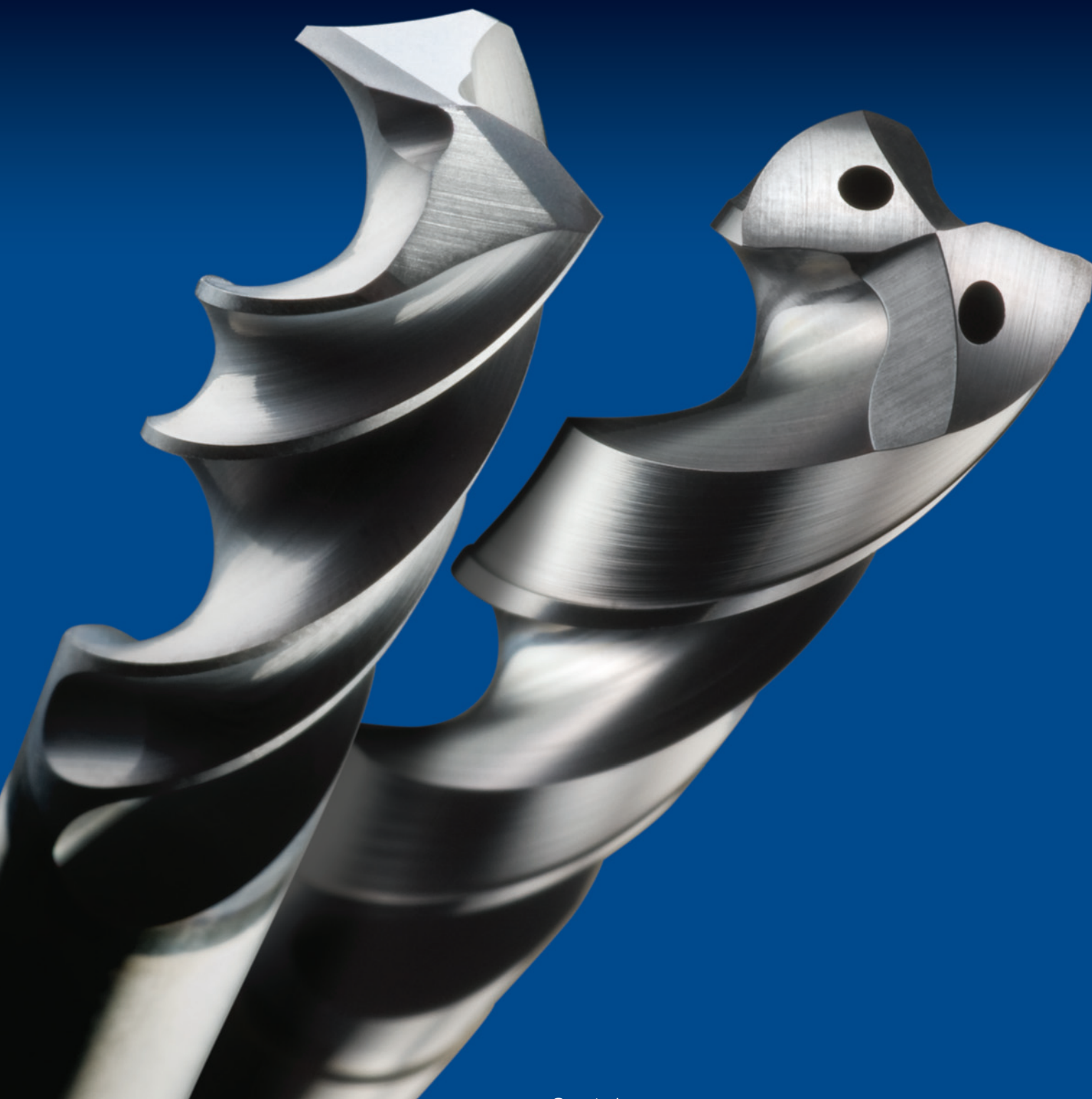




Solid Carbide Tools
An ISO 9001 Certified Company

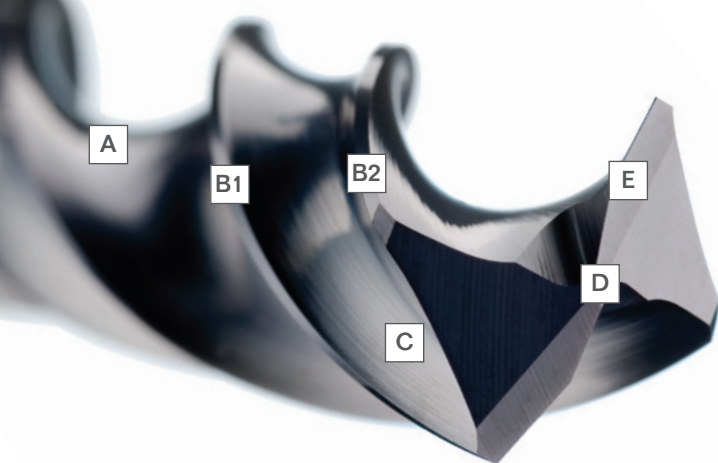


High Performance Drilling Solutions





HIGH PERFORMANCE CARBIDE DRILLS



PERFORMANCE. PRECISION. PASSION. with Hi-PerCarb external coolant drills

The key features designed into the SGS Hi-PerCarb drill allow the product to offer application benefits not only beyond that of standard carbide drills, but also other High Performance drills. Each feature of the SGS Hi-PerCarb drill was uniquely engineered as a solution towards addressing the issues commonly encountered during high production drilling.

A	HIGH PERFORMANCE FLUTE DESIGN	efficiently transports chips increases strength for aggressive drilling captures chip in flute
A	Ti-NAMITE A COATING	improves resistance to heat increases wear resistance increases tool life
B1 B2	DOUBLE MARGIN DESIGN	improves accuracy improves surface finish increases stability and rigidity
C	SECONDARY FLUTE	improves coolant flow to point reduces friction along drill body assists in fine swarf evacuation
D	SPECIALIZED 145° NOTCHED POINT	self centering eliminates need for spot drill improves chip control decreases drill thrust and deflection
E	ENGINEERED EDGE PROTECTION	improves edge strength reduces edge fatigue allows increased feed rates

PERFORMANCE

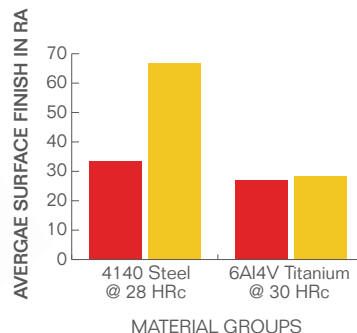
Machining Environment: Haas VM-3 with
9% Water Soluble Oil Flood Coolant

5/16" (.3125) diameter hole:

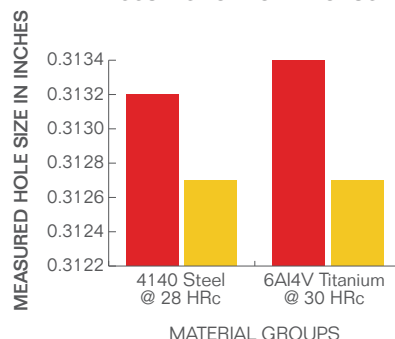
4140 application – .650" deep

6Al-4V application – 1.125" deep

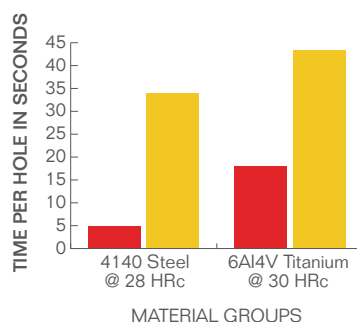
AVERAGE SURFACE FINISH RESULTS



ACCURACY OF HOLE PRODUCED



TOTAL CYCLE TIME

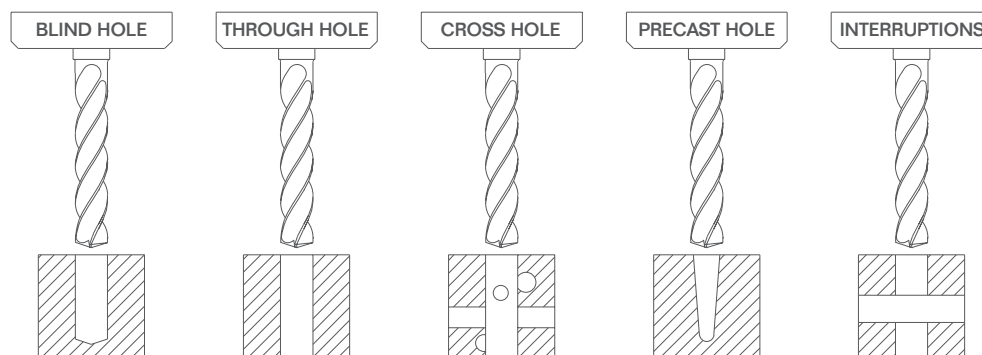


■ SGS HI-PERCARB ■ SOLID CARBIDE DRILL AND REAMER

The second margin gives the Hi-PerCarb drill a burnishing effect and the flute form effectively controls and transports chips allowing the drill to offer superior surface finishes and hole size in high production environments saving cycle time by often avoiding the need for reaming in many applications.

