4	157I	98G	138H	89D	89C	89B	79F	79F	108I	108I	79F	79F	79F	108I	108I	79F
8.1		180H					98J	98J	98I	98I	98J	98J	98J	98I	98I	98J
8.2		131F					92H	92H	164H	164H	92H	92H	92H	164H	164H	92H
8.3							46F	46F	115F	115F	46F	46F	46F	115F	115F	46F
9.1							10B	10B	10B	10B	10B	10B	10B	10B	10B	10B
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS
	DIN 338	ANSI	ANSI	ANSI	ANSI	DIN 338	ANSI	ANSI	DIN 338	DIN 338	ANSI	DIN 338	NAS 907	ANSI
	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	3XD	2.5XD
	118°	135°	118°	135°	118°	135°	135°	135°	135°	135°	135°	135°	135°	118°
	ST	Purple Bronze	ST	ST		ST		TiN		TiN	Bronze	Bronze	Bronze	
	N				W	W						N		
	A101	HX10 HX15 HX18	R10A R15A R18A	R10B R15B R18B	R10H R18H	A108	QC21P	QC21G	QC21PM	QC21GM	R10CO R15CO R18CO	2ACO	R88CO R89CO	R40 R41 R42
	1.00 - 12.00	1/16 - 1/2	1/16 - 1/2	1/16 - 1/2	N80 - 1/2	1.00 - 16.00	1/16 - 11/16	1/16 - 1/2	1.50 - 17.50	1.50 - 13.00	N80 - 11/16	1.00 - 13.00	1/16 - 1/2	N60 - 2"
	103	**105**	**108**	**111**	**114**	**114**	**119**	**119**	**122**	**122**	**123**	**123**	**128**	**130**
1.1	35H	115H	115J	115J	108I	115I	98F	115F	98F	115F	115J	115J	115J	115J
1.2	30H	69H	98H	98H	92I	98I	59F	69F	59F	69F	98H	98H	98H	98J
1.3	25F	75I	89G	89G		82G	66H	75H	66H	75H	89G	89G	89G	89G
1.4	20F	69H	79F	79F		66F	59F	69F	59F	69F	79F	79F	79F	69G
1.5	13E	56F	56E	56E		43E	46D	56D	46D	56D	56E	56E	56E	46F
1.6	9D		33D	33D		30D					33D	33D	33D	33E
1.7														
1.8														
2.1	15E	105I	72E	72E		49E	89H	105H	89H	105H	72E	72E	72E	52F
2.2	8G	59H	36G	36G		30G	49F	59F	49F	59F	36G	36G	36G	30H
2.3	9C	56F	49C	49C		33D	49D	59D	49D	59D	49C	49C	49C	33D
2.4														
3.1	30H	171L	115H	115H	82F	98H	151H	171H	151H	171H	115H	115H	115H	105J
3.2	24F	89I	92D	92D	66D	79F	79H	89H	79H	89H	92D	92D	92D	89G
3.3	20E	95H	72E	72E	52C	66E	79F	95F	79F	95F	72E	72E	72E	66F
3.4	14E	59F	56E	56E	33C	46E		59D		59D	56E	56E	56E	52F
4.1	23E	95H	92F	92F	49C	82G	89H		89H		92F	92F	92F	89G
4.2	12D	75H	66D	66D		52E	49F		49F		66D	66D	66D	52E
4.3	6B		36C	36C		23B					36C	36C	36C	26C
5.1	10G	59H	49G	49G	23E	39G	49F	59H	49F	59H	49G	49G	49G	43H
5.2	6E		23E	23E		23G					23E	23E	23E	26F
5.3	3A		20B	20B		20E					20B	20B	20B	13B
6.1	33G		125H	125H	115H	108G	89I	98I	89I	98I	125H	125H	125H	118H
6.2	35I		131F	131F	118G	115I	79H	89H	79H	89H	131F	131F	131F	125J
6.3	27H		89H	89H		102H	79H	89H	79H	89H	89H	89H	89H	89I
6.4	16G		69F	69F		52G					69F	69F	69F	52H
7.1	33J		108J	108J	148J	108J	351H	400H	351H	400H	108J	108J	108J	108K
7.2	30I		98I	98I	115J	98I	325H	351H	325H	351H	98I	98I	98I	98J
7.3	27H		98H	98H	98G	89H					98H	98H	98H	98I
7.4	24F		89F	89F	95G	79F	276H	315H	276H	315H	89F	89F	89F	82I
8.1	30J				138J	98J								98K
8.2	28H				131I	92H								115I
8.3	14F				66G	46F								56G
9.1	3B		20C	20C		10B					20C	20C	20C	13C
10.1														

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E
	DIN ANSI	ANSI	DIN 1897	ANSI	ANSI	DIN 1899	ANSI	DIN 1897	ANSI	DIN 340	ANSI	ANSI	ANSI	DIN 340	DIN 340	ANSI
	2.5XD	2.5XD	2.5XD	3XD	3XD	2.5XD	2.5XD	2.5XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD
	135°	135°	135°	135°	135°	118°	135°	135°	118°	118°	118°	135°	135°	135°	135°	135°
	TiN	ST	ST		TiN		Bronze	Bronze					TiN		TiN	Bronze
	N		N			N		N		N	W					
	A022	R40C R41C R42C	4ASM	QC41P	QC41G	A720	M40CO M41CO M42CO	4ASM-CO	R51 R52 R55	5ATL	R51FS	QC91P	QC91G	QC91PM	QC91GM	M51CO M52CO
	0.50 - 16.00	N60 - 1/2	1.00 - 12.50	1/16 - 11/16	1/16 - 1/2	0.15 - 1.40	N60 - 3/4	2.30 - 12.00	N80 - 1.3/4	1.00 - 31.00	1/16 - 1/2	1/16 - 11/16	1/16 - 1/2	1.50 - 17.00	1.50 - 12.50	1/16 - 1“
	133	136	139	141	141	143	144	147	148	152	154	155	155	157	157	158
1.1	115K	115J	115J	98F	115F	115A	125K	125K	89G	89G		98F	115F	98F	115F	89G
1.2	105K	98J	98J	59F	69F	98A	108H	108H	82G	82G		59F	69F	59F	69F	82G
1.3	82I	89G	89G	66H	75H	89A	98G	98G	66E	66E		66H	75H	66H	75H	66E
1.4	75H	69G	69G	59F	69F	75A	89G	89G	52E	52E		59F	69F	59F	69F	52E
1.5	52G	46F	46F	46D	56D	56A	59F	59F	30D	30D		46D	56D	46D	56D	30D
1.6	33E	33E	33E			33A	36E	36E	20B	20B						20B
1.7																
1.8																
2.1	49G	52F	52F	89H	105H	72A	72F	72F	33D	33D		89H	105H	89H	105H	33D
2.2	26I	30H	30H	49F	59F	33A	36H	36H	20F	20F		49F	59F	49F	59F	20F
2.3	30E	33D	33D	49D	59D	49A	49D	49D	13B	13B		49D	59D	49D	59D	13B
2.4																
3.1	105K	105J	105J	151H	171H	98A	112K	112K	92H	92H		151H	171H	151H	171H	92H
3.2	82I	89G	89G	79H	89H	79A	98F	98F	69E	69E		79H	89H	79H	89H	69E
3.3	66G	66F	66F	79F	95F	66A	72F	72F	49D	49D		79F	95F	79F	95F	49D
3.4	52G	52F	52F		59D	46A	56F	56F	43D	43D			59D		59D	43D
4.1	82I	89G	89G	89H		75A	98G	98G	56E	56E		89H		89H		56E
4.2	46F	52E	52E	49F		56A	59F	59F	30C	30C		49F		49F		30C
4.3	26C	26C	26C			26A	33C	33C	13A	13A						13A
5.1	43H	43H	43H	49F	59H	33A	49H	49H	26F	26F		49F	59H	49F	59H	26F
5.2	26F	26F	26F			23A	30F	30F	13D	13D						13D
5.3	13B	13B	13B			13A	20C	20C	10A	10A						10A
6.1	118H	118H	118H	89I	98I	115A	125I	125I	98E	98E	89I	89I	98I	89I	98I	98E
6.2	125K	125J	125J	79H	89H	131A	131K	131K	105H	105H		79H	89H	79H	89H	105H
6.3	89I	89I	89I	79H	89H	115A	89J	89J	89G	89G		79H	89H	79H	89H	89G
6.4	52I	52H	52H			89A	52I	52I	52E	52E						52E
7.1	131F	108K	108K	351H		115A	115K	115K	105I	105I	348H	351H	400H	351H	400H	105I
7.2	105K	98J	98J	325H		98A	108J	108J	89H	89H	325H	325H	351H	325H	351H	89H
7.3	105J	98I	98I			89A	102I	102I	89G	89G						89G
7.4	82J	82I	82I	276H		89A	98G	98G	82E	82E	276H	276H	315H	276H	315H	82E
8.1	98K	98K	98K			157A	115M	115M	115I	115I						115I
8.2	115I	115I	115I			82A	92K	92K	85G	85G						85G
8.3	56G	56G	56G				56I	56I	39E	39E						39E
9.1	13C	13C	13C				20C	20C	10A	10A						10A
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS
	ANSI	ANSI	BS 328	ANSI	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	ANSI	DIN 345	DIN 345	DIN 341	DIN 1870/1	DIN 1870/1
	12XD	15XD	10XD	10XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	6XD	10XD	15XD
	118°	118°	118°	135°	135°	118°	135°	135°	135°	135°	118°	118°	118°	118°	118°	130°
			ST				ST	ST	Bronze	Bronze	ST	ST	TiN	ST	ST	ST
			N		N	N						N	N	N	N	W
	0860 1290	1511 1813	A125	QC0860P QC1290P	A243	A244	500-6 501-6 502-6	500-12 501-12 502-12	CO500-6 CO501-6	CO500-12 CO500-12	209 S209	5ATS	A530	A350	A345	A951
	1/8 - 3/4	3/16 - 1"	1.40 - 1"	1/8 - 1/2	3/32 - 1/4	1/8 - 1/4	N60 - 1/2	3/64 - 1/2	1/16 - 1/4	1/16 - 1/4	1/8 - 2"	5.00 - 50.00	8.50 - 40.00	5.00 - 50.00	8.00 - 50.00	10.00 - 30.00
	160	**162**	**162**	**167**	**169**	**169**	**170**	**173**	**175**	**175**	**177**	**180**	**180**	**180**	**183**	**185**
1.1	79E	79E	79E	98F							115I	115I	154I	89I	79G	89G
1.2	72E	72E	72E	59F							98I	98I	131I	82I	72G	72G
1.3	52C	52C	52C	66H	82F	82F	82F	82F			82F	82F	98F	66G	56E	62E
1.4	49C	49C	49C	59F	66F	66F	66F	66F			66F	66F	89F	52F	49D	49D
1.5	20A	20A	20A	46D	43E	43E	43E	43E			39E	39E	66E	33E	20C	26C
1.6	16A	16A	16A		30D	30D	30D	30D	20B	20B	30D	30D	33D	20D	16B	20B
1.7																
1.8																
2.1	30C	30C	30C	89H	49E	49E	49E	49E	95H	95H	49E	49E	79E	43E	39C	39C
2.2	13E	13E	13E	49F	26G	26G	26G	26G	56F	56F	30G	30G	43G	13G	13E	20E
2.3	26A	26A	26A	49D	30C	30C	30C	30C	56D	56D	33C	33C	66C	26C	26A	39A
2.4									30D	30D						
3.1	72G	72G	72G	151H	98I	98I	98I	98I	161H	161H	98I	98I	118I	85I	72G	72G
3.2	59D	59D	59D	79H	79F	79F	79F	79F	85H	85H	79E	79E	92E	66F	59D	52D
3.3	43C	43C	43C	79F	66E	66E	66E	66E	85F	85F	66E	66E	89E	59E	43C	43C
3.4	30C	30C	30C		46E	46E	46E	46E	56D	56D	46E	46E	72E	36E	30C	30C
4.1	36D	36D	36D		75F	75F	75F	75F			75F	75F	105F	52F	49D	59D
4.2	30B	30B	30B		39D	39D	39D	39D			43D	43D	59D	30D	30B	33B
4.3	16A	16A	16A		20B	20B	20B	20B	20D	20D	23B	23B	43B	16B	16A	20A
5.1	16E	16E	16E	49F	33G	33G	33G	33G			33G	33G	43G	26G	26E	23E
5.2	13C	13C	13C		20E	20E	20E	20E	20B	20B	23E	23E	20E	13E	13C	16C
5.3	10A	10A	10A		10A	10A	10A	10A	16B	16B	13A	13A	10A	10A	10A	10A
6.1	79D	79D	79D								108F	108F	197G	108F	89D	72D
6.2	108G	108G	108G	79H							115I	115I	180I	115I	108G	108G
6.3	72F	72F	72F	75H	89H	89H	89H	89H			115H	115H	131G	115H	89F	72F
6.4	52D	52D	52D		52G	52G	52G	52G			52F	52F	115E	52F	52D	52D
7.1	79H	79H	79H	348H							85J	85J	180I	108J	108H	98H
7.2	72G	72G	72G	325H							98I	98I	148I	82I	89G	89G
7.3	72F	72F	72F								92H	92H	115G	89H	89F	79F
7.4	66E	66E	66E	276H	79F	79F	79F	79F			75H	75H	92G	82H	79F	72F
8.1	98H	98H	98H	151D							98K	98K	164J	115L	98J	98J
8.2	85F	85F	85F	125D							92J	92J	164H	85J	98H	98H
8.3	33D	33D	33D								46H	46H	115F	39H	33F	33F
9.1	10A	10A	10A		10B	10B	10B	10B			10B	10B	10B	10B	10A	10A
10.1																

Visual Index - Drills

	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS HM	HSS HM	HM	HM	HM	HSS	HSS
	DIN 1870/2	ANSI	DIN 345	ANSI	DORMER	ANSI	ANSI	ANSI	ANSI	FRATRON	DIN 338	FRATRON	FRATRON	FRATRON	FRATRON	FRATRON
	20XD	4XD	4XD	5XD	4XD	4XD	4XD	1.5XD	4XD	4XD	4XD	3XD	3XD	1XD	1XD	1XD
	130°	135°	118°		118°	118°	118°	118°	118°	118°	118°	118°	118°	90°	90°	90°
	ST	Bronze	Bronze	ST	ST	ST	ST	ST	ST Bronze		ST					TiN
	W		N		N						N					
	A952	209CO	A730	T400	A170	R56	R57	R58	R56CO	D444	A160	D33F D33W D33L	D33M	DS-90 DS-120 DS-142	SPS-90	SPSG-90
	8.00 - 40.00	1/4 - 1.1/2	10.00 - 32.00	1/2 - 1.5/8	13.00 - 1.1/2	33/64 - 1.1/2	33/64 - 1.1/2	1" - 2"	33/64 - 1"	N32 - 1/2	4.00 - 16.00	N68 - 1/2	1.00 - 12.00	1/8 - 1/2	1/4 - 1"	1/4 - 1"
	185	187	189	191	192	194	196	198	199	200	202	203	206	207	208	208
1.1	89G	115J	115J	75E	115H	115H	115H	98F	115H	197E	197E	279S	279S	279S	115E	115E
1.2	72G	98H	98H	46F	98H	98H	98H	59F	98H	197E	197E	246S	246S	246S	98E	98E
1.3	62E	89G	89G	49F	82F	82F	82F	66H	82F	180D	180D	246S	246S	246S	89C	89C
1.4	49D	75F	75F	49D	66E	66E	66E	59F	66E	164D	164D	230S	230S	230S	69C	69C
1.5	26C	56E	56E	36D	43D	43D	43D	46D	43D	131C	131C	148S	148S	148S	46C	46C
1.6	20B	33D	33D		30C	30C	30C		30C	121A	121A	148S	148S	148S	33B	33B
1.7												98S	98S	98S		
1.8												98S	98S	98S		
2.1	39C	79E	79E	66F	49D	49D	49D	89H	49D	131B	131B	98S	98S	174S	52C	52C
2.2	20E	36G	36G	39D	23F	23F	23F	49F	23F	115C	115C			148S	30D	30D
2.3	39A	56C	56C	39D	23B	23B	23B	49D	23B	115A	115A				33B	33B
2.4																
3.1	72G	115J	115J	108E	89H	89H	89H	151H	89H	164C	164C	246T	246T	246T	105E	105E
3.2	52D	92G	92G	59H	72E	72E	72E	79H	72E	131A	131A	246T	246T	246T	89C	89C
3.3	43C	72E	72E	59F	62D	62D	62D	79F	62D	115A	115A	180T	180T	180T	66C	66C
3.4	30C	56E	56E		39D	39D	39D		39D	98A	98A	180T	180T	180T	52B	52B
4.1	59D	92G	92G	69F	56E	56E	56E	89H	56E	115A	115A			148T	89C	89C
4.2	33B	66D	66D	36D	30C	30C	30C	49F	30C	115A	115A			115T	39B	39B
4.3	20A	36C	36C		16A	16A	16A		16A	82A	82A			82S	23A	23A
5.1	23E	49G	49G	49D	26F	26F	26F	49F	26F	98A	98A			148T	43D	43D
5.2	16C	23E	23E		13D	13D	13D	23F	13D	82A	82A			98S	26C	26C
5.3	10A	20B	20B		10A	10A	10A	13B	10A	66A	66A			66S	13A	13A
6.1	72D	125L	125L		115F	115F	115F	108F	115F	180D	180D			902V	89D	89D
6.2	108G	131J	131J		108H	108H	108H	115H	108H	230G	230G	820V	820V	820V	108E	108E
6.3	72F	89H	89H		89G	89G	89G	115H	89G	197C	197C	820V	820V	820V	89D	89D
6.4	52D	69F	69F		52F	52F	52F	52F	52F	164C	164C			230T	52D	52D
7.1	98H	108J	108J		108I	108I	108I	85I	108I	164I	164I	656V	656V	656V	108E	108E
7.2	89G	98I	98I		98H	98H	98H	98H	98H	148H	148H	656V	656V	656V	98E	98E
7.3	79F	98H	98H		89G	89G	89G	92H	89G	131G	131G	367V	367V	367V	98D	98D
7.4	72F	89F	89F		72G	72G	72G	75H	72G	115F	115F	197V	197V	197V	82D	82D
8.1	98J	115K	115K		98I	98I	98I	98I	98I			197X	197X	197X	98F	98F
8.2	98H	92J	92J		92G	92G	92G	92I	92G	197E	197E	328V	328V	328V	115E	115E
8.3	33F	66H	66H		46E	46E	46E	46H	46E						56D	56D
9.1	10A	16C	16C		10A	10A	10A	10B	10A	30C	30C				39A	39A
10.1																

Visual Index - Drills

	SPS-120	SPSG-120	SPR-90	SPRG-90	SPR-120	SPRG-120	SPL-90	SPLG-90	SPL-120	SPLG-120	DC	76HA	A225	A217	A218
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HM	HSS	HSS	HSS	HSS
	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	PRECISION	ANSI	BS 328	ANSI	ANSI
	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD
	120°	120°	90°	90°	120°	120°	90°	90°	120°	120°			120°	120°	120°
		TiN		TiN		TiN		TiN		TiN					
	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1/2	1/4 - 1"	1/4 - 1"	1/4 - 5/8	1/4 - 1/2	N0 - N6	N000 - N8	3/64 - 5/16	N1 - N8	N1 - N8
	208	208	209	209	209	209	210	210	210	210	211	212	213	213	213
1.1	115E	115E	115E	115E	115E	115E	115E	115E	115E	115E	279S	115I	115I	115I	115I
1.2	98E	98E	98E	98E	98E	98E	98E	98E	98E	98E	246S	98I	98I	98I	98I
1.3	89C	89C	89C	89C	89C	89C	89C	89C	89C	89C	246S	82G	82G	82G	82G
1.4	69C	69C	69C	69C	69C	69C	69C	69C	69C	69C	230S	66F	66F	66F	66F
1.5	46C	46C	46C	46C	46C	46C	46C	46C	46C	46C	148S	43E	43E	43E	43E
1.6	33B	33B	33B	33B	33B	33B	33B	33B	33B	33B	148S	30D	30D	30D	30D
1.7											98S				
1.8											98S				
2.1	52C	52C	52C	52C	52C	52C	52C	52C	52C	52C		49E	49E	49E	49E
2.2	30D	30D	30D	30D	30D	30D	30D	30D	30D	30D		26G	26G	26G	26G
2.3	33B	33B	33B	33B	33B	33B	33B	33B	33B	33B		33C	33C	33C	33C
2.4															
3.1	105E	105E	105E	105E	105E	105E	105E	105E	105E	105E	246T	98I	98I	98I	98I
3.2	89C	89C	89C	89C	89C	89C	89C	89C	89C	89C	246T	79F	79F	79F	79F
3.3	66C	66C	66C	66C	66C	66C	66C	66C	66C	66C	180T	66E	66E	66E	66E
3.4	52B	52B	52B	52B	52B	52B	52B	52B	52B	52B	180T	46E	46E	46E	46E
4.1	89C	89C	89C	89C	89C	89C	89C	89C	89C	89C		79F	79F	79F	79F
4.2	39B	39B	39B	39B	39B	39B	39B	39B	39B	39B		43D	43D	43D	43D
4.3	23A	23A	23A	23A	23A	23A	23A	23A	23A	23A		23B	23B	23B	23B
5.1	43D	43D	43D	43D	43D	43D	43D	43D	43D	43D		33G	33G	33G	33G
5.2	26C	26C	26C	26C	26C	26C	26C	26C	26C	26C		16E	16E	16E	16E
5.3	13A	13A	13A	13A	13A	13A	13A	13A	13A	13A		13A	13A	13A	13A
6.1	89D	89D	89D	89D	89D	89D	89D	89D	89D	89D		115G	115G	115G	115G
6.2	108E	108E	108E	108E	108E	108E	108E	108E	108E	108E	820V	108I	108I	108I	108I
6.3	89D	89D	89D	89D	89D	89D	89D	89D	89D	89D	820V	89H	89H	89H	89H
6.4	52D	52D	52D	52D	52D	52D	52D	52D	52D	52D		52G	52G	52G	52G
7.1	108E	108E	108E	108E	108E	108E	108E	108E	108E	108E	656V	108J	108J	108J	108J
7.2	98E	98E	98E	98E	98E	98E	98E	98E	98E	98E	656V	98I	98I	98I	98I
7.3	98D	98D	98D	98D	98D	98D	98D	98D	98D	98D	367V	89H	89H	89H	89H
7.4	82D	82D	82D	82D	82D	82D	82D	82D	82D	82D	197V	72H	72H	72H	72H
8.1	98F	98F	98F	98F	98F	98F	98F	98F	98F	98F	197X	98J	98J	98J	98J
8.2	115E	115E	115E	115E	115E	115E	115E	115E	115E	115E	328V	92H	92H	92H	92H
8.3	56D	56D	56D	56D	56D	56D	56D	56D	56D	56D		46F	46F	46F	46F
9.1	39A	39A	39A	39A	39A	39A	39A	39A	39A	39A		10B	10B	10B	10B
10.1															

Visual Index - Drills

	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	
	ANSI								
	1.5XD							4XD	
	118°	135°	135°	135°	135°	135°	135°	118°	
		ST	ST	ST	ST	ST	ST		
	A221	**TS41HS TS40HS TS42HS**	**TS10HS TS15HS TS18HS**	**TS51HS TS52HS TS55HS**	**TS41CO TS40CO TS42CO**	**TS10CO TS15CO TS18CO**	**TS51CO TS52CO TS55CO**	**ATR41**	**Drill Sets**
	N00 - N8	N50 - 3/8	N50 - 3/8	N50 - 3/8	N50 - 3/8	N50 - 3/8	N50 - 3/8	Size 1 - 4	
	214	**215**	**215**	**215**	**219**	**219**	**219**	**223**	**224**
1.1	115I	115J	115J	115J	125K	125K	125K		
1.2	98I	98J	98J	98J	108H	108H	108H		
1.3	82G	89G	89G	89G	98G	98G	98G	82F	
1.4	66F	69G	69G	69G	89G	89G	89G	66F	
1.5	43E	46F	46F	46F	59F	59F	59F	43E	
1.6	30D	33E	33E	33E	36E	36E	36E	30D	
1.7									
1.8									
2.1	49E	52F	52F	52F	72F	72F	72F	49E	
2.2	26G	30H	30H	30H	36H	36H	36H	26G	
2.3	33C	33D	33D	33D	49D	49D	49D	30C	
2.4									
3.1	98I	105J	105J	105J	112K	112K	112K	98I	
3.2	79F	89G	89G	89G	98F	98F	98F	79F	
3.3	66E	66F	66F	66F	72F	72F	72F	66E	
3.4	46E	52F	52F	52F	56F	56F	56F	46E	
4.1	79F	89G	89G	89G	98G	98G	98G	75F	
4.2	43D	52E	52E	52E	59F	59F	59F	39D	
4.3	23B	26C	26C	26C	33C	33C	33C	20B	
5.1	33G	43H	43H	43H	49H	49H	49H	33G	
5.2	16E	26F	26F	26F	30F	30F	30F	20E	
5.3	13A	13B	13B	13B	20C	20C	20C	10A	
6.1	115G	118H	118H	118H	125I	125I	125I		
6.2	108I	125J	125J	125J	131K	131K	131K		
6.3	89H	89I	89I	89I	89J	89J	89J	89H	
6.4	52G	52H	52H	52H	52I	52I	52I	52G	
7.1	108J	108K	108K	108K	115K	115K	115K		
7.2	98I	98J	98J	98J	108J	108J	108J		
7.3	89H	98I	98I	98I	102I	102I	102I		
7.4	72H	82I	82I	82I	98G	98G	98G	79F	
8.1	98J	98K	98K	98K	115M	115M	115M		
8.2	92H	115I	115I	115I	92K	92K	92K		
8.3	46F	56G	56G	56G	56I	56I	56I		
9.1	10B	13C	13C	13C	20C	20C	20C	10B	
10.1									

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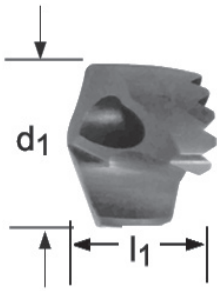
TS55CO 219

Hydra Drill Head

R950

1.3 1.4 1.5 1.6 2.4 3.3 3.4

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity in a wide range of steels and harder materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R950

DORMER

Ti-phon

HM

140°

15/32 - 42.00

* For more information on Hydra, see page 539

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
15/32	11.91	0.4688	9.1	1	0010860
	12.00	0.4724	9.1	1	0010877
	12.10	0.4764	9.1	1	0037904
	12.20	0.4803	9.1	1	0037911
31/64	12.30	0.4844	9.1	1	0010884
	12.50	0.4921	9.4	1	0010907
	12.60	0.4961	9.4	1	0037928
1/2	12.70	0.5000	9.4	1	0010914
	12.80	0.5039	9.4	1	0037935
	12.90	0.5079	9.4	1	0037942
	13.00	0.5118	9.7	1	0010921
33/64	13.10	0.5156	9.7	1	0010938
	13.20	0.5197	9.7	1	0037959
17/32	13.49	0.5313	9.7	1	0010945
	13.50	0.5315	10.3	1	0010952
	13.60	0.5354	10.3	1	0037966
	13.70	0.5394	10.3	1	0037973
	13.80	0.5433	10.3	1	0037980
35/64	13.89	0.5469	10.3	1	0010969
	14.00	0.5512	10.3	1	0010983
	14.10	0.5551	10.3	1	0037997
	14.20	0.5591	10.3	1	0038000
9/16	14.29	0.5625	10.3	1	0011003
	14.50	0.5709	10.3	1	0011010
	14.60	0.5748	11.0	1	0038017
37/64	14.68	0.5781	11.0	1	0011140
	14.70	0.5787	11.0	1	0038024
	14.80	0.5827	11.0	1	0038031
	15.00	0.5906	11.0	1	0011201
19/32	15.08	0.5938	11.0	1	0011218
	15.10	0.5945	11.0	1	0038048
	15.20	0.5984	11.0	1	0038055
	15.24	0.6000	11.0	1	0032268

HYDRA DRILL

DORMER

d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
39/64	15.48	0.6094	11.0	1	0011232
	15.50	0.6102	11.0	1	0011362
	15.60	0.6142	11.6	1	0038062
	15.70	0.6181	11.6	1	0038079
5/8	15.88	0.6250	11.6	1	0011379
	16.00	0.6299	11.6	1	0011386
	16.08	0.6331	11.6	1	0032275
	16.10	0.6339	11.6	1	0038086
	16.20	0.6378	11.6	1	0038093
41/64	16.27	0.6406	11.6	1	0011393
	16.30	0.6417	11.6	1	0032282
	16.50	0.6496	11.6	1	0011409
	16.60	0.6535	12.2	1	0038109
21/32	16.67	0.6563	12.2	1	0012161
	16.70	0.6575	12.2	1	0038116
	17.00	0.6693	12.2	1	0012185
43/64	17.07	0.6719	12.2	1	0012215
	17.10	0.6732	12.2	1	0038123
	17.20	0.6772	12.2	1	0038130
11/16	17.46	0.6875	12.2	1	0012239
	17.50	0.6890	12.2	1	0012253
	17.60	0.6929	12.9	1	0032299
	17.70	0.6969	12.9	1	0038147
45/64	17.86	0.7031	12.9	1	0012260
	18.00	0.7087	12.9	1	0012277
	18.10	0.7126	12.9	1	0038154
	18.20	0.7165	12.9	1	0038161
23/32	18.26	0.7188	12.9	1	0012284
	18.50	0.7283	12.9	1	0012307
	18.60	0.7323	13.5	1	0038178
47/64	18.65	0.7344	13.5	1	0012321
	18.70	0.7362	13.5	1	0038185
	18.90	0.7441	13.5	1	0038192
	19.00	0.7480	13.5	1	0012338
3/4	19.05	0.7500	13.5	1	0012345
	19.10	0.7520	13.5	1	0038208
	19.20	0.7559	13.5	1	0038215
	19.25	0.7579	13.5	1	0032305
	19.30	0.7598	13.5	1	0032312
	19.35	0.7618	13.5	1	0032329
49/64	19.45	0.7656	13.5	1	0012376
	19.50	0.7677	13.5	1	0012383
	19.60	0.7717	14.1	1	0038222
	19.70	0.7756	14.1	1	0038239
25/32	19.84	0.7813	14.1	1	0012406
	20.00	0.7874	14.1	1	0012413
51/64	20.24	0.7969	14.1	1	0012437
	20.50	0.8071	14.1	1	0012451
13/16	20.64	0.8125	14.8	1	0012468
	21.00	0.8268	14.8	1	0012475
53/64	21.03	0.8281	14.8	1	0012536
27/32	21.43	0.8438	14.8	1	0012550
	21.50	0.8465	14.8	1	0012574
55/64	21.83	0.8594	15.0	1	0012604
	22.00	0.8661	15.0	1	0012628
7/8	22.22	0.8750	15.0	1	0012635
	22.50	0.8858	15.0	1	0032336
57/64	22.62	0.8906	15.0	1	0012642
	22.70	0.8937	15.0	1	0038246
	23.00	0.9055	15.1	1	0012666
29/32	23.02	0.9063	15.1	1	0012673
59/64	23.42	0.9219	15.1	1	0012680
	23.50	0.9252	15.1	1	0038253
15/16	23.81	0.9375	15.4	1	0012703
	24.00	0.9449	15.4	1	0012727

HYDRA DRILL

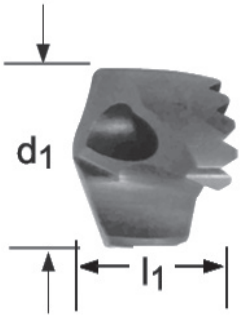
d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
61/64	24.21	0.9531	15.4	1	0012741
	24.50	0.9646	15.4	1	0038260
31/32	24.61	0.9688	15.4	1	0012772
	25.00	0.9844	15.8	1	0012819
63/64	25.00	0.9844	15.8	1	0012826
1“	25.40	1.0000	15.8	1	0012833
	25.50	1.0039	15.8	1	0038277
	25.65	1.0098	15.8	1	0032343
1.1/64	25.80	1.0156	15.8	1	0012840
	26.00	1.0236	16.4	1	0013090
1.1/32	26.19	1.0313	16.4	1	0013120
	26.50	1.0433	16.4	1	0038284
1.3/64	26.59	1.0469	16.4	1	0013229
1.1/16	26.99	1.0625	17.1	1	0013243
	27.00	1.0630	17.1	1	0013267
1.5/64	27.38	1.0781	17.1	1	0013274
	27.50	1.0827	17.1	1	0038291
1.3/32	27.78	1.0938	17.1	1	0013281
	28.00	1.1024	17.7	1	0013304
1.7/64	28.18	1.1094	17.7	1	0013311
	28.50	1.1220	17.7	1	0038307
1.1/8	28.58	1.1250	17.7	1	0013328
1.9/64	28.97	1.1406	18.3	1	0013342
	29.00	1.1417	18.3	1	0013366
1.5/32	29.37	1.1563	18.3	1	0013380
	29.50	1.1614	18.3	1	0038314
1.11/64	29.77	1.1719	18.3	1	0013427
	30.00	1.1811	19.0	1	0013434
1.3/16	30.16	1.1875	19.0	1	0013441
	30.50	1.2008	19.0	1	0013465
1.7/32	30.96	1.2188	21.0	1	46104481
	31.00	1.2205	21.0	1	46104482
1.1/4	31.75	1.2500	21.0	1	46104483
	32.00	1.2598	21.0	1	46104484
	32.50	1.2795	21.0	1	46104485
1.19/64	32.94	1.2969	21.0	1	46104486
	33.00	1.2992	21.0	1	46104487
	33.50	1.3189	21.0	1	46104488
	34.00	1.3386	23.0	1	46104489
1.11/32	34.13	1.3438	23.0	1	46104530
	34.50	1.3583	23.0	1	46104531
1.3/8	34.93	1.3750	23.0	1	46104532
	35.00	1.3780	23.0	1	46104533
	36.00	1.4173	23.0	1	46104534
1.27/64	36.12	1.4219	23.0	1	46104535
	36.50	1.4370	23.0	1	46104536
	37.00	1.4567	25.0	1	46104537
1.15/32	37.31	1.4688	25.0	1	46104538
	37.50	1.4764	25.0	1	46104539
	38.00	1.4961	25.0	1	46104540
1.1/2	38.10	1.5000	25.0	1	46104541
	38.50	1.5157	25.0	1	46104542
1.17/32	38.89	1.5313	25.0	1	46104543
	39.00	1.5354	25.0	1	46104544
	39.50	1.5551	25.0	1	46104545
1.9/16	39.69	1.5625	27.0	1	46104546
	40.00	1.5748	27.0	1	46104547
	41.00	1.6142	27.0	1	46104548
1.5/8	41.28	1.6250	27.0	1	46104549
	42.00	1.6535	27.0	1	46104550

Hydra Drill Head

R960

1.1 | 1.2 | 2.1 | 2.2 | 2.3 | 3.1 | 3.2 | 4.1 | 4.2 | 4.3 | 5.1 | 5.2 | 5.3

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity across a wide range of stainless steel, cast iron & heat resistant materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R960

DORMER

Ti-phon

HM

140°

15/32 - 30.50

* For more information on Hydra, see page 539

d_1 Øh7 Inch	d_1 Øh7 mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
15/32	11.91	0.4688	9.1	1	0013472
	12.00	0.4724	9.1	1	0013489
	12.10	0.4764	9.1	1	0038338
	12.20	0.4803	9.1	1	0038376
31/64	12.30	0.4844	9.1	1	0013496
	12.50	0.4921	9.4	1	0013519
	12.60	0.4961	9.4	1	0038413
1/2	12.70	0.5000	9.4	1	0013526
	12.80	0.5039	9.4	1	0038437
	12.90	0.5079	9.4	1	0038451
	13.00	0.5118	9.7	1	0013533
33/64	13.10	0.5156	9.7	1	0013540
	13.20	0.5197	9.7	1	0038468
17/32	13.49	0.5313	9.7	1	0013557
	13.50	0.5315	10.3	1	0016022
	13.60	0.5354	10.3	1	0038499
	13.70	0.5394	10.3	1	0038529
	13.80	0.5433	10.3	1	0038543
35/64	13.89	0.5469	10.3	1	0016039
	14.00	0.5512	10.3	1	0016046
	14.10	0.5551	10.3	1	0038567
	14.20	0.5591	10.3	1	0038574
9/16	14.29	0.5625	10.3	1	0016053
	14.50	0.5709	10.3	1	0016060
	14.60	0.5748	11.0	1	0038581
37/64	14.68	0.5781	11.0	1	0016077
	14.70	0.5787	11.0	1	0039601
	14.80	0.5827	11.0	1	0039618
	15.00	0.5906	11.0	1	0016084
19/32	15.08	0.5938	11.0	1	0016091
	15.10	0.5945	11.0	1	0039625
	15.20	0.5984	11.0	1	0039632
	15.24	0.6000	11.0	1	0032350

HYDRA DRILL

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
39/64	15.48	0.6094	11.0	1	0016107
	15.50	0.6102	11.0	1	0016114
	15.60	0.6142	11.6	1	0039649
	15.70	0.6181	11.6	1	0039656
5/8	15.88	0.6250	11.6	1	0016121
	16.00	0.6299	11.6	1	0016138
	16.08	0.6331	11.6	1	0032367
	16.10	0.6339	11.6	1	0039663
	16.20	0.6378	11.6	1	0039670
41/64	16.27	0.6406	11.6	1	0016145
	16.30	0.6417	11.6	1	0032374
	16.50	0.6496	11.6	1	0016152
	16.60	0.6535	12.2	1	0039687
21/32	16.67	0.6563	12.2	1	0016169
	16.70	0.6575	12.2	1	0039694
	17.00	0.6693	12.2	1	0016176
43/64	17.07	0.6719	12.2	1	0016183
	17.10	0.6732	12.2	1	0039700
	17.20	0.6772	12.2	1	0039717
11/16	17.46	0.6875	12.2	1	0016190
	17.50	0.6890	12.2	1	0016503
	17.60	0.6929	12.9	1	0032381
	17.70	0.6969	12.9	1	0039724
45/64	17.86	0.7031	12.9	1	0016640
	18.00	0.7087	12.9	1	0016664
	18.10	0.7126	12.9	1	0039731
	18.20	0.7165	12.9	1	0039748
23/32	18.26	0.7188	12.9	1	0016671
	18.50	0.7283	12.9	1	0016688
	18.60	0.7323	13.5	1	0039755
47/64	18.65	0.7344	13.5	1	0016695
	18.70	0.7362	13.5	1	0039762
	18.90	0.7441	13.5	1	0039779
	19.00	0.7480	13.5	1	0016817
3/4	19.05	0.7500	13.5	1	0016879
	19.10	0.7520	13.5	1	0039786
	19.20	0.7559	13.5	1	0039793
	19.25	0.7579	13.5	1	0032398
	19.30	0.7598	13.5	1	0032404
	19.35	0.7618	13.5	1	0032411
49/64	19.45	0.7656	13.5	1	0016886
	19.50	0.7677	13.5	1	0016947
	19.60	0.7717	14.1	1	0039809
	19.70	0.7756	14.1	1	0039816
25/32	19.84	0.7813	14.1	1	0016954
	20.00	0.7874	14.1	1	0017111
51/64	20.24	0.7969	14.1	1	0017128
	20.50	0.8071	14.1	1	0017159
13/16	20.64	0.8125	14.8	1	0017197
	21.00	0.8268	14.8	1	0017166
53/64	21.03	0.8281	14.8	1	0017203
27/32	21.43	0.8438	14.8	1	0017227
	21.50	0.8465	14.8	1	0017234
55/64	21.83	0.8594	15.0	1	0017241
	22.00	0.8661	15.0	1	0017258
7/8	22.22	0.8750	15.0	1	0017371
	22.50	0.8858	15.0	1	0032428
57/64	22.62	0.8906	15.0	1	0017401
	22.70	0.8937	15.0	1	0039823
	23.00	0.9055	15.1	1	0017425
29/32	23.02	0.9063	15.1	1	0017432
59/64	23.42	0.9219	15.1	1	0017456
	23.50	0.9252	15.1	1	0039830
15/16	23.81	0.9375	15.4	1	0017562
	24.00	0.9449	15.4	1	0017579
61/64	24.21	0.9531	15.4	1	0017586

HYDRA DRILL

DORMER

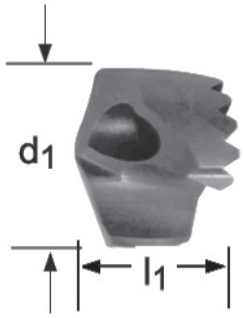
d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
	24.50	0.9646	15.4	1	0039847
31/32	24.61	0.9688	15.4	1	0017593
	25.00	0.9844	15.8	1	0017722
63/64	25.00	0.9844	15.8	1	0017746
1“	25.40	1.0000	15.8	1	0017753
	25.50	1.0039	15.8	1	0039854
	25.65	1.0098	15.8	1	0032435
1.1/64	25.80	1.0156	15.8	1	0018958
	26.00	1.0236	16.4	1	0018965
1.1/32	26.19	1.0312	16.4	1	0018972
	26.50	1.0433	16.4	1	0039878
1.3/64	26.59	1.0469	16.4	1	0018989
1.1/16	26.99	1.0625	17.1	1	0018996
	27.00	1.0630	17.1	1	0019009
1.5/64	27.38	1.0781	17.1	1	0019016
	27.50	1.0827	17.1	1	0039885
1.3/32	27.78	1.0938	17.1	1	0019023
	28.00	1.1024	17.7	1	0019030
1.7/64	28.18	1.1094	17.7	1	0019047
	28.50	1.1220	17.7	1	0039892
1.1/8	28.58	1.1250	17.7	1	0019054
1.9/64	28.97	1.1406	18.3	1	0019061
	29.00	1.1417	18.3	1	0019078
1.5/32	29.37	1.1563	18.3	1	0019085
	29.50	1.1614	18.3	1	0039908
1.11/64	29.77	1.1719	18.3	1	0019092
	30.00	1.1811	19.0	1	0019108
1.3/16	30.16	1.1875	19.0	1	0019115
	30.50	1.2008	19.0	1	0019122

Hydra Drill Head

R970

1.2 | 3.1 | 3.2 | 3.3 | 3.4

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. Engineered for high productivity of cast iron materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R970

DORMER

Ti-phon

HM

140°

15/32 - 30.50

* For more information on Hydra, see page 539

d_1 Øh7 Inch	d_1 Øh7 mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
15/32		0.4689	9.1	1	7332946
	12.0	0.4724	9.1	1	7332947
	12.1	0.4764	9.1	1	7332948
	12.2	0.4803	9.1	1	7332949
31/64		0.4844	9.1	1	7332980
	12.5	0.4921	9.4	1	7332981
	12.6	0.4961	9.4	1	7332982
1/2		0.5000	9.4	1	7332983
	12.8	0.5039	9.4	1	7332984
	12.9	0.5079	9.4	1	7332985
	13.0	0.5118	9.7	1	7332986
33/64		0.5156	9.7	1	7332987
	13.2	0.5197	9.7	1	7332988
17/32		0.5313	9.7	1	7332989
	13.5	0.5315	10.3	1	7332990
	13.6	0.5354	10.3	1	7332991
	13.7	0.5394	10.3	1	7332992
	13.8	0.5433	10.3	1	7332993
35/64		0.5469	10.3	1	7332994
	14.0	0.5512	10.3	1	7332995
	14.1	0.5551	10.3	1	7332996
	14.2	0.5591	10.3	1	7332997
9/16		0.5625	10.3	1	7332998
	14.5	0.5709	10.3	1	7332999
	14.6	0.5748	11.0	1	7333000
37/64		0.5781	11.0	1	7333001
	14.7	0.5787	11.0	1	7333002
	14.8	0.5827	11.0	1	7333003
	15.0	0.5906	11.0	1	7333004
19/32		0.5938	11.0	1	7333005
	15.1	0.5945	11.0	1	7333006
	15.2	0.5984	11.0	1	7333007

HYDRA DRILL

DORMER

d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
	15.24	0.6000	11.0	1	7333008
39/64		0.6094	11.0	1	7333009
	15.5	0.6102	11.6	1	7333010
	15.6	0.6142	11.6	1	7333011
	15.7	0.6181	11.6	1	7333012
5/8		0.6250	11.6	1	7333013
	16.0	0.6299	11.6	1	7333014
	16.08	0.6331	11.6	1	7333015
	16.1	0.6339	11.6	1	7333016
	16.2	0.6378	11.6	1	7333017
41/64		0.6406	11.6	1	7333018
	16.3	0.6417	11.6	1	7333019
	16.5	0.6496	11.6	1	7333020
	16.6	0.6535	12.2	1	7333021
21/32		0.6563	12.2	1	7333022
	16.7	0.6575	12.2	1	7333023
	17.0	0.6693	12.2	1	7333024
43/64		0.6719	12.2	1	7333025
	17.1	0.6732	12.2	1	7333026
	17.2	0.6772	12.2	1	7333027
11/16		0.6875	12.2	1	7333028
	17.5	0.6890	12.2	1	7333029
	17.6	0.6929	12.9	1	7333030
	17.7	0.6969	12.9	1	7333031
45/64		0.7031	12.9	1	7333032
	18.0	0.7087	12.9	1	7333033
	18.1	0.7126	12.9	1	7333034
	18.2	0.7165	12.9	1	7333035
23/32		0.7188	12.9	1	7333036
	18.5	0.7283	12.9	1	7333037
	18.6	0.7323	13.5	1	7333038
47/64		0.7344	13.5	1	7333039
	18.7	0.7362	13.5	1	7333040
	18.9	0.7441	13.5	1	7333041
	19.0	0.7480	13.5	1	7333042
3/4		0.7500	13.5	1	7333043
	19.1	0.7520	13.5	1	7333044
	19.2	0.7559	13.5	1	7333045
	19.25	0.7579	13.5	1	7333046
	19.3	0.7598	13.5	1	7333047
	19.35	0.7618	13.5	1	7333048
49/64		0.7656	13.5	1	7333049
	19.5	0.7677	13.5	1	7333050
	19.6	0.7717	14.1	1	7333051
	19.7	0.7756	14.1	1	7333052
25/32		0.7813	14.1	1	7333053
	20.0	0.7874	14.1	1	7333054
51/64		0.7969	14.1	1	7333055
	20.5	0.8071	14.1	1	7333056
13/16		0.8125	14.8	1	7333057
	21.0	0.8268	14.8	1	7333058
53/64		0.8281	14.8	1	7333059
27/32		0.8438	14.8	1	7333060
	21.5	0.8465	14.8	1	7333061
55/64		0.8594	15.0	1	7333062
	22.0	0.8661	15.0	1	7333063
7/8		0.8750	15.0	1	7333064
	22.5	0.8858	15.0	1	7333065
57/64		0.8906	15.0	1	7333066
	22.7	0.8937	15.0	1	7333067
	23.0	0.9055	15.1	1	7333068
29/32		0.9063	15.1	1	7333069
59/64		0.9219	15.1	1	7333070
	23.5	0.9252	15.1	1	7333071
15/16		0.9375	15.4	1	7333072
	24.0	0.9449	15.4	1	7333073

HYDRA DRILL

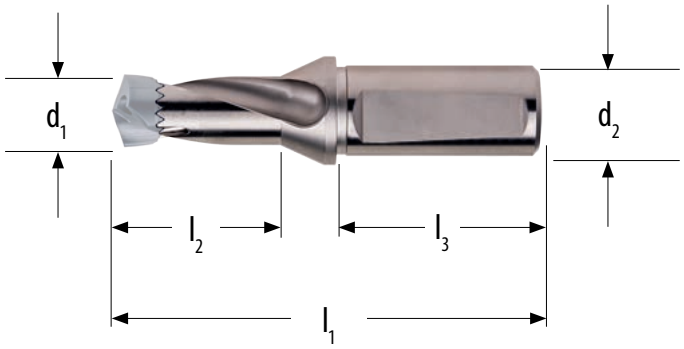
d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
61/64		0.9531	15.4	1	7333074
	24.5	0.9646	15.4	1	7333075
31/32		0.9688	15.4	1	7333076
	25.0	0.9843	15.8	1	7333077
63/64		0.9844	15.8	1	7333078
1		1.0000	15.8	1	7333079
	25.5	1.0039	15.8	1	7333080
	25.65	1.0098	15.8	1	7333081
1.1/64		1.0156	15.8	1	7333082
	26.0	1.0236	16.4	1	7333083
1.1/32		1.0313	16.4	1	7333084
	26.5	1.0433	16.4	1	7333085
1.3/64		1.0469	16.4	1	7333086
1.1/16		1.0625	17.1	1	7333087
	27.0	1.0630	17.1	1	7333088
1.5/64		1.0781	17.1	1	7333089
	27.5	1.0827	17.1	1	7333090
1.3/32		1.0938	17.1	1	7333091
	28.0	1.1024	17.7	1	7333092
1.7/64		1.1094	17.7	1	7333093
	28.5	1.1220	17.7	1	7333094
1.1/8		1.1250	17.7	1	7333095
1.9/64		1.1406	18.3	1	7333096
	29.0	1.1417	18.3	1	7333097
1.5/32		1.1563	18.3	1	7333098
	29.5	1.1614	18.3	1	7333099
1.11/64		1.1719	18.3	1	7333100
	30.0	1.1811	19.0	1	7333101
1.3/16		1.1875	19.0	1	7333102
	30.5	1.2008	19.0	1	7333103
1.7/32		1.2188	21.0	1	7333104
	31.0	1.2205	21.0	1	7333105
1.1/4		1.2500	21.0	1	7333106
	32.0	1.2598	21.0	1	7333107
	32.5	1.2795	21.0	1	7333108
1.19/64		1.2968	21.0	1	7333109
	33.0	1.2992	21.0	1	7333110
	33.5	1.3189	21.0	1	7333111
	34.0	1.3386	23.0	1	7333112
1.11/32		1.3438	23.0	1	7333113
	34.5	1.3583	23.0	1	7333114
1.3/8		1.3750	23.0	1	7333115
	35.0	1.3780	23.0	1	7333116
	36.0	1.4173	23.0	1	7333117
1.27/64		1.4219	23.0	1	7333118
	36.5	1.4370	23.0	1	7333119
	37.0	1.4567	25.0	1	7333120
1.15/32		1.4688	25.0	1	7333121
	37.5	1.4764	25.0	1	7333122
	38.0	1.4961	25.0	1	7333123
1.1/2		1.5000	25.0	1	7333124
	38.5	1.5157	25.0	1	7333125
1.17/32		1.5313	25.0	1	7333126
	39.0	1.5354	25.0	1	7333127
	39.5	1.5551	25.0	1	7333128
1.9/16		1.5625	27.0	1	7333129
	40.0	1.5748	27.0	1	7333130
	41.0	1.6142	27.0	1	7333131
1.5/8		1.6250	27.0	1	7333132
	42.0	1.6535	27.0	1	7333133

DORMER

1.5xD Hydra Bodies

H851

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



H851
Coolant Through

ISO 9766

1.5XD

HSS

140°

NEW

31/64 – 30.5

Four (4) screws and one (1) screwdriver are included with a drill body
Apply starting values for speed and feed with a correction factor of **1.10**

*** Fractional bodies have straight shank**
*** Metric bodies have whistle notch on shank**
*** For more information on Hydra, see page 539**

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	1.5xD Hydra Body - Fractional Shank					1.5xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ inch	l_2 mm	l_1 mm	l_3 mm	H851 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H851 EDP#
15/32	0010860	0013472	7332946	5/8	25.5	88.5	47.63	7833294	16.00	25.5	88.5	48.0	7833297
12.0	0010877	0013489	7332947	5/8	25.5	88.5	47.63	7833294	16.00	25.5	88.5	48.0	7833297
12.1	0037904	0038338	7332948	5/8	25.5	88.5	47.63	7833294	16.00	25.5	88.5	48.0	7833297
12.2	0037911	0038376	7332949	5/8	25.5	88.5	47.63	7833294	16.00	25.5	88.5	48.0	7833297
31/64	0010884	0013496	7332980	5/8	25.5	88.5	47.63	7833294	16.00	25.5	88.5	48.0	7833297
12.5	0010907	0013519	7332981	5/8	25.8	88.8	47.63	7833295	16.00	25.8	88.8	48.0	7833298
12.6	0037928	0038413	7332982	5/8	25.8	88.8	47.63	7833295	16.00	25.8	88.8	48.0	7833298
1/2	0010914	0013526	7332983	5/8	25.8	88.8	47.63	7833295	16.00	25.8	88.8	48.0	7833298
12.8	0037935	0038437	7332984	5/8	25.8	88.8	47.63	7833295	16.00	25.8	88.8	48.0	7833298
12.9	0037942	0038451	7332985	5/8	25.8	88.8	47.63	7833295	16.00	25.8	88.8	48.0	7833298
13.0	0010921	0013533	7332986	5/8	30.9	93.9	47.63	7833296	16.00	27.0	90.0	48.0	7833299
33/64	0010938	0013540	7332987	5/8	30.9	93.9	47.63	7833296	16.00	27.0	90.0	48.0	7833299
13.2	0037959	0038468	7332988	5/8	30.9	93.9	47.63	7833296	16.00	27.0	90.0	48.0	7833299
17/32	0010945	0013557	7332989	5/8	30.9	93.9	47.63	7833296	16.00	27.0	90.0	48.0	7833299
13.5	0010952	0016022	7332990	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
13.6	0037966	0038499	7332991	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
13.7	0037973	0038529	7332992	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
13.8	0037980	0038543	7332993	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
35/64	0010969	0016039	7332994	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
14.0	0010983	0016046	7332995	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
14.1	0037997	0038567	7332996	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
14.2	0038000	0038574	7332997	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
9/16	0011003	0016053	7332998	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
14.5	0011010	0016060	7332999	3/4	30.3	93.9	50.8	7833331	16.00	30.9	93.9	48.0	7833330
14.6	0038017	0038581	7333000	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
37/64	0011140	0016077	7333001	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
14.7	0038024	0039601	7333002	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
14.8	0038031	0039618	7333003	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
15.0	0011201	0016084	7333004	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
19/32	0011218	0016091	7333005	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
15.1	0038048	0039625	7333006	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336

DORMER

HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	1.5xD Hydra Body - Fractional Shank					1.5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H851 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H851 EDP#
15.2	0038055	0039632	7333007	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
15.24	0032268	0032350	7333008	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
39/64	0011232	0016107	7333009	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
15.5	0011362	0016114	7333010	3/4	32.3	97.3	50.8	7833332	20.00	32.3	97.3	50.0	7833336
15.6	0038062	0039649	7333011	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
15.7	0038079	0039656	7333012	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
5/8	0011379	0016121	7333013	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.0	0011386	0016138	7333014	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.08	0032275	0032367	7333015	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.1	0038086	0039663	7333016	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.2	0038093	0039670	7333017	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
41/64	0011393	0016145	7333018	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.3	0032282	0032374	7333019	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.5	0011409	0016152	7333020	3/4	34.9	99.9	50.8	7833333	20.00	34.9	99.9	50.0	7833337
16.6	0038109	0039687	7333021	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
21/32	0012161	0016169	7333022	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
16.7	0038116	0039694	7333023	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
17.0	0012185	0016176	7333024	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
43/64	0012215	0016183	7333025	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
17.1	0038123	0039700	7333026	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
17.2	0038130	0039717	7333027	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
11/16	0012239	0016190	7333028	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
17.5	0012253	0016503	7333029	3/4	36.4	101.4	50.8	7833334	20.00	36.4	101.4	50.0	7833338
17.6	0032299	0032381	7333030	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
17.7	0038147	0039724	7333031	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
45/64	0012260	0016640	7333032	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
18.0	0012277	0016664	7333033	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
18.1	0038154	0039731	7333034	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
18.2	0038161	0039748	7333035	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
23/32	0012284	0016671	7333036	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
18.5	0012307	0016688	7333037	3/4	39.0	104.0	50.8	7833335	20.00	39.0	104.0	50.0	7833339
18.6	0038178	0039755	7333038	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
47/64	0012321	0016695	7333039	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
18.7	0038185	0039762	7333040	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
18.9	0038192	0039779	7333041	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.0	0012338	0016817	7333042	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
3/4	0012345	0016879	7333043	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.1	0038208	0039786	7333044	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.2	0038215	0039793	7333045	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.25	0032305	0032398	7333046	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.3	0032312	0032404	7333047	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.35	0032329	0032411	7333048	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
49/64	0012376	0016886	7333049	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.5	0012383	0016947	7333050	1“	40.4	111.4	57.15	7833345	25.00	40.4	111.4	56.0	7833340
19.6	0038222	0039809	7333051	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
19.7	0038239	0039816	7333052	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
25/32	0012406	0016954	7333053	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
20.0	0012413	0017111	7333054	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
51/64	0012437	0017128	7333055	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
20.5	0012451	0017159	7333056	1“	43.0	114.0	57.15	7833346	25.00	43.0	114.0	56.0	7833341
13/16	0012468	0017197	7333057	1“	44.5	115.5	57.15	7833347	25.00	44.5	115.5	56.0	7833342
21.0	0012475	0017166	7333058	1“	44.5	115.5	57.15	7833347	25.00	44.5	115.5	56.0	7833342
53/64	0012536	0017203	7333059	1“	44.5	115.5	57.15	7833347	25.00	44.5	115.5	56.0	7833342
27/32	0012550	0017227	7333060	1“	44.5	115.5	57.15	7833347	25.00	44.5	115.5	56.0	7833342
21.5	0012574	0017234	7333061	1“	44.5	115.5	57.15	7833347	25.00	44.5	115.5	56.0	7833342
55/64	0012604	0017241	7333062	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
22.0	0012628	0017258	7333063	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
7/8	0012635	0017371	7333064	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
22.5	0032336	0032428	7333065	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
57/64	0012642	0017401	7333066	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
22.7	0038246	0039823	7333067	1“	46.1	117.1	57.15	7833348	25.00	46.1	117.1	56.0	7833343
23.0	0012666	0017425	7333068	1“	47.0	118.0	57.15	7833349	25.00	47.0	118.0	56.0	7833344
29/32	0012673	0017432	7333069	1“	47.0	118.0	57.15	7833349	25.00	47.0	118.0	56.0	7833344
59/64	0012680	0017456	7333070	1“	47.0	118.0	57.15	7833349	25.00	47.0	118.0	56.0	7833344
23.5	0038253	0039830	7333071	1“	47.0	118.0	57.15	7833349	25.00	47.0	118.0	56.0	7833344

HYDRA DRILL

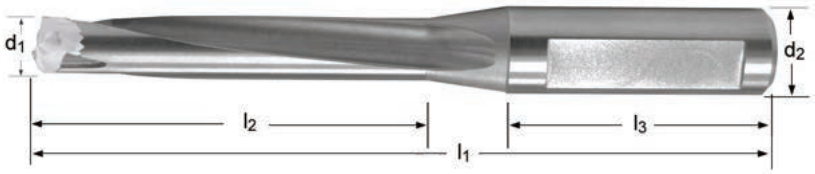
DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	1.5xD Hydra Body - Fractional Shank					1.5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H851 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H851 EDP#
15/16	0012703	0017562	7333072	1“	49.3	124.3	57.15	7833350	32.00	49.3	124.3	60.0	7833357
24.0	0012727	0017579	7333073	1“	49.3	124.3	57.15	7833350	32.00	49.3	124.3	60.0	7833357
61/64	0012741	0017586	7333074	1“	49.3	124.3	57.15	7833350	32.00	49.3	124.3	60.0	7833357
24.5	0038260	0039847	7333075	1“	49.3	124.3	57.15	7833350	32.00	49.3	124.3	60.0	7833357
31/32	0012772	0017593	7333076	1“	49.3	124.3	57.15	7833350	32.00	49.3	124.3	60.0	7833357
25.0	0012819	0017722	7333077	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
63/64	0012826	0017746	7333078	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
1	0012833	0017753	7333079	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
25.5	0038277	0039854	7333080	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
25.65	0032343	0032435	7333081	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
1.1/64	0012840	0018958	7333082	1.1/4	49.7	124.7	60.33	7833351	32.00	49.7	124.7	60.0	7833358
26.0	0013090	0018965	7333083	1.1/4	52.3	127.3	60.33	7833352	32.00	52.3	127.3	60.0	7833359
1.1/32	0013120	0018972	7333084	1.1/4	52.3	127.3	60.33	7833352	32.00	52.3	127.3	60.0	7833359
26.5	0038284	0039878	7333085	1.1/4	52.3	127.3	60.33	7833352	32.00	52.3	127.3	60.0	7833359
1.3/64	0013229	0018989	7333086	1.1/4	52.3	127.3	60.33	7833352	32.00	52.3	127.3	60.0	7833359
1.1/16	0013243	0018996	7333087	1.1/4	52.8	127.8	60.33	7833353	32.00	52.8	127.8	60.0	7833360
27.0	0013267	0019009	7333088	1.1/4	52.8	127.8	60.33	7833353	32.00	52.8	127.8	60.0	7833360
1.5/64	0013274	0019016	7333089	1.1/4	52.8	127.8	60.33	7833353	32.00	52.8	127.8	60.0	7833360
27.5	0038291	0039885	7333090	1.1/4	52.8	127.8	60.33	7833353	32.00	52.8	127.8	60.0	7833360
1.3/32	0013281	0019023	7333091	1.1/4	52.8	127.8	60.33	7833353	32.00	52.8	127.8	60.0	7833360
28.0	0013304	0019030	7333092	1.1/4	54.4	129.4	60.33	7833354	32.00	54.4	129.4	60.0	7833361
1.7/64	0013311	0019047	7333093	1.1/4	54.4	129.4	60.33	7833354	32.00	54.4	129.4	60.0	7833361
28.5	0038307	0039892	7333094	1.1/4	54.4	129.4	60.33	7833354	32.00	54.4	129.4	60.0	7833361
1.1/8	0013328	0019054	7333095	1.1/4	54.4	129.4	60.33	7833354	32.00	54.4	129.4	60.0	7833361
1.9/64	0013342	0019061	7333096	1.1/4	55.8	130.8	60.33	7833355	32.00	55.8	130.8	60.0	7833362
29.0	0013366	0019078	7333097	1.1/4	55.8	130.8	60.33	7833355	32.00	55.8	130.8	60.0	7833362
1.5/32	0013380	0019085	7333098	1.1/4	55.8	130.8	60.33	7833355	32.00	55.8	130.8	60.0	7833362
29.5	0038314	0039908	7333099	1.1/4	55.8	130.8	60.33	7833355	32.00	55.8	130.8	60.0	7833362
1.11/64	0013427	0019092	7333100	1.1/4	55.8	130.8	60.33	7833355	32.00	55.8	130.8	60.0	7833362
30.0	0013434	0019108	7333101	1.1/4	58.4	133.4	60.33	7833356	32.00	58.4	133.4	60.0	7833363
1.3/16	0013441	0019115	7333102	1.1/4	58.4	133.4	60.33	7833356	32.00	58.4	133.4	60.0	7833363
30.5	0013465	0019122	7333103	1.1/4	58.4	133.4	60.33	7833356	32.00	58.4	133.4	60.0	7833363

3xD Hydra Bodies

H853

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

*** Fractional bodies have straight flat on shank**
*** Metric bodies have whistle notch on shank**
*** For more information on Hydra, see page 539**

H853
Coolant Through

DIN 6535HB
DIN 6535HE

3XD

HSS

140°

15/32 - 42.00

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 $Øh_6$ inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 $Øh_6$ mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15/32	0010860	0013472	7332946	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.0	0010877	0013489	7332947	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.1	0037904	0038338	7332948	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.2	0037911	0038376	7332949	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
31/64	0010884	0013496	7332980	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.5	0010907	0013519	7332981	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.6	0037928	0038413	7332982	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
1/2	0010914	0013526	7332983	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.8	0037935	0038437	7332984	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.9	0037942	0038451	7332985	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
13.0	0010921	0013533	7332986	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
33/64	0010938	0013540	7332987	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
13.2	0037959	0038468	7332988	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
17/32	0010945	0013557	7332989	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
13.5	0010952	0016022	7332990	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.6	0037966	0038499	7332991	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.7	0037973	0038529	7332992	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.8	0037980	0038543	7332993	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
35/64	0010969	0016039	7332994	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.0	0010983	0016046	7332995	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.1	0037997	0038567	7332996	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.2	0038000	0038574	7332997	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
9/16	0011003	0016053	7332998	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.5	0011010	0016060	7332999	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.6	0038017	0038581	7333000	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
37/64	0011140	0016077	7333001	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
14.7	0038024	0039601	7333002	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
14.8	0038031	0039618	7333003	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.0	0011201	0016084	7333004	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
19/32	0011218	0016091	7333005	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.1	0038048	0039625	7333006	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.2	0038055	0039632	7333007	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.24	0032268	0032350	7333008	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
39/64	0011232	0016107	7333009	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.5	0011362	0016114	7333010	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293

HYDRA DRILL

DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15.6	0038062	0039649	7333011	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
15.7	0038079	0039656	7333012	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
5/8	0011379	0016121	7333013	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.0	0011386	0016138	7333014	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.08	0032275	0032367	7333015	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.1	0038086	0039663	7333016	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.2	0038093	0039670	7333017	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
41/64	0011393	0016145	7333018	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.3	0032282	0032374	7333019	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.5	0011409	0016152	7333020	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.6	0038109	0039687	7333021	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
21/32	0012161	0016169	7333022	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
16.7	0038116	0039694	7333023	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.0	0012185	0016176	7333024	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
43/64	0012215	0016183	7333025	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.1	0038123	0039700	7333026	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.2	0038130	0039717	7333027	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
11/16	0012239	0016190	7333028	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.5	0012253	0016503	7333029	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.6	0032299	0032381	7333030	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
17.7	0038147	0039724	7333031	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
45/64	0012260	0016640	7333032	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.0	0012277	0016664	7333033	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.1	0038154	0039731	7333034	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.2	0038161	0039748	7333035	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
23/32	0012284	0016671	7333036	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.5	0012307	0016688	7333037	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.6	0038178	0039755	7333038	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
47/64	0012321	0016695	7333039	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
18.7	0038185	0039762	7333040	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
18.9	0038192	0039779	7333041	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.0	0012338	0016817	7333042	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
3/4	0012345	0016879	7333043	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.1	0038208	0039786	7333044	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.2	0038215	0039793	7333045	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.25	0032305	0032398	7333046	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.3	0032312	0032404	7333047	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.35	0032329	0032411	7333048	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
49/64	0012376	0016886	7333049	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.5	0012383	0016947	7333050	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.6	0038222	0039809	7333051	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
19.7	0038239	0039816	7333052	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
25/32	0012406	0016954	7333053	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
20.0	0012413	0017111	7333054	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
51/64	0012437	0017128	7333055	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
20.5	0012451	0017159	7333056	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
13/16	0012468	0017197	7333057	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
21.0	0012475	0017166	7333058	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
53/64	0012536	0017203	7333059	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
27/32	0012550	0017227	7333060	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
21.5	0012574	0017234	7333061	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
55/64	0012604	0017241	7333062	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.0	0012628	0017258	7333063	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
7/8	0012635	0017371	7333064	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.5	0032336	0032428	7333065	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
57/64	0012642	0017401	7333066	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.7	0038246	0039823	7333067	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
23.0	0012666	0017425	7333068	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
29/32	0012673	0017432	7333069	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
59/64	0012680	0017456	7333070	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
23.5	0038253	0039830	7333071	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385

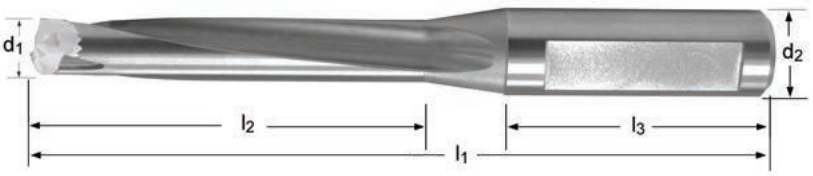
HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15/16	0012703	0017562	7333072	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
24.0	0012727	0017579	7333073	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
61/64	0012741	0017586	7333074	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
24.5	0038260	0039847	7333075	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
31/32	0012772	0017593	7333076	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
25.0	0012819	0017722	7333077	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
63/64	0012826	0017746	7333078	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
1	0012833	0017753	7333079	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
25.5	0038277	0039854	7333080	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
25.65	0032343	0032435	7333081	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
1.1/64	0012840	0018958	7333082	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
26.0	0013090	0018965	7333083	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.1/32	0013120	0018972	7333084	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
26.5	0038284	0039878	7333085	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.3/64	0013229	0018989	7333086	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.1/16	0013243	0018996	7333087	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
27.0	0013267	0019009	7333088	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
1.5/64	0013274	0019016	7333089	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
27.5	0038291	0039885	7333090	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
1.3/32	0013281	0019023	7333091	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
28.0	0013304	0019030	7333092	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.7/64	0013311	0019047	7333093	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
28.5	0038307	0039892	7333094	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.1/8	0013328	0019054	7333095	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.9/64	0013342	0019061	7333096	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
29.0	0013366	0019078	7333097	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
1.5/32	0013380	0019085	7333098	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
29.5	0038314	0039908	7333099	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
1.11/64	0013427	0019092	7333100	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
30.0	0013434	0019108	7333101	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
1.3/16	0013441	0019115	7333102	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
30.5	0013465	0019122	7333103	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
1.7/32	46104481	—	7333104	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
31.00	46104482	—	7333105	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
1.1/4	46104483	—	7333106	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
32.00	46104484	—	7333107	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
32.50	46104485	—	7333108	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
1.19/64	46104486	—	7333109	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
33.00	46104487	—	7333110	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
33.50	46104488	—	7333111	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
34.00	46104489	—	7333112	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
1.11/32	46104530	—	7333113	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
34.50	46104531	—	7333114	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
1.3/8	46104532	—	7333115	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
35.00	46104533	—	7333116	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
36.00	46104534	—	7333117	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
1.27/64	46104535	—	7333118	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
36.50	46104536	—	7333119	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
37.00	46104537	—	7333120	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
1.15/32	46104538	—	7333121	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
37.50	46104539	—	7333122	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
38.00	46104540	—	7333123	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
1.1/2	46104541	—	7333124	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
38.50	46104542	—	7333125	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
1.17/32	46104543	—	7333126	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
39.00	46104544	—	7333127	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
39.50	46104545	—	7333128	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
1.9/16	46104546	—	7333129	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
40.00	46104547	—	7333130	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
41.00	46104548	—	7333131	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
1.5/8	46104549	—	7333132	—	—	—	—	—	40.0	151.5	251.5	70.0	46111412
42.00	46104550	—	7333133	—	—	—	—	—	40.0	151.5	251.5	70.0	46111412

5xD Hydra Bodies

H855

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



H855 Coolant Through

DIN 6535HB DIN 6535HE

5XD

HSS

140°

15/32 - 42.00

Four (4) screws and one (1) screwdriver are included with a drill body

*** Fractional bodies have straight flat on shank**
*** Metric bodies have whistle notch on shank**
*** For more information on Hydra, see page 539**

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
15/32	0010860	0013472	7332946	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.0	0010877	0013489	7332947	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.1	0037904	0038338	7332948	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.2	0037911	0038376	7332949	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
31/64	0010884	0013496	7332980	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.5	0010907	0013519	7332981	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.6	0037928	0038413	7332982	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
1/2	0010914	0013526	7332983	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.8	0037935	0038437	7332984	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.9	0037942	0038451	7332985	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
13.0	0010921	0013533	7332986	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
33/64	0010938	0013540	7332987	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
13.2	0037959	0038468	7332988	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
17/32	0010945	0013557	7332989	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
13.5	0010952	0016022	7332990	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.6	0037966	0038499	7332991	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.7	0037973	0038529	7332992	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.8	0037980	0038543	7332993	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
35/64	0010969	0016039	7332994	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.0	0010983	0016046	7332995	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.1	0037997	0038567	7332996	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.2	0038000	0038574	7332997	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
9/16	0011003	0016053	7332998	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.5	0011010	0016060	7332999	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.6	0038017	0038581	7333000	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
37/64	0011140	0016077	7333001	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
14.7	0038024	0039601	7333002	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
14.8	0038031	0039618	7333003	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.0	0011201	0016084	7333004	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
19/32	0011218	0016091	7333005	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507

DORMER

HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
15.1	0038048	0039625	7333006	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.2	0038055	0039632	7333007	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.24	0032268	0032350	7333008	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
39/64	0011232	0016107	7333009	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.5	0011362	0016114	7333010	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.6	0038062	0039649	7333011	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
15.7	0038079	0039656	7333012	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
5/8	0011379	0016121	7333013	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.0	0011386	0016138	7333014	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.08	0032275	0032367	7333015	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.1	0038086	0039663	7333016	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.2	0038093	0039670	7333017	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
41/64	0011393	0016145	7333018	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.3	0032282	0032374	7333019	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.5	0011409	0016152	7333020	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.6	0038109	0039687	7333021	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
21/32	0012161	0016169	7333022	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
16.7	0038116	0039694	7333023	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.0	0012185	0016176	7333024	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
43/64	0012215	0016183	7333025	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.1	0038123	0039700	7333026	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.2	0038130	0039717	7333027	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
11/16	0012239	0016190	7333028	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.5	0012253	0016503	7333029	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.6	0032299	0032381	7333030	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
17.7	0038147	0039724	7333031	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
45/64	0012260	0016640	7333032	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.0	0012277	0016664	7333033	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.1	0038154	0039731	7333034	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.2	0038161	0039748	7333035	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
23/32	0012284	0016671	7333036	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.5	0012307	0016688	7333037	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.6	0038178	0039755	7333038	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
47/64	0012321	0016695	7333039	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
18.7	0038185	0039762	7333040	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
18.9	0038192	0039779	7333041	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.0	0012338	0016817	7333042	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
3/4	0012345	0016879	7333043	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.1	0038208	0039786	7333044	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.2	0038215	0039793	7333045	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.25	0032305	0032398	7333046	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.3	0032312	0032404	7333047	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.35	0032329	0032411	7333048	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
49/64	0012376	0016886	7333049	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.5	0012383	0016947	7333050	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.6	0038222	0039809	7333051	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
19.7	0038239	0039816	7333052	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
25/32	0012406	0016954	7333053	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
20.0	0012413	0017111	7333054	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
51/64	0012437	0017128	7333055	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
20.5	0012451	0017159	7333056	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
13/16	0012468	0017197	7333057	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
21.0	0012475	0017166	7333058	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
53/64	0012536	0017203	7333059	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
27/32	0012550	0017227	7333060	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
21.5	0012574	0017234	7333061	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
55/64	0012604	0017241	7333062	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.0	0012628	0017258	7333063	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
7/8	0012635	0017371	7333064	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.5	0032336	0032428	7333065	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
57/64	0012642	0017401	7333066	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.7	0038246	0039823	7333067	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
23.0	0012666	0017425	7333068	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
29/32	0012673	0017432	7333069	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583

HYDRA DRILL

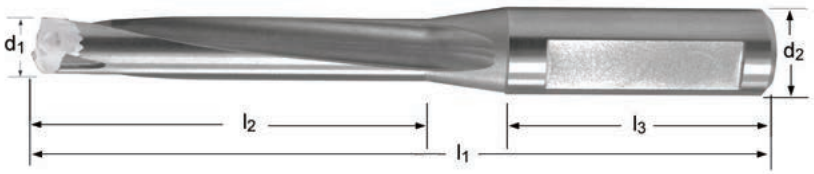
DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
59/64	0012680	0017456	7333070	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
23.5	0038253	0039830	7333071	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
15/16	0012703	0017562	7333072	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
24.0	0012727	0017579	7333073	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
61/64	0012741	0017586	7333074	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
24.5	0038260	0039847	7333075	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
31/32	0012772	0017593	7333076	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
25.0	0012819	0017722	7333077	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
63/64	0012826	0017746	7333078	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
1	0012833	0017753	7333079	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
25.5	0038277	0039854	7333080	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
25.65	0032343	0032435	7333081	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
1.1/64	0012840	0018958	7333082	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
26.0	0013090	0018965	7333083	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.1/32	0013120	0018972	7333084	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
26.5	0038284	0039878	7333085	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.3/64	0013229	0018989	7333086	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.1/16	0013243	0018996	7333087	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
27.0	0013267	0019009	7333088	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
1.5/64	0013274	0019016	7333089	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
27.5	0038291	0039885	7333090	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
1.3/32	0013281	0019023	7333091	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
28.0	0013304	0019030	7333092	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.7/64	0013311	0019047	7333093	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
28.5	0038307	0039892	7333094	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.1/8	0013328	0019054	7333095	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.9/64	0013342	0019061	7333096	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
29.0	0013366	0019078	7333097	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
1.5/32	0013380	0019085	7333098	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
29.5	0038314	0039908	7333099	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
1.11/64	0013427	0019092	7333100	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
30.0	0013434	0019108	7333101	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
1.3/16	0013441	0019115	7333102	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
30.5	0013465	0019122	7333103	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
1.7/32	46104481	—	7333104	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
31.00	46104482	—	7333105	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
1.1/4	46104483	—	7333106	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
32.00	46104484	—	7333107	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
32.50	46104485	—	7333108	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
1.19/64	46104486	—	7333109	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
33.00	46104487	—	7333110	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
33.50	46104488	—	7333111	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
34.00	46104489	—	7333112	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
1.11/32	46104530	—	7333113	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
34.50	46104531	—	7333114	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
1.3/8	46104532	—	7333115	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
35.00	46104533	—	7333116	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
36.00	46104534	—	7333117	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
1.27/64	46104535	—	7333118	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
36.50	46104536	—	7333119	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
37.00	46104537	—	7333120	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
1.15/32	46104538	—	7333121	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
37.50	46104539	—	7333122	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
38.00	46104540	—	7333123	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
1.1/2	46104541	—	7333124	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
38.50	46104542	—	7333125	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
1.17/32	46104543	—	7333126	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
39.00	46104544	—	7333127	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
39.50	46104545	—	7333128	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
1.9/16	46104546	—	7333129	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
40.00	46104547	—	7333130	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
41.00	46104548	—	7333131	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
1.5/8	46104549	—	7333132	—	—	—	—	—	40.0	236.5	336.5	70.0	46111420
42.00	46104550	—	7333133	—	—	—	—	—	40.0	236.5	336.5	70.0	46111420

8xD Hydra Bodies

H858

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



H858 Coolant Through

DIN 6535HB DIN 6535HE

8XD

HSS

140°

13.50 - 42.00

Four (4) screws and one (1) screwdriver are included with a drill body

*** Metric bodies have whistle notch on shank**

*** For more information on Hydra, see page 539**

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank					8xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
13.5	0010952	0016022	7332990	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
13.6	0037966	0038499	7332991	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
13.7	0037973	0038529	7332992	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
13.8	0037980	0038543	7332993	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
35/64	0010969	0016039	7332994	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
14.0	0010983	0016046	7332995	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
14.1	0037997	0038567	7332996	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
14.2	0038000	0038574	7332997	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
9/16	0011003	0016053	7332998	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
14.5	0011010	0016060	7332999	—	—	—	—	—	16.0	124.5	191.5	48.0	0018668
14.6	0038017	0038581	7333000	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
37/64	0011140	0016077	7333001	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
14.7	0038024	0039601	7333002	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
14.8	0038031	0039618	7333003	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.0	0011201	0016084	7333004	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
19/32	0011218	0016091	7333005	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.1	0038048	0039625	7333006	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.2	0038055	0039632	7333007	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.24	0032268	0032350	7333008	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
39/64	0011232	0016107	7333009	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.5	0011362	0016114	7333010	—	—	—	—	—	20.0	133.5	201.5	50.0	0018675
15.6	0038062	0039649	7333011	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
15.7	0038079	0039656	7333012	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
5/8	0011379	0016121	7333013	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.0	0011386	0016138	7333014	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.08	0032275	0032367	7333015	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.1	0038086	0039663	7333016	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.2	0038093	0039670	7333017	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
41/64	0011393	0016145	7333018	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.3	0032282	0032374	7333019	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682

HYDRA DRILL

DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank					8xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
16.5	0011409	0016152	7333020	—	—	—	—	—	20.0	141.5	211.5	50.0	0018682
16.6	0038109	0039687	7333021	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
21/32	0012161	0016169	7333022	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
16.7	0038116	0039694	7333023	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
17.0	0012185	0016176	7333024	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
43/64	0012215	0016183	7333025	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
17.1	0038123	0039700	7333026	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
17.2	0038130	0039717	7333027	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
11/16	0012239	0016190	7333028	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
17.5	0012253	0016503	7333029	—	—	—	—	—	20.0	150.5	221.5	50.0	0018699
17.6	0032299	0032381	7333030	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
17.7	0038147	0039724	7333031	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
45/64	0012260	0016640	7333032	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
18.0	0012277	0016664	7333033	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
18.1	0038154	0039731	7333034	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
18.2	0038161	0039748	7333035	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
23/32	0012284	0016671	7333036	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
18.5	0012307	0016688	7333037	—	—	—	—	—	20.0	158.5	226.5	50.0	0018705
18.6	0038178	0039755	7333038	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
47/64	0012321	0016695	7333039	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
18.7	0038185	0039762	7333040	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
18.9	0038192	0039779	7333041	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.0	0012338	0016817	7333042	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
3/4	0012345	0016879	7333043	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.1	0038208	0039786	7333044	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.2	0038215	0039793	7333045	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.25	0032305	0032398	7333046	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.3	0032312	0032404	7333047	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.35	0032329	0032411	7333048	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
49/64	0012376	0016886	7333049	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.5	0012383	0016947	7333050	—	—	—	—	—	25.0	167.5	251.5	56.0	0018712
19.6	0038222	0039809	7333051	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
19.7	0038239	0039816	7333052	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
25/32	0012406	0016954	7333053	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
20.0	0012413	0017111	7333054	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
51/64	0012437	0017128	7333055	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
20.5	0012451	0017159	7333056	—	—	—	—	—	25.0	175.5	264.5	56.0	0018729
13/16	0012468	0017197	7333057	—	—	—	—	—	25.0	184.5	266.5	56.0	0018736
21.0	0012475	0017166	7333058	—	—	—	—	—	25.0	184.5	266.5	56.0	0018736
53/64	0012536	0017203	7333059	—	—	—	—	—	25.0	184.5	266.5	56.0	0018736
27/32	0012550	0017227	7333060	—	—	—	—	—	25.0	184.5	266.5	56.0	0018736
21.5	0012574	0017234	7333061	—	—	—	—	—	25.0	184.5	266.5	56.0	0018736
55/64	0012604	0017241	7333062	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
22.0	0012628	0017258	7333063	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
7/8	0012635	0017371	7333064	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
22.5	0032336	0032428	7333065	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
57/64	0012642	0017401	7333066	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
22.7	0038246	0039823	7333067	—	—	—	—	—	25.0	192.1	271.1	56.0	0018743
23.0	0012666	0017425	7333068	—	—	—	—	—	25.0	200.5	280.5	56.0	0018750
29/32	0012673	0017432	7333069	—	—	—	—	—	25.0	200.5	280.5	56.0	0018750
59/64	0012680	0017456	7333070	—	—	—	—	—	25.0	200.5	280.5	56.0	0018750
23.5	0038253	0039830	7333071	—	—	—	—	—	25.0	200.5	280.5	56.0	0018750
15/16	0012703	0017562	7333072	—	—	—	—	—	32.0	208.2	295.2	60.0	0018767
24.0	0012727	0017579	7333073	—	—	—	—	—	32.0	208.2	295.2	60.0	0018767
61/64	0012741	0017586	7333074	—	—	—	—	—	32.0	208.2	295.2	60.0	0018767
24.5	0038260	0039847	7333075	—	—	—	—	—	32.0	208.2	295.2	60.0	0018767
31/32	0012772	0017593	7333076	—	—	—	—	—	32.0	208.2	295.2	60.0	0018767
25.0	0012819	0017722	7333077	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
63/64	0012826	0017746	7333078	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
1	0012833	0017753	7333079	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
25.5	0038277	0039854	7333080	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
25.65	0032343	0032435	7333081	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
1.1/64	0012840	0018958	7333082	—	—	—	—	—	32.0	217.0	300.0	60.0	0018774
26.0	0013090	0018965	7333083	—	—	—	—	—	32.0	225.0	310.0	60.0	0018781
1.1/32	0013120	0018972	7333084	—	—	—	—	—	32.0	225.0	310.0	60.0	0018781

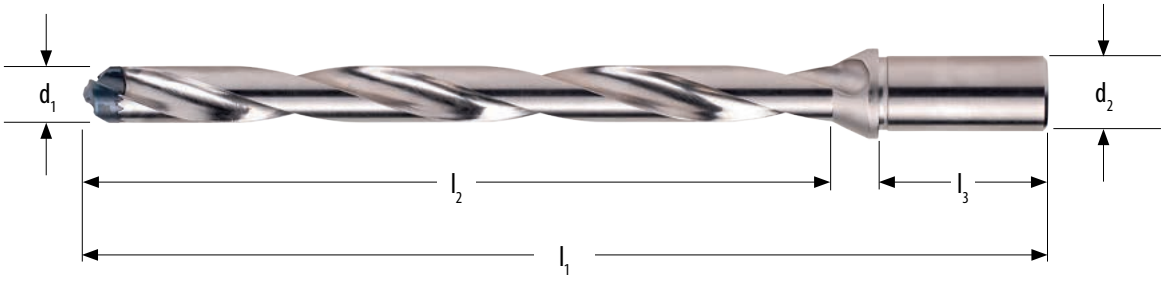
HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank					8xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
26.5	0038284	0039878	7333085	—	—	—	—	—	32.0	225.0	310.0	60.0	0018781
1.3/64	0013229	0018989	7333086	—	—	—	—	—	32.0	225.0	310.0	60.0	0018781
1.1/16	0013243	0018996	7333087	—	—	—	—	—	32.0	234.0	320.0	60.0	0018798
27.0	0013267	0019009	7333088	—	—	—	—	—	32.0	234.0	320.0	60.0	0018798
1.5/64	0013274	0019016	7333089	—	—	—	—	—	32.0	234.0	320.0	60.0	0018798
27.5	0038291	0039885	7333090	—	—	—	—	—	32.0	234.0	320.0	60.0	0018798
1.3/32	0013281	0019023	7333091	—	—	—	—	—	32.0	234.0	320.0	60.0	0018798
28.0	0013304	0019030	7333092	—	—	—	—	—	32.0	242.0	325.0	60.0	0018804
1.7/64	0013311	0019047	7333093	—	—	—	—	—	32.0	242.0	325.0	60.0	0018804
28.5	0038307	0039892	7333094	—	—	—	—	—	32.0	242.0	325.0	60.0	0018804
1.1/8	0013328	0019054	7333095	—	—	—	—	—	32.0	242.0	325.0	60.0	0018804
1.9/64	0013342	0019061	7333096	—	—	—	—	—	32.0	251.0	335.0	60.0	0018811
29.0	0013366	0019078	7333097	—	—	—	—	—	32.0	251.0	335.0	60.0	0018811
1.5/32	0013380	0019085	7333098	—	—	—	—	—	32.0	251.0	335.0	60.0	0018811
29.5	0038314	0039908	7333099	—	—	—	—	—	32.0	251.0	335.0	60.0	0018811
1.11/64	0013427	0019092	7333100	—	—	—	—	—	32.0	251.0	335.0	60.0	0018811
30.0	0013434	0019108	7333101	—	—	—	—	—	32.0	259.0	345.0	60.0	0018828
1.3/16	0013441	0019115	7333102	—	—	—	—	—	32.0	259.0	345.0	60.0	0018828
30.5	0013465	0019122	7333103	—	—	—	—	—	32.0	259.0	345.0	60.0	0018828
1.7/32	46104481	—	7333104	—	—	—	—	—	32.0	271.5	356.5	60.0	46111421
31.00	46104482	—	7333105	—	—	—	—	—	32.0	271.5	356.5	60.0	46111421
1.1/4	46104483	—	7333106	—	—	—	—	—	32.0	271.5	356.5	60.0	46111421
32.00	46104484	—	7333107	—	—	—	—	—	32.0	271.5	356.5	60.0	46111421
32.50	46104485	—	7333108	—	—	—	—	—	40.0	286.5	371.5	60.0	46111422
1.19/64	46104486	—	7333109	—	—	—	—	—	40.0	286.5	371.5	60.0	46111422
33.00	46104487	—	7333110	—	—	—	—	—	40.0	286.5	371.5	60.0	46111422
33.50	46104488	—	7333111	—	—	—	—	—	40.0	286.5	371.5	60.0	46111422
34.00	46104489	—	7333112	—	—	—	—	—	40.0	301.5	396.5	70.0	46111423
1.11/32	46104530	—	7333113	—	—	—	—	—	40.0	301.5	396.5	70.0	46111423
34.50	46104531	—	7333114	—	—	—	—	—	40.0	301.5	396.5	70.0	46111423
1.3/8	46104532	—	7333115	—	—	—	—	—	40.0	301.5	396.5	70.0	46111423
35.00	46104533	—	7333116	—	—	—	—	—	40.0	301.5	396.5	70.0	46111423
36.00	46104534	—	7333117	—	—	—	—	—	40.0	311.5	406.5	70.0	46111424
1.27/64	46104535	—	7333118	—	—	—	—	—	40.0	311.5	406.5	70.0	46111424
36.50	46104536	—	7333119	—	—	—	—	—	40.0	311.5	406.5	70.0	46111424
37.00	46104537	—	7333120	—	—	—	—	—	40.0	326.5	421.5	70.0	46111425
1.15/32	46104538	—	7333121	—	—	—	—	—	40.0	326.5	421.5	70.0	46111425
37.50	46104539	—	7333122	—	—	—	—	—	40.0	326.5	421.5	70.0	46111425
38.00	46104540	—	7333123	—	—	—	—	—	40.0	326.5	421.5	70.0	46111425
1.1/2	46104541	—	7333124	—	—	—	—	—	40.0	336.5	431.5	70.0	46111426
38.50	46104542	—	7333125	—	—	—	—	—	40.0	336.5	431.5	70.0	46111426
1.17/32	46104543	—	7333126	—	—	—	—	—	40.0	336.5	431.5	70.0	46111426
39.00	46104544	—	7333127	—	—	—	—	—	40.0	336.5	431.5	70.0	46111426
39.50	46104545	—	7333128	—	—	—	—	—	40.0	336.5	431.5	70.0	46111426
1.9/16	46104546	—	7333129	—	—	—	—	—	40.0	351.5	451.5	70.0	46111427
40.00	46104547	—	7333130	—	—	—	—	—	40.0	351.5	451.5	70.0	46111427
41.00	46104548	—	7333131	—	—	—	—	—	40.0	351.5	451.5	70.0	46111427
1.5/8	46104549	—	7333132	—	—	—	—	—	40.0	361.5	461.5	70.0	46111428
42.00	46104550	—	7333133	—	—	—	—	—	40.0	361.5	461.5	70.0	46111428

12xD Hydra Bodies

H8512

Metric body, Cylindrical shank



H851
Coolant Through

13.5 – 1.1/64

Four (4) screws and one (1) screwdriver are included with a drill body
Apply starting values for speed and feed with a correction factor of **0.80**

*** For more information on Hydra, see page 539**

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	12xD Hydra Body - Fractional Shank					12xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H8512 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H8512 EDP#
13.5	0010952	0016022	7332990	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
13.6	0037966	0038499	7332991	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
13.7	0037973	0038529	7332992	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
13.8	0037980	0038543	7332993	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
35/64	0010969	0016039	7332994	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
14.0	0010983	0016046	7332995	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
14.1	0037997	0038567	7332996	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
14.2	0038000	0038574	7332997	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
9/16	0011003	0016053	7332998	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
14.5	0011010	0016060	7332999	—	—	—	—	—	16.00	168.0	236.0	48.0	7833364
14.6	0038017	0038581	7333000	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
37/64	0011140	0016077	7333001	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
14.7	0038024	0039601	7333002	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
14.8	0038031	0039618	7333003	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.0	0011201	0016084	7333004	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
19/32	0011218	0016091	7333005	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.1	0038048	0039625	7333006	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.2	0038055	0039632	7333007	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.24	0032268	0032350	7333008	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
39/64	0011232	0016107	7333009	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.5	0011362	0016114	7333010	—	—	—	—	—	20.00	180.0	250.3	50.0	7833365
15.6	0038062	0039649	7333011	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
15.7	0038079	0039656	7333012	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
5/8	0011379	0016121	7333013	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.0	0011386	0016138	7333014	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.08	0032275	0032367	7333015	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.1	0038086	0039663	7333016	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.2	0038093	0039670	7333017	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
41/64	0011393	0016145	7333018	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.3	0032282	0032374	7333019	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366
16.5	0011409	0016152	7333020	—	—	—	—	—	20.00	192.0	262.6	50.0	7833366

HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	12xD Hydra Body - Fractional Shank					12xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H8512 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H8512 EDP#
16.6	0038109	0039687	7333021	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
21/32	0012161	0016169	7333022	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
16.7	0038116	0039694	7333023	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
17.0	0012185	0016176	7333024	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
43/64	0012215	0016183	7333025	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
17.1	0038123	0039700	7333026	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
17.2	0038130	0039717	7333027	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
11/16	0012239	0016190	7333028	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
17.5	0012253	0016503	7333029	—	—	—	—	—	20.00	204.0	275.0	50.0	7833367
17.6	0032299	0032381	7333030	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
17.7	0038147	0039724	7333031	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
45/64	0012260	0016640	7333032	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
18.0	0012277	0016664	7333033	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
18.1	0038154	0039731	7333034	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
18.2	0038161	0039748	7333035	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
23/32	0012284	0016671	7333036	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
18.5	0012307	0016688	7333037	—	—	—	—	—	20.00	216.0	287.2	50.0	7833368
18.6	0038178	0039755	7333038	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
47/64	0012321	0016695	7333039	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
18.7	0038185	0039762	7333040	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
18.9	0038192	0039779	7333041	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.0	0012338	0016817	7333042	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
3/4	0012345	0016879	7333043	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.1	0038208	0039786	7333044	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.2	0038215	0039793	7333045	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.25	0032305	0032398	7333046	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.3	0032312	0032404	7333047	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.35	0032329	0032411	7333048	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
49/64	0012376	0016886	7333049	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.5	0012383	0016947	7333050	—	—	—	—	—	25.00	228.0	305.6	56.0	7833369
19.6	0038222	0039809	7333051	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
19.7	0038239	0039816	7333052	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
25/32	0012406	0016954	7333053	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
20.0	0012413	0017111	7333054	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
51/64	0012437	0017128	7333055	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
20.5	0012451	0017159	7333056	—	—	—	—	—	25.00	240.0	317.8	56.0	7833370
13/16	0012468	0017197	7333057	—	—	—	—	—	25.00	252.0	330.1	56.0	7833371
21.0	0012475	0017166	7333058	—	—	—	—	—	25.00	252.0	330.1	56.0	7833371
53/64	0012536	0017203	7333059	—	—	—	—	—	25.00	252.0	330.1	56.0	7833371
27/32	0012550	0017227	7333060	—	—	—	—	—	25.00	252.0	330.1	56.0	7833371
21.5	0012574	0017234	7333061	—	—	—	—	—	25.00	252.0	330.1	56.0	7833371
55/64	0012604	0017241	7333062	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
22.0	0012628	0017258	7333063	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
7/8	0012635	0017371	7333064	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
22.5	0032336	0032428	7333065	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
57/64	0012642	0017401	7333066	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
22.7	0038246	0039823	7333067	—	—	—	—	—	25.00	264.0	343.0	56.0	7833372
23.0	0012666	0017425	7333068	—	—	—	—	—	25.00	276.0	354.8	56.0	7833373
29/32	0012673	0017432	7333069	—	—	—	—	—	25.00	276.0	354.8	56.0	7833373
59/64	0012680	0017456	7333070	—	—	—	—	—	25.00	276.0	354.8	56.0	7833373
23.5	0038253	0039830	7333071	—	—	—	—	—	25.00	276.0	354.8	56.0	7833373
15/16	0012703	0017562	7333072	—	—	—	—	—	32.00	288.0	371.7	60.0	7833374
24.0	0012727	0017579	7333073	—	—	—	—	—	32.00	288.0	371.7	60.0	7833374
61/64	0012741	0017586	7333074	—	—	—	—	—	32.00	288.0	371.7	60.0	7833374
24.5	0038260	0039847	7333075	—	—	—	—	—	32.00	288.0	371.7	60.0	7833374
31/32	0012772	0017593	7333076	—	—	—	—	—	32.00	288.0	371.7	60.0	7833374
25.0	0012819	0017722	7333077	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375
63/64	0012826	0017746	7333078	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375
1	0012833	0017753	7333079	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375
25.5	0038277	0039854	7333080	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375
25.65	0032343	0032435	7333081	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375
1.1/64	0012840	0018958	7333082	—	—	—	—	—	32.00	300.0	383.8	60.0	7833375

HYDRA DRILL ACCESSORIES

Screws & Screw Driver

H860
Set of 2 Hydra Screws

H861
Hydra Drill Screw Driver

NOTE: Four (4) screws and one (1) screwdriver are included with a drill body

*** For more information on Hydra, see page 539**

H860	H861
N1 - N7	N1 - N6

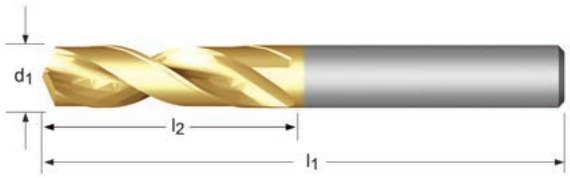
H860	H861	For Hydra Head Range	Pack Qty	H860	H861
H860N1	H861N1	15/32 - 15.5	1	0018835	0018897
H860N2	H861N2	15.6 - 18.5	1	0018842	0018903
H860N3	H861N3	18.6 - 21.5	1	0018859	0018910
H860N4	H861N3	55/64 - 31/32	1	0018866	0018910
H860N5	H861N4	25.0 - 1.3/32	1	0018873	0018927
H860N6	H861N5	28.0 - 33.5	1	0018880	0018934
H860N7	H861N6	34.0 - 42.0	1	46111949	46260354

Multi-Application, Screw Machine Length, Parallel Shank

R520

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty design. Self centering Split Point for easier penetration. TiN coating increases wear resistance and improves tool life.



CDX

R520

DIN 6539

2.5XD

HM

130°

3.00 - 16.50

d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R520
	3.00	0.1181	16	46	1	0116067
	3.10	0.1220	18	49	1	0116074
1/8	3.18	0.1250	18	49	1	0210666
	3.20	0.1260	18	49	1	0116081
	3.30	0.1299	18	49	1	0116098
	3.40	0.1339	20	52	1	0116104
	3.50	0.1378	20	52	1	0116111
	3.60	0.1417	20	52	1	0116128
	3.70	0.1457	20	52	1	0116135
	3.80	0.1496	22	55	1	0116142
	3.90	0.1535	22	55	1	0116159
	4.00	0.1575	22	55	1	0116166
	4.10	0.1614	22	55	1	0116173
	4.20	0.1654	22	55	1	0116180
	4.30	0.1693	24	58	1	0116197
	4.40	0.1732	24	58	1	0116203
	4.50	0.1772	24	58	1	0116210
	4.60	0.1811	24	58	1	0116227
	4.70	0.1850	24	58	1	0116234
	4.80	0.1890	26	62	1	0116241
	4.90	0.1929	26	62	1	0116258
	5.00	0.1969	26	62	1	0116265
	5.10	0.2008	26	62	1	0116272
	5.20	0.2047	26	62	1	0116289
	5.30	0.2087	26	62	1	0116296
	5.40	0.2126	28	66	1	0116302
	5.50	0.2165	28	66	1	0116319
	5.60	0.2205	28	66	1	0116326
	5.70	0.2244	28	66	1	0116333
	5.80	0.2283	28	66	1	0116340
	5.90	0.2323	28	66	1	0116357
	6.00	0.2362	28	66	1	0116364
	6.10	0.2402	31	70	1	0116371

CDX SOLID CARBIDE DRILL

DORMER

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R520
	6.20	0.2441	31	70	1	0116388
	6.30	0.2480	31	70	1	0116395
1/4	6.35	0.2500	31	70	1	0210741
	6.40	0.2520	31	70	1	0116401
	6.50	0.2559	31	70	1	0116418
	6.60	0.2598	31	70	1	0346402
	6.70	0.2638	31	70	1	0346419
	6.80	0.2677	34	74	1	0116425
	6.90	0.2717	34	74	1	0116432
	7.00	0.2756	34	74	1	0116449
	7.10	0.2795	34	74	1	0346426
	7.20	0.2835	34	74	1	0346433
	7.30	0.2874	34	74	1	0116456
	7.40	0.2913	34	74	1	0116463
	7.50	0.2953	34	74	1	0116470
	7.60	0.2992	37	79	1	0346440
	7.70	0.3031	37	79	1	0346457
	7.80	0.3071	37	79	1	0116487
	7.90	0.3110	37	79	1	0346464
5/16	7.94	0.3125	37	79	1	0210789
	8.00	0.3150	37	79	1	0116494
	8.10	0.3189	37	79	1	0346471
	8.20	0.3228	37	79	1	0346488
	8.30	0.3268	37	79	1	0346495
	8.40	0.3307	37	79	1	0346501
	8.50	0.3346	37	79	1	0116500
	8.60	0.3386	40	84	1	0346518
	8.70	0.3425	40	84	1	0216866
	8.80	0.3465	40	84	1	0346525
	8.90	0.3504	40	84	1	0346532
	9.00	0.3543	40	84	1	0116517
	9.10	0.3583	40	84	1	0346549
	9.20	0.3622	40	84	1	0116524
	9.30	0.3661	40	84	1	0116531
	9.40	0.3701	40	84	1	0216873
	9.50	0.3740	40	84	1	0116548
3/8	9.52	0.3750	43	89	1	0210826
	9.60	0.3780	43	89	1	0346556
	9.70	0.3819	43	89	1	0346563
	9.80	0.3858	43	89	1	0346570
	9.90	0.3898	43	89	1	0346587
	10.00	0.3937	43	89	1	0115923
	10.10	0.3976	43	89	1	0346778
	10.20	0.4016	43	89	1	0115930
	10.30	0.4055	43	89	1	0216880
	10.40	0.4094	43	89	1	0115947
	10.50	0.4134	43	89	1	0115954
	11.00	0.4331	47	95	1	0115961
7/16	11.11	0.4375	47	95	1	0210864
	11.20	0.4409	47	95	1	0216897
	11.50	0.4528	47	95	1	0115978
	12.00	0.4724	51	102	1	0115985
	12.50	0.4921	51	102	1	0115992
1/2	12.70	0.5000	51	102	1	0210901
	13.00	0.5118	51	102	1	0116005
	13.50	0.5315	54	107	1	0216903
	14.00	0.5512	54	107	1	0116012
	14.20	0.5591	56	111	1	0216910
	14.25	0.5610	56	111	1	0216927
	14.50	0.5709	56	111	1	0116029
	15.00	0.5906	56	111	1	0116036
	15.10	0.5945	58	115	1	0216934
5/8	15.88	0.6250	58	115	1	0210925
	16.00	0.6299	58	115	1	0116043
	16.50	0.6496	60	119	1	0116050

DORMER FORCE X SOLID CARBIDE DRILL

Multi-Application, Short Length, Reinforced Shank

R458

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

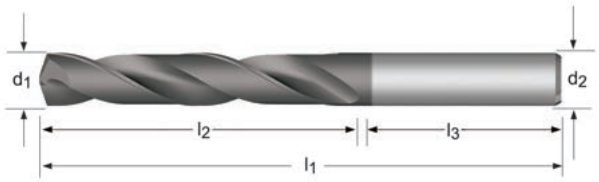
Self centering 4-facet split point and CTW flute construction for enhanced penetration rate. TiAlN coating increases wear resistance and improves tool life at high RPM.

R457

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 3.1 3.2 3.3 3.4
4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

Coolant through clears chips away from the cutting edge. Self centering 4-facet split point for enhanced penetration rates. TiAlN coating increases surface hardness and improves tool life at high RPM.

High productivity in a wide range of materials



R458	R457
DIN 6537 K	DIN 6537 K
3XD	3XD
HM	HM
140°	140°
TiAlN	TiAlN
	Coolant Through
3.00 - 20.00	3.00 - 20.00

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
	3.00	0.1181	20	62	36	6	1	0615324	0614884
	3.10	0.1220	20	62	36	6	1	0626443	0626115
1/8	3.18	0.1252	20	62	36	6	1	0624845	0624432
	3.20	0.1260	20	62	36	6	1	0626450	0626122
30	3.26	0.1283	20	62	36	6	1	0042267	0041833
	3.30	0.1299	20	62	36	6	1	0615331	0614891
	3.40	0.1339	20	62	36	6	1	0615348	0614907
29	3.45	0.1358	20	62	36	6	1	0042274	0041840
	3.50	0.1378	20	62	36	6	1	0615355	0614914
28	3.57	0.1406	20	62	36	6	1	0042281	0041857
9/64	3.57	0.1406	20	62	36	6	1	0625224	0624814
	3.60	0.1417	20	62	36	6	1	0626467	0626139
27	3.66	0.1441	20	62	36	6	1	0042298	0041864
	3.70	0.1457	20	62	36	6	1	0626474	0626146
26	3.73	0.1469	24	66	36	6	1	0626481	0041871
25	3.80	0.1496	24	66	36	6	1	0626498	0041888
24	3.86	0.1520	24	66	36	6	1	0042328	0041895
	3.90	0.1535	24	66	36	6	1	0626504	0626160
23	3.91	0.1539	24	66	36	6	1	0042335	0041901
5/32	3.97	0.1563	24	66	36	6	1	0625163	0624753
22	3.99	0.1571	24	66	36	6	1	0042342	0041918
	4.00	0.1575	24	66	36	6	1	0615362	0614921
21	4.04	0.1591	24	66	36	6	1	0042359	0041925
	4.05	0.1594	24	66	36	6	1	—	0626177
20	4.09	0.1610	24	66	36	6	1	0042366	0041932
	4.10	0.1614	24	66	36	6	1	0626511	0626184
	4.20	0.1654	24	66	36	6	1	0615379	0614938
19	4.22	0.1661	24	66	36	6	1	0042373	0041949
	4.30	0.1693	24	66	36	6	1	0615386	0614945
18	4.31	0.1697	24	66	36	6	1	0042380	0041956
11/64	4.37	0.1720	24	66	36	6	1	0624876	0624463
17	4.39	0.1728	24	66	36	6	1	0042397	0041963
	4.40	0.1732	24	66	36	6	1	0135013	0134832

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Ø “/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
16	4.50	0.1772	24	66	36	6	1	0615393	0041970
15	4.57	0.1799	24	66	36	6	1	0042410	0041987
	4.60	0.1811	24	66	36	6	1	0626528	0626191
14	4.62	0.1819	24	66	36	6	1	0042427	0041994
	4.70	0.1850	24	66	36	6	1	0135020	0626207
13	4.70	0.1850	24	66	36	6	1	0042434	0042007
3/16	4.76	0.1875	28	66	36	6	1	0625033	0624623
12	4.80	0.1890	28	66	36	6	1	0135037	0042014
11	4.85	0.1909	28	66	36	6	1	0042458	0042021
	4.90	0.1929	28	66	36	6	1	0135044	0622070
10	4.92	0.1937	28	66	36	6	1	0042465	0042038
9	4.98	0.1961	28	66	36	6	1	0042472	0042045
	5.00	0.1969	28	66	36	6	1	0615409	0614969
	5.05	0.1988	28	66	36	6	1	—	0626214
8	5.06	0.1992	28	66	36	6	1	0042489	0042052
	5.10	0.2008	28	66	36	6	1	0615416	0614976
7	5.11	0.2012	28	66	36	6	1	0042496	0042069
13/64	5.16	0.2031	28	66	36	6	1	0624890	0624487
6	5.18	0.2039	28	66	36	6	1	0042502	0042076
	5.20	0.2047	28	66	36	6	1	0135051	0134856
5	5.22	0.2055	28	66	36	6	1	0042519	0042083
	5.30	0.2087	28	66	36	6	1	7361260	7361237
4	5.31	0.2091	28	66	36	6	1	0042526	0042090
	5.40	0.2126	28	66	36	6	1	7361261	7361238
3	5.41	0.2130	28	66	36	6	1	0042533	0042106
	5.50	0.2165	28	66	36	6	1	0615423	0614983
7/32	5.56	0.2189	28	66	36	6	1	0625194	0624784
	5.60	0.2205	28	66	36	6	1	0626535	0626221
2	5.61	0.2209	28	66	36	6	1	0042540	0042113
	5.70	0.2244	28	66	36	6	1	0626542	0626238
1	5.79	0.2280	28	66	36	6	1	0042557	0042120
	5.80	0.2283	28	66	36	6	1	0626559	0626245
	5.90	0.2323	28	66	36	6	1	7361262	7361239
A	5.94	0.2339	28	66	36	6	1	0042564	0042137
15/64	5.95	0.2343	28	66	36	6	1	0624913	0624500
	6.00	0.2362	28	66	36	6	1	0615430	0614990
B	6.03	0.2374	34	79	36	8	1	7361263	7361240
	6.05	0.2382	34	79	36	8	1	—	0626252
	6.10	0.2402	34	79	36	8	1	0626566	0626269
C	6.15	0.2421	34	79	36	8	1	7361264	7361241
	6.20	0.2441	34	79	36	8	1	0135068	0134863
D	6.25	0.2461	34	79	36	8	1	0042571	0042144
	6.30	0.2480	34	79	36	8	1	0626573	0626276
1/4	6.35	0.2500	34	79	36	8	1	0624838	0624425
E	6.35	0.2500	34	79	36	8	1	7361265	7361242
	6.40	0.2520	34	79	36	8	1	0135075	0134870
	6.50	0.2559	34	79	36	8	1	0615447	0615003
F	6.53	0.2571	34	79	36	8	1	7361266	7361243
	6.60	0.2598	34	79	36	8	1	0626580	0626283
G	6.63	0.2610	34	79	36	8	1	7361267	7361244
	6.70	0.2638	34	79	36	8	1	0135082	0134887
17/64	6.75	0.2657	34	79	36	8	1	0624937	0624524
H	6.76	0.2661	34	79	36	8	1	0042588	0042151
	6.80	0.2677	34	79	36	8	1	0615454	0615010
	6.90	0.2717	34	79	36	8	1	0615461	0615027
I	6.91	0.2720	34	79	36	8	1	7361268	7361245
	7.00	0.2756	34	79	36	8	1	0615478	0615034
J	7.04	0.2772	41	79	36	8	1	7361269	7361246
	7.10	0.2795	41	79	36	8	1	0626597	0626290
K	7.14	0.2811	41	79	36	8	1	7361270	7361247
9/32	7.14	0.2811	41	79	36	8	1	0625217	0624807
	7.20	0.2835	41	79	36	8	1	7361271	7361248
	7.30	0.2874	41	79	36	8	1	0626603	0626306
L	7.37	0.2902	41	79	36	8	1	0042595	0042168
	7.40	0.2913	41	79	36	8	1	0615485	0615041
M	7.49	0.2949	41	79	36	8	1	0042601	0042175

FORCE X SOLID CARBIDE DRILL

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
	7.50	0.2953	41	79	36	8	1	0615492	0615058
19/64	7.54	0.2969	41	79	36	8	1	0624951	0624548
	7.60	0.2992	41	79	36	8	1	0626610	0626313
N	7.67	0.3020	41	79	36	8	1	0042618	0042182
	7.70	0.3031	41	79	36	8	1	0135099	0134894
	7.80	0.3071	41	79	36	8	1	0626627	0626320
	7.90	0.3110	41	79	36	8	1	0135105	0134900
5/16	7.94	0.3126	41	79	36	8	1	0625156	0624746
	8.00	0.3150	41	79	36	8	1	0615508	0615065
O	8.03	0.3161	47	89	40	10	1	0042625	0042199
	8.05	0.3169	47	89	40	10	1	—	0626337
	8.10	0.3189	47	89	40	10	1	0626634	0626689
	8.20	0.3228	47	89	40	10	1	0135112	0134917
P	8.20	0.3228	47	89	40	10	1	7361272	7361249
	8.30	0.3268	47	89	40	10	1	7361273	7361250
21/64	8.33	0.3280	47	89	40	10	1	0624975	0624562
	8.40	0.3307	47	89	40	10	1	0135129	0134924
Q	8.43	0.3319	47	89	40	10	1	0042632	0042205
	8.50	0.3346	47	89	40	10	1	0615515	0615072
	8.60	0.3386	47	89	40	10	1	0615522	0615089
R	8.61	0.3390	47	89	40	10	1	7361274	7361251
	8.70	0.3425	47	89	40	10	1	0615539	0615096
11/32	8.73	0.3437	47	89	40	10	1	0624869	0624456
	8.80	0.3465	47	89	40	10	1	0626641	0626344
S	8.84	0.3480	47	89	40	10	1	7361275	7361252
	8.90	0.3504	47	89	40	10	1	7361276	0134931
	9.00	0.3543	47	89	40	10	1	0615546	0615102
T	9.09	0.3579	47	89	40	10	1	0042649	0042212
	9.10	0.3583	47	89	40	10	1	0626658	0626351
23/64	9.13	0.3594	47	89	40	10	1	0624999	0624586
	9.20	0.3622	47	89	40	10	1	7361277	7361253
	9.30	0.3661	47	89	40	10	1	0615553	0615119
U	9.35	0.3681	47	89	40	10	1	0042656	0042229
	9.40	0.3701	47	89	40	10	1	0135136	0134948
	9.50	0.3740	47	89	40	10	1	0615560	0615126
3/8	9.52	0.3748	47	89	40	10	1	0625057	0624647
V	9.58	0.3772	47	89	40	10	1	7361278	7361254
	9.60	0.3780	47	89	40	10	1	0626665	0626368
	9.70	0.3819	47	89	40	10	1	0135143	0629062
	9.80	0.3858	47	89	40	10	1	0626672	0626375
W	9.80	0.3858	47	89	40	10	1	7361279	7361255
	9.90	0.3898	47	89	40	10	1	0135150	0134955
25/64	9.92	0.3906	47	89	40	10	1	0625002	0624593
	10.00	0.3937	47	89	40	10	1	0615133	0614693
	10.05	0.3957	55	102	45	12	1	—	0625958
X	10.08	0.3969	55	102	45	12	1	0042663	0042236
	10.10	0.3976	55	102	45	12	1	0626382	0625965
	10.20	0.4016	55	102	45	12	1	0615140	0614709
Y	10.26	0.4039	55	102	45	12	1	0042670	0042243
	10.30	0.4055	55	102	45	12	1	0615157	0614716
13/32	10.32	0.4063	55	102	45	12	1	0624883	0624470
	10.40	0.4094	55	102	45	12	1	0615164	0614723
Z	10.49	0.4130	55	102	45	12	1	0042687	0042250
	10.50	0.4134	55	102	45	12	1	0615171	0614730
	10.60	0.4173	55	102	45	12	1	0626399	0625972
	10.70	0.4213	55	102	45	12	1	7361280	—
27/64	10.72	0.4220	55	102	45	12	1	0625019	0624609
	10.80	0.4252	55	102	45	12	1	0042694	7361256
	10.90	0.4291	55	102	45	12	1	7361281	—
	11.00	0.4331	55	102	45	12	1	0615188	0614747
	11.10	0.4370	55	102	45	12	1	7361282	—
7/16	11.11	0.4374	55	102	45	12	1	0625187	0624777
	11.20	0.4409	55	102	45	12	1	0615195	0614754
	11.30	0.4449	55	102	45	12	1	7361283	7361257

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
	11.40	0.4488	55	102	45	12	1	0135167	0134962
	11.50	0.4528	55	102	45	12	1	0615201	0614761
29/64	11.51	0.4531	55	102	45	12	1	0625026	0624616
	11.60	0.4567	55	102	45	12	1	0135174	0134979
	11.70	0.4606	55	102	45	12	1	7361284	—
	11.80	0.4646	55	102	45	12	1	0626405	0625989
	11.90	0.4685	55	102	45	12	1	7361285	—
15/32	11.91	0.4689	55	102	45	12	1	0624906	0624494
	12.00	0.4724	55	102	45	12	1	0615218	0614778
	12.05	0.4744	60	107	45	14	1	—	0625996
	12.10	0.4764	60	107	45	14	1	0626412	0626009
	12.20	0.4803	60	107	45	14	1	0615225	0614785
31/64	12.30	0.4843	60	107	45	14	1	0625064	0624654
	12.50	0.4921	60	107	45	14	1	0615232	0614792
	12.70	0.5000	60	107	45	14	1	0626429	0626016
1/2	12.70	0.5000	60	107	45	14	1	0624821	0624418
	12.80	0.5039	60	107	45	14	1	0135181	0134986
	13.00	0.5118	60	107	45	14	1	0615249	0614808
33/64	13.10	0.5157	60	107	45	14	1	0625071	0624661
	13.30	0.5236	60	107	45	14	1	7361286	7361258
17/32	13.49	0.5311	60	107	45	14	1	0624920	0624517
	13.50	0.5315	60	107	45	14	1	0615256	0614815
	13.80	0.5433	60	107	45	14	1	0135198	0134993
35/64	13.89	0.5469	60	107	45	14	1	0625088	0624678
	14.00	0.5512	60	107	45	14	1	0615263	0614822
	14.25	0.5610	65	115	48	16	1	0615270	0614839
9/16	14.29	0.5626	65	115	48	16	1	0625200	0624791
	14.50	0.5709	65	115	48	16	1	0615287	0614846
37/64	14.68	0.5780	65	115	48	16	1	0625095	0624685
	14.80	0.5827	65	115	48	16	1	0622032	0135006
	15.00	0.5906	65	115	48	16	1	0615294	0614853
19/32	15.08	0.5937	65	115	48	16	1	0624944	0624531
	15.10	0.5945	65	115	48	16	1	0626436	0626023
	15.30	0.6024	65	115	48	16	1	7361287	7361259
39/64	15.48	0.6094	65	115	48	16	1	0625101	0624692
	15.50	0.6102	65	115	48	16	1	0615300	0614860
	15.80	0.6220	65	115	48	16	1	0135204	0622049
5/8	15.88	0.6252	65	115	48	16	1	0625170	0624760
	16.00	0.6299	65	115	48	16	1	0615317	0614877
41/64	16.27	0.6406	73	123	48	18	1	0625118	0624708
	16.50	0.6496	73	123	48	18	1	0135211	0626030
21/32	16.67	0.6563	73	123	48	18	1	0624968	0624555
	17.00	0.6693	73	123	48	18	1	0135228	0626047
43/64	17.07	0.6720	73	123	48	18	1	0625125	0624715
11/16	17.46	0.6874	73	123	48	18	1	0624852	0624449
	17.50	0.6890	73	123	48	18	1	0135235	0626054
	17.80	0.7008	73	123	48	18	1	0135273	—
45/64	17.86	0.7031	73	123	48	18	1	0625132	0624722
	18.00	0.7087	73	123	48	18	1	0135280	0626061
23/32	18.26	0.7189	79	131	50	20	1	0624982	0624579
	18.50	0.7283	79	131	50	20	1	0135297	0626078
47/64	18.65	0.7343	79	131	50	20	1	0625149	0624739
	18.80	0.7402	79	131	50	20	1	—	0622056
	19.00	0.7480	79	131	50	20	1	0135327	0626085
3/4	19.05	0.7500	79	131	50	20	1	0625040	0624630
	19.50	0.7677	79	131	50	20	1	0135334	0626092
	19.80	0.7795	79	131	50	20	1	0135341	0622063
	20.00	0.7874	79	131	50	20	1	0135358	0626108

DORMER FORCE M SOLID CARBIDE DRILL

Multi-Application, Short Length, Reinforced Shank

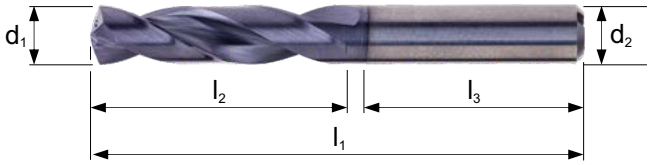
R467

2.1 2.2 2.3 2.4 4.1 4.2 4.3

5.1 5.2 5.3

Self-centering 4-facet split point and CTW flute construction for enhanced penetration rate specifically designed for Stainless Steel (ISO-M) materials. TiAlN coating increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cutting edges. Length designed for 3 x Diameter drilling depths.

High productivity in a wide range of materials



R467

DIN 6537 K

3XD

HM

140°

TiAlN

Coolant Through

3.00 - 16.00

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R467
	3.00	0.1181	20	62	36	6	1	7625100
	3.10	0.1220	20	62	36	6	1	7625101
1/8	3.18	0.1250	20	62	36	6	1	7625102
	3.20	0.1260	20	62	36	6	1	7625103
	3.30	0.1299	20	62	36	6	1	7625104
	3.40	0.1339	20	62	36	6	1	7625105
29	3.45	0.1360	20	62	36	6	1	7625106
	3.50	0.1378	20	62	36	6	1	7625107
9/64	3.57	0.1406	20	62	36	6	1	7625108
	3.60	0.1417	20	62	36	6	1	7625109
	3.70	0.1457	20	62	36	6	1	7625110
	3.80	0.1496	24	66	36	6	1	7625111
	3.90	0.1535	24	66	36	6	1	7625112
5/32	3.97	0.1563	24	66	36	6	1	7625113
	4.00	0.1575	24	66	36	6	1	7625114
	4.05	0.1594	24	66	36	6	1	7625115
	4.10	0.1614	24	66	36	6	1	7625116
	4.20	0.1654	24	66	36	6	1	7625117
	4.30	0.1693	24	66	36	6	1	7625118
11/64	4.37	0.1719	24	66	36	6	1	7625119
	4.40	0.1732	24	66	36	6	1	7625120
	4.50	0.1772	24	66	36	6	1	7625121
	4.60	0.1811	24	66	36	6	1	7625122
	4.70	0.1850	24	66	36	6	1	7625123
3/16	4.76	0.1875	28	66	36	6	1	7625124
	4.80	0.1890	28	66	36	6	1	7625125
	4.90	0.1929	28	66	36	6	1	7625126
	5.00	0.1969	28	66	36	6	1	7625127
	5.05	0.1988	28	66	36	6	1	7625128
	5.10	0.2008	28	66	36	6	1	7625129
7	5.11	0.2010	28	66	36	6	1	7625130
13/64	5.16	0.2031	28	66	36	6	1	7625131
	5.20	0.2047	28	66	36	6	1	7625132

FORCE M SOLID CARBIDE DRILL

DORMER

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R467
5	5.22	0.2055	28	66	36	6	1	7625133
	5.30	0.2087	28	66	36	6	1	7625134
	5.40	0.2126	28	66	36	6	1	7625135
	5.50	0.2165	28	66	36	6	1	7625136
7/32	5.56	0.2188	28	66	36	6	1	7625137
	5.60	0.2205	28	66	36	6	1	7625138
	5.70	0.2244	28	66	36	6	1	7625139
	5.80	0.2283	28	66	36	6	1	7625140
	5.90	0.2323	28	66	36	6	1	7625141
15/64	5.95	0.2344	28	66	36	6	1	7625142
	6.00	0.2362	28	66	36	6	1	7625143
	6.05	0.2382	34	79	36	8	1	7625144
	6.10	0.2402	34	79	36	8	1	7625145
	6.20	0.2441	34	79	36	8	1	7625146
	6.30	0.2480	34	79	36	8	1	7625147
1/4	6.35	0.2500	34	79	36	8	1	7625148
	6.40	0.2520	34	79	36	8	1	7625149
	6.50	0.2559	34	79	36	8	1	7625150
	6.60	0.2598	34	79	36	8	1	7625151
	6.70	0.2638	34	79	36	8	1	7625152
17/64	6.75	0.2656	34	79	36	8	1	7625153
	6.80	0.2677	34	79	36	8	1	7625154
	6.90	0.2717	34	79	36	8	1	7625155
	7.00	0.2756	34	79	36	8	1	7625156
	7.10	0.2795	41	79	36	8	1	7625157
9/32	7.14	0.2813	41	79	36	8	1	7625158
	7.20	0.2835	41	79	36	8	1	7625159
	7.30	0.2874	41	79	36	8	1	7625160
	7.40	0.2913	41	79	36	8	1	7625161
	7.50	0.2953	41	79	36	8	1	7625162
19/64	7.54	0.2969	41	79	36	8	1	7625163
	7.60	0.2992	41	79	36	8	1	7625164
	7.70	0.3031	41	79	36	8	1	7625165
	7.80	0.3071	41	79	36	8	1	7625166
	7.90	0.3110	41	79	36	8	1	7625167
5/16	7.94	0.3125	41	79	36	8	1	7625168
	8.00	0.3150	41	79	36	8	1	7625169
	8.05	0.3169	47	89	40	10	1	7625170
	8.10	0.3189	47	89	40	10	1	7625171
	8.20	0.3228	47	89	40	10	1	7625172
	8.30	0.3268	47	89	40	10	1	7625173
21/64	8.33	0.3281	47	89	40	10	1	7625174
	8.40	0.3307	47	89	40	10	1	7625175
	8.50	0.3346	47	89	40	10	1	7625176
	8.60	0.3386	47	89	40	10	1	7625177
	8.70	0.3425	47	89	40	10	1	7625178
11/32	8.73	0.3438	47	89	40	10	1	7625179
	8.80	0.3465	47	89	40	10	1	7625180
	8.90	0.3504	47	89	40	10	1	7625181
	9.00	0.3543	47	89	40	10	1	7625182
	9.10	0.3583	47	89	40	10	1	7625183
23/64	9.13	0.3594	47	89	40	10	1	7625184
	9.20	0.3622	47	89	40	10	1	7625185
	9.30	0.3661	47	89	40	10	1	7625186
	9.40	0.3701	47	89	40	10	1	7625187
	9.50	0.3740	47	89	40	10	1	7625188
3/8	9.53	0.3750	47	89	40	10	1	7625189
	9.60	0.3780	47	89	40	10	1	7625190
	9.70	0.3819	47	89	40	10	1	7625191
	9.80	0.3858	47	89	40	10	1	7625192
	9.90	0.3898	47	89	40	10	1	7625193
25/64	9.92	0.3906	47	89	40	10	1	7625194
	10.00	0.3937	47	89	40	10	1	7625195
	10.05	0.3957	55	102	45	12	1	7625196
	10.10	0.3976	55	102	45	12	1	7625197
	10.20	0.4016	55	102	45	12	1	7625198

FORCE M SOLID CARBIDE DRILL

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R467
	10.30	0.4055	55	102	45	12	1	7625199
13/32	10.32	0.4063	55	102	45	12	1	7625200
	10.40	0.4094	55	102	45	12	1	7625201
	10.50	0.4134	55	102	45	12	1	7625202
	10.60	0.4173	55	102	45	12	1	7625203
27/64	10.72	0.4219	55	102	45	12	1	7625204
	10.80	0.4252	55	102	45	12	1	7625205
	10.90	0.4291	55	102	45	12	1	7625206
	11.00	0.4331	55	102	45	12	1	7625207
7/16	11.11	0.4375	55	102	45	12	1	7625208
	11.20	0.4409	55	102	45	12	1	7625209
	11.30	0.4449	55	102	45	12	1	7625210
	11.40	0.4488	55	102	45	12	1	7625211
	11.50	0.4528	55	102	45	12	1	7625212
29/64	11.51	0.4531	55	102	45	12	1	7625213
	11.60	0.4567	55	102	45	12	1	7625214
	11.80	0.4646	55	102	45	12	1	7625215
15/32	11.91	0.4688	55	102	45	12	1	7625216
	12.00	0.4724	55	102	45	12	1	7625217
	12.05	0.4744	60	107	45	14	1	7625218
	12.10	0.4764	60	107	45	14	1	7625219
	12.20	0.4803	60	107	45	14	1	7625220
31/64	12.30	0.4844	60	107	45	14	1	7625221
	12.50	0.4921	60	107	45	14	1	7625222
1/2	12.70	0.5000	60	107	45	14	1	7625223
	12.70	0.5000	60	107	45	14	1	7625224
	12.80	0.5039	60	107	45	14	1	7625225
	13.00	0.5118	60	107	45	14	1	7625226
33/64	13.10	0.5156	60	107	45	14	1	7625227
	13.30	0.5236	60	107	45	14	1	7625228
17/32	13.49	0.5313	60	107	45	14	1	7625229
	13.50	0.5315	60	107	45	14	1	7625230
	13.80	0.5433	60	107	45	14	1	7625231
35/64	13.89	0.5469	60	107	45	14	1	7625232
	14.00	0.5512	60	107	45	14	1	7625233
	14.25	0.5610	65	115	48	16	1	7625234
9/16	14.29	0.5625	65	115	48	16	1	7625235
	14.50	0.5709	65	115	48	16	1	7625236
37/64	14.68	0.5781	65	115	48	16	1	7625237
	14.80	0.5827	65	115	48	16	1	7625238
	15.00	0.5906	65	115	48	16	1	7625239
19/32	15.08	0.5938	65	115	48	16	1	7625240
	15.10	0.5945	65	115	48	16	1	7625241
	15.30	0.6024	65	115	48	16	1	7625242
39/64	15.48	0.6094	65	115	48	16	1	7625243
	15.50	0.6102	65	115	48	16	1	7625244
	15.80	0.6220	65	115	48	16	1	7625245
5/8	15.88	0.6250	65	115	48	16	1	7625246
	16.00	0.6299	65	115	48	16	1	7625247

CDX SOLID CARBIDE DRILL

DORMER

Multi-Application, Jobber Length, Parallel Shank

R510

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 3.1 3.2 3.3 3.4 4.1 5.1
7.1 7.2 7.3 7.4 8.1 8.2

CDX

R510

DIN 338

4XD

HM

130°

3.00 - 14.25

Heavy-Duty design. Self centering Split Point for easier penetration.
TiN coating increases wear resistance and improves tool life.

d_1 Øh7 Inch	d_1 Øh7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R510
	3.00	0.1181	33	61	1	0115657
1/8	3.18	0.1250	36	65	1	0380802
	3.20	0.1260	36	65	1	0148990
	3.30	0.1299	36	65	1	0115664
	3.40	0.1339	39	70	1	0115671
	3.50	0.1378	39	70	1	0115688
	3.70	0.1457	39	70	1	0216781
	3.90	0.1535	43	75	1	0345245
	4.00	0.1575	43	75	1	0115695
	4.10	0.1614	43	75	1	0115701
	4.20	0.1654	43	75	1	0115718
	4.30	0.1693	47	80	1	0115725
	4.50	0.1772	47	80	1	0115732
	4.60	0.1811	47	80	1	0216798
	4.70	0.1850	47	80	1	0216804
3/16	4.76	0.1875	52	86	1	0380949
	4.90	0.1929	52	86	1	0115749
	5.00	0.1969	52	86	1	0115756
	5.10	0.2008	52	86	1	0115763
	5.50	0.2165	57	93	1	0115770
	5.60	0.2205	57	93	1	0216811
	5.70	0.2244	57	93	1	0216828
	6.00	0.2362	57	93	1	0115787
1/4	6.35	0.2500	63	101	1	0381038
	6.50	0.2559	63	101	1	0115794
	6.60	0.2598	63	101	1	0345252
	6.80	0.2677	69	109	1	0115800
	6.90	0.2717	69	109	1	0115817
	7.00	0.2756	69	109	1	0115824
	7.30	0.2874	69	109	1	0115831
	7.40	0.2913	69	109	1	0115848
	7.50	0.2953	69	109	1	0115855
	7.80	0.3071	75	117	1	0345269

CDX SOLID CARBIDE DRILL

d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R510
	7.90	0.3110	75	117	1	0345276
5/16	7.94	0.3125	75	117	1	0380963
	8.00	0.3150	75	117	1	0115862
	8.50	0.3346	75	117	1	0115879
	8.70	0.3425	81	125	1	0149003
	8.80	0.3465	81	125	1	0345283
	9.00	0.3543	81	125	1	0115886
	9.20	0.3622	81	125	1	0115893
	9.30	0.3661	81	125	1	0115909
	9.40	0.3701	81	125	1	0216835
	9.50	0.3740	81	125	1	0115916
3/8	9.52	0.3750	87	133	1	0381045
	9.90	0.3898	87	133	1	0345290
	10.00	0.3937	87	133	1	0115558
	10.20	0.4016	87	133	1	0115565
	10.30	0.4055	87	133	1	0216842
	10.40	0.4094	87	133	1	0115572
	10.50	0.4134	87	133	1	0115589
	10.80	0.4252	94	142	1	0345306
	11.00	0.4331	94	142	1	0115596
7/16	11.11	0.4375	94	142	1	0380987
	11.20	0.4409	94	142	1	0216859
	11.50	0.4528	94	142	1	0115602
	12.00	0.4724	101	151	1	0115619
1/2	12.70	0.5000	101	151	1	0381021
	13.00	0.5118	101	151	1	0115626
	14.00	0.5512	108	160	1	0115633
	14.25	0.5610	114	169	1	0115640

FORCE X SOLID CARBIDE DRILL

DORMER

Multi-Application, Standard Length, Reinforced Shank

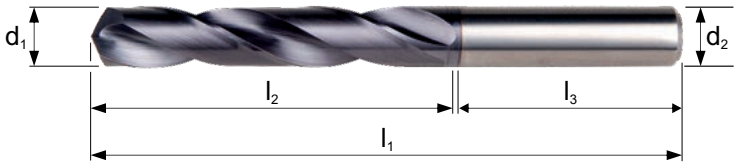
R454 Self centering 4-facet split point and CTW flute construction for enhanced penetration rate. TiAlN coating increases wear resistance, improves tool life at high RPM.

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

R453 Coolant through clears chips away from the cutting edge. Self centering 4-facet split point and CTW flute construction for enhanced penetration rates. TiAlN coating increases surface hardness, improves tool life at high RPM.

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

High productivity in a wide range of materials



R454	R453
DIN 6537 L	DIN 6537 L
5XD	5XD
HM	HM
140°	140°
TiAlN	TiAlN
	Coolant Through
3.00 - 20.00	3.00 - 20.00

d_1 Ø Inch	d_1 Øm$_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh$_6$ mm	Pack Qty	R454	R453
	3.00	0.1181	28	66	36	6	1	0614433	0614051
	3.10	0.1220	28	66	36	6	1	0625712	0625385
1/8	3.18	0.1252	28	66	36	6	1	0624029	0623619
	3.20	0.1260	28	66	36	6	1	0625729	0625392
30	3.26	0.1283	28	66	36	6	1	0041406	0040393
	3.30	0.1299	28	66	36	6	1	0614440	0616147
	3.40	0.1339	28	66	36	6	1	0614457	0614068
29	3.45	0.1358	28	66	36	6	1	0041413	0040409
	3.50	0.1378	28	66	36	6	1	0614464	0614075
28	3.57	0.1406	28	66	36	6	1	0041420	0040416
9/64	3.57	0.1406	28	66	36	6	1	0624401	0623992
	3.60	0.1417	28	66	36	6	1	0625736	0625408
27	3.66	0.1441	28	66	36	6	1	0041437	0040423
	3.70	0.1457	28	66	36	6	1	0625743	0625415
26	3.73	0.1469	36	74	36	6	1	0041444	0040430
25	3.80	0.1496	36	74	36	6	1	0625750	0625422
24	3.86	0.1520	36	74	36	6	1	0041468	0040454
	3.90	0.1535	36	74	36	6	1	0625767	0628911
23	3.91	0.1539	36	74	36	6	1	0041475	0040461
5/32	3.97	0.1563	36	74	36	6	1	0624340	0623930
22	3.99	0.1571	36	74	36	6	1	0041482	0040478
	4.00	0.1575	36	74	36	6	1	0614471	0614082
21	4.04	0.1591	36	74	36	6	1	0041499	0040485
	4.05	0.1594	36	74	36	6	1	—	0625439
20	4.09	0.1610	36	74	36	6	1	0041505	0040492
	4.10	0.1614	36	74	36	6	1	0625774	0625446
	4.20	0.1654	36	74	36	6	1	0614488	0616154
19	4.22	0.1661	36	74	36	6	1	0041512	0040508
	4.30	0.1693	36	74	36	6	1	0614495	0614099
18	4.31	0.1697	36	74	36	6	1	0041529	0040515
11/64	4.37	0.1720	36	74	36	6	1	0624050	0623640
17	4.39	0.1728	36	74	36	6	1	0041536	0040522
	4.40	0.1732	36	74	36	6	1	0134450	0134191

FORCE X SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
	4.50	0.1772	36	74	36	6	1	0614501	0614105
16	4.50	0.1772	36	74	36	6	1	0041543	0040539
15	4.57	0.1799	36	74	36	6	1	0041550	0040546
	4.60	0.1811	36	74	36	6	1	0625781	0625453
14	4.62	0.1819	36	74	36	6	1	0041567	0040553
13	4.70	0.1850	36	74	36	6	1	0625798	0625460
3/16	4.76	0.1874	44	82	36	6	1	0624210	0623800
12	4.80	0.1890	44	82	36	6	1	0134467	0134207
11	4.85	0.1909	44	82	36	6	1	0041598	0040584
	4.90	0.1929	44	82	36	6	1	0134474	0134214
10	4.92	0.1937	44	82	36	6	1	0041604	0040591
9	4.98	0.1961	44	82	36	6	1	0041611	0040607
	5.00	0.1969	44	82	36	6	1	0614518	0614112
	5.05	0.1988	44	82	36	6	1	—	0625477
8	5.06	0.1992	44	82	36	6	1	0041628	0040614
	5.10	0.2008	44	82	36	6	1	0614525	0614129
7	5.11	0.2012	44	82	36	6	1	0041635	0040621
13/64	5.16	0.2031	44	82	36	6	1	0624074	0623664
6	5.18	0.2039	44	82	36	6	1	0041642	0040638
	5.20	0.2047	44	82	36	6	1	0134481	0134221
5	5.22	0.2055	44	82	36	6	1	0041659	0040645
	5.30	0.2087	44	82	36	6	1	—	7361201
4	5.31	0.2091	44	82	36	6	1	0041666	0040652
	5.40	0.2126	44	82	36	6	1	—	7361202
3	5.41	0.2130	44	82	36	6	1	0041673	0040669
	5.50	0.2165	44	82	36	6	1	0614532	0614136
7/32	5.56	0.2189	44	82	36	6	1	0624371	0623961
	5.60	0.2205	44	82	36	6	1	0625804	0625484
2	5.61	0.2209	44	82	36	6	1	0041680	0040676
	5.70	0.2244	44	82	36	6	1	0625811	0625491
1	5.79	0.2280	44	82	36	6	1	0041697	0040683
	5.80	0.2283	44	82	36	6	1	0625828	0625507
	5.90	0.2323	44	82	36	6	1	—	7361203
A	5.94	0.2339	44	82	36	6	1	0041703	0040690
15/64	5.95	0.2343	44	82	36	6	1	0624098	0623688
	6.00	0.2362	44	82	36	6	1	0614549	0614143
B	6.03	0.2374	53	91	36	8	1	7361224	7361204
	6.05	0.2382	53	91	36	8	1	—	0625514
	6.10	0.2402	53	91	36	8	1	0625835	0625521
C	6.15	0.2421	53	91	36	8	1	7361225	7361205
	6.20	0.2441	53	91	36	8	1	0134498	0134238
D	6.25	0.2461	53	91	36	8	1	0041710	0040706
	6.30	0.2480	53	91	36	8	1	0625842	0625538
1/4	6.35	0.2500	53	91	36	8	1	0624012	0623602
E	6.35	0.2500	53	91	36	8	1	7361226	7361206
	6.40	0.2520	53	91	36	8	1	0134504	0134245
	6.50	0.2559	53	91	36	8	1	0614556	0614150
F	6.53	0.2571	53	91	36	8	1	7361227	7361207
	6.60	0.2598	53	91	36	8	1	0625859	0625545
G	6.63	0.2610	53	91	36	8	1	7361228	7361208
	6.70	0.2638	53	91	36	8	1	0614563	0134252
17/64	6.75	0.2657	53	91	36	8	1	0624111	0623701
H	6.76	0.2661	53	91	36	8	1	0041727	0041291
	6.80	0.2677	53	91	36	8	1	0614570	0616116
	6.90	0.2717	53	91	36	8	1	0614587	0614167
I	6.91	0.2720	53	91	36	8	1	7361229	7361209
	7.00	0.2756	53	91	36	8	1	0614594	0614174
J	7.04	0.2772	53	91	36	8	1	7361230	7361210
	7.10	0.2795	53	91	36	8	1	0625866	0625552
K	7.14	0.2811	53	91	36	8	1	7361231	7361211
9/32	7.14	0.2811	53	91	36	8	1	0624395	0623985
	7.20	0.2835	53	91	36	8	1	—	7361212
	7.30	0.2874	53	91	36	8	1	0625873	0625569
L	7.37	0.2902	53	91	36	8	1	0041734	0041307
	7.40	0.2913	53	91	36	8	1	0614600	0616161

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
M	7.49	0.2949	53	91	36	8	1	0041741	0041314
	7.50	0.2953	53	91	36	8	1	0614617	0614181
19/64	7.54	0.2969	53	91	36	8	1	0624135	0623725
	7.60	0.2992	53	91	36	8	1	0625880	0625576
N	7.67	0.3020	53	91	36	8	1	0041758	0041321
	7.70	0.3031	53	91	36	8	1	0134511	0134306
	7.80	0.3071	53	91	36	8	1	0625897	0625583
	7.90	0.3110	53	91	36	8	1	0134528	0134313
5/16	7.94	0.3126	53	91	36	8	1	0624333	0623923
	8.00	0.3150	53	91	36	8	1	0614624	0614198
O	8.03	0.3161	61	103	40	10	1	0041765	0041338
	8.05	0.3169	61	103	40	10	1	—	0625590
	8.10	0.3189	61	103	40	10	1	0625903	0625606
	8.20	0.3228	61	103	40	10	1	0134535	0134320
P	8.20	0.3228	61	103	40	10	1	7361232	7361213
	8.30	0.3268	61	103	40	10	1	—	7361214
21/64	8.33	0.3280	61	103	40	10	1	0624159	0623749
	8.40	0.3307	61	103	40	10	1	0134542	0134337
Q	8.43	0.3319	61	103	40	10	1	0041772	0041345
	8.50	0.3346	61	103	40	10	1	0614631	0614204
	8.60	0.3386	61	103	40	10	1	0614648	0616178
R	8.61	0.3390	61	103	40	10	1	7361233	7361215
	8.70	0.3425	61	103	40	10	1	0614655	0614211
11/32	8.73	0.3437	61	103	40	10	1	0624043	0623633
	8.80	0.3465	61	103	40	10	1	0625910	0625613
S	8.84	0.3480	61	103	40	10	1	7361234	7361216
	8.90	0.3504	61	103	40	10	1	0134559	0134344
	9.00	0.3543	61	103	40	10	1	0614662	0614228
T	9.09	0.3579	61	103	40	10	1	0041789	0041352
	9.10	0.3583	61	103	40	10	1	0625927	0625620
23/64	9.13	0.3594	61	103	40	10	1	0624173	0623763
	9.20	0.3622	61	103	40	10	1	—	7361217
	9.30	0.3661	61	103	40	10	1	0614679	0616123
U	9.35	0.3681	61	103	40	10	1	0041796	0041369
	9.40	0.3701	61	103	40	10	1	0134566	0134351
	9.50	0.3740	61	103	40	10	1	0614686	0614235
3/8	9.52	0.3748	61	103	40	10	1	0624234	0623824
V	9.58	0.3772	61	103	40	10	1	7361235	7361218
	9.60	0.3780	61	103	40	10	1	0625934	0625637
	9.70	0.3819	61	103	40	10	1	0134573	0629055
	9.80	0.3858	61	103	40	10	1	0625941	0625644
W	9.80	0.3858	61	103	40	10	1	7361236	7361219
	9.90	0.3898	61	103	40	10	1	0134580	0134368
25/64	9.92	0.3906	61	103	40	10	1	0624180	0623770
	10.00	0.3937	61	103	40	10	1	0614242	0613870
	10.05	0.3957	70	118	45	12	1	—	0625231
X	10.08	0.3969	70	118	45	12	1	0041802	0041376
	10.10	0.3976	70	118	45	12	1	0625651	0625248
	10.20	0.4016	70	118	45	12	1	0614259	0613887
Y	10.26	0.4039	70	118	45	12	1	0041819	0041383
	10.30	0.4055	70	118	45	12	1	0614266	0613894
13/32	10.32	0.4063	70	118	45	12	1	0624067	0623657
	10.40	0.4094	70	118	45	12	1	0614273	0616130
Z	10.49	0.4130	70	118	45	12	1	0041826	0041390
	10.50	0.4134	70	118	45	12	1	0614280	0613900
	10.60	0.4173	70	118	45	12	1	0625668	0625255
27/64	10.72	0.4220	70	118	45	12	1	0624197	0623787
	10.80	0.4252	70	118	45	12	1	—	7361220
	11.00	0.4331	70	118	45	12	1	0614297	0613917
7/16	11.11	0.4374	70	118	45	12	1	0624364	0623954
	11.20	0.4409	70	118	45	12	1	0614303	0613924
	11.30	0.4449	70	118	45	12	1	—	7361221
	11.40	0.4488	70	118	45	12	1	0134597	0134375
	11.50	0.4528	70	118	45	12	1	0614310	0613931

FORCE X SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
29/64	11.51	0.4531	70	118	45	12	1	0624203	0623794
	11.60	0.4567	70	118	45	12	1	0134603	0134382
	11.80	0.4646	70	118	45	12	1	0625675	0625262
15/32	11.91	0.4689	70	118	45	12	1	0624081	0623671
	12.00	0.4724	70	118	45	12	1	0614327	0613948
	12.05	0.4744	76	124	45	14	1	—	0625279
	12.10	0.4764	76	124	45	14	1	0625682	—
	12.20	0.4803	76	124	45	14	1	0614334	0613955
31/64	12.30	0.4843	76	124	45	14	1	0624241	0623831
	12.50	0.4921	76	124	45	14	1	0614341	0613962
	12.70	0.5000	76	124	45	14	1	0625699	0625286
1/2	12.70	0.5000	76	124	45	14	1	0624005	0623596
	12.80	0.5039	76	124	45	14	1	0134610	0134399
	13.00	0.5118	76	124	45	14	1	0614358	0613979
33/64	13.10	0.5157	76	124	45	14	1	0624258	0623848
	13.30	0.5236	76	124	45	14	1	—	7361222
17/32	13.49	0.5311	76	124	45	14	1	0624104	0623695
	13.50	0.5315	76	124	45	14	1	0614365	0613986
	13.80	0.5433	76	124	45	14	1	0134627	0134405
35/64	13.89	0.5469	76	124	45	14	1	0624265	0623855
	14.00	0.5512	76	124	45	14	1	0614372	0613993
	14.25	0.5610	82	133	48	16	1	0614389	0614006
9/16	14.29	0.5626	82	133	48	16	1	0624388	0623978
	14.50	0.5709	82	133	48	16	1	0614396	0614013
37/64	14.68	0.5780	82	133	48	16	1	0624272	0623862
	14.80	0.5827	82	133	48	16	1	0134634	0134412
	15.00	0.5906	82	133	48	16	1	0614402	0614020
19/32	15.08	0.5937	82	133	48	16	1	0624128	0623718
	15.10	0.5945	82	133	48	16	1	0625705	0625293
	15.30	0.6024	82	133	48	16	1	—	7361223
39/64	15.48	0.6094	82	133	48	16	1	0624289	0623879
	15.50	0.6102	82	133	48	16	1	0614419	0614037
	15.80	0.6220	82	133	48	16	1	0134641	0134429
5/8	15.88	0.6252	82	133	48	16	1	0624357	0623947
	16.00	0.6299	82	133	48	16	1	0614426	0614044
41/64	16.27	0.6406	91	143	48	18	1	0624296	0623886
	16.50	0.6496	91	143	48	18	1	0134658	0625309
21/32	16.67	0.6563	91	143	48	18	1	0624142	0623732
	17.00	0.6693	91	143	48	18	1	0134665	0625316
43/64	17.07	0.6720	91	143	48	18	1	0624302	0623893
11/16	17.46	0.6874	91	143	48	18	1	0624036	0623626
	17.50	0.6890	91	143	48	18	1	0134672	0625323
	17.80	0.7008	91	143	48	18	1	0134689	0134436
45/64	17.86	0.7031	91	143	48	18	1	0624319	0623909
	18.00	0.7087	91	143	48	18	1	0134696	0625330
23/32	18.26	0.7189	99	153	50	20	1	0624166	0623756
	18.50	0.7283	99	153	50	20	1	0134702	0625347
47/64	18.65	0.7343	99	153	50	20	1	0624326	0623916
	19.00	0.7480	99	153	50	20	1	0134719	0625354
3/4	19.05	0.7500	99	153	50	20	1	0624227	0623817
	19.50	0.7677	99	153	50	20	1	0134726	0625361
	19.80	0.7795	99	153	50	20	1	0134733	0134443
	20.00	0.7874	99	153	50	20	1	0134740	0625378

FORCE M SOLID CARBIDE DRILL

DORMER

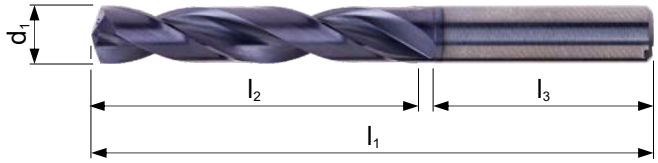
Multi-Application, Standard Length, Reinforced Shank

R463

2.1 2.2 2.3 2.4 4.1 4.2 4.3
5.1 5.2 5.3

Self-centering 4-facet split point and CTW flute construction for enhanced penetration rate specifically designed for Stainless Steel (ISO-M) materials. TiAlN coating increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cutting edges. Length designed for 5 x Diameter drilling depths.

High productivity in a wide range of materials



R463

DIN 6537 L

5XD

HM

140°

TiAlN

Coolant Through

3.00 - 16.00

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R463
	3.00	0.1181	28	66	36	6	1	7624913
	3.10	0.1220	28	66	36	6	1	7624914
1/8	3.18	0.1250	28	66	36	6	1	7624915
	3.20	0.1260	28	66	36	6	1	7624916
	3.30	0.1299	28	66	36	6	1	7624917
	3.40	0.1339	28	66	36	6	1	7624918
29	3.45	0.1360	28	66	36	6	1	7624919
	3.50	0.1378	28	66	36	6	1	7624960
9/64	3.57	0.1406	28	66	36	6	1	7624961
	3.60	0.1417	28	66	36	6	1	7624962
	3.70	0.1457	28	66	36	6	1	7624963
	3.80	0.1496	36	74	36	6	1	7624964
	3.90	0.1535	36	74	36	6	1	7624965
5/32	3.97	0.1563	36	74	36	6	1	7624966
	4.00	0.1575	36	74	36	6	1	7624967
	4.05	0.1594	36	74	36	6	1	7624968
	4.10	0.1614	36	74	36	6	1	7624969
	4.20	0.1654	36	74	36	6	1	7624970
	4.30	0.1693	36	74	36	6	1	7624971
11/64	4.37	0.1719	36	74	36	6	1	7624972
	4.40	0.1732	36	74	36	6	1	7624973
	4.50	0.1772	36	74	36	6	1	7624974
	4.60	0.1811	36	74	36	6	1	7624975
	4.70	0.1850	36	74	36	6	1	7624976
3/16	4.76	0.1875	44	82	36	6	1	7624977
	4.80	0.1890	44	82	36	6	1	7624978
	4.90	0.1929	44	82	36	6	1	7624979
	5.00	0.1969	44	82	36	6	1	7624980
	5.05	0.1988	44	82	36	6	1	7624981
	5.10	0.2008	44	82	36	6	1	7624982
7	5.11	0.2010	44	82	36	6	1	7624983
13/64	5.16	0.2031	44	82	36	6	1	7624984
	5.20	0.2047	44	82	36	6	1	7624985

FORCE M SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R463
5	5.22	0.2055	44	82	36	6	1	7624986
	5.30	0.2087	44	82	36	6	1	7624987
	5.40	0.2126	44	82	36	6	1	7624988
	5.50	0.2165	44	82	36	6	1	7624989
7/32	5.56	0.2188	44	82	36	6	1	7624990
	5.60	0.2205	44	82	36	6	1	7624991
	5.70	0.2244	44	82	36	6	1	7624992
	5.80	0.2283	44	82	36	6	1	7624993
	5.90	0.2323	44	82	36	6	1	7624994
15/64	5.95	0.2344	44	82	36	6	1	7624995
	6.00	0.2362	44	82	36	6	1	7624996
	6.05	0.2382	53	91	36	8	1	7624997
	6.10	0.2402	53	91	36	8	1	7624998
	6.20	0.2441	53	91	36	8	1	7624999
	6.30	0.2480	53	91	36	8	1	7625000
1/4	6.35	0.2500	53	91	36	8	1	7625001
	6.40	0.2520	53	91	36	8	1	7625002
	6.50	0.2559	53	91	36	8	1	7625003
	6.60	0.2598	53	91	36	8	1	7625004
	6.70	0.2638	53	91	36	8	1	7625005
17/64	6.75	0.2656	53	91	36	8	1	7625006
	6.80	0.2677	53	91	36	8	1	7625007
	6.90	0.2717	53	91	36	8	1	7625008
	7.00	0.2756	53	91	36	8	1	7625009
	7.10	0.2795	53	91	36	8	1	7625010
9/32	7.14	0.2813	53	91	36	8	1	7625011
	7.20	0.2835	53	91	36	8	1	7625012
	7.30	0.2874	53	91	36	8	1	7625013
	7.40	0.2913	53	91	36	8	1	7625014
	7.50	0.2953	53	91	36	8	1	7625015
19/64	7.54	0.2969	53	91	36	8	1	7625016
	7.60	0.2992	53	91	36	8	1	7625017
	7.70	0.3031	53	91	36	8	1	7625018
	7.80	0.3071	53	91	36	8	1	7625019
	7.90	0.3110	53	91	36	8	1	7625020
5/16	7.94	0.3125	53	91	36	8	1	7625021
	8.00	0.3150	53	91	36	8	1	7625022
	8.05	0.3169	61	103	40	10	1	7625023
	8.10	0.3189	61	103	40	10	1	7625024
	8.20	0.3228	61	103	40	10	1	7625025
	8.30	0.3268	61	103	40	10	1	7625026
21/64	8.33	0.3281	61	103	40	10	1	7625027
	8.40	0.3307	61	103	40	10	1	7625028
	8.50	0.3346	61	103	40	10	1	7625029
	8.60	0.3386	61	103	40	10	1	7625030
	8.70	0.3425	61	103	40	10	1	7625031
11/32	8.73	0.3438	61	103	40	10	1	7625032
	8.80	0.3465	61	103	40	10	1	7625033
	8.90	0.3504	61	103	40	10	1	7625034
	9.00	0.3543	61	103	40	10	1	7625035
	9.10	0.3583	61	103	40	10	1	7625036
23/64	9.13	0.3594	61	103	40	10	1	7625037
	9.20	0.3622	61	103	40	10	1	7625038
	9.30	0.3661	61	103	40	10	1	7625039
	9.40	0.3701	61	103	40	10	1	7625040
	9.50	0.3740	61	103	40	10	1	7625041
3/8	9.53	0.3750	61	103	40	10	1	7625042
	9.60	0.3780	61	103	40	10	1	7625043
	9.70	0.3819	61	103	40	10	1	7625044
	9.80	0.3858	61	103	40	10	1	7625045
	9.90	0.3898	61	103	40	10	1	7625046
25/64	9.92	0.3906	61	103	40	10	1	7625047
	10.00	0.3937	61	103	40	10	1	7625048
	10.05	0.3957	70	118	45	12	1	7625049
	10.10	0.3976	70	118	45	12	1	7625050

FORCE M SOLID CARBIDE DRILL

DORMER

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R463
	10.20	0.4016	70	118	45	12	1	7625051
	10.30	0.4055	70	118	45	12	1	7625052
13/32	10.32	0.4063	70	118	45	12	1	7625053
	10.40	0.4094	70	118	45	12	1	7625054
	10.50	0.4134	70	118	45	12	1	7625055
	10.60	0.4173	70	118	45	12	1	7625056
27/64	10.72	0.4219	70	118	45	12	1	7625057
	10.80	0.4252	70	118	45	12	1	7625058
	10.90	0.4291	70	118	45	12	1	7625059
	11.00	0.4331	70	118	45	12	1	7625060
7/16	11.11	0.4375	70	118	45	12	1	7625061
	11.20	0.4409	70	118	45	12	1	7625062
	11.30	0.4449	70	118	45	12	1	7625063
	11.40	0.4488	70	118	45	12	1	7625064
	11.50	0.4528	70	118	45	12	1	7625065
29/64	11.51	0.4531	70	118	45	12	1	7625066
	11.60	0.4567	70	118	45	12	1	7625067
	11.80	0.4646	70	118	45	12	1	7625068
15/32	11.91	0.4688	70	118	45	12	1	7625069
	12.00	0.4724	70	118	45	12	1	7625070
	12.05	0.4744	76	124	45	14	1	7625071
	12.20	0.4803	76	124	45	14	1	7625072
31/64	12.30	0.4844	76	124	45	14	1	7625073
	12.50	0.4921	76	124	45	14	1	7625074
1/2	12.70	0.5000	76	124	45	14	1	7625075
	12.70	0.5000	76	124	45	14	1	7625076
	12.80	0.5039	76	124	45	14	1	7625077
	13.00	0.5118	76	124	45	14	1	7625078
33/64	13.10	0.5156	76	124	45	14	1	7625079
	13.30	0.5236	76	124	45	14	1	7625080
17/32	13.49	0.5313	76	124	45	14	1	7625081
	13.50	0.5315	76	124	45	14	1	7625082
	13.80	0.5433	76	124	45	14	1	7625083
35/64	13.89	0.5469	76	124	45	14	1	7625084
	14.00	0.5512	76	124	45	14	1	7625085
	14.25	0.5610	82	133	48	16	1	7625086
9/16	14.29	0.5625	82	133	48	16	1	7625087
	14.50	0.5709	82	133	48	16	1	7625088
37/64	14.68	0.5781	82	133	48	16	1	7625089
	14.80	0.5827	82	133	48	16	1	7625090
	15.00	0.5906	82	133	48	16	1	7625091
19/32	15.08	0.5938	82	133	48	16	1	7625092
	15.10	0.5945	82	133	48	16	1	7625093
	15.30	0.6024	82	133	48	16	1	7625094
39/64	15.48	0.6094	82	133	48	16	1	7625095
	15.50	0.6102	82	133	48	16	1	7625096
	15.80	0.6220	82	133	48	16	1	7625097
5/8	15.88	0.6250	82	133	48	16	1	7625098
	16.00	0.6299	82	133	48	16	1	7625099

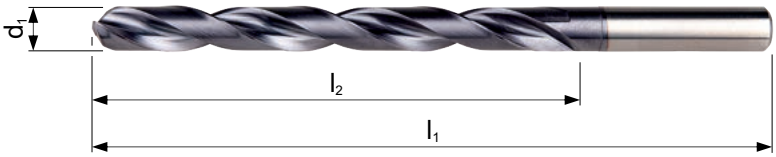
FORCE X SOLID CARBIDE DRILL

Multi-Application, 8xD, Reinforced Shank

R459 Coolant through clears chips away from the cutting edge. Self centering 4-flute split point and CTW flute construction for enhanced penetration rates. TiAlN coating increases surface hardness, improves tool life at high RPM.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4
6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

High productivity in a wide range of materials



R459

Coolant Through

3.00 - 16.00

d_1 Øm$_7$ Inch	d_1 Øm$_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh$_6$ mm	Pack Qty	R459
	3.00	0.1181	37	79	36	6	1	46718973
	3.10	0.1220	37	79	36	6	1	46718974
1/8	3.18	0.1252	37	79	36	6	1	46718975
	3.20	0.1260	37	79	36	6	1	46718976
	3.30	0.1299	37	79	36	6	1	46718977
	3.40	0.1339	37	79	36	6	1	46718978
	3.50	0.1378	37	79	36	6	1	46718979
9/64	3.57	0.1406	37	79	36	6	1	46718990
	3.60	0.1417	37	79	36	6	1	46718991
	3.70	0.1457	37	79	36	6	1	46718992
	3.80	0.1496	48	90	36	6	1	46718993
	3.90	0.1535	48	90	36	6	1	46718994
5/32	3.97	0.1563	48	90	36	6	1	46718995
	4.00	0.1575	48	90	36	6	1	46718996
	4.10	0.1614	48	90	36	6	1	46718997
	4.20	0.1654	48	90	36	6	1	46718998
	4.30	0.1693	48	90	36	6	1	46718999
11/64	4.37	0.1720	48	90	36	6	1	46719000
	4.40	0.1732	48	90	36	6	1	46719001
	4.50	0.1772	48	90	36	6	1	46719002
	4.60	0.1811	48	90	36	6	1	46719003
	4.70	0.1850	62	104	36	6	1	46719004
3/16	4.76	0.1874	62	104	36	6	1	46719005
	4.80	0.1890	62	104	36	6	1	46719006
	4.90	0.1929	62	104	36	6	1	46719007
	5.00	0.1969	62	104	36	6	1	46719008
	5.10	0.2008	62	104	36	6	1	46719009
13/64	5.16	0.2031	62	104	36	6	1	46719010
	5.20	0.2047	62	104	36	6	1	46719011
	5.30	0.2087	62	104	36	6	1	46719012
	5.40	0.2126	62	104	36	6	1	46719013
	5.50	0.2165	62	104	36	6	1	46719014

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 $Øm_7$ Inch	d_1 $Øm_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $Øh_6$ mm	Pack Qty	R459
7/32	5.56	0.2189	62	104	36	6	1	46719015
	5.60	0.2205	62	104	36	6	1	46719016
	5.70	0.2244	62	104	36	6	1	46719017
	5.80	0.2283	62	104	36	6	1	46719018
	5.90	0.2323	62	104	36	6	1	46719019
15/64	5.95	0.2343	62	104	36	6	1	46719020
	6.00	0.2362	62	104	36	6	1	46719021
	6.10	0.2402	84	126	36	8	1	46719022
	6.20	0.2441	84	126	36	8	1	46719023
	6.30	0.2480	84	126	36	8	1	46719024
1/4	6.35	0.2500	84	126	36	8	1	46719025
	6.40	0.2520	84	126	36	8	1	46719026
	6.50	0.2559	84	126	36	8	1	46719027
	6.60	0.2598	84	126	36	8	1	46719028
	6.70	0.2638	84	126	36	8	1	46719029
17/64	6.75	0.2657	84	126	36	8	1	46719030
	6.80	0.2677	84	126	36	8	1	46719031
	6.90	0.2717	84	126	36	8	1	46719032
	7.00	0.2756	84	126	36	8	1	46719033
	7.10	0.2795	84	126	36	8	1	46719034
9/32	7.14	0.2811	84	126	36	8	1	46719035
	7.20	0.2835	84	126	36	8	1	46719036
	7.30	0.2874	84	126	36	8	1	46719037
	7.40	0.2913	84	126	36	8	1	46719038
	7.50	0.2953	84	126	36	8	1	46719039
19/64	7.54	0.2969	84	126	36	8	1	46719040
	7.60	0.2992	84	126	36	8	1	46719041
	7.70	0.3031	84	126	36	8	1	46719042
	7.80	0.3071	84	126	36	8	1	46719043
	7.90	0.3110	84	126	36	8	1	46719044
5/16	7.94	0.3126	84	126	36	8	1	46719045
	8.00	0.3150	84	126	36	8	1	46719046
	8.10	0.3189	106	152	40	10	1	46719047
	8.20	0.3228	106	152	40	10	1	46719048
	8.30	0.3268	106	152	40	10	1	46719049
21/64	8.33	0.3280	106	152	40	10	1	46719050
	8.40	0.3307	106	152	40	10	1	46719051
	8.50	0.3346	106	152	40	10	1	46719052
	8.60	0.3386	106	152	40	10	1	46719053
	8.70	0.3425	106	152	40	10	1	46719054
11/32	8.73	0.3437	106	152	40	10	1	46719055
	8.80	0.3465	106	152	40	10	1	46719056
	8.90	0.3504	106	152	40	10	1	46719057
	9.00	0.3543	106	152	40	10	1	46719058
	9.10	0.3583	106	152	40	10	1	46719059
23/64	9.13	0.3594	106	152	40	10	1	46719060
	9.20	0.3622	106	152	40	10	1	46719061
	9.30	0.3661	106	152	40	10	1	46719062
	9.40	0.3701	106	152	40	10	1	46719063
	9.50	0.3740	106	152	40	10	1	46719064
3/8	9.53	0.3748	106	152	40	10	1	46719065
	9.60	0.3780	106	152	40	10	1	46719066
	9.70	0.3819	106	152	40	10	1	46719067
	9.80	0.3858	106	152	40	10	1	46719068
	9.90	0.3898	106	152	40	10	1	46719069
25/64	9.92	0.3906	106	152	40	10	1	46719070
	10.00	0.3937	106	152	40	10	1	46719071
	10.20	0.4016	128	180	45	12	1	46719072
	10.30	0.4055	128	180	45	12	1	46719073
13/32	10.32	0.4063	128	180	45	12	1	46719074
	10.40	0.4094	128	180	45	12	1	46719075
	10.50	0.4134	128	180	45	12	1	46719076
27/64	10.72	0.4220	128	180	45	12	1	46719077
	10.80	0.4252	128	180	45	12	1	46719078

FORCE X SOLID CARBIDE DRILL

d_1 $Øm_7$ Inch	d_1 $Øm_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $Øh_6$ mm	Pack Qty	R459
	11.00	0.4331	128	180	45	12	1	46719079
7/16	11.11	0.4374	128	180	45	12	1	46719080
	11.20	0.4409	128	180	45	12	1	46719081
	11.30	0.4449	128	180	45	12	1	46719082
	11.50	0.4528	128	180	45	12	1	46719083
29/64	11.51	0.4531	128	180	45	12	1	46719084
	11.80	0.4646	128	180	45	12	1	46719085
15/32	11.91	0.4689	128	180	45	12	1	46719086
	12.00	0.4724	128	180	45	12	1	46719087
	12.20	0.4803	151	202	48	14	1	46719088
31/64	12.30	0.4843	151	202	48	14	1	46719089
	12.50	0.4921	151	202	48	14	1	46719090
1/2	12.70	0.5000	151	202	48	14	1	46719091
	12.80	0.5039	151	202	48	14	1	46719092
	13.00	0.5118	151	202	48	14	1	46719093
33/64	13.10	0.5157	151	202	48	14	1	46719094
17/32	13.49	0.5311	151	202	48	14	1	46719095
	13.50	0.5315	151	202	48	14	1	46719096
35/64	13.89	0.5469	151	202	48	14	1	46719097
	14.00	0.5512	151	202	48	14	1	46719098
	14.25	0.5610	172	227	48	16	1	46719099
9/16	14.29	0.5626	172	227	48	16	1	46719100
	14.50	0.5709	172	227	48	16	1	46719101
37/64	14.68	0.5780	172	227	48	16	1	46719102
	15.00	0.5906	172	227	48	16	1	46719103
19/32	15.08	0.5937	172	227	48	16	1	46719104
	15.10	0.5945	172	227	48	16	1	46719105
39/64	15.48	0.6094	172	227	48	16	1	46719106
	15.50	0.6102	172	227	48	16	1	46719107
5/8	15.88	0.6252	172	227	48	16	1	46719108
	16.00	0.6299	172	227	48	16	1	46719109

ADX SCREW MACHINE DRILL

DORMER

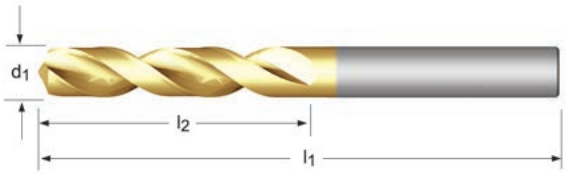
Multi-Application, Screw Machine Length

A520

ADX

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3

Low thrust design. Notched point improves chip formation for enhanced penetration rate. TiN coating increases wear resistance and improves tool life.



A520

3.00 - 13.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	3.00	0.1181	16	46	1	0038901
	3.10	0.1220	18	49	1	0038918
1/8	3.18	0.1250	18	49	1	0171264
	3.20	0.1260	18	49	1	0038925
	3.30	0.1299	18	49	1	0038932
	3.40	0.1339	20	52	1	0038949
	3.50	0.1378	20	52	1	0038956
9/64	3.57	0.1406	20	52	1	0171271
	3.60	0.1417	20	52	1	0038963
	3.70	0.1457	20	52	1	0038970
	3.80	0.1496	22	55	1	0038987
	3.90	0.1535	22	55	1	0038994
5/32	3.97	0.1563	22	55	1	0171288
	4.00	0.1575	22	55	1	0039007
	4.10	0.1614	22	55	1	0039014
	4.20	0.1654	22	55	1	0039021
	4.30	0.1693	24	58	1	0039038
11/64	4.37	0.1719	24	58	1	0171295
	4.40	0.1732	24	58	1	0039045
	4.50	0.1772	24	58	1	0039052
	4.60	0.1811	24	58	1	0039069
	4.70	0.1850	24	58	1	0039076
3/16	4.76	0.1875	26	62	1	0171301
	4.80	0.1890	26	62	1	0039083
	4.90	0.1929	26	62	1	0039090
	5.00	0.1969	26	62	1	0039106
	5.10	0.2008	26	62	1	0039113
13/64	5.16	0.2031	26	62	1	0171318
	5.20	0.2047	26	62	1	0039120
	5.30	0.2087	26	62	1	0039137
	5.40	0.2126	28	66	1	0039144
	5.50	0.2165	28	66	1	0039151
7/32	5.56	0.2188	28	66	1	0171325

ADX SCREW MACHINE DRILL

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	5.60	0.2205	28	66	1	0039168
	5.70	0.2244	28	66	1	0039175
	5.80	0.2283	28	66	1	0039182
	5.90	0.2323	28	66	1	0039199
15/64	5.95	0.2344	28	66	1	0171332
	6.00	0.2362	28	66	1	0039205
	6.10	0.2402	31	70	1	0039212
	6.20	0.2441	31	70	1	0039229
	6.30	0.2480	31	70	1	0039236
1/4	6.35	0.2500	31	70	1	0171349
	6.40	0.2520	31	70	1	0039243
	6.50	0.2559	31	70	1	0039250
	6.60	0.2598	31	70	1	0039267
	6.70	0.2638	31	70	1	0039274
17/64	6.75	0.2656	34	74	1	0171356
	6.80	0.2677	34	74	1	0039281
	6.90	0.2717	34	74	1	0039298
	7.00	0.2756	34	74	1	0039304
	7.10	0.2795	34	74	1	0039311
9/32	7.14	0.2812	34	74	1	0171363
	7.20	0.2835	34	74	1	0039328
	7.30	0.2874	34	74	1	0039335
	7.40	0.2913	34	74	1	0039342
	7.50	0.2953	34	74	1	0039359
19/64	7.54	0.2969	37	79	1	0171370
	7.60	0.2992	37	79	1	0039366
	7.70	0.3031	37	79	1	0039373
	7.80	0.3071	37	79	1	0039380
	7.90	0.3110	37	79	1	0039397
5/16	7.94	0.3125	37	79	1	0171387
	8.00	0.3150	37	79	1	0039403
	8.10	0.3189	37	79	1	0039410
	8.20	0.3228	37	79	1	0039427
	8.30	0.3268	37	79	1	0039434
21/64	8.33	0.3281	37	79	1	0171394
	8.40	0.3307	37	79	1	0039441
	8.50	0.3346	37	79	1	0039458
	8.60	0.3386	40	84	1	0039465
	8.70	0.3425	40	84	1	0039472
11/32	8.73	0.3437	40	84	1	0171400
	8.80	0.3465	40	84	1	0039489
	8.90	0.3504	40	84	1	0039496
	9.00	0.3543	40	84	1	0039502
	9.10	0.3583	40	84	1	0039519
23/64	9.13	0.3594	40	84	1	0171417
	9.20	0.3622	40	84	1	0039526
	9.30	0.3661	40	84	1	0039533
	9.40	0.3701	40	84	1	0039540
	9.50	0.3740	40	84	1	0039557
3/8	9.52	0.3750	43	89	1	0171424
	9.60	0.3780	43	89	1	0039564
	9.70	0.3819	43	89	1	0039571
	9.80	0.3858	43	89	1	0039588
	9.90	0.3898	43	89	1	0039595
25/64	9.92	0.3906	43	89	1	0171431
	10.00	0.3937	43	89	1	0038598
	10.10	0.3976	43	89	1	0038604
	10.20	0.4016	43	89	1	0038611
	10.30	0.4055	43	89	1	0038628
13/32	10.32	0.4063	43	89	1	0171448
	10.40	0.4094	43	89	1	0038635
	10.50	0.4134	43	89	1	0038642
	10.60	0.4173	43	89	1	0038659
	10.70	0.4213	47	95	1	0038666
27/64	10.72	0.4219	47	95	1	0171455
	10.80	0.4252	47	95	1	0038673

ADX SCREW MACHINE DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	10.90	0.4291	47	95	1	0038680
	11.00	0.4331	47	95	1	0038697
	11.10	0.4370	47	95	1	0038703
7/16	11.11	0.4375	47	95	1	0171462
	11.20	0.4409	47	95	1	0038710
	11.30	0.4449	47	95	1	0038727
	11.40	0.4488	47	95	1	0038734
	11.50	0.4528	47	95	1	0038741
29/64	11.51	0.4531	47	95	1	0171479
	11.60	0.4567	47	95	1	0038758
	11.70	0.4606	47	95	1	0038765
	11.80	0.4646	47	95	1	0038772
	11.90	0.4685	51	102	1	0038789
15/32	11.91	0.4688	51	102	1	0171486
	12.00	0.4724	51	102	1	0038796
	12.10	0.4764	51	102	1	0038802
	12.20	0.4803	51	102	1	0038819
	12.30	0.4843	51	102	1	0038826
31/64	12.30	0.4843	51	102	1	0171493
	12.40	0.4882	51	102	1	0038833
	12.50	0.4921	51	102	1	0038840
	12.60	0.4961	51	102	1	0038857
	12.70	0.5000	51	102	1	0038864
1/2	12.70	0.5000	51	102	1	0171509
	12.80	0.5039	51	102	1	0038871
	12.90	0.5079	51	102	1	0038888
	13.00	0.5118	51	102	1	0038895

PFX SCREW MACHINE DRILL

Multi-Application, Premium Cobalt Screw Machine Length - Parabolic Flute

for Advanced Chip Removal

A920

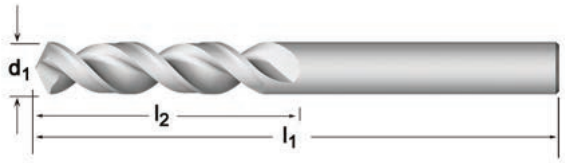
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

A921

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched Point improves chip formation. Premium cobalt base material combined with AlCrN-Top coating increases lubricity and wear resistance which improves tool life.



PFX

A920	A921
DIN ANSI	DIN ANSI
3XD	3XD
HSS-E	HSS-E
130°	130°
1.00 - 20.00	2.50 - 16.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	1.00	0.0394	6	26	1	0050217	—
	1.10	0.0433	7	28	1	0050262	—
3/64	1.19	0.0469	13	35	1	0211427	—
	1.20	0.0472	8	30	1	0050309	—
	1.25	0.0492	8	30	1	0211434	—
	1.30	0.0512	8	30	1	0050316	—
	1.35	0.0531	9	32	1	0211458	—
	1.40	0.0551	9	32	1	0050323	—
	1.50	0.0591	9	32	1	0050347	—
	1.55	0.0610	10	34	1	0211489	—
1/16	1.59	0.0625	16	41	1	0050644	—
	1.60	0.0630	10	34	1	0050668	—
	1.70	0.0669	10	34	1	0050675	—
	1.75	0.0689	11	36	1	0211502	—
	1.80	0.0709	11	36	1	0050682	—
	1.90	0.0748	11	36	1	0050699	—
5/64	1.98	0.0781	17	43	1	0050705	—
	2.00	0.0787	12	38	1	0050712	—
	2.10	0.0827	12	38	1	0050729	—
	2.15	0.0846	13	40	1	0211571	—
	2.20	0.0866	13	40	1	0050743	—
	2.30	0.0906	13	40	1	0050750	—
	2.35	0.0925	14	43	1	0211601	—
3/32	2.38	0.0937	19	41	1	0050767	—
	2.40	0.0945	14	43	1	0050781	—
	2.50	0.0984	14	43	1	0050804	0052488
	2.60	0.1024	14	43	1	0050811	0052495
	2.70	0.1063	16	46	1	0050828	0212509
7/64	2.78	0.1094	21	46	1	0050835	0212523
	2.80	0.1102	16	46	1	0050842	—
	2.90	0.1142	16	46	1	0050859	0212561
	3.00	0.1181	16	46	1	0050866	0052501
	3.10	0.1220	18	49	1	0050873	0052518

PFX SCREW MACHINE DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
1/8	3.18	0.1250	22	48	1	0050880	0212592
	3.20	0.1260	18	49	1	0050897	0052525
	3.30	0.1299	18	49	1	0050903	0052532
	3.40	0.1339	20	52	1	0050910	0052549
	3.50	0.1378	20	52	1	0050927	0052556
9/64	3.57	0.1406	24	49	1	0050934	0212622
	3.60	0.1417	20	52	1	0050941	0052563
	3.70	0.1457	20	52	1	0050958	0052570
	3.80	0.1496	22	55	1	0050965	0052587
	3.90	0.1535	22	55	1	0050972	0052594
5/32	3.97	0.1563	25	52	1	0050989	0212677
	4.00	0.1575	22	55	1	0051009	0052600
	4.10	0.1614	22	55	1	0051016	0052617
	4.20	0.1654	22	55	1	0051023	0052624
	4.30	0.1693	24	58	1	0051030	0052631
11/64	4.37	0.1719	27	54	1	0051047	0286012
	4.40	0.1732	24	58	1	0051054	0052648
	4.50	0.1772	24	58	1	0051061	0052655
	4.60	0.1811	24	58	1	0051078	0052662
	4.70	0.1850	24	58	1	0051085	0052679
3/16	4.76	0.1875	29	56	1	0051092	0335635
	4.80	0.1890	26	62	1	0051108	0052686
	4.90	0.1929	26	62	1	0051115	0052693
	5.00	0.1969	26	62	1	0051122	0052709
	5.10	0.2008	26	62	1	0051139	0052716
13/64	5.16	0.2031	30	57	1	0051146	0441336
	5.20	0.2047	26	62	1	0051153	0052723
	5.30	0.2087	26	62	1	0051160	0052730
	5.40	0.2126	28	66	1	0051177	0052747
	5.50	0.2165	28	66	1	0051191	0052754
7/32	5.56	0.2188	32	60	1	0051207	0632956
	5.60	0.2205	28	66	1	0051214	0052761
	5.70	0.2244	28	66	1	0051221	0052778
	5.80	0.2283	28	66	1	0051238	0052785
	5.90	0.2323	28	66	1	0051245	0052792
15/64	5.95	0.2344	33	62	1	0051269	0632994
	6.00	0.2362	28	66	1	0051276	0052808
	6.10	0.2402	31	70	1	0051283	0052815
	6.20	0.2441	31	70	1	0051290	0052822
	6.30	0.2480	31	70	1	0051306	0052839
1/4	6.35	0.2500	35	64	1	0051313	0633038
	6.40	0.2520	31	70	1	0051320	0052846
	6.50	0.2559	31	70	1	0051337	0052853
	6.60	0.2598	31	70	1	0051344	0052860
	6.70	0.2638	31	70	1	0051351	0052877
17/64	6.75	0.2656	37	67	1	0051368	0633069
	6.80	0.2677	34	74	1	0051375	0052884
	6.90	0.2717	34	74	1	0051382	0052891
	7.00	0.2756	34	74	1	0051429	0052907
	7.10	0.2795	34	74	1	0051436	0052914
9/32	7.14	0.2812	38	68	1	0051443	0633106
	7.20	0.2835	34	74	1	0051450	0052921
	7.30	0.2874	34	74	1	0051467	0052938
	7.40	0.2913	34	74	1	0051474	0052945
	7.50	0.2953	34	74	1	0051481	0052952
19/64	7.54	0.2969	40	70	1	0051498	0633137
	7.60	0.2992	37	79	1	0051504	0052969
	7.70	0.3031	37	79	1	0051511	0052976
	7.80	0.3071	37	79	1	0051528	0053089
	7.90	0.3110	37	79	1	0051535	0053096
5/16	7.94	0.3125	41	71	1	0051542	0633151
	8.00	0.3150	37	79	1	0051566	0053102
	8.10	0.3189	37	79	1	0051580	0053119
	8.20	0.3228	37	79	1	0051603	0053133
	8.30	0.3268	37	79	1	0051610	0053157
21/64	8.33	0.3281	43	75	1	0051627	0633175

PFX SCREW MACHINE DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	8.40	0.3307	37	79	1	0051634	0053249
	8.50	0.3346	37	79	1	0051658	0053256
	8.60	0.3386	40	84	1	0051665	0053263
	8.70	0.3425	40	84	1	0051672	0053270
11/32	8.73	0.3437	43	76	1	0051689	0633205
	8.80	0.3465	40	84	1	0051702	0053287
	8.90	0.3504	40	84	1	0051719	0053294
	9.00	0.3543	40	84	1	0051726	0053300
	9.10	0.3583	40	84	1	0051733	0053317
23/64	9.13	0.3594	44	78	1	0051740	0633236
	9.20	0.3622	40	84	1	0051757	0053324
	9.30	0.3661	40	84	1	0051764	0053331
	9.40	0.3701	40	84	1	0051771	0053348
	9.50	0.3740	40	84	1	0051788	0053355
3/8	9.52	0.3750	46	79	1	0051795	0633250
	9.60	0.3780	43	89	1	0051801	0053362
	9.70	0.3819	43	89	1	0051818	0053379
	9.80	0.3858	43	89	1	0051825	0053386
	9.90	0.3898	43	89	1	0051832	0053393
25/64	9.92	0.3906	48	83	1	0051849	0633274
	10.00	0.3937	43	89	1	0051856	0053409
	10.20	0.4016	43	89	1	0051863	0053416
	10.30	0.4055	43	89	1	0051870	0053423
13/32	10.32	0.4063	49	84	1	0051887	0633304
	10.50	0.4134	43	89	1	0051900	0053447
27/64	10.72	0.4219	51	86	1	0051917	0633328
	10.80	0.4252	47	95	1	0051924	0053454
	11.00	0.4331	47	95	1	0051931	0053461
7/16	11.11	0.4375	52	87	1	0051948	0633342
	11.50	0.4528	47	95	1	0051962	0053485
29/64	11.51	0.4531	54	90	1	0051979	0633366
	11.80	0.4646	47	95	1	0051986	0053492
15/32	11.91	0.4688	54	92	1	0051993	0633373
	12.00	0.4724	51	102	1	0052006	0053508
	12.20	0.4803	51	102	1	0052013	—
31/64	12.30	0.4843	56	94	1	0052020	0633380
	12.50	0.4921	51	102	1	0052037	0053522
1/2	12.70	0.5000	57	95	1	0052044	0633397
	13.00	0.5118	51	102	1	0052068	0053546
33/64	13.10	0.5156	60	98	1	0212257	0633410
	13.50	0.5315	54	107	1	0052075	0053553
35/64	13.89	0.5469	64	102	1	0212264	0633427
	14.00	0.5512	54	107	1	0052082	0053560
9/16	14.29	0.5625	64	102	1	0212271	0633434
	14.50	0.5709	56	111	1	0052099	0053577
37/64	14.68	0.5781	67	105	1	0212288	0633441
	14.75	0.5807	56	111	1	0212295	0633458
	15.00	0.5906	56	111	1	0052105	0053584
19/32	15.08	0.5937	67	105	1	0212301	0633465
39/64	15.48	0.6094	70	108	1	0212318	0633472
	15.50	0.6102	58	115	1	0052112	0053591
5/8	15.88	0.6250	70	108	1	0212325	0633489
	16.00	0.6299	58	115	1	0052129	0053607
41/64	16.27	0.6406	73	114	1	0212332	—
	16.50	0.6496	60	119	1	0212349	—
21/32	16.67	0.6563	73	114	1	0212356	—
	16.75	0.6594	60	119	1	0212363	—
	17.00	0.6693	60	119	1	0052136	—
43/64	17.07	0.6719	73	117	1	0212370	—
11/16	17.46	0.6875	73	117	1	0212387	—
	17.50	0.6890	62	123	1	0052143	—
45/64	17.86	0.7031	76	121	1	0212394	—
	18.00	0.7087	62	123	1	0052457	—
23/32	18.26	0.7188	76	121	1	0212400	—
	18.50	0.7283	64	127	1	0212417	—
47/64	18.65	0.7344	79	127	1	0212424	—

PFX SCREW MACHINE DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	19.00	0.7480	64	127	1	0052464	—
3/4	19.05	0.7500	79	127	1	0212431	—
49/64	19.45	0.7656	83	130	1	0212448	—
	19.50	0.7677	66	131	1	0212455	—
25/32	19.84	0.7813	83	130	1	0212462	—
	20.00	0.7874	66	131	1	0052471	—

ADX JOBBER LENGTH DRILL

Multi-Application, Jobber Length

ADX

A510

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3

Low thrust design. Notched point improves chip formation for enhanced penetration rate. TiN coating increases wear resistance and improves tool life.