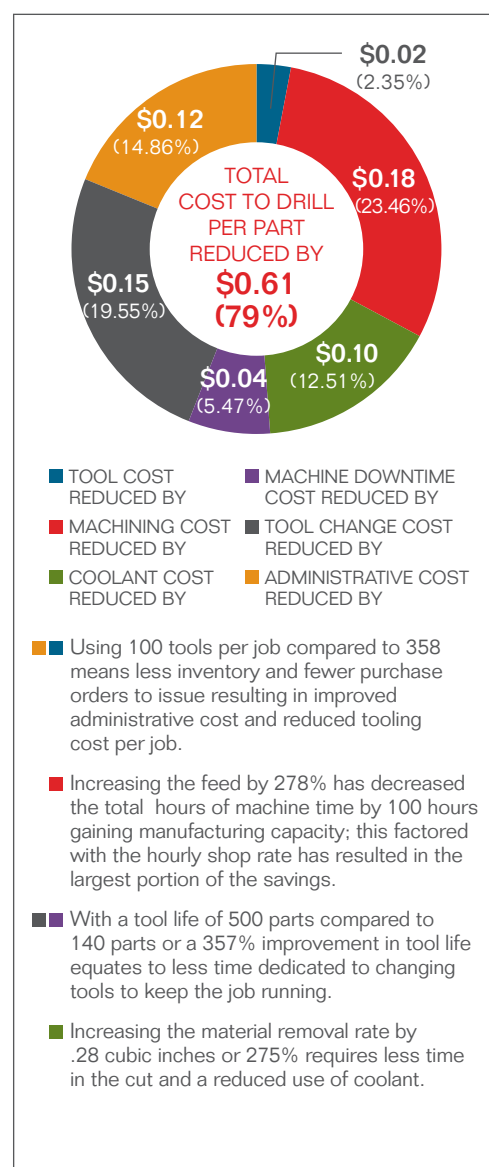
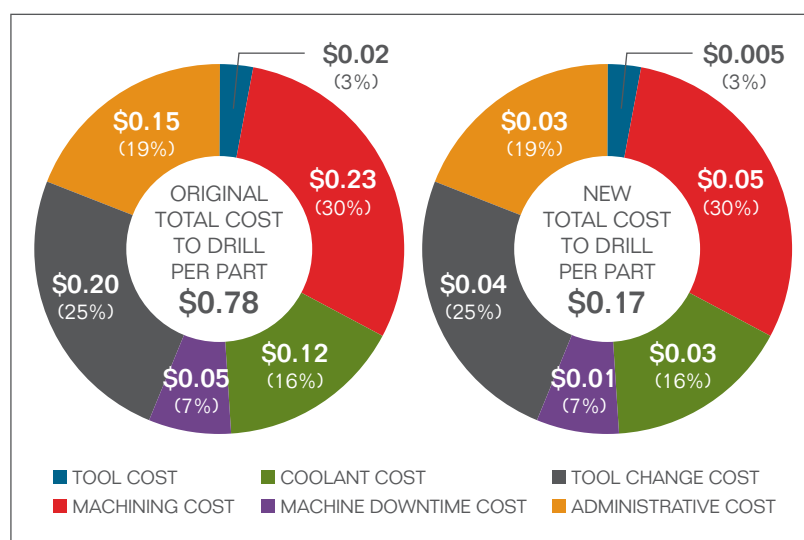
PRECISION

The stability of the double margin design and penetration capability of the point geometry allow the Hi-PerCarb drill to address demanding applications that would normally require reduced operating parameters or a two step process.



PASSION

The secondary flute provides a channel for cooling capabilities normally not found in external coolant drills, this combined with the Ti-NAMITE A tool coating and the high strength edge design results in increased operating parameters with additional tool life.

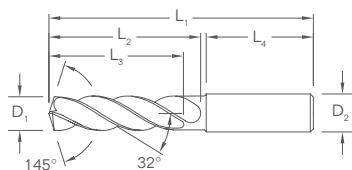


ACTUAL CUSTOMER APPLICATION USING A 6MM DRILL IN 17-4 PH STAINLESS STEEL

	COMPETITOR	SGS HI-PERCARB
NUMBER OF PARTS TO PRODUCE	50000	50000
SURFACE FEET PER MINUTE (SFM)	74	124
SPEED IN REVOLUTIONS PER MINUTE (RPM)	1200	2000
FEED IN INCHES PER MINUTE (IPM)	3.6	10
NUMBER OF PARTS PRODUCED PER TOOL	140	500
DEPTH OF HOLE	0.6800	0.6800
NUMBER OF NEW TOOLS REQUIRED TO COMPLETE JOB	358	100
TOTAL HOURS OF MACHINING TIME	157	57
TOTAL MACHINING COST	\$10,231.48	\$3,683.33
TOOL CHANGE COST	\$1,939.17	\$541.67
TOTAL COST	\$39,017.07	\$8,460.00
COST PER PART	\$0.78	\$0.17
MATERIAL REMOVAL RATE (IN ³ / MIN) – DRILLING	0.16	0.44
CUTTING TIME PER PART – MINUTES	0.19	0.07
SAVINGS PER PART – DOLLARS	0	\$0.61
TOTAL COST SAVINGS / JOB – PERCENTAGE	0	78.32%
TOTAL COST SAVINGS / JOB – DOLLARS	0	\$30,557.07



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 3xD

SERIES 135 3xD


TOLERANCES (inch)			TOLERANCES (mm)		
DIAMETER	D ₁	D ₂	DIAMETER	D ₁	D ₂
≤ 3/4	+0.0001 / +0.0005	h6	≤ 3	+0.0025 / +0.0127	h6
> 3/4 - 1/4	+0.0002 / +0.0006	h6	> 3 - 6	+0.0050 / +0.0152	h6
> 1/4 - 3/8	+0.0002 / +0.0008	h6	> 6 - 10	+0.0050 / +0.0200	h6
> 3/8 - 3/4	+0.0003 / +0.0010	h6	> 10 - 18	+0.0076 / +0.0254	h6
> 3/4 - 1	+0.0003 / +0.0011	h6	> 18 - 30	+0.0076 / +0.0279	h6

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
1/64	0.0156		1/8	1-1/2	1/8	5/64	1	51752
1/32	0.0312		1/8	1-1/2	1/4	3/16	1	51269
3/64	0.0469	1/16-64	1/8	1-1/2	3/8	5/16	1	51270
1/16	0.0625	5/64-60	1/8	2	7/16	3/8	1-1/4	51271
5/64	0.0781		1/8	2	1/2	7/16	1-1/4	51272
3/32	0.0938	1/8-32	1/8	2	1/2	7/16	1-1/4	51273
40	0.0980		1/8	2	9/16	1/2	1-1/4	51274
39	0.0995		1/8	2	9/16	1/2	1-1/4	51753
38	0.1015	5-40	1/8	2	9/16	1/2	1-1/4	51754
37	0.1040	5-44	1/8	2	9/16	1/2	1-1/4	51755
36	0.1065	6-32	1/8	2	9/16	1/2	1-1/4	51756
7/64	0.1094		1/8	2	5/8	9/16	1-1/4	51275
35	0.1100		1/8	2	5/8	9/16	1-1/4	51276
34	0.1110		1/8	2	5/8	9/16	1-1/4	51277
33	0.1130	6-40	1/8	2	5/8	9/16	1-1/4	51757
32	0.1160		1/8	2	5/8	9/16	1-1/4	51758
3,0 mm	0.1181		6mm	62mm	20mm	17mm	36mm	63155
31	0.1200		1/8	2	5/8	9/16	1-1/4	51759
3,1 mm	0.1220		6mm	62mm	20mm	17mm	36mm	63741
1/8	0.1250		1/4	2-1/2	3/4	21/32	1-7/16	51330
3,2 mm	0.1260	M3,5 X 0,35	6mm	62mm	20mm	17mm	36mm	63156
30	0.1285		1/4	2-1/2	3/4	21/32	1-7/16	51278
3,3 mm	0.1299	M4 X 0,7	6mm	62mm	20mm	17mm	36mm	63157
3,4 mm	0.1339		6mm	62mm	20mm	17mm	36mm	63158
29	0.1360	8-32,8-36	1/4	2-1/2	3/4	21/32	1-7/16	51331
3,5 mm	0.1378	M4 X 0,5	6mm	62mm	20mm	17mm	36mm	63159
28	0.1405	8-40	1/4	2-1/2	3/4	2w	1-7/16	51760
9/64	0.1406		1/4	2-1/2	3/4	21/32	1-7/16	51332
3,6 mm	0.1417	M4 X 0,35	6mm	62mm	20mm	17mm	36mm	63160
27	0.1440		1/4	2-1/2	3/4	21/32	1-7/16	51761
3,7 mm	0.1457	M4.5 X 0,75	6mm	62mm	20mm	17mm	36mm	63161
26	0.1470	3/16-24	1/4	2-1/2	3/4	21/32	1-7/16	51762
25	0.1495	10-24	1/4	2-5/8	7/8	23/32	1-7/16	51333
3,8 mm	0.1496		6mm	66mm	24mm	21mm	36mm	63472
24	0.1520	10-28	1/4	2-5/8	7/8	23/32	1-7/16	51763
3,9 mm	0.1535		6mm	66mm	24mm	21mm	36mm	63743
23	0.1540		1/4	2-5/8	7/8	23/32	1-7/16	51764
5/32	0.1562		1/4	2-5/8	7/8	23/32	1-7/16	51334
22	0.1570	10-30	1/4	2-5/8	7/8	23/32	1-7/16	51765
4,0 mm	0.1575	M4,5 X 0,5	6mm	66mm	24mm	21mm	36mm	63162
21	0.1590	10-32	1/4	2-5/8	7/8	23/32	1-7/16	51335
20	0.1610	13/64-24	1/4	2-5/8	7/8	23/32	1-7/16	51279