A510

DIN 338

4XD

HSS

130°

3.00 - 14.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	3.00	0.1181	33	61	1	0036495
	3.10	0.1220	36	65	1	0036501
1/8	3.18	0.1250	36	65	1	0168974
	3.20	0.1260	36	65	1	0036518
	3.30	0.1299	36	65	1	0036525
	3.40	0.1339	39	70	1	0036532
	3.50	0.1378	39	70	1	0036549
9/64	3.57	0.1406	39	70	1	0168981
	3.60	0.1417	39	70	1	0036556
	3.70	0.1457	39	70	1	0036563
	3.80	0.1496	43	75	1	0036570
	3.90	0.1535	43	75	1	0036587
5/32	3.97	0.1563	43	75	1	0168998
	4.00	0.1575	43	75	1	0036594
	4.10	0.1614	43	75	1	0036600
	4.20	0.1654	43	75	1	0036617
	4.30	0.1693	47	80	1	0036624
11/64	4.37	0.1719	47	80	1	0169001
	4.40	0.1732	47	80	1	0036631
	4.50	0.1772	47	80	1	0036648
	4.60	0.1811	47	80	1	0036655
	4.70	0.1850	47	80	1	0036662
3/16	4.76	0.1875	52	86	1	0169018
	4.80	0.1890	52	86	1	0036679
	4.90	0.1929	52	86	1	0036686
	5.00	0.1969	52	86	1	0036693
	5.10	0.2008	52	86	1	0036709
13/64	5.16	0.2031	52	86	1	0169025
	5.20	0.2047	52	86	1	0036716
	5.30	0.2087	52	86	1	0036723
	5.40	0.2126	57	93	1	0036730
	5.50	0.2165	57	93	1	0036747
7/32	5.56	0.2188	57	93	1	0169032

ADX JOBBER LENGTH DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	5.60	0.2205	57	93	1	0036754
	5.70	0.2244	57	93	1	0036761
	5.80	0.2283	57	93	1	0036778
	5.90	0.2323	57	93	1	0036785
15/64	5.95	0.2344	57	93	1	0169049
	6.00	0.2362	57	93	1	0036792
	6.10	0.2402	63	101	1	0036808
	6.20	0.2441	63	101	1	0036815
	6.30	0.2480	63	101	1	0036822
1/4	6.35	0.2500	63	101	1	0169056
	6.40	0.2520	63	101	1	0036839
	6.50	0.2559	63	101	1	0036846
	6.60	0.2598	63	101	1	0036853
	6.70	0.2638	63	101	1	0036860
17/64	6.75	0.2656	69	109	1	0169063
	6.80	0.2677	69	109	1	0036877
	6.90	0.2717	69	109	1	0036884
	7.00	0.2756	69	109	1	0036891
	7.10	0.2795	69	109	1	0036907
9/32	7.14	0.2812	69	109	1	0169070
	7.20	0.2835	69	109	1	0036914
	7.30	0.2874	69	109	1	0036921
	7.40	0.2913	69	109	1	0036938
	7.50	0.2953	69	109	1	0036945
19/64	7.54	0.2969	75	117	1	0169087
	7.60	0.2992	75	117	1	0036952
	7.70	0.3031	75	117	1	0036969
	7.80	0.3071	75	117	1	0036976
	7.90	0.3110	75	117	1	0036983
5/16	7.94	0.3125	75	117	1	0169094
	8.00	0.3150	75	117	1	0036990
	8.10	0.3189	75	117	1	0037003
	8.20	0.3228	75	117	1	0037010
	8.30	0.3268	75	117	1	0037027
21/64	8.33	0.3281	75	117	1	0169100
	8.40	0.3307	75	117	1	0037034
	8.50	0.3346	75	117	1	0037041
	8.60	0.3386	81	125	1	0037058
	8.70	0.3425	81	125	1	0037065
11/32	8.73	0.3437	81	125	1	0169117
	8.80	0.3465	81	125	1	0037072
	8.90	0.3504	81	125	1	0037089
	9.00	0.3543	81	125	1	0037096
	9.10	0.3583	81	125	1	0037102
23/64	9.13	0.3594	81	125	1	0169124
	9.20	0.3622	81	125	1	0037119
	9.30	0.3661	81	125	1	0037126
	9.40	0.3701	81	125	1	0037133
	9.50	0.3740	81	125	1	0037140
3/8	9.52	0.3750	87	133	1	0169131
	9.60	0.3780	87	133	1	0037157
	9.70	0.3819	87	133	1	0037164
	9.80	0.3858	87	133	1	0037171
	9.90	0.3898	87	133	1	0037188
25/64	9.92	0.3906	87	133	1	0169148
	10.00	0.3937	87	133	1	0036174
	10.10	0.3976	87	133	1	0036181
	10.20	0.4016	87	133	1	0036198
	10.30	0.4055	87	133	1	0036204
13/32	10.32	0.4063	87	133	1	0169155
	10.40	0.4094	87	133	1	0036211
	10.50	0.4134	87	133	1	0036228
	10.60	0.4173	87	133	1	0036235
	10.70	0.4213	94	142	1	0036242
27/64	10.72	0.4219	94	142	1	0169162
	10.80	0.4252	94	142	1	0036259

ADX JOBBER LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	10.90	0.4291	94	142	1	0036266
	11.00	0.4331	94	142	1	0036273
	11.10	0.4370	94	142	1	0036280
7/16	11.11	0.4375	94	142	1	0169179
	11.20	0.4409	94	142	1	0036297
	11.30	0.4449	94	142	1	0036303
	11.40	0.4488	94	142	1	0036310
	11.50	0.4528	94	142	1	0036327
29/64	11.51	0.4531	94	142	1	0169186
	11.60	0.4567	94	142	1	0036334
	11.70	0.4606	94	142	1	0036341
	11.80	0.4646	94	142	1	0036358
	11.90	0.4685	101	151	1	0036365
15/32	11.91	0.4688	101	151	1	0169193
	12.00	0.4724	101	151	1	0036372
	12.10	0.4764	101	151	1	0036389
	12.20	0.4803	101	151	1	0036396
	12.30	0.4843	101	151	1	0036402
31/64	12.30	0.4843	101	151	1	0169209
	12.40	0.4882	101	151	1	0036419
	12.50	0.4921	101	151	1	0036426
	12.60	0.4961	101	151	1	0036433
	12.70	0.5000	101	151	1	0036440
1/2	12.70	0.5000	101	151	1	0169216
	12.80	0.5039	101	151	1	0036457
	12.90	0.5079	101	151	1	0036464
	13.00	0.5118	101	151	1	0036471
	14.00	0.5512	108	160	1	0036488

ADX STANDARD LENGTH DRILL

DORMER

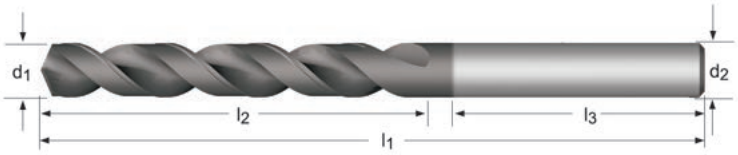
Multi-Application, Premium Cobalt Coolant Feed w/ Reinforced Shank

ADX

A553

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1		

Notched point improves chip formation. Low thrust design. Cobalt base material & TiAlN-Top coating increases wear resistance and improves tool life.



A553

DORMER

5XD

HSS-E

130°

5.00 - 20.00

d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\varnothing h_6$ mm	Pack Qty	A553
5.00	0.1969	36	79	36	6	1	0391204
5.20	0.2047	38	79	36	6	1	0391228
5.50	0.2165	40	79	36	6	1	0391242
6.00	0.2362	43	79	36	6	1	0391280
6.30	0.2480	46	87	36	8	1	0391297
6.50	0.2559	47	87	36	8	1	0391303
6.80	0.2677	48	87	36	8	1	0391327
6.90	0.2717	48	87	36	8	1	0391334
7.00	0.2756	48	87	36	8	1	0391341
7.40	0.2913	54	94	36	8	1	0391365
7.50	0.2953	54	94	36	8	1	0391372
8.00	0.3150	58	94	36	8	1	0391402
8.50	0.3346	75	130	40	10	1	0391419
8.70	0.3425	75	130	40	10	1	0391426
9.00	0.3543	75	130	40	10	1	0391433
9.50	0.3740	75	130	40	10	1	0391457
10.00	0.3937	75	130	40	10	1	0390795
10.20	0.4016	87	150	45	12	1	0390801
10.30	0.4055	87	150	45	12	1	0390818
10.50	0.4134	87	150	45	12	1	0390825
11.00	0.4330	94	150	45	12	1	0390849
11.30	0.4449	94	150	45	12	1	0390856
11.50	0.4528	94	150	45	12	1	0390863
12.00	0.4724	94	150	45	12	1	0390870
12.50	0.4921	101	160	45	14	1	0390887
13.00	0.5118	101	160	45	14	1	0390894
13.50	0.5315	101	160	45	14	1	0390924
14.00	0.5512	101	160	45	14	1	0390948
14.25	0.5610	108	170	48	16	1	0390955
14.50	0.5709	108	170	48	16	1	0390962
15.00	0.5906	108	170	48	16	1	0390986
15.25	0.6004	108	170	48	16	1	0391006
15.50	0.6102	108	170	48	16	1	0391013

ADX STANDARD LENGTH DRILL

d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\varnothing h_6$ mm	Pack Qty	A553
16.00	0.6299	108	170	48	16	1	0391037
16.50	0.6496	125	190	48	18	1	0391051
17.00	0.6693	125	190	48	18	1	0391075
17.50	0.6890	130	190	48	18	1	0391099
17.75	0.6988	130	190	48	18	1	0391105
18.00	0.7087	130	190	48	18	1	0391112
19.00	0.7480	135	200	50	20	1	0391150
19.25	0.7579	140	200	50	20	1	0391167
20.00	0.7874	140	200	50	20	1	0391198

PFX JOBBER LENGTH DRILL

DORMER

Premium Cobalt Jobber Length - Parabolic Flute *for Advanced Chip Removal*

A900

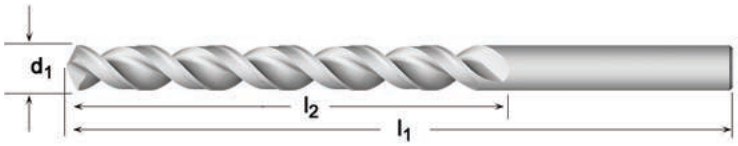
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched Point improves chip formation. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

A901

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium Cobalt base material combined with AlCrN-Top coating increases lubricity and wear resistance which improves tool life.



PFX

A900	A901
DIN ANSI	DIN ANSI
6XD	6XD
HSS-E	HSS-E
130°	130°
1.00 - 20.00	1.50 - 16.00

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	1.00	0.0394	12	34	1	0046289	—
	1.10	0.0433	14	36	1	0046296	—
3/64	1.19	0.0469	19	44	1	0633540	—
	1.20	0.0472	16	38	1	0046302	—
	1.25	0.0492	16	36	1	0633557	—
	1.30	0.0512	16	38	1	0046319	—
	1.40	0.0551	18	40	1	0046326	—
	1.50	0.0591	18	40	1	0046333	0047781
	1.55	0.0610	20	43	1	0633601	0634547
1/16	1.59	0.0625	22	48	1	0046340	0634554
	1.60	0.0630	20	43	1	0046357	0634561
	1.70	0.0669	20	43	1	0046364	—
	1.75	0.0689	22	46	1	0633625	0634592
	1.80	0.0709	22	46	1	0046371	0634615
	1.90	0.0748	22	46	1	0046388	0634639
5/64	1.98	0.0781	25	51	1	0046395	0634653
	2.00	0.0787	24	49	1	0046401	0047798
	2.10	0.0827	24	49	1	0046418	0634691
	2.15	0.0846	27	53	1	0633694	0634707
	2.20	0.0866	27	53	1	0046425	—
	2.30	0.0906	27	53	1	0046432	—
3/32	2.38	0.0937	32	57	1	0046449	0634752
	2.40	0.0945	30	57	1	0046456	0634769
	2.50	0.0984	30	57	1	0046463	0047804
	2.60	0.1024	30	57	1	0046470	0047811
	2.70	0.1063	33	61	1	0046487	0634820
7/64	2.78	0.1094	38	67	1	0046494	0634844
	2.80	0.1102	33	61	1	0046500	—
	2.90	0.1142	33	61	1	0046517	0634882
	3.00	0.1181	33	61	1	0046524	0047828
	3.10	0.1220	36	65	1	0046531	0047835
1/8	3.18	0.1250	41	70	1	0046548	0634912
	3.20	0.1260	36	65	1	0046555	0047842
	3.30	0.1299	36	65	1	0046562	0047859

PFX JOBBER LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	3.40	0.1339	39	70	1	0046579	0047866
	3.50	0.1378	39	70	1	0046586	0047873
9/64	3.57	0.1406	44	73	1	0046593	0634943
	3.60	0.1417	39	70	1	0046609	0047880
	3.70	0.1457	39	70	1	0046616	0047897
	3.80	0.1496	43	75	1	0046623	0047903
	3.90	0.1535	43	75	1	0046630	0047910
5/32	3.97	0.1563	51	79	1	0046647	0634998
	4.00	0.1575	43	75	1	0046654	0047927
	4.10	0.1614	43	75	1	0046661	0047934
	4.20	0.1654	43	75	1	0046678	0047941
	4.30	0.1693	47	80	1	0046685	0047958
11/64	4.37	0.1719	54	83	1	0046692	0635056
	4.40	0.1732	47	80	1	0046708	0047965
	4.50	0.1772	47	80	1	0046715	0047972
	4.60	0.1811	47	80	1	0046722	0047989
	4.70	0.1850	47	80	1	0046739	0047996
3/16	4.76	0.1875	59	89	1	0046746	0635094
	4.80	0.1890	52	86	1	0046753	0048009
	4.90	0.1929	52	86	1	0046760	0048016
	5.00	0.1969	52	86	1	0046777	0048023
	5.10	0.2008	52	86	1	0046784	0048030
13/64	5.16	0.2031	62	92	1	0046807	0635155
	5.20	0.2047	52	86	1	0046814	0048047
	5.30	0.2087	52	86	1	0046821	0048054
	5.40	0.2126	57	93	1	0046838	0048061
	5.50	0.2165	57	93	1	0046845	0048078
7/32	5.56	0.2188	64	95	1	0046852	0635209
	5.60	0.2205	57	93	1	0046869	0048085
	5.70	0.2244	57	93	1	0046876	0048092
	5.80	0.2283	57	93	1	0046883	0048108
	5.90	0.2323	57	93	1	0046890	0048115
15/64	5.95	0.2344	67	98	1	0046906	0635247
	6.00	0.2362	57	93	1	0046913	0048122
	6.10	0.2402	63	101	1	0046920	0048139
	6.20	0.2441	63	101	1	0046937	0048146
	6.30	0.2480	63	101	1	0046944	0048153
1/4	6.35	0.2500	70	102	1	0046951	0635285
	6.40	0.2520	63	101	1	0046968	0048160
	6.50	0.2559	63	101	1	0046975	0048177
	6.60	0.2598	63	101	1	0046999	0048184
	6.70	0.2638	63	101	1	0047002	0048191
17/64	6.75	0.2656	73	105	1	0047019	0635315
	6.80	0.2677	69	109	1	0047026	0048207
	6.90	0.2717	69	109	1	0047033	0048214
	7.00	0.2756	69	109	1	0047057	0048221
	7.10	0.2795	69	109	1	0047064	0048238
9/32	7.14	0.2812	75	108	1	0047071	0635353
	7.20	0.2835	69	109	1	0047088	0048245
	7.30	0.2874	69	109	1	0047095	0048252
	7.40	0.2913	69	109	1	0047101	0048269
	7.50	0.2953	69	109	1	0047118	0048276
19/64	7.54	0.2969	78	111	1	0047125	0635384
	7.60	0.2992	75	117	1	0047132	0048283
	7.70	0.3031	75	117	1	0047149	0048290
	7.80	0.3071	75	117	1	0047156	0048306
	7.90	0.3110	75	117	1	0047163	0048313
5/16	7.94	0.3125	81	114	1	0047170	0635407
	8.00	0.3150	75	117	1	0047187	0048320
	8.10	0.3189	75	117	1	0047194	0048337
	8.20	0.3228	75	117	1	0047200	0048344
	8.30	0.3268	75	117	1	0047217	0048351
21/64	8.33	0.3280	84	117	1	0047224	0635421
	8.40	0.3307	75	117	1	0047231	0048368
	8.50	0.3346	75	117	1	0047255	0048375
	8.60	0.3386	81	125	1	0047262	0048382

PFX JOBBER LENGTH DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	8.70	0.3425	81	125	1	0047286	0048399
11/32	8.73	0.3437	87	121	1	0047293	0635452
	8.80	0.3465	81	125	1	0047309	0048405
	8.90	0.3504	81	125	1	0047316	0048412
	9.00	0.3543	81	125	1	0047323	0048429
	9.10	0.3583	81	125	1	0047330	0048436
23/64	9.13	0.3594	89	124	1	0047347	0635483
	9.20	0.3622	81	125	1	0047354	0048443
	9.30	0.3661	81	125	1	0047361	0048450
	9.40	0.3701	81	125	1	0047378	0048467
	9.50	0.3740	81	125	1	0047385	0048474
3/8	9.52	0.3750	92	127	1	0047392	0635506
	9.60	0.3780	87	133	1	0047408	0048481
	9.70	0.3819	87	133	1	0047415	0048498
	9.80	0.3858	87	133	1	0047422	0048504
	9.90	0.3898	87	133	1	0047439	0048627
25/64	9.92	0.3906	95	130	1	0047446	0635520
	10.00	0.3937	87	133	1	0047453	0048641
	10.20	0.4016	87	133	1	0047460	0048863
	10.30	0.4055	87	133	1	0047477	0048870
13/32	10.32	0.4063	98	133	1	0047484	0635551
	10.40	0.4094	87	133	1	0047491	0048955
	10.50	0.4134	87	133	1	0047507	0049013
27/64	10.72	0.4219	100	137	1	0047514	0635575
	10.80	0.4252	94	142	1	0047521	0049198
	11.00	0.4331	94	142	1	0047538	0049235
7/16	11.11	0.4375	103	140	1	0047545	0635599
	11.50	0.4528	94	142	1	0047569	0049280
29/64	11.51	0.4531	106	143	1	0047576	0635612
	11.80	0.4646	94	142	1	0047583	0049297
15/32	11.91	0.4688	110	146	1	0047590	0635629
	12.00	0.4724	101	151	1	0047606	0049303
31/64	12.30	0.4843	111	149	1	0047620	0635636
	12.50	0.4921	101	151	1	0047637	0049594
1/2	12.70	0.5000	101	151	1	0047644	46073789
	13.00	0.5118	101	151	1	0047668	0049655
33/64	13.10	0.5156	122	168	1	0634318	0635650
	13.50	0.5315	108	160	1	0047675	0049662
35/64	13.89	0.5469	122	168	1	0634325	0635667
	14.00	0.5512	108	160	1	0047682	0049686
9/16	14.29	0.5625	122	168	1	0634332	0635674
	14.50	0.5709	114	169	1	0047699	0049709
37/64	14.68	0.5781	122	168	1	0634349	0635681
	15.00	0.5906	114	169	1	0047705	0049723
19/32	15.08	0.5937	132	181	1	0634363	0635704
39/64	15.48	0.6094	132	181	1	0634370	0635711
	15.50	0.6102	120	178	1	0047712	0050132
5/8	15.88	0.6250	132	181	1	0634387	0635728
	16.00	0.6299	120	178	1	0047729	0050170
41/64	16.27	0.6406	132	181	1	0634394	—
	16.50	0.6496	125	184	1	0634400	—
21/32	16.67	0.6562	132	181	1	0634417	—
	17.00	0.6693	125	184	1	0047736	—
43/64	17.07	0.6719	143	194	1	0634431	—
11/16	17.46	0.6875	143	194	1	0634448	—
	17.50	0.6890	130	191	1	0047743	—
45/64	17.86	0.7031	130	191	1	0634455	—
	18.00	0.7087	130	191	1	0047750	—
23/32	18.26	0.7187	130	191	1	0634462	—
	18.50	0.7283	135	198	1	0634479	—
47/64	18.65	0.7344	135	198	1	0634486	—
	19.00	0.7480	135	198	1	0047767	—
3/4	19.05	0.7500	135	198	1	0634493	—
49/64	19.45	0.7656	135	198	1	0634509	—
	19.50	0.7677	140	205	1	0634516	—
25/32	19.84	0.7812	140	205	1	0634523	—
	20.00	0.7874	140	205	1	0047774	—

DORMER PFX TAPER LENGTH DRILL

Premium Cobalt, Taper Length - Parabolic Flute *for Advanced Chip Removal*

A940

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.2 3.3 3.4 4.1 4.2 4.3
6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

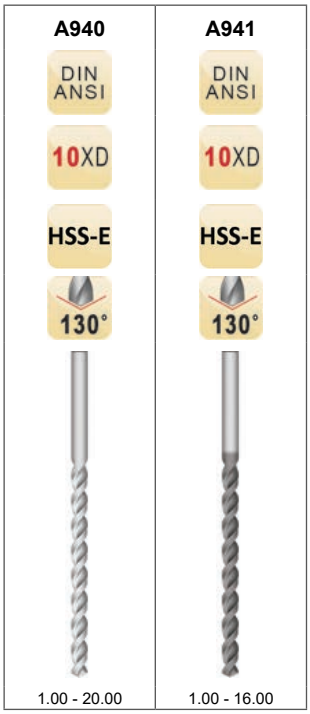
Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

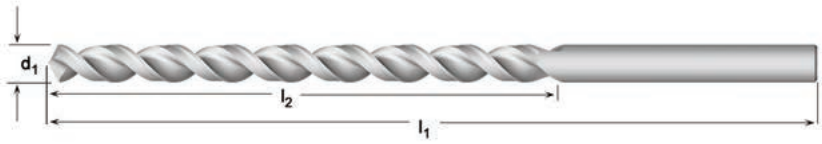
A941

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt base material combined with AlCrN-Top Coating increases lubricity and wear resistance which improves tool life.

PFX





d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	1.00	0.0394	33	56	1	0053614	0059371
	1.10	0.0433	37	60	1	0053621	—
3/64	1.19	0.0469	29	57	1	0635735	0635803
	1.20	0.0472	41	65	1	0053638	—
	1.30	0.0512	41	65	1	0053645	—
	1.40	0.0551	45	70	1	0053751	—
	1.50	0.0591	45	70	1	0053768	0059388
1/16	1.59	0.0625	44	76	1	0053775	0635810
	1.60	0.0630	50	76	1	0054253	—
	1.70	0.0669	50	76	1	0054260	—
	1.80	0.0709	53	80	1	0054383	—
	1.90	0.0748	53	80	1	0054390	—
5/64	1.98	0.0781	51	95	1	0054406	0635827
	2.00	0.0787	56	85	1	0054604	0059401
	2.10	0.0827	56	85	1	0054611	—
	2.20	0.0866	59	90	1	0054628	—
	2.30	0.0906	59	90	1	0054710	—
3/32	2.38	0.0937	57	108	1	0054727	0635834
	2.40	0.0945	62	95	1	0054734	—
	2.50	0.0984	62	95	1	0054789	0059418
	2.60	0.1024	62	95	1	0054796	—
	2.70	0.1063	66	100	1	0054802	—
7/64	2.78	0.1094	64	117	1	0054833	0635841
	2.80	0.1102	66	100	1	0054840	—
	2.90	0.1142	66	100	1	0054857	—
	3.00	0.1181	66	100	1	0054871	0059432
	3.10	0.1220	69	106	1	0055465	0059449
1/8	3.18	0.1250	70	130	1	0055472	0635858
	3.20	0.1260	69	106	1	0055533	0059463
	3.30	0.1299	69	106	1	0055540	0059654
	3.40	0.1339	73	112	1	0055588	0059661
	3.50	0.1378	73	112	1	0055595	0059838
9/64	3.57	0.1406	76	137	1	0055618	0635865

PFX TAPER LENGTH DRILL

DORMER

d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	3.60	0.1417	73	112	1	0055625	0059944
	3.70	0.1457	73	112	1	0055632	0059968
	3.80	0.1496	78	119	1	0056011	0059982
	3.90	0.1535	78	119	1	0056028	0060216
5/32	3.97	0.1563	76	137	1	0056165	0635872
	4.00	0.1575	78	119	1	0056172	0060223
	4.10	0.1614	78	119	1	0056226	0060315
	4.20	0.1654	78	119	1	0056233	0060322
	4.30	0.1693	82	126	1	0056257	0060377
11/64	4.37	0.1719	86	146	1	0056264	0635889
	4.40	0.1732	82	126	1	0056271	0060384
	4.50	0.1772	82	126	1	0056288	0060414
	4.60	0.1811	82	126	1	0056295	0060421
	4.70	0.1850	82	126	1	0056301	0060445
3/16	4.76	0.1875	86	146	1	0056318	0635896
	4.80	0.1890	87	132	1	0056561	0060452
	4.90	0.1929	87	132	1	0056615	0060476
	5.00	0.1969	87	132	1	0056646	0060490
	5.10	0.2008	87	132	1	0056820	0060513
13/64	5.16	0.2031	92	152	1	0056882	0635902
	5.20	0.2047	87	132	1	0056974	0060605
	5.30	0.2087	87	132	1	0057001	0060612
	5.40	0.2126	91	139	1	0057056	0060674
	5.50	0.2165	91	139	1	0057780	0060681
7/32	5.56	0.2188	92	152	1	0057797	0635919
	5.60	0.2205	91	139	1	0057810	0060728
	5.70	0.2244	91	139	1	0057827	0060735
	5.80	0.2283	91	139	1	0057834	0060766
	5.90	0.2323	91	139	1	0057841	0060773
15/64	5.95	0.2344	95	156	1	0057858	0635926
	6.00	0.2362	91	139	1	0057865	0060797
	6.10	0.2402	97	148	1	0057872	0060889
	6.20	0.2441	97	148	1	0058145	0060940
	6.30	0.2480	97	148	1	0058152	0060995
1/4	6.35	0.2500	95	156	1	0058169	0635933
	6.40	0.2520	97	148	1	0058176	0061022
	6.50	0.2559	97	148	1	0058183	0061046
	6.60	0.2598	97	148	1	0058190	0061053
	6.70	0.2638	97	148	1	0058206	0061091
17/64	6.75	0.2656	98	159	1	0058213	0635940
	6.80	0.2677	102	156	1	0058220	0061107
	6.90	0.2717	102	156	1	0058237	0061114
	7.00	0.2756	102	156	1	0058244	0061121
	7.10	0.2795	102	156	1	0058251	0061138
9/32	7.14	0.2812	98	159	1	0058268	0635957
	7.20	0.2835	102	156	1	0058275	0061145
	7.30	0.2874	102	156	1	0058282	0061152
	7.40	0.2913	102	156	1	0058299	0061169
	7.50	0.2953	102	156	1	0058305	0061176
19/64	7.54	0.2969	102	162	1	0058312	0635964
	7.60	0.2992	109	165	1	0058343	0061183
	7.70	0.3031	109	165	1	0058350	0061190
	7.80	0.3071	109	165	1	0058374	0061206
	7.90	0.3110	109	165	1	0058381	0061213
5/16	7.94	0.3125	102	162	1	0058398	0635971
	8.00	0.3150	109	165	1	0058404	0061220
	8.10	0.3189	109	165	1	0058411	0061237
	8.20	0.3228	109	165	1	0058435	0061244
	8.30	0.3268	109	165	1	0058442	0061251
21/64	8.33	0.3281	105	165	1	0058473	0635988
	8.40	0.3307	109	165	1	0058503	0061268
	8.50	0.3346	109	165	1	0058510	0061275
	8.60	0.3386	115	175	1	0058558	0061282
	8.70	0.3425	115	175	1	0058572	0061299
11/32	8.73	0.3438	105	165	1	0058589	0635995
	8.80	0.3465	115	175	1	0058596	0061305

PFX TAPER LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	8.90	0.3504	115	175	1	0058602	0061312
	9.00	0.3543	115	175	1	0058626	0061329
	9.10	0.3583	115	175	1	0058633	0061336
23/64	9.13	0.3594	108	171	1	0058640	0636008
	9.20	0.3622	115	175	1	0058657	0061343
	9.30	0.3661	115	175	1	0058664	0061350
	9.40	0.3701	115	175	1	0058671	0061367
	9.50	0.3740	115	175	1	0058688	0061374
3/8	9.52	0.3750	108	171	1	0058695	0636015
	9.60	0.3780	121	184	1	0058701 [1)]	0061381 [1)]
	9.70	0.3819	121	184	1	0058718 [1)]	0061398 [1)]
	9.80	0.3858	121	184	1	0058725 [1)]	0061404 [1)]
	9.90	0.3898	121	184	1	0058732 [1)]	0061411 [1)]
25/64	9.92	0.3906	111	178	1	0058749 [1)]	0636022 [1)]
	10.00	0.3937	121	184	1	0058756 [1)]	0061428 [1)]
	10.20	0.4016	121	184	1	0058763 [1)]	0061435 [1)]
	10.30	0.4055	121	184	1	0058770 [1)]	0061442 [1)]
13/32	10.32	0.4063	111	178	1	0058787 [1)]	0636039 [1)]
	10.50	0.4134	121	184	1	0058800 [1)]	0061466 [1)]
27/64	10.72	0.4219	117	184	1	0058817 [1)]	0636046 [1)]
	11.00	0.4331	128	195	1	0058831 [1)]	0061480 [1)]
7/16	11.11	0.4375	117	184	1	0058855 [1)]	0636053 [1)]
	11.20	0.4409	128	195	1	0058862 [1)]	0061497 [1)]
	11.50	0.4528	128	195	1	0058886 [1)]	0061633 [1)]
29/64	11.51	0.4531	121	190	1	0058893 [1)]	0636060 [1)]
	11.80	0.4646	128	195	1	0058909 [1)]	0061657 [1)]
15/32	11.91	0.4688	121	190	1	0058916 [1)]	0636077 [1)]
	12.00	0.4724	134	205	1	0058923 [1)]	0061688 [1)]
	12.20	0.4803	134	205	1	0058930 [1)]	0061718 [1)]
31/64	12.30	0.4843	121	197	1	0058978 [1)]	0636084 [1)]
	12.50	0.4921	134	205	1	0058985 [1)]	0061749 [1)]
1/2	12.70	0.5000	121	197	1	0058992 [1)]	0636091 [1)]
	13.00	0.5118	134	205	1	0059012 [1)]	0061817 [1)]
33/64	13.10	0.5156	121	203	1	0059043 [1)]	0636107 [1)]
17/32	13.49	0.5311	121	203	1	0059050 [1)]	—
	13.50	0.5315	140	214	1	0059067 [1)]	0061848 [1)]
35/64	13.89	0.5469	124	210	1	0635742 [1)]	0636114 [1)]
	14.00	0.5512	140	214	1	0059081 [1)]	0061862 [1)]
9/16	14.29	0.5625	124	210	1	0059111 [1)]	0636121 [1)]
	14.50	0.5709	144	220	1	0059128 [1)]	0061886 [1)]
37/64	14.68	0.5781	124	222	1	0059166 [1)]	0636138 [1)]
	15.00	0.5906	144	220	1	0059180 [1)]	0061909 [1)]
19/32	15.08	0.5937	124	222	1	0059203 [1)]	0636145 [1)]
39/64	15.48	0.6094	124	222	1	0635759 [1)]	0636152 [1)]
	15.50	0.6102	149	227	1	0059210 [1)]	0061916 [1)]
5/8	15.88	0.6250	124	222	1	0059227 [1)]	0636169 [1)]
	16.00	0.6299	149	227	1	0059234 [1)]	0061930 [1)]
41/64	16.27	0.6406	130	229	1	0635766 [1)]	—
	16.50	0.6496	154	235	1	0059241 [1)]	—
21/32	16.67	0.6563	130	229	1	0059258 [1)]	—
	17.00	0.6693	154	235	1	0059265 [1)]	—
43/64	17.07	0.6719	137	235	1	0635773 [1)]	—
11/16	17.46	0.6875	137	235	1	0059272 [1)]	—
	17.50	0.6890	158	241	1	0059289 [1)]	—
45/64	17.86	0.7031	143	241	1	0059296 [1)]	—
	18.00	0.7087	158	241	1	0059302 [1)]	—
23/32	18.26	0.7188	143	241	1	0059326 [1)]	—
47/64	18.65	0.7344	149	248	1	0059333 [1)]	—
	19.00	0.7480	162	247	1	0059340 [1)]	—
3/4	19.05	0.7500	149	248	1	0059357 [1)]	—
49/64	19.45	0.7656	152	251	1	0635780 [1)]	—
25/32	19.84	0.7812	152	251	1	0635797 [1)]	—
	20.00	0.7874	166	254	1	0059364 [1)]	—

[1)] <10xD

DORMER

PFX Premium Cobalt, Extra Length - Parabolic Flute *for Advanced Chip Removal*

A976

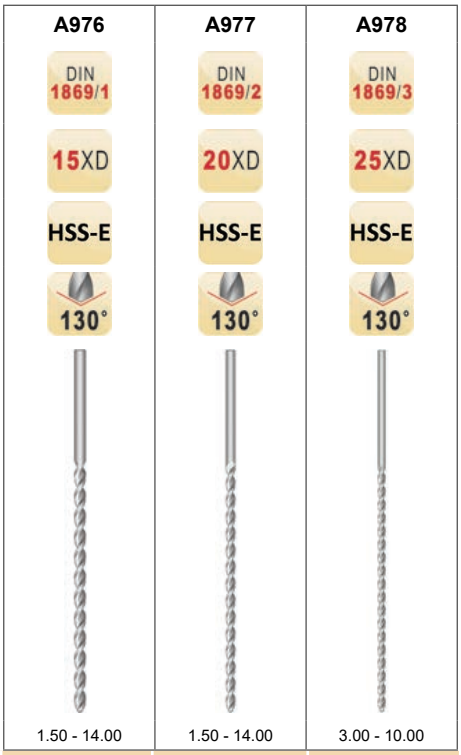
A977

A978

1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 2.1 | 2.2 | 2.3 | 3.2 | 3.3 | 3.4 | 4.1 | 4.2 | 4.3 | 6.3 | 6.4 | 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premuim cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

PFX



d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	1.50	0.0591	100	150	1	—	0347386 [1]	—
	1.50	0.0591	75	115	1	0347362	—	—
1/16	1.59	0.0625	100	150	1	—	0347393 [1]	—
	2.00	0.0787	110	160	1	—	0347409 [1]	—
	2.00	0.0787	85	125	1	0148501	—	—
	2.10	0.0827	85	125	1	0279724	—	—
	2.20	0.0866	90	135	1	0148518	—	—
	2.30	0.0906	90	135	1	0279717	—	—
3/32	2.38	0.0937	115	170	1	—	0347416 [1]	—
	2.40	0.0945	95	140	1	0279731	—	—
	2.50	0.0984	95	140	1	0148525	—	—
	2.60	0.1024	95	140	1	0279748	—	—
	2.70	0.1063	100	150	1	0279755	—	—
	2.80	0.1102	100	150	1	0279762	—	—
	2.90	0.1142	100	150	1	0279779	—	—
	3.00	0.1181	100	150	1	0148532	—	—
	3.00	0.1181	130	190	1	—	0148709	—
	3.00	0.1181	160	240	1	—	—	0347324 [1]
	3.10	0.1220	105	155	1	0279786	—	—
1/8	3.18	0.1250	105	155	1	0347072	—	—
1/8	3.18	0.1250	135	200	1	—	0347218	—
	3.20	0.1260	105	155	1	0279793	—	—
	3.30	0.1299	105	155	1	0148549	—	—
	3.40	0.1339	115	165	1	0279809	—	—
	3.50	0.1378	115	165	1	0148556	—	—
	3.50	0.1378	145	210	1	—	0148716	—
	3.50	0.1378	180	265	1	—	—	0148853
	3.60	0.1417	115	165	1	0279816	—	—
	3.70	0.1457	115	165	1	0148563	—	—

[1] Dormer Standard

PFX EXTRA LENGTH DRILL

d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	3.80	0.1496	120	175	1	0279823	—	—
	3.90	0.1535	120	175	1	0279830	—	—
5/32	3.97	0.1563	120	175	1	0347089	—	—
	4.00	0.1575	120	175	1	0148570	—	—
	4.00	0.1575	150	220	1	—	0148723	—
	4.00	0.1575	190	280	1	—	—	0148860
	4.10	0.1614	120	175	1	0279847	—	—
	4.20	0.1654	120	175	1	0279854	—	—
	4.30	0.1693	125	185	1	0279861	—	—
	4.40	0.1732	125	185	1	0279878	—	—
	4.50	0.1772	125	185	1	0148587	—	—
	4.50	0.1772	160	235	1	—	0148730	—
	4.50	0.1772	200	295	1	—	—	0148877
	4.60	0.1811	125	185	1	0279885	—	—
	4.70	0.1850	125	185	1	0279892	—	—
3/16	4.76	0.1875	135	195	1	0347935	—	—
3/16	4.76	0.1875	170	245	1	—	0347225	—
	4.80	0.1890	135	195	1	0279908	—	—
	4.90	0.1929	135	195	1	0279915	—	—
	5.00	0.1969	135	195	1	0148594	—	—
	5.00	0.1969	170	245	1	—	0148747	—
	5.00	0.1969	210	315	1	—	—	0148884
	5.10	0.2008	135	195	1	0279922	—	—
	5.20	0.2047	135	195	1	0279939	—	—
	5.30	0.2087	135	195	1	0279946	—	—
	5.40	0.2126	140	205	1	0279953	—	—
	5.50	0.2165	140	205	1	0148600	—	—
	5.50	0.2165	180	260	1	—	0148754	—
	5.50	0.2165	225	330	1	—	—	0148891
	5.60	0.2205	140	205	1	0279960	—	—
	5.70	0.2244	140	205	1	0279977	—	—
	5.80	0.2283	140	205	1	0279984	—	—
	5.90	0.2323	140	205	1	0279991	—	—
	6.00	0.2362	140	205	1	0148617	—	—
	6.00	0.2362	180	260	1	—	0148761	—
	6.00	0.2362	225	330	1	—	—	0148907
	6.10	0.2402	150	215	1	0280003	—	—
	6.20	0.2441	150	215	1	0280010	—	—
	6.30	0.2480	150	215	1	0280027	—	—
1/4	6.35	0.2500	150	215	1	0347096	—	—
1/4	6.35	0.2500	190	275	1	—	0347232	—
1/4	6.35	0.2500	235	350	1	—	—	0347331
	6.40	0.2520	150	215	1	0280034	—	—
	6.50	0.2559	150	215	1	0148624	—	—
	6.50	0.2559	190	275	1	—	0148778	—
	6.50	0.2559	235	350	1	—	—	0148914
	6.60	0.2598	150	215	1	0280041	—	—
	6.70	0.2638	150	215	1	0280058	—	—
	6.80	0.2677	155	225	1	0280065	—	—
	6.90	0.2717	155	225	1	0280072	—	—
	7.00	0.2756	155	225	1	0148631	—	—
	7.00	0.2756	200	290	1	—	0148785	—
	7.00	0.2756	250	370	1	—	—	0148921
	7.50	0.2953	155	225	1	0148648	—	—
	7.50	0.2953	200	290	1	—	0148792	—
	7.50	0.2953	250	370	1	—	—	0148938
5/16	7.94	0.3125	165	240	1	0347102	—	—
	8.00	0.3150	165	240	1	0148655	—	—
	8.00	0.3150	210	305	1	—	0148808	—
	8.00	0.3150	265	390	1	—	—	0148945
	8.50	0.3346	165	240	1	0148662	—	—
	8.50	0.3346	210	305	1	—	0148815	—
	8.50	0.3346	265	390	1	—	—	0148952
11/32	8.73	0.3437	175	250	1	0347119	—	—
11/32	8.73	0.3437	220	320	1	—	0347249	—
	9.00	0.3543	175	250	1	0148679	—	—

PFX EXTRA LENGTH DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	9.00	0.3543	220	320	1	—	0148822	—
	9.00	0.3543	280	410	1	—	—	0148969
	9.50	0.3740	175	250	1	0148686	—	—
	9.50	0.3740	220	320	1	—	0148839	—
	9.50	0.3740	280	410	1	—	—	0148976
3/8	9.52	0.3750	185	265	1	0347126	—	—
	10.00	0.3937	185	265	1	0148693	—	—
	10.00	0.3937	235	340	1	—	0148846	—
	10.00	0.3937	295	430	1	—	—	0148983
	10.50	0.4134	185	265	1	0347133	—	—
	10.50	0.4134	235	340	1	—	0347256	—
	11.00	0.4331	195	280	1	0347140	—	—
	11.00	0.4331	250	365	1	—	0347263	—
7/16	11.11	0.4375	195	280	1	0347379	—	—
	11.50	0.4528	195	280	1	0347157	—	—
	11.50	0.4528	250	365	1	—	0347270	—
	12.00	0.4724	205	295	1	0347164	—	—
	12.00	0.4724	260	375	1	—	0347287	—
	12.50	0.4921	205	295	1	0347171	—	—
	12.50	0.4921	260	375	1	—	0347294	—
1/2	12.70	0.5000	205	295	1	0347188	—	—
	13.00	0.5118	205	295	1	0347195	—	—
	13.00	0.5118	260	375	1	—	0347300	—
	14.00	0.5512	215	310	1	0347201	—	—
	14.00	0.5512	270	390	1	—	0347317 [1)]	—

JOBBER DRILL

General Purpose Jobber Length

* *Sets Available on pgs. 224--227*

R10P - *Fractional Sizes*
R15P - *Letter Sizes*
R18P - *Wire Gauge Sizes*

Bright Finish improves chip flow in soft or non-ferrous materials

R10 - *Fractional Sizes*
R15 - *Letter Sizes*
R18 - *Wire Gauge Sizes*

Steam Oxide reduces wear and chip welding in harder ferrous materials for increased wear resistance and lubricity.

							R10P R15P R18P	R10 R15 R18
							ANSI	ANSI
							4XD	4XD
							HSS	HSS
							118°	118°
							N97 - 11/16	N80 - 11/16
d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	97		0.0059	1/16	3/4	12	018697	—
	96		0.0063	1/16	3/4	12	018696	—
	95		0.0067	1/16	3/4	12	018695	—
	94		0.0071	1/16	3/4	12	018694	—
	93		0.0075	1/16	3/4	12	018693	—
	92		0.0079	1/16	3/4	12	018692	—
	91		0.0083	5/64	3/4	12	018691	—
	90		0.0087	5/64	3/4	12	018690	—
	89		0.0091	5/64	3/4	12	018689	—
	88		0.0095	5/64	3/4	12	018688	—
	87		0.0100	5/64	3/4	12	018687	—
	86		0.0105	3/32	3/4	12	018686	—
	85		0.0110	3/32	3/4	12	018685	—
	84		0.0115	3/32	3/4	12	018684	—
	83		0.0120	3/32	3/4	12	018683	—
	82		0.0125	3/32	3/4	12	018682	—
	81		0.0130	3/32	3/4	12	018681	—
	80		0.0135	1/8	3/4	12	018680	018080
	79		0.0145	1/8	3/4	12	018679	018079
1/64			0.0156	3/16	3/4	12	010601	010001
	78		0.0160	3/16	7/8	12	018678	018078
	77		0.0180	3/16	7/8	12	018677	018077
	76		0.0200	3/16	7/8	12	018676	018076
	75		0.0210	1/4	1“	12	018675	018075
	74		0.0225	1/4	1“	12	018674	018074
	73		0.0240	5/16	1.1/8	12	018673	018073
	72		0.0250	5/16	1.1/8	12	018672	018072
	71		0.0260	3/8	1.1/4	12	018671	018071
	70		0.0280	3/8	1.1/4	12	018670	018070
	69		0.0292	1/2	1.3/8	12	018669	018069

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	68		0.0310	1/2	1.3/8	12	018668	018068
1/32			0.0313	1/2	1.3/8	12	010602	010002
	67		0.0320	1/2	1.3/8	12	018667	018067
	66		0.0330	1/2	1.3/8	12	018666	018066
	65		0.0350	5/8	1.1/2	12	018665	018065
	64		0.0360	5/8	1.1/2	12	018664	018064
	63		0.0370	5/8	1.1/2	12	018663	018063
	62		0.0380	5/8	1.1/2	12	018662	018062
	61		0.0390	11/16	1.5/8	12	018661	018061
	60		0.0400	11/16	1.5/8	12	018660	018060
	59		0.0410	11/16	1.5/8	12	018659	018059
	58		0.0420	11/16	1.5/8	12	018658	018058
	57		0.0430	3/4	1.3/4	12	018657	018057
	56		0.0465	3/4	1.3/4	12	018656	018056
3/64			0.0469	3/4	1.3/4	12	010603	010003
	55		0.0520	7/8	1.7/8	12	018655	018055
	54		0.0550	7/8	1.7/8	12	018654	018054
	53		0.0595	7/8	1.7/8	12	018653	018053
1/16			0.0625	7/8	1.7/8	12	010604	010004
	52		0.0635	7/8	1.7/8	12	018652	018052
	51		0.0670	1“	2“	12	018651	018051
	50		0.0700	1“	2“	12	018650	018050
	49		0.0730	1“	2“	12	018649	018049
	48		0.0760	1“	2“	12	018648	018048
5/64			0.0781	1“	2“	12	010605	010005
	47		0.0785	1“	2“	12	018647	018047
	46		0.0810	1.1/8	2.1/8	12	018646	018046
	45		0.0820	1.1/8	2.1/8	12	018645	018045
	44		0.0860	1.1/8	2.1/8	12	018644	018044
	43		0.0890	1.1/4	2.1/4	12	018643	018043
	42		0.0935	1.1/4	2.1/4	12	018642	018042
3/32			0.0938	1.1/4	2.1/4	12	010606	010006
	41		0.0960	1.3/8	2.3/8	12	018641	018041
	40		0.0980	1.3/8	2.3/8	12	018640	018040
	39		0.0995	1.3/8	2.3/8	12	018639	018039
	38		0.1015	1.7/16	2.1/2	12	018638	018038
	37		0.1040	1.7/16	2.1/2	12	018637	018037
	36		0.1065	1.7/16	2.1/2	12	018636	018036
7/64			0.1094	1.1/2	2.5/8	12	010607	010007
	35		0.1100	1.1/2	2.5/8	12	018635	018035
	34		0.1110	1.1/2	2.5/8	12	018634	018034
	33		0.1130	1.1/2	2.5/8	12	018633	018033
	32		0.1160	1.5/8	2.3/4	12	018632	018032
	31		0.1200	1.5/8	2.3/4	12	018631	018031
1/8			0.1250	1.5/8	2.3/4	12	010608	010008
	30		0.1285	1.5/8	2.3/4	12	018630	018030
	29		0.1360	1.3/4	2.7/8	12	018629	018029
	28		0.1405	1.3/4	2.7/8	12	018628	018028
9/64			0.1406	1.3/4	2.7/8	12	010609	010009
	27		0.1440	1.7/8	3“	12	018627	018027
	26		0.1470	1.7/8	3“	12	018626	018026
	25		0.1495	1.7/8	3“	12	018625	018025
	24		0.1520	2“	3.1/8	12	018624	018024
	23		0.1540	2“	3.1/8	12	018623	018023
5/32			0.1563	2“	3.1/8	12	010610	010010
	22		0.1570	2“	3.1/8	12	018622	018022
	21		0.1590	2.1/8	3.1/4	12	018621	018021
	20		0.1610	2.1/8	3.1/4	12	018620	018020
	19		0.1660	2.1/8	3.1/4	12	018619	018019
	18		0.1695	2.1/8	3.1/4	12	018618	018018
11/64			0.1719	2.1/8	3.1/4	12	010611	010011
	17		0.1730	2.3/16	3.3/8	12	018617	018017
	16		0.1770	2.3/16	3.3/8	12	018616	018016

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	15		0.1800	2.3/16	3.3/8	12	018615	018015
	14		0.1820	2.3/16	3.3/8	12	018614	018014
	13		0.1850	2.5/16	3.1/2	12	018613	018013
3/16			0.1875	2.5/16	3.1/2	12	010612	010012
	12		0.1890	2.5/16	3.1/2	12	018612	018012
	11		0.1910	2.5/16	3.1/2	12	018611	018011
	10		0.1935	2.7/16	3.5/8	12	018610	018010
	9		0.1960	2.7/16	3.5/8	12	018609	018009
	8		0.1990	2.7/16	3.5/8	12	018608	018008
	7		0.2010	2.7/16	3.5/8	12	018607	018007
13/64			0.2031	2.7/16	3.5/8	12	010613	010013
	6		0.2040	2.1/2	3.3/4	12	018606	018006
	5		0.2055	2.1/2	3.3/4	12	018605	018005
	4		0.2090	2.1/2	3.3/4	12	018604	018004
	3		0.2130	2.1/2	3.3/4	12	018603	018003
7/32			0.2188	2.1/2	3.3/4	12	010614	010014
	2		0.2210	2.5/8	3.7/8	12	018602	018002
	1		0.2280	2.5/8	3.7/8	12	018601	018001
		A	0.2340	2.5/8	3.7/8	12	015601	015001
15/64			0.2344	2.5/8	3.7/8	12	010615	010015
		B	0.2380	2.3/4	4“	12	015602	015002
		C	0.2421	2.3/4	4“	12	015603	015003
		D	0.2461	2.3/4	4“	12	015604	015004
		E	0.2500	2.3/4	4“	12	015605	015005
1/4			0.2500	2.3/4	4“	12	010616	010016
		F	0.2571	2.7/8	4.1/8	12	015606	015006
		G	0.2610	2.7/8	4.1/8	12	015607	015007
17/64			0.2656	2.7/8	4.1/8	12	010617	010017
		H	0.2661	2.7/8	4.1/8	12	015608	015008
		I	0.2720	2.7/8	4.1/8	12	015609	015009
		J	0.2772	2.7/8	4.1/8	12	015610	015010
		K	0.2811	2.15/16	4.1/4	12	015611	015011
9/32			0.2813	2.15/16	4.1/4	12	010618	010018
		L	0.2902	2.15/16	4.1/4	12	015612	015012
		M	0.2949	3.1/16	4.3/8	12	015613	015013
19/64			0.2969	3.1/16	4.3/8	12	010619	010019
		N	0.3020	3.1/16	4.3/8	12	015614	015014
5/16			0.3125	3.3/16	4.1/2	6	010620	010020
		O	0.3161	3.3/16	4.1/2	6	015615	015015
		P	0.3228	3.5/16	4.5/8	6	015616	015016
21/64			0.3281	3.5/16	4.5/8	6	010621	010021
		Q	0.3319	3.7/16	4.3/4	6	015617	015017
		R	0.3390	3.7/16	4.3/4	6	015618	015018
11/32			0.3437	3.7/16	4.3/4	6	010622	010022
		S	0.3480	3.1/2	4.7/8	6	015619	015019
		T	0.3580	3.1/2	4.7/8	6	015620	015020
23/64			0.3594	3.1/2	4.7/8	6	010623	010023
		U	0.3680	3.5/8	5“	6	015621	015021
3/8			0.3750	3.5/8	5“	6	010624	010024
		V	0.3772	3.5/8	5“	6	015622	015022
		W	0.3858	3.3/4	5.1/8	6	015623	015023
25/64			0.3906	3.3/4	5.1/8	6	010625	010025
		X	0.3969	3.3/4	5.1/8	6	015624	015024
		Y	0.4039	3.7/8	5.1/4	6	015625	015025
13/32			0.4063	3.7/8	5.1/4	6	010626	010026
		Z	0.4130	3.7/8	5.1/4	6	015626	015026
27/64			0.4219	3.15/16	5.3/8	6	010627	010027
7/16			0.4375	4.1/16	5.1/2	6	010628	010028
29/64			0.4531	4.3/16	5.5/8	6	010629	010029
15/32			0.4687	4.5/16	5.3/4	6	010630	010030
31/64			0.4844	4.3/8	5.7/8	6	010631	010031
1/2			0.5000	4.1/2	6“	6	010632	010032
33/64			0.5156	4.13/16	6.5/8	1	010633	010033

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
17/32			0.5313	4.13/16	6.5/8	1	010634	010034
35/64			0.5469	4.13/16	6.5/8	1	010635	010035
9/16			0.5625	4.13/16	6.5/8	1	010636	010036
37/64			0.5781	4.13/16	6.5/8	1	010637	010037
19/32			0.5937	5.3/16	7.1/8	1	010638	010038
39/64			0.6094	5.3/16	7.1/8	1	010639	010039
5/8			0.6250	5.3/16	7.1/8	1	010640	010040
41/64			0.6406	5.3/16	7.1/8	1	010641	010041
21/32			0.6563	5.3/16	7.1/8	1	010642	010042
43/64			0.6719	5.5/8	7.5/8	1	010643	010043
11/16			0.6875	5.5/8	7.5/8	1	010644	010044

JOBBER DRILL

General Purpose Jobber Length, Fractional

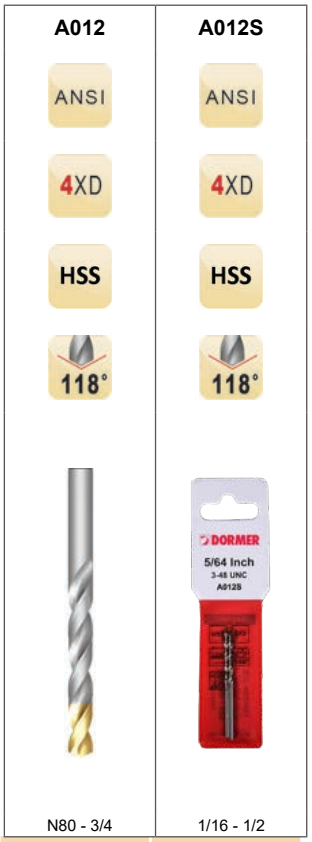
* *Sets Available on pg. 225*

A012

Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases surface hardness and improves tool life.

A012S

Select A012 sizes available in a pouch pack.
1/16 thru 3/16 2 per pack
13/64 thru 1/2 1 per pack



* *Bright / No split point Below N46*

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
	80		0.34	0.0135	1/8	3/4	10	0574256 *	—
	79		0.37	0.0145	1/8	3/4	10	0574249 *	—
1/64			0.40	0.0156	3/16	3/4	10	0573952 *	—
	78		0.41	0.0160	3/16	7/8	10	0574232 *	—
	77		0.46	0.0180	3/16	7/8	10	0574225 *	—
	76		0.51	0.0200	3/16	7/8	10	0574218 *	—
	75		0.53	0.0210	1/4	1“	10	0574201 *	—
	74		0.57	0.0225	1/4	1“	10	0574195 *	—
	73		0.61	0.0240	5/16	1.1/8	10	0574188 *	—
	72		0.64	0.0250	5/16	1.1/8	10	0574171 *	—
	71		0.66	0.0260	3/8	1.1/4	10	0574164 *	—
	70		0.71	0.0280	3/8	1.1/4	10	0574157 *	—
	69		0.742	0.0292	1/2	1.3/8	10	0574140 *	—
	68		0.79	0.0310	1/2	1.3/8	10	0574133 *	—
1/32			0.79	0.0313	1/2	1.3/8	10	0573969 *	—
	67		0.81	0.0320	1/2	1.3/8	10	0574126 *	—
	66		0.84	0.0330	1/2	1.3/8	10	0574119 *	—
	65		0.89	0.0350	5/8	1.1/2	10	0574102 *	—
	64		0.91	0.0360	5/8	1.1/2	10	0574096 *	—
	63		0.94	0.0370	5/8	1.1/2	10	0574089 *	—
	62		0.97	0.0380	5/8	1.1/2	10	0574072 *	—
	61		0.99	0.0390	11/16	1.5/8	10	0574065 *	—
	60		1.02	0.0400	11/16	1.5/8	10	0574058 *	—
	59		1.04	0.0410	11/16	1.5/8	10	0574041 *	—
	58		1.07	0.0420	11/16	1.5/8	10	0574034 *	—
	57		1.09	0.0430	3/4	1.3/4	10	0574027 *	—
	56		1.18	0.0465	3/4	1.3/4	10	0574010 *	—
3/64			1.19	0.0469	3/4	1.3/4	10	0573976 *	—
	55		1.32	0.0520	7/8	1.7/8	10	0574003 *	—
	54		1.40	0.0550	7/8	1.7/8	10	0573990 *	—
	53		1.51	0.0595	7/8	1.7/8	10	0573983 *	—
1/16			1.59	0.0625	7/8	1.7/8	2	—	46524892 *

JOBBER DRILL

DORMER

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
1/16			1.59	0.0625	7/8	1.7/8	10	0578636 *	—
	52		1.61	0.0635	7/8	1.7/8	10	0578704 *	—
	51		1.70	0.0669	1“	2“	10	0578698 *	—
	50		1.78	0.0700	1“	2“	10	0578681 *	—
	49		1.85	0.0730	1“	2“	10	0578674 *	—
	48		1.93	0.0760	1“	2“	10	0578667 *	—
5/64			1.98	0.0781	1“	2“	2	—	46524893 *
5/64			1.98	0.0781	1“	2“	10	0578643 *	—
	47		1.99	0.0785	1“	2“	10	0578650 *	—
	46		2.06	0.0810	1.1/8	2.1/8	10	0571705	—
	45		2.08	0.0820	1.1/8	2.1/8	10	0571699	—
	44		2.18	0.0860	1.1/8	2.1/8	10	0571682	—
	43		2.26	0.0890	1.1/4	2.1/4	10	0571675	—
	42		2.38	0.0935	1.1/4	2.1/4	10	0571668	—
3/32			2.38	0.0938	1.1/4	2.1/4	2	—	46524894
3/32			2.38	0.0938	1.1/4	2.1/4	10	0572061	—
	41		2.44	0.0960	1.3/8	2.3/8	10	0571651	—
	40		2.49	0.0980	1.3/8	2.3/8	10	0571644	—
	39		2.53	0.0995	1.3/8	2.3/8	10	0571620	—
	38		2.58	0.1015	1.7/16	2.1/2	10	0571613	—
	37		2.64	0.1040	1.7/16	2.1/2	10	0571606	—
	36		2.71	0.1065	1.7/16	2.1/2	10	0571590	—
7/64			2.78	0.1094	1.1/2	2.5/8	2	—	46524895
7/64			2.78	0.1094	1.1/2	2.5/8	10	0572184	—
	35		2.79	0.1100	1.1/2	2.5/8	10	0571583	—
	34		2.82	0.1110	1.1/2	2.5/8	10	0571576	—
	33		2.87	0.1130	1.1/2	2.5/8	10	0571569	—
	32		2.95	0.1160	1.5/8	2.3/4	10	0571552	—
	31		3.05	0.1200	1.5/8	2.3/4	10	0571545	—
1/8			3.18	0.1250	1.5/8	2.3/4	2	—	46524896
1/8			3.18	0.1250	1.5/8	2.3/4	10	0571897	—
	30		3.26	0.1285	1.5/8	2.3/4	10	0571538	—
	29		3.45	0.1360	1.3/4	2.7/8	10	0571514	—
	28		3.57	0.1405	1.3/4	2.7/8	10	0571507	—
9/64			3.57	0.1405	1.3/4	2.7/8	2	—	46524897
9/64			3.57	0.1406	1.3/4	2.7/8	10	0572214	—
	27		3.66	0.1440	1.7/8	3“	10	0571491	—
	26		3.73	0.1470	1.7/8	3“	10	0571484	—
	25		3.80	0.1495	1.7/8	3“	10	0571477	—
	24		3.86	0.1520	2“	3.1/8	10	0571460	—
	23		3.91	0.1540	2“	3.1/8	10	0571453	—
5/32	5/32		3.97	0.1563	2“	3.1/8	2	—	46524898
5/32			3.97	0.1563	2“	3.1/8	10	0572146	—
	22		3.99	0.1570	2“	3.1/8	10	0571446	—
	21		4.04	0.1590	2.1/8	3.1/4	10	0571439	—
	20		4.09	0.1610	2.1/8	3.1/4	10	0571422	—
	19		4.22	0.1660	2.1/8	3.1/4	10	0571408	—
	18		4.31	0.1695	2.1/8	3.1/4	10	0571392	—
11/64			4.37	0.1719	2.1/8	3.1/4	2	—	46524899
11/64			4.37	0.1719	2.1/8	3.1/4	10	0571910	—
	17		4.39	0.1730	2.3/16	3.3/8	10	0571385	—
	16		4.50	0.1770	2.3/16	3.3/8	10	0571378	—
	15		4.57	0.1800	2.3/16	3.3/8	10	0571361	—
	14		4.62	0.1820	2.3/16	3.3/8	10	0571354	—
	13		4.70	0.1850	2.5/16	3.1/2	10	0571347	—
3/16			4.76	0.1875	2.5/16	3.1/2	2	—	46524900
3/16			4.76	0.1875	2.5/16	3.1/2	10	0572054	—
	12		4.80	0.1890	2.5/16	3.1/2	10	0571330	—
	11		4.85	0.1910	2.5/16	3.1/2	10	0571323	—
	10		4.92	0.1935	2.7/16	3.5/8	10	0571316	—
	9		4.98	0.1960	2.7/16	3.5/8	10	0571750	—
	8		5.06	0.1990	2.7/16	3.5/8	10	0571743	—
	7		5.11	0.2010	2.7/16	3.5/8	10	0571736	—
13/64			5.16	0.2031	2.7/16	3.5/8	1	—	46524901
13/64			5.16	0.2031	2.7/16	3.5/8	10	0571934	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
	6		5.18	0.2040	2.1/2	3.3/4	10	0571729	—
	5		5.22	0.2055	2.1/2	3.3/4	10	0571712	—
	4		5.31	0.2090	2.1/2	3.3/4	10	0571637	—
	3		5.41	0.2130	2.1/2	3.3/4	10	0571521	—
7/32			5.56	0.2188	2.1/2	3.3/4	1	—	46524902
7/32			5.56	0.2188	2.1/2	3.3/4	10	0572177	—
	2		5.61	0.2210	2.5/8	3.7/8	10	0571415	—
	1		5.79	0.2280	2.5/8	3.7/8	10	0571309	—
		A	5.94	0.2340	2.5/8	3.7/8	10	0571163	—
15/64			5.95	0.2344	2.5/8	3.7/8	1	—	46524903
15/64			5.95	0.2344	2.5/8	3.7/8	10	0571958	—
		B	6.03	0.2380	2.3/4	4“	10	0571170	—
		C	6.15	0.2420	2.3/4	4“	10	0571187	—
		D	6.25	0.2460	2.3/4	4“	10	0571194	—
1/4			6.35	0.2500	2.3/4	4“	1	—	46524904
1/4			6.35	0.2500	2.3/4	4“	10	0571125	—
		E	6.35	0.2500	2.3/4	4“	10	0571200	—
		F	6.53	0.2570	2.7/8	4.1/8	10	0571217	—
		G	6.63	0.2610	2.7/8	4.1/8	10	0571224	—
17/64			6.75	0.2656	2.7/8	4.1/8	1	—	46524905
17/64			6.75	0.2656	2.7/8	4.1/8	10	0571972	—
		H	6.76	0.2660	2.7/8	4.1/8	10	0571231	—
		I	6.91	0.2720	2.7/8	4.1/8	10	0571248	—
		J	7.04	0.2770	2.7/8	4.1/8	10	0571255	—
		K	7.14	0.2810	2.15/16	4.1/4	10	0571262	—
9/32			7.14	0.2813	2.15/16	4.1/4	1	—	46524906
9/32			7.14	0.2813	2.15/16	4.1/4	10	0572207	—
		L	7.37	0.2900	2.15/16	4.1/4	10	0571279	—
		M	7.49	0.2950	3.1/16	4.3/8	10	0571286	—
19/64			7.54	0.2968	3.1/16	4.3/8	1	—	46524907
19/64			7.54	0.2968	3.1/16	4.3/8	10	0571996	—
		N	7.67	0.3020	3.1/16	4.3/8	10	0571293	—
5/16			7.94	0.3125	3.3/16	4.1/2	1	—	46524908
5/16			7.94	0.3125	3.3/16	4.1/2	10	0572139	—
		O	8.03	0.3160	3.3/16	4.1/2	10	0571767	—
		P	8.20	0.3230	3.5/16	4.5/8	10	0571774	—
21/64			8.33	0.3281	3.5/16	4.5/8	1	—	46524909
21/64			8.33	0.3281	3.5/16	4.5/8	10	0572009	—
		Q	8.43	0.3320	3.7/16	4.3/4	10	0571781	—
		R	8.61	0.3390	3.7/16	4.3/4	10	0571798	—
11/32			8.73	0.3437	3.7/16	4.3/4	1	—	46524910
11/32			8.73	0.3437	3.7/16	4.3/4	10	0571903	—
		S	8.84	0.3480	3.1/2	4.7/8	10	0571804	—
		T	9.09	0.3580	3.1/2	4.7/8	10	0571811	—
23/64			9.13	0.3594	3.1/2	4.7/8	1	—	46524911
23/64			9.13	0.3594	3.1/2	4.7/8	10	0572016	—
		U	9.35	0.3680	3.5/8	5“	10	0571828	—
3/8			9.52	0.3750	3.5/8	5“	1	—	46524912
3/8			9.52	0.3750	3.5/8	5“	10	0572078	—
		V	9.58	0.3770	3.5/8	5“	10	0571835	—
		W	9.80	0.3860	3.3/4	5.1/8	10	0571842	—
25/64			9.92	0.3906	3.3/4	5.1/8	1	—	46524913
25/64			9.92	0.3906	3.3/4	5.1/8	10	0572023	—
		X	10.08	0.3970	3.3/4	5.1/8	5	0571859	—
		Y	10.26	0.4040	3.7/8	5.1/4	5	0571866	—
13/32			10.32	0.4063	3.7/8	5.1/4	1	—	46524914
13/32			10.32	0.4063	3.7/8	5.1/4	5	0571927	—
		Z	10.49	0.4130	3.7/8	5.1/4	5	0571873	—
27/64			10.72	0.4219	3.15/16	5.3/8	1	—	46524915
27/64			10.72	0.4219	3.15/16	5.3/8	5	0572030	—
7/16			11.11	0.4375	4.1/16	5.1/2	1	—	46524916
7/16			11.11	0.4375	4.1/16	5.1/2	5	0572160	—
29/64			11.51	0.4531	4.3/16	5.5/8	1	—	46524917
29/64			11.51	0.4531	4.3/16	5.5/8	5	0572047	—
15/32			11.91	0.4687	4.5/16	5.3/4	1	—	46524918
15/32			11.91	0.4687	4.5/16	5.3/4	5	0571941	—

JOBBER DRILL

DORMER

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
31/64			12.30	0.4844	4.3/8	5.7/8	1	—	46524919
31/64			12.30	0.4844	4.3/8	5.7/8	5	0572085	—
1/2			12.70	0.5000	4.1/2	6“	1	—	46524920
1/2			12.70	0.5000	4.1/2	6“	5	0571880	—
33/64			13.10	0.5156	4.13/16	6.5/8	1	0572092	—
17/32			13.49	0.5313	4.13/16	6.5/8	1	0571965	—
35/64			13.89	0.5469	4.13/16	6.5/8	1	0572108	—
9/16			14.29	0.5625	4.13/16	6.5/8	1	0572191	—
37/64			14.68	0.5781	4.13/16	6.5/8	1	0572115	—
19/32			15.08	0.5937	5.3/16	7.1/8	1	0571989	—
39/64			15.48	0.6094	5.3/16	7.1/8	1	0572122	—
5/8			15.88	0.6250	5.3/16	7.1/8	1	0572153	—
21/32			16.67	0.6563	5.3/16	7.1/8	1	0578728	—
11/16			17.46	0.6875	5.5/8	7.5/8	1	0578711	—
45/64			17.86	0.7031	5.5/8	7.5/8	1	0578742	—
23/32			18.26	0.7188	5.5/8	7.5/8	1	0578735	—
47/64			18.65	0.7344	6“	8“	1	0578766	—
3/4			19.05	0.7500	6“	8“	1	0578759	—

General Purpose Jobber Length, DIN Standard

∗ *Sets Available on pg. 228-230*

2A Bright Finish improves chip flow in soft or non-ferrous materials

2AB
A100 Steam Oxide for increased wear resistance & lubricity.

A002
A002S Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

∗ *Bright Below 2mm*

∗ *No split point below 2mm*

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
0.15		0.0059	1.5	19	016215	—	—	—	—
0.16		0.0063	1.5	19	016216	—	—	—	—
0.17		0.0067	1.5	19	016217	—	—	—	—
0.18		0.0070	1.5	19	016218	—	—	—	—
0.19		0.0075	1.5	19	016219	—	—	—	—
0.20		0.0078	2.5	19	016002	—	0000021	—	—
0.21		0.0083	2.5	19	016221	—	—	—	—
0.22		0.0087	2.5	19	016222	—	—	—	—
0.23		0.0091	2.5	19	016223	—	—	—	—
0.24		0.0094	2.5	19	016224	—	—	—	—
0.25		0.0098	3	19	016225	—	0000038	—	—
0.26		0.0102	3	19	016226	—	—	—	—
0.27		0.0106	3	19	016227	—	—	—	—
0.28		0.0110	3	19	016228	—	—	—	—
0.29		0.0114	3	19	016229	—	—	—	—
0.30		0.0118	3	19	016003	—	0000045	—	—
0.32		0.0126	4	19	016232	—	0000052	—	—
	80	0.0135	4	19		—	0029480	—	—
0.34		0.0134	4	19	016234	—	—	—	—
0.35		0.0138	4	19	016235	—	0000069	—	—
0.36		0.0142	4	19	016236	—	—	—	—
	79	0.0145	4	19		—	0029466	—	—
0.38		0.0150	4	19	016238	—	0000076	—	—
	1/64	0.0156	5	20		—	0001219	—	—
0.40		0.0157	5	20	016004	—	0000083	—	—
	78	0.0160	5	20		—	0029459	—	—
0.42		0.0165	5	20	016242	—	0000090	—	—
0.44		0.0173	5	20	016244	—	—	—	—
0.45		0.0177	5	20	016245	—	0000106	—	—
	77	0.0180	5	20		—	0029442	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
0.46		0.0181	5	20	016246	—	—	—	—
0.48		0.0189	5	20	016248	—	0000113	—	—
0.50		0.0197	6	22	016005	—	0000120	—	—
	76	0.0200	6	22	—	—	0029435	—	—
0.52		0.0205	6	22	—	—	0000137	—	—
	75	0.0210	6	22	—	—	0029428	—	—
0.55		0.0217	7	24	016250	—	0000144	—	—
	74	0.0225	7	24	—	—	0029411	—	—
0.58		0.0228	7	24	—	—	0000151	—	—
0.60		0.0236	7	24	016006	—	0000168	—	—
	73	0.0240	8	26	—	—	0029404	—	—
0.62		0.0244	8	26	—	—	0000175	—	—
	72	0.0250	8	26	—	—	0029398	—	—
0.65		0.0256	8	26	016251	—	0000182	—	—
	71	0.0260	8	26	—	—	0029381	—	—
0.68		0.0268	9	28	—	—	0000199	—	—
0.70		0.0276	9	28	016007	—	0000205	—	—
	70	0.0280	9	28	—	—	0029374	—	—
0.72		0.0283	9	28	—	—	0000212	—	—
	69	0.0292	9	28	—	—	0029350	—	—
0.75		0.0295	9	28	016252	—	0000229	—	—
0.78		0.0307	10	30	—	—	0000236	—	—
	68	0.0310	10	30	—	—	0029343	—	—
	1/32	0.0313	10	30	—	—	0001059	—	—
0.80		0.0315	10	30	016008	—	0000243	—	—
	67	0.0320	10	30	—	—	0029336	—	—
0.82		0.0323	10	30	—	—	0000250	—	—
	66	0.0330	10	30	—	—	0029329	—	—
0.85		0.0335	10	30	016253	—	0000267	—	—
0.88		0.0346	11	32	—	—	0000274	—	—
	65	0.0350	11	32	—	—	0029312	—	—
0.90		0.0354	11	32	016009	—	0000281	—	—
	64	0.0360	11	32	—	—	0029305	—	—
0.92		0.0362	11	32	—	—	0000298	—	—
	63	0.0370	11	32	—	—	0029299	—	—
0.95		0.0374	11	32	016254	—	0000304	—	—
	62	0.0380	12	34	—	—	0029282	—	—
0.98		0.0386	12	34	—	—	0000311	—	—
	61	0.0390	12	34	—	—	0029275	—	—
1.00		0.0394	12	34	016010	029010	0000328	0376782	—
	60	0.0400	12	34	—	—	0029268	—	—
	59	0.0410	12	34	—	—	0029244	—	—
1.05		0.0413	12	34	—	—	0000335	—	—
	58	0.0420	14	36	—	—	0029237	—	—
	57	0.0430	14	36	—	—	0029220	—	—
1.10		0.0433	14	36	016011	029011	0000342	0376799	—
1.15		0.0453	14	36	016256	029256	0000359	—	—
	56	0.0465	14	36	—	—	0029213	—	—
	3/64	0.0469	16	38	—	—	0001783	0376928	—
1.20		0.0472	16	38	016012	029012	0000366	0376805	—
1.25		0.0492	16	38	016257	029257	0000373	—	—
1.30		0.0512	16	38	016013	029013	0000380	0376812	—
	55	0.0520	16	38	—	—	0029206	—	—
1.35		0.0531	18	40	016258	029258	0000397	—	—
	54	0.0550	18	40	—	—	0029190	—	—
1.40		0.0551	18	40	016014	029014	0000403	0376829	—
1.45		0.0571	18	40	016259	029259	0000410	—	—
1.50		0.0591	18	40	016015	029015	0000427	0376836	—
	53	0.0595	20	43	—	—	0029183	—	—
1.55		0.0610	20	43	016260	029260	0000434	—	—
	1/16	0.0625	20	43	—	—	0000786	0376881	—
1.60		0.0630	20	43	016016	029016	0000441	0376843	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
	52	0.0635	20	43	—	—	0029176	—	—
1.65		0.0650	20	43	016261	—	0000458	—	—
1.70		0.0669	20	43	016017	029017	0000465	0376850	—
	51	0.0670	22	46	—	—	0029169	—	—
1.75		0.0689	22	46	016262	029262	0000472	—	—
	50	0.0700	22	46	—	—	0029152	—	—
1.80		0.0709	22	46	016018	029018	0000489	0376867	—
1.85		0.0728	22	46	—	—	0000496	—	—
	49	0.0730	22	46	—	—	0029138	—	—
1.90		0.0748	22	46	016019	029019	0000502	0376874	—
	48	0.0760	24	49	—	—	0029121	—	—
1.95		0.0768	24	49	46790303	029264	0000519	—	—
	5/64	0.0781	24	49	—	—	0002100	0376935	—
	47	0.0785	24	49	—	—	0029114	—	—
2.00		0.0787	24	49	016020	029020	0001332	0376041	46524831
2.05		0.0807	24	49	—	—	0001349	—	—
	46	0.0810	24	49	—	—	0029107	—	—
	45	0.0820	24	49	—	—	0029091	—	—
2.10		0.0827	24	49	016021	029021	0001356	0376058	—
2.15		0.0846	27	53	016266	—	0001363	—	—
	44	0.0860	27	53	—	—	0029084	—	—
2.20		0.0866	27	53	016022	029022	0001370	0376898	—
2.25		0.0886	27	53	016267	—	0001387	—	—
	43	0.0890	27	53	—	—	0029077	—	—
2.30		0.0906	27	53	016023	029023	0001394	0376904	—
2.35		0.0925	27	53	016268	029268	0001400	—	—
	42	0.0935	30	57	—	—	0029060	—	—
	3/32	0.0937	30	57	—	—	0001752	0376119	—
2.40		0.0945	30	57	016024	029024	0001417	0376911	—
	41	0.0960	30	57	—	—	0029053	—	—
2.45		0.0965	30	57	—	—	0001424	—	—
	40	0.0980	30	57	—	—	0029046	—	—
2.50		0.0984	30	57	016025	029025	0001431	0376065	46524832
	39	0.0995	30	57	—	—	0029022	—	—
2.55		0.1004	30	57	—	—	001448	—	—
	38	0.1015	30	57	—	—	0029015	—	—
2.60		0.1024	30	57	016026	029026	0001455	0376072	—
	37	0.1040	30	57	—	—	0029008	—	—
2.65		0.1043	30	57	—	—	0001462	—	—
2.70		0.1063	33	61	016027	029027	0001479	0376089	—
	36	0.1065	33	61	—	—	0028995	—	—
2.75		0.1083	33	61	016270	—	0001486	—	—
	7/64	0.1093	33	61	—	—	0002384	0376126	—
	35	0.1100	33	61	—	—	0028988	—	—
2.82		0.1102	33	61	—	—	0001493	0376096	—
	34	0.1110	33	61	—	—	0028971	—	—
2.85		0.1122	33	61	—	—	0001509	—	—
	33	0.1130	33	61	—	—	0028964	—	—
2.90		0.1142	33	61	016029	029029	0001516	0376102	—
	32	0.1160	33	61	—	—	0028957	—	—
2.95		0.1161	33	61	—	—	0001523	—	—
3.00		0.1181	33	61	016030	029030	0001608	0350577	46524833
	31	0.1200	36	65	—	—	0028940	—	—
3.10		0.1220	36	65	016031	029031	0001615	0350584	—
3.15		0.1240	36	65	—	—	0001622	—	—
	1/8	0.1250	36	65	—	—	0001264	0350591	46524834
3.20		0.1260	36	65	016032	029032	0001639	0350607	46524835
3.25		0.1280	36	65	016271	029271	0001646	0605356	—
	30	0.1285	36	65	—	—	0028933	—	—
3.30		0.1299	36	65	016033	029033	0001653	0350614	46524836
3.40		0.1339	39	70	016034	029034	0001660	0350621	—
	29	0.1360	39	70	—	—	0028919	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
3.50		0.1378	39	70	016035	029035	0001677	0350638	46524837
	28	0.1405	39	70	—	—	0028902	—	—
	9/64	0.1406	39	70	—	—	0002650	0350645	—
3.60		0.1417	39	70	016036	029036	0001684	0350652	—
	27	0.1440	39	70	—	—	0028896	—	—
3.70		0.1457	39	70	016037	029037	0001691	0350669	—
	26	0.1470	39	70	—	—	0028889	—	—
3.75		0.1476	39	70	—	—	0001707	—	—
	25	0.1495	43	75	—	—	0028872	—	—
3.80		0.1496	43	75	—	—	0001714	0350676	—
	24	0.1520	43	75	—	—	0028865	—	—
3.90		0.1535	43	75	—	—	0001721	0350683	—
	23	0.1540	43	75	—	—	0028858	—	—
	5/32	0.1562	43	75	—	—	0002094	0350690	46524838
	22	0.1570	43	75	—	—	0028841	—	—
4.00		0.1575	43	75	016040	029040	0001820	0350706	46524839
	21	0.1590	43	75	—	—	0028834	—	—
	20	0.1610	43	75	—	—	0028827	—	—
4.10		0.1614	43	75	016041	029041	0001837	0350713	46524860
4.20		0.1654	43	75	016042	029042	0001844	0350720	46524861
	19	0.1660	43	75	—	—	0028803	—	—
4.25		0.1673	43	75	—	—	0001851	—	—
4.30		0.1693	47	80	—	—	0001868	0350737	—
4.30		0.1693	47	80	016043	029043	0001868	0350737	—
	18	0.1695	47	80	—	—	0028797	—	—
	11/64	0.1719	47	80	—	—	0000793	0350744	—
	17	0.1730	47	80	—	—	0028780	—	—
4.40		0.1732	47	80	016044	029044	0001875	0350751	—
	16	0.1770	47	80	—	—	0028773	—	—
4.50		0.1772	47	80	016045	029045	0001882	0350768	46524862
	15	0.1800	47	80	—	—	0028766	—	—
4.60		0.1811	47	80	016046	029046	0001899	0350775	—
	14	0.1820	47	80	—	—	0028759	—	—
4.70		0.1850	47	80	—	—	0001905	0350782	—
	13	0.1850	47	80	—	—	0028742	—	—
4.75		0.1870	47	80	—	—	0001912	—	—
	3/16	0.1875	52	86	—	—	0001738	0350799	46524863
	12	0.1890	52	86	—	—	0028735	—	—
4.80		0.1890	52	86	016048	029048	0001929	0350805	—
	11	0.1910	52	86	—	—	0028728	—	—
4.90		0.1929	52	86	—	—	0001936	0350812	—
	10	0.1935	52	86	—	—	0028711	—	—
	9	0.1960	52	86	—	—	0029497	—	—
5.00		0.1968	52	86	016050	029050	0001967	0350829	46524864
	8	0.1990	52	86	—	—	0029473	—	—
5.10		0.2008	52	86	016051	029051	0001974	0350836	—
	7	0.2010	52	86	—	—	0029367	—	—
	13/64	0.2031	52	86	—	—	0001073	0350843	46524865
	6	0.2040	52	86	—	—	0029251	—	—
5.20		0.2047	52	86	016052	029052	0001981	0350850	—
	5	0.2055	52	86	—	—	0029145	—	—
5.25		0.2067	52	86	—	—	0001998	—	—
5.30		0.2087	52	86	016053	029053	0002001	0350867	—
	4	0.2090	57	93	—	—	0029039	—	—
5.40		0.2126	57	93	016054	029054	0002018	0350874	—
	3	0.2130	57	93	—	—	0028926	—	—
5.50		0.2165	57	93	016055	029055	0002025	0350881	46524866
	7/32	0.2187	57	93	—	—	0002377	0350898	46524867
5.60		0.2205	57	93	016056	029056	0002032	0350904	—
	2	0.2210	57	93	—	—	0028810	—	—
5.70		0.2244	57	93	016057	029057	0002049	0350911	—
5.75		0.2264	57	93	016276	029276	0002056	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $\varnothing h_8$ mm	d_1 $\varnothing h_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
	1	0.2280	57	93	—	—	0028704	—	—
5.80		0.2283	57	93	016058	029058	0002063	0350928	—
5.90		0.2323	57	93	—	—	0002070	0350935	—
	A	0.2340	57	93	—	—	0028568	—	—
	15/64	0.2344	57	93	—	—	0001189	0350942	—
6.00		0.2362	57	93	016060	029060	0002124	0350959	46524868
	B	0.2380	63	101	—	—	0028575	—	—
6.10		0.2402	63	101	016061	029061	0002131	0350966	—
	C	0.2420	63	101	—	—	0028582	—	—
6.20		0.2441	63	101	016062	029062	0002148	0350973	—
	D	0.2460	63	101	—	—	0028599	—	—
6.25		0.2461	63	101	—	—	0002155	—	—
6.30		0.2480	63	101	016063	029063	0002162	0350980	—
	1/4	0.2500	63	101	—	—	0001080	0350997	46524869
	E	0.2500	63	101	—	—	0028605	—	—
6.40		0.2520	63	101	016064	029064	0002179	0351000	—
6.50		0.2559	63	101	016065	029065	0002186	0351017	46524870
	F	0.2570	63	101	—	—	0028612	—	—
6.60		0.2598	63	101	016066	029066	0002193	0351024	—
	G	0.2610	63	101	—	—	0028629	—	—
6.70		0.2638	63	101	016067	029067	0002209	0351031	—
	17/64	0.2656	69	109	—	—	0001257	0351048	46524871
6.75		0.2657	69	109	016278	029278	0002216	—	—
	H	0.2660	69	109	—	—	0028636	—	—
6.80		0.2677	69	109	016068	029068	0002223	0351055	46524872
6.90		0.2717	69	109	—	—	0002230	0351062	—
	I	0.2720	69	109	—	—	0028643	—	—
7.00		0.2756	69	109	016070	029070	0002247	0351079	46524873
	J	0.2770	69	109	—	—	0028650	—	—
7.10		0.2795	69	109	—	—	0002254	0351086	—
	K	0.2810	69	109	—	—	0028667	—	—
	9/32	0.2812	69	109	—	—	0002643	0351093	—
7.20		0.2835	69	109	016072	029072	0002261	0351109	—
7.25		0.2854	69	109	016279	029279	0002278	—	—
7.30		0.2874	69	109	016073	029073	0002285	0351116	—
	L	0.2900	69	109	—	—	0028674	—	—
7.40		0.2913	69	109	016074	029074	0002292	0351123	—
	M	0.2950	69	109	—	—	0028681	—	—
7.50		0.2953	69	109	016075	029075	0002308	0351130	46524874
	19/64	0.2968	75	117	—	—	0001325	0351147	—
7.60		0.2992	75	117	016076	029076	0002315	0351154	—
	N	0.3020	75	117	—	—	0028698	—	—
7.70		0.3031	75	117	—	—	0002322	0351161	—
7.75		0.3051	75	117	—	—	0002339	—	—
7.80		0.3071	75	117	016078	029078	0002346	0351178	—
7.85		0.3091	75	117	—	029281	—	—	—
7.90		0.3110	75	117	016079	029079	0002353	0351185	—
	5/16	0.3125	75	117	—	—	0002087	0351192	46524875
8.00		0.3150	75	117	016080	029080	0002391	0351208	46524876
	O	0.3160	75	117	—	—	0029503	—	—
8.10		0.3189	75	117	016081	029081	0002407	0351215	—
	P	0.3230	75	117	—	—	0029510	—	—
8.20		0.3228	75	117	016082	029082	0002414	0351222	46524877
8.25		0.3248	75	117	016282	029282	0002421	—	—
8.30		0.3268	75	117	—	—	0002438	0351239	—
	21/64	0.3281	75	117	—	—	0001554	0351246	—
8.40		0.3307	75	117	016084	029084	0002445	0351253	—
	Q	0.3320	75	117	—	—	0029527	—	—
8.50		0.3346	75	117	016085	029085	0002452	0351260	46524878
8.60		0.3386	81	125	016086	029086	0002469	0351277	—
	R	0.3390	81	125	—	—	0029534	—	—
8.70		0.3425	81	125	016087	029087	0002476	—	—
	11/32	0.3437	81	125	—	—	0000779	0351291	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $\emptyset h_8$ mm	d_1 $\emptyset h_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
8.75		0.3445	81	125	016283	029283	0002483	—	—
8.80		0.3465	81	125	016088	029088	0002490	0351307	—
	S	0.3480	81	125	—	—	0029541	—	—
8.90		0.3504	81	125	016089	029089	0002506	0351314	—
9.00		0.3543	81	125	016090	029090	0002513	0351321	46524879
	T	0.3580	81	125	—	—	0029558	—	—
9.10		0.3583	81	125	—	—	0002520	0351338	—
	23/64	0.3594	81	125	—	—	0001561	0351345	—
9.20		0.3622	81	125	—	—	0002537	0351352	—
9.25		0.3642	81	125	—	—	0002544	—	—
9.30		0.3661	81	125	016093	029093	0002551	0351369	—
	U	0.3680	81	125	—	—	0029565	—	—
9.40		0.3701	81	125	016094	029094	0002568	0351376	—
9.50		0.3740	81	125	016095	029095	0002575	0351383	46524880
	3/8	0.3750	87	133	—	—	0001806	0351390	46524881
	V	0.3770	87	133	—	—	0029572	—	—
9.60		0.3780	87	133	016096	029096	0002582	0351406	—
9.70		0.3819	87	133	016097	029097	0002599	0351413	—
9.75		0.3839	87	133	—	—	0002605	—	—
9.80		0.3858	87	133	016098	029098	0002612	0351420	—
	W	0.3860	87	133	—	—	0029589	—	—
9.90		0.3898	87	133	016099	029099	0002629	0351437	—
	25/64	0.3906	87	133	—	—	0001578	0351444	—
10.00		0.3937	87	133	016100	029100	0000526	0351451	46524882
	X	0.3970	87	133	—	—	0029596	—	—
10.10		0.3976	87	133	—	—	0000533	0351468	—
10.20		0.4016	87	133	016102	029102	0000540	0351475	46524883
10.25		0.4035	87	133	—	—	0000557	—	—
	Y	0.4040	87	133	—	—	0029602	—	—
10.30		0.4055	87	133	016103	029103	0000564	0351482	—
	13/32	0.4062	87	133	—	—	0001066	0351499	—
10.40		0.4094	87	133	—	—	0000571	0351505	—
	Z	0.4130	87	133	—	—	0029619	—	—
10.50		0.4134	87	133	016105	029105	0000588	0351512	46524884
10.60		0.4173	87	133	016106	—	0000595	0351529	—
10.70		0.4213	94	142	—	—	0000601	0351536	—
	27/64	0.4219	94	142	—	—	0001585	0351543	—
10.75		0.4232	94	142	—	—	0000618	—	—
10.80		0.4252	94	142	016108	029108	0000625	0351550	—
10.90		0.4291	94	142	016109	029109	0000632	0351567	—
11.00		0.4331	94	142	016110	029110	0000649	0351574	46524885
11.10		0.4370	94	142	—	—	0000656	0351581	—
	7/16	0.4375	94	142	—	—	0002360	0351598	—
11.20		0.4409	94	142	016112	029112	0000663	0351604	—
11.25		0.4429	94	142	—	—	0000670	—	—
11.30		0.4449	94	142	016113	029113	0000687	0351611	—
11.40		0.4488	94	142	016114	029114	0000694	0351628	—
11.50		0.4528	94	142	016115	029115	0000700	0351635	46524886
	29/64	0.4531	94	142	—	—	0001592	0351642	—
11.60		0.4567	94	142	—	—	0000717	0351659	—
11.70		0.4606	94	142	016117	029117	0000724	0351666	—
11.75		0.4626	94	142	—	—	0000731	—	—
11.80		0.4646	94	142	016118	029118	0000748	0351673	—
11.90		0.4685	101	151	—	—	0000755	0351680	—
	15/32	0.4687	101	151	—	—	0001172	0351697	—
12.00		0.4724	101	151	016120	029120	0000816	0351703	46524887
12.10		0.4764	101	151	016121	029121	0000823	0351710	—
12.20		0.4803	101	151	016122	029122	0000830	0351727	—
12.25		0.4823	101	151	—	—	0000847	—	—
12.30		0.4843	101	151	—	—	0000854	0351734	—
	31/64	0.4843	101	151	—	—	0001745	0351741	—
12.40		0.4882	101	151	—	—	0000861	0351758	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 Øh$_8$ mm	d_1 Øh$_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
12.50		0.4921	101	151	016125	029125	0000878	0351765	46524888
12.60		0.4961	101	151	—	—	0000885	0351772	—
	1/2	0.5000	101	151	—	—	0000809	0351789	46524889
12.70		0.5000	101	151	—	029127	0000892	0351796	—
12.75		0.5020	101	151	—	—	0000908	—	—
12.80		0.5039	101	151	016128	029128	0000915	0351802	—
12.90		0.5079	101	151	—	029129	0000922	0351819	—
13.00		0.5118	101	151	016130	029130	0000939	0351826	46524890
	33/64	0.5156	101	151	—	—	0001769	0385333	—
13.10		0.5157	101	151	—	—	0000946	0385180	—
13.20		0.5197	101	151	—	—	0000953	0385524	—
13.25		0.5217	108	160	—	—	0000960	0385579	—
13.30		0.5236	108	160	—	—	0000977	0385197	—
13.40		0.5276	108	160	—	—	0000984	0385531	—
	17/32	0.5313	108	160	—	—	0001240	0385319	—
13.50		0.5315	108	160	034135	016135	0000991	0385548	—
13.60		0.5354	108	160	—	—	0001004	0385203	—
13.70		0.5394	108	160	—	—	0001011	0385210	—
13.75		0.5413	108	160	—	—	0001028	0385586	—
13.80		0.5433	108	160	—	—	0001035	0385227	—
	35/64	0.5469	108	160	—	—	0001776	0385340	—
13.90		0.5472	108	160	—	—	0001042	0385494	—
14.00		0.5512	108	160	034140	016140	0001097	0384497	—
14.25		0.5610	114	169	—	—	0001103	0385234	—
	9/16	0.5625	114	169	—	—	0002636	0385388	—
14.50		0.5709	114	169	034145	016145	0001110	0385241	—
	37/64	0.5781	114	169	—	—	0001790	0385357	—
14.75		0.5807	114	169	—	—	0001127	0385258	—
15.00		0.5906	114	169	034150	016150	0001134	0385265	—
	19/32	0.5937	120	178	—	—	0001318	0385326	—
15.25		0.6004	120	178	—	—	0001141	0385272	—
	39/64	0.6094	120	178	—	—	0001813	0385364	—
15.50		0.6102	120	178	—	016155	0001158	0385289	—
15.75		0.6201	120	178	—	—	0001165	0385296	—
	5/8	0.6250	120	178	—	—	0002117	0385371	—
16.00		0.6299	120	178	—	016160	0001196	0385302	—
	41/64	0.6406	125	184	—	—	0001943	—	—
16.50		0.6496	125	184	—	016165	0001202	—	—
	21/32	0.6562	125	184	—	—	0001547	—	—
17.00		0.6693	125	184	—	016170	0001226	—	—
	43/64	0.6719	130	191	—	—	0001950	—	—
	11/16	0.6875	130	191	—	—	0000762	—	—
17.50		0.6890	130	191	—	016175	0001233	—	—
18.00		0.7087	130	191	—	—	0001271	—	—
18.50		0.7283	135	198	—	—	0001288	—	—
19.00		0.7480	135	198	—	—	0001295	—	—
19.50		0.7677	140	205	—	—	0001301	—	—
20.00		0.7874	140	205	—	—	0001530	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

General Purpose Jobber Length - Left Hand

✱ *Sets Available on pg. 231*

L10 Left hand helix for use in machines where spindle is counter-clockwise & can be used to remove broken parts without damaging threaded holes. Bright Finish improves chip flow in soft or non-ferrous materials

L10

ANSI

4XD

HSS

118°

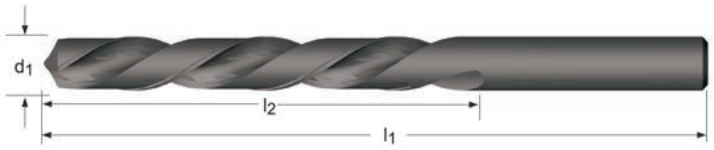
1/32 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	L10
1/32	0.0313	1/2	1.3/8	12	010902
3/64	0.0469	3/4	1.3/4	12	010903
1/16	0.0625	7/8	1.7/8	12	010904
5/64	0.0781	1“	2“	12	010905
3/32	0.0938	1.1/4	2.1/4	12	010906
7/64	0.1094	1.1/2	2.5/8	12	010907
1/8	0.1250	1.5/8	2.3/4	12	010908
9/64	0.1406	1.3/4	2.7/8	12	010909
5/32	0.1563	2“	3.1/8	12	010910
11/64	0.1719	2.1/8	3.1/4	12	010911
3/16	0.1875	2.5/16	3.1/2	12	010912
13/64	0.2031	2.7/16	3.5/8	12	010913
7/32	0.2188	2.1/2	3.3/4	12	010914
15/64	0.2344	2.5/8	3.7/8	12	010915
1/4	0.2500	2.3/4	4“	12	010916
17/64	0.2656	2.7/8	4.1/8	12	010917
9/32	0.2813	2.15/16	4.1/4	12	010918
19/64	0.2969	3.1/16	4.3/8	12	010919
5/16	0.3125	3.3/16	4.1/2	6	010920
21/64	0.3281	3.5/16	4.5/8	6	010921
11/32	0.3437	3.7/16	4.3/4	6	010922
23/64	0.3594	3.1/2	4.7/8	6	010923
3/8	0.3750	3.5/8	5“	6	010924
25/64	0.3906	3.3/4	5.1/8	6	010925
13/32	0.4063	3.7/8	5.1/4	6	010926
27/64	0.4219	3.15/16	5.3/8	6	010927
7/16	0.4375	4.1/16	5.1/2	6	010928
29/64	0.4531	4.3/16	5.5/8	6	010929
15/32	0.4687	4.5/16	5.3/4	6	010930
31/64	0.4844	4.3/8	5.7/8	6	010931
1/2	0.5000	4.1/2	6“	6	010932

JOBBER DRILL

General Purpose Jobber Length - Left Hand

A101 Left hand helix for use in machines where spindle is counter-clockwise & can be used to remove broken parts without damaging threaded holes.



d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	A101
1.00	0.0394	12	34	0002667
1.10	0.0433	14	36	0002674
1.20	0.0472	16	38	0002681
1.25	0.0492	16	38	0002698
1.30	0.0512	16	38	0002704
1.40	0.0551	18	40	0002711
1.50	0.0591	18	40	0002728
1.60	0.0630	20	43	0002735
1.70	0.0669	20	43	0002742
1.80	0.0709	22	46	0002766
1.90	0.0748	22	46	0002773
2.00	0.0787	24	49	0002803
2.10	0.0827	24	49	0002810
2.20	0.0866	27	53	0002827
2.30	0.0906	27	53	0002834
2.40	0.0945	30	57	0002841
2.50	0.0984	30	57	0002858
2.60	0.1024	30	57	0002865
2.70	0.1063	33	61	0002872
2.80	0.1102	33	61	0002889
2.90	0.1142	33	61	0002896
3.00	0.1181	33	61	0002902
3.20	0.1260	36	65	0002919
3.30	0.1299	36	65	0002926
3.50	0.1378	39	70	0002933
3.80	0.1496	43	75	0002940
4.00	0.1575	43	75	0002957
4.20	0.1654	43	75	0002964
4.50	0.1772	47	80	0002971
4.80	0.1890	52	86	0002988
5.00	0.1969	52	86	0002995
5.10	0.2008	52	86	0003008
5.20	0.2047	52	86	0003015

JOBBER DRILL

DORMER

d_1 Øh_8 mm	d_1 decimal Inch	l_2 mm	l_1 mm	A101
5.50	0.2165	57	93	0003022
6.00	0.2362	57	93	0003039
6.50	0.2559	63	101	0003046
7.00	0.2756	69	109	0003053
7.50	0.2953	69	109	0003060
8.00	0.3150	75	117	0003077
8.50	0.3346	75	117	0003084
9.00	0.3543	81	125	0003091
10.00	0.3937	87	133	0002780
11.00	0.4331	94	142	0149027
12.00	0.4724	101	151	0002797

JOBBER DRILL

Heavy Duty Jobber Length (HX Series)

* *HX10 set available on pg. 233*

HX10 - *Fractional Sizes*

HX18 - *Wire Gauge Sizes*

HX15 - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Stronger and more Rigid. Unique surface treatment for improved wear resistance in hard ferrous alloys.

HX10	HX18	HX15
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS	HSS	HSS
135°	135°	135°
1/16 - 1/2	N52 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
1/16			0.0625	7/8	1.7/8	12	022004	—	—
	52		0.0635	7/8	1.7/8	12	—	022152	—
	51		0.0670	1“	2“	12	—	022151	—
	50		0.0700	1“	2“	12	—	022150	—
	49		0.0730	1“	2“	12	—	022149	—
	48		0.0760	1“	2“	12	—	022148	—
5/64			0.0781	1“	2“	12	022005	—	—
	47		0.0785	1“	2“	12	—	022147	—
	46		0.0810	1.1/8	2.1/8	12	—	022146	—
	45		0.0820	1.1/8	2.1/8	12	—	022145	—
	44		0.0860	1.1/8	2.1/8	12	—	022144	—
	43		0.0890	1.1/4	2.1/4	12	—	022143	—
	42		0.0935	1.1/4	2.1/4	12	—	022142	—
3/32			0.0938	1.1/4	2.1/4	12	022006	—	—
	41		0.0960	1.3/8	2.3/8	12	—	022141	—
	40		0.0980	1.3/8	2.3/8	12	—	022140	—
	39		0.0995	1.3/8	2.3/8	12	—	022139	—
	38		0.1015	1.7/16	2.1/2	12	—	022138	—
	37		0.1040	1.7/16	2.1/2	12	—	022137	—
	36		0.1065	1.7/16	2.1/2	12	—	022136	—
7/64			0.1094	1.1/2	2.5/8	12	022007	—	—
	35		0.1100	1.1/2	2.5/8	12	—	022135	—
	34		0.1110	1.1/2	2.5/8	12	—	022134	—
	33		0.1130	1.1/2	2.5/8	12	—	022133	—
	32		0.1160	1.5/8	2.3/4	12	—	022132	—
	31		0.1200	1.5/8	2.3/4	12	—	022131	—
1/8			0.1250	1.5/8	2.3/4	12	022008	—	—
	30		0.1285	1.5/8	2.3/4	12	—	022130	—
	29		0.1360	1.3/4	2.7/8	12	—	022129	—
	28		0.1405	1.3/4	2.7/8	12	—	022128	—
9/64			0.1406	1.3/4	2.7/8	12	022009	—	—
	27		0.1440	1.7/8	3“	12	—	022127	—
	26		0.1470	1.7/8	3“	12	—	022126	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
	25		0.1495	1.7/8	3“	12	—	022125	—
	24		0.1520	2“	3.1/8	12	—	022124	—
	23		0.1540	2“	3.1/8	12	—	022123	—
5/32			0.1563	2“	3.1/8	12	022010	—	—
	22		0.1570	2“	3.1/8	12	—	022122	—
	21		0.1590	2.1/8	3.1/4	12	—	022121	—
	20		0.1610	2.1/8	3.1/4	12	—	022120	—
	19		0.1660	2.1/8	3.1/4	12	—	022119	—
	18		0.1695	2.1/8	3.1/4	12	—	022118	—
11/64			0.1719	2.1/8	3.1/4	12	022011	—	—
	17		0.1730	2.3/16	3.3/8	12	—	022117	—
	16		0.1770	2.3/16	3.3/8	12	—	022116	—
	15		0.1800	2.3/16	3.3/8	12	—	022115	—
	14		0.1820	2.3/16	3.3/8	12	—	022114	—
	13		0.1850	2.5/16	3.1/2	12	—	022113	—
3/16			0.1875	2.5/16	3.1/2	12	022012	—	—
	12		0.1890	2.5/16	3.1/2	12	—	022112	—
	11		0.1910	2.5/16	3.1/2	12	—	022111	—
	10		0.1935	2.7/16	3.5/8	12	—	022110	—
	9		0.1960	2.7/16	3.5/8	12	—	022109	—
	8		0.1990	2.7/16	3.5/8	12	—	022108	—
	7		0.2010	2.7/16	3.5/8	12	—	022107	—
13/64			0.2031	2.7/16	3.5/8	12	022013	—	—
	6		0.2040	2.1/2	3.3/4	12	—	022106	—
	5		0.2055	2.1/2	3.3/4	12	—	022105	—
	4		0.2090	2.1/2	3.3/4	12	—	022104	—
	3		0.2130	2.1/2	3.3/4	12	—	022103	—
7/32			0.2188	2.1/2	3.3/4	12	022014	—	—
	2		0.2210	2.5/8	3.7/8	12	—	022102	—
	1		0.2280	2.5/8	3.7/8	12	—	022101	—
		A	0.2340	2.5/8	3.7/8	12	—	—	022201
15/64			0.2344	2.5/8	3.7/8	12	022015	—	—
		B	0.2374	2.3/4	4“	12	—	—	022202
		C	0.2421	2.3/4	4“	12	—	—	022203
		D	0.2461	2.3/4	4“	12	—	—	022204
		E	0.2500	2.3/4	4“	12	—	—	022205
1/4			0.2500	2.3/4	4“	12	022016	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	022206
		G	0.2610	2.7/8	4.1/8	12	—	—	022207
17/64			0.2656	2.7/8	4.1/8	12	0022017	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	022208
		I	0.2720	2.7/8	4.1/8	12	—	—	022209
		J	0.2772	2.7/8	4.1/8	12	—	—	022210
		K	0.2811	2.15/16	4.1/4	12	—	—	022211
9/32			0.2813	2.15/16	4.1/4	12	022018	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	022212
		M	0.2949	3.1/16	4.3/8	12	—	—	022213
19/64			0.2969	3.1/16	4.3/8	12	022019	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	022214
5/16			0.3125	3.3/16	4.1/2	6	022020	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	022215
		P	0.3228	3.5/16	4.5/8	6	—	—	022216
21/64			0.3281	3.5/16	4.5/8	6	022021	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	022217
		R	0.3390	3.7/16	4.3/4	6	—	—	022218
11/32			0.3437	3.7/16	4.3/4	6	022022	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	022219
		T	0.3580	3.1/2	4.7/8	6	—	—	022220
23/64			0.3594	3.1/2	4.7/8	6	022023	—	—
		U	0.3680	3.5/8	5“	6	—	—	022221
3/8			0.3750	3.5/8	5“	6	022024	—	—
		V	0.3772	3.5/8	5“	6	—	—	022222
		W	0.3858	3.3/4	5.1/8	6	—	—	022223
25/64			0.3906	3.3/4	5.1/8	6	022025	—	—
		X	0.3969	3.3/4	5.1/8	6	—	—	022224
		Y	0.4039	3.7/8	5.1/4	6	—	—	022225

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
13/32			0.4063	3.7/8	5.1/4	6	022026	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	022226
27/64			0.4219	3.15/16	5.3/8	6	022027	—	—
7/16			0.4375	4.1/16	5.1/2	6	022028	—	—
29/64			0.4531	4.3/16	5.5/8	6	022029	—	—
15/32			0.4687	4.5/16	5.3/4	6	022030	—	—
31/64			0.4844	4.3/8	5.7/8	6	022031	—	—
1/2			0.5000	4.1/2	6“	6	022032	—	—

JOBBER DRILL

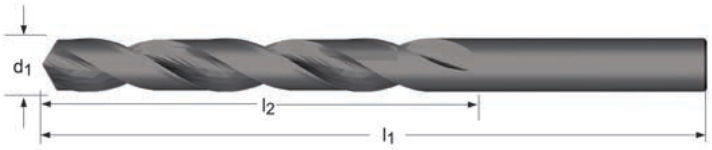
General Purpose Jobber Length (NAS 907 Type A)

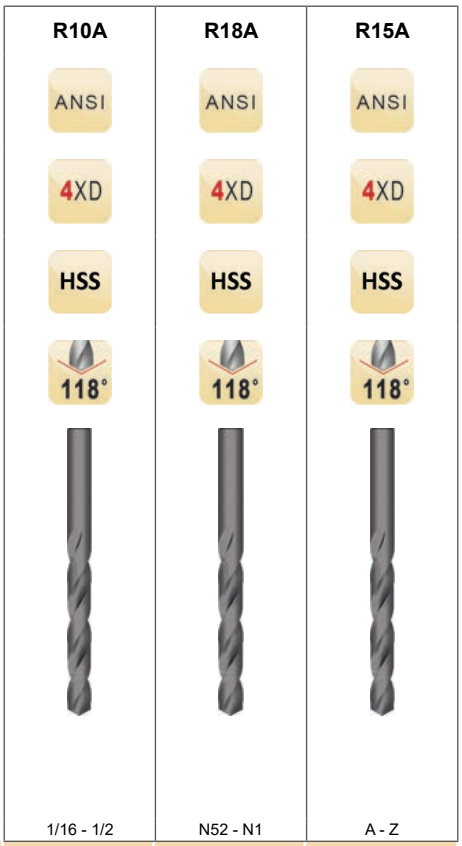
R10A - *Fractional Sizes*

R18A - *Wire Gauge Sizes*

R15A - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration.
Steam oxide surface treatment for increased wear resistance & lubricity





d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
1/16			0.0625	7/8	1.7/8	12	010104	—	—
	52		0.0635	7/8	1.7/8	12	—	018152	—
	51		0.0670	1“	2“	12	—	018151	—
	50		0.0700	1“	2“	12	—	018150	—
	49		0.0730	1“	2“	12	—	018149	—
	48		0.0760	1“	2“	12	—	018148	—
5/64			0.0781	1“	2“	12	010105	—	—
	47		0.0785	1“	2“	12	—	018147	—
	46		0.0810	1.1/8	2.1/8	12	—	018146	—
	45		0.0820	1.1/8	2.1/8	12	—	018145	—
	44		0.0860	1.1/8	2.1/8	12	—	018144	—
	43		0.0890	1.1/4	2.1/4	12	—	018143	—
	42		0.0935	1.1/4	2.1/4	12	—	018142	—
3/32			0.0938	1.1/4	2.1/4	12	010106	—	—
	41		0.0960	1.3/8	2.3/8	12	—	018141	—
	40		0.0980	1.3/8	2.3/8	12	—	018140	—
	39		0.0995	1.3/8	2.3/8	12	—	018139	—
	38		0.1015	1.7/16	2.1/2	12	—	018138	—
	37		0.1040	1.7/16	2.1/2	12	—	018137	—
	36		0.1065	1.7/16	2.1/2	12	—	018136	—
7/64			0.1094	1.1/2	2.5/8	12	010107	—	—
	35		0.1100	1.1/2	2.5/8	12	—	018135	—
	34		0.1110	1.1/2	2.5/8	12	—	018134	—
	33		0.1130	1.1/2	2.5/8	12	—	018133	—
	32		0.1160	1.5/8	2.3/4	12	—	018132	—
	31		0.1200	1.5/8	2.3/4	12	—	018131	—
1/8			0.1250	1.5/8	2.3/4	12	010108	—	—
	30		0.1285	1.5/8	2.3/4	12	—	018130	—
	29		0.1360	1.3/4	2.7/8	12	—	018129	—
	28		0.1405	1.3/4	2.7/8	12	—	018128	—
9/64			0.1406	1.3/4	2.7/8	12	010109	—	—
	27		0.1440	1.7/8	3“	12	—	018127	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
	26		0.1470	1.7/8	3“	12	—	018126	—
	25		0.1495	1.7/8	3“	12	—	018125	—
	24		0.1520	2“	3.1/8	12	—	018124	—
	23		0.1540	2“	3.1/8	12	—	018123	—
5/32			0.1563	2“	3.1/8	12	010110	—	—
	22		0.1570	2“	3.1/8	12	—	018122	—
	21		0.1590	2.1/8	3.1/4	12	—	018121	—
	20		0.1610	2.1/8	3.1/4	12	—	018120	—
	19		0.1660	2.1/8	3.1/4	12	—	018119	—
	18		0.1695	2.1/8	3.1/4	12	—	018118	—
11/64			0.1719	2.1/8	3.1/4	12	010111	—	—
	17		0.1730	2.3/16	3.3/8	12	—	018117	—
	16		0.1770	2.3/16	3.3/8	12	—	018116	—
	15		0.1800	2.3/16	3.3/8	12	—	018115	—
	14		0.1820	2.3/16	3.3/8	12	—	018114	—
	13		0.1850	2.5/16	3.1/2	12	—	018113	—
3/16			0.1875	2.5/16	3.1/2	12	010112	—	—
	12		0.1890	2.5/16	3.1/2	12	—	018112	—
	11		0.1910	2.5/16	3.1/2	12	—	018111	—
	10		0.1935	2.7/16	3.5/8	12	—	018110	—
	9		0.1960	2.7/16	3.5/8	12	—	018109	—
	8		0.1990	2.7/16	3.5/8	12	—	018108	—
	7		0.2010	2.7/16	3.5/8	12	—	018107	—
13/64			0.2031	2.7/16	3.5/8	12	010113	—	—
	6		0.2040	2.1/2	3.3/4	12	—	018106	—
	5		0.2055	2.1/2	3.3/4	12	—	018105	—
	4		0.2090	2.1/2	3.3/4	12	—	018104	—
	3		0.2130	2.1/2	3.3/4	12	—	018103	—
7/32			0.2188	2.1/2	3.3/4	12	010114	—	—
	2		0.2210	2.5/8	3.7/8	12	—	018102	—
	1		0.2280	2.5/8	3.7/8	12	—	018101	—
		A	0.2340	2.5/8	3.7/8	12	—	—	015101
15/64			0.2344	2.5/8	3.7/8	12	010115	—	—
		B	0.2374	2.3/4	4“	12	—	—	015102
		C	0.2421	2.3/4	4“	12	—	—	015103
		D	0.2461	2.3/4	4“	12	—	—	015104
		E	0.2500	2.3/4	4“	12	—	—	015105
1/4			0.2500	2.3/4	4“	12	010116	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	015106
		G	0.2610	2.7/8	4.1/8	12	—	—	015107
17/64			0.2656	2.7/8	4.1/8	12	010117	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	015108
		I	0.2720	2.7/8	4.1/8	12	—	—	015109
		J	0.2772	2.7/8	4.1/8	12	—	—	015110
		K	0.2811	2.15/16	4.1/4	12	—	—	015111
9/32			0.2813	2.15/16	4.1/4	12	010118	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	015112
		M	0.2949	3.1/16	4.3/8	12	—	—	015113
19/64			0.2969	3.1/16	4.3/8	12	010119	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	015114
5/16			0.3125	3.3/16	4.1/2	6	010120	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	015115
		P	0.3228	3.5/16	4.5/8	6	—	—	015116
21/64			0.3281	3.5/16	4.5/8	6	010121	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	015117
		R	0.3390	3.7/16	4.3/4	6	—	—	015118
11/32			0.3437	3.7/16	4.3/4	6	010122	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	015119
		T	0.3580	3.1/2	4.7/8	6	—	—	015120
23/64			0.3594	3.1/2	4.7/8	6	010123	—	—
		U	0.3680	3.5/8	5“	6	—	—	015121
3/8			0.3750	3.5/8	5“	6	010124	—	—
		V	0.3772	3.5/8	5“	6	—	—	015122
		W	0.3858	3.3/4	5.1/8	6	—	—	015123
25/64			0.3906	3.3/4	5.1/8	6	0010125	—	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
		X	0.3969	3.3/4	5.1/8	6	—	—	015124
		Y	0.4039	3.7/8	5.1/4	6	—	—	015125
13/32			0.4063	3.7/8	5.1/4	6	010126	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	015126
27/64			0.4219	3.15/16	5.3/8	6	010127	—	—
7/16			0.4375	4.1/16	5.1/2	6	010128	—	—
29/64			0.4531	4.3/16	5.5/8	6	010129	—	—
15/32			0.4687	4.5/16	5.3/4	6	010130	—	—
31/64			0.4844	4.3/8	5.7/8	6	010131	—	—
1/2			0.5000	4.1/2	6“	6	010132	—	—

JOBBER DRILL

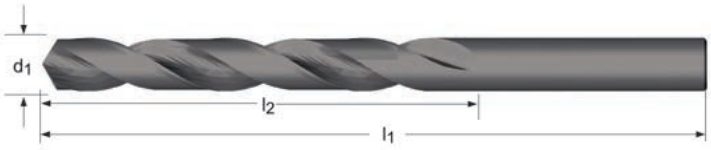
Heavy Duty Jobber Length (NAS 907 Type B)

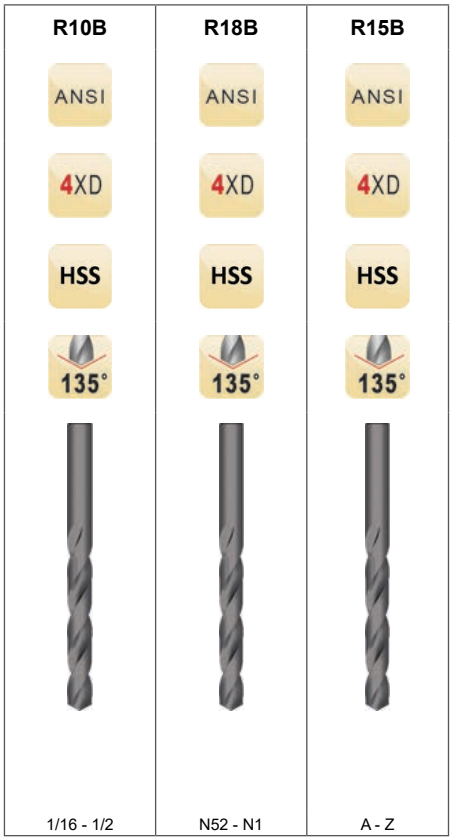
R10B - *Fractional Sizes*

R18B - *Wire Gauge Sizes*

R15B - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance & lubricity. Recommended for tougher ferrous materials.





d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
1/16			0.0625	7/8	1.7/8	12	010204	—	—
	52		0.0635	7/8	1.7/8	12	—	018252	—
	51		0.0670	1“	2“	12	—	018251	—
	50		0.0700	1“	2“	12	—	018250	—
	49		0.0730	1“	2“	12	—	018249	—
	48		0.0760	1“	2“	12	—	018248	—
5/64			0.0781	1“	2“	12	010205	—	—
	47		0.0785	1“	2“	12	—	018247	—
	46		0.0810	1.1/8	2.1/8	12	—	018246	—
	45		0.0820	1.1/8	2.1/8	12	—	018245	—
	44		0.0860	1.1/8	2.1/8	12	—	018244	—
	43		0.0890	1.1/4	2.1/4	12	—	018243	—
	42		0.0935	1.1/4	2.1/4	12	—	018242	—
3/32			0.0938	1.1/4	2.1/4	12	010206	—	—
	41		0.0960	1.3/8	2.3/8	12	—	018241	—
	40		0.0980	1.3/8	2.3/8	12	—	018240	—
	39		0.0995	1.3/8	2.3/8	12	—	018239	—
	38		0.1015	1.7/16	2.1/2	12	—	018238	—
	37		0.1040	1.7/16	2.1/2	12	—	018237	—
	36		0.1065	1.7/16	2.1/2	12	—	018236	—
7/64			0.1094	1.1/2	2.5/8	12	010207	—	—
	35		0.1100	1.1/2	2.5/8	12	—	018235	—
	34		0.1110	1.1/2	2.5/8	12	—	018234	—
	33		0.1130	1.1/2	2.5/8	12	—	018233	—
	32		0.1160	1.5/8	2.3/4	12	—	018232	—
	31		0.1200	1.5/8	2.3/4	12	—	018231	—
1/8			0.1250	1.5/8	2.3/4	12	010208	—	—
	30		0.1285	1.5/8	2.3/4	12	—	018230	—
	29		0.1360	1.3/4	2.7/8	12	—	018229	—
	28		0.1405	1.3/4	2.7/8	12	—	018228	—
9/64			0.1406	1.3/4	2.7/8	12	010209	—	—
	27		0.1440	1.7/8	3“	12	—	018227	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
	26		0.1470	1.7/8	3“	12	—	018226	—
	25		0.1495	1.7/8	3“	12	—	018225	—
	24		0.1520	2“	3.1/8	12	—	018224	—
	23		0.1540	2“	3.1/8	12	—	018223	—
5/32			0.1563	2“	3.1/8	12	010210	—	—
	22		0.1570	2“	3.1/8	12	—	018222	—
	21		0.1590	2.1/8	3.1/4	12	—	018221	—
	20		0.1610	2.1/8	3.1/4	12	—	018220	—
	19		0.1660	2.1/8	3.1/4	12	—	018219	—
	18		0.1695	2.1/8	3.1/4	12	—	018218	—
11/64			0.1719	2.1/8	3.1/4	12	010211	—	—
	17		0.1730	2.3/16	3.3/8	12	—	018217	—
	16		0.1770	2.3/16	3.3/8	12	—	018216	—
	15		0.1800	2.3/16	3.3/8	12	—	018215	—
	14		0.1820	2.3/16	3.3/8	12	—	018214	—
	13		0.1850	2.5/16	3.1/2	12	—	018213	—
3/16			0.1875	2.5/16	3.1/2	12	010212	—	—
	12		0.1890	2.5/16	3.1/2	12	—	018212	—
	11		0.1910	2.5/16	3.1/2	12	—	018211	—
	10		0.1935	2.7/16	3.5/8	12	—	018210	—
	9		0.1960	2.7/16	3.5/8	12	—	018209	—
	8		0.1990	2.7/16	3.5/8	12	—	018208	—
	7		0.2010	2.7/16	3.5/8	12	—	018207	—
13/64			0.2031	2.7/16	3.5/8	12	010213	—	—
	6		0.2040	2.1/2	3.3/4	12	—	018206	—
	5		0.2055	2.1/2	3.3/4	12	—	018205	—
	4		0.2090	2.1/2	3.3/4	12	—	018204	—
	3		0.2130	2.1/2	3.3/4	12	—	018203	—
7/32			0.2188	2.1/2	3.3/4	12	010214	—	—
	2		0.2210	2.5/8	3.7/8	12	—	018202	—
	1		0.2280	2.5/8	3.7/8	12	—	018201	—
		A	0.2340	2.5/8	3.7/8	12	—	—	015201
15/64			0.2344	2.5/8	3.7/8	12	010215	—	—
		B	0.2380	2.3/4	4“	12	—	—	015202
		C	0.2421	2.3/4	4“	12	—	—	015203
		D	0.2461	2.3/4	4“	12	—	—	015204
		E	0.2500	2.3/4	4“	12	—	—	015205
1/4			0.2500	2.3/4	4“	12	010216	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	015206
		G	0.2610	2.7/8	4.1/8	12	—	—	015207
17/64			0.2656	2.7/8	4.1/8	12	010217	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	015208
		I	0.2720	2.7/8	4.1/8	12	—	—	015209
		J	0.2772	2.7/8	4.1/8	12	—	—	015210
		K	0.2811	2.15/16	4.1/4	12	—	—	015211
9/32			0.2813	2.15/16	4.1/4	12	010218	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	015212
		M	0.2949	3.1/16	4.3/8	12	—	—	015213
19/64			0.2969	3.1/16	4.3/8	12	010219	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	015214
5/16			0.3125	3.3/16	4.1/2	6	010220	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	015215
		P	0.3228	3.5/16	4.5/8	6	—	—	015216
21/64			0.3281	3.5/16	4.5/8	6	010221	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	015217
		R	0.3390	3.7/16	4.3/4	6	—	—	015218
11/32			0.3437	3.7/16	4.3/4	6	010222	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	015219
		T	0.3580	3.1/2	4.7/8	6	—	—	015220
23/64			0.3594	3.1/2	4.7/8	6	010223	—	—
		U	0.3680	3.5/8	5“	6	—	—	015221
3/8			0.3750	3.5/8	5“	6	010224	—	—
		V	0.3772	3.5/8	5“	6	—	—	015222
		W	0.3858	3.3/4	5.1/8	6	—	—	015223
25/64			0.3906	3.3/4	5.1/8	6	010225	—	—
		X	0.3969	3.3/4	5.1/8	6	—	—	015224

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
		Y	0.4039	3.7/8	5.1/4	6	—	—	015225
13/32			0.4063	3.7/8	5.1/4	6	010226	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	015226
27/64			0.4219	3.15/16	5.3/8	6	010227	—	—
7/16			0.4375	4.1/16	5.1/2	6	010228	—	—
29/64			0.4531	4.3/16	5.5/8	6	010229	—	—
15/32			0.4687	4.5/16	5.3/4	6	010230	—	—
31/64			0.4844	4.3/8	5.7/8	6	010231	—	—
1/2			0.5000	4.1/2	6“	6	010232	—	—

High Helix Jobber Length

∗ *Sets Available on pg. 232*

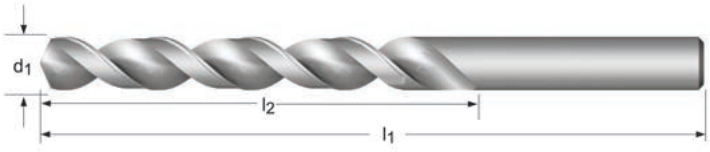
R10H - *Fractional Sizes*

R18H - *Wire Gauge Sizes*

High Helix and Bright Finish for better chip flow in soft or non-ferrous materials.

A108 - *Fractional & Metric Sizes*

Low thrust design self centering Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity. Fast spiral for stainless.



R10H	R18H	A108
ANSI	ANSI	DIN 338
4XD	4XD	4XD
HSS	HSS	HSS
118°	118°	135°
1/32 - 1/2	N80 - N1	1.00 - 16.00

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
	80		0.0135	1/8		3/4		12	—	018580	—
	79		0.0145	1/8		3/4		12	—	018579	—
	78		0.0160	3/16		7/8		12	—	018578	—
	77		0.0180	3/16		7/8		12	—	018577	—
	76		0.0200	3/16		7/8		12	—	018576	—
	75		0.0210	1/4		1“		12	—	018575	—
	74		0.0225	1/4		1“		12	—	018574	—
	73		0.0240	5/16		1.1/8		12	—	018573	—
	72		0.0250	5/16		1.1/8		12	—	018572	—
	71		0.0260	3/8		1.1/4		12	—	018571	—
	70		0.0280	3/8		1.1/4		12	—	018570	—
	69		0.0292	1/2		1.3/8		12	—	018569	—
	68		0.0310	1/2		1.3/8		12	—	018568	—
1/32			0.0313	1/2		1.3/8		12	010502	—	—
	67		0.0320	1/2		1.3/8		12	—	018567	—
	66		0.0330	1/2		1.3/8		12	—	018566	—
	65		0.0350	5/8		1.1/2		12	—	018565	—
	64		0.0360	5/8		1.1/2		12	—	018564	—
	63		0.0370	5/8		1.1/2		12	—	018563	—
	62		0.0380	5/8		1.1/2		12	—	018562	—
	61		0.0390	11/16		1.5/8		12	—	018561	—
		1.00	0.0394		12		34	10	—	—	0007549
	60		0.0400	11/16		1.5/8		12	—	018560	—
	59		0.0410	11/16		1.5/8		12	—	018559	—
	58		0.0420	11/16		1.5/8		12	—	018558	—
	57		0.0430	3/4		1.3/4		12	—	018557	—
		1.10	0.0433		14		36	10	—	—	0007556
	56		0.0465	3/4		1.3/4		12	—	018556	—
3/64			0.0469	3/4		1.3/4		12	010503	—	—
		1.20	0.0472		16		38	10	—	—	0007563
		1.30	0.0512		16		38	10	—	—	0007570
	55		0.0520	7/8		1.7/8		12	—	018555	—
	54		0.0550	7/8		1.7/8		12	—	018554	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
		1.40	0.0551		18		40	10	—	—	0007587
		1.50	0.0591		18		40	10	—	—	0007594
	53		0.0595	7/8		1.7/8		12	—	018553	—
1/16			0.0625	7/8		1.7/8		12	010504	—	
1/16			0.0625		20		43	10	—	—	0007723
		1.60	0.0630		20		43	10	—	—	0007600
	52		0.0635	7/8		1.7/8		12	—	018552	
		1.70	0.0669		20		43	10	—	—	0007617
	51		0.0670	1“		2“		12	—	018551	—
	50		0.0700	1“		2“		12	—	018550	—
		1.80	0.0709		22		46	10	—	—	0007624
	49		0.0730	1“		2“		12	—	018549	—
		1.90	0.0748		22		46	10	—	—	0007631
	48		0.0760	1“		2“		12	—	018548	—
5/64			0.0781	1“		2“		12	010505	—	—
5/64			0.0781		24		49	10	—	—	0008478
	47		0.0785	1“		2“		12	—	018547	—
		2.00	0.0787		24		49	10	—	—	0007969
	46		0.0810	1.1/8		2.1/8		12	—	018546	—
	45		0.0820	1.1/8		2.1/8		12	—	018545	—
		2.10	0.0827		24		49	10	—	—	0007976
	44		0.0860	1.1/8		2.1/8		12	—	018544	—
		2.20	0.0866		27		53	10	—	—	0007983
	43		0.0890	1.1/4		2.1/4		12	—	018543	—
		2.30	0.0906		27		53	10	—	—	0007990
	42		0.0935	1.1/4		2.1/4		12	—	018542	—
3/32			0.0938	1.1/4		2.1/4		12	010506	—	—
3/32			0.0938		30		57	10	—	—	0008232
		2.40	0.0945		30		57	10	—	—	0008003
	41		0.0960	1.3/8		2.3/8		12	—	018541	—
	40		0.0980	1.3/8		2.3/8		12	—	018540	—
		2.50	0.0984		30		57	10	—	—	0008010
	39		0.0995	1.3/8		2.3/8		12	—	018539	—
	38		0.1015	1.7/16		2.1/2		12	—	018538	—
		2.60	0.1024		30		57	10	—	—	0008027
	37		0.1040	1.7/16		2.1/2		12	—	018537	—
		2.70	0.1063		33		61	10	—	—	0008034
	36		0.1065	1.7/16		2.1/2		12	—	018536	—
7/64			0.1094	1.1/2		2.5/8		12	010507	—	—
7/64			0.1094		33		61	10	—	—	0008706
	35		0.1100	1.1/2		2.5/8		12	—	018535	—
		2.80	0.1102		33		61	10	—	—	0008041
	34		0.1110	1.1/2		2.5/8		12	—	018534	—
	33		0.1130	1.1/2		2.5/8		12	—	018533	—
		2.90	0.1142		33		61	10	—	—	0008058
	32		0.1160	1.5/8		2.3/4		12	—	018532	—
		3.00	0.1181		33		61	10	—	—	0008119
	31		0.1200	1.5/8		2.3/4		12	—	018531	—
		3.10	0.1220		36		65	10	—	—	0008126
1/8			0.1250	1.5/8		2.3/4		12	010508	—	—
1/8			0.1250		36		65	10	—	—	0007945
		3.20	0.1260		36		65	10	—	—	0008133
	30		0.1285	1.5/8		2.3/4		12	—	018530	—
		3.30	0.1299		36		65	10	—	—	0008140
		3.40	0.1339		39		70	10	—	—	0008157
	29		0.1360	1.3/4		2.7/8		12	—	018529	—
		3.50	0.1378		39		70	10	—	—	0008164
	28		0.1405	1.3/4		2.7/8		12	—	018528	—
9/64			0.1406	1.3/4		2.7/8		12	010509	—	—
9/64			0.1406		39		70	10	—	—	0008928
		3.60	0.1417		39		70	10	—	—	0008171
	27		0.1440	1.7/8		3“		12	—	018527	—
		3.70	0.1457		39		70	10	—	—	0008188
	26		0.1470	1.7/8		3“		12	—	018526	—
	25		0.1495	1.7/8		3“		12	—	018525	—
		3.80	0.1496		43		75	10	—	—	0008195

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
	24		0.1520	2“		3.1/8		12	—	018524	—
		3.90	0.1535		43		75	10	—	—	0008201
	23		0.1540	2“		3.1/8		12		018523	—
5/32			0.1563	2“		3.1/8		12	010510	—	—
5/32			0.1563		43		75	10	—	—	0008461
	22		0.1570	2“		3.1/8		12	—	018522	—
		4.00	0.1575		43		75	10	—	—	0008256
	21		0.1590	2.1/8		3.1/4		12	—	018521	—
	20		0.1610	2.1/8		3.1/4		12	—	018520	—
		4.10	0.1614		43		75	10	—	—	0008263
		4.20	0.1654		43		75	10	—	—	0008270
	19		0.1660	2.1/8		3.1/4		12	—	018519	—
		4.30	0.1693		47		80	10	—	—	0008287
	18		0.1695	2.1/8		3.1/4		12	—	018518	—
11/64			0.1719	2.1/8		3.1/4		12	010511	—	—
11/64			0.1719		47		80	10	—	—	0007730
	17		0.1730	2.3/16		3.3/8		12	—	018517	—
		4.40	0.1732		47		80	10	—	—	0008294
	16		0.1770	2.3/16		3.3/8		12	—	018516	—
		4.50	0.1772		47		80	10	—	—	0008300
	15		0.1800	2.3/16		3.3/8		12	—	018515	—
		4.60	0.1811		47		80	10	—	—	0008317
	14		0.1820	2.3/16		3.3/8		12	—	018514	—
	13		0.1850	2.5/16		3.1/2		12	—	018513	—
		4.70	0.1850		47		80	10	—	—	0008324
3/16			0.1875	2.5/16		3.1/2		12	010512	—	—
3/16			0.1875		52		86	10	—	—	0008218
	12		0.1890	2.5/16		3.1/2		12	—	018512	—
		4.80	0.1890		52		86	10	—	—	0008331
	11		0.1910	2.5/16		3.1/2		12	—	018511	—
		4.90	0.1929		52		86	10	—	—	0008348
	10		0.1935	2.7/16		3.5/8		12	—	018510	—
	10		0.1935		52		86	10	—	—	46305901
	9		0.1960	2.7/16		3.5/8		12	—	018509	—
		5.00	0.1969		52		86	10	—	—	0008355
	8		0.1990	2.7/16		3.5/8		12	—	018508	—
		5.10	0.2008		52		86	10	—	—	0008362
	7		0.2010	2.7/16		3.5/8		12	—	018507	—
13/64			0.2031	2.7/16		3.5/8		12	010513	—	—
13/64			0.2031		52		86	10	—	—	0007839
	6		0.2040	2.1/2		3.3/4		12	—	018506	—
		5.20	0.2047		52		86	10	—	—	0008379
	5		0.2055	2.1/2		3.3/4		12	—	018505	—
		5.30	0.2087		52		86	10	—	—	0008386
	4		0.2090	2.1/2		3.3/4		12	—	018504	—
		5.40	0.2126		57		93	10	—	—	0008393
	3		0.2130	2.1/2		3.3/4		12	—	018503	—
		5.50	0.2165		57		93	10	—	—	0008409
7/32			0.2188	2.1/2		3.3/4		12	010514	—	—
7/32			0.2188					10	—	—	0008690
		5.60	0.2205		57		93	10	—	—	0008416
	2		0.2210	2.5/8		3.7/8		12	—	018502	—
		5.70	0.2244		57		93	10	—	—	0008423
	1		0.2280	2.5/8		3.7/8		12	—	018501	—
		5.80	0.2283		57		93	10	—	—	0008430
		5.90	0.2323		57		93	10	—	—	0008447
15/64			0.2344	2.5/8		3.7/8		12	010515	—	—
15/64			0.2344		57		93	10	—	—	46305902
		6.00	0.2362		57		93	10	—	—	0008485
		6.10	0.2402		63		101	10	—	—	0008492
		6.20	0.2441		63		101	10	—	—	0008508
		6.30	0.2480		63		101	10	—	—	0008515
1/4			0.2500	2.3/4		4“		12	010516	—	—
1/4			0.2500		63		101	10	—	—	0007846
		6.40	0.2520		63		101	10	—	—	0008522

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
		6.50	0.2559		63		101	10	—	—	0008539
		6.60	0.2598		63		101	10	—	—	0008546
		6.70	0.2638		63		101	10	—	—	0008553
17/64			0.2656	2.7/8		4.1/8		12	010517	—	—
17/64			0.2656		69		109	10	—	—	46305903
		6.80	0.2677		69		109	10	—	—	0008560
		6.90	0.2717		69		109	10	—	—	0008577
		7.00	0.2756		69		109	10	—	—	0008584
		7.10	0.2795		69		109	10	—	—	0008591
9/32			0.2813	2.15/16		4.1/4		12	010518	—	—
9/32			0.2813		69		109	10	—	—	0008911
		7.20	0.2835		69		109	10	—	—	0008607
		7.30	0.2874		69		109	10	—	—	0008614
		7.40	0.2913		69		109	10	—	—	0008621
		7.50	0.2953		69		109	10	—	—	0008638
19/64			0.2969	3.1/16		4.3/8		12	010519	—	—
19/64			0.2969		75		117	10	—	—	46305904
		7.60	0.2992		75		117	10	—	—	0008645
		7.70	0.3031		75		117	10	—	—	0008652
		7.80	0.3071		75		117	10	—	—	0008669
		7.90	0.3110		75		117	10	—	—	0008676
5/16			0.3125	3.3/16		4.1/2		6	010520	—	—
5/16			0.3125		75		117	10	—	—	0008454
		8.00	0.3150		75		117	10	—	—	0008713
		8.10	0.3189		75		117	10	—	—	0008720
		8.20	0.3228		75		117	10	—	—	0008737
		8.30	0.3268		75		117	10	—	—	0008744
21/64			0.3281	3.5/16		4.5/8		6	010521	—	—
21/64			0.3281		75		117	10	—	—	46305905
		8.40	0.3307		75		117	10	—	—	0008751
		8.50	0.3346		75		117	10	—	—	0008768
		8.60	0.3386		81		125	10	—	—	0008775
		8.70	0.3425		81		125	10	—	—	0008782
11/32			0.3437	3.7/16		4.3/4		6	010522	—	—
11/32			0.3437		81		125	10	—	—	0007716
		8.80	0.3465		81		125	10	—	—	0008799
		8.90	0.3504		81		125	10	—	—	0008805
		9.00	0.3543		81		125	10	—	—	0008812
		9.10	0.3583		81		125	10	—	—	0008829
23/64			0.3594	3.1/2		4.7/8		6	010523	—	—
23/64			0.3594		81		125	10	—	—	46305906
		9.20	0.3622		81		125	10	—	—	0008836
		9.30	0.3661		81		125	10	—	—	0008843
		9.40	0.3701		81		125	10	—	—	0008850
		9.50	0.3740		81		125	10	—	—	0008867
3/8			0.3750	3.5/8		5“		6	010524	—	—
3/8			0.3750		87		133	10	—	—	0008249
		9.60	0.3780		87		133	10	—	—	0008874
		9.70	0.3819		87		133	10	—	—	0008881
		9.80	0.3858		87		133	10	—	—	0008898
		9.90	0.3898		87		133	10	—	—	0008904
25/64			0.3906	3.3/4		5.1/8		6	010525	—	—
25/64			0.3906		87		133	10	—	—	46305907
		10.00	0.3937		87		133	10	—	—	0007648
		10.20	0.4016		87		133	5	—	—	0007655
13/32			0.4063	3.7/8		5.1/4		6	010526	—	—
13/32			0.4063		87		133	5	—	—	0007822
		10.50	0.4134		87		133	5	—	—	0007662
27/64			0.4219	3.15/16		5.3/8		6	010527	—	—
27/64			0.4219		94		142	5	—	—	46305908
		10.80	0.4252		94		142	5	—	—	0007679
		11.00	0.4331		94		142	5	—	—	0007686
7/16			0.4375	4.1/16		5.1/2		6	010528	—	—
7/16			0.4375		94		142	5	—	—	0008683
		11.50	0.4528		94		142	5	—	—	0007693

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
29/64			0.4531	4.3/16		5.5/8		6	010529	—	—
29/64			0.4531		94		142	5	—	—	46305909
		11.80	0.4646		94		142	5	—	—	0007709
15/32			0.4687	4.5/16		5.3/4		6	010530	—	—
15/32			0.4687		101		151	5	—	—	0007907
		12.00	0.4724		101		151	5	—	—	0007754
31/64			0.4844	4.3/8		5.7/8		6	010531	—	—
31/64			0.4844		101		151	5	—	—	46305920
		12.50	0.4921		101		151	5	—	—	0007778
1/2			0.5000	4.1/2		6		5	0010532	—	—
1/2			0.5000		101		151	5	—	—	0007747
		12.80	0.5039		101		151	5	—	—	0007785
		12.90	0.5079		101		151	5	—	—	0007792
		13.00	0.5118		101		151	5	—	—	0007808
		13.50	0.5315		108		160	5	—	—	0007815
		14.00	0.5512		108		160	5	—	—	0007853
		14.50	0.5709		114		169	1	—	—	0007860
		15.00	0.5906		114		169	1	—	—	0007877
		15.25	0.6004		120		178	1	—	—	0007884
		15.50	0.6102		120		178	1	—	—	0007891
		16.00	0.6299		120		178	1	—	—	0007921

JOBBER DRILL

General Purpose Jobber Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC21P Bright Finish improves chip flow in soft or non-ferrous materials.

QC21G TiN Coating increases wear resistance and improves tool life.

QC21P	QC21G
ANSI	ANSI
4XD	4XD
HSS	HSS
135°	135°
1/16 - 11/16	1/16 - 1/2

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
1/16	0.0625	7/8	1.7/8	12	015804	081704
52	0.0635	7/8	1.7/8	12	019452	080552
51	0.0670	1“	2“	12	019451	080551
50	0.0700	1“	2“	12	019450	080550
49	0.0730	1“	2“	12	019449	080549
48	0.0760	1“	2“	12	019448	080548
5/64	0.0781	1“	2“	12	015805	081705
47	0.0785	1“	2“	12	019447	080547
46	0.0810	1.1/8	2.1/8	12	019446	080546
45	0.0820	1.1/8	2.1/8	12	019445	080545
44	0.0860	1.1/8	2.1/8	12	019444	080544
43	0.0890	1.1/4	2.1/4	12	019443	080543
42	0.0935	1.1/4	2.1/4	12	019442	080542
3/32	0.0938	1.1/4	2.1/4	12	015806	081706
41	0.0960	1.3/8	2.3/8	12	019441	080541
40	0.0980	1.3/8	2.3/8	12	019440	080540
39	0.0995	1.3/8	2.3/8	12	019439	080539
38	0.1015	1.7/16	2.1/2	12	019438	080538
37	0.1040	1.7/16	2.1/2	12	019437	080537
36	0.1065	1.7/16	2.1/2	12	019436	080536
7/64	0.1094	1.1/2	2.5/8	12	015807	081707
35	0.1100	1.1/2	2.5/8	12	019435	080535
34	0.1110	1.1/2	2.5/8	12	019434	080534
33	0.1130	1.1/2	2.5/8	12	019433	080533
32	0.1160	1.5/8	2.3/4	12	019432	080532
31	0.1200	1.5/8	2.3/4	12	019431	080531
1/8	0.1250	1.5/8	2.3/4	12	015808	081708
30	0.1285	1.5/8	2.3/4	12	019430	080530
29	0.1360	1.3/4	2.7/8	12	019429	080529
28	0.1405	1.3/4	2.7/8	12	019428	080528
9/64	0.1406	1.3/4	2.7/8	12	015809	081709
27	0.1440	1.7/8	3“	12	019427	080527
26	0.1470	1.7/8	3“	12	019426	080526

JOBBER DRILL

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
25	0.1495	1.7/8	3“	12	019425	080525
24	0.1520	2“	3.1/8	12	019424	080524
23	0.1540	2“	3.1/8	12	019423	080523
5/32	0.1563	2“	3.1/8	12	015810	081710
22	0.1570	2“	3.1/8	12	019422	080522
21	0.1590	2.1/8	3.1/4	12	019421	080521
20	0.1610	2.1/8	3.1/4	12	019420	080520
19	0.1660	2.1/8	3.1/4	12	019419	080519
18	0.1695	2.1/8	3.1/4	12	019418	080518
11/64	0.1719	2.1/8	3.1/4	12	015811	081711
17	0.1730	2.3/16	3.3/8	12	019417	080517
16	0.1770	2.3/16	3.3/8	12	019416	080516
15	0.1800	2.3/16	3.3/8	12	019415	080515
14	0.1820	2.3/16	3.3/8	12	019414	080514
13	0.1850	2.5/16	3.1/2	12	019413	080513
3/16	0.1875	2.5/16	3.1/2	12	015812	081712
12	0.1890	2.5/16	3.1/2	12	019412	080512
11	0.1910	2.5/16	3.1/2	12	019411	080511
10	0.1935	2.7/16	3.5/8	12	019410	080510
9	0.1960	2.7/16	3.5/8	12	019409	080509
8	0.1990	2.7/16	3.5/8	12	019408	080508
7	0.2010	2.7/16	3.5/8	12	019407	080507
13/64	0.2031	2.7/16	3.5/8	12	015813	081713
6	0.2040	2.1/2	3.3/4	12	019406	080506
5	0.2055	2.1/2	3.3/4	12	019405	080505
4	0.2090	2.1/2	3.3/4	12	019404	080504
3	0.2130	2.1/2	3.3/4	12	019403	080503
7/32	0.2188	2.1/2	3.3/4	12	015814	081714
2	0.2210	2.5/8	3.7/8	12	019402	080502
1	0.2280	2.5/8	3.7/8	12	019401	080501
A	0.2340	2.5/8	3.7/8	12	019301	—
15/64	0.2344	2.5/8	3.7/8	12	015815	081715
B	0.2374	2.3/4	4“	12	019302	—
C	0.2421	2.3/4	4“	12	019303	—
D	0.2461	2.3/4	4“	12	019304	—
1/4	0.2500	2.3/4	4“	12	015816	081716
F	0.2571	2.7/8	4.1/8	12	019306	—
G	0.2610	2.7/8	4.1/8	12	019307	—
17/64	0.2656	2.7/8	4.1/8	12	015817	081717
H	0.2661	2.7/8	4.1/8	12	019308	—
I	0.2720	2.7/8	4.1/8	12	019309	—
J	0.2772	2.7/8	4.1/8	12	019310	—
K	0.2811	2.15/16	4.1/4	12	019311	—
9/32	0.2813	2.15/16	4.1/4	12	015818	081718
L	0.2902	2.15/16	4.1/4	12	019312	—
M	0.2949	3.1/16	4.3/8	12	019313	—
19/64	0.2969	3.1/16	4.3/8	12	015819	081719
N	0.3020	3.1/16	4.3/8	12	019314	—
5/16	0.3125	3.3/16	4.1/2	6	015820	081720
O	0.3161	3.3/16	4.1/2	6	019315	—
P	0.3228	3.5/16	4.5/8	6	019316	—
21/64	0.3281	3.5/16	4.5/8	6	015821	081721
Q	0.3319	3.7/16	4.3/4	6	019317	—
R	0.3390	3.7/16	4.3/4	6	019318	—
11/32	0.3437	3.7/16	4.3/4	6	015822	081722
S	0.3480	3.1/2	4.7/8	6	019319	—
T	0.3580	3.1/2	4.7/8	6	019320	—
23/64	0.3594	3.1/2	4.7/8	6	015823	081723
U	0.3680	3.5/8	5“	6	019321	—
3/8	0.3750	3.5/8	5“	6	015824	081724
V	0.3772	3.5/8	5“	6	019322	—
W	0.3858	3.3/4	5.1/8	6	019323	—
25/64	0.3906	3.3/4	5.1/8	6	015825	081725
X	0.3969	3.3/4	5.1/8	6	019324	—
Y	0.4039	3.7/8	5.1/4	6	019325	—
13/32	0.4063	3.7/8	5.1/4	6	015826	081726

JOBBER DRILL

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
Z	0.4130	3.7/8	5.1/4	6	019326	—
27/64	0.4219	3.15/16	5.3/8	6	015827	081727
7/16	0.4375	4.1/16	5.1/2	6	015828	081728
29/64	0.4531	4.3/16	5.5/8	6	015829	081729
15/32	0.4687	4.5/16	5.3/4	6	015830	081730
31/64	0.4844	4.3/8	5.7/8	6	015831	081731
1/2	0.5000	4.1/2	6“	6	015832	081732
33/64	0.5156	4.13/16	6.5/8	1	015833	—
17/32	0.5313	4.13/16	6.5/8	1	015834	—
35/64	0.5469	4.13/16	6.5/8	1	015835	—
9/16	0.5625	4.13/16	6.5/8	1	015836	—
37/64	0.5781	4.13/16	6.5/8	1	015837	—
19/32	0.5937	5.3/16	7.1/8	1	015838	—
39/64	0.6094	5.3/16	7.1/8	1	015839	—
5/8	0.6250	5.3/16	7.1/8	1	015840	—
41/64	0.6406	5.3/16	7.1/8	1	015841	—
21/32	0.6563	5.3/16	7.1/8	1	015842	—
43/64	0.6719	5.5/8	7.5/8	1	015843	—
11/16	0.6875	5.5/8	7.5/8	1	015844	—

JOBBER DRILL

General Purpose Jobber Length Parabolic Flute, Metric

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC21PM Bright Finish improves chip flow in soft or non-ferrous materials.

QC21GM TiN Coating increases wear resistance and improves tool life.

QC21PM	QC21GM
DIN 338	DIN 338
4XD	4XD
HSS	HSS
135°	135°
1.50 - 17.50	1.50 - 13.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	QC21PM	QC21GM
1.50	0.0591	18	40	12	013115	019815
2.00	0.0787	24	49	12	013120	019820
2.50	0.0984	30	57	12	013125	019825
3.00	0.1181	33	61	12	013130	019830
3.50	0.1378	39	70	12	013135	—
4.00	0.1575	43	75	12	013140	019840
4.50	0.1772	47	80	12	013145	—
5.00	0.1969	52	86	12	013150	019850
5.20	0.2047	52	86	12	013152	019852
5.50	0.2165	57	93	12	013155	019855
5.60	0.2205	57	93	12	013156	019856
6.00	0.2362	57	93	12	013160	019860
6.50	0.2559	63	101	12	013165	019865
6.80	0.2677	69	109	12	013168	019868
7.00	0.2756	69	109	12	013170	019870
7.50	0.2953	69	109	12	013175	019875
8.00	0.3150	75	117	6	013180	019880
8.20	0.3228	75	117	6	013182	019882
8.50	0.3346	75	117	6	013185	019885
8.60	0.3386	81	125	6	013186	019886
9.00	0.3543	81	125	6	013190	019890
9.50	0.3740	81	125	6	013195	019895
10.00	0.3937	87	133	6	014900	019900
10.50	0.4134	87	133	6	014905	019905
11.00	0.4331	94	142	6	014910	019910
11.50	0.4528	94	142	6	014915	—
12.00	0.4724	101	151	6	014920	019920
12.50	0.4921	101	151	6	014925	019925
13.00	0.5118	101	151	1	014930	019930
13.50	0.5315	108	160	1	014935	—
14.00	0.5512	108	160	1	014940	—
14.50	0.5709	114	169	1	014945	—
15.00	0.5906	114	169	1	014950	—
15.50	0.6102	120	178	1	014955	—
16.00	0.6299	120	178	1	014960	—
16.50	0.6496	125	184	1	014965	—
17.00	0.6693	125	184	1	014970	—
17.50	0.6890	130	191	1	014975	—

COBALT JOBBER DRILL

Heavy Duty Jobber Length (NAS 907 Type J)

* *Sets Available on pg. 234-235*

R10CO - *Fractional Sizes*

R18CO - *Wire Gauge Sizes*

R15CO - *Letter Sizes*

2ACO - *Metric Sizes*

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance & lubricity. For enhanced tool life in ferrous materials

R10CO	R18CO	R15CO	2ACO
ANSI	ANSI	ANSI	DIN 338
4XD	4XD	4XD	4XD
HSS-E	HSS-E	HSS-E	HSS-E
135°	135°	135°	135°
1/64 - 11/16	N80 - N1	A - Z	1.00 - 13.00

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
	80			0.0135	1/8		3/4		12	— [1)]	018380	—	—
	79			0.0145	1/8		3/4		12	— [1)]	018379	—	—
1/64				0.0156	3/16		3/4		12	010301 [1)]	—	—	—
	78			0.0160	3/16		7/8		12	— [1)]	018378	—	—
	77			0.0180	3/16		7/8		12	— [1)]	018377	—	—
	76			0.0200	3/16		7/8		12	— [1)]	018376	—	—
	75			0.0210	1/4		1“		12	— [1)]	018375	—	—
	74			0.0225	1/4		1“		12	— [1)]	018374	—	—
	73			0.0240	5/16		1.1/8		12	— [1)]	018373	—	—
	72			0.0250	5/16		1.1/8		12	— [1)]	018372	—	—
	71			0.0260	3/8		1.1/4		12	— [1)]	018371	—	—
	70			0.0280	3/8		1.1/4		12	— [1)]	018370	—	—
	69			0.0292	1/2		1.3/8		12	— [1)]	018369	—	—
	68			0.0310	1/2		1.3/8		12	— [1)]	018368	—	—
1/32				0.0313	1/2		1.3/8		12	010302 [1)]	—	—	—
	67			0.0320	1/2		1.3/8		12	— [1)]	018367	—	—
	66			0.0330	1/2		1.3/8		12	— [1)]	018366	—	—
	65			0.0350	5/8		1.1/2		12	— [1)]	018365	—	—
	64			0.0360	5/8		1.1/2		12	— [1)]	018364	—	—
	63			0.0370	5/8		1.1/2		12	— [1)]	018363	—	—
	62			0.0380	5/8		1.1/2		12	— [1)]	018362	—	—
	61			0.0390	11/16		1.5/8		12	— [1)]	018361	—	—
			1.00	0.0394		12		34	12	—	—	—	016410
	60			0.0400	11/16		1.5/8		12	—	018360	—	—
	59			0.0410	11/16		1.5/8		12	—	018359	—	—
			1.05	0.0413		12		34	12	—	—	—	016355
	58			0.0420	11/16		1.5/8		12	—	018358	—	—
	57			0.0430	3/4		1.3/4		12	—	018357	—	—
			1.10	0.0433		14		36	12	—	—	—	016411
			1.15	0.0453		14		36	12	—	—	—	016356
	56			0.0465	3/4		1.3/4		12	—	018356	—	—
3/64				0.0469	3/4		1.3/4		12	010303	—	—	—

[1)] No Split Point

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			1.20	0.0472		16		38	12	—	—	—	016412
			1.25	0.0492		16		38	12	—	—	—	016357
			1.30	0.0512		16		38	12	—	—	—	016413
	55			0.0520	7/8		1.7/8		12	—	018355	—	—
			1.35	0.0531		18		40	12	—	—	—	016358
			1.40	0.0551		18		40	12	—	—	—	016414
	54			0.0550	7/8		1.7/8		12	—	018354	—	—
			1.45	0.0571		18		40	12	—	—	—	016359
			1.50	0.0591		18		40	12	—	—	—	016415
	53			0.0595	7/8		1.7/8		12	—	018353	—	—
			1.55	0.0610		20		43	12	—	—	—	016360
1/16				0.0625	7/8		1.7/8		12	010304	—	—	—
			1.60	0.0630		20		43	12	—	—	—	016416
	52			0.0635	7/8		1.7/8		12	—	018352	—	—
			1.65	0.0650		20		43	12	—	—	—	016361
			1.70	0.0669		20		43	12	—	—	—	016417
	51			0.0670	1“		2“		12	—	018351	—	—
			1.75	0.0689		22		46	12	—	—	—	016362
	50			0.0700	1“		2“		12	—	018350	—	—
			1.80	0.0709		22		46	12	—	—	—	016418
			1.85	0.0728		22		46	12	—	—	—	016363
	49			0.0730	1“		2“		12	—	018349	—	—
			1.90	0.0748		22		46	12	—	—	—	016419
	48			0.0760	1“		2“		12	—	018348	—	—
			1.95	0.0768		24		49	12	—	—	—	016364
5/64				0.0781	1“		2“		12	010305	—	—	—
	47			0.0785	1“		2“		12	—	018347	—	—
			2.00	0.0787		24		49	12	—	—	—	016420
			2.05	0.0807		24		49	12	—	—	—	016365
	46			0.0810	1.1/8		2.1/8		12	—	018346	—	—
	45			0.0820	1.1/8		2.1/8		12	—	018345	—	—
			2.10	0.0827		24		49	12	—	—	—	016421
	44			0.0860	1.1/8		2.1/8		12	—	018344	—	—
			2.20	0.0866		27		53	12	—	—	—	016422
	43			0.0890	1.1/4		2.1/4		12	—	018343	—	—
			2.30	0.0906		27		53	12	—	—	—	016423
			2.35	0.0925		27		53	12	—	—	—	016368
	42			0.0935	1.1/4		2.1/4		12	—	018342	—	—
3/32				0.0938	1.1/4		2.1/4		12	010306	—	—	—
			2.40	0.0945		30		57	12	—	—	—	016424
	41			0.0960	1.3/8		2.3/8		12	—	018341	—	—
	40			0.0980	1.3/8		2.3/8		12	—	018340	—	—
			2.50	0.0984		30		57	12	—	—	—	016425
	39			0.0995	1.3/8		2.3/8		12	—	018339	—	—
	38			0.1015	1.7/16		2.1/2		12	—	018338	—	—
			2.60	0.1024		30		57	12	—	—	—	016426
	37			0.1040	1.7/16		2.1/2		12	—	018337	—	—
			2.70	0.1063		33		61	12	—	—	—	016427
	36			0.1065	1.7/16		2.1/2		12	—	018336	—	—
7/64				0.1094	1.1/2		2.5/8		12	010307	—	—	—
	35			0.1100	1.1/2		2.5/8		12	—	018335	—	—
			2.80	0.1102		33		61	12	—	—	—	016428
	34			0.1110	1.1/2		2.5/8		12	—	018334	—	—
	33			0.1130	1.1/2		2.5/8		12	—	018333	—	—
			2.90	0.1142		33		61	12	—	—	—	016429
	32			0.1160	1.5/8		2.3/4		12	—	018332	—	—
			3.00	0.1181		33		61	12	—	—	—	016430
	31			0.1200	1.5/8		2.3/4		12	—	018331	—	—
			3.10	0.1220		36		65	12	—	—	—	016431
1/8				0.1250	1.5/8		2.3/4		12	010308	—	—	—
			3.20	0.1260		36		65	12	—	—	—	016432
			3.25	0.1280		36		65	12	—	—	—	016371
	30			0.1285	1.5/8		2.3/4		12	—	018330	—	—
			3.30	0.1299		36		65	12	—	—	—	016433
			3.40	0.1339		39		70	12	—	—	—	016434
	29			0.1360	1.3/4		2.7/8		12	—	018329	—	—

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			3.50	0.1378		39		70	12	—	—	—	016435
	28			0.1405	1.3/4		2.7/8		12	—	018328	—	—
9/64				0.1406	1.3/4		2.7/8		12	010309	—	—	—
			3.60	0.1417		39		70	12	—	—	—	016436
	27			0.1440	1.7/8		3“		12	—	018327	—	—
			3.70	0.1457		39		70	12	—	—	—	016437
	26			0.1470	1.7/8		3“		12	—	018326	—	—
			3.75	0.1476		39		70	12	—	—	—	016372
			3.80	0.1496		43		75	12	—	—	—	016438
	25			0.1495	1.7/8		3“		12	—	018325	—	—
	24			0.1520	2“		3.1/8		12	—	018324	—	—
	23			0.1540	2“		3.1/8		12	—	018323	—	—
5/32				0.1563	2“		3.1/8		12	010310	—	—	—
	22			0.1570	2“		3.1/8		12	—	018322	—	—
			4.00	0.1575		43		75	12	—	—	—	016440
	21			0.1590	2.1/8		3.1/4		12	—	018321	—	—
	20			0.1610	2.1/8		3.1/4		12	—	018320	—	—
			4.10	0.1614		43		75	12	—	—	—	016441
			4.20	0.1654		43		75	12	—	—	—	016442
	19			0.1660	2.1/8		3.1/4		12	—	018319	—	—
			4.25	0.1673		43		75	12	—	—	—	016373
			4.30	0.1693		47		80	12	—	—	—	016443
	18			0.1695	2.1/8		3.1/4		12	—	018318	—	—
11/64				0.1719	2.1/8		3.1/4		12	010311	—	—	—
	17			0.1730	2.3/16		3.3/8		12	—	018317	—	—
			4.40	0.1732		47		80	12	—	—	—	016444
			4.50	0.1772		47		80	12	—	—	—	016445
	16			0.1770	2.3/16		3.3/8		12	—	018316	—	—
	15			0.1800	2.3/16		3.3/8		12	—	018315	—	—
	14			0.1820	2.3/16		3.3/8		12	—	018314	—	—
			4.70	0.1850		47		80	12	—	—	—	016447
	13			0.1850	2.5/16		3.1/2		12	—	018313	—	—
3/16				0.1875	2.5/16		3.1/2		12	010312	—	—	—
			4.80	0.1890		52		86	12	—	—	—	016448
	12			0.1890	2.5/16		3.1/2		12	—	018312	—	—
	11			0.1910	2.5/16		3.1/2		12	—	018311	—	—
	10			0.1935	2.7/16		3.5/8		12	—	018310	—	—
	9			0.1960	2.7/16		3.5/8		12	—	018309	—	—
			5.00	0.1969		52		86	12	—	—	—	016450
	8			0.1990	2.7/16		3.5/8		12	—	018308	—	—
			5.10	0.2008		52		86	12	—	—	—	016451
	7			0.2010	2.7/16		3.5/8		12	—	018307	—	—
13/64				0.2031	2.7/16		3.5/8		12	010313	—	—	—
	6			0.2040	2.1/2		3.3/4		12	—	018306	—	—
			5.20	0.2047		52		86	12	—	—	—	016452
	5			0.2055	2.1/2		3.3/4		12	—	018305	—	—
			5.25	0.2067		52		86	12	—	—	—	016375
			5.30	0.2087		52		86	12	—	—	—	016453
	4			0.2090	2.1/2		3.3/4		12	—	018304	—	—
	3			0.2130	2.1/2		3.3/4		12	—	018303	—	—
			5.50	0.2165		57		93	12	—	—	—	016455
7/32				0.2188	2.1/2		3.3/4		12	010314	—	—	—
			5.60	0.2205		57		93	12	—	—	—	016456
	2			0.2210	2.5/8		3.7/8		12	—	018302	—	—
			5.70	0.2244		57		93	12	—	—	—	016457
	1			0.2280	2.5/8		3.7/8		12	—	018301	—	—
			5.90	0.2323		57		93	12	—	—	—	016459
		A		0.2340	2.5/8		3.7/8		12	—	—	015301	—
15/64				0.2344	2.5/8		3.7/8		12	010315	—	—	—
			6.00	0.2362		57		93	12	—	—	—	016460
		B		0.2374	2.3/4		4“		12	—	—	015302	—
			6.10	0.2402		63		101	12	—	—	—	016461
		C		0.2421	2.3/4		4“		12	—	—	015303	—
			6.20	0.2441		63		101	12	—	—	—	016462
		D		0.2461	2.3/4		4“		12	—	—	015304	—
			6.30	0.2480		63		101	12	—	—	—	016463

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
		E		0.2500	2.3/4		4“		12	—	—	015305	—
1/4				0.2500	2.3/4		4“		12	010316	—	—	—
			6.40	0.2520		63		101	12	—	—	—	016464
			6.50	0.2559		63		101	12	—	—	—	016465
		F		0.2571	2.7/8		4.1/8		12	—	—	015306	—
			6.60	0.2598		63		101	12	—	—	—	016466
		G		0.2610	2.7/8		4.1/8		12	—	—	015307	—
			6.70	0.2638		63		101	12	—	—	—	016467
17/64				0.2656	2.7/8		4.1/8		12	010317	—	—	—
		H		0.2661	2.7/8		4.1/8		12	—	—	015308	—
			6.80	0.2677		69		109	12	—	—	—	016468
			6.90	0.2717		69		109	12	—	—	—	016469
		I		0.2720	2.7/8		4.1/8		12	—	—	015309	—
			7.00	0.2756		69		109	12	—	—	—	016470
		J		0.2772	2.7/8		4.1/8		12	—	—	015310	—
			7.10	0.2795		69		109	12	—	—	—	016471
		K		0.2811	2.15/16		4.1/4		12	—	—	015311	—
9/32				0.2813	2.15/16		4.1/4		12	010318	—	—	—
			7.20	0.2835		69		109	12	—	—	—	016472
			7.25	0.2854		69		109	12	—	—	—	016379
			7.30	0.2874		69		109	12	—	—	—	016473
		L		0.2902	2.15/16		4.1/4		12	—	—	015312	—
		M		0.2949	3.1/16		4.3/8		12	—	—	015313	—
			7.50	0.2953		69		109	12	—	—	—	016475
19/64				0.2969	3.1/16		4.3/8		12	010319	—	—	—
		N		0.3020	3.1/16		4.3/8		12	—	—	015314	—
			7.80	0.3071		75		117	12	—	—	—	016478
			7.90	0.3110		75		117	12	—	—	—	016479
5/16				0.3125	3.3/16		4.1/2		6	010320	—	—	—
			8.00	0.3150		75		117	6	—	—	—	016480
		O		0.3161	3.3/16		4.1/2		6	—	—	015315	—
			8.20	0.3228		75		117	6	—	—	—	016482
		P		0.3228	3.5/16		4.5/8		6	—	—	015316	—
21/64				0.3281	3.5/16		4.5/8		6	010321	—	—	—
			8.40	0.3307		75		117	6	—	—	—	016484
		Q		0.3319	3.7/16		4.3/4		6	—	—	015317	—
			8.50	0.3346		75		117	6	—	—	—	016485
		R		0.3390	3.7/16		4.3/4		6	—	—	015318	—
11/32				0.3437	3.7/16		4.3/4		6	010322	—	—	—
			8.80	0.3465		81		125	6	—	—	—	016488
		S		0.3480	3.1/2		4.7/8		6	—	—	015319	—
			8.90	0.3504		81		125	6	—	—	—	016489
			9.00	0.3543		81		125	6	—	—	—	016490
		T		0.3580	3.1/2		4.7/8		6	—	—	015320	—
			9.10	0.3583		81		125	6	—	—	—	016491
23/64				0.3594	3.1/2		4.7/8		6	010323	—	—	—
			9.20	0.3622		81		125	6	—	—	—	016492
			9.30	0.3661		81		125	6	—	—	—	016493
		U		0.3680	3.5/8		5“		6	—	—	015321	—
			9.40	0.3701		81		125	6	—	—	—	016494
			9.50	0.3740		81		125	6	—	—	—	016495
3/8				0.3750	3.5/8		5“		6	010324	—	—	—
		V		0.3772	3.5/8		5“		6	—	—	015322	—
			9.60	0.3780		87		133	6	—	—	—	016496
			9.70	0.3819		87		133	6	—	—	—	016497
			9.80	0.3858		87		133	6	—	—	—	016498
		W		0.3858	3.3/4		5.1/8		6	—	—	015323	—
25/64				0.3906	3.3/4		5.1/8		6	010325	—	—	—
			10.00	0.3937		87		133	6	—	—	—	016300
		X		0.3969	3.3/4		5.1/8		6	—	—	015324	—
			10.20	0.4016		87		133	6	—	—	—	016302
		Y		0.4039	3.7/8		5.1/4		6	—	—	015325	—
13/32				0.4063	3.7/8		5.1/4		6	010326	—	—	—
		Z		0.4130	3.7/8		5.1/4		6	—	—	015326	—
			10.50	0.4134		87		133	6	—	—	—	016305
27/64				0.4219	3.15/16		5.3/8		6	010327	—	—	—

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			10.80	0.4252		94		142	6	—	—	—	016308
			11.00	0.4331		94		142	6	—	—	—	016310
7/16				0.4375	4.1/16		5.1/2		6	010328	—	—	—
			11.20	0.4409		94		142	6	—	—	—	016312
			11.50	0.4528		94		142	6	—	—	—	016315
29/64				0.4531	4.3/16		5.5/8		6	010329	—	—	—
			11.80	0.4646		94		142	6	—	—	—	016318
15/32				0.4687	4.5/16		5.3/4		6	010330	—	—	—
			12.00	0.4724		101		151	6	—	—	—	016320
			12.20	0.4803		101		151	6	—	—	—	016322
31/64				0.4844	4.3/8		5.7/8		6	010331	—	—	—
			12.50	0.4921		101		151	6	—	—	—	016325
1/2				0.5000	4.1/2		6“		6	010332	—	—	—
			13.00	0.5118		101		151	1	—	—	—	016330
33/64				0.5156	4.13/16		6.5/8		1	010333	—	—	—
17/32				0.5313	4.13/16		6.5/8		1	010334	—	—	—
35/64				0.5469	4.13/16		6.5/8		1	010335	—	—	—
9/16				0.5625	4.13/16		6.5/8		1	010336	—	—	—
37/64				0.5781	4.13/16		6.5/8		1	010337	—	—	—
19/32				0.5937	5.3/16		7.1/8		1	010338	—	—	—
39/64				0.6094	5.3/16		7.1/8		1	010339	—	—	—
5/8				0.6250	5.3/16		7.1/8		1	010340	—	—	—
41/64				0.6406	5.3/16		7.1/8		1	010341	—	—	—
21/32				0.6563	5.3/16		7.1/8		1	010342	—	—	—
43/64				0.6719	5.5/8		7.5/8		1	010343	—	—	—
11/16				0.6875	5.5/8		7.5/8		1	010344	—	—	—

COBALT JOBBER DRILL

Heavy Duty Jobber Length (NAS 907 Type D)

R88CO - *Fractional Sizes*

R89CO - *Wire Gauge Sizes*

Low thrust design self centering Split Point for easier penetration. Shorter Flute Lengths. Cobalt base material with Bronze Oxide for wear resistance and lubricity.

R88CO	R89CO
NAS 907	NAS 907
3XD	3XD
HSS-E	HSS-E
135°	135°
1/16 - 1/2	N52 - N3

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R88CO	R89CO
1/16		0.0625	7/16	1.7/8	12	058704	—
	52	0.0635	7/16	1.7/8	12	—	058852
	51	0.0670	1/2	2“	12	—	058851
	50	0.0700	1/2	2“	12	—	058850
	49	0.0730	1/2	2“	12	—	058849
5/64		0.0781	1/2	2“	12	058705	—
	46	0.0810	9/16	2.1/8	12	—	058846
	45	0.0820	9/16	2.1/8	12	—	058845
	44	0.0860	9/16	2.1/8	12	—	058844
	43	0.0890	5/8	2.1/4	12	—	058843
	42	0.0935	5/8	2.1/4	12	—	058842
3/32		0.0938	5/8	2.1/4	12	058706	—
	41	0.0960	5/8	2.3/8	12	—	058841
	40	0.0980	13/16	2.3/8	12	—	058840
	39	0.0995	13/16	2.3/8	12	—	058839
	36	0.1065	13/16	2.1/2	12	—	058836
7/64		0.1094	13/16	2.5/8	12	058707	—
	31	0.1200	7/8	2.3/4	12	—	058831
1/8		0.1250	7/8	2.3/4	12	058708	—
	30	0.1285	15/16	2.3/4	12	—	058830
	29	0.1360	15/16	2.7/8	12	—	058829
9/64		0.1406	15/16	2.7/8	12	058709	—
	27	0.1440	1“	3“	12	—	058827
	26	0.1470	1“	3“	12	—	058826
	25	0.1495	1“	3“	12	—	058825
	24	0.1520	1“	3.1/8	12	—	058824
5/32		0.1563	1“	3.1/8	12	058710	—
	22	0.1570	1.1/16	3.1/8	12	—	058822
	21	0.1590	1.1/16	3.1/4	12	—	058821
	20	0.1610	1.1/16	3.1/4	12	—	058820
11/64		0.1719	1.1/16	3.1/4	12	058711	—
	16	0.1770	1.1/8	3.3/8	12	—	058816
	13	0.1850	1.1/8	3.1/2	12	—	058813

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R88CO	R89CO
3/16		0.1875	1.1/8	3.1/2	12	058712	—
	12	0.1890	1.1/8	3.1/2	12	—	058812
	11	0.1910	1.3/16	3.1/2	12	—	058811
	10	0.1935	1.3/16	3.5/8	12	—	058810
	9	0.1960	1.3/16	3.5/8	12	—	058809
	8	0.1990	1.3/16	3.5/8	12	—	058808
	7	0.2010	1.3/16	3.5/8	12	—	058807
13/64		0.2031	1.3/16	3.5/8	12	058713	—
	6	0.2040	1.1/4	3.3/4	12	—	058806
	5	0.2055	1.1/4	3.3/4	12	—	058805
	3	0.2130	1.1/4	3.3/4	12	—	058803
7/32		0.2188	1.1/4	3.3/4	12	058714	—
15/64		0.2344	1.5/16	3.7/8	12	058715	—
1/4		0.2500	1.3/8	4“	12	058716	—
17/64		0.2656	1.7/16	4.1/8	12	058717	—
9/32		0.2813	1.1/2	4.1/4	12	058718	—
19/64		0.2969	1.9/16	4.3/8	12	058719	—
5/16		0.3125	1.5/8	4.1/2	6	058720	—
21/64		0.3281	1.11/16	4.5/8	6	058721	—
11/32		0.3437	1.11/16	4.3/4	6	058722	—
23/64		0.3594	1.3/4	4.7/8	6	058723	—
3/8		0.3750	1.13/16	5“	6	058724	—
25/64		0.3906	1.7/8	5.1/8	6	058725	—
13/32		0.4063	1.15/16	5.1/4	6	058726	—
27/64		0.4219	2“	5.3/8	6	058727	—
7/16		0.4375	2.1/16	5.1/2	6	058728	—
29/64		0.4531	2.1/8	5.5/8	6	058729	—
15/32		0.4687	2.1/8	5.3/4	6	058730	—
31/64		0.4844	2.3/16	5.7/8	6	058731	—
1/2		0.5000	2.1/4	6“	6	058732	—

SCREW MACHINE DRILL

General Purpose Screw Machine Length

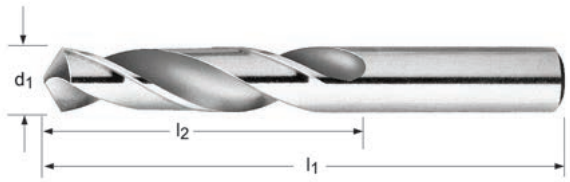
* Sets Available on pg. 236

R40 - *Fractional Sizes*

R41 - *Wire Gauge Sizes*

R42 - *Letter Sizes*

Bright Finish improves chip flow in soft or non-ferrous materials



R40	R41	R42
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS	HSS	HSS
118°	118°	118°
3/64 - 2“	N60 - N1	A - Z

[1] *Sizes 45/64 and larger are steam oxide*
[2] *1” reduced shank*
[3] *1-1/4” reduced shank*
[4] *1-1/2” reduced shank*

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
	60		0.0400	1/2	1.3/8	12	—	041060	—
	59		0.0410	1/2	1.3/8	12	—	041059	—
	58		0.0420	1/2	1.3/8	12	—	041058	—
	57		0.0430	1/2	1.3/8	12	—	041057	—
	56		0.0465	1/2	1.3/8	12	—	041056	—
3/64			0.0469	1/2	1.3/8	12	040003	—	—
	55		0.0520	5/8	1.5/8	12	—	041055	—
	54		0.0550	5/8	1.5/8	12	—	041054	—
	53		0.0595	5/8	1.5/8	12	—	041053	—
1/16			0.0625	5/8	1.5/8	12	040004	—	—
	52		0.0635	11/16	1.11/16	12	—	041052	—
	51		0.0670	11/16	1.11/16	12	—	041051	—
	50		0.0700	11/16	1.11/16	12	—	041050	—
	49		0.0730	11/16	1.11/16	12	—	041049	—
	48		0.0760	11/16	1.11/16	12	—	041048	—
5/64			0.0781	11/16	1.11/16	12	040005	—	—
	47		0.0785	11/16	1.11/16	12	—	041047	—
	46		0.0810	3/4	1.3/4	12	—	041046	—
	45		0.0820	3/4	1.3/4	12	—	041045	—
	44		0.0860	3/4	1.3/4	12	—	041044	—
	43		0.0890	3/4	1.3/4	12	—	041043	—
	42		0.0935	3/4	1.3/4	12	—	041042	—
3/32			0.0938	3/4	1.3/4	12	040006	—	—
	41		0.0960	13/16	1.13/16	12	—	041041	—
	40		0.0980	13/16	1.13/16	12	—	041040	—
	39		0.0995	13/16	1.13/16	12	—	041039	—
	38		0.1015	13/16	1.13/16	12	—	041038	—
	37		0.1040	13/16	1.13/16	12	—	041037	—
	36		0.1065	13/16	1.13/16	12	—	041036	—
7/64			0.1094	13/16	1.13/16	12	040007	—	—
	35		0.1100	7/8	1.7/8	12	—	041035	—
	34		0.1110	7/8	1.7/8	12	—	041034	—
	33		0.1130	7/8	1.7/8	12	—	041033	—
	32		0.1160	7/8	1.7/8	12	—	041032	—

SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
	31		0.1200	7/8	1.7/8	12	—	041031	—
1/8			0.1250	7/8	1.7/8	12	040008	—	—
	30		0.1285	15/16	1.15/16	12	—	041030	—
	29		0.1360	15/16	1.15/16	12	—	041029	—
	28		0.1405	15/16	1.15/16	12	—	041028	—
9/64			0.1406	15/16	1.15/16	12	040009	—	—
	27		0.1440	1“	2.1/16	12	—	041027	—
	26		0.1470	1“	2.1/16	12	—	041026	—
	25		0.1495	1“	2.1/16	12	—	041025	—
	24		0.1520	1“	2.1/16	12	—	041024	—
	23		0.1540	1“	2.1/16	12	—	041023	—
5/32			0.1563	1“	2.1/16	12	040010	—	—
	22		0.1570	1.1/16	2.1/8	12	—	041022	—
	21		0.1590	1.1/16	2.1/8	12	—	041021	—
	20		0.1610	1.1/16	2.1/8	12	—	041020	—
	19		0.1660	1.1/16	2.1/8	12	—	041019	—
	18		0.1695	1.1/16	2.1/8	12	—	041018	—
11/64			0.1719	1.1/16	2.1/8	12	040011	—	—
	17		0.1730	1.1/8	2.3/16	12	—	041017	—
	16		0.1770	1.1/8	2.3/16	12	—	041016	—
	15		0.1800	1.1/8	2.3/16	12	—	041015	—
	14		0.1820	1.1/8	2.3/16	12	—	041014	—
	13		0.1850	1.1/8	2.3/16	12	—	041013	—
3/16			0.1875	1.1/8	2.3/16	12	040012	—	—
	12		0.1890	1.3/16	2.1/4	12	—	041012	—
	11		0.1910	1.3/16	2.1/4	12	—	041011	—
	10		0.1935	1.3/16	2.1/4	12	—	041010	—
	9		0.1960	1.3/16	2.1/4	12	—	041009	—
	8		0.1990	1.3/16	2.1/4	12	—	041008	—
	7		0.2010	1.3/16	2.1/4	12	—	041007	—
13/64			0.2031	1.3/16	2.1/4	12	040013	—	—
	6		0.2040	1.1/4	2.3/8	12	—	041006	—
	5		0.2055	1.1/4	2.3/8	12	—	041005	—
	4		0.2090	1.1/4	2.3/8	12	—	041004	—
	3		0.2130	1.1/4	2.3/8	12	—	041003	—
7/32			0.2188	1.1/4	2.3/8	12	040014	—	—
	2		0.2210	1.5/16	2.7/16	12	—	041002	—
	1		0.2280	1.5/16	2.7/16	12	—	041001	—
		A	0.2340	1.5/16	2.7/16	12	—	—	042001
15/64			0.2344	1.5/16	2.7/16	12	040015	—	—
		B	0.2374	1.3/8	2.1/2	12	—	—	042002
		C	0.2421	1.3/8	2.1/2	12	—	—	042003
		D	0.2461	1.3/8	2.1/2	12	—	—	042004
		E	0.2500	1.3/8	2.1/2	12	—	—	042005
1/4			0.2500	1.3/8	2.1/2	12	040016	—	—
		F	0.2571	1.7/16	2.5/8	12	—	—	042006
		G	0.2610	1.7/16	2.5/8	12	—	—	042007
17/64			0.2656	1.7/16	2.5/8	12	040017	—	—
		H	0.2661	1.1/2	2.11/16	12	—	—	042008
		I	0.2720	1.1/2	2.11/16	12	—	—	042009
		J	0.2772	1.1/2	2.11/16	12	—	—	042010
		K	0.2811	1.1/2	2.11/16	12	—	—	042011
9/32			0.2813	1.1/2	2.11/16	12	040018	—	—
		L	0.2902	1.9/16	2.3/4	12	—	—	042012
		M	0.2949	1.9/16	2.3/4	12	—	—	042013
19/64			0.2969	1.9/16	2.3/4	12	040019	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042014
5/16			0.3125	1.5/8	2.13/16	6	040020	—	—
		O	0.3161	1.11/16	2.15/16	6	—	—	042015
		P	0.3228	1.11/16	2.15/16	6	—	—	042016
21/64			0.3281	1.11/16	2.15/16	6	040021	—	—
		Q	0.3319	1.11/16	3“	6	—	—	042017
		R	0.3390	1.11/16	3“	6	—	—	042018
11/32			0.3437	1.11/16	3“	6	040022	—	—
		S	0.3480	1.3/4	3.1/16	6	—	—	042019

SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
		T	0.3580	1.3/4	3.1/16	6	—	—	042020
23/64			0.3594	1.3/4	3.1/16	6	040023	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042021
3/8			0.3750	1.13/16	3.1/8	6	040024	—	—
		V	0.3772	1.7/8	3.1/4	6	—	—	042022
		W	0.3858	1.7/8	3.1/4	6	—	—	042023
25/64			0.3906	1.7/8	3.1/4	6	040025	—	—
		X	0.3969	1.15/16	3.5/16	6	—	—	042024
		Y	0.4039	1.15/16	3.5/16	6	—	—	042025
13/32			0.4063	1.15/16	3.5/16	6	040026	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042026
27/64			0.4219	2“	3.3/8	6	040027	—	—
7/16			0.4375	2.1/16	3.7/16	6	040028	—	—
29/64			0.4531	2.1/8	3.9/16	6	040029	—	—
15/32			0.4687	2.1/8	3.5/8	6	040030	—	—
31/64			0.4844	2.3/16	3.11/16	6	040031	—	—
1/2			0.5000	2.1/4	3.3/4	6	040032	—	—
33/64			0.5156	2.3/8	3.7/8	1	040033	—	—
17/32			0.5313	2.3/8	3.7/8	1	040034	—	—
35/64			0.5469	2.1/2	4“	1	040035	—	—
9/16			0.5625	2.1/2	4“	1	040036	—	—
37/64			0.5781	2.5/8	4.1/8	1	040037	—	—
19/32			0.5937	2.5/8	4.1/8	1	040038	—	—
39/64			0.6094	2.3/4	4.1/4	1	040039	—	—
5/8			0.6250	2.3/4	4.1/4	1	040040	—	—
41/64			0.6406	2.7/8	4.1/2	1	040041	—	—
21/32			0.6563	2.7/8	4.1/2	1	040042	—	—
43/64			0.6719	2.7/8	4.5/8	1	040043	—	—
11/16			0.6875	2.7/8	4.5/8	1	040044	—	—
45/64			0.7031	3“	4.3/4	1	040545 [1]	—	—
23/32			0.7188	3“	4.3/4	1	040546 [1]	—	—
47/64			0.7344	3.1/8	5“	1	040547 [1]	—	—
3/4			0.7500	3.1/8	5“	1	040548 [1]	—	—
49/64			0.7656	3.1/4	5.1/8	1	040549 [1]	—	—
25/32			0.7813	3.1/4	5.1/8	1	040550 [1]	—	—
51/64			0.7969	3.3/8	5.1/4	1	040551 [1]	—	—
13/16			0.8125	3.3/8	5.1/4	1	040552 [1]	—	—
53/64			0.8281	3.1/2	5.3/8	1	040553 [1]	—	—
27/32			0.8438	3.1/2	5.3/8	1	040554 [1]	—	—
55/64			0.8594	3.1/2	5.1/2	1	040555 [1]	—	—
7/8			0.8750	3.1/2	5.1/2	1	040556 [1]	—	—
57/64			0.8906	3.5/8	5.5/8	1	040557 [1]	—	—
29/32			0.9063	3.5/8	5.5/8	1	040558 [1]	—	—
59/64			0.9219	3.3/4	5.3/4	1	040559 [1]	—	—
15/16			0.9375	3.3/4	5.3/4	1	040560 [1]	—	—
61/64			0.9531	3.7/8	5.7/8	1	040561 [1]	—	—
31/32			0.9688	3.7/8	5.7/8	1	040562 [1]	—	—
63/64			0.9844	4“	6“	1	040563 [1]	—	—
1“			1.0000	4“	6“	1	040600 [1]	—	—
1.1/16			1.0625	4“	6.1/4	1	040604 [1] [2]	—	—
1.1/8			1.1250	4“	6.3/8	1	040608 [1] [2]	—	—
1.3/16			1.1875	4.1/4	6.5/8	1	040612 [1] [2]	—	—
1.1/4			1.2500	4.3/8	6.3/4	1	040616 [1] [2]	—	—
1.5/16			1.3125	4.3/8	7“	1	040620 [1] [3]	—	—
1.3/8			1.3750	4.1/2	7.1/8	1	040624 [1] [3]	—	—
1.7/16			1.4375	4.3/4	7.3/8	1	040628 [1] [3]	—	—
1.1/2			1.5000	4.7/8	7.1/2	1	040632 [1] [3]	—	—
1.9/16			1.5625	4.7/8	7.3/4	1	040636 [1] [4]	—	—
1.5/8			1.6250	4.7/8	7.3/4	1	040640 [1] [4]	—	—
1.3/4			1.7500	5.1/8	8“	1	040648 [1] [4]	—	—
1.13/16			1.8125	5.3/8	8.1/4	1	040652 [1] [4]	—	—
1.7/8			1.8750	5.3/8	8.1/4	1	040656 [1] [4]	—	—
1.15/16			1.9375	5.5/8	8.1/2	1	040660 [1] [4]	—	—
2“			2.0000	5.5/8	8.1/2	1	040700 [1] [4]	—	—

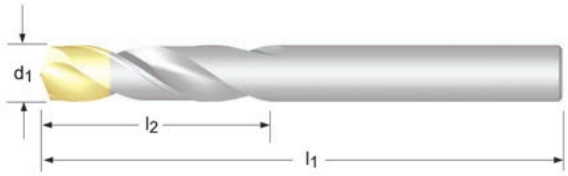
SCREW MACHINE DRILL

General Purpose Screw Machine Length

✱ *Sets Available on pg. 237*

A022 Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

Metric sizes to DIN1897 lengths.
Fractional sizes to ANSI lengths.