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 3xD

SERIES 135 3xD

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
4,1 mm	0.1614	M5 / M5 X 0,75	6mm	66mm	24mm	21mm	36mm	63744
4,2 mm	0.1654		6mm	66mm	24mm	21mm	36mm	63163
19	0.1660		1/4	2-5/8	7/8	23/32	1-7/16	51766
4,3 mm	0.1693		6mm	66mm	24mm	21mm	36mm	63164
18	0.1695		1/4	2-5/8	7/8	23/32	1-7/16	51767
11/64	0.1719	M5 X 0,5	1/4	2-5/8	7/8	23/32	1-7/16	51336
17	0.1730		1/4	2-5/8	7/8	23/32	1-7/16	51768
4,4 mm	0.1732		6mm	66mm	24mm	21mm	36mm	63745
16	0.1770		1/4	2-5/8	7/8	23/32	1-7/16	51769
4,5 mm	0.1772		6mm	66mm	24mm	21mm	36mm	63165
15	0.1800	12-28	1/4	2-5/8	7/8	23/32	1-7/16	51770
4,6 mm	0.1811		6mm	66mm	24mm	21mm	36mm	63166
14	0.1820		1/4	2-5/8	7/8	23/32	1-7/16	51771
13	0.1850		1/4	2-5/8	7/8	23/32	1-7/16	51772
4,7 mm	0.1850		6mm	66mm	24mm	21mm	36mm	63746
3/16	0.1875	7/32-32	1/4	2-5/8	1	53/64	1-7/16	51337
12	0.1890		1/4	2-5/8	1	53/64	1-7/16	51773
4,8 mm	0.1890		6mm	66mm	28mm	24mm	36mm	63167
11	0.1910		1/4	2-5/8	1	53/64	1-7/16	51774
4,9 mm	0.1929		6mm	66mm	28mm	24mm	36mm	63747
10	0.1935	14-20	1/4	2-5/8	1	53/64	1-7/16	51775
9	0.1960		1/4	2-5/8	1	53/64	1-7/16	51776
5,0 mm	0.1969		6mm	66mm	28mm	24mm	36mm	63168
8	0.1990		1/4	2-5/8	1	53/64	1-7/16	51777
5,1 mm	0.2008		6mm	66mm	28mm	24mm	36mm	63748
7	0.2010	1/4-20	1/4	2-5/8	1	53/64	1-7/16	51338
13/64	0.2031		1/4	2-5/8	1	53/64	1-7/16	51339
6	0.2040		1/4	2-5/8	1	53/64	1-7/16	51778
5,2 mm	0.2047		6mm	66mm	28mm	24mm	36mm	63749
5	0.2055		1/4	2-5/8	1	53/64	1-7/16	51779
5,25 mm	0.2067	M6 X 0,75	6mm	66mm	28mm	24mm	36mm	63169
5,3 mm	0.2087		6mm	66mm	28mm	24mm	36mm	63170
4	0.2090		1/4	2-5/8	1	53/64	1-7/16	51780
5,4 mm	0.2126		6mm	66mm	28mm	24mm	36mm	63750
3	0.2130		1/4	2-5/8	1	53/64	1-7/16	51340
5,5 mm	0.2165	M6 X 0,5	6mm	66mm	28mm	24mm	36mm	63171
7/32	0.2188		1/4	2-5/8	1	53/64	1-7/16	51341
5,6 mm	0.2205		6mm	66mm	28mm	24mm	36mm	63751
2	0.2210		1/4	2-5/8	1	53/64	1-7/16	51781
5,7 mm	0.2244		6mm	66mm	28mm	24mm	36mm	63752
1	0.2280	1/4-28	1/4	2-5/8	1	53/64	1-7/16	51782
5,8 mm	0.2283		6mm	66mm	28mm	24mm	36mm	63172
5,9 mm	0.2323		6mm	66mm	28mm	24mm	36mm	63753
A	0.2340		1/4	2-5/8	1	53/64	1-7/16	51601
15/64	0.2344		1/4	2-5/8	1	53/64	1-7/16	51342
6,0	0.2362	M7 X 1	6mm	66mm	28mm	24mm	36mm	63173
B	0.2380		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51602
6,1 mm	0.2402		8mm	79mm	34mm	28mm	36mm	63754
C	0.2420		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51603
6,2 mm	0.2441		8mm	79mm	34mm	28mm	36mm	63755



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 3xD

SERIES 135 3xD

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
D	0.2460	M7 X 0,75	1/4	3-1/8	1-5/16	1-3/64	1-7/16	51604
6,25 mm	0.2461		8mm	79mm	34mm	28mm	36mm	63174
6,3 mm	0.2480		8mm	79mm	34mm	28mm	36mm	63756
1/4	0.2500	5/16-18	1/4	3-1/8	1-5/16	1-3/64	1-7/16	51343
E	0.2500		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51605
6,4 mm	0.2520		8mm	79mm	34mm	28mm	36mm	63175
6,5 mm	0.2559	5/16-20	8mm	79mm	34mm	28mm	36mm	63213
F	0.2570		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51344
6,6 mm	0.2598		8mm	79mm	34mm	28mm	36mm	63757
G	0.2610	5/16-24	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51606
6,7 mm	0.2638		8mm	79mm	34mm	28mm	36mm	63758
17/64	0.2656		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51345
H	0.2660	M8 X 1,25	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51607
6,8 mm	0.2677		8mm	79mm	34mm	28mm	36mm	63176
6,9 mm	0.2717		8mm	79mm	34mm	28mm	36mm	63759
I	0.2720	M8 X 1	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51346
7,0 mm	0.2756		8mm	79mm	34mm	28mm	36mm	63177
J	0.2770		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51608
7,1 mm	0.2795	5/16-32	8mm	79mm	41mm	34mm	36mm	63760
K	0.2810		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51609
9/32	0.2812		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51347
7,2 mm	0.2835	M8 X 0,75	8mm	79mm	41mm	34mm	36mm	63761
7,25 mm	0.2854		8mm	79mm	41mm	34mm	36mm	63178
7,3 mm	0.2874		8mm	79mm	41mm	34mm	36mm	63762
L	0.2900	M8 X 0,5	5/16	3-1/8	1-9/16	1-3/16	1-7/16	51610
7,4 mm	0.2913		8mm	79mm	41mm	34mm	36mm	63763
M	0.2950		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51611
7,5 mm	0.2953	M9 X 1,25	8mm	79mm	41mm	34mm	36mm	63179
19/64	0.2969		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51348
7,6 mm	0.2992		8mm	79mm	41mm	34mm	36mm	63764
N	0.3020	3/8-16	5/16	3-1/8	1-9/16	1-3/16	1-7/16	51612
7,7 mm	0.3031		8mm	79mm	41mm	34mm	36mm	63765
7,8 mm	0.3071		8mm	79mm	41mm	34mm	36mm	63180
7,9 mm	0.3110	M9 x 1	8mm	79mm	41mm	34mm	36mm	63766
5/16	0.3125		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51349
8,0 mm	0.3150		8mm	79mm	41mm	34mm	36mm	63181
O	0.3160	3/8	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51613
8,1 mm	0.3189		10mm	89mm	47mm	40mm	40mm	63767
8,2 mm	0.3228		10mm	89mm	47mm	40mm	40mm	63768
P	0.3230	3/8-20	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51614
8,3 mm	0.3268		10mm	89mm	47mm	40mm	40mm	63769
21/64	0.3281		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51350
8,4 mm	0.3307	3/8-24	10mm	89mm	47mm	40mm	40mm	63182
Q	0.3320		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51351
8,5 mm	0.3346		10mm	89mm	47mm	40mm	40mm	63183
8,6 mm	0.3386	M10 X 1,5	10mm	89mm	47mm	40mm	40mm	63770
R	0.3390		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51615
8,7 mm	0.3425		10mm	89mm	47mm	40mm	40mm	63771
11/32	0.3438	3/8-32	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51352
8,8 mm	0.3465		10mm	89mm	47mm	40mm	40mm	63184