A022

DIN ANSI

2.5XD

HSS

135°

0.50 - 16.00

✱ *2mm and smaller are bright with no split point*

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	0.50	0.0197	3	20	10	0600382
	0.60	0.0236	3.5	21	10	0600399
	0.70	0.0276	4.5	23	10	0600405
1/32	0.79	0.0313	13	35	10	0600542
	0.80	0.0315	5	24	10	0600412
	0.90	0.0354	5.5	25	10	0600429
	1.00	0.0394	6	26	10	0600436
	1.10	0.0433	7	28	10	0600443
3/64	1.19	0.0469	13	35	10	0600559
	1.20	0.0472	8	30	10	0600450
	1.30	0.0512	8	30	10	0600467
	1.40	0.0551	9	32	10	0600474
	1.50	0.0591	9	32	10	0600481
1/16	1.59	0.0625	16	41	10	0600535
	1.60	0.0630	10	34	10	0600498
	1.70	0.0669	10	34	10	0600504
	1.80	0.0709	11	36	10	0600511
	1.90	0.0748	11	36	10	0600528
5/64	1.98	0.0781	17	43	10	0600566
	2.00	0.0787	12	38	10	0600115
	2.10	0.0827	12	38	10	0600122
	2.20	0.0866	13	40	10	0600139
	2.25	0.0886	13	40	10	0600146
	2.30	0.0906	13	40	10	0600153
3/32	2.38	0.0937	20	45	10	0600238
	2.40	0.0945	14	43	10	0600160
	2.50	0.0984	14	43	10	0600177
	2.60	0.1024	14	43	10	0600184
	2.65	0.1043	14	43	10	0600191
	2.70	0.1063	16	46	10	0600207
7/64	2.78	0.1094	22	47	10	0600245
	2.80	0.1102	16	46	10	0600214
	2.90	0.1142	16	46	10	0600221

SCREW MACHINE DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	3.00	0.1181	16	46	10	0588697
	3.10	0.1220	18	49	10	0589083
1/8	3.18	0.1250	23	49	10	0588727
	3.20	0.1260	18	49	10	0589090
	3.25	0.1280	18	49	10	0589106
	3.30	0.1299	18	49	10	0589113
	3.40	0.1339	20	52	10	0589120
	3.50	0.1378	20	52	10	0589137
9/64	3.57	0.1406	25	50	10	0589878
	3.60	0.1417	20	52	10	0589144
	3.70	0.1457	20	52	10	0589151
	3.80	0.1496	22	55	10	0589168
	3.90	0.1535	22	55	10	0589175
5/32	3.97	0.1563	26	53	10	0589410
	4.00	0.1575	22	55	10	0589205
	4.10	0.1614	22	55	10	0589212
	4.20	0.1654	22	55	10	0589229
	4.30	0.1693	24	58	10	0589236
11/64	4.37	0.1719	28	55	10	0588932
	4.40	0.1732	24	58	10	0589243
	4.50	0.1772	24	58	10	0589250
	4.60	0.1811	24	58	10	0589267
	4.70	0.1850	24	58	10	0589274
3/16	4.76	0.1875	30	57	10	0589182
	4.80	0.1890	26	62	10	0589281
	4.90	0.1929	26	62	10	0589298
	5.00	0.1969	26	62	10	0589304
	5.10	0.2008	26	62	10	0589311
13/64	5.16	0.2031	31	58	10	0589014
	5.20	0.2047	26	62	10	0589328
	5.30	0.2087	26	62	10	0589335
	5.40	0.2126	28	66	10	0589342
	5.50	0.2165	28	66	10	0589359
7/32	5.56	0.2188	33	61	10	0589649
	5.60	0.2205	28	66	10	0589366
	5.70	0.2244	28	66	10	0589373
	5.80	0.2283	28	66	10	0589380
	5.90	0.2323	28	66	10	0589397
15/64	5.95	0.2344	34	63	10	0589069
	6.00	0.2362	28	66	10	0589434
	6.10	0.2402	31	70	10	0589441
	6.20	0.2441	31	70	10	0589458
	6.30	0.2480	31	70	10	0589465
1/4	6.35	0.2500	36	65	10	0588710
	6.40	0.2520	31	70	10	0589472
	6.50	0.2559	31	70	10	0589489
	6.60	0.2598	31	70	10	0589496
	6.70	0.2638	31	70	10	0589502
	6.80	0.2677	34	74	10	0589519
	6.90	0.2717	34	74	10	0589526
	7.00	0.2756	34	74	10	0589533
	7.10	0.2795	34	74	10	0589540
9/32	7.14	0.2813	40	70	10	0589861
	7.20	0.2835	34	74	10	0589557
	7.30	0.2874	34	74	10	0589564
	7.40	0.2913	34	74	10	0589571
	7.50	0.2953	34	74	10	0589588
	7.60	0.2992	37	79	10	0589595
	7.70	0.3031	37	79	10	0589601
	7.80	0.3071	37	79	10	0589618
	7.90	0.3110	37	79	10	0589625
5/16	7.94	0.3125	43	73	10	0589403
	8.00	0.3150	37	79	10	0589656
	8.10	0.3189	37	79	10	0589663
	8.20	0.3228	37	79	10	0589670
	8.30	0.3268	37	79	10	0589687

SCREW MACHINE DRILL

d_1 $\varnothing h_8$ Inch	d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	8.40	0.3307	37	79	10	0589694
	8.50	0.3346	37	79	10	0589700
	8.60	0.3386	40	84	10	0589717
	8.70	0.3425	40	84	10	0589724
11/32	8.73	0.3438	45	78	10	0588925
	8.80	0.3465	40	84	10	0589731
	8.90	0.3504	40	84	10	0589748
	9.00	0.3543	40	84	10	0589755
	9.10	0.3583	40	84	10	0589762
	9.20	0.3622	40	84	10	0589779
	9.30	0.3661	40	84	10	0589786
	9.40	0.3701	40	84	10	0589793
	9.50	0.3740	40	84	10	0589809
3/8	9.52	0.3750	48	81	10	0589199
	9.60	0.3780	43	89	10	0589816
	9.70	0.3819	43	89	10	0589823
	9.80	0.3858	43	89	10	0589830
	9.90	0.3898	43	89	10	0589847
	10.00	0.3937	43	89	10	0588734
	10.10	0.3976	43	89	5	0588741
	10.20	0.4016	43	89	5	0588758
	10.30	0.4055	43	89	5	0588765
13/32	10.32	0.4062	51	86	5	0589007
	10.40	0.4094	43	89	5	0588772
	10.50	0.4134	43	89	5	0588789
	10.60	0.4173	43	89	5	0588796
	10.70	0.4213	47	95	5	0588802
	10.80	0.4252	47	95	5	0588819
	10.90	0.4291	47	95	5	0588826
	11.00	0.4331	47	95	5	0588833
	11.10	0.4370	47	95	5	0588840
7/16	11.11	0.4375	54	89	5	0589632
	11.20	0.4409	47	95	5	0588857
	11.30	0.4449	47	95	5	0588864
	11.50	0.4528	47	95	5	0588871
	11.60	0.4567	47	95	5	0588888
	11.70	0.4606	47	95	5	0588895
	11.80	0.4646	47	95	5	0588901
	11.90	0.4685	51	102	5	0588918
	12.00	0.4724	51	102	5	0588949
	12.10	0.4764	51	102	5	0588956
	12.20	0.4803	51	102	5	0588963
	12.50	0.4921	51	102	5	0588970
1/2	12.70	0.5000	60	98	5	0588703
	13.00	0.5118	51	102	5	0588987
	13.50	0.5315	54	107	1	0588994
	14.00	0.5512	54	107	1	0589021
9/16	14.29	0.5625	67	105	1	0589854
	14.50	0.5709	56	111	1	0589038
	15.00	0.5906	56	111	1	0589045
	15.50	0.6102	58	115	1	0589052
5/8	15.88	0.6250	73	111	1	0589427
	16.00	0.6299	58	115	1	0589076

SCREW MACHINE DRILL

Heavy Duty Screw Machine Length (NAS 907 Type C)

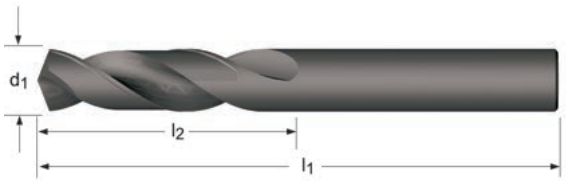
✱ *Sets Available on pg. 238*

R40C - *Fractional Sizes*

R41C - *Wire Gauge Sizes*

R42C - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance and lubricity.



R40C	R41C	R42C
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS	HSS	HSS
135°	135°	135°
1/16 - 1/2	N60 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C
	60		0.0400	1/2	1.3/8	12	—	041860 [1)]	—
	59		0.0410	1/2	1.3/8	12	—	041859 [1)]	—
	58		0.0420	1/2	1.3/8	12	—	041858 [1)]	—
	57		0.0430	1/2	1.3/8	12	—	041857 [1)]	—
	56		0.0465	1/2	1.3/8	12	—	041856 [1)]	—
	55		0.0520	5/8	1.5/8	12	—	041855 [1)]	—
	54		0.0550	5/8	1.5/8	12	—	041854 [1)]	—
	53		0.0595	5/8	1.5/8	12	—	041853 [1)]	—
1/16			0.0625	5/8	1.5/8	12	040804	—	—
	52		0.0635	11/16	1.11/16	12	—	041852	—
	51		0.0670	11/16	1.11/16	12	—	041851	—
	50		0.0700	11/16	1.11/16	12	—	041850	—
	49		0.0730	11/16	1.11/16	12	—	041849	—
	48		0.0760	11/16	1.11/16	12	—	041848	—
5/64			0.0781	11/16	1.11/16	12	040805	—	—
	47		0.0785	11/16	1.11/16	12	—	041847	—
	46		0.0810	3/4	1.3/4	12	—	041846	—
	45		0.0820	3/4	1.3/4	12	—	041845	—
	44		0.0860	3/4	1.3/4	12	—	041844	—
	43		0.0890	3/4	1.3/4	12	—	041843	—
	42		0.0935	3/4	1.3/4	12	—	041842	—
3/32			0.0938	3/4	1.3/4	12	040806	—	—
	41		0.0960	13/16	1.13/16	12	—	041841	—
	40		0.0980	13/16	1.13/16	12	—	041840	—
	39		0.0995	13/16	1.13/16	12	—	041839	—
	38		0.1015	13/16	1.13/16	12	—	041838	—
	37		0.1040	13/16	1.13/16	12	—	041837	—
	36		0.1065	13/16	1.13/16	12	—	041836	—
7/64			0.1094	13/16	1.13/16	12	040807	—	—
	35		0.1100	7/8	1.7/8	12	—	041835	—
	34		0.1110	7/8	1.7/8	12	—	041834	—

[1)] Not Split Point

SCREW MACHINE DRILL

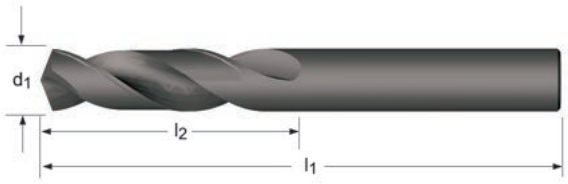
d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C
	33		0.1130	7/8	1.7/8	12	—	041833	—
	32		0.1160	7/8	1.7/8	12	—	041832	—
	31		0.1200	7/8	1.7/8	12	—	041831	—
1/8			0.1250	7/8	1.7/8	12	040808	—	—
	30		0.1285	15/16	1.15/16	12	—	041830	—
	29		0.1360	15/16	1.15/16	12	—	041829	—
	28		0.1405	15/16	1.15/16	12	—	041828	—
9/64			0.1406	15/16	1.15/16	12	040809	—	—
	27		0.1440	1“	2.1/16	12	—	041827	—
	26		0.1470	1“	2.1/16	12	—	041826	—
	25		0.1495	1“	2.1/16	12	—	041825	—
	24		0.1520	1“	2.1/16	12	—	041824	—
	23		0.1540	1“	2.1/16	12	—	041823	—
5/32			0.1563	1“	2.1/16	12	040810	—	—
	22		0.1570	1.1/16	2.1/8	12	—	041822	—
	21		0.1590	1.1/16	2.1/8	12	—	041821	—
	20		0.1610	1.1/16	2.1/8	12	—	041820	—
	19		0.1660	1.1/16	2.1/8	12	—	041819	—
	18		0.1695	1.1/16	2.1/8	12	—	041818	—
11/64			0.1719	1.1/16	2.1/8	12	040811	—	—
	17		0.1730	1.1/8	2.3/16	12	—	041817	—
	16		0.1770	1.1/8	2.3/16	12	—	041816	—
	15		0.1800	1.1/8	2.3/16	12	—	041815	—
	14		0.1820	1.1/8	2.3/16	12	—	041814	—
	13		0.1850	1.1/8	2.3/16	12	—	041813	—
3/16			0.1875	1.1/8	2.3/16	12	040812	—	—
	12		0.1890	1.3/16	2.1/4	12	—	041812	—
	11		0.1910	1.3/16	2.1/4	12	—	041811	—
	10		0.1935	1.3/16	2.1/4	12	—	041810	—
	9		0.1960	1.3/16	2.1/4	12	—	041809	—
	8		0.1990	1.3/16	2.1/4	12	—	041808	—
	7		0.2010	1.3/16	2.1/4	12	—	041807	—
13/64			0.2031	1.3/16	2.1/4	12	040813	—	—
	6		0.2040	1.1/4	2.3/8	12	—	041806	—
	5		0.2055	1.1/4	2.3/8	12	—	041805	—
	4		0.2090	1.1/4	2.3/8	12	—	041804	—
	3		0.2130	1.1/4	2.3/8	12	—	041803	—
7/32			0.2188	1.1/4	2.3/8	12	040814	—	—
	2		0.2210	1.5/16	2.7/16	12	—	041802	—
	1		0.2280	1.5/16	2.7/16	12	—	041801	—
		A	0.2340	1.5/16	2.7/16	12	—	—	042801
15/64			0.2344	1.5/16	2.7/16	12	040815	—	—
		B	0.2380	1.3/8	2.1/2	12	—	—	042802
		C	0.2420	1.3/8	2.1/2	12	—	—	042803
		D	0.2460	1.3/8	2.1/2	12	—	—	042804
		E	0.2500	1.3/8	2.1/2	12	—	—	042805
1/4			0.2500	1.3/8	2.1/2	12	040816	—	—
		F	0.2570	1.7/16	2.5/8	12	—	—	042806
		G	0.2610	1.7/16	2.5/8	12	—	—	042807
17/64			0.2656	1.7/16	2.5/8	12	040817	—	—
		H	0.2660	1.1/2	2.11/16	12	—	—	042808
		I	0.2720	1.1/2	2.11/16	12	—	—	042809
		J	0.2770	1.1/2	2.11/16	12	—	—	042810
		K	0.2810	1.1/2	2.11/16	12	—	—	042811
9/32			0.2813	1.1/2	2.11/16	12	040818	—	—
		L	0.2900	1.9/16	2.3/4	12	—	—	042812
		M	0.2950	1.9/16	2.3/4	12	—	—	042813
19/64			0.2969	1.9/16	2.3/4	12	040819	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042814
5/16			0.3125	1.5/8	2.13/16	6	040820	—	—
		O	0.3160	1.11/16	2.15/16	6	—	—	042815
		P	0.3230	1.11/16	2.15/16	6	—	—	042816
21/64			0.3281	1.11/16	2.15/16	6	040821	—	—
		Q	0.3320	1.11/16	3“	6	—	—	042817
		R	0.3390	1.11/16	3“	6	—	—	042818
11/32			0.3437	1.11/16	3“	6	040822	—	—

SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C
		S	0.3480	1.3/4	3.1/16	6	—	—	042819
		T	0.3580	1.3/4	3.1/16	6	—	—	042820
23/64			0.3594	1.3/4	3.1/16	6	040823	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042821
3/8			0.3750	1.13/16	3.1/8	6	040824	—	—
		V	0.3770	1.7/8	3.1/4	6	—	—	042822
		W	0.3860	1.7/8	3.1/4	6	—	—	042823
25/64			0.3906	1.7/8	3.1/4	6	040825	—	—
		X	0.3970	1.15/16	3.5/16	6	—	—	042824
		Y	0.4040	1.15/16	3.5/16	6	—	—	042825
13/32			0.4063	1.15/16	3.5/16	6	040826	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042826
27/64			0.4219	2“	3.3/8	6	040827	—	—
7/16			0.4375	2.1/16	3.7/16	6	040828	—	—
29/64			0.4531	2.1/8	3.9/16	6	040829	—	—
15/32			0.4687	2.1/8	3.5/8	6	040830	—	—
31/64			0.4844	2.3/16	3.11/16	6	040831	—	—
1/2			0.5000	2.1/4	3.3/4	6	040832	—	—

SCREW MACHINE DRILL

4ASM Low thrust design self centering Split Point for easier penetration.
Steam Oxide surface treatment for increased wear resistance & lubricity.



4ASM

DIN 1897

2.5XD

HSS

135°

1.00 - 12.50

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASM
1.00	0.0394	6	22	12	046100 [1]
1.25	0.0492	8	30	12	046125 [1]
1.30	0.0512	8	30	12	046130 [1]
1.65	0.0650	11	34	12	046165
2.00	0.0787	12	38	12	046200
2.30	0.0906	13	40	12	046230
2.40	0.0945	14	43	12	046240
2.50	0.0984	14	43	12	046250
3.00	0.1181	16	46	12	046300
3.10	0.1220	18	49	12	046310
3.20	0.1260	18	49	12	046320
3.30	0.1299	18	49	12	046330
3.40	0.1339	20	52	12	046340
3.50	0.1378	20	52	12	046350
3.70	0.1457	20	52	12	046370
4.00	0.1575	22	55	12	046400
4.20	0.1654	22	55	12	046420
4.50	0.1772	24	58	12	046450
5.00	0.1969	26	62	12	046500
5.50	0.2165	28	66	12	046550
5.70	0.2244	28	66	12	046570
5.80	0.2283	28	66	12	046580
6.00	0.2362	28	66	12	046600
6.20	0.2441	31	70	12	046620
6.40	0.2520	31	70	12	046640
6.50	0.2559	31	70	12	046650
6.60	0.2598	31	70	12	046660
6.80	0.2677	34	74	12	046680
6.90	0.2717	34	74	12	046690
7.00	0.2756	34	74	12	046700
7.20	0.2835	34	74	12	046720
7.50	0.2953	37	79	12	046750

[1] Not Split Point

SCREW MACHINE DRILL

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASM
8.00	0.3150	37	79	6	046800
8.10	0.3189	37	79	6	046810
8.40	0.3307	37	79	6	046840
8.50	0.3346	37	79	6	046850
8.70	0.3425	40	84	6	046870
9.00	0.3543	40	84	6	046900
9.10	0.3583	40	84	6	046910
9.20	0.3622	40	84	6	046920
9.30	0.3661	40	84	6	046930
9.50	0.3740	40	84	6	046950
9.70	0.3819	43	89	6	046970
10.00	0.3937	43	89	6	047000
10.20	0.4016	43	89	6	047002
10.50	0.4134	43	89	6	047005
10.80	0.4252	47	95	6	047008
11.00	0.4331	47	95	6	047110
11.20	0.4409	47	95	6	047112
11.50	0.4528	47	95	6	047115
11.80	0.4646	47	95	6	047118
12.00	0.4724	51	102	6	047200
12.20	0.4803	51	102	6	047220
12.50	0.4921	51	102	6	047250

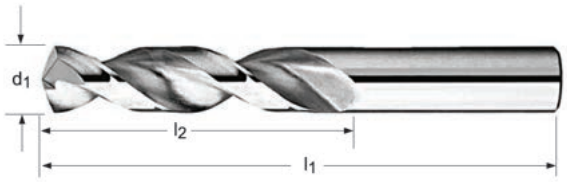
SCREW MACHINE DRILL

General Purpose Screw Machine Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for eaisier penetration.

QC41P Bright Finish improves chip flow in soft or non-ferrous materials.

QC41G TiN Coating increases wear resistance and improves tool life.



QC41P	QC41G
ANSI	ANSI
3XD	3XD
HSS	HSS
135°	135°
1/16 - 11/16	1/16 - 1/2

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC41P	QC41G
1/16	0.0625	5/8	1.5/8	12	058304	062304
5/64	0.0781	11/16	1.11/16	12	058305	062305
3/32	0.0938	3/4	1.3/4	12	058306	062306
40	0.0980	13/16	1.13/16	12	060040	061440
39	0.0995	13/16	1.13/16	12	060039	061439
38	0.1015	13/16	1.13/16	12	060038	061438
37	0.1040	13/16	1.13/16	12	060037	061437
36	0.1065	13/16	1.13/16	12	060036	061436
7/64	0.1094	13/16	1.13/16	12	058307	062307
35	0.1100	7/8	1.7/8	12	060035	061435
34	0.1110	7/8	1.7/8	12	060034	061434
33	0.1130	7/8	1.7/8	12	060033	061433
32	0.1160	7/8	1.7/8	12	060032	061432
31	0.1200	7/8	1.7/8	12	060031	061431
1/8	0.1250	7/8	1.7/8	12	058308	062308
30	0.1285	15/16	1.15/16	12	060030	061430
29	0.1360	15/16	1.15/16	12	060029	061429
28	0.1405	15/16	1.15/16	12	060028	061428
9/64	0.1406	15/16	1.15/16	12	058309	062309
27	0.1440	1“	2.1/16	12	060027	061427
26	0.1470	1“	2.1/16	12	060026	061426
25	0.1495	1“	2.1/16	12	060025	061425
24	0.1520	1“	2.1/16	12	060024	061424
23	0.1540	1“	2.1/16	12	060023	061423
5/32	0.1563	1“	2.1/16	12	058310	062310
22	0.1570	1.1/16	2.1/8	12	060022	061422
21	0.1590	1.1/16	2.1/8	12	060021	061421
20	0.1610	1.1/16	2.1/8	12	060020	061420
19	0.1660	1.1/16	2.1/8	12	060019	061419
18	0.1695	1.1/16	2.1/8	12	060018	061418
11/64	0.1719	1.1/16	2.1/8	12	058311	062311
17	0.1730	1.1/8	2.3/16	12	060017	061417
16	0.1770	1.1/8	2.3/16	12	060016	061416

SCREW MACHINE DRILL

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC41P	QC41G
15	0.1800	1.1/8	2.3/16	12	060015	061415
14	0.1820	1.1/8	2.3/16	12	060014	061414
13	0.1850	1.1/8	2.3/16	12	060013	061413
3/16	0.1875	1.1/8	2.3/16	12	058312	062312
12	0.1890	1.3/16	2.1/4	12	060012	061412
11	0.1910	1.3/16	2.1/4	12	060011	061411
10	0.1935	1.3/16	2.1/4	12	060010	061410
9	0.1960	1.3/16	2.1/4	12	060009	061409
8	0.1990	1.3/16	2.1/4	12	060008	061408
7	0.2010	1.3/16	2.1/4	12	060007	061407
13/64	0.2031	1.3/16	2.1/4	12	058313	062313
6	0.2040	1.1/4	2.3/8	12	060006	061406
5	0.2055	1.1/4	2.3/8	12	060005	061405
4	0.2090	1.1/4	2.3/8	12	060004	061404
3	0.2130	1.1/4	2.3/8	12	060003	061403
7/32	0.2188	1.1/4	2.3/8	12	058314	062314
2	0.2210	1.5/16	2.7/16	12	060002	061402
1	0.2280	1.5/16	2.7/16	12	060001	061401
15/64	0.2344	1.5/16	2.7/16	12	058315	062315
1/4	0.2500	1.3/8	2.1/2	12	058316	062316
17/64	0.2656	1.7/16	2.5/8	12	058317	062317
9/32	0.2812	1.1/2	2.11/16	12	058318	062318
19/64	0.2969	1.9/16	2.3/4	12	058319	062319
5/16	0.3125	1.5/8	2.13/16	6	058320	062320
21/64	0.3281	1.11/16	2.15/16	6	058321	062321
11/32	0.3437	1.11/16	3“	6	058322	062322
23/64	0.3594	1.3/4	3.1/16	6	058323	062323
3/8	0.3750	1.13/16	3.1/8	6	058324	062324
25/64	0.3906	1.7/8	3.1/4	6	058325	062325
13/32	0.4063	1.15/16	3.5/16	6	058326	062326
27/64	0.4219	2“	3.3/8	6	058327	062327
7/16	0.4375	2.1/16	3.7/16	6	058328	062328
29/64	0.4531	2.1/8	3.9/16	6	058329	062329
15/32	0.4687	2.1/8	3.5/8	6	058330	062330
31/64	0.4844	2.3/16	3.3/4	6	058331	062331
1/2	0.5000	2.1/4	3.3/4	6	058332	062332
33/64	0.5156	2.3/8	3.7/8	1	058333	—
17/32	0.5313	2.3/8	3.7/8	1	058334	—
35/64	0.5469	2.1/2	4“	1	058335	—
9/16	0.5625	2.1/2	4“	1	058336	—
37/64	0.5781	2.5/8	4.1/8	1	058337	—
19/32	0.5937	2.5/8	4.1/8	1	058338	—
5/8	0.6250	2.3/4	4.1/4	1	058340	—
11/16	0.6875	2.7/8	4.5/8	1	058344	—

MICRO - Screw Machine Length Drills

A720

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Smallest size range available. Bright finish improves chip flow in soft or non-ferrous materials. Good wear resistance in abrasive or hard materials.

A720

DIN 1899

2.5XD

HSS-E

118°

0.15 - 1.40

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	d_2 Ø mm	Pack Qty	A720
0.15	0.0059	1.0	25	1	10	0044988
0.16	0.0063	1.4	25	1	10	0566961
0.17	0.0067	1.4	25	1	10	0612057
0.18	0.0070	1.4	25	1	10	0044995
0.20	0.0078	1.8	25	1	10	0045008
0.22	0.0087	1.8	25	1	10	0045015
0.25	0.0098	2.2	25	1	10	0045022
0.27	0.0106	2.2	25	1	10	0566978
0.28	0.0110	2.2	25	1	10	0045039
0.30	0.0118	2.2	25	1	10	0045046
0.35	0.0138	2.8	25	1	10	0045053
0.38	0.0150	2.8	25	1	10	0045060
0.39	0.0154	3.6	25	1	10	0045077
0.40	0.0157	3.6	25	1	10	0045084
0.45	0.0177	3.6	25	1	10	0045107
0.50	0.0197	4.0	25	1	10	0045114
0.55	0.0217	4.5	25	1	10	0612064
0.60	0.0236	4.5	25	1	10	0045121
0.62	0.0244	5.0	25	1	10	0612071
0.65	0.0256	5.0	25	1	10	0612088
0.70	0.0276	5.6	25	1	10	0615577
0.75	0.0295	5.6	25	1	10	0612101
0.80	0.0315	6.3	25	1.5	10	0615584
0.85	0.0335	6.3	25	1.5	10	0612125
0.90	0.0354	7.1	25	1.5	10	0615591
0.95	0.0374	7.1	25	1.5	10	0612149
1.00	0.0394	8.0	25	1.5	10	0615607
1.05	0.0413	8.0	25	1.5	10	0612163
1.10	0.0433	9.0	25	1.5	10	0615614
1.20	0.0472	10.0	25	1.5	10	0615621
1.30	0.0512	10.0	25	1.5	10	0615638
1.40	0.0551	11.2	25	1.5	10	0615645

COBALT SCREW MACHINE DRILL

Heavy Duty Screw Machine Length

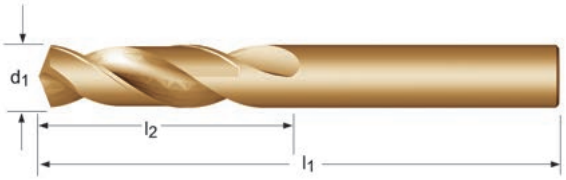
* *Sets Available on pg. 239*

M40CO - *Fractional Sizes*

M41CO - *Wire Gauge Sizes*

M42CO - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity.



M40CO	M41CO	M42CO
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
1/16 - 3/4	N60 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
	60		0.0400	1/2	1.3/8	12	—	041360 [1]	—
	59		0.0410	1/2	1.3/8	12	—	041359 [1]	—
	58		0.0420	1/2	1.3/8	12	—	041358 [1]	—
	57		0.0430	1/2	1.3/8	12	—	041357 [1]	—
	56		0.0465	1/2	1.3/8	12	—	041356 [1]	—
	55		0.0520	5/8	1.5/8	12	—	041355 [1]	—
	54		0.0550	5/8	1.5/8	12	—	041354 [1]	—
	53		0.0595	5/8	1.5/8	12	—	041353 [1]	—
1/16			0.0625	5/8	1.5/8	12	040304	—	—
	52		0.0635	11/16	1.11/16	12	—	041352	—
	51		0.0670	11/16	1.11/16	12	—	041351	—
	50		0.0700	11/16	1.11/16	12	—	041350	—
	49		0.0730	11/16	1.11/16	12	—	041349	—
	48		0.0760	11/16	1.11/16	12	—	041348	—
5/64			0.0781	11/16	1.11/16	12	040305	—	—
	47		0.0785	11/16	1.11/16	12	—	041347	—
	46		0.0810	3/4	1.3/4	12	—	041346	—
	45		0.0820	3/4	1.3/4	12	—	041345	—
	44		0.0860	3/4	1.3/4	12	—	041344	—
	43		0.0890	3/4	1.3/4	12	—	041343	—
	42		0.0935	3/4	1.3/4	12	—	041342	—
3/32			0.0938	3/4	1.3/4	12	040306	—	—
	41		0.0960	13/16	1.13/16	12	—	041341	—
	40		0.0980	13/16	1.13/16	12	—	041340	—
	39		0.0995	13/16	1.13/16	12	—	041339	—
	38		0.1015	13/16	1.13/16	12	—	041338	—
	37		0.1040	13/16	1.13/16	12	—	041337	—
	36		0.1065	13/16	1.13/16	12	—	041336	—
7/64			0.1094	13/16	1.13/16	12	040307	—	—
	35		0.1100	7/8	1.7/8	12	—	041335	—
	34		0.1110	7/8	1.7/8	12	—	041334	—
	33		0.1130	7/8	1.7/8	12	—	041333	—

[1] Not Split Point

COBALT SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
	32		0.1160	7/8	1.7/8	12	—	041332	—
	31		0.1200	7/8	1.7/8	12	—	041331	—
1/8			0.1250	7/8	1.7/8	12	040308	—	—
	30		0.1285	15/16	1.15/16	12	—	041330	—
	29		0.1360	15/16	1.15/16	12	—	041329	—
	28		0.1405	15/16	1.15/16	12	—	041328	—
9/64			0.1406	15/16	1.15/16	12	040309	—	—
	27		0.1440	1“	2.1/16	12	—	041327	—
	26		0.1470	1“	2.1/16	12	—	041326	—
	25		0.1495	1“	2.1/16	12	—	041325	—
	24		0.1520	1“	2.1/16	12	—	041324	—
	23		0.1540	1“	2.1/16	12	—	041323	—
5/32			0.1563	1“	2.1/16	12	040310	—	—
	22		0.1570	1.1/16	2.1/8	12	—	041322	—
	21		0.1590	1.1/16	2.1/8	12	—	041321	—
	20		0.1610	1.1/16	2.1/8	12	—	041320	—
	19		0.1660	1.1/16	2.1/8	12	—	041319	—
	18		0.1695	1.1/16	2.1/8	12	—	041318	—
11/64			0.1719	1.1/16	2.1/8	12	040311	—	—
	17		0.1730	1.1/8	2.3/16	12	—	041317	—
	16		0.1770	1.1/8	2.3/16	12	—	041316	—
	15		0.1800	1.1/8	2.3/16	12	—	041315	—
	14		0.1820	1.1/8	2.3/16	12	—	041314	—
	13		0.1850	1.1/8	2.3/16	12	—	041313	—
3/16			0.1875	1.1/8	2.3/16	12	040312	—	—
	12		0.1890	1.3/16	2.1/4	12	—	041312	—
	11		0.1910	1.3/16	2.1/4	12	—	041311	—
	10		0.1935	1.3/16	2.1/4	12	—	041310	—
	9		0.1960	1.3/16	2.1/4	12	—	041309	—
	8		0.1990	1.3/16	2.1/4	12	—	041308	—
	7		0.2010	1.3/16	2.1/4	12	—	041307	—
13/64			0.2031	1.3/16	2.1/4	12	040313	—	—
	6		0.2040	1.1/4	2.3/8	12	—	041306	—
	5		0.2055	1.1/4	2.3/8	12	—	041305	—
	4		0.2090	1.1/4	2.3/8	12	—	041304	—
	3		0.2130	1.1/4	2.3/8	12	—	041303	—
7/32			0.2188	1.1/4	2.3/8	12	040314	—	—
	2		0.2210	1.5/16	2.7/16	12	—	041302	—
	1		0.2280	1.5/16	2.7/16	12	—	041301	—
		A	0.2340	1.5/16	2.7/16	12	—	—	042301
15/64			0.2344	1.5/16	2.7/16	12	040315	—	—
		B	0.2380	1.3/8	2.1/2	12	—	—	042302
		C	0.2420	1.3/8	2.1/2	12	—	—	042303
		D	0.2460	1.3/8	2.1/2	12	—	—	042304
		E	0.2500	1.3/8	2.1/2	12	—	—	042305
1/4			0.2500	1.3/8	2.1/2	12	040316	—	—
		F	0.2570	1.7/16	2.5/8	12	—	—	042306
		G	0.2610	1.7/16	2.5/8	12	—	—	042307
17/64			0.2656	1.7/16	2.5/8	12	040317	—	—
		H	0.2660	1.1/2	2.11/16	12	—	—	042308
		I	0.2720	1.1/2	2.11/16	12	—	—	042309
		J	0.2770	1.1/2	2.11/16	12	—	—	042310
		K	0.2810	1.1/2	2.11/16	12	—	—	042311
9/32			0.2813	1.1/2	2.11/16	12	040318	—	—
		L	0.2900	1.9/16	2.3/4	12	—	—	042312
		M	0.2950	1.9/16	2.3/4	12	—	—	042313
19/64			0.2969	1.9/16	2.3/4	12	040319	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042314
5/16			0.3125	1.5/8	2.13/16	6	040320	—	—
		O	0.3160	1.11/16	2.15/16	6	—	—	042315
		P	0.3230	1.11/16	2.15/16	6	—	—	042316
21/64			0.3281	1.11/16	2.15/16	6	040321	—	—
		Q	0.3320	1.11/16	3“	6	—	—	042317
		R	0.3390	1.11/16	3“	6	—	—	042318
11/32			0.3437	1.11/16	3“	6	040322	—	—
		S	0.3480	1.3/4	3.1/16	6	—	—	042319

COBALT SCREW MACHINE DRILL

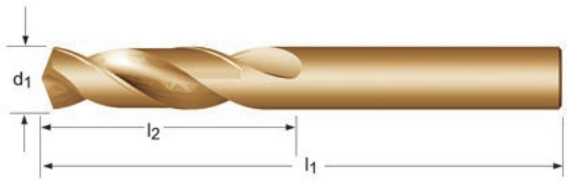
d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
		T	0.3580	1.3/4	3.1/16	6	—	—	042320
23/64			0.3594	1.3/4	3.1/16	6	040323	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042321
3/8			0.3750	1.13/16	3.1/8	6	040324	—	—
		V	0.3770	1.7/8	3.1/4	6	—	—	042322
		W	0.3860	1.7/8	3.1/4	6	—	—	042323
25/64			0.3906	1.7/8	3.1/4	6	040325	—	—
		X	0.3970	1.15/16	3.5/16	6	—	—	042324
		Y	0.4040	1.15/16	3.5/16	6	—	—	042325
13/32			0.4063	1.15/16	3.5/16	6	040326	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042326
27/64			0.4219	2“	3.3/8	6	040327	—	—
7/16			0.4375	2.1/16	3.7/16	6	040328	—	—
29/64			0.4531	2.1/8	3.9/16	6	040329	—	—
15/32			0.4687	2.1/8	3.5/8	6	040330	—	—
31/64			0.4844	2.3/16	3.11/16	6	040331	—	—
1/2			0.5000	2.1/4	3.3/4	6	040332	—	—
33/64			0.5156	2.3/8	3.7/8	1	046033	—	—
17/32			0.5313	2.3/8	3.7/8	1	046034	—	—
35/64			0.5469	2.1/2	4“	1	046035	—	—
9/16			0.5625	2.1/2	4“	1	046036	—	—
37/64			0.5781	2.5/8	4.1/8	1	046037	—	—
19/32			0.5937	2.5/8	4.1/8	1	046038	—	—
39/64			0.6094	2.3/4	4.1/4	1	046039	—	—
5/8			0.6250	2.3/4	4.1/4	1	046040	—	—
41/64			0.6406	2.7/8	4.1/2	1	046041	—	—
21/32			0.6563	2.7/8	4.1/2	1	046042	—	—
43/64			0.6719	2.7/8	4.5/8	1	046043	—	—
11/16			0.6875	2.7/8	4.5/8	1	046044	—	—
45/64			0.7031	3“	4.3/4	1	046045	—	—
23/32			0.7188	3“	4.3/4	1	046046	—	—
47/64			0.7344	3.1/8	5“	1	046047	—	—
3/4			0.7500	3.1/8	5“	1	046048	—	—

COBALT SCREW MACHINE DRILL

Heavy Duty Screw Machine Length, Metric

4ASMCO

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity.



4ASMCO

DIN 1897

2.5XD

HSS-E

135°

2.30 - 12.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASMCO
2.30	0.0906	13	40	12	032230
2.50	0.0984	14	43	12	032250
3.00	0.1181	16	46	12	032300
3.10	0.1220	18	49	12	032310
3.20	0.1260	18	49	12	032320
3.30	0.1299	18	49	12	032330
3.40	0.1339	20	52	12	032340
3.50	0.1378	20	52	12	032350
3.60	0.1417	20	52	12	032360
3.70	0.1457	20	52	12	032370
4.00	0.1575	22	55	12	032400
4.10	0.1614	22	55	12	032410
4.20	0.1654	22	55	12	032420
4.70	0.1850	24	58	12	032470
4.80	0.1890	26	62	12	032480
4.90	0.1929	26	62	12	032490
5.00	0.1969	26	62	12	032500
5.10	0.2008	26	62	12	032510
5.50	0.2165	28	66	12	032550
5.70	0.2244	28	66	12	032570
6.00	0.2362	28	66	12	032600
6.40	0.2520	31	70	12	032640
6.50	0.2559	31	70	12	032650
6.80	0.2677	34	74	12	032680
7.00	0.2756	34	74	12	032700
8.00	0.3150	37	79	6	032800
8.50	0.3346	37	79	6	032850
9.50	0.3740	40	84	6	032950
9.80	0.3858	43	89	6	032980
10.00	0.3937	43	89	6	033000
10.20	0.4016	43	89	6	033002
10.50	0.4134	43	89	6	033005
11.00	0.4331	47	95	6	033110
11.20	0.4409	47	95	6	033112
11.50	0.4528	47	95	6	033115
12.00	0.4724	51	102	6	033200

TAPER LENGTH DRILL

General Purpose Taper Length

* *Sets Available on pg. 240*

R51 - *Fractional Sizes*

R52 - *Wire Gauge Sizes*

R55 - *Letter Sizes*

Bright finish improves chip flow in soft or non-ferrous materials.
Longer flute and Overall length for depth and reach.

* *Sizes 45/64 and larger are steam oxide*

R51	R52	R55
ANSI	ANSI	ANSI
6XD	6XD	6XD
HSS	HSS	HSS
118°	118°	118°
1/64 - 1.3/4	N80 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
	80		0.0135	5/16	1.1/2	12	—	052080	—
	79		0.0145	5/16	1.1/2	12	—	052079	—
1/64			0.0156	5/16	1.1/2	12	051001	—	—
	78		0.0160	5/16	1.1/2	12	—	052078	—
	77		0.0180	5/16	1.1/2	12	—	052077	—
	76		0.0200	5/16	1.1/2	12	—	052076	—
	75		0.0210	5/16	1.1/2	12	—	052075	—
	74		0.0225	5/16	1.1/2	12	—	052074	—
	73		0.0240	5/16	1.1/2	12	—	052073	—
	72		0.0250	5/16	1.1/2	12	—	052072	—
	71		0.0260	3/4	2“	12	—	052071	—
	70		0.0280	3/4	2“	12	—	052070	—
	69		0.0292	3/4	2“	12	—	052069	—
	68		0.0310	3/4	2“	12	—	052068	—
1/32			0.0313	3/4	2“	12	051002	—	—
	67		0.0320	3/4	2“	12	—	052067	—
	66		0.0330	3/4	2“	12	—	052066	—
	65		0.0350	3/4	2“	12	—	052065	—
	64		0.0360	3/4	2“	12	—	052064	—
	63		0.0370	3/4	2“	12	—	052063	—
	62		0.0380	3/4	2“	12	—	052062	—
	61		0.0390	1.1/8	2.1/4	12	—	052061	—
	60		0.0400	1.1/8	2.1/4	12	—	052060	—
	59		0.0410	1.1/8	2.1/4	12	—	052059	—
	58		0.0420	1.1/8	2.1/4	12	—	052058	—
	57		0.0430	1.1/8	2.1/4	12	—	052057	—
	56		0.0465	1.1/8	2.1/4	12	—	052056	—
3/64			0.0469	1.1/8	2.1/4	12	051003	—	—
	55		0.0520	1.3/4	3“	12	—	052055	—
	54		0.0550	1.3/4	3“	12	—	052054	—
	53		0.0595	1.3/4	3“	12	—	052053	—
1/16			0.0625	1.3/4	3“	12	051004	—	—

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
	52		0.0635	2“	3.3/4	12	—	052052	—
	51		0.0670	2“	3.3/4	12	—	052051	—
	50		0.0700	2“	3.3/4	12	—	052050	—
	49		0.0730	2“	3.3/4	12	—	052049	—
	48		0.0760	2“	3.3/4	12	—	052048	—
5/64			0.0781	2“	3.3/4	12	051005	—	—
	47		0.0785	2.1/4	4.1/4	12	—	052047	—
	46		0.0810	2.1/4	4.1/4	12	—	052046	—
	45		0.0820	2.1/4	4.1/4	12	—	052045	—
	44		0.0860	2.1/4	4.1/4	12	—	052044	—
	43		0.0890	2.1/4	4.1/4	12	—	052043	—
	42		0.0935	2.1/4	4.1/4	12	—	052042	—
3/32			0.0938	2.1/4	4.1/4	12	051006	—	—
	41		0.0960	2.1/2	4.5/8	12	—	052041	—
	40		0.0980	2.1/2	4.5/8	12	—	052040	—
	39		0.0995	2.1/2	4.5/8	12	—	052039	—
	38		0.1015	2.1/2	4.5/8	12	—	052038	—
	37		0.1040	2.1/2	4.5/8	12	—	052037	—
	36		0.1065	2.1/2	4.5/8	12	—	052036	—
7/64			0.1094	2.1/2	4.5/8	12	051007	—	—
	35		0.1100	2.3/4	5.1/8	12	—	052035	—
	34		0.1110	2.3/4	5.1/8	12	—	052034	—
	33		0.1130	2.3/4	5.1/8	12	—	052033	—
	32		0.1160	2.3/4	5.1/8	12	—	052032	—
	31		0.1200	2.3/4	5.1/8	12	—	052031	—
1/8			0.1250	2.3/4	5.1/8	12	051008	—	—
	30		0.1285	3“	5.3/8	12	—	052030	—
	29		0.1360	3“	5.3/8	12	—	052029	—
	28		0.1405	3“	5.3/8	12	—	052028	—
9/64			0.1406	3“	5.3/8	12	051009	—	—
	27		0.1440	3“	5.3/8	12	—	052027	—
	26		0.1470	3“	5.3/8	12	—	052026	—
	25		0.1495	3“	5.3/8	12	—	052025	—
	24		0.1520	3“	5.3/8	12	—	052024	—
	23		0.1540	3“	5.3/8	12	—	052023	—
5/32			0.1563	3“	5.3/8	12	051010	—	—
	22		0.1570	3.3/8	5.3/4	12	—	052022	—
	21		0.1590	3.3/8	5.3/4	12	—	052021	—
	20		0.1610	3.3/8	5.3/4	12	—	052020	—
	19		0.1660	3.3/8	5.3/4	12	—	052019	—
	18		0.1695	3.3/8	5.3/4	12	—	052018	—
11/64			0.1719	3.3/8	5.3/4	12	051011	—	—
	17		0.1730	3.3/8	5.3/4	12	—	052017	—
	16		0.1770	3.3/8	5.3/4	12	—	052016	—
	15		0.1800	3.3/8	5.3/4	12	—	052015	—
	14		0.1820	3.3/8	5.3/4	12	—	052014	—
	13		0.1850	3.3/8	5.3/4	12	—	052013	—
3/16			0.1875	3.3/8	5.3/4	12	051012	—	—
	12		0.1890	3.5/8	6“	12	—	052012	—
	11		0.1910	3.5/8	6“	12	—	052011	—
	10		0.1935	3.5/8	6“	12	—	052010	—
	9		0.1960	3.5/8	6“	12	—	052009	—
	8		0.1990	3.5/8	6“	12	—	052008	—
	7		0.2010	3.5/8	6“	12	—	052007	—
13/64			0.2031	3.5/8	6“	12	051013	—	—
	6		0.2040	3.5/8	6“	12	—	052006	—
	5		0.2055	3.5/8	6“	12	—	052005	—
	4		0.2090	3.5/8	6“	12	—	052004	—
	3		0.2130	3.5/8	6“	12	—	052003	—
7/32			0.2188	3.5/8	6“	12	051014	—	—
	2		0.2210	3.3/4	6.1/8	12	—	052002	—
	1		0.2280	3.3/4	6.1/8	12	—	052001	—
		A	0.2340	3.3/4	6.1/8	12	—	—	055001
15/64			0.2344	3.3/4	6.1/8	12	051015	—	—
		B	0.2380	3.3/4	6.1/8	12	—	—	055002
		C	0.2420	3.3/4	6.1/8	12	—	—	055003

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
		D	0.2460	3.3/4	6.1/8	12	—	—	055004
		E	0.2500	3.3/4	6.1/8	12	—	—	055005
1/4			0.2500	3.3/4	6.1/8	12	051016	—	—
		F	0.2570	3.7/8	6.1/4	12	—	—	055006
		G	0.2610	3.7/8	6.1/4	6	—	—	055007
17/64			0.2656	3.7/8	6.1/4	6	051017	—	—
		H	0.2660	3.7/8	6.1/4	6	—	—	055008
		I	0.2720	3.7/8	6.1/4	6	—	—	055009
		J	0.2770	3.7/8	6.1/4	6	—	—	055010
		K	0.2810	3.7/8	6.1/4	6	—	—	055011
9/32			0.2813	3.7/8	6.1/4	6	051018	—	—
		L	0.2900	4“	6.3/8	6	—	—	055012
		M	0.2950	4“	6.3/8	6	—	—	055013
19/64			0.2969	4“	6.3/8	6	051019	—	—
		N	0.3020	4“	6.3/8	6	—	—	055014
5/16			0.3125	4“	6.3/8	6	051020	—	—
		O	0.3161	4.1/8	6.1/2	6	—	—	055015
		P	0.3230	4.1/8	6.1/2	6	—	—	055016
21/64			0.3281	4.1/8	6.1/2	6	051021	—	—
		Q	0.3320	4.1/8	6.1/2	6	—	—	055017
		R	0.3390	4.1/8	6.1/2	6	—	—	055018
11/32			0.3437	4.1/8	6.1/2	6	051022	—	—
		S	0.3480	4.1/4	6.3/4	6	—	—	055019
		T	0.3580	4.1/4	6.3/4	6	—	—	055020
23/64			0.3594	4.1/4	6.3/4	6	051023	—	—
		U	0.3680	4.1/4	6.3/4	6	—	—	055021
3/8			0.3750	4.1/4	6.3/4	6	051024	—	—
		V	0.3770	4.3/8	7“	6	—	—	055022
		W	0.3860	4.3/8	7“	6	—	—	055023
25/64			0.3906	4.3/8	7“	6	051025	—	—
		X	0.3970	4.3/8	7“	6	—	—	055024
		Y	0.4040	4.3/8	7“	6	—	—	055025
13/32			0.4063	4.3/8	7“	6	051026	—	—
		Z	0.4130	4.5/8	7.1/4	6	—	—	055026
27/64			0.4219	4.5/8	7.1/4	6	051027	—	—
7/16			0.4375	4.5/8	7.1/4	6	051028	—	—
29/64			0.4531	4.3/4	7.1/2	6	051029	—	—
15/32			0.4687	4.3/4	7.1/2	6	051030	—	—
31/64			0.4844	4.3/4	7.3/4	6	051031	—	—
1/2			0.5000	4.3/4	7.3/4	6	051032	—	—
33/64			0.5156	4.3/4	8“	1	051033	—	—
17/32			0.5313	4.3/4	8“	1	051034	—	—
35/64			0.5469	4.7/8	8.1/4	1	051035	—	—
9/16			0.5625	4.7/8	8.1/4	1	051036	—	—
37/64			0.5781	4.7/8	8.3/4	1	051037	—	—
19/32			0.5937	4.7/8	8.3/4	1	051038	—	—
39/64			0.6094	4.7/8	8.3/4	1	051039	—	—
5/8			0.6250	4.7/8	8.3/4	1	051040	—	—
41/64			0.6406	5.1/8	9“	1	051041	—	—
21/32			0.6563	5.1/8	9“	1	051042	—	—
43/64			0.6719	5.3/8	9.1/4	1	051043	—	—
11/16			0.6875	5.3/8	9.1/4	1	051044	—	—
45/64			0.7031	5.5/8	9.1/2	1	051045 [1)]	—	—
23/32			0.7188	5.5/8	9.1/2	1	051046 [1)]	—	—
47/64			0.7344	5.7/8	9.3/4	1	051047 [1)]	—	—
3/4			0.7500	5.7/8	9.3/4	1	051048 [1)]	—	—
49/64			0.7656	6“	9.7/8	1	051049 [1)]	—	—
25/32			0.7813	6“	9.7/8	1	051050 [1)]	—	—
51/64			0.7969	6.1/8	10“	1	051051 [1)]	—	—
13/16			0.8125	6.1/8	10“	1	051052 [1)]	—	—
53/64			0.8281	6.1/8	10“	1	051053 [1)]	—	—
27/32			0.8438	6.1/8	10“	1	051054 [1)]	—	—
55/64			0.8594	6.1/8	10“	1	051055 [1)]	—	—
7/8			0.8750	6.1/8	10“	1	051056 [1)]	—	—
57/64			0.8906	6.1/8	10“	1	051057 [1)]	—	—

[1)] *steam oxide*

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
29/32			0.9063	6.1/8	10“	1	051058 [1)]	—	—
59/64			0.9219	6.1/8	10.3/4	1	051059 [1)]	—	—
15/16			0.9375	6.1/8	10.3/4	1	051060 [1)]	—	—
61/64			0.9531	6.3/8	11“	1	051061 [1)]	—	—
31/32			0.9688	6.3/8	11“	1	051062 [1)]	—	—
63/64			0.9844	6.3/8	11“	1	051063 [1)]	—	—
1“			1.0000	6.3/8	11“	1	051100 [1)]	—	—
1.1/64			1.0156	6.1/2	11.1/8	1	051101 [1)]	—	—
1.1/32			1.0312	6.1/2	11.1/8	1	051102 [1)]	—	—
1.3/64			1.0469	6.5/8	11.1/4	1	051103 [1)]	—	—
1.1/16			1.0625	6.5/8	11.1/4	1	051104 [1)]	—	—
1.5/64			1.0781	6.7/8	11.1/2	1	051105 [1)]	—	—
1.3/32			1.0937	6.7/8	11.1/2	1	051106 [1)]	—	—
1.7/64			1.1094	7.1/8	11.3/4	1	051107 [1)]	—	—
1.1/8			1.1250	7.1/8	11.3/4	1	051108 [1)]	—	—
1.9/64			1.1406	7.1/4	11.7/8	1	051109 [1)]	—	—
1.5/32			1.1563	7.1/4	11.7/8	1	051110 [1)]	—	—
1.11/64			1.1719	7.3/8	12“	1	051111 [1)]	—	—
1.3/16			1.1875	7.3/8	12“	1	051112 [1)]	—	—
1.13/64			1.2031	7.1/2	12.1/8	1	051113 [1)]	—	—
1.7/32			1.2187	7.1/2	12.1/8	1	051114 [1)]	—	—
1.15/64			1.2344	7.7/8	12.1/2	1	051115 [1)]	—	—
1.1/4			1.2500	7.7/8	12.1/2	1	051116 [1)]	—	—
1.5/16			1.3125	8.5/8	14.1/4	1	051120 [1)]	—	—
1.3/8			1.3750	8.7/8	14.1/2	1	051124 [1)]	—	—
1.7/16			1.4375	9.1/8	14.3/4	1	051128 [1)]	—	—
1.1/2			1.5000	9.3/8	15“	1	051132 [1)]	—	—
1.9/16			1.5625	9.5/8	15.1/4	1	051136 [1)]	—	—
1.5/8			1.6250	9.7/8	15.5/8	1	051140 [1)]	—	—
1.3/4			1.7500	10.1/2	16.1/4	1	051148 [1)]	—	—

[1)] *steam oxide*

TAPER LENGTH DRILL

General Purpose Taper Length, Metric

5ATL Bright Finish improves chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.

∗ *18mm and larger are steam oxide*

5ATL

DIN 340

6XD

HSS

118°

1.00 - 31.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	5ATL
1.00	0.0394	33	56	12	056100
1.20	0.0472	41	65	12	056120
1.25	0.0492	41	65	12	056125
1.30	0.0512	41	65	12	056130
1.40	0.0551	45	70	12	056140
1.50	0.0591	45	70	12	056150
1.60	0.0630	50	76	12	056160
1.70	0.0669	50	76	12	056170
1.80	0.0709	53	80	12	056180
1.90	0.0748	53	80	12	056190
2.00	0.0787	56	85	12	056200
2.10	0.0827	56	85	12	056210
2.15	0.0846	59	90	12	056215
2.20	0.0866	59	90	12	056220
2.30	0.0906	59	90	12	056230
2.40	0.0945	62	95	12	056240
2.50	0.0984	62	95	12	056250
3.00	0.1181	66	100	12	056300
3.10	0.1220	69	106	12	056310
3.20	0.1260	69	106	12	056320
3.30	0.1299	69	106	12	056330
3.40	0.1339	73	112	12	056340
3.50	0.1378	73	112	12	056350
3.60	0.1417	73	112	12	056360
3.70	0.1457	73	112	12	056370
3.80	0.1496	78	119	12	056380
4.00	0.1575	78	119	12	056400
4.20	0.1654	78	119	12	056420
4.30	0.1693	82	126	12	056430
4.50	0.1772	82	126	12	056450
4.60	0.1811	82	126	12	056460
4.80	0.1890	87	132	12	056480

TAPER LENGTH DRILL

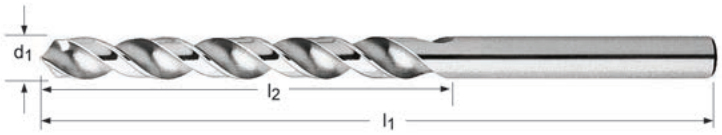
d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	5ATL
5.00	0.1969	87	132	12	056500
5.50	0.2165	91	139	12	056550
5.60	0.2205	91	139	12	056560
5.70	0.2244	91	139	12	056570
6.00	0.2362	91	139	12	056600
6.40	0.2520	97	148	6	056640
6.50	0.2559	97	148	6	056650
6.80	0.2677	102	156	6	056680
7.00	0.2756	102	156	6	056770
7.20	0.2835	102	156	6	056720
7.50	0.2953	102	156	6	056750
7.80	0.3071	109	165	6	056780
8.00	0.3150	109	165	6	056800
8.20	0.3228	109	165	6	056820
8.50	0.3346	109	165	6	056850
9.00	0.3543	115	175	6	056900
9.20	0.3622	115	175	6	056920
9.50	0.3740	115	175	6	056950
9.80	0.3858	121	184	6	056980
10.00	0.3937	121	184	6	057100
10.20	0.4016	121	184	6	057102
10.50	0.4134	121	184	6	057105
11.00	0.4331	128	195	6	057110
11.20	0.4409	128	195	6	057112
11.50	0.4528	128	195	6	057115
12.00	0.4724	134	205	6	057120
12.50	0.4921	134	205	6	057125
13.00	0.5118	134	205	1	057130
13.50	0.5315	140	214	1	057135
13.80	0.5433	140	214	1	057138
14.00	0.5512	140	214	1	057140
14.50	0.5709	144	220	1	057145
15.00	0.5906	144	220	1	057150
15.50	0.6102	149	227	1	057155
16.00	0.6299	149	227	1	057160
16.50	0.6496	154	235	1	057165
17.00	0.6693	154	235	1	057170
17.50	0.6890	158	241	1	057175
18.00	0.7087	158	241	1	057180 [1]
18.50	0.7283	162	247	1	057185 [1]
19.00	0.7480	162	247	1	057190 [1]
19.50	0.7677	166	254	1	057195 [1]
20.00	0.7874	166	254	1	057200 [1]
20.50	0.8071	171	261	1	057205 [1]
21.00	0.8268	171	261	1	057210 [1]
21.50	0.8465	176	268	1	057215 [1]
22.00	0.8661	176	268	1	057220 [1]
22.50	0.8858	180	275	1	057225 [1]
23.00	0.9055	180	275	1	057230 [1]
23.50	0.9252	180	275	1	057235 [1]
24.00	0.9449	185	282	1	057240 [1]
24.50	0.9646	185	282	1	057245 [1]
25.00	0.9843	185	282	1	057250 [1]
25.50	1.0039	190	290	1	057255 [1]
26.00	1.0236	190	290	1	057260 [1]
26.50	1.0433	190	290	1	057265 [1]
27.00	1.0630	195	298	1	057270 [1]
28.00	1.1024	195	298	1	057280 [1]
28.50	1.1220	201	307	1	057285 [1]
29.00	1.1417	201	307	1	057290 [1]
29.50	1.1614	201	307	1	057295 [1]
30.00	1.1811	201	307	1	057300 [1]
30.50	1.2008	207	316	1	057305 [1]
31.00	1.2205	207	316	1	057310 [1]

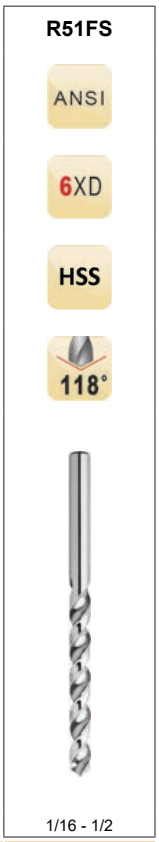
[1] *steam oxide*

TAPER LENGTH DRILL

High Helix Taper Length

R51FS High Helix and Bright Finish for better chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.





d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51FS
1/16	0.0625	1.3/4	3“	12	051504
5/64	0.0781	2“	3.3/4	12	051505
3/32	0.0938	2.1/4	4.1/4	12	051506
7/64	0.1094	2.1/2	4.5/8	12	051507
1/8	0.1250	2.3/4	5.1/8	12	051508
9/64	0.1406	3“	5.3/8	12	051509
5/32	0.1563	3“	5.3/8	12	051510
11/64	0.1719	3.3/8	5.3/4	12	051511
3/16	0.1875	3.3/8	5.3/4	12	051512
13/64	0.2031	3.5/8	6“	12	051513
7/32	0.2188	3.5/8	6“	12	051514
15/64	0.2344	3.3/4	6.1/8	12	051515
1/4	0.2500	3.3/4	6.1/8	12	051516
17/64	0.2656	3.7/8	6.1/4	6	051517
9/32	0.2813	3.7/8	6.1/4	6	051518
19/64	0.2969	4“	6.3/8	6	051519
5/16	0.3125	4“	6.3/8	6	051520
21/64	0.3281	4.1/8	6.1/2	6	051521
11/32	0.3437	4.1/8	6.1/2	6	051522
23/64	0.3594	4.1/4	6.3/4	6	051523
3/8	0.3750	4.1/4	6.3/4	6	051524
25/64	0.3906	4.3/8	7“	6	051525
13/32	0.4063	4.3/8	7“	6	051526
27/64	0.4219	4.5/8	7.1/4	6	051527
7/16	0.4375	4.5/8	7.1/4	6	051528
29/64	0.4531	4.3/4	7.1/2	6	051529
15/32	0.4687	4.3/4	7.1/2	6	051530
31/64	0.4844	4.3/4	7.3/4	6	051531
1/2	0.5000	4.3/4	7.3/4	6	051532

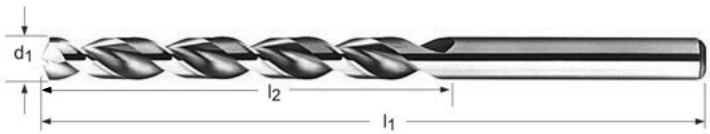
TAPER LENGTH DRILL

General Purpose Taper Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC91P Bright Finish improves chip flow in soft or non-ferrous materials.

QC91G TiN Coating increases wear resistance and improves tool life.



QC91P	QC91G
ANSI	ANSI
6XD	6XD
HSS	HSS
135°	135°
1/16 - 11/16	1/16 - 1/2

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC91P	QC91G
1/16	0.0625	1.3/4	3“	12	057904	055904
52	0.0635	2“	3.3/4	12	059452	050952
51	0.0670	2“	3.3/4	12	059451	050951
50	0.0700	2“	3.3/4	12	059450	050950
49	0.0730	2“	3.3/4	12	059449	050949
48	0.0760	2“	3.3/4	12	059448	—
5/64	0.0781	2“	3.3/4	12	057905	055905
47	0.0785	2.1/4	4.1/4	12	059447	050947
46	0.0810	2.1/4	4.1/4	12	059446	050946
45	0.0820	2.1/4	4.1/4	12	059445	050945
44	0.0860	2.1/4	4.1/4	12	059444	050944
43	0.0890	2.1/4	4.1/4	12	059443	050943
42	0.0935	2.1/4	4.1/4	12	059442	050942
3/32	0.0938	2.1/4	4.1/4	12	057906	055906
41	0.0960	2.1/2	4.5/8	12	059441	050941
40	0.0980	2.1/2	4.5/8	12	059440	050940
39	0.0995	2.1/2	4.5/8	12	059439	050939
38	0.1015	2.1/2	4.5/8	12	059438	050938
37	0.1040	2.1/2	4.5/8	12	059437	050937
36	0.1065	2.1/2	4.5/8	12	059436	050936
7/64	0.1094	2.1/2	4.5/8	12	057907	055907
35	0.1100	2.3/4	5.1/8	12	059435	050935
34	0.1110	2.3/4	5.1/8	12	059434	050934
33	0.1130	2.3/4	5.1/8	12	059433	—
32	0.1160	2.3/4	5.1/8	12	059432	050932
31	0.1200	2.3/4	5.1/8	12	059431	050931
1/8	0.1250	2.3/4	5.1/8	12	057908	055908
30	0.1285	3“	5.3/8	12	059430	050930
29	0.1360	3“	5.3/8	12	059429	050929
28	0.1405	3“	5.3/8	12	059428	050928
9/64	0.1406	3“	5.3/8	12	057909	055909
27	0.1440	3“	5.3/8	12	059427	—
26	0.1470	3“	5.3/8	12	059426	050926

TAPER LENGTH DRILL

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC91P	QC91G
25	0.1495	3“	5.3/8	12	059425	050925
24	0.1520	3“	5.3/8	12	059424	050924
23	0.1540	3“	5.3/8	12	059423	—
5/32	0.1563	3“	5.3/8	12	057910	055910
22	0.1570	3.3/8	5.3/4	12	059422	—
21	0.1590	3.3/8	5.3/4	12	059421	050921
20	0.1610	3.3/8	5.3/4	12	059420	050920
19	0.1660	3.3/8	5.3/4	12	059419	050919
18	0.1695	3.3/8	5.3/4	12	059418	050918
11/64	0.1719	3.3/8	5.3/4	12	057911	055911
17	0.1730	3.3/8	5.3/4	12	059417	050917
16	0.1770	3.3/8	5.3/4	12	059416	050916
15	0.1800	3.3/8	5.3/4	12	059415	050915
14	0.1820	3.3/8	5.3/4	12	059414	050914
13	0.1850	3.3/8	5.3/4	12	059413	050913
3/16	0.1875	3.3/8	5.3/4	12	057912	055912
12	0.1890	3.5/8	6“	12	059412	—
11	0.1910	3.5/8	6“	12	059411	050911
10	0.1935	3.5/8	6“	12	059410	—
9	0.1960	3.5/8	6“	12	059409	050909
8	0.1990	3.5/8	6“	12	059408	050908
7	0.2010	3.5/8	6“	12	059407	050907
13/64	0.2031	3.5/8	6“	12	057913	055913
6	0.2040	3.5/8	6“	12	059406	050906
5	0.2055	3.5/8	6“	12	059405	050905
4	0.2090	3.5/8	6“	12	059404	050904
3	0.2130	3.5/8	6“	12	059403	050903
7/32	0.2188	3.5/8	6“	12	057914	055914
2	0.2210	3.3/4	6.1/8	12	059402	050902
1	0.2280	3.3/4	6.1/8	12	059401	—
15/64	0.2344	3.3/4	6.1/8	12	057915	055915
1/4	0.2500	3.3/4	6.1/8	12	057916	055916
17/64	0.2656	3.7/8	6.1/4	6	057917	055917
9/32	0.2813	3.7/8	6.1/4	6	057918	055918
19/64	0.2969	4“	6.3/8	6	057919	055919
5/16	0.3125	4“	6.3/8	6	057920	055920
21/64	0.3281	4.1/8	6.1/2	6	057921	055921
11/32	0.3437	4.1/8	6.1/2	6	057922	055922
23/64	0.3594	4.1/4	6.3/4	6	057923	—
3/8	0.3750	4.1/4	6.3/4	6	057924	055924
25/64	0.3906	4.3/8	7“	6	057925	055925
13/32	0.4063	4.3/8	7“	6	057926	055926
27/64	0.4219	4.5/8	7.1/4	6	057927	055927
7/16	0.4375	4.5/8	7.1/4	6	057928	055928
29/64	0.4531	4.3/4	7.1/2	6	057929	055929
15/32	0.4687	4.3/4	7.1/2	6	057930	—
31/64	0.4844	4.3/4	7.3/4	6	057931	—
1/2	0.5000	4.3/4	7.3/4	6	057932	055932
33/64	0.5156	4.3/4	8“	1	057933	—
17/32	0.5313	4.3/4	8“	1	057934	—
35/64	0.5469	4.7/8	8.1/4	1	057935	—
9/16	0.5625	4.7/8	8.1/4	1	057936	—
37/64	0.5781	4.7/8	8.3/4	1	057937	—
19/32	0.5937	4.7/8	8.3/4	1	057938	—
5/8	0.6250	4.7/8	8.3/4	1	057940	—
21/32	0.6563	5.1/8	9“	1	057942	—
11/16	0.6875	5.3/8	9.1/4	1	057944	—

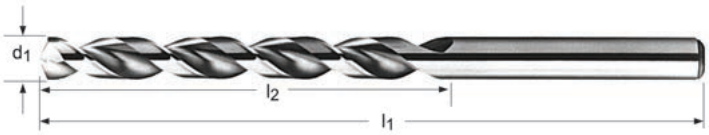
TAPER LENGTH DRILL

General Purpose Taper Length Parabolic Flute, Metric

Heavy-Duty Parabolic Flute design for efficient chip evacuation. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC91PM Bright Finish improves chip flow in soft or non-ferrous materials.

QC91GM TiN Coating increases wear resistance and improves tool life.



QC91PM	QC91GM
DIN 340	DIN 340
6XD	6XD
HSS	HSS
135°	135°
1.50 - 17.00	1.50 - 12.50

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	QC91PM	QC91GM
1.50	0.0591	45	70	12	050015	050215
2.00	0.0787	56	85	12	050020	050220
2.50	0.0984	62	95	12	050025	050225
3.00	0.1181	66	100	12	050030	050230
3.50	0.1378	73	112	12	050035	050235
4.00	0.1575	78	119	12	050040	050240
4.50	0.1772	82	126	12	050045	050245
5.00	0.1969	87	132	12	050050	050250
5.20	0.2047	87	132	12	050052	050252
5.50	0.2165	91	139	12	050055	050255
6.00	0.2362	91	139	12	050060	050260
6.50	0.2559	97	148	6	050065	050265
6.80	0.2677	102	156	6	050068	—
7.00	0.2756	102	156	6	050070	050270
8.00	0.3150	109	165	6	050080	050280
8.20	0.3228	109	165	6	050082	—
8.50	0.3346	109	165	6	050085	050285
8.60	0.3386	115	175	6	050086	050286
9.00	0.3543	115	175	6	050090	050290
9.50	0.3740	115	175	6	050095	—
10.00	0.3937	121	184	6	050100	050300
10.50	0.4134	121	184	6	050105	050305
11.00	0.4331	128	195	6	050110	—
12.00	0.4724	134	205	6	050120	050320
12.50	0.4921	134	205	6	050125	050325
13.00	0.5118	134	205	1	050130	—
13.50	0.5315	140	214	1	050135	—
14.00	0.5512	140	214	1	050140	—
15.00	0.5906	144	220	1	050150	—
15.50	0.6102	149	227	1	050155	—
16.00	0.6299	149	227	1	050160	—
17.00	0.6693	154	235	1	050170	—

COBALT TAPER LENGTH DRILL

Heavy Duty Taper Length

M51CO - *Fractional Sizes*

M52CO - *Wire Gauge Sizes*

Low thrust design Heavy Duty self centering Split Point for easier penetration.
Cobalt base material with Bronze Oxide for wear resistance and lubricity.

M51CO	M52CO
ANSI	ANSI
6XD	6XD
HSS-E	HSS-E
135°	135°
1/16 - 1"	N40 - N1

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M51CO	M52CO
1/16		0.0625	1.3/4	3"	12	051304	—
5/64		0.0781	2"	3.3/4	12	051305	—
3/32		0.0938	2.1/4	4.1/4	12	051306	—
	40	0.0980	2.1/2	4.5/8	12	—	052340
	39	0.0995	2.1/2	4.5/8	12	—	052339
	36	0.1065	2.1/2	4.5/8	12	—	052336
7/64		0.1094	2.1/2	4.5/8	12	051307	—
	35	0.1100	2.3/4	5.1/8	12	—	052335
	34	0.1110	2.3/4	5.1/8	12	—	052334
	33	0.1130	2.3/4	5.1/8	12	—	052333
	32	0.1160	2.3/4	5.1/8	12	—	052332
	31	0.1200	2.3/4	5.1/8	12	—	052331
1/8		0.1250	2.3/4	5.1/8	12	051308	—
	30	0.1285	3"	5.3/8	12	—	052330
	29	0.1360	3"	5.3/8	12	—	052329
	28	0.1405	3"	5.3/8	12	—	052328
9/64		0.1406	3"	5.3/8	12	051309	—
	27	0.1440	3"	5.3/8	12	—	052327
	26	0.1470	3"	5.3/8	12	—	052326
	25	0.1495	3"	5.3/8	12	—	052325
	24	0.1520	3"	5.3/8	12	—	052324
5/32		0.1563	3"	5.3/8	12	051310	—
	22	0.1570	3.3/8	5.3/4	12	—	052322
	21	0.1590	3.3/8	5.3/4	12	—	052321
	20	0.1610	3.3/8	5.3/4	12	—	052320
	19	0.1660	3.3/8	5.3/4	12	—	052319
	18	0.1695	3.3/8	5.3/4	12	—	052318
11/64		0.1719	3.3/8	5.3/4	12	051311	—
	17	0.1730	3.3/8	5.3/4	12	—	052317
	16	0.1770	3.3/8	5.3/4	12	—	052316
	15	0.1800	3.3/8	5.3/4	12	—	052315
	14	0.1820	3.3/8	5.3/4	12	—	052314

COBALT TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M51CO	M52CO
	13	0.1850	3.3/8	5.3/4	12	—	052313
3/16		0.1875	3.3/8	5.3/4	12	051312	—
	12	0.1890	3.5/8	6“	12	—	052312
	11	0.1910	3.5/8	6“	12	—	052311
	10	0.1935	3.5/8	6“	12	—	052310
	9	0.1960	3.5/8	6“	12	—	052309
	8	0.1990	3.5/8	6“	12	—	052308
	7	0.2010	3.5/8	6“	12	—	052307
13/64		0.2031	3.5/8	6“	12	051313	—
	5	0.2055	3.5/8	6“	12	—	052305
	4	0.2090	3.5/8	6“	12	—	052304
	3	0.2130	3.5/8	6“	12	—	052303
7/32		0.2188	3.5/8	6“	12	051314	—
	2	0.2210	3.3/4	6.1/8	12	—	052302
	1	0.2280	3.3/4	6.1/8	12	—	052301
15/64		0.2344	3.3/4	6.1/8	12	051315	—
1/4		0.2500	3.3/4	6.1/8	12	051316	—
17/64		0.2656	3.7/8	6.1/4	6	051317	—
9/32		0.2813	3.7/8	6.1/4	6	051318	—
19/64		0.2969	4“	6.3/8	6	051319	—
5/16		0.3125	4“	6.3/8	6	051320	—
21/64		0.3281	4.1/8	6.1/2	6	051321	—
11/32		0.3437	4.1/8	6.1/2	6	051322	—
23/64		0.3594	4.1/4	6.3/4	6	051323	—
3/8		0.3750	4.1/4	6.3/4	6	051324	—
25/64		0.3906	4.3/8	7“	6	051325	—
13/32		0.4063	4.3/8	7“	6	051326	—
27/64		0.4219	4.5/8	7.1/4	6	051327	—
7/16		0.4375	4.5/8	7.1/4	6	051328	—
29/64		0.4531	4.3/4	7.1/2	6	051329	—
15/32		0.4687	4.3/4	7.1/2	6	051330	—
31/64		0.4844	4.3/4	7.3/4	6	051331	—
1/2		0.5000	4.3/4	7.3/4	6	051332	—
33/64		0.5156	4.3/4	8“	1	051333 [1)]	—
17/32		0.5313	4.3/4	8“	1	051334 [1)]	—
35/64		0.5469	4.7/8	8.1/4	1	051335 [1)]	—
9/16		0.5625	4.7/8	8.1/4	1	051336 [1)]	—
37/64		0.5781	4.7/8	8.3/4	1	051337 [1)]	—
19/32		0.5937	4.7/8	8.3/4	1	051338 [1)]	—
39/64		0.6094	4.7/8	8.3/4	1	051339 [1)]	—
5/8		0.6250	4.7/8	8.3/4	1	051340 [1)]	—
41/64		0.6406	5.1/8	9“	1	051341 [1)]	—
21/32		0.6563	5.1/8	9“	1	051342 [1)]	—
43/64		0.6719	5.3/8	9.1/4	1	051343 [1)]	—
11/16		0.6875	5.3/8	9.1/4	1	051344 [1)]	—
45/64		0.7031	5.5/8	9.1/2	1	051345 [1)]	—
23/32		0.7188	5.5/8	9.1/2	1	051346 [1)]	—
47/64		0.7344	5.7/8	9.3/4	1	051347 [1)]	—
3/4		0.7500	5.7/8	9.3/4	1	051348 [1)]	—
49/64		0.7656	6“	9.7/8	1	051349 [1)]	—
25/32		0.7813	6“	9.7/8	1	051350 [1)]	—
51/64		0.7969	6.1/8	10“	1	051351 [1)]	—
13/16		0.8125	6.1/8	10“	1	051352 [1)]	—
53/64		0.8281	6.1/8	10“	1	051353 [1)]	—
27/32		0.8438	6.1/8	10“	1	051354 [1)]	—
55/64		0.8594	6.1/8	10“	1	051355 [1)]	—
7/8		0.8750	6.1/8	10“	1	051356 [1)]	—
57/64		0.8906	6.1/8	10“	1	051357 [1)]	—
29/32		0.9063	6.1/8	10“	1	051358 [1)]	—
59/64		0.9219	6.1/8	10.3/4	1	051359 [1)]	—
15/16		0.9375	6.1/8	10.3/4	1	051360 [1)]	—
61/64		0.9531	6.3/8	11“	1	051361 [1)]	—
31/32		0.9688	6.3/8	11“	1	051362 [1)]	—
63/64		0.9844	6.3/8	11“	1	051363 [1)]	—
1“		1.0000	6.3/8	11“	1	051364 [1)]	—

[1)] Notched Point

EXTRA LENGTH DRILL

General Purpose Extra Length

0860 8“ Overall length

1290 12“ Overall length

Bright Finish improves chip flow in soft or non-ferrous materials

0860	1290
ANSI	ANSI
12XD	12XD
HSS	HSS
118°	118°
1/8 - 1/2	1/8 - 3/4

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	0860	1290
1/8	0.1250	6“	8“	1	057408	—
1/8	0.1250	9“	12“	1	—	059608
9/64	0.1406	9“	12“	1	—	059609
5/32	0.1563	6“	8“	1	057410	—
5/32	0.1563	9“	12“	1	—	059610
11/64	0.1719	9“	12“	1	—	059611
3/16	0.1875	6“	8“	1	057412	—
3/16	0.1875	9“	12“	1	—	059612
13/64	0.2031	9“	12“	1	—	059613
7/32	0.2188	6“	8“	1	057414	—
7/32	0.2188	9“	12“	1	—	059614
15/64	0.2344	9“	12“	1	—	059615
1/4	0.2500	6“	8“	1	057416	—
1/4	0.2500	9“	12“	1	—	059616
17/64	0.2656	9“	12“	1	—	059617
9/32	0.2813	6“	8“	1	057418	—
9/32	0.2813	9“	12“	1	—	059618
19/64	0.2969	9“	12“	1	—	059619
5/16	0.3125	6“	8“	1	057420	—
5/16	0.3125	9“	12“	1	—	059620
21/64	0.3281	9“	12“	1	—	059621
11/32	0.3437	6“	8“	1	057422	—
11/32	0.3437	9“	12“	1	—	059622
23/64	0.3594	9“	12“	1	—	059623
3/8	0.3750	6“	8“	1	057424	—
3/8	0.3750	9“	12“	1	—	059624
25/64	0.3906	9“	12“	1	—	059625
13/32	0.4063	6“	8“	1	057426	—
13/32	0.4063	9“	12“	1	—	059626
27/64	0.4219	9“	12“	1	—	059627
7/16	0.4375	6“	8“	1	057428	—
7/16	0.4375	9“	12“	1	—	059628

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	0860	1290
29/64	0.4531	9“	12“	1	—	059629
15/32	0.4687	6“	8“	1	057430	—
15/32	0.4687	9“	12“	1	—	059630
31/64	0.4844	9“	12“	1	—	059631
1/2	0.5000	6“	8“	1	057432	—
1/2	0.5000	9“	12“	1	—	059632
33/64	0.5156	9“	12“	1	—	059633 [1]
17/32	0.5313	9“	12“	1	—	059634 [1]
35/64	0.5469	9“	12“	1	—	059635 [1]
9/16	0.5625	9“	12“	1	—	059636 [1]
37/64	0.5781	9“	12“	1	—	059637 [1]
19/32	0.5937	9“	12“	1	—	059638 [1]
39/64	0.6094	9“	12“	1	—	059639 [1]
5/8	0.6250	9“	12“	1	—	059640 [1]
21/32	0.6563	9“	12“	1	—	059642 [1]
11/16	0.6875	9“	12“	1	—	059644 [1]
23/32	0.7188	9“	12“	1	—	059646 [1]
3/4	0.7500	9“	12“	1	—	059648 [1]

1) 33/64 and larger are steam oxide

EXTRA LENGTH DRILL

PRECISION

General Purpose Extra Length

1511 Bright Finish improves chip flow in soft or
1813 non-ferrous materials

A125 Steam Oxide for increased wear resistance & lubricity.

1813 Series - 33/64 and larger are steam oxide
1511 Series - 17/32 and larger are steam oxide
A125 Series - under 3/32 are bright

1511	1813	A125
ANSI	ANSI	BS 328
15XD	15XD	10XD
HSS	HSS	HSS
118°	118°	118°
3/16 - 1“	1/4 - 1“	1.4mm - 1“

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh_8 mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
	0.0551	1.40			100	160	1	—	—	0019832
	0.0591	1.50			100	160	1	—	—	0019856
	0.0591	1.50			80	125	1	—	—	0019849
1/16	0.0625	1.59			100	160	1	—	—	0173664
1/16	0.0625	1.59			80	125	1	—	—	0173657
	0.0709	1.80			100	160	1	—	—	0019863
5/64	0.0781	1.98			100	160	1	—	—	0173688
5/64	0.0781	1.98			80	125	1	—	—	0173671
	0.0787	2.00			100	160	1	—	—	0020074
	0.0787	2.00			80	125	1	—	—	0020067
	0.0866	2.20			100	160	1	—	—	0020036
3/32	0.0938	2.38			100	160	1	—	—	0173701
3/32	0.0938	2.38			80	125	1	—	—	0173695
	0.0984	2.50			100	160	1	—	—	0020050
	0.0984	2.50			80	125	1	—	—	0020043
7/64	0.1094	2.78			100	160	1	—	—	0173725
7/64	0.1094	2.78			80	125	1	—	—	0173718
	0.1181	3.00			100	160	1	—	—	0020128
	0.1181	3.00			150	200	1	—	—	0020135
	0.1181	3.00			200	250	1	—	—	0020142
1/8	0.1250	3.18			100	160	1	—	—	0173732
1/8	0.1250	3.18			150	200	1	—	—	0173749
1/8	0.1250	3.18			200	250	1	—	—	0173756
1/8	0.1250	3.18			250	310	1	—	—	0173763
	0.1299	3.30			100	160	1	—	—	0020081
	0.1378	3.50			100	160	1	—	—	0020098
	0.1378	3.50			150	200	1	—	—	0020104
	0.1378	3.50			200	250	1	—	—	0020111
9/64	0.1406	3.57			100	160	1	—	—	0173770
9/64	0.1406	3.57			150	200	1	—	—	0173787
9/64	0.1406	3.57			250	310	1	—	—	0214398
5/32	0.1563	3.97			100	160	1	—	—	0173794

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh_8 mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
5/32	0.1563	3.97			150	200	1	—	—	0173800
5/32	0.1563	3.97			200	250	1	—	—	0173817
5/32	0.1563	3.97			250	310	1	—	—	0173824
	0.1575	4.00			100	160	1	—	—	0020197
	0.1575	4.00			150	200	1	—	—	0020203
	0.1575	4.00			200	250	1	—	—	0020210
	0.1575	4.00			250	310	1	—	—	0020227
11/64	0.1719	4.37			100	160	1	—	—	0173831
11/64	0.1719	4.37			150	200	1	—	—	0173848
11/64	0.1719	4.37			250	310	1	—	—	0214404
	0.1772	4.50			100	160	1	—	—	0020159
	0.1772	4.50			150	200	1	—	—	0020166
	0.1772	4.50			200	250	1	—	—	0020173
	0.1772	4.50			250	310	1	—	—	0020180
3/16	0.1875	4.76			100	160	1	—	—	0173855
3/16	0.1875	4.76			150	200	1	—	—	0173862
3/16	0.1875	4.76			200	250	1	—	—	0173879
3/16	0.1875	4.76			250	310	1	—	—	0173886
3/16	0.1875	4.76			300	400	1	—	—	0173893
3/16	0.1875		11“	15“			1	059512	—	—
	0.1969	5.00			100	160	1	—	—	0020265
	0.1969	5.00			150	200	1	—	—	0020272
	0.1969	5.00			200	250	1	—	—	0020289
	0.1969	5.00			250	310	1	—	—	0020296
	0.1969	5.00			300	400	1	—	—	0020302
13/64	0.2031	5.16			150	200	1	—	—	0173909
13/64	0.2031	5.16			200	250	1	—	—	0173916
13/64	0.2031	5.16			250	310	1	—	—	0173923
	0.2165	5.50			150	200	1	—	—	0020234
	0.2165	5.50			200	250	1	—	—	0020241
	0.2165	5.50			250	310	1	—	—	0020258
7/32	0.2188	5.56			150	200	1	—	—	0173930
7/32	0.2188	5.56			200	250	1	—	—	0173947
7/32	0.2188	5.56			250	310	1	—	—	0173954
15/64	0.2344	5.95			150	200	1	—	—	0173961
15/64	0.2344	5.95			200	250	1	—	—	0173978
15/64	0.2344	5.95			250	310	1	—	—	0214442
	0.2362	6.00			150	200	1	—	—	0020340
	0.2362	6.00			200	250	1	—	—	0020357
	0.2362	6.00			250	310	1	—	—	0020364
	0.2362	6.00			300	400	1	—	—	0020371
1/4	0.2500	6.35			150	200	1	—	—	0173985
1/4	0.2500	6.35			200	250	1	—	—	0173992
1/4	0.2500	6.35			250	310	1	—	—	0174005
1/4	0.2500	6.35			300	400	1	—	—	0174012
1/4	0.2500	6.35			400	460	1	—	—	0174029
1/4	0.2500		11“	15“			1	059516	—	—
1/4	0.2500		13“	18“			1	—	059716	—
	0.2559	6.50			150	200	1	—	—	0020319
	0.2559	6.50			200	250	1	—	—	0020326
	0.2559	6.50			250	310	1	—	—	0020333
17/64	0.2656	6.75			150	200	1	—	—	0174036
17/64	0.2656	6.75			200	250	1	—	—	0174043
17/64	0.2656	6.75			400	460	1	—	—	0214466
17/64	0.2656		13“	18“			1	—	059717	—
	0.2756	7.00			150	200	1	—	—	0020418
	0.2756	7.00			200	250	1	—	—	0020425
	0.2756	7.00			250	310	1	—	—	0020432
9/32	0.2813	7.14			150	200	1	—	—	0174050
9/32	0.2813	7.14			200	250	1	—	—	0174067
9/32	0.2813	7.14			250	310	1	—	—	0174074
9/32	0.2813	7.14			400	460	1	—	—	0214473
9/32	0.2813		13“	18“			1	—	059718	—
	0.2953	7.50			150	200	1	—	—	0020388
	0.2953	7.50			200	250	1	—	—	0020395
	0.2953	7.50			250	310	1	—	—	0020401

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 $Øh_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
19/64	0.2969	7.54			250	310	1	—	—	0214480
19/64	0.2969	7.54			400	460	1	—	—	0214497
19/64	0.2969		13“	18“			1	—	059719	—
5/16	0.3125	7.94			150	200	1	—	—	0174081
5/16	0.3125	7.94			200	250	1	—	—	0174098
5/16	0.3125	7.94			250	310	1	—	—	0174104
5/16	0.3125	7.94			300	400	1	—	—	0174111
5/16	0.3125	7.94			400	460	1	—	—	0174128
5/16	0.3125		11“	15“			1	059520	—	—
5/16	0.3125		13“	18“			1	—	059720	—
	0.3150	8.00			200	250	1	—	—	0020463
	0.3150	8.00			250	310	1	—	—	0020470
	0.3150	8.00			300	400	1	—	—	0020487
21/64	0.3281	8.33			250	310	1	—	—	0174135
21/64	0.3281	8.33			400	460	1	—	—	0214503
21/64	0.3281		13“	18“			1	—	059721	—
	0.3346	8.50			200	250	1	—	—	0020449
	0.3346	8.50			250	310	1	—	—	0020456
11/32	0.3437	8.73			200	250	1	—	—	0174142
11/32	0.3437	8.73			250	310	1	—	—	0174159
11/32	0.3437	8.73			300	400	1	—	—	0174166
11/32	0.3437	8.73			400	460	1	—	—	0214510
11/32	0.3437		11“	15“			1	059522	—	—
11/32	0.3437		13“	18“			1	—	059722	—
	0.3543	9.00			200	250	1	—	—	0020517
	0.3543	9.00			250	310	1	—	—	0020524
	0.3543	9.00			300	400	1	—	—	0020531
23/64	0.3594	9.13			250	310	1	—	—	0174180
23/64	0.3594	9.13			400	460	1	—	—	0214527
23/64	0.3594		13“	18“			1	—	059723	—
	0.3740	9.50			200	250	1	—	—	0020494
	0.3740	9.50			250	310	1	—	—	0020500
3/8	0.3750	9.52			200	250	1	—	—	0174197
3/8	0.3750	9.52			250	310	1	—	—	0174203
3/8	0.3750	9.52			300	400	1	—	—	0174210
3/8	0.3750	9.52			400	460	1	—	—	0174227
3/8	0.3750		11“	15“			1	059524	—	—
3/8	0.3750		13“	18“			1	—	059724	—
25/64	0.3906	9.92			250	310	1	—	—	0214534
25/64	0.3906	9.92			400	460	1	—	—	0214541
25/64	0.3906		13“	18“			1	—	059725	—
	0.3937	10.00			200	250	1	—	—	0019900
	0.3937	10.00			250	310	1	—	—	0019917
	0.3937	10.00			300	400	1	—	—	0019924
13/32	0.4063	10.32			200	250	1	—	—	0174234
13/32	0.4063	10.32			250	310	1	—	—	0174241
13/32	0.4063	10.32			400	460	1	—	—	0214558
13/32	0.4063		13“	18“			1	—	059726	—
	0.4134	10.50			200	250	1	—	—	0019870
	0.4134	10.50			250	310	1	—	—	0019887
	0.4134	10.50			300	400	1	—	—	0019894
27/64	0.4219	10.72			250	310	1	—	—	0214565
27/64	0.4219		13“	18“			1	—	059727	—
	0.4331	11.00			200	250	1	—	—	0019931
	0.4331	11.00			250	310	1	—	—	0019948
	0.4331	11.00			300	400	1	—	—	0019955
7/16	0.4375	11.11			200	250	1	—	—	0174265
7/16	0.4375	11.11			250	310	1	—	—	0174272
7/16	0.4375	11.11			300	400	1	—	—	0174289
7/16	0.4375	11.11			400	460	1	—	—	0214589
7/16	0.4375		11“	15“			1	059528	—	—
7/16	0.4375		13“	18“			1	—	059728	—
29/64	0.4531	11.51			250	310	1	—	—	0214596
29/64	0.4531	11.51			400	460	1	—	—	0214602
29/64	0.4531		13“	18“			1	—	059729	—
15/32	0.4688	11.91			200	250	1	—	—	0174296

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 $Øh_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
15/32	0.4687	11.91			250	310	1	—	—	0174302
15/32	0.4687	11.91			400	460	1	—	—	0214619
15/32	0.4687		13“	18“			1	—	059730	—
	0.4724	12.00			200	250	1	—	—	0019962
	0.4724	12.00			250	310	1	—	—	0019979
	0.4724	12.00			300	400	1	—	—	0019986
31/64	0.4844	12.30			250	310	1	—	—	0214626
31/64	0.4844	12.30			400	460	1	—	—	0214633
31/64	0.4844		13“	18“			1	—	059731	—
1/2	0.5000	12.70			200	250	1	—	—	0174319
1/2	0.5000	12.70			250	310	1	—	—	0174326
1/2	0.5000	12.70			300	400	1	—	—	0174333
1/2	0.5000	12.70			400	460	1	—	—	0174340
1/2	0.5000		11“	15“			1	059532	—	—
1/2	0.5000		13“	18“			1	—	059732	—
	0.5118	13.00			250	310	1	—	—	0019993
	0.5118	13.00			300	400	1	—	—	0020005
33/64	0.5156	13.10			250	310	1	—	—	0214640
33/64	0.5156	13.10			400	460	1	—	—	0214657
33/64	0.5156		13“	18“			1	—	059733	—
17/32	0.5313	13.49			250	310	1	—	—	0214664
17/32	0.5313	13.49			400	460	1	—	—	0214671
17/32	0.5313		11“	15“			1	059534	—	—
17/32	0.5313		13“	18“			1	—	059734	—
35/64	0.5469	13.89			250	310	1	—	—	0214688
35/64	0.5469	13.89			400	460	1	—	—	0214695
35/64	0.5469		13“	18“			1	—	059735	—
	0.5512	14.00			250	310	1	—	—	0020012
	0.5512	14.00			300	400	1	—	—	0020029
9/16	0.5625	14.29			250	310	1	—	—	0214701
9/16	0.5625	14.29			400	460	1	—	—	0214718
9/16	0.5625		11“	15“			1	059536	—	—
9/16	0.5625		13“	18“			1	—	059736	—
37/64	0.5781	14.68			250	310	1	—	—	0214725
37/64	0.5781		13“	18“			1	—	059737	—
19/32	0.5937	15.08			250	310	1	—	—	0214749
19/32	0.5937	15.08			400	460	1	—	—	0214756
19/32	0.5937		13“	18“			1	—	059738	—
39/64	0.6094	15.48			250	310	1	—	—	0214763
39/64	0.6094	15.48			400	460	1	—	—	0214770
39/64	0.6094		13“	18“			1	—	059739	—
5/8	0.6250	15.88			250	310	1	—	—	0214787
5/8	0.6250	15.88			400	460	1	—	—	0214794
5/8	0.6250		11“	15“			1	059540	—	—
5/8	0.6250		13“	18“			1	—	059740	—
21/32	0.6563	16.67			250	310	1	—	—	0214800
21/32	0.6563	16.67			400	460	1	—	—	0214817
21/32	0.6563		11“	15“			1	059542	—	—
21/32	0.6563		13“	18“			1	—	059742	—
11/16	0.6875	17.46			250	310	1	—	—	0214824
11/16	0.6875	17.46			400	460	1	—	—	0214831
11/16	0.6875		11“	15“			1	059544	—	—
11/16	0.6875		13“	18“			1	—	059744	—
23/32	0.7188	18.26			250	310	1	—	—	0214848
23/32	0.7188	18.26			400	460	1	—	—	0214855
23/32	0.7188		11“	15“			1	059546	—	—
23/32	0.7188		13“	18“			1	—	059746	—
3/4	0.7500	19.05			250	310	1	—	—	0214862
3/4	0.7500	19.05			400	460	1	—	—	0214879
3/4	0.7500		11“	15“			1	059548	—	—
3/4	0.7500		13“	18“			1	—	059748	—
25/32	0.7813	19.84			400	460	1	—	—	0214886
25/32	0.7813		11“	15“			1	059550	—	—
25/32	0.7813		13“	18“			1	—	059750	—
13/16	0.8125	20.64			400	460	1	—	—	0214893
13/16	0.8125		11“	15“			1	059552	—	—

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 $Øh_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
13/16	0.8125		13“	18“			1	—	059752	—
7/8	0.8750	22.22			400	460	1	—	—	0214909
7/8	0.8750		11“	15“			1	059554	—	—
7/8	0.8750		13“	18“			1	—	059756	—
15/16	0.9375	23.81			400	460	1	—	—	0214916
15/16	0.9375		11“	15“			1	059556	—	—
15/16	0.9375		13“	18“			1	—	059760	—
1“	1.0000	25.40			400	460	1	—	—	0214923
1“	1.0000		11“	15“			1	059558	—	—
1“	1.0000		13“	18“			1	—	059764	—

EXTRA LENGTH DRILL

General Purpose Extra Length Parabolic Flute

QC0860P 8“ Overall length

QC1290P 12“ Overall length

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.

QC0860P	QC1290P
ANSI	ANSI
10XD	10XD
HSS	HSS
135°	135°
1/8 - 1/2	1/8 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC0860P	QC1290P
1/8	0.1250	6“	8“	1	055608	—
1/8	0.1250	9“	12“	1	—	060308
9/64	0.1406	6“	8“	1	055609	—
9/64	0.1406	9“	12“	1	—	060309
5/32	0.1563	6“	8“	1	055610	—
5/32	0.1563	9“	12“	1	—	060310
11/64	0.1719	6“	8“	1	055611	—
11/64	0.1719	9“	12“	1	—	060311
3/16	0.1875	6“	8“	1	055612	—
3/16	0.1875	9“	12“	1	—	060312
13/64	0.2031	6“	8“	1	055613	—
13/64	0.2031	9“	12“	1	—	060313
7/32	0.2188	6“	8“	1	055614	—
7/32	0.2188	9“	12“	1	—	060314
15/64	0.2344	6“	8“	1	055615	—
15/64	0.2344	9“	12“	1	—	060315
1/4	0.2500	6“	8“	1	055616	—
1/4	0.2500	9“	12“	1	—	060316
17/64	0.2656	6“	8“	1	055617	—
17/64	0.2656	9“	12“	1	—	060317
9/32	0.2813	6“	8“	1	055618	—
9/32	0.2813	9“	12“	1	—	060318
19/64	0.2969	6“	8“	1	055619	—
19/64	0.2969	9“	12“	1	—	060319
5/16	0.3125	6“	8“	1	055620	—
5/16	0.3125	9“	12“	1	—	060320
21/64	0.3281	6“	8“	1	055621	—
21/64	0.3281	9“	12“	1	—	060321
11/32	0.3437	6“	8“	1	055622	—
11/32	0.3437	9“	12“	1	—	060322
23/64	0.3594	6“	8“	1	055623	—
23/64	0.3594	9“	12“	1	—	060323
3/8	0.3750	6“	8“	1	055624	—

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC0860P	QC1290P
3/8	0.3750	9“	12“	1	—	060324
25/64	0.3906	6“	8“	1	055625	—
25/64	0.3906	9“	12“	1	—	060325
13/32	0.4063	6“	8“	1	055626	—
13/32	0.4063	9“	12“	1	—	060326
27/64	0.4219	6“	8“	1	055627	—
27/64	0.4219	9“	12“	1	—	060327
7/16	0.4375	6“	8“	1	055628	—
7/16	0.4375	9“	12“	1	—	060328
29/64	0.4531	6“	8“	1	055629	—
15/32	0.4687	6“	8“	1	055630	—
15/32	0.4687	9“	12“	1	—	060330
31/64	0.4844	6“	8“	1	055631	—
1/2	0.5000	6“	8“	1	055632	—
1/2	0.5000	9“	12“	1	—	060332

AIRCRAFT EXTENSION DRILL

Aircraft Extension (NAS 907)

A243 (NAS 907 Type B) Low thrust design self centering 135° Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.

A244 (NAS 907 Type A) Low thrust design self centering 118° Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.

A243	A244
NAS 907	NAS 907
4XD	4XD
HSS	HSS
135°	118°
3/32 - 1/4	1/8 - 1/4

d_1 Øh$_8$ Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A243	A244
3/32	0.0938	1.1/4	6“	10	0240458	—
40	0.0980	1.3/8	6“	10	0241141	—
1/8	0.1250	1.5/8	6“	10	0240434	0375914
30	0.1285	1.5/8	6“	10	0241035	—
5/32	0.1563	2“	6“	10	0240465	0375938
21	0.1590	2.1/8	6“	10	0240939	—
20	0.1610	2.1/8	6“	10	0240922	—
3/16	0.1875	2.5/16	6“	10	0240441	0375921
11	0.1910	2.5/16	6“	10	0240823	—
10	0.1935	2.7/16	6“	10	0240816	—
1/4	0.2500	2.3/4	6“	10	0240410	0375907

AIRCRAFT EXTENSION DRILL

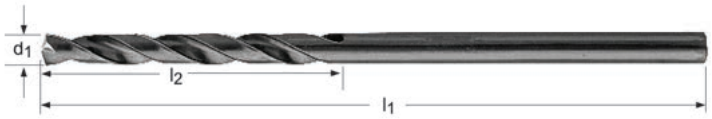
Aircraft Extension (NAS 907 Type B)

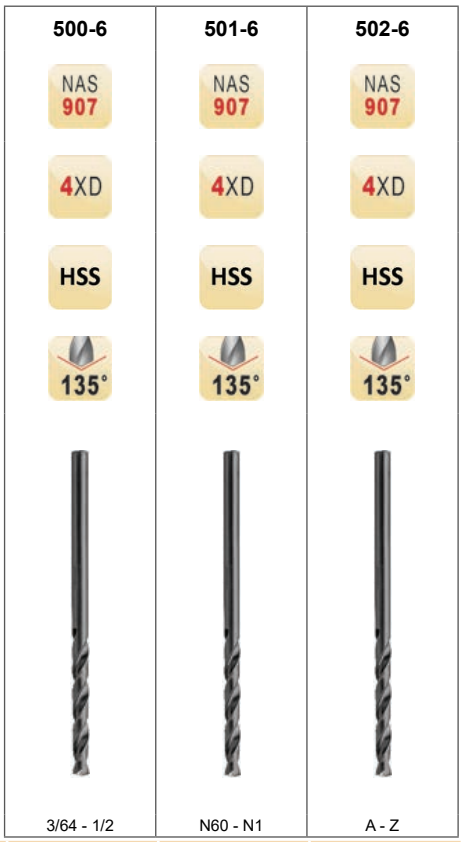
500-6 - *Fractional Sizes*

501-6 - *Wire Gauge Sizes*

502-6 - *Letter Sizes*

Low thrust design self centering 135° Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity. 6“ overall length.





d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
	60		0.0400	11/16	6“	12	—	058160 [1]	—
	59		0.0410	11/16	6“	12	—	058159 [1]	—
	58		0.0420	11/16	6“	12	—	058158 [1]	—
	57		0.0430	3/4	6“	12	—	058157 [1]	—
	56		0.0465	3/4	6“	12	—	058156 [1]	—
3/64			0.0469	3/4	6“	12	058003	—	—
	55		0.0520	7/8	6“	12	—	058155 [1]	—
	54		0.0550	7/8	6“	12	—	058154 [1]	—
	53		0.0595	7/8	6“	12	—	058153 [1]	—
1/16			0.0625	7/8	6“	12	058004	—	—
	52		0.0635	7/8	6“	12	—	058152	—
	51		0.0670	1“	6“	12	—	058151	—
	50		0.0700	1“	6“	12	—	058150	—
	49		0.0730	1“	6“	12	—	058149	—
	48		0.0760	1“	6“	12	—	058148	—
5/64			0.0781	1“	6“	12	058005	—	—
	47		0.0785	1“	6“	12	—	058147	—
	46		0.0810	1.1/8	6“	12	—	058146	—
	45		0.0820	1.1/8	6“	12	—	058145	—
	44		0.0860	1.1/8	6“	12	—	058144	—
	43		0.0890	1.1/4	6“	12	—	058143	—
	42		0.0935	1.1/4	6“	12	—	058142	—
3/32			0.0938	1.1/4	6“	12	058006	—	—
	41		0.0960	1.3/8	6“	12	—	058141	—
	40		0.0980	1.3/8	6“	12	—	058140	—
	39		0.0995	1.3/8	6“	12	—	058139	—
	38		0.1015	1.7/16	6“	12	—	058138	—
	37		0.1040	1.7/16	6“	12	—	058137	—
	36		0.1065	1.7/16	6“	12	—	058136	—
7/64			0.1094	1.1/2	6“	12	058007	—	—
	35		0.1100	1.1/2	6“	12	—	058135	—
	34		0.1110	1.1/2	6“	12	—	058134	—

[1] Not Split Point

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
	33		0.1130	1.1/2	6“	12	—	058133	—
	32		0.1160	1.5/8	6“	12	—	058132	—
	31		0.1200	1.5/8	6“	12	—	058131	—
1/8			0.1250	1.5/8	6“	12	058008	—	—
	30		0.1285	1.5/8	6“	12	—	058130	—
	29		0.1360	1.3/4	6“	12	—	058129	—
	28		0.1405	1.3/4	6“	12	—	058128	—
9/64			0.1406	1.3/4	6“	12	058009	—	—
	27		0.1440	1.7/8	6“	12	—	058127	—
	26		0.1470	1.7/8	6“	12	—	058126	—
	25		0.1495	1.7/8	6“	12	—	058125	—
	24		0.1520	2“	6“	12	—	058124	—
	23		0.1540	2“	6“	12	—	058123	—
5/32			0.1563	2“	6“	12	058010	—	—
	22		0.1570	2“	6“	12	—	058122	—
	21		0.1590	2.1/8	6“	12	—	058121	—
	20		0.1610	2.1/8	6“	12	—	058120	—
	19		0.1660	2.1/8	6“	12	—	058119	—
	18		0.1695	2.1/8	6“	12	—	058118	—
11/64			0.1719	2.1/8	6“	12	058011	—	—
	17		0.1730	2.3/16	6“	12	—	058117	—
	16		0.1770	2.3/16	6“	12	—	058116	—
	15		0.1800	2.3/16	6“	12	—	058115	—
	14		0.1820	2.3/16	6“	12	—	058114	—
	13		0.1850	2.5/16	6“	12	—	058113	—
3/16			0.1875	2.5/16	6“	12	058012	—	—
	12		0.1890	2.5/16	6“	12	—	058112	—
	11		0.1910	2.5/16	6“	12	—	058111	—
	10		0.1935	2.7/16	6“	12	—	058110	—
	9		0.1960	2.7/16	6“	12	—	058109	—
	8		0.1990	2.7/16	6“	12	—	058108	—
	7		0.2010	2.7/16	6“	12	—	058107	—
13/64			0.2031	2.7/16	6“	12	058013	—	—
	6		0.2040	2.1/2	6“	12	—	058106	—
	5		0.2055	2.1/2	6“	12	—	058105	—
	4		0.2090	2.1/2	6“	12	—	058104	—
	3		0.2130	2.1/2	6“	12	—	058103	—
7/32			0.2188	2.1/2	6“	12	058014	—	—
	2		0.2210	2.5/8	6“	12	—	058102	—
	1		0.2280	2.5/8	6“	12	—	058101	—
		A	0.2340	2.5/8	6“	12	—	—	058201
15/64			0.2344	2.5/8	6“	12	058015	—	—
		B	0.2380	2.3/4	6“	12	—	—	058202
		C	0.2420	2.3/4	6“	12	—	—	058203
		D	0.2460	2.3/4	6“	12	—	—	058204
		E	0.2500	2.3/4	6“	12	—	—	058205
1/4			0.2500	2.3/4	6“	12	058016	—	—
		F	0.2570	2.7/8	6“	12	—	—	058206
		G	0.2610	2.7/8	6“	6	—	—	058207
17/64			0.2656	2.7/8	6“	6	058017	—	—
		H	0.2660	2.7/8	6“	6	—	—	058208
		I	0.2720	2.7/8	6“	6	—	—	058209
		J	0.2770	2.7/8	6“	6	—	—	058210
		K	0.2810	2.15/16	6“	6	—	—	058211
9/32			0.2813	2.15/16	6“	6	058018	—	—
		L	0.2900	2.15/16	6“	6	—	—	058212
		M	0.2950	3.1/16	6“	6	—	—	058213
19/64			0.2969	3.1/16	6“	6	058019	—	—
		N	0.3020	3.1/16	6“	6	—	—	058214
5/16			0.3125	3.3/16	6“	6	058020	—	—
		O	0.3160	3.3/16	6“	6	—	—	058215
		P	0.3230	3.5/16	6“	6	—	—	058216
21/64			0.3281	3.5/16	6“	6	058021	—	—
		Q	0.3320	3.7/16	6“	6	—	—	058217
		R	0.3390	3.7/16	6“	6	—	—	058218
11/32			0.3437	3.7/16	6“	6	058022	—	—

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
		S	0.3480	3.1/2	6“	6	—	—	058219
		T	0.3580	3.1/2	6“	6	—	—	058220
23/64			0.3594	3.1/2	6“	6	058023	—	—
		U	0.3680	3.5/8	6“	6	—	—	058221
3/8			0.3750	3.5/8	6“	6	058024	—	—
		V	0.3770	3.5/8	6“	6	—	—	058222
		W	0.3860	3.3/4	6“	6	—	—	058223
25/64			0.3906	3.3/4	6“	6	058025	—	—
		X	0.3970	3.3/4	6“	6	—	—	058224
		Y	0.4040	3.7/8	6“	6	—	—	058225
13/32			0.4063	3.7/8	6“	6	058026	—	—
		Z	0.4130	3.7/8	6“	6	—	—	058226
27/64			0.4219	3.15/16	6“	6	058027	—	—
7/16			0.4375	4.1/16	6“	6	058028	—	—
29/64			0.4531	4.3/16	6“	6	058029	—	—
15/32			0.4687	4.5/16	6“	6	058030	—	—
31/64			0.4844	4.3/8	6“	6	058031	—	—
1/2			0.5000	4.1/2	6“	6	058032	—	—

AIRCRAFT EXTENSION DRILL

Aircraft Extension (NAS 907 Type B)

500-12 - *Fractional Sizes*

501-12 - *Wire Gauge Sizes*

502-12 - *Letter Sizes*

Low thrust design self centering 135° Split Point for easier penetration.
Steam Oxide for increased wear resistance & lubricity.
12“ Over All Length

500-12	501-12	502-12
NAS 907	NAS 907	NAS 907
4XD	4XD	4XD
HSS	HSS	HSS
135°	135°	135°
3/64 - 1/2	N50 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-12	501-12	502-12
3/64			0.0469	3/4	12“	12	059003 [1)]	—	—
1/16			0.0625	7/8	12“	12	059004	—	—
	50		0.0700	1“	12“	12	—	059150	—
	49		0.0730	1“	12“	12	—	059149	—
	48		0.0760	1“	12“	12	—	059148	—
5/64			0.0781	1“	12“	12	059005	—	—
	47		0.0785	1“	12“	12	—	059147	—
	46		0.0810	1.1/8	12“	12	—	059146	—
	45		0.0820	1.1/8	12“	12	—	059145	—
	44		0.0860	1.1/8	12“	12	—	059144	—
	43		0.0890	1.1/4	12“	12	—	059143	—
	42		0.0935	1.1/4	12“	12	—	059142	—
3/32			0.0938	1.1/4	12“	12	059006	—	—
	41		0.0960	1.3/8	12“	12	—	059141	—
	40		0.0980	1.3/8	12“	12	—	059140	—
	37		0.1040	1.7/16	12“	12	—	059137	—
	36		0.1065	1.7/16	12“	12	—	059136	—
7/64			0.1094	1.1/2	12“	12	059007	—	—
	31		0.1200	1.5/8	12“	12	—	059131	—
1/8			0.1250	1.5/8	12“	12	059008	—	—
	30		0.1285	1.5/8	12“	12	—	059130	—
	29		0.1360	1.3/4	12“	12	—	059129	—
9/64			0.1406	1.3/4	12“	12	059009	—	—
	27		0.1440	1.7/8	12“	12	—	059127	—
	26		0.1470	1.7/8	12“	12	—	059126	—
	25		0.1495	1.7/8	12“	12	—	059125	—
	23		0.1540	2“	12“	12	—	059123	—
5/32			0.1563	2“	12“	12	059010	—	—
	22		0.1570	2“	12“	12	—	059122	—
	21		0.1590	2.1/8	12“	12	—	059121	—
	20		0.1610	2.1/8	12“	12	—	059120	—
	19		0.1660	2.1/8	12“	12	—	059119	—

[1)] Not Split Point

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-12	501-12	502-12
	18		0.1695	2.1/8	12“	12	—	059118	—
11/64			0.1719	2.1/8	12“	12	059011	—	—
	17		0.1730	2.3/16	12“	12	—	059117	—
	16		0.1770	2.3/16	12“	12	—	059116	—
	13		0.1850	2.5/16	12“	12	—	059113	—
3/16			0.1875	2.5/16	12“	6	059012	—	—
	12		0.1890	2.5/16	12“	6	—	059112	—
	11		0.1910	2.5/16	12“	6	—	059111	—
	10		0.1935	2.7/16	12“	6	—	059110	—
	9		0.1960	2.7/16	12“	6	—	059109	—
	7		0.2010	2.7/16	12“	6	—	059107	—
13/64			0.2031	2.7/16	12“	6	059013	—	—
	5		0.2055	2.1/2	12“	6	—	059105	—
	4		0.2090	2.1/2	12“	6	—	059104	—
	3		0.2130	2.1/2	12“	6	—	059103	—
7/32			0.2188	2.1/2	12“	6	059014	—	—
	1		0.2280	2.5/8	12“	6	—	059101	—
		A	0.2340	2.5/8	12“	6	—	—	059201
15/64			0.2344	2.5/8	12“	6	059015	—	—
		B	0.2380	2.3/4	12“	6	—	—	059202
		C	0.2420	2.3/4	12“	6	—	—	059203
		D	0.2460	2.3/4	12“	6	—	—	059204
		E	0.2500	2.3/4	12“	6	—	—	059205
1/4			0.2500	2.3/4	12“	6	059016	—	—
		F	0.2570	2.7/8	12“	6	—	—	059206
		G	0.2610	2.7/8	12“	6	—	—	059207
17/64			0.2656	2.7/8	12“	6	059017	—	—
		H	0.2660	2.7/8	12“	6	—	—	059208
		I	0.2720	2.7/8	12“	6	—	—	059209
		J	0.2770	2.7/8	12“	6	—	—	059210
		K	0.2810	2.15/16	12“	6	—	—	059211
9/32			0.2813	2.15/16	12“	6	059018	—	—
		L	0.2900	2.15/16	12“	6	—	—	059212
		M	0.2950	3.1/16	12“	6	—	—	059213
19/64			0.2969	3.1/16	12“	6	059019	—	—
		N	0.3020	3.1/16	12“	6	—	—	059214
5/16			0.3125	3.3/16	12“	6	059020	—	—
		O	0.3160	3.3/16	12“	6	—	—	059215
		P	0.3230	3.5/16	12“	6	—	—	059216
21/64			0.3281	3.5/16	12“	6	059021	—	—
		Q	0.3320	3.7/16	12“	6	—	—	059217
		R	0.3390	3.7/16	12“	6	—	—	059218
11/32			0.3437	3.7/16	12“	6	059022	—	—
		S	0.3480	3.1/2	12“	3	—	—	059219
		T	0.3580	3.1/2	12“	3	—	—	059220
23/64			0.3594	3.1/2	12“	3	059023	—	—
		U	0.3680	3.5/8	12“	3	—	—	059221
3/8			0.3750	3.5/8	12“	3	059024	—	—
		V	0.3770	3.5/8	12“	3	—	—	059222
		W	0.3860	3.3/4	12“	3	—	—	059223
25/64			0.3906	3.3/4	12“	3	059025	—	—
		X	0.3970	3.3/4	12“	3	—	—	059224
		Y	0.4040	3.7/8	12“	3	—	—	059225
13/32			0.4063	3.7/8	12“	3	059026	—	—
		Z	0.4130	3.7/8	12“	3	—	—	059226
27/64			0.4219	3.15/16	12“	3	059027	—	—
7/16			0.4375	4.1/16	12“	3	059028	—	—
29/64			0.4531	4.3/16	12“	3	059029	—	—
15/32			0.4687	4.5/16	12“	3	059030	—	—
31/64			0.4844	4.3/8	12“	3	059031	—	—
1/2			0.5000	4.1/2	12“	3	059032	—	—

AIRCRAFT EXTENSION DRILL

Heavy Duty Cobalt Aircraft Extension (NAS 907 Type J)

CO500-6 - *Fractional Sizes, 6" Over All Length*

CO501-6 - *Wire Gauge Sizes, 6" Over All Length*

CO500-12 - *Fractional Sizes, 12" Over All Length*

CO501-12 - *Wire Gauge Sizes, 12" Over All Length*

Low thrust design self centering 135° Split Point for easier penetration. Low thrust design. Cobalt base material with Bronze Oxide for wear resistance and lubricity. For enhanced tool life in ferrous materials.

d_1 Ø Inch	d_1	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	CO500-6	CO501-6	CO500-12	CO501-12
1/16		0.0625	7/8	12"	12	—	—	052604	—
1/16		0.0625	7/8	6"	12	053604	—	—	—
	52	0.0635	7/8	6"	12	—	053752	—	—
	51	0.0670	1"	6"	12	—	053751	—	—
	50	0.0700	1"	6"	12	—	053750	—	—
	49	0.0730	1"	6"	12	—	053749	—	—
	48	0.0760	1"	6"	12	—	053748	—	—
5/64		0.0781	1"	12"	12	—	—	052605	—
5/64		0.0781	1"	6"	12	053605	—	—	—
	47	0.0785	1"	6"	12	—	053747	—	—
	46	0.0810	1.1/8	6"	12	—	053746	—	—
	45	0.0820	1.1/8	6"	12	—	053745	—	—
	44	0.0860	1.1/8	6"	12	—	053744	—	—
	43	0.0890	1.1/4	6"	12	—	053743	—	—
	42	0.0935	1.1/4	6"	12	—	053742	—	—
3/32		0.0938	1.1/4	12"	12	—	—	052606	—
3/32		0.0938	1.1/4	6"	12	053606	—	—	—
	41	0.0960	1.3/8	6"	12	—	053741	—	—
	40	0.0980	1.3/8	12"	12	—	—	—	052840
	40	0.0980	1.3/8	6"	12	—	053740	—	—
	39	0.0995	1.3/8	6"	12	—	053739	—	—
	38	0.1015	1.7/16	6"	12	—	053738	—	—
	37	0.1040	1.7/16	6"	12	—	053737	—	—
	36	0.1065	1.7/16	6"	12	—	053736	—	—
7/64		0.1094	1.1/2	12"	12	—	—	052607	—
7/64		0.1094	1.1/2	6"	12	053607	—	—	—
	35	0.1100	1.1/2	6"	12	—	053735	—	—
	34	0.1110	1.1/2	6"	12	—	053734	—	—
	33	0.1130	1.1/2	6"	12	—	053733	—	—
	32	0.1160	1.5/8	6"	12	—	053732	—	—
	31	0.1200	1.5/8	6"	12	—	053731	—	—
1/8		0.1250	1.5/8	12"	12	—	—	052608	—
1/8		0.1250	1.5/8	6"	12	053608	—	—	—

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	CO500-6	CO501-6	CO500-12	CO501-12
	30	0.1285	1.5/8	12“	12	—	—	—	052830
	30	0.1285	1.5/8	6“	12	—	053730	—	—
	29	0.1360	1.3/4	12“	12	—	—	—	052829
	29	0.1360	1.3/4	6“	12	—	053729	—	—
	28	0.1405	1.3/4	6“	12	—	053728	—	—
9/64		0.1406	1.3/4	12“	12	—	—	052609	—
9/64		0.1406	1.3/4	6“	12	053609	—	—	—
	27	0.1440	1.7/8	12“	12	—	—	—	052827
	27	0.1440	1.7/8	6“	12	—	053727	—	—
	26	0.1470	1.7/8	6“	12	—	053726	—	—
	25	0.1495	1.7/8	6“	12	—	053725	—	—
	24	0.1520	2“	6“	12	—	053724	—	—
	23	0.1540	2“	6“	12	—	053723	—	—
5/32		0.1563	2“	12“	12	—	—	052610	—
5/32		0.1563	2“	6“	12	053610	—	—	—
	22	0.1570	2“	6“	12	—	053722	—	—
	21	0.1590	2.1/8	12“	12	—	—	—	052821
	21	0.1590	2.1/8	6“	12	—	053721	—	—
	20	0.1610	2.1/8	12“	12	—	—	—	052820
	20	0.1610	2.1/8	6“	12	—	053720	—	—
	19	0.1660	2.1/8	12“	12	—	—	—	052819
	19	0.1660	2.1/8	6“	12	—	053719	—	—
	18	0.1695	2.1/8	6“	12	—	053718	—	—
11/64		0.1719	2.1/8	12“	12	—	—	052611	—
11/64		0.1719	2.1/8	6“	12	053611	—	—	—
	17	0.1730	2.3/16	6“	12	—	053717	—	—
	16	0.1770	2.3/16	12“	12	—	—	—	052816
	16	0.1770	2.3/16	6“	12	—	053716	—	—
	15	0.1800	2.3/16	6“	12	—	053715	—	—
	14	0.1820	2.3/16	6“	12	—	053714	—	—
	13	0.1850	2.5/16	6“	12	—	053713	—	—
3/16		0.1875	2.5/16	12“	6	—	—	052612	—
3/16		0.1875	2.5/16	6“	12	053612	—	—	—
	12	0.1890	2.5/16	6“	12	—	053712	—	—
	11	0.1910	2.5/16	12“	12	—	—	—	052811
	11	0.1910	2.5/16	6“	12	—	053711	—	—
	10	0.1935	2.7/16	12“	6	—	—	—	052810
	10	0.1935	2.7/16	6“	12	—	053710	—	—
	9	0.1960	2.7/16	6“	12	—	053709	—	—
	8	0.1990	2.7/16	6“	12	—	053708	—	—
	7	0.2010	2.7/16	6“	12	—	053707	—	—
13/64		0.2031	2.7/16	12“	6	—	—	052613	—
13/64		0.2031	2.7/16	6“	12	053613	—	—	—
	6	0.2040	2.1/2	6“	12	—	053706	—	—
	5	0.2055	2.1/2	6“	12	—	053705	—	—
	4	0.2090	2.1/2	6“	12	—	053704	—	—
	3	0.2130	2.1/2	6“	12	—	053703	—	—
7/32		0.2188	2.1/2	12“	6	—	—	052614	—
7/32		0.2188	2.1/2	6“	12	053614	—	—	—
	2	0.2210	2.5/8	12“	6	—	—	—	052802
	2	0.2210	2.5/8	6“	12	—	053702	—	—
	1	0.2280	2.5/8	6“	12	—	053701	—	—
15/64		0.2344	2.5/8	12“	6	—	—	052615	—
15/64		0.2344	2.5/8	6“	12	053615	—	—	—
1/4		0.2500	2.3/4	12“	6	—	—	052616	—
1/4		0.2500	2.3/4	6“	12	053616	—	—	—

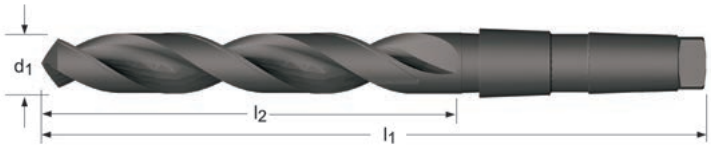
TAPER SHANK DRILL

General Purpose Taper Shank

209 Standard Taper Type

S209 Small Taper Type

Steam Oxide for increased tool life & lubricity.



209	S209
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
1/8 - 2“	1/2 - 2“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
1/8	0.1250	1.7/8	5.1/8	1	1	020008	—
9/64	0.1406	2.1/8	5.3/8	1	1	020009	—
5/32	0.1563	2.1/8	5.3/8	1	1	020010	—
11/64	0.1719	2.1/2	5.3/4	1	1	020011	—
3/16	0.1875	2.1/2	5.3/4	1	1	020012	—
13/64	0.2031	2.3/4	6“	1	1	020013	—
7/32	0.2188	2.3/4	6“	1	1	020014	—
15/64	0.2344	2.7/8	6.1/8	1	1	020015	—
1/4	0.2500	2.7/8	6.1/8	1	1	020016	—
17/64	0.2656	3“	6.1/4	1	1	020017	—
9/32	0.2813	3“	6.1/4	1	1	020018	—
19/64	0.2969	3.1/8	6.3/8	1	1	020019	—
5/16	0.3125	3.1/8	6.3/8	1	1	020020	—
21/64	0.3281	3.1/4	6.1/2	1	1	020021	—
11/32	0.3437	3.1/4	6.1/2	1	1	020022	—
23/64	0.3594	3.1/2	6.3/4	1	1	020023	—
3/8	0.3750	3.1/2	6.3/4	1	1	020024	—
25/64	0.3906	3.5/8	7“	1	1	020025	—
13/32	0.4063	3.5/8	7“	1	1	020026	—
27/64	0.4219	3.7/8	7.1/4	1	1	020027	—
7/16	0.4375	3.7/8	7.1/4	1	1	020028	—
29/64	0.4531	4.1/8	7.1/2	1	1	020029	—
15/32	0.4687	4.1/8	7.1/2	1	1	020030	—
31/64	0.4844	4.3/8	8.1/4	2	1	020031	—
1/2	0.5000	4.3/8	7.3/4	1	1	—	023032
1/2	0.5000	4.3/8	8.1/4	2	1	020032	—
33/64	0.5156	4.5/8	8“	1	1	—	023033
33/64	0.5156	4.5/8	8.1/2	2	1	020033	—
17/32	0.5313	4.5/8	8“	1	1	—	023034
17/32	0.5313	4.5/8	8.1/2	2	1	020034	—
35/64	0.5469	4.7/8	8.1/4	1	1	—	023035
35/64	0.5469	4.7/8	8.3/4	2	1	020035	—
9/16	0.5625	4.7/8	8.1/4	1	1	—	023036

TAPER SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
9/16	0.5625	4.7/8	8.3/4	2	1	020036	—
37/64	0.5781	4.7/8	8.3/4	2	1	020037	—
19/32	0.5937	4.7/8	8.3/4	2	1	020038	—
39/64	0.6094	4.7/8	8.3/4	2	1	020039	—
5/8	0.6250	4.7/8	8.3/4	2	1	020040	—
41/64	0.6406	5.1/8	9“	2	1	020041	—
21/32	0.6563	5.1/8	9“	2	1	020042	—
43/64	0.6719	5.3/8	9.1/4	2	1	020043	—
11/16	0.6875	5.3/8	9.1/4	2	1	020044	—
45/64	0.7031	5.5/8	9.1/2	2	1	020045	—
23/32	0.7188	5.5/8	9.1/2	2	1	020046	—
47/64	0.7344	5.7/8	9.3/4	2	1	020047	—
3/4	0.7500	5.7/8	9.3/4	2	1	020048	—
49/64	0.7656	6“	9.7/8	2	1	020049	—
25/32	0.7813	6“	9.7/8	2	1	020050	—
51/64	0.7969	6.1/8	10“	2	1	—	023051
51/64	0.7969	6.1/8	10.3/4	3	1	020051	—
13/16	0.8125	6.1/8	10“	2	1	—	023052
13/16	0.8125	6.1/8	10.3/4	3	1	020052	—
53/64	0.8281	6.1/8	10“	2	1	—	023053
53/64	0.8281	6.1/8	10.3/4	3	1	020053	—
27/32	0.8438	6.1/8	10“	2	1	—	023054
27/32	0.8438	6.1/8	10.3/4	3	1	020054	—
55/64	0.8594	6.1/8	10.3/4	3	1	020055	—
7/8	0.8750	6.1/8	10“	2	1	—	023056
7/8	0.8750	6.1/8	10.3/4	3	1	020056	—
57/64	0.8906	6.1/8	10.3/4	3	1	020057	—
29/32	0.9063	6.1/8	10“	2	1	—	023058
29/32	0.9063	6.1/8	10.3/4	3	1	020058	—
59/64	0.9219	6.1/8	10.3/4	3	1	020059	—
15/16	0.9375	6.1/8	10.3/4	3	1	020060	—
61/64	0.9531	6.3/8	11“	3	1	020061	—
31/32	0.9688	6.3/8	11“	3	1	020062	—
63/64	0.9844	6.3/8	11“	3	1	020063	—
1“	1.0000	6.3/8	11“	3	1	020100	—
1.1/64	1.0156	6.1/2	11.1/8	3	1	020101	—
1.1/32	1.0312	6.1/2	11.1/8	3	1	020102	—
1.3/64	1.0469	6.5/8	11.1/4	3	1	020103	—
1.1/16	1.0625	6.5/8	11.1/4	3	1	020104	—
1.5/64	1.0781	6.7/8	12.1/2	4	1	020105	—
1.3/32	1.0937	6.7/8	11.1/2	3	1	—	023106
1.3/32	1.0937	6.7/8	12.1/2	4	1	020106	—
1.7/64	1.1094	7.1/8	11.3/4	3	1	—	023107
1.7/64	1.1094	7.1/8	12.3/4	4	1	020107	—
1.1/8	1.1250	7.1/8	11.3/4	3	1	—	023108
1.1/8	1.1250	7.1/8	12.3/4	4	1	020108	—
1.9/64	1.1406	7.1/4	11.7/8	3	1	—	023109
1.9/64	1.1406	7.1/4	12.7/8	4	1	020109	—
1.5/32	1.1563	7.1/4	11.7/8	3	1	—	023110
1.5/32	1.1563	7.1/4	12.7/8	4	1	020110	—
1.11/64	1.1719	7.3/8	12“	3	1	—	023111
1.11/64	1.1719	7.3/8	13“	4	1	020111	—
1.3/16	1.1875	7.3/8	12“	3	1	—	023112
1.3/16	1.1875	7.3/8	13“	4	1	020112	—
1.13/64	1.2031	7.1/2	12.1/8	3	1	—	023113
1.7/32	1.2187	7.1/2	12.1/8	3	1	—	023114
1.7/32	1.2187	7.1/2	13.1/8	4	1	020114	—
1.15/64	1.2344	7.7/8	13.1/2	4	1	020115	—
1.1/4	1.2500	7.7/8	12.1/2	3	1	—	023116
1.1/4	1.2500	7.7/8	13.1/2	4	1	020116	—
1.17/64	1.2656	8.1/2	14.1/8	4	1	020117	—
1.9/32	1.2813	8.1/2	14.1/8	4	1	020118	—
1.19/64	1.2969	8.5/8	14.1/4	4	1	020119	—
1.5/16	1.3125	8.5/8	14.1/4	4	1	020120	—
1.21/64	1.3281	8.3/4	14.3/8	4	1	020121	—
1.11/32	1.3437	8.3/4	14.3/8	4	1	020122	—

TAPER SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
1.3/8	1.3750	8.7/8	14.1/2	4	1	020124	—
1.13/32	1.4063	9“	14.5/8	4	1	020126	—
1.27/64	1.4219	9.1/8	14.3/4	4	1	020127	—
1.7/16	1.4375	9.1/8	14.3/4	4	1	020128	—
1.15/32	1.4687	9.1/4	14.7/8	4	1	020130	—
1.31/64	1.4844	9.3/8	15“	4	1	020131	—
1.1/2	1.5000	9.3/8	15“	4	1	020132	—
1.33/64	1.5156	9.3/8	15“	4	1	—	023133
1.17/32	1.5313	9.3/8	15“	4	1	—	023134
1.17/32	1.5313	9.3/8	16.3/8	5	1	020134	—
1.35/64	1.5469	9.5/8	15.1/4	4	1	—	023135
1.9/16	1.5625	9.5/8	15.1/4	4	1	—	023136
1.9/16	1.5625	9.5/8	16.5/8	5	1	020136	—
1.19/32	1.5937	9.7/8	15.1/2	4	1	—	023138
1.39/64	1.6094	10“	15.5/8	4	1	—	023139
1.5/8	1.6250	10“	15.5/8	4	1	—	023140
1.5/8	1.6250	10“	17“	5	1	020140	—
1.21/32	1.6563	10.1/8	15.3/4	4	1	—	023142
1.11/16	1.6875	10.1/8	15.3/4	4	1	—	023144
1.11/16	1.6875	10.1/8	17.1/8	5	1	020144	—
1.47/64	1.7344	10.3/8	16.1/4	4	1	—	023147
1.3/4	1.7500	10.1/8	17.1/8	5	1	020148	—
1.3/4	1.7500	10.3/8	16.1/4	4	1	—	023148
1.25/32	1.7813	10.3/8	16.1/4	4	1	—	023150
1.13/16	1.8125	10.1/8	17.1/8	5	1	020152	—
1.13/16	1.8125	10.3/8	16.1/4	4	1	—	023152
1.7/8	1.8750	10.1/2	16.1/2	4	1	—	023156
1.7/8	1.8750	10.3/8	17.3/8	5	1	020156	—
1.15/16	1.9375	10.3/8	17.3/8	5	1	020160	—
1.15/16	1.9375	10.5/8	16.5/8	4	1	—	023160
1.31/32	1.9687	10.5/8	16.5/8	4	1	—	023162
2“	2.0000	10.3/8	17.3/8	5	1	020200	—
2“	2.0000	10.5/8	16.5/8	4	1	—	023200

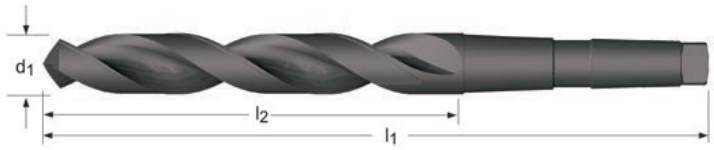
TAPER SHANK DRILL

General Purpose Taper Shank, Metric

5ATS Steam Oxide for increased wear resistance & lubricity.

A350 Long series. Steam Oxide for increased wear resistance & lubricity.

A530 TiN Coating increases wear resistance and improves tool life. Thinned Point design above 14mm diameter to reduce thrust and improve chip formation.



	5ATS	A350	A530
	DIN 345	DIN 341	DIN 345
	4XD	6XD	4XD
	HSS	HSS	HSS
	118°	118°	118°
	5.00 - 50.00	5.00 - 50.00	8.50 - 40.00

d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
5.00	0.1969	74	155	1	1	—	0034071	—
5.00	0.1969	52	133	1	1	026050	—	—
5.50	0.2165	80	161	1	1	—	0034088	—
5.50	0.2165	57	138	1	1	026055	—	—
6.00	0.2362	80	161	1	1	—	0034118	—
6.00	0.2362	57	138	1	1	026060	—	—
6.50	0.2559	63	144	1	1	026065	—	—
6.70	0.2638	86	167	1	1	—	0034125	—
6.80	0.2677	93	174	1	1	—	0034149	—
6.80	0.2677	69	150	1	1	026068	—	—
7.00	0.2756	93	174	1	1	—	0034156	—
7.00	0.2756	69	150	1	1	026070	—	—
7.50	0.2953	93	174	1	1	—	0034163	—
7.50	0.2953	69	150	1	1	026075	—	—
8.00	0.3150	100	181	1	1	—	0034187	—
8.00	0.3150	75	156	1	1	026080	—	—
8.40	0.3307	100	181	1	1	—	0034200	—
8.50	0.3346	100	181	1	1	—	0034217	—
8.50	0.3346	75	156	1	1	026085	—	0041277
8.75	0.3445	107	188	1	1	—	0034224	—
9.00	0.3543	107	188	1	1	—	0034248	—
9.00	0.3543	81	162	1	1	026090	—	0041284
9.50	0.3740	107	188	1	1	—	0034279	—
9.50	0.3740	81	162	1	1	026095	—	—
9.80	0.3858	116	197	1	1	—	0034293	—
10.00	0.3937	116	197	1	1	—	0033241	—
10.00	0.3937	87	168	1	1	026100	—	0040713
10.20	0.4016	116	197	1	1	—	0033265	—
10.20	0.4016	87	168	1	1	026102	—	0040720
10.50	0.4134	116	197	1	1	—	0033289	—
10.50	0.4134	87	168	1	1	026105	—	0040737
10.70	0.4213	125	206	1	1	—	0033296	—
11.00	0.4331	125	206	1	1	—	0033319	—

TAPER SHANK DRILL

d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
11.00	0.4331	94	175	1	1	026110	—	0040744
11.50	0.4528	125	206	1	1	—	0033333	—
11.50	0.4528	94	175	1	1	026115	—	0040751
11.75	0.4626	125	206	1	1	—	0033340	—
11.75	0.4626	94	175	1	1	—	—	0040768
11.80	0.4646	125	206	1	1	—	0033357	—
12.00	0.4724	134	215	1	1	—	0033364	—
12.00	0.4724	101	182	1	1	026120	—	0040775
12.20	0.4803	101	182	1	1	026122	—	—
12.50	0.4921	134	215	1	1	—	0033395	—
12.50	0.4921	101	182	1	1	026125	—	0040799
12.80	0.5039	101	182	1	1	026128	—	—
13.00	0.5118	134	215	1	1	—	0033401	—
13.00	0.5118	101	182	1	1	026130	—	0040812
13.50	0.5315	142	223	1	1	—	0033418	—
13.50	0.5315	108	189	1	1	026135	—	0040829
13.80	0.5433	108	189	1	1	026138	—	—
14.00	0.5512	142	223	1	1	—	0033432	—
14.00	0.5512	108	189	1	1	026140	—	0040836
14.25	0.5610	147	245	2	1	—	0033449	—
14.25	0.5610	114	212	2	1	026142	—	—
14.50	0.5709	147	245	2	1	—	0033456	—
14.50	0.5709	114	212	2	1	026145	—	0040850
14.75	0.5807	147	245	2	1	—	0033463	—
14.75	0.5807	114	212	2	1	026147	—	—
15.00	0.5906	147	245	2	1	—	0033470	—
15.00	0.5906	114	212	2	1	026150	—	0040874
15.25	0.6004	120	218	2	1	—	—	0040881
15.25	0.6004	153	251	2	1	—	0033487	—
15.50	0.6102	153	251	2	1	—	0033494	—
15.50	0.6102	120	218	2	1	026155	—	0040898
15.75	0.6201	153	251	2	1	—	0033500	—
15.75	0.6201	120	218	2	1	026157	—	—
16.00	0.6299	153	251	2	1	—	0033517	—
16.00	0.6299	120	218	2	1	026160	—	0040911
16.25	0.6398	159	257	2	1	—	0033524	—
16.50	0.6496	159	257	2	1	—	0033531	—
16.50	0.6496	125	223	2	1	026165	—	0040935
16.75	0.6594	159	257	2	1	—	0033548	—
17.00	0.6693	159	257	2	1	—	0033555	—
17.00	0.6693	125	223	2	1	026170	—	0040942
17.25	0.6791	165	263	2	1	—	0033562	—
17.50	0.6890	165	263	2	1	—	0033579	—
17.50	0.6890	130	228	2	1	026175	—	0040966
18.00	0.7087	165	263	2	1	—	0033593	—
18.00	0.7087	130	228	2	1	026180	—	0040980
18.50	0.7283	171	269	2	1	—	0033616	—
18.50	0.7283	135	233	2	1	026185	—	0040997
19.00	0.7480	171	269	2	1	—	0033623	—
19.00	0.7480	135	233	2	1	026190	—	0041017
19.50	0.7677	177	275	2	1	—	0033647	—
19.50	0.7677	140	238	2	1	026195	—	0041024
19.75	0.7776	177	275	2	1	—	0033654	—
20.00	0.7874	177	275	2	1	—	0033661	—
20.00	0.7874	140	238	2	1	026200	—	0041048
20.25	0.7972	184	282	2	1	—	0033678	—
20.50	0.8071	184	282	2	1	—	0033685	—
20.50	0.8071	145	243	2	1	026205	—	0041055
21.00	0.8268	184	282	2	1	—	0033692	—
21.00	0.8268	145	243	2	1	026210	—	0041062
21.50	0.8465	191	289	2	1	—	0033708	—
21.50	0.8465	150	248	2	1	026215	—	0041079
22.00	0.8661	191	289	2	1	—	0033715	—
22.00	0.8661	150	248	2	1	026220	—	0041086
22.50	0.8858	198	296	2	1	—	0033722	—
22.50	0.8858	155	253	2	1	026225	—	0041093

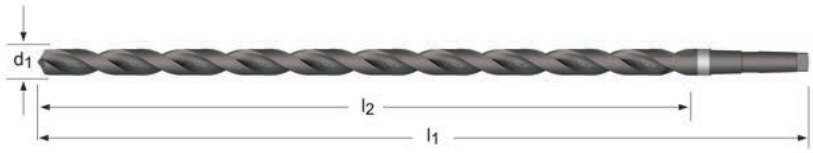
TAPER SHANK DRILL

d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
23.00	0.9055	198	296	2	1	—	0033739	—
23.00	0.9055	155	253	2	1	026230	—	0041109
23.50	0.9252	198	319	3	1	—	0033746	—
23.50	0.9252	155	276	3	1	026235	—	0041116
24.00	0.9449	206	327	3	1	—	0033753	—
24.00	0.9449	160	281	3	1	026240	—	0041123
24.50	0.9646	206	327	3	1	—	0033760	—
24.50	0.9646	160	281	3	1	026245	—	0041130
25.00	0.9843	206	327	3	1	—	0033777	—
25.00	0.9843	160	281	3	1	026250	—	0041147
25.50	1.0039	165	286	3	1	—	—	0041154
25.50	1.0039	214	335	3	1	—	0033784	—
26.00	1.0236	214	335	3	1	—	0033791	—
26.00	1.0236	165	286	3	1	026260	—	0041161
26.50	1.0433	214	335	3	1	—	0033807	—
26.50	1.0433	165	286	3	1	026265	—	0041178
27.00	1.0630	222	343	3	1	—	0033814	—
27.00	1.0630	170	291	3	1	026270	—	0041185
27.50	1.0827	170	291	3	1	—	—	0041192
27.50	1.0827	222	343	3	1	—	0033821	—
28.00	1.1024	222	343	3	1	—	0033838	—
28.00	1.1024	170	291	3	1	026280	—	0041208
28.50	1.1220	175	296	3	1	—	—	0041215
29.00	1.1417	230	351	3	1	—	0033845	—
29.00	1.1417	175	296	3	1	026290	—	0041222
29.50	1.1614	175	296	3	1	—	—	0041239
30.00	1.1811	230	351	3	1	—	0033852	—
30.00	1.1811	175	296	3	1	026300	—	0041246
30.50	1.2008	239	360	3	1	—	0033869	—
31.00	1.2205	239	360	3	1	—	0033876	—
31.00	1.2205	180	301	3	1	026310	—	0041253
31.50	1.2402	239	360	3	1	—	0033883	—
32.00	1.2598	248	397	4	1	—	0033890	—
32.00	1.2598	185	334	4	1	026320	—	0041260
33.00	1.2992	185	334	4	1	—	—	0148433
33.00	1.2992	248	397	4	1	—	0033906	—
34.00	1.3386	257	406	4	1	—	0033913	—
34.00	1.3386	190	339	4	1	026340	—	—
35.00	1.3780	257	406	4	1	—	0033920	—
35.00	1.3780	190	339	4	1	026350	—	0148457
36.00	1.4173	267	416	4	1	—	0033937	—
36.00	1.4173	195	344	4	1	026360	—	—
37.00	1.4567	267	416	4	1	—	0033944	—
37.00	1.4567	195	344	4	1	026370	—	—
38.00	1.4961	277	426	4	1	—	0033951	—
38.00	1.4961	200	349	4	1	026380	—	—
39.00	1.5354	277	426	4	1	—	0033968	—
40.00	1.5748	277	426	4	1	—	0033975	—
40.00	1.5748	200	349	4	1	026400	—	0148471
41.00	1.6142	287	436	4	1	—	0033982	—
42.00	1.6535	287	436	4	1	—	0033999	—
42.00	1.6535	205	354	4	1	026420	—	—
43.00	1.6929	298	447	4	1	—	0034002	—
44.00	1.7323	298	447	4	1	—	0034019	—
44.00	1.7323	210	359	4	1	026440	—	—
45.00	1.7717	298	447	4	1	—	0034026	—
46.00	1.8110	310	459	4	1	—	0034033	—
47.00	1.8504	310	459	4	1	—	0034040	—
48.00	1.8898	321	470	4	1	—	0034057	—
50.00	1.9685	321	470	4	1	—	0034101	—
50.00	1.9685	220	369	4	1	026500	—	—

DORMER TAPER SHANK DRILL

General Purpose Taper Shank - Extra Length

A345 Steam Oxide for increase wear resistance & lubricity.



A345

DIN 1870/1

10XD

HSS

118°

8.00 - 50.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A345
	8.00	0.3150	165	265	1	1	0418383
	8.50	0.3346	165	265	1	1	0418390
	9.00	0.3543	175	275	1	1	0418406
	9.50	0.3740	175	275	1	1	0420201
3/8	9.52	0.3750	185	285	1	1	0418307
	10.00	0.3937	185	285	1	1	0418062
13/32	10.32	0.4063	185	285	1	1	0418116
	10.50	0.4134	185	285	1	1	0420171
	11.00	0.4331	195	300	1	1	0418079
7/16	11.11	0.4375	195	300	1	1	0418369
	11.50	0.4528	195	300	1	1	0419564
29/64	11.51	0.4531	205	310	1	1	0418284
	12.00	0.4724	205	310	1	1	0418093
	12.50	0.4921	205	310	1	1	0419571
1/2	12.70	0.5000	205	310	1	1	0418055
	13.00	0.5118	205	310	1	1	0418109
17/32	13.49	0.5313	220	325	1	1	0418161
	13.50	0.5315	220	325	1	1	0419588
	14.00	0.5512	220	325	1	1	0418123
9/16	14.29	0.5625	220	340	2	1	0418413
37/64	14.68	0.5781	220	340	2	1	0418321
	15.00	0.5906	220	340	2	1	0418130
39/64	15.48	0.6094	230	355	2	1	0418338
	15.50	0.6102	230	355	2	1	0419601
5/8	15.88	0.6250	230	355	2	1	0418352
	16.00	0.6299	230	355	2	1	0418147
41/64	16.27	0.6406	230	355	2	1	0418345
	16.50	0.6496	230	355	2	1	0419618
21/32	16.67	0.6563	230	355	2	1	0418215
	17.00	0.6693	230	355	2	1	0418154
11/16	17.46	0.6875	245	370	2	1	0418086
	17.50	0.6890	245	370	2	1	0419625

TAPER SHANK DRILL

DORMER

d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A345
	18.00	0.7087	245	370	2	1	0418178
	18.50	0.7283	245	370	2	1	0419632
	19.00	0.7480	245	370	2	1	0418185
3/4	19.05	0.7500	260	385	2	1	0418291
	19.50	0.7677	260	385	2	1	0419649
	20.00	0.7874	260	385	2	1	0418192
	20.50	0.8071	260	385	2	1	0419656
	21.00	0.8268	260	385	2	1	0418208
	21.50	0.8465	270	405	2	1	0419663
	22.00	0.8661	270	405	2	1	0418222
7/8	22.22	0.8750	270	405	2	1	0418376
	22.50	0.8858	270	405	2	1	0419670
	23.00	0.9055	270	405	2	1	0419687
	23.50	0.9252	270	425	3	1	0419694
	24.00	0.9449	290	440	3	1	0418239
	24.50	0.9646	290	440	3	1	0419700
	25.00	0.9843	290	440	3	1	0418246
1“	25.40	1.0000	290	440	3	1	0418031 [1]
	25.50	1.0039	290	440	3	1	0419717 [1]
	26.00	1.0236	290	440	3	1	0418253 [1]
	26.50	1.0433	290	440	3	1	0419724 [1]
	27.00	1.0630	305	460	3	1	0418260 [1]
	28.00	1.1024	305	460	3	1	0418277 [1]
	29.00	1.1417	305	460	3	1	0419731 [1]
	30.00	1.1811	305	460	3	1	0418314 [1]
1.1/4	31.75	1.2500	320	480	3	1	0418048 [1]
	31.00	1.2205	320	480	3	1	0419748 [1]
	32.00	1.2598	320	505	4	1	0419755 [1]
	33.00	1.2992	320	505	4	1	0422564 [1]
	34.00	1.3386	340	530	4	1	0419762 [1]
	35.00	1.3780	340	530	4	1	0419779 [1]
	36.00	1.4173	340	530	4	1	0419786 [1]
	37.00	1.4567	340	530	4	1	0419793 [1]
	38.00	1.4961	360	555	4	1	0419809 [1]
1.1/2	38.10	1.5000	360	555	4	1	0419540 [1]
	39.00	1.5354	360	555	4	1	0419816 [1]
	40.00	1.5748	360	555	4	1	0419823 [1]
	41.00	1.6142	360	555	4	1	0419830 [1]
	42.00	1.6535	360	555	4	1	0419847 [1]
1.3/4	44.45	1.7500	385	585	4	1	0419557 [1]
	45.00	1.7717	385	585	4	1	0419854 [1]
	48.00	1.8898	405	605	4	1	0419861 [1]
	50.00	1.9685	405	605	4	1	0419878 [1]

[1] < 10xD

TAPER SHANK DRILL

General Purpose Parabolic Flute Taper Shank - Extra Length, Metric

A951
A952

Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Bright Finish in flutes improves chip flow for soft or non-ferrous materials.

∗ Lands are steam oxide for increased wear resistance & lubricity.

A951	A952
DIN 1870/1	DIN 1870/2
15XD	20XD
HSS	HSS
130°	130°
10.00 - 30.00	8.00 - 40.00

d_1 Øh8 mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A951	A952
8.00	0.3150	210	330	1	1	—	0423639
8.50	0.3346	210	330	1	1	—	0423646
9.00	0.3543	220	345	1	1	—	0423653
10.00	0.3937	185	285	1	1	0418420	—
10.00	0.3937	235	360	1	1	—	0419885
10.50	0.4134	235	360	1	1	—	0419892
11.00	0.4331	195	300	1	1	0418437	—
11.00	0.4331	250	375	1	1	—	0419908
11.50	0.4528	250	375	1	1	—	0419915
12.00	0.4724	205	310	1	1	0418444	—
12.00	0.4724	260	395	1	1	—	0419922
12.50	0.4921	205	310	1	1	0418451	—
12.50	0.4921	260	395	1	1	—	0419939
13.00	0.5118	205	310	1	1	0418468	—
13.00	0.5118	260	395	1	1	—	0420188
13.50	0.5315	220	325	1	1	0418475	—
13.50	0.5315	275	410	1	1	—	0419946
14.00	0.5512	220	325	1	1	0418482	—
14.00	0.5512	275	410	1	1	—	0419953
14.50	0.5709	220	340	2	1	0418499 [1)]	—
14.50	0.5709	275	425	2	1	—	0419960 [2)]
15.00	0.5906	220	340	2	1	0418505 [1)]	—
15.00	0.5906	275	425	2	1	—	0419977 [2)]
15.50	0.6102	230	355	2	1	0418512 [1)]	—
15.50	0.6102	295	445	2	1	—	0419984 [2)]
16.00	0.6299	230	355	2	1	0418529 [1)]	—
16.00	0.6299	295	445	2	1	—	0420195 [2)]
16.50	0.6496	230	355	2	1	0418536 [1)]	—
16.50	0.6496	295	445	2	1	—	0419991 [2)]
17.00	0.6693	230	355	2	1	0418543 [1)]	—
17.00	0.6693	295	445	2	1	—	0420003 [2)]

[1)] < 15xD
[2)] < 20xD

TAPER SHANK DRILL

DORMER

d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A951	A952
17.50	0.6890	245	370	2	1	0418550 [1]	—
17.50	0.6890	310	465	2	1	—	0420010 [2]
18.00	0.7087	245	370	2	1	0418567 [1]	—
18.00	0.7087	310	465	2	1	—	0420027 [2]
18.50	0.7283	245	370	2	1	0418574 [1]	—
18.50	0.7283	310	465	2	1	—	0420034 [2]
19.00	0.7480	245	370	2	1	0418581 [1]	—
19.00	0.7480	310	465	2	1	—	0420041 [2]
19.50	0.7677	260	385	2	1	0418598 [1]	—
19.50	0.7677	325	490	2	1	—	0420058 [2]
20.00	0.7874	260	385	2	1	0418604 [1]	—
20.00	0.7874	325	490	2	1	—	0420065 [2]
21.00	0.8268	260	385	2	1	0418611 [1]	—
21.00	0.8268	325	490	2	1	—	0420072 [2]
22.00	0.8661	270	405	2	1	0418628 [1]	—
22.00	0.8661	345	515	2	1	—	0420089 [2]
23.00	0.9055	270	405	2	1	0418635 [1]	—
23.00	0.9055	345	515	2	1	—	0420096 [2]
24.00	0.9449	290	440	3	1	0418642 [1]	—
24.00	0.9449	365	555	3	1	—	0420102 [2]
25.00	0.9843	290	440	3	1	0418659 [1]	—
25.00	0.9843	365	555	3	1	—	0420119 [2]
26.00	1.0236	290	440	3	1	0418666 [1]	—
26.00	1.0236	365	555	3	1	—	0420126 [2]
27.00	1.0630	305	460	3	1	0418673 [1]	—
27.00	1.0630	385	580	3	1	—	0420133 [2]
28.00	1.1024	305	460	3	1	0418680 [1]	—
28.00	1.1024	385	580	3	1	—	0420140 [2]
29.00	1.1417	305	460	3	1	0418697 [1]	—
29.00	1.1417	385	580	3	1	—	0420157 [2]
30.00	1.1811	305	460	3	1	0418703 [1]	—
30.00	1.1811	385	580	3	1	—	0420164 [2]
31.00	1.2205	410	610	3	1	—	0423585 [2]
32.00	1.2598	410	635	4	1	—	0423592 [2]
33.00	1.2992	410	635	4	1	—	0423608 [2]
34.00	1.3386	430	665	4	1	—	0423660 [2]
35.00	1.3780	430	665	4	1	—	0423677 [2]
38.00	1.4961	460	695	4	1	—	0423615 [2]
40.00	1.5748	460	695	4	1	—	0423622 [2]

[1] < 15xD
[2] < 20xD

COBALT TAPER SHANK DRILL

Cobalt Heavy Duty Taper Shank

209CO Notched Point reduces thrust. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.

209CO

ANSI

4XD

HSS-E

135°

1/4 - 1.1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209CO
1/4	0.2500	2.7/8	6.1/8	1	1	021316
9/32	0.2813	3“	6.1/4	1	1	021318
5/16	0.3125	3.1/8	6.3/8	1	1	021320
11/32	0.3437	3.1/4	6.1/2	1	1	021322
3/8	0.3750	3.1/2	7.3/8	2	1	021324
13/32	0.4063	3.5/8	7.1/2	2	1	021326
27/64	0.4219	3.7/8	7.3/4	2	1	021327
7/16	0.4375	3.7/8	7.3/4	2	1	021328
29/64	0.4531	4.1/8	8“	2	1	021329
15/32	0.4687	4.1/8	8“	2	1	021330
31/64	0.4844	4.3/8	8.1/4	2	1	021331
1/2	0.5000	4.3/8	8.1/4	2	1	021332
33/64	0.5156	4.5/8	8.1/2	2	1	021333
17/32	0.5313	4.5/8	8.1/2	2	1	021334
35/64	0.5469	4.7/8	8.3/4	2	1	021335
9/16	0.5625	4.7/8	8.3/4	2	1	021336
37/64	0.5781	4.7/8	8.3/4	2	1	021337
19/32	0.5937	4.7/8	8.3/4	2	1	021338
39/64	0.6094	4.7/8	8.3/4	2	1	021339
5/8	0.6250	4.7/8	8.3/4	2	1	021340
41/64	0.6406	5.1/8	9“	2	1	021341
21/32	0.6563	5.1/8	9.3/4	3	1	021342
43/64	0.6719	5.3/8	10“	3	1	021343
11/16	0.6875	5.3/8	10“	3	1	021344
45/64	0.7031	5.5/8	10.1/4	3	1	021345
23/32	0.7188	5.5/8	10.1/4	3	1	021348
47/64	0.7344	5.7/8	10.1/2	3	1	021347
3/4	0.7500	5.7/8	10.1/2	3	1	021350
49/64	0.7656	6“	10.5/8	3	1	021349
25/32	0.7813	6“	10.5/8	3	1	021352
51/64	0.7969	6.1/8	10.3/4	3	1	021351
13/16	0.8125	6.1/8	10.3/4	3	1	021354
53/64	0.8281	6.1/8	10.3/4	3	1	021353

COBALT TAPER SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209CO
27/32	0.8438	6.1/8	10.3/4	3	1	021355
55/64	0.8594	6.1/8	10.3/4	3	1	021357
7/8	0.8750	6.1/8	10.3/4	3	1	021356
57/64	0.8906	6.1/8	10.3/4	3	1	021358
29/32	0.9062	6.1/8	10.3/4	3	1	021359
59/64	0.9219	6.1/8	10.3/4	3	1	021362
15/16	0.9375	6.1/8	10.3/4	3	1	021360
61/64	0.9531	6.3/8	11“	3	1	021363
31/32	0.9688	6.3/8	11“	3	1	021364
63/64	0.9844	6.3/8	11“	3	1	021365
1“	1.0000	6.3/8	11“	3	1	021400
1.1/64	1.0156	6.1/2	12.1/8	4	1	021401
1.1/32	1.0312	6.1/2	12.1/8	4	1	021402
1.1/16	1.0625	6.5/8	12.1/4	4	1	021404
1.3/32	1.0937	6.7/8	12.1/2	4	1	021406
1.7/64	1.1094	7.1/8	12.3/4	4	1	021407
1.1/8	1.1250	7.1/8	12.3/4	4	1	021408
1.11/64	1.1719	7.3/8	13“	4	1	021411
1.3/16	1.1875	7.3/8	13“	4	1	021412
1.7/32	1.2188	7.1/2	13.1/8	4	1	021414
1.1/4	1.2500	7.7/8	13.1/2	4	1	021416
1.9/32	1.2813	8.1/2	14.1/8	4	1	021418
1.11/32	1.3437	8.3/4	14.3/8	4	1	021422
1.3/8	1.3750	8.7/8	14.1/2	4	1	021424
1.7/16	1.4375	9.1/8	14.3/4	4	1	021428
1.1/2	1.5000	9.3/8	15“	4	1	021432

COBALT TAPER SHANK DRILL

Metric Cobalt Heavy Duty Taper Shank

A730 Notched Point reduces thrust. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.

A730

DIN 345

4XD

HSS-E

118°

1/4 - 1.1/2

d_1 Ø mm	d_1 decimal mm	l_2 mm	l_1 mm	MTS	Pack Qty	A730
10.00	0.3937	87	168	1	1	0045190
10.20	0.4016	87	168	1	1	0045206
10.50	0.4134	87	168	1	1	0045213
10.80	0.4252	94	175	1	1	0045220
11.00	0.4331	94	175	1	1	0045237
11.50	0.4528	94	175	1	1	0045244
11.80	0.4646	94	175	1	1	0045251
12.00	0.4724	101	182	1	1	0045268
12.20	0.4803	101	182	1	1	0045275
12.50	0.4921	101	182	1	1	0045282
12.80	0.5039	101	182	1	1	0045299
13.00	0.5118	101	182	1	1	0045305
13.50	0.5315	108	189	1	1	0045312
13.80	0.5433	108	189	1	1	0045329
14.00	0.5512	108	189	1	1	0045336
14.25	0.5610	114	212	2	1	0045343
14.50	0.5709	114	212	2	1	0045350
14.75	0.5807	114	212	2	1	0045367
15.00	0.5906	114	212	2	1	0045374
15.25	0.6004	120	218	2	1	0045381
15.50	0.6102	120	218	2	1	0045398
15.75	0.6201	120	218	2	1	0045404
16.00	0.6299	120	218	2	1	0045411
16.25	0.6398	120	218	2	1	0045428
16.50	0.6496	125	223	2	1	0045435
17.00	0.6693	125	223	2	1	0045459
17.25	0.6791	130	228	2	1	0045466
17.50	0.6890	130	228	2	1	0045473
17.75	0.6988	130	228	2	1	0045480
18.00	0.7087	130	228	2	1	0045497
18.25	0.7185	135	233	2	1	0045503
18.50	0.7283	135	233	2	1	0045510
18.75	0.7382	135	233	2		0045527

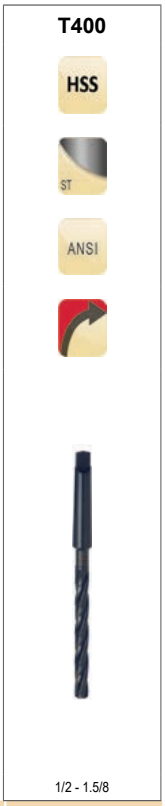
COBALT TAPER SHANK DRILL

d_1 Ø mm	d_1 decimal mm	l_2 mm	l_1 mm	MTS	Pack Qty	A730
19.00	0.7480	135	233	2	1	0045534
19.25	0.7579	140	238	2	1	0045541
19.50	0.7677	140	238	2	1	0045558
19.75	0.7776	140	238	2	1	0045565
20.00	0.7874	140	238	2	1	0045572
20.25	0.7972	145	243	2	1	0045589
20.50	0.8071	145	243	2	1	0045596
20.75	0.8169	145	243	2	1	0045602
21.00	0.8268	145	243	2	1	0045619
21.50	0.8465	150	248	2	1	0045626
22.00	0.8661	150	248	2	1	0045640
22.50	0.8858	155	253	2	1	0045664
23.00	0.9055	155	253	2	1	0045688
23.50	0.9252	155	276	3	1	0045695
24.00	0.9449	160	281	3	1	0045701
24.50	0.9646	160	281	3	1	0045718
25.00	0.9843	160	281	3	1	0045725
25.50	1.0039	165	286	3	1	0045732
26.00	1.0236	165	286	3	1	0045749
26.50	1.0433	165	286	3	1	0045756
27.00	1.0630	170	291	3	1	0045763
27.50	1.0827	170	291	3	1	0045770
28.00	1.1024	170	291	3	1	0045787
28.50	1.1220	175	296	3	1	0045794
29.00	1.1417	175	296	3	1	0045800
30.00	1.1811	175	296	3	1	0045824
31.00	1.2205	180	301	3	1	0045848
32.00	1.2598	185	334	4	1	0045862

HSS CORE DRILL

Taper Shank - 4-Flute

T400 Core drill with taper shank for enlarging pre-drilled or cast holes in a wide range of materials.



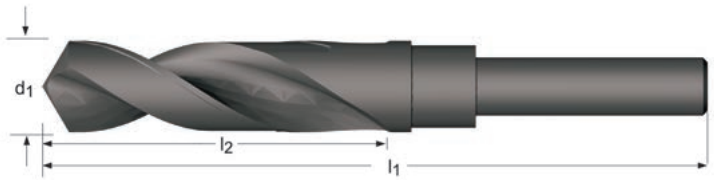
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	T400
1/2	0.5000	4.3/8	8.1/4	2	1	024532
17/32	0.5312	4.5/8	8.1/2	2	1	024534
9/16	0.5625	4.7/8	8.3/4	2	1	024536
5/8	0.6250	4.7/8	8.3/4	2	1	024540
21/32	0.6562	5.1/8	9“	2	1	024542
3/4	0.7500	5.7/8	9.3/4	2	1	024548
25/32	0.7812	6“	9.7/8	2	1	024550
7/8	0.8750	6.1/8	10.3/4	3	1	024556
1“	1.0000	6.3/8	11“	3	1	024600
1.1/32	1.0312	6.1/2	11.1/8	3	1	024602
1.1/16	1.0625	6.5/8	11.1/4	3	1	024604
1.1/8	1.1250	7.1/8	12.3/4	4	1	024608
1.5/32	1.1562	7.1/4	12.7/8	4	1	024610
1.1/4	1.2500	7.7/8	13.1/2	4	1	024616
1.5/16	1.3125	8.5/8	14.1/4	4	1	024620
1.11/32	1.3438	8.3/4	14.3/8	4	1	024622
1.3/8	1.3750	8.7/8	14.1/2	4	1	024624
1.1/2	1.5000	9.3/8	15“	4	1	024632
1.9/16	1.5625	9.5/8	16.5/8	5	1	024636
1.5/8	1.6250	10“	17“	5	1	024640

REDUCED SHANK DRILL

DORMER

General Purpose Reduced Shank - 1/2”Shank

A170 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.



A170

13.00 - 1.1/2

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	A170
	13.00	0.5118			83	156	1	0030165
33/64	13.10	0.5157	3.1/8	6“			1	0121870
17/32	13.49	0.5313	3.1/8	6“			1	0030295
	13.50	0.5315			83	156	1	0030172
35/64	13.89	0.5469	3.1/8	6“			1	0121887
	14.00	0.5512			83	156	1	0030196
9/16	14.29	0.5625	3.1/8	6“			1	0030523
	14.50	0.5709			83	156	1	0030202
37/64	14.68	0.5781	3.1/8	6“			1	0121894
	15.00	0.5906			83	156	1	0030219
19/32	15.08	0.5937	3.1/8	6“			1	0030349
39/64	15.48	0.6094	3.1/8	6“			1	0121900
	15.50	0.6102			83	156	1	0030226
5/8	15.88	0.6250	3.1/8	6“			1	0030509
	16.00	0.6299			84	157	1	0030240
41/64	16.27	0.6406	3.1/8	6“			1	0030479
	16.50	0.6496			84	157	1	0030257
21/32	16.67	0.6563	3.1/8	6“			1	0030370
	17.00	0.6693			84	157	1	0030264
43/64	17.07	0.6719	3.1/8	6“			1	0121917
11/16	17.46	0.6875	3.1/8	6“			1	0030141
	17.50	0.6890			84	157	1	0030271
45/64	17.86	0.7031	3.1/8	6“			1	0030288
	18.00	0.7087			84	157	1	0030301
23/32	18.26	0.7188	3.1/8	6“			1	0030400
	18.50	0.7283			84	157	1	0030318
47/64	18.65	0.7344	3.1/8	6“			1	0121924
	19.00	0.7480			84	157	1	0030325
3/4	19.05	0.7500	3.1/8	6“			1	0030462
49/64	19.45	0.7656	3“	6“			1	0121931
	19.50	0.7677			81	158	1	0030332
25/32	19.84	0.7812	3“	6“			1	0030431
	20.00	0.7874			81	158	1	0030356

REDUCED SHANK DRILL

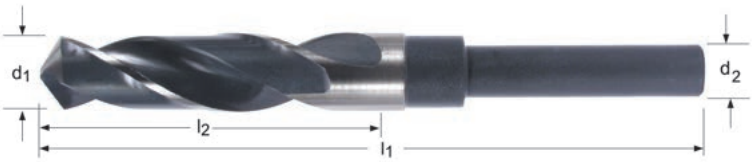
d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	A170
51/64	20.24	0.7969	3“	6“			1	0030486
13/16	20.64	0.8125	3“	6“			1	0030189
	21.00	0.8268			82	158	1	0030363
53/64	21.03	0.8281	3“	6“			1	0121948
27/32	21.43	0.8437	3“	6“			1	0030448
55/64	21.83	0.8594	3“	6“			1	0121955
	22.00	0.8661			82	158	1	0030387
7/8	22.22	0.8750	3“	6“			1	0030516
57/64	22.62	0.8906	3“	6“			1	0030493
	23.00	0.9055			82	158	1	0030394
29/32	23.02	0.9062	3“	6“			1	0121863
59/64	23.42	0.9220	3“	6“			1	0121962
15/16	23.81	0.9375	3“	6“			1	0030233
	24.00	0.9449			83	159	1	0030417
61/64	24.21	0.9531	3“	6“			1	0121979
31/32	24.61	0.9688	3“	6“			1	0030455
	25.00	0.9843			83	159	1	0030424
63/64	25.00	0.9844	3“	6“			1	0121986
1“	25.40	1.0000	3“	6“			1	0030134
1.1/32	26.19	1.0312	3“	6“			1	0172728
1.1/16	26.99	1.0625	3“	6“			1	0172735
1.7/64	28.18	1.1094	3“	6“			1	0238288
1.1/8	28.58	1.1250	3“	6“			1	0172759
1.9/64	28.97	1.1406	3“	6“			1	0238301
1.5/32	29.37	1.1563	3“	6“			1	0172766
1.3/16	30.16	1.1875	3“	6“			1	0172773
1.7/32	30.96	1.2188	3“	6“			1	0172780
1.1/4	31.75	1.2500	3“	6“			1	0172797
1.5/16	33.34	1.3125	3“	6“			1	0172803
1.3/8	34.93	1.3750	3“	6“			1	0172810
1.7/16	36.51	1.4375	3“	6“			1	0172827
1.1/2	38.10	1.5000	3“	6“			1	0172834

REDUCED SHANK DRILL

General Purpose Reduced Shank - 1/2”Shank

✱ *Sets Available on pg. 241*

R56 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.



R56

ANSI

4XD

HSS

118°

33/64 - 1.1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56
33/64	0.5156	3“	6“	1/2	1	091433
17/32	0.5313	3“	6“	1/2	1	091434
35/64	0.5469	3“	6“	1/2	1	091435
9/16	0.5625	3“	6“	1/2	1	091436
37/64	0.5781	3“	6“	1/2	1	091437
19/32	0.5937	3“	6“	1/2	1	091438
39/64	0.6094	3“	6“	1/2	1	091439
5/8	0.6250	3“	6“	1/2	1	091440
41/64	0.6406	3“	6“	1/2	1	091441
21/32	0.6563	3“	6“	1/2	1	091442
43/64	0.6719	3“	6“	1/2	1	091443
11/16	0.6875	3“	6“	1/2	1	091444
45/64	0.7031	3“	6“	1/2	1	091445
23/32	0.7188	3“	6“	1/2	1	091446
47/64	0.7344	3“	6“	1/2	1	091447
3/4	0.7500	3“	6“	1/2	1	091448
49/64	0.7656	3“	6“	1/2	1	091449
25/32	0.7813	3“	6“	1/2	1	091450
51/64	0.7969	3“	6“	1/2	1	091451
13/16	0.8125	3“	6“	1/2	1	091452
53/64	0.8281	3“	6“	1/2	1	091453
27/32	0.8438	3“	6“	1/2	1	091454
55/64	0.8594	3“	6“	1/2	1	091455
7/8	0.8750	3“	6“	1/2	1	091456
57/64	0.8906	3“	6“	1/2	1	091457
29/32	0.9063	3“	6“	1/2	1	091458
59/64	0.9219	3“	6“	1/2	1	091459
15/16	0.9375	3“	6“	1/2	1	091460
61/64	0.9531	3“	6“	1/2	1	091461
31/32	0.9688	3“	6“	1/2	1	091462
63/64	0.9844	3“	6“	1/2	1	091463
1“	1.0000	3“	6“	1/2	1	091464
1.1/64	1.0156	3“	6“	1/2	1	091465

REDUCED SHANK DRILL

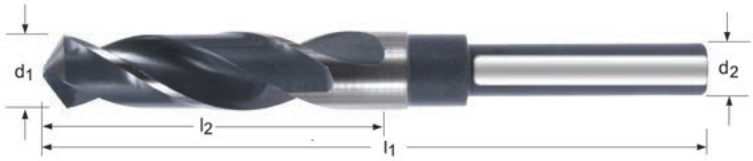
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56
1.1/32	1.0312	3“	6“	1/2	1	091486
1.3/64	1.0469	3“	6“	1/2	1	091467
1.1/16	1.0625	3“	6“	1/2	1	091468
1.5/64	1.0781	3“	6“	1/2	1	091469
1.3/32	1.0937	3“	6“	1/2	1	091470
1.7/64	1.1094	3“	6“	1/2	1	091471
1.1/8	1.1250	3“	6“	1/2	1	091472
1.9/64	1.1406	3“	6“	1/2	1	091473
1.5/32	1.1563	3“	6“	1/2	1	091487
1.11/64	1.1719	3“	6“	1/2	1	091474
1.3/16	1.1875	3“	6“	1/2	1	091476
1.13/64	1.2031	3“	6“	1/2	1	091475
1.7/32	1.2187	3“	6“	1/2	1	091488
1.15/64	1.2344	3“	6“	1/2	1	091477
1.1/4	1.2500	3“	6“	1/2	1	091480
1.9/32	1.2813	3“	6“	1/2	1	091479
1.5/16	1.3125	3“	6“	1/2	1	091482
1.11/32	1.3437	3“	6“	1/2	1	091497
1.3/8	1.3750	3“	6“	1/2	1	091483
1.13/32	1.4063	3“	6“	1/2	1	091492
1.7/16	1.4375	3“	6“	1/2	1	091484
1.15/32	1.4687	3“	6“	1/2	1	091495
1.1/2	1.5000	3“	6“	1/2	1	091485

REDUCED SHANK DRILL

General Purpose Reduced Shank - 1/2”Shank with 3-Flats

✱ *Sets Available on pg. 241*

R57 Silver & Deming Drills with 3-Flat Shank. Steam Oxide for increased wear resistance & lubricity.



R57

ANSI

4XD

HSS

118°

33/64 - 1.1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R57
33/64	0.5156	3“	6“	1/2	1	091533
17/32	0.5313	3“	6“	1/2	1	091534
35/64	0.5469	3“	6“	1/2	1	091535
9/16	0.5625	3“	6“	1/2	1	091536
37/64	0.5781	3“	6“	1/2	1	091537
19/32	0.5937	3“	6“	1/2	1	091538
39/64	0.6094	3“	6“	1/2	1	091539
5/8	0.6250	3“	6“	1/2	1	091540
41/64	0.6406	3“	6“	1/2	1	091541
21/32	0.6563	3“	6“	1/2	1	091542
43/64	0.6719	3“	6“	1/2	1	091543
11/16	0.6875	3“	6“	1/2	1	091544
45/64	0.7031	3“	6“	1/2	1	091545
23/32	0.7188	3“	6“	1/2	1	091546
47/64	0.7344	3“	6“	1/2	1	091547
3/4	0.7500	3“	6“	1/2	1	091548
49/64	0.7656	3“	6“	1/2	1	091549
25/32	0.7813	3“	6“	1/2	1	091550
51/64	0.7969	3“	6“	1/2	1	091551
13/16	0.8125	3“	6“	1/2	1	091552
53/64	0.8281	3“	6“	1/2	1	091553
27/32	0.8438	3“	6“	1/2	1	091554
55/64	0.8594	3“	6“	1/2	1	091555
7/8	0.8750	3“	6“	1/2	1	091556
57/64	0.8906	3“	6“	1/2	1	091557
29/32	0.9063	3“	6“	1/2	1	091558
59/64	0.9219	3“	6“	1/2	1	091559
15/16	0.9375	3“	6“	1/2	1	091560
61/64	0.9531	3“	6“	1/2	1	091561
31/32	0.9688	3“	6“	1/2	1	091562
63/64	0.9844	3“	6“	1/2	1	091563
1“	1.0000	3“	6“	1/2	1	091564
1.1/64	1.0156	3“	6“	1/2	1	091565

REDUCED SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R57
1.1/32	1.0312	3“	6“	1/2	1	091586
1.3/64	1.0469	3“	6“	1/2	1	091567
1.1/16	1.0625	3“	6“	1/2	1	091568
1.5/64	1.0781	3“	6“	1/2	1	091569
1.3/32	1.0937	3“	6“	1/2	1	091570
1.7/64	1.1094	3“	6“	1/2	1	091571
1.1/8	1.1250	3“	6“	1/2	1	091572
1.9/64	1.1406	3“	6“	1/2	1	091573
1.5/32	1.1563	3“	6“	1/2	1	091587
1.11/64	1.1719	3“	6“	1/2	1	091575
1.3/16	1.1875	3“	6“	1/2	1	091576
1.13/64	1.2031	3“	6“	1/2	1	091577
1.7/32	1.2187	3“	6“	1/2	1	091588
1.15/64	1.2344	3“	6“	1/2	1	091579
1.1/4	1.2500	3“	6“	1/2	1	091580
1.9/32	1.2813	3“	6“	1/2	1	091589
1.5/16	1.3125	3“	6“	1/2	1	091582
1.11/32	1.3437	3“	6“	1/2	1	091592
1.3/8	1.3750	3“	6“	1/2	1	091583
1.13/32	1.4063	3“	6“	1/2	1	091595
1.7/16	1.4375	3“	6“	1/2	1	091584
1.15/32	1.4687	3“	6“	1/2	1	091598
1.1/2	1.5000	3“	6“	1/2	1	091585

REDUCED SHANK DRILL

General Purpose Reduced Shank - 3/4”Shank

R58 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity

R58

ANSI

1.5XD

HSS

118°

1“ - 2“

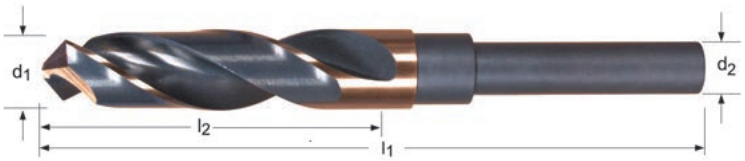
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R58
1“	1.0000	3“	6“	3/4	1	091264
1.1/32	1.0312	3“	6“	3/4	1	091266
1.1/16	1.0625	3“	6“	3/4	1	091268
1.3/32	1.0937	3“	6“	3/4	1	091270
1.1/8	1.1250	3“	6“	3/4	1	091272
1.5/32	1.1563	3“	6“	3/4	1	091274
1.3/16	1.1875	3“	6“	3/4	1	091276
1.7/32	1.2187	3“	6“	3/4	1	091278
1.1/4	1.2500	3“	6“	3/4	1	091280
1.9/32	1.2813	3“	6“	3/4	1	091282
1.5/16	1.3125	3“	6“	3/4	1	091284
1.11/32	1.3437	3“	6“	3/4	1	091286
1.3/8	1.3750	3“	6“	3/4	1	091288
1.13/32	1.4063	3“	6“	3/4	1	091290
1.7/16	1.4375	3“	6“	3/4	1	091292
1.15/32	1.4687	3“	6“	3/4	1	091294
1.1/2	1.5000	3“	6“	3/4	1	091296
1.9/16	1.5625	3“	6“	3/4	1	091298
1.5/8	1.6250	3“	6“	3/4	1	091300
1.11/16	1.6875	3“	6“	3/4	1	091302
1.3/4	1.7500	3“	6“	3/4	1	091304
1.13/16	1.8125	3“	6“	3/4	1	091306
1.7/8	1.8750	3“	6“	3/4	1	091308
1.15/16	1.9375	3“	6“	3/4	1	091310
2“	2.0000	3“	6“	3/4	1	091312

REDUCED SHANK DRILL

Cobalt, Heavy Duty, Reduced Shank - 1/2”Shank

* *Sets Available on pg. 241*

R56CO Silver & Deming Drills. Self centering Split Point reduces thrust. Cobalt base material with Bronze/Steam Oxide for wear resistance and lubricity. Suitable for ferrous materials.



R56CO

ANSI

4XD

HSS-E

118°

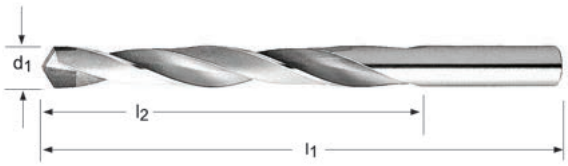
33/64 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56CO
33/64	0.5156	3“	6“	1/2	1	092333
17/32	0.5313	3“	6“	1/2	1	092334
35/64	0.5469	3“	6“	1/2	1	092335
9/16	0.5625	3“	6“	1/2	1	092336
37/64	0.5781	3“	6“	1/2	1	092337
19/32	0.5937	3“	6“	1/2	1	092338
39/64	0.6094	3“	6“	1/2	1	092339
5/8	0.6250	3“	6“	1/2	1	092340
41/64	0.6406	3“	6“	1/2	1	092341
21/32	0.6563	3“	6“	1/2	1	092342
43/64	0.6719	3“	6“	1/2	1	092343
11/16	0.6875	3“	6“	1/2	1	092344
45/64	0.7031	3“	6“	1/2	1	092345
23/32	0.7188	3“	6“	1/2	1	092346
47/64	0.7344	3“	6“	1/2	1	092347
3/4	0.7500	3“	6“	1/2	1	092348
49/64	0.7656	3“	6“	1/2	1	092349
25/32	0.7813	3“	6“	1/2	1	092350
51/64	0.7969	3“	6“	1/2	1	092351
13/16	0.8125	3“	6“	1/2	1	092352
53/64	0.8281	3“	6“	1/2	1	092353
27/32	0.8438	3“	6“	1/2	1	092354
55/64	0.8594	3“	6“	1/2	1	092355
7/8	0.8750	3“	6“	1/2	1	092356
57/64	0.8906	3“	6“	1/2	1	092357
29/32	0.9063	3“	6“	1/2	1	092358
59/64	0.9219	3“	6“	1/2	1	092359
15/16	0.9375	3“	6“	1/2	1	092360
61/64	0.9531	3“	6“	1/2	1	092361
31/32	0.9688	3“	6“	1/2	1	092362
63/64	0.9844	3“	6“	1/2	1	092363
1“	1.0000	3“	6“	1/2	1	092364

SPECIAL PURPOSE DRILL

Jobber Length Carbide Tipped

D444 Heavy-Duty Brazed Carbide Tipped for abrasive materials or non-ferrous materials.



D444

N32 - 1/2

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D444
32	0.1160	1.5/8	2.3/4	1	034632
1/8	0.1250	1.5/8	2.3/4	1	034408
30	0.1285	1.5/8	2.3/4	1	034630
29	0.1360	1.3/4	2.7/8	1	034629
9/64	0.1406	1.3/4	2.7/8	1	034409
25	0.1495	1.7/8	3“	1	034625
5/32	0.1563	2“	3.1/8	1	034410
21	0.1590	2.1/8	3.1/4	1	034621
20	0.1610	2.1/8	3.1/4	1	034620
19	0.1660	2.1/8	3.1/4	1	034619
18	0.1695	2.1/8	3.1/4	1	034618
11/64	0.1719	2.1/8	3.1/4	1	034411
17	0.1730	2.3/16	3.3/8	1	034617
15	0.1800	2.3/16	3.3/8	1	034615
14	0.1820	2.3/16	3.3/8	1	034614
13	0.1850	2.5/16	3.1/2	1	034613
3/16	0.1875	2.5/16	3.1/2	1	034412
11	0.1910	2.5/16	3.1/2	1	034611
10	0.1935	2.7/16	3.5/8	1	034610
9	0.1960	2.7/16	3.5/8	1	034609
7	0.2010	2.7/16	3.5/8	1	034607
13/64	0.2031	2.7/16	3.5/8	1	034413
3	0.2130	2.1/2	3.3/4	1	034603
7/32	0.2188	2.1/2	3.3/4	1	034414
1	0.2280	2.5/8	3.7/8	1	034601
15/64	0.2344	2.5/8	3.7/8	1	034415
B	0.2380	2.3/4	4“	1	034502
C	0.2420	2.3/4	4“	1	034503
E	0.2500	2.3/4	4“	1	034505
1/4	0.2500	2.3/4	4“	1	034416
F	0.2570	2.7/8	4.1/8	1	034506
G	0.2610	2.7/8	4.1/8	1	034507
17/64	0.2656	2.7/8	4.1/8	1	034417

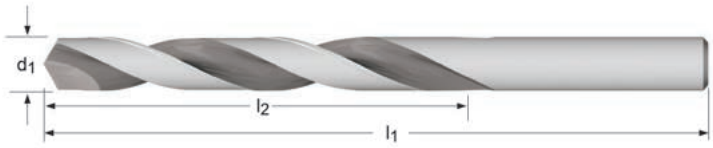
SPECIAL PURPOSE DRILL

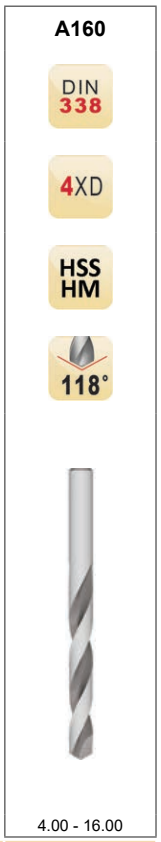
d_1 Ø “/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D444
H	0.2660	2.7/8	4.1/8	1	034508
I	0.2720	2.7/8	4.1/8	1	034509
J	0.2770	2.7/8	4.1/8	1	034510
K	0.2810	2.15/16	4.1/4	1	034511
9/32	0.2813	2.15/16	4.1/4	1	034418
L	0.2900	2.15/16	4.1/4	1	034512
19/64	0.2969	3.1/16	4.3/8	1	034419
N	0.3020	3.1/16	4.3/8	1	034514
5/16	0.3125	3.3/16	4.1/2	1	034420
O	0.3160	3.3/16	4.1/2	1	034515
P	0.3230	3.5/16	4.5/8	1	034516
21/64	0.3281	3.5/16	4.5/8	1	034421
Q	0.3320	3.7/16	4.3/4	1	034517
R	0.3390	3.7/16	4.3/4	1	034518
11/32	0.3437	3.7/16	4.3/4	1	034422
S	0.3480	3.1/2	4.7/8	1	034519
T	0.3580	3.1/2	4.7/8	1	034520
23/64	0.3594	3.1/2	4.7/8	1	034423
U	0.3680	3.5/8	5“	1	034521
3/8	0.3750	3.5/8	5“	1	034424
25/64	0.3906	3.3/4	5.1/8	1	034425
13/32	0.4063	3.7/8	5.1/4	1	034426
Z	0.4130	3.7/8	5.1/4	1	034526
27/64	0.4219	3.15/16	5.3/8	1	034427
7/16	0.4375	4.1/16	5.1/2	1	034428
29/64	0.4531	4.3/16	5.5/8	1	034429
15/32	0.4687	4.5/16	5.3/4	1	034430
31/64	0.4844	4.3/8	5.7/8	1	034431
1/2	0.5000	4.1/2	6“	1	034432

DORMER

Jobber Length Carbide Tipped

A160 Heavy-Duty Brazed Carbide Tipped for abrasive materials or non-ferrous materials.





d_1 Øh8 mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A160
4.00	0.1575	43	75	1	0029725
4.50	0.1772	47	80	1	0029732
5.00	0.1969	52	86	1	0029749
5.50	0.2165	57	93	1	0029756
6.00	0.2362	57	93	1	0029763
6.50	0.2559	63	101	1	0029770
6.80	0.2677	69	109	1	0029787
7.00	0.2756	69	109	1	0029794
7.50	0.2953	69	109	1	0029800
8.00	0.3150	75	117	1	0029817
8.50	0.3346	75	117	1	0029824
9.00	0.3543	81	125	1	0029831
9.50	0.3740	81	125	1	0029848
10.00	0.3937	87	133	1	0029626
10.20	0.4016	87	133	1	0029633
10.50	0.4134	87	133	1	0029640
11.00	0.4331	94	142	1	0029657
11.50	0.4528	94	142	1	0029664
12.00	0.4724	101	151	1	0029671
13.00	0.5118	101	151	1	0029688
14.00	0.5512	108	160	1	0029695
15.00	0.5906	114	169	1	0029701
16.00	0.6299	120	178	1	0029718

SOLID CARBIDE DRILL

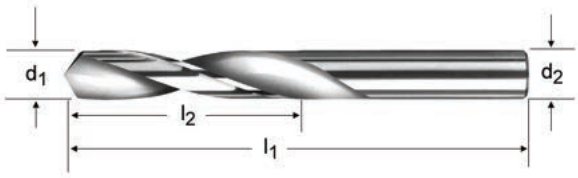
General Purpose Solid Carbide Jobber Length

D33F - *Fractional Sizes*

D33W - *Wire Gauge Sizes*

D33L - *Letter Sizes*

4-Facet Self Centering Point. Low thrust design. For abrasive or non-ferrous materials.