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 3xD

SERIES 135 3xD

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
S	0.3480		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51616
8,9 mm	0.3504		10mm	89mm	47mm	40mm	40mm	63772
9,0 mm	0.3543	M10 X 1	10mm	89mm	47mm	40mm	40mm	63185
T	0.3580		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51617
9,1 mm	0.3583		10mm	89mm	47mm	40mm	40mm	63773
23/64	0.3594		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51353
9,2 mm	0.3622	M10 X 0,75	10mm	89mm	47mm	40mm	40mm	63774
9,25 mm	0.3642		10mm	89mm	47mm	40mm	40mm	63186
9,3 mm	0.3661		10mm	89mm	47mm	40mm	40mm	63775
U	0.3680	7/16-14	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51354
9,4 mm	0.3701		10mm	89mm	47mm	40mm	40mm	63776
9,5 mm	0.3740	M10 X 0,5	10mm	89mm	47mm	40mm	40mm	63187
3/8	0.3750		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51355
V	0.3770		1/2	3-1/2	1-27/32	1-37/64	1-9/16	51618
9,6 mm	0.3780		10mm	89mm	47mm	40mm	40mm	63777
9,7 mm	0.3819		10mm	89mm	47mm	40mm	40mm	63778
9,8 mm	0.3858		10mm	89mm	47mm	40mm	40mm	63779
W	0.3860		1/2	3-1/2	1-27/32	1-37/64	1-9/16	51619
9,9 mm	0.3898		10mm	89mm	47mm	40mm	40mm	63780
25/64	0.3906	7/16-20	1/2	3-1/2	1-27/32	1-37/64	1-9/16	51356
10,0 mm	0.3937		10mm	89mm	47mm	40mm	40mm	63188
X	0.3970	7/16-24	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51620
10,1 mm	0.3976		12mm	102mm	55mm	45mm	45mm	63781
10,2 mm	0.4016	M12 X 1,75	12mm	102mm	55mm	45mm	45mm	63189
Y	0.4040	7/16-28	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51621
10,3 mm	0.4055		12mm	102mm	55mm	45mm	45mm	63782
13/32	0.4062		1/2	4-1/16	2-3/16	1-51/64	1-49/64	51357
10,4 mm	0.4094		12mm	102mm	55mm	45mm	45mm	63783
Z	0.4130		1/2	4-1/16	2-3/16	1-51/64	1-49/64	51622
10,5 mm	0.4134	M12 X 1,5	12mm	102mm	55mm	45mm	45mm	63190
10,6 mm	0.4173		12mm	102mm	55mm	45mm	45mm	63784
10,7 mm	0.4213		12mm	102mm	55mm	45mm	45mm	63785
27/64	0.4219	1/2-13	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51358
10,8 mm	0.4252	M12 X 1,25	12mm	102mm	55mm	45mm	45mm	63191
10,9 mm	0.4291		12mm	102mm	55mm	45mm	45mm	63786
11,0 mm	0.4331	M12 X 1	12mm	102mm	55mm	45mm	45mm	63192
11,1 mm	0.4370		12mm	102mm	55mm	45mm	45mm	63787
7/16	0.4375	1/4-18 NPT	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51359
11,2 mm	0.4409		12mm	102mm	55mm	45mm	45mm	63788
11,25 mm	0.4429		12mm	102mm	55mm	45mm	45mm	63193
11,3 mm	0.4449		12mm	102mm	55mm	45mm	45mm	63789
11,4 mm	0.4488		12mm	102mm	55mm	45mm	45mm	63790
11,5 mm	0.4528	M12 X 0,5	12mm	102mm	55mm	45mm	45mm	63194
29/64	0.4531	1/2-20	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51360
11,6 mm	0.4567		12mm	102mm	55mm	45mm	45mm	63791
11,7 mm	0.4606		12mm	102mm	55mm	45mm	45mm	63792
11,8 mm	0.4646		12mm	102mm	55mm	45mm	45mm	63793
11,9 mm	0.4685		12mm	102mm	55mm	45mm	45mm	63794
15/32	0.4688	1/2-28	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51361
12,0 mm	0.4724	M14 X 2	12mm	102mm	55mm	45mm	45mm	63195



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 3xD

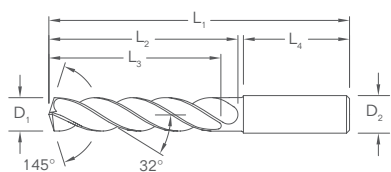
SERIES 135 3xD

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
31/64	0.4844	9/16-12	1/2	4-1/4	2-5/16	1-7/8	1-49/64	51362
12,5 mm	0.4921	M14 X 1,5	14mm	107mm	60mm	49mm	45mm	63196
1/2	0.5000		1/2	4-1/4	2-5/16	1-7/8	1-49/64	51363
12,8 mm	0.5039	M14 X 1,25	14mm	107mm	60mm	49mm	45mm	63197
13,0 mm	0.5118	M14 X 1	14mm	107mm	60mm	49mm	45mm	63198
33/64	0.5156	9/16-18	5/8	4-1/4	2-5/16	1-7/8	1-49/64	51364
17/32	0.5312	5/8-11	5/8	4-1/4	2-5/16	1-7/8	1-49/64	51365
13,5 mm	0.5315		14mm	107mm	60mm	49mm	45mm	63199
35/64	0.5469	5/8-12	5/8	4-1/4	2-5/16	1-7/8	1-49/64	51783
14,0 mm	0.5512	M16 X 2	14mm	107mm	60mm	49mm	45mm	63200
9/16	0.5625		5/8	4-9/16	2-1/2	2	1-57/64	51366
14,5 mm	0.5709	M16 X 1,5	16mm	115mm	65mm	51mm	48mm	63201
37/64	0.5781	5/8-18	5/8	4-9/16	2-1/2	2	1-57/64	51367
15,0 mm	0.5906	M16 X 1	16mm	115mm	65mm	51mm	48mm	63202
19/32	0.5938	11/16-11	5/8	4-9/16	2-1/2	2	1-57/64	51784
39/64	0.6094	11/16-12	5/8	4-9/16	2-1/2	2	1-57/64	51785
15,5 mm	0.6102	M18 X 2,5	16mm	115mm	65mm	51mm	48mm	63203
5/8	0.6250	11/16-16	5/8	4-9/16	2-1/2	2	1-57/64	51368
16,0 mm	0.6299		16mm	115mm	65mm	51mm	48mm	63204
41/64	0.6406	11/16-24	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51786
16,5 mm	0.6496	M18 X 1,5	18mm	123mm	73mm	58mm	48mm	63205
21/32	0.6562	3/4-10	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51369
17,0 mm	0.6693		18mm	123mm	73mm	58mm	48mm	63206
43/64	0.6719	3/4-12	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51787
11/16	0.6875	3/4-16	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51370
17,5 mm	0.6890	M20 X 2,5	18mm	123mm	73mm	58mm	48mm	63207
45/64	0.7031	3/4-20, 1/2-14 NPT	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51788
18,0 mm	0.7087		18mm	123mm	73mm	58mm	48mm	63208
23/32	0.7188		3/4	4-7/8	2-3/4	2-5/16	1-57/64	51789
18,5 mm	0.7283	M20 X 1,5	20mm	131mm	79mm	63mm	50mm	63209
47/64	0.7344	13/16-12	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51790
19,0 mm	0.7480		20mm	131mm	79mm	63mm	50mm	63210
3/4	0.7500	13/16-16	3/4	5-1/4	3-1/16	2-7/16	1-31/32	51371
49/64	0.7656	7/8-9	7/8	5-1/4	3-1/16	2-7/16	1-31/32	51372
19,5 mm	0.7677	M22 X 2,5	20mm	131mm	79mm	63mm	50mm	63211
25/32	0.7812		7/8	6	3-11/16	2-11/16	2-1/8	51791
20,0 mm	0.7874		20mm	131mm	79mm	63mm	50mm	63212
51/64	0.7969	7/8-12	7/8	6	3-11/16	2-11/16	2-1/8	51792
13/16	0.8125	7/8-14	7/8	6	3-11/16	2-11/16	2-1/8	51373
7/8	0.8750	15/16-16, 1-8	7/8	6	3-11/16	2-11/16	2-1/8	51374
59/64	0.9219	1-12	1	6	3-11/16	2-11/16	2-1/8	51375