D33F	D33W	D33L
3XD	3XD	3XD
HM	HM	HM
118°	118°	118°
1/32 - 1/2	N68 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
	68		0.0310	5/16	1.1/4	1	—	003500	—
1/32			0.0313	5/16	1.1/4	1	003501	—	—
	67		0.0320	5/16	1.1/4	1	—	003502	—
	66		0.0330	5/16	1.1/4	1	—	003503	—
	65		0.0350	5/8	1.3/8	1	—	003504	—
	64		0.0360	5/8	1.3/8	1	—	003505	—
	63		0.0370	5/8	1.3/8	1	—	003506	—
	62		0.0380	5/8	1.3/8	1	—	003507	—
	61		0.0390	5/8	1.3/8	1	—	003508	—
	60		0.0400	3/4	1.1/2	1	—	003509	—
	59		0.0410	3/4	1.1/2	1	—	003510	—
	58		0.0420	3/4	1.1/2	1	—	003511	—
	57		0.0430	3/4	1.1/2	1	—	003512	—
	56		0.0465	3/4	1.1/2	1	—	003513	—
3/64			0.0469	3/4	1.1/2	1	003514	—	—
	55		0.0520	3/4	1.1/2	1	—	003515	—
	54		0.0550	3/4	1.1/2	1	—	003516	—
	53		0.0595	3/4	1.1/2	1	—	003517	—
1/16			0.0625	3/4	1.1/2	1	003518	—	—
	52		0.0635	3/4	1.1/2	1	—	003519	—
	51		0.0670	3/4	1.1/2	1	—	003520	—
	50		0.0700	7/8	1.3/4	1	—	003521	—
	49		0.0730	7/8	1.3/4	1	—	003522	—
	48		0.0760	7/8	1.3/4	1	—	003523	—
5/64			0.0781	7/8	1.3/4	1	003524	—	—
	47		0.0785	7/8	1.3/4	1	—	003525	—
	46		0.0810	7/8	1.3/4	1	—	003526	—
	45		0.0820	7/8	1.3/4	1	—	003527	—
	44		0.0860	1“	2“	1	—	003528	—
	43		0.0890	1“	2“	1	—	003529	—
	42		0.0935	1“	2“	1	—	003530	—
3/32			0.0938	1“	2“	1	003531	—	—
	41		0.0960	1“	2“	1	—	003532	—

SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
	40		0.0980	1“	2“	1	—	003533	—
	39		0.0995	1.1/4	2.1/4	1	—	003534	—
	38		0.1015	1.1/4	2.1/4	1	—	003535	—
	37		0.1040	1.1/4	2.1/4	1	—	003536	—
	36		0.1065	1.1/4	2.1/4	1	—	003537	—
7/64			0.1094	1.1/4	2.1/4	1	003538	—	—
	35		0.1100	1.1/4	2.1/4	1	—	003539	—
	34		0.1110	1.1/4	2.1/4	1	—	003540	—
	33		0.1130	1.1/4	2.1/4	1	—	003541	—
	32		0.1160	1.1/4	2.1/4	1	—	003542	—
	31		0.1200	1.1/4	2.1/4	1	—	003543	—
1/8			0.1250	1.1/4	2.1/4	1	003544	—	—
	30		0.1285	1.3/8	2.1/2	1	—	003545	—
	29		0.1360	1.3/8	2.1/2	1	—	003546	—
	28		0.1405	1.3/8	2.1/2	1	—	003547	—
9/64			0.1406	1.3/8	2.1/2	1	003548	—	—
	27		0.1440	1.3/8	2.1/2	1	—	003549	—
	26		0.1470	1.3/8	2.1/2	1	—	003550	—
	25		0.1495	1.3/8	2.1/2	1	—	003551	—
	24		0.1520	1.3/8	2.1/2	1	—	003552	—
	23		0.1540	1.3/8	2.1/2	1	—	003553	—
5/32			0.1563	1.3/8	2.1/2	1	003554	—	—
	22		0.1570	1.3/8	2.1/2	1	—	003555	—
	21		0.1590	1.3/8	2.1/2	1	—	003556	—
	20		0.1610	1.3/8	2.1/2	1	—	003557	—
	19		0.1660	1.5/8	2.3/4	1	—	003558	—
	18		0.1695	1.5/8	2.3/4	1	—	003559	—
11/64			0.1719	1.5/8	2.3/4	1	003560	—	—
	17		0.1730	1.5/8	2.3/4	1	—	003561	—
	16		0.1770	1.5/8	2.3/4	1	—	003562	—
	15		0.1800	1.5/8	2.3/4	1	—	003563	—
	14		0.1820	1.5/8	2.3/4	1	—	003564	—
	13		0.1850	1.5/8	2.3/4	1	—	003565	—
3/16			0.1875	1.5/8	2.3/4	1	003566	—	—
	12		0.1890	1.5/8	2.3/4	1	—	003567	—
	11		0.1910	1.5/8	2.3/4	1	—	003568	—
	10		0.1935	1.5/8	2.3/4	1	—	003569	—
	9		0.1960	1.3/4	3“	1	—	003570	—
	8		0.1990	1.3/4	3“	1	—	003571	—
	7		0.2010	1.3/4	3“	1	—	003572	—
13/64			0.2031	1.3/4	3“	1	003573	—	—
	6		0.2040	1.3/4	3“	1	—	003574	—
	5		0.2055	1.3/4	3“	1	—	003575	—
	4		0.2090	1.3/4	3“	1	—	003576	—
	3		0.2130	1.3/4	3“	1	—	003577	—
7/32			0.2188	1.3/4	3“	1	003578	—	—
	2		0.2210	1.3/4	3“	1	—	003579	—
	1		0.2280	1.3/4	3“	1	—	003580	—
		A	0.2340	2“	3.1/4	1	—	—	003581
15/64			0.2344	2“	3.1/4	1	003582	—	—
		B	0.2380	2“	3.1/4	1	—	—	003583
		C	0.2420	2“	3.1/4	1	—	—	003584
		D	0.2460	2“	3.1/4	1	—	—	003585
1/4			0.2500	2“	3.1/4	1	003586	—	—
		F	0.2570	2“	3.1/4	1	—	—	003587
		G	0.2610	2.1/8	3.1/2	1	—	—	003588
17/64			0.2656	2.1/8	3.1/2	1	003589	—	—
		H	0.2660	2.1/8	3.1/2	1	—	—	003590
		I	0.2720	2.1/8	3.1/2	1	—	—	003591
		J	0.2770	2.1/8	3.1/2	1	—	—	003592
		K	0.2810	2.1/8	3.1/2	1	—	—	003593
9/32			0.2813	2.1/8	3.1/2	1	003594	—	—
		L	0.2900	2.1/8	3.1/2	1	—	—	003595
		M	0.2950	2.3/8	4“	1	—	—	003596
19/64			0.2969	2.3/8	4“	1	003597	—	—
		N	0.3020	2.3/8	4“	1	—	—	003598

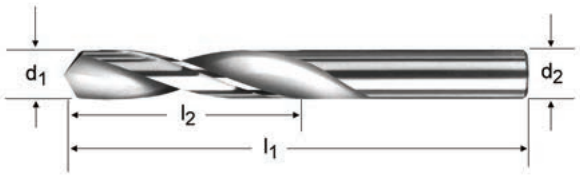
SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
5/16			0.3125	2.3/8	4“	1	003599	—	—
		O	0.3160	2.3/8	4“	1	—	—	003600
		P	0.3230	2.3/8	4“	1	—	—	003601
21/64			0.3281	2.3/8	4“	1	003602	—	—
		Q	0.3320	2.3/8	4“	1	—	—	003603
		R	0.3390	2.3/8	4“	1	—	—	003604
11/32			0.3437	2.3/8	4“	1	003605	—	—
		S	0.3480	2.3/8	4“	1	—	—	003606
		T	0.3580	2.3/4	4.1/4	1	—	—	003607
23/64			0.3594	2.3/4	4.1/4	1	003608	—	—
		U	0.3680	2.3/4	4.1/4	1	—	—	003609
3/8			0.3750	2.3/4	4.1/4	1	003610	—	—
		V	0.3770	2.3/4	4.1/4	1	—	—	003611
		W	0.3860	2.7/8	4.1/2	1	—	—	003612
25/64			0.3906	2.7/8	4.1/2	1	003613	—	—
		X	0.3970	2.7/8	4.1/2	1	—	—	003614
		Y	0.4040	2.7/8	4.1/2	1	—	—	003615
13/32			0.4063	2.7/8	4.1/2	1	003616	—	—
		Z	0.4130	2.7/8	4.1/2	1	—	—	003617
27/64			0.4219	2.7/8	4.1/2	1	003618	—	—
7/16			0.4375	2.7/8	4.1/2	1	003619	—	—
29/64			0.4531	3“	4.3/4	1	003620	—	—
15/32			0.4687	3“	4.3/4	1	003621	—	—
31/64			0.4844	3“	4.3/4	1	003622	—	—
1/2			0.5000	3“	4.3/4	1	003623	—	—

SOLID CARBIDE DRILL

General Purpose Solid Carbide Jobber Length, Metric

D33M Self Centering Point. Low thrust design. For abrasive or non-ferrous materials.



D33M

3XD

HM

118°

1.00 - 12.00

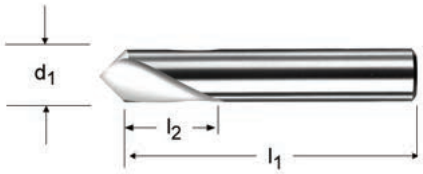
d_1 Ø mm	d_1 decimal Inch	l_2 inch	l_1 inch	Pack Qty	D33M
1.00	0.0394	5/8	1.1/2	1	003472
1.50	0.0591	3/4	1.1/2	1	003473
2.00	0.0787	7/8	1.3/4	1	003474
2.05	0.0807	7/8	1.3/4	1	003475
2.50	0.0984	1“	2“	1	003476
3.00	0.1181	1.1/4	2.1/4	1	003477
3.30	0.1299	1.3/8	2.1/2	1	003624
3.50	0.1378	1.3/8	2.1/2	1	003478
4.00	0.1575	1.3/8	2.1/2	1	003626
4.50	0.1772	1.5/8	2.3/4	1	003479
5.00	0.1969	1.3/4	3“	1	003630
5.50	0.2165	1.3/4	3“	1	003480
6.00	0.2362	2“	3.1/4	1	003481
6.50	0.2559	2“	3.1/4	1	003482
7.00	0.2756	2.1/8	3.1/2	1	003483
7.50	0.2953	2.3/8	4“	1	003484
8.00	0.3150	2.3/8	4“	1	003485
8.50	0.3346	2.3/8	4“	1	003486
9.00	0.3543	2.3/4	4.1/4	1	003487
9.50	0.3740	2.3/4	4.1/4	1	003488
10.00	0.3937	2.7/8	4.1/2	1	003631
10.50	0.4134	2.7/8	4.1/2	1	003489
10.75	0.4232	2.7/8	4.1/2	1	003490
11.00	0.4331	2.7/8	4.1/2	1	003491
11.50	0.4528	3“	4.3/4	1	003492
12.00	0.4724	3“	4.3/4	1	003493

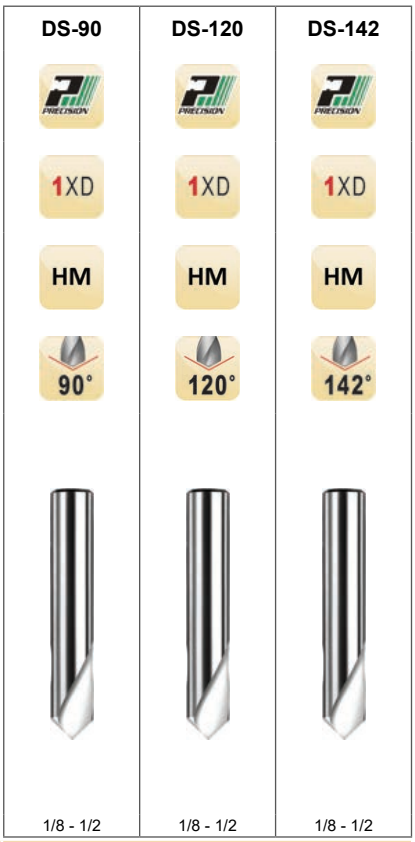
SOLID CARBIDE DRILL

General Purpose Solid Carbide Standard Length - Spotting Drill

DS-90
DS-120
DS-142

Provides 90°, 120° or 142° included angle spot locations or chamfers for follow-up drilling & tapping operations.





d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	DS-90	DS-120	DS-142
1/8	0.1250	3/8	2“	1	003332	7378063	7378069
3/16	0.1875	3/4	3“	1	003334	7378064	7378970
1/4	0.2500	3/4	3“	1	003336	7378068	7378974
5/16	0.3125	1“	2.1/2	1	003338	7378066	7378972
3/8	0.3750	1“	3“	1	003340	7378065	7378971
1/2	0.5000	1“	4“	1	003342	7378067	7378973

SPECIAL PURPOSE DRILL

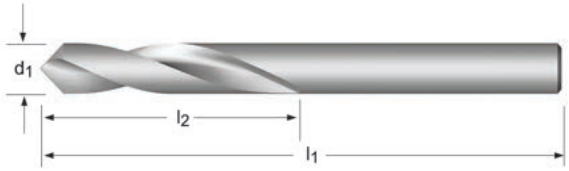
Spotting Drill - Short Length

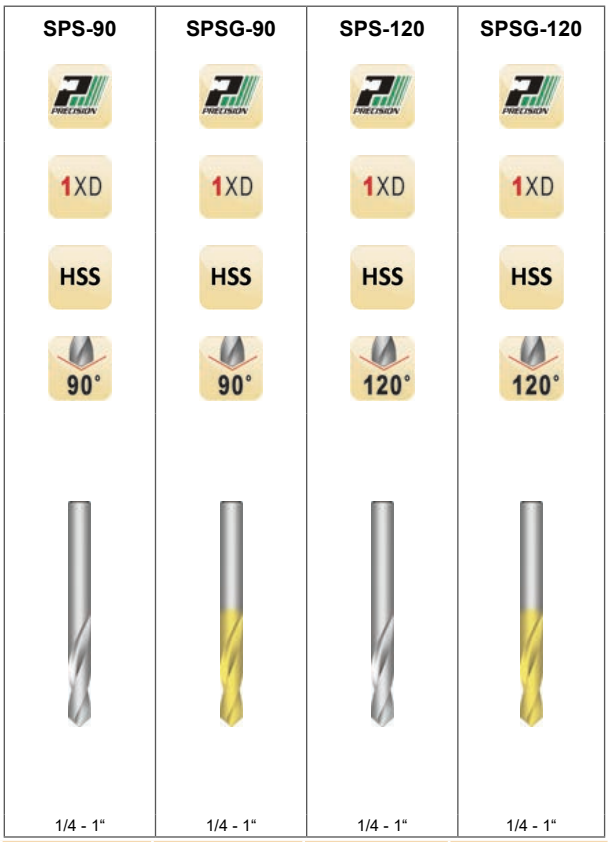
SPS-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPSG-90 TiN Coating for increased wear resistance and improved tool life.

SPS-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPSG-120 TiN Coating for increased wear resistance and improved tool life.





d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPS-90	SPSG-90	SPS-120	SPSG-120
1/4	0.2500	3/4	2.1/2	1	087900	087906	087950	087956
3/8	0.3750	1.1/8	3.1/8	1	087901	087907	087951	087957
1/2	0.5000	1.3/8	3.3/4	1	087902	087908	087952	087958
5/8	0.6250	1.5/8	4.3/8	1	087903	087909	087953	087959
3/4	0.7500	1.7/8	5“	1	087904	087910	087954	087960
1“	1.0000	2.1/4	6“	1	087905	087911	087955	087961

SPECIAL PURPOSE DRILL

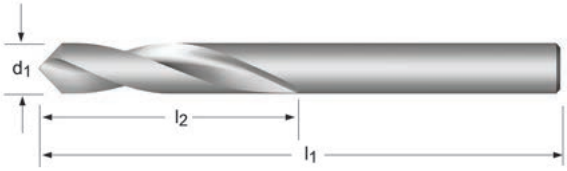
Spotting Drill - Regular Length

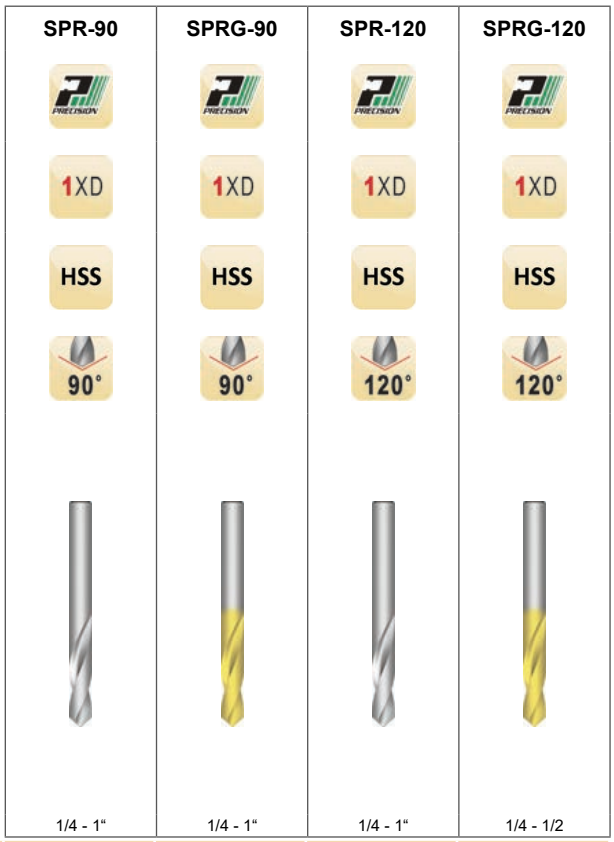
SPR-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPRG-90 TiN Coating for increased wear resistance and improved tool life.

SPR-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPRG-120 TiN Coating for increased wear resistance and improved tool life.





d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPR-90	SPRG-90	SPR-120	SPRG-120
1/4	0.2500	3/4	4“	1	087912	087918	087962	087968
3/8	0.3750	1.1/8	5“	1	087913	087919	087963	087969
1/2	0.5000	1.3/8	6“	1	087914	087920	087964	087970
5/8	0.6250	1.5/8	7“	1	087915	087921	087965	—
3/4	0.7500	1.7/8	8“	1	087916	087922	087966	—
1“	1.0000	2.1/4	8“	1	087917	087923	087967	—

SPECIAL PURPOSE DRILL

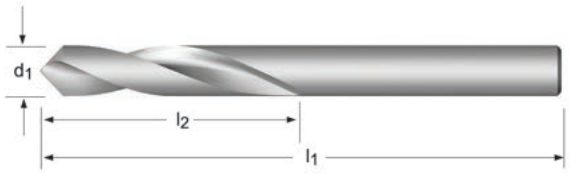
Spotting Drill - Long Length

SPL-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPLG-90 TiN Coating for increased wear resistance and improved tool life.

SPL-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPLG-120 TiN Coating for increased wear resistance and improved tool life.



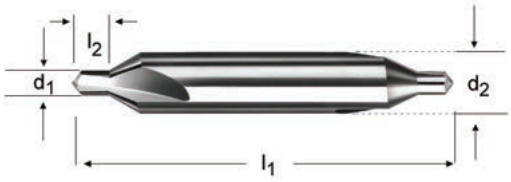
SPL-90	SPLG-90	SPL-120	SPLG-120
1/4 - 1“	1/4 - 1“	1/4 - 5/8	1/4 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPL-90	SPLG-90	SPL-120	SPLG-120
1/4	0.2500	3/4	6“	1	087924	087930	087974	087980
3/8	0.3750	1.1/8	7“	1	087925	087931	087975	087981
1/2	0.5000	1.3/8	8“	1	087926	087932	087976	087982
5/8	0.6250	1.5/8	9“	1	087927	—	087977	—
3/4	0.7500	1.7/8	10“	1	087928	087934	—	—
1“	1.0000	2.1/4	10“	1	087929	087935	—	—

SOLID CARBIDE DRILL

General Purpose Combined Drill and Countersink (Center Drill)

DC 60° C'sink. Better abrasion resistance / Longer tool life. Bright Finish improves chip flow in soft or non-ferrous materials



DC

1XD

HM

N0 - N6

Nr.	d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	DC
0	1/32	1/32	1.1/2	1/8	1	003251
1	3/64	3/64	1.1/2	1/8	1	003252
2	5/64	5/64	2“	3/16	1	003253
3	7/64	7/64	2“	1/4	1	003254
4	1/8	1/8	2.1/8	5/16	1	003255
5	3/16	3/16	2.3/4	7/16	1	003256
6	7/32	7/32	3“	1/2	1	003257

SPECIAL PURPOSE DRILL

General Purpose Combined Drill and Countersink (Center Drill)

76HA 60° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

76HA

ANSI

1XD

HSS

N000 - N8

Nr.	d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	76HA
000	0.0200	0.0300	1.1/4	1/8	12	097630
00	0.0250	0.0300	1.1/8	1/8	12	097620
0	1/32	0.0380	1.1/8	1/8	12	097610
1	3/64	3/64	1.1/4	1/8	12	097601
2	5/64	5/64	1.7/8	3/16	12	097602
3	7/64	7/64	2"	1/4	12	097603
4	1/8	1/8	2.1/8	5/16	12	097604
5	3/16	3/16	2.3/4	7/16	6	097605
6	7/32	7/32	3"	1/2	6	097606
7	1/4	1/4	3.1/4	5/8	1	097607
8	5/16	5/16	3.1/2	3/4	1	097608

SPECIAL PURPOSE DRILL

General Purpose Combined Drill and Countersink (Center Drill)

A225 60° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A217 82° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A217SET 5 pc. set consists of N1, N2, N3, N4 & N5

A218 90° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A218SET 5 pc. set consists of N1, N2, N3, N4 & N5

A225	A217	A218
BS 328	ANSI	ANSI
1XD	1XD	1XD
HSS	HSS	HSS
60°	82°	90°
3/64 - 5/16	N1 - N8	N1 - N8

Nr.	d_1 Ø Inch	d_1 decimal Inch	l_2 max/min Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	A225	A217	A218
BS1	3/64	0.0469	5/64 - 1/16	1.1/2	1/8	1	0172988	—	—
BS2	1/16	0.0625	3/32 - 5/64	1.3/4	3/16	1	0172995	—	—
BS3	3/32	0.0938	5/32 - 1/8	2"	1/4	1	0173008	—	—
BS4	1/8	0.1250	3/16 - 5/32	2.1/4	5/16	1	0173015	—	—
BS5	3/16	0.1875	9/32 - 1/4	2.1/2	7/16	1	0173022	—	—
BS5A	7/32	0.2188	5/16 - 9/32	2.3/4	1/2	1	0173039	—	—
BS6	1/4	0.2500	3/8 - 5/16	3"	5/8	1	0173046	—	—
BS7	5/16	0.3125	15/32 - 13/32	3.1/2	3/4	1	0173053	—	—
1		0.0469	.055-.067	1.1/4	1/8	1	—	0239216	—
1		0.0469	.055-.067	1.1/4	1/8	1	—	—	0239292
2		0.0781	.094-.106	1.7/8	3/16	1	—	0239223	—
2		0.0781	.094-.106	1.7/8	3/16	1	—	—	0239308
3		0.1094	.130-.154	2"	1/4	1	—	0239230	—
3		0.1094	.130-.154	2"	1/4	1	—	—	0239315
4		0.1250	.150-.173	2.1/8	5/16	1	—	0239247	—
4		0.1250	.150-.173	2.1/8	5/16	1	—	—	0239322
5		0.1875	.232-.256	2.3/4	7/16	1	—	0239254	—
5		0.1875	.232-.256	2.3/4	7/16	1	—	—	0239339
6		0.2188	.272-.295	3"	1/2	1	—	0239261	—
6		0.2188	.272-.295	3"	1/2	1	—	—	0239346
7		0.2500	.315-.339	3.1/4	5/8	1	—	0239278	—
7		0.2500	.315-.339	3.1/4	5/8	1	—	—	0239353
8		0.3125	.394-.417	3.1/2	3/4	1	—	0239285	—
8		0.3125	.394-.417	3.1/2	3/4	1	—	—	0239360

Set	Style	Pieces per set	Contents of set	Pack Qty	A217 set	A218 set
A217SET	A217	5	N1, N2, N3, N4, N5	1	0423912	—
A218SET	A218	5	N1, N2, N3, N4, N5	1	—	0423929

DORMER

Cobalt Combined Drill and Countersink (Center Drill)

A221 60° C'sink. Cobalt base material for wear resistance. Bright Finish improves chip flow in soft or non-ferrous materials

A221SET

5 peice set includes N1, N2, N3, N4 & N5

A221	A221SET
ANSI	ANSI
1.5XD	1.5XD
HSS-E	HSS-E
N00 - N8	Set

Nr.	Set	d_1 Ø Inch	Style	d_1 decimal Inch	Pieces per Set	l_2 Inch	Contents of set	l_1 Inch	d_2 Ø Inch	Pack Qty	A221	A221SET
00		0.025		0.0250		1/32		1.1/8	1/8	1	0241851 [1)]	—
0		1/32		0.0313		1/32		1.1/8	1/8	1	0241844 [1)]	—
1		3/64		0.0469		3/64		1.1/4	1/8	1	0241868	—
2		5/64		0.0781		5/64		1.7/8	3/16	1	0241875	—
3		7/64		0.1094		7/64		2"	1/4	1	0241882	—
4		1/8		0.1250		1/8		2.1/8	5/16	1	0241899	—
5		3/16		0.1875		3/16		2.3/4	7/16	1	0241905	—
6		7/32		0.2188		7/32		3"	1/2	1	0241912	—
7		1/4		0.2500		1/4		3.1/4	5/8	1	0241929	—
8		5/16		0.3125		5/16		3.1/2	3/4	1	0241936	—
	A221SET		A221		5		N1, N2, N3, N4, N5			1	—	0423936

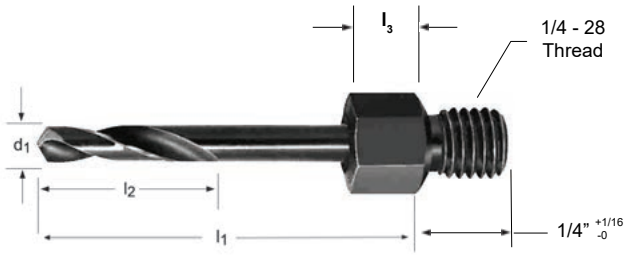
[1)] single ended only

SPECIAL PURPOSE DRILL

HSS, Threaded Hex Shank Drills

TS41HS - *Stub, Wire Gauge Sizes*
TS40HS - *Stub, Fractional Sizes*
TS42HS - *Stub, Letter Sizes*
TS18HS - *Short, Wire Gauge Sizes*
TS10HS - *Short, Fractional Sizes*
TS15HS - *Short, Letter Sizes*
TS52HS - *Long, Wire Gauge Sizes*
TS51HS - *Long, Fractional Sizes*
TS55HS - *Long, Wire Gauge Sizes*

NAS-965 Type B Steam Oxide for increased wear resistance & lubricity. Shank design for drilling in confined spaces. Low thrust design self centering Split Point for easier penetration.
1/4-28 thread



TS41HS TS40HS TS42HS	TS18HS TS10HS TS15HS	TS52HS TS51HS TS55HS
HSS	HSS	HSS
135°	135°	135°
N50 - N1 3/32 - 3/8 A - G	N50 - N1 3/32 - 3/8 A - G	N50 - N1 3/32 - 3/8 A - G

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41HS TS40HS TS42HS	TS18HS TS10HS TS15HS	TS52HS TS51HS TS55HS
N50	5/16	1/2	1/8	1	7877827	—	—
N50	9/16	1"	1/4	1	—	7877968	
N50	7/8	2 1/8	1/4	1	—	—	7878029
3/32	5/16	1/2	1/8	1	7877828	—	—
3/32	9/16	1"	1/4	1	—	7877969	—
3/32	7/8	2 1/8	1/4	1	—	—	7878030
N40	5/16	1/2	1/8	1	7877829	—	—
N40	9/16	1"	1/4	1	—	7877970	—
N40	7/8	2 1/8	1/4	1	—	—	7878031
N39	5/16	1/2	1/8	1	7877910	—	—
N39	9/16	1"	1/4	1	—	7877971	—
N39	7/8	2 1/8	1/4	1	—	—	7878032
N38	5/16	1/2	1/8	1	7877911	—	—
N38	9/16	1"	1/4	1	—	7877972	
N38	7/8	2 1/8	1/4	1	—	—	7878033
N37	5/16	1/2	1/8	1	7877912	—	—
N37	9/16	1"	1/4	1	—	7877973	—
N37	7/8	2 1/8	1/4	1	—	—	7878034
N36	5/16	1/2	1/8	1	7877913	—	—
N36	9/16	1"	1/4	1	—	7877974	—
N36	7/8	2 1/8	1/4	1	—	—	7878035
7/64	5/16	1/2	1/8	1	7877914	—	—
7/64	9/16	1"	1/4	1	—	7877975	—
7/64	7/8	2 1/8	1/4	1	—	—	7878036
N35	5/16	1/2	1/8	1	7877915	—	—
N35	9/16	1"	1/4	1	—	7877976	—
N35	7/8	2 1/8	1/4	1	—	—	7878037
N34	5/16	1/2	1/8	1	7877916	—	—
N34	9/16	1"	1/4	1	—	7877977	—
N34	7/8	2 1/8	1/4	1	—	—	7878038
N33	5/16	1/2	1/8	1	7877917	—	—

SPECIAL PURPOSE DRILL

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41HS TS40HS TS42HS	TS18HS TS10HS TS15HS	TS52HS TS51HS TS55HS
N33	9/16	1"	1/4	1	—	7877978	—
N33	7/8	2 1/8	1/4	1	—	—	7878039
N32	5/16	1/2	1/8	1	7877918	—	—
N32	9/16	1"	1/4	1	—	7877979	—
N32	7/8	2 1/8	1/4	1	—	—	7878040
N31	5/16	1/2	1/8	1	7877919	—	—
N31	9/16	1"	1/4	1	—	7877980	—
N31	7/8	2 1/8	1/4	1	—	—	7878041
1/8	5/16	1/2	1/8	1	7877920	—	—
1/8	9/16	1"	1/4	1	—	7877981	—
1/8	7/8	2 1/8	1/4	1	—	—	7878042
N30	5/16	9/16	1/8	1	7877921	—	—
N30	9/16	1 1/4	1/4	1	—	7877982	—
N30	1 1/8	2 1/8	1/4	1	—	—	7878043
N29	5/16	9/16	1/8	1	7877922	—	—
N29	9/16	1 1/4	1/4	1	—	7877983	—
N29	1 1/8	2 1/8	1/4	1	—	—	7878044
N28	5/16	9/16	1/8	1	7877923	—	—
N28	9/16	1 1/4	1/4	1	—	7877984	—
N28	1 1/8	2 1/8	1/4	1	—	—	7878045
9/64	5/16	9/16	1/8	1	7877924	—	—
9/64	9/16	1 1/4	1/4	1	—	7877985	—
9/64	1 1/8	2 1/8	1/4	1	—	—	7878046
N27	5/16	9/16	1/8	1	7877925	—	—
N27	9/16	1 1/4	1/4	1	—	7877986	—
N27	1 1/8	2 1/8	1/4	1	—	—	7878047
N26	5/16	9/16	1/8	1	7877926	—	—
N26	9/16	1 1/4	1/4	1	—	7877987	—
N26	1 1/8	2 1/8	1/4	1	—	—	7878048
N25	5/16	9/16	1/8	1	7877927	—	—
N25	9/16	1 1/4	1/4	1	—	7877988	—
N25	1 1/8	2 1/8	1/4	1	—	—	7878049
N24	5/16	9/16	1/8	1	7877928	—	—
N24	9/16	1 1/4	1/4	1	—	7877989	—
N24	1 1/8	2 1/8	1/4	1	—	—	7878050
N23	5/16	9/16	1/8	1	7877929	—	—
N23	9/16	1 1/4	1/4	1	—	7877990	—
N23	1 1/8	2 1/8	1/4	1	—	—	7878051
5/32	5/16	9/16	1/8	1	7877930	—	—
5/32	9/16	1 1/4	1/4	1	—	7877991	—
5/32	1 1/8	2 1/8	1/4	1	—	—	7878052
N22	5/16	9/16	1/8	1	7877931	—	—
N22	9/16	1 1/4	1/4	1	—	7877992	—
N22	1 1/8	2 1/8	1/4	1	—	—	7878053
N21	5/16	9/16	1/8	1	7877932	—	—
N21	9/16	1 1/4	1/4	1	—	7877993	—
N21	1 1/8	2 1/8	1/4	1	—	—	7878054
N20	5/16	9/16	1/8	1	7877933	—	—
N20	9/16	1 1/4	1/4	1	—	7877994	—
N20	1 1/8	2 1/8	1/4	1	—	—	7878055
N19	5/16	9/16	1/8	1	7877934	—	—
N19	9/16	1 1/4	1/4	1	—	7877995	—
N19	1 1/8	2 1/8	1/4	1	—	—	7878056
N18	5/16	9/16	1/8	1	7877935	—	—
N18	9/16	1 1/4	1/4	1	—	7877996	—
N18	1 1/8	2 1/8	1/4	1	—	—	7878057
11/64	5/16	9/16	1/8	1	7877936	—	—
11/64	9/16	1 1/4	1/4	1	—	7877997	—
11/64	1 1/8	2 1/8	1/4	1	—	—	7878357
N17	5/16	9/16	1/8	1	7877937	—	—
N17	9/16	1 1/4	1/4	1	—	7877998	—
N17	1 1/8	2 1/8	1/4	1	—	—	7878059

SPECIAL PURPOSE DRILL

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41HS TS40HS TS42HS	TS18HS TS10HS TS15HS	TS52HS TS51HS TS55HS
N16	5/16	9/16	1/8	1	7877938	—	—
N16	9/16	1 1/4	1/4	1	—	7877999	—
N16	1 1/8	2 1/8	1/4	1	—	—	7878060
N15	5/16	9/16	1/8	1	7877939	—	—
N15	9/16	1 1/4	1/4	1	—	7878000	—
N15	1 1/8	2 1/8	1/4	1	—	—	7878061
N14	5/16	9/16	1/8	1	7877940	—	—
N14	9/16	1 1/4	1/4	1	—	7878001	—
N14	1 1/8	2 1/8	1/4	1	—	—	7878062
N13	5/16	9/16	1/8	1	7877941	—	—
N13	9/16	1 1/4	1/4	1	—	7878002	—
N13	1 1/8	2 1/8	1/4	1	—	—	7878063
3/16	5/16	9/16	1/8	1	7877942	—	—
3/16	9/16	1 1/4	1/4	1	—	7878003	—
3/16	1 1/8	2 1/8	1/4	1	—	—	7878064
N12	5/16	9/16	1/8	1	7877943	—	—
N12	9/16	1 1/4	1/4	1	—	7878004	—
N12	1 1/8	2 1/8	1/4	1	—	—	7878065
N11	5/16	9/16	1/8	1	7877944	—	—
N11	9/16	1 1/4	1/4	1	—	7878005	—
N11	1 1/8	2 1/8	1/4	1	—	—	7878066
N10	5/16	9/16	1/8	1	7877945	—	—
N10	9/16	1 1/4	1/4	1	—	7878006	—
N10	1 1/8	2 1/8	1/4	1	—	—	7878067
N9	5/16	5/8	1/4	1	7877946	—	—
N9	9/16	1 1/4	5/16	1	—	7878007	—
N9	1 1/8	2 1/8	5/16	1	—	—	7878068
N8	5/16	5/8	1/4	1	7877947	—	—
N8	9/16	1 1/4	5/16	1	—	7878008	—
N8	1 1/8	2 1/8	5/16	1	—	—	7878069
N7	5/16	5/8	1/4	1	7877948	—	—
N7	9/16	1 1/4	5/16	1	—	7878009	—
N7	1 1/8	2 1/8	5/16	1	—	—	7878070
13/64	5/16	5/8	1/4	1	7877949	—	—
13/64	9/16	1 1/4	5/16	1	—	7878010	—
13/64	1 1/8	2 1/8	5/16	1	—	—	7878071
N6	5/16	5/8	1/4	1	7877950	—	—
N6	9/16	1 1/4	5/16	1	—	7878011	—
N6	1 1/8	2 1/8	5/16	1	—	—	7878072
N5	5/16	5/8	1/4	1	7877951	—	—
N5	9/16	1 1/4	5/16	1	—	7878012	—
N5	1 1/8	2 1/8	5/16	1	—	—	7878073
N4	5/16	5/8	1/4	1	7877952	—	—
N4	9/16	1 1/4	5/16	1	—	7878013	—
N4	1 1/8	2 1/8	5/16	1	—	—	7878074
N3	5/16	5/8	1/4	1	7877953	—	—
N3	9/16	1 1/4	5/16	1	—	7878014	—
N3	1 1/8	2 1/8	5/16	1	—	—	7878075
7/32	5/16	5/8	1/4	1	7877954	—	—
7/32	9/16	1 1/4	5/16	1	—	7878015	—
7/32	1 1/8	2 1/8	5/16	1	—	—	7878076
N2	5/16	5/8	1/4	1	7877955	—	—
N2	9/16	1 1/4	5/16	1	—	7878016	—
N2	1 1/8	2 1/8	5/16	1	—	—	7878077
N1	5/16	5/8	1/4	1	7877956	—	—
N1	9/16	1 1/4	5/16	1	—	7878017	—
N1	1 1/8	2 1/8	5/16	1	—	—	7878078
A	5/16	5/8	1/4	1	7877957	—	—
A	9/16	1 1/4	5/16	1	—	7878018	—
A	1 1/8	2 1/8	5/16	1	—	—	7878079
15/64	5/16	5/8	1/4	1	7877958	—	—
15/64	9/16	1 1/4	5/16	1	—	7878019	—
15/64	1 1/8	2 1/8	5/16	1	—	—	7878080
B	5/16	5/8	1/4	1	7877959	—	—

SPECIAL PURPOSE DRILL

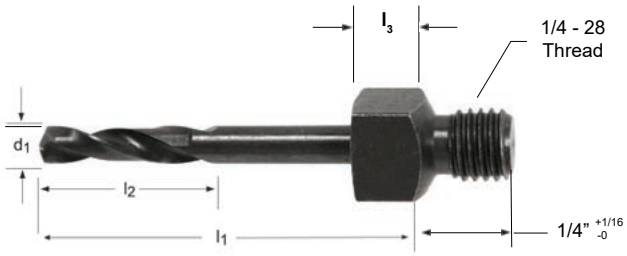
d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41HS TS40HS TS42HS	TS18HS TS10HS TS15HS	TS52HS TS51HS TS55HS
B	9/16	1 1/4	5/16	1	—	7878020	—
B	1 1/8	2 1/8	5/16	1	—	—	7878081
C	5/16	5/8	1/4	1	7877960	—	—
C	9/16	1 1/4	5/16	1	—	7878021	—
C	1 1/8	2 1/8	5/16	1	—	—	7878082
D	5/16	5/8	1/4	1	7877961	—	—
D	9/16	1 1/4	5/16	1	—	7878022	—
D	1 1/8	2 1/8	5/16	1	—	—	7878083
1/4	5/16	5/8	1/4	1	7877962	—	—
1/4	9/16	1 1/4	5/16	1	—	7878023	—
1/4	1 1/8	2 1/8	5/16	1	—	—	7878084
F	5/16	5/8	1/4	1	7877963	—	—
F	9/16	1 1/4	5/16	1	—	7878024	—
F	1 1/8	2 1/8	5/16	1	—	—	7878085
G	5/16	5/8	1/4	1	7877964	—	—
G	9/16	1 1/4	5/16	1	—	7878025	—
G	1 1/8	2 1/8	5/16	1	—	—	7878086
9/32	5/16	5/8	1/4	1	7877965	—	—
9/32	9/16	1 1/4	5/16	1	—	7878026	—
9/32	1 1/8	2 1/8	5/16	1	—	—	7878087
5/16	5/16	5/8	1/4	1	7877966	—	—
5/16	9/16	1 1/4	5/16	1	—	7878027	—
5/16	1 1/8	2 1/8	5/16	1	—	—	7878088
3/8	5/16	5/8	1/4	1	7877967	—	—
3/8	9/16	1 1/4	5/16	1	—	7878028	—
3/8	1 1/8	2 1/8	5/16	1	—	—	7878089

SPECIAL PURPOSE DRILL

Cobalt, Threaded Square Shank Drills

TS41CO - *Stub, Wire Gauge Sizes*
TS40CO - *Stub, Fractional Sizes*
TS42CO - *Stub, Letter Sizes*
TS18CO - *Short, Wire Gauge Sizes*
TS10CO - *Short, Fractional Sizes*
TS15CO - *Short, Letter Sizes*
TS52CO - *Long, Wire Gauge Sizes*
TS51CO - *Long, Fractional Sizes*
TS55CO - *Long, Wire Gauge Sizes*

NAS-965 Type D Steam Oxide for increased wear resistance & lubricity. Shank design for drilling in confined spaces. Low thrust design self centering Split Point for easier penetration.
1/4-28 thread



TS41CO TS40CO TS42CO	TS18CO TS10CO TS15CO	TS52CO TS51CO TS55CO
HSS-E	HSS-E	HSS-E
135°	135°	135°
N50 - N1 3/32 - 3/8 A - G	N50 - N1 3/32 - 3/8 A - G	N50 - N1 3/32 - 3/8 A - G

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41CO TS40CO TS42CO	TS18CO TS10CO TS15CO	TS52CO TS51CO TS55CO
N50	5/16	1/2	1/8	1	7878110	—	—
N50	9/16	1"	1/4	1	—	7878171	
N50	7/8	2 1/8	1/4	1	—	—	7878232
3/32	5/16	1/2	1/8	1	7878111	—	—
3/32	9/16	1"	1/4	1	—	7878172	—
3/32	7/8	2 1/8	1/4	1	—	—	7878233
N40	5/16	1/2	1/8	1	7878112	—	—
N40	9/16	1"	1/4	1	—	7878173	—
N40	7/8	2 1/8	1/4	1	—	—	7878234
N39	5/16	1/2	1/8	1	7878113	—	—
N39	9/16	1"	1/4	1	—	7878174	—
N39	7/8	2 1/8	1/4	1	—	—	7878235
N38	5/16	1/2	1/8	1	7878114	—	—
N38	9/16	1"	1/4	1	—	7878175	—
N38	7/8	2 1/8	1/4	1	—	—	7878236
N37	5/16	1/2	1/8	1	7878115	—	—
N37	9/16	1"	1/4	1	—	7878176	—
N37	7/8	2 1/8	1/4	1	—	—	7878237
N36	5/16	1/2	1/8	1	7878116	—	—
N36	9/16	1"	1/4	1	—	7878177	—
N36	7/8	2 1/8	1/4	1	—	—	7878238
7/64	5/16	1/2	1/8	1	7878117	—	—
7/64	9/16	1"	1/4	1	—	7878178	—
7/64	7/8	2 1/8	1/4	1	—	—	7878239
N35	5/16	1/2	1/8	1	7878118	—	—
N35	9/16	1"	1/4	1	—	7878179	—
N35	7/8	2 1/8	1/4	1	—	—	7878240
N34	5/16	1/2	1/8	1	7878119	—	—
N34	9/16	1"	1/4	1	—	7878180	—
N34	7/8	2 1/8	1/4	1	—	—	7878241
N33	5/16	1/2	1/8	1	7878120	—	—

SPECIAL PURPOSE DRILL

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41CO TS40CO TS42CO	TS18CO TS10CO TS15CO	TS52CO TS51CO TS55CO
N33	9/16	1"	1/4	1	—	7878181	—
N33	7/8	2 1/8	1/4	1	—	—	7878242
N32	5/16	1/2	1/8	1	7878121	—	—
N32	9/16	1"	1/4	1	—	7878182	—
N32	7/8	2 1/8	1/4	1	—	—	7878243
N31	5/16	1/2	1/8	1	7878122	—	—
N31	9/16	1"	1/4	1	—	7878183	—
N31	7/8	2 1/8	1/4	1	—	—	7878244
1/8	5/16	1/2	1/8	1	7878123	—	—
1/8	9/16	1"	1/4	1	—	7878184	—
1/8	7/8	2 1/8	1/4	1	—	—	7878245
N30	5/16	9/16	1/8	1	7878124	—	—
N30	9/16	1 1/4	1/4	1	—	7878185	—
N30	1 1/8	2 1/8	1/4	1	—	—	7878246
N29	5/16	9/16	1/8	1	7878125	—	—
N29	9/16	1 1/4	1/4	1	—	7878186	—
N29	1 1/8	2 1/8	1/4	1	—	—	7878247
N28	5/16	9/16	1/8	1	7878126	—	—
N28	9/16	1 1/4	1/4	1	—	7878187	—
N28	1 1/8	2 1/8	1/4	1	—	—	7878248
9/64	5/16	9/16	1/8	1	7878127	—	—
9/64	9/16	1 1/4	1/4	1	—	7878188	—
9/64	1 1/8	2 1/8	1/4	1	—	—	7878249
N27	5/16	9/16	1/8	1	7878128	—	—
N27	9/16	1 1/4	1/4	1	—	7878189	—
N27	1 1/8	2 1/8	1/4	1	—	—	7878250
N26	5/16	9/16	1/8	1	7878129	—	—
N26	9/16	1 1/4	1/4	1	—	7878190	—
N26	1 1/8	2 1/8	1/4	1	—	—	7878251
N25	5/16	9/16	1/8	1	7878130	—	—
N25	9/16	1 1/4	1/4	1	—	7878191	—
N25	1 1/8	2 1/8	1/4	1	—	—	7878252
N24	5/16	9/16	1/8	1	7878131	—	—
N24	9/16	1 1/4	1/4	1	—	7878192	—
N24	1 1/8	2 1/8	1/4	1	—	—	7878253
N23	5/16	9/16	1/8	1	7878132	—	—
N23	9/16	1 1/4	1/4	1	—	7878193	—
N23	1 1/8	2 1/8	1/4	1	—	—	7878254
5/32	5/16	9/16	1/8	1	7878133	—	—
5/32	9/16	1 1/4	1/4	1	—	7878194	—
5/32	1 1/8	2 1/8	1/4	1	—	—	7878255
N22	5/16	9/16	1/8	1	7878134	—	—
N22	9/16	1 1/4	1/4	1	—	7878195	—
N22	1 1/8	2 1/8	1/4	1	—	—	7878256
N21	5/16	9/16	1/8	1	7878135	—	—
N21	9/16	1 1/4	1/4	1	—	7878196	—
N21	1 1/8	2 1/8	1/4	1	—	—	7878257
N20	5/16	9/16	1/8	1	7878136	—	—
N20	9/16	1 1/4	1/4	1	—	7878197	—
N20	1 1/8	2 1/8	1/4	1	—	—	7878258
N19	5/16	9/16	1/8	1	7878137	—	—
N19	9/16	1 1/4	1/4	1	—	7878198	—
N19	1 1/8	2 1/8	1/4	1	—	—	7878259
N18	5/16	9/16	1/8	1	7878138	—	—
N18	9/16	1 1/4	1/4	1	—	7878199	—
N18	1 1/8	2 1/8	1/4	1	—	—	7878260
11/64	5/16	9/16	1/8	1	7878139	—	—
11/64	9/16	1 1/4	1/4	1	—	7878200	—
11/64	1 1/8	2 1/8	1/4	1	—	—	7878261
N17	5/16	9/16	1/8	1	7878140	—	—
N17	9/16	1 1/4	1/4	1	—	7878201	—
N17	1 1/8	2 1/8	1/4	1	—	—	7878262

SPECIAL PURPOSE DRILL

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41CO TS40CO TS42CO	TS18CO TS10CO TS15CO	TS52CO TS51CO TS55CO
N16	5/16	9/16	1/8	1	7878141	—	—
N16	9/16	1 1/4	1/4	1	—	7878202	—
N16	1 1/8	2 1/8	1/4	1	—	—	7878263
N15	5/16	9/16	1/8	1	7878142	—	—
N15	9/16	1 1/4	1/4	1	—	7878203	—
N15	1 1/8	2 1/8	1/4	1	—	—	7878264
N14	5/16	9/16	1/8	1	7878143	—	—
N14	9/16	1 1/4	1/4	1	—	7878204	—
N14	1 1/8	2 1/8	1/4	1	—	—	7878265
N13	5/16	9/16	1/8	1	7878144	—	—
N13	9/16	1 1/4	1/4	1	—	7878205	—
N13	1 1/8	2 1/8	1/4	1	—	—	7878266
3/16	5/16	9/16	1/8	1	7878145	—	—
3/16	9/16	1 1/4	1/4	1	—	7878206	—
3/16	1 1/8	2 1/8	1/4	1	—	—	7878267
N12	5/16	9/16	1/8	1	7878146	—	—
N12	9/16	1 1/4	1/4	1	—	7878207	—
N12	1 1/8	2 1/8	1/4	1	—	—	7878268
N11	5/16	9/16	1/8	1	7878147	—	—
N11	9/16	1 1/4	1/4	1	—	7878208	—
N11	1 1/8	2 1/8	1/4	1	—	—	7878269
N10	5/16	9/16	1/8	1	7878148	—	—
N10	9/16	1 1/4	1/4	1	—	7878209	—
N10	1 1/8	2 1/8	1/4	1	—	—	7878270
N9	5/16	5/8	1/4	1	7878149	—	—
N9	9/16	1 1/4	5/16	1	—	7878210	—
N9	1 1/8	2 1/8	5/16	1	—	—	7878271
N8	5/16	5/8	1/4	1	7878150	—	—
N8	9/16	1 1/4	5/16	1	—	7878211	—
N8	1 1/8	2 1/8	5/16	1	—	—	7878272
N7	5/16	5/8	1/4	1	7878151	—	—
N7	9/16	1 1/4	5/16	1	—	7878212	—
N7	1 1/8	2 1/8	5/16	1	—	—	7878273
13/64	5/16	5/8	1/4	1	7878152	—	—
13/64	9/16	1 1/4	5/16	1	—	7878213	—
13/64	1 1/8	2 1/8	5/16	1	—	—	7878274
N6	5/16	5/8	1/4	1	7878153	—	—
N6	9/16	1 1/4	5/16	1	—	7878214	—
N6	1 1/8	2 1/8	5/16	1	—	—	7878275
N5	5/16	5/8	1/4	1	7878154	—	—
N5	9/16	1 1/4	5/16	1	—	7878215	—
N5	1 1/8	2 1/8	5/16	1	—	—	7878276
N4	5/16	5/8	1/4	1	7878155	—	—
N4	9/16	1 1/4	5/16	1	—	7878216	—
N4	1 1/8	2 1/8	5/16	1	—	—	7878277
N3	5/16	5/8	1/4	1	7878156	—	—
N3	9/16	1 1/4	5/16	1	—	7878217	—
N3	1 1/8	2 1/8	5/16	1	—	—	7878278
7/32	5/16	5/8	1/4	1	7878157	—	—
7/32	9/16	1 1/4	5/16	1	—	7878218	—
7/32	1 1/8	2 1/8	5/16	1	—	—	7878279
N2	5/16	5/8	1/4	1	7878158	—	—
N2	9/16	1 1/4	5/16	1	—	7878219	—
N2	1 1/8	2 1/8	5/16	1	—	—	7878280
N1	5/16	5/8	1/4	1	7878159	—	—
N1	9/16	1 1/4	5/16	1	—	7878220	—
N1	1 1/8	2 1/8	5/16	1	—	—	7878281
A	5/16	5/8	1/4	1	7878160	—	—
A	9/16	1 1/4	5/16	1	—	7878221	—
A	1 1/8	2 1/8	5/16	1	—	—	7878079
15/64	5/16	5/8	1/4	1	7878161	—	—
15/64	9/16	1 1/4	5/16	1	—	7878222	—
15/64	1 1/8	2 1/8	5/16	1	—	—	7878283
B	5/16	5/8	1/4	1	7878162	—	—

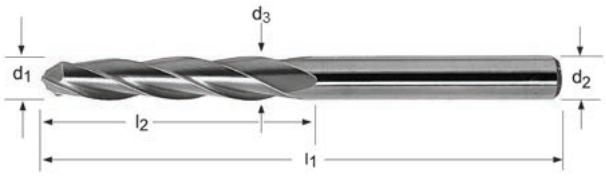
SPECIAL PURPOSE DRILL

d_1 Ø Nr.	l_2 Inch	l_1 Inch	l_3 Inch	Pack Qty	TS41CO TS40CO TS42CO	TS18CO TS10CO TS15CO	TS52CO TS51CO TS55CO
B	9/16	1 1/4	5/16	1	—	7878223	—
B	1 1/8	2 1/8	5/16	1	—	—	7878081
C	5/16	5/8	1/4	1	7878163	—	—
C	9/16	1 1/4	5/16	1	—	7878224	—
C	1 1/8	2 1/8	5/16	1	—	—	7878082
D	5/16	5/8	1/4	1	7878164	—	—
D	9/16	1 1/4	5/16	1	—	7878225	—
D	1 1/8	2 1/8	5/16	1	—	—	7878083
1/4	5/16	5/8	1/4	1	7878165	—	—
1/4	9/16	1 1/4	5/16	1	—	7878226	—
1/4	1 1/8	2 1/8	5/16	1	—	—	7878287
F	5/16	5/8	1/4	1	7878166	—	—
F	9/16	1 1/4	5/16	1	—	7878227	—
F	1 1/8	2 1/8	5/16	1	—	—	7878085
G	5/16	5/8	1/4	1	7878167	—	—
G	9/16	1 1/4	5/16	1	—	7878228	—
G	1 1/8	2 1/8	5/16	1	—	—	7878086
9/32	5/16	5/8	1/4	1	7878168	—	—
9/32	9/16	1 1/4	5/16	1	—	7878229	—
9/32	1 1/8	2 1/8	5/16	1	—	—	7878290
5/16	5/16	5/8	1/4	1	7878169	—	—
5/16	9/16	1 1/4	5/16	1	—	7878230	—
5/16	1 1/8	2 1/8	5/16	1	—	—	7878291
3/8	5/16	5/8	1/4	1	7878170	—	—
3/8	9/16	1 1/4	5/16	1	—	7878231	—
3/8	1 1/8	2 1/8	5/16	1	—	—	7878292

SPECIAL PURPOSE DRILL

3-Flute Tapered Aircraft Router

ATR41 For cutting, trimming and routing without pre-drilling. 1/4“ Taper per foot. Bright Finish improves chip flow in soft or non-ferrous materials



ATR41

4XD

HSS

118°

N1 - N4

Router Nr.	d_1 Ø Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	d_3 Ø Inch	# of Flutes	Pack Qty	ATR41
1	0.0810	0.0980	13/16	2“	0.0980	3	12	041701
2	0.1100	0.1280	7/8	2.1/4	0.1280	3	12	041702
3	0.1650	0.1875	1.1/16	2.1/2	0.1875	3	12	041703
4	0.2240	0.2500	1.1/4	2.3/4	0.2500	4	12	041704

JOBBER DRILL SETS

General Purpose Jobber Length Sets

C15R10P Bright Finish improves chip flow in
C29R10P soft or non-ferrous materials

C15R10 Steam Oxide reduces wear and chip
C29R10 welding in harder ferrous materials.

C15R10P C29R10P	C15R10 C29R10
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	R10P Sets	R10 Sets
C15R10	R10	15	1/16 - 1/2 x 32nds	1	—	099978
C29R10	R10	29	1/16 - 1/2 x 64ths	1	—	099977
C15R10P	R10P	15	1/16-1/2 x 32nds	1	090163	—
C29R10P	R10P	29	1/16 - 1/2 x 64ths	1	090162	—

JOBBER DRILL SETS

General Purpose Jobber Length Sets

A097 Self centering Split Point, low thrust design. TiN Coated Tip increases surface hardness and improves tool life.

C20R18P
C60R18P Bright Finish improves chip flow in soft or non-ferrous materials

C20R18
C60R18 Steam Oxide for increased wear resistance & lubricity.

A097	C20R18 C60R18	C20R18P C60R18P
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS	HSS	HSS
118°	118°	118°
Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A097	R18 sets	R18P sets
12	A012	60	Nr.1 - Nr.60	1	0574324	—	—
14	A012	26	A - Z	1	0574331	—	—
18	A012	29	1/16 - 1/2 x 1/64	1	0574317	—	—
20	A012	15	1/16 - 1/2 x 1/32	1	0574348	—	—
30	A012	115	1/16 - 1/2 x 1/64, Nr.1 - Nr.60, A-Z	1	0574362	—	—
60	A012	13	1/16 - 1/4 x 1/64	1	0574355	—	—
C20R18	R18	20	N61 - N80	1	—	099981	—
C60R18	R18	60	N1 - N60	1	—	099976	—
C20R18P	R18P	20	N61 - N80	1	—	—	090161
C60R18P	R18P	60	N1 - N60	1	—	—	090101

JOBBER DRILL SETS

General Purpose Jobber Length and Combination Sets

C26R15P

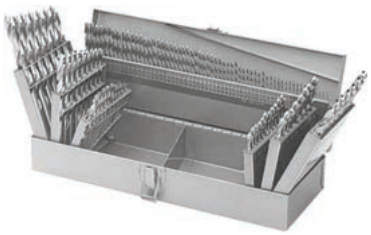
Bright Finish improves chip flow in soft or non-ferrous materials

C26R15

Steam Oxide for increased wear resistance & lubricity.

C114COMBP
C115COMBP

Bright Finish improves chip flow in soft or non-ferrous materials



	C26R15P	C26R15	C115COMBP	C114COMBP
	ANSI	ANSI	ANSI	ANSI
	4XD	4XD	4XD	4XD
	HSS	HSS	HSS	HSS
	118°	118°	118°	118°
	Set	Set	Set	Set

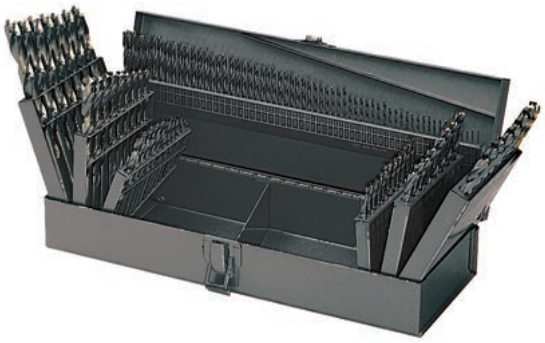
Set	Style	Pieces per Set	Sizes	Pack Qty	C26R15P	C26R15	C115COMBP	C114COMBP
C114COMBP	R10P, R18P, R10PM	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x 5 mm	1	—	—	—	090114
C115COMBP	R10P, R18P, R15P	115	1/16-1/2 x 64ths, N1-6N0, A-Z	1	—	—	090123	—
C26R15	R15	26	A - Z	1	—	099983	—	—
C26R15P	R15P	26	A - Z	1	090126	—	—	—

JOBBER DRILL SETS

General Purpose Jobber Length Combination Sets

C114COMB
C115COMB

Steam Oxide for increased wear resistance & lubricity.



C114COMB	C115COMB
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C114COMB	C115COMB
C114COMB	R10, R18, 2AB	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x .5 mm	1	099990	—
C115COMB	R10, R18, R15	115	1/16-1/2 x 64ths, N1-N60, A-Z	1	—	099982

General Purpose Jobber Length Metric Sets

A191
A190 Steam Oxide for increased wear resistance & lubricity.

C252A Bright Finish improves chip flow in soft or non-ferrous materials

C252AB
C502AB Steam Oxide for increased wear resistance & lubricity.

	A191	A190	C252A	C252AB C502AB
	DIN 338	DIN 338	DIN 338	DIN 338
	4XD	4XD	4XD	4XD
	HSS	HSS	HSS	HSS
	118°	118°	118°	118°
	Set	Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A191	A190	C252A	C252AB C502AB
12	A100	60	No.1 - No.60	1	—	0179437	—	—
18	A100	29	1/16 inch - 1/2 inch x 1/64 inch	1	—	0179451	—	—
20	A100	15	1/16 inch - 1/2 inch x 1/32 inch	1	—	0179468	—	—
201	A100	19	1.0 mm - 10.0 mm x 0.5 mm	1	—	0030547	—	—
202	A100	51	1.0 mm - 6.0 mm x 0.1 mm	1	—	0030554	—	—
203	A100	41	6.0 mm - 10.0 mm x 0.1 mm	1	—	0030561	—	—
204	A100	25	1.0 mm - 13.0 mm x 0.5 mm	1	—	0030578	—	—
206	A100	29	1.0 mm - 13.0 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	—	0030585	—	—
209	A100	91	1.0 mm - 10.0 mm x 0.1 mm	1	—	0179482	—	—
3	A100	21	1/16 inch - 3/8 inch x 1/64 inch	1	—	0179413	—	—
31M	A100	20	0.3 mm - 1.0 mm x 0.05 mm + 0.38 mm, 0.52 mm, 0.58 mm, 0.78 mm, 0.82 mm	1	0149133	—	—	—
413	A100	13	1.5 mm - 6.5 mm x 0.5 mm + 3.3 mm, 4.2 mm	1	0030608	—	—	—
419	A100	19	1.0 mm - 10.0 mm x 0.5 mm	1	0030615	—	—	—
61-80	A100	20	No.61 - No. 80	1	0179499	—	—	—
C252A	2A	25	1.0mm - 13mm x .5mm	1	—	—	099987	—
C252AB	2AB	25	1.0mm - 13mm x .5mm	1	—	—	—	099988
C502AB	2AB	50	1.0mm - 5.9mm x .1mm	1	—	—	—	099985

General Purpose Jobber Length Metric Sets

A094 Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases wear resistance and improves tool life.

A094

DIN 338

4XD

HSS

118°

Set

Set	Sizes	Pieces per Set	Sizes	Pack Qty	A094
413	A002	13	1.5 mm - 6.5 mm x 0.5 mm + 3.3 mm, 4.2 mm	1	46610302
419	A002	19	1.0 mm - 10.0 mm x 0.5 mm	1	46610303

General Purpose Jobber Length Metric Sets

A095 Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

Set	Style	Pieces per Set	C	Pack Qty	A095
18	A002	29	1/16 inch - 1/2 inch x 1/64 inch	1	0385395
20	A002	15	1/16 inch - 1/2 inch x 1/32 inch	1	46610305
200	A002	24	1.0 mm - 10.5 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	46610306
201	A002	19	1.0 mm - 10.0 mm x 0.5 mm	1	0385418
202	A002	51	1.0 mm - 6.0 mm x 0.1 mm	1	0385425
203	A002	41	6.0 mm - 10.0 mm x 0.1 mm	1	0385432
204	A002	25	1.0 mm - 13.0 mm x 0.5 mm	1	0385449
206	A002	29	1.0 mm - 13.0 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	0392331
209	A002	91	1.0 mm - 10.0 mm x 0.1 mm	1	0385562

JOBBER DRILL SETS

General Purpose Jobber Length Left Hand Sets

C15L10
C29L10

Bright Finish improves chip flow in soft or non-ferrous materials

Set	Style	Pieces per Set	Sizes	Pack Qty	C15L10	C29L10
C15L10	L10	15	1/16-1/2 x 32nds, Left Hand	1	099955	—
C29L10	L10	29	1/16 - 1/2 x 64ths, Left Hand	1	—	099935

High Helix Jobber Length Set

A287 Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance & lubricity. Fast spiral helix for improved chip flow when drilling stainless steel.

Set	Style	Pieces per Set	C	Pack Qty	A287
18	A108	29	1/16 - 1/2 x 1/64	1	0308523

JOBBER DRILL SETS

Heavy Duty Jobber Length Set

C29HX10 Low thrust design self centering Split Point for easier penetration. Stronger and more Rigid. Unique surface treatment for improved wear resistance.

C29HX10

ANSI

4XD

HSS

135°

Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29HX10
C29HX10	HX10	29	1/16 -1/2 x 64ths	1	091010

JOBBER DRILL SETS

Heavy Duty Cobalt Jobber Length Sets (NAS 907 Type J)

C13R10CO
C15R10CO
C21R10CO
C29R10CO
C60R18CO
C26R15CO

Low thrust design self centering 135° Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.

C13R10CO C15R10CO C21R10CO C29R10CO	C26R15CO	C60R18CO
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
Set	Set	Set

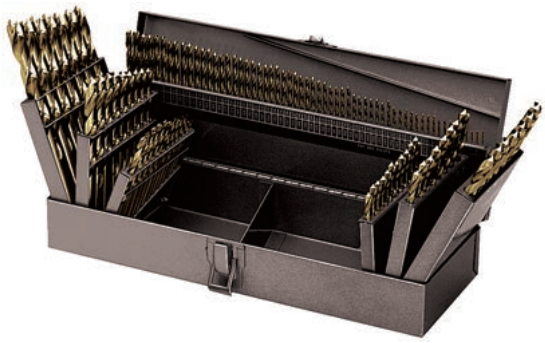
Set	Style	Pieces per Set	Sizes	Pack Qty	C29R10CO	C26R15CO	C60R18CO
C13R10CO	R10CO	13	1/16-1/4x 64ths	1	099944	—	—
C15R10CO	R10CO	15	1/16-1/2 x 32nds	1	090291	—	—
C21R10CO	R10CO	21	1/16-3/8 x 64ths	1	099701	—	—
C26R15CO	R15CO	26	A - Z	1	—	090292	—
C29R10CO	R10CO	29	1/16 - 1/2 x 64ths	1	090290	—	—
C60R18CO	R18CO	60	N1 - N60	1	—	—	090600

JOBBER DRILL SETS

Heavy Duty Cobalt Jobber Length Combination Sets (NAS 907 Type J)

C115COMBC
C114COMBC

Low thrust design self centering 135° Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.



	C115COMBC	C114COMBC
	ANSI	ANSI
	4XD	4XD
	HSS-E	HSS-E
	135°	135°
	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C115COMBC	C114COMBC
C114COMBC	R10CO, R18CO, 2ACO	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x .5 mm	1	—	099705
C115COMBC	R10CO, R18CO, R15CO	115	1/16-1/2 x 64ths, N1-N60, A-Z	1	099706	—

SCREW MACHINE DRILL SETS

General Purpose Screw Machine Drill Sets

C29R40
C60R41
C26R42

Bright Finish improves chip flow in soft or non-ferrous materials

	C29R40	C60R41	C26R42
	ANSI	ANSI	ANSI
	2.5XD	2.5XD	2.5XD
	HSS	HSS	HSS
	118°	118°	118°
	Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R40	C60R41	C26R42
C26R42	R42	26	A - Z	1	—	—	090173
C29R40	R40	29	1/16-1/2 x 64ths	1	090170	—	—
C60R41	R41	60	N1 - N60	1	—	090174	—

General Purpose Screw Machine Drill Set

A088 Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

A088

DIN ANSI

2.5XD

HSS

135°

Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A088
200S	A022	24	1.0 mm - 10.5 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	0616185

SCREW MACHINE DRILL SETS

Heavy Duty Screw Machine Drill Set

C29R40C
C60R41C

Low thrust design self centering Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity.

	C29R40C	C60R41C
	ANSI	ANSI
	2.5XD	2.5XD
	HSS	HSS
	135°	135°
	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R40C	C60R41C
C29R40C	R40C	29	1/16 - 1/2 x 64ths	1	099903	—
C60R41C	R41C	60	N1 - N60	1	—	099930

SCREW MACHINE DRILL SETS

Cobalt Heavy Duty Screw Machine Drill Sets

C29M40CO
C60M41CO
C26M42CO

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.

C29M40CO	C60M41CO	C26M42CO
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29M40CO	C60M41CO	C26M42CO
C26M42CO	M42CO	26	A - Z	1	—	—	099961
C29M40CO	M40CO	29	1/16 - 1/2 x 64ths	1	099962	—	—
C60M41CO	M41CO	60	N1 - N60	1	—	099960	—

TAPER LENGTH DRILL SETS

General Purpose Taper Length Drill Sets

C29R51 Bright Finish improves chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.

C29R51

ANSI

6XD

HSS

118°

Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R51
C29R51	R51	29	1/16 - 1/2 x 64ths	1	090154

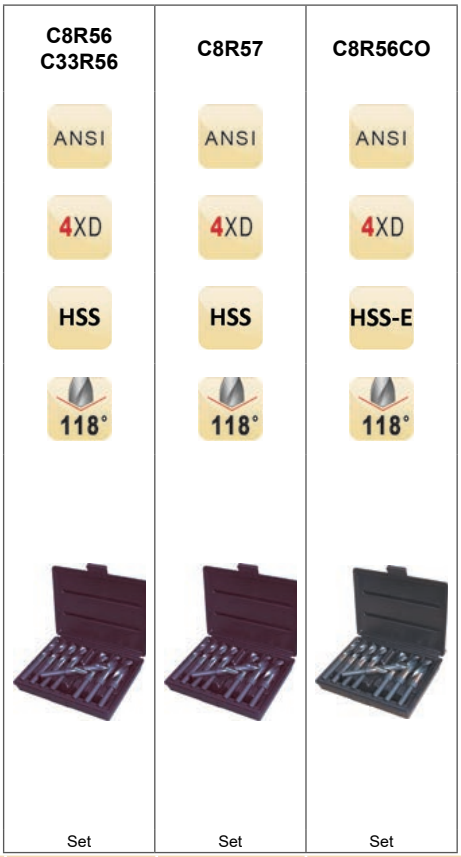
REDUCED SHANK DRILL SETS

Reduced Shank Drill Sets

C8R56
C33R56 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.

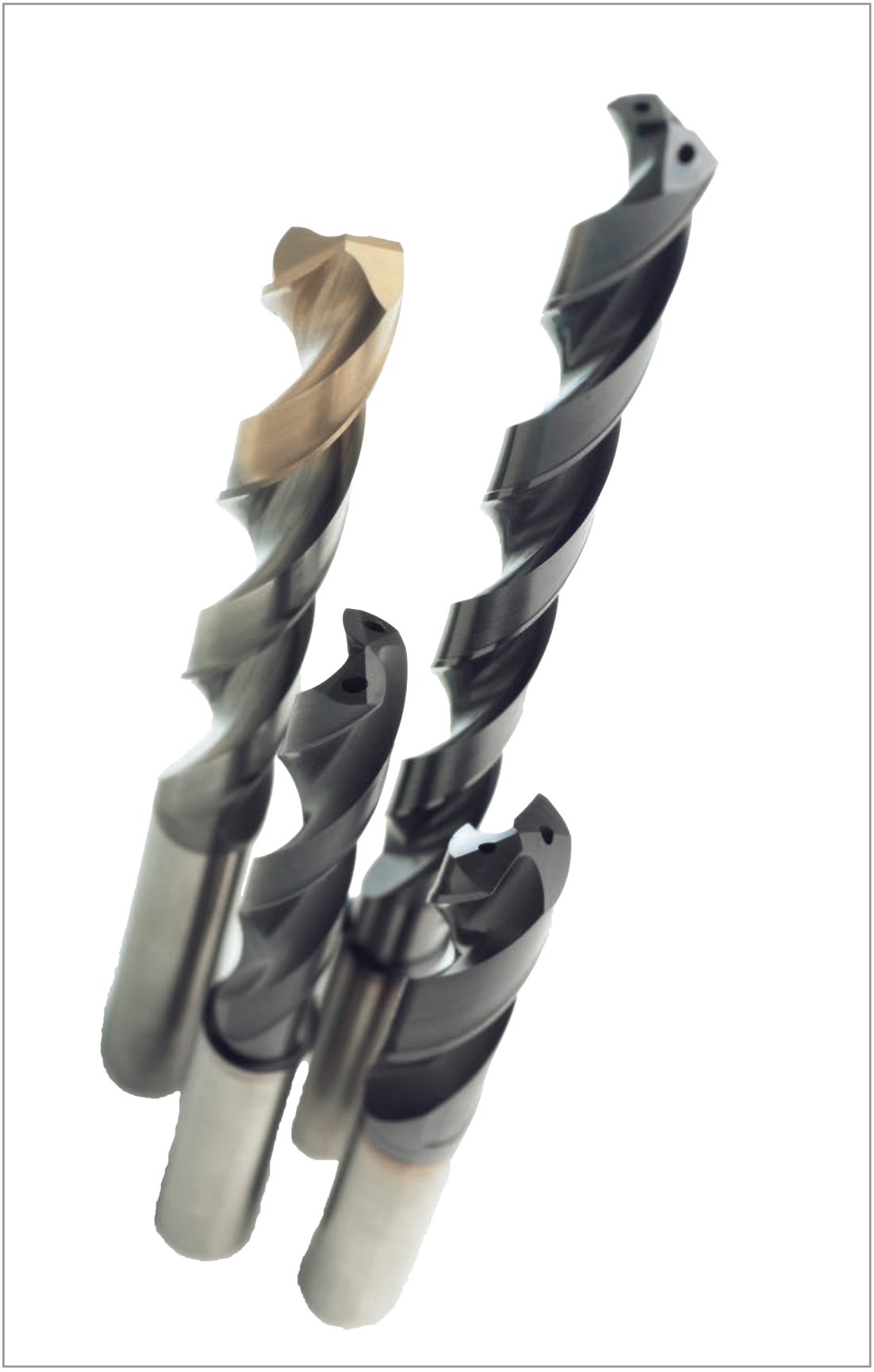
C8R57 Silver & Deming Drills with **Tri-Flat** Shank. Steam Oxide for increased wear resistance & lubricity.

C8R56CO Heavy Duty Cobalt Silver & Deming Drills. Self centering 118° Split Point reduces thrust. Cobalt base material with Bronze/ Steam Oxide for wear resistance and lubricity. Suitable for ferrous materials.



Set	Style	Pieces per Set	Sizes	Pack Qty	C8R56 C33R56	C8R57	C8R56CO
C33R56	R56	33	1/2“ Reduced Shank*, 1/2 - 1“x 64ths, S&D	1	090231	—	—
C8R56	R56	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	090556	—	—
C8R56CO	R56CO	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	—	—	090328
C8R57	R57	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	—	090558	—

*1/2“ R56 drill is a straight shank, not a reduced shank



Visual Index - Taps

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

SHARK LINE

Visual Index - Taps

Thread Form:	UNC	UNC	UNF	UNF	M	M	MF	MF	UNC	UNF	UNC	UNF	UNC	UNF	UNC
Standard:	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI
Class of Fit:	2BX	2BX	2BX	2BX	6HX	6HX	6HX	6HX	2B	2B	2B 3B	2B 3B	2B	2B	2BX
Hole Type:															
Depth of Cut:	2XD	2.5XD	2XD	2.5XD	2XD	2.5XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
Tool Material:	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM
Chamfer:	C 2-3	E 1.5-2	C 2-3	E 1.5-2	C 2-3	E 1.5-2	C 2-3	E 1.5-2	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5
Flute Geometry:															
Direction of Cut:															
Finish/Coating:	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top
Coolant Through:															
Style:	E814	E815	E914	E915	E630	E631	E770	E771	E809	E909	E813	E913	E811	E911	E816
Range:	1/4 - 1"	1/4 - 1"	No.10 - 7/8	1/4 - 1"	M5 - M24	M6 - M24	M8 - M14	M10 - M14	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 3/4
Page #	259	259	259	259	260	260	260	260	261	261	262	262	264	264	265

AMG																ISO
1.1									■ 108	■ 108						P 1
1.2									■ 95	■ 95	● 72	● 72				P 1
1.3									■ 75	■ 75	● 59	● 59				P 2
1.4									● 69	● 69	● 52	● 52	■ 98	■ 98		P 3
1.5									● 43	● 42	● 33	● 33	■ 66	■ 66	● 55	P 4
1.6													● 36	● 36	■ 42	H 1
1.7															● 22	H 3
1.8																H 4
2.1											■ 46	■ 46				M 1
2.2											■ 33	■ 33				M 3
2.3											■ 20	■ 20				M 2
2.4																S 2
3.1	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98								K 1
3.2	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82								K 2
3.3	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115								K 3
3.4	● 82	● 82	● 82	● 82	● 82	● 82	● 82	● 82								K 4
4.1																S 1
4.2													● 33	● 33	● 42	S 2
4.3															■ 26	S 3
5.1																S 1
5.2													● 33	● 33	● 16	S 2
5.3															■ 10	S 3
6.1									■ 39	■ 39						N 3
6.2	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98						N 3
6.3									■ 66	■ 66						N 3
6.4	● 16	● 16	● 16	● 16	● 16	● 16	● 16	● 16								N 4
7.1																N 1
7.2																N 1
7.3																N 1
7.4	● 66	● 66	● 66	● 66	● 66	● 66	● 66	● 66								N 2
8.1																O
8.2	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49								O
8.3																O
9.1																H
10.1																O

Visual Index - Taps

SHARK LINE

	UNF	M	MF	M	MF	M	MF	M	MF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	M	
	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	
	2BX	6H	6H	6H	6H	6H	6H	6H	6H	2B	2B	2B 3B	2B 3B	2B	2B	2BX	2BX	6H	
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	1.5XD	1.5XD	2XD	
	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	
	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	
										λ40°	λ40°	λ40°	λ40°	λ45°	λ45°	λ15°	λ15°	λ40°	
	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	
	E916	E625	E765	E629	E769	E627	E767	E817	E917	E808	E908	E812	E912	E810	E910	E805	E905	E624	
	No. 10 - 3/4	M4 - M24	M8 - M18	M4 - M24	M8 - M18	M3 - M24	M8 - M14	M3 - M12	M3 - M12	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 3/4	No.10 - 3/4	M4 - M24	
🕮	265	266	266	267	267	268	268	269	269	270	270	271	271	273	273	274	274	275	
AMG																			ISO
1.1		■ 108	■ 108							■ 108	■ 108							■ 108	P 1
1.2		■ 95	■ 95	● 72	● 72					■ 95	■ 95	● 72	● 72					■ 95	P 1
1.3		■ 75	■ 75	● 59	● 59					■ 75	■ 75	● 59	● 59					■ 75	P 2
1.4		● 69	● 69	● 52	● 52	■ 98	■ 98			● 69	● 69	● 52	● 52	■ 98	■ 98			● 69	P 3
1.5	● 55	● 43	● 43	● 33	● 33	■ 66	■ 66	● 55	● 55	● 43	● 43	● 33	● 33	■ 66	■ 66	● 55	● 55	● 43	P 4
1.6	■ 42					● 36	● 36	■ 42	■ 42					● 36	● 36	■ 42	■ 42		H 1
1.7	● 22							● 22	● 22							● 22	● 22		H 3
1.8																			H 4
2.1				■ 46	■ 46							■ 46	■ 46						M 1
2.2				■ 33	■ 33							■ 33	■ 33						M 3
2.3				■ 20	■ 20							■ 20	■ 20						M 2
2.4																			S 2
3.1																			K 1
3.2																			K 2
3.3																			K 3
3.4																			K 4
4.1																			S 1
4.2	● 42					● 33	● 33	● 42	● 42					● 33	● 33	● 42	● 42		S 2
4.3	■ 26							■ 26	■ 26							■ 26	■ 26		S 3
5.1																			S 1
5.2	● 16					● 33	● 33	● 16	● 16					● 33	● 33	● 16	● 16		S 2
5.3	■ 10							■ 10	■ 10							■ 10	■ 10		S 3
6.1		■ 39	■ 39							■ 39	■ 39							■ 39	N 3
6.2		● 98	● 98							● 98	● 98							● 98	N 3
6.3		■ 66	■ 66							■ 66	■ 66							■ 66	N 3
6.4																			N 4
7.1																			N 1
7.2																			N 1
7.3																			N 1
7.4																			N 2
8.1																			O
8.2																			O
8.3																			O
9.1																			H
10.1																			O

Visual Index - Taps

	MF	M	MF	M	MF	M	MF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF
	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	ANSI	DIN 2184-1	DIN 2184-1
	6H	6H	6H	6H	6H	6H	6H	2B	2B	2B	2B	3B	3B	3B	3B	2B	2B
	2XD	2.5XD	2.5XD	2.5XD	2.5XD	1.5XD	1.5XD	3XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	P	P	P	P	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3
	λ40°	λ40°	λ40°	λ45°	λ45°	λ15°	λ15°										
	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiCN	TiCN	TiCN	TiCN			ST	ST		
	E764	E628	E768	E626	E766	E806	E906	1672AP (UNC)	1672AP (UNF)	1674 (UNC)	1674 (UNF)	E025	E035	E026	E036	EP20	EP30
	M8 - M18	M4 - M24	M8 - M18	M3 - M24	M8 - M14	M3 - M12	M8 - M12	No.4 - 1"	No.10 - 3/4	1/4 - 1"	1/4 - 1"	No.6 - 1"	No.6 - 1"	No.2 - 1"	No.10 - 1"	No.4 - 1"	No.8 - 1"
📖	275	276	276	277	277	278	278	279	279	279	279	280	280	280	280	282	278
1.1	■ 108							110	110	120	120	82	82	82	82	82	82
1.2	■ 95	● 72	● 72					90	90	100	100	72	72	72	72	72	72
1.3	■ 75	● 59	● 59					55	55	65	65	59	59	59	59	59	59
1.4	● 69	● 52	● 52	■ 98	■ 98			55	55	65	65	52	52	52	52	52	52
1.5	● 43	● 33	● 33	■ 66	■ 66	● 55	● 55	45	45	50	50	33	33	33	33	33	33
1.6				● 36	● 36	■ 42	■ 42					16	16	16	16	16	16
1.7						● 22	● 22										
1.8																	
2.1		■ 46	■ 46					50	50	60	60			26	26		
2.2		■ 33	■ 33					40	40	40	40			23	23		
2.3		■ 20	■ 20					40	40	45	45			16	16		
2.4																	
3.1												49	49	49	49	49	49
3.2												26	26	26	26	26	26
3.3												49	49	49	49	49	49
3.4												26	26	26	26	26	26
4.1								35	35	40	40	33	33			33	33
4.2				● 33	● 33	● 42	● 42	25	25	30	30	16	16			16	16
4.3						■ 26	■ 26										
5.1								35	35	40	40	39	39			39	39
5.2				● 33	● 33	● 16	● 16	20	20	25	25	16	16			16	16
5.3						■ 10	■ 10										
6.1	■ 39							45	45	50	50	39	39			39	39
6.2	● 98							120	120	125	125	98	98			98	98
6.3	■ 66							100	100	110	110	66	66			66	66
6.4																	
7.1								85	85	95	95	52	52			52	52
7.2								100	100	120	120	115	115			115	115
7.3								85	85	95	95	66	66			66	66
7.4								30	30	40	40	49	49			49	49
8.1												98	98			98	98
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	UNC	UNF	M	MF	M	M	M	MF	M	M	MF	MF	M	M	MF
	DIN 2184-1	DIN 2184-1	ISO 529	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	DIN 371<10 376>12	DIN 371<10 376>12	DIN 374	DIN 374	ISO 529	ISO 529	ISO 529
	2B	2B	2B	2B	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H
	2.5XD	2.5XD	2.5XD	2.5XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
	B 3.5-5	C 2-3	B 3.5-5	B 3.5-5	P	P	P	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5
	ST	ST	ST	ST	TiCN	TiCN	TiCN		ST	ST		ST		ST		ST	ST
	EP21	EP31	E021	E031	1673AP (M)	1673AP (MF)	1675 (M)	E005	E006	E016	EP006H	EP016H	EP10	EP11	E000	E001	E011
	No.4 - 1"	No.8 - 1"	No.2 - 1"	No.8 - 1"	M4 - M24	M8 - M24	M12 - M20	M4 - M20	M4 - M20	M8 - M14	M2 - M30	M2 - M30	M4 - M30	M4 - M30	M1.6 - M24	M1.6 - M24	M4 - M24
🕮	282	282	283	283	284	284	284	285	285	285	286	286	287	287	288	288	288
1.1	82	82	82	82	110	110	120	82	82	82	82	82	82	82	82	82	82
1.2	72	72	72	72	90	90	100	72	72	72	72	72	72	72	72	72	72
1.3	59	59	59	59	55	55	65	59	59	59	59	59	59	59	59	59	59
1.4	52	52	52	52	55	55	65	52	52	52	52	52	52	52	52	52	52
1.5	33	33	33	33	45	45	50	33	33	33	33	33	33	33	33	33	33
1.6	16	16	16	16				16	16	16	16	16	16	16	16	16	16
1.7																	
1.8																	
2.1	23	23	23	23	50	50	60		26	26		23		23		23	23
2.2	20	20	20	20	40	40	40		23	23		20		20		20	20
2.3	13	13	13	13	40	40	45		16	16		13		13		13	13
2.4																	
3.1	49	49	49	49				49	49	49	49	49	49	49	49	49	49
3.2	26	26	26	26				26	26	26	26	26	26	26	26	26	26
3.3	49	49	49	49				49	49	49	49	49	49	49	49	49	49
3.4	26	26	26	26				26	26	26	26	26	26	26	26	26	26
4.1					35	35	40	33			33		33		33		
4.2					25	25	30	16			16		16		16		
4.3																	
5.1					35	35	40	39			39		39		39		
5.2					20	20	25	16			16		16		16		
5.3																	
6.1					45	45	50	39			39		39		39		
6.2					120	120	125	98			98		98		98		
6.3					100	100	110	66			66		66		66		
6.4																	
7.1					85	85	95	52			52		52		52		
7.2					100	100	120	115			115		115		115		
7.3					85	85	95	66			66		66		66		
7.4					30	30	40	49			49		49		49		
8.1								98			98		98		98		
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	E000TIN	1629AP (UNC)	1629AP (UNF)	1659AP (M)	E201	E252	1985 (UNC)	1985 (UNF)	1676AP (UNC)	1676AP (UNF)	1678 (UNC)	1678 (UNF)	E027	E037	E028	E038	EX20
	M3 - M20	No.4 - 1"	No.10 - 5/8	M3 - M12	M3 - M10	M8 - M24	No.4 - 1"	No.4 - 7/8	No.4 - 1"	No.10 - 7/8	1/4 - 1"	1/4 - 7/8	No.6 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"
📖	288	290	290	291	292	292	293	293	294	294	294	294	295	295	295	295	296
1.1	131						75	75	100	100	110	110	82	82	82	82	82
1.2	131						69	69	80	80	90	90	72	72	72	72	72
1.3	105						49	49	50	50	55	55	59	59	59	59	59
1.4	89						49	49	50	50	55	55	52	52	52	52	52
1.5	43	45	45	45			30	30	40	40	45	45	33	33	33	33	33
1.6	36	25	25	25			16	16						16		16	
1.7																	
1.8																	
2.1	26						36	36	45	45	50	50			23	23	
2.2	23						20	20	30	30	35	35			20	20	
2.3	16								35	35	40	40			13	13	
2.4		30	30	30													
3.1	72	90	90	90	49	49											
3.2	59	70	70	70	26	26											
3.3	82	65	65	65	49	49											
3.4	59	35	35	35	26	26											
4.1	49						20	20	30	30	35	35	33	33			33
4.2	23						16	16	20	20	25	25	16	16			16
4.3		10	10	10			7	7									
5.1	59						30	30	30	30	35	35	39	39			39
5.2	26						16	16	15	15	20	20	16	16			16
5.3		15	15	15			10	10									
6.1	59								40	40	45	45	39				
6.2	148				66	66			100	100	120	120	98				
6.3	115								90	90	100	100	66				
6.4		25	25	25	16	16											
7.1									80	80	90	90	52	52			52
7.2									95	95	115	115	115	115			115
7.3	98								80	80	90	90	66	66			66
7.4	72				49	49			30	30	35	35	49	49			49
8.1													98	98			
8.2	148				33	33											
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNF	UNC	UNF	UNC	UNF	M	MF	M	M	M	MF	M	M	MF	MF	M	M
	DIN 2184-1	DIN 2184-1	DIN 2184-1	ISO 529	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	DIN 371≤10 376>12	DIN 371≤10 376>12	DIN 374	DIN 374	ISO 529	ISO 529
	2B	2B	2B	2B	2B	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	Semi-B	Semi-B	Semi-B	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3
	λ45°	λ45°	λ45°	λ45°	λ45°	λ50°	λ50°	λ50°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°
		ST	ST	ST	ST	TiCN	TiCN	TiCN		ST	ST		ST		ST		ST
	EX30	EX21	EX31	E023	E033	1677AP (M)	1677AP (MF)	1679 (M)(MF)	E007	E008	E018	EX006H	EX016H	EX10	EX11	E002	E003
	No.8 - 1"	No.4 - 1"	No.8 - 1"	No.2 - 1"	No.8 - 1"	M4 - M24	M8 - M24	M6 - M24	M4 - M16	M4 - M20	M8 - M14	M2 - M64	M2 - M64	M4 - M30	M4 - M30	M2 - M24	M2 - M24
🕮	296	296	296	297	297	298	298	298	299	299	299	300	300	301	301	302	302
1.1	82	82	82	82	82	100	100	110	82	82	82	82	82	82	82	82	82
1.2	72	72	72	72	72	80	80	90	72	72	72	72	72	72	72	72	72
1.3	59	59	59	59	59	50	50	55	59	59	59	59	59	59	59	59	59
1.4	52	52	52	52	52	50	50	55	52	52	52	52	52	52	52	52	52
1.5	33	33	33	33	33	40	40	45	33	33	33	33	33	33	33	33	33
1.6					16												
1.7																	
1.8																	
2.1		23	23	23	23	45	45	50		23	23		23		23		23
2.2		20	20	20	20	30	30	35		20	20		20		20		20
2.3		13	13	13	13	35	35	40		13	13		13		13		13
2.4																	
3.1																	
3.2																	
3.3																	
3.4																	
4.1	33					30	30	35	33			33		33		33	
4.2	16					20	20	25	16			16		16		16	
4.3																	
5.1	39					30	30	35	39			39		39		39	
5.2	16					15	15	20	16			16		16		16	
5.3																	
6.1						40	40	45									
6.2						100	100	120									
6.3						90	90	100									
6.4																	
7.1	52					80	80	89	52			52		52		52	
7.2	115					95	95	115	115			115		115		115	
7.3	66					80	80	90	66			66		66		66	
7.4	49					30	30	35	49			49		49		49	
8.1																	
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	MF	UNC	UNF	M	UNC	UNF	M	UNC	UNF	UNC	UNF	M	MF	M	G	G	G
	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN 5156	DIN 5156	DORMER ISO
	6H	2B	2B	6H	2B 3B	2B 3B	6H	2B	2B	2B	2B	6H	6H	6H	Normal	Normal	Normal
	2.5XD	1.5XD	1.5XD	1.5XD				3XD	3XD	3XD	3XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD
	HSS-E	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E
	C 2-3	Semi-B	Semi-B	Semi-B	E 1.5-2	E 1.5-2	E 1.5-2	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	B 3.5-5	B 3.5-5	B 3.5-5
	λ45°	λ17°	λ17°	λ17°													
	ST	TiAlN Top	TiAlN Top	TiAlN Top	TiN	TiN	TiN	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top		ST	ST
	E013	1630AP (UNC)	1630AP (UNF)	1660AP (M)	1641 (UNC)	1641 (UNF)	1671 (M)	1681AP (UNC)	1681AP (UNF)	1691AP (UNC)	1691AP (UNF)	1687AP (M)	1687AP (MF)	1697AP (M)	EP40	EP41	E041
	M4 - M22	No.4 - 1"	No.10 - 7/8	M3 - M12	No.4 - 1/2	No.10 - 3/8	M3 - M10	No.4 - 1"	No.10 - 7/8	1/4 - 1"	5/16 - 1/2	M4 - M20	M10 - M16	M6 - M20	1/8 - 1"	1/8 - 1"	1/8 - 3/4
📖	302	303	303	304	305	305	306	307	307	308	308	309	309	309	310	310	311
1.1	82				150	150	150	150	150	165	165	150	150	165	82	82	82
1.2	72				125	125	125	125	125	135	135	125	125	135	72	72	72
1.3	59				90	90	90	90	90	100	100	90	90	100	59	59	59
1.4	52				90	90	90	90	90	100	100	90	90	100	52	52	52
1.5	33	45	45	45											33	33	33
1.6		25	25	25											16	16	16
1.7																	
1.8																	
2.1	23				70	70	70	70	70	80	80	70	70	80		23	23
2.2	20				60	60	60	60	60	70	70	60	60	70		20	20
2.3	13				50	50	50	50	50	60	60	50	50	60		13	13
2.4		30	30	30													
3.1		90	90	90											49	49	49
3.2		70	70	70											26	26	26
3.3		65	65	65											49	49	49
3.4		35	35	35											26	26	26
4.1					60	60	60	60	60	70	70	60	60	70	33		
4.2															16		
4.3		10	10	10													
5.1					45	45	45	45	45	55	55	45	45	55	39		
5.2															16		
5.3		15	15	15													
6.1					55	55	55	55	55	70	70	55	55	70	39		
6.2					180	180	180	180	180	200	200	180	180	200	98		
6.3					130	130	130	130	130	160	160	130	130	160	66		
6.4		25	25	25													
7.1					180	180	180	180	180	200	200	180	180	200	52		
7.2					200	200	200	200	200	240	240	200	200	240	115		
7.3					230	230	230	230	230	260	260	230	230	260	66		
7.4															49		
8.1															98		
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	G	G	G	UNC	UNF	UNS	UNC	UNF	UNC	UNF	UNC	UNF	M	MF	UNC	UNF	UNS
	DIN 5156	DIN 5156	DORMER ISO	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ISO 529	ISO 529	ANSI	ANSI	ANSI
	Normal	Normal	Normal	2B 3B	2B 3B	3B	2B 3B	2B 3B	3B	3B	3B	3B	6H	6H	3B	3B	3B
	2.5XD	2.5XD	2.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
	C 2-3	C 2-3	C 2-3														
	λ45°	λ45°	λ45°														
		ST	ST						ST	ST	TN	TN					
	EX40	EX41	E043	1500 (UNC)	1500 (UNF)	1500 (UNS)	1528 (UNC)	1528 (UNF)	1500A (UNC)	1500A (UNF)	TN1500 (UNC)	TN1500 (UNF)	E500	E513	1500L (UNC)	1500L (UNF)	1500L (UNS)
	1/8 - 1.1/2	1/8 - 1.1/2	1/8 - 3/4	1/4 - 1.1/2	1/4 - 1.1/2	11/16 - 1"	No.1 - No.12	No.0 - No.12	1/4 - 1"	1/4 - 7/8	1/4 - 7/8	1/4 - 3/4	M1 - M56	M3 - M50	1/4 - 1"	1/4 - 1"	1"
🕮	312	312	313	314	314	314	314	314	317	317	318	318	319	321	323	323	323
1.1	82	82	82	60	60	60	60	60	60	60	59	59	23	23	60	60	60
1.2	72	72	72	45	45	45	45	45	45	45	46	46	20	20	45	45	45
1.3	59	59	59	30	30	30	30	30	30	30	30	30	16	16	30	30	30
1.4	52	52	52	30	30	30	30	30	30	30	30	30	13	13	30	30	30
1.5	33	33	33	20	20	20	20	20	20	20	20	20	10	10	20	20	20
1.6			16	10	10	10	10	10	10	10	10	10			10	10	10
1.7																	
1.8																	
2.1		23	23	25	25	25	25	25	25	25	26	26			25	25	25
2.2		20	20	15	15	15	15	15	15	15	26	26			15	15	15
2.3		13	13	15	15	15	15	15	15	15	16	16			15	15	15
2.4																	
3.1				50	50	50	50	50	50	50	49	49	39	39	50	50	50
3.2				30	30	30	30	30	30	30	30	30	23	23	30	30	30
3.3				30	30	30	30	30	30	30	30	30	33	33	30	30	30
3.4				15	15	15	15	15	15	15	16	16	16	16	15	15	15
4.1	33			20	20	20	20	20	20	20	20	20			20	20	20
4.2	16			15	15	15	15	15	15	15	16	16			15	15	15
4.3																	
5.1	39			20	20	20	20	20	20	20	20	20			20	20	20
5.2	16			10	10	10	10	10	10	10	10	10			10	10	10
5.3																	
6.1				25	25	25	25	25	25	25	26	26	13	13	25	25	25
6.2				80	80	80	80	80	80	80	79	79	33	33	80	80	80
6.3				60	60	60	60	60	60	60	59	59	23	23	60	60	60
6.4				10	10	10	10	10	10	10	10	10	7	7	10	10	10
7.1	52			50	50	50	50	50	50	50	49	49			50	50	50
7.2	115			100	100	100	100	100	100	100	98	98	39	39	100	100	100
7.3	66			75	75	75	75	75	75	75	75	75	23	23	75	75	75
7.4	49			20	20	20	20	20	20	20	20	20	16	16	20	20	20
8.1	98			25	25	25	25	25	25	25	30	30			25	25	25
8.2				15	15	15	15	15	15	15	16	16	16	16	15	15	15
8.3													10	10			
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	UNC	UNF	UNC	UNF	M	M	UNC	UNS	UNC	UNF	UNC	UNF	M	M	M
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ISO 529	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ISO 529
	2B 3B	2B 3B	3B	2B 3B	3B	3B	6H	6H		2B	3B	3B	2B	2B	6H	6H	6H
	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
									P								
											N	N	N/ST	N/ST	N	N	TiN
	E061	E071	1508 (UNC)	1508 (UNF)	1595 (UNC)	1595 (UNF)	1700 (M)	E501	1500OV (UNC)	1505 (UNS)	1599 (UNC)	1599 (UNF)	1600 (UNC)	1600 (UNF)	1599 (M)	1599SB (M)	E504
	No.6 - 1.1/2	No.6 - 1.1/2	1/4 - 1/2	1/4 - 1/2	1/4 - 5/16	1/4 - 1/4	M1.6 - M36	M3 - M24	1/4 - 5/8	1.1/8 - 2"	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	M6 - M14	M6 - M12	M3 - M24
🕮	324	324	325	325	325	325	326	327	328	329	330	330	330	330	331	331	332
1.1	72	72	60	60	66	66	49	23	49	49							46
1.2	66	66	45	45	59	59	36	20	36	36							39
1.3	52	52	30	30	39	39	26	16	26	26							33
1.4	39	39	30	30	39	39	26	13	26	26							26
1.5	23	23	20	20	26	26	16	10	16	16							20
1.6	13	13	10	10	16	16	7		7	7							
1.7																	
1.8																	
2.1			25	25	30	30	20		20	20							
2.2			15	15	20	20	13		13	13							
2.3			15	15	20	20	13		13	13							
2.4																	
3.1	39	39	50	50	46	46	39	39	39	39	49	49	49	49	49	49	59
3.2	23	23	30	30	26	26	26	23	26	26	36	36	36	36	36	36	39
3.3	33	33	30	30	26	26	26	33	26	26	36	36	36	36	36	36	72
3.4	16	16	15	15	16	16	13	16	13	13	20	20	20	20	20	20	39
4.1			20	20	20	20	16		16	16							
4.2			15	15	16	16	13		13	13							
4.3					7	7											
5.1			20	20	26	26	16		16	16							
5.2			10	10	10	10	7		7	7							
5.3																	
6.1	39	39	25	25	30	30	20	13	20	20							
6.2	98	98	80	80	89	89	66	33	66	66							66
6.3	66	66	60	60	69	69	49	23	49	49							46
6.4			10	10	10	10	7	7	7	7	13	13	13	13	13	13	13
7.1			50	50	49	49	39		39	39							
7.2			100	100	98	98	79	39	79	79							79
7.3	66	66	75	75	66	66	59	23	59	59							46
7.4	49	49	20	20	20	20	16	16	16	16							33
8.1			25	25	98	98	26		26	26							
8.2	39	39	15	15	26	26	13	16	13	13	13	13	13	13	13	13	33
8.3	23	23						10									20
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	M	M	UNC	UNF	UNS
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	2B 3B	2B 3B	2B	2B	3B	3B	2B 3B	2B 3B	2B 3B	3B	3B	3B	6H	6H	2B 3B	2B 3B	3B
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	1.25XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS
											P	P					
	TN	TN			ST	ST	TN	TN	TN	TN							
	1534 (UNC)	1534 (UNF)	TN1534 (UNC)	TN1534 (UNF)	1585 (UNC)	1585 (UNF)	1585A (UNC)	1585A (UNF)	TN1585 (UNC)	TN1585 (UNF)	1634 (UNC)	1634 (UNF)	1785M	TN1785	1534NR (UNC)	1534NR (UNF)	1534NR (UNS)
	No.5 - No.12	No.5 - No.12	No.4 - No.12	No.10	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	1/4 - 1/2	1/4 - 1/2	No.4 - No.8	No.10	M2 - M18	M4 - M12	No.1 - No.12	No.0 - No.12	No.4
🕮	333	333	333	333	334	334	334	334	334	334	336	336	337	337	338	338	338
1.1	66	66	79	79	66	66	66	66	79	79	66	66	66	79	66	66	66
1.2	66	66	75	75	66	66	66	66	75	75	66	66	66	75	66	66	66
1.3	39	39	49	49	39	39	39	39	49	49	39	39	39	49	39	39	39
1.4	39	39	49	49	39	39	39	39	49	49	39	39	39	49	39	39	39
1.5	26	26	30	30	26	26	26	26	30	30	26	26	26	30	26	26	26
1.6	16	16	20	20	16	16	16	16	20	20	16	16	16	20	16	16	16
1.7																	
1.8																	
2.1	30	30	39	39	30	30	30	30	39	39	30	30	30	39	30	30	30
2.2	20	20	26	26	20	20	20	20	26	26	20	20	20	26	20	20	20
2.3	20	20	26	26	20	20	20	20	26	26	20	20	20	26	20	20	20
2.4																	
3.1	46	46	49	49	46	46	46	46	49	49	46	46	46	49	46	46	46
3.2	26	26	30	30	26	26	26	26	30	30	26	26	26	30	26	26	26
3.3	26	26	30	30	26	26	26	26	30	30	26	26	26	30	26	26	26
3.4	16	16	20	20	16	16	16	16	20	20	16	16	16	20	16	16	16
4.1	20	20			20	20	20	20			20	20	20		20	20	20
4.2	16	16			16	16	16	16			16	16	16		16	16	16
4.3	7	7			7	7	7	7			7	7	7		7	7	7
5.1	26	26	30	30	26	26	26	26	30	30	26	26	26	30	26	26	26
5.2	10	10	13	13	10	10	10	10	13	13	10	10	10	13	10	10	10
5.3																	
6.1	30	30	39	39	30	30	30	30	39	39	30	30	30	39	30	30	30
6.2	89	89	115	115	89	89	89	89	115	115	89	89	89	115	89	89	89
6.3	69	69	89	89	69	69	69	69	89	89	69	69	69	89	69	69	69
6.4	10	10	13	13	10	10	10	10	13	13	10	10	10	13	10	10	10
7.1	49	49	66	66	49	49	49	49	66	66	49	49	49	66	49	49	49
7.2	98	98	125	125	98	98	98	98	125	125	98	98	98	125	98	98	98
7.3	66	66	79	79	66	66	66	66	79	79	66	66	66	79	66	66	66
7.4	20	20	26	26	20	20	20	20	26	26	20	20	20	26	20	20	20
8.1	98	98	121	121	98	98	98	98	121	121	98	98	98	121	98	98	98
8.2	26	26	30	30	26	26	26	26	30	30	26	26	26	30	26	26	26
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	M	UNC	UNF	UNC	UNF	UNC	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	2B 3B	2B 3B	6H	3B	2B 3B	2B 3B	2B 3B	2B	3B	3B	3B	3B	3B	3B	2B 3B	2B 3B	3B
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
				P	P												
									λ30°	λ30°	λ30°	λ30°	λ52°	λ52°	λ52°	λ52°	λ40°
																	ST
	1585NR (UNC)	1585NR (UNF)	1785NR	1534NE (UNC)	1534NE (UNF)	1593 (UNC)	1593 (UNF)	1585OV (UNC)	1582 (UNC)	1582 (UNF)	1586 (UNC)	1586 (UNF)	1587 (UNC)	1587 (UNF)	1588 (UNC)	1588 (UNF)	1590 (UNC)
	1/4 - 3/4	1/4 - 3/4	M1.6 - M20	No.4 - 1/2	No.10 - 1/2	No.6 - No.10	No.10	1/4 - 5/8	No.4 - No.10	No.10 - No.10	1/4 - 1/2	1/4 - 1/2	No.3 - No.12	No.4 - No.10	1/4 - 1/2	1/4 - 1/2	No.6 - No.10
📖	340	340	341	342	342	343	343	343	344	344	344	344	345	345	345	345	346
1.1	66	66	66	66	66	66	66	66	66	66	66	66					69
1.2	59	59	59	66	66	66	66	66	49	49	49	49					59
1.3	46	46	46	39	39	39	39	39	36	36	36	36					39
1.4	33	33	33	39	39	39	39	39	36	36	36	36					39
1.5	16	16	16	26	26	26	26	26									30
1.6	10	10	10	16	16	16	16	16									
1.7																	
1.8																	
2.1	20	20	20	30	30	30	30	30	26	26	26	26					30
2.2	13	13	13	20	20	20	20	20	20	20	20	20					26
2.3	10	10	10	20	20	20	20	20	20	20	20	20					20
2.4																	
3.1			46	46	46	46	46	46									
3.2			26	26	26	26	26	26									
3.3			26	26	26	26	26	26									
3.4			16	16	16	16	16	16									
4.1				20	20	20	20	20	20	20	20	20					20
4.2				16	16	16	16	16	16	16	16	16					16
4.3	10	10	10	7	7	7	7	7	7	7	7	7					7
5.1	33	33	33	26	26	26	26	26	20	20	20	20					
5.2	13	13	13	10	10	10	10	10	16	16	16	16					
5.3																	10
6.1	33	33	33	30	30	30	30	30					30	30	30	30	
6.2				89	89	89	89	89					79	79	79	79	
6.3	49	49	49	69	69	69	69	69					79	79	79	79	
6.4				10	10	10	10	10									
7.1	33	33	33	49	49	49	49	49					49	49	49	49	
7.2	82	82	82	98	98	98	98	98					66	66	66	66	
7.3	43	43	43	66	66	66	66	66					66	66	66	66	
7.4	33	33	33	20	20	20	20	20									
8.1	66	66	66	98	98	98	98	98									
8.2				26	26	26	26	26									
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNF	UNC	UNF	M	UNC	UNF	M	UNC	UNF	M	UNC	UNF	NPT	NPT	NPT	NPT	NPT
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI B94.9	ANSI B94.9	ANSI B94.9
	3B	3B	3B	6H	2B 3B	2B 3B	6H	2B 3B	2B 3B	6H	2B	2B	Normal	Normal	Normal	Normal	Normal
	2.5XD	2.5XD	2.5XD	2.5XD	1.25XD	2.5XD	2.5XD	3XD	3XD	3XD	2.5XD	2.5XD	2XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
											E 1.5-2	E 1.5-2			C 2-3	C 2-3	C 2-3
	λ40°	λ40°	λ40°	λ52°													
	ST	ST	ST											TiN		TiN	
	1590 (UNF)	1591 (UNC)	1591 (UNF)	1788 (M)	1580 (UNC)	1580 (UNF)	1580 (M)	3300 (UNC)	3300 (UNF)	3300 (M)	3306E (UNC)	3306E (UNF)	1541 (NPT)	TN1541	E710	E721	6541
	No.6 - No.10	1/4 - 1/2	1/4 - 1/2	M3 - M12	No.2 - 3/8	No.10 - 3/8	M3 - M12	No.1 - 1/2	No.0 - 3/8	M3 - M10	No.4 - 5/16	No.10 - 5/16	1/16 - 2"	1/8 - 3/4	1/16 - 2"	1/8 - 1"	1/8 - 2"
🕮	346	346	346	347	348	348	349	350	350	351	352	352	353	353	354	354	355
1.1	69	69	69		98	98	98	98	98	98	98	98	13	16	13	13	13
1.2	59	59	59		79	79	79	79	79	79	79	79	13	16	13	13	13
1.3	39	39	39		49	49	49	49	49	49	49	49	20	23	20	20	20
1.4	39	39	39		49	49	49	49	49	49	49	49	16	20	16	16	16
1.5	30	30	30		30	30	30	30	30	30	30	30	10	13	10	10	10
1.6																	
1.7																	
1.8																	
2.1	30	30	30		39	39	39	39	39	39	39	39					
2.2	26	26	26		30	30	30	30	30	30	30	30					
2.3	20	20	20														
2.4																	
3.1													20	23	20	20	20
3.2													13	16	13	13	13
3.3													20	23	20	20	20
3.4													13	16	13	13	13
4.1	20	20	20		30	30	30	30	30	30	30	30					
4.2	16	16	16		26	26	26	26	26	26	26	26					
4.3	7	7	7														
5.1					30	30	30	30	30	30	30	30					
5.2																	
5.3	10	10	10														
6.1				30	39	39	39	39	39	39	39	39					
6.2				79	121	121	121	121	121	121	121	121	36	39	36	36	36
6.3				79	98	98	98	98	98	98	98	98					
6.4																	
7.1				49	79	79	79	79	79	79	79	79					
7.2				66	161	161	161	161	161	161	161	161					
7.3				66	98	98	98	98	98	98	98	98	36	39	36	36	36
7.4													23	26	23	23	23
8.1													13	16	13	13	13
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	NPT	NPT	NPT	NPT	NPT	NPT	NPTF	NPTF	NPTF	NPTF	NPTF	NPSM	NPSF	Rc	G	UNC	UNF
	ANSI B94.9	ANSI	ANSI	ANSI	ANSI	ANSI B94.9	ANSI	ANSI	ANSI	ANSI	ANSI B94.9	ANSI	ANSI	ISO 2284	ISO 2284	ANSI	ANSI
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	3B	3B
	1.5XD	1.5XD	1.5XD	2XD	2XD	1.5XD	2XD	1.5XD	2XD	2XD	1.5XD	2XD	2XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
						C 2-3					C 2-3			C 2-3			
				λ30°					λ30°								
	N		ST					TiN									
	1544 (NPT)	1545 (NPT)	1545A (NPT)	1548 (NPT)	1568 (NPT)	E711	1543 (NPTF)	TN1543	1549 (NPTF)	1567 (NPTF)	E712	1542 (NPS)	1592 (NPSF)	E550	E547	1572 (UNC)	1572 (UNF)
	1/16 - 1.1/4	1/8 - 1"	1/16 - 3/4	1/16 - 1"	1/8 - 1.1/2"	1/8 - 1.1/2	1/16 - 1":	1/8 - 3/4	1/16 - 3/4	1/8 - 1"	1/16 - 1.1/4	1/8 - 1"	1/8 - 3/4	1/8 - 2"	1/8 - 2"	No.4 - 1/2	No.10 - 1/4
📖	356	357	357	358	359	360	361	361	362	363	364	365	365	366	367	368	368
1.1	13	13	13	13	13	13	13	16	13	13	13	13	13	72	23	49	49
1.2	13	13	13	13	13	13	13	16	13	13	13	13	13	66	20	30	30
1.3	20	20	20	20	20	20	20	23	20	20	20	20	20	52	16	26	26
1.4	16	16	16	16	16	16	16	20	16	16	16	16	16	39	13	26	26
1.5	10	10	10	10	10	10	10	13	10	10	10	10	10	23	10		
1.6														13			
1.7																	
1.8																	
2.1														23		16	16
2.2														16		7	7
2.3														23			
2.4																	
3.1	20	20	20	20	20	20	20	23	20	20	20	20	20	39	39		
3.2	13	13	13	13	13	13	13	16	13	13	13	13	13	23	23		
3.3	20	20	20	20	20	20	20	23	20	20	20	20	20	33	33		
3.4	13	13	13	13	13	13	13	16	13	13	13	13	13	16	16		
4.1																	
4.2																	
4.3																	
5.1																	
5.2																	
5.3																	
6.1														39	13	26	26
6.2	36	36	36	36	36	36	36	39	36	36	36	36	36	98	33	66	66
6.3														66	23	49	49
6.4														13	7		
7.1																39	39
7.2														115	39	79	79
7.3	36	36	36	36	36	36	36	39	36	36	36	36	36	66	23	59	59
7.4	23	23	23	23	23	23	23	26	23	23	23	23	23	49	16	16	16
8.1	13	13	13	13	13	13	13	16	13	13	13	13	13				
8.2														39	16		
8.3														23	10		
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	EGM	EGM	UNC	UNC	UNC	UNF	UNC	UNF	M	NPT
	ANSI	ANSI	DORMER ISO	DORMER ISO	ANSI	ANSI	ANSI	ANSI	DORMER DIN	DORMER DIN	DORMER ISO	ANSI
	2B 3B	2B 3B	6H	6H	3B	3B	2B	2B	2B	Medium	6H	Normal
	1.5XD	1.5XD	1.5XD	2XD	3.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
			C 2-3	C 2-3	T	P			C 2-3	C 2-3	C 2-3	
				λ40°			λ15°	λ15°	λ30°	λ30°	λ30°	λ27°
									ST	ST	ST	
	1578 (UNC)	1578 (UNF)	E620	E621	U1511	1519 (UNC)	1994 (UNC)	1994 (UNF)	E651	E654	E650	E653
	No.4 - 1/4	No.10 - 1/4	M3 - M16	M3 - M16	1/4 - 1/2	1/4 - 3/4	No.4 - 1/2	No.10 - 1/2	No.6 - 5/8	No.8 - 5/8	M3 - M16	1/8 - 1"
🕮	368	368	369	369	370	371	372	372	373	373	374	375
1.1	66	66	23		39	49	82	82	82	82	82	82
1.2	59	59	20	59	33	36	72	72	72	72	72	72
1.3	46	46	16	46	26	26	59	59	59	59	59	59
1.4	33	33	13	33	20	26	49	49	49	49	49	49
1.5	16	16	10	16	16	16						
1.6	10	10				7						
1.7												
1.8												
2.1	20	20		20		20						
2.2	13	13		13		13						
2.3	10	10		10		13						
2.4												
3.1			39		46	39						
3.2			23		26	26	26	26	26	26	26	26
3.3			33		39	26						
3.4			16			13						
4.1						16						
4.2						13						
4.3	10	10										
5.1	33	33				16						
5.2	13	13		13		7						
5.3												
6.1	33	33	13			20						
6.2			33		52	66	98	98	98	98	98	98
6.3	49	49	23		39	49	66	66	66	66	66	66
6.4			7			7						
7.1	33	33		33		39	59	59	59	59	59	59
7.2	82	82	39	82	66	79	115	115	115	115	115	115
7.3	43	43	23	43	39	59						
7.4	33	33	16	33		16						
8.1	66	66				26	98	98	98	98	98	98
8.2			16		26	13						
8.3			10									
9.1												
10.1												

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1500 314
1500A 317
1500L 323
1500OV 328
1505 329
1508 325
1519 371
1528 314
1534 333
1534NE 342
1534NR 338
1541 353
1542 365
1543 361
1544 356
1545 357
1545A 357
1548 358
1549 362
1567 363
1568 359
1572 368
1578 368
1580 348
1580M 349
1582 344
1585 334
1585A 334
1585NR 340
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1588 345
1590 346
1591 346
1592 365
1593 343
1595 325
1599 330
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1630AP 303
1634 336
1641 305
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1675 284
1676AP 294
1677AP 298
1678 294
1679 298
1681AP 307
1985 293
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1691AP 308
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3300 350
3300M 351
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E002 302
E003 302
E005 285
E006 285
E007 299
E008 299
E011 288
E013 302
E016 285
E018 299
E021 283
E023 297
E025 280
E026 280
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E041 311
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E201 292
E500 319
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E624 275
E625 266
E626 277
E627 268
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E630 260
E631 260
E650 374
E651 373
E653 375
E654 373
E710 354
E711 360
E712 364
E721 354
E764 275
E765 266
E766 277
E767 268
E768 276
E769 267
E770 260
E771 260
E805 274
E806 278
E808 270
E809 261
E810 273
E811 264
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E813 262
E814 259
E815 259
E816 265
E817 269
E905 274
E906 278
E908 270
E909 261
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E912 271
E913 262
E914 259
E915 259
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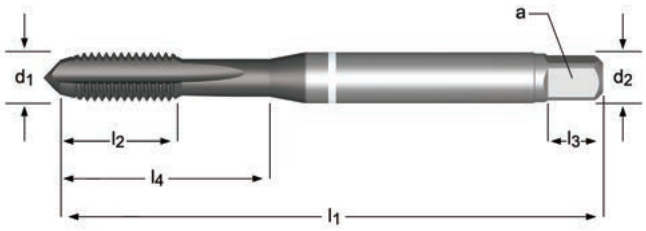
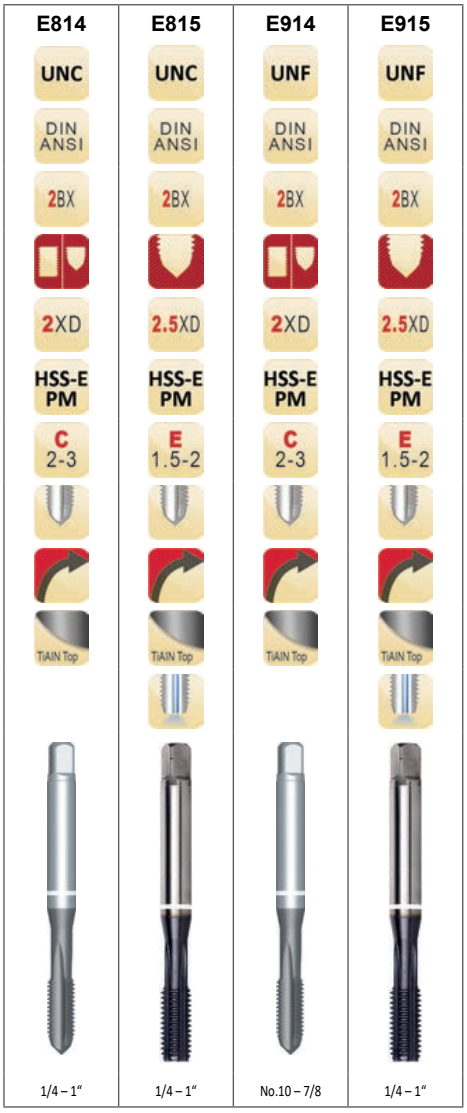
DIN ANSI Machine Tap, White Shark for Cast Iron

E814
E914 Designed for semi-bottoming or through hole tapping in Cast Iron applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

E815
E915 Coolant through design allows for higher tapping speeds and better tool life. This design eliminates the problems associated with inadequate coolant supply in some applications. Full Bottoming.

■ 3.1 3.2 3.3 8.2
● 3.4 6.2 6.4 7.4





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	◹ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E814	E815	E914	E915
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	4	4.10	N21	H4	—	—	7350222	—
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	4	5.10	N7	H5	7350203	7350231	—	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	4	5.50	N3	H5	—	—	7350223	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	4	5.50	N3	H4	—	—	—	7350240
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	4	6.60	F	H5	7350204	—	—	—
5/16		18	3.543	0.787	1.339	0.318	0.236	0.380	4	6.60	F	H5	—	7350232	—	—
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	4	6.90	I	H5	—	—	7350224	—
	5/16	24	3.543	0.787	1.339	0.318	0.236	0.380	4	6.90	I	H5	—	—	—	7350241
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	4	8.00	5/16	H5	7350205	7350233	—	—
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	4	8.50	Q	H5	—	—	7350225	7350242
7/16		14	3.937	0.787	–	0.323	0.240	0.410	4	9.40	U	H5	7350206	7350234	—	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	4	9.90	25/64	H5	—	—	7350226	7350243
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H5	7350207	7350235	—	—
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H5	—	—	7350227	7350244
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350208	7350236	—	—
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	—	7350228	7350245
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350209	7350237	—	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H6	—	—	7350229	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	—	—	7350246
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350220	7350238	—	—
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	—	7350230	7350247
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350221	7350239	—	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	—	—	7350248

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends .

DIN ANSI Machine Tap, White Shark for Cast Iron

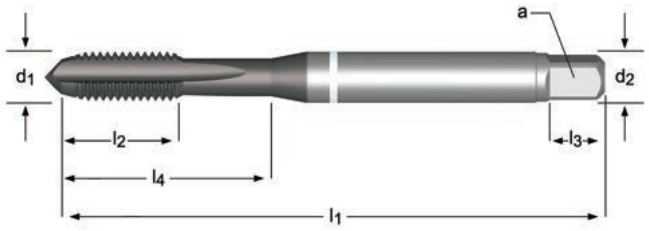
E630
E770

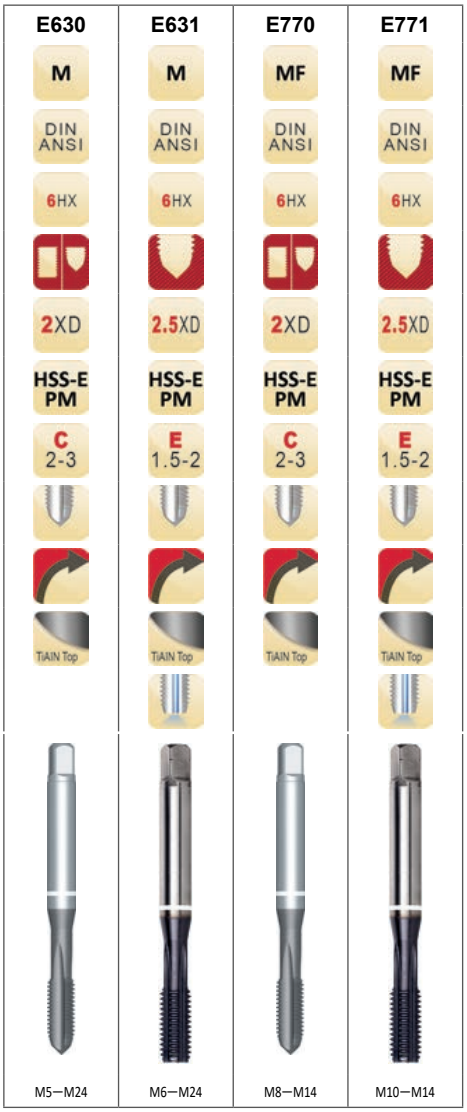
Designed for semi-bottoming or through hole tapping in Cast Iron applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

E631
E771

Coolant through design allows for higher tapping speeds and better tool life. This design eliminates the problems associated with inadequate coolant supply in some applications. Full Bottoming.

■ 3.1 3.2 3.3 8.2
● 3.4 6.2 6.4 7.4





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	▨ a Inch	l_3 mm	No. of flutes	↔	↔	Limits	E630	E631	E770	E771
5		0.80	70	13	25	0.194	0.150	6	4	4.20	N19	D4	7350249	—	—	—
6		1.00	80	15	25	0.255	0.189	8	4	5.00	N9	D5	—	7350265	—	—
6		1.00	80	15	30	0.255	0.189	8	4	5.00	N9	D5	7350250	—	—	—
	8	1.00	90	18	35	0.318	0.236	10	4	7.00	J	D5	—	—	7350259	—
8		1.25	90	18	35	0.318	0.236	10	4	6.80	H	D5	7350251	—	—	—
8		1.25	90	20	34	0.318	0.236	10	4	6.80	H	D5	—	7350266	—	—
	10	1.00	90	20	35	0.381	0.284	11	4	9.00	T	D6	—	—	7350260	—
	10	1.25	100	20	39	0.381	0.284	11	4	8.80	11/32	D6	—	—	7350261	7350274
10		1.50	100	20	39	0.381	0.284	11	4	8.50	Q	D6	7350252	7350267	—	—
	12	1.25	100	21	–	0.367	0.273	11	4	10.80	27/64	D6	—	—	7350262	7350275
	12	1.50	100	21	–	0.367	0.273	11	4	10.50	Z	D6	—	—	7350263	7350276
12		1.75	110	23	–	0.367	0.273	11	4	10.30	Y	D6	7350253	7350268	—	—
	14	1.50	100	21	–	0.429	0.320	13	4	12.50	31/64	D7	—	—	7350264	7350277
14		2.00	110	23	–	0.429	0.320	13	4	12.00	15/32	D7	7350254	7350269	—	—
16		2.00	110	23	–	0.480	0.358	14	4	14.00	35/64	D7	7350255	7350270	—	—
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350256	7350271	—	—
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350257	7350272	—	—
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350258	7350273	—	—

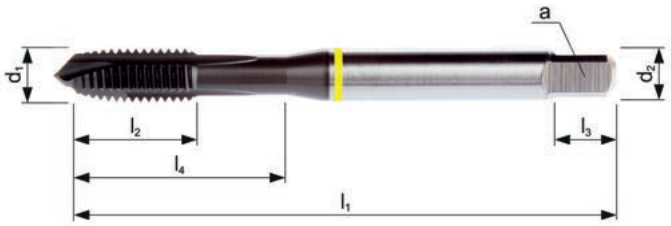
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

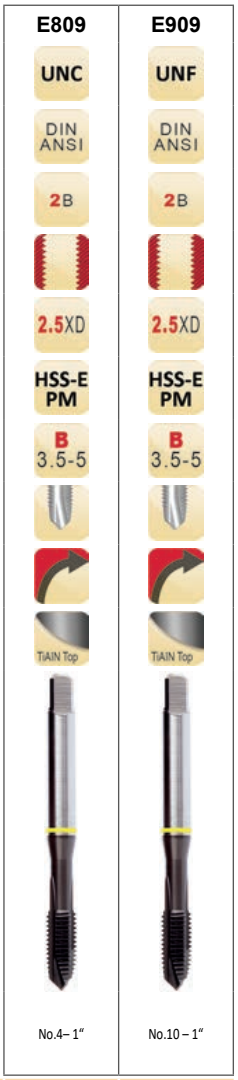
DIN ANSI Machine Tap, Yellow Shark for Low Alloy Steels

E809
E909

Designed for through hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

■ 1.1 1.2 1.3 6.1 6.3
● 1.4 1.5 6.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	☐ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E809	E909
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350469	—
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350470	—
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350471	—
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350472	—
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350482
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350473	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H4	—	7350483
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350474	—
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4	—	7350484
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350475	—
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H4	—	7350485
7/16		14	3.937	0.787	–	0.323	0.240	0.410	3	9.40	U	H5	7350476	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	3	9.90	25/64	H5	—	7350486
1/2		13	4.331	0.906	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350477	—
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	3	11.50	29/64	H5	—	7350487
5/8		11	4.331	0.906	–	0.480	0.358	0.560	3	13.50	17/32	H5	7350478	—
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	3	14.50	37/64	H5	—	7350488
3/4		10	4.921	1.181	–	0.590	0.439	0.690	3	16.50	21(32	H5	7350479	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	3	17.50	11/16	H5	—	7350489
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350480	—
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350490
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350481	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350491

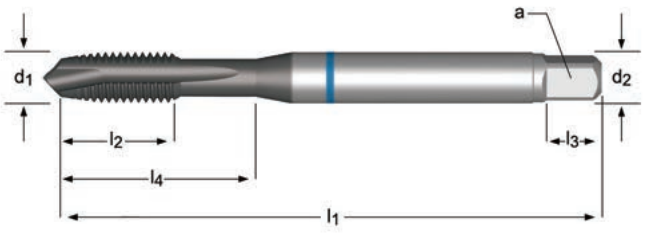
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

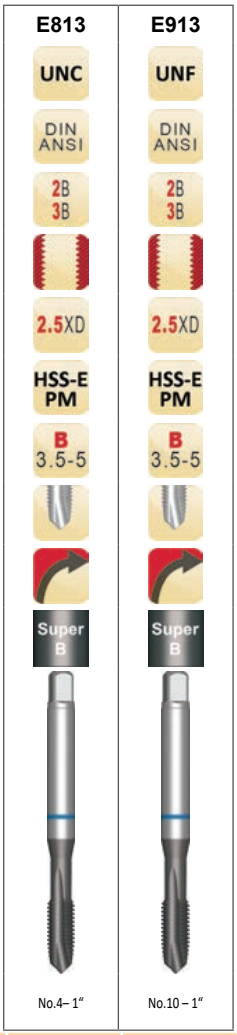
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E813
E913

Designed for superior performance through hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment to offer improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ 2.1 2.2 2.3
- ● 1.2 1.3 1.4 1.5





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E813	E913
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350278	—
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H3	7350279	—
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350280	—
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350281	—
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350299
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350282	—
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H3	7350283	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H5	—	7350300
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H3	—	7350301
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350284	—
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H3	7350285	—
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4	—	7350302
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H3	—	7350303
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H3	7350287	—
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H5	7350286	—
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H4	—	7350304
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H3	—	7350305
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350291	—
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H3	7350292	—
7/16		14	3.937	0.787	–	0.323	0.240	0.410	4	9.40	U	H5	7350288	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	4	9.90	25/64	H5	—	7350306
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H5	7350289	—
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H3	7350290	—
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H5	—	7350307
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H3	—	7350308

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

SPIRAL POINT PLUG TAPS

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E813	E913
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	7350309
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H3	—	7350310
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350293	—
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H3	7350294	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	7350311
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H3	—	7350312
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350295	—
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H4	7350296	—
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350313
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H4	—	7350314
1“		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350297	—
1“		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H4	7350298	—
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350315
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H4	—	7350316

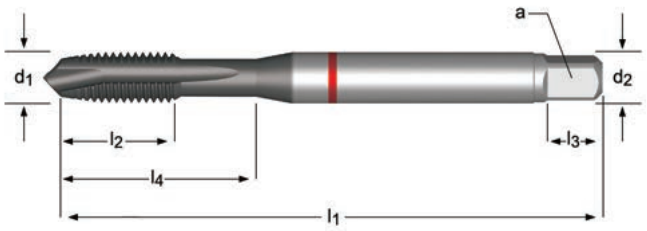
Note: Sizes up to 3/8” have male centers on both ends • Sizes over 3/8” have female centers on both ends.

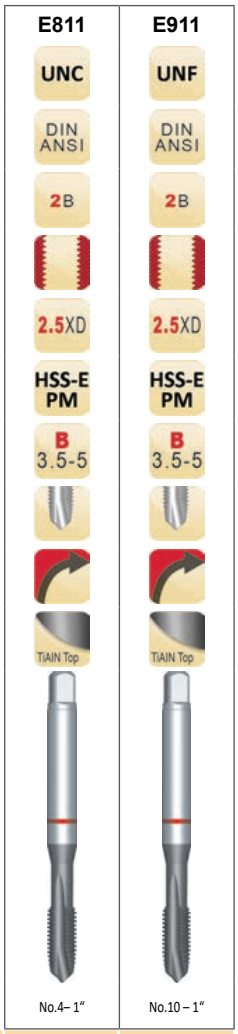
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E811
E911

Designed for high performance through hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with an additional edge treatment provides excellent performance and consistency in high production applications.

- ■ 1.4 1.5
- ● 1.6 4.2 5.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E811	E911
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350391	—
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350392	—
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350393	—
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350404
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350394	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H4	—	7350405
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350395	—
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4	—	7350406
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350396	—
	3/8	24	3.543	0.787	1.476	0.318	0.284	0.440	3	8.50	Q	H4	—	7350407
3/8		16	3.543	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350397	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	3	9.90	25/64	H5	—	7350408
7/16		14	3.937	0.787	–	0.323	0.240	0.410	3	9.40	U	H5	7350398	—
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	3	11.50	29/64	H5	—	7350409
1/2		13	4.331	0.906	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350399	—
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	3	14.50	37/64	H5	—	7350410
5/8		11	4.331	0.906	–	0.480	0.358	0.560	3	13.50	17/32	H5	7350400	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	7350411
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350401	—
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350412
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350402	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350413
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350403	—

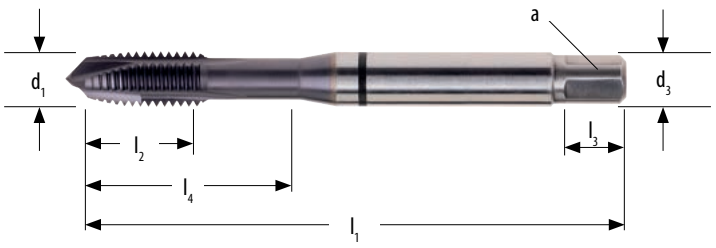
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

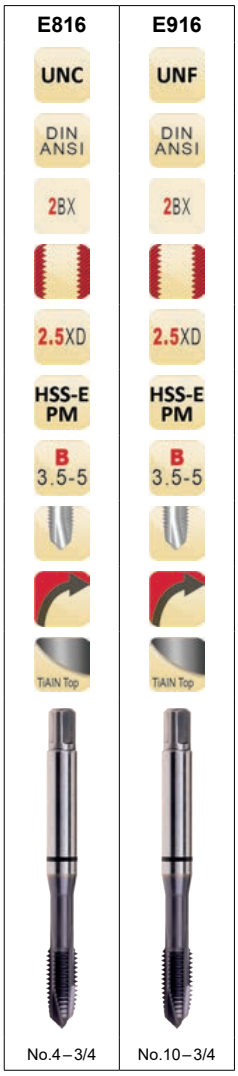
DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E816
E916

Designed for high performance through hole tapping in high strength and heat resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry that significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

- ■ 1.6 4.3 5.3
- ● 1.5 1.7 4.2 5.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	◹ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E816	E916
4		40	2.205	0.472	0.827	0.141	0.108	0.190	3	2.35	N43	H2	7812046	—
6		32	2.480	0.551	0.866	0.168	0.129	0.250	3	2.85	N36	H3	7812047	—
8		32	2.756	0.610	1.102	0.194	0.150	0.250	3	3.50	N29	H3	7812048	—
10		24	3.150	0.669	1.024	0.255	0.189	0.310	3	3.90	N25	H3	7812049	—
	10	32	3.150	0.669	1.024	0.255	0.189	0.310	3	4.10	N21	H3	—	7812107
1/4		20	3.543	0.807	1.378	0.318	0.236	0.380	3	5.10	N7	H5	7812100	—
	1/4	28	3.543	0.807	1.339	0.318	0.236	0.380	3	5.50	N3	H4	—	7812108
5/16		18	3.937	0.906	1.535	0.381	0.236	0.440	3	6.60	F	H5	7812101	—
	5/16	24	3.937	0.906	1.535	0.381	0.284	0.440	3	6.90	I	H4	—	7812109
3/8		16	3.937	0.787	1.535	0.381	0.236	0.440	3	8.00	5/16	H5	7812102	—
	3/8	24	3.937	0.787	1.535	0.381	0.284	0.440	3	8.50	Q	H4	—	7812110
7/16		14	3.937	0.787	–	0.323	0.240	0.410	4	9.40	U	H5	7812103	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.440	4	9.90	25/64	H5	—	7812111
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H5	7812104	—
	1/2	20	4.331	0.906	–	0.367	0.273	0.440	4	11.50	29/64	H5	—	7812112
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H5	7812105	—
	5/8	18	4.331	0.906	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	7812113
3/4		10	4.921	1.181	–	0.590	0.440	0.690	4	16.50	21/32	H5	7812106	—
	3/4	16	4.921	1.181	–	0.590	0.440	0.690	4	17.50	11/16	H5	—	7812114

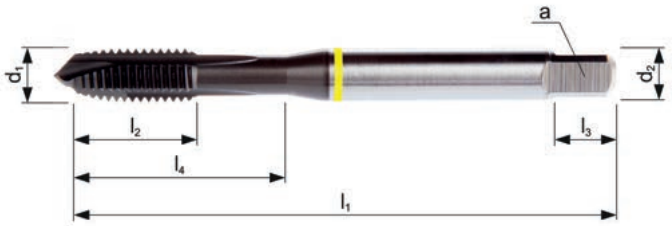
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

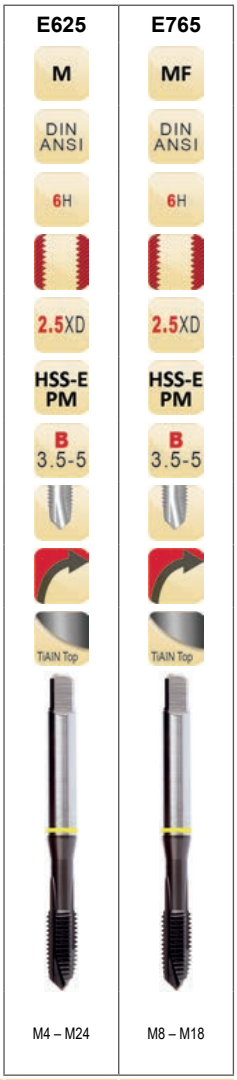
DIN ANSI Machine Tap, Yellow Shark for Low Alloy Steels

E625
E765

Designed for through hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes	↔	↔	Limits	E625	E765
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350492	—
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350493	—
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350494	—
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5	—	7350503
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350495	—
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350504
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350496	—
	12	1.25	100	21	–	0.367	0.273	11	3	10.80	27/64	D6	—	7350505
	12	1.50	100	21	–	0.367	0.273	11	3	10.50	Z	D6	—	7350506
12		1.75	110	23	–	0.367	0.273	11	3	10.30	Y	D6	7350497	—
	14	1.50	100	21	–	0.429	0.320	13	3	12.50	31/64	D7	—	7350507
14		2.00	110	23	–	0.429	0.320	13	3	12.00	15/32	D7	7350498	—
	16	1.50	100	21	–	0.480	0.358	14	3	14.50	9/16	D7	—	7350508
16		2.00	110	23	–	0.480	0.358	14	3	14.00	35/64	D7	7350499	—
	18	1.50	110	24	–	0.542	0.404	16	3	16.50	41/64	D7	—	7350509
18		2.50	125	30	–	0.542	0.404	16	3	15.50	39/64	D7	7350500	—
20		2.50	140	30	–	0.652	0.487	18	3	17.50	11/16	D7	7350501	—
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350502	—

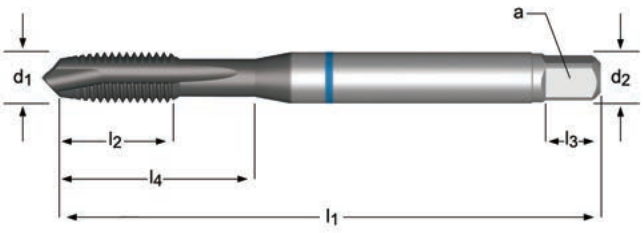
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

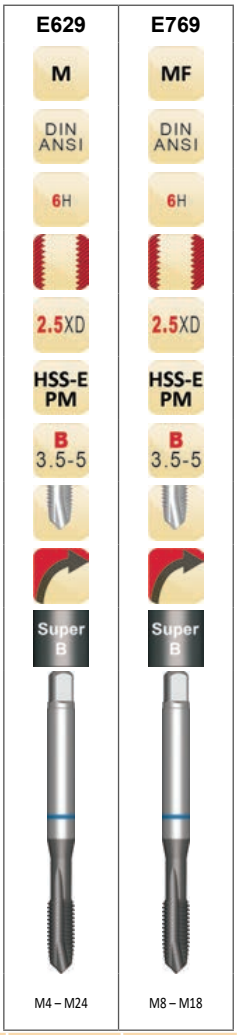
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E629
E769

Designed for superior performance through hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment to offer improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ 2.1 2.2 2.3
- ● 1.2 1.3 1.4 1.5





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes			Limits	E629	E769
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350317	—
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350318	—
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350319	—
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5	—	7350328
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350320	—
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350329
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350321	—
	12	1.25	100	21	–	0.367	0.273	11	4	10.80	27/64	D6	—	7350330
	12	1.50	100	21	–	0.367	0.273	11	4	10.50	Z	D6	—	7350331
12		1.75	110	23	–	0.367	0.273	11	4	10.30	Y	D6	7350322	—
	14	1.50	100	21	–	0.429	0.320	13	4	12.50	31/64	D7	—	7350332
14		2.00	110	23	–	0.429	0.320	13	4	12.00	15/32	D7	7350323	—
	16	1.50	100	21	–	0.480	0.358	14	4	14.50	9/16	D7	—	7350333
16		2.00	110	23	–	0.480	0.358	14	4	14.00	35/64	D7	7350324	—
	18	1.50	110	24	–	0.542	0.404	16	4	16.50	41/64	D7	—	7350334
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350325	—
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350326	—
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350327	—

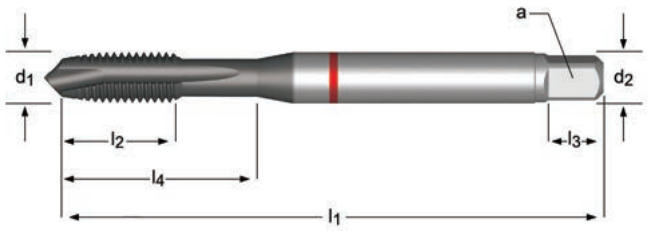
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

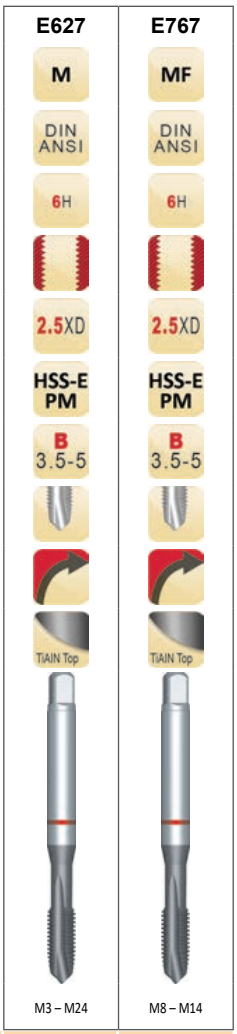
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E627
E767

Designed for high performance through hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with an additional edge treatment provides excellent performance and consistency in high production applications.

- ■ 1.4 1.5
- ● 1.6 4.2 5.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	▨ a Inch	l_3 mm	No. of flutes			Limits	E627	E767
3		0.50	56	9	18	0.141	0.108	5	3	2.50	N40	D3	7350414	—
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350415	—
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350416	—
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350417	—
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5	—	7350426
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350418	—
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350427
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350419	—
	12	1.50	100	21	–	0.367	0.273	11	3	10.50	Z	D6	—	7350428
12		1.75	110	23	–	0.367	0.273	11	3	10.30	Y	D6	7350420	—
	14	1.50	100	21	–	0.429	0.320	13	3	12.50	31/64	D7	—	7350429
14		2.00	110	23	–	0.429	0.320	13	3	12.00	15/32	D7	7350421	—
16		2.00	110	23	–	0.480	0.358	14	3	14.00	35/64	D7	7350422	—
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350423	—
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350424	—
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350425	—

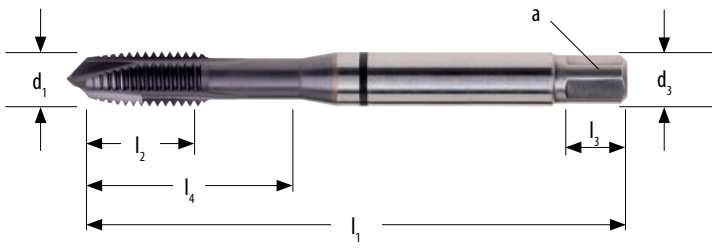
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

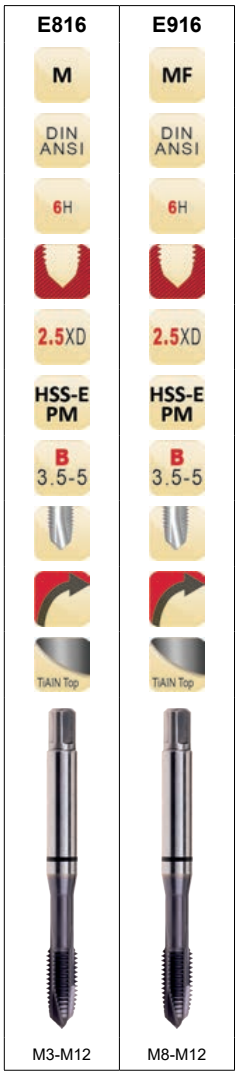
DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E817
E917

Designed for high performance through hole tapping in high strength and heat resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry that significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

■ 1.6 4.3 5.3
● 1.5 1.7 4.2 5.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	◹ a Inch	l_3 mm	No. of flutes			Limits	E817	E917
3		0.50	63	15	22	0.168	0.129	6	3	2.50	N40	D3	7812115	—
4		0.70	70	16	28	0.194	0.150	6	3	3.30	N30	D4	7812116	—
5		0.80	80	17	26	0.255	0.189	8	3	4.20	N19	D4	7812117	—
6		1.00	90	21	35	0.318	0.236	10	3	5.00	N9	D5	7812118	—
8		1.25	100	23	39	0.381	0.284	11	3	6.80	H	D5	7812119	—
	8	1.00	100	23	39	0.381	0.284	11	3	7.00	J	D5	—	7812122
10		1.50	100	20	38	0.381	0.284	11	3	8.50	Q	D6	7812120	—
	10	1.25	100	20	38	0.381	0.284	11	3	8.80	11/32	D5		7812123
12		1.75	110	23	-	0.367	0.273	11	4	10.30	Y	D6	7812121	—
	12	1.25	110	23	-	0.367	0.273	11	4	10.80	27/64	D5	—	7812124
	12	1.50	110	23	-	0.367	0.273	11	4	10.50	Z	D5	—	7812125

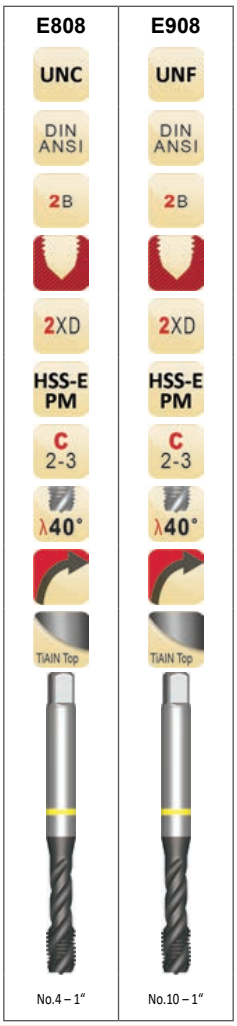
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

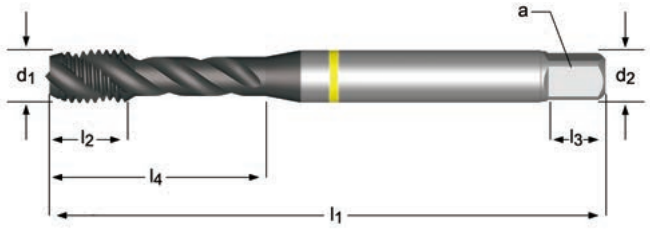
DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E808
E908

Designed for blind hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combined with a special 40° Spiral Flute geometry prevents nesting and reduces the risk of re-cutting chips on reversal allowing taps to operate at higher speeds while providing improved thread quality.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E808	E908
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350510	—
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350511	—
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350512	—
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350513	—
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350523
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350514	—
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H4	—	7350524
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350515	—
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H4	—	7350525
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350516	—
	3/8	24	3.543	0.591	1.476	0.381	0.284	0.440	3	8.50	Q	H4	—	7350526
7/16		14	3.937	0.591	–	0.323	0.240	0.410	3	9.40	U	H5	7350517	—
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	3	9.90	25/64	H5	—	7350527
1/2		13	4.331	0.709	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350518	—
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	3	11.50	29/64	H5	—	7350528
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350519	—
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	7350529
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350520	—
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	7350530
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350521	—
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350531
1"		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350522	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350532

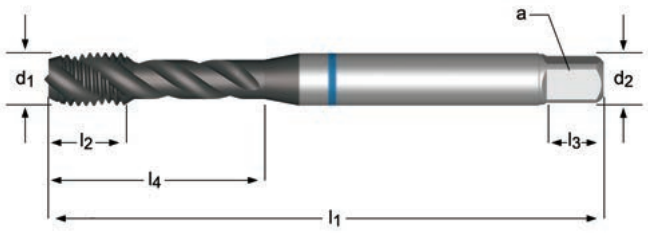
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

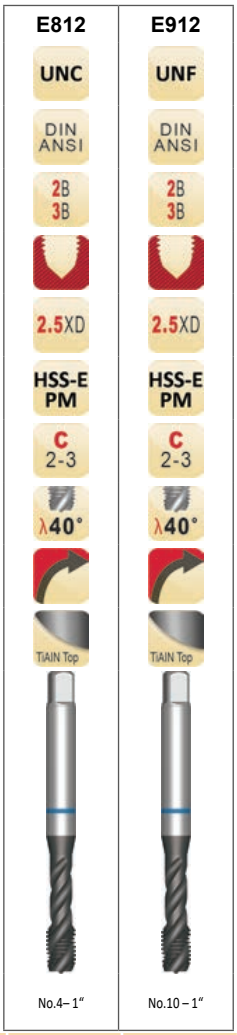
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E812
E912

Designed for superior performance blind hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment and a 40° Flute angle facilitates better chip evacuation offering improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ 2.1 2.2 2.3
- ● 1.2 1.3 1.4 1.5





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	◹ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E812	E912
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350335	—
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.80	N36	H3	7350336	—
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350337	—
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350338	—
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350356
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350339	—
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H3	7350340	—
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H5	—	7350357
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H3	—	7350358
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350341	—
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H3	7350342	—
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H4	—	7350359
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H3	—	7350360
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H5	7350343	—
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H3	7350344	—
	3/8	24	3.543	0.591	1.476	0.318	0.284	0.440	3	8.50	Q	H4	—	7350361
	3/8	24	3.543	0.591	1.476	0.318	0.284	0.440	3	8.50	Q	H3	—	7350362
7/16		14	3.937	0.591	–	0.323	0.240	0.410	4	9.40	U	H5	7350345	—
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	4	9.90	25/64	H5	—	7350363
1/2		13	4.331	0.709	–	0.367	0.273	0.440	4	10.70	27/64	H5	7350346	—
1/2		13	4.331	0.709	–	0.367	0.273	0.440	4	10.70	27/64	H3	7350347	—
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	4	11.50	29/64	H5	—	7350364
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	4	11.50	29/64	H3	—	7350365
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350348	—
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H3	7350349	—
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	7350366
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H3	—	7350367

SPIRAL FLUTE TAPS

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E812	E912
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350350	—
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H3	7350351	—
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	7350368
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H3	—	7350369
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350352	—
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H4	7350353	—
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350370
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H4	—	7350371
1“		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350354	—
1“		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H4	7350355	—
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350372
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H4	—	7350373

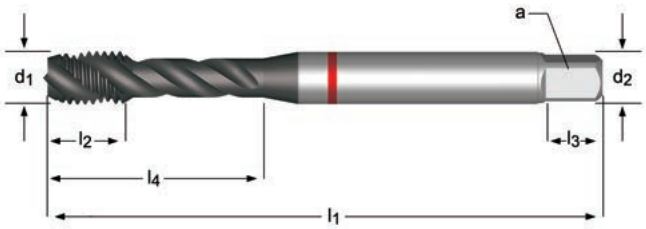
Note: Sizes up to 3/8” have male centers on both ends • Sizes over 3/8” have female centers on both ends.

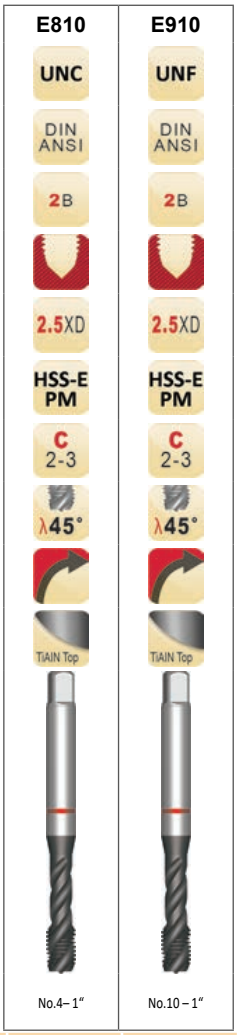
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E810
E910

Designed for high performance blind hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with a special 45° Flute Geometry and an additional edge treatment provides excellent performance and consistency in high production applications. The back taper built into this design further facilitates chip evacuation and reduces torque when the tap reverses. It is recommended to use a toolholder with minimal float or soft start.

■ 1.4 1.5
● 1.6 4.2 5.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E810	E910
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350430	—
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350431	—
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350432	—
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350433	—
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3	—	7350443
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350434	—
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H4	—	7350444
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350435	—
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.9	I	H4	—	7350445
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350436	—
	3/8	24	3.543	0.591	1.476	0.381	0.284	0.440	3	8.50	Q	H4	—	7350446
7/16		14	3.937	0.591	–	0.323	0.240	0.410	3	9.40	U	H5	7350437	—
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	3	9.90	25/64	H5	—	7350447
1/2		13	4.331	0.709	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350438	—
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	3	11.50	29/64	H5	—	7350448
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350439	—
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	7350449
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350440	—
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	7350450
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350441	—
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	7350451
1"		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350442	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	7350452

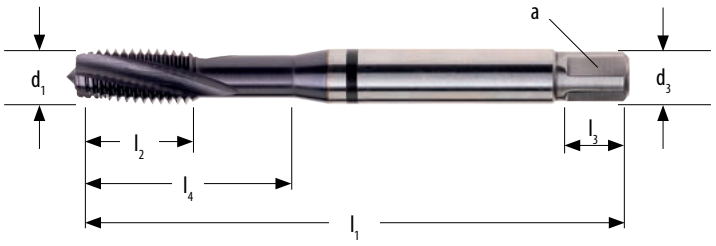
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

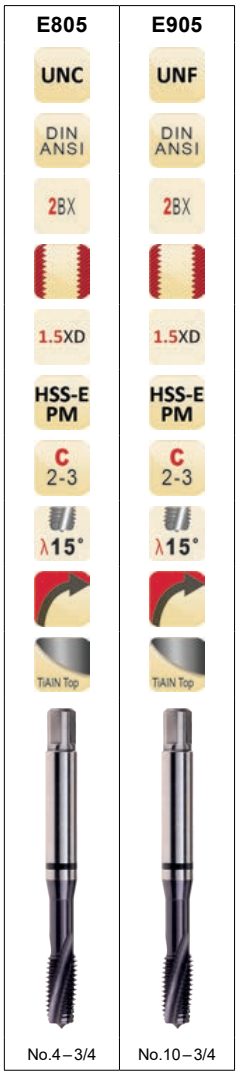
DIN-ANSI Machine Tap Black Shark for Hard Alloys, Spiral Flute

E805
E905

Designed for high performance blind hole tapping in high strength and heat-resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry what significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

- ■ 1.6 4.3 5.3
- ● 1.5 1.7 4.2 5.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E805	E905
4		40	2.205	0.472	0.827	0.141	0.108	0.190	3	2.35	N43	H2	7812126	—
6		32	2.480	0.551	0.866	0.168	0.129	0.250	3	2.85	N36	H2	7812127	—
8		32	2.756	0.610	1.102	0.194	0.150	0.250	3	3.50	N29	H3	7812128	—
10		24	3.150	0.669	1.024	0.255	0.189	0.310	3	3.90	N25	H3	7812129	—
	10	32	3.150	0.669	1.024	0.255	0.189	0.310	3	4.10	N21	H3	—	7812137
1/4		20	3.543	0.807	1.378	0.318	0.236	0.380	3	5.10	N7	H5	7812130	—
	1/4	28	3.543	0.807	1.339	0.318	0.236	0.380	3	5.50	N3	H4	—	7812138
5/16		18	3.937	0.906	1.535	0.381	0.236	0.440	3	6.60	F	H5	7812131	—
	5/16	24	3.937	0.906	1.535	0.381	0.284	0.440	3	6.90	I	H4	—	7812139
3/8		16	3.937	0.787	1.535	0.381	0.236	0.440	3	8.00	5/16	H5	7812132	—
	3/8	24	3.937	0.787	1.535	0.381	0.284	0.440	3	8.50	Q	H4	—	7812140
7/16		14	3.937	0.787	-	0.323	0.240	0.410	4	9.40	U	H5	7812133	—
	7/16	20	3.937	0.787	-	0.325	0.240	0.440	4	9.90	25/64	H5	—	7812140
1/2		13	4.331	0.906	-	0.367	0.273	0.440	4	10.80	27/64	H5	7812134	—
	1/2	20	4.331	0.906	-	0.367	0.273	0.440	4	11.50	29/64	H5	—	7812142
5/8		11	4.331	0.906	-	0.480	0.358	0.560	4	13.50	17/32	H5	7812135	—
	5/8	18	4.331	0.906	-	0.480	0.358	0.560	4	14.50	37/64	H5	—	7812143
3/4		10	4.921	1.181	-	0.590	0.440	0.690	4	16.50	21/32	H5	7812136	—
	3/4	16	4.921	1.181	-	0.590	0.440	0.690	4	17.50	11/16	H5	—	7812144

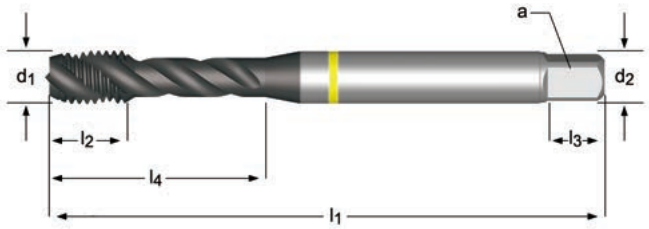
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

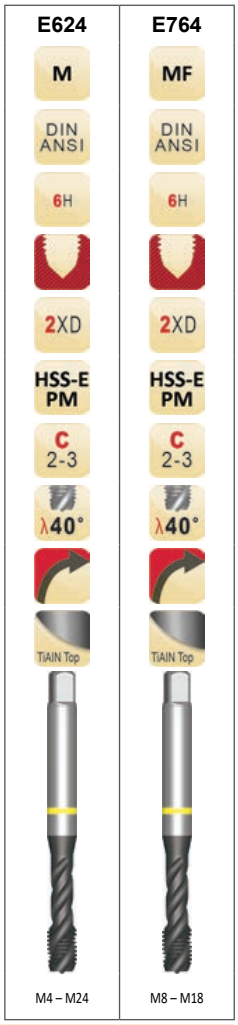
DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E624
E764

Designed for blind hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combined with a special 40° Spiral Flute geometry prevents nesting and reduces the risk of re-cutting chips on reversal allowing taps to operate at higher speeds while providing improved thread quality.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes	↔	↔	Limits	E624	E764
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350533	—
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350534	—
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350535	—
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5	—	7350544
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350536	—
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350545
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350537	—
	12	1.25	100	15	–	0.367	0.273	11	3	10.80	27/64	D6	—	7350546
	12	1.50	100	15	–	0.367	0.273	11	3	10.50	Z	D6	—	7350547
12		1.75	110	18	–	0.367	0.273	11	3	10.30	Y	D6	7350538	—
	14	1.50	100	15	–	0.429	0.320	13	3	12.50	31/64	D7	—	7350548
14		2.00	110	20	–	0.429	0.320	13	3	12.00	15/32	D7	7350539	—
	16	1.50	100	15	–	0.480	0.358	14	4	14.50	9/16	D7	—	7350549
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350540	—
	18	1.50	110	17	–	0.542	0.404	16	4	16.50	41/64	D7	—	7350550
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350541	—
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350542	—
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350543	—

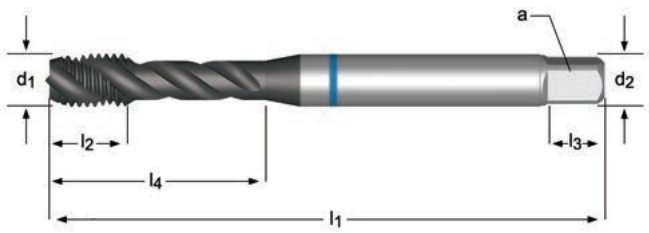
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

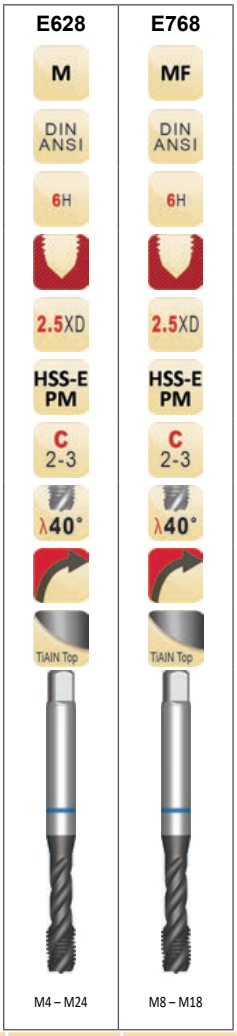
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E628
E768

Designed for superior performance blind hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment and a 40° Flute angle facilitates better chip evacuation offering improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ 2.1 2.2 2.3
- ● 1.2 1.3 1.4 1.5





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	▨ a Inch	l_3 mm	No. of flutes			Limits	E628	E768
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350374	—
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350375	—
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350376	—
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5	—	7350385
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350377	—
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350386
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350378	—
	12	1.50	100	15	–	0.367	0.273	11	4	10.50	Z	D6	—	7350387
12		1.75	110	18	–	0.367	0.273	11	4	10.30	Y	D6	7350379	—
	14	1.50	100	15	–	0.429	0.320	13	4	12.50	31/64	D7	—	7350388
14		2.00	110	20	–	0.429	0.320	13	4	12.00	15/32	D7	7350380	—
	16	1.50	100	15	–	0.480	0.358	14	4	14.50	9/16	D7	—	7350389
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350381	—
	18	1.50	110	17	–	0.542	0.404	16	4	16.50	41/64	D7	—	7350390
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350382	—
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350383	—
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350384	—

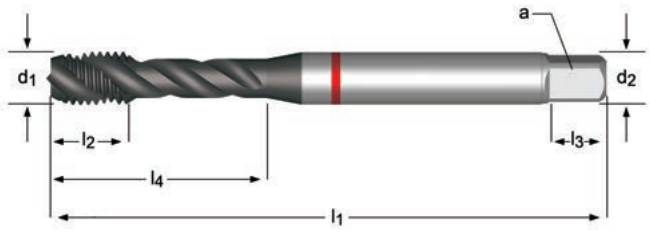
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

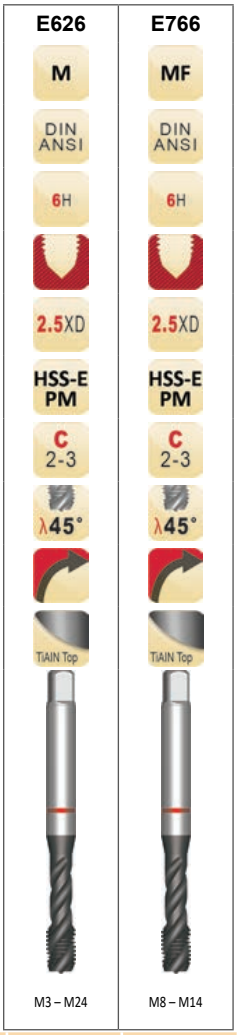
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E626
E766

Designed for high performance blind hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with a special 45° Flute Geometry and an additional edge treatment provides excellent performance and consistency in high production applications. The back taper built into this design further facilitates chip evacuation and reduces torque when the tap reverses. It is recommended to use a toolholder with minimal float or soft start.

- ■ 1.4 1.5
- • 1.6 4.2 5.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	▨ a Inch	l_3 mm	No. of flutes			Limits	E626	E766
3		0.50	56	6	18	0.141	0.108	5	3	2.50	N40	D3	7350453	—
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350454	—
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350455	—
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350456	—
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5	—	7350465
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350457	—
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6	—	7350466
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350458	—
	12	1.25	100	15	–	0.367	0.273	11	3	10.80	27/64	D6	—	7350467
12		1.75	110	18	–	0.367	0.273	11	3	10.30	Y	D6	7350459	—
	14	1.50	100	15	–	0.429	0.320	13	3	12.50	31/64	D7	—	7350468
14		2.00	110	20	–	0.429	0.320	13	3	12.00	15/32	D7	7350460	—
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350461	—
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350462	—
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350463	—
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350464	—

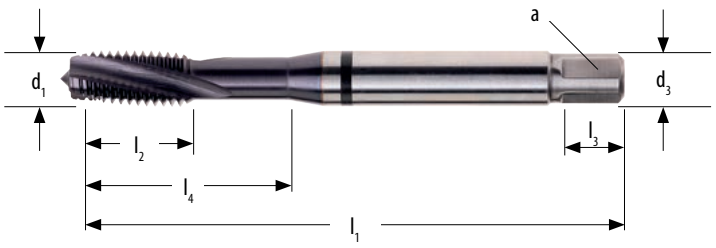
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

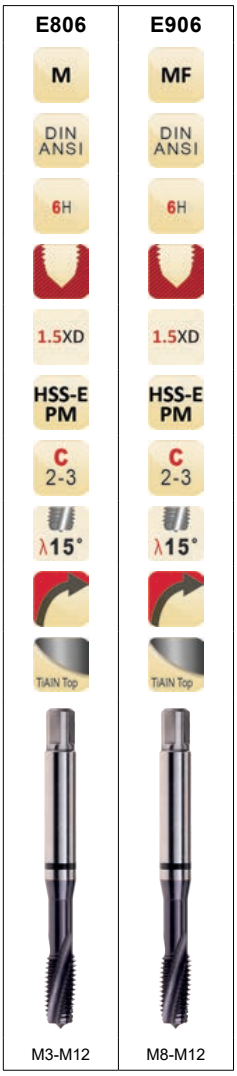
DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E806
E906

Designed for high performance blind hole tapping in high strength and heat-resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry what significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

■ 1.6 4.3 5.3
● 1.5 1.7 4.2 5.2





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	◹ a Inch	l_3 mm	No. of flutes	↔	↔	Limits	E806	E906
3		0.50	63	15	22	0.168	0.129	6	3	2.50	N40	D3	7812145	—
4		0.70	70	16	28	0.194	0.150	6	3	3.30	N30	D4	7812146	—
5		0.80	80	17	26	0.255	0.189	8	3	4.20	N19	D4	7812147	—
6		1.00	90	21	35	0.318	0.236	10	3	5.00	N9	D5	7812148	—
8		1.25	100	23	39	0.381	0.284	11	3	6.80	H	D5	7812149	—
	8	1.00	100	23	39	0.381	0.284	11	3	7.00	J	D5	—	7812152
10		1.50	100	20	38	0.381	0.284	11	3	8.50	Q	D6	7812150	—
12		1.75	110	23	-	0.367	0.273	11	4	10.30	Y	D6	7812151	—
	10	1.25	100	20	38	0.381	0.284	11	3	8.80	11/32	D5	—	7812153
	12	1.25	110	23	-	0.367	0.273	11	4	10.80	27/64	D5	—	7812155
	12	1.50	110	23	-	0.367	0.273	11	4	10.50	Z	D5	—	7812154

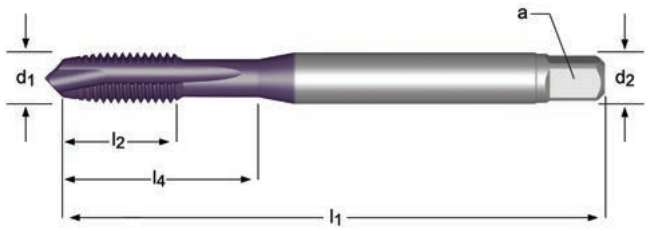
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

MXP Multi-Application, Plug Chamfer

1672AP Designed for through hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1674 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 2.4 4.1 4.2 5.1 5.2 6.1 6.2
6.3 7.1 7.2 7.3 7.4



APPLIX®

1672AP	1674 Coolant Through
UNC UNF	UNC UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
No.4 - 1“	1/4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	☐ a Inch	# of Flutes	Limits	Pack Qty	1672AP	1674
4		40	2.205	0.433	0.709	0.141	0.110	2	H2	1	46204859 [1]	—
6		32	2.205	0.472	0.787	0.141	0.110	2	H3	1	46204864 [1]	—
8		32	2.480	0.512	0.827	0.168	0.131	3	H3	1	46204869 [1]	—
	10	32	2.756	0.512	0.984	0.194	0.152	3	H3	1	46204852 [1]	—
10		24	2.756	0.591	0.984	0.194	0.152	3	H3	1	46204851 [1]	—
	1/4	28	3.150	0.669	1.181	0.255	0.191	3	H4	1	46204850 [1]	1716512 [1]
1/4		20	3.150	0.669	1.181	0.255	0.191	3	H5	1	46204849 [1]	1716510 [1]
	5/16	24	3.543	0.669	1.378	0.318	0.238	3	H4	1	46204861 [1]	—
5/16		18	3.543	0.787	1.378	0.318	0.238	3	H5	1	46204860 [1]	1716514 [1]
	3/8	24	3.937	0.709	1.535	0.381	0.286	3	H4	1	46204858 [1]	—
3/8		16	3.937	0.866	1.535	0.381	0.286	3	H5	1	46204857 [1]	1716518 [1]
	7/16	20	3.937	0.866		0.323	0.242	3	H5	1	46204866 [2]	—
7/16		14	3.937	0.866		0.323	0.242	3	H5	1	46204865 [2]	—
	1/2	20	3.937	0.866		0.367	0.275	3	H5	1	—	—
	1/2	20	3.937	0.866		0.397	0.275	3	H5	1	46204848 [2]	—
1/2		13	4.331	0.984		0.367	0.275	3	H5	1	46204847 [2]	1716534 [2]
	5/8	18	3.937	0.866		0.480	0.360	4	H5	1	46204863 [2]	—
5/8		11	4.331	1.063		0.480	0.360	4	H5	1	46204862 [2]	1716538 [2]
	3/4	16	4.331	0.984		0.590	0.442	4	H5	1	46204856 [2]	—
3/4		10	4.921	1.181		0.590	0.442	4	H5	1	46204855 [2]	—
3/4		10	4.921	1.181		0.590	0.442	4	H5	1	—	1716542 [2]
7/8		9	5.512	1.260		0.697	0.523	4	H6	1	46204868 [2]	—
1“		8	6.299	1.417		0.800	0.600	4	H6	1	46204854 [2]	— [2]

[1] Reinforced Shanks
[2] Reduced Shanks

DORMER

Multi-Application, Plug Chamfer

E025
E035

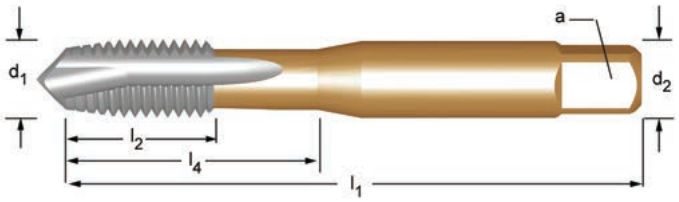
Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
E025 = UNC Sizes, E035 = UNF Sizes

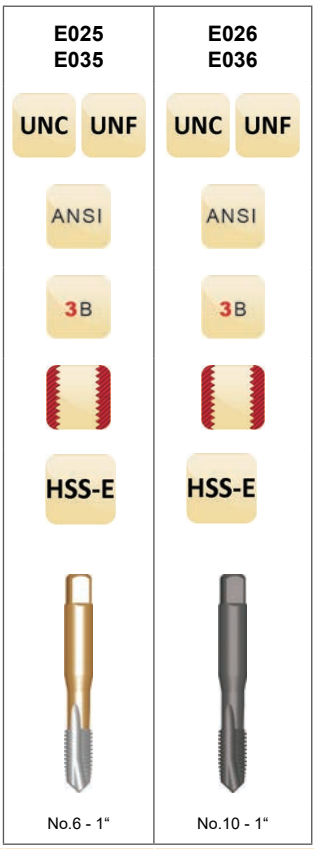
1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

E026
E036

Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E026 = UNC Sizes, E036 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	# of Flutes	Limits	↔	↔	l_4 Inch	Pack Qty	E025 E035		E026 E036	
2		56	1.3/4	0.3140	0.1410	0.1100	2	H2	N50	1.80	0.3140	1	—		0583203	1)
4		40	1.7/8	0.6091	0.1410	0.1100	2	H2	N43	2.35	0.6091	1	—		0581254	1)
5		40	1.15/16	0.7404	0.1410	0.1100	2	H2	N38	2.65	0.7404	1	—		0581261	1)
	6	40	2“	0.2610	0.1410	0.1100	2	H2	N33	2.95	0.5938	1	0581957	1)	—	
6		32	2“	0.2610	0.1410	0.1100	2	H2	N36	2.85	0.5938	1	0581070	1)	0581278	1)
	8	36	2.1/8	0.2484	0.1680	0.1310	2	H2	N29	3.50	0.6526	1	0581964		—	
8		32	2.1/8	0.2484	0.1680	0.1310	2	H2	N29	3.50	0.6526	1	0581087	1)	0581285	1)
	10	32	2.3/8	0.4303	0.1940	0.1520	2	H2	N21	4.10	0.8434	1	0581971	1)	0582145	1)
10		24	2.3/8	0.4303	0.1940	0.1520	2	H3	N25	3.90	0.8434	1	0581094	1)	0581292	1)
	12	28	2.3/8	0.4173	0.2200	0.1650	2	H3	N14	4.70	0.8848	1	—	1)	0582152	1)
12		24	2.3/8	0.4173	0.2200	0.1650	2	H3	N16	4.50	0.8848	1	0581100	1)	0581308	1)
	1/4	28	2.1/2	0.5075	0.2550	0.1910	2	H3	N3	5.50	1.0073	1	0581995	1)	0582169	1)
	1/4	28	2.1/2	0.5075	0.2550	0.1910	3	H3	N3	5.50	1.0073	1	0582008	1)	0582176	1)
1/4		20	2.1/2	0.5075	0.2550	0.1910	2	H3	N7	5.10	1.0073	1	0581117	1)	0581315	1)
1/4		20	2.1/2	0.5075	0.2550	0.1910	3	H3	N7	5.10	1.0073	1	0581124	1)	0581339	1)
1/4		20	2.1/2	0.5075	0.2550	0.1910	3	H11	N7	5.10	1.0073	1	—		0581322	1)3)
	5/16	24	2.23/32	0.5939	0.3180	0.2380	2	H3	I	6.90	1.1891	1	0582015	1)	0582183	1)
	5/16	24	2.23/32	0.5939	0.3180	0.2380	3	H3	I	6.90	1.1891	1	0582022	1)	0582190	1)
5/16		18	2.23/32	0.5939	0.3180	0.2380	2	H3	F	6.60	1.1891	1	0581131	1)	0581346	1)
5/16		18	2.23/32	0.5939	0.3180	0.2380	3	H3	F	6.60	1.1891	1	0581148	1)	0581360	1)
5/16		18	2.23/32	0.5939	0.3180	0.2380	3	H11	F	6.60	1.1891	1	—		0581353	1)3)
	3/8	24	2.15/16	0.6020	0.3810	0.2860	2	H3	Q	8.50	1.2915	1	0582039	1)	0582206	1)
	3/8	24	2.15/16	0.6020	0.3810	0.2860	3	H3	Q	8.50	1.2915	1	0582046	1)	0582213	1)
3/8		16	2.15/16	0.6020	0.3810	0.2860	2	H3	5/16	8.00	1.2915	1	0581155	1)	0581377	1)
3/8		16	2.15/16	0.6020	0.3810	0.2860	3	H3	5/16	8.00	1.2915	1	0581162	1)	0581391	1)
3/8		16	2.15/16	0.6020	0.3810	0.2860	3	H11	5/16	8.00	1.2915	1	—		0581384	1)3)
	7/16	20	3.5/32	0.9055	0.3230	0.2420	3	H3	25/64	9.90	—	1	0582053	2)	0582220	2)
7/16		14	3.5/32	0.9055	0.3230	0.2420	3	H3	U	9.40	—	1	0581179	2)	0581407	2)
	1/2	20	3.3/8	0.9055	0.3670	0.2750	2	H3	29/64	11.50	—	1	0582060	2)	0582237	2)

[1] Reinforced Shanks
[2] Reduced Shanks
[3] Oversize +.005”, not 3B

SPIRAL POINT TAPS

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits	↔	↔	l_4 Inch	Pack Qty	E025 E035	E026 E036
	1/2	20	3.3/8	0.9055	0.3670	0.2750	3	H3	29/64	11.50	—	1	0582077 [2)]	0582244 [2)]
1/2		13	3.3/8	0.9055	0.3670	0.2750	2	H3	27/64	10.80	—	1	0581186 [2)]	0581414 [2)]
1/2		13	3.3/8	0.9055	0.3670	0.2750	3	H3	27/64	10.80	—	1	0581193 [2)]	0581438 [2)]
1/2		13	3.3/8	0.9055	0.3670	0.2750	3	H11	27/64	10.80	—	1	—	0581421 [2)3)]
	9/16	18	3.19/32	0.9843	0.4290	0.3220	3	H3	33/64	12.90	—	1	0582084 [2)]	0582251 [2)]
9/16		12	3.19/32	0.9843	0.4290	0.3220	3	H3	31/64	12.20	—	1	0581209 [2)]	0581445 [2)]
	5/8	18	3.13/16	0.9843	0.4800	0.3600	3	H3	37/64	14.50	—	1	0582091 [2)]	0582268 [2)]
5/8		11	3.13/16	0.9843	0.4800	0.3600	3	H3	17/32	13.50	—	1	0581216 [2)]	0581469 [2)]
5/8		11	3.13/16	0.9843	0.4800	0.3600	3	H11	17/32	13.50	—	1	—	0581452 [2)3)]
	3/4	16	4.1/4	1.1614	0.5900	0.4420	3	H3	11/16	17.50	—	1	0582107 [2)]	0582275 [2)]
3/4		10	4.1/4	1.1614	0.5900	0.4420	3	H4	21/32	16.50	—	1	0581223 [2)]	0581476 [2)]
	7/8	14	4.11/16	1.1614	0.6970	0.5230	3	H4	13/16	20.40	—	1	0582114 [2)]	0582282 [2)]
7/8		9	4.11/16	1.1614	0.6970	0.5230	3	H4	49/64	19.50	—	1	0581230 [2)]	0581483 [2)]
	1“	12	5.1/8	1.3976	0.8000	0.6000	3	H4	59/64	23.25	—	1	— [2)]	0582299 [2)]
	1“	14	5.1/8	1.3976	0.8000	0.6000	3	H4	59/64	23.50	—	1	0582138 [2)]	0582305 [2)]
1“		8	5.1/8	1.3976	0.8000	0.6000	3	H4	7/8	22.25	—	1	0581247 [2)]	0581490 [2)]

[1)] Reinforced Shanks
[2)] Reduced Shanks
[3)] Oversize +.005”, not 3B

DORMER

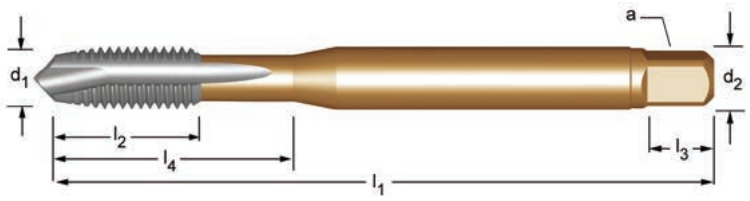
Multi-Application, Plug Chamfer

EP20/ EP30 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
EP20 = UNC Sizes, EP30 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP21/ EP31 Premium substrate with steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.
EP21 = UNC Sizes, EP31 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP20/EP30	EP21/EP31
UNC UNF	UNC UNF
DIN 2184-1	DIN 2184-1
2B	2B
HSS-E	HSS-E
No.4 - 1“	No.4 - 1“

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	◹ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	EP20/EP30	EP21/ EP31
4		40	2.845	56	9	3.5	2.7	6	3	2.35	18	H2	1	0138021 1)	0138175 1)
5		40	3.175	56	10	3.5	2.7	6	3	2.65	18	H2	1	0138038 1)	0138182 1)
6		32	3.505	56	11	4.0	3.0	6	3	2.85	20	H2	1	0138045 1)	0138199 1)
	8	36	4.166	63	12	4.5	3.4	8	3	3.5	21	H3	1	0138366 1)	0138472 1)
8		32	4.166	63	12	4.5	3.4	8	3	3.5	21	H3	1	0138052 1)	0138205 1)
	10	32	4.826	70	13	6.0	4.9	8	3	4.1	25	H3	1	0138373 1)	0138489 1)
10		24	4.826	70	13	6.0	4.9	8	3	3.9	25	H3	1	0138069 1)	0138212 1)
12		24	5.486	80	15	6.0	4.9	8	3	4.5	30	H3	1	0138076 1)	0138229 1)
	1/4	28	6.350	80	15	7.0	5.5	8	3	5.5	30	H4	1	0138380 1)	0138496 1)
1/4		20	6.350	80	15	7.0	5.5	8	3	5.1	30	H5	1	0138083 1)	0138274 1)
	5/16	24	7.938	90	18	8.0	6.2	9	3	6.9	35	H4	1	0138397 1)	0138502 1)
5/16		18	7.938	90	18	8.0	6.2	9	3	6.6	35	H5	1	0138090 1)	0138281 1)
	3/8	24	9.525	100	20	10.0	8.0	11	3	8.5	39	H4	1	0138403 1)	0138519 1)
3/8		16	9.525	100	20	10.0	8.0	11	3	8	39	H5	1	0138106 1)	0138298 1)
	7/16	20	11.112	100	20	8.0	6.2	9	3	9.9	-	H5	1	0138410 2)	0138526 2)
7/16		14	11.112	100	20	8.0	6.2	9	3	9.4	-	H5	1	0138113 2)	0138304 2)
	1/2	20	12.700	110	23	9.0	7.0	10	3	11.5	-	H5	1	0138427 2)	0138533 2)
1/2		13	12.700	110	23	9.0	7.0	10	3	10.8	-	H5	1	0138120 2)	0138311 2)
	5/8	18	15.875	110	25	12.0	9.0	12	3	14.5	-	H5	1	0138434 2)	0138540 2)
5/8		11	15.875	110	25	12.0	9.0	12	3	13.5	-	H5	1	0138137 2)	0138328 2)
	3/4	16	19.050	125	30	14.0	11.0	14	4	17.5	-	H5	1	0138441 2)	0138557 2)
3/4		10	19.050	125	30	14.0	11.0	14	4	16.5	-	H5	1	0138144 2)	0138335 2)
	7/8	14	22.225	140	34	18.0	14.5	17	4	20.4	-	H6	1	0138458 2)	0138564 2)
7/8		9	22.225	140	34	18.0	14.5	17	4	19.5	-	H6	1	0138151 2)	0138342 2)
	1“	12	25.400	160	38	18.0	14.5	17	4	23.25	-	H6	1	0138465 2)	0138571 2)
1“		8	25.400	160	38	18.0	14.5	17	4	22.25	-	H6	1	0138168 2)	0138359 2)

Note: DIN shank and square dimensions will necessitate metric holders

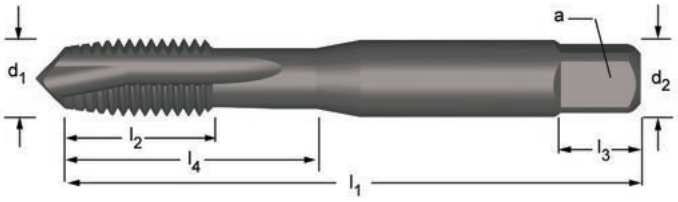
1) Reinforced Shanks
2) Reduced Shanks

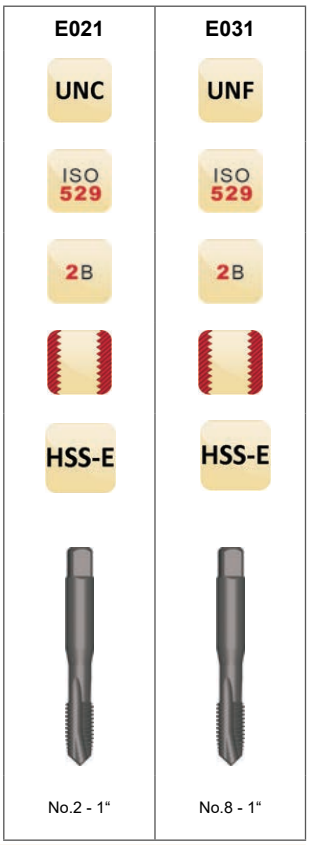
Multi-Application, PLUG CHAMFER

E021
E031

Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E021 = UNC Sizes, E031 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E021	E031
2		56	2.184	44.5	9.5	2.80	2.24	5	2	1.85	9.5	H2	1	0010396 [1]	—
4		40	2.845	48	14	3.15	2.50	5	3	2.35	14	H2	1	0569108 [1]	—
5		40	3.175	48	12.5	3.15	2.50	5	3	2.65	12.5	H2	1	0010419 [1]	—
6		32	3.505	50	16	3.55	2.80	5	3	2.85	16	H3	1	0569115 [1]	—
	8	36	4.166	53	9.5	4.5	3.55	6	3	3.50	17	H3	1	—	0569641 [1]
8		32	4.166	53	9.5	4.50	3.55	6	3	3.50	17	H3	1	0569122 [1]	—
	10	32	4.826	58	11	5.0	4.00	7	3	4.10	20	H3	1	—	0569658 [1]
10		24	4.826	58	11	5.00	4.00	7	3	3.90	20	H3	1	0569139 [1]	—
12		24	5.486	62	12	5.60	4.50	7	3	4.50	21	H3	1	0569146 [1]	—
	1/4	28	6.350	66	13	6.3	5.00	8	3	5.50	26	H4	1	—	0569665 [1]
1/4		20	6.350	66	13	6.30	5.00	8	3	5.10	26	H5	1	0569153 [1]	—
	5/16	24	7.938	72	16	8.0	6.30	9	3	6.90	29	H4	1	—	0569672 [1]
5/16		18	7.938	72	16	8.00	6.30	9	3	6.60	29	H5	1	0569160 [1]	—
	3/8	24	9.525	80	18	10.0	8.00	11	3	8.50	32	H4	1	—	0569689 [1]
3/8		16	9.525	80	18	10.00	8.00	11	3	8.00	32	H5	1	0569177 [1]	—
	7/16	20	11.112	85	19	8.0	6.30	9	3	9.90	-	H5	1	—	0569696 [2]
7/16		14	11.112	85	19	8.00	6.30	9	3	9.40	-	H5	1	0569184 [2]	—
	1/2	20	12.700	89	22	9.0	7.10	10	3	11.50	-	H5	1	—	0569702 [2]
1/2		13	12.700	89	22	9.00	7.10	10	3	10.80	-	H5	1	0569191 [2]	—
	9/16	18	14.288	95	24	11.2	9.00	12	3	12.90	-	H5	1	—	0569719 [2]
	5/8	18	15.875	102	24	12.5	10.00	13	3	14.50	-	H5	1	—	0569726 [2]
5/8		11	15.875	102	24	12.50	10.00	13	3	13.50	-	H5	1	0569207 [2]	—
	3/4	16	19.050	112	29	14.0	11.20	14	4	17.50	-	H5	1	—	0569733 [2]
3/4		10	19.050	112	29	14.00	11.20	14	4	16.50	-	H5	1	0569214 [2]	—
	7/8	14	22.225	118	29	16.0	12.50	16	4	20.40	-	H6	1	—	0569740 [2]
7/8		9	22.225	118	29	16.00	12.50	16	4	19.50	-	H6	1	0569221 [2]	—
	1“	12	25.400	130	35	18.0	14.00	18	4	23.25	-	H6	1	—	0569757 [2]
1“		8	25.400	130	35	18.00	14.00	18	4	22.25	-	H6	1	0569238 [2]	—

Note: ISO shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

UNION BUTTERFIELD®

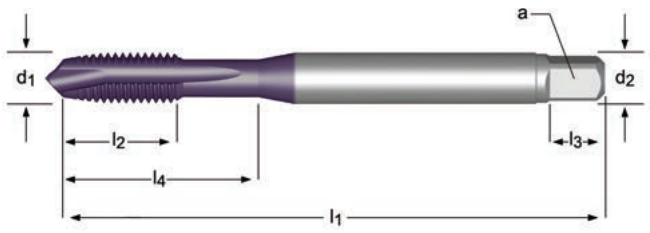
APPLIX®

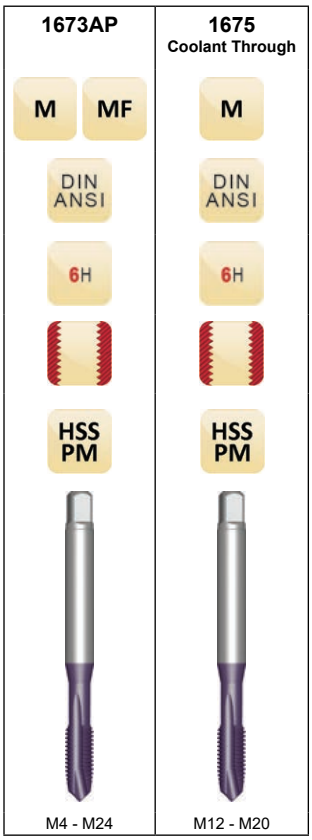
MXP Multi-Application, Plug Chamfer, Metric

1673AP Designed for through hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1675 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4





M	MF	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	⧄ a Inch	# of Flutes	Limits	Pack Qty	1673AP	1675
4		0.70	63	13	21	0.168	0.131	3	D4	1	46204884 [1]	—
5		0.80	70	15	25	0.194	0.152	3	D4	1	46204885 [1]	—
6		1.00	80	17	30	0.255	0.191	3	D5	1	46204886 [1]	—
	8	1.00	90	17	35	0.318	0.238	3	D5	1	46205008 [1]	—
8		1.25	90	20	35	0.318	0.238	3	D5	1	46204887 [1]	—
	10	1.25	100	16	39	0.381	0.286	3	D6	1	46204870 [1]	—
10		1.50	100	22	39	0.381	0.286	3	D6	1	46204871 [1]	—
	12	1.25	100	21		0.367	0.275	3	D6	1	46205009 [2]	—
	12	1.50	100	22		0.367	0.275	3	D6	1	46204872 [2]	—
12		1.75	110	24		0.367	0.275	3	D6	1	46204873 [2]	1716722 [2]
	14	1.50	100	22		0.429	0.322	4	D7	1	46204874 [2]	—
14		2.00	110	26		0.429	0.322	4	D7	1	46204875 [2]	—
	16	1.50	100	22		0.480	0.360	4	D7	1	46204876 [2]	—
16		2.00	110	27		0.480	0.360	4	D7	1	46204877 [2]	1716730 [2]
	18	1.50	110	25		0.542	0.406	4	D7	1	46204878 [2]	—
20		2.50	140	32		0.652	0.489	4	D7	1	46204881 [2]	1716738 [2]
	24	2.00	140	27		0.760	0.570	4	D8	1	46204882 [2]	—
24		3.00	160	34		0.760	0.570	4	D8	1	46204883 [2]	—

[1] Reinforced Shanks
[2] Reduced Shanks

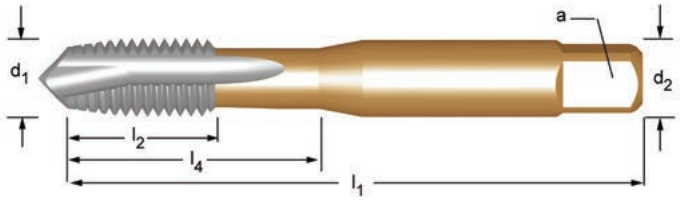
Multi-Application, Plug Chamfer

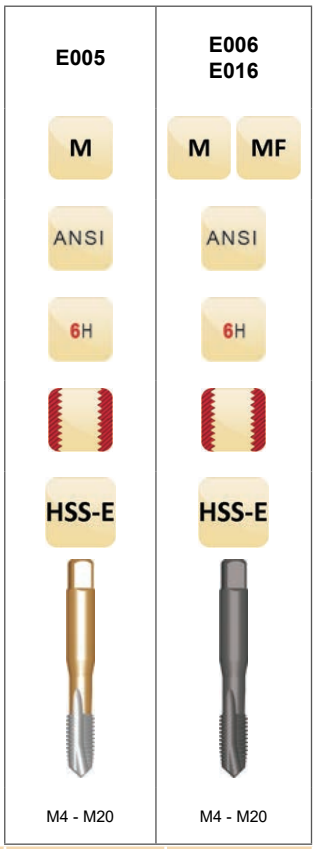
E005 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
E005 = Metric Coarse

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

E006/ E016 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E006 = Metric Coarse, E016 = Metric Fine

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





M	MF	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	▱ a Inch	# of Flutes	↔	↔	l_4 Inch	Limits	Pack Qty	E005	E006 E016
4		0.70	2.1/8	0.2484	0.1680	0.1310	2	3.30	N30	0.6526	D4	1	0580301 [1]	0580462 [1]
4		0.70	2.1/8	0.2484	0.1680	0.1310	3	3.30	N30	0.6526	D4	1	0580318 [1]	0583180 [1]
5		0.80	2.3/8	0.4303	0.1940	0.1520	2	4.20	N19	0.8434	D4	1	0580325 [1]	0580479 [1]
5		0.80	2.3/8	0.4303	0.1940	0.1520	3	4.20	N19	0.8434	D4	1	0580332 [1]	0580486 [1]
6		1.00	2.1/2	0.5075	0.2550	0.1910	2	5.00	N9	1.0073	D5	1	0580349 [1]	0580493 [1]
6		1.00	2.1/2	0.5075	0.2550	0.1910	3	5.00	N9	1.0073	D5	1	0580356 [1]	0580509 [1]
	8	1.00	2.23/32	0.5939	0.3180	0.2380	3	7.00	J	1.1891	D5	1	—	0580950 [1]
8		1.25	2.23/32	0.5939	0.3180	0.2380	2	6.80	H	1.1891	D5	1	0580363 [1]	0580516 [1]
8		1.25	2.23/32	0.5939	0.3180	0.2380	3	6.80	H	1.1891	D5	1	0580370 [1]	0583197 [1]
	10	1.00	2.15/16	0.6020	0.3810	0.2860	3	9.00	T	1.2915	D6	1	—	0580967 [1]
10		1.50	2.15/16	0.6020	0.3810	0.2860	2	8.50	Q	1.2915	D6	1	0580387 [1]	0580523 [1]
10		1.50	2.15/16	0.6020	0.3810	0.2860	3	8.50	Q	1.2915	D6	1	0580394 [1]	0580530 [1]
12		1.75	3.3/8	0.9055	0.3670	0.2750	2	10.30	Y		D6	1	0580400 [2]	0580547 [2]
12		1.75	3.3/8	0.9055	0.3670	0.2750	3	10.30	Y		D6	1	0580417 [2]	0580554 [2]
	14	1.50	3.19/32	0.9843	0.4290	0.3220	3	12.50	31/64		D7	1	—	0580974 [2]
14		2.00	3.19/32	0.9843	0.4290	0.3220	3	12.00	15/32		D7	1	0580424 [2]	0580561 [2]
16		2.00	3.13/16	0.9843	0.4800	0.3600	3	14.00	35/64		D7	1	0580431 [2]	0580578 [2]
18		2.50	4.1/32	1.1614	0.5420	0.4060	3	15.50	39/64		D7	1	0580448 [2]	0580585 [2]
20		2.50	4.15/32	1.1614	0.6520	0.4890	3	17.50	11/16		D7	1	0580455 [2]	0580592 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

DORMER

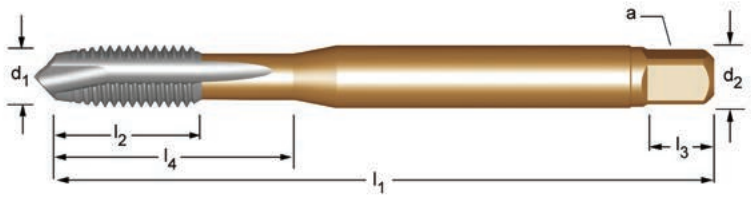
Multi-Application, Plug Chamfer

EP006H Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP016H Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP006H	EP016H
M	M
DIN 371≤10 376≥12	DIN 371≤10 376≥12
6H	6H
HSS-E	HSS-E
M2 - M30	M2 - M30

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	☐ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	EP006H	EP016H
2	0.40	50	6	2.8	2.1	5	2	1.6	9	D3	1	0137239 [1]	0137253 [1]
2.5	0.45	50	8	2.8	2.1	5	2	2.1	12.5	D3	1	0137246 [1]	0137291 [1]
3	0.50	56	10	2.2	1.8	4	3	2.5	18	D3	1	0135716 [2]	0136126 [2]
3	0.50	56	9	3.5	2.7	6	3	2.5	18	D3	1	0135709 [1]	0136119 [1]
3.5	0.60	56	11	4.0	3.0	6	3	2.9	20	D4	1	0135723 [1]	0136133 [1]
4	0.70	63	12	2.8	2.1	5	3	3.3	21	D4	1	0135747 [2]	0136157 [2]
4	0.70	63	12	4.5	3.4	6	3	3.3	21	D4	1	0135730 [1]	0136140 [1]
4.5	0.75	70	13	6.0	4.9	8	3	3.8	25	D4	1	0135754 [1]	0136164 [1]
5	0.80	70	13	3.5	2.7	6	3	4.2	25	D4	1	0135853 [2]	0136188 [2]
5	0.80	70	13	6.0	4.9	8	3	4.2	25	D4	1	0135846 [1]	0136171 [1]
6	1.00	80	15	4.5	3.4	6	3	5	30	D5	1	0135877 [2]	0136201 [2]
6	1.00	80	15	6.0	4.9	8	3	5	30	D5	1	0135860 [1]	0136195 [1]
7	1.00	80	15	7.0	5.5	8	3	6	30	D5	1	0135884 [1]	0136218 [1]
8	1.25	90	18	6.0	4.9	8	3	6.8	35	D5	1	0135907 [2]	0136232 [2]
8	1.25	90	18	8.0	6.2	9	3	6.8	35	D5	1	0135891 [1]	0136225 [1]
10	1.50	100	20	7.0	5.5	8	3	8.5	-	D6	1	0135921 [2]	0136256 [2]
10	1.50	100	20	10.0	8.0	11	3	8.5	39	D6	1	0135914 [1]	0136249 [1]
12	1.75	110	23	9.0	7.0	10	3	10.3	-	D6	1	0135938 [2]	0136263 [2]
14	2.00	110	25	11.0	9.0	12	3	12	-	D7	1	0135945 [2]	0136317 [2]
16	2.00	110	25	12.0	9.0	12	3	14	-	D7	1	0135952 [2]	0136324 [2]
18	2.50	125	30	14.0	11.0	14	4	15.5	-	D7	1	0135969 [2]	0136331 [2]
20	2.50	140	30	16.0	12.0	15	4	17.5	-	D7	1	0135976 [2]	0136348 [2]
22	2.50	140	34	18.0	14.5	17	4	19.5	-	D8	1	0135983 [2]	0136355 [2]
24	3.00	160	38	18.0	14.5	17	4	21	-	D8	1	0135990 [2]	0136362 [2]
27	3.00	160	38	20.0	16.0	19	4	24	-	D8	1	0136003 [2]	0136379 [2]
30	3.50	180	45	22.0	18.0	21	4	26.5	-	D9	1	0136010 [2]	0136386 [2]

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks (DIN 371)
[2] Reduced Shanks (DIN 376)

SPIRAL POINT TAPS

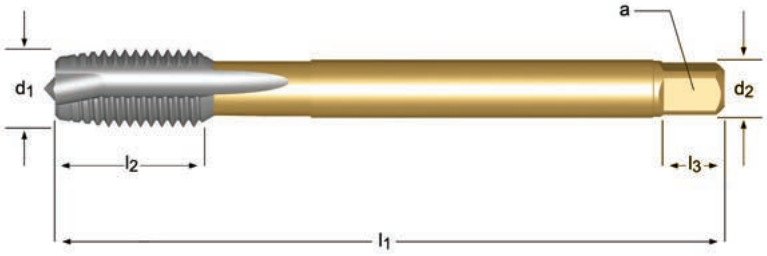
Multi-Application, Plug Chamfer

EP10 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP11 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP10	EP11
MF	MF
DIN 374	DIN 374
6H	6H
HSS-E	HSS-E
M4 - M30	M4 - M30

MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	◪ a mm	l_3 mm	# of Flutes	↔	Limits	Pack Qty	EP10	EP11
4	0.50	63	12	2.8	2.1	5	3	3.5	D4	1	0137345	0137642
5	0.50	70	13	3.5	2.7	6	3	4.5	D4	1	0137352	0137659
6	0.75	80	15	4.5	3.4	6	3	5.3	D5	1	0137369	0137666
8	0.75	80	15	6.0	4.9	8	3	7.3	D5	1	0137376	0137673
8	1.00	90	18	6.0	4.9	8	3	7	D5	1	0137383	0137680
10	0.75	90	18	7.0	5.5	8	3	9.3	D6	1	0137390	0137697
10	1.00	90	18	7.0	5.5	8	3	9	D6	1	0137406	0137703
10	1.25	100	20	7.0	5.5	8	3	8.8	D6	1	0137413	0137710
12	1.00	100	21	9.0	7.0	10	3	11	D6	1	0137420	0137727
12	1.25	100	21	9.0	7.0	10	3	10.8	D6	1	0137437	0137819
12	1.50	100	21	9.0	7.0	10	3	10.5	D6	1	0137444	0137826
14	1.00	100	21	11.0	9.0	12	3	13	D7	1	0137451	0137833
14	1.25	100	21	11.0	9.0	12	3	13	D7	1	0137468	0137840
14	1.50	100	21	11.0	9.0	12	3	12.5	D7	1	0137475	0137857
16	1.00	100	21	12.0	9.0	12	3	15	D7	1	0137482	0137864
16	1.50	100	21	12.0	9.0	12	3	14.5	D7	1	0137499	0137871
18	1.00	110	24	14.0	11.0	14	4	17	D7	1	0137505	0137888
18	1.50	110	24	14.0	11.0	14	4	16.5	D7	1	0137512	0137895
20	1.00	125	24	16.0	12.0	15	4	19	D7	1	0137529	0137901
20	1.50	125	24	16.0	12.0	15	4	18.5	D7	1	0137536	0137918
22	1.50	125	25	18.0	14.5	17	4	20.5	D8	1	0137543	0137925
24	1.50	140	28	18.0	14.5	17	4	22.5	D8	1	0137550	0137932
24	2.00	140	28	18.0	14.5	17	4	22	D8	1	0137567	0137949
25	1.50	140	28	18.0	14.5	17	4	23.5	D8	1	0137574	0137956
26	1.50	140	28	18.0	14.5	17	4	24.5	D8	1	0137581	0137963
27	1.50	140	28	20.0	16.0	19	4	25.5	D8	1	0137598	0137970
27	2.00	140	28	20.0	16.0	19	4	25	D8	1	0137604	0137987
28	1.50	140	28	20.0	16.0	19	4	26.5	D9	1	0137611	0137994
30	1.50	150	28	22.0	18.0	21	4	28.5	D9	1	0137628	0138007
30	2.00	150	28	22.0	18.0	21	4	28	D9	1	0137635	0138014

Note: DIN shank and square dimensions will necessitate metric holders

DORMER

Multi-Application, Plug Chamfer

E000 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
E000 = Metric Coarse, E000TIN = TiN Coated

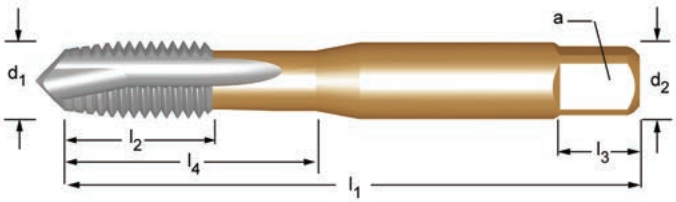
1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

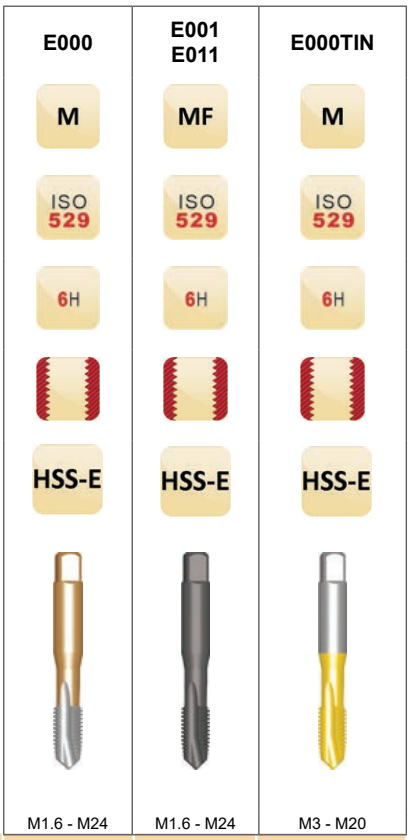
E000TIN E000 with a TiN coat

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
5.1 5.2 6.1 6.2 6.3 7.3 7.4 8.2

E001
E011 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E001 = Metric Coarse, E011 = Metric Fine

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





M1.6 - M24 | M1.6 - M24 | M3 - M20

M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	E000	E001 E011	E000TIN
1.6		0.35	41	7	2.50	2.00	4	2	1.25	7	D3	1	0168769 [1]	0168790 [1]	—
2		0.40	41	8	2.50	2.00	4	2	1.6	8	D3	1	0168776 [1]	0168806 [1]	—
2.5		0.45	44.5	9.5	2.80	2.24	5	2	2.05	9.5	D3	1	0168783 [1]	0168813 [1]	—
3		0.50	48	15	3.15	2.50	5	3	2.5	15	D3	1	0567586 [1]	0567722 [1]	46196635 [1]
3.5		0.60	50	16	3.55	2.80	5	3	2.9	16	D4	1	0567593 [1]	0567739 [1]	—
	4	0.50	53	17	4.0	3.15	6	3	3.5	17	D4	1	—	0568385 [1]	—
4		0.70	53	17	4.00	3.15	6	3	3.3	17	D4	1	0567609 [1]	0567746 [1]	46196636 [1]
	5	0.50	58	11	5.0	4.00	7	3	4.5	22	D4	1	—	0568392 [1]	—
5		0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	0567616 [1]	0567753 [1]	46196637 [1]
	6	0.50	66	13	6.3	5.00	8	3	5.5	26	D5	1	—	0568408 [1]	—
	6	0.75	66	13	6.3	5.00	8	3	5.3	26	D5	1	—	0568415 [1]	—
6		1.00	66	13	6.30	5.00	8	3	5.0	26	D5	1	0567623 [1]	0567760 [1]	46196638 [1]
	8	0.75	72	16	8.0	6.30	9	3	7.3	29	D5	1	—	0568422 [1]	—
	8	1.00	72	16	8.0	6.30	9	3	7.0	29	D5	1	—	0568439 [1]	—
8		1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0567630 [1]	0567777 [1]	46196639 [1]
	10	1.00	80	18	10.0	8.00	11	3	9.0	34	D6	1	—	0568446 [1]	—
	10	1.25	80	18	10.0	8.00	11	3	8.8	34	D6	1	—	0568453 [1]	—
10		1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0567647 [1]	0567784 [1]	46196690 [1]
	12	1.00	89	22	9.0	7.10	10	3	11.0	-	D6	1	—	0568460 [2]	—
	12	1.25	89	22	9.0	7.10	10	3	10.8	-	D6	1	—	0568477 [2]	—
	12	1.50	89	22	9.0	7.10	10	3	10.5	-	D6	1	—	0568484 [2]	—
12		1.75	89	22	9.00	7.10	10	3	10.3	-	D6	1	0567654 [2]	0567791 [2]	46196691 [2]
	14	1.00	95	24	11.2	9.00	12	3	13.0	-	D7	1	—	0568491 [2]	—
	14	1.25	95	24	11.2	9.00	12	3	12.8	-	D7	1	—	0568507 [2]	—
	14	1.50	95	24	11.2	9.00	12	3	12.5	-	D7	1	—	0568514 [2]	—
14		2.00	95	24	11.20	9.00	12	3	12.0	-	D7	1	0567661 [2]	0567807 [2]	—
	16	1.00	102	24	12.5	10.00	13	3	15.0	-	D7	1	—	0568521 [2]	—
	16	1.50	102	24	12.5	10.00	13	3	14.5	-	D7	1	—	0568538 [2]	—
16		2.00	102	24	12.50	10.00	13	3	14.0	-	D7	1	0567678 [2]	0567814 [2]	46196692 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	⧄ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E000	E001 E011	E000TIN
	18	1.00	112	29	14.0	11.20	14	4	17.0	-	D7	1	—	0568545 [2]	—
	18	1.50	112	29	14.0	11.20	14	4	16.5	-	D7	1	—	0568552 [2]	—
18		2.50	112	29	14.00	11.20	14	4	15.5	-	D7	1	0567685 [2]	0567821 [2]	—
	20	1.00	112	29	14.0	11.20	14	4	19.0	-	D7	1	—	0568569 [2]	—
	20	1.50	112	29	14.0	11.20	14	4	18.5	-	D7	1	—	0568576 [2]	—
	20	2.00	112	29	14.0	11.20	14	4	18.0	-	D7	1	—	0568583 [2]	—
20		2.50	112	29	14.00	11.20	14	4	17.5	-	D7	1	0567692 [2]	—	46196693 [2]
	22	1.50	118	29	16.0	12.50	16	4	20.5	-	D8	1	—	0568590 [2]	—
22		2.50	118	29	16.00	12.50	16	4	19.5	-	D8	1	0567708 [2]	0567845 [2]	—
	24	1.50	130	35	18.0	14.00	18	4	22.5	-	D8	1	—	0568606 [2]	—
	24	2.00	130	35	18.0	14.00	18	4	22.0	-	D8	1	—	0568613 [2]	—
24		3.00	130	35	18.00	14.00	18	4	21.0	-	D8	1	0567715 [2]	0567852 [2]	—

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

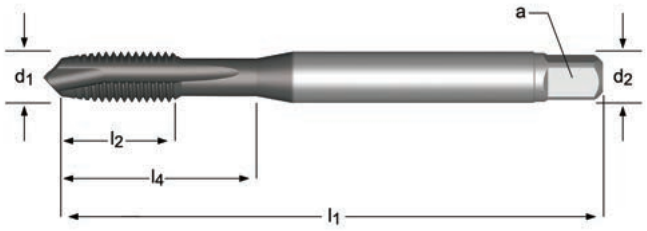
UNION BUTTERFIELD®

APPLIX®

HMD Hard Materials / Cast Iron, Plug Chamfer

1629AP Designed for through hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 1.6 2.4 3.1 3.2 3.3 3.4 4.3 5.3 6.4



1629AP

UNF UNC

DIN ANSI

2B

HSS PM

No.4 - 1"

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits	Pack Qty	1629AP
4		40	2.205	0.472	0.709	0.141	0.110	2	H2	1	46204796 [1]
6		32	2.205	0.472	0.787	0.141	0.110	3	H3	1	46204801 [1]
8		32	2.480	0.512	0.827	0.168	0.131	3	H3	1	46204805 [1]
	10	32	2.756	0.512	0.984	0.194	0.152	3	H3	1	46204759 [1]
10		24	2.756	0.591	0.984	0.194	0.152	3	H3	1	46204758 [1]
	1/4	28	3.150	0.669	1.181	0.255	0.191	3	H4	1	46204757 [1]
1/4		20	3.150	0.669	1.181	0.255	0.191	3	H5	1	46204756 [1]
	5/16	24	3.543	0.669	1.378	0.318	0.238	3	H4	1	46204798 [1]
5/16		18	3.543	0.787	1.378	0.318	0.238	3	H5	1	46204797 [1]
	3/8	24	3.937	0.709	1.535	0.381	0.286	3	H4	1	46204795 [1]
3/8		16	3.937	0.866	1.535	0.381	0.286	3	H5	1	46204794 [1]
	1/2	20	3.937	0.866		0.367	0.275	3	H5	1	46204755 [1]
1/2		13	4.331	0.984		0.367	0.275	3	H5	1	46204754 [2]
	5/8	18	3.937	0.866		0.480	0.360	3	H5	1	46204800 [2]
5/8		11	4.331	1.063		0.480	0.360	3	H5	1	46204799 [2]
3/4		10	4.921	1.181		0.590	0.442	3	H5	1	46204792 [2]
7/8		9	5.512	1.260		0.697	0.523	3	H6	1	46204804 [2]
1"		8	6.299	1.417		0.800	0.600	3	H6	1	46204791 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

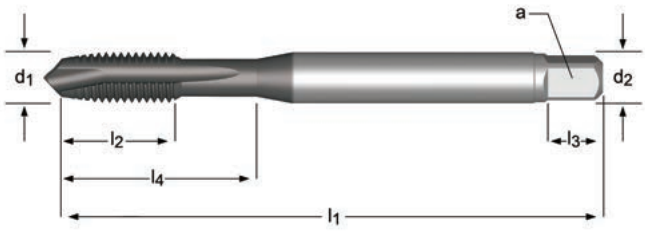
SPIRAL POINT TAPS

HMD Hard Materials / Cast Iron, Plug Chamfer

APPLIX®

1659AP Designed for through hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 1.6 2.4 3.1 3.2 3.3 3.4 4.3 5.3 6.4



1659AP(MF)

M

DIN ANSI

6H

HSS PM

M3 - M12

M	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	⊠ a Inch	# of Flutes	Limits	Pack Qty	1659AP
3	0.50	56	11	18	0.141	0.110	3	D3	1	46204832
4	0.70	63	13	21	0.168	0.131	3	D4	1	46204833 1)
5	0.80	70	15	25	0.194	0.152	3	D4	1	46204834 1)
6	1.00	80	17	30	0.255	0.191	3	D5	1	46204835 1)
8	1.25	90	20	35	0.318	0.238	3	D5	1	46204837 1)
10	1.50	100	22	39	0.381	0.286	3	D6	1	46204829 1)
12	1.75	110	24		0.367	0.275	3	D6	1	46204831 2)

1) Reinforced Shanks
2) Reduced Shanks

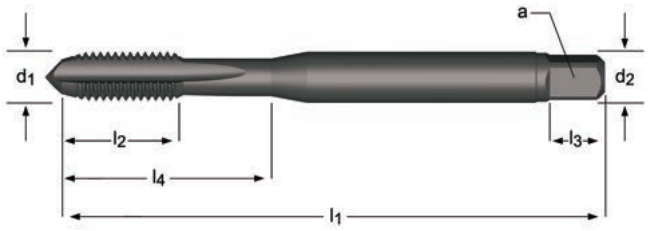
STRAIGHT FLUTE TAPS

For Cast Iron, Plug Chamfer

E201
E252

Designed for through or blind hole tapping with a specific geometry for cast iron and those materials producing broken, powdery chips. Also ideal for non-metallics, cast brass, and other brass materials. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials.

3.1 3.2 3.3 3.4 6.2 6.4 7.4 8.2



E201	E252
M	M
DIN 371	DIN 376
6HX	6HX
HSS PM	HSS PM
M3 - M10	M8 - M24

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	E201	E252
3	0.50	56	9	3.5	2.7	6	3	2.5	18	D3	1	0165607 [1]	—
4	0.70	63	12	4.5	3.4	6	4	3.3	21	D4	1	0085196 [1]	—
5	0.80	70	13	6.0	4.9	8	4	4.2	25	D4	1	0085202 [1]	—
6	1.00	80	15	6.0	4.9	8	4	5.0	30	D5	1	0085219 [1]	—
8	1.25	90	18	6.0	4.9	8	4	6.8		D5	1	—	0087343 [1]
8	1.25	90	18	8.0	6.2	9	4	6.8	35	D5	1	0085226 [1]	—
10	1.50	100	20	10.0	8.0	11	4	8.5	39	D6	1	0085189 [1]	—
10	1.50	100	20	7.0	5.5	8	4	8.5		D6	1	—	0087268 [2]
12	1.75	110	23	9.0	7.0	10	4	10.3		D6	1	—	0087275 [2]
14	2.00	110	25	11.0	9.0	12	4	12.0		D7	1	—	0087282 [2]
16	2.00	110	25	12.0	9.0	12	4	14.0		D7	1	—	0087299 [2]
18	2.50	125	30	14.0	11.0	14	4	15.5		D7	1	—	0087305 [2]
20	2.50	140	30	16.0	12.0	15	4	17.5		D7	1	—	0087312 [2]
22	2.50	140	34	18.0	14.5	17	4	19.5		D8	1	—	0087329 [2]
24	3.00	160	38	18.0	14.5	17	4	21.0		D8	1	—	0087336 [2]

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

DDX, High Hook, Plug Chamfer

1985 Type DDX taps feature a special O.D. and P.D. relief and increased back taper. Intended for use in through hole applications where a free cutting action is desirable. Designed to produce a class 2B fit. Sizes No.4 - 3/8" are 'necked' to allow for use in deep hole applications. Steam oxide reduces wear and prevents chip welding when through hole tapping in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 4.1 4.2 4.3 5.1 5.2 5.3

1985

UNC UNF

ANSI

2B

HSS

No.4 - 1"

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	☐ a Inch	l_3 Inch	# of Flutes	1_4 Inch	Pack Qty	1985	
	4	48	1.7/8	9/16	0.1410	0.1100	3/16	2	0.69	1	1013038	1)
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	0.69	1	1013037	1)
	5	44	1.15/16	5/8	0.1410	0.1100	3/16	2	0.75	1	1013040	1)
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	0.75	1	1013039	1)
	6	40	2"	11/16	0.1410	0.1100	3/16	2	0.78	1	1013042	1)
6		32	2"	11/16	0.1410	0.1100	3/16	2	0.78	1	1013041	1)
	8	36	2.1/8	3/4	0.1680	0.1310	1/4	2	0.81	1	1013044	1)
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	0.81	1	1013043	1)
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	0.94	1	1013046	1)
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	0.94	1	1013045	1)
	1/4	28	2.1/2	1"	0.2550	0.1910	5/16	2	1.19	1	1013050	1)
1/4		20	2.1/2	1"	0.2550	0.1910	5/16	2	1.19	1	1013049	1)
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	1.31	1	1013052	1)
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	1.31	1	1013051	1)
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	1.44	1	1013054	1)
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	1.44	1	1013053	1)
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	–	1	1013056	2)
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	–	1	1013055	2)
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	–	1	1013058	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	–	1	1013057	2)
	9/16	18	3.19/32	1.21/32	0.4290	0.3220	1/2	3	–	1	1013060	2)
9/16		12	3.19/32	1.21/32	0.4290	0.3220	1/2	3	–	1	1013059	2)
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	3	–	1	1013062	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	3	–	1	1013061	2)
	3/4	16	4.1/4	2"	0.5900	0.4420	11/16	3	–	1	1013066	2)
3/4		10	4.1/4	2"	0.5900	0.4420	11/16	3	–	1	1013065	2)
	7/8	14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	–	1	1013068	2)
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	–	1	1013067	2)
1"		8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	–	1	1013069	2)

[1] Reinforced Shanks
[2] Reduced Shanks

APPLIX SPIRAL FLUTE TAP (48°-52°)

UNION BUTTERFIELD

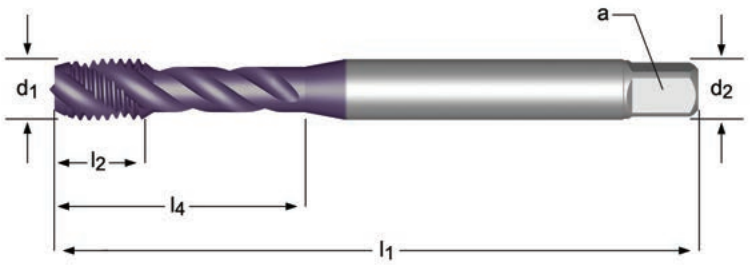
APPLIX®

MXL Multi-Application, Semi-Bottoming

1676AP Designed for blind hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1678 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4



1676AP(UNF)	1678(UNF)
UNC UNF	UNC UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
No.4 - 1“	1/4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	⍁ a Inch	# of Flutes	Limits	Pack Qty	1676AP	1678
4		40	2.205	0.236	0.709	0.141	0.110	3	H2	1	46204902 [1]	—
6		32	2.205	0.236	0.787	0.141	0.110	3	H2	1	46204907 [1]	—
8		32	2.480	0.236	0.827	0.168	0.131	3	H3	1	46204912 [1]	—
	10	32	2.756	0.354	0.984	0.194	0.152	3	H3	1	46204895 [1]	—
10		24	2.756	0.354	0.984	0.194	0.152	3	H3	1	46204894 [1]	—
	1/4	28	3.150	0.433	1.181	0.255	0.191	3	H4	1	46204893 [1]	1717512 [1]
1/4		20	3.150	0.433	1.181	0.255	0.191	3	H5	1	46204892 [1]	1717510 [1]
	5/16	24	3.543	0.472	1.378	0.318	0.238	3	H4	1	46204904 [1]	—
5/16		18	3.543	0.472	1.378	0.318	0.238	3	H5	1	46204903 [1]	1717514 [1]
	3/8	24	3.937	0.551	1.535	0.381	0.286	3	H4	1	46204901 [1]	—
3/8		16	3.937	0.551	1.535	0.381	0.286	3	H5	1	46204900 [1]	1717518 [1]
	7/16	20	3.937	0.591		0.323	0.242	3	H5	1	46204909 [2]	1717532 [2]
7/16		14	3.937	0.591		0.323	0.242	3	H5	1	46204908 [2]	1717530 [2]
	1/2	20	3.937	0.630		0.367	0.275	3	H5	1	46204891 [2]	—
1/2		13	4.331	0.630		0.367	0.275	3	H5	1	46204890 [2]	1717534 [2]
	5/8	18	3.937	0.745		0.480	0.360	3	H5	1	46204906 [2]	—
5/8		11	4.331	0.745		0.480	0.360	3	H5	1	46204905 [2]	1717538 [2]
	3/4	16	4.331	0.820		0.590	0.442	3	H5	1	46204899 [2]	—
3/4		10	4.921	0.820		0.590	0.442	3	H5	1	46204898 [2]	1717542 [2]
	7/8	14	4.921	0.910		0.697	0.523	4	H6	1	46204910 [2]	—
7/8		9	5.512	0.910		0.697	0.523	4	H6	1	46204911 [2]	46204932 [2]
1“		8	6.299	1.025		0.800	0.600	4	H6	1	46204897 [2]	1717546 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

Multi-Application, Semi-Bottoming

E027
E037

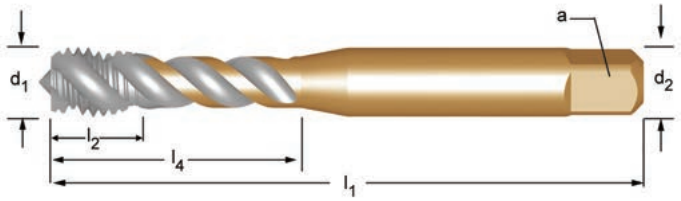
Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.
E027 = UNC Sizes, E037 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 6.1 6.2 6.3 7.1 7.2 7.3 7.4 8.1

E028
E038

Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E028 = UNC Sizes, E038 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3



E027/E037	E028/E038
UNC UNF	UNC UNF
ANSI	ANSI
3B	3B
HSS-E	HSS-E
No.6- 1“	No.4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits	↔	↔	l_4 Inch	Pack Qty	E027 E037	E028 E038
4		40	1.7/8	0.6091	0.1410	0.1100	3	H2	N43	2.35	0.6091	1	—	0581643 [1]
5		40	1.15/16	0.7404	0.1410	0.1100	3	H2	N38	2.65	0.7404	1	—	0581650 [1]
6		32	2“	0.2610	0.1410	0.1100	3	H2	N36	2.85	0.5938	1	0581506	0581667 [1]
8		32	2.1/8	0.2484	0.1680	0.1310	3	H2	N29	3.50	0.6526	1	0581513	0581674 [1]
	10	32	2.3/8	0.2650	0.1940	0.1520	3	H2	N21	4.10	0.8434	1	0582312	0582435 [1]
10		24	2.3/8	0.2650	0.1940	0.1520	3	H3	N25	3.90	0.8434	1	0581520	0581681 [1]
12		24	2.3/8	0.2520	0.2200	0.1650	3	H3	N16	4.50	0.8848	1	0581537	0581698 [1]
	1/4	28	2.1/2	0.3937	0.2550	0.1910	3	H3	N3	5.50	1.0993	1	0582329	0582442 [1]
1/4		20	2.1/2	0.3937	0.2550	0.1910	3	H3	N7	5.10	1.0993	1	0581544	0581704 [1]
	5/16	24	2.23/32	0.4567	0.3180	0.2380	3	H3	I	6.90	1.3094	1	0582336	0582459 [1]
5/16		18	2.23/32	0.4567	0.3180	0.2380	3	H3	F	6.60	1.3094	1	0581551	0581711 [1]
	3/8	24	2.15/16	0.5315	0.3810	0.2860	3	H3	Q	8.50	1.4415	1	0582343	0582466 [1]
3/8		16	2.15/16	0.5315	0.3810	0.2860	3	H3	5/16	8.00	1.4415	1	0581568	0581728 [1]
3/8		16	2.15/16	0.5315	0.3810	0.2860	3	H5	5/16	8.00	1.4415	1	—	0581735 [1][3]
	7/16	20	3.5/32	0.6299	0.3230	0.2420	3	H3	25/64	9.90	-	1	0582350	0582473 [2]
7/16		14	3.5/32	0.6299	0.3230	0.2420	3	H3	U	9.40	-	1	0581575	0581742 [2]
	1/2	20	3.3/8	0.6890	0.3670	0.2750	3	H3	29/64	11.50	-	1	0582367	0582480 [2]
1/2		13	3.3/8	0.6890	0.3670	0.2750	3	H3	27/64	10.80	-	1	0581582	0581759 [2]
	9/16	18	3.19/32	0.7087	0.4290	0.3220	3	H3	33/64	12.90	-	1	0582374	0582497 [2]
9/16		12	3.19/32	0.7087	0.4290	0.3220	3	H3	31/64	12.20	-	1	0581599	0581766 [2]
	5/8	18	3.13/16	0.7087	0.4800	0.3600	3	H3	37/64	14.50	-	1	0582381	0582503 [2]
5/8		11	3.13/16	0.7087	0.4800	0.3600	3	H3	17/32	13.50	-	1	0581605	0581773 [2]
	3/4	16	4.1/4	0.8858	0.5900	0.4420	3	H3	11/16	17.50	-	1	0582398	0582510 [2]
3/4		10	4.1/4	0.8858	0.5900	0.4420	3	H4	21/32	16.50	-	1	0581612	0581780 [2]
	7/8	14	4.11/16	0.9843	0.6970	0.5230	3	H4	13/16	20.40	-	1	0582404	0582527 [2]
7/8		9	4.11/16	0.9843	0.6970	0.5230	3	H4	49/64	19.50	-	1	0581629	0581797 [2]
	1“	14	5.1/8	1.1811	0.8000	0.6000	3	H4	59/64	23.50	-	1	0582428	0582541 [2]
1“		8	5.1/8	1.1811	0.8000	0.6000	3	H4	7/8	22.25	-	1	0581636	0581803 [2]

[1] Reinforced Shanks
[2] Reduced Shanks
[3] Class of fit: 2B

SPIRAL FLUTE TAPS (45°)

DORMER

Multi-Application, Semi-Bottoming

EX20
EX30

Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

EX20 = UNC Sizes, EX30 = UNF Sizes

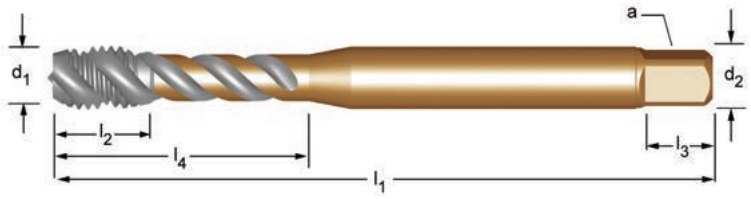
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX21
EX31

Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

EX21 = UNC Sizes, EX31 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



EX20/EX30	EX21/EX31
UNC UNF	UNC UNF
DIN 2184-1	DIN 2184-1
2B	2B
HSS-E	HSS-E
No.4 - 1“	No.4 - 1“

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes	↔	Limits	l_4 mm	Pack Qty	EX20 EX30		EX21 EX31	
4		40	2.845	56	6	3.5	2.7	6	3	2.35	H2	18	1	0150269	1)	0150412	1)
5		40	3.175	56	6	3.5	2.7	6	3	2.65	H2	18	1	0150276	1)	0150429	1)
6		32	3.505	56	7	4.0	3.0	6	3	2.85	H2	20	1	0150283	1)	0150436	1)
	8	36	4.166	63	7	4.5	3.4	8	3	3.5	H3	21	1	0168325	1)	0168431	1)
8		32	4.166	63	7	4.5	3.4	8	3	3.5	H3	21	1	0150290	1)	0150443	1)
	10	32	4.826	70	8	6.0	4.9	8	3	4.1	H3	25	1	0168332	1)	0168448	1)
10		24	4.826	70	8	6.0	4.9	8	3	3.9	H3	25	1	0150306	1)	0150450	1)
12		24	5.486	80	10	6.0	4.9	8	3	4.5	H3	30	1	0150313	1)	0150467	1)
	1/4	28	6.350	80	10	7.0	5.5	8	3	5.5	H4	30	1	0168349	1)	0168455	1)
1/4		20	6.350	80	10	7.0	5.5	8	3	5.1	H5	30	1	0150320	1)	0150474	1)
	5/16	24	7.938	90	12	8.0	6.2	9	3	6.9	H4	35	1	0168356	1)	0168462	1)
5/16		18	7.938	90	12	8.0	6.2	9	3	6.6	H5	35	1	0150337	1)	0150627	1)
	3/8	24	9.525	100	15	10.0	8.0	11	3	8.5	H4	39	1	0168363	1)	0168479	1)
3/8		16	9.525	100	15	10.0	8.0	11	3	8	H5	39	1	0150344	1)	0151945	1)
	7/16	20	11.112	100	15	8.0	6.2	9	3	9.9	H5	-	1	0168370	2)	0168486	2)
7/16		14	11.112	100	15	8.0	6.2	9	3	9.4	H5	-	1	0150351	2)	0159507	2)
	1/2	20	12.700	110	18	9.0	7.0	10	3	11.5	H5	-	1	0168387	2)	0168493	2)
1/2		13	12.700	110	18	9.0	7.0	10	3	10.8	H5	-	1	0150368	2)	0159514	2)
	5/8	18	15.875	110	20	12.0	9.0	12	4	14.5	H5	-	1	0168394	2)	0168509	2)
5/8		11	15.875	110	20	12.0	9.0	12	4	13.5	H5	-	1	0150375	2)	0159552	2)
	3/4	16	19.050	125	25	14.0	11.0	14	4	17.5	H5	-	1	0168400	2)	0168516	2)
3/4		10	19.050	125	25	14.0	11.0	14	4	16.5	H5	-	1	0150382	2)	0159576	2)
	7/8	14	22.225	140	25	18.0	14.5	17	4	20.4	H6	-	1	0168417	2)	0168523	2)
7/8		9	22.225	140	25	18.0	14.5	17	4	19.5	H6	-	1	0150399	2)	0159590	2)
	1“	12	25.400	160	30	18.0	14.5	17	4	23.25	H6	-	1	0168424	2)	0168530	2)
1“		8	25.400	160	30	18.0	14.5	17	4	22.25	H6	-	1	0150405	2)	0168318	2)

Note: DIN shank and square dimensions will necessitate metric holders

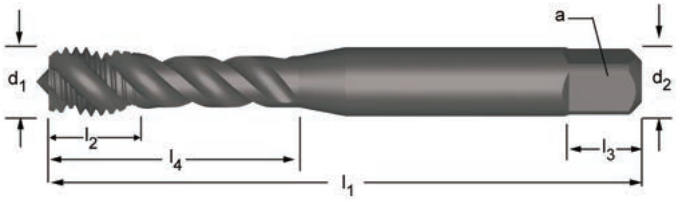
[1] Reinforced Shanks
[2] Reduced Shanks

Multi-Application, Semi-Bottoming

E023
E033 Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E023 = UNC Sizes, E033 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



E023/E033

UNC UNF

ISO 529

2B

HSS-E

No.2 - 1"

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▱ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E023 E033	
2		56	2.184	44.5	9.5	2.80	2.24	5	2	1.85	9.5	H2	1	0010440	1)
4		40	2.845	48	6	3.15	2.50	5	3	2.35	14	H2	1	0569382	1)
5		40	3.175	48	6	3.15	2.50	5	3	2.65	12.5	H2	1	0010471	1)
6		32	3.505	50	6	3.55	2.80	5	3	2.85	16	H2	1	0569399	1)
	8	36	4.166	53	7	4.5	3.55	6	3	3.50	17	H3	1	0570081	1)
8		32	4.166	53	7	4.50	3.55	6	3	3.50	17	H3	1	0569405	1)
	10	32	4.826	58	8	5.0	4.00	7	3	4.10	20	H3	1	0570098	1)
10		24	4.826	58	8	5.00	4.00	7	3	3.90	20	HH3	1	0569412	1)
12		24	5.486	62	12	5.60	4.50	7	3	4.50	21	H3	1	0569429	1)
	1/4	28	6.350	66	10	6.3	5.00	8	3	5.50	28	H4	1	0570104	1)
1/4		20	6.350	66	10	6.30	5.00	8	3	5.10	28	H5	1	0569436	1)
	5/16	24	7.938	72	12	8.0	6.30	9	3	6.90	31	H4	1	0570111	1)
5/16		18	7.938	72	12	8.00	6.30	9	3	6.60	31	H5	1	0569443	1)
	3/8	24	9.525	80	15	10.0	8.00	11	3	8.50	34	H4	1	0570128	1)
3/8		16	9.525	80	15	10.00	8.00	11	3	8.00	34	H5	1	0569450	1)
	7/16	20	11.112	85	19	8.0	6.30	9	3	9.90	-	H5	1	0570135	2)
7/16		14	11.112	85	19	8.00	6.30	9	3	9.40	-	H5	1	0569467	2)
	1/2	20	12.700	89	22	9.0	7.10	10	3	11.50	-	H5	1	0570142	2)
1/2		13	12.700	89	19	9.00	7.10	10	3	10.80	-	H5	1	0569474	2)
	9/16	18	14.288	95	24	11.2	9.00	12	3	12.90	-	H5	1	0570159	2)
	5/8	18	15.875	102	24	12.5	10.00	13	4	14.50	-	H5	1	0570166	2)
5/8		11	15.875	102	24	12.50	10.00	13	4	13.50	-	H5	1	0569481	2)
	3/4	16	19.050	112	29	14.0	11.20	14	4	17.50	-	H5	1	0570173	2)
3/4		10	19.050	112	29	14.00	11.20	14	4	16.50	-	H5	1	0569498	2)
	7/8	14	22.225	118	29	16.0	12.50	16	4	20.40	-	H6	1	0570180	2)
7/8		9	22.225	118	29	16.00	12.50	16	4	19.50	-	H6	1	0569504	2)
	1"	12	25.400	130	35	18.0	14.00	18	4	23.25	-	H6	1	0570197	2)
1"		8	25.400	130	35	18.00	14.00	18	4	22.25	-	H6	1	0569511	2)

Note: ISO shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAP (48°-52°)

UNION BUTTERFIELD

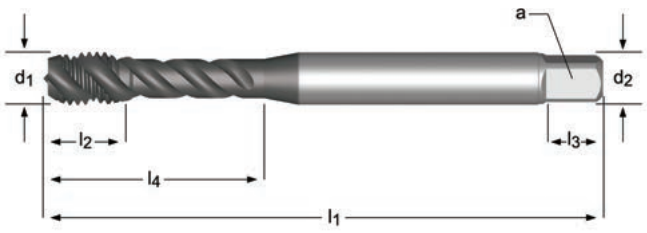
APPLIX

MXL Multi-Application, Semi-Bottoming

1677AP Designed for blind hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1679 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4



	1677AP(M)	1679(M)
	M MF	M MF
	DIN ANSI	DIN ANSI
	6H	6H
	HSS PM	HSS PM
	M4 - M24	M6 - M24

M	MF	TPI	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	▱ a Inch	# of Flutes	Pack Qty	1677AP	1679(M)
4		0.70	63	6	21	D4	0.168	0.131	3	1	46204927 [1]	—
5		0.80	70	9	25	D4	0.194	0.152	3	1	46204928 [1]	—
6		1.00	80	11	30	D5	0.255	0.191	3	1	46204929 [1]	1717704 [1]
	8	1.00	90	12	35	D5	0.318	0.238	3	1	46205010 [1]	—
8		1.25	90	12	35	D5	0.318	0.238	3	1	46204930 [1]	1717706 [1]
	10	1.25	100	14	39	D6	0.381	0.286	3	1	46204913 [1]	1717708
10		1.50	100	14	39	D6	0.381	0.286	3	1	46204914 [1]	1717710 [1]
	12	1.50	100	16		D6	0.367	0.275	3	1	46204915 [2]	—
12		1.75	110	16		D6	0.367	0.275	3	1	46204916 [2]	1717722 [2]
	14	1.50	100	18		D7	0.429	0.322	3	1	46204917 [2]	—
14		2.00	110	18		D7	0.429	0.322	3	1	46204918 [2]	1717726 [2]
16		2.00	110	19		D7	0.480	0.360	3	1	46204920 [2]	1717730 [2]
	18	1.50	110	21		D7	0.542	0.406	3	1	46204921 [2]	—
18		2.50	125	21		D7	0.542	0.406	3	1	46204922 [2]	1717734 [2]
	20	1.50	125	21		D7	0.652	0.489	3	1	46204923 [2]	—
20		2.50	140	21		D7	0.652	0.489	3	1	46204924 [2]	1717738 [2]
24		3.00	160	26		D8	0.760	0.570	4	1	46204926 [2]	1717742 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

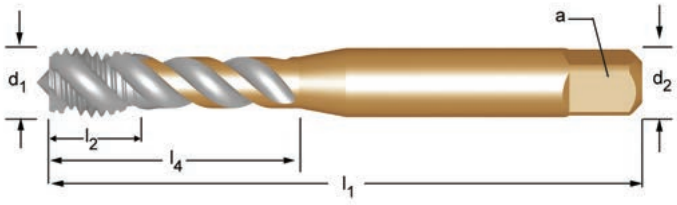
Multi-Application, Semi-Bottoming

E007 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.
E007 = Metric Coarse, E017 = Metric Fine

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

E008
E018 Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E008 = Metric Coarse, E018 = Metric Fine

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



E007	E008/E018
M	M MF
ANSI	ANSI
6H	6H
HSS-E	HSS-E
M4 - M20	M4 - M20

M	MF	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	# of flutes	Limits			l_4 Inch	Pack Qty	E007		E008 E018	
4		0.70	2.1/8	0.2484	0.1680	0.1310	3	D4	3.30	N30	0.6526	1	0580608	1)	0580707	1)
5		0.80	2.3/8	0.2650	0.1940	0.1520	3	D4	4.20	N19	0.8434	1	0580615	1)	0580714	1)
6		1.00	2.1/2	0.3937	0.2550	0.1910	3	D5	5.00	N9	1.0993	1	0580622	1)	0580721	1)
	8	1.00	2.23/32	0.4567	0.3180	0.2380	3	D5	7.00	J	1.3094	1	—		0581032	1)
8		1.25	2.23/32	0.4567	0.3180	0.2380	3	D5	6.80	H	1.3094	1	0580639	1)	0580738	1)
	10	1.00	2.15/16	0.5315	0.3810	0.2860	3	D6	9.00	T	1.4415	1	—		0581049	1)
10		1.50	2.15/16	0.5315	0.3810	0.2860	3	D6	8.50	Q	1.4415	1	0580646	1)	0580745	1)
12		1.75	3.3/8	0.6890	0.3670	0.2750	3	D6	10.30	Y		1	0580653	2)	0580752	2)
	14	1.50	3.19/32	0.7087	0.4290	0.3220	3	D7	12.50	31/64		1	—		0581056	2)
14		2.00	3.19/32	0.7087	0.4290	0.3220	3	D7	12.00	15/32		1	—	2)	0580769	2)
16		2.00	3.13/16	0.7087	0.4800	0.3600	3	D7	14.00	35/64		1	0580677	2)	0580776	2)
20		2.50	4.15/32	0.8858	0.6520	0.4890	3	D7	17.50	11/16		1	—	2)	0580790	2)

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

DORMER

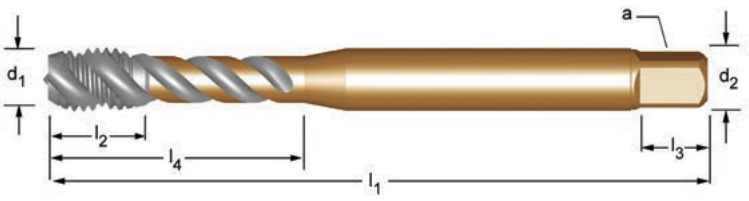
Multi-Application, Semi-Bottoming

EX006H Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX016H Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



EX006H	EX016H
M	M
DIN 371≤10 376≥12	DIN 371≤10 376≥12
6H	6H
HSS-E	HSS-E
M2 - M64	M2 - M64

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	EX006H	EX016H
2	0.40	45	4	2.8	2.1	5	3	1.6	9	D3	1	0137307 [1]	0137321 [1]
2.5	0.45	50	4	2.8	2.1	5	3	2.05	12.5	D3	1	0137314 [1]	0137338 [1]
3	0.50	56	6	3.5	2.7	6	3	2.5	18	D3	1	0136591 [1]	0136942 [1]
3.5	0.60	56	7	4.0	3.0	6	3	2.9	20	D4	1	0136607 [1]	0136966 [1]
4	0.70	63	7	4.5	3.4	6	3	3.3	21	D4	1	0136614 [1]	0136973 [1]
5	0.80	70	8	6.0	4.9	8	3	4.2	25	D4	1	0136621 [1]	0136980 [1]
6	1.00	80	10	4.5	3.4	6	3	5	31	D5	1	0136645 [2]	0137000 [2]
6	1.00	80	10	6.0	4.9	8	3	5	31	D5	1	0136638 [1]	0136997 [1]
7	1.00	80	10	7.0	5.5	8	3	6	31	D5	1	0136652 [1]	0137017 [1]
8	1.25	90	13	6.0	4.9	8	3	6.8	35	D5	1	0136676 [2]	0137031 [2]
8	1.25	90	12	8.0	6.2	9	3	6.8	35	D5	1	0136669 [1]	0137024 [1]
10	1.50	100	15	7.0	5.5	8	3	8.5	39	D6	1	0136690 [2]	0137055 [2]
10	1.50	100	15	10.0	8.0	11	3	8.5	39	D6	1	0136683 [1]	0137048 [1]
12	1.75	110	16	9.0	7.0	10	3	10.3	-	D6	1	0136706 [2]	0137062 [2]
14	2.00	110	20	11.0	9.0	12	3	12	-	D7	1	0136713 [2]	0137079 [2]
16	2.00	110	20	12.0	9.0	12	4	14	-	D7	1	0136720 [2]	0137086 [2]
18	2.50	125	25	14.0	11.0	14	4	15.5	-	D7	1	0136737 [2]	0137093 [2]
20	2.50	140	25	16.0	12.0	15	4	17.5	-	D7	1	0136744 [2]	0137109 [2]
22	2.50	140	25	18.0	14.5	17	4	19.5	-	D8	1	0136829 [2]	0137116 [2]
24	3.00	160	30	18.0	14.5	17	4	21	-	D8	1	0136836 [2]	0137123 [2]
27	3.00	160	30	20.0	16.0	19	4	24	-	D8	1	0136843 [2]	0137130 [2]
30	3.50	180	36	22.0	18.0	21	4	26.5	-	D9	1	0136850 [2]	0137147 [2]
33	3.50	180	36	25.0	20.0	23	4	29.5	-	D9	1	0136867 [2]	0137154 [2]
36	4.00	200	40	28.0	22.0	25	4	32	-	D9	1	0136874 [2]	0137161 [2]
39	4.00	200	40	32.0	24.0	27	4	35	-	D9	1	0136881 [2]	0137178 [2]
42	4.50	200	45	32.0	24.0	27	4	37.5	-	D10	1	0136898 [2]	0137185 [2]
48	5.00	250	50	36.0	29.0	32	4	43	-	D11	1	0136904 [2]	0137192 [2]
52	5.00	250	50	40.0	32.0	35	5	47	-	D11	1	0136911 [2]	0137208 [2]
56	5.50	250	55	40.0	32.0	35	5	50.5	-	D11	1	0136928 [2]	0137215 [2]
64	6.00	315	60	50.0	39.0	42	6	58	-	D12	1	0136935 [2]	0137222 [2]

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks (DIN 371)

[2] Reduced Shanks (DIN 376)

SPIRAL FLUTE TAPS (45°)

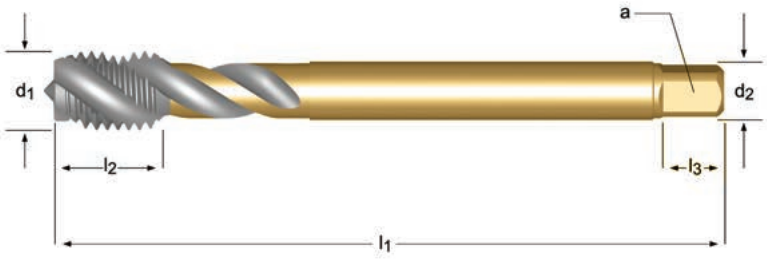
Multi-Application, Semi-Bottoming

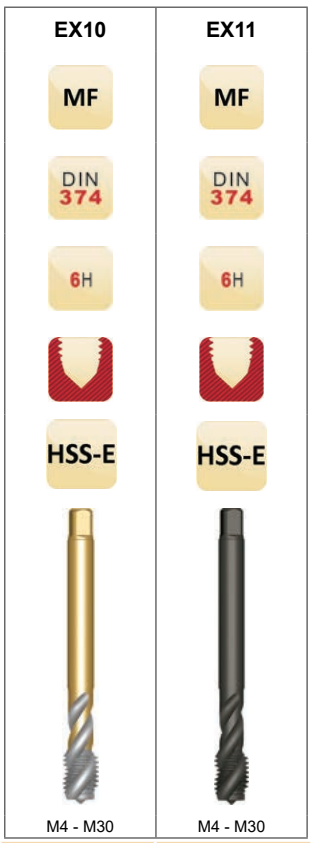
EX10 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX11 Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3





MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Limits	Pack Qty	EX10	EX11
4	0.50	63	7	2.8	2.1	5	3	3.5	D4	1	0149669	0149966
5	0.50	70	8	3.5	2.7	6	3	4.5	D4	1	0149676	0149973
6	0.75	80	10	4.5	3.4	6	3	5.3	D5	1	0149683	0149980
8	0.75	80	13	6.0	4.9	8	3	7.3	D5	1	0149690	0149997
8	1.00	90	13	6.0	4.9	8	3	7	D5	1	0149706	0150009
10	0.75	90	13	7.0	5.5	8	3	9.3	D6	1	0149713	0150016
10	1.00	90	13	7.0	5.5	8	3	9	D6	1	0149720	0150023
10	1.25	100	15	7.0	5.5	8	3	8.8	D6	1	0149737	0150030
12	1.00	100	15	9.0	7.0	10	3	11	D6	1	0149744	0150047
12	1.25	100	15	9.0	7.0	10	3	10.8	D6	1	0149751	0150054
12	1.50	100	15	9.0	7.0	10	3	10.5	D6	1	0149768	0150061
14	1.00	100	15	11.0	9.0	12	3	13	D7	1	0149775	0150078
14	1.25	100	15	11.0	9.0	12	3	12.8	D7	1	0149782	0150085
14	1.50	100	15	11.0	9.0	12	3	12.5	D7	1	0149799	0150092
16	1.00	100	15	12.0	9.0	12	4	15	D7	1	0149805	0150108
16	1.50	100	15	12.0	9.0	12	4	14.5	D7	1	0149812	0150115
18	1.00	110	17	14.0	11.0	14	4	17	D7	1	0149829	0150122
18	1.50	110	17	14.0	11.0	14	4	16.5	D7	1	0149836	0150139
20	1.00	125	17	16.0	12.0	15	4	19	D7	1	0149843	0150146
20	1.50	125	17	16.0	12.0	15	4	18.5	D7	1	0149850	0150153
22	1.50	125	17	18.0	14.5	17	4	20.5	D8	1	0149867	0150160
24	1.50	140	20	18.0	14.5	17	4	22.5	D8	1	0149874	0150177
24	2.00	140	20	18.0	14.5	17	4	22	D8	1	0149881	0150184
25	1.50	140	20	18.0	14.5	17	4	23.5	D8	1	0149898	0150191
26	1.50	140	20	18.0	14.5	17	4	24.5	D8	1	0149904	0150207
27	1.50	140	20	20.0	16.0	19	4	25.5	D8	1	0149911	0150214
27	2.00	140	20	20.0	16.0	19	4	25	D8	1	0149928	0150221
28	1.50	140	20	20.0	16.0	19	4	26.5	D9	1	0149935	0150238
30	1.50	150	20	22.0	18.0	21	4	28.5	D9	1	0149942	0150245
30	2.00	150	20	22.0	18.0	21	4	28	D9	1	0149959	0150252

Note: DIN shank and square dimensions will necessitate metric holders

SPIRAL FLUTE TAPS (45°)

DORMER

Multi-Application, Semi-Bottoming

E002 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

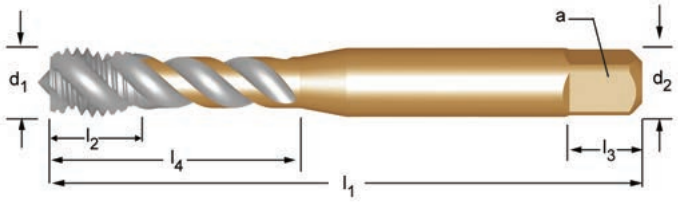
E002 = Metric Coarse

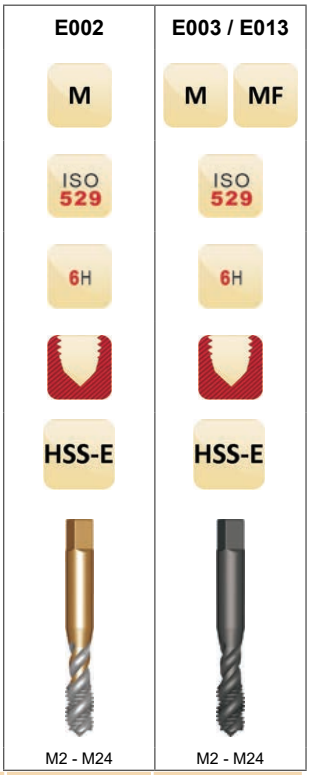
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

E003 **E013** Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E003 = Metric Coarse, E013 = Metric Fine

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3





Note: ISO shank and square dimensions will necessitate metric holders

M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	Limits	↔	l_4 mm	Pack Qty	E002	E003 E013
2		0.40	41	8	2.50	2.00	4	2	D3	1.6	8	1	0168820 [1]	0168844 [1]
2.5		0.45	44.5	9.5	2.80	2.24	5	2	D3	2.05	9.5	1	0168837 [1]	0168851 [1]
3		0.50	48	6	3.15	2.50	5	3	D3	2.5	12.5	1	0567869 [1]	0568002 [1]
	4	0.50	53	7	4.0	3.15	6	3	D4	3.5	19	1	—	0568798 [1]
4		0.70	53	7	4.00	3.15	6	3	D4	3.3	19	1	0567883 [1]	0568026 [1]
	5	0.50	58	8	5.0	4.0	7	3	D4	4.5	22	1	—	0568804 [1]
5		0.80	58	8	5.00	4.00	7	3	D4	4.2	22	1	0567890 [1]	0568033 [1]
	6	0.50	66	10	6.3	5.0	8	3	D5	5.5	27	1	—	0568811 [1]
	6	0.75	66	10	6.3	5.0	8	3	D5	5.3	27	1	—	0568828 [1]
6		1.00	66	10	6.30	5.00	8	3	D5	5.0	27	1	0567906 [1]	0568040 [1]
	8	0.75	72	12	8.0	6.3	9	3	D5	7.3	31	1	—	0568835 [1]
	8	1.00	72	12	8.0	6.3	9	3	D5	7.0	31	1	—	0568842 [1]
8		1.25	72	12	8.00	6.30	9	3	D5	6.8	31	1	0567913 [1]	0568057 [1]
	10	1.00	80	15	10.0	8.0	11	3	D6	9.0	35	1	—	0568859 [1]
	10	1.25	80	15	10.0	8.0	11	3	D6	8.8	35	1	—	0568866 [1]
10		1.50	80	15	10.00	8.00	11	3	D6	8.5	35	1	0567920 [1]	0568064 [1]
	12	1.00	89	16	9.0	7.1	10	3	D6	11.0	-	1	—	0568873 [2]
	12	1.25	89	16	9.0	7.1	10	3	D6	10.8	-	1	—	0568880 [2]
	12	1.50	89	16	9.0	7.1	10	3	D6	10.5	-	1	—	0568897 [2]
12		1.75	89	16	9.00	7.10	10	3	D6	10.3	-	1	0567937 [2]	0568071 [2]
	14	1.50	95	18	11.2	9.0	12	3	D7	12.5	-	1	—	0568903 [2]
14		2.00	95	18	11.20	9.00	12	3	D7	12.0	-	1	0567944 [2]	0568088 [2]
	16	1.00	102	18	12.5	10.0	13	4	D7	15.0	-	1	—	0568910 [2]
	16	1.50	102	18	12.5	10.0	13	4	D7	14.5	-	1	—	0568927 [2]
16		2.00	102	18	12.50	10.00	13	4	D7	14.0	-	1	0567951 [2]	0568095 [2]
	18	1.50	112	29	14.0	11.2	14	4	D7	16.5	-	1	—	0568934 [2]
18		2.50	112	29	14.00	11.20	14	4	D7	15.5	-	1	0567968 [2]	0568101 [2]
	20	1.50	112	29	14.0	11.2	14	4	D7	18.5	-	1	—	0568941 [2]
20		2.50	112	29	14.00	11.20	14	4	D7	17.5	-	1	0567975 [2]	0568118 [2]
	22	1.50	118	29	16.0	12.5	16	4	D8	20.5	-	1	—	0568958 [2]
22		2.50	118	29	16.00	12.50	16	4	D8	19.5	-	1	0567982 [2]	0568125 [2]
24		3.00	130	35	18.00	14.00	18	4	D8	21.0	-	1	0567999 [2]	0568132 [2]

[1] Reinforced Shanks, [2] Reduced Shanks

UNION BUTTERFIELD

SPIRAL FLUTE TAP (16°-19°)

APPLIX

HMD Hard Materials / Cast Iron, Semi-Bottoming

1630AP Designed for blind hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1630AP

UNC UNF

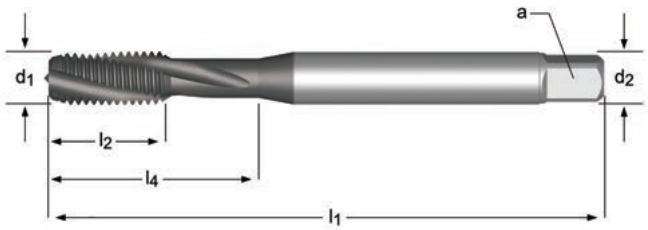
DIN ANSI

2B

HSS PM

No.4 - 1“

1.5 1.6 2.4 3.1 3.2 3.3 3.4 4.3 5.3 6.4



UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	▨ a Inch	# of Flutes	Pack Qty	1630AP	
4		40	2.205	0.236	0.709	H2	0.141	0.110	2	1	46204818	1)
6		32	2.205	0.236	0.787	H2	0.141	0.110	2	1	46204823	1)
8		32	2.480	0.236	0.827	H3	0.168	0.131	2	1	46204828	1)
	10	32	2.756	0.354	0.984	H3	0.194	0.152	3	1	46204811	1)
10		24	2.756	0.354	0.984	H3	0.194	0.152	3	1	46204810	1)
	1/4	28	3.150	0.433	1.181	H4	0.255	0.191	3	1	46204809	1)
1/4		20	3.150	0.433	1.181	H5	0.255	0.191	3	1	46204808	1)
	5/16	24	3.543	0.472	1.378	H4	0.318	0.238	3	1	46204820	1)
5/16		18	3.543	0.472	1.378	H5	0.318	0.238	3	1	46204819	1)
	3/8	24	3.937	0.551	1.535	H4	0.381	0.286	3	1	46204817	1)
3/8		16	3.937	0.551	1.535	H5	0.381	0.286	3	1	46204816	1)
	7/16	20	3.937	0.591	–	H5	0.323	0.242	3	1	46204825	2)
7/16		14	3.937	0.591	–	H5	0.323	0.242	3	1	46204824	2)
	1/2	20	3.937	0.630	–	H5	0.367	0.275	3	1	46204807	2)
1/2		13	4.331	0.630	–	H5	0.367	0.275	3	1	46204806	2)
	5/8	18	3.937	0.745	–	H5	0.480	0.360	4	1	46204822	2)
5/8		11	4.331	0.745	–	H5	0.480	0.360	4	1	46204821	2)
	3/4	16	4.331	0.820	–	H5	0.590	0.442	4	1	46204815	2)
3/4		10	4.921	0.820	–	H5	0.590	0.442	4	1	46204814	2)
	7/8	14	4.921	0.910	–	H6	0.697	0.523	4	1	46204826	2)
7/8		9	5.512	0.910	–	H6	0.697	0.523	4	1	46204827	2)
1“		8	6.299	1.025	–	H6	0.800	0.600	4	1	46204813	2)

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAP (16°-19°)

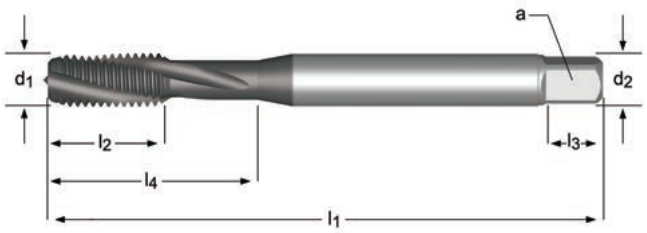
UNION BUTTERFIELD

APPLIX

HMD Hard Materials / Cast Iron, Semi-Bottoming

1660AP Designed for blind hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 1.6 2.4 3.1 3.2 3.3 3.4 4.3 5.3 6.4



1660AP(M)

M

DIN ANSI

6H

HSS PM

M3 - M12

M	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	a Inch	# of Flutes	Limits	Pack Qty	1660AP(M)	
3	0.50	56	8	18	0.141	0.110	3	D3	1	46204841	
4	0.70	63	6	21	0.168	0.131	3	D4	1	46204842	1)
5	0.80	70	9	25	0.194	0.152	3	D4	1	46204843	1)
6	1.00	80	11	30	0.255	0.191	3	D5	1	46204844	1)
8	1.25	90	12	35	0.318	0.238	3	D5	1	46204846	1)
10	1.50	100	14	39	0.381	0.286	3	D6	1	46204838	1)
12	1.75	110	16		0.367	0.275	3	D6	1	46204840	2)

1) Reinforced Shanks
2) Reduced Shanks

Multi-Application / Lube Grooves, Full-Bottoming

1641 Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. TiN coated for enhanced performance. The hard, smooth coating provides a greater lubricity, increases tool life, and improves thread flank finish.

The entry taper is full bottoming style (1-2 thread chamfer) for blind hole tapping.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 5.1 6.1 6.2 6.3 7.1 7.2 7.3

1641(UNC)	1641(UNF)
UNC	UNF
ANSI	ANSI
2B 3B	2B 3B
HSS PM	HSS PM
No.4 - 1/2	No.10 - 3/8

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	l_3 Inch	d_2 Ø Inch	▨ a Inch	Limits	Pack Qty	1641(UNC)	1641(UNF)
4		40	1.7/8	5/16	9/16	3/16	0.141	0.110	H3	1	1712221	—
4		40	1.7/8	5/16	9/16	3/16	0.141	0.110	H5	1	1712223	—
6		32	2“	3/8	11/16	3/16	0.141	0.110	H3	1	1712233	—
6		32	2“	3/8	11/16	3/16	0.141	0.110	H5	1	1712235	—
8		32	2.1/8	3/8	3/4	1/4	0.141	0.110	H3	1	1712239	—
8		32	2.1/8	3/8	3/4	1/4	0.141	0.110	H5	1	1712241	—
	10	32	2.3/8	1/2	7/8	1/4	0.194	0.152	H4	1	—	1712258
	10	32	2.3/8	1/2	7/8	1/4	0.194	0.152	H6	1	—	1712260
10		24	2.3/8	1/2	7/8	1/4	0.194	0.152	H6	1	1712254	—
	1/4	28	2.1/2	5/8	1“	5/16	0.255	0.191	H4	1	—	1712270
	1/4	28	2.1/2	5/8	1“	5/16	0.255	0.191	H6	1	—	1712272
1/4		20	2.1/2	5/8	1“	5/16	0.255	0.191	H4	1	1712264	—
1/4		20	2.1/2	5/8	1“	5/16	0.255	0.191	H6	1	1712266	—
	5/16	24	2.23/32	11/16	1.1/8	3/8	0.318	0.238	H7	1	—	1712285
5/16		18	2.23/32	11/16	1.1/8	3/8	0.318	0.238	H5	1	1712277	—
5/16		18	2.23/32	11/16	1.1/8	3/8	0.318	0.238	H7	1	1712279	—
	3/8	24	2.15/16	3/4	1.1/4	7/16	0.381	0.286	H7	1	—	1712297
3/8		16	2.15/16	3/4	1.1/4	7/16	0.381	0.286	H5	1	1712289	—
3/8		16	2.15/16	3/4	1.1/4	7/16	0.381	0.286	H7	1	1712291	—
1/2		13	3.3/8	15/16	1.21/32	7/16	0.367	0.275	H5	1	1712301	—
1/2		13	3.3/8	15/16	1.21/32	7/16	0.367	0.275	H8	1	1712304	—

UNION BUTTERFIELD

Multi-Application / Lube Grooves, Full-Bottoming

1671 Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. TiN coated for enhanced performance. The hard, smooth coating provides a greater lubricity, increases tool life, and improves thread flank finish.

The entry taper is full bottoming style for blind hole tapping.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**

1671(M)

M

ANSI

6H

HSS PM

M3 - M10

M	P mm	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	l_3 Inch	d_2 Ø Inch	◪ a Inch	Limits	Pack Qty	1671(M)
3	0.50	1.15/16	5/16	1/2	3/16	0.141	0.110	D5	1	1713051
4	0.70	2.1/8	3/8	3/4	1/4	0.168	0.131	D6	1	1713052
5	0.80	2.3/8	1/2	7/8	1/4	0.194	0.152	D7	1	1713053
6	1.00	2.1/2	5/8	1“	5/16	0.255	0.191	D8	1	1713054
8	1.00	2.23/32	11/16	1.1/8	3/8	0.318	0.238	D9	1	1713055
8	1.25	2.23/32	11/16	1.1/8	3/8	0.318	0.238	D9	1	1713056
10	1.50	2.15/16	3/4	1.1/4	7/16	0.381	0.286	D10	1	1713057

THREAD FORMING TAPS

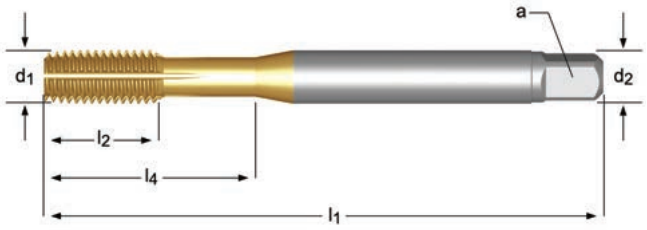
MXR Multi-Application / Lube Grooves, Semi-Bottoming

APPLIX

1681AP Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1681AP(UNC)	1681AP(UNF)
UNC	UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
No.4 - 1“	No.10 - 7/8

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 5.1 6.1 6.2 6.3 7.1 7.2 7.3



UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	a Inch	Pack Qty	1681AP (UNC)	1681AP (UNF)
4		40	2.205	0.433	0.709	H5	0.141	0.110	1	46204945 [1]	—
6		32	2.205	0.472	0.787	H5	0.141	0.110	1	46204950 [1]	—
8		32	2.480	0.512	0.827	H5	0.168	0.131	1	46204955 [1]	—
	10	32	2.756	0.512	0.984	H6	0.194	0.152	1	—	46204938 [1]
10		24	2.756	0.591	0.984	H6	0.194	0.152	1	46204937 [1]	—
12		24	3.150	0.630	1.142	H6	0.220	0.165	1	46371643 [1]	—
	1/4	28	3.150	0.669	1.181	H6	0.255	0.191	1	—	46204936 [1]
1/4		20	3.150	0.669	1.181	H6	0.255	0.191	1	46204935 [1]	—
	5/16	24	3.543	0.669	1.378	H7	0.318	0.238	1	—	46204947 [1]
5/16		18	3.546	0.787	1.378	H7	0.318	0.238	1	46204946 [1]	—
	3/8	24	3.937	0.709	1.535	H7	0.381	0.286	1	—	46204944 [1]
3/8		16	3.937	0.866	1.535	H7	0.381	0.286	1	46204943 [1]	—
	7/16	20	3.937	0.866	–	H8	0.323	0.242	1	—	46204952 [2]
7/16		14	3.937	0.866	–	H8	0.323	0.242	1	46204951 [2]	—
	1/2	20	3.937	0.866	–	H8	0.397	0.275	1	—	46204934 [2]
1/2		13	4.331	0.984	–	H8	0.367	0.275	1	46204933 [2]	—
5/8		11	4.331	1.063	–	H8	0.480	0.360	1	46204948 [2]	—
	3/4	16	4.331	0.984	–	H8	0.590	0.442	1	—	46204942 [2]
3/4		10	4.921	1.181	–	H8	0.590	0.442	1	46204941 [2]	—
	7/8	14	4.921	1.024	–	H9	0.697	0.523	1	—	46204953 [2]
7/8		9	5.512	1.260	–	H9	0.697	0.523	1	46204954 [2]	—
1“		8	6.299	1.417	–	H9	0.800	0.600	1	46204940 [2]	—

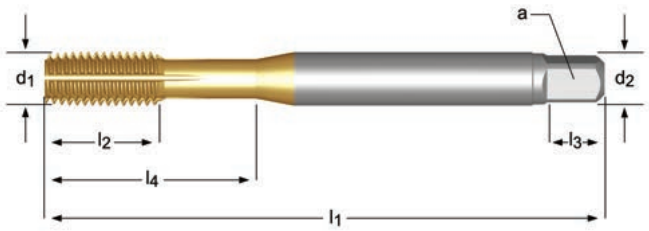
[1] Reinforced Shanks
[2] Reduced Shanks

THREAD FORMING TAPS

MXR Multi-Application / Lube Grooves, Semi-Bottoming

1691AP Coolant thru premium PM substrate allows higher tapping speeds in soft ferrous or non-ferrous materials. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 5.1 6.1 6.2 6.3 7.1 7.2 7.3



1691AP(UNC)	1691AP(UNF)
UNC	UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
1/4 - 1“	5/16 - 1/2

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	▨ a Inch	Pack Qty	1691AP (UNC)	1691AP (UNF)
1/4		20	3.150	0.669	1.181	H6	0.255	0.191	1	46204976 [1)]	—
	5/16	24	3.543	0.669	1.378	H7	0.318	0.238	1	—	46204985 [1)]
5/16		18	3.546	0.787	1.378	H7	0.318	0.238	1	46204984 [1)]	—
	3/8	24	3.937	0.709	1.535	H7	0.381	0.286	1	—	46204983 [1)]
3/8		16	3.937	0.866	1.535	H7	0.381	0.286	1	46204982 [1)]	—
	7/16	20	3.937	0.866	–	H8	0.323	0.242	1	—	46204989 [2)]
	1/2	20	3.937	0.866	–	H8	0.397	0.275	1	—	46204975 [2)]
1/2		13	4.331	0.984	–	H8	0.367	0.275	1	46204974 [2)]	—
5/8		11	4.331	1.063	–	H8	0.480	0.360	1	46204986 [2)]	—
3/4		10	4.921	1.181	–	H8	0.590	0.442	1	46204980 [2)]	—
1“		8	6.299	1.417	–	H9	0.800	0.600	1	46204979 [2)]	—

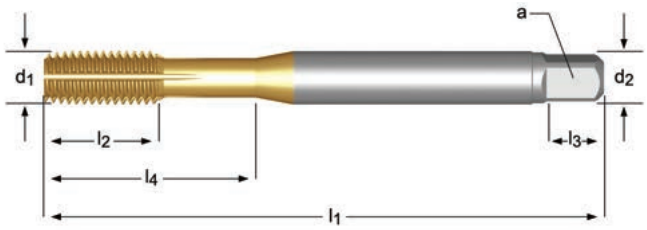
[1)] Reinforced Shanks
[2)] Reduced Shanks

MXR Multi-Application / Lube Grooves, Semi-Bottoming

1687AP Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow. Features a semi-bottoming lead for improved performance and longer tool life. Can be used for through or blind holes.

1697AP Coolant thru premium PM substrate allows higher tapping speeds in soft ferrous or non-ferrous materials. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 5.1 6.1 6.2 6.3 7.1 7.2 7.3



APPLIX

1687AP	1697AP
M MF	M
DIN ANSI	DIN ANSI
6H	6H
HSS PM	HSS PM
M4 - M20	M6 - M20

M	MF	P mm	l_1 mm	l_2 mm	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	⍁ a Inch	Pack Qty	1687AP	1697AP
4		0.70	63	13		21	D6	0.168	0.131	1	46204970 [1]	—
5		0.80	70	15		25	D7	0.194	0.152	1	46204971 [1]	—
6		1.00	80	17		30	D8	0.255	0.191	1	46204972 [1]	46205004 [1]
8		1.25	90	20		25	D9	0.318	0.238	1	46204973 [1]	—
8		1.25	90	20		35	D9	0.318	0.238	1	—	46205005 [1]
	10	1.25	100	16		39	D10	0.381	0.286	1	46204956 [1]	—
10		1.50	100	22		39	D10	0.381	0.286	1	46204957 [1]	46204991 [1]
	12	1.50	100	22			D11	0.367	0.275	1	46204958 [2]	—
12		1.75	110	24			D11	0.367	0.275	1	46204959 [2]	46204993 [2]
	14	1.50	100	22			D10	0.429	0.322	1	46204960 [2]	—
14		2.00	110	26			D11	0.429	0.322	1	46204961 [2]	— [2]
	16	1.50	100	22			D10	0.480	0.360	1	46204962 [2]	—
16		2.00	110	27			D11	0.480	0.360	1	46204963 [2]	46204997 [2]
	20	1.50	125		25		D11	0.652	0.489	1	—	46205000 [2]
20		2.50	140	32			D12	0.652	0.489	1	46204967 [2]	— [2]

[1] Reinforced Shanks
[2] Reduced Shanks

PIPE TAPS, STRAIGHT FLUTE

DORMER

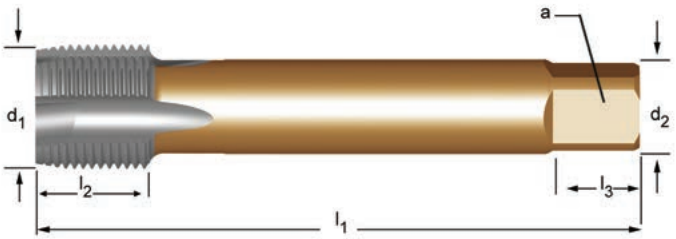
Parallel Thread, G (BSP), Plug Style

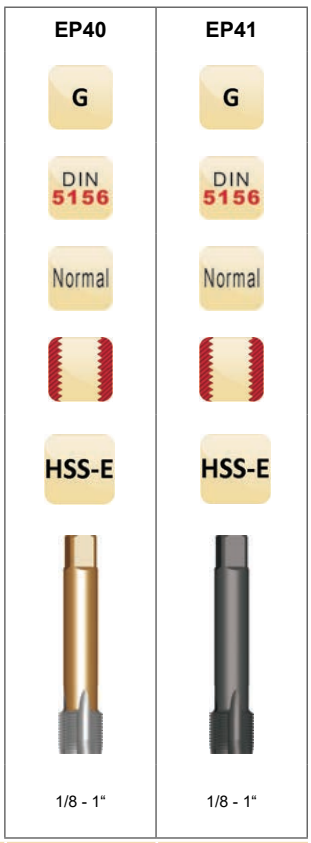
EP40 Bronze oxide body and shank reduces rust and corrosion. Bright flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP41 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of flutes	↔	Pack Qty	EP40	EP41
1/8	28	9.728	90	18	7.0	5.5	8	3	8.8	1	0138588	0138663
1/4	19	13.157	100	21	11.0	9.0	12	3	11.8	1	0138595	0138670
3/8	19	16.662	100	21	12.0	9.0	12	4	15.25	1	0138601	0138687
1/2	14	20.955	125	24	16.0	12.0	15	4	19	1	0138618	0138694
5/8	14	22.911	125	24	18.0	14.5	17	4	21	1	0138625	0138700
3/4	14	26.441	140	28	20.0	16.0	19	4	24.5	1	0138632	0147054
7/8	14	30.201	150	28	22.0	18.0	21	4	28.25	1	0138649	0149645
1“	11	33.249	160	30	25.0	20.0	23	4	30.75	1	0138656	0149652

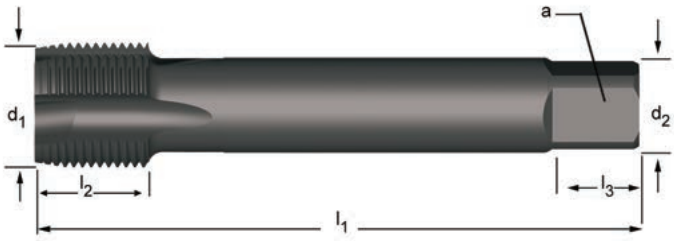
Note: DIN shank and square dimensions will necessitate metric holders

PIPE TAPS, STRAIGHT FLUTE

Parallel Thread, G(BSP), Plug Style

E041 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



E041

G

DORMER ISO

Normal

HSS-E

1/8 - 3/4

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes		Pack Qty	E041
1/8	28	9.728	90	15	8.0	6.3	9	3	8.80	1	0569818
1/4	19	13.157	100	19	10.0	8.0	11	3	11.80	1	0569825
3/8	19	16.662	100	21	12.5	10.0	13	3	15.25	1	0569832
1/2	14	20.955	125	26	16.0	12.5	16	4	19.00	1	0569849
3/4	14	26.441	140	28	20.0	16.0	20	4	24.50	1	0569856

Note: ISO shank and square dimensions will necessitate metric holders

PIPE TAPS, SPIRAL FLUTE

DORMER

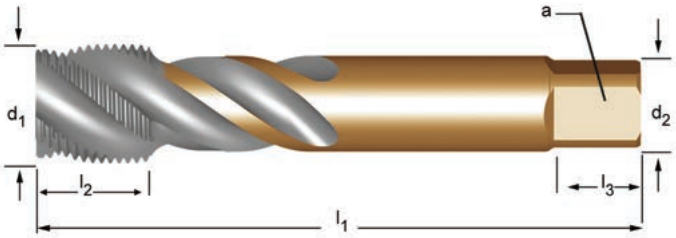
Parallel Thread, G(BSP), Semi- Bottoming

EX40 Bronze oxide body and shank reduces rust and corrosion. Bright flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4 8.1

EX41 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



EX40	EX41
G	G
DIN 5156	DIN 5156
Normal	Normal
HSS-E	HSS-E
1/8 - 1.1/2	1/8 - 1.1/2

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of flutes	↔	Pack Qty	EX40	EX41
1/8	28	9.728	90	13	7.0	5.5	8	3	8.8	1	0168547	0168653
1/4	19	13.157	100	15	11.0	9.0	12	3	11.8	1	0168554	0168660
3/8	19	16.662	100	15	12.0	9.0	12	4	15.25	1	0168561	0168677
1/2	14	20.955	125	18	16.0	12.0	15	4	19	1	0168578	0168684
5/8	14	22.911	125	18	18.0	14.5	17	4	21	1	0168585	0168691
3/4	14	26.441	140	20	20.0	16.0	19	4	24.5	1	0168592	0168707
7/8	14	30.201	150	20	22.0	18.0	21	4	28.25	1	0168608	0168714
1“	11	33.249	160	22	25.0	20.0	23	4	30.75	1	0168615	0168721
1.1/8	11	37.897	170	22	28.0	22.0	25	4	35	1	0168622	0168738
1.1/4	11	41.910	170	22	32.0	24.0	27	4	39.5	1	0168639	0168745
1.1/2	11	47.803	190	23	36.0	29.0	32	4	45	1	0168646	0168752

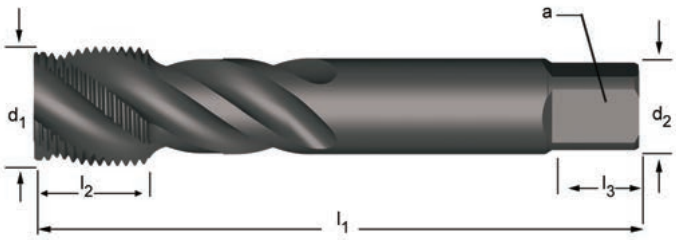
Note: DIN shank and square dimensions will necessitate metric holders

PIPE TAPS, SPIRAL FLUTE

Parallel Thread, G(BSP), Semi-Bottoming

E043 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3



E043

G

DORMER ISO

Normal

HSS-E

1/8 - 3/4

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	⊠ a mm	l_3 mm	# of flutes	↔	Pack Qty	E043
1/8	28	9.728	90	15	8.0	6.3	9	3	8.80	1	0569917
1/4	19	13.157	100	19	10.0	8.0	11	3	11.80	1	0569924
3/8	19	16.662	100	21	12.5	10.0	13	4	15.25	1	0569931
1/2	14	20.955	125	26	16.0	12.5	16	4	19.00	1	0569948
3/4	14	26.441	140	28	20.0	16.0	20	4	24.50	1	0569955

Note: ISO shank and square dimensions will necessitate metric holders

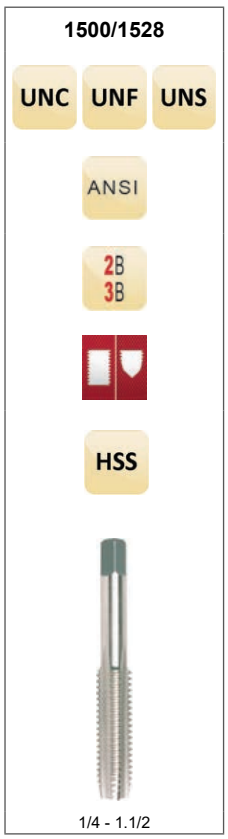
UNION BUTTERFIELD

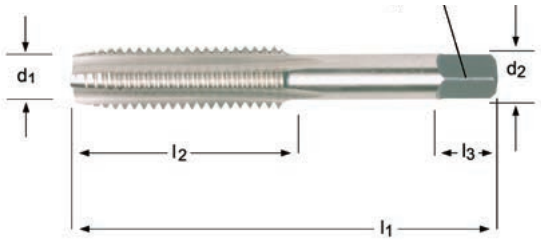
General Purpose

1500
1500S
1528
1528S

The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.
Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

1500 - Fractional sizes
1528 - Machine screw sizes
1500S / 1528S - Sets include 1 of each tap (Taper, Plug, and Bottoming)





- *Sizes 0 thru 3/8 have male centers on thread end*
- *Sizes larger than 3/8 all have female centers / flat ends*

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
0		**80**		**1.5/8**	**5/16**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010593**	**1010594**	**1010596**	**1010999**
0		80		1.5/8	5/16	0.1410	0.1100	3/16	2	H2	1	—	1010595	1010597	—
1	**64**			**1.11/16**	**3/8**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010598**	**1010599**	**1010601**	**1011000**
1		**72**		**1.11/16**	**3/8**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010603**	**1010604**	**1010606**	**1011001**
2	56			1.3/4	7/16	0.1410	0.1100	3/16	2	H2	1	—	1010615	1010617	—
2	**56**			**1.3/4**	**7/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H1**	**1**	**1010608**	**1010610**	**1010612**	**—**
2	56			1.3/4	7/16	0.1410	0.1100	3/16	3	H2	1	1010609	1010611	1010613	1011003
2		**64**		**1.3/4**	**7/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	—	—	—	**1011073**
3	48			1.13/16	1/2	0.1410	0.1100	3/16	2	H2	1	—	1010631	—	—
3	**48**			**1.13/16**	**1/2**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010625**	**1010627**	**1010629**	**1011005**
3		**56**		**1.13/16**	**1/2**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010634**	**1010636**	**1010637**	**1011074**
4	40			1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	—	1010650	1010652	—
4	40			1.7/8	9/16	0.1410	0.1100	3/16	3	H1	1	1010643	1010645	1010647	—
4	**40**			**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010644**	**1010646**	**1010648**	**1011008**
4		**48**		**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010653**	**1010655**	**1010656**	**1011075**
4			**36**	**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	—	—	—	**1011006**
5	**40**			**1.15/16**	**5/8**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010660**	**1010662**	**1010664**	**1011010**
5		**44**		**1.15/16**	**5/8**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010669**	**1010671**	**1010672**	**1011076**
6	32			2“	11/16	0.1410	0.1100	3/16	2	H2	1	—	1010685	1010688	—
6	32			2“	11/16	0.1410	0.1100	3/16	2	H3	1	—	1010686	1010689	—
6	32			2“	11/16	0.1410	0.1100	3/16	3	H1	1	1010675	1010678	1010681	—
6	32			2“	11/16	0.1410	0.1100	3/16	3	H2	1	1010676	1010679	1010682	1011012
6	**32**			**2“**	**11/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H3**	**1**	**1010677**	**1010680**	**1010683**	**1011013**
6		**40**		**2“**	**11/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010690**	**1010692**	**1010693**	**1011014**

UNION BUTTERFIELD

HAND TAPS

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▱ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
8	32			2.1/8	3/4	0.1680	0.1310	1/4	2	H2	1	—	1010706	1010709	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	2	H3	1	—	1010707	1010710	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	3	H2	1	—	1010712	1010715	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	3	H3	1	—	1010713	1010716	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	4	H1	1	—	1010699	—	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	4	H2	1	1010697	1010700	1010703	1011016
8	**32**			**2.1/8**	**3/4**	**0.1680**	**0.1310**	**1/4**	**4**	**H3**	**1**	**1010698**	**1010701**	**1010704**	**1011017**
8		**36**		**2.1/8**	**3/4**	**0.1680**	**0.1310**	**1/4**	**4**	**H2**	**1**	**1010717**	**1010719**	**1010720**	**1011018**
10	24			2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	1010733	1010736	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	1010734	1010737	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	3	H2	1	—	1010739	—	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	—	1010740	1010743	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	4	H1	1	—	1010726	—	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	4	H2	1	1010724	1010727	1010730	1011020
10	**24**			**2.3/8**	**7/8**	**0.1940**	**0.1520**	**1/4**	**4**	**H3**	**1**	**1010725**	**1010728**	**1010731**	**1011021**
10		32		2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	1010754	1010757	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	1010755	1010758	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	3	H2	1	—	1010760	1010763	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	—	1010761	1010764	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	4	H2	1	1010745	1010748	1010751	1011023
10		**32**		**2.3/8**	**7/8**	**0.1940**	**0.1520**	**1/4**	**4**	**H3**	**1**	**1010746**	**1010749**	**1010752**	**1011024**
12	**24**			**2.3/8**	**15/16**	**0.2200**	**0.1650**	**9/32**	**4**	**H3**	**1**	**1010765**	**1010767**	**1010768**	**1011025**
12		**28**		**2.3/8**	**15/16**	**0.2200**	**0.1650**	**9/32**	**4**	**H3**	**1**	**1010769**	**1010771**	**1010772**	**1011026**
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H1	1	1010001	1010004	1010008	—
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H2	1	1010002	1010005	1010009	—
1/4	**20**			**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**4**	**H3**	**1**	**1010003**	**1010006**	**1010010**	**1011029**
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H5	1		1010007	1010011	—
1/4		28		2.1/2	1“	0.2550	0.1910	5/16	4	H2	1	—	1010016	1010020	—
1/4		**28**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**4**	**H3**	**1**	**1010014**	**1010017**	**1010021**	**1011032**
1/4		28		2.1/2	1“	0.2550	0.1910	5/16	4	H4	1	—	1010018	1010022	—
5/16	18			2.23/32	1.1/8	0.3180	0.2380	3/8	4	H2	1	1010024	1010027	1010031	—
5/16	**18**			**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**4**	**H3**	**1**	**1010025**	**1010028**	**1010032**	**1011035**
5/16		**24**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**4**	**H3**	**1**	**1010036**	**1010039**	**1010043**	**1011038**
3/8	16			2.15/16	1.1/4	0.3810	0.2860	7/16	4	H2	1	1010046	1010049	1010053	—
3/8	**16**			**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**4**	**H3**	**1**	**1010047**	**1010050**	**1010054**	**1011041**
3/8	16			2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	1010051	1010055	—
3/8		**24**		**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**4**	**H3**	**1**	**1010058**	**1010061**	**1010065**	**1011044**
7/16	**14**			**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**4**	**H3**	**1**	**1010067**	**1010070**	**1010074**	**1011045**
7/16		**20**		**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**4**	**H3**	**1**	**1010076**	**1010079**	**1010083**	**1011046**
1/2	13			3.3/8	1.21/32	0.3670	0.2750	7/16	4	H2	1	—	1010087	1010091	—
1/2	**13**			**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**4**	**H3**	**1**	**1010085**	**1010088**	**1010092**	**1011047**
1/2	13			3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	1010089	1010093	—
1/2		**20**		**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**4**	**H3**	**1**	**1010094**	**1010097**	**1010101**	**1011048**
9/16	**12**			**3.19/32**	**1.21/32**	**0.4290**	**0.3220**	**1/2**	**4**	**H3**	**1**	**1010103**	**1010106**	**1010108**	**1011049**
9/16		**18**		**3.19/32**	**1.21/32**	**0.4290**	**0.3220**	**1/2**	**4**	**H3**	**1**	**1010110**	**1010113**	**1010116**	**1011050**
5/8	**11**			**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**4**	**H3**	**1**	**1010118**	**1010121**	**1010123**	**1011051**
5/8		**18**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**4**	**H3**	**1**	**1010125**	**1010128**	**1010131**	**1011052**
11/16			**11**	**4.1/32**	**1.13/16**	**0.5420**	**0.4060**	**5/8**	**4**	**H3**	**1**	**—**	**—**	**—**	**1011053**
11/16			**16**	**4.1/32**	**1.13/16**	**0.5420**	**0.4060**	**5/8**	**4**	**H3**	**1**	**—**	**—**	**—**	**1011054**
3/4	**10**			**4.1/4**	**2“**	**0.5900**	**0.4420**	**11/16**	**4**	**H3**	**1**	**1010139**	**1010142**	**1010144**	**1011055**
3/4		**16**		**4.1/4**	**2“**	**0.5900**	**0.4420**	**11/16**	**4**	**H3**	**1**	**1010146**	**1010149**	**1010152**	**1011056**
7/8	**9**			**4.11/16**	**2.7/32**	**0.6970**	**0.5230**	**3/4**	**4**	**H4**	**1**	**1010154**	**1010157**	**1010159**	**1011057**
7/8		**14**		**4.11/16**	**2.7/32**	**0.6970**	**0.5230**	**3/4**	**4**	**H4**	**1**	**1010160**	**1010163**	**1010166**	**1011058**

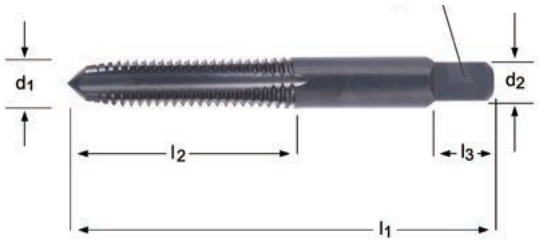
HAND TAPS

UNION BUTTERFIELD

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
1“	8			5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010167	1010170	1010172	1011059
1“		12		5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010173	1010174	1010175	1011060
1“			14	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010176	1010178	1010181	1011061
1.1/8	7			5.7/16	2.9/16	0.8960	0.6720	7/8	4	H4	1	1010182	1010183	1010184	1011062
1.1/8		12		5.7/16	2.9/16	0.8960	0.6720	7/8	4	H4	1	1010185	1010186	1010187	1011063
1.1/4	7			5.3/4	2.9/16	1.0210	0.7660	1“	4	H4	1	1010188	1010189	1010190	1011064
1.1/4		12		5.3/4	2.9/16	1.0210	0.7660	1“	6	H4	1	1010191	1010192	1010193	1011065
1.3/8	6			6.1/16	3“	1.1000	0.8310	1.1/16	4	H4	1	1010194	1010195	1010196	1011066
1.3/8		12		6.1/16	3“	1.1000	0.8310	1.1/16	6	H4	1	1010197	1010198	1010199	1011067
1.1/2	6			6.3/8	3“	1.2300	0.9250	1.1/8	4	H4	1	1010200	1010201	1010202	1011068
1.1/2		12		6.3/8	3“	1.2300	0.9250	1.1/8	6	H4	1	1010203	1010204	1010205	1011069

General Purpose

1500A Similar in design to the standard 1500 series, but steam oxide treated to reduce wear and chip welding in harder ferrous materials. Not recommended for non-ferrous applications. For through or blind hole tapping.



1500A

UNC UNF

ANSI

3B

HSS

1/4 - 1“

[1] *Male centers on thread end*
[2] *Female centers / flat ends*

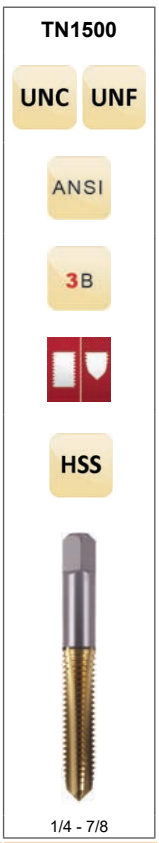
UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500A	
1/4		20	2.1/2	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1050006	1)
	1/4	28	2.1/2	1.000	0.2550	0.1910	5/16	4	H3	Bottoming	1	1050021	1)
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1050039	1)
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1050028	1)
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1050061	1)
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1050050	1)
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1050079	2)
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1050070	2)
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1050097	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1050088	2)
	9/16	18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1050113	2)
9/16		12	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1050106	2)
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1050128	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1050121	2)
	3/4	16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1050149	2)
3/4		10	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1050142	2)
	7/8	14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1050163	2)
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1050157	2)
1“		8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1050170	2)

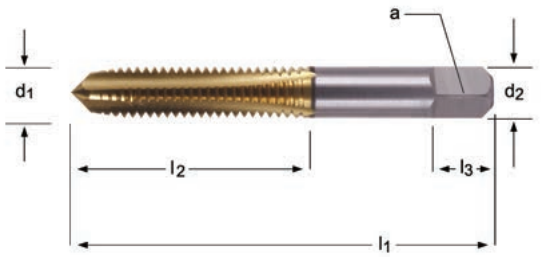
UNION BUTTERFIELD

General Purpose

TN1500

Similar in design to the 1500 series but TiN coated for enhanced performance. The hard, smooth finish provides greater lubricity, increases tool life, improves thread flank finish, and allows higher tapping speeds. For through or blind hole tapping.





[1] *Male centers on thread end*
[2] *Female centers / flat ends*

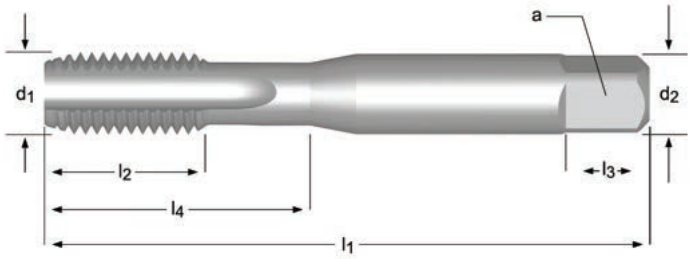
UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	TN1500	
	1/4	28	2.1/2	1.0000	0.2550	0.1910	5/16	4	H3	Plug	1	1060017	1)
1/4		20	2.1/2	1.0000	0.2550	0.1910	5/16	4	H3	Plug	1	1060006	1)
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1060039	1)
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1060028	1)
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1060061	1)
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1060050	1)
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1060079	2)
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1060070	2)
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1060097	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1060088	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Bottoming	1	1060092	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1060121	2)
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Bottoming	1	1060131	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Bottoming	1	1060123	2)
	3/4	16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Bottoming	1	1060152	2)
3/4		10	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Bottoming	1	1060144	2)
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1060157	2)

General Purpose

E500 The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and semi-bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Semi-Bottoming - 1-2 pitch chamfer length

Sets include 1 of each tap (Taper, Plug, and Bottoming)



E500

M

ISO 529

6H

HSS

M1 - M56

Note: ISO shank and square dimensions will necessitate metric holders

Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Pack Qty	Taper	Plug	Semi - Bottoming	Sets
1	0.25	38	4.5	2.50	2.00	4	2	0.75	4.5	1	0160152	0160169	0122464	—
1.2	0.25	38	4.5	2.50	2.00	4	2	0.95	4.5	1	0160176	0160183	0122471	—
1.4	0.30	40	6	2.50	2.00	4	2	0.95	6	1	0160190	0160206	0122488	—
1.6	0.35	41	8	2.50	2.00	4	2	1.25	8	1	0155035	0139950	0093900	0155028
1.7	0.35	41	8	2.50	2.00	4	2	1.35	8	1	0155004	0093924	0093931	0154991
1.8	0.35	41	8	2.50	2.00	4	2	1.45	8	1	0154960	0093948	0093955	—
2	0.40	41	8	2.50	2.00	4	3	1.6	8	1	0094259	0094266	0094273	0154939
2	0.45	41	8	2.50	2.00	4	3	1.55	8	1	0160244	0160251	0160268	—
2.2	0.45	44.5	9.5	2.80	2.24	5	3	1.75	9.5	1	0154915	0094167	0094174	—
2.3	0.45	44.5	9.5	2.80	2.24	5	3	1.85	9.5	1	0154885	0094198	0094204	—
2.5	0.45	44.5	9.5	2.80	2.24	5	3	2.05	9.5	1	0154854	0094228	0094235	0154847
2.6	0.45	44.5	9.5	2.80	2.24	5	3	2.15	9.5	1	0156735	0156742	0122440	—
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	1	0154823	0094440	0094457	0094464
3	0.60	48	12.5	3.15	2.50	5	3	2.4	12.5	1	0159927	0159934	0159941	—
3.5	0.60	50	14	3.55	2.80	5	3	2.9	14	1	0094402	0094419	0094426	0154809
4	0.70	53	14	4.00	3.15	6	3	3.3	14	1	0154786	0094648	0094655	0094662
4	0.75	53	14	4.00	3.15	6	3	3.25	14	1	0160213	0160220	0160237	—
4.5	0.75	53	9.5	4.50	3.55	6	3	3.8	18	1	0154762	0094617	0094624	0154755
5	0.80	58	11	5.00	4.00	7	3	4.2	22	1	0154731	0094761	0094778	0154724
5	0.90	58	11	5.00	4.00	7	3	4.1	22	1	0159958	0159965	0159972	—
5.5	0.90	62	12	5.60	4.50	7	3	4.6	21	1	0159996	0160008	0160015	—
6	1.00	66	13	6.30	5.00	8	3	5	26	1	0094808	0094815	0094822	0154700
7	1.00	66	13	7.10	5.60	8	3	6	26	1	0154687	0139967	0094846	0094853
8	1.25	72	16	8.00	6.30	9	3	6.8	29	1	0154663	0094877	0094884	0094891
9	1.25	72	16	9.00	7.10	10	3	7.8	29	1	0154649	0152119	0094914	0154632
10	1.50	80	18	10.00	8.00	11	3	8.5	34	1	0153246	0093979	0093986	0154618
11	1.50	85	19	8.00	6.30	9	3	9.5		1	0154595	0094006	0094013	0154588
12	1.75	89	22	9.00	7.10	10	3	10.3		1	0154564	0094037	0094044	0094051
14	2.00	95	24	11.20	9.00	12	4	12		1	0152980	0094075	0094082	0154540
16	2.00	102	24	12.50	10.00	13	4	14		1	0154526	0094105	0094112	0154519
18	2.50	112	29	14.00	11.20	14	4	15.5		1	0154496	0094136	0094143	0154489
20	2.50	112	29	14.00	11.20	14	4	17.5		1	0154465	0150719	0094297	0154458

HAND TAPS

DORMER

Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes		l_4 mm	Pack Qty	Taper	Plug	Semi - Bottoming	Sets
22	2.50	118	29	16.00	12.50	16	4	19.5		1	0154434	0094310	0094327	0154427
24	3.00	130	35	18.00	14.00	18	4	21		1	0154403	0094341	0094358	0154397
27	3.00	135	35	20.00	16.00	20	4	24		1	0154366	0094365	0094372	—
30	3.50	138	41	20.00	16.00	20	4	26.5		1	0154359	0094488	0094495	—
33	3.50	151	41	22.40	18.00	22	4	29.5		1	0154342	0152225	0094525	—
36	4.00	162	47	25.00	20.00	24	4	32		1	0154335	0094549	0094556	—
39	4.00	170	47	28.00	22.40	26	4	35		1	0154328	0152232	0094587	—
42	4.50	170	53	28.00	22.40	26	6	37.5		1	0154311	0152249	0094686	—
45	4.50	187	54	31.50	25.00	28	6	40.5		1	0154304	0152256	0094709	—
48	5.00	187	60	31.50	25.00	28	6	43		1	0154298	0152263	0094730	—
52	5.00	200	60	35.50	28.00	31	6	47		1	—	—	0094792	—
56	5.50	200	60	35.50	28.00	31	6	50.5		1	—	—	0122457	—

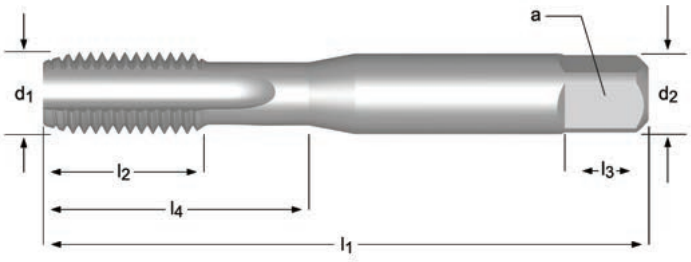
Note: ISO shank and square dimensions will necessitate metric holders

General Purpose

E513 The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and semi-bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Semi-Bottoming - 1-2 pitch chamfer length

3 pc.(No.6) sets include 1 of each tap (Taper, Plug and Bottoming)
2 pc.(No.7) sets include 1 of each tap (Plug and Bottoming)



Note: ISO shank and square dimensions will necessitate metric holders

E513
MF
ISO 529
6H
HSS

M3 - M50

Nominal d_1	Pitch MF	l_1 mm	l_2 mm	d_2 Ø mm	◻ a mm	# of Flutes	l_3 mm	↔	l_4 mm	Pack Qty	Taper	Plug	Semi - Bottoming	2 Pc Sets	3 Pc Sets
3	0.35	48	12.5	3.15	2.50	3	5	2.65	12.5	1	0160039	0160046	0096567	—	—
3.5	0.35	48	12.5	3.15	2.50	3	5	3.2	12.5	1	—	—	0343111	—	—
4	0.50	53	14	4.00	3.15	3	6	3.5	14	1	0156766	0152454	0096680	0155561	—
5	0.50	58	11	5.00	4.00	3	7	4.5	22	1	0156728	0096727	0096734	0096741	—
5	0.75	58	11	5.00	4.00	3	7	4.3	22	1	0157046	0156773	0123027	—	—
6	0.50	66	13	6.30	5.00	3	8	5.5	26	1	0156780	0156797	0123034	—	—
6	0.75	66	13	6.30	5.00	3	8	5.3	26	1	0156803	0152461	0096765	0096772	—
7	0.75	66	13	7.10	5.60	3	8	6.3	26	1	0160053	0096789	0096796	—	—
8	0.50	72	16	8.00	6.30	3	9	7.5	29	1	0160060	0160077	0123058	—	—
8	0.75	72	16	8.00	6.30	3	9	7.3	29	1	0157053	0152478	0096802	0096819	—
8	1.00	72	16	8.00	6.30	3	9	7	29	1	0157060	0152485	0096826	0155554	—
9	0.75	72	16	9.00	7.10	3	10	8.3	29	1	—	—	0343128	—	—
9	1.00	72	16	9.00	7.10	3	10	8	29	1	0159644	0155752	0096833	—	—
10	0.50	80	18	10.00	8.00	3	11	9.5	34	1	—	—	0343135	—	—
10	0.75	80	18	10.00	8.00	3	11	9.3	34	1	0160084	0160091	0123065	—	—
10	1.00	80	18	10.00	8.00	3	11	9	34	1	0157077	0152492	0096086	0155547	0157084
10	1.25	80	18	10.00	8.00	3	11	8.8	34	1	0157091	0152508	0096079	0155530	0157107
11	0.75	85	19	8.00	6.30	3	9	10.3		1	0160107	0160114	0123072	—	—
11	1.00	85	19	8.00	6.30	3	9	10		1	0159651	0096093	0096109	—	—
11	1.25	85	19	8.00	6.30	3	9	9.8		1	—	—	0343142	—	—
12	0.75	89	22	9.00	7.10	3	10	11.3		1	—	—	0343166	—	—
12	1.00	89	22	9.00	7.10	3	10	11		1	0157114	0152515	0096154	0155523	—
12	1.25	89	22	9.00	7.10	3	10	10.8		1	0157121	0152522	0096116	0096123	0157138
12	1.50	89	22	9.00	7.10	3	10	10.5		1	0157145	0096130	0096147	0155516	0157152
13	1.50	89	22	9.00	7.10	3	10	11.5		1	—	—	0343173	—	—
14	1.00	95	24	11.20	9.00	4	12	13		1	0156810	0152539	0096185	0155509	—
14	1.25	95	24	11.20	9.00	4	12	12.8		1	0156827	0152546	0096161	—	0156834
14	1.50	95	24	11.20	9.00	4	12	12.5		1	0156841	0152553	0096178	0155486	0156858
15	1.50	95	24	11.20	9.00	4	12	13.5		1	—	0096192	0096208	—	—
16	1.00	102	24	12.50	10.00	4	13	15		1	0156865	0152560	0096246	0096253	—
16	1.25	102	24	12.50	10.00	4	13	14.8		1	—	—	0343203	—	—
16	1.50	102	24	12.50	10.00	4	13	14.5		1	0156872	0152577	0096222	0096239	0156889

HAND TAPS

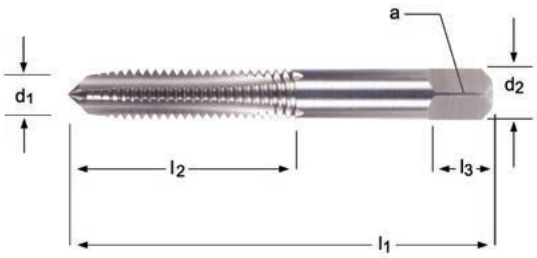
DORMER

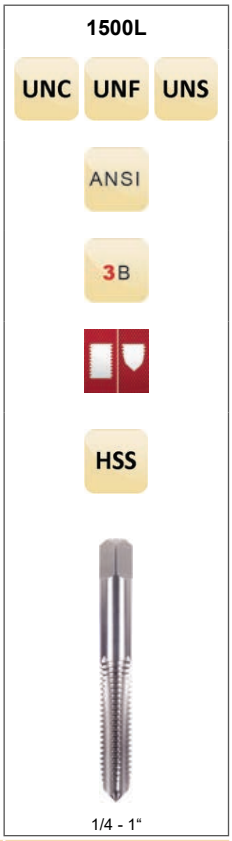
Nominal d_1	Pitch MF	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	# of Flutes	l_3 mm	↔	l_4 mm	Pack Qty	Taper	Plug	Semi - Bottoming	2 Pc Sets	3 Pc Sets
18	1.00	112	29	14.00	11.20	4	14	17		1	0156896	0096277	0096284	0096291	—
18	1.50	112	29	14.00	11.20	4	14	16.5		1	0156902	0152584	0096260	0155479	0156919
18	2.00	112	29	14.00	11.20	4	14	16		1	0156926	0096307	0096314	0096321	—
20	1.00	112	29	14.00	11.20	4	14	19		1	0156933	0096345	0096352	0096369	—
20	1.50	112	29	14.00	11.20	4	14	18.5		1	0156940	0152591	0096338	0155462	0156957
20	2.00	112	29	14.00	11.20	4	14	18		1	0156964	0096376	0096383	0155455	—
22	1.00	118	29	16.00	12.50	4	16	21		1	—	0096406	0096413	0155448	—
22	1.50	118	29	16.00	12.50	4	16	20.5		1	0156971	0152607	0096390	0155431	—
22	2.00	118	29	16.00	12.50	4	16	20		1	0156988	0096420	0096437	0096444	—
24	1.00	130	35	18.00	14.00	4	18	23		1	—	0096475	0096482	—	—
24	1.50	130	35	18.00	14.00	4	18	22.5		1	0156995	0152614	0096451	0096468	—
24	2.00	130	35	18.00	14.00	4	18	22		1	0157008	0096499	0096505	0155745	—
25	1.50	130	35	18.00	14.00	4	18	23.5		1	0157015	0152621	0096512	0150740	0157022
26	1.50	130	35	18.00	14.00	4	18	24.5		1	—	0096529	0096536	—	—
27	1.50	135	35	20.00	16.00	4	20	25.5		1	—	0155738	0123010	—	—
27	2.00	135	35	20.00	16.00	4	20	25		1	—	—	0123041	—	—
28	1.50	138	35	20.00	16.00	4	20	26.5		1	—	0096543	0096550	—	—
30	1.50	138	41	20.00	16.00	4	20	28.5		1	—	0096574	0096581	—	—
30	2.00	138	41	20.00	16.00	4	20	28		1	—	0155721	0123003	—	—
32	1.50	151	41	22.40	18.00	4	22	30.5		1	0157039	0155578	0096598	—	—
33	2.00	151	41	22.40	18.00	4	22	31		1	—	0096604	0096611	—	—
35	1.50	162	47	25.00	20.00	4	24	33.5		1	—	0096628	0096635	—	—
36	1.50	162	47	25.00	20.00	4	24	34.5		1	—	—	0343302	—	—
36	2.00	162	47	25.00	20.00	4	24	34		1	—	0152638	0096642	—	—
36	3.00	162	47	25.00	20.00	4	24	33		1	—	0096659	0096666	—	—
39	3.00	170	47	28.00	22.40	4	26	36		1	—	0152645	0096673	—	—
40	1.50	170	53	28.00	22.40	6	26	38.5		1	—	0155691	0096697	—	—
42	1.50	170	53	28.00	22.40	6	26	40.5		1	—	0155684	0096703	—	—
42	3.00	170	53	28.00	22.40	6	26	39		1	—	—	0343319	—	—
45	1.50	187	54	31.50	25.00	6	28	43.5		1	—	0155677	0096710	—	—
48	1.50	187	60	31.50	25.00	6	28	46.5		1	—	—	0343333	—	—
48	2.00	187	60	31.50	25.00	6	28	46		1	—	—	0343340	—	—
48	3.00	187	60	31.50	25.00	6	28	45		1	—	—	0343357	—	—
50	1.50	187	60	31.50	25.00	6	28	48.5		1	—	0155660	0096758	—	—

Note: ISO shank and square dimensions will necessitate metric holders

General Purpose, Left Hand

1500L Left Hand. Similar in design to the standard 1500 series but finished with left hand threads, which when viewed axially, wind in a counter-clockwise and receding direction. Available in plug chamfer. For through or blind hole applications.





UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	◻ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500L
	1/4		28	2.1/2	1"	0.2550	0.1910	5/16	4	H3	Plug	1	1011775
1/4			20	2.1/2	1"	0.2550	0.1910	5/16	4	H3	Plug	1	1011772
	5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1011781
5/16			18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1011778
	3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1011787
3/8			16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1011784
	7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1011793
7/16			14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1011790
	1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1011799
1/2			13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1011796
	9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1011805
9/16			12	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1011802
	5/8		18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1011811
5/8			11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1011808
	3/4		16	4.1/4	2"	0.5900	0.4420	11/16	4	H3	Plug	1	1011823
3/4			10	4.1/4	2"	0.5900	0.4420	11/16	4	H3	Plug	1	1011820
	7/8		14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1011829
7/8			9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1011826
		1"	14	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011838
	1"		12	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011835
1"			8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011832

DORMER

General Purpose

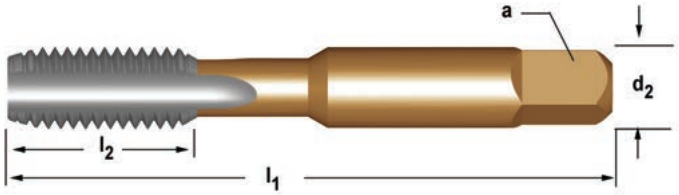
E061
E071

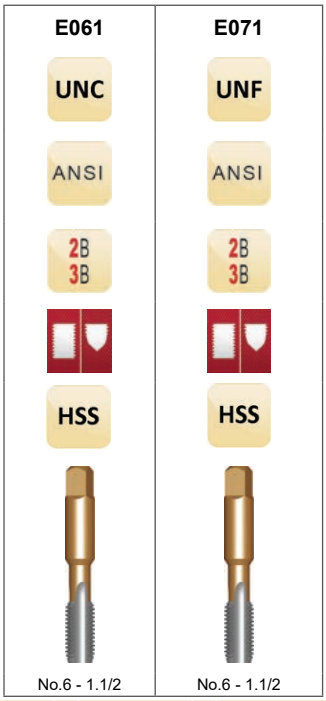
The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and semi-bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Semi-Bottoming - 1-2 pitch chamfer length

Premium substrate with bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

E061 = UNC Sizes, E071 = UNF Sizes





Nominal d_1	TP UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	# of Flutes	Limits	↔	↔	l_4 Inch	Pack Qty	Taper	Plug	Semi - Bottoming	Sets
6	32		2“	0.5800	0.1410	0.1100	3	H3	36	2.85	0.5800	1	0348291	0348307	0348314	0348321
6		40	2“	0.5800	0.1410	0.1100	3	H2	33	2.90	0.5800	1	0349427	0349434	0349441	0349458
8	32		2.1/8	0.6500	0.1680	0.1310	4	H3	29	3.50	0.6500	1	0348284	0348338	0348345	0348352
8		36	2.1/8	0.6500	0.1680	0.1310	4	H2	29	3.50	0.6500	1	0349465	0349472	0349489	0349496
10	24		2.3/8	0.7600	0.1940	0.1520	4	H3	25	3.90	0.7600	1	0348369	0348376	0348383	0348390
10		32	2.3/8	0.7600	0.1940	0.1520	4	H3	21	4.10	0.7600	1	0349502	0349519	0349526	0349533
12	24		2.3/8	0.8100	0.2200	0.1650	4	H3	16	4.50	0.8100	1	0348406	0348413	0348420	0348437
12		28	2.3/8	0.8100	0.2200	0.1650	4	H3	15	4.70	0.8100	1	0349540	0349557	0349564	0349571
1/4	20		2.1/2	0.6500	0.2550	0.1910	4	H3	7	5.10	1.0630	1	0348444	0348451	0348468	0348475
1/4		28	2.1/2	0.6500	0.2550	0.1910	4	H3	3	5.50	1.0630	1	0349588	0349595	0349601	0349618
5/16	18		2.23/32	0.7700	0.3180	0.2380	4	H3	F	6.60	1.2598	1	0348482	0348499	0348505	0348512
5/16		24	2.23/32	0.7700	0.3180	0.2380	4	H3	I	6.90	1.2598	1	0349625	0349632	0349649	0349656
3/8	16		2.15/16	0.8100	0.3810	0.2860	4	H3	5/16	8.00	1.3780	1	0348529	0348536	0348543	0348550
3/8		24	2.15/16	0.8100	0.3810	0.2860	4	H3	Q	8.50	1.3780	1	0349663	0349670	0349687	0349694
7/16	14		3.5/32	0.9055	0.3230	0.2420	4	H3	U	9.40		1	0348567	0348574	0348581	0348598
7/16		20	3.5/32	0.9055	0.3230	0.2420	4	H3	25/64	9.90		1	0349700	0349717	0349724	0349731
1/2	13		3.3/8	0.9055	0.3670	0.2750	4	H3	27/64	10.80		1	0348604	0348611	0348628	0348635
1/2		20	3.3/8	0.9055	0.3670	0.2750	4	H3	29/64	11.50		1	0349748	0349755	0349762	0349779
9/16	12		3.19/32	0.9843	0.4290	0.3220	4	H3	27/64	12.20		1	0351833	0348642	0348659	0348666
9/16		18	3.19/32	0.9843	0.4290	0.3220	4	H3	33/64	12.90		1	0349786	0349793	0349809	0349816
5/8	11		3.13/16	0.9843	0.4800	0.3600	4	H3	17/32	13.50		1	0348673	0348680	0348697	0348703
5/8		18	3.13/16	0.9843	0.4800	0.3600	4	H3	37/64	14.50		1	0349823	0349830	0349847	0349854
3/4	10		4.1/4	1.1811	0.5900	0.4420	4	H3	21/32	16.50		1	0348710	0348727	0348734	0348741
3/4		16	4.1/4	1.1811	0.5900	0.4420	4	H3	11/16	17.50		1	0349861	0349878	0349885	0351932
7/8	9		4.11/16	1.1811	0.6970	0.5230	4	H4	49/64	19.50		1	0348758	0348765	0348772	0348789
7/8		14	4.11/16	1.1811	0.6970	0.5230	4	H4	13/16	20.40		1	0349892	0349908	0349915	0349922
1“	8		5.1/8	1.4173	0.8000	0.6000	4	H4	7/8	22.25		1	0348796 [1]	0348802 [1]	0348819 [1]	0348826 [1]
1“		12	5.1/8	1.4173	0.8000	0.6000	4	H4	59/64	23.25		1	0349939 [1]	0349946 [1]	0349953 [1]	0349960 [1]
1“		14	5.1/8	1.4173	0.8000	0.6000	4	H4	59/64	23.25		1	0349977 [1]	0349984 [1]	0349991 [1]	0350003 [1]
1.1/8	7		5.7/16	1.3976	0.8950	0.6710	4	H4	63/64	25.00		1	0388112 [1]	0388129 [1]	0388136 [1]	0259719 [1]
1.1/8		12	5.7/16	1.3976	0.8950	0.6710	4	H4	1.3/64	26.50		1	0388235 [1]	0388242 [1]	0388259 [1]	—
1.1/4	7		5.3/4	1.6338	1.0210	0.7650	4	H4	1.7/64	28.00		1	0388143 [1]	0388150 [1]	0388167 [1]	0259702 [1]
1.1/4		12	5.3/4	1.6338	1.0210	0.7650	6	H4	1.5/32	29.50		1	0388266 [1]	0388273 [1]	0388280 [1]	—
1.3/8	6		6.1/16	1.8700	1.1090	0.8300	4	H4	1.7/32	30.75		1	0388174 [1]	0388181 [1]	0388198 [1]	—
1.3/8		12	6.1/16	1.8700	1.1090	0.8300	6	H4	1.9/32	32.75		1	0388297 [1]	0388303 [1]	0388310 [1]	—
1.1/2	6		6.3/8	1.8700	1.2330	0.9520	4	H4	1.11/32	34.00		1	0388204 [1]	0388211 [1]	0388228 [1]	0259696 [1]
1.1/2		12	6.3/8	1.8700	1.2330	0.9250	6	H4	1.27/64	36.00		1	0388327 [1]	0388334 [1]	0388341 [1]	—

[1] Bright Finish

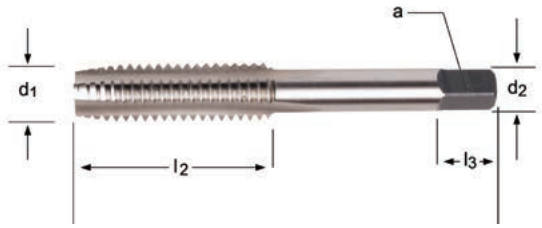
UNION BUTTERFIELD

HAND TAPS

General Purpose, Optional Flutes

1508 - *Optional 3 Flute*
1595 - *Optional 2 Flute*

Fewer flutes than standard, providing more space for chip evacuation and particularly when tapping holes greater than 1.5 tap diameters in depth. For through or blind hole applications.



1508 (UNC)	1508 (UNF)	1595
UNC	UNF	UNF UNC
ANSI	ANSI	ANSI
3B	2B 3B	3B
HSS	HSS	HSS
1/4 - 1/2	1/4 - 5/16	1/4 - 5/16

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	☑ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1508(UNC)	1508(UNF)	1595
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Plug	1	—	1010223	—
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Plug	1	—	—	1010208
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Plug	1	1010216	—	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Plug	1	—	—	1010206
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Bottoming	1	—	—	—
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Bottoming	1	—	—	1010209
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Bottoming	1	1010219	—	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Bottoming	1	—	—	1010207
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Plug	1	—	1010236	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Plug	1	1010230	—	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H3	Plug	1	—	—	1010210
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Bottoming	1	—	1010237	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Bottoming	1	1010233	—	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H3	Bottoming	1	—	—	1010211
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Plug	1	—	1010246	—
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Plug	1	1010240	—	—
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Bottoming	1	—	1010247	—
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Bottoming	1	1010243	—	—
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	Plug	1	—	1010250	—
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	Plug	1	1010248	—	—
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Plug	1	—	1010254	—
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Plug	1	1010252	—	—
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Bottoming	1	1010253	—	—

HAND TAPS

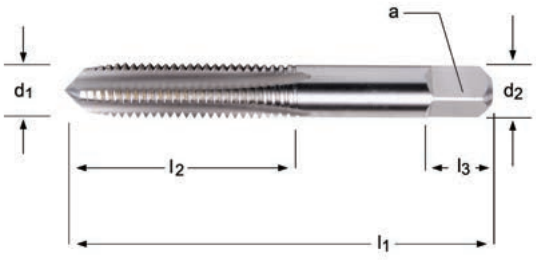
UNION BUTTERFIELD

General Purpose

1700(M) The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

1700S Sets include 1 of each tap (Taper, Plug, and Bottoming).



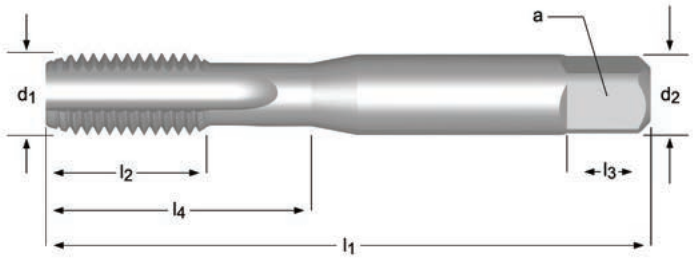
1700(M)	1700S
M	M
ANSI	ANSI
6H	6H
HSS	HSS
M1.6 - M36	M2 - M20

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	l_3 Inch	⍁ a Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
M1.6	0.35	1.5/8	5/16	0.1410	3/16	0.1100	2	D3	1	1012408	1012409	1012410	—
M1.8	0.35	1.11/16	3/8	0.1410	3/16	0.1100	2	D3	1	1012411	1012412	—	—
M2	0.40	1.3/4	7/16	0.1410	3/16	0.1100	3	D3	1	1012414	1012415	1012416	1012558
M2.3	0.40	1.3/4	7/16	0.1410	3/16	0.1100	3	D3	1	—	1012421	1012422	—
M2.5	0.45	1.13/16	1/2	0.1410	3/16	0.1100	3	D3	1	1012423	1012424	1012425	1012560
M2.6	0.45	1.13/16	1/2	0.1410	3/16	0.1100	3	D3	1	1012426	1012427	—	—
M3	0.50	1.15/16	5/8	0.1410	3/16	0.1100	3	D3	1	1012432	1012433	1012434	1012561
M3.5	0.60	2“	11/16	0.1410	3/16	0.1100	3	D4	1	1012435	1012436	1012437	1012562
M4	0.70	2.1/8	3/4	0.1680	1/4	0.1310	4	D4	1	1012441	1012442	1012443	1012563
M4.5	0.75	2.3/8	7/8	0.1940	1/4	0.1520	4	D4	1	1012444	1012445	—	—
M5	0.80	2.3/8	7/8	0.1940	1/4	0.1520	4	D4	1	1012453	1012454	1012455	1012564
M6	1.00	2.1/2	1“	0.2550	5/16	0.1910	4	D5	1	1012459	1012460	1012461	1012565
M7	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012465	1012466	1012467	1012576
M8	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012468	1012469	1012470	1012577
M8	1.25	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012471	1012472	1012473	1012566
M9	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D5	1	—	1012478	1012479	—
M10	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D5	1	1012480	1012481	1012482	1012578
M10	1.50	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D6	1	1012483	1012484	1012485	1012567
M11	1.50	3.5/32	1.7/16	0.3230	13/32	0.2420	4	D6	1	—	1012493	1012494	—
M12	1.25	3.3/8	1.21/32	0.3670	7/16	0.2750	4	D5	1	1012498	1012499	1012500	1012579
M12	1.75	3.3/8	1.21/32	0.3670	7/16	0.2750	4	D6	1	1012495	1012496	1012497	1012568
M14	1.50	3.19/32	1.21/32	0.4290	1/2	0.3220	4	D6	1	1012501	1012502	1012503	—
M14	2.00	3.19/32	1.21/32	0.4290	1/2	0.3220	4	D7	1	1012504	1012505	1012506	1012580
M16	1.50	3.13/16	1.13/16	0.4800	9/16	0.3600	4	D6	1	1012513	1012514	1012515	—
M16	2.00	3.13/16	1.13/16	0.4800	9/16	0.3600	4	D7	1	1012516	1012517	1012518	1012581
M18	1.50	4.1/32	1.13/16	0.5420	5/8	0.4060	4	D6	1	1012522	1012523	1012524	—
M18	2.50	4.1/32	1.13/16	0.5420	5/8	0.4060	4	D7	1	1012525	1012526	1012527	1012582
M20	1.50	4.15/32	2“	0.6520	11/16	0.4890	4	D6	1	1012534	1012535	1012536	—
M20	2.50	4.15/32	2“	0.6520	11/16	0.4890	4	D7	1	1012537	1012538	1012539	1012583
M22	1.50	4.11/16	2.7/32	0.6970	3/4	0.5230	4	D6	1	1012540	1012541	1012542	—
M22	2.50	4.11/16	2.7/32	0.6970	3/4	0.5230	4	D7	1	1012543	1012544	1012545	—
M24	2.00	4.29/32	2.7/32	0.7600	3/4	0.5700	4	D7	1	1012546	1012547	1012548	—
M24	3.00	4.29/32	2.7/32	0.7600	3/4	0.5700	4	D8	1	1012555	1012556	1012557	—
M30	3.50	5.7/16	2.9/16	1.0210	1“	0.7660	4	D9	1	1012570	1012571	1012572	—
M36	4.00	6.1/16	3“	1.2330	1.1/8	0.9250	4	D9	1	—	1012574	1012575	—

General Purpose, Left Hand

E501

Left Hand. Similar in design to the standard E500 series but finished with left hand threads, which when viewed axially, wind in a counter-clockwise and receding direction. Available in taper, plug, and semi-bottoming chamfer. For through or blind hole applications.



Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	Taper	Plug	Semi - Bottoming
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	D3	1	0159828	0095058	0095065
4	0.70	53	14	4.00	3.15	6	3	3.3	14	D4	1	0159835	0095072	0095089
5	0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	—	0095096	0095102
6	1.00	66	13	6.30	5.00	8	3	5	26	D5	1	0159859	0095119	0095126
8	1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0159866	0095133	0095140
10	1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0159873	0094938	0094945
12	1.75	89	22	9.00	7.10	10	3	10.3		D6	1	0159880	0094952	0094969
14	2.00	95	24	11.20	9.00	12	4	12		D7	1	0159897	0094976	0094983
16	2.00	102	24	12.50	10.00	13	4	14		D7	1	0159903	0094990	0095003
18	2.50	112	29	14.00	11.20	14	4	15.5		D7	1	—	—	0095010
20	2.50	112	29	14.00	11.20	14	4	17.5		D7	1	0159910	0095027	0095034
22	2.50	118	29	16.00	12.50	16	4	19.5		D7	1	—	—	0122495
24	3.00	130	35	18.00	14.00	18	4	21		D8	1	—	0152447	0095041

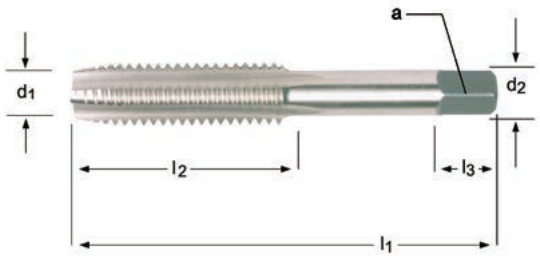
Note: ISO shank and square dimensions will necessitate metric holders

UNION BUTTERFIELD

General Purpose, Oversize

1500OV(UNC)

0.005” oversize. Similar in design to the standard 1500 series, but with a pitch diameter which is 0.0050” to 0.0055” larger than the basic pitch diameter. Used primarily where a part will be plated or treated after tapping. Available as a standard with a plug chamfer. Oversize P.D. limits are equivalent to H11.
For through or blind hole applications.



1500OV(UNC)

UNC

ANSI

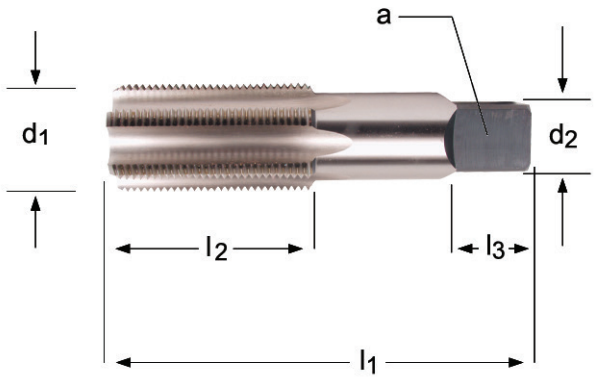
HSS

1/4 - 5/8

UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500OV(UNC)
1/4	20	2.1/2	1.000	0.2550	0.1910	5/16	4	H11	Plug	1	1011748
5/16	18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H11	Plug	1	1011749
3/8	16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H11	Plug	1	1011750
1/2	13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H11	Plug	1	1011752
5/8	11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H11	Plug	1	1011753

General Purpose, 8-Pitch

1505 Proven performers for manufacturers of oil field equipment, large valves, electric utilities, power generation machinery, and general construction. For through or blind hole applications.



1505(UNS)

UNS

ANSI

2B

HSS

1.1/8 - 2“

Nominal d_1	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming
1.1/8	8	5.7/16	2.9/16	0.8960	0.6720	7/8	4	H5	1	1013310	1013311	1013312
1.1/4	8	5.3/4	2.9/16	1.0210	0.7660	1“	4	H5	1	1013313	1013314	1013315
1.3/8	8	6.1/16	3“	1.1080	0.8310	1.1/16	4	H5	1	1013316	1013317	1013318
1.1/2	8	6.3/8	3“	1.2330	0.9250	1.1/8	6	H5	1	1013319	1013320	1013321
1.5/8	8	6.11/16	3.3/16	1.3050	0.9780	1.1/8	6	H6	1	1013322	1013323	1013324
1.3/4	8	7“	3.3/16	1.4300	1.0720	1.1/4	6	H6	1	1013325	1013326	1013327
1.7/8	8	7.5/16	3.9/16	1.5190	1.1390	1.1/4	6	H6	1	1013328	1013329	1013330
2“	8	7.5/8	3.9/16	1.6440	1.2330	1.3/8	6	H6	1	1013331	1013332	1013333

HAND TAPS

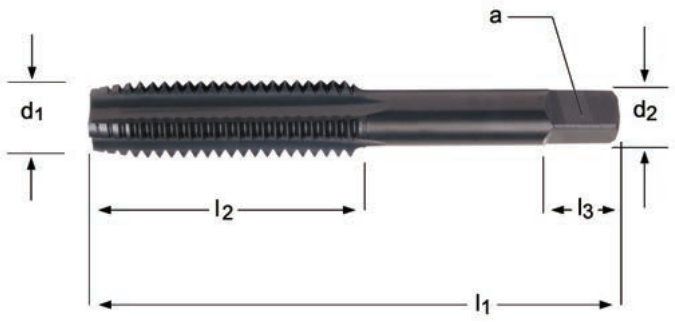
UNION BUTTERFIELD

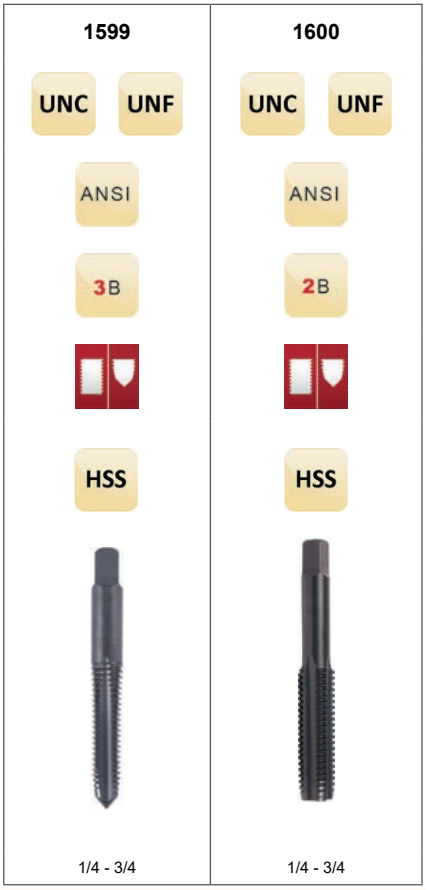
For Cast Iron

1599
1600

Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken, powdery chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.

1599 - H3
1600 - H5



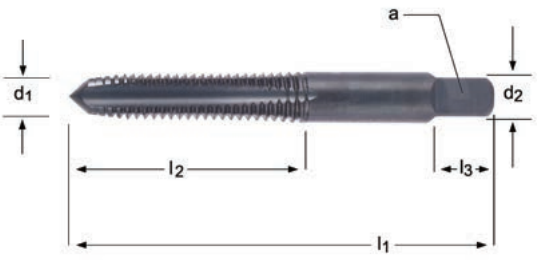


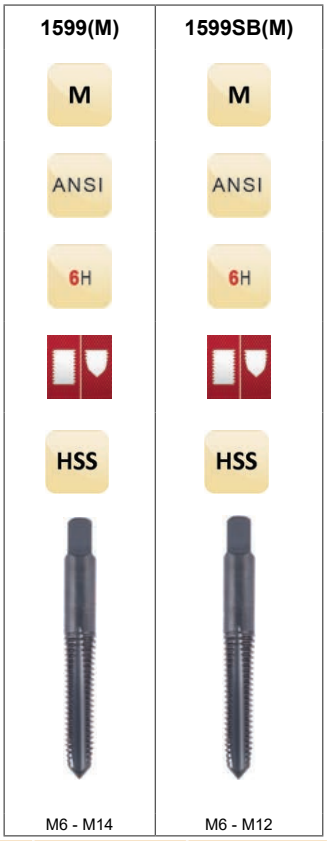
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☑ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1599 Plug	1599 Bottoming	1600 Plug	1600 Bottoming
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	4	H3	1	1010256	1010257	—	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	4	H5	1	—	—	1011256	1011257
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	4	H5	1	—	—	1011258	1011259
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	1	1010260	1010261	—	—
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	4	H5	1	—	—	—	1011261
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	1	—	1010263	—	—
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H5	1	—	—	1011262	1011263
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010264	1010265	—	—
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	—	1011264	1011265
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010266	1010267	—	—
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	—	1011266	1011267
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	4	H5	1	—	—	1011268	1011269
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	1	—	1010271	—	—
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H5	1	—	—	1011270	1011271
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010272	1010273	—	—
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	—	—	1011273
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010274	1010275	—	—
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	—	1011274	1011275
9/16	12		3.19/32	1.21/32	0.4290	0.3220	1/2	4	H5	1	—	—	1011276	1011277
9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	—	1010279	—	—
9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H5	1	—	—	—	1011279
5/8	11		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	1	1010280	1010281	—	—
5/8	11		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H5	1	—	—	1011280	1011281
3/4	10		4.1/4	2“	0.5900	0.4420	11/16	4	H3	1	—	1010285	—	—
3/4	10		4.1/4	2“	0.5900	0.4420	11/16	4	H5	1	—	—	—	1011285
3/4		16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	1	1010286	1010287	—	—
3/4		16	4.1/4	2“	0.5900	0.4420	11/16	4	H5	1	—	—	—	1011287

For Cast Iron

1599(M)
1599SB(M)

Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.



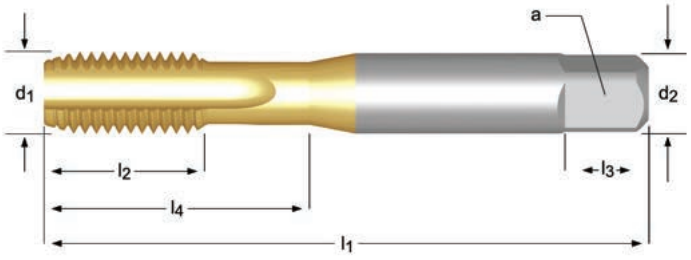


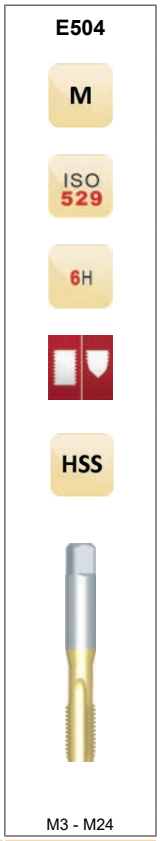
Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1599M Plug	1599M Bottoming	1599SB Semi-Bottoming
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	4	D5	1	1012256	1012266	1012276
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	4	D5	1	1012258	1012268	1012278
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	4	D6	1	1012260	1012270	1012280
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	4	D6	1	1012262	1012272	1012282
M14	1.25	3.19/32	1.21/32	0.4290	0.3220	1/2	4	D4	1	1010288	—	—

DORMER

For Cast Iron, Semi-Bottoming

E504 Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. TiN coating increases the surface hardness and improves tool life.





M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	E504
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	D3	1	0122563
4	0.70	53	14	4.00	3.15	6	3	3.3	14	D4	1	0122556
5	0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	0122501
6	1.00	66	13	6.30	5.00	8	3	5	26	D5	1	0122518
8	1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0122525
10	1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0122532

Note: ISO shank and square dimensions will necessitate metric holders

UNION BUTTERFIELD

SPIRAL POINT TAPS

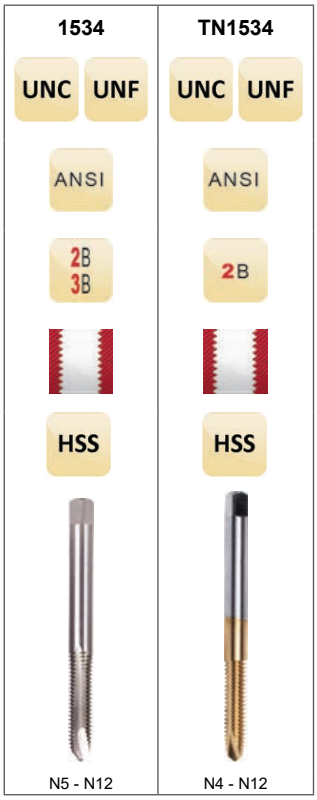
Relieved Style, Machine Screw Sizes

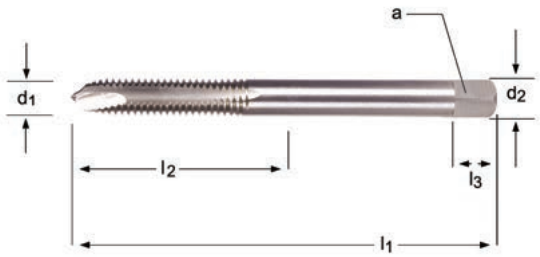
1534
TN1534

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1534 style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright finish - improves chip flow in soft or non-ferrous materials.
TiN Coating - increases surface hardness and improves tool life.





UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534	TN1534
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	—	1060805
	5	44	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1012358	—
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1012356	—
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012357	—
	6	40	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1012366	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H1	Plug	1	1012359	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1012360	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H3	Plug	1	1012361	1062361
	6	40	2“	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012367	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012363	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H3	Bottoming	1	1012364	—
	8	36	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1012375	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H1	Plug	1	1012368	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1012369	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Plug	1	1012370	1062370
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Bottoming	1	1012372	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Bottoming	1	1012373	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1012381	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1012382	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1012383	1062383
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1012377	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1012378	1062378
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1012385	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1012386	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1012379	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1012380	—
	12	28	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1012388	—
12		24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1012389	1062389
12		24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Bottoming	1	1012699	—

SPIRAL POINT TAPS

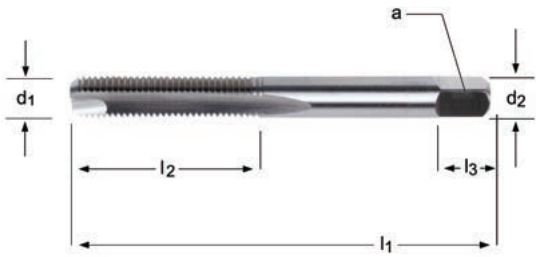
Relieved Style, Fractional Sizes

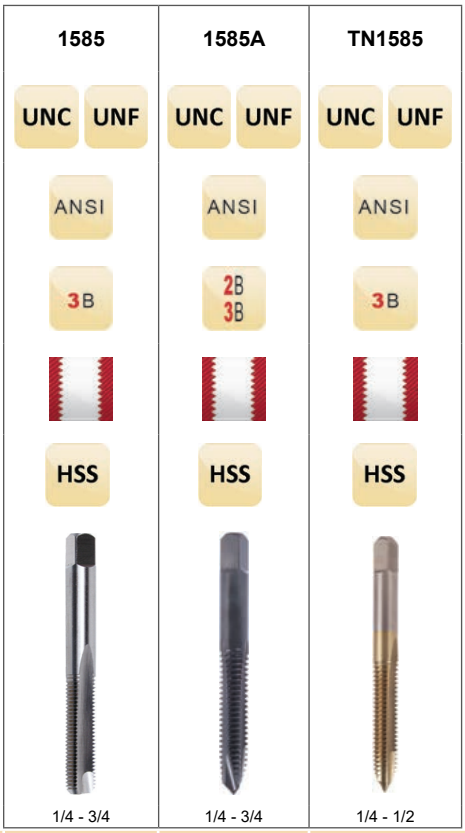
1585
1585A
TN1585

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1585 style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright Finish - improves chip flow in soft or non-ferrous materials.
Steam Oxide - reduces wear and prevents chip welding in harder ferrous materials.
TiN Coating - increases surface hardness and improves tool life.





UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1585	1585A	TN1585
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H1	Plug	1	1010290	—	—
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H2	Plug	1	1010291	—	—
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Plug	1	1010292	1050292	1060292
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	3	H3	Plug	1	1010295	—	1060295
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	3	H5	Plug	1	1010296	—	1060296
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H5	Plug	1	1010293	—	1060293
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Bottoming	1	1010294	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H2	Plug	1	1010298	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	3	H2	Plug	1	1010302	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Plug	1	1010299	1050299	1060299
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H4	Plug	1	1010300	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	3	H4	Plug	1	1010303	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Bottoming	1	1010301	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H1	Plug	1	1010304	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H2	Plug	1	1010305	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Plug	1	1010306	1050306	1060306
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H3	Plug	1	1010309	—	1060309
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H5	Plug	1	1010310	—	1060310
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H5	Plug	1	1010307	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Bottoming	1	1010308	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H2	Plug	1	1010316	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Plug	1	1010313	1050313	1060313
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H4	Plug	1	1010317	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Bottoming	1	1010315	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H1	Plug	1	1010318	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H3	Plug	1	1010320	1050320	1060320
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H2	Plug	1	1010319	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H5	Plug	1	1010321	—	1060321
	3/8	24	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H3	Plug	1	1010324	1050324	1060324
	3/8	24	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H4	Plug	1	1010325	—	—

UNION BUTTERFIELD

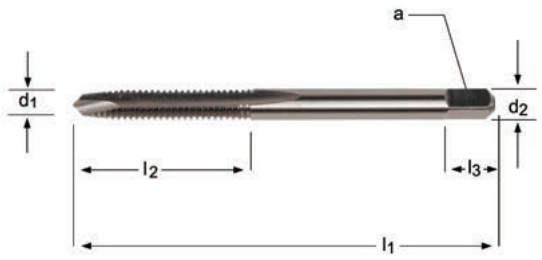
SPIRAL POINT TAPS

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1585	1585A	TN1585
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H2	Plug	1	1010327	—	—
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H3	Plug	1	1010328	1050328	1060328
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H5	Plug	1	1010329	—	—
	7/16	20	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H2	Plug	1	1010331	—	—
	7/16	20	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H3	Plug	1	1010332	1050332	1060332
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H1	Plug	1	1010334	—	—
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H2	Plug	1	1010335	—	—
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H3	Plug	1	1010336	1050336	1060336
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H5	Plug	1	1010337	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H1	Plug	1	1010338	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H2	Plug	1	1010339	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H3	Plug	1	1010340	1050340	1060340
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H5	Plug	1	1010341	—	—
5/8		11	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H3	Plug	1	1010342	1050342	—
5/8		11	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H5	Plug	1	1010343	—	—
	5/8	18	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H3	Plug	1	1012774	—	—
3/4		10	4.1/2	2“	0.5900	11/16	0.4420	3	H3	Plug	1	—	1050344	—
3/4		10	4.1/4	2“	0.5900	11/16	0.4420	3	H3	Plug	1	1010344	—	—
3/4		10	4.1/4	2“	0.5900	11/16	0.4420	3	H5	Plug	1	1010345	—	—
	3/4	16	4.1/2	2“	0.5900	11/16	0.4420	3	H3	Plug	1	—	1052775	—
	3/4	16	4.1/4	2“	0.5900	11/16	0.4420	3	H3	Plug	1	1012775	—	—

SPIRAL POINT TAPS

Relieved Style, Machine Screw Sizes

1634 Premium Cobalt substrate. Designed for tough jobs in high temperature alloys, stainless steel, cast iron, abrasive non-ferrous materials and other similar materials. Due to their premium steel content and special design, this range will effectively increase productivity through longer tool life. Ideally suited for through hole tapping.



UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1634
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1011102
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1011104
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1011105
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1011106

UNION BUTTERFIELD

SPIRAL POINT TAPS

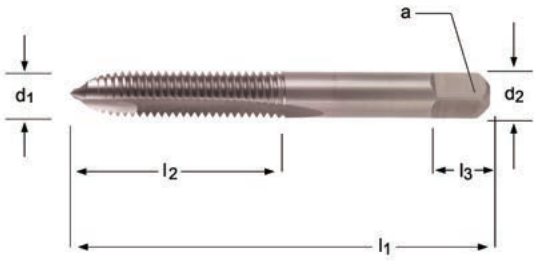
Relieved Style, Metric

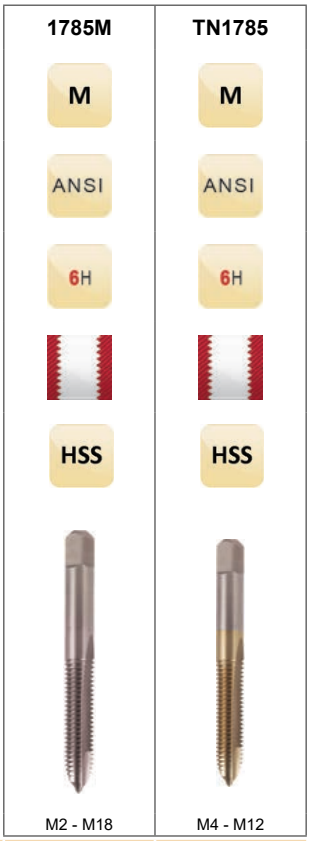
1785M
TN1785

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1785M style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright Finish - improves chip flow in soft or non-ferrous materials.
TiN Coating - increases surface hardness and improves tool life.





M	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1785M	TN1785
M2	0.40	1.3/4	7/16	0.1410	3/16	0.1100	2	D3	Plug	1	1012659	—
M2.5	0.45	1.13/16	1/2	0.1410	3/16	0.1100	2	D3	Plug	1	1012662	—
M3	0.50	1.15/16	5/8	0.1410	3/16	0.1100	2	D3	Plug	1	1012664	—
M3.5	0.60	2“	11/16	0.1410	3/16	0.1100	2	D4	Plug	1	1012666	—
M4	0.70	2.1/8	3/4	0.1680	1/4	0.1310	2	D4	Plug	1	—	1062668
M4	0.70	2.1/8	3/4	0.1680	1/4	0.1310	2	D4	Plug	1	1012668	—
M4.5	0.75	2.3/8	7/8	0.1940	1/4	0.1520	2	D4	Plug	1	1012669	—
M5	0.80	2.3/8	7/8	0.1940	1/4	0.1520	2	D4	Plug	1	—	1062672
M5	0.80	2.3/8	7/8	0.1940	1/4	0.1520	2	D4	Plug	1	1012672	—
M6	1.00	2.1/2	1“	0.2550	5/16	0.1910	2	D5	Plug	1	—	1062674
M6	1.00	2.1/2	1“	0.2550	5/16	0.1910	2	D5	Plug	1	1012674	—
M7	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	2	D5	Plug	1	1012676	—
M8	1.25	2.23/32	1.1/8	0.3180	3/8	0.2380	2	D5	Plug	1	—	1062678
M8	1.25	2.23/32	1.1/8	0.3180	3/8	0.2380	2	D5	Plug	1	1012678	—
M9	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	3	D5	Plug	1	1012680	—
M10	1.50	2.15/16	1.1/4	0.3810	7/16	0.2860	3	D6	Plug	1	—	1062682
M10	1.50	2.15/16	1.1/4	0.3810	7/16	0.2860	3	D6	Plug	1	1012682	—
M11	1.50	3.5/32	1.7/16	0.3230	13/32	0.2420	3	D6	Plug	1	1012685	—
M12	1.75	3.3/8	1.21/32	0.3670	7/16	0.2750	3	D6	Plug	1	—	1062686
M12	1.75	3.3/8	1.21/32	0.3670	7/16	0.2750	3	D6	Plug	1	1012686	—
M14	2.00	3.19/32	1.21/32	0.4290	1/2	0.3220	3	D7	Plug	1	1012689	—
M16	2.00	3.13/16	1.13/16	0.4800	9/16	0.3600	3	D7	Plug	1	1012693	—
M18	2.50	4.1/32	1.13/16	0.5420	5/8	0.4060	3	D7	Plug	1	1012696	—

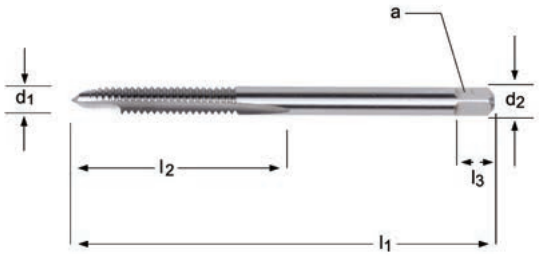
SPIRAL POINT TAPS

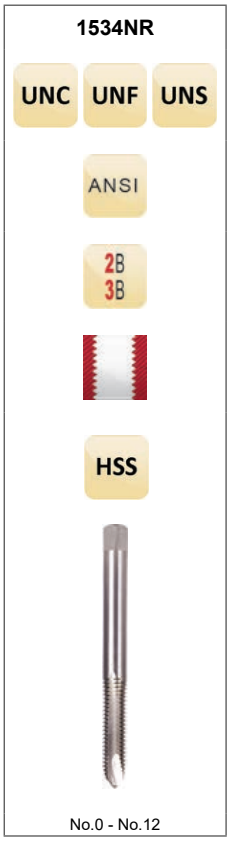
UNION BUTTERFIELD

Non-Relieved Style, Machine Screw Sizes

1534NR

Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the 1534/1585 series. For through hole applications.
Sizes in bold font indicate the most commonly used flute and 'H' limit for that size.





UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534NR
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010775
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010776
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010778
	1		72	1.11/16	3/8	0.1410	0.1100	3/16	2	H1	Plug	1	1010783
	1		72	1.11/16	3/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010784
1			64	1.11/16	3/8	0.1410	0.1100	3/16	2	H1	Plug	1	1010779
1			64	1.11/16	3/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010780
	2		64	1.3/4	7/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010791
	2		64	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010792
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010787
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010788
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010790
	3		56	1.13/16	1/2	0.1410	0.1100	3/16	2	H1	Plug	1	1010799
	3		56	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Plug	1	1010800
3			48	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Plug	1	1010796
3			48	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010798
		4	36	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010803
	4		48	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010809
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010804
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010805
	4		48	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010811
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010807
	5		44	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010817
5			40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010813
5			40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010815
	6		40	2"	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010825
6			32	2"	11/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010818
6			32	2"	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010819
6			32	2"	11/16	0.1410	0.1100	3/16	2	H3	Plug	1	1010820
	6		40	2"	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010827
6			32	2"	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010822
6			32	2"	11/16	0.1410	0.1100	3/16	2	H3	Bottoming	1	1010823

UNION BUTTERFIELD

SPIRAL POINT TAPS

UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534NR
	8		36	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1010835
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H1	Plug	1	1010828
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1010829
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Plug	1	1010830
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Bottoming	1	1010832
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Bottoming	1	1010833
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1010843
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1010844
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1010845
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1010847
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1010848
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1010837
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1010838
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1010839
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1010841
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1010842
	12		28	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1010853
12			24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1011071
12			24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Bottoming	1	1011072

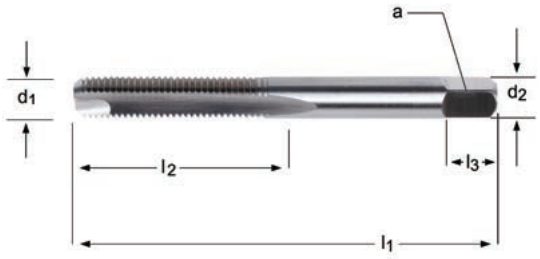
SPIRAL POINT TAPS

UNION BUTTERFIELD

Non-Relieved Style, Fractional Sizes

1585NR

Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the regular 1534/1585 series. For through hole applications.
Sizes in bold font indicate the most commonly used flute and 'H' limit for that size.



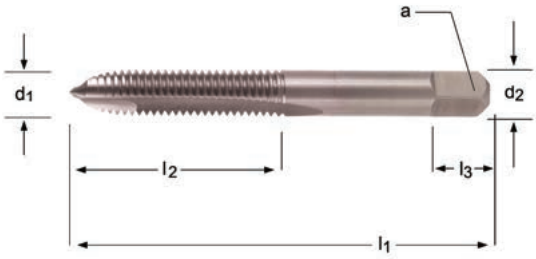
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☑ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H1	1	1012813	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H2	1	1012814	—
1/4	**20**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**2**	**H3**	**1**	**1012815**	**1012817**
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H5	1	1012816	—
1/4	**20**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**3**	**H3**	**1**	**1012818**	**—**
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H1	1	1012820	—
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H2	1	1012821	—
1/4		**28**	**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**2**	**H3**	**1**	**1012822**	**1012824**
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	2	H2	1	1012828	—
5/16	**18**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**2**	**H3**	**1**	**1012829**	**47197820**
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	2	H5	1	1012830	—
5/16	**18**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**3**	**H3**	**1**	**1012832**	**1012831**
5/16		**24**	**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**2**	**H3**	**1**	**1012836**	**—**
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H2	1	1012842	—
3/8	**16**		**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**3**	**H3**	**1**	**1012843**	**—**
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H5	1	1012844	—
3/8		**24**	**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**3**	**H3**	**1**	**1012847**	**—**
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H2	1	1012849	—
7/16	**14**		**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**3**	**H3**	**1**	**1012850**	**—**
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H5	1	1012851	—
7/16		**20**	**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**3**	**H3**	**1**	**1012853**	**—**
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H2	1	1012856	—
1/2	**13**		**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**3**	**H3**	**1**	**1012857**	**—**
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H5	1	1012858	—
1/2		**20**	**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**3**	**H3**	**1**	**1012861**	**—**
5/8	**11**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H3**	**1**	**1012863**	**—**
5/8	**11**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H5**	**1**	**1012864**	**—**
5/8		**18**	**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H3**	**1**	**1012867**	**—**
3/4	**10**		**4.1/2**	**2“**	**0.5900**	**0.4420**	**11/16**	**3**	**H3**	**1**	**1012865**	**—**
3/4	10		4.1/2	2“	0.5900	0.4420	11/16	3	H5	1	1012866	—
3/4		**16**	**4.1/2**	**2“**	**0.5900**	**0.4420**	**11/16**	**3**	**H3**	**1**	**1012868**	**—**

UNION BUTTERFIELD

SPIRAL POINT TAPS

Non-Relieved, Metric Sizes

1785NR Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the regular 1785 series. For through hole applications.



1785NR

M

ANSI

6H

HSS

M1.6 - M20

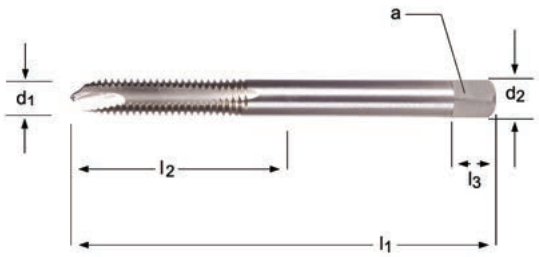
M	P mm	l_1 Inch	l_2 Inch	l_3 Inch	d_2 Ø Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1785NR
1.6	0.35	1.5/8	5/16	0.1410	0.1100	3/16	2	D3	Plug	1	1012890
2	0.40	1.3/4	7/16	0.1410	0.1100	3/16	2	D3	Plug	1	1012891
2.5	0.45	1.13/16	1/2	0.1410	0.1100	3/16	2	D3	Plug	1	1012893
3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	2	D3	Plug	1	1012896
3.5	0.60	2“	11/16	0.1410	0.1100	3/16	2	D4	Plug	1	1012897
4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	2	D4	Plug	1	1012898
4.5	0.75	2.3/8	7/8	0.1940	0.1520	1/4	2	D4	Plug	1	1012899
5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	2	D4	Plug	1	1012900
6	1.00	2.1/2	1“	0.2550	0.1910	5/16	2	D5	Plug	1	1012901
7	1.00	2.23/32	1.1/8	0.3180	0.2380	3/8	2	D5	Plug	1	1012902
8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	2	D5	Plug	1	1012903
10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	3	D6	Plug	1	1012904
12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	3	D6	Plug	1	1012905
14	2.00	3.19/32	1.21/32	0.4290	0.3220	1/2	3	D7	Plug	1	1012906
16	2.00	3.13/16	1.13/16	0.4800	0.3600	9/16	3	D7	Plug	1	1012907
20	2.50	4.15/32	2“	0.6520	0.4890	11/16	3	D7	Plug	1	1012909

SPIRAL POINT TAPS

UNION BUTTERFIELD

Extension / Non-Relieved Style

1534NE Similar in design and thread geometries to the standard 1534NR series, but with a longer shank length. Bright finish improves chip flow in soft or non-ferrous materials. For through hole applications.



1534NE(UNC)

UNC UNF

ANSI

3B

HSS

No.4 - 1/2

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Chamfer	1534NE
4		40	4“	9/16	0.1410	0.1100	3/16	2	H2	1	Plug	1020002
6		32	4“	11/16	0.1410	0.1100	3/16	2	H3	1	Plug	1020004
6		32	6“	11/16	0.1410	0.1100	3/16	2	H3	1	Plug	1020006
8		32	4“	3/4	0.1680	0.1310	1/4	2	H3	1	Plug	1020008
8		32	6“	3/4	0.1680	0.1310	1/4	2	H3	1	Plug	1020010
	10	32	4“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020016
	10	32	6“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020018
10		24	4“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020012
10		24	6“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020014
	1/4	28	4“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020024
	1/4	28	6“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020026
1/4		20	4“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020020
1/4		20	6“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020022
	5/16	24	4“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020032
	5/16	24	6“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020034
5/16		18	4“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020028
5/16		18	6“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020030
	3/8	24	4“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020040
	3/8	24	6“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020042
3/8		16	4“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020036
3/8		16	6“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020038
	7/16	20	6“	1.7/16	0.3230	0.2420	13/32	3	H3	1	Plug	1020046
7/16		14	6“	1.7/16	0.3230	0.2420	13/32	3	H3	1	Plug	1020044
	1/2	20	6“	1.21/32	0.3670	0.2750	7/16	3	H3	1	Plug	1020050
1/2		13	6“	1.21/32	0.3670	0.2750	7/16	3	H3	1	Plug	1020048

UNION BUTTERFIELD

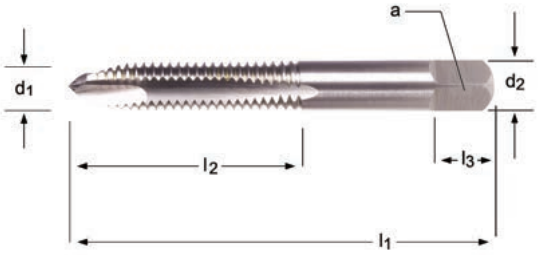
SPIRAL POINT TAPS

Oversize / Relieved Style

1593
1585OV

Similar in design to the standard 1534/1585 series but with a pitch diameter larger than the basic pitch diameter. Used primarily where a part will be plated or treated after tapping. For through hole applications.

1593: 0.003” - 0.0035” Oversize
1585OV: 0.005” Oversize



1593	1585OV
UNC UNF	UNC
ANSI	ANSI
2B 3B	2B
HSS	HSS
N6 - N10	1/4 - 5/8

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1593	1585OV
6		32	2“	11/16	0.1410	0.1100	3/16	2	H7	Plug	1	1010877	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H7	Plug	1	1010879	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H7	Plug	1	1010883	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H7	Plug	1	1010881	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H11	Plug	1	—	1011754
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H11	Plug	1	—	1011755
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H11	Plug	1	—	1011756
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H11	Plug	1	—	1011757
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H11	Plug	1	—	1011758
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	3	H11	Plug	1	—	1011759

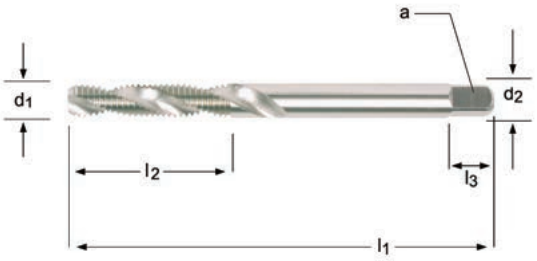
SPIRAL FLUTE TAPS

UNION BUTTERFIELD

Regular Spiral 30°

1582 - *Machine Screw Sizes*
1586 - *Fractional Sizes*

Generally used where chip disposal is a problem. The spiral flute design effictively draws chips out of the hole. Recommended for use when tapping blind or through holes in a variety of materials. Excellent choice for non-ferrous applications.



1582 / 1586

UNC UNF

ANSI

3B

HSS

No.4 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
4	40		1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	1010905	1010906
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010909	1010910
8	32		2.1/8	3/4	0.1680	0.1310	1/4	2	H3	1	1010913	1010914
10	24		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	1010915	1010916
10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	1010917	1010918
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H3	1	1010346	1010347
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010348	1010349
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	1	1010350	1010351
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010352	1010353
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010354	1010355
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010356	1010357
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010358	1010359
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010360	1010361
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010362	1010363
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010366	1010367
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010368	1010369

UNION BUTTERFIELD

SPIRAL FLUTE TAPS

High Spiral Helicut 52°

1587 *- Machine Screw Sizes*
1588 *- Fractional Sizes*

Similar to the regular spiral flute design of 1582/1586 except that the faster spiral improves the chip drawing action and permits the bridging of larger gaps inside a hole. For blind or through hole applications. Excellent choice for non-ferous applications.

1587 / 1588

UNC UNF

ANSI

2B 3B

HSS

N4 - 1/2

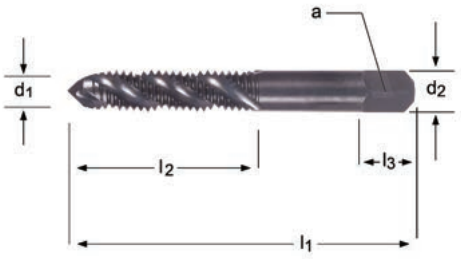
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☑ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
4	40		1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	1010887	1010888
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010891	1010892
8	32		2.1/8	3/4	0.1680	0.1310	1/4	3	H3	1	1010895	1010896
10	24		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010897	1010898
10		32	2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010899	1010900
1/4	20		2.1/2	1.000	0.2550	0.1910	5/16	3	H3	1	1010398	1010399
1/4		28	2.1/2	1.000	0.2550	0.1910	5/16	3	H3	1	1010400	1010401
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010402	1010403
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010404	1010405
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010406	1010407
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010408	1010409
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010410	1010411
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010412	1010413
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010414	1010415
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010416	1010417

SPIRAL FLUTE TAPS

Heavy Duty Spiral 40°

1590 *- Machine Screw Sizes*
1591 *- Fractional Sizes*

A slower helix angle, larger core diameter, three flutes and wider throat dimensions than the regular 1587/1588 series. Designed for tough blind or through hole tapping. Chip ejection is more efficient and problems such as chipping and breakage are largely eliminated. A steam oxide finish makes this tap ideal for use in ferrous materials and higher strength alloys.



1590 / 1591

UNC UNF

ANSI

3B

HSS

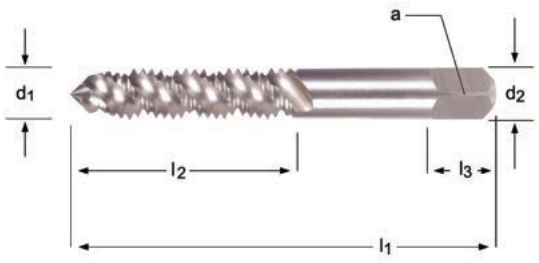
N6 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010937	1010938
6		40	2“	11/16	0.1410	0.1100	3/16	2	H3	1	—	1010940
10	24		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010945	1010946
10		32	2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010947	1010948
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010953	1010954
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010955	1010956
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010957	1010958
3/8	16		2.5/16	1.1.4	0.3810	0.2860	7/16	3	H3	1	1010961	1010962
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010965	1010966
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010969	1010970

SPIRAL FLUTE TAPS

High Spiral Helicut 52°, Metric

1788(M) Similar to the regular spiral flute design of 1582/1586 except that the faster spiral improves the chip drawing action and permits the bridging of larger gaps inside a hole. For blind or through hole applications. Excellent choice for non-ferrous applications.



1788(M)

M

ANSI

6H

HSS

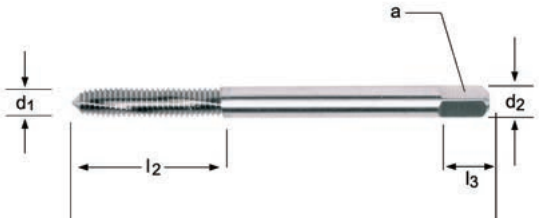
M3 - M12

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	No. of Flutes	Limits	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	2	D3	1	1012920	1012940
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	3	D4	1	1012923	1012943
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	3	D4	1	1012925	1012945
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	3	D5	1	1012926	1012946
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	3	D5	1	1012928	1012948
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	3	D6	1	1012930	1012950
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	3	D6	1	1012932	1012952

UNION BUTTERFIELD

Rol-Rite / Spiral Lobe

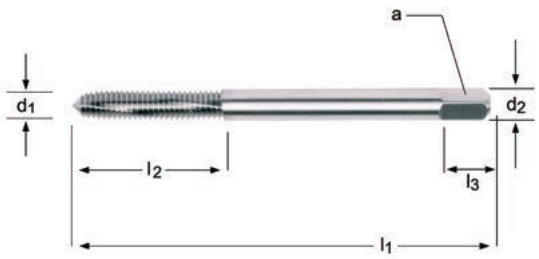
1580 The Rol-Rite style has a spiral lobe pattern and no oil or lubrication grooves. It is designed for general purpose applications and is particularly suited for through holes in thin sections and for interrupted holes. For through or blind hole applications.



Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H2	1	—	1310004
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H3	1	—	1310005
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H3	1	1310012	1310014
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H5	1	—	1310015
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H3	1	—	1310022
6	32		2“	11/16	0.1410	0.1100	3/16	H3	1	1310028	1310031
6	32		2“	11/16	0.1410	0.1100	3/16	H5	1	1310029	—
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H3	1	1310038	1310041
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H5	1	1310039	1310042
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310048	1310051
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H4	1	—	1310057
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310055	1310058
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310068	1310071
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H6	1	1310069	—
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310074	1310076
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310078	1310080
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H7	1	—	1310081
5/16		24	2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310082	—
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	1310086	1310088
3/8		24	2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	—	1310092

Rol-Rite, Spiral Lobe

1580(M) The Rol-Rite style has a spiral lobe pattern and no oil or lubrication grooves. It is designed for general purpose applications and is particularly suited for through holes in thin sections and for interrupted holes.



1580(M)

M

ANSI

6H

HSS

M3 - M12

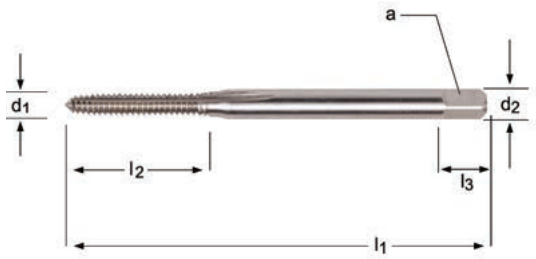
Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	D5	1	1310400	1310401
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	D6	1	1310402	1310403
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	D7	1	1310404	1310405
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	D8	1	1310406	1310407
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	D9	1	1310408	1310409
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	D10	1	1310410	1310411
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	D11	1	1310412	1310413

THREAD FORMING TAPS

UNION BUTTERFIELD

Rol-Form / Lube Grooves

3300 The Rol-Form style has 2-4 grooves (depending on size) extending the full length of thread to assure lubrication in the forming zone and to eliminate build up of the hydraulic pressure in blind holes. They are particularly suited to blind holes in thin walled die castings.



3300

UNC UNF

ANSI

2B 3B

HSS

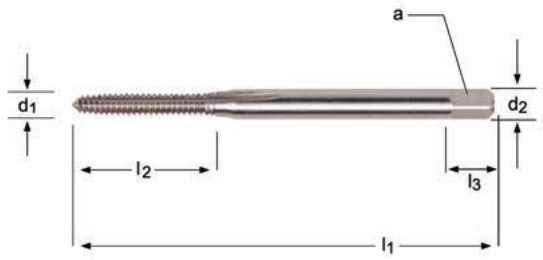
N0 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
0		80	1.5/8	5/16	0.1410	0.1100	3/16	H2	1	—	1310110
1	64		1.11/16	3/8	0.1410	0.1100	3/16	H2	1	—	1310111
1		72	1.11/16	3/8	0.1410	0.1100	3/16	H2	1	—	1310112
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H2	1	—	1310113
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H3	1	—	1310114
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H3	1	1310121	1310123
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H5	1	1310122	—
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H3	1	—	1310131
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H5	1	—	1310132
6	32		2“	11/16	0.1410	0.1100	3/16	H3	1	1310137	1310140
6	32		2“	11/16	0.1410	0.1100	3/16	H5	1	1310138	1310141
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H3	1	1310147	1310150
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H5	1	1310148	1310151
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310157	1310160
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310158	1310161
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310163	1310166
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310164	1310167
12	24		2.3/8	15/16	0.2200	0.1650	9/32	H4	1	1310169	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310177	1310180
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H6	1	1310178	1310181
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310183	1310185
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310187	1310189
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H7	1	1310188	1310190
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	1310195	1310197
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H7	1	1310196	1310198
3/8		24	2.15/16	1.1/4	0.3810	0.2860	1/2	H7	1	1310200	1310202
1/2	13		3.3/8	1.21/32	0.3670	0.2750	23/32	H5	1	1310211	—

Rol-Form, Lube Grooves

3300(M)

The Rol-Form style has 1-2 lube grooves (depending on size) extending the full length of thread to assure lubrication in the forming zone and to eliminate build up of the hydraulic pressure in blind holes. They are particularly suited to blind holes in thin walled die castings.



3300(M)

M

ANSI

6H

HSS

M3 - M10

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	Limits	Grooves	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	D5	1	1	1310500	1310501
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	D6	1	1	1310502	1310503
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	D7	1	1	1310504	1310505
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	D8	2	1	1310506	1310507
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	D9	2	1	1310508	1310509
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	D10	2	1	1310510	1310511

Extension Rol-Form / Lube Grooves

3306E Similar in design and thread geometries to the standard 3300 series but with longer shank lengths than standard.

3306E(UNF)

UNC UNF

ANSI

2B

HSS

N4 - 5/16

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	Limits	Chamfer	Pack Qty	3306E
4		40	4“	9/16	0.1410	0.1100	3/16	H3	Bottoming	1	1321002
4		40	4“	9/16	0.1410	0.1100	3/16	H5	Bottoming	1	1321004
6		32	4“	11/16	0.1410	0.1100	3/16	H3	Bottoming	1	1321006
8		32	4“	3/4	0.1680	0.1310	1/4	H3	Bottoming	1	1321014
	10	32	4“	7/8	0.1940	0.1520	1/4	H4	Bottoming	1	1321030
10		24	4“	7/8	0.1940	0.1520	1/4	H4	Bottoming	1	1321022
1/4		20	4“	1“	0.2550	0.1910	5/16	H4	Bottoming	1	1321038
5/16		18	4“	1.1/8	0.3180	0.2380	3/8	H5	Bottoming	1	1321062

General Purpose, Medium Hook, NPT

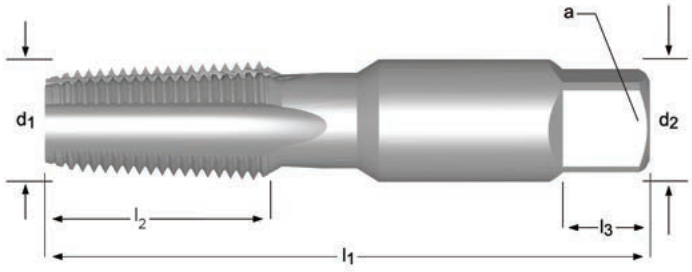
1541

TN1541

Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials. The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.

TiN coating increases surface hardness and improves tool life.

Made to Metal Cutting Tool Institute Standards, table 311



1541(NPT)	TN1541
NPT	NPT
ANSI	ANSI
Normal	Normal
HSS	HSS
1/16 - 2"	1/8 - 3/4

Nominal d_1	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	1541	TN1541
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010518	—
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010528	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010519	1060519
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010520	1060520
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010521	1060521
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010522	1060522
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010523	1060523
1"	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010524	—
1.1/4	11.5	4"	1.3/4	1.3130	0.9840	15/16	5	1	1010525	—
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1"	7	1	1010526	—
2"	11.5	4.1/2	1.3/4	1.8750	1.4060	1.1/8	7	1	1010527	—

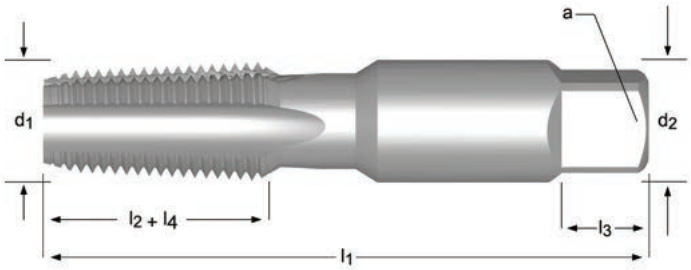
DORMER

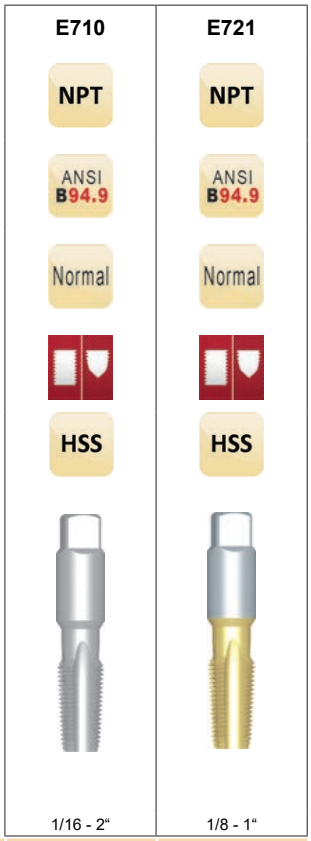
General Purpose, Medium Hook, NPT

E710
E721

Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials. The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.

TiN coating increases surface hardness and improves tool life.





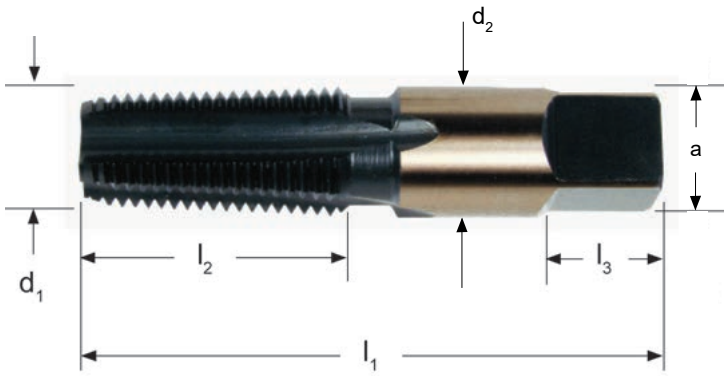
Nominal d_1	TPI	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm		# of Flutes	l_4 mm	Pack Qty	E710	E721
1/16	27	65	17	7.9	5.9	8	6.3	4	11.7	1	0159491	—
1/8	27	70	19	11.1	8.3	10	8.5	4	11.9	1	0099889	0161463
1/8	27	70	19	11.1	8.3	10	8.5	4	11.9	Set of 2	0210314 [1)]	—
1/4	18	75	27	14.3	10.7	11	11	4	17.6	1	0099872	0161470
1/4	18	75	27	14.3	10.7	11	11	4	17.6	Set of 2	0210321 [1)]	—
3/8	18	80	27	17.8	13.5	13	14.5	4	19.5	1	0099919	0161487
3/8	18	80	27	17.8	13.5	13	14.5	4	19.5	Set of 2	0210338 [1)]	—
1/2	14	100	35	17.5	13.1	16	18	4	22.7	1	0099865	0161494
1/2	14	100	35	17.5	13.1	16	18	4	22.7	Set of 2	0210345 [1)]	—
3/4	14	105	35	23.0	17.2	17	23	5	24.4	1	0099902	0161500
3/4	14	105	35	23.0	17.2	17	23	5	24.4	Set of 2	0210352 [1)]	—
1"	11.5	115	43	28.6	21.4	21	29	5	29.4	1	0099834	0161517
1.1/4	11.5	125	43	33.3	25.0	24	38	5	27.7	1	0099858	—
1.1/2	11.5	135	43	38.1	28.6	25	44	7	28.9	1	0099841	—
2"	11.5	145	43	47.6	35.7	29	56	7	26.6	1	0099896	—

[1)] Sets (No.7) include: *1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)*

PIPE TAPS

General Purpose / Work-Rite, NPT

6541 Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials.
The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.