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 5xD

SERIES 135 5xD



TOLERANCES (inch)		
DIAMETER	D ₁	D ₂
≥ 1/8 - 1/4	+0.0002 / +0.0006	h6
> 1/4 - 3/8	+0.0002 / +0.0008	h6
> 3/8 - 3/4	+0.0003 / +0.0010	h6

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
1/8	0.1250		1/4	3	1	53/64	1-15/16	51580
30	0.1285		1/4	3	1	53/64	1-15/16	51581
29	0.1360	8-32,8-36	1/4	3	1	53/64	1-15/16	51582
9/64	0.1406		1/4	3	1	53/64	1-15/16	51583
25	0.1495	10-24	1/4	3-1/4	1-1/4	1-5/64	1-15/16	51584
5/32	0.1562		1/4	3-1/4	1-1/4	1-5/64	1-15/16	51585
21	0.1590	10-32	1/4	3-1/4	1-1/4	1-5/64	1-15/16	51586
20	0.1610	13/64-24	1/4	3-1/4	1-1/4	1-5/64	1-15/16	51587
11/64	0.1719		1/4	3-1/4	1-1/4	1-5/64	1-15/16	51588
3/16	0.1875		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51589
7	0.2010	1/4-20	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51506
13/64	0.2031		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51507
5	0.2055		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51590
4	0.2090	1/4-24	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51508
3	0.2130	1/4-28	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51509
7/32	0.2188	1/4-32	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51510
15/64	0.2344		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51591
1/4	0.2500		1/4	3-5/8	2-5/64	1-51/64	1-7/16	51511
F	0.2570	5/16-18	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51512
17/64	0.2656	5/16-20	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51513
I	0.2720	5/16-24	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51514
9/32	0.2812	5/16-32	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51515
19/64	0.2969		5/16	3-5/8	2-5/64	1-51/64	1-7/16	51516
5/16	0.3125	3/8-16	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51517
P	0.3230		3/8	4	2-13/32	2-1/8	1-9/16	51518
21/64	0.3281	3/8-20	3/8	4	2-13/32	2-1/8	1-9/16	51519
Q	0.3320	3/8-24	3/8	4	2-13/32	2-1/8	1-9/16	51520
11/32	0.3438	3/8-32	3/8	4	2-13/32	2-1/8	1-9/16	51521
S	0.3480		3/8	4	2-13/32	2-1/8	1-9/16	51522
23/64	0.3594		3/8	4	2-13/32	2-1/8	1-9/16	51523
U	0.3680	7/16-14	3/8	4	2-13/32	2-1/8	1-9/16	51524
3/8	0.3750		3/8	4	2-13/32	2-1/8	1-9/16	51525
W	0.3860		1/2	4	2-13/32	2-1/8	1-9/16	51526
25/64	0.3906	7/16-20	1/2	4	2-13/32	2-1/8	1-9/16	51527
13/32	0.4062		1/2	4-11/16	2-3/4	2-23/64	1-49/64	51528
27/64	0.4219	1/2-13	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51529
7/16	0.4375	1/4-18 NPT	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51530
29/64	0.4531	1/2-20	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51531
15/32	0.4688	1/2-28	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51532
31/64	0.4844	9/16-12	1/2	4-7/8	3-1/32	2-19/32	1-49/64	51533
1/2	0.5000		1/2	4-7/8	3-1/32	2-19/32	1-49/64	51534
33/64	0.5156	9/16-18	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51535



EXTERNAL COOLANT DRILLS FOR DEPTHS UP TO 5xD

SERIES 135 5xD

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
17/32	0.5312	5/8-11	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51536
35/64	0.5469	5/8-12	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51537
9/16	0.5625		5/8	5-1/4	3-1/4	2-3/4	1-57/64	51538
37/64	0.5781	5/8-18	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51539
19/32	0.5938	11/16-11	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51592
39/64	0.6094	11/16-12	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51593
5/8	0.6250	11/16-16	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51540
41/64	0.6406	11/16-24	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51594
21/32	0.6562	3/4-10	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51541
43/64	0.6719	3/4-12	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51595
11/16	0.6875	3/4-16	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51542
45/64	0.7031	3/4-20, 1/2-14 NPT	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51543
23/32	0.7188		3/4	6	4	3-3/8	1-31/32	51596
47/64	0.7344	13/16-12	3/4	6	4	3-3/8	1-31/32	51544
3/4	0.7500	13/16-16	3/4	6	4	3-3/8	1-31/32	51545



SPEED & FEED RECOMMENDATIONS

SERIES 135 3xD

SERIES 135 3xD FRACTIONAL	HARDNESS	SPEED sfm	FEED (inch/rev)									
	BRINELL		1/64	1/32	1/16	1/8	1/4	3/8	1/2	5/8	7/8	
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	400	0.00050	0.0010	0.0020	0.0040	0.0080	0.0120	0.0160	0.0200	0.0280	
	> 200 ≤ 300	350	0.00045	0.0009	0.0018	0.0035	0.0070	0.0105	0.0140	0.0175	0.0245	
	> 300 ≤ 420	160	0.00035	0.0008	0.0015	0.0030	0.0060	0.0090	0.0120	0.0150	0.0210	
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	300	0.00035	0.0008	0.0015	0.0030	0.0060	0.0090	0.0120	0.0150	0.0210	
	> 270 ≤ 370	220	0.00030	0.0006	0.0013	0.0025	0.0050	0.0075	0.0100	0.0125	0.0175	
	> 370 ≤ 450	120	0.00020	0.0005	0.0009	0.0018	0.0035	0.0055	0.0070	0.0090	0.0125	
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	220	0.00030	0.0006	0.0013	0.0025	0.0050	0.0075	0.0100	0.0125	0.0175	
	> 250 ≤ 330	150	0.00020	0.0005	0.0009	0.0018	0.0035	0.0055	0.0070	0.0090	0.0125	
	> 330 ≤ 450	70	0.00010	0.0003	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0070	
■ CAST IRON Gray, Malleable, Ductile	≤ 200	400	0.00060	0.0013	0.0025	0.0050	0.0100	0.0150	0.0200	0.0250	0.0350	
	> 200 ≤ 330	250	0.00055	0.0011	0.0023	0.0045	0.0090	0.0135	0.0180	0.0225	0.0315	
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	200	0.00030	0.0006	0.0013	0.0025	0.0050	0.0075	0.0100	0.0125	0.0175	
	> 250 ≤ 330	150	0.00025	0.0005	0.0010	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140	
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	90	0.00020	0.0005	0.0009	0.0018	0.0035	0.0055	0.0070	0.0090	0.0125	
	> 270 ≤ 370	70	0.00020	0.0004	0.0008	0.0015	0.0030	0.0045	0.0060	0.0075	0.0105	
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	120	0.00020	0.0005	0.0009	0.0018	0.0035	0.0055	0.0070	0.0090	0.0125	
	> 280 ≤ 350	100	0.00020	0.0004	0.0008	0.0015	0.0030	0.0045	0.0060	0.0075	0.0105	
	> 350 ≤ 440	70	0.00015	0.0003	0.0007	0.0013	0.0025	0.0040	0.0050	0.0065	0.0090	
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	60	0.00010	0.0003	0.0005	0.0010	0.0020	0.0030	0.0040	0.0050	0.0070	
	> 220 ≤ 330	40	0.00010	0.0002	0.0004	0.0008	0.0015	0.0025	0.0030	0.0040	0.0055	
	> 330 ≤ 420	30	0.00005	0.0001	0.0003	0.0005	0.0010	0.0015	0.0020	0.0025	0.0035	
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	700	0.00070	0.0014	0.0028	0.0055	0.0110	0.0165	0.0220	0.0275	0.0385	
	> 80	600	0.00060	0.0013	0.0025	0.0050	0.0100	0.0150	0.0200	0.0250	0.0350	
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	500	0.00025	0.0005	0.0010	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140	
	> 140	400	0.00025	0.0005	0.0010	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140	
rpm = sfm × 3.82 / D ₁						ipm = (inch/rev) × rpm						