6541

NPT

ANSI B94.9

Normal

1/8 - 2"

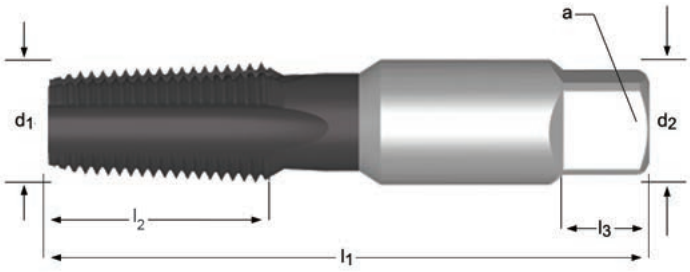
NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	6541
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	8110601
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	8110602
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	8110603
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	8110604
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	8110605
1"	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	8110606
1.1/4	11.5	4"	1.3/4	1.3130	0.9840	15/16	5	1	8110607
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1	7	1	8110608
2"	11.5	4.1/2	1.3/4	1.8750	1.4060	1.1/8	7	1	8110609

UNION BUTTERFIELD

Low Rake for Cast Iron, NPT

1544

Straight Flute. Low rake heavy-duty for cast iron and heat treated alloy steels. Nitride surface treatment reduces wear and chip welding. Manufactured with a cutting geometry specifically for gray cast irons producing broken chips. The design makes these taps also appropriate for non-metallics, cast brass and other brass materials producing broken, powdery chips.



1544

NPT

ANSI B94.9

Normal

HSS

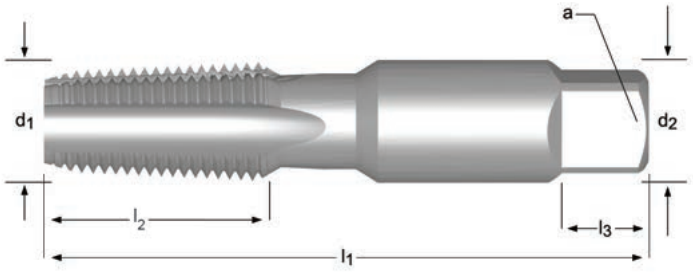
1/16 - 1.1/4

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⊿ a Inch	l_3 Inch	# of Flutes	Pack Qty	1544
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1011760
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1011761
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1011762
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1011763
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1011764
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1011765
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1011766
1.1/4	11.5	4“	1.3/4	1.3130	0.9840	15/16	5	1	1011767

High Hook, NPT

1545 Designed with a high hook and deep flutes to handle the tough curly chips of free cutting materials such as low carbon and leaded steels, boiler plate, aluminum and die castings.

1545A Identical to the 1545 series but with steam oxide surface treatment to prevent galling and chipping.



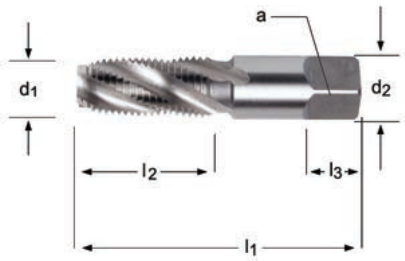
1545	1545A
NPT	NPT
ANSI	ANSI
Normal	Normal
HSS	HSS
1/18 - 1“	1/16 - 3/4

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Pack Qty	1545	1545A
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	—	1052869
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1012879	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1012870	1052870
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1012871	1052871
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1012872	1052872
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1012873	1052873
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1012874	1052874
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1012875	—

UNION BUTTERFIELD

Spiral Flute, 30°, NPT

1548 Designed with a medium hook. Most effective when used in applications that produce, long, stringy chips. The spiral flute design effectively draws the chips from the hole being tapped.



1548

NPT

ANSI

Normal

HSS

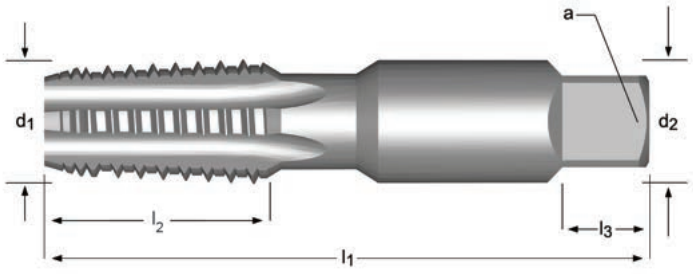
1/16 - 1“

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	1548
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010920
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010924
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010922
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010926
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010928
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010930
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010932
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010934

Interrupted Thread, NPT

1568

Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips. Ideal for use in soft, ductile materials or those producing long, continuous chips.



1568

NPT

ANSI

Normal

HSS

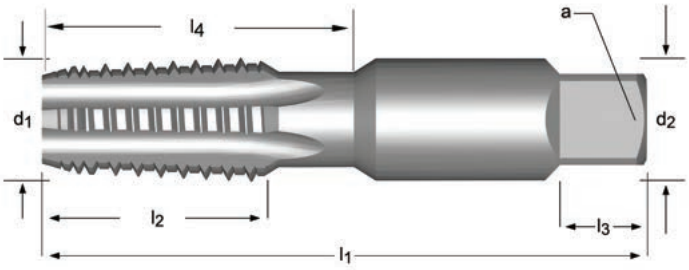
1/8 - 1.1/2

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	1568
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	5	1	1010560
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	5	1	1010551
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	5	1	1010552
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	5	1	1010553
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	5	1	1010554
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010555
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010556
1.1/4	11.5	4“	1.3/4	1.3130	0.9840	15/16	5	1	1010557
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1“	7	1	1010558

DORMER

Interrupted Thread, NPT

E711 Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips. Ideal for use in soft, ductile materials or those producing long, continuous chips.



E711

NPT

ANSI B94.9

Normal

HSS

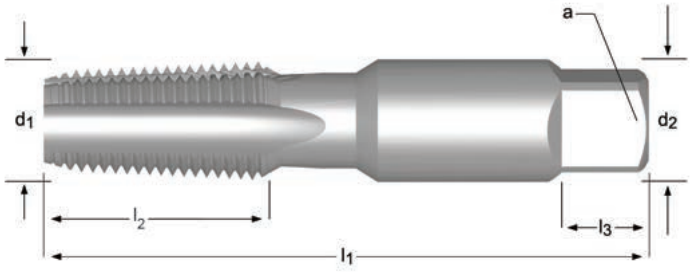
1/8 - 1.1/2

NPT	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	Pack Qty	E711
1/8	27	10.29	70	19	309	11.1	8.3	10	5	8.5	1	0099957
1/4	18	13.72	75	27	44.6	14.3	10.7	11	5	11.0	1	0099940
3/8	18	17.15	80	27	46.5	17.8	13.5	13	5	14.5	1	0099971
1/2	14	21.33	100	35	57.7	17.5	13.1	16	5	18.0	1	0099933
3/4	14	26.67	105	35	59.4	23.0	17.2	17	5	23.0	1	0099964
1“	11.5	33.40	115	43	72.4	28.6	21.4	21	5	29.0	1	0099926
1.1/2	11.5	48.26	135	43	71.9	38.1	28.6	25	7	44.0	1	0124079

Dryseal, NPTF, Medium Hook

1543 Similar in design to the 1541 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.

TN1543 TiN coated option increases surface hardness and improves tool life.



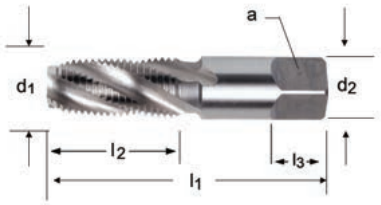
1543(NPTF)	TN1543
NPTF	NPTF
ANSI	ANSI
Normal	Normal
HSS	HSS
1/16 - 1“	1/8 - 3/4

NPTF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	☐ a Inch	l_3 Inch	# of Flutes	Pack Qty	1543(NPTF)	TN1543
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010529	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	—	1060530
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010539	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010530	—
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	—	1060531
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010531	—
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	—	1060532
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010532	—
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	—	1060533
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010533	—
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	—	1060534
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010534	—
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010535	—

UNION BUTTERFIELD

Spiral Flute, Dryseal, NPTF

1549 Spiral Flute 30º. Medium hook for evacuation of long, stringy chips. Similar in design to the 1548 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



1549

NPTF

ANSI

Normal

HSS

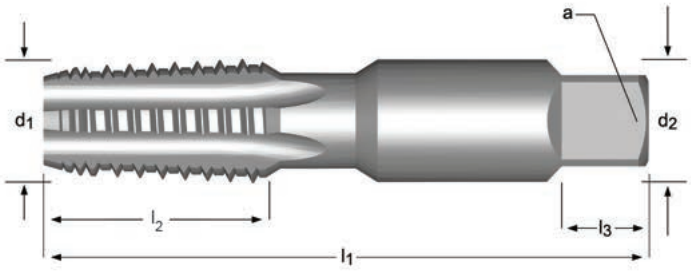
1/16 - 3/4

NPTF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⊠ a Inch	l_3 Inch	# of Flutes	Pack Qty	1549
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010921
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010925
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010923
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010927
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010929
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010931
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010933

Interrupted Thread, Dryseal, NPTF

1567 Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips.

Similar in design to the 1568 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



1567

NPTF

ANSI

Normal

HSS

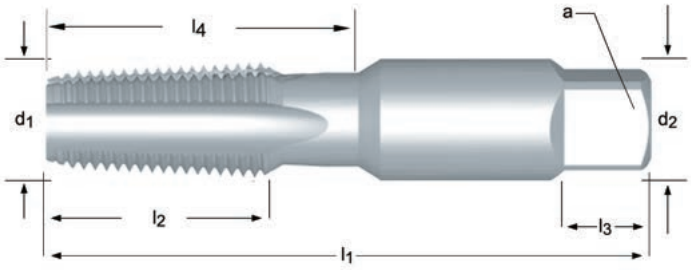
1/8 - 1“

NPTF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Pack Qty	1567
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	5	1	1010570
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	5	1	1010561
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	5	1	1010562
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	5	1	1010563
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	5	1	1010564
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010565
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010566

DORMER

General Purpose, Medium Hook, Dryseal, NPTF

E712 Medium hook for multi-material tapping. Similar in design to the E710 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



E712

NPTF

ANSI B94.9

Normal

HSS

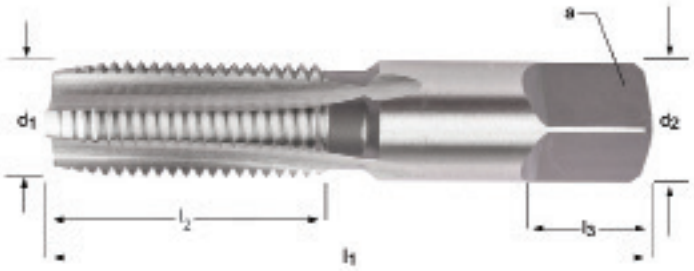
1/16 - 1.1/4

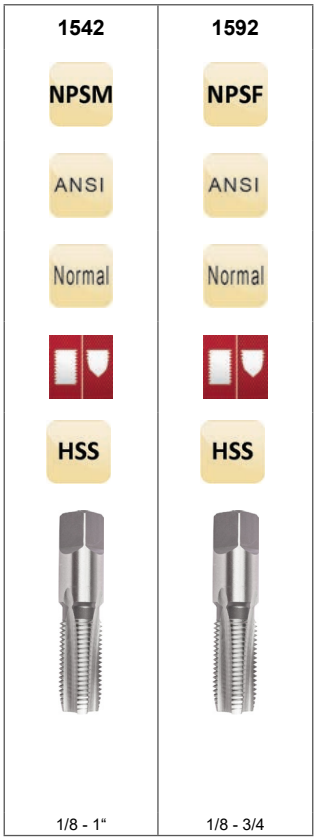
NPTF	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes		Pack Qty	E712
1/16	27	7.94	65	17	11.7	8.1	6.0	8	4	6.20	1	0100004
1/8	27	10.29	70	19	11.9	11.1	8.3	10	4	8.40	1	0100035
1/4	18	13.72	75	27	17.6	14.3	10.7	11	4	10.90	1	0100028
3/8	18	17.15	80	27	19.5	17.8	13.5	13	4	14.25	1	0100059
1/2	14	21.34	100	35	22.7	17.5	13.1	16	4	17.75	1	0100011
3/4	14	26.67	105	35	24.4	23.0	17.2	17	5	23.00	1	0100042
1“	11.5	33.40	115	43	29.4	28.6	21.4	21	5	29.00	1	0099988
1.1/4	11.5	42.16	125	43	27.7	33.4	24.9	23	5	37.75	1	0099995

Straight Pipe Taps, NPS & NPSF

1542 NPSM (Mechanical) - Suitable for tapping holes for low pressure work, and then assemble with either taper threaded or straight threaded pipe or fitting and secure a tight joint with lubricant or sealer.

1592 NPSF (Dryseal) - Similar in design to the 1542 series but manufactured to Dryseal American National Standard Pipe Thread NPSF specifications. Intended for low pressure work where a sealer is not used such as fuel and oil lines. When assembling with a dryseal taper-threaded part there will not be any clearance between the crest and roof of the threads.



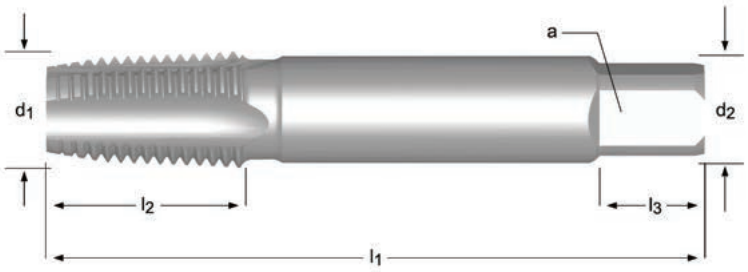


Nominal d_1	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☑ a Inch	l_3 Inch	# of Flutes	Pack Qty	1542	1592
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010587	1010592
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010581	1010588
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010582	1010589
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010583	1010590
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010584	1010591
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010585	1011070
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010586	—

DORMER

Taper Pipe Taps, British Standard

E550 Similar to the E710 but manufactured to British Standard Taper Pipe Thread specification (BSPT).



E550

Rc

ISO 2284

Normal

HSS

1/8 - 2"

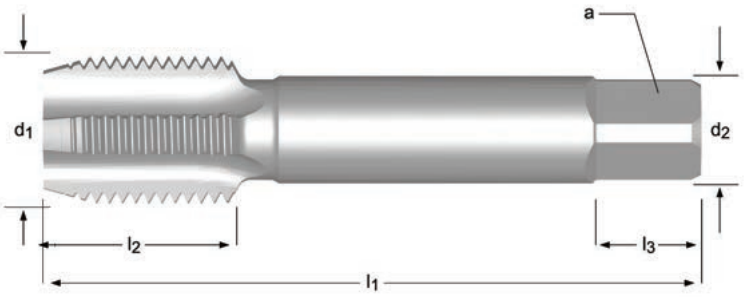
Rc	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Pack Qty	E550	
1/8	28	9.728	59	15	8.0	6.3	9	3	8.4	1	0099490	
1/8	28	9.728	59	15	8.0	6.3	9	3	8.4	Set of 2	0159408	1)
1/4	19	13.157	67	19	10.0	8.0	11	3	11.2	1	0099483	
1/4	19	13.157	67	19	10.0	8.0	11	3	11.2	Set of 2	0159422	1)
3/8	19	16.662	75	21	12.5	10.0	13	3	14.75	1	0099520	
3/8	19	16.662	75	21	12.5	10.0	13	3	14.75	Set of 2	0159446	1)
1/2	14	20.955	87	26	16.0	12.5	16	5	18.25	1	0099476	
1/2	14	20.955	87	26	16.0	12.5	16	5	18.25	Set of 2	0159460	1)
3/4	14	26.441	96	28	20.0	16.0	20	5	23.75	1	0099513	
3/4	14	26.441	96	28	20.0	16.0	20	5	23.75	Set of 2	0159484	1)
1"	11	33.249	109	33	25.0	20.0	24	5	30	1	0099445	
1.1/4	11	41.910	119	36	31.5	25.0	28	5	38.5	1	0099469	
1.1/2	11	47.803	125	37	35.5	28.0	31	7	44.5	1	0099452	
2"	11	59.614	140	41	40.0	31.5	34	7	56	1	0099506	

Note: ISO shank and square dimensions will necessitate metric holders

[1] Sets (No.7) include: *1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)*

Straight Pipe Taps, British Standard

E547 Similar to the NPS pipe taps, but manufactured to British Standard Parallel Pipe Thread specifications (BSPP).



E547

G

ISO 2284

Normal

HSS

1/8 - 2“

Nominal d_1	TPI	l_1 mm	l_2 mm	d_2 Ø mm	⍁ a mm	l_3 mm	# of Flutes	↔	Pack Qty	Taper	Plug	Bottoming
1/8	28	59	15	8.0	8.0	9	4	8.8	1	0157169	0157176	0099285
1/4	19	67	19	10.0	8.0	11	4	11.8	1	0157190	0157206	0099278
3/8	19	75	21	12.5	10.0	13	4	15.25	1	0157220	0157237	0099315
1/2	14	87	26	16.0	12.5	16	4	19	1	0157251	0157268	0099261
5/8	14	91	26	18.0	14.0	18	4	21	1	0157282	0099322	0099339
3/4	14	96	28	20.0	16.0	20	4	24.5	1	0157299	0150757	0099308
7/8	14	102	29	22.4	18.0	22	4	28.25	1	0157305	0099353	0099360
1“	11	109	33	25.0	20.0	24	4	30.75	1	0157312	0157329	0099254
1.1/4	11	119	36	31.5	25.0	28	6	39.5	1	0157336	0099216	0099223
1.1/2	11	125	37	35.5	28.0	31	6	45	1	0157343	0099193	0099209
2“	11	140	41	40.0	31.5	34	6	57	1	0157367	0157374	0099292

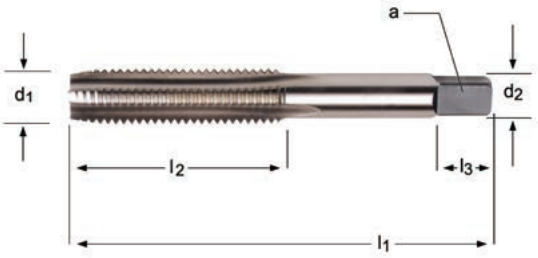
Note: ISO shank and square dimensions will necessitate metric holders

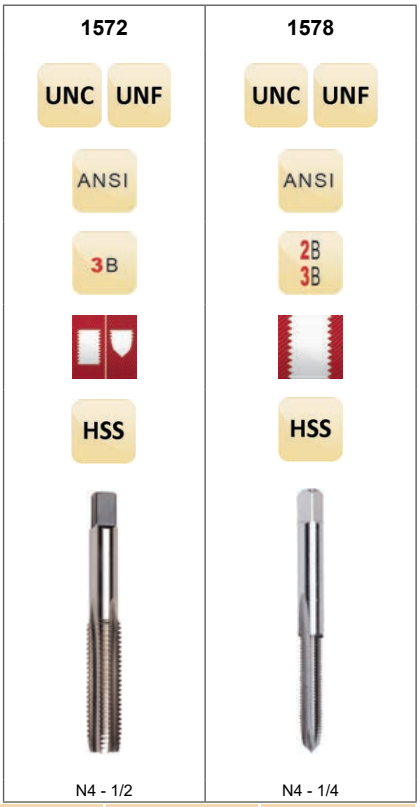
UNION BUTTERFIELD

Screw Thread Insert, STI

1572 - *Straight flute, hand tap*
1578 - *Spiral point, machine tap*

Designed for use in aluminum, magnesium, and other non-ferrous materials where taps of this type are most commonly used. Taps suitable for other materials can be furnished on request. STI taps are dimensionally oversize and utilize a larger tap drill size so that the thread they produce will accept a helical coil wire screw thread insert of the same nominal size and pitch. For a particular size and pitch the lower H-Limit number is suggested for class 2B and 3B threads, while the higher H-Limit is suggested for class 2B.





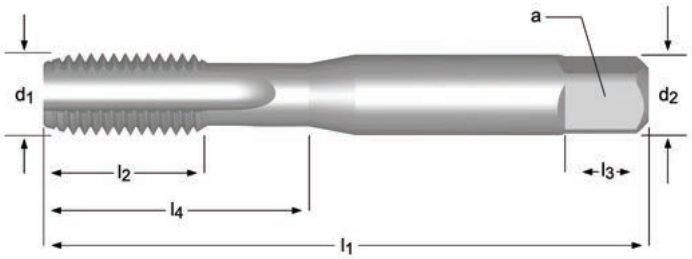
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1572 - Plug	1572 Bottoming	1578 - Plug
4	40		2“	11/16	0.1410	0.1100	3/16	2	H2	1	—	—	1010491
4	40		2“	11/16	0.1410	0.1100	3/16	3	H2	1	1010419	1010421	—
6	32		2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	—	1010494
6	32		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	—	1010495
6	32		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010427	1010429	—
8	32		2.3/8	15/16	0.2200	0.1650	9/32	2	H2	1	—	—	1010498
8	32		2.3/8	15/16	0.2200	0.1650	9/32	2	H3	1	—	—	1010499
8	32		2.3/8	15/16	0.2200	0.1650	9/32	3	H3	1	1010435	1010437	—
10	24		2.1/2	1“	0.2550	0.1910	5/16	3	H2	1	1010438	1010440	—
10		32	2.1/2	1“	0.2550	0.1910	9/32	2	H2	1	—	—	1010502
10		32	2.1/2	1“	0.2550	0.1910	5/16	3	H2	1	1010442	1010444	—
10		32	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010443	1010445	—
1/4	20		2.23/32	1.1/8	0.3180	0.2380	5/16	2	H2	1	—	—	1010506
1/4	20		2.23/32	1.1/8	0.3180	0.2380	5/16	2	H3	1	—	—	1010507
1/4	20		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010451	1010453	—
1/4		28	2.23/32	1.1/8	0.3180	0.2380	5/16	2	H2	1	—	—	1010508
1/4		28	2.23/32	1.1/8	0.3180	0.2380	5/16	2	H3	1	—	—	1010509
1/4		28	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H2	1	—	1010456	—
5/16	18		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010458	—	—
3/8	16		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010466	1010468	—
7/16	14		3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	1010474	—	—
7/16		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	—	—	—
1/2	13		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	1	1010482	—	—
1/2		20	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	—	—	—

Screw Thread Insert, STI, Semi-Bottoming

E620 - Straight flute

E621 - Spiral flute

Designed for use in aluminum, magnesium, and other non-ferrous materials where taps of this type are most commonly used. Taps suitable for other materials can be furnished on request. STI taps are dimensionally oversize and utilize a larger tap drill size so that the thread they produce will accept a helical coil wire screw thread insert of the same nominal size and pitch.



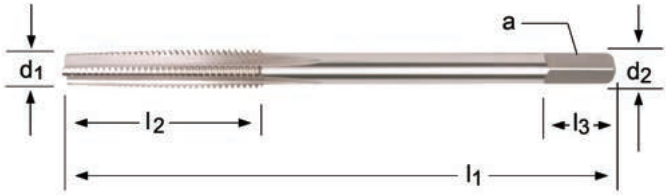
	E620	E621
	EGM	EGM
	DORMER ISO	DORMER ISO
	6H	6H
	HSS	HSS
	M3 - M16	M3 - M16

Nominal d_1	P mm	l_1 mm	l_2 mm	d_2 Ø mm	⍁ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Pack Qty	E620	E621
3	0.50	53	14	4.00	3.15	6	3	3.2	14	1	0384824	0384916
4	0.70	58	11	5.00	4.00	7	3	4.2	20	1	0384831	0384923
5	0.80	66	13	6.30	5.00	8	3	5.2	26	1	0384848	0384930
6	1.00	72	16	8.00	6.30	9	3	6.3	29	1	0384855	—
6	1.00	72	16	8.00	6.30	9	3	6.3	31	1	—	0384947
8	1.25	80	18	10.00	8.00	11	3	8.4	32	1	0384862	—
8	1.25	80	18	10.00	8.00	11	3	8.4	34	1	—	0384954
10	1.50	89	22	9.00	7.10	10	3	10.5		1	0384879	0384961
12	1.75	95	24	11.20	9.00	12	4	12.5		1	0384886	—
12	1.75	95	24	11.20	9.00	12	3	12.5		1	—	0384978
14	2.00	112	29	14.00	11.20	14	4	14.5		1	0384893	—
14	2.00	112	29	14.00	11.20	14	3	14.5		1	—	0384985
16	2.00	112	29	14.00	11.20	14	4	16.5		1	0384909	—
16	2.00	112	29	14.00	11.20	14	3	16.5		1	—	0384992

UNION BUTTERFIELD

Nut Style

U1511 For small production runs in conventional tapping machines. They have a relatively long shank smaller than the minor diameter to permit accumulation of several nuts after tapping. Available in taper style, 7-10 thread chamfer.



UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	U1511
1/4	20	5“	1.5/8	0.1850	0.1390	9/16	4	H3	Taper	1	1010375
5/16	18	5.1/2	1.13/16	0.2400	0.1800	5/8	4	H3	Taper	1	1010376
3/8	16	6“	2“	0.2940	0.2200	11/16	4	H3	Taper	1	1010377
1/2	13	7“	2.1/2	0.4000	0.3000	7/8	4	H3	Taper	1	1010378

Pulley Style

1519 These taps have the same major diameters and pitch diameters as standard fractional size taps, but with extended shanks for reaching locations inaccessible to regular hand taps. Although originally designed for tapping pulley holes, the long shank permits tapping other long reach applications.

1519

UNC

ANSI

3B

HSS

1/4 - 3/4

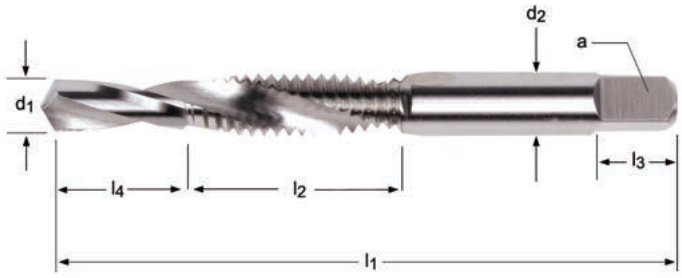
UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1519
1/4	20	6“	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1010379
1/4	20	8“	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1010380
5/16	18	6“	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1010381
5/16	18	8“	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1010382
3/8	16	6“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010383
3/8	16	8“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010384
3/8	16	10“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010385
1/2	13	6“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010388
1/2	13	8“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010389
1/2	13	10“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010390
5/8	11	6“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010392
5/8	11	8“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010393
5/8	11	10“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010394
3/4	10	10“	2.000	0.7590	0.5690	3/4	4	H3	Plug	1	1010396

UNION BUTTERFIELD

Combination Drill & Tap

1994 Spiral Flute 15º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Bright finish improves chip flow in soft or non-ferrous materials.



1994(UNF)

UNC UNF

ANSI

2B

HSS

No.4 - 1/2

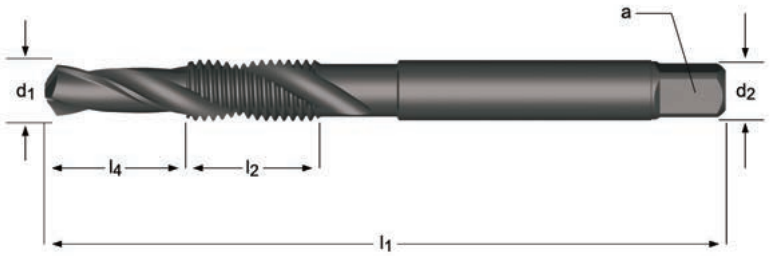
UNC	UNF	TPI	d_1 Ø Inch	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	l_4 Inch	# of Flutes	Pack Qty	1994
4		40	0.0890	1.7/8	3/8	0.1410	0.1100	3/16	1/4	2	1	1110010
5		40	0.1015	1.15/16	13/32	0.1410	0.1100	3/16	9/32	2	1	1110020
6		32	0.1110	2“	7/16	0.1410	0.1100	3/16	5/16	2	1	1110030
8		32	0.1360	2.1/8	1/2	0.1680	0.1310	1/4	3/8	2	1	1110040
10		24	0.1540	2.3/8	5/8	0.1940	0.1520	1/4	13/32	2	1	1110050
	10	32	0.1610	2.3/8	5/8	0.1940	0.1520	1/4	13/32	2	1	1110054
12		24	0.1800	2.3/8	21/32	0.2200	0.1650	9/32	15/32	2	1	1110060
	12	28	0.1850	2.3/8	21/32	0.2200	0.1650	9/32	15/32	2	1	1110064
1/4		20	0.2055	2.1/2	25/32	0.2550	0.1910	5/16	17/32	2	1	1110080
	1/4	28	0.2188	2.1/2	25/32	0.2550	0.1910	5/16	17/32	2	1	1110084
5/16		18	0.2660	2.27/32	15/16	0.3180	0.2380	3/8	11/16	2	1	1110090
	5/16	24	0.2770	2.27/32	15/16	0.3180	0.2380	3/8	11/16	2	1	1110094
3/8		16	0.3230	3.3/8	1.1/16	0.3810	0.2860	7/16	13/16	2	1	1110100
	3/8	24	0.3390	3.3/8	1.1/16	0.3810	0.2860	7/16	13/16	2	1	1110104
7/16		14	0.3770	3.3/4	1.1/4	0.3230	0.2420	13/32	1“	2	1	1110110
	7/16	20	0.3937	3.3/4	1.1/4	0.3230	0.2420	13/32	1“	2	1	1110114
1/2		13	0.4331	4.1/16	1.3/8	0.3670	0.2750	7/16	1.1/8	2	1	1110120
	1/2	20	0.4531	4.1/16	1.3/8	0.3670	0.2750	7/16	1.1/8	2	1	1110124

Combination Drill & Tap

E651
E654

Spiral Flute 30º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Steam oxide finish reduces wear and chip welding in harder ferrous materials.



E651 / E654

UNC UNF

DORMER DIN

2B

HSS

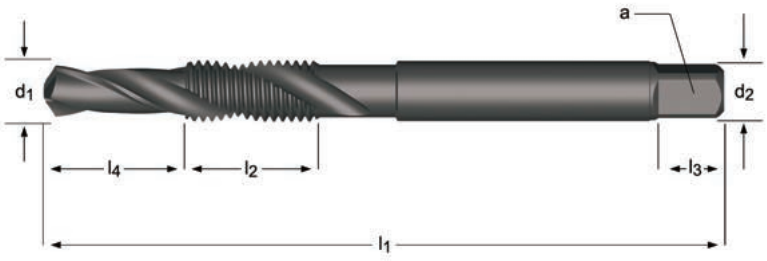
No.6 - 5/8

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	a mm	# of Flutes	Pack Qty	E651 / E654
6		32	2.85	56.9	12	6.0	3.50	2.90	2	1	0388907
8		32	3.50	64.0	12	8.0	4.50	3.55	2	1	0273272
	8	36	3.50	64.0	13	8.0	4.50	3.55	2	1	0339053
10		24	3.90	72.0	15	10.0	5.00	4.00	2	1	0273197
	10	32	4.10	72.0	16	10.0	5.00	4.00	2	1	0338971
12		24	4.50	77.0	15	11.0	5.60	4.50	2	1	0273210
	12	28	4.70	77.0	17	11.0	5.60	4.50	2	1	0338995
1/4		20	5.10	83.0	17	13.0	6.30	5.00	2	1	0273227
	1/4	28	5.50	83.0	19	13.0	6.30	5.00	2	1	0339008
5/16		18	6.60	94.0	21	16.0	8.00	6.30	2	1	0273241
	5/16	24	6.90	94.0	22	16.0	8.00	6.30	2	1	0339022
3/8		16	8.00	104.0	23	19.0	10.00	8.00	2	1	0273234
	3/8	24	8.50	104.0	24	19.0	10.00	8.00	2	2	0339015
7/16		14	9.40	107.0	25	22.0	8.00	6.30	2	1	0273265
	7/16	20	9.90	107.0	25	22.0	8.00	6.30	2	1	0339046
1/2		13	10.80	114.0	29	25.0	9.00	7.10	2	1	0273203
	1/2	20	11.50	114.0	29	25.0	9.00	7.10	2	1	0338988
9/16		12	12.20	124.0	29	28.0	11.20	9.00	2	1	0273289
	9/16	18	12.90	124.0	30	28.0	11.20	9.00	2	1	0339060
5/8		11	13.50	134.0	31	32.5	12.50	10.00	2	1	0273258
	5/8	18	14.50	134.0	32	32.0	12.50	10.00	2	1	0339039

Combination Drill & Tap

E650 Spiral Flute 30º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Steam oxide finish reduces wear and chip welding in harder ferrous materials.

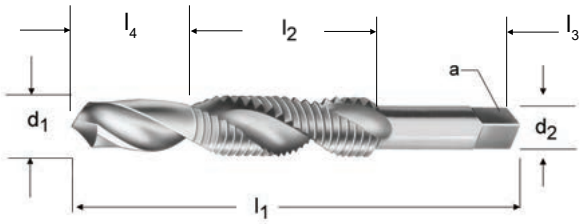


M	P mm	d_1 Ø mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	Pack Qty	E650
3	0.50	2.5	56	10	6	3.15	2.5	5.0	2	1	0167861
4	0.70	3.3	65	12	8	4.0	3.15	6.0	2	1	0127551
5	0.80	4.2	69	15	10	5.0	4.00	7.0	2	1	0127568
6	1.00	5.0	84	18	12	6.3	5.00	8.0	2	1	0127575
8	1.25	6.8	96	21	16	8.0	6.30	9.0	2	1	0127582
10	1.50	8.5	108	22	20	10.0	8.00	11.0	2	1	0127513
12	1.75	10.2	113	29	24	9.0	7.10	10.0	2	1	0127520
14	2.00	12.0	123	30	28	11.2	9.00	12.0	2	1	0127537
16	2.00	14.0	134	32	32	12.5	10.00	13.0	2	1	0127544

Combination Drill & Tap, NPT Pipe Threads

E653 Spiral Flute 27º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity.

Bright finish improves chip flow in soft or non-ferrous materials.



E653

NPT

ANSI

Normal

HSS

1/8 - 1“

NPT	TPI	d_1 nom Inch	l_1 Inch	l_2 Inch	l_3 Inch	l_4 Inch	d_2 Ø Inch	☐ a Inch	# of Flutes	Pack Qty	E653
1/8	27	0.3346	2.7/8	3/4	3/8	3/4	0.4370	0.3280	2	1	0297285
1/4	18	0.4331	3.5/16	1.1/16	7/16	7/8	0.5620	0.4210	2	1	0297278
3/8	18	0.5709	3.1/2	1.1/16	1/2	15/16	0.7000	0.5310	2	1	0297308
1/2	14	0.7087	4.3/8	1.3/8	5/8	1.1/4	0.6870	0.5150	2	1	0297261
3/4	14	0.9055	4.9/16	1.3/8	11/16	1.5/16	0.9060	0.6790	2	1	0297292
1“	11.5	1.1417	5.3/8	1.3/4	13/16	1.5/8	1.1250	0.8430	2	1	0297247

Tap Wrench, T-Handle

1215 T-Handle tap wrenches have a sliding handle and chuck. Designed for hand tapping in tight places and can also be used with any tool that can be turned by hand.

Tap Wrench #	Hand Reamer Capacity Inch	Hand Reamer Capacity mm	Hand Tap Capacity Inch	Hand Tap Capacity mm	Pack Qty	1215
T0	1/8 - 3/16	M3 - M5	1/16 - 5/32	M1 - M4	1	1810372
T1	3/16 - 5/16	M4 - M7	3/16 - 7/16	M4 - M10	1	1810373
T2	1/4 - 15/32	M6 - M14	1/4 - 9/16	M6 - M14	1	1810374

Tap Wrench, Straight Handle

3850 Straight handle tap wrenches are ideal for hand tapping. The straight handle design provides greater leverage, particularly suited for use with larger diameters. Simple to operate. Hardened steel jaws are opened and closed by simply twisting one hand which is knurled for side gripping.

Number	Hand Reamer Capacity Inch	Hand Reamer Capacity mm	Hand Tap Capacity Inch	Hand Tap Capacity mm	l_1 Length	Pack Qty	3850
8	1/8 - 5/16	M3 - M8	1/16 - 5/16	M1 - M8	7“	1	1810017
9	3/16 - 3/8	M5 - M9	3/16 - 1/2	M4 - M12	10.1/2“	1	1810018
10	1/4 - 9/16	M6 - M14	1/4 - 3/4	M3 - M8	15“	1	1810019
11	3/8 - 3/4	M9 - M19	3/8 - 1“	M10 - M25	20“	1	1810020
12	3/8 - 7/8	M9 - M22	3/8 - 1.1/8	M10 - M27	25.5/8“	1	1810021
14	5/8 - 1.1/2	M16 - M39	7/8 - 1.7/8	M22 - M42	40.1/2“	1	1810022

Tap & Drill Combination Sets

229CSET 18 piece tap (styles 1500 and 1528) with corresponding drills (styles R10P & R18P). Metal index.

229CSET

UNC

ANSI

HSS

Set

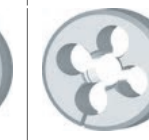
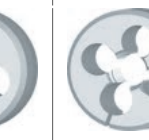
Set	Style	Pieces per Set	UNC Tap Sizes	Tap Drill Sizes	Pack Qty	229CSET
229C	1500,1528 Taps; R10P,R15P,R18P Drills	18	6-32,8-32,10-24,10-32,1/4-20,5/16-18,3/8-16,7/16-14,1/2-13	#36,#29,#25,#21,#7,F,5/16,U,27/64	1	4111502

Visual Index - Dies

Thread Form:	UNC	UNF
Standard:	ANSI	ANSI
Tolerance:		
Chamfer:		
Tool Material:	CS	CS
Direction of Cut:		
Finish/Coating:		
Style:	**2010(UNC)**	**2010(UNF)**
Range:	No.4 - 1.1/2	No.10 - 1.1/2

Application Material Groups (AMG)			**Hardness HRC**	**Page #**	**383**	**383**
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	1.1	26	26
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	1.2	23	23
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	1.3	20	20
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	1.4	16	16
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	1.5		
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	1.6		
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	1.7		
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	1.8		
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	2.1	13	13
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	2.2	7	7
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	2.3		
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	2.4		
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	3.1	26	26
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	3.2	23	23
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	3.3	20	20
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	3.4	16	16
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	4.1		
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	4.2		
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	4.3	7	7
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	5.1	30	30
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	5.2	7	7
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	5.3	7	7
6.Copper	6.1 Copper	Commercially Pure	<100 HB	6.1	30	30
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	6.2	26	26
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	6.3	23	23
	6.4 High Strength Bronze	Ampco 18-25	<49	6.4		
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	7.1	33	33
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	7.2	49	49
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	7.3	49	49
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	7.4	33	33
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	8.1	49	49
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	8.2	33	33
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	8.3	16	16
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	9.1		
10.Graphite	10.1 Standard graphite		---	10.1		

Visual Index - Dies

	UNS	NPT	UNC	UNF	UNC	UNF	M	G
	ANSI	ANSI	ANSI	ANSI	BS 1127: 1950	BS 1127: 1950	ANSI	BS 1127: 1950
					1.75XP	1.75XP		1.75XP
	CS	CS	HSS	HSS	HSS	HSS	HSS	HSS
								
	2010(UNS)	**2010(NPT)**	**2510(UNC)**	**2510(UNF)**	**F320**	**F330**	**2710M**	**F370**
	1“	1/8 - 1/2	No.5 - 7/8	No.5 - 7/8	No.4 - 1.1/4	No.4 - 1.1/2	M2 - M20	1/8 - 1.1/2
	373	**373**	**385**	**385**	**387**	**387**	**389**	**390**
1.1	26	26	26	26	26	26	26	26
1.2	23	23	23	23	23	23	23	23
1.3	20	20	20	20	20	20	20	20
1.4	16	16	16	16	16	16	16	16
1.5								
1.6								
1.7								
1.8								
2.1	13	13	13	13	13	13	13	13
2.2	7	7	7	7	7	7	7	7
2.3								
2.4								
3.1	26	26	26	26	26	26	26	26
3.2	23	23	23	23	23	23	23	23
3.3	20	20	20	20	20	20	20	20
3.4	16	16	16	16	16	16	16	16
4.1								
4.2								
4.3	7	7	7	7	7	7	7	7
5.1	30	30	30	30	30	30	30	30
5.2	7	7	7	7	7	7	7	7
5.3	7	7	7	7	7	7	7	7
6.1	30	30	30	30	30	30	30	30
6.2	26	26	26	26	26	26	26	26
6.3	23	23	23	23	23	23	23	23
6.4								
7.1	33	33	33	33	33	33	33	33
7.2	49	49	49	49	49	49	49	49
7.3	49	49	49	49	49	49	49	49
7.4	33	33	33	33	33	33	33	33
8.1	49	49	49	49	49	49	49	49
8.2	33	33	33	33	33	33	33	33
8.3	16	16	16	16	16	16	16	16
9.1								
10.1								

Visual Index - Dies

	M	UNC	UNF	UNS	NPT	M	M	MF
	ISO 2568	ANSI	ANSI	ANSI	ANSI	ANSI	BS 1127: 1950	BS 1127: 1950
	6g						6g	6g
	1.75XP						1.75XP	1.75XP
	HSS	CS	CS	CS	CS	CS	HSS	HSS
	F201	**2025(UNC)**	**2025(UNF)**	**2025(UNS)**	**2025(NPT)**	**2325M**	**F302**	**F312**
	M3 - M20	1/4 - 1.1/2	1/4 - 1.1/2	11/16 - 1“	1/8 - 1“	M6 - M20	M3 - M36	M8 - M24
	391	**392**	**392**	**392**	**392**	**393**	**394**	**395**
1.1	26	26	26	26	26	26	26	26
1.2	23	23	23	23	23	23	23	23
1.3	20	20	20	20	20	20	20	20
1.4	16	16	16	16	16	16	16	16
1.5								
1.6								
1.7								
1.8								
2.1	13	13	13	13	13	13	13	13
2.2	7	7	7	7	7	7	7	7
2.3								
2.4								
3.1	26	26	26	26	26	26	26	26
3.2	23	23	23	23	23	23	23	23
3.3	20	20	20	20	20	20	20	20
3.4	16	16	16	16	16	16	16	16
4.1								
4.2								
4.3	7	7	7	7	7	7	7	7
5.1	30	30	30	30	30	30	30	30
5.2	7	7	7	7	7	7	7	7
5.3	7	7	7	7	7	7	7	7
6.1	30	30	30	30	30	30	30	30
6.2	26	26	26	26	26	26	26	26
6.3	23	23	23	23	23	23	23	23
6.4								
7.1	33	33	33	33	33	33	33	33
7.2	49	49	49	49	49	49	49	49
7.3	49	49	49	49	49	49	49	49
7.4	33	33	33	33	33	33	33	33
8.1	49	49	49	49	49	49	49	49
8.2	33	33	33	33	33	33	33	33
8.3	16	16	16	16	16	16	16	16
9.1								
10.1								

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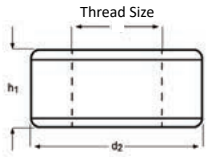
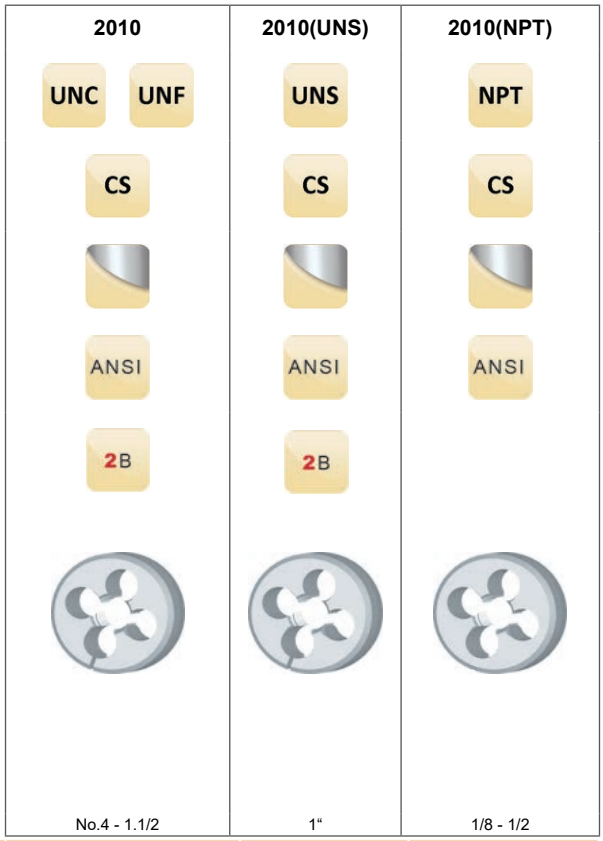
Round Adjustable, Split Type

2010 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die NPT type dies are not split*





UNC	UNF	UNS	NPT	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2010 (UNC)(UNF)	2010 (UNS)	2010 (NPT)
4				40	13/16	1/4	1	1410016	—	—
5				40	13/16	1/4	1	1410022	—	—
6				32	1“	3/8	1	1410027	—	—
6				32	13/16	1/4	1	1410026	—	—
8				32	1“	3/8	1	1410033	—	—
8				32	13/16	1/4	1	1410032	—	—
	10			32	1“	3/8	1	1410042	—	—
	10			32	13/16	1/4	1	1410041	—	—
10				24	1“	3/8	1	1410039	—	—
10				24	13/16	1/4	1	1410038	—	—
	12			28	13/16	1/4	1	1410047	—	—
12				24	13/16	1/4	1	1410044	—	—
	1/4			28	1“	3/8	1	1410069	—	—
	1/4			28	1.1/2	1/2	1	1410071	—	—
	1/4 (UNEF)			32	1“	3/8	1	1410077	—	—
1/4				20	1“	3/8	1	1410064	—	—
1/4				20	1.1/2	1/2	1	1410066	—	—
1/4				20	13/16	1/4	1	1410063	—	—
	5/16			24	1“	3/8	1	1410085	—	—
	5/16			24	1.1/2	1/2	1	1410087	—	—
	5/16			32	1“	3/8	1	1410090	—	—
5/16				18	1“	3/8	1	1410080	—	—
5/16				18	1.1/2	1/2	1	1410082	—	—
5/16				18	13/16	1/4	1	1410079	—	—
5/16				18	2“	5/8	1	1410083	—	—
	3/8			24	1“	3/8	1	1410097	—	—
	3/8			24	1.1/2	1/2	1	1410099	—	—
3/8				16	1“	3/8	1	1410093	—	—
3/8				16	1.1/2	1/2	1	1410095	—	—
3/8				16	2“	5/8	1	1410096	—	—
			1/8	27	1“	3/8	1	—	—	1410203
			1/8	27	1.1/2	1/2	1	—	—	1410204
	7/16			20	1“	3/8	1	1410105	—	—

DIES

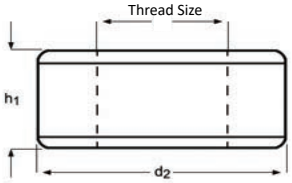
UNION BUTTERFIELD

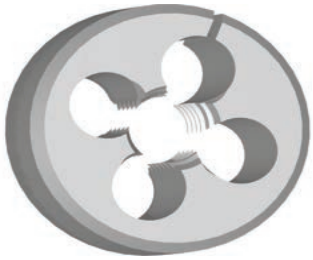
UNC	UNF	UNS	NPT	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2010 (UNC)(UNF)	2010 (UNS)	2010 (NPT)
	7/16			20	1.1/2	1/2	1	1410107	—	—
7/16				14	1“	3/8	1	1410101	—	—
7/16				14	1.1/2	1/2	1	1410103	—	—
	1/2			20	1.1/2	1/2	1	1410114	—	—
1/2				13	1.1/2	1/2	1	1410110	—	—
1/2				13	2“	5/8	1	1410111	—	—
			1/4	18	1.1/2	1/2	1	—	—	1410205
			1/4	18	2“	5/8	1	—	—	1410206
	9/16			18	1.1/2	1/2	1	1410120	—	—
9/16				12	1.1/2	1/2	1	1410117	—	—
	5/8			18	1.1/2	1/2	1	1410126	—	—
	5/8			18	2“	5/8	1	1410127	—	—
5/8				11	1.1/2	1/2	1	1410123	—	—
5/8				11	2“	5/8	1	1410124	—	—
			3/8	18	1.1/2	1/2	1	—	—	1410207
			3/8	18	2“	5/8	1	—	—	1410208
	3/4			16	2“	5/8	1	1410133	—	—
3/4				10	2“	5/8	1	1410131	—	—
			1/2	14	2“	5/8	1	—	—	1410209
	7/8			14	2“	5/8	1	1410137	—	—
7/8				9	2“	5/8	1	1410135	—	—
		1“		14	3“	1“	1	—	1410144	—
	1“			12	3“	1“	1	1410142	—	—
1“				8	3“	1“	1	1410140	—	—
1.1/8				7	3“	1“	1	1410145	—	—
	1.1/4			12	3“	1“	1	1410148	—	—
1.1/4				7	3“	1“	1	1410147	—	—
1.3/8				6	3“	1“	1	1410149	—	—
	1.1/2			12	3“	1“	1	1410152	—	—
1/1/2				6	3“	1“	1	1410151	—	—

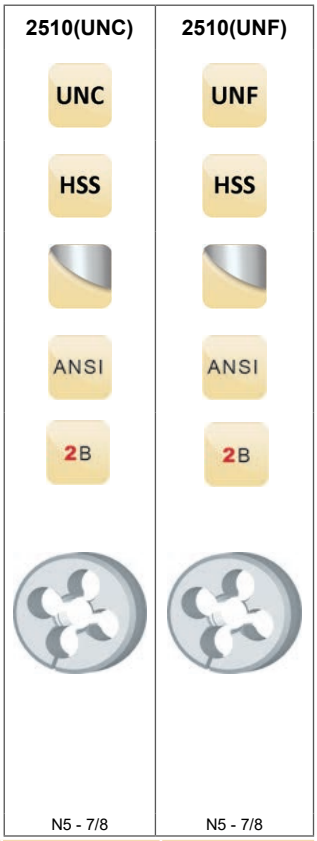
Round Adjustable, Split Type

2510 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*







UNC	UNF	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2510(UNC)	2510(UNF)
	5	44	13/16	1/4	1	—	1410154
5		40	13/16	1/4	1	1410153	—
	6	40	13/16	1/4	1	—	1410157
	8	36	13/16	1/4	1	—	1410161
8		32	1“	3/8	1	1410160	—
8		32	13/16	1/4	1	1410159	—
	10	32	1“	3/8	1	—	1410165
	10	32	13/16	1/4	1	—	1410166
10		24	1“	3/8	1	1410164	—
10		24	13/16	1/4	1	1410163	—
	12	28	13/16	1/4	1	—	1410169
12		24	13/16	1/4	1	1410167	—
	1/4	28	1“	3/8	1	—	1410175
	1/4	28	1.1/2	1/2	1	—	1410176
	1/4	28	13/16	1/4	1	—	1410174
1/4		20	1“	3/8	1	1410172	—
1/4		20	1.1/2	1/2	1	1410173	—
	5/16	24	1“	3/8	1	—	1410181
	5/16	24	1.1/2	1/2	1	—	1410182
	5/16	24	13/16	1/4	1	—	1410180
5/16		18	1“	3/8	1	1410178	—
5/16		18	1.1/2	1/2	1	1410179	—
	3/8	24	1“	3/8	1	—	1410185
	3/8	24	1.1/2	1/2	1	—	1410186
3/8		16	1“	3/8	1	1410183	—
3/8		16	1.1/2	1/2	1	1410184	—
	7/16	20	1“	3/8	1	—	1410189
	7/16	20	1.1/2	1/2	1	—	1410190
7/16		14	1“	3/8	1	1410187	—
7/16		14	1.1/2	1/2	1	1410188	—
	1/2	20	1.1/2	1/2	1	—	1410192
1/2		13	1.1/2	1/2	1	1410191	—
	9/16	18	1.1/2	1/2	1	—	1410194

DIES

UNION BUTTERFIELD

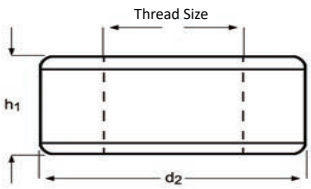
UNC	UNF	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2510(UNC)	2510(UNF)
9/16		12	1.1/2	1/2	1	1410193	—
	5/8	18	1.1/2	1/2	1	—	1410197
5/8		11	1.1/2	1/2	1	1410195	—
	3/4	16	2“	5/8	1	—	1410200
3/4		10	2“	5/8	1	1410199	—
	7/8	14	2“	5/8	1	—	1410202
7/8		9	2“	5/8	1	1410201	—

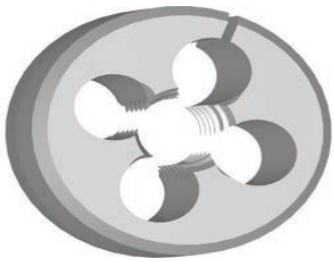
Round Adjustable, Split Type

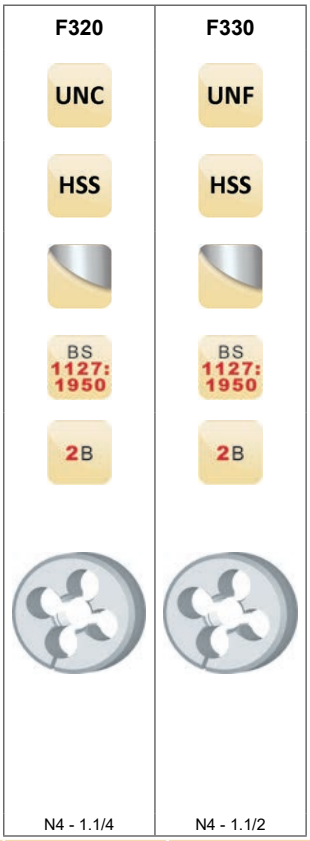
F320
F330

Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*







UNC	UNF	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F320	F330
	4	48	2.85	13/16	1/4	1	—	0207307
4		40	2.85	13/16	1/4	1	0206614	—
	5	44	3.18	13/16	1/4	1	—	0207314
5		40	3.18	13/16	1/4	1	0206621	—
	6	40	3.51	13/16	1/4	1	—	0207338
6		32	3.51	13/16	1/4	1	0206645	—
	8	36	4.17	13/16	1/4	1	—	0207352
8		32	4.17	1“	3/8	1	0206676	—
8		32	4.17	13/16	1/4	1	0206669	—
	10	32	4.83	13/16	1/4	1	—	0207376
	10	32	4.83	1“	3/8	1	—	0207383
10		24	4.83	1“	3/8	1	0206690	—
10		24	4.83	13/16	1/4	1	0206683	—
	12	28	5.49	13/16	1/4	1	—	0207390
12		24	5.49	13/16	1/4	1	0206706	—
	1/4	28	6.35	1“	3/8	1	—	0207420
	1/4	28	6.35	1.1/2	1/2	1	—	0207444
	1/4	28	6.35	13/16	1/4	1	—	0207413
1/4		20	6.35	1“	3/8	1	0206737	—
1/4		20	6.35	1.1/2	1/2	1	0206751	—
1/4		20	6.35	1.5/16	7/16	1	0206744	—
1/4		20	6.35	13/16	1/4	1	0206720	—
	5/16	24	7.94	1“	3/8	1	—	0207451
	5/16	24	7.94	1.1/2	1/2	1	—	0207475
	5/16	24	7.94	1.5/16	7/16	1	—	0207468
5/16		18	7.94	1“	3/8	1	0206768	—
5/16		18	7.94	1.1/2	1/2	1	0206782	—
	3/8	24	9.53	1“	3/8	1	—	0207482
	3/8	24	9.53	1.1/2	1/2	1	—	0207505
	3/8	24	9.53	1.5/16	7/16	1	—	0207499
3/8		16	9.53	1“	3/8	1	0206799	—
3/8		16	9.53	1.1/2	1/2	1	0206812	—
3/8		16	9.53	1.5/16	7/16	1	0206805	—

DIES

DORMER

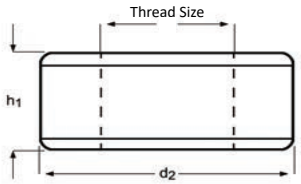
UNC	UNF	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F320	F330
	7/16	20	11.11	1“	3/8	1	—	0207512
	7/16	20	11.11	1.1/2	1/2	1	—	0207536
	7/16	20	11.11	1.5/16	7/16	1	—	0207529
7/16		14	11.11	1.1/2	1/2	1	0206850	—
7/16		14	11.11	1.5/16	7/16	1	0206843	—
	1/2	20	12.70	1.1/2	1/2	1	—	0207550
	1/2	20	12.70	1.5/16	7/16	1	—	0207543
1/2		13	12.70	1.1/2	1/2	1	0206874	—
1/2		13	12.70	1.5/16	7/16	1	0206867	—
1/2		13	12.70	2“	5/8	1	0206881	—
	9/16	18	14.29	1.1/2	1/2	1	—	0207581
	9/16	18	14.29	1.5/16	7/16	1	—	0207574
9/16		12	14.29	1.1/2	1/2	1	0206904	—
	5/8	18	15.88	1.1/2	1/2	1	—	0207604
	5/8	18	15.88	2“	5/8	1	—	0207611
5/8		11	15.88	1.1/2	1/2	1	0206928	—
5/8		11	15.88	2“	5/8	1	0206935	—
	3/4	16	19.05	1.1/2	1/2	1	—	0207635
	3/4	16	19.05	2“	5/8	1	—	0207642
3/4		10	19.05	1.1/2	1/2	1	0206959	—
3/4		10	19.05	2“	5/8	1	0206966	—
	7/8	14	22.23	2“	5/8	1	—	0207659
7/8		9	22.23	2“	5/8	1	0206973	—
	1“	12	25.40	2“	5/8	1	—	0207666
1“		8	25.40	2“	5/8	1	0206980	—
	1.1/8	12	28.58	3“	7/8	1	—	0207673
1.1/8		7	28.58	3“	7/8	1	0206997	—
	1.1/4	12	31.75	3“	7/8	1	—	0207680
1.1/4		7	31.75	3“	7/8	1	0207000	—
	1.1/2	12	38.10	3“	7/8	1	—	0207703

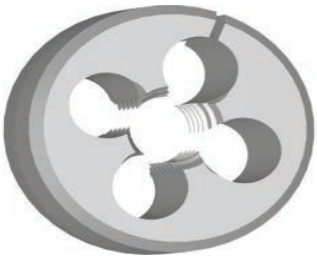
Round Adjustable, Split Type

2710M

Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





2710M

M

HSS

ANSI

6H

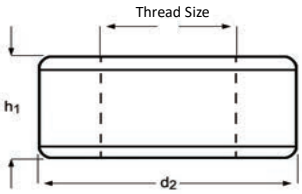
M2 - M20

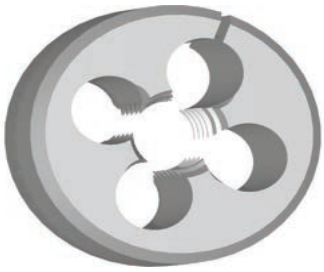
M	P mm	d_2 Ø Inch	h_1 Inch	Pack Qty	2710M
2	0.40	13/16	1/4	1	1410573
2.5	0.45	13/16	1/4	1	1410575
3	0.50	13/16	1/4	1	1410577
4	0.70	13/16	1/4	1	1410579
4.5	0.75	13/16	1/4	1	1410580
5	0.80	13/16	1/4	1	1410581
6	1.00	1“	3/8	1	1410582
8	1.25	1“	3/8	1	1410584
9	1.25	1“	3/8	1	1410585
10.0	1.50	1“	3/8	1	1410586
12	1.75	1“	3/8	1	1410630
12	1.75	1.1/2	1/2	1	1410588
14	2.00	1.1/2	1/2	1	1410589
16	2.00	1.1/2	1/2	1	1410590
18	2.50	2“	5/8	1	1410591
20	2.50	2“	5/8	1	1410592

Round Adjustable, Split Type

F370 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die.*





F370

G

HSS

BS 1127: 1950

1/8 - 1.1/2

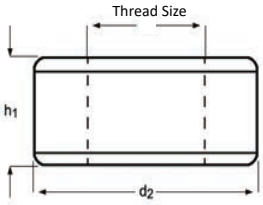
G(BSP)	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F370
1/8	28	9.73	1“	3/8	1	0209325
1/4	19	13.16	1.5/16	7/16	1	0209332
3/8	19	16.66	1.1/2	1/2	1	0209349
1/2	14	20.96	2“	5/8	1	0209356
5/8	14	22.91	2“	5/8	1	0209363
3/4	14	26.44	2“	5/8	1	0209370
7/8	14	30.20	2.1/4	11/16	1	0209387
1“	11	33.25	2.1/4	11/16	1	0209394
1.1/4	11	41.91	3“	7/8	1	0209400
1.1/2	11	47.80	4“	1“	1	0209417

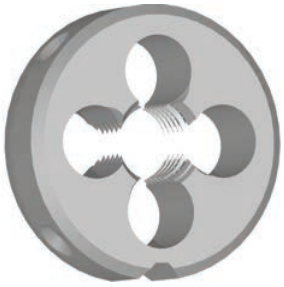
Gun Nosed Dies (Left Hand)

F201

Left hand gun nosed dies have a chamfer length similar to semi-bottoming taps to lead the threads. This design direct chips away from the cutting area. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





F201

M

HSS

ISO 2568

6H

M3 - M20

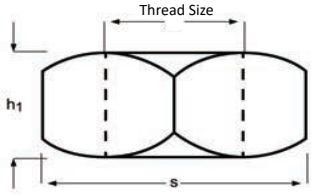
M	P mm	d_2 Ø mm	h_1 mm	Pack Qty	F201
3	0.50	20	5	1	0164747
4	0.70	20	5	1	0105030
5	0.80	20	7	1	0105047
6	1.00	20	7	1	0105054
8	1.25	25	9	1	0105061
10	1.50	30	11	1	0104996
12	1.75	38	14	1	0105009
14	2.00	38	14	1	0105016
16	2.00	45	18	1	0105023
18	2.50	45	18	1	0164754
20	2.50	45	18	1	0164761

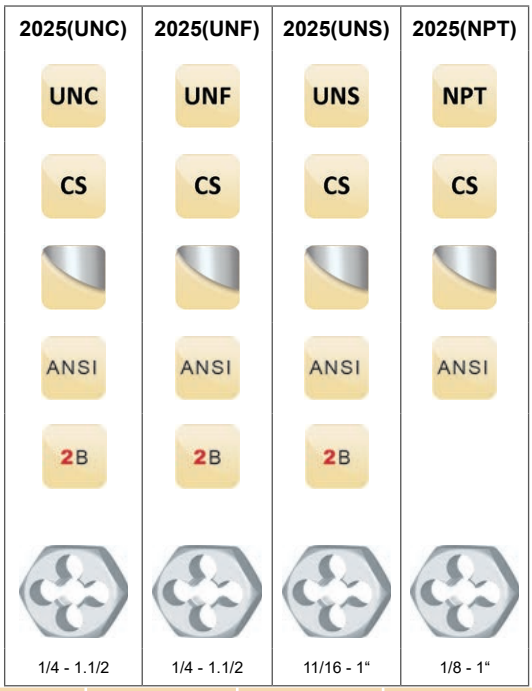
UNION BUTTERFIELD

Hexagon Rethreading Bolt Dies (Dienuts)

2025 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*



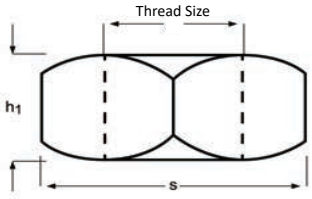


UNC	UNF	UNS	NPT	TPI	S Inch	h_1 Inch	Pack Qty	2025(UNC)	2025(UNF)	2025(UNS)	2025(NPT)
			1/8	27	1.1/16	3/8	1	—	—	—	1410270
	1/4			28	19/32	1/2	1	—	1410240	—	—
1/4				20	19/32	1/2	1	1410239	—	—	—
			1/4	18	1.1/4	5/8	1	—	—	—	1410271
	5/16			24	11/16	5/16	1	—	1410242	—	—
5/16				18	11/16	5/16	1	1410241	—	—	—
	3/8			24	25/32	3/8	1	—	1410244	—	—
3/8				16	25/32	3/8	1	1410243	—	—	—
			3/8	18	1.7/16	5/8	1	—	—	—	1410272
	7/16			20	7/8	7/16	1	—	1410246	—	—
7/16				14	7/8	7/16	1	1410245	—	—	—
	1/2			20	1.1/16	1/2	1	—	1410248	—	—
1/2				13	1.1/16	1/2	1	1410247	—	—	—
			1/2	14	1.5/8	3/4	1	—	—	—	1410273
	9/16			18	1.1/16	1/2	1	—	1410250	—	—
9/16				12	1.1/16	1/2	1	1410249	—	—	—
	5/8			18	1.1/4	5/8	1	—	1410252	—	—
5/8				11	1.1/4	5/8	1	1410251	—	—	—
		11/16		11	1.7/16	3/4	1	—	—	1410253	—
		11/16		16	1.7/16	3/4	1	—	—	1410254	—
	3/4			16	1.7/16	3/4	1	—	1410256	—	—
3/4				10	1.7/16	3/4	1	1410255	—	—	—
			3/4	14	2"	13/16	1	—	—	—	1410274
	7/8			14	1.5/8	7/8	1	—	1410258	—	—
7/8				9	1.5/8	7/8	1	1410257	—	—	—
		1"		14	1.13/16	1"	1	—	—	1410261	—
	1"			12	1.13/16	1"	1	—	1410260	—	—
1"				8	1.13/16	1"	1	1410259	—	—	—
			1"	11.5	2.3/8	1"	1	—	—	—	1410275
	1.1/8			12	2"	1"	1	—	1410263	—	—
1.1/8				7	2"	1"	1	1410262	—	—	—
	1.1/4			12	2.3/16	1"	1	—	1410265	—	—
1.1/4				7	2.3/16	1"	1	1410264	—	—	—
	1.3/8			12	2.3/8	1"	1	—	1410267	—	—
1.3/8				6	2.3/8	1"	1	1410266	—	—	—
	1.1/2			12	2.9/16	1"	1	—	1410269	—	—
1.1/2				6	2.9/16	1"	1	1410268	—	—	—

Hexagon Rethreading Bolt Dies (Dienuts)

2325M Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die.*



2325M

M

CS

ANSI

6H

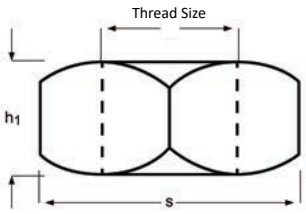
M6 - M20

M	P mm	S Inch	h_1 Inch	Pack Qty	2325M
6	1.00	1	3/8	1	1410609
8	1.25	1	3/8	1	1410611
9	1.25	1	3/8	1	1410612
10	1.50	1	3/8	1	1410613
12	1.75	1	3/8	1	1410615
14	2.00	1.7/16	1/2	1	1410616
16	2.00	1.7/16	1/2	1	1410618
18	1.50	1.7/16	1/2	1	1410620
18	2.50	1.7/16	1/2	1	1410619
20	2.50	1.13/16	3/4	1	1410621

Hexagon Rethreading Bolt Dies (Dienuts)

F302 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on te size of the die.*



F302

M

HSS

BS 1127: 1950

6H

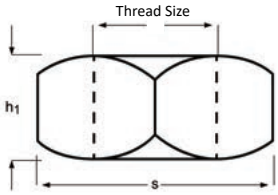
M3 - M36

M	P mm	S decimal Inch	h_1 Inch	Pack Qty	F302
3	0.50	0.7100	1/4	1	0105627
4	0.70	0.7100	1/4	1	0105672
5	0.80	0.7100	1/4	1	0105719
6	1.00	0.7100	1/4	1	0105733
7	1.00	0.8200	5/16	1	0105740
8	1.25	0.8200	5/16	1	0105757
10	1.50	0.9200	3/8	1	0105528
11	1.50	1.0100	7/16	1	0105535
12	1.75	1.1000	1/2	1	0105542
14	2.00	1.3000	5/8	1	0105559
16	2.00	1.3000	5/8	1	0105566
18	2.50	1.4800	11/16	1	0105573
20	2.50	1.4800	11/16	1	0105580
22	2.50	1.6700	13/16	1	0105597
24	3.00	2.0500	15/16	1	0105603
27	3.00	2.2200	1.1/16	1	0105610
30	3.50	2.2200	1.1/16	1	0105634
33	3.50	2.5800	1.1/8	1	0105641
36	4.00	2.7600	1.1/4	1	0105658

Hexagon Rethreading Bolt Dies (Dienuts)

F312 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*



F312

MF

HSS

BS 1127: 1950

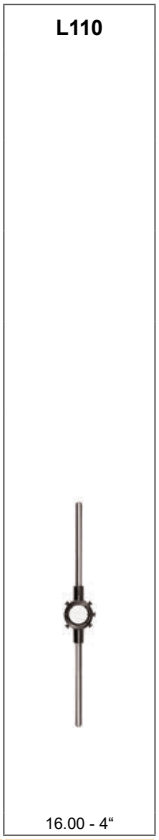
6H

M8 - M24

MF	P mm	S decimal Inch	h_1 Inch	Pack Qty	F312
8	0.75	0.8200	5/16	1	0206331
8	1.00	0.8200	5/16	1	0206348
10	1.00	0.9200	3/8	1	0206379
10	1.25	0.9200	3/8	1	0206386
12	1.00	1.0100	7/16	1	0206393
12	1.25	1.0100	7/16	1	0206409
12	1.50	1.0100	7/16	1	0206416
14	1.50	1.3000	5/8	1	0206430
16	1.50	1.3000	5/8	1	0206454
18	1.50	1.4800	11/16	1	0206461
20	1.50	1.4800	11/16	1	0206485
22	1.50	1.6700	13/16	1	0206508
24	1.50	2.0500	15/16	1	0206522
24	2.00	2.0500	15/16	1	0206539

Die Stocks, Straight Handle

L110 Designed for use with Dormer gun nosed dies.
The die is held in place by two opposed cone point screws in the stock which locate in two indents in the die. When this is effected, the split in the die lines up opposite a third pointed set screw which can be run in to spread the die slightly for minute adjustment.



Nr.	Die Size Ø x H	Pack Qty	L110
1“	16 x 5	1	0111604
2a	20 x 5	1	0111611
2b	20 x 7	1	0111628
3	25 x 9	1	0111635
4“	30 x 11	1	0111642
5	38 x 14	1	0111666
5f	38 x 10	1	0111659
6	45 x 18	1	0111680
6f	45 x 14	1	0111673
7	55 x 22	1	0111703
7f	55 x 16	1	0111697
8	65 x 25	1	0111727
8f	65 x 18	1	0111710
9	75 x 30	1	0111741
9f	75 x 20	1	0111734
10	90 x 36	1	0111765
10f	90 x 22	1	0111758
	13/16 x 1/4	1	0218013
	1 x 3/8	1	0218020
	1.5/16 x 7/16	1	0218037
	1.1/2 x 1/2	1	0218044
	2 x 5/8	1	0218051
	2.1/4 x 11/16	1	0218068
	3 x 7/8	1	0218075
	4 x 1	1	0218082

Technical Tips on Threading with Dies

1. Before starting the die or dienut, chamfer the end of the bar at an angle of 45 degrees to eliminate sudden loading of the leading edges. Ensure the die or dienut is presented to the bolt squarely.

2. Make use of the large tolerances associated with the major diameter of the bolt, by reducing the diameter of the bar (see below). This will reduce the cutting force to a minimum.

3. Use the gun nose type of die, as this ensures the chips are directed away from the cutting area.

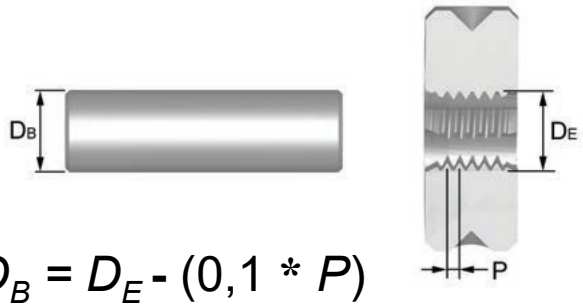
4. Ensure a good supply of the correct lubricant is aimed at the cutting area.

5. When adjusting split dies, avoid opening out as this will cause rubbing. Split dies may be closed down by approximately 0.15mm, by turning the adjustment screws equally. Pressure on one side of the die only may cause breakage.

6. Generally speaking, dienuts are used for reclaiming or cleaning out existing threads by hand. They tend to be of a more robust construction and should only be used in exceptional circumstances to cut a thread from solid.

Pre-machining Dimensions

The diameter of the bolt blank must be smaller than the max. external diameter of the screw thread.



$$D_B = D_E - (0{,}1 * P)$$

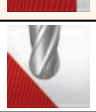
Visual Index - End Mills

HSS End Mill - Feed Rate Chart

Feed per Tooth (Ft) Dia Inches

Type of Cut	Alpha Code	0.078	1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4	7/8	1”	1.1/4	1.1/2
↕ 0,5D ↔ D	A	0.0003	0.0005	0.0007	0.0009	0.0011	0.0017	0.0024	0.0028	0.0033	0.0038	0.0038	0.0038	0.0039	0.0041	0.0042	0.0043
	B	0.0003	0.0005	0.0006	0.0009	0.0010	0.0015	0.0021	0.0026	0.0030	0.0034	0.0034	0.0034	0.0035	0.0037	0.0037	0.0038
	C	0.0003	0.0004	0.0006	0.0007	0.0009	0.0014	0.0019	0.0023	0.0027	0.0031	0.0031	0.0031	0.0031	0.0033	0.0034	0.0034
	D	0.0003	0.0004	0.0006	0.0008	0.0009	0.0015	0.0020	0.0024	0.0028	0.0032	0.0032	0.0032	0.0033	0.0035	0.0038	0.0040
	E	0.0005	0.0007	0.0009	0.0014	0.0017	0.0025	0.0034	0.0041	0.0048	0.0055	0.0056	0.0006	0.0057	0.0060	0.0066	0.0069
	F	0.0004	0.0005	0.0007	0.0008	0.0010	0.0013	0.0016	0.0020	0.0022	0.0025	0.0028	0.0031	0.0031	0.0033	0.0033	0.0033
↕ D ↔ 0,8D	G					0.0010	0.0013	0.0014	0.0017	0.0020	0.0022	0.0025	0.0028	0.0028	0.0021	0.0021	0.0022
	H					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0025	0.0021	0.0019	0.0019	0.0020
	I					0.0008	0.0011	0.0011	0.0014	0.0016	0.0018	0.0020	0.0023	0.0023	0.0017	0.0017	0.0018
	J					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0026	0.0026	0.0019	0.0019	0.0020
	K					0.0014	0.0019	0.0026	0.0031	0.0036	0.0059	0.0035	0.0039	0.0038	0.0043	0.0043	0.0046
	L					0.0004	0.0005	0.0007	0.0008	0.0010	0.0011	0.0012	0.0013	0.0013	0.0013	0.0015	0.0017
↕ 1,5D ↔ 0,25D	M	0.0003	0.0005	0.0007	0.0009	0.0012	0.0016	0.0022	0.0027	0.0031	0.0036	0.0041	0.0045	0.0035	0.0041	0.0038	0.0042
	N	0.0003	0.0004	0.0006	0.0008	0.0011	0.0015	0.0020	0.0024	0.0028	0.0032	0.0037	0.0041	0.0024	0.0037	0.0034	0.0038
	O	0.0002	0.0004	0.0006	0.0007	0.0010	0.0013	0.0018	0.0022	0.0026	0.0029	0.0033	0.0036	0.0029	0.0033	0.0031	0.0034
	P	0.0003	0.0004	0.0006	0.0008	0.0011	0.0014	0.0019	0.0023	0.0027	0.0031	0.0015	0.0039	0.0031	0.0035	0.0033	0.0036
	Q	0.0004	0.0006	0.0008	0.0010	0.0015	0.0019	0.0026	0.0031	0.0036	0.0041	0.0035	0.0039	0.0039	0.0044	0.0050	0.0055
	R	0.0005	0.0006	0.0008	0.0010	0.0011	0.0015	0.0019	0.0022	0.0026	0.0029	0.0033	0.0036	0.0036	0.0036	0.0041	0.0043
↕ 1,5D ↔ 0,1D	S	0.0004	0.0006	0.0009	0.0011	0.0015	0.0020	0.0028	0.0034	0.0039	0.0045	0.0051	0.0056	0.0044	0.0051	0.0048	0.0052
	T	0.0004	0.0006	0.0008	0.0010	0.0014	0.0018	0.0025	0.0030	0.0035	0.0051	0.0046	0.0051	0.0040	0.0046	0.0043	0.0047
	U	0.0003	0.0005	0.0007	0.0009	0.0013	0.0016	0.0023	0.0028	0.0032	0.0036	0.0041	0.0046	0.0036	0.0041	0.0039	0.0043
	V	0.0004	0.0005	0.0008	0.0010	0.0013	0.0017	0.0024	0.0029	0.0034	0.0039	0.0043	0.0048	0.0038	0.0043	0.0041	0.0045
	X	0.0005	0.0007	0.0010	0.0013	0.0018	0.0023	0.0032	0.0039	0.0045	0.0052	0.0044	0.0049	0.0048	0.0055	0.0062	0.0068
	Y	0.0006	0.0008	0.0010	0.0012	0.0014	0.0019	0.0023	0.0028	0.0024	0.0036	0.0041	0.0045	0.0045	0.0045	0.0051	0.0054

Carbide End Mill - Feed Rate Chart

# of Flutes	Type of Cut	Depth/ Width of Cut	Alpha Code	Feed Per Tooth (Ft) Dia Inches										
				1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4
>4		↕ 1,5 ↔ 0,05	A				0.0010	0.0015	0.0015	0.0015	0.0015	0.0020	0.0020	0.0025
			B				0.0020	0.0020	0.0025	0.0030	0.0035	0.0040	0.0040	0.0045
			C				0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0070
3-4		↕ 1,5 ↔ 0,1	A	0.0010	0.0015	0.0020	0.0020	0.0025	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050
			B	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0070
			C	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050	0.0060	0.0065	0.0070	0.0080	0.0090
3-4		↕ 1 ↔ 0,5	A	0.0005	0.0005	0.0005	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0025
			B	0.0005	0.0005	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0030	0.0035	0.0040
			C	0.0005	0.0010	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050
2-3		↕ 0,5 ↔ 1	A	0.0005	0.0010	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0025	0.0030
			B	0.0010	0.0010	0.0010	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0035	0.0040
			C	0.0015	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0050
3-4		↕ 0,5 ↔ 1 ↕ 1 ↔ 0,5												
			B				0.0010	0.0020	0.0030	0.0030	0.0035	0.0040	0.0040	0.0040
2 & 4		↕ 0,1 - 0,5mm ↔ 0,1 - 0,5mm	A	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0030	0.0030		
			BC	0.0010	0.0010	0.0015	0.0020	0.0020	0.0025	0.0030	0.0035	0.0040		
4		↕ 0,01 - 0,1 ↔ ≤ 1	A				0.0020	0.0020	0.0025	0.0030		0.0030		
			BC				0.0020	0.0025	0.0030	0.0035		0.0040		

Visual Index - End Mills

How To Use The Charts on the Left to Find Cutting Feed Rate (IPR):

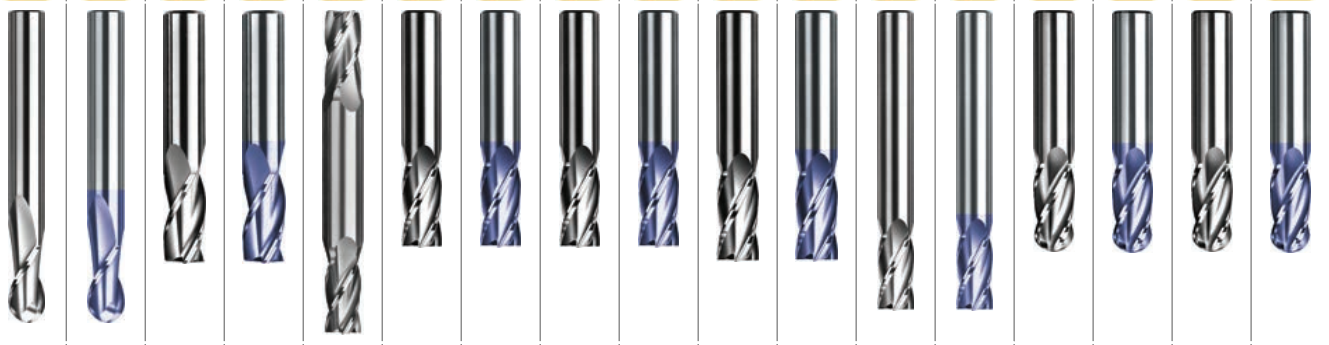
1. Find your Alpha Code on the AMG Chart (example: 279U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # of flutes to find your Ft Range.

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - End Mills

Tool Material:	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM
Application:															
Type:	W	W	W												
Number of Flutes:	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2
Cut Length:															
Helix:	λ45°	λ45°	λ37°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°
Shank:															
Finish/Coating:		ZrN	ZrN			TiAlN				TiAlN		AlTiN		AlTiN	
Tolerance:				Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Direction:															
Style:	**S106**	**S206**	**S207**	**S116**	**S108**	**S208**	**S109**	**S110**	**S111**	**S211**	**S112**	**S212**	**S113**	**S213**	**S114**
Range:	1/4 - 1"	1/4 - 1"	1/8 - 1"	1/8 - 1/2	1/16 - 5/8	1/16 - 5/8	2.00 - 25.00	1/8 - 1/2	1/8 - 1/2	1/8 - 1/2	1/16 - 1/2	1/16 - 1/2	2.00 - 20.00	2.00 - 12.00	1/8 - 5/8
Page #	**405**	**405**	**406**	**407**	**408**	**408**	**409**	**410**	**411**	**411**	**412**	**412**	**413**	**413**	**414**
1.1				289B	289B	400B	289B	269B	249B	361B	289B	400B	289B	400B	269B
1.2				223B	223B	298B	223B	212B	200B	269B	223B	298B	223B	298B	212B
1.3				223B	223B	298B	223B	212B	200B	269B	223B	298B	223B	298B	212B
1.4				180B	180B	259B	180B	171B	161B	239B	180B	259B	180B	259B	170B
1.5				161B	161B	230B	161B	152B	144B	200B	161B	230B	161B	230B	152B
1.6				148B	148B	200B	148B	140B	131B	180B	148B	200B	148B	200B	140B
1.7															
1.8															
2.1				200A	200A	325A	200A	190A	180A	298A	200A	325A	200A	325A	190A
2.2				141A	141A	223A	141A	125A	108A	180A	141A	223A	141A	223A	125A
2.3				108A	108A	174A	108A	103A	98A	171A	108A	174A	108A	174A	103A
2.4				89A	89A	131A	89A	78A	66A	131A	89A	131A	89A	131A	78A
3.1				374B	374B	551B	374B	336A	298B	499B	374B	551B	374B	551B	336A
3.2				318B	318B	525B	318B	284B	249B	400B	318B	525B	318B	525B	284B
3.3				318B	318B	525B	318B	284B	249B	400B	318B	525B	318B	525B	284B
3.4				249B	249B	374B	249B	225B	200B	341B	249B	374B	249B	374B	225B
4.1						230B				200B		230B		230B	
4.2						200B				180B		200B		200B	
4.3						190B				174B		190B		190B	
5.1						230B				200B		230B		230B	
5.2						161A				141A		161A		161A	
5.3						98A				85A		98A		98A	
6.1				649C	649C		649C	617C	584C		649C		649C		617C
6.2				499C	499C		499C	474C	449C		499C		499C		474C
6.3				499C	499C		499C	474C	449C		499C		499C		474C
6.4				125B	125B		125B	117B	108B		125B		125B		117B
7.1	2326C	2326C	2093C	1499C	1499C		1499C	1424C	1348C		1499C		1499C		1424C
7.2	1749C	1749C	1575C	1499C	1499C		1499C	1424C	1348C		1499C		1499C		1424C
7.3	1171C	1171C	1056C	649C	649C		649C	617C	584C		649C		649C		617C
7.4	751B	751B	676B	400B	400B		400B	380B	361B		400B		400B		380B
8.1															
8.2															
8.3															
9.1															
10.1															

Visual Index - End Mills



	S115	S215	S121	S221	S129	S134	S234	S135	S235	S136	S236	S137	S237	S138	S238	S139	S239
	1/8 - 1/2	1/8 - 1/2	1/16 - 1/2	1/16 - 1/2	1/8 - 1/2	1/16 - 1“	1/16 - 1“	2.00 - 25.00	2.00 - 20.00	1/8 - 3/4	1/8 - 3/4	1/8 - 1“	1/8 - 1“	1/16 - 3/4	1/16 - 3/4	2.00 - 12.00	2.00 - 12.00
	415	415	416	416	417	418	418	419	419	420	420	421	421	422	422	423	423
1.1	249B	361B	289B	400B	361B	361B	499B	361B	499B	343B	474B	325B	449B	361B	499B	361B	499B
1.2	200B	269B	223B	298B	325B	325B	449B	325B	449B	312B	425B	298B	400B	325B	449B	325B	449B
1.3	200B	269B	223B	298B	325B	325B	449B	325B	449B	312B	425B	298B	400B	325B	449B	325B	449B
1.4	161B	239B	180B	259B	298B	298B	423B	298B	423B	287B	406B	276B	390B	298B	423B	298B	423B
1.5	144B	200B	161B	230B	249B	249B	400B	249B	400B	238B	380B	226B	361B	249B	400B	249B	400B
1.6	131B	180B	148B	200B	230B	230B	328B	230B	328B	205B	313B	180B	298B	230B	328B	230B	328B
1.7																	
1.8																	
2.1	180A	298A	200A	325A	239A	239A	351A	239A	351A	220A	338A	200A	325A	239A	351A	239A	351A
2.2	108A	180A	141A	223A	171A	171A	276A	171A	276A	156A	251A	141A	226A	171A	276A	171A	276A
2.3	98A	171A	108A	174A	131A	131A	200A	131A	200A	123A	182A	115A	164A	131A	200A	131A	200A
2.4	82A	89A			105A	105A	164A	105A	164A	97A	140A	89A	115A	98A	148A	98A	148A
3.1	298B	499B	374B	551B	449B	449B	699B	449B	699B	405B	650B	361B	600B	449B	699B	449B	699B
3.2	249B	400B	318B	525B	377B	377B	649B	377B	649B	338B	578B	298B	508B	377B	649B	377B	649B
3.3	249B	400B	318B	525B	377B	377B	649B	377B	649B	338B	578B	298B	508B	377B	649B	377B	649B
3.4	200B	341B	249B	374B	279B	279B	430B	279B	430B	254B	415B	230B	400B	279B	430B	279B	430B
4.1		200B		230B			259B		259B		245B		230B		259B		259B
4.2		180B		200B			230B		230B		220B		210B		230B		230B
4.3		174B		190B			200B		200B		190B		180B		200B		200B
5.1	148B	200B		230B			266B		266B		251B		236B		266B		266B
5.2		141A		161A			200A		200A		190A		180A		200A		200A
5.3		85A		98A			131A		131A		123A		115A		131A		131A
6.1	584C		649C		679C	679C		679C		646C		613C		679C		679C	
6.2	449C		499C		574C	574C		574C		546C		518C		574C		574C	
6.3	449C		499C		574C	574C		574C		546C		518C		574C		574C	
6.4	108B		125B		144B	144B		144B		138B		131B		144B		144B	
7.1	1348C		1499C		1601C	1601C		1601C		1525C		1450C		1601C		1601C	
7.2	1348C		1499C		1601C	1601C		1601C		1525C		1450C		1601C		1601C	
7.3	584C		649C		708C	708C		708C		674C		640C		708C		708C	
7.4	361B		400B		479B	479B		479B		455B		430B		479B		479B	
8.1																	
8.2																	
8.3																	
9.1																	
10.1																	

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	S146	S246	S147	S247	S223HA	S223HB	S248HA	S248HB	C110	C600	C601	C602	C603	C123	C604	C605
	HM	HM	HM	HM	HM	HM	HM	HM	HSS-E PM	HSS	HSS	HSS	HSS-E	HSS-E PM	HSS	HSS
	1/4 - 5/8	1/4 - 5/8	1/8 - 5/8	1/8 - 5/8	1/8 - 1"	1/8 - 1"	5/16 - 1"	5/16 - 1"	1.00 - 50.00	1/8 - 3/4	1/8 - 1.1/2	1/8 - 1"	1/8 - 1"	1/16 - 40.00	1/8 - 3/4	1/4 - 1"
	424	424	425	425	426	426	427	427	428	430	431	432	433	434	436	437
1.1	343B	450B	325B	400B	801C	801C	801C	801C	197A	98A	98A	98A	164A	180A	112S	164A
1.2	312B	412B	298B	374B	778C	778C	778C	778C	164A	89A	89A	89A	131A	148A	89S	131A
1.3	312B	412B	298B	374B	522C	522C	522C	522C	131B	75B	75B	75B	115B	131B	79T	115B
1.4	287B	387B	276B	351B	463B	463B	463B	463B	115B				98B	115B		
1.5	238B	363B	226B	325B	328B	328B	328B	328B								
1.6	205B	288B	180B	249B	285A	285A	285A	285A								
1.7					187A	187A	364A	364A								
1.8					125A	125A	240A	240A								
2.1	220A	288A	200A	226A	489B	489B	489B	489B	98F				75F	82F		75F
2.2	156A	233A	141A	190A	400B	400B	400B	400B								62F
2.3	123A	176A	115A	151A	302B	302B	302B	302B								
2.4		135A		121A	256A	256A	256A	256A								
3.1	405B	500B	361B	499B	456C	456C	771C	771C	115A	82A	82A	82A	92A	98A	89S	
3.2	338B	540N	298B	430B	381B	381B	571B	571B	98A	66A	66A	66A	75A	82A	72S	
3.3	338B	540B	298B	430B	305B	305B	538B	538B	164B	82B	82B	82B	131B	148B	89T	
3.4	255B	384B	230B	338B	256B	256B	433B	433B	98B				82B	98B		
4.1		230B		200B	522B	522B	1017B	1017B	115D	59D	59D	59D	92D	98D	62V	92D
4.2		210B		190B	463B	463B	902B	902B	82D	49D	49D	49D	75D	82D	49V	
4.3		180B			387A	387A	755B	755B								
5.1		238B		210B	358B	358B	614B	614B	197D	98D	98D	98D	157D	164D	108V	157D
5.2		176A			269A	269A	525A	525A	49C	20C	20C	20C	43C	49C	20U	
5.3					223A	223A	436A	436A								
6.1	646C		613C	699C					279C	180C	180C	180C	410C	262C	200U	410C
6.2	602C		518C	571C					279C	197C	197C	197C	410C	262C	223U	
6.3	546C		518C	571C					279C	197C	197C	197C	410C	262C	223U	
6.4	137B		131B	180B												
7.1	1526C		1450C	1650C					722E	197E	197E	197E	984E	656E	243X	984E
7.2	1526C		1450C	1650C					722E	180E	180E	180E	984E	656E	194X	984E
7.3	674C		640C	708C					279E	115E	115E	115E	295E	262E	144X	295E
7.4	455B		430B	410B												
8.1									295C	197C	197C	197C	410C	262C	200U	410C
8.2																
8.3																
9.1																
10.1																

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	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS-E PM	HSS-E PM	HSS	HSS-E
	Z 2	Z 3	Z 3	Z 4-8	Z 4-8	Z 4-8	Z 4-8	Z 4-8	Z 4-8	Z 4	Z 4	Z 4-8	Z 4-6	Z 4-8	Z 4-6
	λ38°	λ30°	λ30° γ12° DIN 1835B	λ30°	λ30° TiCN	λ30°	λ30° TiCN	λ30°	λ30°	λ30°	λ30°	λ30° γ12° DIN 1835B	λ30° γ12° DIN 1835B	λ30°	λ30°
	+.003 -.000	+.003 -.000	e8	+.005 -.000	+.005 -.000	+.005 -.000	+.005 -.000	+.005 -.000	+.005 -.000	Normal	+.003 -.000	k10	k10	+.003 -.000	+.003 -.000
	C606	C607	C346	C608	C609	C610	C611	C612	C613	C614	C615	C247	C273	C617	C618
	1/4 - 3/4	1/8 - 1"	3.00 - 20.00	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 3/4	1/8 - 3/4	1/8 - 1"	2.00 - 50.00	2.00 - 40.00	1/8 - 1"	1/8 - 1"
	438	439	440	441	441	442	442	443	444	445	446	447	449	451	452
1.1	148A		148A	164G	197G	164G	197G	148G	148G	115S	164S	180S	164S	115S	164S
1.2	118A	131A	115A	131G	184G	131G	184G	118G	118G	92S	131S	148S	164S	92S	131S
1.3	102B	115B	98B	115H	161H	115H	161H	102H	102H	79T	115T	131T	115T	79T	115T
1.4		98B	82B	98H	138H	98H	138H	89H	89H	69T	98T	115T	98T	69T	98T
1.5		66C													
1.6															
1.7															
1.8															
2.1	66F		66F	75L	105L	75L	105L	66L	66L	52Y	75Y	82Y	33Y	52Y	75Y
2.2	56F	62F													
2.3															
2.4															
3.1			82A	92G	128G	92G	128G	82G	82G	92S	92S	98S	82S	92S	92S
3.2		75A	66A	75G	105G	75G	105G	66G	66G	75S	75S	82S	66S	75S	75S
3.3		131B	115B	131H	184H	131H	184H	118H	118H	92T	131T	148T	131T	92T	131T
3.4		82B	66B	82H	128H	82H	128H	72H	72H	56T	82T	82T	82T	56T	82T
4.1	82D	92D	82D	92J	128J	92J	128J	82J	82J	62V	92V	98V	82V	62V	92V
4.2		75D	66D	75J	105J	75J	105J	66J	66J	52V	75V	82V	66V	52V	75V
4.3		33D													
5.1	141D		148D	157J	220J	157J	220J	141J	141J	108V	157V	164V	148V	108V	157V
5.2		43C	33C	43I	59I	43I	59I	36I	36I	20U	43U	49U	33U	20U	43U
5.3		20D													
6.1	367C		230C	410I	574I	410I	574I	367I	367I	203U	410U	262U	230U	203U	410U
6.2		410C	230C	410I	574I	410I	574I	367I	367I	223U	410U	262U	230U	223U	410U
6.3		410C	230C	410I	574I	410I	574I	367I	367I	223U	410U	262U	230U	223U	410U
6.4		49C													
7.1	886E		590E								984X	656X	590X		984X
7.2	886E		590E	984K	1378K	984K	1378K	886K	886K	197X	984X	656X	590X	197X	984X
7.3	266E	295E		295K	413K	295K	413K	266K	266K	148X	295X	262X	230X	148X	295X
7.4		197A													
8.1	367C		230C	410I	574I	410I	574I	367I	367I	203U	410U	262U	230U	203U	410U
8.2		410C													
8.3															
9.1															
10.1															

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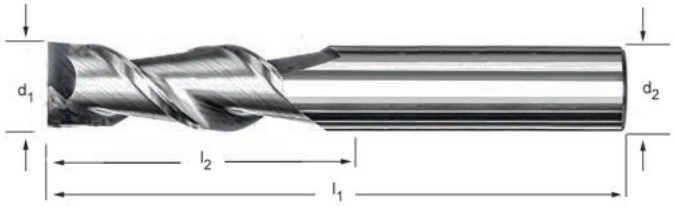
C110 428
C123 434
C247 447
C273 449
C346 440
C600 430
C601 431
C602 432
C603 433
C604 436
C605 437
C606 438
C607 439
C608 441
C609 441
C610 442
C611 442
C612 443
C613 444
C614 445
C615 446
C617 451
C618 452
S106 405
S108 408
S109 409
S110 410
S111 411
S112 412
S113 413
S114 414
S115 415
S116 407
S121 416
S129 417
S134 418
S135 419
S136 420
S137 421
S138 422
S139 423
S146 424
S147 425
S206 405
S207 406
S208 408
S211 411
S212 412
S213 413
S215 415
S221 416
S223HA 426
S223HB 426
S234 418
S235 419
S236 420
S237 421
S238 422
S239 423
S246 424
S247 425
S248HA 427
S248HB 427

Solid Carbide 2-Flute End Mill

Regular Length, Square End, 45° Helix

S106 Double gullet flute design allows for fast, efficient evacuation of chips in soft and non-ferrous materials

S206 Zirconium coating increases surface hardness, improves chip evacuation and tool life allowing for higher removal rates in soft and non-ferrous materials

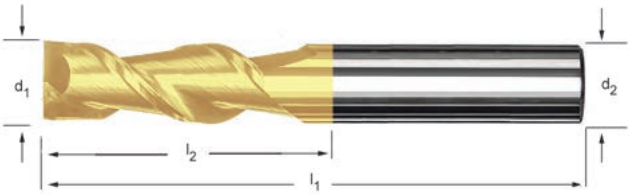


d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S106	S206
1/4	0.2500	1/4	1“	2-1/2	2	1	7648490	7648497
5/16	0.3125	5/16	1“	3“	2	1	7648491	7648498
3/8	0.3750	3/8	1“	2-1/2	2	1	7648492	7648499
1/2	0.5000	1/2	1-1/4	3“	2	1	7648493	7648500
5/8	0.6250	5/8	1-5/8	3-1/2	2	1	7648494	7648501
3/4	0.7500	3/4	1-3/4	4“	2	1	7648495	7648502
1“	1.0000	1“	1-1/2	4“	2	1	7648496	7648503

Solid Carbide 2-Flute End Mill

Regular Length, Square End, 37° Helix

S207 Unique flute design along with the Zirconium coating allow for faster speeds and feeds in soft and non-ferrous materials

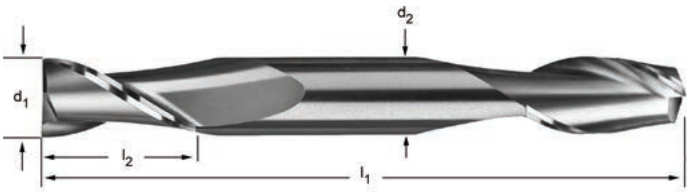


d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S207
1/8	0.1250	1/8	1/2	1-1/2	2	1	7648504
1/8	0.1250	1/8	3/4	2“	2	1	7648505
5/32	0.1563	5/32	9/16	2“	2	1	7648506
3/16	0.1875	3/16	3/4	2“	2	1	7648507
3/16	0.1875	3/16	1-1/8	3“	2	1	7648508
1/4	0.2500	1/4	1“	2-1/2	2	1	7648509
1/4	0.2500	1/4	1-1/2	4“	2	1	7648510
5/16	0.3125	5/16	3/4	2-1/2	2	1	7648511
5/16	0.3125	5/16	1-5/8	4“	2	1	7648512
3/8	0.3750	3/8	1“	2-1/2	2	1	7648513
3/8	0.3750	3/8	2“	4“	2	1	7648514
7/16	0.4375	7/16	1“	2-1/2	2	1	7648515
7/16	0.4375	7/16	2“	4“	2	1	7648516
1/2	0.5000	1/2	1“	3“	2	1	7648517
1/2	0.5000	1/2	3“	6“	2	1	7648518
9/16	0.5625	9/16	1-1/4	3“	2	1	7648519
5/8	0.6250	5/8	1-5/8	3-1/2	2	1	7648520
5/8	0.6250	5/8	2-1/4	5“	2	1	7648521
3/4	0.7500	3/4	1-3/4	4“	2	1	7648522
3/4	0.7500	3/4	3“	6“	2	1	7648523
1“	1.0000	1“	1-1/2	4“	2	1	7648524
1“	1.0000	1“	4“	6“	2	1	7648525

Solid Carbide 2-Flute End Mill

Regular Length, Square End, Double End, 30° Helix

S116 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials



d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S116
1/8	0.1250	3/8	3/8	3“	2	1	7648650
5/32	0.1562	3/8	7/16	3“	2	1	7648651
3/16	0.1875	3/8	1/2	3“	2	1	7648652
1/4	0.2500	3/8	5/8	3“	2	1	7648653
5/16	0.3125	3/8	3/4	3.1/2	2	1	7648654
3/8	0.3750	3/8	3/4	3.1/2	2	1	7648655
1/2	0.5000	1/2	1“	4“	2	1	7648656

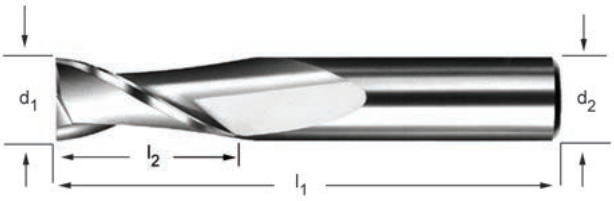
Solid Carbide 2-Flute End Mill

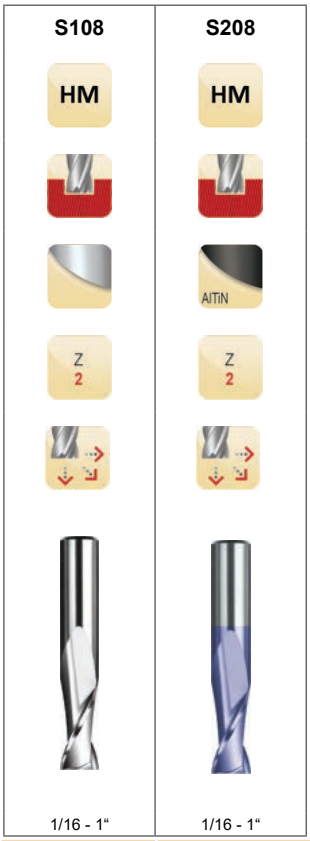
DORMER

Regular Length, Square End, 30° Helix

S108 Bright finish improves chip flow in soft and non-ferrous materials.

S208 ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



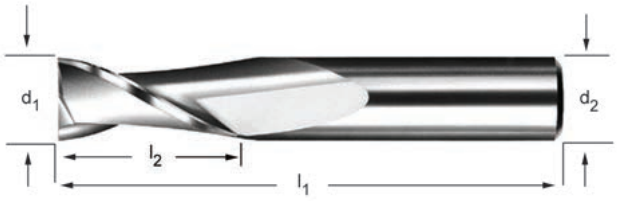


d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S108	S208
1/16	0.0625	1/8	1/4	1.1/2	2	1	7648526	7648544
5/64	0.0781	1/8	1/4	1.1/2	2	1	7648527	7648545
3/32	0.0938	1/8	3/8	1.1/2	2	1	7648528	7648546
1/8	0.1250	1/8	1/2	1.1/2	2	1	7648529	7648547
9/64	0.1406	3/16	9/16	2“	2	1	7648530	—
5/32	0.1562	3/16	9/16	2“	2	1	7648531	7648548
11/64	0.1719	3/16	9/16	2“	2	1	7648532	—
3/16	0.1875	3/16	5/8	2“	2	1	7648533	7648549
7/32	0.2188	1/4	5/8	2.1/2	2	1	7648534	7648550
1/4	0.2500	1/4	3/4	2.1/2	2	1	7648535	7648551
5/16	0.3125	5/16	7/8	2.1/2	2	1	7648536	7648552
3/8	0.3750	3/8	7/8	2.1/2	2	1	7648537	7648553
7/16	0.4375	7/16	1“	2.1/2	2	1	7648538	7648554
1/2	0.5000	1/2	1“	3“	2	1	7648539	7648555
9/16	0.5625	9/16	1.1/4	3.1/2	2	1	7648540	7648556
5/8	0.6250	5/8	1.1/4	3.1/2	2	1	7648541	7648557
3/4	0.7500	3/4	1.1/2	4“	2	1	7648542	—
1“	1.0000	1“	1.1/2	4“	2	1	7648543	—

Solid Carbide 2-Flute End Mill

Regular Length, Square End, 30° Helix

S109 Bright finish improves chip flow in soft and non-ferrous materials.



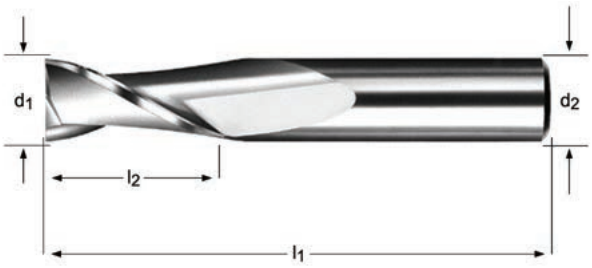
d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	S109
2.00	0.0787	3.0	6.0	38.0	2	1	7648558
2.50	0.0984	3.0	7.0	38.0	2	1	7648559
3.00	0.1181	3.0	12.0	38.0	2	1	7648560
4.00	0.1575	4.0	14.0	50.0	2	1	7648561
4.50	0.1772	5.0	14.0	50.0	2	1	7648562
5.00	0.1969	5.0	16.0	50.0	2	1	7648563
6.00	0.2362	6.0	19.0	63.0	2	1	7648564
7.00	0.2756	8.0	19.0	63.0	2	1	7648565
8.00	0.3150	8.0	20.0	63.0	2	1	7648566
9.00	0.3543	10.0	22.0	70.0	2	1	7648567
10.00	0.3937	10.0	22.0	70.0	2	1	7648568
11.00	0.4331	11.0	25.0	70.0	2	1	7648569
12.00	0.4724	12.0	25.0	75.0	2	1	7648570
14.00	0.5512	14.0	30.0	88.0	2	1	7648571
16.00	0.6299	16.0	32.0	88.0	2	1	7648572
20.00	0.7874	20.0	38.0	100.0	2	1	7648573
25.00	0.9843	25.0	38.0	100.0	2	1	7648574

Solid Carbide 2-Flute End Mill

DORMER

Long Length, Square End, 30° Helix

S110 Bright finish improves chip flow in soft and non-ferrous materials.



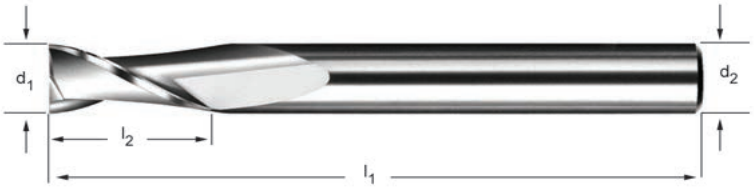
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S110
1/8	0.1250	1/8	3/4	2“	2	1	7648575
3/16	0.1875	3/16	3/4	2.1/2	2	1	7648576
1/4	0.2500	1/4	1.1/8	3“	2	1	7648577
3/8	0.3750	3/8	1.1/8	3“	2	1	7648578
1/2	0.5000	1/2	2“	4“	2	1	7648579

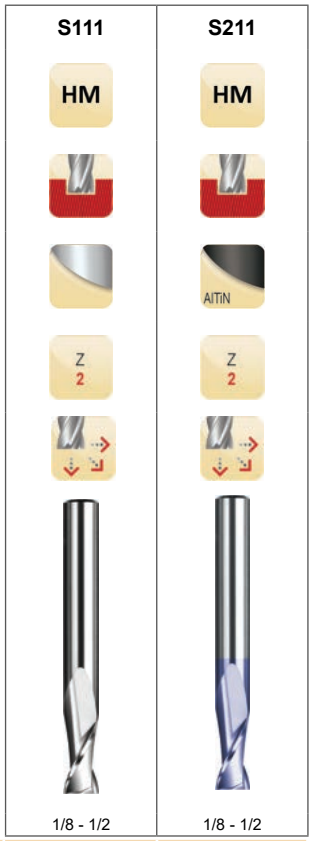
Solid Carbide 2-Flute End Mill

Extra Long Length, Square End, 30° Helix

S111 Bright finish improves chip flow in soft and non-ferrous materials.

S211 ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S111	S211
1/8	0.1250	1/8	1“	3“	2	1	7648580	7648586
3/16	0.1875	3/16	1.1/8	3“	2	1	7648581	7648587
1/4	0.2500	1/4	1.1/2	4“	2	1	7648582	7648588
5/16	0.3125	5/16	1.5/8	4“	2	1	7648583	—
3/8	0.3750	3/8	1.3/4	4“	2	1	7648584	7648589
1/2	0.5000	1/2	3“	6“	2	1	7648585	7648590

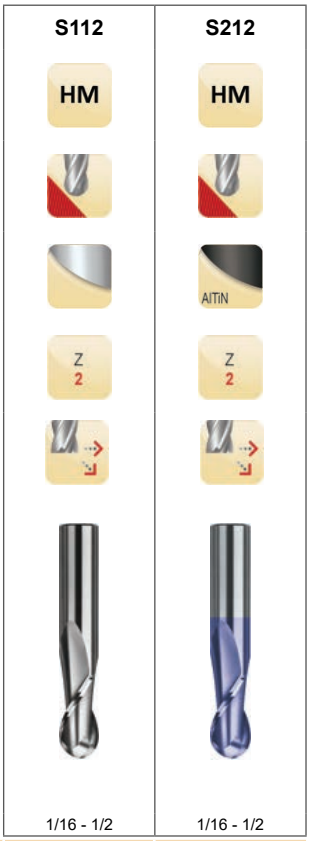
Solid Carbide 2-Flute End Mill

DORMER

Regular Length, Ball Nose, 30° Helix

S112 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S212 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



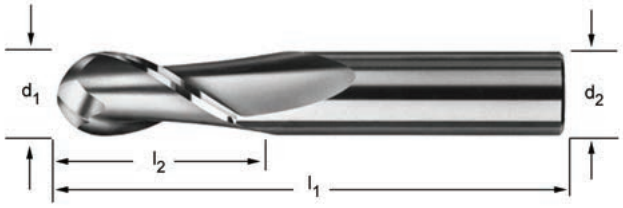
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S112	S212
1/16	0.0625	1/8	1/4	1.1/2	2	1	7648591	7648601
3/32	0.0938	1/8	3/8	1.1/2	2	1	7648592	—
1/8	0.1250	1/8	1/2	1.1/2	2	1	7648593	7648602
5/32	0.1562	3/16	9/16	2“	2	1	7648594	—
3/16	0.1875	3/16	5/8	2“	2	1	7648595	7648603
7/32	0.2188	1/4	5/8	2.1/2	2	1	7648596	7648604
1/4	0.2500	1/4	3/4	2.1/2	2	1	7648597	7648605
5/16	0.3125	5/16	7/8	2.1/2	2	1	7648598	7648606
3/8	0.3750	3/8	7/8	2.1/2	2	1	7648599	7648607
1/2	0.5000	1/2	1“	3“	2	1	7648600	7648608

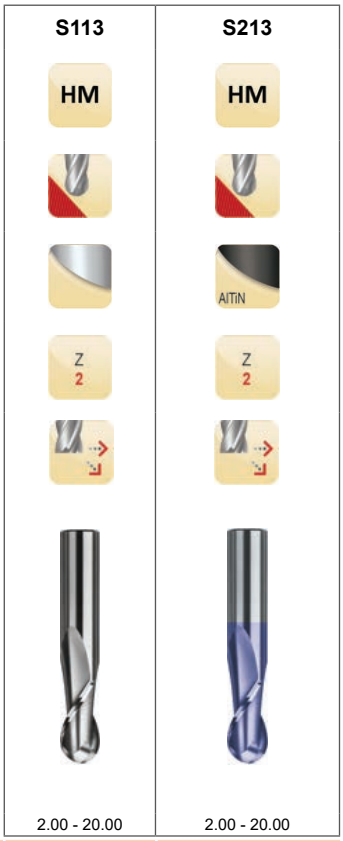
Solid Carbide 2-Flute End Mill

Regular Length, Ball Nose, 30° Helix

S113 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S213 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



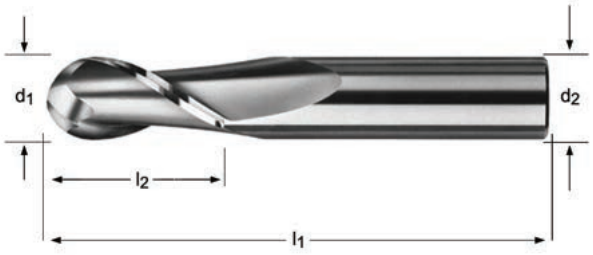


d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	S113	S213
2.00	0.0787	3.0	6.0	38.0	2	1	7648609	—
2.50	0.0984	3.0	6.0	38.0	2	1	7648610	—
3.00	0.1181	3.0	12.0	38.0	2	1	7648611	7648622
4.00	0.1575	4.0	14.0	50.0	2	1	7648612	7648623
5.00	0.1969	5.0	16.0	50.0	2	1	7648613	7648624
6.00	0.2362	6.0	19.0	63.0	2	1	7648614	7648625
7.00	0.2756	8.0	19.0	63.0	2	1	7648615	7648626
8.00	0.3150	8.0	19.0	63.0	2	1	7648616	7648627
9.00	0.3543	10.0	22.0	70.0	2	1	7648617	7648628
10.00	0.3937	10.0	22.0	70.0	2	1	7648618	7648629
12.00	0.4724	12.0	25.0	75.0	2	1	7648619	7648630
16.00	0.6299	16.0	32.0	88.0	2	1	7648620	—
20.00	0.7874	20.0	38.0	100.0	2	1	7648621	—

Solid Carbide 2-Flute End Mill

Long Length, Ball Nose, 30° Helix

S114 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.



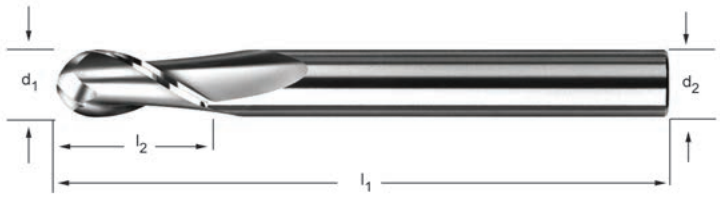
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S114
1/8	0.1250	1/8	3/4	2“	2	1	7648631
3/16	0.1875	3/16	3/4	2.1/2	2	1	7648632
1/4	0.2500	1/4	1.1/8	3“	2	1	7648633
5/16	0.3125	5/16	1.1/8	3“	2	1	7648634
3/8	0.3750	3/8	1.1/8	3“	2	1	7648635
1/2	0.5000	1/2	2“	4“	2	1	7648636
5/8	0.6250	5/8	2.1/4	5“	2	1	7648637

Solid Carbide 2-Flute End Mill

Extra Long Length, Ball Nose, 30° Helix

S115 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S215 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



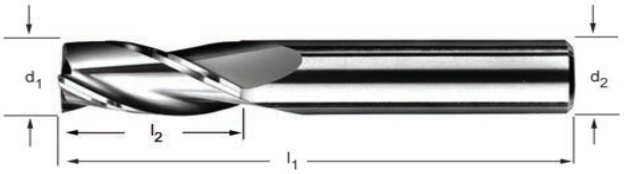
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S115	S215
1/8	0.1250	1/8	1“	3“	2	1	7648638	7648644
3/16	0.1875	3/16	1.1/8	3“	2	1	7648639	7648645
1/4	0.2500	1/4	1.1/2	4“	2	1	7648640	7648646
5/16	0.3125	5/16	1.5/8	4“	2	1	7648641	7648647
3/8	0.3750	3/8	1.3/4	4“	2	1	7648642	7648648
1/2	0.5000	1/2	3“	6“	2	1	7648643	7648649

Solid Carbide 3-Flute End Mill

Regular Length, Square End, 30° Helix

S121 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.

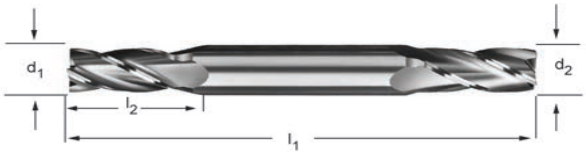
S221 3-flute design for less chatter. ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S121	S221
1/16	0.0625	1/8	1/4	1.1/2	3	1	7648657	7648666
3/32	0.0938	1/8	3/8	1.1/2	3	1	7648658	7648667
1/8	0.1250	1/8	1/2	1.1/2	3	1	7648659	7648668
5/32	0.1562	3/16	9/16	2“	3	1	7648660	7648669
3/16	0.1875	3/16	5/8	2“	3	1	7648661	7648670
1/4	0.2500	1/4	3/4	2.1/2	3	1	7648662	7648671
5/16	0.3125	5/16	7/8	2.1/2	3	1	7648663	7648672
3/8	0.3750	3/8	7/8	2.1/2	3	1	7648664	7648673
1/2	0.5000	1/2	1“	3“	3	1	7648665	7648674

Square End, Double End , 30° Helix

S129 **Regular Length**. Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials.



1/8 - 1/2

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S129
1/8	0.1250	3/8	3/8	3“	4	1	7648719
5/32	0.1562	3/8	7/16	3“	4	1	7648720
3/16	0.1875	3/8	1/2	3“	4	1	7648721
1/4	0.2500	3/8	5/8	3“	4	1	7648722
5/16	0.3125	3/8	3/4	3.1/2	4	1	7648723
3/8	0.3750	3/8	3/4	3.1/2	4	1	7648724
1/2	0.5000	1/2	1“	4“	4	1	7648725

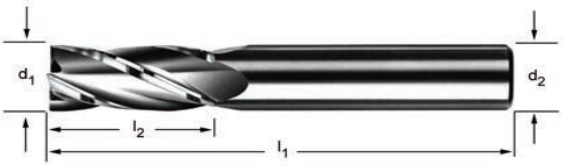
Solid Carbide 4-Flute End Mill

DORMER

Regular Length, Square End , 30° Helix

S134 Bright finish improves chip flow in soft or non-ferrous materials.

S234 ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



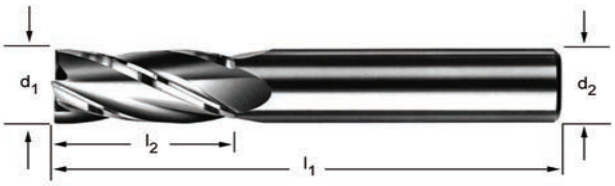
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S124	S234
1/16	0.0625	1/8	1/4	1.1/2	4	1	7648726	7648748
5/64	0.0781	1/8	1/4	1.1/2	4	1	7648727	7648749
3/32	0.0938	1/8	3/8	1.1/2	4	1	7648728	7648750
7/64	0.1094	1/8	3/8	1.1/2	4	1	7648729	7648751
1/8	0.1250	1/8	1/2	1.1/2	4	1	7648730	7648752
9/64	0.1406	3/16	9/16	2“	4	1	7648731	7648753
5/32	0.1562	3/16	9/16	2“	4	1	7648732	7648754
11/64	0.1719	3/16	9/16	2“	4	1	7648733	7648755
3/16	0.1875	3/16	5/8	2“	4	1	7648734	7648756
13/64	0.2031	1/4	5/8	2.1/2	4	1	7648735	7648757
7/32	0.2188	1/4	5/8	2.1/2	4	1	7648736	7648758
1/4	0.2500	1/4	3/4	2.1/2	4	1	7648737	7648759
5/16	0.3125	5/16	7/8	2.1/2	4	1	7648738	7648760
3/8	0.3750	3/8	7/8	2.1/2	4	1	7648739	7648761
7/16	0.4375	7/16	1“	2.1/2	4	1	7648740	7648762
1/2	0.5000	1/2	1“	3“	4	1	7648741	7648763
9/16	0.5625	9/16	1.1/4	3.1/2	4	1	7648742	7648764
5/8	0.6250	5/8	1.1/4	3.1/2	4	1	7648743	7648765
11/16	0.6875	3/4	1.1/2	4“	4	1	7648744	7648766
3/4	0.7500	3/4	1.1/2	4“	4	1	7648745	7648767
7/8	0.8750	7/8	1.1/2	4“	4	1	7648746	7648768
1“	1.0000	1“	1.1/2	4“	4	1	7648747	7648769

Solid Carbide 4-Flute End Mill

Regular Length, Square End , 30° Helix

S135 Bright finish improves chip flow in soft or non-ferrous materials.

S235 AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	S135	S235
							2.00 - 25.00	2.00 - 20.00
2.00	0.0787	3.0	6.0	38.0	4	1	7648770	7648789
2.50	0.0984	3.0	7.0	38.0	4	1	7648771	7648790
3.00	0.1181	3.0	12.0	38.0	4	1	7648772	7648791
3.50	0.1378	4.0	12.0	50.0	4	1	7648773	7648792
4.00	0.1575	4.0	14.0	50.0	4	1	7648774	7648793
4.50	0.1772	5.0	14.0	50.0	4	1	7648775	7648794
5.00	0.1969	5.0	16.0	50.0	4	1	7648776	7648795
6.00	0.2362	6.0	19.0	63.0	4	1	7648777	7648796
7.00	0.2756	8.0	19.0	63.0	4	1	7648778	7648797
8.00	0.3150	8.0	19.0	63.0	4	1	7648779	7648798
9.00	0.3543	10.0	22.0	70.0	4	1	7648780	7648799
10.00	0.3937	10.0	22.0	70.0	4	1	7648781	7648800
11.00	0.4331	11.0	25.0	70.0	4	1	7648782	7648801
12.00	0.4724	12.0	25.0	75.0	4	1	7648783	7648802
14.00	0.5512	14.0	30.0	88.0	4	1	7648784	7648803
16.00	0.6299	16.0	32.0	88.0	4	1	7648785	7648804
18.00	0.7087	18.0	36.0	100.0	4	1	7648786	7648805
20.00	0.7874	20.0	38.0	100.0	4	1	7648787	7648806
25.00	0.9843	25.0	38.0	100.0	4	1	7648788	—

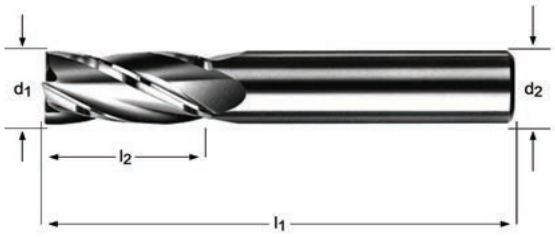
Solid Carbide 4-Flute End Mill

DORMER

Long Length, Square End , 30° Helix

S136 Bright finish improves chip flow in soft or non-ferrous materials.

S236 AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



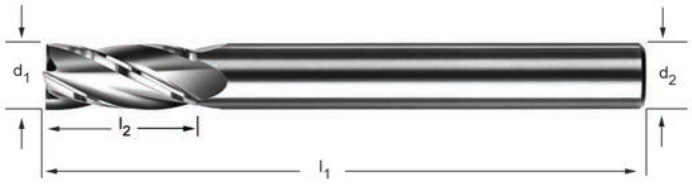
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S136	S236
1/8	0.1250	1/8	3/4	2“	4	1	7648807	7648816
3/16	0.1875	3/16	3/4	2.1/2	4	1	7648808	7648817
1/4	0.2500	1/4	1.1/8	3“	4	1	7648809	7648818
5/16	0.3125	5/16	1.1/8	3“	4	1	7648810	7648819
3/8	0.3750	3/8	1.1/8	3“	4	1	7648811	7648820
7/16	0.4375	7/16	2“	4“	4	1	7648812	7648821
1/2	0.5000	1/2	2“	4“	4	1	7648813	7648822
5/8	0.6250	5/8	2.1/4	5“	4	1	7648814	7648823
3/4	0.7500	3/4	2.1/4	5“	4	1	7648815	7648824

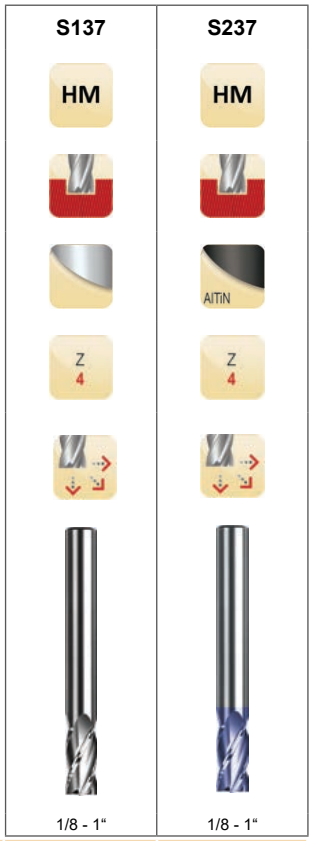
Solid Carbide 4-Flute End Mill

Extra Long Length, Square End , 30° Helix

S137 Bright finish improves chip flow in soft or non-ferrous materials.

S237 AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S137	S237
1/8	0.1250	1/8	1“	3“	4	1	7648825	7648835
3/16	0.1875	3/16	1.1/8	3“	4	1	7648826	7648836
1/4	0.2500	1/4	1.1/2	4“	4	1	7648827	7648837
5/16	0.3125	5/16	1.5/8	4“	4	1	7648828	7648838
3/8	0.3750	3/8	1.3/4	4“	4	1	7648829	7648839
7/16	0.4375	7/16	3“	6“	4	1	7648830	7648840
1/2	0.5000	1/2	3“	6“	4	1	7648831	7648841
5/8	0.6250	5/8	3“	6“	4	1	7648832	7648842
3/4	0.7500	3/4	3“	6“	4	1	7648833	7648843
1“	1.0000	1“	3“	6“	4	1	7648834	7648844

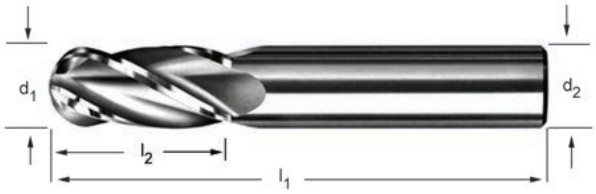
Solid Carbide 4-Flute End Mill

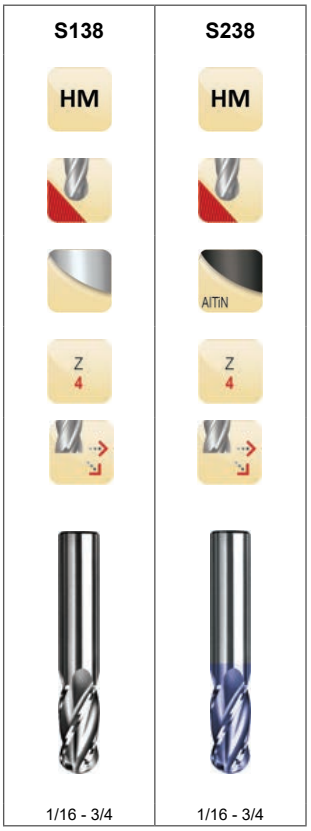
DORMER

Regular Length, Ball Nose , 30° Helix

S138 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S238 Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





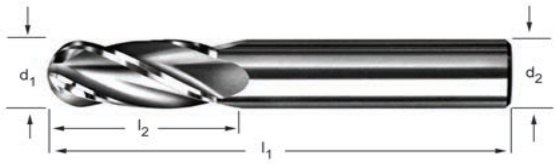
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S138	S238
1/16	0.0625	1/8	1/4	1.1/2	4	1	7648845	7648857
3/32	0.0938	1/8	3/8	1.1/2	4	1	7648846	7648858
1/8	0.1250	1/8	1/2	1.1/2	4	1	7648847	7648859
5/32	0.1562	3/16	9/16	2“	4	1	7648848	7648860
3/16	0.1875	3/16	5/8	2“	4	1	7648849	7648861
1/4	0.2500	1/4	3/4	2.1/2	4	1	7648850	7648862
5/16	0.3125	5/16	7/8	2.1/2	4	1	7648851	7648863
3/8	0.3750	3/8	7/8	2.1/2	4	1	7648852	7648864
7/16	0.4375	7/16	1“	2.1/2	4	1	7648853	7648865
1/2	0.5000	1/2	1“	3“	4	1	7648854	7648866
5/8	0.6250	5/8	1.1/4	3.1/2	4	1	7648855	7648867
3/4	0.7500	3/4	1.1/2	4“	4	1	7648856	7648868

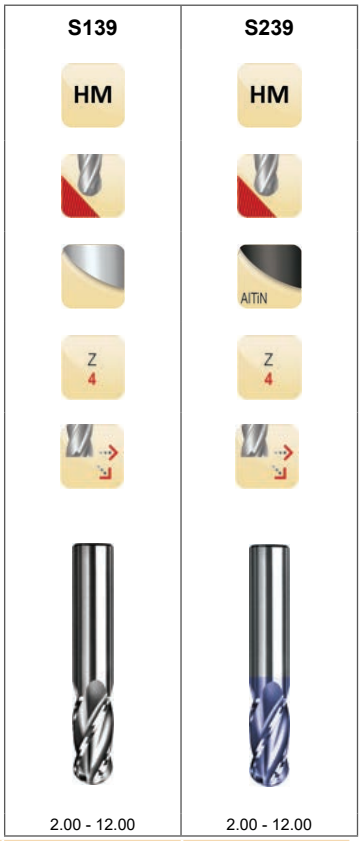
Solid Carbide 4-Flute End Mill

Regular Length, Ball Nose, 30° Helix

S139 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S239 Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	S139	S239
2.00	0.0787	3.0	6.0	38.0	4	1	7648877	7648878
3.00	0.1181	3.0	12.0	38.0	4	1	7648876	7648879
4.00	0.1575	4.0	14.0	50.0	4	1	7648875	7648880
4.50	0.1772	5.0	14.0	50.0	4	1	7648874	—
5.00	0.1969	5.0	16.0	50.0	4	1	7648873	7648881
6.00	0.2362	6.0	19.0	63.0	4	1	7648872	7648882
8.00	0.3150	8.0	19.0	63.0	4	1	7648871	7648883
10.00	0.3937	10.0	22.0	70.0	4	1	7648870	7648884
12.00	0.4724	12.0	25.0	75.0	4	1	7648869	7648885

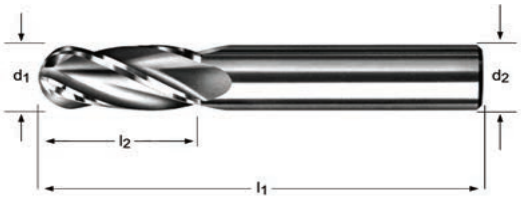
Solid Carbide 4-Flute End Mill

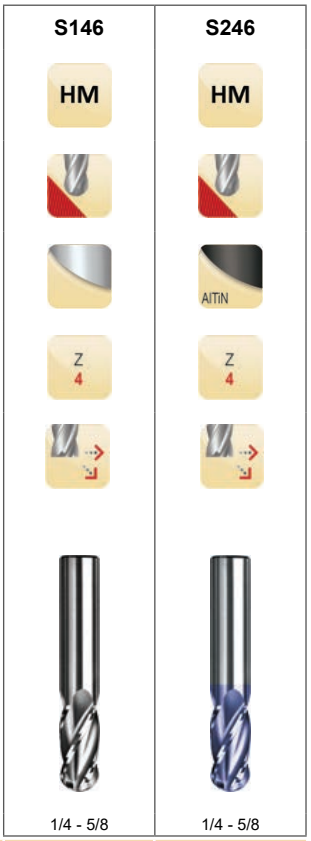
DORMER

Long Length, Ball Nose, 30° Helix

S146 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S246 Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





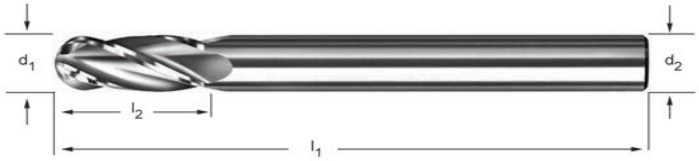
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S146	S246
1/4	0.2500	1/4	1.1/8	3“	4	1	7648886	7648890
3/8	0.3750	3/8	1.1/8	3“	4	1	7648887	7648891
1/2	0.5000	1/2	2“	4“	4	1	7648888	7648892
5/8	0.6250	5/8	2.1/4	5“	4	1	7648889	7648893

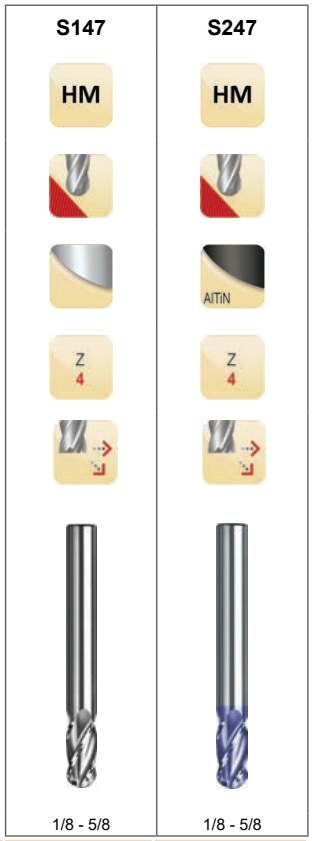
Solid Carbide 4-Flute End Mill

Extra Long Length, Ball Nose, 30° Helix

S147 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S247 Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S147	S247
1/8	0.1250	1/8	1“	3“	4	1	7648894	7648901
3/16	0.1875	3/16	1.1/8	3“	4	1	7648895	7648902
1/4	0.2500	1/4	1.1/2	4“	4	1	7648896	7648903
5/16	0.3125	5/16	1.5/8	4“	4	1	7648897	7648904
3/8	0.3750	3/8	1.3/4	4“	4	1	7648898	7648905
1/2	0.5000	1/2	3“	6“	4	1	7648899	7648906
5/8	0.6250	5/8	3“	6“	4	1	7648900	7648907

Solid Carbide 4-Flute End Mill

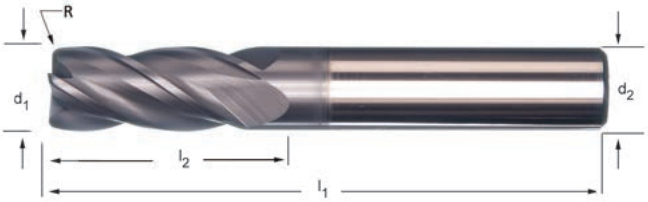
DORMER

Regular Length, Corner Radius, Unequal Helix

S223HA
S223HB

ALTiN coating increases hardness, and improves tool life allowing higher metal removal rates. These unequal helix cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for milling tough alloys and hardened steels.

S223HB has a Weldon shank.



d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	R Radius	# of Flutes	Pack Qty	S223HA	S223HB
1/8	0.1250	1/8	3/8	1-1/2	.015	4	1	7648675	7648697
1/8	0.1250	1/8	3/8	1-1/2	.030	4	1	7648676	7648698
3/16	0.1875	3/16	7/16	2"	.015	4	1	7648677	7648699
3/16	0.1875	3/16	7/16	2"	.030	4	1	7648678	7648700
1/4	0.2500	1/4	5/8	2-1/2	.015	4	1	7648679	7648701
1/4	0.2500	1/4	5/8	2-1/2	.030	4	1	7648680	7648702
5/16	0.3125	1/4	1/2	2"	.015	4	1	7648681	7648703
5/16	0.3125	1/4	1/2	2"	.030	4	1	7648682	7648704
3/8	0.3750	3/8	7/8	2-1/2	.015	4	1	7648683	7648705
3/8	0.3750	3/8	7/8	2-1/2	.030	4	1	7648684	7648706
7/16	0.4375	7/16	5/8	2-1/2	.020	4	1	7648685	7648707
7/16	0.4375	7/16	5/8	2-1/2	.045	4	1	7648686	7648708
1/2	0.5000	1/2	1-1/4	3"	.030	4	1	7648687	7648709
1/2	0.5000	1/2	1-1/4	3"	.060	4	1	7648688	7648710
9/16	0.5625	9/16	1-1/8	3-1/2	.045	4	1	7648689	7648711
9/16	0.5625	9/16	1-1/8	3-1/2	.060	4	1	7648690	7648712
5/8	0.6250	5/8	1-1/4	3-1/2	.060	4	1	7648691	7648713
5/8	0.6250	5/8	1-1/4	5"	.090	4	1	7648692 *	7648714 *
3/4	0.7500	3/4	1-1/2	4"	.030	4	1	7648693	7648715
3/4	0.7500	3/4	1-1/2	4"	.060	4	1	7648694	7648716
1"	1.0000	1"	2-1/4	5"	.030	4	1	7648695 *	7648717 *
1"	1.0000	1"	2-1/4	5"	.090	4	1	7648696 *	7648718 *

* Will require a reduction of 30% - 60% in cutting speed.

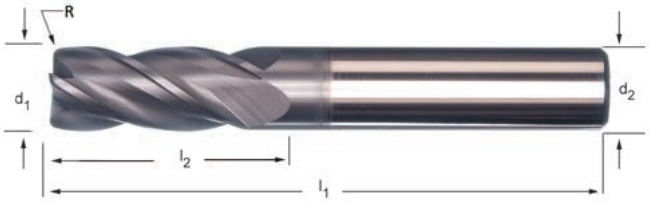
Solid Carbide 5-Flute End Mill

Regular Length, Corner Radius, Unequal Helix

S248HA
S248HB

ALTiN coating increases hardness, and improves tool life allowing higher metal removal rates. These unequal helix cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for milling tough alloys and hardened steels.

S248HB has a Weldon shank.



d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	R Radius	# of Flutes	Pack Qty	S248HA	S248HB
5/16	0.3125	5/16	13/16	2-1/2	.015	5	1	7648908	7648927
5/16	0.3125	5/16	13/16	2-1/2	.030	5	1	7648909	7648928
3/8	0.3750	3/8	7/8	2-1/2	.015	5	1	7648910	7648929
3/8	0.3750	3/8	7/8	2-1/2	.030	5	1	7648911	7648930
7/16	0.4375	7/16	5/8	2-1/2	.020	5	1	7648912	7648931
7/16	0.4375	7/16	5/8	2-1/2	.045	5	1	7648913	7648932
1/2	0.5000	1/2	1“	3“	.030	5	1	7648914	7648933
1/2	0.5000	1/2	1-1/4	3“	.030	5	1	7648915	7648934
1/2	0.5000	1/2	1-1/4	3“	.060	5	1	7648916	7648935
9/16	0.5625	9/16	1-1/8	3-1/2	.020	5	1	7648917	7648936
9/16	0.5625	9/16	1-1/8	3-1/2	.045	5	1	7648918	7648937
9/16	0.5625	9/16	1-1/8	3-1/2	.060	5	1	7648919	7648938
5/8	0.6250	5/8	1-1/4	3-1/2	.045	5	1	7648920	7648939
5/8	0.6250	5/8	1-1/4	3-1/2	.060	5	1	7648921	7648940
5/8	0.6250	5/8	1-1/4	3-1/2	.090	5	1	7648922	7648941
3/4	0.7500	3/4	1-1/2	4“	.030	5	1	7648923	7648942
3/4	0.7500	3/4	1-1/2	4“	.060	5	1	7648924	7648943
1“	1.0000	1“	2-1/4	5“	.030	5	1	7648925 *	7648944 *
1“	1.0000	1“	2-1/4	5“	.090	5	1	7648926 *	7648945 *

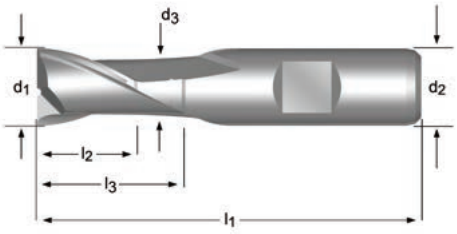
* Will require a reduction of 30% - 60% in cutting speed.

HSS-PM 2-Flute End Mill

DORMER

Stub Length, Square End, Weldon Shank, 30° Helix

C110 Powdered Metal. P9 slotting tolerance.



d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C110
	1.00	6	2.5	47	2	-	-	1	0353165
	1.50	6	3	47	2	-	-	1	0353172
1/16	1.59	6	3	47	2	-	-	1	0639795
	1.80	6	4	48	2	-	-	1	0353189
	2.00	6	4	48	2	-	-	1	0353301
3/32	2.38	6	5	49	2	-	-	1	0639801
	2.50	6	5	49	2	-	-	1	0353318
	2.80	6	5	49	2	-	-	1	0353325
	3.00	6	5	49	2	-	-	1	0353370
1/8	3.18	6	6	50	2	-	-	1	0639818
	3.50	6	6	50	2	-	-	1	0353387
	3.80	6	7	51	2	-	-	1	0353394
	4.00	6	7	51	2	-	-	1	0353424
	4.50	6	7	51	2	-	-	1	0353431
3/16	4.76	6	8	52	2	-	-	1	0639825
	4.80	6	8	52	2	-	-	1	0353448 1)2)
	5.00	6	8	52	2	-	-	1	0353455
	5.50	6	8	52	2	-	-	1	0353462
	5.75	6	8	52	2	-	-	1	0353479 1)2)
	6.00	6	8	52	2	-	-	1	0353486
1/4	6.35	10	10	60	2	-	-	1	0639832
	6.50	10	10	60	2	-	-	1	0353493
	6.75	10	10	60	2	-	-	1	0629031
	7.00	10	10	60	2	-	-	1	0353509
	7.50	10	10	60	2	-	-	1	0353516
	7.75	10	11	61	2	-	-	1	0573495 1)2)
5/16	7.94	10	11	61	2	-	-	1	0639849
	8.00	10	11	61	2	-	-	1	0353523
	8.50	10	11	61	2	-	-	1	0353530
	9.00	10	11	61	2	-	-	1	0353547

[1] Diameter tolerance h10
[2] Slot not in P9 tolerance
[3] Available in HSCo only

HSS-PM 2-Flute End Mill

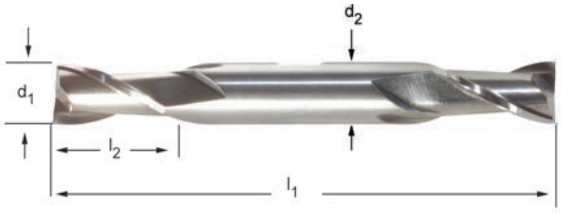
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C110	
	9.50	10	11	61	2	-	-	1	0353554	
3/8	9.52	10	13	63	2	22.5	9.5	1	0639856	
	9.70	10	13	63	2	22.5	9.5	1	0573501	1)2)
	10.00	10	13	63	2	22.5	9.5	1	0353196	
13/32	10.32	12	13	70	2	-	-	1	0639863	
	10.50	12	13	70	2	-	-	1	0353202	
	11.00	12	13	70	2	-	-	1	0353219	
7/16	11.11	12	13	70	2	-	-	1	0639870	
	11.50	12	13	70	2	-	-	1	0573433	
	11.70	12	16	73	2	27.5	11.5	1	0573440	1)2)
	12.00	12	16	73	2	27.5	11.5	1	0353226	
	12.50	12	16	73	2	27.5	11.5	1	0573457	
1/2	12.70	12	16	73	2	27.5	11.5	1	0639887	
	13.00	12	16	73	2	27.5	11.5	1	0353233	
17/32	13.49	12	16	73	2	27.5	11.5	1	0639894	
	13.70	12	16	73	2	27.5	11.5	1	0573464	1)2)
	14.00	12	16	73	2	27.5	11.5	1	0353240	
9/16	14.29	12	16	73	2	27.5	11.5	1	0639900	
	15.00	12	16	73	2	27.5	11.5	1	0353257	
	15.70	16	19	79	2	30.5	15.5	1	0573471	1)2)
5/8	15.88	16	19	79	2	30.5	15.5	1	0639917	
	16.00	16	19	79	2	30.5	15.5	1	0353264	
	17.00	16	19	79	2	30.5	15.5	1	0353271	
11/16	17.46	16	19	79	2	30.5	15.5	1	0639924	
	17.70	16	19	79	2	30.5	15.5	1	0628942	
	18.00	16	19	79	2	30.5	15.5	1	0353288	
	19.00	16	19	79	2	30.5	15.5	1	0353295	
3/4	19.05	20	22	88	2	37.5	18.5	1	0639931	
	19.70	20	22	88	2	37.5	19.5	1	0628959	
	20.00	20	22	88	2	37.5	19.5	1	0353332	
	21.70	20	22	88	2	37.5	19.5	1	0628966	
	22.00	20	22	88	2	37.5	19.5	1	0353349	
7/8	22.22	20	22	88	2	37.5	19.5	1	0639948	
	24.00	25	26	102	2	45.5	23.5	1	0573488	
	24.70	25	26	102	2	45.5	24.5	1	0628973	
	25.00	25	26	102	2	45.5	24.5	1	0353356	
1“	25.40	25	26	102	2	45.5	24.5	1	0621929	
	26.00	25	26	102	2	45.5	24.5	1	0628980	
	28.00	25	26	102	2	45.5	24.5	1	0353363	
1.1/8	28.58	25	26	102	2	45.5	24.5	1	0639962	
	30.00	25	26	102	2	45.5	24.5	1	0353400	
1.1/4	31.75	32	32	112	2	51.5	31.5	1	0639979	
	32.00	32	32	112	2	51.5	31.5	1	0353417	
	35.00	32	32	112	2	51.5	31.5	1	0639986	1)3)
	36.00	32	32	112	2	51.5	31.5	1	0628997	1)3)
	40.00	40	38	130	2	59.5	39.0	1	0629000	1)3)
	45.00	40	38	130	2	59.5	38.0	1	0629017	1)3)
	50.00	50	45	147	2	66.5	48.0	1	0629024	1)3)

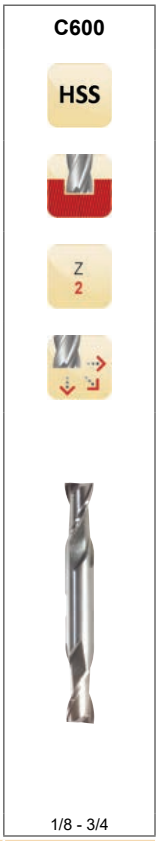
[1] Diameter tolerance h10
[2] Slot not in P9 tolerance
[3] Available in HSCo only

HSS 2-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C600 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.



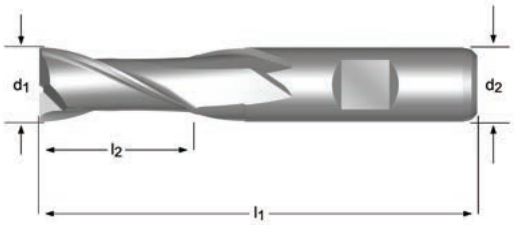


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C600
1/8	0.1250	3/8	3.1/16	3/8	2	1	7647759
5/32	0.1562	7/16	3.1/8	3/8	2	1	7647820
3/16	0.1875	7/16	3.1/4	3/8	2	1	7647821
1/4	0.2500	1/2	3.3/8	3/8	2	1	7647822
9/32	0.2812	9/16	3.3/8	3/8	2	1	7647823
5/16	0.3125	9/16	3.1/2	3/8	2	1	7647824
11/32	0.3437	9/16	3.1/2	3/8	2	1	7647825
3/8	0.3750	9/16	3.1/2	3/8	2	1	7647826
13/32	0.4062	13/16	4.1/8	1/2	2	1	7647827
7/16	0.4375	13/16	4.1/8	1/2	2	1	7647828
1/2	0.5000	13/16	4.1/8	1/2	2	1	7647829
5/8	0.6250	1.1/8	5“	5/8	2	1	7647830
3/4	0.7500	1.5/16	5.5/8	3/4	2	1	7647831

HSS 2-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C601 Bright finish improves chip flow in soft or non-ferrous materials.



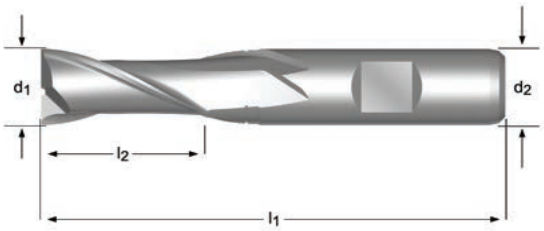
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C601
1/8	0.1250	3/8	2.5/16	3/8	2	1	7647832
3/16	0.1875	7/16	2.3/8	3/8	2	1	7647833
1/4	0.2500	1/2	2.7/16	3/8	2	1	7647834
5/16	0.3125	9/16	2.1/2	3/8	2	1	7647835
3/8	0.3750	9/16	2.1/2	3/8	2	1	7647836
7/16	0.4375	13/16	2.11/16	3/8	2	1	7647837
1/2	0.5000	13/16	2.11/16	3/8	2	1	7647838
1/2	0.5000	1“	3.1/4	1/2	2	1	7647839
9/16	0.5625	1.1/8	3.3/8	1/2	2	1	7647840
5/8	0.6250	1.1/8	3.3/8	1/2	2	1	7647841
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	7647844
11/16	0.6875	1.5/16	3.5/8	1/2	2	1	7647842
11/16	0.6875	1.5/16	3.3/4	5/8	2	1	7647845
3/4	0.7500	1.5/16	3.5/8	1/2	2	1	7647843
3/4	0.7500	1.5/16	3.3/4	5/8	2	1	7647846
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	7647859
13/16	0.8125	1.1/2	4“	5/8	2	1	7647847
7/8	0.8750	1.1/2	4“	5/8	2	1	7647848
7/8	0.8750	1.1/2	4.1/8	3/4	2	1	7647860
7/8	0.8750	1.1/2	4.1/8	7/8	2	1	7647851
15/16	0.9375	1.1/2	4“	5/8	2	1	7647849
1“	1.0000	1.1/2	4“	5/8	2	1	7647850
1“	1.0000	1.1/2	4.1/8	3/4	2	1	7647861
1“	1.0000	1.1/2	4.1/8	7/8	2	1	7647852
1“	1.0000	1.5/8	4.1/2	1“	2	1	7647853
1.1/8	1.1250	1.5/8	4.1/4	3/4	2	1	7647862
1.1/8	1.1250	1.5/8	4.1/2	1“	2	1	7647854
1.1/4	1.2500	1.5/8	4.1/2	1“	2	1	7647855
1.1/4	1.2500	1.5/8	4.1/2	1.1/4	2	1	7647857
1.1/2	1.5000	1.5/8	4.1/4	3/4	2	1	7647863
1.1/2	1.5000	1.5/8	4.1/2	1“	2	1	7647856
1.1/2	1.5000	1.5/8	4.1/2	1.1/4	2	1	7647858

HSS 2-Flute End Mill

Regular Length, Square End, Keyway, Weldon Shank, 30° Helix

C602

Keyway cutter, close tolerance (+0.0000”/-0.0015”). Bright finish improves chip flow in soft or non-ferrous materials.

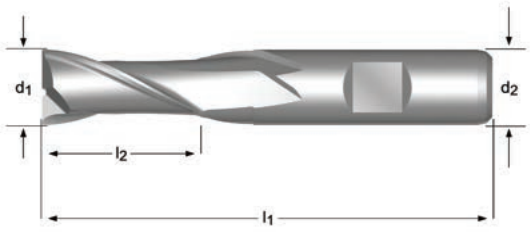


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C602
1/8	0.1250	3/8	2.5/16	3/8	2	1	7647864
3/16	0.1875	7/16	2.3/8	3/8	2	1	7647865
1/4	0.2500	1/2	2.7/16	3/8	2	1	7647866
5/16	0.3125	9/16	2.1/2	3/8	2	1	7647867
3/8	0.3750	9/16	2.1/2	3/8	2	1	7647868
1/2	0.5000	1“	3.1/4	1/2	2	1	7647869
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	7647870
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	7647871
7/8	0.8750	1.1/2	4.1/8	7/8	2	1	7647872
1“	1.0000	1.5/8	4.1/2	1“	2	1	7647873

Cobalt 2-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C603 Bright finish improves chip flow in soft or non-ferrous materials.



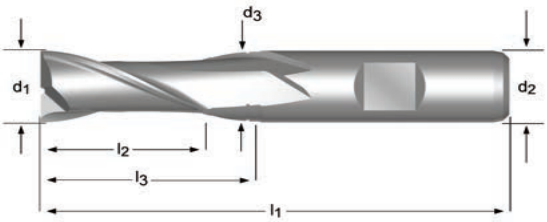
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C603
1/8	0.1250	3/8	2.5/16	3/8	2	1	7647874
3/16	0.1875	7/16	2.3/8	3/8	2	1	7647875
1/4	0.2500	1/2	2.7/16	3/8	2	1	7647876
5/16	0.3125	9/16	2.1/2	3/8	2	1	7647877
3/8	0.3750	9/16	2.1/2	3/8	2	1	7647878
1/2	0.5000	1“	3.1/4	1/2	2	1	7647879
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	7647880
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	7647881
1“	1.0000	1.5/8	4.1/2	1“	2	1	7647882

HSS-PM 2-Flute End Mill

DORMER

Regular Length, Square End, Weldon Shank, 30° Helix

C123 Powdered Metal. P9 slotting tolerance.



d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C123	
1/16	1.59	6	7	51	2	—	—	1	0640012	1)
	2.00	6	7	51	2	—	—	1	0353646	
	2.50	6	8	52	2	—	—	1	0353653	
	3.00	6	8	52	2	—	—	1	0353714	
1/8	3.18	6	10	54	2	—	—	1	0640029	1)
	3.50	6	10	54	2	—	—	1	0353721	
5/32	3.97	6	11	55	2	—	—	1	0640036	1)
	4.00	6	11	55	2	—	—	1	0353769	
	4.50	6	11	55	2	—	—	1	0353776	
3/16	4.76	6	13	57	2	—	—	1	0640043	1)
	5.00	6	13	57	2	—	—	1	0353790	
	5.50	6	13	57	2	—	—	1	0353806	
	6.00	6	13	57	2	—	—	1	0353813	
1/4	6.35	10	16	66	2	—	—	1	0640050	1)
	6.50	10	16	66	2	—	—	1	0353820	
	7.00	10	16	66	2	—	—	1	0353837	
	7.50	10	16	66	2	—	—	1	0353844	
5/16	7.94	10	19	69	2	—	—	1	0640067	1)
	8.00	10	19	69	2	—	—	1	0353851	
	8.50	10	19	69	2	—	—	1	0353868	
	9.00	10	19	69	2	—	—	1	0353875	
	9.50	10	19	69	2	—	—	1	0353882	
3/8	9.52	10	22	72	2	31.5	9.5	1	0640074	1)
	10.00	10	22	72	2	31.5	9.5	1	0353561	
	11.00	12	22	79	2	—	—	1	0353578	
	12.00	12	26	83	2	37.5	11.5	1	0353585	
1/2	12.70	12	26	83	2	37.5	11.5	1	0640081	1)
	13.00	12	26	83	2	37.5	11.5	1	0353592	
	14.00	12	26	83	2	37.5	11.5	1	0353608	
9/16	14.29	12	26	83	2	37.5	11.5	1	0640098	1)

[1] Diameter tolerance -.0005 inches / -.0013 inches
[2] Diameter tolerance -.0005 inches / -.0015 inches
[3] Available in HSCo only

HSS-PM 2-Flute End Mill

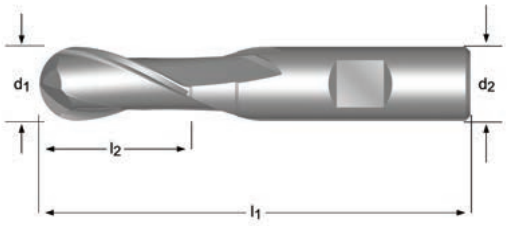
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C123	
	15.00	12	26	83	2	37.5	11.5	1	0353615	
5/8	15.88	16	32	92	2	43.5	15.5	1	0640104	1)
	16.00	16	32	92	2	43.5	15.5	1	0353622	
	18.00	16	32	92	2	43.5	15.5	1	0353639	
3/4	19.05	20	38	104	2	53.5	18.5	1	0640111	2)
	20.00	20	38	104	2	53.5	19.5	1	0353660	
	22.00	20	38	104	2	53.5	19.5	1	0353677	
	25.00	25	45	121	2	64.5	24.5	1	0353691	
1“	25.40	25	45	121	2	64.5	24.5	1	0640128	
	30.00	25	45	121	2	64.5	24.5	1	0353738	
	32.00	32	53	133	2	72.5	31.5	1	0353745	
	36.00	32	53	133	2	72.5	31.5	1	0353752	3)
	40.00	40	63	155	2	84.5	39.0	1	0353783	3)

[1] Diameter tolerance -.0005 inches / -.0013 inches
[2] Diameter tolerance -.0005 inches / -.0015 inches
[3] Available in HSCo only

HSS 2-Flute End Mill

Regular Length, Ball Nose, Weldon Shank, 30° Helix

C604 Ball nose for cutting internal radius. Bright finish improves chip flow in soft or non-ferrous materials.

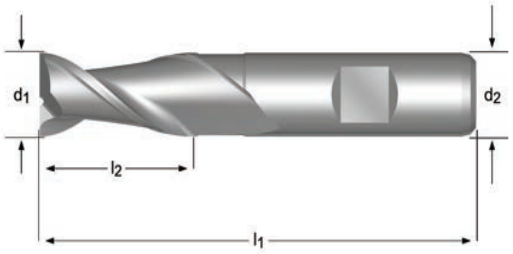


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 inch	d_2 Ø Inch	# of Flutes	Pack Qty	C604
1/8	0.1250	3/8	2.5/16	3/8	2	1	7647883
3/16	0.1875	1/2	2.3/8	3/8	2	1	7647884
1/4	0.2500	5/8	2.7/16	3/8	2	1	7647885
5/16	0.3125	3/4	2.1/2	3/8	2	1	7647886
3/8	0.3750	3/4	2.1/2	3/8	2	1	7647887
7/16	0.4375	1“	3.1/4	1/2	2	1	7647888
1/2	0.5000	1“	3.1/4	1/2	2	1	7647889
9/16	0.5625	1.1/8	3.3/8	1/2	2	1	7647890
5/8	0.6250	1.1/8	3.3/8	1/2	2	1	7647891
3/4	0.7500	1.5/16	3.5/8	1/2	2	1	7647892

HSS 2-Flute End Mill

Regular Length, Square End, Weldon Shank, 37° Helix

C605 High Helix design for aluminum and other non-ferrous materials.

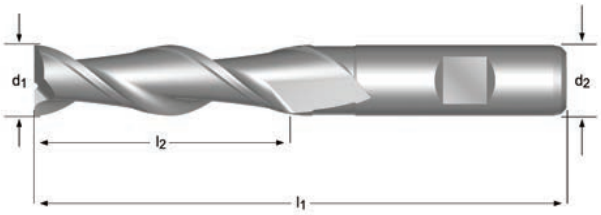


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C605
1/4	0.2500	5/8	2.7/16	3/8	2	1	7647893
5/16	0.3125	3/4	2.1/2	3/8	2	1	7647894
3/8	0.3750	3/4	2.1/2	3/8	2	1	7647895
1/2	0.5000	1.1/4	3.1/4	1/2	2	1	7647896
3/4	0.7500	1.5/8	3.7/8	3/4	2	1	7647897
1“	1.0000	2“	4.1/2	1“	2	1	7647898

HSS 2-Flute End Mill

Long Length, Square End, Weldon Shank, 37° Helix

C606 High Helix design for aluminum and other non-ferrous materials.

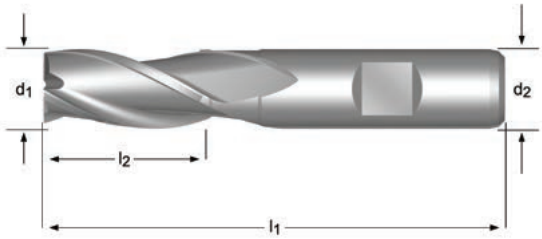


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C606
1/4	0.2500	1.1/4	3.1/16	3/8	2	1	7647899
5/16	0.3125	1.3/8	3.1/8	3/8	2	1	7647900
3/8	0.3750	1.1/2	3.1/4	3/8	2	1	7647901
1/2	0.5000	2“	4“	1/2	2	1	7647902
3/4	0.7500	3“	5.1/4	3/4	2	1	7647903

HSS 3-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C607 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.



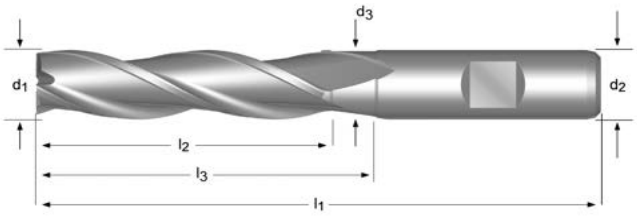
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C607
1/8	0.1250	3/8	2.5/16	3/8	3	1	7647904
3/16	0.1875	1/2	2.3/8	3/8	3	1	7647905
1/4	0.2500	5/8	2.7/16	3/8	3	1	7647906
5/16	0.3125	3/4	2.1/2	3/8	3	1	7647907
3/8	0.3750	3/4	2.1/2	3/8	3	1	7647908
7/16	0.4375	1“	2.11/16	3/8	3	1	7647909
1/2	0.5000	1.1/4	3.1/4	1/2	3	1	7647910
9/16	0.5625	1.3/8	3.3/8	1/2	3	1	7658817
5/8	0.6250	1.5/8	3.3/4	5/8	3	1	7647912
3/4	0.7500	1.5/8	3.3/4	5/8	3	1	7647913
3/4	0.7500	1.5/8	3.7/8	3/4	3	1	7647916
1“	1.0000	1.7/8	4“	5/8	3	1	7647914
1“	1.0000	2“	4.1/2	1“	3	1	7647915

Cobalt 3-Flute End Mill

DORMER

Long Length, Square End, Weldon Shank, 30° Helix

C346 P9 slotting tolerance. 3 flute design provides less chatter.



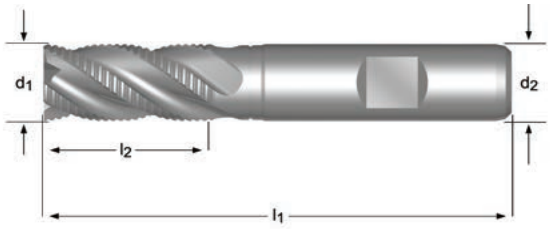
d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C346
3.00	6	12	56	3	-	-	1	0122297
4.00	6	19	63	3	-	-	1	0122303
5.00	6	24	68	3	-	-	1	0122310
6.00	6	24	68	3	-	-	1	0122327
7.00	10	30	80	3	-	-	1	0126325
8.00	10	38	88	3	-	-	1	0126332
9.00	10	38	88	3	-	-	1	0126349
10.00	10	45	95	3	-	-	1	0126233
11.00	12	45	102	3	-	-	1	0126240
12.00	12	53	110	3	-	-	1	0126257
13.00	12	53	110	3	64.5	11.5	1	0126264
14.00	12	53	110	3	64.5	11.5	1	0126271
15.00	12	53	110	3	64.5	11.5	1	0126288
16.00	16	63	123	3	74.5	15.5	1	0126295
18.00	16	63	123	3	74.5	15.5	1	0126301
20.00	20	75	141	3	90.5	19.5	1	0126318

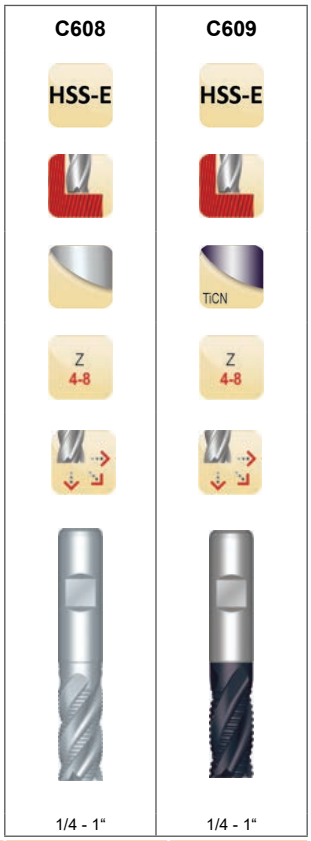
Cobalt 4-Flute End Mill

Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

C608 Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.

C609 TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.





d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C608	C609
1/4	0.2500	5/8	2.7/16	3/8	4	1	7647917	7647927
5/16	0.3125	3/4	2.1/2	3/8	4	1	7647918	7647928
3/8	0.3750	3/4	2.1/2	3/8	4	1	7647919	7647929
7/16	0.4375	1.1/4	3.1/4	1/2	4	1	7647920	7647930
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	7647921	7647931
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	7647922	—
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	7647923	7647932
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	7647924	7647933
7/8	0.8750	1.7/8	4.1/8	3/4	5	1	7647925	—
1“	1.0000	2“	4.1/2	1“	5	1	7647926	7647934

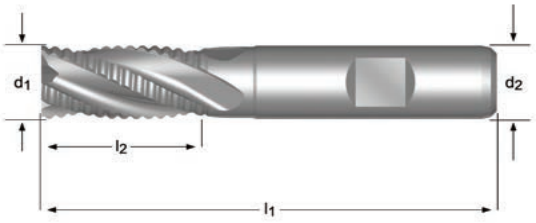
Cobalt Multi-Flute End Mill

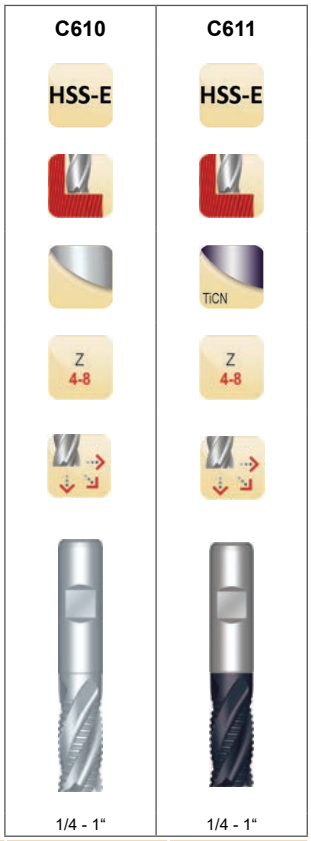
DORMER

Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

C610 Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.

C611 TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.



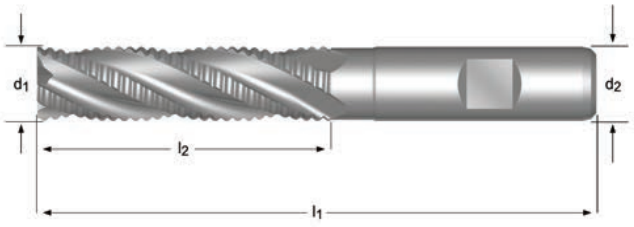


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C610	C611
1/4	0.2500	5/8	2.7/16	3/8	4	1	7647935	7647945
5/16	0.3125	3/4	2.1/2	3/8	4	1	7647936	7647946
3/8	0.3750	3/4	2.1/2	3/8	4	1	7647937	7647947
7/16	0.4375	1.1/4	3.1/4	1/2	4	1	7647938	7647948
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	7647939	7647949
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	7647940	—
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	7647941	7647950
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	7647942	7647951
7/8	0.8750	1.7/8	4.1/8	3/4	5	1	7647943	7647952
1“	1.0000	2“	4.1/2	1“	5	1	7647944	7647953

Cobalt 4-Flute End Mill

Long Length, Square End, Roughing, Weldon Shank, 30° Helix

C612 Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.

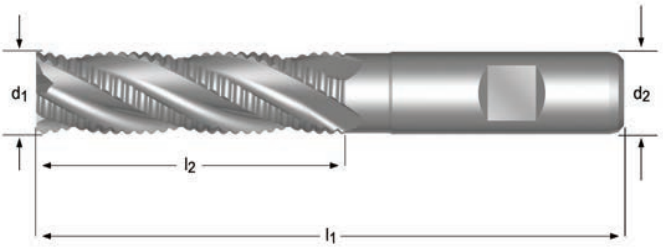


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C612
1/4	0.2500	1.1/4	3.1/8	3/8	4	1	7647954
3/8	0.3750	1.1/2	3.1/4	3/8	4	1	7647955
1/2	0.5000	2“	4“	1/2	4	1	7647956
5/8	0.6250	2.1/2	4.5/8	5/8	4	1	7647957
3/4	0.7500	3“	5.1/4	3/4	4	1	7647958
7/8	0.8750	3.1/2	5.3/4	3/4	6	1	7647959
1“	1.0000	4“	6.1/2	1“	5	1	7647960

Cobalt 4-Flute End Mill

Long Length, Square End, Roughing, Weldon Shank, 30° Helix

C613 Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.

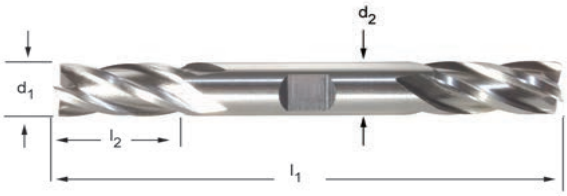


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C613
1/4	0.2500	1.1/4	3.1/8	3/8	4	1	7647961
3/8	0.3750	1.1/2	3.1/4	3/8	4	1	7647962
1/2	0.5000	2“	4“	1/2	4	1	7647963
3/4	0.7500	3“	5.1/4	3/4	4	1	7647964

HSS 4-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C614 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.



C614

HSS

Z 4

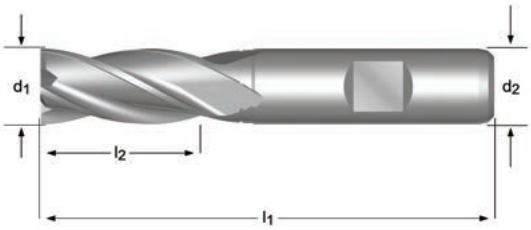
1/8 - 3/4

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C614
1/8	0.1250	3/8	3.1/16	3/8	4	1	7647965
3/16	0.1875	1/2	3.1/4	3/8	4	1	7647966
1/4	0.2500	5/8	3.3/8	3/8	4	1	7647967
5/16	0.3125	3/4	3.1/2	3/8	4	1	7647968
3/8	0.3750	3/4	3.1/2	3/8	4	1	7647969
1/2	0.5000	1“	4.1/8	1/2	4	1	7647970
5/8	0.6250	1.3/8	5“	5/8	4	1	7647971
3/4	0.7500	1.5/8	5.5/8	3/4	4	1	7647972

HSS 4-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C615 Bright finish improves chip flow in soft or non-ferrous materials.

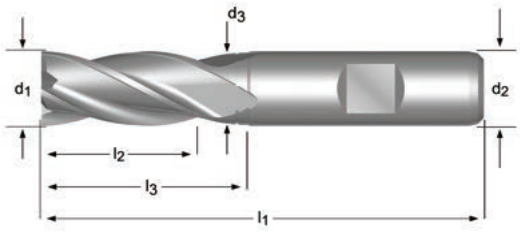


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C615
1/8	0.1250	3/8	2.5/16	3/8	4	1	7647973
3/16	0.1875	1/2	2.3/8	3/8	4	1	7647974
1/4	0.2500	5/8	2.7/16	3/8	4	1	7647975
5/16	0.3125	3/4	2.1/2	3/8	4	1	7647976
3/8	0.3750	3/4	2.1/2	3/8	4	1	7647977
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	7647978
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	7647979
11/16	0.6875	1.5/8	3.3/4	5/8	4	1	7647980
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	7647981
7/8	0.8750	1.7/8	4.1/8	7/8	4	1	7647982
1“	1.0000	2“	4.1/2	1“	4	1	7647983

Cobalt-PM Multi-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C247 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.



d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C247	
	2.00	6	7	51	4	—	—	1	0354667	
	2.50	6	8	52	4	—	—	1	0354674	
	3.00	6	8	52	4	—	—	1	0354728	
1/8	3.18	6	10	54	4	—	—	1	0640142	1)
	3.50	6	10	54	4	—	—	1	0354735	
	4.00	6	11	55	4	—	—	1	0354766	
	4.50	6	11	55	4	—	—	1	0354773	
3/16	4.76	6	13	57	4	—	—	1	0640159	1)
	5.00	6	13	57	4	—	—	1	0354780	
	5.50	6	13	57	4	—	—	1	0354797	
	6.00	6	13	57	4	—	—	1	0354803	
1/4	6.35	10	16	66	4	—	—	1	0640166	1)
	6.50	10	16	66	4	—	—	1	0354810	
	7.00	10	16	66	4	—	—	1	0354827	
	7.50	10	16	66	4	—	—	1	0354834	
5/16	7.94	10	19	69	4	—	—	1	0640173	1)
	8.00	10	19	69	4	—	—	1	0354841	
	8.50	10	19	69	4	—	—	1	0354858	
	9.00	10	19	69	4	—	—	1	0354865	
	9.50	10	19	69	4	—	—	1	0354872	
3/8	9.52	10	22	72	4	31.5	9.5	1	0640180	1)
	10.00	10	22	72	4	31.5	9.5	1	0354582	
	11.00	12	22	79	4	—	—	1	0354599	
	12.00	12	26	83	4	37.5	11.5	1	0354605	
1/2	12.70	12	26	83	4	37.5	11.5	1	0640197	1)
	13.00	12	26	83	4	37.5	11.5	1	0354612	
	14.00	12	26	83	4	37.5	11.5	1	0354629	
9/16	14.29	12	26	83	4	37.5	11.5	1	0640203	1)
	15.00	12	26	83	4	37.5	11.5	1	0354636	
5/8	15.88	16	32	92	4	43.5	15.5	1	0640210	1)

[1] Diameter tolerance +.0025 inches / -.0005 inches
[2] Not center Cutting
[3] Available in HSCo only

Cobalt-PM Multi-Flute End Mill

DORMER

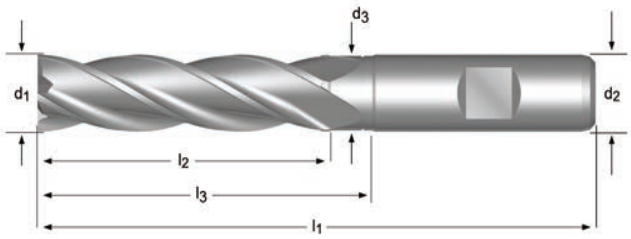
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C247	
	16.00	16	32	92	4	43.5	15.5	1	0354643	
	17.00	16	32	92	4	43.5	15.5	1	0609316	
	18.00	16	32	92	4	43.5	15.5	1	0354650	
	19.00	16	32	92	4	43.5	15.5	1	0609323	
3/4	19.05	20	38	104	4	53.5	18.5	1	0640227	1)
	20.00	20	38	104	4	53.5	19.5	1	0354681	
	21.00	20	38	104	4	53.5	19.5	1	0609330	
	22.00	20	38	104	5	53.5	19.5	1	0354698	
7/8	22.22	20	38	104	5	53.5	19.5	1	0640234	1)
	23.00	20	38	104	5	53.5	19.5	1	0609347	
	24.00	25	45	121	5	64.5	23.5	1	0609354	
	25.00	25	45	121	5	64.5	24.5	1	0354704	
1“	25.40	25	45	121	5	64.5	24.5	1	0640241	1)
	26.00	25	45	121	6	64.5	24.5	1	0609361	
	28.00	25	45	121	6	64.5	24.5	1	0354711	
	30.00	25	45	121	6	64.5	24.5	1	0354742	
	32.00	32	53	133	6	72.5	31.5	1	0354759	
	36.00	32	53	133	6	72.5	31.5	1	0609378	2)3)
	40.00	40	63	155	6	84.5	39.0	1	0609385	2)3)
	50.00	50	75	177	8	96.5	48.0	1	0640258	2)3)

1) Diameter tolerance +.0025 inches / -.0005 inches
2) Not center Cutting
3) Available in HSCo only

Cobalt-PM Multi-Flute End Mill

Long Length, Square End, Weldon Shank

C273 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.



d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C273	
	2.00	6	10	54	4	—	—	1	0354964	
	2.50	6	12	56	4	—	—	1	0354971	
	3.00	6	12	56	4	—	—	1	0355022	
1/8	3.18	6	15	59	4	—	—	1	0640265	1)
	3.50	6	15	59	4	—	—	1	0355039	
	4.00	6	19	63	4	—	—	1	0355060	
	4.50	6	19	63	4	—	—	1	0355077	
3/16	4.76	6	24	68	4	—	—	1	0640272	1)
	5.00	6	24	68	4	—	—	1	0355084	
	5.50	6	24	68	4	—	—	1	0355091	
	6.00	6	24	68	4	—	—	1	0355107	
1/4	6.35	10	30	80	4	—	—	1	0640289	1)
	7.00	10	30	80	4	—	—	1	0355114	
	8.00	10	38	88	4	—	—	1	0355121	
	9.00	10	38	88	4	—	—	1	0355138	
3/8	9.52	10	45	95	4	54.5	9.5	1	0640296	1)
	10.00	10	45	95	4	54.5	9.5	1	0354889	
	11.00	12	45	102	4	—	—	1	0354896	
	12.00	12	53	110	4	64.5	11.5	1	0354902	
1/2	12.70	12	53	110	4	64.5	11.5	1	0640302	1)
	13.00	12	53	110	4	64.5	11.5	1	0354919	
	14.00	12	53	110	4	64.5	11.5	1	0354926	
	15.00	12	53	110	4	64.5	11.5	1	0354933	
5/8	15.88	16	63	123	4	74.5	15.5	1	0640319	1)
	16.00	16	63	123	4	74.5	15.5	1	0354940	
	18.00	16	63	123	4	74.5	15.5	1	0354957	
3/4	19.05	20	75	141	4	90.5	18.5	1	0640326	1)
	20.00	20	75	141	4	90.5	19.5	1	0354988	
	22.00	20	75	141	5	90.5	19.5	1	0354995	
	25.00	25	90	166	5	109.5	24.5	1	0355008	

[1] Diameter tolerance +.0025 inches / -.0005 inches
[2] Available in HSCo only
[3] Not Center Cutting

Cobalt-PM Multi-Flute End Mill

DORMER

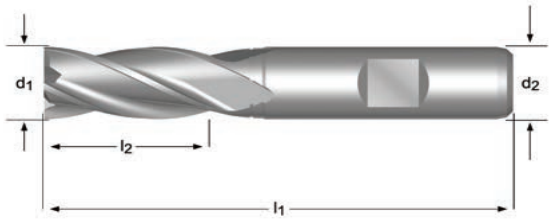
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C273	
1“	25.40	25	90	166	5	109.5	24.5	1	0640340	1)
	28.00	25	90	166	6	109.5	24.5	1	0355015	
	30.00	25	90	166	6	109.5	24.5	1	0355046	
	32.00	32	106	186	6	125.5	31.5	1	0355053	
	40.00	40	125	217	6	146.5	39.0	1	0609309	2)3)

1) Diameter tolerance +.0025 inches / -.0005 inches
2) Available in HSCo only
3) Not Center Cutting

HSS Multi-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C617 Multi-flute finishing. Bright finish improves chip flow in soft or non-ferrous materials.



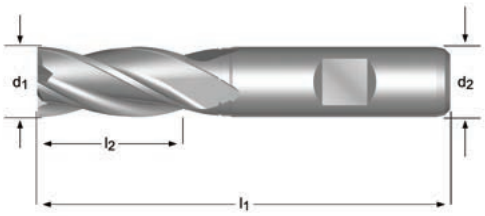
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C617
1/8	0.1250	3/8	2.5/16	3/8	4	1	7647984
3/16	0.1875	1/2	2.3/8	3/8	4	1	7647985
1/4	0.2500	5/8	2.7/16	3/8	4	1	7647986
5/16	0.3125	3/4	2.1/2	3/8	4	1	7647987
3/8	0.3750	3/4	2.1/2	3/8	4	1	7647988
7/16	0.4375	1“	2.11/16	3/8	4	1	7647989
1/2	0.5000	1“	2.11/16	3/8	4	1	7647990
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	7647991
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	7647992
5/8	0.6250	1.3/8	3.3/8	1/2	4	1	7647993
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	7647996
11/16	0.6875	1.5/8	3.5/8	1/2	4	1	7647994
11/16	0.6875	1.5/8	3.3/4	5/8	4	1	7647997
3/4	0.7500	1.5/8	3.5/8	1/2	4	1	7647995
3/4	0.7500	1.5/8	3.3/4	5/8	4	1	7647998
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	7648005
13/16	0.8125	1.7/8	4“	5/8	6	1	7647999
7/8	0.8750	1.7/8	4“	5/8	6	1	7648000
7/8	0.8750	1.7/8	4.1/8	3/4	4	1	7648006
7/8	0.8750	1.7/8	4.1/8	7/8	4	1	7648002
1“	1.0000	1.7/8	4“	5/8	6	1	7648001
1“	1.0000	1.7/8	4.1/8	3/4	4	1	7648007
1“	1.0000	1.7/8	4.1/8	7/8	4	1	7648003
1“	1.0000	2“	4.1/2	1“	4	1	7648004

Cobalt 4-Flute End Mill

DORMER

Regular Length, Square End, Weldon Shank, 30° Helix

C618 Multi-flute finishing for high strength heat resistant materials, stainless and alloy steel, super alloys, and titanium alloys.



d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	C618
1/8	0.1250	3/8	2.5/16	3/8	4	1	7648008
3/16	0.1875	1/2	2.3/8	3/8	4	1	7648009
1/4	0.2500	5/8	2.7/16	3/8	4	1	7648010
5/16	0.3125	3/4	2.1/2	3/8	4	1	7648011
3/8	0.3750	3/4	2.1/2	3/8	4	1	7648012
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	7648013
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	7648014
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	7648015
1“	1.0000	2“	4.1/2	1“	4	1	7648016

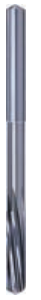
Visual Index - Reamers

Feed Rate Chart - Reamers

Alpha Code	Reamers - Feed in Inches per Revolution Ø Diameter												
	1/16	5/64	1/8	3/16	5/16	25/64	1/2	5/8	25/32	1”	1-13/16	1-1/2	2”
A	0.002	0.002	0.003	0.004	0.006	0.007	0.007	0.009	0.010	0.011	0.013	0.015	0.017
B	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.011	0.012	0.014	0.016	0.020	0.022
C	0.003	0.003	0.005	0.007	0.009	0.010	0.011	0.013	0.015	0.017	0.019	0.024	0.027
D	0.031	0.004	0.006	0.008	0.011	0.013	0.014	0.016	0.019	0.021	0.024	0.029	0.033
E	0.004	0.006	0.007	0.010	0.014	0.015	0.017	0.020	0.021	0.025	0.030	0.036	0.043
F	0.006	0.007	0.010	0.014	0.017	0.020	0.022	0.025	0.028	0.031	0.037	0.047	0.059

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Reamers

Tool Material:	HM	HM	HM	HM	HM	HSS-E	HSS	HSS	HSS-E	HSS-E	HSS	HSS
Finish/Coating:									ST		ST Bronze	
Standard:	DIN 8050	DIN 8093	DIN 8051	DIN 8094	DIN 8093	DIN 212	ANSI	ANSI	BS 328	DIN 212	ANSI	ANSI
Direction of Cut:												
Shank:					DIN 6535HA							
Tolerance:	H7	H7	H7	H7	Ø.95-5.5 0,+0.004 Ø5.51-12 0,+0.005	Ø.95-5.5 0,+0.004 Ø5.51-12 0,+0.005	USCTI	USCTI	H7	H7		USCTI
Tolerance:												
Countersink Angle:												
Taper Gradient:												1:48
												
Style:	B441	B400	B442	B411	B481	B170	4533	4535	B901	B157	B122	4588
Range:	10.00 - 20.00	1.00 - 20.00	10.00 - 20.00	5.00 - 30.00	0.98 - 12.05	0.98 - 12.00	N60 - 1.1/2	1/16 - 1“	1.50 - 1/2	2.00 - 20.00	3/8 - 1.1/16	7/0 - 10
Page #	457	458	459	460	461	463	466	470	471	472	473	474
1.1	59B	59B	59B	59B	59B	82C	82C	82C	59C	82C	59C	59C
1.2	59B	59B	59B	59B	59B	66C	66C	66C	46C	66C	46C	46C
1.3	46B	46B	46B	46B	46B	52C	52C	52C	36C	52C	36C	36C
1.4	46B	46B	46B	46B	46B	49B	49B	49B	33B	49B	33B	33B
1.5	33C	33C	33C	33C	33C	30B	30B	30B	16B	30B	16B	16B
1.6	33C	33C	33C	33C	33C	16A	16A	16A	13A	16A	13A	13A
1.7												
1.8												
2.1						36C	36C	36C	26C	36C	26C	26C
2.2						20B	20B	20B		20B	16B	16B
2.3						26B	26B	26B		26B	20B	20B
2.4							20B	20B				
3.1	56D	56D	56D	56D	56D	52E	52E	52E	46E		46E	46E
3.2	56D	56D	56D	56D	56D	49D	49D	49D	36D		36D	36D
3.3	56D	56D	56D	56D	56D	43C	43C	43C	33C		33C	33C
3.4	46D	46D	46D	46D	46D	36C	36C	36C	30C		30C	30C
4.1	46C	46C	46C	46C	46C	49C	49C	49C	36C	49C	36C	36C
4.2	46C	46C	46C	46C	46C	30B	30B	30B	16B	30B	16B	16B
4.3	33B	33B	33B	33B	33B	16B	16B	16B	13B	16B	13B	13B
5.1	33C	33C	33C	33C	33C	26D	26D	26D	16D	26D	16D	16D
5.2	33B	33B	33B	33B	33B	16C	16C	16C	10C	16C		
5.3	33B	33B	33B	33B	33B	10C	10C	10C	7C	10C		
6.1	125E	125E	125E	125E	125E	82D	82D	82D	59D	82D	59D	59D
6.2	125E	125E	125E	125E	125E	92E	92E	92E	66E	92E	66E	66E
6.3	125E	125E	125E	125E	125E	82D	82D	82D	59D		59D	59D
6.4	125D	125D	125D	125D	125D	46D	46D	46D	36D		36D	36D
7.1	197D	197D	197D	197D	197D				75F	92F	75F	75F
7.2	197D	197D	197D	197D	197D				59F	82F	59F	59F
7.3	82D	82D	82D	82D	82D					66E	49E	49E
7.4	82D	82D	82D	82D	82D					52D	46D	46D
8.1	82C	82C	82C	82C	82C					98B		
8.2	43C	43C	43C	43C	43C				69B		69B	69B
8.3												
9.1										10A		
10.1												

Visual Index - Reamers

	HSS-E	HSS	HSS	HSS	HSS		HSS	HSS	HSS	HSS	HSS	HSS
	ST	ST	ST							ST	ST	
	BS 328	DIN 311	ANSI	ANSI	DORMER		ANSI	ANSI	ANSI	DIN 206	BS 328	ANSI
	H7	k11	USCTI	USCTI			USCTI	USCTI	USCTI	H7		USCTI
												60°
												↓
												100°
							1:48	1:48			1:48	
	B101	**B121**	**4579**	**4500**	**B334**	**B335**	**4587**	**4591**	**4600**	**B100**	**B301**	**4608**
	3.00 - 2"	10.00 - 30.00	7/16 - 1.1/16	1/8 - 1"	N000 N16	Blades Nuts	N0 - N10	N0 - N10	1/8 - 1"	1.50 - 50.00	1/16 - 1/2	1/4 - 1"

	475	**477**	**478**	**479**	**480**	**481**	**482**	**483**	**484**	**485**	**487**	**488**
1.1	59C	59C	59C	82C	59C		59C	59C	59C	59C	59C	98F
1.2	46C	46C	46C	66C	46C		46C	46C	46C	46C	46C	82E
1.3	36C	36C	36C	52C	36C		36C	36C	36C	36C	36C	66D
1.4	33B	33B	33B	49B	33B		33B	33B	33B	33B	33B	49D
1.5	16B	16B	16B	30B	16B		16B	16B	16B	16B	16B	33B
1.6	13A	13A	13A	16A	13A		13A	13A	13A	13A	13A	20A
1.7												
1.8												
2.1	26C		26C	36C	26F		26C	26C	26C	26F	26C	26C
2.2			16B	20B			16B	16B	16B		16B	20B
2.3			20B	26B			20B	20B	20B		20B	13A
2.4				20B					20B			
3.1	46E	46E	46E	52E	46E		46E	46E	46E	46E	46E	82F
3.2	36D	36D	36D	49D	36D		36D	36D	36D	36D	36D	49D
3.3	33C	33C	33C	43C	33C		33C	33C	33C	33C	33C	39C
3.4	30C	30C	30C	36C	30C		30C	30C	30C	30C	30C	26C
4.1	36C	36C	36C	49C	36C		36C	36C	36C	36C	36C	39C
4.2	16B		16B	30B	16B		16B	16B	16B	16B	16B	33A
4.3	13B		13B	16B	13B		13B	13B	13B	13B	13B	26A
5.1	16D		16D	26D	16D		16D	16D	16D	16D	16D	39C
5.2	10C			16C	10C					10C		20B
5.3	7C			10C	7C					7C		13A
6.1	59D		59D	82D	59D		59D	59D	59D	59D	59D	82D
6.2	66E		66E	92E	66E		66E	66E	66E	66E	66E	66F
6.3	59D		59D	82D	59D		59D	59D	59D	59D	59D	82F
6.4	36D		36D	46D	36D		36D	36D	36D	36D	36D	33D
7.1	75F		75F		75F		75F	75F	75F	75F	75F	98G
7.2	59F		59F		59F		59F	59F	59F	59F	59F	82F
7.3			49E				49E	49E	49E		49E	66F
7.4			46D				46D	46D	46D		46D	33F
8.1												98G
8.2	69B	69B	69B		69B		69B	69B	69B	69B	69B	66G
8.3												
9.1												
10.1												

List Number Index - Reamers

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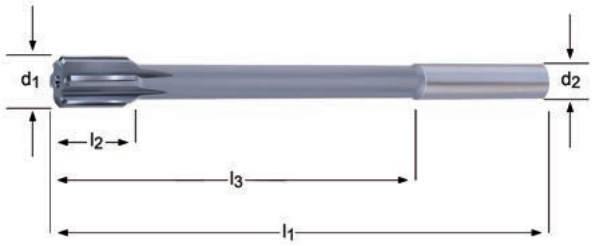
B411.....460
B441.....457
B442.....459
B481.....461
B901.....471

APPLICATION CARBIDE REAMER

Machine Reamer, Straight Shank, Brazed Carbide Tipped

B441 Extremely unequal flute spacing. Straight flute. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 5.1 5.2
5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2



B441

HM

DIN 8050

10.00 - 20.00

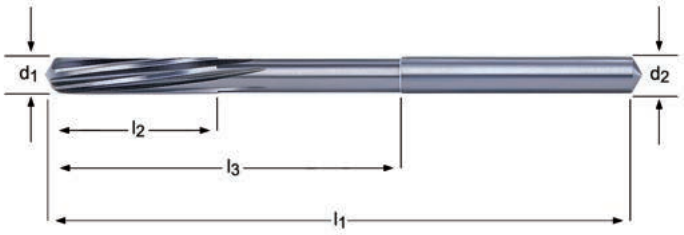
d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B441
10.0	133	19	87	6	10	1	0421086
11.0	142	19	96	6	10	1	0421093
12.0	151	19	105	6	10	1	0421109
13.0	151	19	105	6	10	1	0426302
14.0	160	19	110	6	12.5	1	0421116
15.0	162	19	112	6	12.5	1	0421123
16.0	170	22	120	6	12.5	1	0421130
17.0	175	22	123	6	14	1	0421147
18.0	182	22	130	6	14	1	0421154
19.0	189	22	131	6	16	1	0421161
20.0	195	22	137	6	16	1	0421178

DORMER

Machine Reamer, Straight Shank

B400 Extremely unequal flute spacing with left hand slow spiral, right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



B400

HM

DIN 8093

1.00 - 20.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_6$ mm	Pack Qty	B400
1.0	34	5.5	15	3	1.0	1	0052983
1.2	38	7.5	16.5	3	1.2	1	0052990
1.4	40	8	18	3	1.5	1	0053003
1.5	40	8	18	3	1.5	1	0053010
1.6	43	9	20	3	1.6	1	0053027
1.8	46	10	22	4	1.8	1	0053034
2.0	49	11	24	4	2.0	1	0053041
2.2	53	12	25	4	2.2	1	0053058
2.5	57	14	29	4	2.5	1	0053065
2.8	61	15	33	6	3.0	1	0053072
3.0	61	15	33	6	3.0	1	0144152
3.2	65	16	37	6	3.2	1	0144169
3.5	70	18	42	6	3.5	1	0144176
4.0	75	19	47	6	4.0	1	0144183
4.5	80	21	52	6	4.5	1	0144190
5.0	86	23	58	6	5.0	1	0144206
5.5	93	26	57	6	5.6	1	0144213
6.0	93	26	57	6	5.6	1	0144220
6.5	101	28	65	6	6.3	1	0144237
7.0	109	31	73	6	7.1	1	0144244
8.0	117	33	81	6	8.0	1	0144251
9.0	125	36	85	6	9.0	1	0144268
10.0	133	38	93	6	10.0	1	0144275
12.0	151	44	111	6	10.0	1	0144282
14.0	160	47	115	6	12.5	1	0144299 [1)]
16.0	170	52	125	6	12.5	1	0144305 [1)]
18.0	182	56	137	6	14.0	1	0144312 [1)]
20.0	195	60	147	6	16.0	1	0144329 [1)]

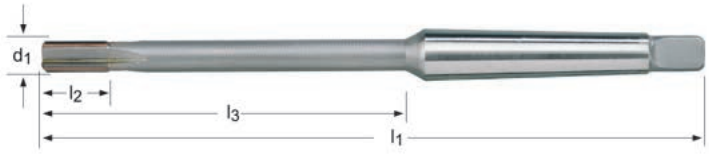
[1)] Brazed Carbide Tipped

APPLICATION CARBIDE REAMER

Machine Reamer, Taper Shank, Brazed Carbide Tipped

B442 Extremely unequal flute spacing with straight flute. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



B442

HM

DIN 8051

10.00 - 20.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B442
10.0	168	19	102.5	6	1	1	0421185
12.0	182	19	116.5	6	1	1	0421192
14.0	189	19	123.5	6	1	1	0421208
15.0	204	19	124	6	2	1	0421215
16.0	210	22	130	6	2	1	0421222
17.0	214	22	134	6	2	1	0421239
18.0	219	22	139	6	2	1	0421246
19.0	223	22	143	6	2	1	0426319
20.0	228	22	148	6	2	1	0421253

Machine Reamer, Taper Shank

B411 Extremely unequal spacing with left hand spiral, and right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 5.1 5.2
5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

B411

HM

DIN 8094

5.00 - 30.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B411
5.0	133	23	67.5	6	1	1	0053195 [1]
6.0	138	26	72.5	6	1	1	0053201 [1]
7.0	150	31	84.5	6	1	1	0053218 [1]
8.0	156	33	90.5	6	1	1	0053225 [1]
9.0	162	36	96.5	6	1	1	0053232 [1]
10.0	168	38	102.5	6	1	1	0053126 [1]
12.0	182	44	116.5	6	1	1	0053140 [1]
14.0	189	47	123.5	8	1	1	0053164 [1]
15.0	204	50	124	8	2	1	0053171 [1]
16.0	210	52	130	8	2	1	0053188 [1]
17.0	214	54	134	6	2	1	0144336 [2]
18.0	219	56	139	6	2	1	0144343 [2]
19.0	223	58	143	6	2	1	0144350 [2]
20.0	228	60	148	6	2	1	0144367 [2]
22.0	237	64	157	6	2	1	0144374 [2]
24.0	268	68	169	8	3	1	0144381 [2]
25.0	268	68	169	8	3	1	0144398 [2]
26.0	273	70	174	8	3	1	0144404 [2]
30.0	281	73	182	8	3	1	0144411 [2]

[1] Carbide Head
[2] Carbide Tipped

APPLICATION CARBIDE REAMER

High Precision, Straight Shank

B481

High Precision NC Centesimal Reamers are offered in 0.01mm increments. Extremely unequal flute spacing with left hand slow spiral, right hand cut. For machining reaming of abrasive, hard ferrous, and non-ferrous materials. Ideal for hydraulic and heat shrink tool holding systems.

B481

HM

DIN 8093

0.98 - 12.05

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 5.1 5.2
5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_6$ mm	Pack Qty	B481
0.98	49.5	6	21.5	3	4	1	0421567
0.99	49.5	6	21.5	3	4	1	0421574
1.00	49.5	6	21.5	3	4	1	0421581
1.01	49.5	6	21.5	3	4	1	0421598
1.02	49.5	6	21.5	3	4	1	0421604
1.03	49.5	9	21.5	3	4	1	0421611
1.48	49	9	21	3	4	1	0421628
1.49	49	9	21	3	4	1	0421635
1.50	49	9	21	3	4	1	0421642
1.51	49	9	21	3	4	1	0421659
1.52	49	9	21	3	4	1	0421666
1.53	49	9	21	3	4	1	0421673
1.98	49	12	21	4	4	1	0421680
1.99	49	12	21	4	4	1	0421697
2.00	49	12	21	4	4	1	0421857
2.01	49	12	21	4	4	1	0421864
2.02	49	12	21	4	4	1	0421871
2.03	49	12	21	4	4	1	0421888
2.48	59	16	31	4	4	1	0421895
2.49	59	16	31	4	4	1	0421901
2.50	59	16	31	4	4	1	0421918
2.51	59	16	31	4	4	1	0421925
2.52	59	16	31	4	4	1	0421932
2.53	59	16	31	4	4	1	0421949
2.97	62.5	17	35	6	4	1	0421956
2.98	62.5	17	35	6	4	1	0421963
2.99	62.5	17	35	6	4	1	0421970
3.00	62.5	17	35	6	4	1	0421987
3.01	62.5	17	35	6	4	1	0421994
3.02	62.5	17	35	6	4	1	0422007
3.03	62.5	17	35	6	4	1	0422014
3.97	75	19	47	6	4	1	0422021
3.98	75	19	47	6	4	1	0422038

APPLICATION CARBIDE REAMER

DORMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_6$ mm	Pack Qty	B481
3.99	75	19	47	6	4	1	0422045
4.00	75	19	47	6	4	1	0422052
4.01	75	19	47	6	4	1	0422069
4.02	75	19	47	6	4	1	0422076
4.03	75	19	47	6	4	1	0422083
4.97	86	23	50	6	6	1	0422090
4.98	86	23	50	6	6	1	0422106
4.99	86	23	50	6	6	1	0422113
5.00	86	23	50	6	6	1	0422120
5.01	86	23	50	6	6	1	0422137
5.02	86	23	50	6	6	1	0422144
5.03	86	23	50	6	6	1	0422151
5.97	93	26	57	6	6	1	0422168
5.98	93	26	57	6	6	1	0422175
5.99	93	26	57	6	6	1	0422182
6.00	93	26	57	6	6	1	0422199
6.01	93	26	57	6	6	1	0422205
6.02	93	26	57	6	6	1	0422212
6.03	93	26	57	6	6	1	0422229
7.97	117	33	81	6	8	1	0422236
7.98	117	33	81	6	8	1	0422243
7.99	117	33	81	6	8	1	0422250
8.00	117	33	81	6	8	1	0422267
8.01	117	33	81	6	8	1	0422274
8.02	117	33	81	6	8	1	0422281
8.03	117	33	81	6	8	1	0422298
8.04	117	33	81	6	8	1	0422304
9.97	133	38	93	6	10	1	0422311
9.98	133	38	93	6	10	1	0422328
9.99	133	38	93	6	10	1	0422335
10.00	133	38	93	6	10	1	0421703
10.01	133	38	93	6	10	1	0421710
10.02	133	38	93	6	10	1	0421727
10.03	133	38	93	6	10	1	0421734
10.04	133	38	93	6	10	1	0421741
10.05	133	38	93	6	10	1	0421758
11.97	151	44	106	6	12	1	0421765
11.98	151	44	106	6	12	1	0421772
11.99	151	44	106	6	12	1	0421789
12.00	151	44	106	6	12	1	0421796
12.01	151	44	106	6	12	1	0421802
12.02	151	44	106	6	12	1	0421819
12.03	151	44	106	6	12	1	0421826
12.04	151	44	106	6	12	1	0421833
12.05	151	44	106	6	12	1	0421840

APPLICATION COBALT REAMER

High Precision, Straight Shank

B170 Centesimal Reamer by 0.01mm increments. Left hand slow spiral, right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4

B170

HSS-E

DIN 212

0.98 - 12.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B170
0.98	34	5.5	15	3	1.0	1	0127957
0.99	34	5.5	15	3	1.0	1	0127964
1.00	34	5.5	15	3	1.0	1	0127971
1.01	34	5.5	15	3	1.0	1	0127988
1.02	34	5.5	15	3	1.0	1	0127995
1.03	34	5.5	15	3	1.0	1	0128008
1.04	34	5.5	15	3	1.0	1	0128015
1.05	34	5.5	15	3	1.0	1	0128022
1.49	40	8.0	18	3	1.5	1	0128459
1.50	40	8.0	18	3	1.5	1	0128466
1.51	43	9.0	20	3	1.6	1	0050392
1.52	43	9.0	20	3	1.6	1	0128473
1.98	49	11.0	24	4	2.0	1	0128916
1.99	49	11.0	24	4	2.0	1	0128923
2.00	49	11.0	24	4	2.0	1	0130896
2.01	49	11.0	24	4	2.0	1	0130902
2.02	49	11.0	24	4	2.0	1	0130919
2.03	49	11.0	24	4	2.0	1	0130926
2.04	49	11.0	24	4	2.0	1	0130933
2.05	49	11.0	24	4	2.0	1	0130940
2.49	57	14.0	28	4	2.5	1	0131367
2.50	57	14.0	28	4	2.5	1	0131374
2.51	57	14.0	28	4	2.5	1	0131381
2.52	57	14.0	28	4	2.5	1	0131398
2.98	61	15.0	32	6	3.0	1	0131848
2.99	61	15.0	32	6	3.0	1	0131855
3.00	61	15.0	32	6	3.0	1	0131862
3.01	65	16.0	35	6	3.2	1	0050491
3.02	65	16.0	35	6	3.2	1	0131879
3.03	65	16.0	35	6	3.2	1	0131886
3.04	65	16.0	35	6	3.2	1	0131893
3.05	65	16.0	35	6	3.2	1	0131909
3.49	70	18.0	40	6	3.5	1	0132302

APPLICATION COBALT REAMER

DORMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B170
3.50	70	18.0	40	6	3.5	1	0132319
3.51	70	18.0	40	6	3.5	1	0132326
3.52	70	18.0	40	6	3.5	1	0132333
3.98	75	19.0	43	6	4.0	1	0132784
3.99	75	19.0	43	6	4.0	1	0132791
4.00	75	19.0	43	6	4.0	1	0132807
4.01	75	19.0	43	6	4.0	1	0132814
4.02	75	19.0	43	6	4.0	1	0132821
4.03	75	19.0	43	6	4.0	1	0132838
4.04	75	19.0	43	6	4.0	1	0132845
4.05	75	19.0	43	6	4.0	1	0132852
4.49	80	21.0	47	6	4.5	1	0133286
4.50	80	21.0	47	6	4.5	1	0133293
4.51	80	21.0	47	6	4.5	1	0133309
4.52	80	21.0	47	6	4.5	1	0133316
4.98	86	23.0	52	6	5.0	1	0133767
4.99	86	23.0	52	6	5.0	1	0133774
5.00	86	23.0	52	6	5.0	1	0133781
5.01	86	23.0	52	6	5.0	1	0133798
5.02	86	23.0	52	6	5.0	1	0133804
5.03	86	23.0	52	6	5.0	1	0133811
5.04	86	23.0	52	6	5.0	1	0133828
5.05	86	23.0	52	6	5.0	1	0133835
5.49	93	26.0	57	6	5.6	1	0134269
5.50	93	26.0	57	6	5.6	1	0134276
5.51	93	26.0	57	6	5.6	1	0134283
5.52	93	26.0	57	6	5.6	1	0134290
5.98	93	26.0	57	6	5.6	1	0134757
5.99	93	26.0	57	6	5.6	1	0134764
6.00	93	26.0	57	6	5.6	1	0134771
6.01	101	28.0	63	6	6.3	1	0134788
6.02	101	28.0	63	6	6.3	1	0134795
6.03	101	28.0	63	6	6.3	1	0134801
6.04	101	28.0	63	6	6.3	1	0134818
6.05	101	28.0	63	6	6.3	1	0134825
6.49	101	28.0	63	6	6.3	1	0135242
6.50	101	28.0	63	6	6.3	1	0135259
6.51	101	28.0	63	6	6.3	1	0135303
6.52	101	28.0	63	6	6.3	1	0135310
6.98	109	31.0	69	6	7.1	1	0135761
6.99	109	31.0	69	6	7.1	1	0135778
7.00	109	31.0	69	6	7.1	1	0135785
7.01	109	31.0	69	6	7.1	1	0135792
7.02	109	31.0	69	6	7.1	1	0135808
7.03	109	31.0	69	6	7.1	1	0135815
7.04	109	31.0	69	6	7.1	1	0135822
7.05	109	31.0	69	6	7.1	1	0135839
7.49	109	31.0	69	6	7.1	1	0136270
7.50	109	31.0	69	6	7.1	1	0136287
7.51	117	33.0	75	6	8.0	1	0136294
7.52	117	33.0	75	6	8.0	1	0136300
7.98	117	33.0	75	6	8.0	1	0136751
7.99	117	33.0	75	6	8.0	1	0136768
8.00	117	33.0	75	6	8.0	1	0136959
8.01	117	33.0	75	6	8.0	1	0136775
8.02	117	33.0	75	6	8.0	1	0136782
8.03	117	33.0	75	6	8.0	1	0136799
8.04	117	33.0	75	6	8.0	1	0136805
8.05	117	33.0	75	6	8.0	1	0136812
8.49	117	33.0	75	6	8.0	1	0137260
8.50	117	33.0	75	6	8.0	1	0137277
8.51	125	36.0	81	6	9.0	1	0050590
8.52	125	36.0	81	6	9.0	1	0137284
8.98	125	36.0	81	6	9.0	1	0137734
8.99	125	36.0	81	6	9.0	1	0137741
9.00	125	36.0	81	6	9.0	1	0137758

APPLICATION COBALT REAMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh_9 mm	Pack Qty	B170
9.01	125	36.0	81	6	9.0	1	0137765
9.02	125	36.0	81	6	9.0	1	0137772
9.03	125	36.0	81	6	9.0	1	0137789
9.04	125	36.0	81	6	9.0	1	0137796
9.05	125	36.0	81	6	9.0	1	0137802
9.49	125	36.0	81	6	9.0	1	0138236
9.50	125	36.0	81	6	9.0	1	0138243
9.51	133	38.0	87	6	10.0	1	0138250
9.52	133	38.0	87	6	10.0	1	0138267
9.98	133	38.0	87	6	10.0	1	0138717
9.99	133	38.0	87	6	10.0	1	0138724
10.00	133	38.0	87	6	10.0	1	0128930
10.01	133	38.0	87	6	10.0	1	0128947
10.02	133	38.0	87	6	10.0	1	0128954
10.03	133	38.0	87	6	10.0	1	0128961
10.04	133	38.0	87	6	10.0	1	0128978
10.05	133	38.0	87	6	10.0	1	0128985
10.49	133	38.0	87	6	10.0	1	0129463
10.51	133	38.0	87	6	10.0	1	0129470
10.52	133	38.0	87	6	10.0	1	0129487
10.98	142	41.0	96	6	10.0	1	0129883
10.99	142	41.0	96	6	10.0	1	0129890
11.00	142	41.0	96	6	10.0	1	0129906
11.01	142	41.0	96	6	10.0	1	0129913
11.02	142	41.0	96	6	10.0	1	0129920
11.03	142	41.0	96	6	10.0	1	0129937
11.04	142	41.0	96	6	10.0	1	0129944
11.05	142	41.0	96	6	10.0	1	0129951
11.49	142	41.0	96	6	10.0	1	0130384
11.50	142	41.0	96	6	10.0	1	0130391
11.51	142	41.0	96	6	10.0	1	0130407
11.52	142	41.0	96	6	10.0	1	0130414
11.98	151	44.0	105	6	10.0	1	0130865
11.99	151	44.0	105	6	10.0	1	0130872
12.00	151	44.0	105	6	10.0	1	0130889

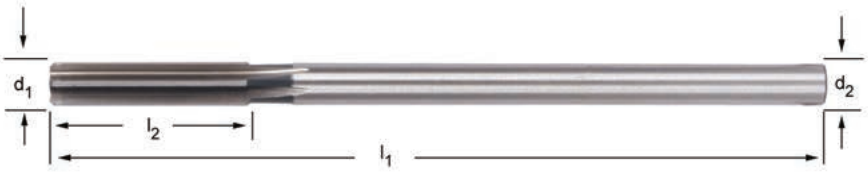
HSS REAMER

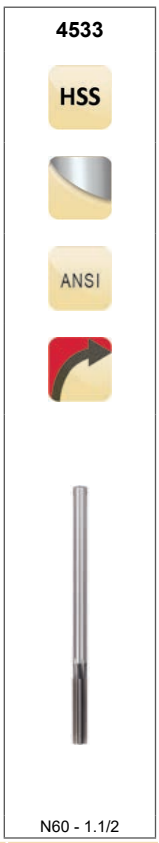
UNION BUTTERFIELD

Chucking Reamer, Straight Shank

4533 Straight Flute, Right Hand Cut. Chucking reamers have shorter and deeper flutes than hand reamers and are specifically designed for accurate machine reaming in most materials and equipment including screw machines, turret lathes, drill presses, and machining centers. Recommended for most general purpose reaming.

Produced per ASME B94.2-1995 Standards.





d_1 Ø "/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
N60	0.0400	0.0390	1/2	2.1/2	4	1	5010173
N59	0.0410	0.0390	1/2	2.1/2	4	1	5010175
N58	0.0420	0.0390	1/2	2.1/2	4	1	5010177
N57	0.0430	0.0390	1/2	2.1/2	4	1	5010179
N56	0.0465	0.0455	1/2	2.1/2	4	1	5010186
3/64	0.0469	0.0455	1/2	2.1/2	4	1	5010187
N55	0.0520	0.0510	1/2	2.1/2	4	1	5010198
N54	0.0550	0.0510	1/2	2.1/2	4	1	5010204
N53	0.0595	0.0585	1/2	2.1/2	4	1	5010213
1/16	0.0625	0.0585	1/2	2.1/2	4	1	5010219
N52	0.0635	0.0585	1/2	2.1/2	4	1	5010221
N51	0.0670	0.0660	3/4	3“	4	1	5010228
N50	0.0700	0.0660	3/4	3“	4	1	5010234
N49	0.0730	0.0660	3/4	3“	4	1	5010240
N48	0.0760	0.0720	3/4	3“	4	1	5010246
5/64	0.0781	0.0720	3/4	3“	4	1	5010251
N47	0.0785	0.0720	3/4	3“	4	1	5010252
N46	0.0810	0.0771	3/4	3“	4	1	5010257
N45	0.0820	0.0771	3/4	3“	4	1	5010259
N44	0.0860	0.0810	3/4	3“	4	1	5010267
N43	0.0890	0.0810	3/4	3“	4	1	5010273
N42	0.0935	0.0880	3/4	3“	4	1	5010282
3/32	0.0938	0.0880	3/4	3“	4	1	5010283
N41	0.0960	0.0928	7/8	3.1/2	4	1	5010288
N40	0.0980	0.0928	7/8	3.1/2	4	1	5010292
N39	0.0995	0.0928	7/8	3.1/2	4	1	5010295
N38	0.1015	0.0950	7/8	3.1/2	4	1	5010299
N37	0.1040	0.0950	7/8	3.1/2	4	1	5010304
N36	0.1065	0.1030	7/8	3.1/2	4	1	5010309
7/64	0.1094	0.1030	7/8	3.1/2	4	1	5010316
N35	0.1100	0.1030	7/8	3.1/2	4	1	5010318
N34	0.1110	0.1055	7/8	3.1/2	4	1	5010320
N33	0.1130	0.1055	7/8	3.1/2	4	1	5010324

UNION BUTTERFIELD

HSS REAMER

d_1 Ø “/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
N32	0.1160	0.1120	7/8	3.1/2	4	1	5010330
N31	0.1200	0.1120	7/8	3.1/2	4	1	5010338
	0.1230	0.1120	7/8	3.1/2	4	1	5010344
	0.1240	0.1190	7/8	3.1/2	4	1	5010346
	0.1247	0.1190	7/8	3.1/2	4	1	5010349
1/8	0.1250	0.1190	7/8	3.1/2	4	1	5010350
	0.1260	0.1190	7/8	3.1/2	4	1	5010354
N30	0.1285	0.1190	7/8	3.1/2	4	1	5010359
N29	0.1360	0.1275	1“	4“	4	1	5010374
N28	0.1405	0.1350	1“	4“	4	1	5010383
9/64	0.1410	0.1350	1“	4“	4	1	5010384
N27	0.1440	0.1350	1“	4“	4	1	5010391
N26	0.1470	0.1430	1“	4“	4	1	5010397
N25	0.1495	0.1430	1“	4“	4	1	5010402
N24	0.1520	0.1460	1“	4“	4	1	5010407
N23	0.1540	0.1460	1“	4“	4	1	5010411
5/32	0.1562	0.1510	1“	4“	6	1	5010416
N22	0.1570	0.1510	1“	4“	6	1	5010418
N21	0.1590	0.1530	1.1/8	4.1/2	6	1	5010422
N20	0.1610	0.1530	1.1/8	4.1/2	6	1	5010426
N19	0.1660	0.1595	1.1/8	4.1/2	6	1	5010436
N18	0.1695	0.1595	1.1/8	4.1/2	6	1	5010443
11/64	0.1719	0.1645	1.1/8	4.1/2	6	1	5010448
N17	0.1730	0.1645	1.1/8	4.1/2	6	1	5010451
N16	0.1770	0.1700	1.1/8	4.1/2	6	1	5010459
N15	0.1800	0.1755	1.1/8	4.1/2	6	1	5010465
N14	0.1820	0.1755	1.1/8	4.1/2	6	1	5010469
N13	0.1850	0.1800	1.1/8	4.1/2	6	1	5010475
	0.1855	0.1800	1.1/8	4.1/2	6	1	5010476
	0.1865	0.1800	1.1/8	4.1/2	6	1	5010478
	0.1870	0.1800	1.1/8	4.1/2	6	1	5010479
3/16	0.1875	0.1800	1.1/8	4.1/2	6	1	5010480
	0.1885	0.1800	1.1/8	4.1/2	6	1	5010482
N12	0.1890	0.1800	1.1/8	4.1/2	6	1	5010483
N11	0.1910	0.1860	1.1/4	5“	6	1	5010487
N10	0.1935	0.1860	1.1/4	5“	6	1	5010492
N9	0.1960	0.1895	1.1/4	5“	6	1	5010498
N8	0.1990	0.1895	1.1/4	5“	6	1	5010504
N7	0.2010	0.1945	1.1/4	5“	6	1	5010508
13/64	0.2031	0.1945	1.1/4	5“	6	1	5010513
N6	0.2040	0.1945	1.1/4	5“	6	1	5010515
N5	0.2055	0.2016	1.1/4	5“	6	1	5010518
N4	0.2090	0.2016	1.1/4	5“	6	1	5010525
N3	0.2130	0.2075	1.1/4	5“	6	1	5010533
7/32	0.2188	0.2075	1.1/4	5“	6	1	5010545
N2	0.2210	0.2173	1.1/2	6“	6	1	5010550
N1	0.2280	0.2173	1.1/2	6“	6	1	5010564
A	0.2340	0.2265	1.1/2	6“	6	1	5010576
15/64	0.2344	0.2265	1.1/2	6“	6	1	5010577
B	0.2380	0.2329	1.1/2	6“	6	1	5010585
C	0.2420	0.2329	1.1/2	6“	6	1	5010593
D	0.2460	0.2329	1.1/2	6“	6	1	5010602
	0.2480	0.2329	1.1/2	6“	6	1	5010606
	0.2490	0.2400	1.1/2	6“	6	1	5010608
	0.2495	0.2400	1.1/2	6“	6	1	5010609
1/4	0.2500	0.2400	1.1/2	6“	6	1	5010610
	0.2510	0.2400	1.1/2	6“	6	1	5010612
F	0.2570	0.2485	1.1/2	6“	6	1	5010619
G	0.2610	0.2485	1.1/2	6“	6	1	5010622
17/64	0.2656	0.2485	1.1/2	6“	6	1	5010623
H	0.2660	0.2485	1.1/2	6“	6	1	5010624
I	0.2720	0.2485	1.1/2	6“	6	1	5010626
J	0.2770	0.2485	1.1/2	6“	6	1	5010627
K	0.2810	0.2485	1.1/2	6“	6	1	5010628
9/32	0.2812	0.2485	1.1/2	6“	6	1	5010629
L	0.2900	0.2792	1.1/2	6“	6	1	5010630

HSS REAMER

UNION BUTTERFIELD

d_1 Ø "/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
M	0.2950	0.2792	1.1/2	6“	6	1	5010631
19/64	0.2969	0.2792	1.1/2	6“	6	1	5010632
N	0.3020	0.2792	1.1/2	6“	6	1	5010633
	0.3105	0.2792	1.1/2	6“	6	1	5010636
	0.3115	0.2792	1.1/2	6“	6	1	5010638
	0.3120	0.2792	1.1/2	6“	6	1	5010639
5/16	0.3125	0.2792	1.1/2	6“	6	1	5010640
	0.3135	0.2792	1.1/2	6“	6	1	5010642
O	0.3160	0.2792	1.1/2	6“	6	1	5010645
P	0.3230	0.2792	1.1/2	6“	6	1	5010647
21/64	0.3281	0.2792	1.1/2	6“	6	1	5010648
Q	0.3320	0.2792	1.1/2	6“	6	1	5010649
R	0.3390	0.2792	1.1/2	6“	6	1	5010650
11/32	0.3438	0.2792	1.1/2	6“	6	1	5010651
S	0.3480	0.3100	1.3/4	7“	6	1	5010652
T	0.3580	0.3100	1.3/4	7“	6	1	5010653
23/64	0.3594	0.3100	1.3/4	7“	6	1	5010654
U	0.3680	0.3100	1.3/4	7“	6	1	5010655
	0.3730	0.3100	1.3/4	7“	6	1	5010658
	0.3740	0.3100	1.3/4	7“	6	1	5010659
	0.3745	0.3100	1.3/4	7“	6	1	5010660
3/8	0.3750	0.3100	1.3/4	7“	6	1	5010661
	0.3760	0.3100	1.3/4	7“	6	1	5010662
V	0.3770	0.3100	1.3/4	7“	6	1	5010663
W	0.3860	0.3100	1.3/4	7“	6	1	5010665
25/64	0.3906	0.3100	1.3/4	7“	6	1	5010666
X	0.3970	0.3100	1.3/4	7“	6	1	5010667
Y	0.4040	0.3100	1.3/4	7“	6	1	5010668
13/32	0.4062	0.3100	1.3/4	7“	6	1	5010670
Z	0.4130	0.3730	1.3/4	7“	6	1	5010671
27/64	0.4219	0.3730	1.3/4	7“	6	1	5010672
	0.4355	0.3730	1.3/4	7“	6	1	5010673
	0.4365	0.3730	1.3/4	7“	6	1	5010674
	0.4370	0.3730	1.3/4	7“	6	1	5010675
7/16	0.4375	0.3730	1.3/4	7“	6	1	5010676
	0.4385	0.3730	1.3/4	7“	6	1	5010677
29/64	0.4531	0.3730	1.3/4	7“	6	1	5010678
15/32	0.4688	0.3730	1.3/4	7“	6	1	5010679
31/64	0.4844	0.4355	2“	8“	6	1	5010680
	0.4980	0.4355	2“	8“	6	1	5010681
	0.4990	0.4355	2“	8“	6	1	5010682
	0.4995	0.4355	2“	8“	6	1	5010683
1/2	0.5000	0.4355	2“	8“	6	1	5010684
	0.5010	0.4355	2“	8“	6	1	5010685
33/64	0.5156	0.4355	2“	8“	6	1	5010690
17/32	0.5312	0.4355	2“	8“	6	1	5010691
35/64	0.5469	0.4355	2“	8“	8	1	5010692
9/16	0.5625	0.4355	2“	8“	8	1	5010693
37/64	0.5781	0.4355	2“	8“	8	1	5010694
19/32	0.5938	0.4355	2“	8“	8	1	5010695
39/64	0.6094	0.5620	2.1/4	9“	8	1	5010696
5/8	0.6250	0.5620	2.1/4	9“	8	1	5010698
41/64	0.6406	0.5620	2.1/4	9“	8	1	5010700
21/32	0.6562	0.5620	2.1/4	9“	8	1	5010701
43/64	0.6719	0.5620	2.1/4	9“	8	1	5010702
11/16	0.6875	0.5620	2.1/4	9“	8	1	5010703
45/64	0.7031	0.5620	2.1/4	9“	8	1	5010704
23/32	0.7188	0.5620	2.1/4	9“	8	1	5010705
47/64	0.7344	0.6245	2.1/2	9.1/2	8	1	5010706
3/4	0.7500	0.6245	2.1/2	9.1/2	8	1	5010708
49/64	0.7656	0.6245	2.1/2	9.1/2	8	1	5010710
25/32	0.7812	0.6245	2.1/2	9.1/2	8	1	5010711
51/64	0.7969	0.6245	2.1/2	9.1/2	8	1	5010712
13/16	0.8125	0.6245	2.1/2	9.1/2	8	1	5010713
53/64	0.8281	0.6245	2.1/2	9.1/2	8	1	5010714
27/32	0.8438	0.6245	2.1/2	9.1/2	8	1	5010715

UNION BUTTERFIELD

HSS REAMER

d_1 Ø "/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
55/64	0.8594	0.7495	2.5/8	10“	8	1	5010716
7/8	0.8750	0.7495	2.5/8	10“	8	1	5010717
57/64	0.8906	0.7495	2.5/8	10“	8	1	5010718
29/32	0.9062	0.7495	2.5/8	10“	8	1	5010719
59/64	0.9219	0.7495	2.5/8	10“	8	1	5010720
15/16	0.9375	0.7495	2.5/8	10“	8	1	5010721
61/64	0.9531	0.7495	2.5/8	10“	8	1	5010722
31/32	0.9688	0.7495	2.5/8	10“	8	1	5010723
63/64	0.9844	0.8745	2.3/4	10.1/2	8	1	5010724
1“	1.0000	0.8745	2.3/4	10.1/2	8	1	5010725
1.1/16	1.0625	0.8745	2.3/4	10.1/2	8	1	5010726
1.1/8	1.1250	0.8745	2.7/8	11“	8	1	5010727
1.3/16	1.1875	0.9995	2.7/8	11“	8	1	5010728
1.1/4	1.2500	0.9995	3“	11.1/2	8	1	5010729
1.3/8	1.3750	0.9995	3.1/4	12“	8	1	5010731
1.1/2	1.5000	1.2495	3.1/2	12.1/2	8	1	5010733

HSS REAMER

UNION BUTTERFIELD

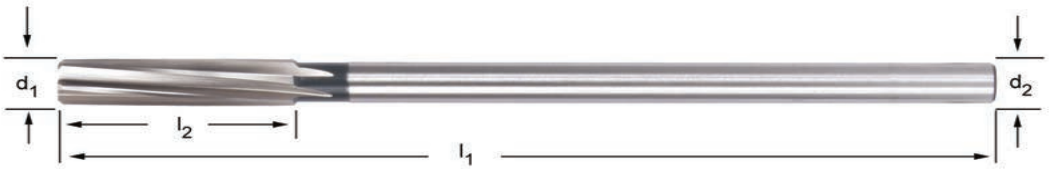
Chucking Reamer, Straight Shank

4535

Slow Right Hand Spiral Flute, Right Hand Cut. Cuts with a smoother, chatter free action than straight flute reamers. Recommended for more difficult to ream materials, better surface finish requirements, applications with an interruption, and to aid in chip evacuation in blind holes.

Designed for accurate machine reaming using all types of equipment and incorporating all other design features of the straight flute style.

Produced per ASME B94.2-1995 standards.

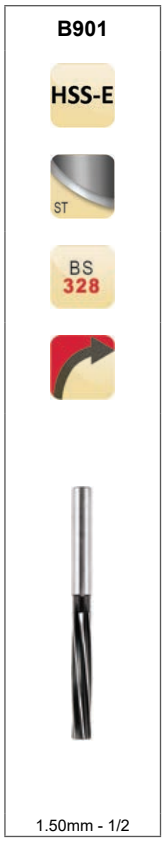


d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4535
1/16	0.0625	0.0585	1/2	2.1/2	4	1	5010054
5/64	0.0781	0.0720	3/4	3“	4	1	5010055
3/32	0.0938	0.0880	3/4	3“	4	1	5010056
7/64	0.1094	0.1030	7/8	3.1/2	4	1	5010057
1/8	0.1250	0.1190	7/8	3.1/2	4	1	5010058
5/32	0.1562	0.1510	1“	4“	6	1	5010060
11/64	0.1719	0.1645	1.1/8	4.1/2	6	1	5010061
3/16	0.1875	0.1800	1.1/8	4.1/2	6	1	5010062
13/64	0.2031	0.1945	1.1/4	5“	6	1	5010063
7/32	0.2188	0.2075	1.1/4	5“	6	1	5010064
1/4	0.2500	0.2400	1.1/2	6“	6	1	5010066
17/64	0.2656	0.2485	1.1/2	6“	6	1	5010067
9/32	0.2812	0.2485	1.1/2	6“	6	1	5010068
5/16	0.3125	0.2792	1.1/2	6“	6	1	5010070
11/32	0.3438	0.2792	1.1/2	6“	6	1	5010072
3/8	0.3750	0.3100	1.3/4	7“	6	1	5010074
25/64	0.3906	0.3100	1.3/4	7“	6	1	5010075
13/32	0.4062	0.3100	1.3/4	7“	6	1	5010076
7/16	0.4375	0.3730	1.3/4	7“	6	1	5010078
31/64	0.4844	0.4355	2“	8“	6	1	5010081
1/2	0.5000	0.4355	2“	8“	6	1	5010082
17/32	0.5312	0.4355	2“	8“	6	1	5010083
9/16	0.5625	0.4355	2“	8“	8	1	5010084
5/8	0.6250	0.5620	2.1/4	9“	8	1	5010086
11/16	0.6875	0.5620	2.1/4	9“	8	1	5010088
3/4	0.7500	0.6245	2.1/2	9.1/2	8	1	5010090
7/8	0.8750	0.7495	2.5/8	10“	8	1	5010094
1“	1.0000	0.8745	2.3/4	10.1/2	8	1	5010098

COBALT REAMER

Machine Reamer, Straight Shank

B901 Left Hand Slow Spiral, Right Hand Cut. Steam Oxide in flutes reduces wear and chip welding in soft ferrous materials.



d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	Pack Qty	B901
	1.50	44	21	4	1	0180808
1/16	1.59	44	21	4	1	0180815
	2.00	50	25	4	1	0180822
3/32	2.38	58	29	4	1	0180839
	2.50	58	29	4	1	0180846
	3.00	62	31	4	1	0180853
1/8	3.18	66	33	4	1	0180860
	3.50	71	35	4	1	0180877
5/32	3.97	76	38	6	1	0180891
	4.00	76	38	6	1	0180907
	4.50	81	41	6	1	0180921
3/16	4.76	87	44	6	1	0180938
	5.00	87	44	6	1	0180945
13/64	5.16	87	44	6	1	0180952
	5.50	93	47	6	1	0180969
7/32	5.56	93	47	6	1	0180976
15/64	5.95	93	47	6	1	0180983
	6.00	93	47	6	1	0180990
1/4	6.35	100	50	6	1	0181003
	7.00	107	54	6	1	0181010
9/32	7.14	107	54	6	1	0181027
5/16	7.94	115	58	6	1	0181034
	8.00	115	58	6	1	0181041
	9.00	124	62	6	1	0181065
3/8	9.52	133	66	6	1	0181072
	10.00	133	66	6	1	0181089
	11.00	142	71	6	1	0181102
7/16	11.11	142	71	6	1	0181119
	12.00	152	76	6	1	0181126
1/2	12.70	152	76	6	1	0181133

COBALT REAMER

DORMER

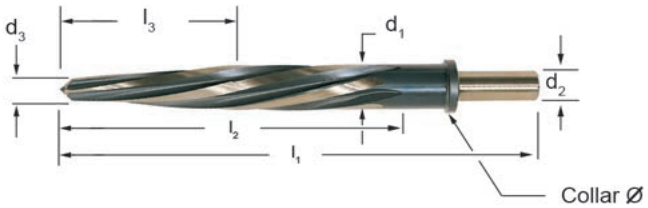
Machine Reamer, Straight Shank

B157 Left Hand Fast Sprial, Right Hand Cut. Designed for Stainless Steel, Titanium, and Nickel Alloy applications.

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	l_4 mm	# of Flutes	d_2 Øh_9 mm	Pack Qty	B157
2.0	49	11	3.5	24	3	2.0	1	0049648
3.0	61	15	4.0	32	3	3.0	1	0122198
4.0	75	19	4.0	43	3	4.0	1	0049679
5.0	86	23	4.5	52	3	5.0	1	0049693
6.0	93	26	6.0	57	3	5.6	1	0049716
7.0	109	31	7.0	69	3	7.1	1	0049730
8.0	117	33	9.0	75	3	8.0	1	0049747
9.0	125	36	9.5	81	3	9.0	1	0049754
10.0	133	38	10.0	87	3	10.0	1	0049617
11.0	142	41	10.5	96	3	10.0	1	0049624
12.0	151	44	11.0	105	3	10.0	1	0049631
13.0	151	44	11.5	105	3	10.0	1	0140352
14.0	160	47	12.0	110	3	12.5	1	0140369
15.0	162	50	12.5	112	3	12.5	1	0140376
16.0	170	52	13.0	120	3	12.5	1	0140383
17.0	175	54	13.5	123	3	14.0	1	0140390
18.0	182	56	14.0	130	3	14.0	1	0140406
19.0	189	58	14.5	131	3	16.0	1	0140413
20.0	195	60	15.0	137	3	16.0	1	0140420

Car Reamer (Alignment Reamer), Reduced Shank

B122 Left Hand Helical Flute, Right Hand Cut. 1/2" Reduced Shank with Tri-Flats. Combination Bronze and Steam Oxide in flutes reduces wear and chip welding in harder ferrous materials. Used to align or enlarge holes.



Note: Collar diameter = d_1 + 1/8"
Collar thickness = 3/16"
Shank Length = 1.1/2"

B122

HSS

ST Bronze

ANSI

3/8 - 1.1/16

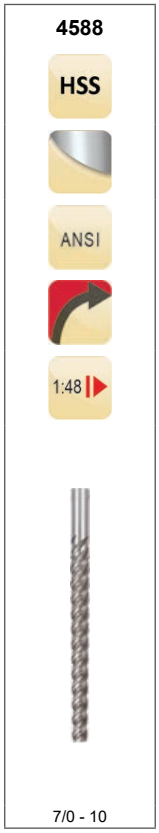
d_1 Ø Inch	d_1 decimal Inch	l_1 Inch	l_2 Inch	l_3 Inch	# of Flutes	d_2 Ø Inch	d_3 Ø Inch	Pack Qty	B122
3/8	0.3750	5.1/4	3.1/16	2	5	3/8	7/32	1	0426296
1/2	0.5000	5.5/16	3.3/4	2.5/8	5	1/2	1/4	1	0252376
9/16	0.5625	6.9/16	4.5/16	3.3/16	5	1/2	5/16	1	0252437
5/8	0.6250	6.9/16	4.5/16	3.3/16	5	1/2	3/8	1	0252413
11/16	0.6875	7	4.13/16	3.9/16	5	1/2	7/16	1	0252369
3/4	0.7500	7	4.13/16	3.9/16	5	1/2	1/2	1	0252406
13/16	0.8125	7.1/4	5.1/8	3.7/8	5	1/2	9/16	1	0252383
7/8	0.8750	7.1/4	5.1/8	3.7/8	5	1/2	5/8	1	0252420
15/16	0.9375	7.1/4	5.1/8	3.7/8	5	1/2	11/16	1	0252390
1"	1.0000	7.1/4	5.1/8	3.7/8	5	1/2	3/4	1	0252345
1.1/16	1.0625	7.1/4	5.1/4	3.7/8	5	1/2	13/16	1	0252352

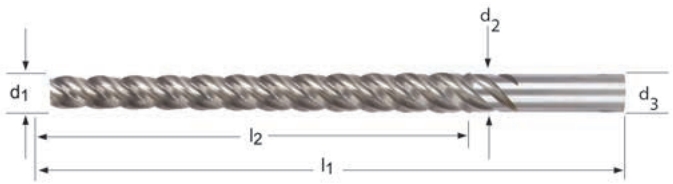
HSS REAMER

UNION BUTTERFIELD

Machine Reamer, Taper Pin Type, Straight Shank

4588 Left hand high spiral. Right hand cut taper pin (1/4” per foot). Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. Ideal geometry for the machine reaming of pin holes on a production basis. Helical construction prevents chips from packing in flutes and reduces breakage.





nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4588
7/0	0.0497	0.0666	5/64	13/16	1.13/16	2	1	5011157
6/0	0.0611	0.0810	3/32	15/16	1.15/16	2	1	5011158
5/0	0.0719	0.0966	7/64	1.3/16	2.3/16	2	1	5011159
4/0	0.0869	0.1142	1/8	1.5/16	2.5/16	2	1	5011160
3/0	0.1029	0.1300	9/64	1.5/16	2.5/16	2	1	5011161
2/0	0.1137	0.1462	5/32	1.9/16	2.9/16	3	1	5011162
1	0.1447	0.1798	3/16	1.11/16	2.15/16	3	1	5011164
2	0.1600	0.2010	13/64	1.15/16	3.3/16	3	1	5011165
3	0.1813	0.2294	15/64	2.5/16	3.11/16	3	1	5011166
4	0.2071	0.2600	17/64	2.9/16	4.1/16	3	1	5011167
5	0.2410	0.2994	5/16	2.13/16	4.5/16	3	1	5011168
6	0.2773	0.3540	23/64	3.11/16	5.7/16	3	1	5011169
7	0.3297	0.4220	13/32	4.7/16	6.5/16	3	1	5011170
8	0.3971	0.5050	7/16	5.3/16	7.3/16	3	1	5011171
9	0.4800	0.6066	9/16	6.1/16	8.5/16	4	1	5011172
10	0.5799	0.7216	5/8	6.13/16	9.5/16	4	1	5011173

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

COBALT REAMER

Machine Reamer, Taper Shank

B101 Left hand slow spiral, right hand. Steam oxide in flutes reduces wear chip welding harder ferrous materials.

Note: All sizes have 1mm x 45 chamfer (lead).
Cutting diameters are produced to H7 tolerance

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	MTS	Pack Qty	B101
	3.00	112	33	4	1	1	0181560
1/8	3.18	112	33	4	1	1	0181140
	3.50	115	35	6	1	1	0181577
	4.00	117	38	6	1	1	0181584
	4.50	120	41	6	1	1	0181591
3/16	4.76	124	44	6	1	1	0181164
	5.00	124	44	6	1	1	0181607
	5.50	127	47	6	1	1	0181614
	6.00	127	47	6	1	1	0181621
1/4	6.35	130	50	6	1	1	0181188
	6.50	130	50	6	1	1	0181638
	7.00	134	54	6	1	1	0181645
5/16	7.94	138	58	6	1	1	0181201
	8.00	138	58	6	1	1	0181669
	8.50	138	58	6	1	1	0181676
	9.00	142	62	6	1	1	0181683
	9.50	142	62	6	1	1	0181690
3/8	9.52	146	66	6	1	1	0181225
	10.00	146	66	6	1	1	0181706
	10.50	146	66	6	1	1	0181713
	11.00	151	71	6	1	1	0181720
7/16	11.11	151	71	6	1	1	0181249
	12.00	156	76	6	1	1	0181744
	12.50	156	76	6	1	1	0181751
1/2	12.70	156	76	6	1	1	0181263
	13.00	156	76	6	1	1	0181768
	13.50	161	81	6	1	1	0181775
	14.00	161	81	8	1	1	0181782
9/16	14.29	181	81	8	2	1	0181287
	14.50	181	81	8	2	1	0181799
	15.00	181	81	8	2	1	0181805
	15.50	187	87	8	2	1	0181812
5/8	15.88	187	87	8	2	1	0181300

COBALT REAMER

DORMER

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	MTS	Pack Qty	B101
	16.00	187	87	8	2	1	0181829
	16.50	187	87	8	2	1	0181836
	17.00	187	87	8	2	1	0181843
	18.00	193	93	8	2	1	0181850
	19.00	193	93	8	2	1	0181867
3/4	19.05	200	100	8	2	1	0181348
	20.00	200	100	8	2	1	0181874
13/16	20.64	200	100	8	2	1	0181362
	21.00	200	100	8	2	1	0181881
	22.00	207	107	8	2	1	0181898
7/8	22.22	207	107	8	2	1	0181386
	23.00	207	107	8	2	1	0181904
	24.00	242	115	8	3	1	0181911
	25.00	242	115	10	3	1	0181928
1“	25.40	242	115	10	3	1	0181423
	26.00	242	115	10	3	1	0181935
	27.00	251	124	10	3	1	0181942
	28.00	251	124	10	3	1	0181959
1.1/8	28.58	251	124	10	3	1	0181447
	29.00	251	124	10	3	1	0181966
	30.00	251	124	10	3	1	0181973
	31.00	260	133	10	3	1	0181980
1.1/4	31.75	260	133	10	3	1	0181461
	32.00	293	133	10	4	1	0181997
	34.00	302	142	10	4	1	0182017
1.3/8	34.93	302	142	10	4	1	0181485
	35.00	302	142	10	4	1	0182024
	36.00	302	142	10	4	1	0182031
	37.00	302	142	10	4	1	0182048
	38.00	312	152	10	4	1	0182055
1.1/2	38.10	312	152	10	4	1	0181508
	39.00	312	152	10	4	1	0182062
	40.00	312	152	10	4	1	0182079
	41.00	312	152	10	4	1	0182086
	42.00	312	152	10	4	1	0182093
	43.00	323	163	10	4	1	0182109
	44.00	323	163	10	4	1	0182116
1.3/4	44.45	323	163	10	4	1	0181522
	45.00	323	163	12	4	1	0182123
	46.00	323	163	12	4	1	0182130
	47.00	323	163	12	4	1	0182147
	48.00	334	174	12	4	1	0182154
	50.00	334	174	12	4	1	0182178
2“	50.80	334	174	12	4	1	0181546

Bridge Reamer, Taper Shank

B121 Left hand fast spiral, right hand cut tapered bridge reamer. Used in structural iron and steel applications for badly misaligned holes. The l_3 length has a 1:10 starting taper.

B121

HSS

ST

DIN 311

10.00 - 30.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B121
10.0	171	95	30	4	1	1	0049020
11.0	176	100	33	4	1	1	0049037
12.0	199	105	39	4	2	1	0049044
13.0	199	105	39	4	2	1	0049051
14.0	209	115	42	4	2	1	0049068
15.0	219	125	45	4	2	1	0049075
16.0	229	135	48	4	2	1	0049082
17.0	251	135	51	4	3	1	0049099
18.0	261	145	58	4	3	1	0049105
19.0	261	145	58	4	3	1	0049112
20.0	271	155	62	4	3	1	0049129
21.0	271	155	62	4	3	1	0049136
22.0	281	165	66	4	3	1	0049143
23.0	281	165	66	4	3	1	0049150
24.0	296	180	72	4	3	1	0049167
25.0	296	180	72	4	3	1	0049174
26.0	296	180	72	4	3	1	0049181
30.0	311	195	78	5	3	1	0049211

HSS REAMER

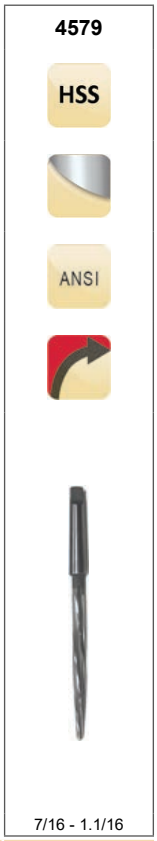
UNION BUTTERFIELD

Bridge Reamer, Taper Shank

4579

Left hand slow spiral, right hand cut tapered bridge reamer. Used in structural iron and steel applications for badly misaligned holes.

Produced per ASME B94.2-1995 standards.



nom Ø	d_1 Ø (min)	d_2 Ø (max)	MTS	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4579
7/16	1/4	7/16	2	4.3/8	8.1/4	4	1	5011055
1/2	9/32	1/2	2	5.1/8	9“	4	1	5011056
9/16	11/32	9/16	2	5.1/8	9“	4	1	5011057
5/8	3/8	5/8	2	6.1/8	10“	4	1	5011058
11/16	25/64	11/16	3	7.1/8	11.3/4	4	1	5011059
3/4	7/16	3/4	3	7.3/8	12“	4	1	5011060
13/16	1/2	13/16	3	7.3/8	12“	4	1	5011061
7/8	9/16	7/8	3	7.3/8	12“	4	1	5011062
15/16	5/8	15/16	3	7.3/8	12“	4	1	5011063
1“	11/16	1“	3	7.3/8	12“	4	1	5011064
1.1/16	3/4	1.1/16	3	7.3/8	12“	4	1	5011065

HSS REAMER

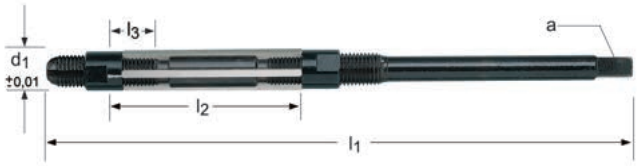
Hand Reamer, Square Drive

4500 Straight flute hand reamer with square drive, right hand cut. Widely used by hand for the final sizing of drilled holes. The square on the shank allows it to be held in either a tap wrench or a vise depending on whether it is the reamer or the part that is rotating. A long starting taper allows for ease of entry and accurate alignment. The straight flute style is recommended for most general purpose hand reaming applications.

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4500
1/8	0.1250	1.1/2	3“	4	1	5010928
3/16	0.1875	1.3/4	3.1/2	6	1	5010930
1/4	0.2500	2“	4“	6	1	5010932
5/16	0.3125	2.1/4	4.1/2	6	1	5010934
3/8	0.3750	2.1/2	5“	6	1	5010936
7/16	0.4375	2.3/4	5.1/2	6	1	5010938
1/2	0.5000	3“	6“	6	1	5010940
9/16	0.5625	3.1/4	6.1/2	8	1	5010942
5/8	0.6250	3.1/2	7“	8	1	5010944
3/4	0.7500	4.3/16	8.3/8	8	1	5010948
7/8	0.8750	4.7/8	9.3/4	8	1	5010950
1“	1.0000	5.7/16	10.7/8	8	1	5010952

Adjustable Hand Reamer, Replaceable Blade Type

B334 For light duty sizing of uninterrupted holes.

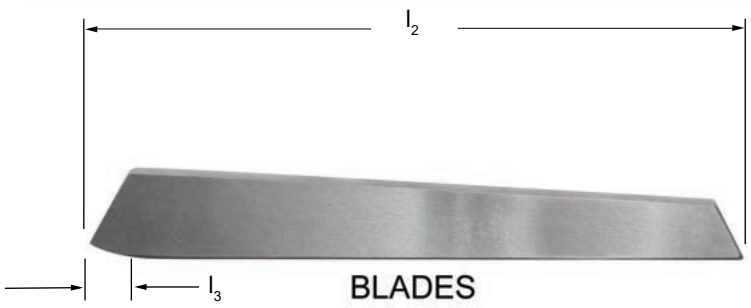


Nr.	d min-max mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	⍁ a mm	Pack Qty	B334
000	6.4 - 7.2	110	32	7	4	3.0	1	0052174
00	7.2 - 8.0	110	32	7	4	3.4	1	0052167
0	8.0 - 9.0	115	34	9	5	3.8	1	0052150
1	9.0 - 10.0	115	34	9	5	4.3	1	0052181
2	10.0 - 11.0	115	34	9	5	4.9	1	0052228
3	11.0 - 12.0	125	35	9	5	4.9	1	0052235
4	12.0 - 13.5	135	41	9	5	6.2	1	0052242
5	13.5 - 15.5	146	50	12	5	7.0	1	0052259
6	15.5 - 18.0	166	60	12	5	8.0	1	0052266
7	18.0 - 21.0	178	65	15	5	9.0	1	0052273
8	21.0 - 24.0	195	76	15	5	11.0	1	0052280
9	24.0 - 27.5	218	82	18	5	12.0	1	0052297
10	27.5 - 31.5	245	86	18	5	14.5	1	0052198
11	31.5 - 37.0	280	98	18	6	18.0	1	0052204
12	37.0 - 45.0	325	108	20	6	20.0	1	0052211
13	45.0 - 55.0	370	118	20	6	26.0	1	0140819
14	55.0 - 67.0	400	125	20	6	32.0	1	0140826
15	67.0 - 80.0	435	140	23	8	39.0	1	0140833
16	80.0 - 95.0	475	155	23	8	49.0	1	0140840

HSS REAMER

Adjustable Hand Reamer, Replaceable Blade Type

B335 Replace blades & nuts for use with B334



B335

HSS

DORMER

N000 BLADES - N16 NUTS

Nr.	l_2 mm	l_3 mm	Nuts Pack Qty	B335 Nuts	Blades Pack Qty	B335 Blades
000	32	7	1	0144640	4	0052327
00	32	7	1	0144633	4	0052310
0	34	9	1	0144626	5	0052303
1	34	9	1	0144657	5	0052334
2	34	9	1	0144664	5	0052372
3	35	9	1	0144671	5	0052389
4	41	9	1	0144688	5	0052396
5	50	12	1	0144695	5	0052402
6	60	12	1	0144701	5	0052419
7	65	15	1	0144718	5	0052426
8	76	15	1	0144725	5	0052433
9	82	18	1	0144732	5	0052440
10	86	18	1	0144749	5	0052341
11	98	18	1	0144756	6	0052358
12	108	20	1	0144763	6	0052365
13	118	20	1	0144770	6	0144589
14	125	20	1	0144787	6	0144596
15	140	23	1	0144794	8	0144602
16	155	23	1	0144800	8	0144619

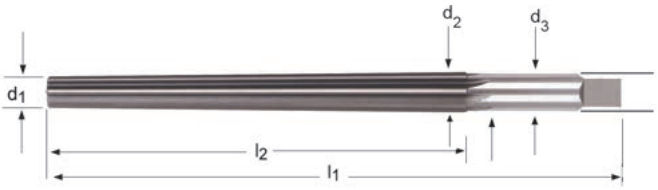
HSS REAMER

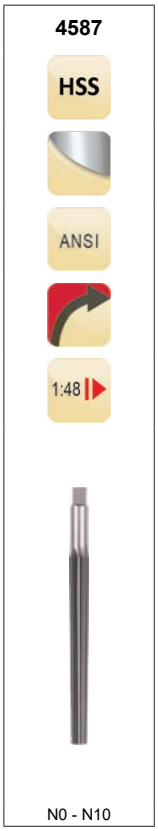
UNION BUTTERFIELD

Hand Reamer, Taper Pin Type, Square Drive

4587 Straight flute taper pin (1/4” per foot), right hand cut.
Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use.
Recommended for most materials.

Produced per ASME B94.2-1995 standards.





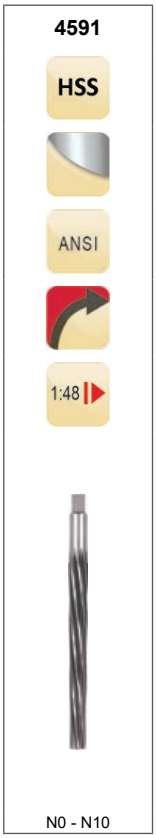
nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4587
0	0.1287	0.1638	11/64	1.11/16	2.15/16	6	1	5011129
1	0.1447	0.1798	3/16	1.11/16	2.15/16	6	1	5011130
2	0.1600	0.2010	13/64	1.15/16	3.3/16	6	1	5011131
3	0.1813	0.2294	15/64	2.5/16	3.11/16	6	1	5011132
4	0.2071	0.2600	17/64	2.9/16	4.1/16	6	1	5011133
5	0.2410	0.2994	5/16	2.13/16	4.5/16	6	1	5011134
6	0.2773	0.3540	23/64	3.11/16	5.7/16	6	1	5011135
7	0.3297	0.4220	13/32	4.7/16	6.5/16	6	1	5011136
8	0.3971	0.5050	7/16	5.3/16	7.3/16	6	1	5011137
9	0.4800	0.6066	9/16	6.1/16	8.5/16	8	1	5011138
10	0.5799	0.7216	5/8	6.13/16	9.5/16	8	1	5011139

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

Hand Reamer, Taper Pin, Square Drive

4591 Left hand slow spiral flute, right hand cut taper pin (1/4” per foot) hand reamer with square drive.
Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use.
Recommended for most materials.

Produced per ASME B94.2-1995 standards.



nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4591
0	0.1287	0.1638	11/64	1.11/16	2.15/16	6	1	5011146
1	0.1447	0.1798	3/16	1.11/16	2.15/16	6	1	5011147
2	0.1600	0.2010	13/64	1.15/16	3.3/16	6	1	5011148
3	0.1813	0.2294	15/64	2.5/16	3.11/16	6	1	5011149
4	0.2071	0.2600	17/64	2.9/16	4.1/16	6	1	5011150
5	0.2410	0.2994	5/16	2.13/16	4.5/16	6	1	5011151
6	0.2773	0.3540	23/64	3.11/16	5.7/16	6	1	5011152
7	0.3297	0.4220	13/32	4.7/16	6.5/16	6	1	5011153
8	0.3971	0.5050	7/16	5.3/16	7.3/16	6	1	5011154
9	0.4800	0.6066	9/16	6.1/16	8.5/16	8	1	5011155
10	0.5799	0.7216	5/8	6.13/16	9.5/16	8	1	5011156

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

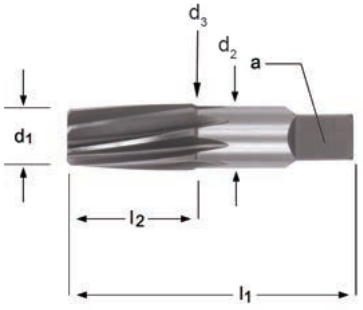
HSS REAMER

UNION BUTTERFIELD

Hand Reamer, Taper Pipe Type, Square Drive

4600 Left hand spiral flute, right hand cut taper (3/4” per foot) taper pipe reamer.
Intended for reaming holes to be tapped with American Standard taper pipe taps. Generally used by hand with a tap wrench.

Produced per ASME B94.2-1995 standards.



nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	▨ a mm	# of Flutes	Pack Qty	4600
1/8	0.3160	0.3620	0.4375	3/4	2.1/8	0.3280	6	1	1810007
1/4	0.4060	0.4720	0.5625	1.1/16	2.7/16	0.4210	6	1	1810008
3/8	0.5400	0.6060	0.7000	1.1/16	2.9/16	0.5310	8	1	1810009
1/2	0.6650	0.7510	0.6875	1.3/8	3.1/8	0.5150	8	1	1810010
3/4	0.8760	0.9620	0.9063	1.3/8	3.1/4	0.6790	10	1	1810011
1“	1.1030	1.2120	1.1250	1.3/4	3.3/4	0.8430	10	1	1810012

Note: Nom Ø (column 1) is the NPT pipe thread size.
This is not the tool diameter.

Hand Reamer, Square Drive

B100 Left hand spiral flute, right hand cut.
Widely used by hand for the final sizing of drilled holes. The square on the shank allows it to be held in either a tap wrench or a vise depending on whether it is the reamer or the part that is rotating. A long starting taper allows for ease of entry and accurate alignment.

B100

HSS

ST

DIN 206

1.50 - 50.00

Produced per DIN206 Form B.
Cutting diameters are produced to H7 tolerance.
Shank diameters (same as cutting diameters) but produced to e9 tolerance.

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	▨ a mm	Pack Qty	B100
	1.50	41	20	5	3	1.12	1	0179987
1/16	1.59	41	20	5	3	1.12	1	0179598
	1.60	44	21	5	3	1.25	1	0179994
5/64	1.98	47	23	6	4	1.40	1	0179604
	2.00	50	25	6	4	1.60	1	0048610
3/32	2.38	54	27	7	4	1.80	1	0179611
	2.50	58	29	7	4	2.10	1	0048634
7/64	2.78	62	31	8	6	2.10	1	0179628
	3.00	62	31	8	6	2.40	1	0048719
1/8	3.18	66	33	8	6	2.40	1	0179635
	3.20	66	33	8	6	2.40	1	0048726
	3.50	71	35	9	6	2.70	1	0048733
9/64	3.57	71	35	9	6	2.70	1	0179642
5/32	3.97	76	38	10	6	3.00	1	0179659
	4.00	76	38	10	6	3.00	1	0048801
11/64	4.37	81	41	10	6	3.40	1	0179666
	4.50	81	41	10	6	3.40	1	0048818
3/16	4.76	87	44	11	6	3.80	1	0179673
	5.00	87	44	11	6	3.80	1	0048887
13/64	5.16	87	44	11	6	3.80	1	0179680
	5.50	93	47	12	6	4.30	1	0048894
7/32	5.56	93	47	12	6	4.30	1	0179697
15/64	5.95	93	47	12	6	4.90	1	0179703
	6.00	93	47	12	6	4.90	1	0048917
1/4	6.35	100	50	13	6	4.90	1	0179710
	6.50	100	50	13	6	4.90	1	0140314
17/64	6.75	107	54	14	6	5.50	1	0179727
	7.00	107	54	14	6	5.50	1	0048924
9/32	7.14	107	54	14	6	6.20	1	0179734
	7.50	107	54	14	6	6.20	1	0140321
19/64	7.54	115	58	15	6	6.20	1	0179741
5/16	7.94	115	58	15	6	6.20	1	0179758
	8.00	115	58	15	6	6.20	1	0048931

HSS REAMER

DORMER

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	☐ a mm	Pack Qty	B100
21/64	8.33	115	58	15	6	7.00	1	0179765
	8.50	115	58	15	6	7.00	1	0140338
11/32	8.73	124	62	16	6	7.00	1	0179772
	9.00	124	62	16	6	7.00	1	0048948
23/64	9.13	124	62	16	6	8.00	1	0179789
	9.50	124	62	16	6	8.00	1	0140345
3/8	9.52	124	62	17	6	8.00	1	0179796
25/64	9.92	133	66	17	6	8.00	1	0179802
	10.00	133	66	17	6	8.00	1	0048511
13/32	10.32	133	66	17	6	8.00	1	0179819
	10.50	133	66	17	6	8.00	1	0180006
	11.00	142	71	18	6	9.00	1	0048528
7/16	11.11	142	71	18	6	9.00	1	0179826
	11.50	142	71	18	6	9.00	1	0180013
	12.00	152	76	19	6	9.00	1	0048535
	12.50	152	76	19	6	10.00	1	0180020
1/2	12.70	152	76	19	6	10.00	1	0179840
	13.00	152	76	19	6	10.00	1	0048542
17/32	13.49	163	81	20	8	11.00	1	0179857
	13.50	163	81	20	8	11.00	1	0180037
	14.00	163	81	20	8	11.00	1	0048559
9/16	14.29	163	81	20	8	11.00	1	0179864
	14.50	163	81	20	8	11.00	1	0180044
	15.00	163	81	20	8	12.00	1	0048566
19/32	15.08	163	81	22	8	12.00	1	0179871
5/8	15.88	175	87	22	8	12.00	1	0179888
	16.00	175	87	22	8	12.00	1	0048573
	17.00	175	87	22	8	13.00	1	0048580
11/16	17.46	188	93	23	8	14.50	1	0179895
	18.00	188	93	23	8	14.50	1	0048597
	19.00	188	93	23	8	14.50	1	0048603
3/4	19.05	188	93	25	8	14.50	1	0179901
	20.00	201	100	25	8	16.00	1	0048658
13/16	20.64	201	100	25	8	16.00	1	0179925
	21.00	201	100	25	8	16.00	1	0180051
	22.00	215	107	27	8	18.00	1	0048665
7/8	22.22	215	107	27	8	18.00	1	0179949
	23.00	215	107	27	8	18.00	1	0180068
	24.00	231	115	29	8	18.00	1	0048672
	25.00	231	115	29	8	20.00	1	0048689
1“	25.40	231	115	29	8	20.00	1	0179970
	26.00	231	115	29	8	20.00	1	0048696
	27.00	247	124	31	10	22.00	1	0180075
	28.00	247	124	31	10	22.00	1	0048702
	29.00	247	124	31	10	22.00	1	0180082
	30.00	247	124	31	10	24.00	1	0048740
	31.00	265	133	33	10	24.00	1	0180099
	32.00	265	133	33	10	24.00	1	0048757
	33.00	265	133	33	10	26.00	1	0180105
	34.00	284	142	36	10	26.00	1	0048764
	35.00	284	142	36	10	29.00	1	0048771
	36.00	284	142	36	10	29.00	1	0048788
	37.00	284	142	36	10	29.00	1	0180112
	38.00	305	152	38	10	29.00	1	0048795
	39.00	305	152	38	10	32.00	1	0180129
	40.00	305	152	38	10	32.00	1	0048825
	45.00	326	163	41	12	35.00	1	0048856
	50.00	347	174	44	12	39.00	1	0048900

Hand Reamer, Taper Pin Type, Square Drive

B301

Straight flute taper pin (1/4” per foot), straight shank reamer. Designed to convert a straight hole into a tapered hole into which standard taper pins will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use. Recommended for most materials.

nom Ø	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	☐ a mm	d_2 Ø mm	Pack Qty	B301
1/16	1.10	51	25	4	1.2	1.63	1	0182277 [1]
5/64	1.50	51	25	4	1.6	2.03	1	0182284 [1]
3/32	1.75	57	32	4	2.0	2.41	1	0182291 [1]
7/64	2.03	64	38	4	2.2	2.82	1	0182307 [1]
1/8	2.30	70	44	4	2.5	3.23	1	0182314 [1]
9/64	2.64	73	48	4	2.8	3.63	1	0182321 [1]
5/32	2.95	76	51	4	3.1	4.01	1	0182338 [1]
11/64	3.23	89	57	4	3.6	4.42	1	0182345 [1]
3/16	3.50	102	70	4	4.0	4.95	1	0182352 [1]
7/32	4.13	102	70	6	4.5	5.59	1	0182369 [1]
1/4	4.64	117	86	6	5.0	6.43	1	0182376 [2]
9/32	5.23	143	105	6	5.6	7.42	1	0182383 [2]
5/16	5.84	143	105	6	6.3	8.03	1	0182390 [2]
11/32	6.43	152	114	6	7.1	8.81	1	0182406 [2]
3/8	7.03	165	127	6	8.0	9.68	1	0182413 [2]
13/32	7.42	191	146	6	8.0	10.46	1	0182420 [2]
7/16	8.21	191	146	6	9.0	11.25	1	0182437 [2]
1/2	9.41	210	165	6	10.0	12.85	1	0182444 [2]

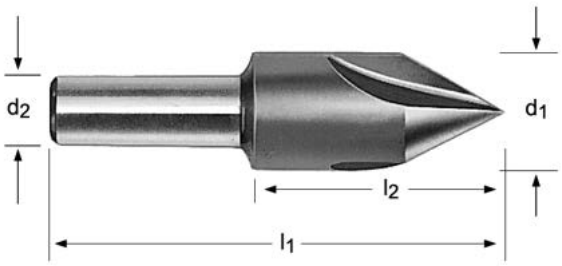
[1] Limit of tolerance +0.0030
[2] Limit of tolerance +0.0050

HSS REAMER

UNION BUTTERFIELD

Straight Shank, 3-Flute

4608 Center Reamer, Available in 60º, 82º, 90º, or 100º angles. Widely used to finish ream lathe centers in shafts, and countersink angles for screw heads and rivets. The odd number of flutes promotes smooth reamed finishes while eliminating chatter and providing better accuracy in most applications.



d_1 Ø Inch	Angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4608
1/4	60º	3/16	3/4	1.1/2	3	1	5011093
1/4	82º	3/16	3/4	1.1/2	3	1	5011098
1/4	90º	3/16	3/4	1.1/2	3	1	5011103
1/4	100º	3/16	3/4	1.1/2	3	1	5011108
3/8	60º	1/4	7/8	1.3/4	3	1	5011094
3/8	82º	1/4	7/8	1.3/4	3	1	5011099
3/8	90º	1/4	7/8	1.3/4	3	1	5011104
3/8	100º	1/4	7/8	1.3/4	3	1	5011109
1/2	60º	3/8	1“	2“	3	1	5011095
1/2	82º	3/8	1“	2“	3	1	5011100
1/2	90º	3/8	1“	2“	3	1	5011105
1/2	100º	3/8	1“	2“	3	1	5011110
5/8	60º	3/8	1“	2.1/4	3	1	5011096
5/8	82º	3/8	1“	2.1/4	3	1	5011101
5/8	90º	3/8	1“	2.1/4	3	1	5011106
5/8	100º	3/8	1“	2.1/4	3	1	5011111
3/4	60º	1/2	1.1/4	2.5/8	3	1	5011097
3/4	82º	1/2	1.1/4	2.5/8	3	1	5011102
3/4	90º	1/2	1.1/4	2.5/8	3	1	5011107
3/4	100º	1/2	1.1/4	2.5/8	3	1	5011112
1“	60º	1/2	1“	3“	3	1	46262132
1“	82º	1/2	1“	3“	3	1	46262133
1“	90º	1/2	1“	3“	3	1	46262134
1“	100º	1/2	1“	3“	3	1	46262135

Visual Index - Countersinks & Counterbores

Visual Index - Countersinks & Counterbores

Alpha Code	Countersinks, Counterbores - Feed in Inches per Revolution Ø Diameter									
	1/4	5/16	5/64	5/8	25/32	1"	1-1/4	1-1/2	2-3/8	3"
A	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.005	0.006	0.006
B	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008
C	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
D	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010	0.011
E	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012	0.013
F	0.004	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.014
G	0.004	0.005	0.006	0.007	0.008	0.009	0.011	0.013	0.014	0.016
H	0.005	0.006	0.007	0.008	0.009	0.010	0.012	0.014	0.016	0.018

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Countersinks & Counterbores

Tool Material:	HM	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS	HSS	HSS	HSS-E	HSS
Finish/Coating:					TiN				TiAlN		AlTiCN	TiAlN
Standard:	DIN 335C	ANSI	ANSI	DIN 334C	DIN 334C	DIN 335C	DORMER	DIN 335C	DIN 335C	DIN 335C	DIN 335C	DIN 335C
Direction of Cut:												
Application:												
Shank:												
Countersink Angle:	90°	60°	60°	60°	60°	82°	90°	90°	90°	90°	90°	100°
		90°	82°									
Style:	G400	4603	4602	G135	G335	G154	G149	G136	G560	G142	G570	G171
Range:	6.30 - 31.00	1/4 - 1.1/2	1/2 - 1"	6.30 - 25.00	6.30 - 25.00	6.30 - 25.00	5.00 - 50.00	4.30 - 31.00	6.30 - 31.00	4.80 - 31.00	6.30 - 31.00	6.30 - 25.00
Page #	494	495	496	497	497	498	499	500	500	501	502	503
1.1	98F	98F	98F	98F	164E	98F	98D	98F	164E	98F	148E	164E
1.2	82E	82E	82E	82E	131E	82E	82D	82E	131E	82E	118E	131E
1.3	66D	66D	66D	66D	98D	66D	66C	66D	98D	66D	89D	98D
1.4	49D	49D	49D	49D	66D	49D	49B	49D	66D	49D	72D	66D
1.5	33B	33B	33B	33B	49B	33B	33A	33B	49B		56B	49B
1.6	20A	20A	20A	20A	33B	20A	20A	20A	33B		39B	33B
1.7												
1.8												
2.1	26C	26C	26C	26C		26C	26B	26C		26C	56C	
2.2	20B	20B	20B	20B		20B	20A	20B		20B	39B	
2.3	13A	13A	13A	13A		13A		13A		13A	49A	
2.4											33A	
3.1	82F	82F	82F	82F	148F	82F	82D	82F	148F		131C	148F
3.2	49D	49D	49D	49D	115D	49D	49C	49D	115D		105C	115D
3.3	39C	39C	39C	39C	98C	39C	39A	39C	98C		89C	98C
3.4	26C	26C	26C	26C	98C	26C	26A	26C	98C		79C	98C
4.1	39C	39C	39C	39C	66C	39C	39B	39C	66C	39C		66C
4.2	33A	33A	33A	33A	49A	33A	33A	33A	49A	33A		49A
4.3	26A	26A	26A	26A	33A	26A	26A	26A	33A			33A
5.1	39C	39C	39C	39C	66C	39C	39B	39C	66C	39C		66C
5.2	20B	20B	20B	20B	33B	20B	20A	20B	33B	20B	20A	33B
5.3	13A	13A	13A	13A	20A	13A	13A	13A	20A		13A	20A
6.1	82D	82D	82D	82D	131D	82D	82B	82D	131D	82D	131D	131D
6.2	66F	66F	66F	66F	98F	66F	66C	66F	98F	66F	98F	98F
6.3	82F	82F	82F	82F	131F	82F	82C	82F	131F	82F	131F	131F
6.4	33D	33D	33D	33D	49D	33D	33B	33D	49D		49D	49D
7.1	98G	98G	98G	98G	164G	98G	98D	98G	164G	98G	148G	164G
7.2	82F	82F	82F	82F	131F	82F	82C	82F	131F	82F	118F	131F
7.3	66F	66F	66F	66F	98F	66F	66C	66F	98F	66F	89F	98F
7.4	33F	33F	33F	33F	49F	33F	33C	33F	49F	33F	43F	49F
8.1	98G	98G	98G	98G	164G	98G	98D	98G	164G	98G		164G
8.2	66G	66G	66G	66G	98G	66G	66D	66G	98G	66G		98G
8.3												
9.1												
10.1												

Visual Index - Countersinks & Counterbores

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
					TiN						
	DORMER	DIN 335A	DIN 334D	DIN 335D	DIN 335D	DIN 335C	ANSI	ANSI	ANSI	ANSI	ANSI
	90°	90°	60°	90°	90°	90°					
	G600	**G132**	**G137**	**G138**	**G338**	**G236**	**4702**	**4706**	**4705**	**4703**	**4704**
	6.30 - 25.00	8.00 - 20.00	16.00 - 80.00	25.00 - 80.00	25.00 - 63.00	Set	1/4 - 2"	1/4 - 1"	1/4 - 1"	1/4 - 2.1/2	3/32 - 2"
	504	**505**	**506**	**507**	**507**	**508**	**509**	**510**	**510**	**512**	**513**
1.1	72F		98F	98F	164F		82C	82C	82C	82C	
1.2	56E		82E	82E	131E		66C	66C	66C	66C	
1.3	49D	66E	66D	66D	98D		52C	52C	52C	52C	
1.4	39D	49D	49D	49D	66D		49B	49B	49B	49B	
1.5	26B	33D	33B	33B	49B		30B	30B	30B	30B	
1.6	20A	20B	20A	20A	33A		16A	16A	16A	16A	
1.7											
1.8											
2.1	26C		26C	26C			36C	36C	36C	36C	
2.2	20B		20B	20B			20B	20B	20B	20B	
2.3	13A	13B	13A	13A			26B	26B	26B	26B	
2.4											
3.1	82F		82F	82F	148F		52E	52E	52E	52E	
3.2	49D		49D	49D	115D		49D	49D	49D	49D	
3.3	39C		39C	39C	98C		43C	43C	43C	43C	
3.4		26D	26C	26C	98C		36C	36C	36C	36C	
4.1			39C	39C	66C		49C	49C	49C	49C	
4.2		26A	33A	33A	49A		30B	30B	30B	30B	
4.3		26A	26A	26A	33A		16B	16B	16B	16B	
5.1			39C	39C	66C		26D	26D	26D	26D	
5.2		20C	20B	20B	33B		16C	16C	16C	16C	
5.3		13B	13A	13A	20A		10C	10C	10C	10C	
6.1	82D		82D	82D	131D		82D	82D	82D	82D	
6.2	66F		66F	66F	98F		92E	92E	92E	92E	
6.3	82F		82F	82F	131F		82D	82D	82D	82D	
6.4	33D	33F	33D	33D	49D		46D	46D	46D	46D	
7.1	98G		98G	98G	164G						
7.2	82F		82F	82F	131F						
7.3	66F		66F	66F	98F						
7.4	33F		33F	33F	49F						
8.1			98G	98G	164G						
8.2			66G	66G	98G						
8.3		16G									
9.1											
10.1											

List Number Index - Countersinks/Counterbores

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4705..... 510
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G132..... 505
G135.....497
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G138.....507
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G570..... 502
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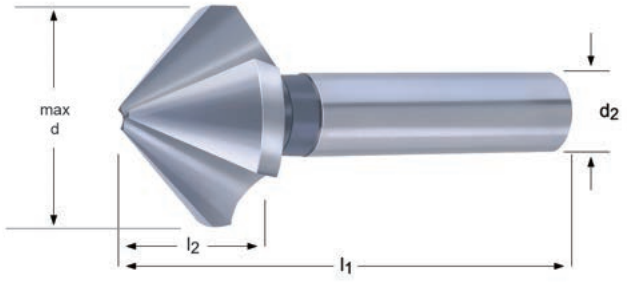
MULTI-APPLICATION CARBIDE COUNTERSINK DORMER

Solid Carbide, Straight Shank, 3-Flute

G400 90º Countersink with Straight Shank. Recommended for abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	



G400

HM

DIN 335C

6.30 - 31.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_6$ mm	# of Flutes	Pack Qty	G400
6.3 (1/4)	1.5	5.0	45	5	3	1	0128787
8.3 (5/16)	2.0	6.0	50	6	3	1	0128794
10.4 (3/8)	2.5	7.1	50	6	3	1	0128725
12.4 (1/2)	2.8	8.0	56	8	3	1	0128732
16.5 (5/8)	3.2	10.0	60	10	3	1	0128749
20.5 (3/4)	3.5	12.5	63	10	3	1	0128756
25.0 (1“)	3.8	15.0	67	10	3	1	0128763
31.0 (1.1/4)	4.2	18.0	71	12	3	1	0128770

UNION BUTTERFIELD

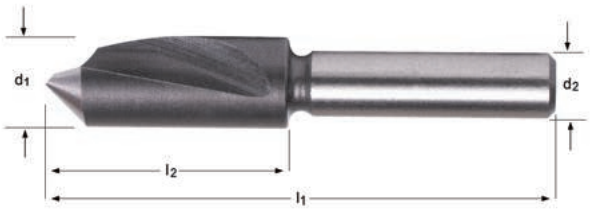
HSS COUNTERSINK

Countersink, Straight Shank, Single-Flute

4603

Available in 60º, 82º, or 90º angles. Engineered for machine use and light portable work. Single flute construction and low controlled relief assure the user of chatterless operation.

Best results obtained using high speeds and low feed. Recommended that the predrilled hole be at least 10% of the countersink diameter.



4603

HSS

ANSI

1/4 - 1.1/2

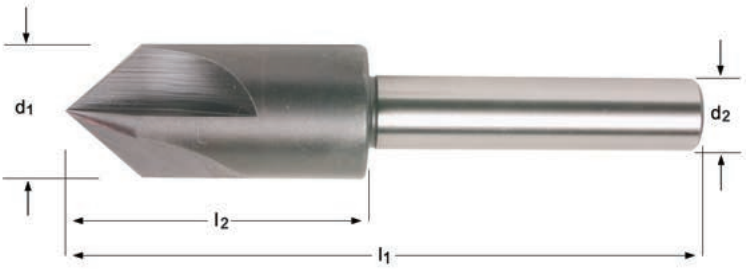
d_1 Ø Inch	angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4603
1/4	82°	3/16	11/16	1.7/16	1	1	4710797
1/4	90°	3/16	11/16	1.7/16	1	1	4710805
3/8	60°	1/4	7/8	1.3/4	1	1	4710790
3/8	82°	1/4	25/32	1.21/32	1	1	4710798
3/8	90°	1/4	3/4	1.5/8	1	1	4710806
1/2	60°	1/4	1“	2“	1	1	4710791
1/2	82°	1/4	27/32	1.27/32	1	1	4710799
1/2	90°	1/4	13/32	1.13/16	1	1	4710807
5/8	82°	3/8	1.3/32	2.3/32	1	1	4710800
5/8	90°	3/8	1“	2“	1	1	4710808
3/4	60°	3/8	1.13/32	2.21/32	1	1	4710793
3/4	82°	3/8	1.5/32	2.13/32	1	1	4710801
3/4	90°	3/8	1.1/16	2.5/16	1	1	4710809
1“	60°	1/2	1.9/16	3.1/8	1	1	4710794
1“	82°	1/2	1.1/4	2.13/16	1	1	4710802
1“	90°	1/2	1.1/4	2.13/16	1	1	4710810
1.1/4	60°	1/2	1.3/4	3.3/4	1	1	4710795
1.1/4	82°	1/2	1.1/2	3.1/2	1	1	4710803
1.1/4	90°	1/2	1.9/16	3.9/16	1	1	4710811
1.1/2	60°	1/2	2.5/16	4.1/4	1	1	4710796
1.1/2	82°	1/2	1.15/16	3.7/8	1	1	4710804
1.1/2	90°	1/2	1.13/16	3.3/4	1	1	4710812

HSS COUNTERSINK

UNION BUTTERFIELD

Countersink, Straight Shank, 4-Flute

4602 Countersink with angles of 60º for centers or 82º for flat head screws. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



d_1 Ø Inch	Angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4602
1/2	60°	1/2	1.5/8	3.7/8	4	1	4710588
1/2	82°	1/2	1.5/8	3.7/8	4	1	4710593
5/8	60°	1/2	1.3/4	4“	4	1	4710589
5/8	82°	1/2	1.3/4	4“	4	1	4710594
3/4	60°	1/2	1.7/8	4.1/8	4	1	4710590
3/4	82°	1/2	1.7/8	4.1/8	4	1	4710595
7/8	60°	1/2	2“	4.1/4	4	1	4710591
7/8	82°	1/2	2“	4.1/4	4	1	4710596
1“	60°	1/2	2.1/8	4.3/8	4	1	4710592
1“	82°	1/2	2.1/8	4.3/8	4	1	4710597

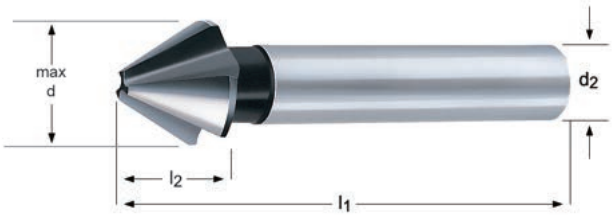
HSS COUNTERSINK

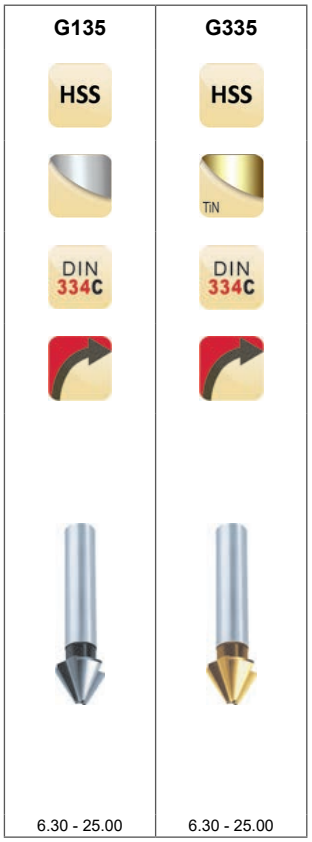
Straight Shank, 3-Flute

60º countersink with straight shank for multiple materials.

G135 Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G335 TiN coated for improved wear resistance.

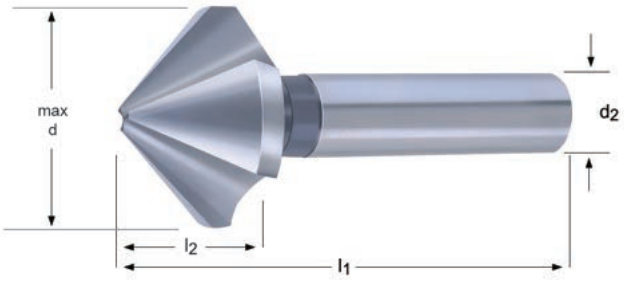




max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G135	G335
6.3 (1/4)	1.6	6.8	45	5	3	1	0108482	0149546
8.0 (5/16)	2.0	8.5	50	6	3	1	0108499	0149553
10.0 (3/8)	2.5	7.6	50	6	3	1	0144817	0149560
12.5 (1/2)	3.2	11.7	56	8	3	1	0108444	0149577
16.0 (5/8)	4.0	14.5	63	10	3	1	0108451	0149584
20.0 (3/4)	5.0	17.5	67	10	3	1	0108468	0149591
25.0 (1“)	6.3	20.5	71	10	3	1	0108475	0149607

Straight Shank, 3-Flute

G154 82º countersink for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.

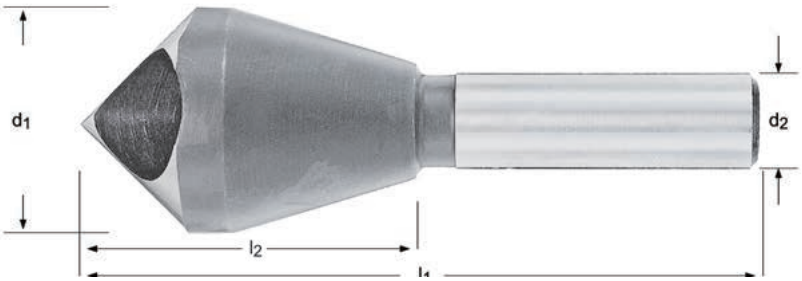


max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G154
6.3 (1/4)	1.5	5.5	45	5	3	1	0149348
8.3 (5/16)	2.0	6.5	50	6	3	1	0149355
10.4 (3/8)	2.5	7.6	50	6	3	1	0149362
12.4 (1/2)	2.8	8.5	56	8	3	1	0149379
16.5 (5/8)	3.2	10.5	60	10	3	1	0149386
20.5 (3/4)	3.5	13.0	63	10	3	1	0149393
25.0 (1“)	3.8	15.5	67	10	3	1	0149409

COBALT COUNTERSINK

Straight Shank, Single Flute

G149 90º Countersink, single flute, for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



max d mm	min d mm	l_2 mm	l_1 mm	d_2 Ø mm	d_1 Ø mm	# of Flutes	Pack Qty	G149
5	2	19.0	45	6	10	1	1	0109106
10	5	23.0	48	8	14	1	1	0109038
15	10	34.0	65	10	21	1	1	0109045
20	15	43.0	84	12	28	1	1	0109052
25	20	48.0	102	15	35	1	1	0109069
30	25	61.0	115	15	44	1	1	0109076
35	30	65.0	127	15	48	1	1	0109083
40	35	66.0	136	15	53	1	1	0109090
50	40	85.0	166	20	60	1	1	0109113

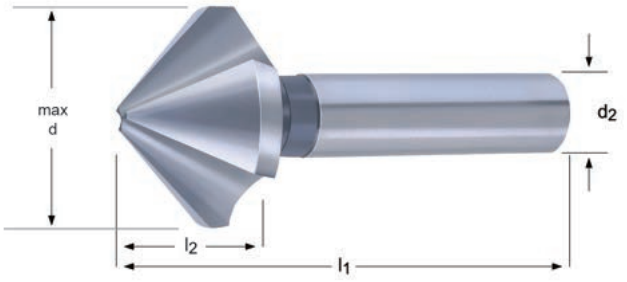
HSS COUNTERSINK

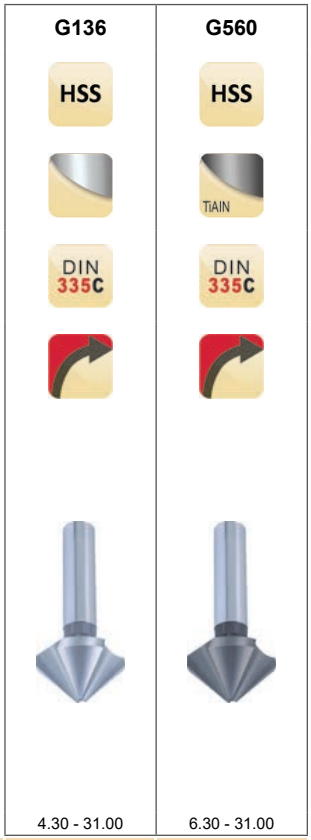
DORMER

Straight Shank, 3-Flute

G136 90º Countersink with straight shank for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G560 90º Countersink with straight shank for multiple materials. TiAlN coating increases surface hardness, improves chip flow, and increases tool life.



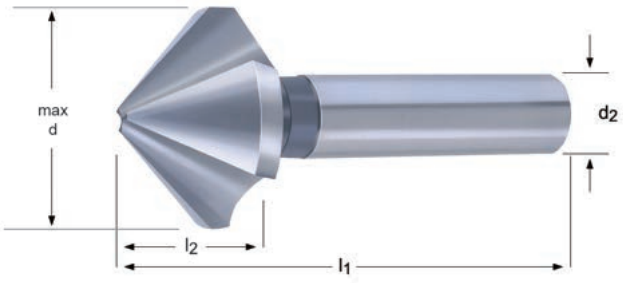


max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G136	G560
4.3	1.3	4.0	40	4	3	1	0108659	—
5.0	1.5	4.5	40	4	3	1	0108666	—
5.3	1.5	4.5	40	4	3	1	0108673	—
5.8	1.5	5.0	45	5	3	1	0108680	—
6.0	1.5	5.0	45	5	3	1	0108697	—
6.3	1.5	5.5	45	5	3	1	0108703	0109694
7.0	1.8	5.5	50	6	3	1	0108710	—
7.3	1.8	6.1	50	6	3	1	0108727	—
8.0	2.0	6.1	50	6	3	1	0108734	0127711
8.3	2.0	6.5	50	6	3	1	0108741	0127728
9.4	2.2	7.2	50	6	3	1	0108758	—
10.0	2.5	7.6	50	6	3	1	0108505	0109632
10.4	2.5	7.6	50	6	3	1	0108512	0109649
11.5	2.8	8.0	56	8	3	1	0108529	—
12.4	2.8	8.5	56	8	3	1	0108536	0109656
13.4	2.9	9.0	56	8	3	1	0108543	—
15.0	3.2	9.5	60	10	3	1	0108550	—
16.5	3.2	10.5	60	10	3	1	0108567	0109663
19.0	3.5	11.7	63	10	3	1	0108574	—
20.5	3.5	13.0	63	10	3	1	0108581	0109670
23.0	3.8	13.7	67	10	3	1	0108598	—
25.0	3.8	15.5	67	10	3	1	0108604	0109687
26.0	3.8	15.5	67	10	3	1	0108611	—
28.0	4.0	16.5	71	12	3	1	0108628	—
30.0	4.2	18.5	71	12	3	1	0108635	—
31.0	4.2	18.5	71	12	3	1	0108642	0127735

HSS COUNTERSINK

Straight Shank, 3-Flute

G142 90° Countersink with extra radial relief for soft or gummy materials. Bright finish improves chip flow in these materials.



G142

HSS

DIN 335C

4.80 - 31.00

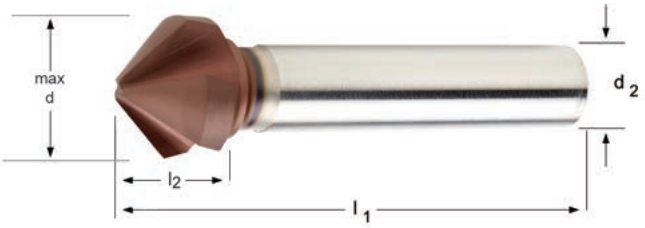
max d mm	min d mm	l_2 mm	l_1 mm	d_2 $\emptyset h_9$ mm	# of Flutes	Pack Qty	G142
4.8	1.3	4.5	40	4	3	1	0168059
5.0	1.5	4.5	40	4	3	1	0168066
6.0	1.5	5.0	45	5	3	1	0168073
6.3	1.5	5.5	45	5	3	1	0149270
7.0	1.8	5.5	50	6	3	1	0168080
7.3	1.8	6.1	50	6	3	1	0168097
8.0	2.0	6.1	50	6	3	1	0168103
8.3	2.0	6.5	50	6	3	1	0150658
10.0	2.5	7.6	50	6	3	1	0168110
10.4	2.5	7.6	50	6	3	1	0149287
11.5	2.8	8.0	56	8	3	1	0168127
12.4	2.8	8.5	56	8	3	1	0149294
15.0	3.2	9.5	60	10	3	1	0168134
16.5	3.2	10.5	60	10	3	1	0149300
19.0	3.5	11.7	63	10	3	1	0168141
20.5	3.5	13.0	63	10	3	1	0149317
23.0	3.8	13.7	67	10	3	1	0168158
25.0	3.8	15.5	67	10	3	1	0149324
31.0	4.2	18.5	71	12	3	1	0149331

COBALT COUNTERSINK

DORMER

Straight Shank, 3-Flute

G570 90º Countersink with AlTiCN coating designed primarily for Alloy Steels and Stainless Steels. Special PVD coating increases surface hardness and temperature resistance while maintaining a high level of toughness even in dry cutting conditions.

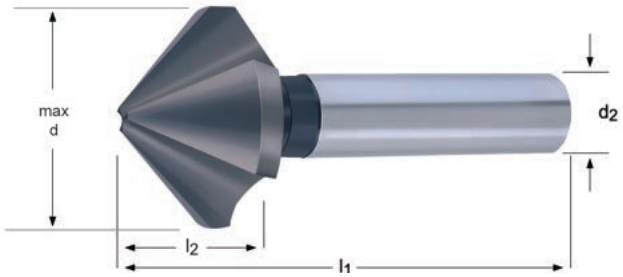


max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G570
6.3	1.5	6.5	45	5	3	1	46381760
8.3	2.0	8.2	50	6	3	1	46381761
10.4	2.5	9.7	50	6	3	1	46381762
12.4	2.8	10.6	56	8	3	1	46381763
16.5	3.2	13.9	60	10	3	1	46381764
20.5	3.5	17.1	63	10	3	1	46381765
25.0	3.8	21.4	67	10	3	1	46381766
31.0	4.2	24.4	71	12	3	1	46381767

HSS COUNTERSINK

Straight Shank, 3-Flute

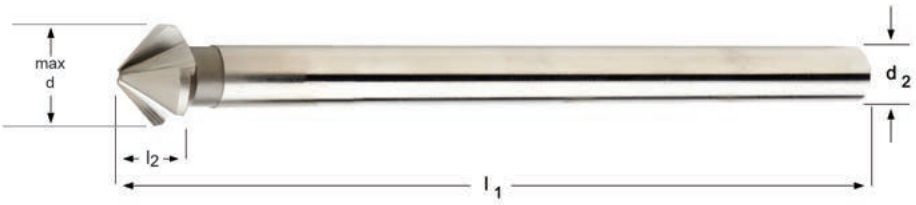
G171 100° Countersink with straight shank design for cast iron, soft steels & aluminum. TiAlN coating increases surface hardness and improves tool life at higher speeds.

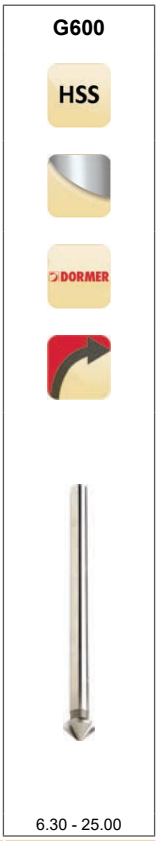


max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G171
6.3	1.5	4.5	44.0	5.0	3	1	0372609
8.3	2.0	5.5	49.0	6.0	3	1	0372616
10.4	2.5	6.6	49.0	6.0	3	1	0372555
12.4	2.8	7.0	53.0	6.0	3	1	0372562
16.5	3.2	9.0	56.0	6.0	3	1	0372579
20.5	3.5	11.0	61.0	10.0	3	1	0372586
25.0	3.8	13.5	65.0	10.0	3	1	0372593

Straight Shank, 3-Flute

G600 90° Countersink with straight shank for long reach applications. Multi-material type excellent for soft to medium steels. Bright finish improves chip flow in softer materials.



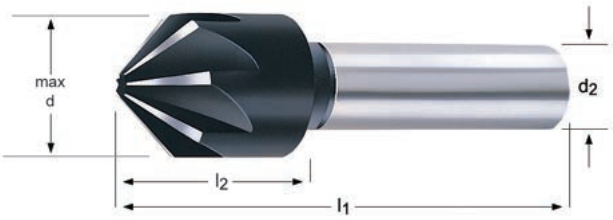


max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G600
6.3	1.3	6.4	154	5	3	1	46381768
8.3	1.8	8.3	155	6	3	1	46381769
10.4	2.2	9.7	157	6	3	1	46381770
12.4	2.5	10.6	158	8	3	1	46381771
15.0	2.8	12.6	159	10	3	1	46381772
16.5	2.8	13.9	161	10	3	1	46381773
20.5	3.0	17.1	164	10	3	1	46381774
25.0	3.2	21.4	168	10	3	1	46381775

HSS COUNTERSINK

Straight Shank, Multi-Flute

G132 90° Multi-flute countersink for better stability in harder materials. More flutes to share the load when cutting at slower speeds.



G132

HSS

DIN 335A

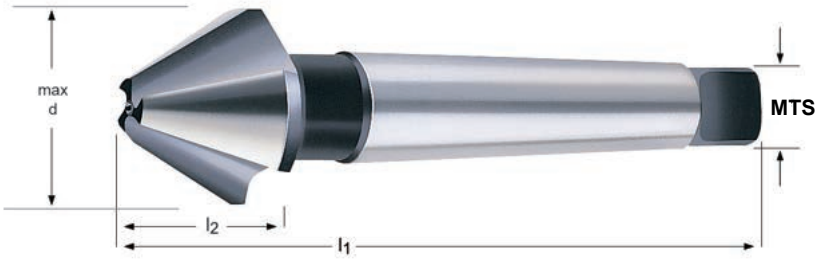
8.00 - 20.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G132
8.0	-	0.0	48	8	5	1	0108291
12.5	2.0	15.5	48	8	5	1	0108260
16.0	3.2	19.5	56	10	7	1	0108277
20.0	5.0	23.0	60	10	7	1	0108284

Taper Shank, 3-Flute

G137

60º Countersink with MorseTaper Shank for multiple materials. Bright finish improves chip flow in soft ferrous and non-ferrous materials.



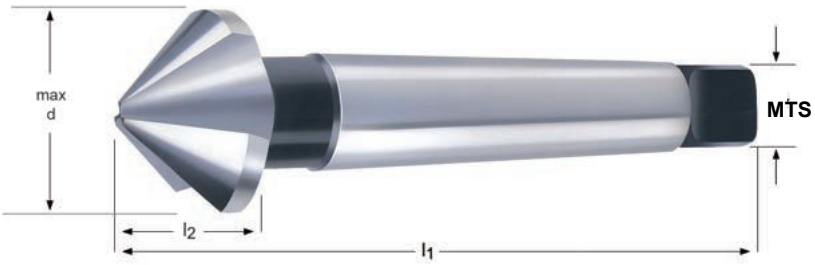
max d mm	min d mm	l_2 mm	l_1 mm	MTS	# of Flutes	Pack Qty	G137
16.0 (5/8)	4.0	14.5	90	1	3	1	0108765
20.0 (3/4)	5.0	17.5	106	2	3	1	0108772
25.0 (1“)	6.3	20.0	112	2	3	1	0108789
31.5 (1.1/4)	10.0	23.0	118	2	3	1	0108796
40.0 (1.1/2)	12.5	28.5	150	3	3	1	0108802
50.0 (2“)	16.0	36.0	160	3	3	1	0108819
63.0 (2.1/2)	20.0	43.0	190	4	3	1	0108826
80.0 (3“)	25.0	54.0	200	4	3	1	0108833

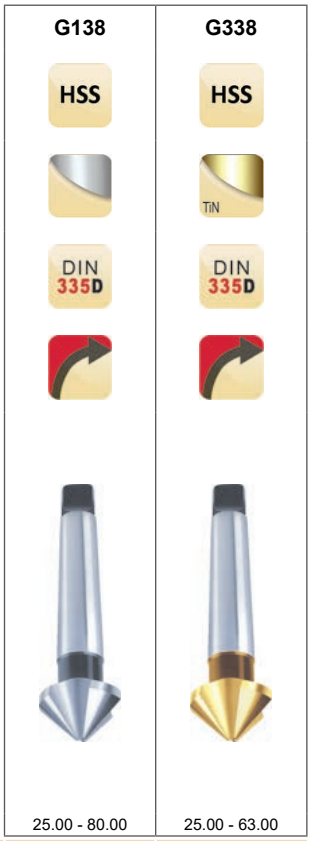
HSS COUNTERSINK

Taper Shank, 3-Flute

G138 90° Countersink with Morse Taper Shank for multiple materials. Excellent for steel, titanium & nickle alloys. Bright finish improves chip flow in soft ferrous and non-ferrous materials.

G338 90° Countersink with Morse Taper Shank for multiple materials. TiN coating increases surface hardness and improves chip flow in steel, cast iron and aluminum alloys.





max d mm	min d mm	l_2 mm	l_1 mm	MTS	# of Flutes	Pack Qty	G138	G338
25.0	3.8	15.5	106	2	3	1	0108895	0109502
30.0	4.2	18.5	112	2	3	1	0108925	—
31.0	4.2	20.0	112	2	3	1	0108932	0109519
34.0	4.5	19.5	118	2	3	1	0108949	—
37.0	4.8	21.7	118	2	3	1	0108956	0109526
40.0	10.0	20.5	140	3	3	1	0108963	0109533
50.0	14.0	24.1	150	3	3	1	0108970	0109540
63.0	16.0	28.5	180	4	3	1	0108987	0109557
80.0	22.0	36.0	190	4	3	1	0108994	—

Straight Shank, 3-Flute

G236 90° Countersink sets in 4 or 6 pcs. Sets 1&2 in bright finish improves chip flow in soft ferrous & non-ferrous materials. Set 3 in TiAlN coating increases surface hardness and improves tool life.

G236

HSS

DIN 335C

Set

Set	Styles in set	Pieces per Set	Diameters in set	Pack Qty	G236
1	G136	6	6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm	1	0217887
2	G136	4	6.30 mm, 10.40 mm, 16.50 mm, 20.50 mm	1	0344750
3	G560	6	6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm	1	46521338

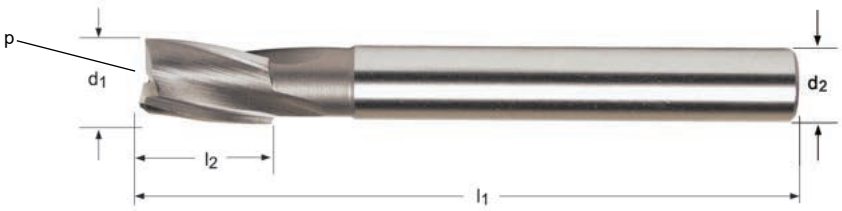
UNION BUTTERFIELD

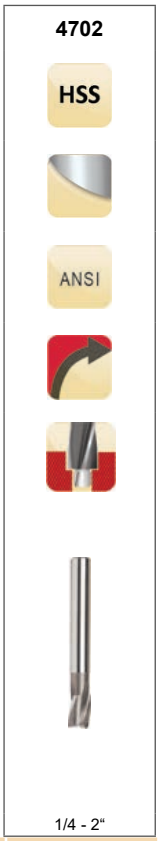
HSS COUNTERBORE

Counterbore Body - Interchangeable Pilot Type

4702 Short Length

Used to enlarge the end of a preformed hole when a flat bottom is required. The counterbore is an end cutting tool which utilizes and interchangeable pilot to align the enlarged hole being machined with the preformed hole. The 3 and 5 flute counterbore reduces chatter and improves finish.





d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pilot (p) Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4702
1/4	3/4	3.13/16	15/64	3	3/32	1/8	3/16	1	6210031
9/32	3/4	3.13/16	17/64	3	3/32	1/8	7/32	1	6210032
5/16	3/4	3.13/16	19/64	3	3/32	1/8	1/4	1	6210033
11/32	3/4	3.13/16	5/16	3	3/32	1/8	9/32	1	6210034
3/8	1“	4.1/16	5/16	3	5/32	3/16	5/16	1	6210035
13/32	1“	4.1/16	3/8	3	5/32	3/16	11/32	1	6210036
7/16	1“	4.1/16	3/8	3	5/32	3/16	3/8	1	6210037
15/32	1.1/4	4.5/16	7/16	3	3/16	3/16	13/32	1	6210038
1/2	1.1/4	4.5/16	7/16	3	3/16	3/16	7/16	1	6210039
9/16	1.1/4	4.5/16	1/2	3	3/16	3/16	1/2	1	6210041
19/32	1.1/4	5.1/8	1/2	3	3/16	3/16	17/32	1	6210042
5/8	1.1/4	5.1/8	1/2	3	3/16	3/16	9/16	1	6210043
11/16	1.1/4	5.1/8	1/2	3	3/16	3/16	5/8	1	6210045
3/4	1.1/2	5.3/8	1/2	3	1/4	5/16	11/16	1	6210047
25/32	1.1/2	5.3/8	5/8	3	1/4	5/16	23/32	1	6210048
13/16	1.1/2	5.3/8	5/8	3	1/4	5/16	3/4	1	6210049
27/32	1.1/2	5.3/8	3/4	3	1/4	5/16	25/32	1	6210050
7/8	1.1/2	5.3/8	3/4	3	1/4	5/16	13/16	1	6210051
1“	1.3/4	6.3/8	3/4	3	5/16	3/8	15/16	1	6210055
2“	2.1/2	8.3/8	1.1/2	5	1/2	9/16	1.15/16	1	6210065

HSS COUNTERBORE

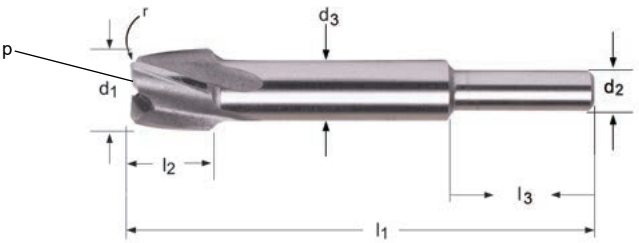
UNION BUTTERFIELD

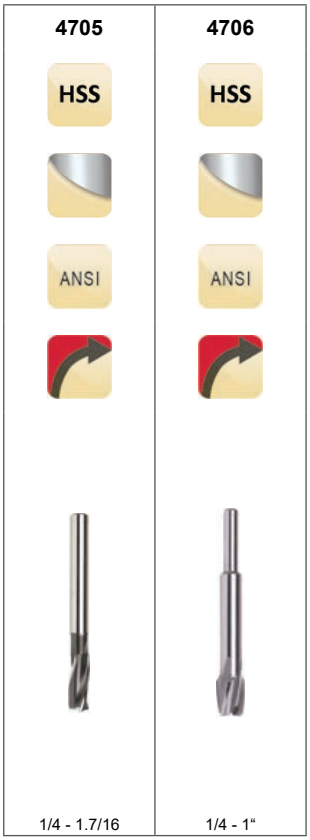
Counterbore Body, Aircraft Series - Interchangeable Pilot Type

4705 Long Series, 3-flute

4706 Short Series (Aircraft) 4-flute with corner radius

Used for the facing of bosses, and counterboring recesses for spring pockets and screw heads. Supplied with corner radius to produce the fillets necessary for this type of work. Designed for pneumatic or electric drills.





d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	l_3 Inch	d_3 Ø Inch	# of Flutes	Pilot (p) Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4705	4706
1/4	1/2	2.3/8	1/4	1.1/8	15/64	4	3/32	1/8	3/16	1	—	6210137 [1]
1/4	3/4	3.13/16	15/64	3.1/16	15/64	3	3/32	1/8	3/16	1	6210107	—
5/16	1/2	2.3/8	1/4	7/8	17/64	4	3/32	1/8	1/4	1	—	6210139 [1]
5/16	3/4	3.13/16	19/64	3.1/16	19/64	3	3/32	1/8	1/4	1	6210109	—
11/32	1/2	2.3/8	1/4	7/8	19/64	4	3/32	1/8	9/32	1	—	6210140 [1]
3/8	1/2	2.3/8	1/4	7/8	5/16	4	3/32	3/16	5/16	1	—	6210141 [2]
3/8	3/4	3.13/16	5/16	3.1/16	5/16	3	3/32	3/16	5/16	1	6210111	—
13/32	1/2	2.13/16	1/4	7/8	5/16	4	1/8	3/16	11/32	1	—	6210142 [2]
7/16	1/2	2.13/16	1/4	7/8	5/16	4	1/8	3/16	3/8	1	—	6210143 [2]
7/16	3/4	3.13/16	3/8	3.1/16	3/8	3	1/8	3/16	3/8	1	6210113	—
15/32	1/2	2.13/16	1/4	7/8	5/16	4	1/8	1/4	13/32	1	—	6210144 [2]
1/2	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	7/16	1	—	6210145 [2]
1/2	3/4	3.13/16	7/16	3.1/16	7/16	3	1/8	1/4	7/16	1	6210115	—
17/32	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	15/32	1	—	6210146 [2]
17/32	3/4	5.3/8	1/2	4.5/8	1/2	3	1/8	1/4	15/32	1	6210116	—
9/16	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	1/2	1	—	6210147 [2]
9/16	3/4	5.3/8	1/2	4.5/8	1/2	3	1/8	1/4	1/2	1	6210117	—
19/32	3/4	5.3/8	1/2	4.3/16	9/16	3	1/8	1/4	17/32	1	6210118	—
5/8	3/4	5.3/8	1/2	4.3/16	9/16	3	1/8	1/4	9/16	1	6210119	—
11/16	1/2	2.13/16	1/4	7/8	1/2	4	1/8	1/4	5/8	1	—	6210151 [3]
21/32	1.1/4	5.3/8	1/2	3.5/8	9/16	3	3/16	1/4	19/32	1	6210120	—
11/16	1.1/4	5.3/8	1/2	3.5/8	5/8	3	3/16	1/4	5/8	1	6210121	—
3/4	1.1/4	5.3/8	1/2	3.5/8	11/16	3	3/16	5/16	11/16	1	6210123	—

[1] 1/32 Corner Radius
[2] 3/64 Corner Radius
[3] 0.0550” Corner Radius

UNION BUTTERFIELD

HSS COUNTERBORE

d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	l_3 Inch	d_3 Ø Inch	# of Flutes	Pilot Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4705	4706	
3/4	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	11/16	1	—	6210153	3)
25/32	1.1/4	5.3/8	1/2	3.5/8	11/16	3	3/16	5/16	23/32	1	6210124	—	
13/16	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	3/4	1	6210125	—	
13/16	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	3/4	1	—	6210155	3)
7/8	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	13/16	1	6210126	—	
7/8	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	13/16	1	—	6210157	3)
15/16	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	7/8	1	6210127	—	
1“	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	3/8	15/16	1	6210128	—	
1“	1/2	2.13/16	1/4	7/8	1/2	4	3/16	3/8	15/16	1	—	6210161	3)

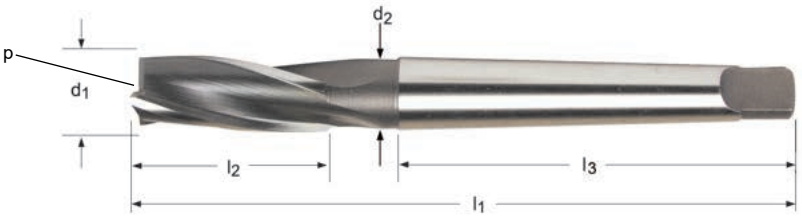
[1] 1/32 Corner Radius
[2] 3/64 Corner Radius
[3] 0.0550” Corner Radius

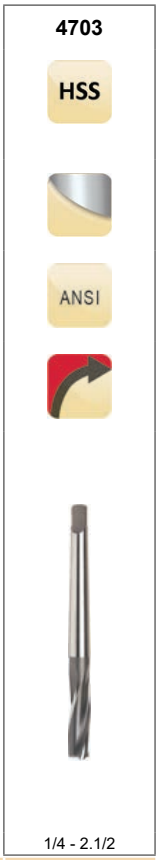
HSS COUNTERBORE

UNION BUTTERFIELD

Counterbore Body, Taper Shank, Short Series - Interchangeable Pilot Type

4703 Short counterbore body, with taper shank for use with detachable pilots which align counterbore to existing drilled hole. 3 & 5 Flute designs for less chatter.





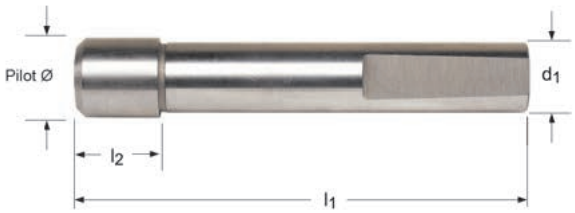
d_1 Ø Inch	l_2 Inch	l_1 Inch	MTS	d_2 Neck Dia. Inch	l_3 Shank Length Inch	# of Flutes	pilot (p) mounting Ø Inch	pilot Ø min	pilot Ø max	Pack Qty	4703
5/16	3/4	3.13/16	1	19/64	2.9/16	3	3/32	1/8	1/4	1	6210068 *
1/2	1.1/4	4.5/16	1	29/64	2.9/16	3	3/16	1/4	7/16	1	6210074
9/16	1.1/4	4.5/16	1	29/64	2.9/16	3	3/16	1/4	1/2	1	6210076 *
11/16	1.1/4	5.1/8	2	5/8	3.1/8	3	3/16	1/4	5/8	1	6210080
3/4	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	11/16	1	6210082
13/16	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	3/4	1	6210084
7/8	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	13/16	1	6210085
15/16	1.1/2	6.1/8	2	7/8	3.7/8	3	1/4	5/16	7/8	1	6210086
1“	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	15/16	1	6210087
1.1/16	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1“	1	6210088
1.1/8	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1.1/16	1	6210089
1.3/16	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1.1/8	1	6210090
1.1/4	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.3/16	1	6210091
1.5/16	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.1/4	1	6210092 *
1.3/8	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.5/16	1	6210093
1.1/2	2“	7.7/8	4	1.3/16	4.7/8	5	3/8	7/16	1.7/16	1	6210094
1.5/8	2.1/4	8.1/8	4	1.3/8	4.7/8	5	7/16	1/2	1.9/16	1	6210095
1.3/4	2.1/4	8.1/8	4	1.3/8	4.7/8	5	7/16	1/2	1.11/16	1	6210096 *
2“	2.1/2	8.3/8	4	1.1/2	4.7/8	5	1/2	9/16	1.5/16	1	6210098
2.1/8	2.1/2	9.7/8	5	1.3/4	6.1/8	5	1/2	9/16	2.1/16	1	6210099
2.1/4	2.1/2	9.7/8	5	1.3/4	6.1/8	5	1/2	9/16	2.3/16	1	6210100 *

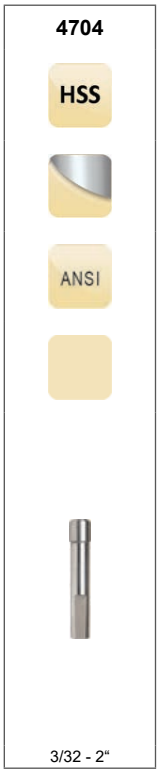
* Starred items are outgoing products and are available only while supplies last.

HSS COUNTERBORE

Counterbore Pilot, Detachable

4704 Interchangeable detachable pilots for use with counterbore bodies. Pilot shank diameters must match counterbore body “pilot diameter” for proper match.





pilot Ø Inch	d_1 Ø Inch	l_2 Inch	l_1 Inch	Pack Qty	4704
1/8	3/32	1/8	1.1/4	1	3210114
5/32	3/32	3/16	1.5/16	1	3210115
3/16	3/32	3/16	1.5/16	1	3210116
7/32	3/32	1/4	1.3/8	1	3210117
1/4	3/32	1/4	1.3/8	1	3210118
1/8	1/8	1/8	1.7/16	1	3210249
5/32	1/8	3/16	1.1/2	1	3210251
3/16	1/8	3/16	1.1/2	1	3210255
7/32	1/8	1/4	1.9/16	1	3210258
1/4	1/8	1/4	1.9/16	1	3210259
9/32	1/8	5/16	1.5/8	1	3210261
5/16	1/8	5/16	1.5/8	1	3210262
3/8	1/8	3/8	1.11/16	1	3210263
7/16	1/8	7/16	1.3/4	1	3210264
1/2	1/8	1/2	1.13/16	1	3210265
3/16	5/32	3/16	1.9/16	1	3210119
7/32	5/32	1/4	1.5/8	1	3210120
1/4	5/32	1/4	1.5/8	1	3210121
9/32	5/32	5/16	1.11/16	1	3210122
5/16	5/32	5/16	1.11/16	1	3210123
3/8	5/32	3/8	1.3/4	1	3210124
3/16	3/16	1/4	1.7/8	1	3210281
7/32	3/16	1/4	1.7/8	1	3210284
1/4	3/16	1/4	1.7/8	1	3210125
9/32	3/16	5/16	1.15/16	1	3210287
5/16	3/16	5/16	1.15/16	1	3210126
11/32	3/16	3/8	2“	1	3210444
3/8	3/16	3/8	2“	1	3210127
13/32	3/16	7/16	2.1/16	1	3210445
7/16	3/16	7/16	2.1/16	1	3210128
15/32	3/16	1/2	2.1/8	1	3210446
1/2	3/16	1/2	2.1/8	1	3210129
9/16	3/16	9/16	2.3/16	1	3210130
5/8	3/16	9/16	2.3/16	1	3210131
13/16	3/16	13/16	2.7/16	1	3210296

HSS COUNTERBORE

UNION BUTTERFIELD

pilot Ø Inch	d_1 Ø Inch	l_2 Inch	l_1 Inch	Pack Qty	4704
7/8	3/16	7/8	2.1/2	1	3210297
1/4	1/4	1/4	1.11/16	1	3210300
9/32	1/4	5/16	1.3/4	1	3210302
5/16	1/4	5/16	1.3/4	1	3210132
3/8	1/4	3/8	1.13/16	1	3210133
7/16	1/4	7/16	1.7/8	1	3210134
1/2	1/4	1/2	1.15/16	1	3210135
17/32	1/4	9/16	2“	1	3210447
9/16	1/4	9/16	2“	1	3210136
5/8	1/4	5/8	2.1/16	1	3210137
11/16	1/4	11/16	2.1/8	1	3210138
3/4	1/4	3/4	2.3/16	1	3210139
13/16	1/4	7/8	2.5/16	1	3210140
1“	1/4	1“	2.7/16	1	3210314
3/8	5/16	3/8	2“	1	3210142
7/16	5/16	7/16	2.1/16	1	3210143
1/2	5/16	1/2	2.1/8	1	3210144
9/16	5/16	9/16	2.3/16	1	3210145
5/8	5/16	5/8	2.1/4	1	3210146
11/16	5/16	11/16	2.5/16	1	3210147
3/4	5/16	3/4	2.3/8	1	3210148
13/16	5/16	7/8	2.1/2	1	3210149
15/16	5/16	1“	2.5/8	1	3210151
1“	5/16	1“	2.5/8	1	3210152
7/16	3/8	7/16	2.5/16	1	3210155
1/2	3/8	1/2	2.3/8	1	3210156
9/16	3/8	9/16	2.7/16	1	3210157
5/8	3/8	5/8	2.1/2	1	3210158
11/16	3/8	11/16	2.9/16	1	3210159
3/4	3/8	3/4	2.5/8	1	3210160
13/16	3/8	7/8	2.3/4	1	3210161
7/8	3/8	7/8	2.3/4	1	3210162
15/16	3/8	1“	2.5/8	1	3210163
9/16	7/16	5/8	2.7/8	1	3210173
11/16	7/16	3/4	3“	1	3210175
3/4	7/16	3/4	3“	1	3210176
13/16	7/16	7/8	3.1/8	1	3210177
7/8	7/16	7/8	3.1/8	1	3210178
15/16	7/16	1“	3.1/4	1	3210179
1“	7/16	1“	3.1/4	1	3210180
9/16	1/2	5/8	3.1/8	1	3210195
1“	1/2	1“	3.1/2	1	3210202
1.1/2	1/2	1.1/2	4“	1	3210210

List Number Index - Miscellaneous

Pgs. 515-519

411 518
430.....518
K520 519
K521 519
1800 516
1815 516
1816 516
1900 517

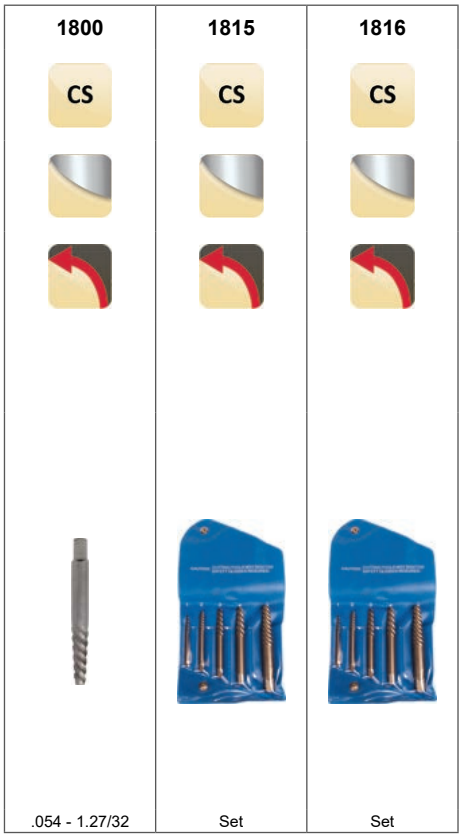
UNION BUTTERFIELD

SCREW EXTRACTOR

1800 Screw Extractor

1815 Screw Extractor Set, 5 piece

1816 Screw Extractor Set, 6 piece



Nr.	d_1 Ø Inch	Sizes in Set	d_2 Ø Inch	Pieces per Set	l_1 Inch	Capacity For Screws & Bolts	Capacity For Pipe Sizes	Pack Qty	1800	1815set	1816set
801	0.0540		5/32		2“	3/16 - 1/4		12	3210001	—	—
802	0.0860		3/16		2.3/8	1/4 - 5/16		12	3210002	—	—
803	1/8		1/4		2.3/4	5/16 - 7/16		12	3210003	—	—
804	11/64		5/16		3“	7/16 - 9/16		6	3210004	—	—
805	1/4		7/16		3.3/8	9/16 - 3/4	1/8 - 1/4	6	3210005	—	—
806	3/8		5/8		3.3/4	3/4 - 1“	3/8	1	3210006	—	—
807	31/64		3/4		4.1/8	1 - 1.3/8	1/2	1	3210007	—	—
808	47/64		1“		4.3/8	1.3/8 - 1.3/4	3/4	1	3210008	—	—
809	31/32		1.1/4		4.5/8	1.3/4 - 2.1/8	1	1	3210009	—	—
810	1.7/32		1.17/32		5“	2.1/8 - 2.1/2	1.1/4	1	3210010	—	—
811	1.15/32		1.27/32		5.5/8	2.1/2 - 3	1.1/2	1	3210011	—	—
812	1.27/32		2.9/32		6.1/4	3 - 3.1/2	2	1	3210012	—	—
1815		801 - 805		5		3/16 - 3/4	1/8 - 1/4	1	—	3210013	—
1816		801 - 806		6		3/16 - 1	1/8 - 3/8	1	—	—	3210014

DRILLING & TAPPING FLUID

1900

Drilling & Tapping Fluid - A heavy oil for drilling & tapping all ferrous and non-ferrous materials. Increases productivity and extends tool life. Environmentally safe.

Wax Stick - Multi-purpose wax that sticks to the tool and effectively removes heat while adding lubrication. Withstands trememdous pressure. Can be used in lieu of drilling/tapping fluids and cutting oils.

Foam - Heavy duty aerosol foam coats the tools as it foams on contact. Will not contaminate existing coolant.

Light Tapping Fluid - A light viscosity heavy duty drilling & tapping fluid for reducing torque. Ideal for use with a re-circulation system. Can be added to existing cutting oils to increase lubricity. Will not contaminate existing coolant as it will float to the surface for easy skimming.

Sizes	Style	Description	Pack Qty	1900
1/2 oz	Trial Size	Drilling & Tapping Fluid	1	1910512
4 oz	Squirt Bottle	Drilling & Tapping Fluid	24	1910501
16 oz	Squirt Bottle	Drilling & Tapping Fluid	12	1910502
1 gal	Bottle	Drilling & Tapping Fluid	4	1910503
5 gal	Dispenser	Drilling & Tapping Fluid	1	1910506
5 gal	Pail	Drilling & Tapping Fluid	1	1910504
55 gal	Drum	Drilling & Tapping Fluid	1	1910505
1 lb	Stick	Wax	24	1950501
20 oz	Aerosal Can	Foam	12	1910509
1 gal	Bottle	Light Drilling & Tapping Fluid	4	1930503
16 oz	Squirt Bottle	Light Drilling & Tapping Fluid	12	1930502
16 oz	Squirt Bottle	Light Tapping Fluid (single)	1	46437347
16 oz	Squirt Bottle	Drilling & Tapping Fluid (single)	1	46437348
20 oz	Aerosal Can	Foam (single)	1	46437349
1 lb	Stick	Wax (single)	1	46437430

SLEEVES & KEYS

411 Taper shank (internal and external) adapters. Heat treated and externally ground. Steam oxide surface finish prevents corosion.

430 Drill Drift. Dropped forged steel keys used for removing taper shank tools from adapting sleeves and machine spindles.

MTS #1 - #5

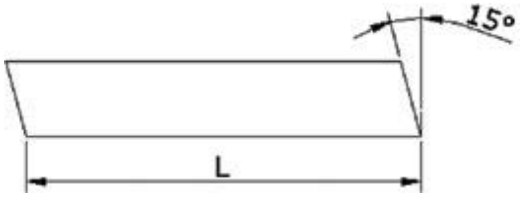
MTS #1 - #5

430 MTS #	411 Inside Taper	411 Outside Taper	Length	Pack Qty	411	430
1			4.1/2	1	—	3210338
2			5.1/2	1	—	3210339
3			7	1	—	3210340
4			8	1	—	3210341
5			9.7/8	1	—	3210342
	1	2	3.1/2	1	3210046	—
	1	3	3.15/16	1	3210047	—
	1	4	4.13/16	1	3210048	—
	2	3	4.3/8	1	3210050	—
	2	4	4.13/16	1	3210051	—
	3	4	5.5/16	1	3210053	—
	3	5	6.1/16	1	3210054	—
	4	5	6.1/2	1	3210055	—
	5	6	8.1/2	1	3210057	—

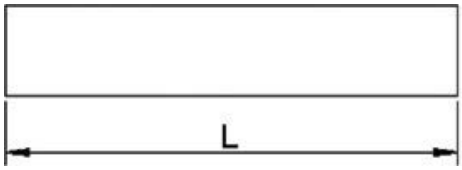
DORMER

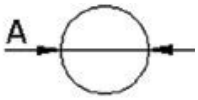
TOOL BIT BLANKS

K520 Cobalt ground blank with 15º beveled ends



K521 Cobalt round blank





Sizes	Overall Length	K520
4	100	0160732
5	160	0160749
6	100	0110478
6	160	0110485
6	200	0110492
8	100	0110546
8	160	0110553
8	200	0110560
10	100	0110171
10	160	0110195
10	200	0110201
12	100	0110225
12	160	0110249
12	200	0110256
14	160	0110294
14	200	0110300
16	100	0110317
16	160	0110324
16	200	0110331
20	160	0110379
20	200	0110386
25	200	0110409
3/16	2.1/2	0254721
1/4	2.1/2	0254684
1/4	4“	0197943
5/16	2.1/2	0254790
5/16	3“	0254806
5/16	4“	0197950
3/8	3“	0254769
3/8	4“	0197967
3/8	6“	0254776
7/16	3.1/2	0340691
1/2	4“	0197974
1/2	6“	0197981
5/8	4.1/2	0197998
5/8	6“	0254820

Sizes	Overall Length	K521
4	100	0110799
6	160	0110805
8	100	0164884
8	200	0110843
10	100	0110850
10	200	0110881
12	100	0110904
12	160	0110911
12	200	0110607
14	200	0110638
15	100	0110645
16	160	0110669
18	160	0164914
1/4	4”	0110720
1/2	6”	0110782

Technical Section - Icon Descriptions

Material

Carbide

High Speed Steel

High Speed Cobalt

High Speed Powder Metallurgy Steel

High Speed Cobalt Powder Metallurgy Steel

High Speed Steel and Carbide

Chromium Steel

Coating

Bright

Steam Tempered

Nitride

Nitride/ Steam Tempered

Bronze

Titanium Aluminium Nitride

Titanium Carbo-Nitride

Titanium Nitride

Bright/ Steam Tempered

Bright/ Titanium Nitride

Steam Tempered/ Bronze

Titanium Aluminium Nitride - Top

Titanium Nitride - Top

Ti-phon (TiAlCrSiN)

Purple / Bronze (Dual oxide surface treatment)

Alcrona Top (AlCrN - Top)

Aluminium Titanium Carbo-Nitride

Aluminium Titanium Nitride

Zirconium Coating

Technical Section - Icon Descriptions

Common Icons

Direction

Right hand rotation

Left hand rotation

Depth

Drilling icons

Point Angle

Countersink [0]

60º Countersink

82º Countersink

90º Countersink

Form

Normal Helix

Quick Helix

Continuously Thinned Web

Coolant

Internal Coolant

Technical Section - Icon Descriptions

Drilling icons

Shank

Straight Shank

Morse taper shank

DIN 6535 HA
(cylindrical)

DIN 6535 HE

Reduced shank

Threaded Hex Shank

DIN 6535 HB / HE

DIN 6535 HB
(Weldon Shank)

Manufacturing Standards

Technical Section - Icon Descriptions

Reaming - Countersink Icons

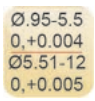
Taper Gradient

Imperial Standard Taper

Metric Standard Taper

Tolerance

Industry standard hole tolerance



Specific Reamer Tolerance

ISO Tolerance for shafts

Application

Countersink

Counterbore

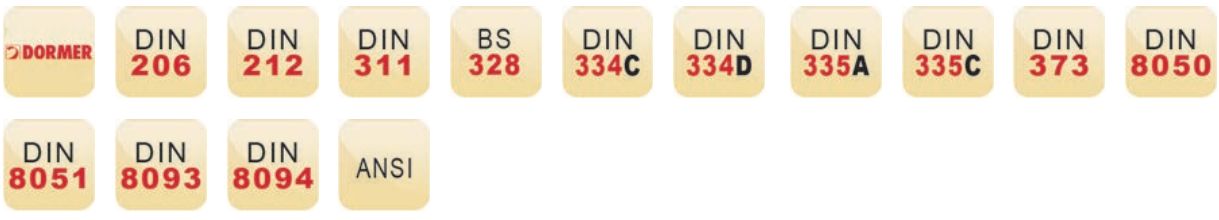
Countersink [0]

Shank

Straight

Morse taper

Manufacturing Standards



Technical Section - Icon Descriptions

Threading icons

Thread form

Metric coarse

Metric fine

Unified Coarse

Unified Fine

Unified Special

British standard pipe fastening - G series

National taper pipe

National taper pipe dryseal

National straight pipe dryseal

National straight pipe mechanical

ISO Metric Coarse to DIN8140-2

British standard pipe taper - Rc Series

Flute Geometry

Straight Flute

Spiral Point

Fluteless - thread forming

15º Helix

17º Helix

27º Helix

30º Helix

40º Helix

45º Helix

50º Helix

52º Helix

Straight Flute (hand tap)

Hole Type

Through hole

Blind hole

Through or blind hole

Technical Section - Icon Descriptions

Threading icons

Chamfer

Plug chamfer

Semi-bottoming

Full-bottoming

Semi-bottoming

Plug

Taper

Tolerance

Common Class of fit

Multiple Classes of fit

Closer class of fit for accuracy

Common metric class of fit

Class of fit outside Std. for high strength or abrasive materials

Normal

Standards

Technical Section - Icon Descriptions

Milling icons

Type

For steels with low to high resistance

For soft and malleable materials

Application

Slotting P9 tolerance

Slotting

Finishing (side cutting)

Roughing

Ball nose

Corner radius inside

Corner rounding outside

Direction

Slotting, ramping, plunging

Slotting, ramping

Finishing (side cutting)

Cut Length

Extra short

Short

Medium

Long

Extra long

Technical Section - Icon Descriptions

Milling icons

Diameter tolerance

Industry standard shaft tolerances

Helix Angle

Unequal Helix

# of teeth or flutes

Shank

Straight Shank

Weldon Shank

ToolMaterials

High Speed Steel

HSS

A medium-alloyed high speed steel that has good machinability and good performance. HSS exhibits hardness, toughness and wear resistance characteristics that make it attractive in a wide range of applications, for example in drills and taps.

Cobalt High Speed Steel

HSS-E

This high speed steel contains cobalt for increased hot hardness. The composition of HSCo is a good combination of toughness and hardness. It has good machinability and good wear resistance, which makes it usable for drills, taps, milling cutters and reamers.

Non Cobalt Powder Metallurgy Steel

HSS PM

Has a finer and more consistent grain structure than HSCo resulting in a tougher product. Tool life and wear resistance is normally higher than HSCo and this grade has superior edge strength and rigidity. Mainly used for milling cutters and taps.

Sintered Cobalt High Speed Steel

HSS-E PM

HSCo-XP is a Cobalt high speed steel which has been produced using powder metallurgy technology. High speed steel produced by this method exhibits superior toughness and grindability. Taps and milling cutters find particular advantage when manufactured from XP grade steel.

Chromium Steel

CS

Chromium steel is a tool steel in which the principal alloying element is Chromium. It is used only for the manufacture of taps and dies. This steel has lower hot hardness properties in comparison with high speed steels. Suited for hand tap applications.

	Grade	Hardness (HV10)	C %	W %	Mo %	Cr %	V %	Co %	Tool Material
HSS	M2	810-850	0.9	6.4	5.0	4.2	1.8	-	HSS
HSS-E	M35	830-870	0.93	6.4	5.0	4.2	1.8	4.8	HSCO
	M42	870-960	1.08	1.5	9.4	3.9	1.2	8.0	
HSS PM	-	830-870	0.9	6.25	5.0	4.2	1.9	-	HSS Powder Metal
HSS-E PM	ASP 2017	860-900	0.8	3.0	3.0	4.0	1.0	8.0	HSCO Powder Metal
	ASP 2030	870-910	1.28	6.4	5.0	4.2	3.1	8.5	
	ASP 2052	870-910	1.6	10.5	2.0	4.8	5.0	8.0	
CS	-	775-825	1.03	-	-	1.5	-	-	Chromium Steel

Carbide Materials

Carbide Materials (or Hard Materials)

HM

A sintered powder metallurgy steel, consisting of a metallic carbide composite with binder metal. The most central raw material is tungsten carbide (WC). Tungsten carbide contributes to the hardness of the material. Tantalum carbide (TaC), titanium carbide (TiC) and niobium carbide (NbC) complements WC and adjusts the properties to what is desired. These three materials are called cubic carbides. Cobalt (Co) acts as a binder and keeps the material together.

Carbide materials are often characterised by high compression strength, high hardness and therefore high wear resistance, but also by limited flexural strength and toughness. Carbide is used in taps, reamers, milling cutters, drills and thread milling cutters.

Properties	HSS materials	Carbide materials	K10/30F (often used for solid tools)
Hardness (HV30)	800-950	1300-1800	1600
Density (g/cm^3)	8.0-9.0	7.2-15	14.45
Compressive strength (N/mm^2)	3000-4000	3000-8000	6250
Flexural strength, (bending) (N/mm^2)	2500-4000	1000-4700	4300
Heat resistance (°C)	550	1000	900
E-module (KN/mm^2)	260-300	460-630	580
Grain size (μm)	-	0.2-10	0.8

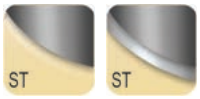
The combination of hard particle (WC) and binder metal (Co) give the following changes in characteristics.

Characteristic	Higher WC content give	Higher Co content give
Hardness	Higher hardness	Lower hardness
Compressive strength (CS)	Higher CS	Lower CS
Bending strength (BS)	Lower BS	Higher BS

Grain size also influences the material properties. Small grain sizes means higher hardness and coarse grains give more toughness.

Technical Section - General

Surface Treatments



Steam Tempering
Steam tempering gives a strongly adhering blue oxide surface that acts to retain cutting fluid and prevent chip to tool welding, thereby counteracting the formation of a built-up edge. Steam tempering can be applied to any bright tool but is most effective on drills and taps.

Bronze Finish
The bronze finish is a thin oxide layer formed on the tool surface and it is applied principally to Cobalt and Vanadium high speed steels.

Nitriding (FeN)
Nitriding is a process that is used to increase the hardness and wear resistance of the surface of a tool. It is particularly suitable for taps that are used on abrasive materials such as cast iron, bakelite, etc. Nitriding is used on twist drills when it is desirable to increase the strength and wear resistance of the cylindrical lands.

Surface Coatings

Titanium Nitride Coating (TiN)
Titanium Nitride is a gold colored ceramic coating applied by physical vapour deposition (PVD). High hardness combined with low friction properties ensures considerably longer tool life, or alternatively, better cutting performance from tools which have not been coated. TiN coating is used mainly for drills and taps.

Titanium Carbon Nitride Coating (TiCN)
Titanium Carbon Nitride is a ceramic coating applied by PVD coating technology. TiCN is harder than TiN and has a lower coefficient of friction. Its hardness and toughness in combination with good wear resistance ensures that it finds its principal application in the field of milling to enhance the performance of milling cutters.

Titanium Aluminum Nitride Coating (TiAlN)
Titanium Aluminium Nitride is a multi layer ceramic coating applied by PVD coating technology, which exhibits high toughness and oxidation stability. These properties make it ideal for higher speeds and feeds, whilst at the same time improving tool life TiAlN is suitable for drilling and tapping. It is recommended to use TiAlN when machining dry.

Technical Section - General

Chromium Nitride Coating (CrN)
CrN is an excellent coating for aluminum alloys, copper alloys and low alloyed steel materials. CrN can also be used as an alternative on Titanium and Nickel alloys. This coating has a low tendency for built-up edges.

Alcrona Top (AlCrN Top)
Alcrona Top is an aluminum chromium nitride coating mostly used for milling cutters. The coatings hot hardness and high oxidation resistance are two unique properties. When machining applications involving heavy mechanical and thermal stresses, these properties translate into supreme wear resistance.

Hardlube (TiAlN/WC/C)
Super B is a Titanium Aluminum Nitride + Tungsten Carbide + Carbon Coating used for wet and minimal lubrication machining in drilling, milling and tapping applications. Very effective for cast iron, hardened steels and heat resistant super alloys.

Surface treatment / Coating properties

Surface Treaments	Color	Coating material	Hardness (HV)	Thick-ness (µm)	Coating structure	Frict. coeff. against steel	Max. appl. temp. (°C)
	Dark grey	Fe 304	400	Max. 5	Conversion into the surface	–	550
	Bronze	Fe 304	400	Max. 5	Conversion into the surface	–	550
	Grey	FeN	1300	20	Diffusion zone	–	550
	Gold	TiN	2300	1-4	Mono-layer	0.4	600
	Blue grey	TiCN	3000	1-4	Multi-layer gradient	0.4	500
	Black grey	TiAlN	3300	3	Nano structured	0.3-0.35	900
	Silver grey	CrN	1750	3-4	Mono-layer	0.5	700
	Blue grey	AlCrN Top	3200		Mono-layer	0.35	1100
	Black	TiAlN+ WC/C	3000	2-6	Multi-layer lamellar	0.2	800

Decimal Equivalents

Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent
80	.0135	**1/16**	**.0625**	3.3 mm	.1299	5.4 mm	.2126	O	.3160	13.50 mm	.5315
0.35 mm	.0138	1.6 mm	.0630	3.4 mm	.1339	3	.2130	8.1 mm	.3189	**35/64**	**.5469**
79	.0145	52	.0635	29	.1360	5.5 mm	.2165	8.2 mm	.3228	14.00 mm	.5512
1/64	**.0156**	1.65 mm	.0650	3.5 mm	.1378	**7/32**	**.2188**	P	.3230	**9/16**	**.5625**
.4 mm	.0157	1.7 mm	.0669	28	.1405	5.6 mm	.2205	8.25 mm	.3248	14.50 mm	.5709
78	.0160	51	.0670	**9/64**	**.1406**	2	.2210	8.3 mm	.3268	**37/64**	**.5781**
.45 mm	.0177	1.75 mm	.0689	3.6 mm	.1417	5.7 mm	.2244	**21/64**	**.3281**	15.00 mm	.5906
77	.0180	50	.0700	27	.1440	5.75 mm	.2264	8.4 mm	.3307	**19/32**	**.5938**
.5 mm	.0197	1.8 mm	.0709	3.7 mm	.1457	1	.2280	Q	.3320	**39/64**	**.6094**
76	.0200	1.85 mm	.0728	26	.1470	5.8 mm	.2283	8.5 mm	.3346	15.50 mm	.6102
75	.0210	49	.0730	3.75 mm	.1476	5.9 mm	.2323	8.6 mm	.3386	**5/8**	**.6250**
.55 mm	.0217	1.9 mm	.0748	25	.1495	A	.2340	R	.3390	16.00 mm	.6299
74	.0225	48	.0760	3.8 mm	.1496	**15/64**	**.2344**	8.7 mm	.3425	**41/64**	**.6406**
.6 mm	.0236	1.95 mm	.0768	24	.1520	6 mm	.2362	**11/32**	**.3438**	16.50 mm	.6496
73	.0240	**5/64**	**.0781**	3.9 mm	.1535	B	.2380	8.75 mm	.3445	**21/32**	**.6562**
72	.0250	47	.0785	23	.1540	6.1 mm	.2402	8.8 mm	.3465	17.00 mm	.6693
.65 mm	.0256	2 mm	.0787	**5/32**	**.1562**	C	.2420	S	.3480	**43/64**	**.6719**
71	.0260	2.05 mm	.0807	22	.1570	6.2 mm	.2441	8.90 mm	.3504	**11/16**	**.6875**
.7 mm	.0276	46	.0810	4 mm	.1575	D	.2460	9.00 mm	.3543	17.50 mm	.6890
70	.0280	45	.0820	21	.1590	6.25 mm	.2461	T	.3580	**45/64**	**.7031**
69	.0292	2.1 mm	.0827	20	.1610	6.3 mm	.2480	9.10 mm	.3583	18.00 mm	.7087
.75 mm	.0295	2.15 mm	.0846	4.1 mm	.1614	E	.2500	**23/64**	**.3594**	**23/32**	**.7188**
68	.0310	44	.0860	4.2 mm	.1654	**1/4**	**.2500**	9.20 mm	.3622	18.50 mm	.7283
1/32	**.0312**	2.2 mm	.0866	19	.1660	6.4 mm	.2520	9.25 mm	.3642	**47/64**	**.7344**
.8 mm	.0315	2.25 mm	.0886	4.25 mm	.1673	6.5 mm	.2559	9.30 mm	.3661	19.00 mm	.7480
67	.0320	43	.0890	4.3 mm	.1693	F	.2570	U	.3680	**3/4**	**.7500**
66	.0330	2.3 mm	.0906	18	.1695	6.6 mm	.2598	9.40 mm	.3701	**49/64**	**.7656**
.85 mm	.0335	2.35 mm	.0925	**11/64**	**.1719**	G	.2610	9.50 mm	.3740	19.50 mm	.7677
65	.0350	42	.0935	17	.1730	6.7 mm	.2638	**3/8**	**.3750**	**25/32**	**.7812**
.9 mm	.0354	**3/32**	**.0938**	4.4 mm	.1732	**17/64**	**.2656**	V	.3770	20.00 mm	.7874
64	.0360	2.4 mm	.0945	16	.1770	6.75 mm	.2657	9.60 mm	.3780	**51/64**	**.7969**
63	.0370	41	.0960	4.5 mm	.1772	H	.2660	9.70 mm	.3819	20.50 mm	.8071
.95 mm	.0374	2.45 mm	.0965	15	.1800	6.8 mm	.2677	9.75 mm	.3839	**13/16**	**.8125**
62	.0380	40	.0980	4.6 mm	.1811	6.9 mm	.2717	9.80 mm	.3858	21.00 mm	.8268
61	.0390	2.5 mm	.0984	14	.1820	I	.2720	W	.3860	**53/64**	**.8281**
1 mm	.0394	39	.0995	13	.1850	7 mm	.2756	9.90 mm	.3898	**27/32**	**.8438**
60	.0400	38	.1015	4.7 mm	.1850	J	.2770	**25/64**	**.3906**	21.50 mm	.8465
59	.0410	2.60 mm	.1024	4.75 mm	.1870	7.1 mm	.2795	10.00 mm	.3937	**55/64**	**.8594**
1.05 mm	.0413	37	.1040	**3/16**	**.1875**	K	.2810	X	.3970	22.00 mm	.8661
58	.0420	2.7 mm	.1063	4.8 mm	.1890	**9/32**	**.2812**	Y	.4040	**7/8**	**.8750**
57	.0430	36	.1065	12	.1890	7.2 mm	.2835	**13/32**	**.4062**	22.50 mm	.8858
1.1 mm	.0433	2.75 mm	.1083	11	.1910	7.25 mm	.2854	Z	.4130	**57/64**	**.8906**
1.15 mm	.0453	**7/64**	**.1094**	4.9 mm	.1929	7.3 mm	.2874	10.50 mm	.4134	23.00 mm	.9055
56	.0465	35	.1100	10	.1935	L	.2900	**27/64**	**.4219**	**29/32**	**.9062**
3/64	**.0469**	2.8 mm	.1102	9	.1960	7.4 mm	.2913	11.00 mm	.4331	**59/64**	**.9219**
1.2 mm	.0472	34	.1110	5 mm	.1969	M	.2950	**7/16**	**.4375**	23.50 mm	.9252
1.25 mm	.0492	33	.1130	8	.1990	7.5 mm	.2953	11.50 mm	.4528	**15/16**	**.9375**
1.3 mm	.0512	2.9 mm	.1142	5.1 mm	.2008	**19/64**	**.2969**	**29/64**	**.4531**	24.00 mm	.9449
55	.0520	32	.1160	7	.2010	7.6 mm	.2992	**15/32**	**.4688**	**61/64**	**.9531**
1.35 mm	.0531	3 mm	.1181	**13/64**	**.2031**	N	.3020	12.00 mm	.4724	24.50 mm	.9646
54	.0550	31	.1200	6	.2040	7.7 mm	.3031	**31/64**	**.4844**	**31/32**	**.9688**
1.4 mm	.0551	3.1 mm	.1220	5.2 mm	.2047	7.75 mm	.3051	12.50 mm	.4921	25.00 mm	.9843
1.45 mm	.0571	**1/8**	**.1250**	5	.2055	7.8 mm	.3071	**1/2**	**.5000**	**63/64**	**.9844**
1.5 mm	.0591	3.2 mm	.1260	5.25 mm	.2067	7.9 mm	.3110	13.00 mm	.5118	**1.0000**	**1.0000**
53	.0595	3.25 mm	.1280	5.3 mm	.2087	**5/16**	**.3125**	**33/64**	**.5156**		
1.55 mm	.0610	30	.1285	4	.2090	8 mm	.3150	**17/32**	**.5312**		

Hardness Conversion Table

Rockwell Hardness			Brinell	Tensile Strength
C	B	A	Hardness	(Lbs./Sq.In.)
70	—	86.5	780	—
69	—	86.0	762	—
68	—	85.5	745	—
67	—	85.0	728	—
66	—	84.5	712	—
65	—	84.0	697	—
64	—	83.5	682	—
63	—	83.0	668	—
62	—	82.5	653	—
61	—	82.0	640	—
60	—	81.0	627	314,000
59	—	80.5	614	307,000
58	—	80.0	601	299,000
57	—	79.5	578	291,000
56	—	79.0	567	284,000
55	—	78.5	555	277,000
54	—	78.0	545	270,000
53	—	77.5	534	263,000
52	—	77.0	514	256,000
51	—	76.5	505	250,000
50	—	76.0	495	243,000
49	—	75.5	477	236,000
48	—	75.0	469	230,000
47	—	74.0	461	223,000
46	115	73.5	444	217,000
45	115	73.0	429	211,000
44	114	72.5	415	205,000
43	114	72.0	408	200,000
42	113	71.5	401	195,000
41	112	71.0	388	188,000
40	112	70.5	375	182,000
39	111	70.0	369	176,000

Rockwell Hardness			Brinell	Tensile Strength
C	B	A	Hardness	(Lbs./Sq.In.)
38	110	69.5	363	171,000
37	110	69.0	352	167,000
36	109	68.5	341	162,000
35	109	68.0	331	158,000
34	108	67.5	321	153,000
33	108	67.0	311	148,000
32	107	66.5	302	144,000
31	106	66.0	293	140,000
30	105	65.5	285	136,000
29	104	65.0	277	133,000
28	104	64.5	269	131,000
27	103	64.0	265	130,000
26	103	63.5	262	128,000
25	102	63.0	255	125,000
24	102	62.5	248	122,000
23	101	62.0	241	119,000
22	100	61.5	235	116,000
21	99	61.0	229	113,000
20	98	60.0	223	110,000
19	97	59.5	220	108,000
18	97	59.0	217	107,000
17	96	58.0	212	104,000
16	96	57.5	207	101,000
15	95	57.0	202	99,000
14	94	56.5	200	98,000
13	93	56.0	197	97,000
12	92	55.5	192	95,000
11	92	55.0	189	94,000
10	91	54.0	187	93,000
9	90	53.5	183	91,000
8	89	53.0	179	89,000
7	88	52.5	174	87,000

Lubricants

Lubricants or coolants are used on cutting tools to reduce friction or to reduce heat.

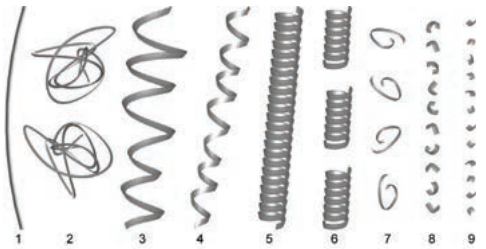
Type of Lubricant	Description	Advantages	Disadvantages
Emulsion	Emulsions or water-soluble cutting oils give lubrication properties combined with good cooling property. The oil concentrate in emulsion contains additives that give different properties like lubricators, preservatives and EP additives to improve bearing strength.	Reduces heat. Flushes away chips.	Disposal cost. Environment
Minimal lubrication	Minimal lubrication is a small amount of oil distributed with compressed air to lubricate the cutting or forming process.	Low cost. Good	Bad chip removal. Requires good set up of nozzle positioning
Oil	Cutting oils have good lubrication properties but do not provide such good cooling as water-based cutting fluids.	Good	High cost. Environment.
Dry / compressed air	Compressed air directed to the cutting process.	Clean process. Remove Chips. Low cost.	Works in a limited no. of applications.

Types Of Chips

Chip formation is mostly caused by plastic deformation. This process, due to the friction generated during machining, generates heat. Heat has the positive effect of increasing the plasticity of the workpiece material, but the negative effect of increasing the wear on the tool. When workpiece material reaches its breakage point, then the chip is generated. Its form and development depend on different factors, such as:

- Chemical-physical compatibility between tool and workpiece materials
- Cutting operation
- Cutting conditions (speed, feed, material removal rate)
- Tool geometry
- Friction coefficient (with or without coating)
- Lubrication

Depending on different combinations of the above mentioned factors, the chips can turn out in many different ways (see figure below).



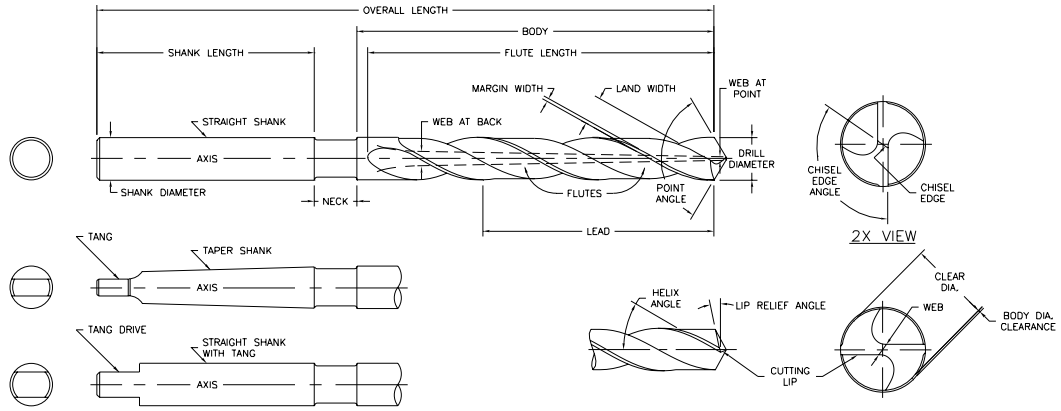
Chips that are shaped as small “6’s & 9’s” are desireable in most machining applications. this will allow for the best possible chip evacuation from the deepest cavities. Tool life is also increased dramatically when chips are kept small and manageable. When the heat generated from cutting is kept in the chip instead of the tool, wear is kept to minimum.

Industry Standard tolerancess For Shafts & Holes

Tolerance values are shown in Microns (μm) Formula for Microns ...1 μm = 0.001 mm / 0.000039

Toler-ance	Diameter (mm)							
	> 1 ≤ 3	> 3 ≤ 6	> 6 ≤ 10	> 10 ≤ 18	> 18 ≤ 30	> 30 ≤ 50	> 50 ≤ 80	> 80 ≤ 120
	Diameter (inch)							
	> 0.039 ≤ 0.118	> 0.118 ≤ 0.236	> 0.236 ≤ 0.394	> 0.394 ≤ 0.709	> 0.709 ≤ 1.181	> 1.181 ≤1.968	>1.968 ≤ 3.149	> 3.149 ≤ 4.724
	Tolerance values (μm)							
e8	-14 / -28	-20 / -38	-25 / -47	-32 / -59	-40 / -73	-50 / -89	-60 / -106	-72 / -126
f6	-6 / -12	-10 / -18	-13 / -22	-16 / -27	-20 / -33	-25 / -41	-30 / -49	-36 / -58
f7	-6 / -16	-10 / -22	-13 / -28	-16 / -34	-20 / -41	-25 / -50	-30 / -60	-36 / -71
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13	0 / -16	0 / -19	0 / -22
h7	0 / -10	0 / -12	0 / -15	0 / -18	0 / -21	0 / -25	0 / -30	0 / -35
h8	0 / -14	0 / -18	0 / -22	0 / -27	0 / -33	0 / -39	0 / -46	0 / -54
h9	0 / -25	0 / -30	0 / -36	0 / -43	0 / -52	0 / -62	0 / -74	0 / -87
h10	0 / -40	0 / -48	0 / -58	0 / -70	0 / -84	0 / -100	0 / -120	0 / -140
h11	0 / -60	0 / -75	0 / -90	0 / -110	0 / -130	0 / -160	0 / -190	0 / -220
h12	0 / -100	0 / -120	0 / -150	0 / -180	0 / -210	0 / -250	0 / -300	0 / -350
k10	+40 / 0	+48 / 0	+58 / 0	+70 / 0	+84 / 0	+100 / 0	+120 / 0	+140 / 0
k12	+100 / 0	+120 / 0	+150 / 0	+180 / 0	+210 / 0	+250 / 0	+300 / 0	+350 / 0
m7	+2 / +12	+4 / +16	+6 / +21	+7 / +25	+8 / +29	+9 / +34	+11 / +41	+13 / +48
js14	+/- 125	+/- 150	+/- 180	+/- 215	+/- 260	+/- 310	+/- 370	+/- 435
js16	+/- 300	+/- 375	+/- 450	+/- 550	+/- 650	+/- 800	+/- 950	+/- 1100
H7	+10 / 0	+12 / 0	+15 / 0	+18 / 0	+21 / 0	+25 / 0	+30 / 0	+35 / 0
H8	+14 / 0	+18 / 0	+22 / 0	+27 / 0	+ 33 / 0	+39 / 0	+46 / 0	+54 / 0
H9	+25 / 0	+30 / 0	+36 / 0	+43 / 0	+52 / 0	+62 / 0	+74 / 0	+87 / 0
H12	+100 / 0	+120 / 0	+150 / 0	+180 / 0	+210 / 0	+250 / 0	+300 / 0	+350 / 0
P9	-6 / -31	-12 / -42	-15 / -51	-18 / -61	-22 / -74	-26 / -86	-32 / -106	-37 / -124
S7	-13 / -22	-15 / -27	-17 / -32	-21 / -39	-27 / -48	-34 / -59	-42 / -72	-58 / -93

Drill Nomenclature



Axis—The imaginary straight line which forms the longitudinal center line of a drill.

Backtaper—A slight decrease in diameter from front to back in the body of a drill.

Body—The portion of a drill extending from the shank or neck to the outer corners of the cutting lips.

Body Clearance Diameter—The portion of the land that has been cut away so it will not bind against the walls of the hole.

Chisel-Edge—The edge at the end of the web that connects the cutting lips.

Chisel-Edge Angle—The included angle between the chisel-edge and cutting lip, as viewed from the end of a drill.

Clearance Diameter—The diameter over the cut away portion of the drill lands.

Drill—A rotary end cutting tool having one or more cutting lips, and having one or more helical or straight flutes for the passage of chips and the admission of a cutting fluid.

Drill Diameter—The diameter over the margins of a drill measured at the point.

Flute Length—The length from the outer corners of the cutting lips to the extreme back of the flutes. Includes the sweep of the tool used to generate the flutes and therefore does not indicate the usable length of flutes.

Flutes—Helical or straight grooves cut or formed in the body of a drill to provide cutting lips, permit removal of chips, and allow cutting fluid to reach the cutting lips.

Helix Angle—The angle formed by the leading edge of the land with a plane containing the axis of a drill.

Land—The peripheral portion of the body between adjacent flutes.

Land Width—The distance between the leading edge and heel of the land; measured at a right angle to the leading edge.

Lead—The axial advance of a leading edge of the land in one turn around the circumference.

Lip Relief Angle—The axial relief angle at the outer corner of the lip; measured by projection to a plane tangent to the periphery at the outer corner of the lip.

Lips—The cutting edges of a two flute drill extending from the chisel- edge to the periphery.

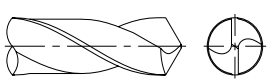
Margin—The cylindrical portion of the land, which is not cut away, to provide clearance.

Neck—The section of reduced diameter between the body and the shank of a drill.

Overall Length—The length from the extreme end of the shank to the outer corners of the cutting lip. It does not include the conical shank end often used on straight shank drills, nor the conical cutting point used on both straight and taper shank drills.

Point—The cutting end of a drill, made up of the ends of the lands and the web. In form, it resembles a cone, but departs from a true cone to furnish clearance behind the cutting lips.

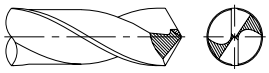
Conventional—Conventional Points with 118° included point angles are the most commonly used because they provide satisfactory results in a wide variety of materials. A possible limitation is that the straight chisel edge contributes to walking at the drill point, often making it necessary to spot the hole for improved accuracy.



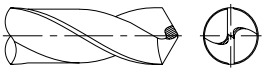
(CONTINUED FROM PRIOR PAGE)

Drill Nomenclature

Split — Split-Points (commonly called Crankshaft Points) were originally developed for use on drills designed for deep oil holes in automotive crankshafts. Since its inception, the split-point has gained widespread use and is applied to both 118° and 135° included point angles. Its main advantages are the ability to reduce thrust and eliminate walking at the drill point. This is a distinct advantage when the drill is used in a portable drill or in drilling applications where bushings cannot be used. The split-point also has two positive rake cutting edges extending to the center of the drill, which can assist as a chipbreaker to produce small chips which can readily be ejected.



Notched — Notched Points were developed for drilling tough alloys. Commonly incorporated on heavy web drills, which allow the point to withstand the higher thrust loads required in drilling these materials. As with the split-point, the Notched Point contains two additional positive rake cutting edges extending toward the center of the drill. These secondary cutting lips, which extend no further than half the original cutting lip, can assist in chip control and reduce the torque required in drilling tough materials. Notched Points can be incorporated on both 118° and 135° included point angles, making them suitable for drilling a wide variety of materials.



Point Angle—The included angle between the cutting lips projected upon a plane parallel to the drill axis and parallel to the two cutting lips.

Relative Lip Height—The difference in indicator reading between the cutting lips of a drill. Measured at a right angle to the cutting lip at a specific distance from the axis of the tool.

Shank—The part of a drill by which it is held and driven.

Tang—The flattened end of a taper shank, intended to fit into a driving slot in a socket.

Tang Drive—Two opposite parallel driving flats on the extreme end of a straight shank.

Taper Shank— Drills having conical shanks suitable for direct fitting in machine spindles, driving sleeves, or sockets. Tapered shanks generally have a tang.

Web—The central portion of the body that joins the lands. The extreme end of the web forms the chisel-edge on a two flute drill.

Web Thickness—The thickness of the web at the point, unless another specific location is indicated.

Drilling terminology/ operating formulas

Speed — The speed of a drill is determined by the rate at which the outer periphery of the tool rotates in relation to material being cut. In general, the SFM at which a drill will operate is within a range based upon the workpiece material, its condition, hardness, and depth of hole. The deeper the hole, the greater tendency there is for more heat to be generated, due to length of drill engagement, as well as chip compaction. Thus, speed reduction is often recommended to minimize the amount of heat being generated. By increasing the SFM, fewer holes will result. Therefore, it is usually advisable to start the drilling process at a slower SFM and then increase to the maximum.

Feed — Feed rates for drilling are governed by the drill diameter machinability of materials and depth of hole. Small drills, harder materials, and deeper holes require additional considerations in selecting the proper feed rates.

The following terms and formulas can be used to determine the appropriate operating parameters.

Terms			Formulas		
IPM	=	Inches Per Minute	IPR x RPM	=	**IPM**
IPR	=	Inches Per Revolution	$\frac{IPM}{RPM}$	=	**IPR**
RPM	=	Revolutions Per Minute	$\frac{SFM \times 3.82}{D}$	=	**RPM**
SFM	=	Surface Feet Per Minute	D x RPM x .26	=	**SFM**
D	=	Drill Diameter			

Note: For element and tolerance information, see specific technical sections on Solid Carbide or High Speed Steel.

Optimizing the Drilling Operation/Troubleshooting

Drill Selection

Use the shortest drill the application will permit in order to achieve maximum tool rigidity.

Holders

Tool holders and collets must provide good concentricity between the drill and the machine spindle. Use a positive back stop to prevent the tool from backing up into the holder. Never collet the tool over the flutes or over-tighten the holder. Static runout in the tool assembly must be accurately checked and maintained.

Workpiece

A secure and rigid workpiece to minimize deflection is needed, particularly on through-hole applications.

Coolants

Coolants are recommended when drilling mild steel and high temperature alloys. The purpose of the coolant media is to direct the chips away from the cutting tool and workpiece. Excessive coolant pressure and/or too much volume can negatively affect performance. When using coolant fed drills, the coolant pressure that is required should be higher than normal. Suggested pressure for coolant fed drills is minimally 150 PSI. As the diameter of the drill is reduced, the higher the pressure. This is to assist the chip in evacuating from a more confined area.

Drilling Troubleshooting Guide

Problem	Solution
Wear on Outer Corners	• Reduce cutting speed • Increase feed (IPR) • Improve direction of coolant flow • Increase coolant pressure • Add corner break
Chipping of Chisel Edge	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Check point centrality and lip height • Increase feed rate
Chipping of Cutting Lips	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Reduce speed • Reduce point clearance • Increase hone
Cracking of Lands	• Check movement of workpiece • Increase back taper • Check accuracy of drill runout • Chip packing; increase flute form opening or peck drill (HSS or HSCO only) • Slow down helix, horizontal drilling • Increase feed • When spot drilling, reduce feed • Improve direction of coolant flow • Increase coolant pressure
Oversize Hole	• Increase speed, reduce feed • Check workpiece clamping accuracy and movement • Check accuracy of drill runout • Chip packing, increase flute form opening or peck drill (HSS or HSCO only) • Check point centrality and lip height
Undersize Hole	• Improve direction of coolant flow • Reduce cutting speed, increase feed • Check drill diameter
Hole Not Round	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Check point centrality and lip height • Chip packing, increase flute form opening or peck drill (HSS or HSCO only)
Drill Breakage	• Chip packing, increase flute form opening or peck drill (HSS or HSCO only) • Check workpiece clamping accuracy and movement • Check accuracy of drill runout • Reduce feed rate, increase feed rate • Improve direction of coolant flow • Increase coolant pressure

HoleSize/AchievableHoleTolerances

As geometric, substrate and coating configurations become more advanced, the ability of a drill to produce a more accurate hole size increases. In general, a standard geometry tool will achieve a hole size to H12. However as the configuration of the drill becomes more complex the achievable hole size, under favorable conditions, can be as good as H8.

To offer a better insight, listed below are the product types and their achievable hole tolerances:

HSS General Purpose drills – H12

HSS / HSCo Parabolic Flute Deep Hole Drills (PFX) – H10

HSS / HSCo High performance TiN/ TiALN coated (ADX) – H9

Solid Carbide High Performance TiN / TiALN coated (CDX) – H8

NOMINAL HOLE DIAMETER (MM)

∅ (mm)	H8	H9	H10	H12
≤ 3	0 / +0.014	0 / +0.025	0 / +0.040	0 / +0.100
> 3 ≤ 6	0 / +0.018	0 / +0.030	0 / +0.048	0 / +0.120
> 6 ≤ 10	0 / +0.022	0 / +0.036	0 / +0.058	0 / +0.150
> 10 ≤ 18	0 / +0.027	0 / +0.043	0 / +0.070	0 / +0.180
> 18 ≤ 30	0 / +0.033	0 / +0.052	0 / +0.084	0 / +0.210

NOMINAL HOLE DIAMETER (INCHES)

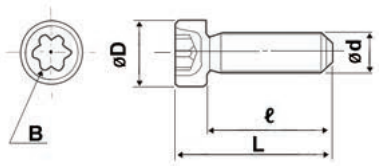
∅ (inch)	H8	H9	H10	H12
≤ .1181	0 / +0.0006	0 / +0.0010	0 / +0.0016	0 / +0.0040
>.1181≤.2362	0 / +0.0007	0 / +0.0012	0 / +0.0019	0 / +0.0048
>.2362 ≤.3937	0 / +0.0009	0 / +0.0015	0 / +0.0023	0 / +0.0059
>.3937≤.7087	0 / +0.0011	0 / +0.0017	0 / +0.0028	0 / +0.0071
>.7087≤1.1811	0 / +0.0013	0 / +0.0021	0 / +0.0033	0 / +0.0083

In view of the ability of some drills to produce a much tighter hole tolerance, due consideration should be given to drilled holes which are subject to secondary operations, eg. tapping, reaming. The diameter of the drill will need to be increased from what is recommended to account for the fact that the hole size produced will be smaller.

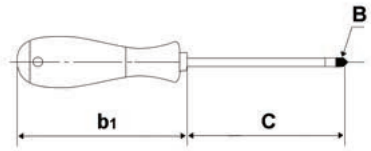
Torque Table

H860	H861	H853 3xD	H855 5xD	H858 8xD	TORQUE VALUES Nm (metric System)	TORQUE VALUES in/lbs (inch System)
H860N1	H861N1	12.0mm-15.0mm 31/64"-39/64"	12.0mm-15.0mm 31/64"-39/64"	14.0mm-15.0mm	0.75-0.99	6.6-8.8
H860N2	H861N2	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm	0.93-1.24	8.2-11.0
H860N3	H861N3	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm	1.84-2.44	16.3-21.6
H860N4	H861N3	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm	2.73-3.72	24.2-32.9
H860N5	H861N4	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm	4.14-5.52	36.6-48.8
H860N6	H861N5	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm	4.97-6.63	44.0-58.7
H860N7	H861N6	35.0mm-42.5mm	35.0mm-42.5mm	35.0mm-42.5mm	7.20	63.7

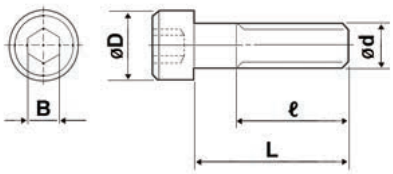
Screws and screw-drivers data



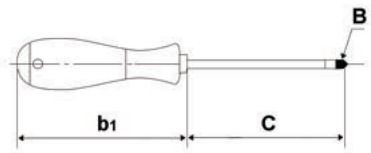
e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N1	M2.2	0.45	7.5	5.7	3.5	8IP
H860N2	M2.5	0.45	9.0	7.0	4.1	10IP
H860N3	M3.0	0.50	10.5	8.0	4.9	15IP
H860N4	M3.5	0.60	11.5	8.8	5.5	15IP
H860N5	M4.0	0.70	12.5	9.5	6.0	20IP
H860N6	M4.5	0.75	14.3	10.8	6.8	25IP



code	B	C	b1
H861N1	8IP	60	104
H861N2	10IP	80	111
H861N3	15IP	80	111
H861N4	20IP	100	118
H861N5	25IP	100	118



e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N7	M5.0	0.8	15	FULL	8.5	4



e-code	B	C	b1
H861N6	4	75	111

Drilling Hints & Tips with the Hydra Drill

COOLANTS
For maximum chip evacuation and tool performance, coolant use is recommended.

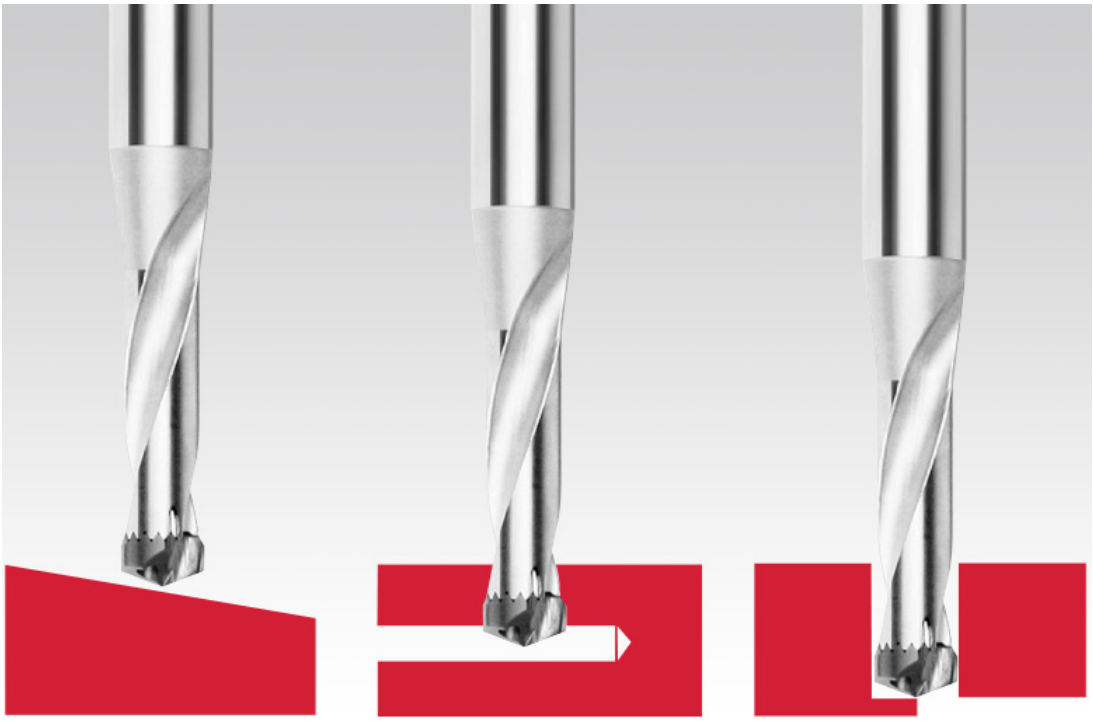
Emulsion coolant concentration of 6 – 8% is recommended for most applications, at a coolant pressure of 20 bar or higher. For high strength steel, stainless steels and tougher drilling applications, use a higher concentration of 10-12%. In these applications, particularly in stainless steels, it is recommended to use the maximum coolant pressure on the machine.

The Hydra-drill coolant holes provide improved web strength and reduce heat at the cutting edges for increased productivity and longer tool life.

HOLDERS
Always use tool holders and collets that provide good concentricity between the drill and the machine spindle. Use a positive stop to prevent the tool from backing up into the holder. Radial runout in the tool assembly must be accurately checked and maintained.

WORKPIECE
A secure and rigid workpiece will minimise deflection, and allow for better accuracy and true position of the hole.

FEEDS
It is important not to underfeed the drill which will cause it to dwell and dull. This is particularly true in work hardening materials. Feed rates should be high enough for proper chip formation.



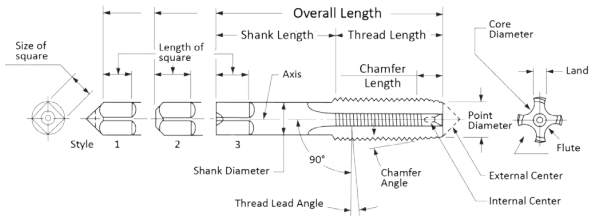
Entrance or exit on an angular surface

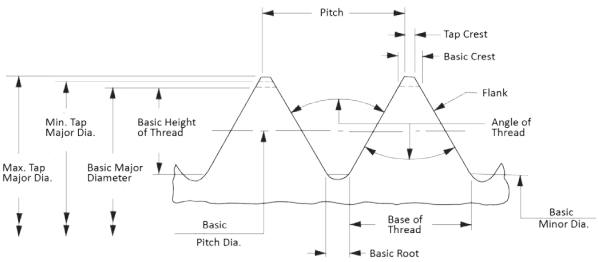
Drilling through cross holes

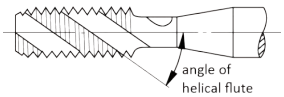
Interrupt at exit

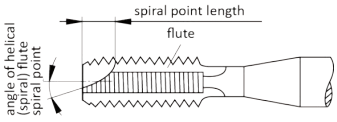
In these drilling scenarios, reducing feed rate to 1/3 (33%) is generally recommended. Drilling into an entry angle of more than 10º is NOT recommended – surface should be milled flat first.

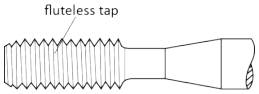
Technical Section - Threading

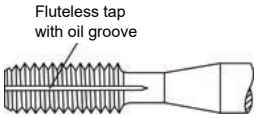












Allowance: The minimum clearance or maximum interference which is intended between mating parts.

Angle of Thread: The angle included between the flanks of a thread measured in an axial plane.

Back Taper: A slight taper on the threaded portion of the tap making the pitch diameter near the shank smaller than that at the chamfer.

Basic: The theoretical or nominal standard size from which all variations are made.

Chamfer: The tapered and relieved cutting teeth at the front end of the threaded section. Common types of chamfer are taper, 8 to 10 pitches long, plug, 3 to 5 pitches and bottoming, 1 to 2 pitches.

Crest: The top surface joining the two sides or flanks of a thread.

Cutting Face: The leading side of the land.

Flute: The longitudinal channels formed on a tap to create cutting edges on the thread profile.

Heel: The following side of the land.

Height of Thread: In profile, distance between crest and bottom section of thread measured normal to the axis.

Hook Face: A concave cutting face of the land. This may be varied for different materials and conditions.

Interrupted Thread: Alternate teeth are removed in the thread helix on a tap; usually restricted to those having an odd number of flutes.

Land: One of the threaded sections between the flutes of a tap.

Lead of Thread: The distance a screw thread advances axially in one turn.

Major Diameter: The largest diameter of the screw or nut on a straight screw thread.

Minor Diameter: The smallest diameter of the screw or nut on a straight screw thread.

Neck: The reduced diameter, on some taps, between the threaded portion and the shank.

Pitch: The distance from a point on one thread to a corresponding point on the next thread, measured parallel to the axis.

Pitch Diameter: On a straight screw thread, the diameter of an imaginary cylinder where the width of the thread and the width of the space between threads is equal.

Point Diameter: The diameter at the leading end of the chamfered portion.

Radial: The straight face of a land, the plane of which passes through the axis of the tap.

Rake: The angle of the cutting face of the land in relation to an axial plane intersecting the cutting face at the major diameter.

Relief: The removal of metal behind the cutting edge to provide clearance between the part being threaded and a portion of the threaded land. Also, see back taper.

> **CHAMFER RELIEF:** The gradual decrease in land height from cutting edge to heel on the chamfered portion of the tap land to provide radial clearance for the cutting edge.
>
> **CON-ECCENTRIC RELIEF:** Radial relief in the thread form starting at the back of a concentric margin.
>
> **ECCENTRIC THREAD RELIEF:** Radial relief in the thread form starting at the cutting edge and continuing to the heel.

Root: The bottom surface joining the flanks of two adjacent threads.

Side or flank of thread: The surface of the thread which connects the crest with the root.

Shank: The portion of the tap by which it is held and driven.

Spiral Point: An oblique cutting edge ground into the lands to provide a shear cutting action on the first few threads.

Square: The squared end of the tap shank.

Thread: The helical formed tooth of the tap which produces the thread in a tapped hole.

Thread Lead Angle: The angle made by the helix of the thread at the pitch diameter, with a plane perpendicular to the axis.

Threads Per Inch: The number of threads in one inch of length.

Thread:

> **SINGLE:** A thread in which lead is equal to pitch.
>
> **DOUBLE:** A thread in which lead is equal to twice the pitch.
>
> **TRIPLE:** A thread in which lead is equal to triple the pitch.

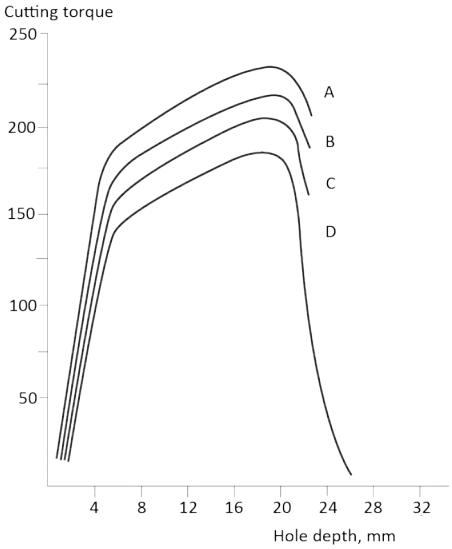
Tap Geometries & Applications

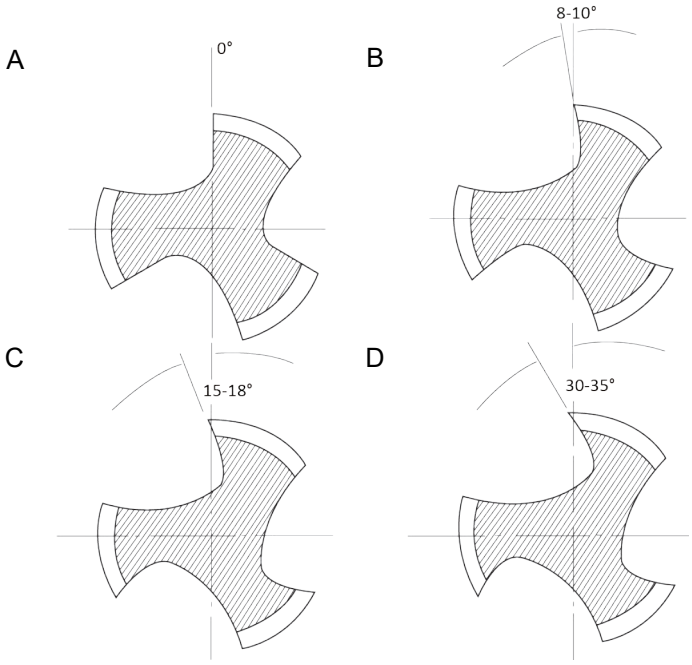
Description	Chips
Taps with straight flutes Straight flutes are the most commonly used type of tap. Suitable for use on most materials, mainly short chipping steel and cast iron, they form the basis of the program.	
Taps with interrupted thread The interrupted thread ensures less friction and therefore less resistance, which is particularly important when threading material which is resilient and difficult to machine (e.g. aluminium, bronze). It is also easier for lubricant to penetrate to the cutting edges, thus helping to minimize the torque generated	
Spiral point taps The tap has a straight fairly shallow flute and is often referred to as a gun nose or spiral point tap. The gun nose or spiral point is designed to drive the chips forward. The relatively shallow flutes ensure that the sectional strength is maximised. They also act to allow lubricant to reach the cutting edges. This type of tap is recommended for threading through holes.	
Nut taps These taps are generally used to thread nuts but can be used also on deep through holes. They have a shank diameter smaller than the nominal and a longer overall length, because their function is to accumulate nuts. They are used on special machines designed to thread huge amounts of nuts. They can work in steel and stainless steel. The first serial tap has a very long chamfer, in order to spread the cutting load on almost two thirds of the thread length.	