SPEED & FEED RECOMMENDATIONS

SERIES 135 3xD

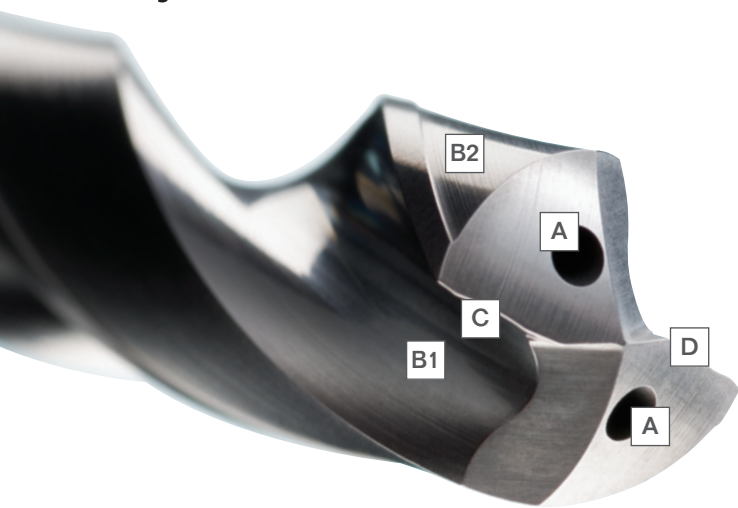
SERIES 135 3xD METRIC	HARDNESS	SPEED	FEED (mm/rev)						
	BRINELL	m/min	3	6	8	10	12	16	20
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	122	0.095	0.195	0.255	0.320	0.385	0.515	0.640
	> 200 ≤ 300	107	0.085	0.170	0.225	0.280	0.340	0.450	0.560
	> 300 ≤ 420	49	0.070	0.145	0.190	0.240	0.290	0.385	0.480
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	91	0.070	0.145	0.190	0.240	0.290	0.385	0.480
	> 270 ≤ 370	67	0.060	0.120	0.160	0.200	0.240	0.320	0.400
	> 370 ≤ 450	37	0.040	0.085	0.115	0.145	0.170	0.230	0.285
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	67	0.060	0.120	0.160	0.200	0.240	0.320	0.400
	> 250 ≤ 330	46	0.040	0.085	0.115	0.145	0.170	0.230	0.285
	> 330 ≤ 450	21	0.025	0.050	0.065	0.080	0.095	0.130	0.160
■ CAST IRON Gray, Malleable, Ductile	≤ 200	122	0.120	0.240	0.320	0.400	0.485	0.640	0.800
	> 200 ≤ 330	76	0.110	0.215	0.290	0.360	0.435	0.575	0.720
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	61	0.060	0.120	0.160	0.200	0.240	0.320	0.400
	> 250 ≤ 330	46	0.050	0.095	0.130	0.160	0.195	0.255	0.320
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	27	0.040	0.085	0.115	0.145	0.170	0.230	0.285
	> 270 ≤ 370	21	0.035	0.070	0.095	0.120	0.145	0.190	0.240
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	37	0.040	0.085	0.115	0.145	0.170	0.230	0.285
	> 280 ≤ 350	30	0.035	0.070	0.095	0.120	0.145	0.190	0.240
	> 350 ≤ 440	21	0.030	0.060	0.085	0.105	0.120	0.165	0.205
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	18	0.025	0.050	0.065	0.080	0.095	0.130	0.160
	> 220 ≤ 330	12	0.020	0.035	0.050	0.065	0.070	0.105	0.125
	> 330 ≤ 420	9	0.010	0.025	0.030	0.040	0.050	0.065	0.080
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	213	0.135	0.265	0.355	0.440	0.530	0.705	0.880
	> 80	183	0.120	0.240	0.320	0.400	0.485	0.640	0.800
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	152	0.050	0.095	0.130	0.160	0.195	0.255	0.320
	> 140	122	0.050	0.095	0.130	0.160	0.195	0.255	0.320
rpm = (1000 × m/min) / (3.14 × D ₁)					mm/min = (mm/rev) × rpm				



SPEED & FEED RECOMMENDATIONS

SERIES 135 5xD

SERIES 135 5xD FRACTIONAL	HARDNESS	SPEED	FEED (inch/rev)						
	BRINELL	sfm	1/8	3/16	1/4	3/8	1/2	5/8	3/4
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	360	0.00400	0.0060	0.0080	0.0120	0.0160	0.0200	0.0280
	> 200 ≤ 300	310	0.00350	0.0053	0.0070	0.0105	0.0140	0.0175	0.0245
	> 300 ≤ 420	150	0.00300	0.0045	0.0060	0.0090	0.0120	0.0150	0.0210
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	270	0.00300	0.0045	0.0060	0.0090	0.0120	0.0150	0.0210
	> 270 ≤ 370	200	0.00250	0.0038	0.0050	0.0075	0.0100	0.0125	0.0175
	> 370 ≤ 450	110	0.00175	0.0026	0.0035	0.0055	0.0070	0.0090	0.0125
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	200	0.00250	0.0038	0.0050	0.0075	0.0100	0.0125	0.0175
	> 250 ≤ 330	130	0.00175	0.0027	0.0035	0.0055	0.0070	0.0090	0.0125
	> 330 ≤ 450	60	0.00100	0.0015	0.0020	0.0030	0.0040	0.0050	0.0070
■ CAST IRON Gray, Malleable, Ductile	≤ 200	360	0.00500	0.0075	0.0100	0.0150	0.0200	0.0250	0.0350
	> 200 ≤ 330	230	0.00450	0.0068	0.0090	0.0135	0.0180	0.0225	0.0315
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	180	0.00250	0.0038	0.0050	0.0075	0.0100	0.0125	0.0175
	> 250 ≤ 330	130	0.00200	0.0030	0.0040	0.0060	0.0080	0.0100	0.0140
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	80	0.00175	0.0026	0.0035	0.0055	0.0070	0.0090	0.0125
	> 270 ≤ 370	60	0.00150	0.0023	0.0030	0.0045	0.0060	0.0075	0.0105
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	100	0.00175	0.0027	0.0035	0.0055	0.0070	0.0090	0.0125
	> 280 ≤ 350	80	0.00150	0.0023	0.0030	0.0045	0.0060	0.0075	0.0105
	> 350 ≤ 440	60	0.00125	0.0019	0.0025	0.0040	0.0050	0.0065	0.0090
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	50	0.00100	0.0015	0.0020	0.0030	0.0040	0.0050	0.0070
	> 220 ≤ 330	30	0.00075	0.0012	0.0015	0.0025	0.0030	0.0040	0.0055
	> 330 ≤ 420	20	0.00050	0.0008	0.0010	0.0015	0.0020	0.0025	0.0035
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	630	0.00550	0.0083	0.0110	0.0165	0.0220	0.0275	0.0385
	> 80	540	0.00500	0.0075	0.0100	0.0150	0.0200	0.0250	0.0350
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	450	0.00200	0.0030	0.0040	0.0060	0.0080	0.0100	0.0140
	> 140	360	0.00200	0.0030	0.0040	0.0060	0.0080	0.0100	0.0140
rpm = sfm × 3.82 / D ₁					ipm = (inch/rev) × rpm				



PERFORMANCE. PRECISION. PASSION. with ICe-Carb internal coolant drills

The design of the SGS ICe-Carb was created to bring to the end user the ability to achieve high performance results with high production demands. The internal coolant design allows for better control of machining temperatures during these types of applications, while the geometry features provide effective and efficient chip creation and removal. The results of the ICe-Carb design are reduced cutting loads, increased operating parameters and improved tool life.

A COOLANT THROUGH DESIGN

promotes controlled and consistent operating temperatures
improves coolant flow to the cut while maintaining strength
increases tool life at increased operating parameters

B1 HIGH PERFORMANCE FLUTE DESIGN

optimized open flute design offers more room for chip movement
engineered flute profile to reduce tool pressure from chip congestion
improved surface finish through effective chip evacuation

B2 POLISHED Ti-NAMITE A COATING

reduces friction between the chip and tool preventing the impediment of chip flow
decreased machine loads associated with chip clogging
reduced friction reduces heat and abrasion wear

C HIGH PENETRATION 140° POINT GEOMETRY

split point geometry for improved drill penetration and accuracy
cam relief drill point creates stronger more symmetrical end geometry
self centering design with high penetration capabilities

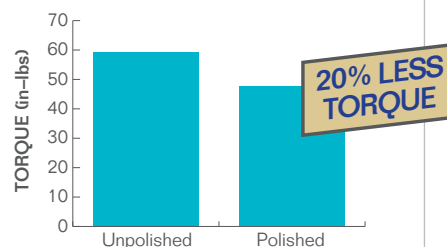
D ENGINEERED CUTTING EDGES

precisely ground with a curvature that allows efficient chip creation and control
edge honing designed for longevity through wear resistance, strength through a resistance to chip under load and efficient shearing through controlled hone dimensions
engineered radial grind along the edge of the flute results in a negative corner position to strengthen and protect

PERFORMANCE

The cutting edges of the SGS ICe-Carb are designed to allow the tool to achieve high penetration rates, while the highly polished Ti-NAMITE A tool coating allows the chips to move smoothly along the flute and out of the cut. This helps to avoid chip clogging often associated with elevated penetration rates. Through efficient chip creation and movement, the drill operates at lower loads under identical conditions.

TORQUE COMPARISON
8620 Carbon Steel @ 175 BHN
3/8" Diameter 1.125" Deep
350 sfm / 29 ipm



PRECISION

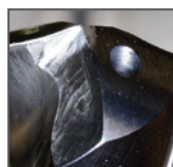
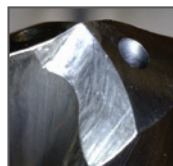
The more efficient a drill can function, the more precise the results it can produce. The symmetrical grind of the cam relieved point ensures balanced pressure during cutting, while the split point design ensures fast and accurate engagement into the material. Precision must be maintained throughout the life of the drill, so the SGS ICe-Carb's specialized hone, strong margin design and negative corner position help to delay the wear that often causes a drill to lose precision in the cut and prematurely end tool life.