Description	Chips
Taps with flutes only on the chamfer lead The cutting part of the tap is formed by gun nosing in the same manner as for a spiral point tap, the function being to drive the chips forward ahead of the cutting edges. This design is extremely rigid which facilitates good machining results. However, the short length of the gun nosing limits its application to a depth of hole less than about 1.5 x Ø.	
Taps with spiral flutes Taps with spiral flutes are intended primarily for threading in blind holes. The helical flute transports the chips back away from the cutting edges and out of the hole, thus avoiding packing of chips in the flutes or at the bottom of the hole. In this way, danger of breaking the tap or damaging the thread is minimised.	
Cold forming taps Cold forming taps differ from cutting taps in that the thread is produced by plastic deformation of the component material rather than by the traditional cutting action. This means that no chips are produced by their action. The application range is materials with good formability. Tensile strength (Rm) should not exceed 1200 N/mm^2 and the elongation factor (A_5) should not be less than 10%. Cold forming taps without flutes are suitable for normal machining and are especially suitable when vertically tapping blind holes. They are also available with through coolant.	
Through coolant taps The performance of taps with through coolant holes is higher than the same taps used with external lubrication. These kinds of taps allow better evacuation of the chip, which is transported away from the cutting area itself. Wear on the cutting edge is reduced, since the cooling effect on the cutting zone is higher than the heat generation. Lubrication can be oil, emulsion or air pressurised with oil mist. Working pressure not less then 15 bar is required, but good results can be obtained with minimal lubrication.	

TappingTechnicalData

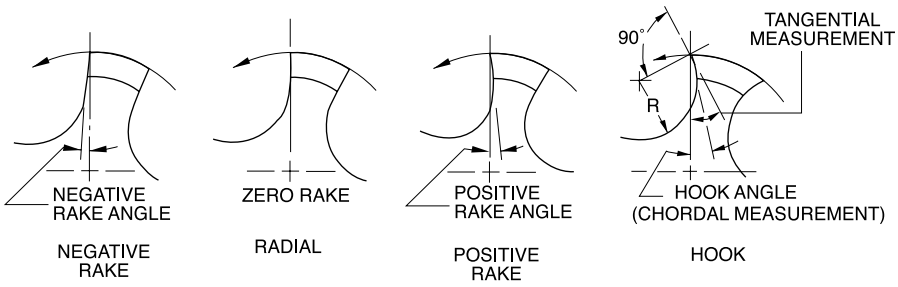
Rake Angles



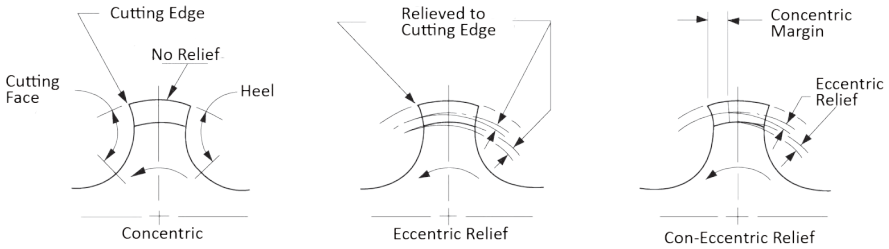


Threading tap M10 used with various rake angles in steel (low carbon steel)

The rake angle has a primary influence on cutting forces and consequently the cutting torque and surface finish of the thread. Test results made with different rake angles are shown in the above diagram, illustrating how cutting torque decreases with a larger rake angle. There is, however, a limit. A large rake angle means lower strength of the cutting edge.



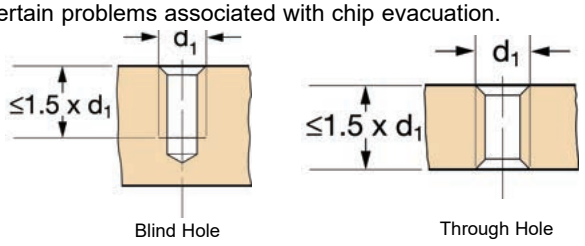
Relief Angles



Cutting Chamfers

The cutting part of a tap is the teeth of the chamfer on the leading end of the tap. The rest of the thread length is the cylindrical guiding part, which is slightly back-tapered for clearance. A decision on the best type of chamfer form has to be carefully made as both the tap life and quality of thread are greatly affected.

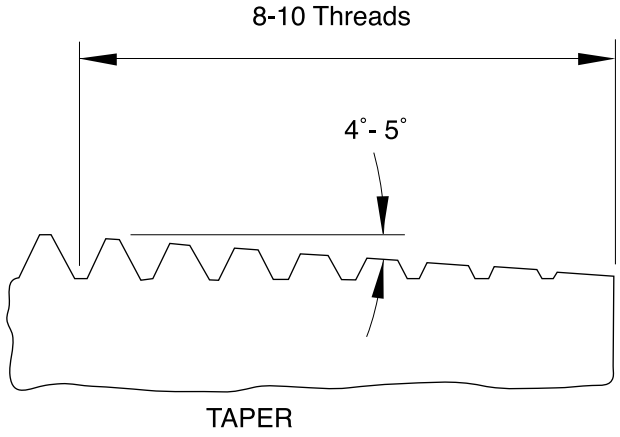
Generally, the form and length of chamfer depend on the type of hole to be tapped. Though holes do not normally cause difficulties whereas the tapping of blind holes can create certain problems associated with chip evacuation.

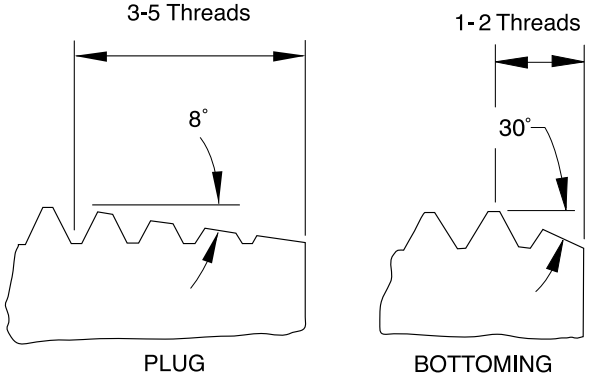


The length of the chamfer is determined by careful consideration of the following factors:

- The number of chamfer cutting teeth cannot be kept too low so as to avoid overloading, premature dulling and oversized or rough threads.
- A chamfer lead that is too long, however, increases the torque and the danger of breakage.

Commonly used chamfers are taper, plug and bottoming. Eight to ten cutting teeth per land are produced by a taper chamfer. A plug chamfer produces three to five cutting teeth per land and a bottoming chamfer one to two cutting teeth per land. The recommended radial relief behind the cutting edge of the chamfer portion is .004" to .005" relief per 1/16 of land width.





Tapping Speeds

Correct tapping speeds are very important in obtaining efficient tapping results. There are many factors which affect tapping speeds, some of which are listed below:

Material Factors:

- Thermo-conductivity of the material and wall thickness as it affects heat dispersion.
- Variations in carbon content of steel.
- Hard spots in material.
- Depth of hole to be tapped.
- Percentage of full thread to be tapped.

Tap Factors:

- Major diameters, pitch and lead.
- Style of tap.
- Width of lands.
- Amount of hook or rake.
- Length of chamfer. Bottoming taps normally require slower speeds than plug chamfered taps

Mechanical Factors:

- Type of tapping machine and holder; Speeds for small diameter taps are often governed by the limitation of the machine.
- Condition of tapping machine and spindle.
- Type of fixture.
- Vertical or horizontal tapping (faster speeds for vertical tapping).
- Method of feeding the tap.
- Cutting fluid used and method of application.

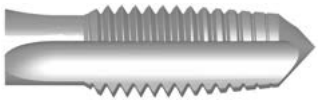
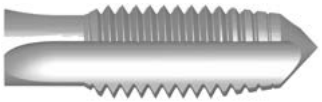
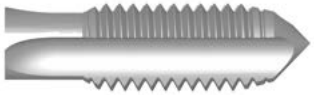
The optimum speed for tapping is the highest speed that conditions permit, consistent with economic tool life.

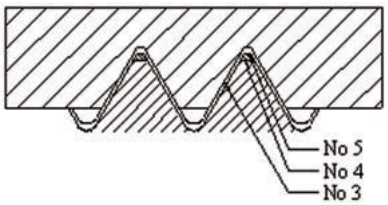
Proper tapping speeds are determined best by experiment. In the table below the speeds shown should be used as a guide only, and the suggested surface feet per minute adjusted upward or downward until the best results are obtained.

$$RPM = \frac{3.82 \times SFM}{D} \qquad SFM = .26 \times RPM \times D$$

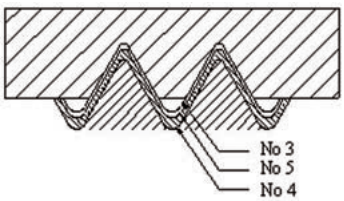
CHAMFER LENGTHS AND SERIAL TAPS

The first group (No. 1, No. 2, No. 3) includes taps with complete thread profile and the difference is in the chamfer length. The second group (No. 4, No. 5) includes taps with incomplete thread profile. They have lower pitch and outer diameter, compared to the complete standard, and longer chamfer. After using them, a finishing tap No. 3, must be used.

No. 1 =		6-8 x P 
No. 2 =		4-6 x P 
No. 3 =		2-3 x P 
No. 4 =		6-8 x P
No. 5 =		3,5-5 x P



Ø<=M10



Ø>=M12

ISO	Set code number	Including tap number
	No. 6	No. 1 + No. 2 + No. 3
	No. 7	No. 2 + No. 3
	No. 8	No. 4 + No. 5 + No. 3
	No. 9	No. 5 + No. 3
DIN	**Set code number**	**Including tap number**
	No. 8	No.3 (form C) + No.4 (form A) + No.5 (form B)
	No. 9	No.3 (form C) + No.5 (form B)
ANSI	**Set code number**	**Including tap number**
	Hand Tap (No. 6)	Taper(No.1) + Plug(No.2) + Bottoming(No.3)

Tapping Technical Data

The Relationship Between H-Limit and Class of Fit

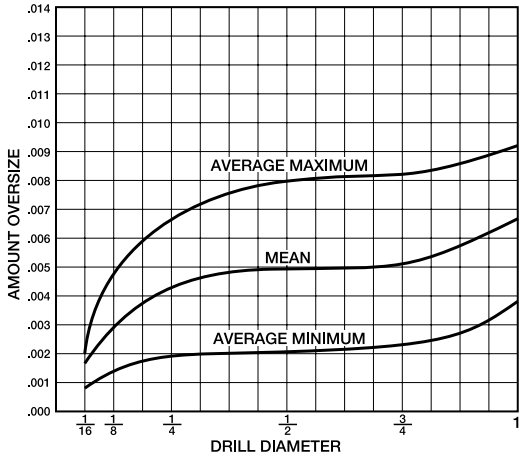
H-limits are used to properly size a tap for the threaded hole to be produced. They are selected based upon the tolerance required for the part. These tolerances are defined by the symbols class 1B, 2B, or 3B. Class 1B has the broadest tolerance and is generally applied to DIY (Do It Yourself) type nuts and bolts. Class 2B is the most common and is used for general fasteners and threaded parts. Class 3B is the tightest tolerance and used for close fit and high strength fastening applications, primarily in the automotive and aerospace industry.

Once the class of thread and part tolerance has been defined, an H-limit is selected to produce a thread that is within the minimum and maximum limits for that class of fit. These limits are the same as the Go and No Go thread plug gage dimensions. The goal is to select a tap with an H-limit that is near the middle of the part tolerance. For instance, if the total tolerance was .005", the tap should be approximately .0025" larger than the minimum limit of the part and .0025" smaller than the maximum. However, to handle the widest variety of tapping conditions, the "40% rule" is commonly used. Using this rule, the tap is placed at 40% of the part tolerance. For example, if the part tolerance is .005", multiplying .005" by 0.40 equals .002". Thus, the tap would be .002" larger than the minimum limit of the part or Go thread gage.

With the position of the tap in relationship to the part tolerance established, the selection of an H-limit number, such as H3, H4, H5, etc. is possible. H-limits are a sequence of size "steps" in .0005" increments beginning at the minimum size limit of the part, starting with H1. In other words, an H1 limit is one .0005" increment larger than the minimum limit of Go gage, an H2 is two .0005" increments (or .001) larger than the minimum limit, an H3 is three .0005" increments (or .0015") and so on. In the example above, a tap that is .002" larger than minimum limit, is four .0005" increments larger, or an H4. This would be tht tap H-limit recommendation for this tolerance.

If after selecting the proper H-limit, an oversize or undersized thread exists, or if shrinkage due to heat treating or plating will occur, larger of smaller H-limits may be required to adjust to the condition.

Probable Oversize Values For Drilled Holes



Drills will normally cut a hole larger in diameter than the drill itself. The amount depends upon the rigidity of the equipment, stiffness of the drill, accuracy of the point, the material being drilled, and many other contributing factors. However, averaging all factors, the charge below shows what might be expected with standard drills without guide bushings in steel or cast iron using good drilling practices and reasonable care in the resharpening of the drills.

Drills as received from our factory will usually drill hole sizes between the minimum and mean lines. Reconditioned drills, however, may produce hole sizes between the minimum and maximum lines depending upon drill wear, margin pick-up, and accuracy of resharpening.

Probable Oversize Diameters in Drilling

Drill Dia., Inch	Amount Oversize, Inch Average Max	Mean	Average Min.
1/16	.002	.0015	.001
1/8	.0045	.003	.001
1/4	.0065	.004	.002

Drill Dia., Inch	Amount Oversize, Inch Average Max	Mean	Average Min.
1/2	.008	.005	.002
3/4	.008	.005	.003
1	.004	.009	.007

Pitch Diameter Limits

Fractional and Machine Screw

All standard Ground Thread Taps will be marked with the letter G to designate Ground Thread. The letter G will be followed by the letter H to designate above basic (L below basic) and a numeral to designate the pitch diameter limits.

Example: G H3 indicates a Ground Thread Tap with pitch diameter limits .0010 to .0015 over basic

Pitch diameter limits for Taps to 1" diameter inclusive:

L1 = Basic to Basic minus .0005

H1 = Basic to Basic plus .0005

H2 = Basic plus .0005 to Basic plus .0010

H3 = Basic plus .0010 to Basic plus .0015

H4 = Basic plus .0015 to Basic plus .0020

H5 = Basic plus .0020 to Basic plus .0025

H6 = Basic plus .0025 to Basic plus .0030

Pitch Diameter limits for Taps over 1" diameter to 1-1/2" diameter inclusive:

H4 = Basic plus .0010 to Basic plus .0020

Pitch Diameter limit numbers for taps not shown above or those over 1-1/2" diameter.

For taps with H or L limit numbers not shown above or over 1-1/2" diameter for example H12 or L10, the H or L limit number divided by 2 indicates in thousandths of an inch the amount the maximum tap pitch diameter is over basic in the H series or the amount the minimum tap pitch diameter is under basic on the L series.

Metric I.S.O

Where the tap pitch diameter is over or under basic thread pitch diameter by even multiples of .00052", the tap will be marked with the letter “D” or “DU” respectively, followed by a limit number. The limit number is determined as follows:

$$D \quad \text{Limit No.} = \frac{\text{Amt. Tap PD High Limit Is Over Basic PD}}{.00052"}$$

$$DU \quad \text{Limit No.} = \frac{\text{Amt. Tap PD Low Limit Is Under Basic PD}}{.00052"}$$

Examples:

M1.6 x .035 - for D3 limit, max. tap PD = basic plus .0015"
Tap PD tolerance = minus .0006"

M12 x 1.75-for D6 limit, max. tap PD = basic plus .0030"
Tap PD tolerance = minus .0012"

M39 x 4-for D10 limit, max. tap PD = basic plus .0050"
Tap PD tolerance = minus .0020"

M6 x 1-for DU 4 limit, min. tap PD = basic minus .0020"
Tap PD tolerance = plus .0010"

Metric taps will be marked with a capital M followed by the nominal size in millimeters and the pitch in millimeters separated by the sign “x.” For example, M1.6 x 0.35; M6 x 1; M10 x 1.5.

Specials

Special taps are to be marked with the nominal diameter and number of threads per inch and form of thread as specified by the purchaser on his order or blue print provided such specifications are reasonably correct.

Special Ground Thread taps made to the pitch diameter limits shown will also be marked with the corresponding limit number.

When taps are specified to be a certain amount oversize or undersized, it is standard practice to add or subtract this amount from the basic pitch diameter of the nominal size tap. This dimension then becomes the new minimum pitch diameter for the special tap to which Standard Tolerance for the nominal size is added.

Undersize or oversize taps will be marked with the nominal size and pitch, followed by the amount the minimum pitch diameter is over or under basic. For example, 1/2–13+.010".

Whenever possible, in the case of oversize, undersize, or other special taps, orders should specify the minimum and maximum tap pitch diameter desired.

Left hand taps will be marked “Left Hand” or “LH.”

Technical Section - Threading

The limits and tolerances of external threads for unified screws are designated by the letter ”A”, which results in class 1A, class 2A, and class 3A screws. The nut (internal thread) limits and tolerances are designated by the letter “B” resulting in class 1B, class 2B, and class 3B.

Tolerances: The tolerance of the tapped hole in the unified series is always 1.3 times the tolerance of the screw for the same class of fit. In the American National Standard, pitch diameter tolerances on both the nut and the screw were equal with the nut above basic and the screw below basic.

Class 1A and 1B: This class of fit is intended to cover the manufacture of threaded parts where quick and easy assembly is necessary or desired and an allowance is provided to permit ready assembly.

Class 2A and 2B: This class of fit is intended to cover screws, bolts and nuts, but it is also suitable for a variety of other applications. An allowance is provided to minimize galling and seizure in assembling and use. It will also accommodate limited amount of plating, coating or finish.

Class 3A and 3B: This class of fit is provided for those applications where closeness of fit, accuracy of lead and angle of thread is important. No allowance is provided and these threads are obtained consistently only by use of high quality production equipment and checked by a very efficient system of gaging and inspection.

Unified and American standard threads have substantially the same thread form. Threads of both standards are mechanically interchangeable. The main difference between the two standards are: Variation of tolerance with size, differences in amounts of pitch diameter tolerance for external and internal threads, and differences in thread designations.

Caution: Select the proper percent of thread for the material to be tapped.

Remember: As the drilled hole becomes smaller the amount of chips to be removed becomes so great that the friction generated may require as much power as does the actual cutting.

TABLE OVER TAP TOLERANCE VS TOLERANCE ON INTERNAL THREAD (NUT)

Tolerance class, Tap			Tolerance, Internal thread (Nut)					Application
ISO	DIN	ANSI BS						
ISO 1	4 H	3 B	4 H	5 H				Fit without allowance
ISO 2	6 H	2 B	4 G	5 G	6 H			Normal fit
ISO 3	6 G	1 B			6 G	7 H	8 H	Fit with large allowance
-	7 G	-				7 G	8 G	Loose fit for following treatement or coating

Thread tolerances for taps are collected in standard reference DIN 13.

Normal tolerance is ISO 2 (6H) on taps, which generates an average quality fit between screw and nut. Lower tolerance (ISO 1) generates a fine fit without a gap on the flanks between screw and nut. Higher tolerance (ISO 3) generates a rough fit, with large gap. It is used in the case of a nut which will later be coated or if a loose fit is preferred.

Between tolerances 6H (ISO2) and 6G (ISO3), as well as between 6G and 7G, the tap manufacturer produces taps with tolerance 6HX and 6GX. “X” means the tolerance is outside standard and it is used for taps working high strength material or abrasive material such as cast iron. These materials do not cause oversize problems, so higher tolerance can be used in order to increase tool life. The width of the tolerance is equal between, for example, 6H and 6HX.

Forming taps are usually produced with a 6HX or 6GX tolerance.

The tolerance icon for BSW and BSF is medium. This refers to BS 84 “medium fit”.

Pipe threads with the tolerance icon “Normal” refer to the following standards:

G threads to ISO 228-1. One class for internal thread (tap), and class A and B for external thread (die).
R, Rc and R threads to ISO 7-1.
NPT and NPSM to ANSI B1.20.1.
NPTF and NPSF to ANSI B1.20.3.
PG to DIN 40 430.

SELF-LOCKING THREAD FORM

Concept

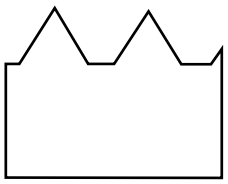
Designed to produce threads for self-locking operations and put a lock on fastener costs.

This is not to be confused as just another range of taps for a specific application. It is a thread form. Utilizing the latest generation CNC equipment this thread form can be produced on straight flute, spiral flute, spiral point, roll form and even the range of Applix high performance taps.

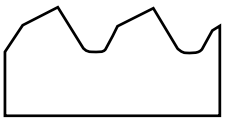
Although this is a made-to-order program, quantities of up to 48 pieces of any style would be delivered in no greater than 10 working days.

The relatively small quantities being produced and the additional thread grinding required does mean that taps featuring this thread form can be marginally more expensive than conventionally ground taps. Depending on the size, quantity, and/or the type of tool being compared, the additional cost will vary. However, before making a pure price decision we recommend a review of the added benefits of the concepts featured in this catalog and how they help in offsetting costs in other areas.

Self-Locking Threads and How They Work



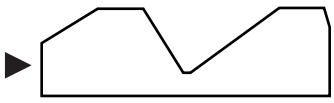
Standard Thread Form



Self-Locking Thread Form

Taps ground to the adjacent self-locking thread form produce a highly efficient female thread form with a 30° inclined wedge that provides optimum locking contact with the crests of the male threads of a standard bolt or screw. The thread form produced is ideal for a wide variety of applications where vibration resistance is a must. Clamping forces are evenly distributed along the entire length of thread engagement providing a capability to resist the forces created by vibration that can loosen ordinary threaded fasteners. The end result is a standard male fastener locked firmly in place without having to resort to the use of costly adhesives, locking devices or inserts.

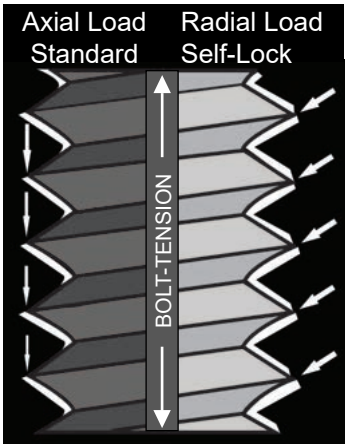
On the smaller diameters, <8-32 but including 8-36, because of their size, the taps are ground with a modified ramp form.

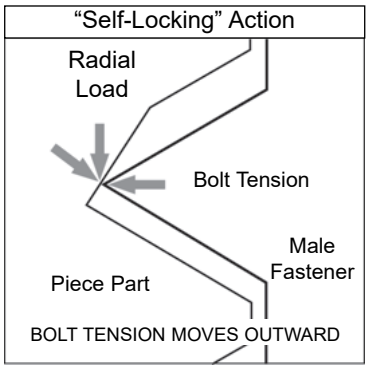


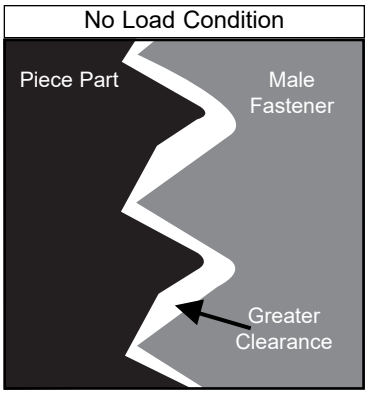
Key Features and Benefits

Improves Holding Power
A 30° wedge lock on the female thread creates a continuous spiral contact along the entire thread length for improved holding power versus standard thread forms.

Clamp Load More Evenly Distributed
Clamp load forces are spread evenly across all threads versus conventional 60° thread forms that put the clamping force on the first few threads only with the other threads receiving limited or no contact at all.







Reduces Fastener Costs
Utilizing this thread form converts standard male fasteners into highly efficient self-locking ones and may eliminate the necessity for costly locking fasteners, chemical bonds, nylon plugs or other devices to maintain tightness.

Faster Assembly Operations
The larger tap drill size creates greater clearance with the male fastener than conventionally produced threads. In assembling fasteners produced with this thread form it is clearly noticeable that the fasteners turn more freely irrespective of whether by hand or utilizing assembly machinery. Assembly costs are lower and assembly related rejects are additionally reduced.

Holding Power that Lasts and Lasts
There is no loss of locking power in those applications requiring frequent loosening and tightening of the male fastener. This eliminates time intensive disassembly and assembly procedures. Conventional locking fasteners would be either destroyed or their locking power severely diminished.

Threading Solution for Soft Materials
The optimum load distribution provided by this thread form eliminates thread stripping that is typical with thread forms that concentrate clamping load on fewer threads. Ideal for aluminum and other lightweight, soft materials in applications where stripping is frequent.

Environmentally Friendly
Because the threads produced permit the male fastener to be locked in place by simply tightening, there is no necessity for bonding materials or chemical agents which eliminates the need for using potentially environmentally harmful products plus saving valuable time and cost.

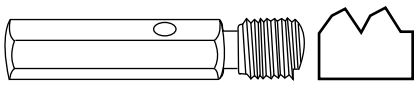
SELF-LOCKING THREAD FORM

Gaging for Self-Locking Threads

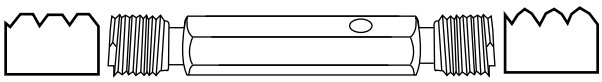
An essential element in high quality thread production is an accurate gaging capability. To facilitate the latter Precision offers a complete gaging system for self-locking threads, which consists
of the following:

LARGER DIAMETERS

Go-Pitch Diameter and Ramp Gage



Hi-Pitch Diameter and Ramp Gage



SMALLER DIAMETERS

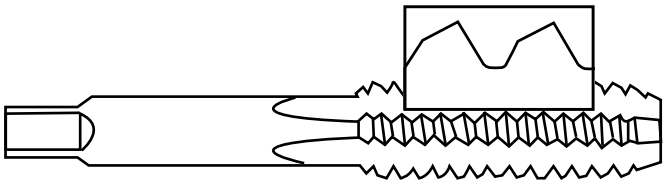
Go-Pitch Diameter and Ramp Gage Hi-Limit Gage

Precision certifies all new gages for self-locking threads to insure their functional accuracy. A certificate of compliance can be provided for a nominal charge. It is highly recommended that they be returned on a periodic basis for recertification.

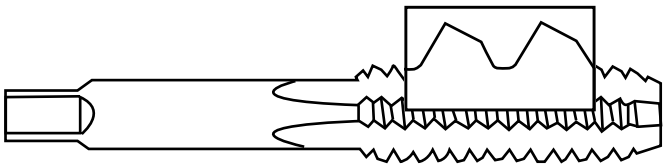
When placing your inquiry for a self-locking tap, simply advise the type of gage(s) you require and one consistent with whatever size is ordered will be quoted and supplied.

How to Order

Style ‘RW’



Style ‘LW’



Unless otherwise specified, the taps will be provided featuring a ramp angle in the direction detailed and referred to as style “RW.”

When tapping is to be effected from the opposite end of a through hole, the style “LW” must be special ordered. This style features the ramp angle in the opposite direction as detailed, and is generally used in the production of nuts.

There is no requirement to specify an H or D limit. Basically, one size fits all because contact is not made on the thread flanks but on the wedge ramp.

To place an order call or fax Customer Service at:
TEL: 1-800-877-3745 • FAX: 1-815-459-2804

Simply identify the following:
–The List No. or description of the standard tap.
–The size, number of flutes and chamfer requirements.
–The ramp style (RW or LW).

Should a gage be required, simply indicate the type when placing the order.

Technical Section - Threading

TAP DRILL SIZES FOR UNIVERSAL AND M-PROFILE SCREW THREADS

Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percent of Thread	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable % of Thread (inches)
0-80	56	.0465	83	.0015	.0480	74
—	3/64	.0469	81	.0015	.0484	71
—	1.20mm	.0472	79	.0015	.0487	69
—	1.25mm	.0492	67	.0015	.0507	57
1-64	54	.0550	89	.0015	.0565	81
—	1.45mm	.0571	78	.0015	.0586	71
—	53	.0595	67	.0015	.0610	59
1-72	1.5mm	.0591	77	.0015	.0606	68
—	53	.0595	75	.0015	.0610	67
—	1.55mm	.0610	67	.0015	.0606	68
2-56	51	.0670	82	.0017	.0687	74
—	1.75mm	.0689	73	.0017	.0706	66
—	50	.0700	69	.0017	.0717	62
—	1.80mm	.0709	65	.0017	.0726	58
2-64	50	.0700	79	.0017	.0717	70
—	1.80mm	.0709	74	.0017	.0726	66
—	49	.0730	64	.0017	.0747	56
3-48	48	.0760	85	.0019	.0779	78
—	5/64	.0781	77	.0019	.0800	70
—	47	.0785	76	.0019	.0804	69
—	2.00mm	.0787	75	.0019	.0806	68
—	46	.0810	67	.0019	.0829	60
—	45	.0820	63	.0019	.0839	56
3-56	46	.0810	78	.0019	.0829	69
—	45	.0820	73	.0019	.0839	65
—	2.10mm	.0827	70	.0019	.0846	62
—	2.15mm	.0846	62	.0019	.0865	54
4-40	44	.0860	80	.0020	.0880	74
—	2.20mm	.0866	78	.0020	.0886	72
—	43	.0890	71	.0020	.0910	65
—	2.30mm	.0906	66	.0020	.0926	60
4-48	2.35mm	.0925	72	.0020	.0926	72
—	42	.0935	68	.0020	.0955	61
—	3/32	.0938	68	.0020	.0958	60
—	2.40mm	.0945	65	.0020	.0965	57
5-40	40	.0980	83	.0023	.1003	76
—	39	.0995	79	.0023	.1018	71
—	38	.1015	72	.0023	.1038	65
—	2.60mm	.1024	70	.0023	.1047	63
5-44	38	.1015	79	.0023	.1038	72
—	2.60mm	.1024	77	.0023	.1047	69
—	37	.1040	71	.0023	.1063	63
6-32	37	.1040	84	.0023	.1063	78
—	36	.1065	78	.0023	.1088	72
—	7/64	.1094	70	.0026	.1120	64
—	35	.1100	69	.0026	.1126	63
—	34	.1100	67	.0026	.1136	60
6-40	34	.1110	83	.0026	.1136	75
—	33	.1130	77	.0026	.1156	69
—	2.90mm	.1142	73	.0026	.1168	65
—	32	.1160	68	.0026	.1186	60
8-32	3.40mm	.1339	74	.0029	.1368	67
—	29	.1360	69	.0029	.1389	62

Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percent of Thread	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable % of Thread (inches)
8-36	29	.1360	78	.0029	.1389	70
—	3.5mm	.1378	72	.0029	.1407	65
10-24	27	.1440	85	.0032	.1472	79
—	3.70mm	.1457	82	.0032	.1489	76
—	26	.1470	79	.0032	.1502	74
—	25	.1495	75	.0032	.1527	69
—	24	.1520	70	.0032	.1552	64
10-32	5/32	.1563	83	.0032	.1595	75
—	22	.1570	81	.0032	.1602	73
—	21	.1590	76	.0032	.1622	68
12-24	11/64	.1719	82	.0035	.1754	75
—	17	.1730	79	.0035	.1765	73
—	16	.1770	72	.0035	.1805	66
12-28	16	.1770	84	.0035	.1805	77
—	15	.1800	78	.0035	.1835	70
—	4.60mm	.1811	75	.0035	.1846	67
—	14	.1820	73	.0035	.1855	66
1/4-20	9	.1960	83	.0038	.1998	77
—	8	.1990	79	.0038	.2028	73
—	7	.2010	75	.0038	.2048	70
—	13/64	.2031	72	.0038	.2069	66
1/4-28	5.40mm	.2126	81	.0038	.2164	72
—	3	.2130	80	.0038	.2168	72
5/16-18	F	.2570	77	.0038	.2608	72
—	6.60mm	.2598	73	.0038	.2636	68
—	G	.2610	71	.0041	.2651	66
5/16-24	H	.2660	86	.0041	.2701	78
—	6.80mm	.2677	83	.0041	.2718	75
—	I	.2720	75	.0041	.2761	67
3/8-16	7.80mm	.3071	84	.0044	.3115	78
—	7.90mm	.3110	79	.0044	.3154	73
—	5/16	.3125	77	.0044	.3169	72
—	O	.3160	73	.0044	.3204	68
3/8-24	21/64	.3281	87	.0044	.3325	79
—	8.40mm	.3307	82	.0044	.3351	74
—	Q	.3320	79	.0044	.3364	71
—	8.50mm	.3346	75	.0044	.3390	67
7/16-14	T	.3580	86	.0046	.3626	81
—	23/64	.3594	84	.0046	.3640	79
—	9.20mm	.3622	81	.0046	.3668	76
—	9.30mm	.3661	77	.0046	.3707	72
—	U	.3680	75	.0046	.3726	70
—	9.40mm	.3701	73	.0046	.3747	68
7/16-20	W	.3860	79	.0046	.3906	72
—	25/64	.3906	72	.0046	.3952	65
1/2-13	10.50mm	.4134	87	.0047	.4181	82
—	27/64	.4219	78	.0047	.4266	73
1/2-20	29/64	.4531	72	.0047	.4578	65

TAP DRILL SIZES FOR METRIC M-PROFILE SCREW THREADS

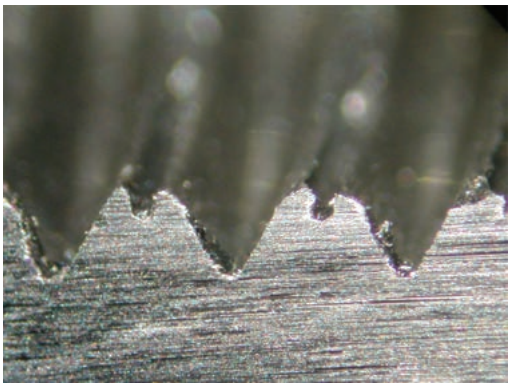
Metric of Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theoretical Percent of Thread	Probable Mean Oversize	Probable Hole Size	Probable Percent Thread
M1.6 x 0.35	1.20mm	.0472	88	.0014	.0486	80
—	1.25mm	.0492	77	.0014	.0506	69
M2 x 0.4	1/16	.0625	79	.0015	.0640	72
—	1.60mm	.0630	77	.0017	.0647	69
—	52	.0635	74	.0017	.0652	66
M2.5 x 0.45	2.05mm	.0807	77	.0019	.0826	69
—	46	.0810	76	.0019	.0829	67
—	45	.0820	71	.0019	.0839	63
M3 x 0.5	40	.0980	79	.0023	.1003	70
—	2.5mm	.0984	77	.0023	.1007	68
—	39	.0995	73	.0023	.1018	64
M3.5 x 0.6	33	.1130	81	.0026	.1156	72
—	2.9mm	.1142	77	.0026	.1168	68
—	32	.1160	71	.0026	.1186	63
M4 x 0.7	3.2mm	.1260	88	.0029	.1289	80
—	30	.1285	81	.0029	.1314	73
—	3.3mm	.1299	77	.0029	.1328	69
M4.5 x 0.75	3.7mm	.1457	82	.0032	.1489	74
—	26	.1470	79	.0032	.1502	70
—	25	.1495	72	.0032	.1527	64

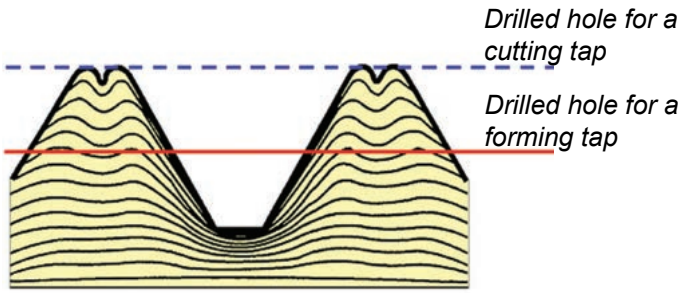
Metric of Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theoretical Percent of Thread	Probable Mean Oversize	Probable Hole Size	Probable Percent Thread
M5 x 0.8	4.2mm	.1654	77	.0032	.1686	69
—	19	.1660	75	.0032	.1692	68
M6 x 1	10	.1935	84	.0038	.1973	76
—	9	.1960	79	.0038	.1998	71
—	5mm	.1969	77	.0038	.2006	70
—	8	.1990	73	.0038	.2028	65
M7 x 1	A	.2340	81	.0038	.2378	74
—	6mm	.2362	77	.0038	.2400	70
—	B	.2380	74	.0038	.2418	66
M8 x 1.25	6.7mm	.2638	80	.0041	.2679	74
—	17/64	.2656	77	.0041	.2697	71
—	H	.2660	77	.0041	.2701	70
—	6.8mm	.2677	74	.0041	.2718	68
M10 x 1.5	8.4mm	.3307	82		.0044	.3351
—	Q	.3320	80	.0044	.3364	75
—	8.5mm	.3346	77	.0044	.3390	71
M12 x 1.5	10.4mm	.4094	81		.0047	.4141
—	Z	.4130	77	.0047	.4177	71
M12 x 1.75	10.20mm	.4016	79		.0047	.4063
—	Y	.4040	76	.0047	.4087	71
—	13/32	.4062	74	.0047	.4109	69

Note: "Probable Hole Size" columns listed above apply to HSS/HSCo Drills ONLY. When using Solid Carbide Drills as Tap-Drills you must ADD the average Oversize amount per diameter to the size listed in these "Probable Hole Size" columns.

Flow Of Material When Forming A Thread

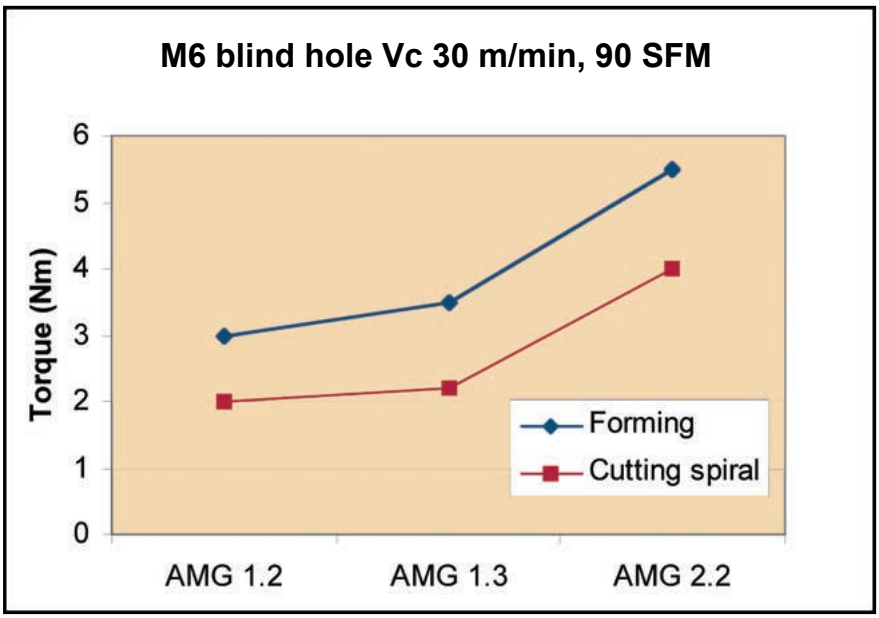
The tapping hole size depends upon the material being drilled, the cutting conditions selected and the condition of the equipment being used. If material is pushed up at the thread entry by the tap and/or the life of the tap is too short, select a slightly larger drill diameter. If on the other hand the profile of the thread formed is insufficient, then select a slightly smaller drill diameter.





Section of thread obtained by forming tap on steel C45

Cold forming taps require more power on the spindle, compared to a cutting tap of the same size, since it generates higher torque.



Torque comparison between forming and cutting taps in different material groups.

Technical Section - Threading

Note: Recommended thread percentage for various (Inch standard) tap sizes is shown in the “60% Thread “ columns below. This is also the average percentage that is desirable for metric sizes. Use the “Probable Percent of Thread” column in the “Metric Sizes” tables below.

TAP DRILL SIZES FOR FORMING TAPS

Machine Screw Sizes

Tap Size	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread		50% Thread	
	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size
0-80	0.0536	1.35mm	0.0540	1.35mm	0.0545	—	0.0549	54	0.0554	54	0.0558	1.0mm
1-64	0.0650	1.65mm	0.0655	1.65mm	0.0661	—	0.0666	—	0.0672	51	0.0677	51
1-72	0.0659	1.65mm	0.0663	—	0.0669	1.7mm	0.0673	51	0.0679	51	0.0683	—
2-56	0.0769	1.95mm	0.0774	1.95mm	0.0781	23498	0.0787	47	0.0794	2.0mm	0.0799	—
2-64	0.0780	5/64	0.0785	47	0.0791	2.0mm	0.0796	2.0mm	0.0802	—	0.0807	2.05mm
3-48	0.0884	2.25mm	0.0890	43	0.0898	43	0.0905	2.3mm	0.0913	2.3mm	0.0919	—
3-56	0.0899	43	0.0904	—	0.0911	2.3mm	0.0917	2.3mm	0.0924	2.35mm	0.0929	2.35mm
4-40	0.0993	2.5mm	0.1000	39	0.1010	39	0.1018	38	0.1028	2.6mm	0.1035	2.6mm
4-48	0.1014	38	0.1020	38	0.1028	2.6mm	0.1035	2.6mm	0.1043	37	0.1049	37
5-40	0.1123	34	0.1130	33	0.1140	33	0.1148	2.9mm	0.1158	32	0.1165	32
5-44	0.1134	33	0.1141	2.9mm	0.1150	2.9mm	0.1157	—	0.1166	32	0.1173	32
6-32	0.1221	3.1mm	0.1230	3.1mm	0.1243	—	0.1252	40916	0.1264	3.2mm	0.1274	—
6-40	0.1253	1/8	0.1260	3.2mm	0.1270	3.2mm	0.1278	3.25mm	0.1288	30	0.1295	30
8-32	0.1481	3.75mm	0.1490	—	0.1503	25	0.1512	3.8mm	0.1524	24	0.1534	3.9mm
8-36	0.1498	25	0.1507	3.8mm	0.1518	24	0.1526	24	0.1537	3.9mm	0.1546	23
10-24	0.1688	—	0.1700	18	0.1717	23682	0.1729	23682	0.1746	—	0.1758	—
10-32	0.1741	17	0.1750	—	0.1763	—	0.1772	16	0.1784	4.5mm	0.1794	—
12-24	0.1948	10	0.1960	9	0.1977	5.0mm	0.1989	8	0.2006	5.1mm	0.2018	7
12-28	0.1978	5.0mm	0.1989	8	0.2003	8	0.2014	7	0.2028	—	0.2039	13/64

Fractional Sizes

Tap Size	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread		50% Thread	
	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size
1/4-20	.2245	5.7mm	.2260	—	.2280	1	.2295	1	.2315	—	.2330	5.9mm
1/4-28	.2318	—	.2329	5.9mm	.2343	A	.2354	15/64	.2368	6.0mm	.2379	B
5/16-18	0.2842	7.2mm	.2861	7.25mm	.2879	7.3mm	.2898	L	.2917	7.4mm	.2936	—
5/16-24	0.2912	7.4mm	.2927	—	.2941	M	.2955	7.5mm	.2969	19/64	.2983	7.6mm
3/8-16	.3431	11/32	.3452	8.75mm	.3474	S	.3495	8.9mm	.3516	—	.3537	9.0mm
3/8-24	.3537	9.0mm	.3552	9.0mm	.3566	—	.3580	T	.3594	23/64	.3608	—
7/16-14	.4011	—	.4035	Y	.4059	13/32	.4084	—	.4108	—	.4132	Z
7/16-20	0.4120	Z	.4137	10.5mm	.4154	—	.4171	—	.4188	—	.4205	—
1/2-13	.4608	—	.4634	—	.4660	—	.4686	15/32	.4712	12mm	.4738	12mm
1/2-20	.4745	—	.4762	—	.4779	—	.4796	—	.4813	—	.4830	31/64

Metric Sizes

Metric Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percentage of thread %	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable Percent of Thread %
M3 x0.5	36	0.1065	86	.0026	.1091	67
—	2.7mm	0.1062	88	.0026	.1088	70
M4 x 0.7	27	0.1440	72	.0032	.1472	54
—	3.6mm	.1417	84	.0032	.1449	67
—	9/64	.1406	90	.0032	.1438	73
M5 x 0.8	14	0.1820	69	.0035	.1855	53
—	4.6mm	.1811	74	.0035	.1846	57
—	15	.1800	79	.0035	.1835	62
—	16	0.1770	92	.0035	.1805	76
M6 x 1	7/32	.2188	65	.0038	.2226	51
—	5.4mm	.2126	88	.0038	.2164	74

Metric Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percentage of thread %	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable Percent of Thread %
M8 x 1.25	7.4mm	0.2910	71	.0042	.2952	59
—	L	0.2900	75	.0042	.2942	62
—	7.3mm	.2874	82	.0042	.2916	70
M10 x 1.5	U	0.3680	64	.0046	.3726	53
—	9.3mm	0.3660	69	.0046	.3706	58
—	9.2mm	0.3620	78	.0046	.3666	67
—	23/64	.3594	85	.0046	.3640	74
M12 x 1.5	11.3mm	.4449	70	.0047	.4496	57
—	7/16	.4375	86	.0047	.4422	75
M12 x 1.75	7/16	.4375	75	.0047	.4422	65
—	11mm	.4331	84	.0047	.4378	73

*Probable percent of full thread produced in tapped hole using standard drill sizes.

Tap Projection and Hole Size for Pipe Taps

Nominal Size	Tap Thread Limits L_2	Tap Thread Limits L_2 Tolerance	Taper Per Ft. Limits Min.	Taper Per Ft. Limits Max.	Projection NPT & NPTF Min.	Projection NPT & NPTF Max.	Projection SAE - Short Min.	Projection SAE - Short Max.	Ream Dia. Large End	Gage Width L_1	L_3	A	Tap Drill Size B	Tap Drill Size BB
1/16 - 27	0.3120	±1/16	23/32	25/32	.250	0.3750	.222	.259	.2515	0.1600	.1111	.2711	15/64	C
1/8 - 27	0.3120	±1/16	23/32	25/32	.250	.375	.222	.259	.3440	0.1615	.1111	.2726	21/64	Q
1/4 - 18	0.4590	±1/16	23/32	25/32	.397	0.5210	.333	.389	.4472	0.2278	.1667	.3945	27/64	7/16
3/8 - 18	0.4540	±1/16	23/32	25/32	.392	.516	.333	0.3890	.5826	0.2400	.1667	.4067	9/16	37/64
1/2 - 14	0.5790	±1/16	23/32	25/32	.517	.641	.429	0.5000	.7213	0.3200	.2143	.5343	11/16	45/64
3/4 - 14	0.5650	±1/16	23/32	25/32	.503	0.6270	.429	.500	.9317	0.3390	.2143	.5533	57/64	29/32
1 - 11-1/2	0.6780	±3/32	23/32	25/32	.584	.772	—	—	1.1691	0.4000	.2609	.6609	1-1/8	1-9/64
1-1/4 - 11-1/2	0.6860	±3/32	23/32	25/32	.592	0.7800	—	—	1.5138	0.4200	.2609	.6809	1-15/32	1-31/64
1-1/2 - 11-1/2	0.6990	±3/32	23/32	25/32	.606	0.7920	—	—	1.7528	0.4200	.2609	.6809	1-45/64	1-23/32
2 - 11-1/2	0.6670	±3/32	23/32	25/32	.574	.760	—	—	2.2267	0.4360	.2609	.6909	2-11/64	2-3/16

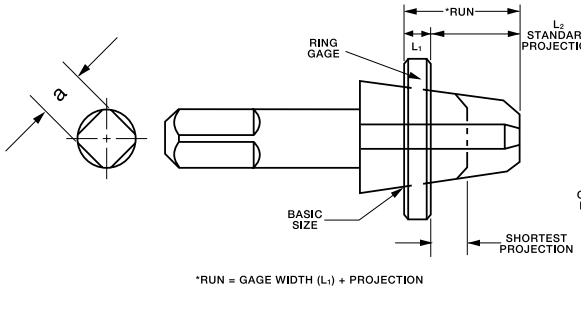
TOLERANCES

Ground Thread = A maximum lead deviation of plus or minus .0005" within any two threads no further apart than 1" is permitted.

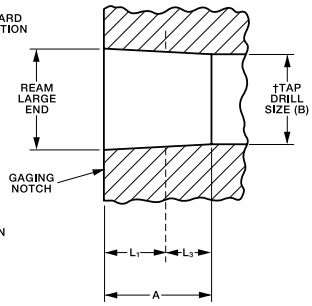
Threads per inch	Angle Tolerance
	Half Angle
	Ground Thread
8	25' Plus or Minus
11-1/2 to 27 inclusive	30' Plus or minus

*Distance small end of tap projects through L_1 Taper Thread Ring Gage.
**Recommended sizes given permit direct tapping without reaming the hole, but only give a full thread for approx. L_1 distance.
***TAP DRILL SIZE (B) is size for use with a taper reamer. The tap drill size for use without a taper reamer is shown in column BB

Projection thru ring gauge



Reamed hole data



Recommended Minor Diameters and Tap Drills for STI Spiral Point and Hand Taps

Nominal Diameter	T.R.I. UNC	T.R.I. UNF	Aluminum Diameter of Tapped Holes Min.	Aluminum Diameter of Tapped Holes Max.	Aluminum Recommended Minor/ Drill Size Tap Drill Size	Aluminum Recommended Minor/ Drill Size Dec Eq.	Plastic - Steel - Magnesium Diameter of Tapped Holes Min.	Plastic - Steel - Magnesium Diameter of Tapped Holes Max.	Plastic - Steel - Magnesium Recommended Minor/ Drill Size Tap Drill Size	Plastic - Steel - Magnesium Recommended Minor/ Drill Size Dec. Eq
4	40	—	.1160	.1210	31	.1200	.1190	.1240	31	.1200
6	32	—	.1440	.1500	26	.1470	.1480	.1540	25	.1495
8	32	—	.1700	.1760	17	.1730	.1740	.1800	16	.1770
10	24	—	.1990	.2050	13/64	.2031	.2030	.2090	5	.2055
10	—	32	.1960	.2020	7	.2010	.2000	.2060	13/64	.2031
1/4	20	—	.2610	.2670	H	.2660	.2650	.2710	H	.2660
1/4	—	28	.2570	.2640	G	.2610	.2610	.2680	6.7MM	.2638
5/16	18	—	.3280	.3340	Q	.3320	.3310	.3370	Q	.3320
5/16	—	24	.3230	.3300	21/64	.3281	.3270	.3340	21/64	.3281
3/8	16	—	.3900	.3980	X	.3970	.3960	.4020	X	.3970
3/8	—	24	.3850	.3920	25/64	.3906	.3890	.3960	25/64	.3906
7/16	14	—	.4530	.4630	29/64	.4531	.4610	.4710	29/64	.4531
7/16	—	20	.4500	.4580	29/64	.4531	.4530	.4610	29/64	.4531
1/2	13	—	.5150	.5250	33/64	.5156	.5230	.5330	17/32	.5312
1/2	—	20	.5130	.5220	33/64	.5156	.5150	.5240	17/32	.5312

Tap Size Recommendations for Classes 2B and 3B

Machine Screw Sizes

Size	Threads Per Inch NC	Threads Per Inch NF	Recommended Tap for Class of Thread Class 2B	Recommended Tap for Class of Thread Class 3B	Pitch Diameter Limits for Class of Thread Min. All Classes (Basic)	Pitch Diameter Limits for Class of Thread Max Class 2B	Pitch Diameter Limits for Class of Thread Max Class 3B
0	—	80	H2	H1	.0519	.0542	.0536
1	64	—	H2	H1	.0629	.0655	.0648
1	—	72	H2	H1	.0640	.0665	.0659
2	56	—	H2	H1	.0744	.0772	.0765
2	—	64	H2	H1	.0759	.0786	.0779
3	48	—	H2	H1	.0855	.0885	.0877
3	—	56	H2	H1	.0874	.0902	.0895
4	40	—	H2	H2	.0958	.0991	.0982
4	—	48	H2	H1	.0985	.1016	.1008
5	40	—	H2	H2	.1088	.1121	.1113
5	—	44	H2	H1	.1102	.1134	.1126
6	32	—	H3	H2	.1177	.1214	.1204
6	—	40	H2	H2	.1218	.1252	.1243
8	32	—	H3	H2	.1437	.1475	.1465
8	—	36	H2	H2	.1460	.1496	.1487
10	24	—	H3	H3	.1629	.1672	.1661
10	—	32	H3	H2	.1697	.1736	.1726
12	24	—	H3	H3	.1889	.1933	.1922
12	—	28	H3	H3	.1928	.1970	.1959

Fractional Sizes

Size	Threads Per Inch NC	Threads Per Inch NF	Recommended Tap For Class of Thread Class 2B	Recommended Tap For Class of Thread Class 3B	Pitch Diameter Limits For Class of Thread Min. All Classes (Basic)	Pitch Diameter Limits For Class of Thread Max Class 2B	Pitch Diameter Limits For Class of Thread Max Class 3B
1/4	20	—	H5	H3	.2175	.2223	.2211
1/4	—	28	*H4	H3	.2268	.2311	.2300
5/16	18	—	H5	H3	.2764	.2817	.2803
5/16	—	24	*H4	H3	.2854	.2902	.2890
3/8	16	—	H5	H3	.3344	.3401	.3387
3/8	—	24	*H4	H3	.3479	.3528	.3516
7/16	14	—	H5	H3	.3911	.3972	.3957
7/16	—	20	H5	H3	.4050	.4104	.4091
1/2	13	—	H5	H3	.4500	.4565	.4548
1/2	—	20	H5	H3	.4675	.4731	.4717
9/16	12	—	H5	H3	.5084	.5152	.5135
9/16	—	18	H5	H3	.5264	.5323	.5308
5/8	11	—	H5	H3	.5660	.5732	.5714
5/8	—	18	H5	H3	.5889	.5949	.5934
3/4	10	—	H5	H5	.6850	.6927	.6907
3/4	—	16	H5	H3	.7094	.7159	.7143
7/8	9	—	H6	H4	.8028	.8110	.8089
7/8	—	14	H6	H4	.8286	.8356	.8339
1	8	—	H6	H4	.9188	.9276	.9254
1	—	12	H6	H4	.9459	.9535	.9516

* Note: In cast iron applications we recommend style 1600 (H5 limit) for class 2B fit.

Metric Sizes for Class 6H

Thread Size Nominal Dia. (mm)	Thread Size Pitch (mm)	Internal Thread-Class 6H (Inches) Minor Dia. Min.	Minor Dia. Max.	Pitch Dia. Min.	Pitch Dia. Max.	Recommended Tap Major Dia.	Tap Size	Limit Number
1.6	0.35	.0481	.0520	.0541	.0574	.0630	M1.6 x 0.35	D-3
2	0.4	.0617	.0661	.0686	.0720	.0788	M2 x 0.4	D-3
2.5	0.45	.0793	.0841	.0870	.0906	.0985	M2.5 x 0.45	D-3
3	0.5	.0969	.1023	.1054	.1092	.1182	M3 x 0.5	D-3
3.5	0.6	.1123	.1185	.1225	.1268	.1378	M3.5 x 0.6	D-4
4	0.7	.1277	.1347	.1396	.1442	.1575	M4 x 0.7	D-4
4.5	0.75	.1452	.1526	.1580	.1626	.1772	M4.5 x 0.75	D-4
5	0.8	.1628	.1706	.1764	.1812	.1969	M5 x 0.8	D-4
6	1.0	.1936	.2028	.2107	.2165	.2363	M6 x 1	D-5
7	1.0	.2330	.2422	.2500	.2559	.2756	M7 x 1	D-5
8	1.25	.2617	.2721	.2830	.2892	.3150	M8 x 1.25	D-5
10	1.5	.3298	.3415	.3554	.3624	.3937	M10 x 1.5	D-6
12	1.75	.3979	.4110	.4277	.4355	.4725	M12 x 1.75	D-6
14	2.0	.4660	.4807	.5001	.5083	.5512	M14 x 2	D-7
16	2.0	.5447	.5594	.5788	.5871	.6300	M16 x 2	D-7
20	2.5	.6809	.6985	.7235	.7322	.7875	M20 x 2.5	D-7
24	3.0	.8171	.8366	.8682	.8785	.9449	M24 x 3	D-8
30	3.5	1.0320	1.0539	1.0917	1.1026	1.1812	M30 x 3.5	D-9
36	4.0	1.2469	1.2704	1.3151	1.3268	1.4174	M36 x 4	D-9

Forming Type Taps Machine Screw and Fractional Sizes

Tap Size UNC-NF	Basic P.D.	Tap Recommendations For Class 2B Fit Styles	Tap Recommendations For Class 2B Fit Max. PD. Thread	Tap Recommendations For Class 3B Fit Styles	Tap Recommendations For Class 3B Fit Max. PD. Thread	Oversize Forming Taps Styles	Oversize Forming Taps Max. PD. Thread
0-80	.0519	—	—	H-2	.0536	—	—
1-64	.0629	—	—	H-2	.0648	—	—
1-72	.0640	—	—	H-2	.0659	—	—
2-56	.0744	H-3	.0772	H-2	.0765	—	—
2-64	.0759	H-3	.0786	H-2	.0779	—	—
3-48	.0855	H-3	.0885	H-2	.0877	—	—
3-56	.0874	H-3	.0902	H-2	.0895	—	—
4-40	.0958	H-5	.0991	H-3	.0982	—	—
4-48	.0985	H-5	.1016	H-3	.1008	—	—
5-40	.1088	H-5	.1121	H-3	.1113	—	—
5-44	.1102	H-5	.1134	H-3	.1126	—	—
6-32	.1177	H-5	.1214	H-3	.1204	—	—
6-40	.1218	H-5	.1252	H-3	.1243	—	—
8-32	.1437	H-5	.1475	H-3	.1465	—	—
8-36	.1460	H-5	.1496	H-3	.1487	—	—

Tap Size UNC-NF	Basic P.D.	Tap Recommendations For Class 2B Fit Styles	Tap Recommendations For Class 2B Fit Max. PD. Thread	Tap Recommendations For Class 3B Fit Styles	Tap Recommendations For Class 3B Fit Max. PD. Thread	Oversize Forming Taps Styles	Oversize Forming Taps Max. PD. Thread
10-24	.1629	H-6	.1672	H-4	.1661	—	—
10-32	.1697	H-6	.1736	H-4	.1762	—	—
12-24	.1889	H-6	.1933	H-4	.1922	—	—
12-2 8	.1928	H-6	.1970	H-4	.1959	—	—
1/4-20	.2175	H-6	.2223	H-4	.2211	H-8	.2215
1/4-28	.2268	H-6	.2311	H-4	.2300	H-8	.2308
5/16-18	.2764	H-7	.2817	H-5	.2803	H-9	.2809
5/16-24	.2854	H-7	.2902	H-5	.2890	H-9	.2899
3/8-16	.3344	H-7	.3401	H-5	.3387	H-9	.3389
3/8-24	.3479	H-7	.3528	H-5	.3516	H-9	.3524
7/16-14	.3911	H-8	.3972	H-5	.3957	—	—
7/16-20	.4050	H-8	.4104	H-5	.4091	—	—
1/2-13	.4500	H-8	.4565	H-5	.4548	H-10	.4550
1/2-20	.4675	H-8	.4731	H-5	.4717	H-10	.4725

UNIFIED SCREW THREAD LIMITS

Diameter - Pitch Combinations for Class of Fit

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
0–80 UNF	2B	.0465	.0514	.0519	.0542	.0600
—	3B	.0465	.0514	.0519	.0536	.0600
1–64 UNC	2B	.0561	.0623	.0629	.0655	.0730
—	3B	.0561	.0623	.0629	.0648	.0730
1–72 UNF	2B	.0580	.0635	.0640	.0665	.0730
—	3B	.0580	.0635	.0640	.0659	.0730
2–56 UNC	2B	.0667	.0737	.0744	.0772	.0860
—	3B	.0667	.0737	.0744	.0765	.0860
2–64 UNF	2B	.0691	.0753	.0759	.0786	.0860
—	3B	.0691	.0753	.0759	.0779	.0860
3–48 UNC	2B	.0764	.0845	.0855	.0885	.0990
—	3B	.0764	.0845	.0855	.0877	.0990
3–56 UNF	2B	.0797	.0865	.0874	.0902	.0990
—	3B	.0797	.0865	.0874	.0895	.0990
4–40 UNC	2B	.0849	.0939	.0958	.0991	.1120
—	3B	.0849	.0939	.0958	.0982	.1120
4–48 UNF	2B	.0894	.0968	.0985	.1016	.1120
—	3B	.0894	.0968	.0985	.1008	.1120
5–40 UNC	2B	.0979	.1062	.1088	.1121	.1250

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
—	3B	.0979	.1062	.1088	.1113	.1250
5–44 UNF	2B	.1004	.1079	.1102	.1134	.1250
—	3B	.1004	.1079	.1102	.1126	.1250
6–32 UNC	2B	.1040	.1140	.1177	.1214	.1380
—	3B	.1040	.1140	.1177	.1204	.1380
6–40 UNF	2B	.1110	.1190	.1218	.1252	.1380
—	3B	.1110	.1186	.1218	.1243	.1380
8–32 UNC	2B	.1300	.1390	.1437	.1475	.1640
—	3B	.1300	.1389	.1437	.1465	.1640
8–36 UNF	2B	.1340	.1420	.1460	.1496	.1640
—	3B	.1340	.1416	.1460	.1487	.1640
10–24 UNC	2B	.1450	.1560	.1629	.1672	.1900
—	3B	.1450	.1555	.1629	.1661	.1900
10–32 UNF	2B	.1560	.1640	.1697	.1736	.1900
—	3B	.1560	.1641	.1697	.1726	.1900
12–24 UNC	2B	.1710	.1810	.1889	.1933	.2160
—	3B	.1710	.1807	.1889	.1922	.2160
12–28 UNF	2B	.1770	.1860	.1928	.1970	.2160
—	3B	.1770	.1857	.1928	.1959	.2160

Fractional Sizes

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
1/4–20 UNC	1B	.1960	.2070	.2175	.2248	.2500
—	2B	.1960	.2070	.2175	.2224	.2500
—	3B	.1960	.2067	.2175	.2211	.2500
1/4–28 UNF	1B	.2110	.2200	.2268	.2333	.2500
—	2B	.2110	.2200	.2268	.2311	.2500
—	3B	.2110	.2190	.2268	.2300	.2500
5/16–18 UNC	1B	.2520	.2650	.2764	.2843	.3125
—	2B	.2520	.2650	.2764	.2817	.3125
—	3B	.2520	.2630	.2764	.2803	.3125
5/16–24 UNF	1B	.2670	.2770	.2854	.2925	.3125
—	2B	.2670	.2770	.2854	.2902	.3125
—	3B	.2670	.2754	.2854	.2890	.3125
3/8–16 UNC	1B	.3070	.3210	.3344	.3429	.3750
—	2B	.3070	.3210	.3344	.3401	.3750
—	3B	.3070	.3182	.3344	.3387	.3750

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
3/8–24 UNF	1B	.3300	.3400	.3479	.3553	.3750
—	2B	.3300	.3400	.3479	.3528	.3750
—	3B	.3300	.3372	.3479	.3516	.3750
7/16–14 UNC	1B	.3600	.3760	.3911	.4003	.4375
—	2B	.3600	.3760	.3911	.3972	.4375
—	3B	.3600	.3717	.3911	.3957	.4375
7/16–20 UNF	1B	.3830	.3950	.4050	.4131	.4375
—	2B	.3830	.3950	.4050	.4104	.4375
—	3B	.3830	.3916	.4050	.4091	.4375
1/2–13 UNC	1B	.4170	.4340	.4500	.4597	.5000
—	2B	.4170	.4340	.4500	.4565	.5000
—	3B	.4170	.4284	.4500	.4548	.5000
1/2–20 UNF	1B	.4460	.4570	.4675	.4759	.5000
—	2B	.4460	.4570	.4675	.4731	.5000
—	3B	.4460	.4537	.4675	.4717	.5000

Metric Sizes (ANSA B1.13M-1983) All dimensions are in millimeters.

Basic Thread Discription	Tol. Class	Minor Diameter		Pitch Diameter			Major Diameter Min.	
		Min.	Max.	Min.	Max.	Tol.	Min.	Max.
M1.6 x 0.35	6H	1.221	1.321	1.373	1.458	.085	1.600	1.736
M2 x 0.4	6H	1.567	1.679	1.740	1.830	.090	2.000	2.148
M2.5 x 0.45	6H	2.013	2.138	2.208	2.303	.095	2.500	2.660
M3 x 0.5	6H	2.459	2.599	2.675	2.775	.100	3.000	3.172
M3.5 x 0.6	6H	2.850	3.010	3.110	3.222	.112	3.500	3.699
M4 x 0.7	6H	3.242	3.422	3.545	3.663	.118	4.000	4.219
M5 x 0.8	6H	4.134	4.334	4.480	4.605	.125	5.000	5.240
M6 x 1	6H	4.917	5.153	5.350	5.500	.150	6.000	6.294
M8 x 1.25	6H	6.647	6.912	7.188	7.348	.160	8.000	8.340

Basic Thread Discription	Tol. Class	Minor Diameter		Pitch Diameter			Major Diameter Min.	
		Min.	Max.	Min.	Max.	Tol.	Min.	Max.
M8 x 1	6H	6.917	7.153	7.350	7.500	.150	8.000	8.294
M10 x 1.5	6H	8.376	8.676	9.026	9.206	.180	10.000	10.396
M10 x 1.25	6H	8.647	8.912	9.188	9.348	.160	10.000	10.340
M10 x 0.75	6H	9.188	9.378	9.513	9.645	.132	10.000	10.240
M12 x 1.75	6H	10.106	10.441	10.863	11.063	.200	12.000	12.453
M12 x 1.5	6H	10.376	10.676	11.026	11.216	.190	12.000	12.406
M12 x 1.25	6H	10.647	10.912	11.188	11.368	.180	12.000	12.360
M12 x 1	6H	10.917	11.153	11.350	11.510	.160	12.000	12.304

*Internal Thread Minor Diameter Tolerances. Internal thread minor diameter tolerances are based on a length of engagement equal to the nominal diameter. For general applications these tolerances are suitable for lengths of engagement up to 1-1/2 diameters. However, some thread applications have lengths of engagement which are greater than 1-1/2 diameters or less than the nominal diameter. For such applications it may be advantageous to increase or decrease the tolerance, respectively.

TAPPING SPEEDS

Conventional Table (Surface Feet Per Minute to Revolutions Per Minute)

Tap Sizes		Surface Feet Per Minute																	
		5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
UNC/ UNF	Pipe	Revolutions Per Minute																	
0	—	318	637	955	1273	1592	1910	2546	3183	3820	4456	5093	5729	6366	7003	7639	8276	8913	9549
1	—	273	546	819	1046	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6805	7326	7849
2	—	212	424	637	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
3	—	191	382	573	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
4	—	174	347	521	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5116
5	—	147	294	441	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
6	—	136	273	409	553	691	829	1106	1382	1659	1935	2212	2488	2766	3042	3318	3595	3871	4148
8	—	119	239	358	466	583	699	932	1165	1398	1631	1864	2097	2330	2563	2796	3029	3262	3495
10	—	101	201	302	402	502	603	804	1005	1205	1406	1607	1808	2009	2210	2411	2612	2813	3014
12	—	87	174	260	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4	—	76	153	229	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16	—	62	123	185	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8	—	50	101	151	204	255	305	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	1/8	43	87	130	175	219	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
1/2	—	38	76	115	153	191	229	305	382	458	535	611	688	764	840	917	993	1070	1146
9/16	1/4	34	68	102	137	172	206	274	342	410	478	547	616	683	752	820	888	952	1020
5/8	—	32	64	96	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
11/16	3/8	28	55	83	111	138	167	222	278	333	389	444	500	556	611	667	722	778	833
3/4	—	25	51	76	102	128	153	203	255	305	357	407	458	509	560	611	662	713	764
7/8	1/2	22	43	65	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1	—	19	38	57	76	96	115	153	191	230	268	305	344	382	420	458	497	535	573
1-1/8	3/4	17	34	51	68	84	102	136	170	204	238	272	306	340	373	407	441	475	509
1-1/4	—	15	31	46	61	76	92	122	153	183	214	244	275	305	336	367	397	428	458
1-3/8	1	14	28	42	56	69	83	111	139	167	194	222	250	278	306	333	361	389	417
1-1/2	—	13	25	38	51	63	76	102	127	153	178	204	229	255	280	305	331	356	382
1- 5/8	—	12	23	35	47	59	71	94	118	141	165	188	212	235	259	282	306	329	353
1-3/4	—	11	22	33	44	55	65	87	109	131	153	175	196	218	240	262	284	306	327
1-7/8	—	10	20	30	41	51	61	81	102	122	143	163	183	204	224	244	265	285	306
2	—	9	19	29	38	48	57	76	96	115	134	153	172	191	210	229	248	267	287

Metric Sizes

Tap Sizes	Surface Feet Per Minute																	
	5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
Metric	Revolutions Per Minute																	
M 1	490	979	1469	1959	2449	2938	3918	4897	5877	6856	7836	8815	9795	10774	11754	12733	13713	14692
M 2	242	484	725	967	1209	1451	1934	2418	2901	3385	3868	4352	4835	5319	5803	6286	6770	7253
M 3	162	324	486	647	809	971	1295	1619	1942	2266	2590	2914	3237	3561	3885	4208	4532	4856
M 3.5	138	277	415	554	692	830	1107	1384	1661	1938	2214	2491	2768	3045	3322	3599	3875	4152
M 4	122	243	365	487	608	730	973	1217	1460	1703	1946	2190	2433	2676	2920	3163	3406	3650
M 5	97	194	291	388	485	582	776	970	1163	1357	1551	1745	1939	2133	2327	2521	2715	2909
M 6	81	162	243	324	405	486	647	809	971	1133	1295	1457	1619	1781	1942	2104	2266	2428
M 7	69	138	208	277	346	415	554	692	830	969	1107	1246	1384	1522	1661	1799	1938	2076
M 8	61	121	182	243	303	364	485	606	728	849	970	1091	1213	1334	1455	1577	1698	1819
M 10	48	97	145	194	242	291	388	485	582	679	776	873	970	1067	1163	1260	1357	1454
M 12	40	81	121	162	202	243	324	405	486	567	647	728	809	890	971	1052	1133	1214
M 14	35	69	104	139	173	208	277	347	416	485	555	624	693	763	832	901	971	1040
M 16	30	61	91	121	152	182	243	303	364	424	485	546	606	667	728	788	849	910
M 18	27	54	81	108	135	162	216	269	323	377	431	485	539	593	647	700	754	808
M 20	24	49	73	97	121	146	194	243	291	340	388	437	485	534	582	631	680	728
M 22	22	44	66	88	110	132	176	221	265	309	353	397	441	485	529	573	618	662
M 24	20	40	61	81	101	121	162	202	243	283	323	364	404	445	485	526	566	606
M 27	18	36	54	72	90	108	144	180	216	252	287	323	359	395	431	467	503	539
M 30	16	32	49	65	81	97	129	162	194	226	259	291	323	356	388	420	453	485

Typical Tapping Problems

Problem	*Cause*	*Solution*
DIMENSIONAL ACCURACY		
Oversize Pitch Diameter		
	Incorrect Tap	1. Use correct H limit 2. Use longer chamfered taps 3. Consider less free cutting NR style
	Chip packing	1. Use spiral pointed or spiral fluted taps 2. Reduce number of flutes to create extra chip space 3. Use larger drill size 4. In blind hole applications, allow deeper holes where applicable or shorten the thread length of the parts 5. Use recommended lubricant
	Galling	1. Apply surface treatment such as steam oxide, TiN, TiCN or CrN 2. Use recommended lubricant 3. Reduce tapping speed 4. Use correct tap for the material being tapped
	Operating Conditions	1. Ensure correct tapping speeds to avoid torn threads 2. Check alignment of tap and drilled hole 3. Use lead screw tapper 4. Use tapping machine with adequate horsepower 5. Check misalignment of tap and drilled hole due to loose spindle or worn holder
	Tool Condition	1. Check accuracy of chamfer lead grinding 2. Ensure correct cutting angles 3. Land widths too narrow 4. Check burrs from regrinding not present
Oversize Internal Diameter		
	Hole Size	1. Use smaller drill size 2. Avoid tapered hole 3. Use taps with correct chamfer
	Galling	See solutions prescribed under Oversize Pitch Diameter
Undersized Pitch Diameter		
	Incorrect Tap	1. Use oversize taps » For cutting materials such as copper alloy, aluminum alloy and cast iron » For cutting tubing which will have “spring back” action after tapping 2. Use taps with correct chamfer angle 3. Use taps with higher cutting angle
	Damaged Thread	Use proper reversing speed to avoid damaging tapped thread on the existing hole
	Leftover Chips	1. Improve operating conditions to eliminate leftover chips in the hole 2. Remove left over chips prior to gage checking
Undersized Internal Diameter		
	Hole Size	Use larger drill size
SURFACE FINISH		
Torn or Rough Threads		
	Dull Tap	Resharpen
	Chamfer too short	Increase chamfer length
	Incorrect rake angle	Use correct rake angle suitable for material tapped
	Galling	1. Use thread relieved taps 2. Reduce land width 3. Apply surface treatment such as steam oxide, TiN, or chrome 4. Use recommended lubricant 5. Reduce tapping speed 6. Use larger drill size 7. Check alignment between tap and hole

Technical Section - Threading

Problem	*Cause*	*Solution*
	Chip Packing	1. Use spiral pointed or spiral fluted taps 2. Use larger drill size
Chattering on Tapped Thread		
	Too Positive	1. Use lower rake angle 2. Reduce amount of thread relief - consider NR style 3. Use taps with wider land
	Tool Condition	Use taps with wider land
TOOL LIFE		
Breakage		
	Incorrect Tap Selection	1. Tapping too deep. Avoid chip packing in the flutes or bottom of the hole. Use spiral pointed, spiral fluted or cold forming tap. 2. Use correct surface treatment such as steam oxide, TiN, TiCN or CrN
	Excessive Tapping Torque	1. Hole too small - use correct size drill 2. Shorten thread length 3. Increase rake angle 4. Use a tap with more thread relief and reduced land width 5. Use spiral pointed or spiral fluted taps
	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and the hole and tapered hole 3. Use floating type of tapping holder 4. Use tapping holder with torque adjustment 5. Avoid hitting bottom of the hole
	Tool Condition	1. Use taps with wider land width 2. Remove all worn sections when regrinding the flutes 3. Regrind tool more frequently
Chipping		
	Incorrect Tap Selection	1. Use tap with lower rake angle 2. Consider different tool steel 3. Reduce hardness of the tap 4. Increase chamfer length 5. Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps
	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and hole 3. Avoid sudden reverse in blind hole tapping 4. Avoid galling 5. Use larger drill size 6. Ensure adequate lubricant 7. Check for hard spots in the workpiece
Excessive Wear		
	Incorrect Tap Selection	1. Consider specially designed taps 2. Change to an Applix style of tap made from PM material 3. Apply special surface treatment such as steam oxide, TiN, TiCN or CrN 4. Increase chamfer length
	Operating Conditions	1. Reduce tapping speed 2. Apply adequate lubrication 3. Avoid work hardening the material being tapped 4. Use larger drill size
	Tool Condition	1. Ensure correct rake angle 2. Minimize heat in grinding process to avoid de-tempering

Technical Tips on Threading with Dies

1. Before starting the die or dienut, chamfer the end of the bar at an angle of 45 degrees to eliminate sudden loading of the leading edges. Ensure the die or dienut is presented to the bolt squarely.

2. Make use of the large tolerances associated with the major diameter of the bolt, by reducing the diameter of the bar (see below). This will reduce the cutting force to a minimum.

3. Use the gun nose type of die, as this ensures the chips are directed away from the cutting area.

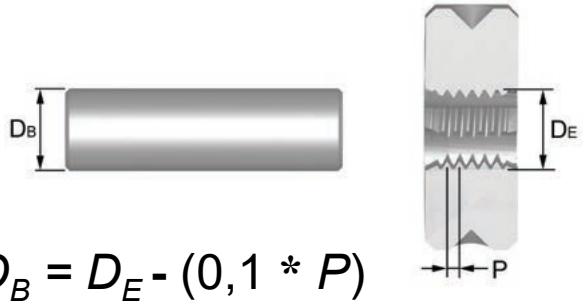
4. Ensure a good supply of the correct lubricant is aimed at the cutting area.

5. When adjusting split dies, avoid opening out as this will cause rubbing. Split dies may be closed down by approximately 0.15mm, by turning the adjustment screws equally. Pressure on one side of the die only may cause breakage.

6. Generally speaking, dienuts are used for reclaiming or cleaning out existing threads by hand. They tend to be of a more robust construction and should only be used in exceptional circumstances to cut a thread from solid.

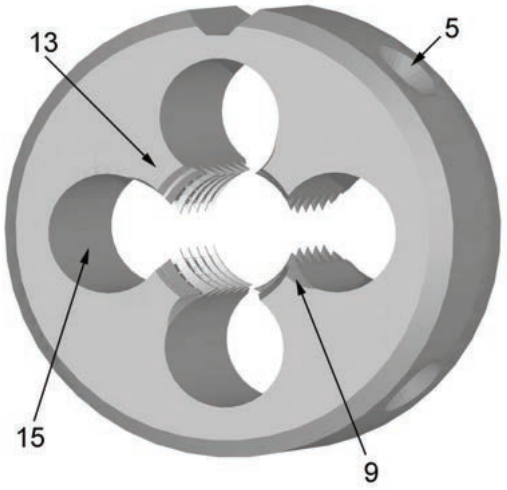
Pre-machining Dimensions

The diameter of the bolt blank must be smaller than the max. external diameter of the screw thread.

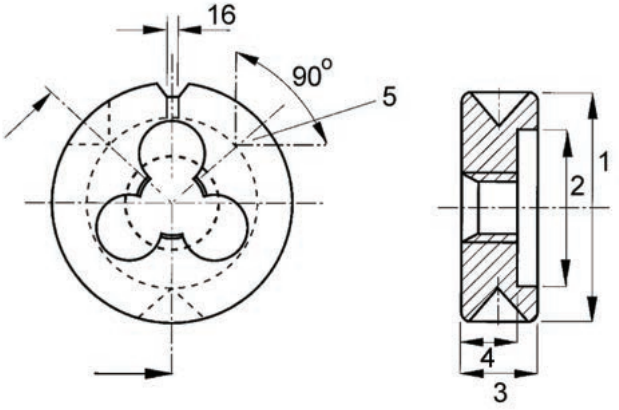


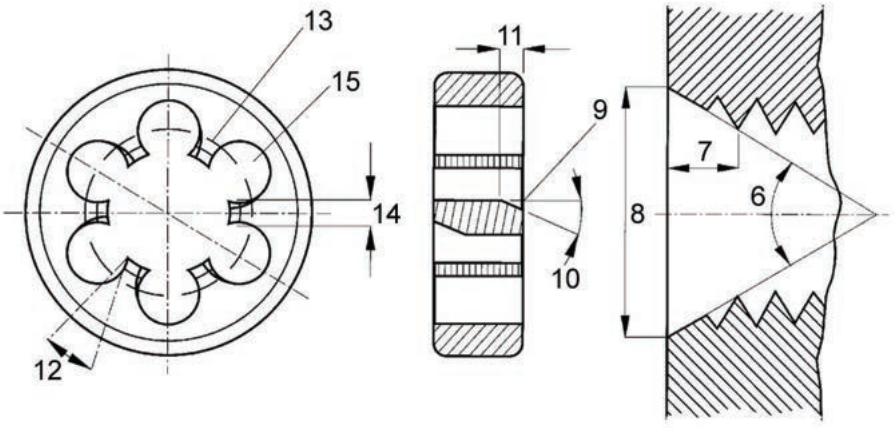
$$D_B = D_E - (0{,}1 * P)$$

DieDefinitions/Nomenclature



1 Outside Diameter
2 Recess Diameter
3 Thickness
4 Thread Length
5 Conical Hole for Fixing Screw
6 Chamfer Angle
7 Chamfer Length
8 Chamfer Diameter
9 Gun-nose
10 Spiral Angle
11 Spiral Length
12 Rake Angle
13 Land
14 Width of Land
15 Clearance Hole
16 Split of Adjustment

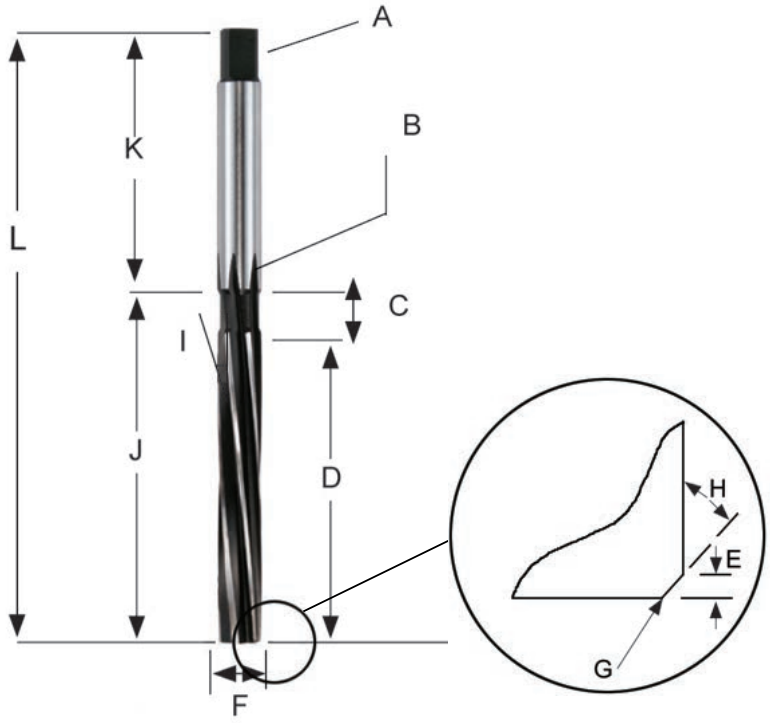




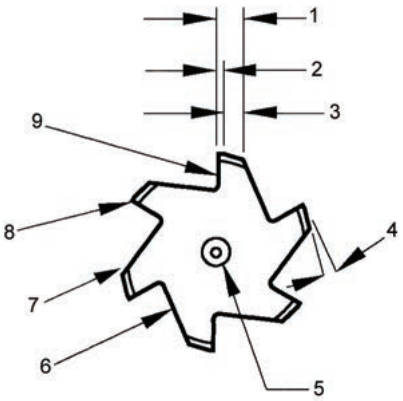
Trouble Shooting When Threading With Dies

Problem	*Cause*	*Solution*
Oversize / Undersize		
	Misalignment	Correct alignment, ensure cleanliness
	Incorrect axial feed rate	Ensure axial feed rate is controlled accurately
Poor finish		
	Incorrect rake angle for the material	Try alternative dies or special die
	Incorrect/lack of lubricant	See lubricants section
	Incorrect speed	Follow recommendations in Catalog
	Bar diameter too large	Reduce to appropriate size
	Bar end not chamfered	Ensure bar end is chamfered
Chipping / Breakage		
	Wrong type of die	Follow recommendations in Catalog
	Speed too high	Follow recommendations in Catalog
	Bar diameter too large	Reduce to appropriate size
	Bar end not chamfered	Ensure bar end is chamfered
	Misalignment	Correct alignment, ensure cleanliness
Rapid wear		
	Incorrect/lack of lubricant	See lubricants section
	Speed too high	Follow recommendations in Catalog
Built up edge		
	Incorrect/lack of lubricant	See section lubricants
	Bar diameter too large	Reduce to appropriate size
	Speed too low	Follow recommendations in Catalog

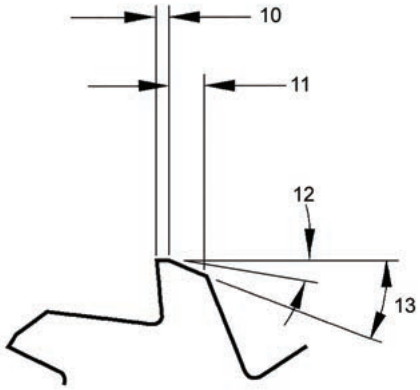
Reamer Definitions / Nomenclature



A Tang
B Recess
C Recess Length
D Cut Length
E Bevel Lead Length
F Diameter
G Bevel Lead
H Bevel Lead Angle
I Helix Angle
J Body Length
K Shank Length
L Overall Length



1 Width of Land
2 Circular Land
3 Clearance
4 Clearance Angle
5 Centre Hole
6 Flute
7 Heel
8 Cutting Edge
9 Face



10 Width of Primary Clearance

11 Width of Secondary Clearance

12 Primary Clearance Angle

13 Secondary Clearance Angle

Technical Tips On Reaming

To obtain the best results when using reamers it is essential to make them 'work'. It is a common fault to prepare holes for reaming with too little stock left in. If insufficient stock is left in the hole before reaming, then the reamer will rub, quickly show wear and will result in loss of diameter. It is equally important for performance not to leave too much stock in the hole. (See Stock Removal on next page).

1. Select the optimum type of reamer and the optimum speeds and feeds for the application. Ensure that pre-drilled holes are the correct diameter.

2. The workpiece must be held rigid and the machine spindle should have no play.

3. The chuck in which a straight shank reamer is held must be good quality. If the reamer slips in the chuck and the feed is automatic, breakage of the reamer may occur.

4. When driving a Morse Taper Shank reamer into a socket, sleeve or machine spindle, always use a soft faced hammer. Make sure there is a good fit between the reamer shank and the sleeve or socket otherwise misalignment will occur and the reamer may cut oversize.

5. Keep tool overhang from machine spindle to a minimum.

6. Use recommended lubricants to enhance the life of the reamer and ensure the fluid reaches the cutting edges. As reaming is not a heavy cutting operation, soluble oil 40:1 dilution is normally satisfactory. Air blasting may be used with grey cast iron, if dry machining.

7. Do not allow the flutes of a reamer to become blocked with chips.

8. Before the reamer is reground, check concentricity between centers. In most instances only the bevel lead will need regrinding.

9. Keep reamers sharp. Frequent regrinding is good economy, but it is important to understand that reamers cut only on the bevel and taper leads and not on the lands. Consequently only these leads need regrinding. Accuracy of regrinding is important to hole quality and tool life.

Hand / Machine Reamers

Although both hand and machine reamers offer the same capability regarding finished hole size, the use of each must be considered according to application. A hand reamer, for reasons of alignment, has a long taper lead, whereas a machine reamer has only a 45 degree bevel lead. A machine reamer cuts only on the bevel lead, a hand reamer cuts on the bevel lead and also on the taper lead.

Applications

The results obtained in reaming are to a great extent dependent upon the condition of the drilled hole. If deep scores or form deviations are inherent in the hole, reaming is probably not going to rectify these inaccuracies or produce a finish within tolerance requirements. A reamer can also be mounted in a floating holder with enough clearance to permit the reamer to move freely along the existing hole.

Suggested Stock Removal

Material ≥	Core-Drilled Hole Diameter (inches)					
	5/32	> 5/32 – 3/8	> 3/8 – 5/8	> 5/8 – 1	> 1 – 1-1/2	> 1-1/2 – 2-1/2
Steel* Hard cast-iron	.004	.004 – .008	.006 – .010	.008 – .014	.010 – .018	.016 – .025
Soft cast-iron Light alloys* Copper, soft Copper, alloys	.005	.005 – .012	.008 – .016	.010 – .020	.016 – .024	.024 – .031
Plastics (Duro plastics)	.007	.007 – .012	.010 – .016	.013 – .020	.016 – .024	.020 – .031

* For soft materials and quick spiral machine reamers add 50% of allowance.

Table of Speeds and Feeds

Type of Material	Speed Range (sfm) HSS	Speed Range (sfm) Carbide	Type of Feed
Magnesium	200 – 400	500 – 1000	M-H
Aluminum	150 – 300	500 – 1000	M-H
Brass and Bronze – Free Mach.	125 – 200	250 – 400	M
– Tough	75 – 125	150 – 250	M
Copper and Hard Bronze	50 – 75	100 – 150	L
Cast Iron – Soft (Ferritic)	50 – 100	150 – 250	H
– Medium (Pearlitic)	25 – 50	75 – 150	L-M
– Hard (Mart. or Acicular)	15 – 25	50 – 75	L
Steel – Under 200 BHN	55 – 80	200 – 300	M-H
– 200 - 300 BHN	30 – 55	125 – 200	M
– 300 - 400 BHN	20 – 30	50 – 125	L
– 400 - 500 BHN	10 – 20	35 – 50	L
– 500 - BHN Plus	—	15 – 35	L
Stainless – Free Mach. and 400 Ann.	40 – 60	150 – 250	M
– 300 Series	20 – 30	80 – 120	M
– P.H. and H.T. 400 series	15 – 25	60 – 100	L-M
High Temp Alloy – Nickel Base	10 – 20	40 – 70	L
– Cobalt Base	10 – 15	30 – 45	L
Titanium – Pure	35 – 50	50 – 100	M
– Alloys	10 – 20	35 – 50	L-M

Diameter Range	Feed (ipr) for Diameter Range Light (L)	Medium (M)	Heavy (H)
≥ 1/16”	.0002” – .001”	.0005” – .002”	.001” – .003”
> 1/16” – 1/8”	.001” – .002”	.002” – .004”	.003” – .006”
> 1/8” – 1/4”	.002” – .004”	.004” – .006”	.006” – .010”
> 1/4” – 1/2”	.004” – .006”	.006” – .010”	.010” – .015”
> 1/2” – 1”	.006” – .010”	.010” – .020”	.015” – .030”
> 1”	.010” – .020”	.020” – .040”	.030” – .050”

Technical Section - Reaming

Application Reamers

As with most cutting tools, the substrate and geometric configuration of reamers differs, dependent on the material they are intended to cut. As such, care should be taken to ensure that the correct choice of reamer is made.

CNC reamers are manufactured with a shank tolerance of h6. This enables the reamer to be used in hydraulic and heat shrink tool holding systems, offering enhanced accuracy and concentricity.

Adjustable Reamers

Several types of adjustable reamers are available, all offering varying degrees of diameter adjustment. It is an important aspect of adjustable reamers to follow this set procedure:

- Adjust the reamer to the required diameter.
- Check the reamer between centers for concentricity and lip height variation.
- If required, grind the reamer to eliminate any eccentricity or lip height variation.
- Re-check the diameter.

Stock Removal

The recommended stock removal in reaming is dependent on the application material and the surface finish of the pre-drilled hole. General guidelines for stock removal are shown in the following tables:

Size of reamed hole (mm)	When pre-drilled	When pre-core-drilled
Below 4	0.1	0.1
Over 4 to 11	0.2	0.15
Over 11 to 3	0.3	0.2
Over 39 to 50	0.4	0.3

Size of reamed hole (inches)	When pre-drilled	When Pre-core-drilled
Below 3/16	0.004	0.004
3/16 to ½	0.008	0.006
½ to 1. ½	0.010	0.008
1. ½ to 2	0.016	0.010

Selection Of Reamer Types

Reaming is a recognized method of producing dimensionally accurate holes of fine surface finish. Dormer offers a range of reamers for producing holes to H7 tolerance.

Reamers are classified into various types:

- Solid - available in two shank types, Straight (cylindrical) and Morse Taper.
- Shell - for use on arbors.
- Expanding - with adjustable HSS blades and used for light work.

Applications - Reamer Selection

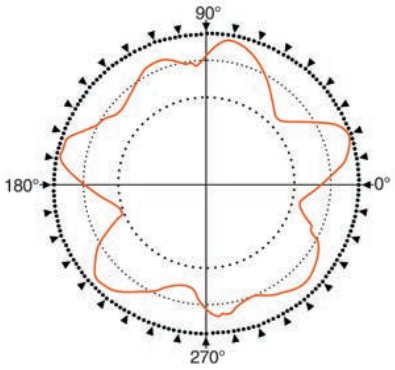
The most common types of reamers have a left-hand spiral because the main applications involve through holes requiring chips to be pushed forward. For blind holes, reamers with straight flutes or right hand spirals are recommended.

The most efficient reaming conditions depend on the application, material, quality of hole required, stock removal, lubrication and other factors. A general guide to surface speeds and feeds for machine reamers is shown in the reamer AMG and feed charts (see Dormer catalogue or Product Selector) and stock removal tables.

Extremely unequal spacing on reamers means that the divide is not the same for each tooth. As there are no two teeth diametrically opposite each other, the reamer produces a hole with a roundness variance of between 1 and 2 µm. This compared with a variance of up to 10µm with unequal spacing.

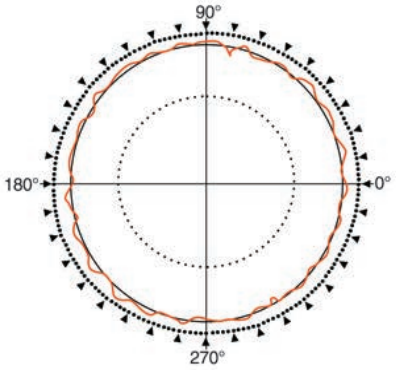
Carbide Reamers - Comparison spacing / EU spacing

unequal spacing
roundness error up to 10 µm



Results of roundness

extremely unequal spacing
roundness error up to 1 - 2 µm



Results of roundness

Trouble Shooting When Reaming

Problem — *Cause*	*Solution*
Broken or twisted tangs	
Incorrect fit between shank and socket	Ensure the shank and the socket are clean and free from damage
Rapid Tool Wear	
Insufficient stock to remove	Increase the amount of stock to be removed
Oversize Hole	
Excessive lip height variation	Regrind to correct specification
Displacement in the machine spindle	Repair and rectify spindle displacement
Defects on the tool holder	Replace tool holder
Tool shank is damaged	Replace or regrind the shank
Ovality of the tool	Replace or regrind the tool
Asymmetric bevel lead angle	Regrind to correct specification
Too high feed or cutting speed	Adjust cutting conditions in accordance with Catalog or Product Selector
Undersize hole	
Insufficient stock to remove	Increase the amount of stock to be removed
Too much heat generated while reaming. The hole widens and shrinks.	Increase coolant flow
The tool diameter is worn and is undersize.	Regrind to correct specification.
Too low feed or cutting speed	Adjust cutting conditions in accordance with the Dormer Product Selector.
Pre-drilled hole is too small	Decrease the amount of stock to be removed.
Oval and conical holes	
Displacement in the machine spindle	Repair and rectify spindle displacement
Misalignment between tool and hole	Use a bridge reamer
Asymmetric bevel lead angle	Regrind to correct specification
Bad Hole finish	
Excessive stock to remove	Decrease the amount of stock to be removed
Worn out tool	Regrind to specification
Too small cutting rake angle	Regrind to specification
Too diluted emulsion or cutting oil	Increase % concentration
Feed and/or speed too low	Adjust cutting conditions in accordance with Catalog/ Product Selector
Cutting speed too high	Adjust cutting conditions in accordance with Catalog/ Product Selector
The tool clamps and breaks	
Worn out tool	Regrind to correct specification
Back taper of the tool is too small	Check and replace / modify the tool
The width of the land is too wide	Check and replace / modify the tool
Workpiece material tend to squeeze	Use an adjustable reamer to compensate for the displacement
Pre-drilled hole is too small	Decrease the amount of stock to be removed
Heterogeneous material with hard inclusions	Use solid carbide reamer

General Hints On Counterboring and Countersinking

COUNTERBORING

The counterbore is an end cutting tool which is used to enlarge a preformed hole when a flat bottom is required or to spotface when a machine finish is required. It may have a fixed pilot (solid pattern) Fig.1 or be designed Fig.2 for an interchangeable pilot Fig. 3.

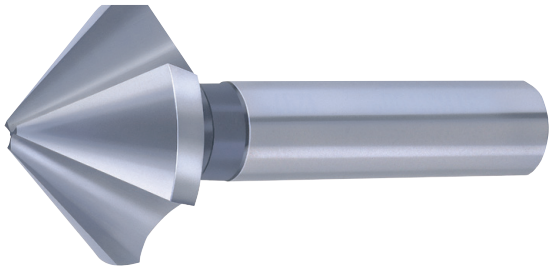
Fig.1

Fig.2

Fig. 3

COUNTERSINKING

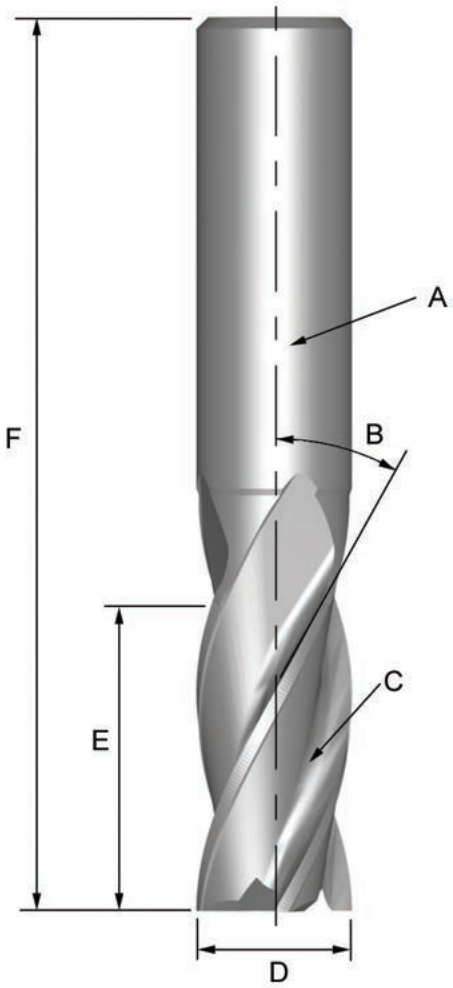
The countersink is an conical cutting tool, usually made with angular relief, having one or more flutes with specific size angle cutting edges. It is used for chamfering and countersinking holes. The countersink may have a straight shank, tapered shank, bit stock shank or special shank requiring a special holder, for holding in a power or hand operated machine.



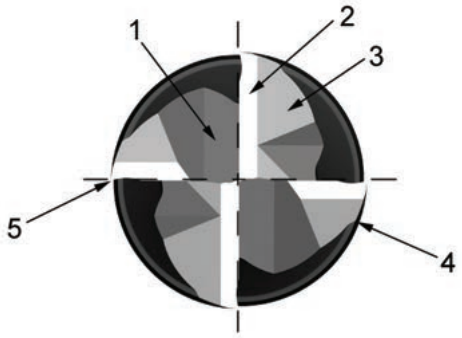
Trouble Shooting when Counterboring

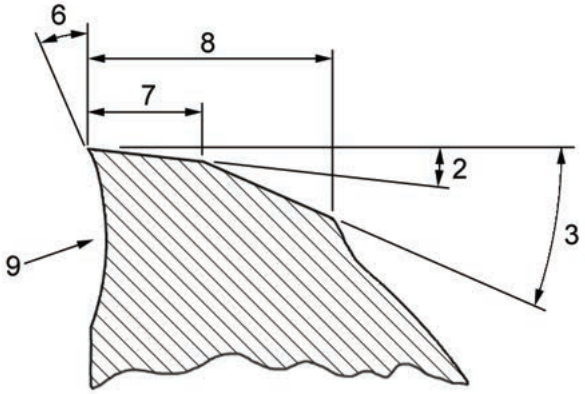
Problem / *Cause*	*Solution*
Excessive Cutting Edge Wear	
Incorrect feeds & speeds	Increase feed - especially when machining ductile or free machining materials. Also try reducing speed
Rough cutting edge	Lightly hone cutting edge with fine grit diamond hone
Insufficient coolant	Increase coolant flow - review type of coolant
Chipping	
Poor chip removal	Use tool with larger flute space - larger diameter or fewer flutes
Recutting work hardened chips	Increase coolant flow
Vibration	Increase rigidity of set-up, especially worn tool holders
Short Tool Life	
Excessive cratering	Increase speed or decrease feed
Abrasive material	Decrease speed and increase feed Increase coolant flow
Hard materials	Reduce speed - rigidity very important
Insufficient chip room	Use larger diameter tool
Delayed resharpening	Prompt resharpening to original geometry will increase tool life
Glazed Finish	
Feed too light	Increase feed
Dull cutting edge	Resharpen tool to original geometry
Insufficient clearance	Resharpen tool with more clearance
Rough Finish	
Dull cutting edge	Resharpen to original tool geometry
Wrong feeds & speeds	Increase speed - also try reducing feed
Chattering	
Insufficient machine horsepower	Use tool with fewer flutes as correct feeds & speeds must be maintained
Vibration	Resharpen tool with more clearance

Nomenclature



A Shank
B Helix Angle
C Flute
D Outside Diameter
E Cutting Length
F Overall Length





1 Gash
2 Primary Relief Angle
3 Secondary Relief Angle
4 Heel
5 Cutting Edge

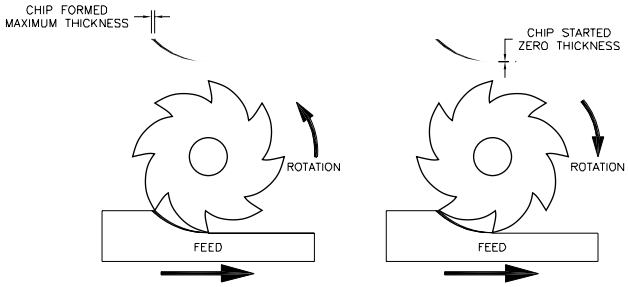
6 Rake Angle
7 Width of Primary Relief Land
8 Width of Secondary Relief Land
9 Undercut Face

MILLING EFFECTIVELY

Types Of Cuts

Climb Milling Versus Conventional Milling

CLIMB MILLING **CONVENTIONAL MILLING**



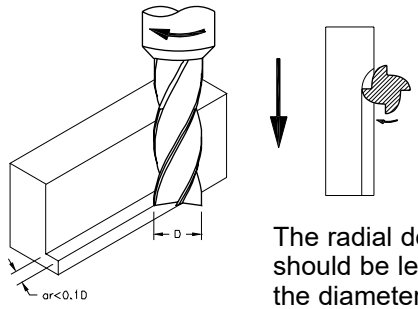
In conventional milling, the cutter revolves opposite to the direction of table feed. Therefore the width of the chip starts at zero and increases to a maximum at the end of the cut. This can lead to accelerated tool wear under some conditions. Conventional milling may be advantageous when milling hot rolled steel, surface hardened and steels with a surface scale.

In climb milling, the cutter revolves in the same direction as the table feed. The tooth meets the work at the top of the cut, producing the thickest part of the chip first. In horizontal applications the resultant force created by climb milling can act as a clamping force, acting towards the machine table.

It is important to make sure that the machine tool has no leadscrew backlash. Normally climb milling improves product surface finish and increases tool life.

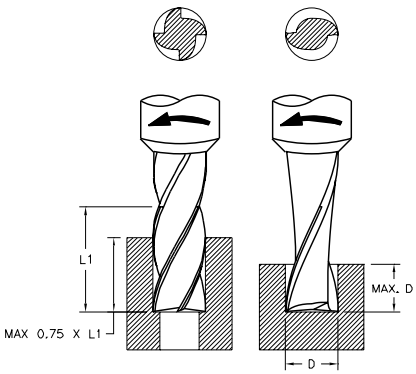
Peripheral Milling The milling of a surface which is parallel to the end mill axis.

Peripheral (Cylindrical, Slab) Milling



The radial depth of cut should be less than 0.1 of the diameter of the mill: $a_r < 0.1\ D$.

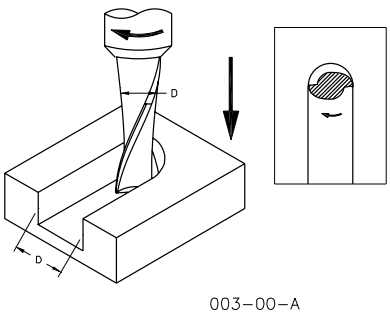
Plunge Milling The direct movement between the workpiece and the center line of the end mill when the end mill sinks directly into the workpiece.



In order to be able to "drill," i.e. mill with axial feed, an end mill must have an end face cutting edge that goes all the way to the center. An example of such a solid drilling operation is keyway milling in the middle of a shaft.

In boring, the depth of a hole may be up to 75% of the cutting edge length. In solid drilling, however, it should not exceed 0.5-1 D.

Slot Milling



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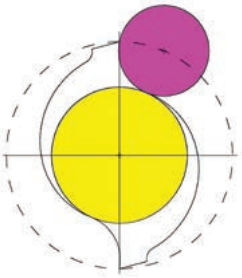
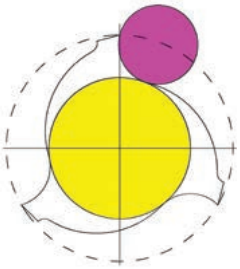
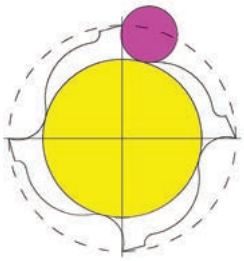
The radial depth of cut is equal to the diameter of the mill: $a_r = D$.

All slotting applications are a combination of conventional and climb milling. Refer to adjacent section.

FEATURES OF THE END MILL - CHOOSING THE NUMBER OF FLUTES

Number of flutes should be determined by:

- Milled material
- Dimension of workpiece
- Milling conditions

2 Flutes	3 Flutes	4 Flutes (or multi-flutes)
		
Flexural strength — Low ⟷ High		
Chip space — Big ⟷ Small		
• Large chip space. • Easy chip ejection. • Good for slot milling. • Good for heavy duty milling. • Less rigidity due to small section area. • Lower quality surface finish	• Chip space almost as large as for 2 flutes. • Larger section area - higher rigidity than 2 flutes • Improved surface finish	• Highest rigidity. • Largest section area – small chip space. • Gives best surface finish. • Recommended for profiling, side milling and shallow slotting.

FEATURES OF THE END MILL – HELIX ANGLE

Increasing the number of flutes makes the load on the single tooth more homogeneous and consequently, this allows for a better finish. But with a high helix angle, the load (FV) along the cutter axis is increased too. A high FV can give:

- Load problems on the bearings
- Cutter movement along the spindle axis. To avoid this problem it is necessary to use Weldon or screwed shanks.

Technical Section - Milling

DIRECTION OF USE OF THE CUTTER

We can split the range of the cutters in relationship to the possible working directions to the workpiece surface. There are three different types:

3 Directions	2 Directions	1 Direction

Please note that the axial direction is possible only with center cutting end mills.

MRR (MATERIAL REMOVAL RATE) Q

We can calculate material removal rate *Q* as the volume of material removed divided by the time taken to cut. The volume removed is the initial volume of the workpiece minus the final volume. The cutting time is the time needed for the tool to move through the length of the workpiece. This parameter strongly influences the finishing grade of the workpiece.

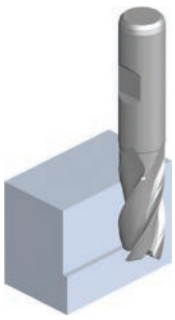
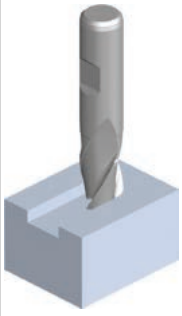
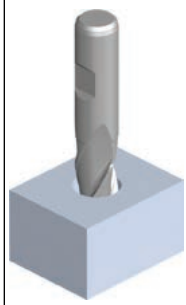
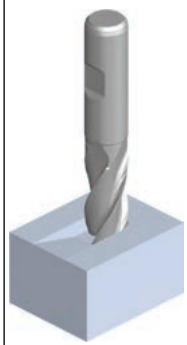
$$Q = \frac{a_p * a_e * v_f}{1000}$$

Q = MRR (cm^3/min) a_e = radial depth (mm)

a_p = axial depth (mm) v_f = feed rate mm/min

APPLICATIONS

The MRR and the applications are strongly related. For each different application we have a different MRR that increases with the engagement section of the cutter on the workpiece. The recent Dormer Catalogue was produced with simple icons that show the different applications.

Side Milling	Face Milling	Slot Milling	Plunge Milling	Ramping
				
The radial depth of cut should be less than 0.25 of the diameter of the end mill.	The radial depth of cut should be no more than 0.9 of the diameter, axial depth of cut less than 0.1 of the diameter.	Machining of a slot for keyways. The radial depth of cut is equal to the diameter on the end mill.	It is possible to drill the work-piece with an end mill only with the cutting centre. In this operation the feed has to be halved.	Both axial and radial entering into the workpiece.

MILLING EFFECTIVELY

End Mill Selection

Utilize the shortest possible tool available for the application with the largest diameter permissible and the shortest flute length as depth of cut allows. Extra length end mills have excessive overhang, thus a reduction in feed up to 25% may be required. Stub length end mills, due to their short overall and flute length, have more rigidity, thus an increase in feed rates of up to 25% may be required.

Speeds

Solid Carbide end mills must be run at higher speeds than High Speed Steel end mills. Many times, lighter cuts at higher speeds can improve the finish of the workpiece.

When the application is a slotting cut, the speed should be reduced by approximately 20%. Speeds should be decreased when milling hard or tough materials or when taking heavy cuts. Speeds should be increased when milling softer materials or when taking lighter cuts. Speeds should also be increased for finishing cuts.

Coolants

Coolants are recommended when milling mild steel and high temperature alloys. The purpose of the coolant media is to direct the chips away from the cutting tool and workpiece. This prevents damage to the cutting edges due to recutting the chips. When machining titanium, coolant flow must be heavy and directed at the area of cut to prevent overheating and assist in chip removal.

Milling Terminology/Operating Formulas

The following terms and formulas can be used to determine the appropriate operating parameters.

Terms			Formulas		
SFM	=	Surface Feet Per Minute	$\frac{D \times RPM \times .26}{}$	=	SFM
RPM	=	Revolutions Per Minute	$\frac{SFM \times 3.82}{D}$	=	RPM
F	=	Feed in Inches Per Minute	$\frac{}{}$		
Ft	=	Feed Per Tooth	$\frac{Ft \times T \times RPM}{}$	=	F
D	=	Cutting Diameter	$\frac{F}{T \times RPM}$	=	Ft
T	=	Number of Teeth	$\frac{}{}$		

TABLE OF CUTTING SPEEDS

Conversion Table (Surface Feet Per Minute to Revolutions Per Minute)

DIA. In Inches	Surface Feet Per Minute: 15'	20'	25'	30'	35'	40'	45'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	DIA. In Inches
	Revolutions Per Minute																	
1/64	3667	4890	6112	7334	8559	9779	11002	12224	14669	17114	19558	22003	24448	26893	29338	31782	34227	1/64
1/32	1834	2445	3056	3667	4278	4890	5501	6112	7334	8557	9779	11002	12224	13446	14669	15891	17114	1/32
3/64	1222	1630	2037	2445	2852	3260	3667	4075	4890	5705	6519	7334	8149	8964	9779	10594	11409	3/64
1/16	917	1222	1528	1833	2139	2445	2750	3056	3667	4278	4889	5500	6112	6723	7333	7945	8556	1/16
3/32	611	815	1019	1222	1426	1630	1834	2037	2445	2852	3260	3667	4075	4482	4890	5297	5705	3/32
1/8	458	611	764	917	1070	1222	1375	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	1/8
5/32	367	489	611	733	856	978	1100	1222	1467	1711	1956	2200	2445	2689	2934	3178	3423	5/32
3/16	306	407	509	611	713	815	917	1019	1222	1426	1620	1833	2037	2241	2445	2648	2852	3/16
1/4	229	306	382	458	535	611	688	764	917	1070	1222	1375	1528	1681	1833	1986	2139	1/4
5/16	183	244	306	367	428	489	550	611	733	856	978	1100	1222	1345	1467	1589	1711	5/16
3/8	153	204	255	306	357	407	458	509	611	713	815	917	1019	1120	1222	1324	1426	3/8
7/16	131	175	218	262	306	349	393	437	524	611	698	786	873	960	1048	1135	1222	7/16
1/2	115	153	191	229	267	306	344	382	458	535	611	688	764	840	917	993	1070	1/2
5/8	92	122	153	183	214	244	275	306	367	428	489	550	611	672	733	794	856	5/8
3/4	76	102	127	153	178	204	229	255	306	357	407	458	509	560	611	662	713	3/4
7/8	66	87	109	131	153	175	196	218	262	306	349	393	473	480	524	568	611	7/8
1	57	76	96	115	134	153	172	191	229	267	306	344	382	420	458	479	535	1
1-1/8	51	68	85	102	119	136	153	170	204	238	272	306	340	373	407	441	475	1-1/8
1-1/4	46	61	76	92	107	122	138	153	183	214	244	275	306	336	367	397	428	1-1/4
1-3/8	42	56	70	83	97	111	125	139	167	194	222	250	278	306	333	361	389	1-3/8
1-1/2	38	51	64	76	89	102	115	127	153	178	204	229	255	280	309	331	357	1-1/2
1-5/8	35	47	59	71	82	94	106	118	141	165	188	212	235	259	282	306	329	1-5/8
1-3/4	33	44	55	66	76	87	98	109	131	153	175	196	218	240	262	284	306	1-3/4
1-7/8	31	41	51	61	71	82	92	102	122	143	163	183	204	224	244	265	285	1-7/8
2	29	38	48	57	67	76	86	96	115	134	153	172	191	210	229	248	267	2
2-1/4	26	34	42	51	59	68	76	85	102	119	136	153	170	187	204	221	238	2-1/4
2-1/2	23	31	38	46	54	61	69	76	92	107	122	138	153	168	183	199	214	2-1/2
2-3/4	21	28	35	42	49	56	62	70	83	97	111	125	139	153	167	181	194	2-3/4
3	19	26	32	38	45	51	57	64	76	89	102	115	127	140	153	166	178	3
3-1/4	18	24	29	35	41	47	53	59	71	82	94	106	118	129	141	153	165	3-1/4
3-1/2	16	22	27	33	38	44	49	55	66	76	87	98	109	120	131	142	153	3-1/2
3-3/4	15	20	26	31	36	41	46	51	61	71	81	92	102	112	122	132	143	3-3/4
4	14	19	24	29	33	38	43	48	57	67	76	86	96	105	115	124	134	4
4-1/2	13	17	21	26	30	34	38	42	51	59	68	76	85	93	102	110	119	4-1/2
5	12	15	19	23	27	31	34	38	46	54	61	69	76	84	92	99	107	5
5-1/2	10	14	17	21	24	28	31	35	42	49	56	63	70	76	83	90	97	5-1/2
6	10	13	16	19	22	26	29	32	38	45	51	57	64	70	76	83	89	6
6-1/2	9	12	15	18	21	24	26	29	35	41	47	53	59	65	71	76	82	6-1/2
7	8	11	14	16	19	22	25	27	33	38	44	49	55	60	66	71	76	7
7-1/2	8	10	13	15	18	20	23	26	31	36	41	46	51	56	61	66	71	7-1/2
8	7	10	12	14	17	19	22	24	29	33	38	43	48	53	57	62	67	8
8-1/2	7	9	11	14	16	18	20	23	27	32	36	40	45	49	54	58	63	8-1/2
9	6	9	11	13	15	17	19	21	26	30	34	38	42	47	51	55	59	9
9-1/2	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56	9-1/2
10	6	8	10	12	13	15	17	19	23	27	31	34	38	42	46	50	54	10
11	5	7	9	10	12	14	16	17	21	24	28	31	35	38	42	45	49	11
12	5	6	8	10	11	13	14	16	19	22	26	29	32	35	38	41	45	12
	15'	20'	25'	30'	35'	40'	45'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	

CUTTING DATA

S400HA
SLOTTING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/16	15,600	29.44	255	0.0019
3/32	15,600	35.98	383	0.0039
1/8	15,600	42.52	511	0.0027
3/16	15,600	61.42	766	0.0039
1/4	15,600	70.87	1022	0.0045
5/16	12,000	85.05	983	0.0071
3/8	12,000	103.93	1179	0.0087
1/2	12,000	127.56	1572	0.0106
5/8	9,600	118.12	1572	0.0123
3/4	6,000	89.76	1179	0.0150
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S400HA
SIDE CUTTING

Materials	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/16	12,000	40.01	197	0.0033
3/32	12,000	48.35	295	0.0040
1/8	12,000	56.69	393	0.0047
3/16	12,000	80.32	590	0.0067
1/4	12,000	94.49	786	0.0079
5/16	9,600	108.66	786	0.0113
3/8	9,600	127.56	943	0.0133
1/2	9,600	160.56	1258	0.0167
5/8	7,200	146.52	1179	0.0204
3/4	4,800	113.39	943	0.0236
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

S401HA
SLOTTING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
5/32	12,400	36.4	508	0.0029
1/4	12,400	45.4	812	0.0037
5/16	9,920	54.5	812	0.0055
3/8	9,920	66.6	975	0.0067
1/2	9,920	81.8	1300	0.0082
5/8	7,440	75.7	1218	0.0102
3/4	4,960	60.6	975	0.0122
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S401HA
SIDE CUTTING

Materials	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
5/32	12,400	42.4	508	0.0034
1/4	12,400	60.6	812	0.0049
5/16	9,920	69.6	812	0.0070
3/8	9,920	81.8	975	0.0082
1/2	9,920	103	1300	0.0104
5/8	7,440	93.9	1218	0.0126
3/4	4,960	75.7	975	0.0153
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

Materials:	**AMG 6.1 - 6.4** Copper Alloys			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
5/32	3,720	9.1	152	0.0024
1/4	3,720	11.5	244	0.0031
5/16	2,852	13.6	234	0.0048
3/8	2,852	16.6	280	0.0058
1/2	2,852	20.5	374	0.0072
5/8	2,232	19.1	365	0.0086
3/4	1,426	15.2	280	0.0107
Axial DOC (maximum) = 0.5 x D				

Materials	**AMG 6.1 - 6.4** Copper Alloys			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
5/32	3,720	10.6	152	0.0028
1/4	3,720	15.2	244	0.0041
5/16	2,852	17.6	234	0.0062
3/8	2,852	20.6	280	0.0072
1/2	2,852	25.8	374	0.0090
5/8	2,232	23.6	365	0.0106
3/4	1,426	19.1	280	0.0134
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

CUTTING DATA

S402HA
PROFILING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	14,500	71.65	950	0.0049
5/16	11,200	81.9	917	0.0073
3/8	11,200	96.2	1100	0.0086
1/2	11,200	122.85	1467	0.0110
5/8	8,800	110.5	1441	0.0126
3/4	5,600	104	1100	0.0186
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

Axial Depth of Cut (DOC) recommendation = 0.2 x D
Radial Depth of Cut (DOC) recommendation = 0.5 x D
Note: Reduce the Feed in "Long Length" options by 50%

S403HA & S404HA
SLOTTING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	15,600	43	511	0.0028
3/16	15,600	61.4	766	0.0039
1/4	15,600	73.7	1022	0.0047
5/16	12,000	86	983	0.0072
3/8	12,000	104.4	1179	0.0087
7/16	12,000	116.65	1376	0.0097
1/2	12,000	128.9	1572	0.0107
5/8	9,600	116.65	1572	0.0122
3/4	6,000	92.15	1179	0.0154
1"	6,000	98.3	1572	0.0164
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S403HA & S404HA
SIDE CUTTING

Materials	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,000	55.25	393	0.0046
3/16	12,000	79.8	590	0.0067
1/4	12,000	92.2	786	0.0077
5/16	9,600	110.55	786	0.0115
3/8	9,600	129	943	0.0134
7/16	9,600	144.4	1100	0.0150
1/2	9,600	159.8	1258	0.0166
5/8	7,200	147.4	1179	0.0205
3/4	4,800	113.6	943	0.0237
1"	4,800	116.65	1258	0.0243
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 1")**				

S405HA
HIGH SPEED CUTTING (FINISHING)

Materials:	**AMG 1.3-1.6** Carbon Steels, Alloy Steels **AMG 3.4** Cast Iron (up to 50 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	16,800	240	1100	0.0143
5/16	12,600	240	1032	0.0190
3/8	10,000	235	983	0.0235
1/2	8,400	200	1100	0.0238
5/8	6,300	150	1032	0.0238
3/4	5,000	120	983	0.0240
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

Materials:	**AMG 1.7 - 1.8** Alloy Steels & Tool Steels (from 50 HRC up to 60 HRC)			
"D" Tool Dia."	***RPM***	***IPM***	***SFM***	***IPR***
1/4	8,400	120	550	0.0143
5/16	6,300	120	516	0.0190
3/8	5,000	120	491	0.0240
1/2	4,200	100	550	0.0238
5/8	3,150	75	516	0.0238
3/4	2,500	58	491	0.0232
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

Materials:	**AMG 1.8** Hardened Steels (from 60 HRC up to 65 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	4,200	58	275	0.0138
5/16	3,200	58	262	0.0181
3/8	2,500	58	246	0.0232
1/2	2,100	50	275	0.0238
5/8	1,600	37	262	0.0231
3/4	1,260	30	248	0.0238
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

Technical Section - Milling

S406HA & S406HB

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.1-1.5** Carbon Steels, Alloy Steels, and Cast Iron (under 40 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,735	10.2	417	0.0008
3/16	8,490	10.9	417	0.0013
1/4	6,370	11.5	417	0.0018
5/16	5,100	13	418	0.0025
3/8	4,245	18.4	417	0.0043
7/16	4,010	24.5	460	0.0061
1/2	3,500	25.9	459	0.0074
9/16	3,110	26	458	0.0084
5/8	2,800	26.1	459	0.0093
3/4	2,340	24	460	0.0103
1"	1,755	17.4	460	0.0099

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 2.2-2.4** Stainless Steels (300 Series)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	9,625	7.3	315	0.0008
3/16	6,385	8.3	314	0.0013
1/4	4,810	9.6	315	0.0020
5/16	3,850	10.7	315	0.0028
3/8	3,210	15.4	315	0.0048
7/16	2,750	20.9	315	0.0076
1/2	2,400	21	314	0.0088
9/16	2,140	21.2	315	0.0099
5/8	1,925	21.2	315	0.0110
3/4	1,600	19.4	314	0.0121
1"	1,200	14.7	314	0.0123

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 2.1-2.3** Stainless Steels (400 Series)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	13,475	7.6	441	0.0006
3/16	12,000	8.4	590	0.0007
1/4	6,815	9.6	446	0.0014
5/16	5,390	10.7	441	0.0020
3/8	4,490	15.4	441	0.0034
7/16	3,850	20.9	441	0.0054
1/2	3,370	21	441	0.0062
9/16	2,990	21.2	441	0.0071
5/8	2,700	21.2	442	0.0079
3/4	2,250	19.4	442	0.0086
1"	1,685	15.1	441	0.0090

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 4.1-4.3** Titanium			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	8,320	7.6	272	0.0009
3/16	5,550	8.4	273	0.0015
1/4	4,160	9.6	272	0.0023
5/16	3,330	10.7	273	0.0032
3/8	2,770	15.4	272	0.0056
7/16	2,380	20.7	273	0.0087
1/2	2,080	21	272	0.0101
9/16	1,850	21.2	273	0.0115
5/8	1,660	21.2	272	0.0128
3/4	1,390	19.4	273	0.0140
1"	1,040	15.1	272	0.0145

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 5.1-5.3** Nickel Alloys, Inconel, Hastelloy			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	2,565	2.1	84	0.0008
3/16	1,685	1.8	83	0.0011
1/4	1,285	2.5	84	0.0019
5/16	1,025	2.8	84	0.0027
3/8	855	4.1	84	0.0048
7/16	735	5.5	84	0.0075
1/2	640	5.6	84	0.0088
9/16	570	5.7	84	0.0100
5/8	510	5.6	84	0.0110
3/4	425	5.2	84	0.0122
1"	315	4.3	83	0.0137

Axial DOC (maximum) = 0.5 x D (Slotting)
Axial DOC (maximum) = 1.0 x D (Side Cutting)
Radial DOC (maximum) = 0.35 x D (Side Cutting)

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

CUTTING DATA

S407HA

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.1-1.4** Alloy Steels			
	AMG 3.1-3.3 Cast Iron (up to 30 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,735	10.2	417	0.0008
3/16	8,490	10.9	417	0.0013
1/4	6,370	11.5	417	0.0018
5/16	5,100	13	418	0.0025
3/8	4,245	18.4	417	0.0043
7/16	4,010	24.5	460	0.0061
1/2	3,500	25.9	459	0.0074
9/16	3,110	26	458	0.0084
5/8	2,800	26.1	459	0.0093
3/4	2,340	24	460	0.0103
1"	1,755	17.4	460	0.0099
Axial DOC (maximum) = 1 x D (Slotting) **Axial DOC (maximum) = 1.5 x D (Side Cutting)** **Radial DOC (maximum) = 0.5 x D (Side Cutting)**				

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.4-1.6** Alloy Steels			
	AMG 3.2-3.4 Cast Iron (from 30 HRC to 40 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	8,910	7.1	292	0.0008
3/16	5,940	7.6	292	0.0013
1/4	4,460	8.1	292	0.0018
5/16	3,560	9.1	291	0.0026
3/8	2,970	12.7	292	0.0043
7/16	2,800	17	321	0.0061
1/2	2,460	18	322	0.0073
9/16	2,180	18.1	321	0.0083
5/8	1,960	18.3	321	0.0093
3/4	1,640	16.7	322	0.0102
1"	1,230	12.2	322	0.0099
Axial DOC (maximum) = 1 x D (Slotting) **Axial DOC (maximum) = 1.5 x D (Side Cutting)** **Radial DOC (maximum) = 0.5 x D (Side Cutting)**				

MILLING TROUBLESHOOTING GUIDE

Problem	*Solution*	
Chipping of the Cutting Edge	• Apply hone .0005" to .001" • Try air blow or coolant • Reduce depth of cut • Check amount of wear on collet	•Reduce feed per tooth •If wet cutting, change to dry cutting •Check tool runout •Improve the stability of the work-holding
Extreme Flank Wear	• Use coated end mill • If conventional milling, change to climb • If using water soluble cutting fluid, change to non-water soluble cutting fluid	•Increase helix angle •If conventional milling, change to climb
Vibration / Chattering	• Use larger diameter end mill • Increase feed per tooth • Increase helix angle • Reduce length of flutes or overhang	• Reduce cutting speed • Check or change the holder • Increase number of flutes • Tighten chuck or use stronger chuck
Deflection	• Reduce depth of cut • Increase feed per tooth • Increase helix angle • If using water soluble cutting fluid, change to non-water soluble cutting fluid	• Use larger diameter end mill • Reduce length of flutes or overhang • If using 2-flute type, change to 4-flute type • If climb milling, change to conventional milling
Poor Surface Finish	• Reduce end mill runout • Increase cutting speed • Reduce feed per tooth • Use small hone .0003" to .0006" • Increase helix angle	•Increase number of flutes •Increase volume of air or cutting fluid •Reduce depth of cut •If dry cutting, change to wet cutting
Waviness	• Reduce helix angle • Check end mill runout	•Reduce depth of cut •Check or change the holder
End Mill Fracturing	• Reduce depth of cut • Reduce feed per tooth	•Reduce length of flutes or overhang •If chip jamming occurs, reduce the number of flutes
Poor Chip Disposal	• Use air blow • Reduce depth of cut • Reduce feed per tooth	•Reduce the number of flutes •Increase volume of air or cutting fluid •Increase cutting speed
Burring Workpiece Chipping	• Reduce helix angle • Reduce feed per tooth	•Reduce depth of cut
Chip Welding	• Use coolant • Use coated end mill	•Increase volume of cutting fluid •Increase helix angle

APPLICATION MATERIAL GROUP (AMG) CHART WITH MATERIAL EXAMPLES

Application Material Groups (AMG)			Hardness HRC
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38
6.Copper	6.1 Copper	Commercially Pure	<100 HB
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB
	6.4 High Strength Bronze	Ampco 18-25	<49
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---
	8.2 Thermosetting plastics	Bakelit, Pertinax	---
	8.3 Reinforced plastic materials	CFK, GFKAFK	---
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54
10.Graphite	10.1 Standard graphite		---

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

Feed Rate Chart - Drills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Alpha Code	Feed in Inches per Revolution (IPR) ± 25% — Ø Diameter															
	1mm/ 1/32”	2mm/ 3/32”	3mm/ 1/8”	4mm/ 5/32”	5mm/ 3/16”	6mm/ 1/4”	8mm/ 5/16”	10mm/ 3/8”	12mm/ 1/2”	15mm/ 9/16”	16mm/ 5/8”	20mm/ 3/4”	25mm/ 1”	30mm/ 1.1/8”	40mm/ 1.5/8”	50mm/ 2”
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090	
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100	
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140	
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200	
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200	
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228				
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291				
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472				

Calculations:
(inch)

RPM = SFM/D x 3.82
SFM = RPM x D x .262
IPM = IPR x RPM
IPR = IPM ÷ RPM
Inch = mm x .0394

Terms:
D = Drill Diameter
RPM = Revolutions Per Minute
SFM = Surface Feet per Minute
IPM = Inches Per Minute
IPR = Inches Per Revolution

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
209	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F
0860	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1290	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1511	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1813	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
209CO	115J	98H	89G	75F	56E	33D			79E	36G	56C		115J	92G	72E	56E	92G
2A	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
2AB	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
2ACO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
4ASM	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
4ASMCO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
500-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
500-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
501-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
501-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
502-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
502-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
5ATL	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
5ATS	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F
76HA	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A002	154J	131J	115F	98F	59F	33E			66F	39G	52C		131J	98E	92E	85E	75F
A012	154J	131J	115F	98F	59F	33E			66F	39G	52C		131J	98E	92E	85E	75F
A022	115K	105K	82I	75H	52G	33E			49G	26I	30E		105K	82I	66G	52G	82I
A100	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
A101	35H	30H	25F	20F	13E	9D			15E	8G	9C		30H	24F	20E	14E	23E
A108	115I	98I	82G	66F	43E	30D			49E	30G	33D		98H	79F	66E	46E	82G
A125	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
A160	197E	197E	180D	164D	131C	121A			131B	115C	115A		164C	131A	115A	98A	115A
A170	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
A217	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A218	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A221	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A225	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A243			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
A244			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
A345	79G	72G	56E	49D	20C	16B			39C	13E	26A		72G	59D	43C	30C	49D
A350	89I	82I	66G	52F	33E	20D			43E	13G	26C		85I	66F	59E	36E	52F
A510	187M	154M	131K	98H	69F	36D			92G	46I	62G		138K	105J	92J	82F	105G
A520	187M	154M	131K	105I	69G	36E			98I	52I	66G		157M	121K	98J	85F	112I
A530	154I	131I	98F	89F	66E	33D			79E	43G	66C		118I	92E	89E	72E	105F
A553	279L	230L	197L	148H	92F	49D			131G	62I	89G		230K	164J	148J	138F	148G
A720	115A	98A	89A	75A	56A	33A			72A	33A	49A		98A	79A	66A	46A	75A
A730	115J	98H	89G	75F	56E	33D			79E	36G	56C		115J	92G	72E	56E	92G
A900	125H	108H	85H	85H	69E	52E			49E	23E	30C		79J	62J	62J	46I	72E
A901	197J	164J	144I	144I	108G	85G			56E	30E	36C		190I	154I	112J	92I	115G
A920	131J	112J	105I	105I	75E	62E			49F	23F	30D		112L	85L	85L	62J	98G
A921	197M	171M	174J	174J	125G	98G			56F	30F	36D		174L	138L	138L	118J	157I
A940	125F	108F	72G	72G	56C	39C			49C	23E	30B			52I	52I	39H	59E
A941	174G	151G	118G	118G	75D	56D			56C	30E	36B		118I	98I	98I	79H	82F
A951	89G	72G	62E	49D	26C	20B			39C	20E	39A		72G	52D	43C	30C	59D
A952	89G	72G	62E	49D	26C	20B			39C	20E	39A		72G	52D	43C	30C	59D
A976	102C	85C	72C	72C	39A	33A			39B	23C	26A			75C	52C	36A	49C
A977	102B	85B	72B	72B	39A	33A			39B	23B	26A			75B	52B	36A	49B
A978	102A	85A	72A	72A	39A	33A			39A	23A	26A			75A	52A	36A	49A
ATR41			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
CO500-12						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO500-6						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO501-12						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO501-6						20B			95H	56F	56D	30D	161H	85H	85F	56D	
D33F	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33L	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33M	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33W	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D444	197E	197E	180D	164D	131C	121A			131B	115C	115A		164C	131A	115A	98A	115A
DC	279S	246S	246S	230S	148S	148S	98S	98S					246T	246T	180T	180T	
DS-90	279S	246S	246S	230S	148S	148S	98S	98S	174S	148S			246T	246T	180T	180T	148T
DS-120	279S	246S	246S	230S	148S	148S	98S	98S	174S	148S			246T	246T	180T	180T	148T

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**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
209	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	
0860	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1290	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1511	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1813	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
209CO	66D	36C	49G	23E	20B	125L	131J	89H	69F	108J	98I	98H	89F	115K	92J	66H	16C	
2A	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
2AB	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
2ACO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
4ASM	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
4ASMCO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
500-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
500-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
501-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
501-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
502-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
502-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
5ATL	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
5ATS	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	
76HA	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A002	43D	23B	43G	23E	10A	164G	108I	128H	98G	134K	125J	108I	108I	98I	164H	115F	10B	
A012	43D	23B	43G	23E	10A	164G	108I	128H	98G	134K	125J	108I	108I	98I	164H	115F	10B	
A022	46F	26C	43H	26F	13B	118H	125K	89I	52I	131F	105K	105J	82J	98K	115I	56G	13C	
A100	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
A101	12D	6B	10G	6E	3A	33G	35I	27H	16G	33J	30I	27H	24F	30J	28H	14F	3B	
A108	52E	23B	39G	23G	20E	108G	115I	102H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
A125	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
A160	115A	82A	98A	82A	66A	180D	230G	197C	164C	164I	148H	131G	115F		197E		30C	
A170	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
A217	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A218	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A221	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A225	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A243	39D	20B	33G	20E	10A			89H	52G				79F				10B	
A244	39D	20B	33G	20E	10A			89H	52G				79F				10B	
A345	30B	16A	26E	13C	10A	89D	108G	89F	52D	108H	89G	89F	79F	98J	98H	33F	10A	
A350	30D	16B	26G	13E	10A	108F	115I	115H	52F	108J	82I	89H	82H	115L	85J	39H	10B	
A510	66H	13B	56I	30E	20E	131D	164I	148I	66F	164G	164M	102I	108I	213G	164G	115F		
A520	66G	13B	56I	36G	23E	131E	164I	148K	66F	180I	164M	121K	115I	213G	164G	115F		
A530	59D	43B	43G	20E	10A	197G	180I	131G	115E	180I	148I	115G	92G	164J	164H	115F	10B	
A553	98E	26C	82I	49E	33G	230G	279I	262I	115G	230H	328M	180I	180J	295G				
A720	56A	26A	33A	23A	13A	115A	131A	115A	89A	115A	98A	89A	89A	157A	82A			
A730	66D	36C	49G	23E	20B	125L	131J	89H	69F	108J	98I	98H	89F	115K	92J	66H	16C	
A900	49E	20C	46G	23G	20C	213G	174I	112H	98G	197J	148N	131N	92I	180I	131G			
A901	79G	33E	72I	36I	33E			184I	157I				157I					
A920	59G	33C	49I	30G	20E	213H	216J	131J	102G	246L	148N	131N	118J	180J	131H			
A921	95I	52E	79L	46I	33G			233J	164I				157J					
A940	43C	20C				213F	230F	112G	98G	174H	148N	131N	98G	180H	131F			
A941	59D	26D						157H	138H				138H					
A951	33B	20A	23E	16C	10A	72D	108G	72F	52D	98H	89G	79F	72F	98J	98H	33F	10A	
A952	33B	20A	23E	16C	10A	72D	108G	72F	52D	98H	89G	79F	72F	98J	98H	33F	10A	
A976	36A	16A						98D	89D				89D					
A977	36A	16A						98C	89C				89C					
A978	36A	16A						98B	89B				89B					
ATR41	39D	20B	33G	20E	10A			89H	52G				79F				10B	
CO500-12		20D		20B	16B													
CO500-6		20D		20B	16B													
CO501-12		20D		20B	16B													
CO501-6		20D		20B	16B													
D33F							820V	820V		656V	656V	367V	197V	197X	328V			
D33L							820V	820V		656V	656V	367V	197V	197X	328V			
D33M							820V	820V		656V	656V	367V	197V	197X	328V			
D33W							820V	820V		656V	656V	367V	197V	197X	328V			
D444	115A	82A	98A	82A	66A	180D	230G	197C	164C	164I	148H	131G	115F		197E		30C	
DC							820V	820V		656V	656V	367V	197V	197X	328V			
DS-90	115T	82S	148T	98S	66S	902V	820V	820V	230T	656V	656V	367V	197V	197X	328V			
DS-120	115T	82S	148T	98S	66S	902V	820V	820V	230T	656V	656V	367V	197V	197X	328V			

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**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
DS-142	279S	246S	246S	230S	148S	148S	98S	98S	174S	148S			246T	246T	180T	180T	148T
HX10	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
HX15	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
HX18	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
L10	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
M40CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M41CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M42CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M51CO	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
M52CO	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
QC0860P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		
QC1290P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		
QC21G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC21GM	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC21P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC21PM	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC41G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC41P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC91G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC91GM	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC91P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC91PM	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
R10	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R10A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10H	108I	92I											82F	66D	52C	33C	49C
R10P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R15	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R15A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R18	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R18A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18H	108I	92I											82F	66D	52C	33C	49C
R18P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R40	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R40C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R41	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R41C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R42	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R42C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R453	443V	394V	361V	328V	262V	213U	98U	82U	246V	115V	98U		394W	394W	262V	262V	180V
R454	410V	361V	295V	262V	197V	164U	98U	82U	148U	131T	115T	115T	295W	295W	230V	230V	164U
R457	443W	394W	361W	328W	262W	213U	98U	82U	246V	115V	98U		394W	394W	262V	262V	180V
R458	410W	361W	295W	262V	197V	164U	98U	82U	148U	131T	115T	115T	295W	295W	230V	230V	164U
R459	443V	394V	361U	328U	262U	180T			246V	115V	98U		394W	394W	262V	262V	
R463									279G	246G	197F						180V
R467									279G	246G	197F						180V
R51	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R510	328W	295W	295W	262W	180V	148V	115T	98S	164V				295X	295X	213W	213W	148V
R51FS																	
R52	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R520	328X	295X	295X	262X	180X	148W	115U	98T	164W				295Y	295Y	213X	213X	197W
R55	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R56	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R56CO	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R57	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R58	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
R88CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R89CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R950 1.5x			361W	307W	307W	217T						127T			318U	318U	
R950 3x			328W	279W	279W	230U						115T			289V	289V	
R950 5x			328V	279V	279V	213U						115S			279V	279V	
R950 8x			295U	246U	246U	197T						98S			262U	262U	

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**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
DS-142	115T	82S	148T	98S	66S	902V	820V	820V	230T	656V	656V	367V	197V	197X	328V			
HX10	75H		59H															
HX15	75H		59H															
HX18	75H		59H															
L10	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
M40CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M41CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M42CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M51CO	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
M52CO	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
QC0860P			49F				79H	75H		348H	325H		276H	151D	125D			
QC1290P			49F				79H	75H		348H	325H		276H	151D	125D			
QC21G			59H			98I	89H	89H		400H	351H		315H					
QC21GM			59H			98I	89H	89H		400H	351H		315H					
QC21P	49F		49F			89I	79H	79H		351H	325H		276H					
QC21PM	49F		49F			89I	79H	79H		351H	325H		276H					
QC41G			59H			98I	89H	89H										
QC41P	49F		49F			89I	79H	79H		351H	325H		276H					
QC91G			59H			98I	89H	89H		400H	351H		315H					
QC91GM			59H			98I	89H	89H		400H	351H		315H					
QC91P	49F		49F			89I	79H	79H		351H	325H		276H					
QC91PM	49F		49F			89I	79H	79H		351H	325H		276H					
R10	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R10A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10H			23E			115H	118G			148J	115J	98G	95G	138J	131I	66G		
R10P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R15	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R15A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R18	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R18A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18H			23E			115H	118G			148J	115J	98G	95G	138J	131I	66G		
R18P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R40	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R40C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R41	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R41C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R42	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R42C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R453	148V	131U				410W	722W	722W	328V	820W	820W	656V	492V					
R454	131U	115T				328V	656V	656V	262U	738W	738W	590V	394V					
R457	148V	131U				410W	722W	722W	328V	820W	820W	656V	492V					
R458	131U	115T				328V	656V	656V	262U	738W	738W	590V	394V					
R459						410V	722V	722V	328U	935W	935W	623V	312V					
R463	148V	131U	180U	148U	131U													
R467	148V	131U	180U	148U	131U													
R51	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R510			164V							738Y	738Y	492X	213X	246X	377V			
R51FS						89I				348H	325H		276H					
R52	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R520	148V	115U	164W							738Z	738Z	492Y	213Y	246Z	377V			
R55	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R56	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R56CO	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R57	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R58	49F		49F	23F	13B	108F	115H	115H	52F	85I	98H	92H	75H	98I	92I	46H	10B	
R88CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R89CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R950 1.5x																		
R950 3x																		
R950 5x																		
R950 8x																		

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**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
R950 12x			262U	223U	223U	158S						92S			231U	231U	
R960 1.5x	397W	361W							217V	180T	144T		433V	418V			163T
R960 3x	361W	328W							197V	164T	131T		394V	380V			148T
R960 5x	361V	328V							164V	164S	131S		374V	354V			148T
R960 8x	328U	295U							148U	131S	115S		348U	328U			115S
R960 12x	289U	262U							157U	131S	92S		315U	304U			118S
R970 1.5x	397W	361W											433V	418V	318U	318U	
R970 3x	361W	328W											394V	380V	289U	289U	
R970 5x	361V	328V											374V	354V	279V	279V	
R970 8x	328U	295U											346U	328U	262U	262U	
R970 12x	289U	262U											315U	314U	231U	231U	
S209	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F
SPL-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPL-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPLG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPLG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPR-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPR-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPRG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPRG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPS-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPS-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPSG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPSG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
T400	75F	46F	49F	49D	36D				66F	39D	39D		108E	59H	59F		69F
TS10CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS15CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS18CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS40CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS41CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS42CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS51CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS52CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS55CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
TS10HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS15HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS18HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS40HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS41HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS42HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS51HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS52HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS55HS	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G

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**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
R950 12x																		
R960 1.5x	127T	108S	127T	108S	90S													
R960 3x	115T	98S	115T	98S	82S													
R960 5x	115T	98S	115T	98S	82S													
R960 8x	98S	82S	98S	82S	66S													
R960 12x	92S	78S	92S	78S	66S													
R970 1.5x																		
R970 3x																		
R970 5x																		
R970 8x																		
R970 12x																		
S209	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	
SPL-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPL-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPLG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPLG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPR-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPR-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPRG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPRG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPS-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPS-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPSG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPSG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
T400	36D		49D															
TS10CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS15CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS18CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS40CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS41CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS42CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS51CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS52CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS55CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
TS10HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS15HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS18HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS40HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS41HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS42HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS51HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS52HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS55HS	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	

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For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
1500	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500A	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500L	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500OV	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1505	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1508	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1519	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1528	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1534	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1534NE	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1534NR	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1541	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1542	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1543	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1544													65	40	40	25	
1545	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1545A	60	45	30	30	20	10			25	15	15						20
1548	60	50	35	35					25	20	20						20
1549	60	50	35	35					25	20	20						20
1567	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1568	45	35	25	15	10				25	15	15						20
1572	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1578	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1580	120	100	60	60	40				50	30	40						40
1582	60	50	35	35					25	20	20						20
1585	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1585A	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1585NR	65	60	40	40	25	15			20	13	10		50	30	30	20	20
1585OV	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1586	60	50	35	35					26	20	20						20
1587																	
1588																	
1590	70	60	40	40	30				30	26	20						20
1591	70	60	40	40	30				30	26	20						20
1592	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1593	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1595	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1599													65	40	40	25	
1599SB													65	40	40	25	
1600													65	40	40	25	
1629AP					45	25						30	90	70	65	35	
1630AP					45	25						30	90	70	65	35	
1634	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1641	150	125	90	90					70	60	50						60
1659AP					45	25						30	90	70	65	35	
1660AP					45	25						30	90	70	65	35	
1671	150	125	90	90					70	60	50						60
1672AP	110	90	55	55	45				50	40	40						35
1673AP	110	90	55	55	45				50	40	40						35
1674	120	100	65	65	50				60	40	45						40
1675	120	100	65	65	50				60	40	45						40
1676AP	100	80	50	50	40				45	30	35						30
1677AP	100	80	50	50	40				45	30	35						30
1678	110	90	55	55	45				50	40	40						35
1679	110	90	55	55	45				50	40	40						35
1681AP	150	125	90	90					70	50	60						60
1687AP	150	125	90	90					70	50	60						60
1691AP	165	135	100	100					80	70	60						70
1697AP	165	135	100	100					80	70	60						70
1700M	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1785M	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1785NR	66	59	46	33	16	10			20	13	10		46	26	26	16	

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For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
1500	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500A	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500L	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500OV	15		20	10		25	80	60	10	50	100	75	20	25	15			
1505	15		20	10		25	80	60	10	50	100	75	20	25	15			
1508	15		20	10		25	80	60	10	50	100	75	20	25	15			
1519	15		20	10		25	80	60	10	50	100	75	20	25	15			
1528	15		20	10		25	80	60	10	50	100	75	20	25	15			
1534	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1534NE	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1534NR	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1541	15		20	10		25	80	60	10	50	100	75	20	25	15			
1542	15		20	10		25	80	60	10	50	100	75	20	25	15			
1543	15		20	10		25	80	60	10	50	100	75	20	25	15			
1544									15									
1545	15		20	10		25	80	60	10	50	100	75	20	25	15			
1545A	15		20	10		25	80	60	10	50	100	75	20	25	15			
1548	15	5	20	15														
1549	15	5	20	15														
1567	15		20	10		25	80	60	10	50	100	75	20	25	15			
1568	10		20	10		30	50	50		50	75	50		25	15			
1572	15		20	10		25	80	60	10	50	100	75	20	25	15			
1578	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1580	30		40			50	150	120		100	200	125						
1582	15	5	20	15														
1585	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585A	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585NR	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585OV	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1586	15	5	20	15														
1587						30	80	60		50	60	60						
1588						30	80	60		50	60	60						
1590	15	5			10													
1591	15	5			10													
1592	15		20	10		25	80	60	10	50	100	75	20	25	15			
1593	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1595	15		20	10		25	80	60	10	50	100	75	20	25	15			
1599									15									
1599SB									15									
1600									15									
1629AP		10			15				25									
1630AP		10			15				25									
1634	16	7	26	10		30	89	69	10	49	98	66	20	98	26			
1641			45			55	180	130		180	200	230						
1659AP		10			15				25									
1660AP		10			15				25									
1671			45			55	180	130		180	200	230						
1672AP	25		35	20		45	120	100		85	100	85	30					
1673AP	25		35	20		45	120	100		85	100	85	30					
1674	30		40	25		50	125	110		95	120	95	40					
1675	30		40	25		50	125	110		95	120	95	40					
1676AP	20		30	15		40	100	90		80	95	80	30					
1677AP	20		30	15		40	100	90		80	95	80	30					
1678	25		35	20		45	120	100		85	100	85	30					
1679	25		35	20		45	120	100		85	100	85	30					
1681AP			45			55	180	130		180	200	230						
1687AP			45			55	180	130		180	200	230						
1691AP			55			70	200	160		200	240	260						
1697AP			55			70	200	160		200	240	260						
1700M	15		20	10		25	80	60	10	50	100	75	20	25	15			
1785M	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1785NR		10	33	13		33		49		33	82	43	33	66				

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
1788(M)																	
1985	75	69	49	49	30	16			36	20							20
1994	82	72	59	49										26			
3300	98	79	49	49	30				39	30							30
3306E	98	79	49	49	30				39	30							30
6541	16	16	23	20	13								23	16	23	16	
E000	82	72	59	52	33	16							49	26	49	26	33
E000TIN	131	131	105	89	43	36			26	23	16		72	23	16		49
E001	82	72	59	52	33	16			23	20	13		49	26	49	26	
E002	82	72	59	52	33												33
E003	82	72	59	52	33				23	20	13						
E005	82	72	59	52	33	16							49	26	49	26	33
E006	82	72	59	52	33	16			26	23	16		49	26	49	26	
E007	82	72	59	52	33												33
E008	82	72	59	52	33				23	20	13						
E011	82	72	59	52	33	16			23	20	13		49	26	49	26	
E013	82	72	59	52	33				23	20	13						
E016	82	72	59	52	33	16			26	23	16		49	26	49	26	
E018	82	72	59	52	33				23	20	13						
E021	82	72	59	52	33	16			23	20	13		49	26	49	26	
E023	82	72	59	52	33				23	20	13						
E025	82	72	59	52	33	16							49	26	49	26	33
E026	82	72	59	52	33	16			26	23	16		49	26	49	26	
E027	82	72	59	52	33												33
E028	82	72	59	52	33				23	20	13						
E033	82	72	59	52	33	16			23	20	13						
E035	82	72	59	52	33	16							49	26	49	26	33
E036	82	72	59	52	33	16			26	23	16		49	26	49	26	
E037	82	72	59	52	33	16											33
E038	82	72	59	52	33	16			23	20	13						
E061	72	66	52	39	23	13							39	23	33	16	
E071	72	66	52	39	23	13							39	23	33	16	
E201													49	26	49	26	
E252													49	26	49	26	
E500	23	20	16	13	10								39	23	33	16	
E501	23	20	16	13	10								39	23	33	16	
E504	46	39	33	26	20								59	39	72	39	
E513	23	20	16	13	10								39	23	33	16	
E547	23	20	16	13	10								39	23	33	16	
E550	72	66	52	39	23	13			23	16	23		39	23	33	16	
E620	23	20	16	13	10								39	23	33	16	
E621		59	46	33	16				20	13	10						
E624	108	95	75	69	43												
E625	108	95	75	69	43												
E626				98	66	36											
E627				98	66	36											
E628		72	59	52	33				46	33	20						
E629		72	59	52	33				46	33	20						
E630													98	82	115	82	
E631													98	82	115	82	
E650	82	72	59	49										26			
E651	82	72	59	49										26			
E653	82	72	59	49										26			
E654	82	72	59	49										26			
E710	13	13	20	16	10								20	13	20	13	
E711	13	13	20	16	10								20	13	20	13	
E712	13	13	20	16	10								20	13	20	13	
E721	13	13	20	16	10								20	13	20	13	
E764	108	95	75	69	43												
E765	108	95	75	69	43												
E766				98	66	36											
E767				98	66	36											
E768		72	59	52	33				46	33	20						

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
1788(M)						30	79	79		49	66	66						
1985	16	7	30	16	10													
1994							98	66		59	115			98				
3300	26		30			39	121	98		79	161	98						
3306E	26		30			39	121	98		79	161	98						
6541							39					39	26	16				
E000	16		39	16		39	98	66		52	115	66	49	98				
E000TIN	23		59	26		59	148	115				98	72		148			
E001																		
E002	16		39	16						52	115	66	49					
E003																		
E005	16		39	16		39	98	66		52	115	66	49	98				
E006																		
E007	16		39	16						52	115	66	49					
E008																		
E011																		
E013																		
E016																		
E018																		
E021																		
E023																		
E025	16		39	16		39	98	66		52	115	66	49	98				
E026																		
E027	16		39	16		39	98	66		52	115	66	49	98				
E028																		
E033																		
E035	16		39	16		39	98	66		52	115	66	49	98				
E036																		
E037	16		39	16						52	115	66	49	98				
E038																		
E061						39	98	66				66	49		39	23		
E071						39	98	66				66	49		39	23		
E201							66		16				49		33			
E252							66		16				49		33			
E500						13	33	23	7		39	23	16		16	10		
E501						13	33	23	7		39	23	16		16	10		
E504							66	46	13		79	46	33		33	20		
E513						13	33	23	7		39	23	16		16	10		
E547						13	33	23	7		39	23	16		16	10		
E550						39	98	66	13		115	66	49		39	23		
E620						13	33	23	7		39	23	16		16	10		
E621				13						33	82	43	33					
E624						39	98	66										
E625						39	98	66										
E626	33			33														
E627	33			33														
E628																		
E629																		
E630							98		16				66		49			
E631							98		16				66		49			
E650							98	66		59	115			98				
E651							98	66		59	115			98				
E653							98	66		59	115			98				
E654							98	66		59	115			98				
E710							36					36	23	13				
E711							36					36	23	13				
E712							36					36	23	13				
E721							36					36	23	13				
E764						39	98	66										
E765						39	98	66										
E766	33			33														
E767	33			33														
E768																		

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
E769		72	59	52	33				46	33	20						
E770													98	82	115	82	
E771													98	82	115	82	
E805					55	42	22										
E806					55	42	22										
E808	108	95	75	69	43												
E809	108	95	75	69	43												
E810				98	66	36											
E811				98	66	36											
E812		72	59	52	33				46	33	20						
E813		72	59	52	33				46	33	20						
E814													98	82	115	82	
E815													98	82	115	82	
E816					55	42	22										
E817					55	42	22										
E905					55	42	22										
E906					55	42	22										
E908	108	95	75	69	43												
E909	108	95	75	69	43												
E910				98	66	36											
E911				98	66	36											
E912		72	59	52	33				46	33	20						
E913		72	59	52	33				46	33	20						
E914													98	82	115	82	
E915													98	82	115	82	
E916					55	42	22										
E917					55	42	22										
EP006H	82	72	59	52	33	16							49	26	49	26	33
EP016H	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP10	82	72	59	52	33	16							49	26	49	26	33
EP11	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP20	82	72	59	52	33	16							49	26	49	26	33
EP21	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP30	82	72	59	52	33	16							49	26	49	26	33
EP31	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP40	82	72	59	52	33	16							49	26	49	26	33
EP41	82	72	59	52	33	16			23	20	13		49	26	49	26	
EX006H	82	72	59	52	33												33
EX016H	82	72	59	52	33				23	20	13						
EX10	82	72	59	52	33												33
EX11	82	72	59	52	33				23	20	13						
EX20	82	72	59	52	33												33
EX21	82	72	59	52	33				23	20	13						
EX30	82	72	59	52	33												33
EX31	82	72	59	52	33				23	20	13						
EX40	82	72	59	52	33												33
EX41	82	72	59	52	33				23	20	13						
TN1500	59	46	30	30	20	10			26	26	16		49	30	30	16	20
TN1534	79	75	49	49	30	20			39	26	26		49	30	30	20	
TN1541	16	16	23	20	13								23	16	23	16	
TN1543	16	16	23	20	13								23	16	23	16	
TN1585	79	75	49	49	30	20			39	26	26		49	30	30	20	
TN1785	79	75	49	49	30	20			39	26	26		49	30	30	20	
U1511	39	33	26	20	16								46	26	39		

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
E769																		
E770							98		16				66		49			
E771							98		16				66		49			
E805	42	26		16	10													
E806	42	26		16	10													
E808						39	98	66										
E809						39	98	66										
E810	33			33														
E811	33			33														
E812																		
E813																		
E814							98		16				66		49			
E815							98		16				66		49			
E816	42	26		16	10													
E817	42	26		16	10													
E905	42	26		16	10													
E906	42	26		16	10													
E908						39	98	66										
E909						39	98	66										
E910	33			33														
E911	33			33														
E912																		
E913																		
E914							98		16				66		49			
E915							98		16				66		49			
E916	42	26		16	10													
E917	42	26		16	10													
EP006H	16		39	16		39	98	66		52	115	66	49	98				
EP016H																		
EP10	16		39	16		39	98	66		52	115	66	49	98				
EP11																		
EP20	16		39	16		39	98	66		52	115	66	49	98				
EP21																		
EP30	16		39	16		39	98	66		52	115	66	49	98				
EP31																		
EP40	16		39	16		39	98	66		52	115	66	49	98				
EP41																		
EX006H	16		39	16						52	115	66	49					
EX016H																		
EX10	16		39	16						52	115	66	49					
EX11																		
EX20	16		39	16						52	115	66	49					
EX21																		
EX30	16		39	16						52	115	66	49					
EX31																		
EX40	16		39	16						52	115	66	49	98				
EX41																		
TN1500	16		20	10		26	79	59	10	49	98	75	20	30	16			
TN1534			30	13		39	115	89	13	66	125	79	26	121	30			
TN1541							39					39	26	16				
TN1543							39					39	26	16				
TN1585			30	13		39	115	89	13	66	125	79	26	121	30			
TN1785			30	13		39	115	89	13	66	125	79	26	121	30			
U1511							52	39			66	39			26			

APPLICATION MATERIAL GROUPS - DIES
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
2010	26	23	20	16					13	7			26	23	20	16	
2025	26	23	20	16					13	7			26	23	20	16	
2325M	26	23	20	16					13	7			26	23	20	16	
2510	26	23	20	16					13	7			26	23	20	16	
2710M	26	23	20	16					13	7			26	23	20	16	
F201	26	23	20	16					13	7			26	23	20	16	
F302	26	23	20	16					13	7			26	23	20	16	
F312	26	23	20	16					13	7			26	23	20	16	
F320	26	23	20	16					13	7			26	23	20	16	
F330	26	23	20	16					13	7			26	23	20	16	
F370	26	23	20	16					13	7			26	23	20	16	

APPLICATION MATERIAL GROUPS - DIES
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
2010		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2025		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2325M		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2510		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2710M		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F201		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F302		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F312		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F320		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F330		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F370		7	30	7	7	30	26	23		33	49	49	33	49	33	16		

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
C110	197A	164A	131B	115B					98F				115A	98A	164B	98B	115D
C123	180A	148A	131B	115B					82F				98A	82A	148B	98B	98D
C247	180S	148S	131T	115T					82Y				98S	82S	148T	82T	98V
C273	164S	164S	115T	98T					33Y				82S	66S	131T	82T	82V
C346	148A	115A	98B	82B					66F				82A	66A	115B	66B	82D
C600	98A	89A	75B										82A	66A	82B		59D
C601	98A	89A	75B										82A	66A	82B		59D
C602	98A	89A	75B										82A	66A	82B		59D
C603	164A	131A	115B	98B					75F				92A	75A	131B	82B	92D
C604	112S	89S	79T										89S	72S	89T		62V
C605	164A	131A	115B						75F	62F							92D
C606	148A	118A	102B						66F	56F							82D
C607		131A	115B	98B	66C					62F				75A	131B	82B	92D
C608	164G	131G	115H	98H					75L				92G	75G	131H	82H	92J
C609	197G	184G	161H	138H					105L				128G	105G	184H	128H	128J
C610	164G	131G	115H	98H					75L				92G	75G	131H	82H	92J
C611	197G	184G	161H	138H					105L				128G	105G	184H	128H	128J
C612	148G	118G	102H	89H					66L				82G	66G	118H	72H	82J
C613	148G	118G	102H	89H					66L				82G	66G	118H	72H	82J
C614	115S	92S	79T	69T					52Y				92S	75S	92T	56T	62V
C615	164S	131S	115T	98T					75Y				92S	75S	131T	82T	92V
C617	115S	92S	79T	69T					52Y				92S	75S	92T	56T	62V
C618	164S	131S	115T	98T					75Y				92S	75S	131T	82T	92V
S106																	
S108	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
S109	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
S110	269B	212B	212B	171B	152B	140B			190A	125A	103A	78A	336B	284B	284B	225B	
S111	249B	200B	200B	161B	144B	131B			180A	108A	98A	66A	298B	249B	249B	200B	
S112	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
S113	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
S114	269B	212B	212B	171B	152B	140B			190A	125A	103A	78A	336B	284B	284B	225B	
S115	249B	200B	200B	161B	144B	131B			180A	108A	98A	82A	298B	249B	249B	200B	
S116	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
S121	289B	223B	223B	180B	161B	148B			200A	141A	108A		374B	318B	318B	249B	
S129	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
S134	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
S135	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
S136	343B	312B	312B	287B	238B	205B			220A	156A	123A	97A	405B	338B	338B	254B	
S137	325B	298B	298B	276B	226B	180B			200A	141A	115A	89A	361B	298B	298B	230B	
S138	361B	325B	325B	298B	249B	230B			239A	171A	131A	98A	449B	377B	377B	279B	
S139	361B	325B	325B	298B	249B	230B			239A	171A	131A	98A	449B	377B	377B	279B	
S146	343B	312B	312B	287B	238B	205B			220A	156A	123A	97A	405B	338B	338B	254B	
S147	325B	298B	298B	276B	226B	180B			200A	141A	115A		361B	298B	298B	230B	
S206																	
S207																	
S208	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
S211	361B	269B	269B	239B	200B	180B			298A	180A	171A	131A	499B	400B	400B	341B	200B
S212	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
S213	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
S215	361B	269B	269B	239B	200B	180B			298A	180A	171A	89A	499B	400B	400B	341B	200B
S221	400B	298B	298B	259B	230B	200B			325A	223A	174A		551B	525B	525B	374B	230B
S223HA	801C	778C	522C	463B	328B	285A	187A	125A	489B	400B	302B	256B	456C	381B	305B	256B	255B
S223HB	801C	778C	522C	463B	328B	285A	187A	125A	489B	400B	302B	256B	456C	381B	305B	256B	255B
S234	499B	449B	449B	423B	400B	328B			351A	276A	200A	164A	699B	649B	649B	430B	259B
S235	499B	449B	449B	423B	400B	328B			351A	276A	200A	164A	699B	649B	649B	430B	259B
S236	474B	425B	425B	406B	380B	313B			338A	251A	182A	140A	650B	578B	578B	415B	245B

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
C110	82D		197D	49C		279C	279C	279C		722E	722E	279E		295C				
C123	82D		164D	49C		262C	262C	262C		656E	656E	262E		262C				
C247	82V		164V	49U		262U	262U	262U		656X	656X	262X		262U				
C273	66V		148V	33U		230U	230U	230U		590X	590X	230X		230U				
C346	66D		148D	33C		230C	230C	230C		590E	590E			230C				
C600	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
C601	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
C602	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
C603	75D		157D	43C		410C	410C	410C		984E	984E	295E		410C				
C604	49V		108V	20U		200U	223U	223U		243X	194X	144X		200U				
C605			157D			410C				984E	984E	295E		410C				
C606			141D			367C				886E	886E	266E		367C				
C607	75D	33D		43C	20D		410C	410C	49C			295E	197A		410C			
C608	75J		157J	43I		410I	410I	410I			984K	295K		410I				
C609	105J		220J	59I		574I	574I	574I			1378K	413K		574I				
C610	75J		157J	43I		410I	410I	410I			984K	295K		410I				
C611	105J		220J	59I		574I	574I	574I			1378K	413K		574I				
C612	66J		141J	36I		367I	367I	367I			886K	266K		367I				
C613	66J		141J	36I		367I	367I	367I			886K	266K		367I				
C614	52V		108V	20U		203U	223U	223U			197X	148X		203U				
C615	75V		157V	43U		410U	410U	410U		984X	984X	295X		410U				
C617	52V		108V	20U		203U	223U	223U			197X	148X		203U				
C618	75V		157V	43U		410U	410U	410U		984X	984X	295X		410U				
S106										2326C	1749C	1171C	751B					
S108						649C	499C	499C	125B	1499C	1499C	649C	400B					
S109						649C	499C	499C	125B	1499C	1499C	649C	400B					
S110						617C	474C	474C	117B	1424C	1424C	617C	380B					
S111						584C	449C	449C	108B	1348C	1348C	584C	361B					
S112						649C	499C	499C	125B	1499C	1499C	649C	400B					
S113						649C	499C	499C	125B	1499C	1499C	649C	400B					
S114						617C	474C	474C	117B	1424C	1424C	617C	380B					
S115			148B			584C	449C	449C	108B	1348C	1348C	584C	361B					
S116						649C	499C	499C	125B	1499C	1499C	649C	400B					
S121						649C	499C	499C	125B	1499C	1499C	649C	400B					
S129						679C	574C	574C	144B	1601C	1601C	708C	479B					
S134						679C	574C	574C	144B	1601C	1601C	708C	479B					
S135						679C	574C	574C	144B	1601C	1601C	708C	479B					
S136						646C	546C	546C	138B	1525C	1525C	674C	455B					
S137						613C	518C	518C	131B	1450C	1450C	640C	430B					
S138						679C	574C	574C	144B	1601C	1601C	708C	479B					
S139						679C	574C	574C	144B	1601C	1601C	708C	479B					
S146						646C	546C	546C	138B	1525C	1525C	674C	455B					
S147						613C	518C	518C	131B	1450C	1450C	640C	430B					
S206										2326C	1749C	1171C	751B					
S207										2093C	1575C	1056C	676B					
S208	200B	190B	230B	161A	98A													
S211	180B	174B	200B	141A	85A													
S212	200B	190B	230B	161A	98A													
S213	200B	190B	230B	161A	98A													
S215	180B	174B	200B	141A	85A													
S221	200B	190B	230B	161A	98A													
S223HA	463B	387A	358B	269A	223A													
S223HB	463B	387A	358B	269A	223A													
S234	230B	200B	266B	200A	131A													
S235	230B	200B	266B	200A	131A													
S236	220B	190B	251B	190A	123A													
S237	210B	180B	236B	180A	115A													

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
S237	449B	400B	400B	390B	361B	298B			325A	226A	164A	115A	600B	508B	508B	400B	230B
S238	499B	449B	449B	423B	400B	328B			351A	276A	200A	148A	699B	649B	649B	430B	259B
S239	499B	449B	449B	423B	400B	328B			351A	276A	200A	148A	699B	649B	649B	430B	259B
S246	450B	412B	412B	387B	363B	288B			288A	233A	176A	135A	500B	540B	540B	384B	230B
S247	400B	374B	374B	351B	325B	249B			226A	190A	151A	121A	499B	430B	430B	338B	200B
S248HA	801C	778C	522C	463B	328B	285A	364A	240A	489B	400B	302B	256A	771C	571B	538B	433B	1017B
S248HB	801C	778C	522C	463B	328B	285A	364A	240A	489B	400B	302B	256A	771C	571B	538B	433B	1017B

Feed Rate Chart - Solid Carbide End Mills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # Flutes to find your Ft Range.

# of Flutes	Type of Cut	Depth/ Width of Cut	Alpha Code	Feed Per Tooth (Ft) Dia Inches										
				1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4
>4		↕ 1,5 ↔ 0,05	A				0.0010	0.0015	0.0015	0.0015	0.0015	0.0020	0.0020	0.0025
			B				0.0020	0.0020	0.0025	0.0030	0.0035	0.0040	0.0040	0.0045
			C				0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0070
3-4		↕ 1,5 ↔ 0,1	A	0.0010	0.0015	0.0020	0.0020	0.0025	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050
			B	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0055	0.0060	0.0070
			C	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050	0.0060	0.0065	0.0070	0.0080	0.0090
3-4		↕ 1 ↔ 0,5	A	0.0005	0.0005	0.0005	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0025
			B	0.0005	0.0005	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0030	0.0035	0.0040
			C	0.0005	0.0010	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050
2-3		↕ 0,5 ↔ 1	A	0.0005	0.0010	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0025	0.0030
			B	0.0010	0.0010	0.0010	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0035	0.0040
			C	0.0015	0.0015	0.0015	0.0020	0.0025	0.0030	0.0035	0.0040	0.0045	0.0050	0.0050
3-4		↕ 0,5 ↔ 1 ↕ 1 ↔ 0,5												
			B				0.0010	0.0020	0.0030	0.0030	0.0035	0.0040	0.0040	0.0040
2 & 4		↕ 0,1 - 0,5mm ↔ 0,1 - 0,5mm	A	0.0010	0.0010	0.0015	0.0015	0.0020	0.0020	0.0025	0.0030	0.0030		
			BC	0.0010	0.0010	0.0015	0.0020	0.0020	0.0025	0.0030	0.0035	0.0040		
4		↕ 0,01 - 0,1 ↔ ≤ 1	A				0.0020	0.0020	0.0025	0.0030		0.0030		
			BC				0.0020	0.0025	0.0030	0.0035		0.0040		

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
S238	230B	200B	266B	200A	131A													
S239	230B	200B	266B	200A	131A													
S246	210B	180B	238B	176A														
S247	190B		210B			699C	571C	571C	180B	1650C	1650C	708C	410B					
S248HA	902B	755B	614B	525A	436A													
S248HB	902B	755B	614B	525A	436A													

Feed Rate Chart - HSS End Mills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # Flutes to find your Ft Range.

		Feed per Tooth (Ft) Dia Inches															
Type of Cut	Alpha Code	0.078	1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4	7/8	1"	1.1/4	1.1/2
↕ 0,5D ↔ D	A	0.0003	0.0005	0.0007	0.0009	0.0011	0.0017	0.0024	0.0028	0.0033	0.0038	0.0038	0.0038	0.0039	0.0041	0.0042	0.0043
	B	0.0003	0.0005	0.0006	0.0009	0.0010	0.0015	0.0021	0.0026	0.0030	0.0034	0.0034	0.0034	0.0035	0.0037	0.0037	0.0038
	C	0.0003	0.0004	0.0006	0.0007	0.0009	0.0014	0.0019	0.0023	0.0027	0.0031	0.0031	0.0031	0.0031	0.0033	0.0034	0.0034
	D	0.0003	0.0004	0.0006	0.0008	0.0009	0.0015	0.0020	0.0024	0.0028	0.0032	0.0032	0.0032	0.0033	0.0035	0.0038	0.0040
	E	0.0005	0.0007	0.0009	0.0014	0.0017	0.0025	0.0034	0.0041	0.0048	0.0055	0.0056	0.0006	0.0057	0.0060	0.0066	0.0069
	F	0.0004	0.0005	0.0007	0.0008	0.0010	0.0013	0.0016	0.0020	0.0022	0.0025	0.0028	0.0031	0.0031	0.0033	0.0033	0.0033
↕ D ↔ 0,8D	G					0.0010	0.0013	0.0014	0.0017	0.0020	0.0022	0.0025	0.0028	0.0028	0.0021	0.0021	0.0022
	H					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0026	0.0026	0.0019	0.0019	0.0020
	I					0.0008	0.0011	0.0011	0.0014	0.0016	0.0018	0.0020	0.0023	0.0023	0.0017	0.0017	0.0018
	J					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0026	0.0026	0.0019	0.0019	0.0020
	K					0.0014	0.0019	0.0026	0.0031	0.0036	0.0059	0.0035	0.0039	0.0038	0.0043	0.0043	0.0046
	L					0.0004	0.0005	0.0007	0.0008	0.0010	0.0011	0.0012	0.0013	0.0013	0.0013	0.0015	0.0017
↕ 1,5D ↔ 0,25D	M	0.0003	0.0005	0.0007	0.0009	0.0012	0.0016	0.0022	0.0027	0.0031	0.0036	0.0041	0.0045	0.0035	0.0041	0.0038	0.0042
	N	0.0003	0.0004	0.0006	0.0008	0.0011	0.0015	0.0020	0.0024	0.0028	0.0032	0.0037	0.0041	0.0024	0.0037	0.0034	0.0038
	O	0.0002	0.0004	0.0006	0.0007	0.0010	0.0013	0.0018	0.0022	0.0026	0.0029	0.0033	0.0036	0.0029	0.0033	0.0031	0.0034
	P	0.0003	0.0004	0.0006	0.0008	0.0011	0.0014	0.0019	0.0023	0.0027	0.0031	0.0015	0.0039	0.0031	0.0035	0.0033	0.0036
	Q	0.0004	0.0006	0.0008	0.0010	0.0015	0.0019	0.0026	0.0031	0.0036	0.0041	0.0035	0.0039	0.0039	0.0044	0.0050	0.0055
	R	0.0005	0.0006	0.0008	0.0010	0.0011	0.0015	0.0019	0.0022	0.0026	0.0029	0.0033	0.0036	0.0036	0.0036	0.0041	0.0043
↕ 1,5D ↔ 0,1D	S	0.0004	0.0006	0.0009	0.0011	0.0015	0.0020	0.0028	0.0034	0.0039	0.0045	0.0051	0.0056	0.0044	0.0051	0.0048	0.0052
	T	0.0004	0.0006	0.0008	0.0010	0.0014	0.0018	0.0025	0.0030	0.0035	0.0051	0.0046	0.0051	0.0040	0.0046	0.0043	0.0047
	U	0.0003	0.0005	0.0007	0.0009	0.0013	0.0016	0.0023	0.0028	0.0032	0.0036	0.0041	0.0046	0.0036	0.0041	0.0039	0.0043
	V	0.0004	0.0005	0.0008	0.0010	0.0013	0.0017	0.0024	0.0029	0.0034	0.0039	0.0043	0.0048	0.0038	0.0043	0.0041	0.0045
	X	0.0005	0.0007	0.0010	0.0013	0.0018	0.0023	0.0032	0.0039	0.0045	0.0052	0.0044	0.0049	0.0048	0.0055	0.0062	0.0068
	Y	0.0006	0.0008	0.0010	0.0012	0.0014	0.0019	0.0023	0.0028	0.0024	0.0036	0.0041	0.0045	0.0045	0.0045	0.0051	0.0054

Easy Calculations: (inch)
RPM = SFM/D x 3.82 **F** = Ft x T x RPM
RPM = [(m/min.) x 1000] ÷ (3.14 x D)

Terms: **RPM** = Revolutions Per Minute **F** = Feed Inches Per Minute
Ft = Feed Per Tooth **T** = Number of Teeth **D** = Cutting Dia.
SFM = Surface Feet per Minute

APPLICATION MATERIAL GROUPS - REAMERS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
4500	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4531	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4532	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4533	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4535	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4536	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4537	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4579	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4587	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4588	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4591	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4600	59C	46C	36C	33B	16B	13A			26C	16B	20B	20B	46E	36D	33C	30C	36C
4608	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
B100	59C	46C	36C	33B	16B	13A			26F				46E	36D	33C	30C	36C
B101	59C	46C	36C	33B	16B	13A			26C				46E	36D	33C	30C	36C
B121	59C	46C	36C	33B	16B	13A							46E	36D	33C	30C	36C
B122	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
B157	82C	66C	52C	49B	30B	16A			36C	20B	26B						49C
B170	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
B301	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
B334	59C	46C	36C	33B	16B	13A			26F				46E	36D	33C	30C	36C
B400	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B411	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B441	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B442	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B481	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B901	59C	46C	36C	33B	16B	13A			26C				46E	36D	33C	30C	36C

APPLICATION MATERIAL GROUPS - COUNTERSINKS
SURFACE FEET PER MINUTE (SFM)

Feed rate chart see page 584.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
4602	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
4603	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
4702	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4703	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4705	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4706	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
G171	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G132			66E	49D	33D	20B					13B					26D	
G135	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G136	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G137	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G138	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G142	98F	82E	66D	49D					26C	20B	13A						39C
G149	98D	82D	66C	49B	33A	20A			26B	20A			82D	49C	39A	26A	39B
G154	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G335	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G338	164F	131E	98D	66D	49B	33A							148F	115D	98C	98C	66C
G400	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G560	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G570	148E	118E	89D	72D	56B	39B			56C	39B	49A	33A	131C	105C	89C	79C	
G600	72F	56E	49D	39D	26B	20A			26C	20B	13A		82F	49D	39C		

Feed Rate Chart - Reamers

Alpha Code	Reamers - Feed in Inches per Revolution Ø Diameter												
	1/16	5/64	1/8	3/16	5/16	25/64	1/2	5/8	25/32	1"	1-13/16	1-1/2	2"
A	0.002	0.002	0.003	0.004	0.006	0.007	0.007	0.009	0.010	0.011	0.013	0.015	0.017
B	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.011	0.012	0.014	0.016	0.020	0.022
C	0.003	0.003	0.005	0.007	0.009	0.010	0.011	0.013	0.015	0.017	0.019	0.024	0.027
D	0.031	0.004	0.006	0.008	0.011	0.013	0.014	0.016	0.019	0.021	0.024	0.029	0.033
E	0.004	0.006	0.007	0.010	0.014	0.015	0.017	0.020	0.021	0.025	0.030	0.036	0.043
F	0.006	0.007	0.010	0.014	0.017	0.020	0.022	0.025	0.028	0.031	0.037	0.047	0.059

APPLICATION MATERIAL GROUPS - REAMERS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 584. For material examples, see page 567*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
4500	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4531	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4532	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4533	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4535	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4536	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4537	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4579	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4587	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4588	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4591	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4600	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4608	30B	16B	26D	16C	10C	82D	92E	82D	46D									
B100	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B101	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B121															69B			
B122	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
B157	30B	16B	26D	16C	10C	82D	92E			92F	82F	66E	52D	98B			10A	
B170	30B	16B	26D	16C	10C	82D	92E	82D	46D									
B301	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
B334	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B400	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B411	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B441	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B442	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B481	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B901	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			

APPLICATION MATERIAL GROUPS - COUNTERSINKS
SURFACE FEET PER MINUTE (SFM)

Material examples page 585.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
4602	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
4603	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
4702	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4703	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4705	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4706	30B	16B	26D	16C	10C	82D	92E	82D	46D									
G171	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G132	26A	26A		20C	13B				33F							16G		
G135	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G136	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G137	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G138	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G142	33A		39C	20B		82D	66F	82F		98G	82F	66F	33F	98G	66G			
G149	33A	26A	39B	20A	13A	82B	66C	82C	33B	98D	82C	66C	33C	98D	66D			
G154	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G335	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G338	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G400	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G560	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G570				20A	13A	131D	98F	131F	49D	148G	118F	89F	43F					
G600						82D	66F	82F	33D	98G	82F	66F	33F					

Feed Rate Chart - Countersinks, Counterbores

Alpha Code	Countersinks, Counterbores - Feed in Inches per Revolution — ø Diameter									
	1/4	5/16	5/64	5/8	25/32	1"	1-1/4	1-1/2	2-3/8	3"
A	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.005	0.006	0.006
B	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008
C	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
D	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010	0.011
E	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012	0.013
F	0.004	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.014
G	0.004	0.005	0.006	0.007	0.008	0.009	0.011	0.013	0.014	0.016
H	0.005	0.006	0.007	0.008	0.009	0.010	0.012	0.014	0.016	0.018

EDP NUMBER INDEX - 000021 - 003342

EDP#	E-Code	Page #
0000021	A100.2	95
0000038	A100.25	95
0000045	A100.3	95
0000052	A100.32	95
0000069	A100.35	95
0000076	A100.38	95
0000083	A100.4	95
0000090	A100.42	95
0000106	A100.45	95
0000113	A100.48	96
0000120	A100.5	96
0000137	A100.52	96
0000144	A100.55	96
0000151	A100.58	96
0000168	A100.6	96
0000175	A100.62	96
0000182	A100.65	96
0000199	A100.68	96
0000205	A100.7	96
0000212	A100.72	96
0000229	A100.75	96
0000236	A100.78	96
0000243	A100.8	96
0000250	A100.82	96
0000267	A100.85	96
0000274	A100.88	96
0000281	A100.9	96
0000298	A100.92	96
0000304	A100.95	96
0000311	A100.98	96
0000328	A1001.0	96
0000335	A1001.05	96
0000342	A1001.1	96
0000359	A1001.15	96
0000366	A1001.2	96
0000373	A1001.25	96
0000380	A1001.3	96
0000397	A1001.35	96
0000403	A1001.4	96
0000410	A1001.45	96
0000427	A1001.5	96
0000434	A1001.55	96
0000441	A1001.6	96
0000458	A1001.65	97
0000465	A1001.7	97
0000472	A1001.75	97
0000489	A1001.8	97
0000496	A1001.85	97
0000502	A1001.9	97
0000519	A1001.95	97
0000526	A10010.0	100
0000533	A10010.1	100
0000540	A10010.2	100
0000557	A10010.25	100
0000564	A10010.3	100
0000571	A10010.4	100
0000588	A10010.5	100
0000595	A10010.6	100
0000601	A10010.7	100
0000618	A10010.75	100
0000625	A10010.8	100
0000632	A10010.9	100
0000649	A10011.0	100
0000656	A10011.1	100
0000663	A10011.2	100
0000670	A10011.25	100
0000687	A10011.3	100
0000694	A10011.4	100
0000700	A10011.5	100
0000717	A10011.6	100
0000724	A10011.7	100
0000731	A10011.75	100
0000748	A10011.8	100
0000755	A10011.9	100
0000762	A10011/16	101
0000779	A10011/32	99
0000786	A1001/16	96
0000793	A10011/64	98
0000809	A1001/2	101
0000816	A10012.0	100
0000823	A10012.1	100
0000830	A10012.2	100
0000847	A10012.25	100
0000854	A10012.3	100
0000861	A10012.4	100
0000878	A10012.5	101
0000885	A10012.6	101
0000892	A10012.7	101
0000908	A10012.75	101
0000915	A10012.8	101
0000922	A10012.9	101
0000939	A10013.0	101
0000946	A10013.1	101
0000953	A10013.2	101
0000960	A10013.25	101
0000977	A10013.3	101
0000984	A10013.4	101
0000991	A10013.5	101
0001004	A10013.6	101
0001011	A10013.7	101
0001028	A10013.75	101
0001035	A10013.8	101
0001042	A10013.9	101
0001059	A1001/32	96
0001066	A10013/32	100
0001073	A10013/64	98
0001080	A1001/4	99
0001097	A10014.0	101
0001103	A10014.25	101
0001110	A10014.5	101
0001127	A10014.75	101
0001134	A10015.0	101
0001141	A10015.25	101
0001158	A10015.5	101
0001165	A10015.75	101
0001172	A10015/32	100
0001189	A10015/64	99
0001196	A10016.0	101
0001202	A10016.5	101
0001219	A1001/64	95
0001226	A10017.0	101
0001233	A10017.5	101
0001240	A10017/32	101
0001257	A10017/64	99
0001264	A1001/8	97
0001271	A10018.0	101
0001288	A10018.5	101
0001295	A10019.0	101
0001301	A10019.5	101
0001318	A10019/32	101
0001325	A10019/64	101
0001332	A1002.0	97
0001349	A1002.05	97
0001356	A1002.1	97
0001363	A1002.15	97
0001370	A1002.2	97
0001387	A1002.25	97
0001394	A1002.3	97
0001400	A1002.35	97
0001417	A1002.4	97
0001424	A1002.45	97
0001431	A1002.5	97
0001448	A1002.55	97
0001455	A1002.6	97
0001462	A1002.65	97
0001479	A1002.7	97
0001486	A1002.75	97
0001493	A1002.8	97
0001509	A1002.85	97
0001516	A1002.9	97
0001523	A1002.95	97
0001530	A10020.0	101
0001547	A10021/32	101
0001554	A10021/64	99
0001561	A10023/64	100
0001578	A10025/64	100
0001585	A10027/64	100
0001592	A10029/64	100
0001608	A1003.0	97
0001615	A1003.1	97
0001622	A1003.15	97
0001639	A1003.2	97
0001646	A1003.25	97
0001653	A1003.3	97
0001660	A1003.4	97
0001677	A1003.5	98
0001684	A1003.6	98
0001691	A1003.7	98
0001707	A1003.75	98
0001714	A1003.8	98
0001721	A1003.9	98
0001738	A1003/16	98
0001745	A10031/64	100
0001752	A1003/32	97
0001769	A10033/64	101
0001776	A10035/64	101
0001783	A1003/64	96
0001790	A10037/64	101
0001806	A1003/8	100
0001813	A10039/64	101
0001820	A1004.0	98
0001837	A1004.1	98
0001844	A1004.2	98
0001851	A1004.25	98
0001868	A1004.3	98
0001875	A1004.4	98
0001882	A1004.5	98
0001899	A1004.6	98
0001905	A1004.7	98
0001912	A1004.75	98
0001929	A1004.8	98
0001936	A1004.9	98
0001943	A10041/64	101
0001950	A10043/64	101
0001967	A1005.0	98
0001974	A1005.1	98
0001981	A1005.2	98
0001998	A1005.25	98
0002001	A1005.3	98
0002018	A1005.4	98
0002025	A1005.5	98
0002032	A1005.6	98
0002049	A1005.7	98
0002056	A1005.75	98
0002063	A1005.8	99
0002070	A1005.9	99
0002087	A1005/16	99
0002094	A1005/32	98
0002100	A1005/64	97
0002117	A1005/8	97
0002124	A1006.0	99
0002131	A1006.1	99
0002148	A1006.2	99
0002155	A1006.25	99
0002162	A1006.3	99
0002179	A1006.4	99
0002186	A1006.5	99
0002193	A1006.6	99
0002209	A1006.7	99
0002216	A1006.75	99
0002223	A1006.8	99
0002230	A1006.9	99
0002247	A1007.0	99
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0002261	A1007.2	99
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0002292	A1007.4	99
0002308	A1007.5	99
0002315	A1007.6	99
0002322	A1007.7	99
0002339	A1007.75	99
0002346	A1007.8	99
0002353	A1007.9	99
0002360	A1007/16	100
0002377	A1007/32	98
0002384	A1007/64	97
0002391	A1008.0	99
0002407	A1008.1	99
0002414	A1008.2	99
0002421	A1008.25	99
0002438	A1008.3	99
0002445	A1008.4	99
0002452	A1008.5	99
0002469	A1008.6	99
0002476	A1008.7	99
0002483	A1008.75	100
0002490	A1008.8	100
0002506	A1008.9	100
0002513	A1009.0	100
0002520	A1009.1	100
0002537	A1009.2	100
0002544	A1009.25	100
0002551	A1009.3	100
0002568	A1009.4	100
0002575	A1009.5	100
0002582	A1009.6	100
0002599	A1009.7	100
0002605	A1009.75	100
0002612	A1009.8	100
0002629	A1009.9	100
0002636	A1009/16	101
0002643	A1009/32	99
0002650	A1009/64	98
0002667	A1011.0	103
0002674	A1011.1	103
0002681	A1011.2	103
0002698	A1011.25	103
0002704	A1011.3	103
0002711	A1011.4	103
0002728	A1011.5	103
0002735	A1011.6	103
0002742	A1011.7	103
0002766	A1011.8	103
0002773	A1011.9	103
0002780	A10110.0	104
0002797	A10112.0	104
0002803	A1012.0	103
0002810	A1012.1	103
0002827	A1012.2	103
0002834	A1012.3	103
0002841	A1012.4	103
0002858	A1012.5	103
0002865	A1012.6	103
0002872	A1012.7	103
0002889	A1012.8	103
0002896	A1012.9	103
0002902	A1013.0	103
0002919	A1013.2	103
0002926	A1013.3	103
0002933	A1013.5	103
0002940	A1013.8	103
0002957	A1014.0	103
0002964	A1014.2	103
0002971	A1014.5	103
0002988	A1014.8	103
0002995	A1015.0	103
0003008	A1015.1	103
0003015	A1015.2	103
0003022	A1015.5	104
0003039	A1016.0	104
0003046	A1016.5	104
0003053	A1017.0	104
0003060	A1017.5	104
0003077	A1018.0	104
0003084	A1018.5	104
0003091	A1019.0	104
003251	DCN0	211
003252	DCN1	211
003253	DCN2	211
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