SGS ICE-CARB VS. 2 COMPETITORS

DRILL SIZE	3/8" (.3750)
DEPTH OF HOLE	1.875"
MATERIAL	316 STAINLESS STEEL @ 140 BHN
SPEED	1430 RPM (140 sfm)
FEED	8.5 IPM (.0059 ipr)
COOLANT	8% WATER SOLUBLE @ 700 psi
MACHINE	HAAS VF-3 VMC
TYPE OF HOLE	BLIND

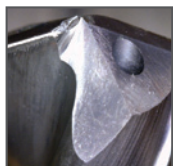
CONDITION OF DRILLS AFTER 175 HOLES

SGS ICe-Carb



No damage found, good condition to continue using; .375" Ø throughout depth with good finish

Competitor 1



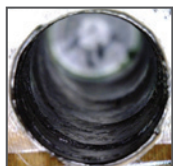
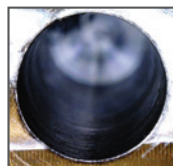
Point severely chipped with wear on margins; Coating loss below cutting lips; .375" Ø held but surface finish deteriorating

Competitor 2

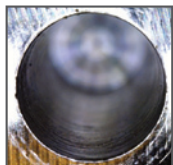
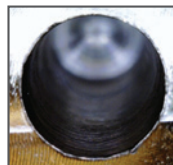


Better condition than Competitor 1 but unacceptable holes; Holes out of round, oversized to .385" Ø and tapered to .392" Ø with heavy swirl marks

FIRST HOLE



LAST HOLE



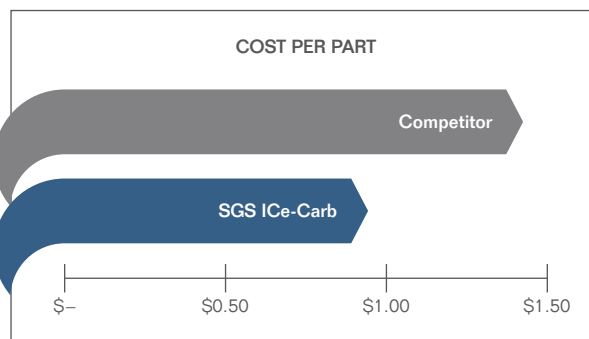
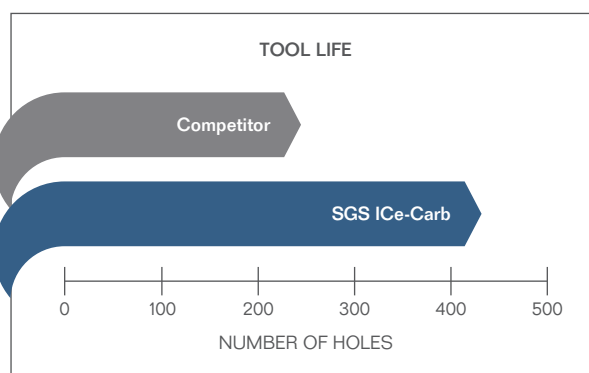
PASSION

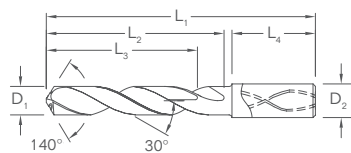
Controlling temperatures during the cutting process certainly helps to improve the operating parameters and tool life a tool is capable of achieving. All of the high performance features of the ICe-Carb are engineered to work together to create the most efficient total cutting performance beyond what simply having coolant through the tool can offer. The flute profile compliments the coolant through design of the ICe-Carb to create a strong cutting tool that effectively transports the chips being created, while the cutting edges offer a balance of strength and shear.

ACTUAL CUSTOMER TEST IN 17-4 PH STAINLESS STEEL @ 36 HRc

SGS ICE-CARB 8xD VS. COMPETITOR M

SPEED (RPM)	1600
FEED (IPM)	9.6
HOLE DIAMETER	9.1mm (.3583)
HOLE DEPTH	3.3"
COOLANT PRESSURE	60 psi (BELOW RECOMMENDATIONS)
TYPE OF COOLANT	WATER SOLUBLE
TYPE OF MACHINE	CNC LATHE – LIVE PART



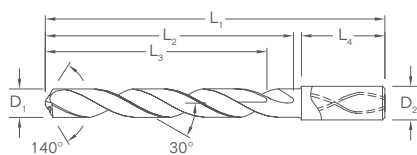


TOLERANCES (inch)			TOLERANCES (mm)		
DIAMETER	D ₁	D ₂	DIAMETER	D ₁	D ₂
≥ 1/8 - 1/4	+0.0002 / +0.0006	h6	≤ 3	+0,0025 / +0,0127	h6
> 1/4 - 3/8	+0.0002 / +0.0008	h6	> 3 - 6	+0,0050 / +0,0152	h6
> 3/8 - 3/4	+0.0003 / +0.0010	h6	> 6 - 10	+0,0050 / +0,0200	h6
> 3/4 - 1	+0.0003 / +0.0011	h6	> 10 - 18	+0,0076 / +0,0254	h6
			> 18 - 30	+0,0076 / +0,0279	h6

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
3,0 mm	0.1181		6	66	28	23	36	63901
3,1 mm	0.1220		6	66	28	23	36	63902
1/8	0.1250		6	66	28	23	36	51901
3,2 mm	0.1260	M3,5 X 0,35	6	66	28	23	36	63903
3,3 mm	0.1299	M4 X 0,7	6	66	28	23	36	63904
3,4 mm	0.1339		6	66	28	23	36	63905
29	0.1360	8-32,8-36	6	66	28	23	36	51902
3,5 mm	0.1378	M4 X 0,5	6	66	28	23	36	63906
9/64	0.1406		6	66	28	23	36	51903
3,6 mm	0.1417	M4 X 0,35	6	66	28	23	36	63907
3,7 mm	0.1457	M4,5 X 0,75	6	66	28	23	36	63908
3,8 mm	0.1496	10-24	6	74	36	29	36	51904
3,9 mm	0.1535		6	74	36	29	36	63909
5/32	0.1562		6	74	36	29	36	51905
4,0 mm	0.1575	M4,5 X 0,5	6	74	36	29	36	63910
21	0.1590	10-32	6	74	36	29	36	51906
4,1 mm	0.1614		6	74	36	29	36	63911
4,2 mm	0.1654	M5 / M5 x 0,75	6	74	36	29	36	63912
4,3 mm	0.1693		6	74	36	29	36	63913
11/64	0.1719		6	74	36	29	36	51907
4,4 mm	0.1732	12-24	6	74	36	29	36	63914
4,5 mm	0.1772	M5 X 0,5	6	74	36	29	36	63915
4,6 mm	0.1811	12-28	6	74	36	29	36	63916
4,7 mm	0.1850	12-32	6	74	36	29	36	63917
3/16	0.1875		6	82	44	35	36	51908
4,8 mm	0.1890	7/32-32	6	82	44	35	36	63918
4,9 mm	0.1929		6	82	44	35	36	63919
5,0 mm	0.1969	M6 X 1	6	82	44	35	36	63920
5,1 mm	0.2008	1/4-20	6	82	44	35	36	63900
13/64	0.2031		6	82	44	35	36	51910
5,2 mm	0.2047	M6 X 0,75	6	82	44	35	36	63921
5,3 mm	0.2087		6	82	44	35	36	63922
5,4 mm	0.2126		6	82	44	35	36	63998
5,5 mm	0.2165	M6 X 0,5	6	82	44	35	36	63923
7/32	0.2188	1/4-32	6	82	44	35	36	51912
5,6 mm	0.2205		6	82	44	35	36	63924
5,7 mm	0.2244		6	82	44	35	36	63925
5,8 mm	0.2283		6	82	44	35	36	63926
5,9 mm	0.2323		6	82	44	35	36	63927
15/64	0.2344		6	82	44	35	36	51913
6,0 mm	0.2362	M7 X 1	6	82	44	35	36	63928
6,1 mm	0.2402		8	91	53	43	36	63929

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
6,2 mm	0.2441	M7 X 0,75	8	91	53	43	36	63930
6,3 mm	0.2480		8	91	53	43	36	63931
1/4	0.2500		8	91	53	43	36	51914
6,4 mm	0.2520	5/16-18	8	91	53	43	36	63932
6,5 mm	0.2559		8	91	53	43	36	63933
F	0.2570		8	91	53	43	36	51915
6,6 mm	0.2598	5/16-20	8	91	53	43	36	63934
6,7 mm	0.2638		8	91	53	43	36	63935
17/64	0.2657		8	91	53	43	36	51916
6,8 mm	0.2677	M8 X 1,25	8	91	53	43	36	63936
6,9 mm	0.2717	5/16-24	8	91	53	43	36	63999
7,0 mm	0.2756	M8 X 1	8	91	53	43	36	63937
7,1 mm	0.2795	5/16-32	8	91	53	43	36	63938
9/32	0.2812		8	91	53	43	36	51918
7,2 mm	0.2835		8	91	53	43	36	63939
7,3 mm	0.2874	M8 X 0,5	8	91	53	43	36	63940
7,4 mm	0.2913		8	91	53	43	36	63941
7,5 mm	0.2953		8	91	53	43	36	63942
19/64	0.2969	M9 X 1,25	8	91	53	43	36	51919
7,6 mm	0.2992		8	91	53	43	36	63943
7,7 mm	0.3031		8	91	53	43	36	63944
7,8 mm	0.3071	3/8-16	8	91	53	43	36	63945
7,9 mm	0.3110		8	91	53	43	36	63946
5/16	0.3125		8	91	53	43	36	51920
8,0 mm	0.3150	M9 X 1	8	91	53	43	36	63947
8,1 mm	0.3189	3/8-20	10	103	61	49	40	63948
8,2 mm	0.3228		10	103	61	49	40	63949
8,3 mm	0.3268		10	103	61	49	40	63950
21/64	0.3281	3/8-24	10	103	61	49	40	51921
8,4 mm	0.3307		10	103	61	49	40	63951
Q	0.3320		10	103	61	49	40	51922
8,5 mm	0.3346	M10 X 1,5	10	103	61	49	40	63952
8,6 mm	0.3386	3/8-32	10	103	61	49	40	63953
8,7 mm	0.3425		10	103	61	49	40	63954
11/32	0.3438		10	103	61	49	40	51923
8,8 mm	0.3465	M10 X 1,25	10	103	61	49	40	63955
8,9 mm	0.3504	M10 X 1	10	103	61	49	40	63956
9,0 mm	0.3543		10	103	61	49	40	63957
9,1 mm	0.3583		10	103	61	49	40	63958
23/64	0.3594	M10 X 0,75	10	103	61	49	40	51924
9,2 mm	0.3622		10	103	61	49	40	63959
9,3 mm	0.3661		10	103	61	49	40	63960
U	0.3680	7/16-14	10	103	61	49	40	51925
9,4 mm	0.3701		10	103	61	49	40	63961
9,5 mm	0.3740		10	103	61	49	40	63962
3/8	0.3750	M11 / M10 X 0,5	10	103	61	49	40	51926
9,6 mm	0.3780		10	103	61	49	40	63963
9,7 mm	0.3819		10	103	61	49	40	63964
9,8 mm	0.3858		10	103	61	49	40	63965
9,9 mm	0.3898		10	103	61	49	40	63966

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
25/64	0.3906	7/16-20	10	103	61	49	40	51927
10,0 mm	0.3937		10	103	61	49	40	63967
10,1 mm	0.3976	M12 X 1,75	12	118	71	56	45	63968
10,2 mm	0.4016		12	118	71	56	45	63969
10,3 mm	0.4055		12	118	71	56	45	63970
13/32	0.4062		12	118	71	56	45	51928
10,4 mm	0.4094	M12 X 1,5	12	118	71	56	45	63971
10,5 mm	0.4134		12	118	71	56	45	63972
10,6 mm	0.4173		12	118	71	56	45	63973
10,7 mm	0.4213		12	118	71	56	45	63974
27/64	0.4219	1/2-13	12	118	71	56	45	51929
10,8 mm	0.4252	M12 X 1,25	12	118	71	56	45	63975
10,9 mm	0.4291		12	118	71	56	45	63976
11,0 mm	0.4331	M12 X 1	12	118	71	56	45	63977
11,1 mm	0.4370		12	118	71	56	45	63978
7/16	0.4375	1/4-18NPT	12	118	71	56	45	51930
11,2 mm	0.4409		12	118	71	56	45	63979
11,3 mm	0.4449	M12 X 0,5	12	118	71	56	45	63980
11,4 mm	0.4488		12	118	71	56	45	63981
11,5 mm	0.4528		12	118	71	56	45	64000
11,6 mm	0.4567		12	118	71	56	45	63982
11,7 mm	0.4606		12	118	71	56	45	63983
11,8 mm	0.4646		12	118	71	56	45	63984
11,9 mm	0.4685		12	118	71	56	45	63985
15/32	0.4688	1/2-28	12	118	71	56	45	51932
12,0 mm	0.4724	M14 X 2	12	118	71	56	45	63986
31/64	0.4844		14	124	77	60	45	51933
12,5 mm	0.4921	M14 X 1,5	14	124	77	60	45	63987
1/2	0.5000		14	124	77	60	45	51934
12,8 mm	0.5039	M14 X 1,25	14	124	77	60	45	63988
13,0 mm	0.5118		14	124	77	60	45	63989
33/64	0.5156	9/16-18	14	124	77	60	45	51935
13,5 mm	0.5315	5/8-11	14	124	77	60	45	64001
13,8 mm	0.5433		14	124	77	60	45	63990
14,0 mm	0.5512	M16 X 2	14	124	77	60	45	63991
9/16	0.5625		16	133	83	63	48	51937
14,5 mm	0.5709	M16 X 1,5	16	133	83	63	48	63992
37/64	0.5781		16	133	83	63	48	51938
14,8 mm	0.5827		16	133	83	63	48	63993
15,0 mm	0.5906		16	133	83	63	48	63994
15,5 mm	0.6102	M18 X 2,5	16	133	83	63	48	63995
15,8 mm	0.6220		16	133	83	63	48	63996
5/8	0.6250	11/16-16	16	133	83	63	48	51939
16,0 mm	0.6299		16	133	83	63	48	63997
21/32	0.6562	3/4-10	18	143	93	71	48	51940
11/16	0.6875	3/4-16	18	143	93	71	48	51941
3/4	0.7500	13/16-16	20	153	101	77	50	51942



TOLERANCES (inch)			TOLERANCES (mm)		
DIAMETER	D ₁	D ₂	DIAMETER	D ₁	D ₂
≥ 1/8 - 1/4	+0.0002 / +0.0006	h6	≤ 3	+0,0025 / +0,0127	h6
> 1/4 - 3/8	+0.0002 / +0.0008	h6	> 3 - 6	+0,0050 / +0,0152	h6
> 3/8 - 3/4	+0.0003 / +0.0010	h6	> 6 - 10	+0,0050 / +0,0200	h6
			> 10 - 18	+0,0076 / +0,0254	h6
			> 18 - 30	+0,0076 / +0,0279	h6

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
3,0 mm	0.1181		6	72	34	29	36	63575
3,1 mm	0.1220		6	72	34	29	36	63576
1/8	0.1250		6	72	34	29	36	51801
3,2 mm	0.1260	M3,5 X 0,35	6	72	34	29	36	63577
3,3 mm	0.1299	M4 X 0,7	6	72	34	29	36	63578
3,4 mm	0.1339		6	72	34	29	36	63579
29	0.1360	8-32,8-36	6	72	34	29	36	51802
3,5 mm	0.1378	M4 X 0,5	6	72	34	29	36	63580
9/64	0.1406		6	72	34	29	36	51803
3,6 mm	0.1417	M4 X 0,35	6	72	34	29	36	63581
3,7 mm	0.1457	M4,5 X 0,75	6	72	34	29	36	63582
3,8 mm	0.1496	10-24	6	81	43	36	36	63583
3,9 mm	0.1535		6	81	43	36	36	63584
5/32	0.1562		6	81	43	36	36	51804
4,0 mm	0.1575	M4,5 X 0,5	6	81	43	36	36	63585
21	0.1590	10-32	6	81	43	36	36	51805
4,1 mm	0.1614		6	81	43	36	36	63586
4,2 mm	0.1654	M5 / M5 X 0,75	6	81	43	36	36	63587
4,3 mm	0.1693		6	81	43	36	36	63588
11/64	0.1719		6	81	43	36	36	51806
4,4 mm	0.1732	12-24	6	81	43	36	36	63589
4,5 mm	0.1772	M5 X 0,5	6	81	43	36	36	63590
4,6 mm	0.1811	12-28	6	81	43	36	36	63591
4,7 mm	0.1850	12-32	6	81	43	36	36	63592
3/16	0.1875		6	95	57	48	36	51807
4,8 mm	0.1890	7/32-32	6	95	57	48	36	63593
4,9 mm	0.1929		6	95	57	48	36	63594
5,0 mm	0.1969	M6 X 1	6	95	57	48	36	63595
5,1 mm	0.2008	1/4-20	6	95	57	48	36	63596
13/64	0.2031		6	95	57	48	36	51808
5,2 mm	0.2047	M6 X 0,75	6	95	57	48	36	63597
5,3 mm	0.2087		6	95	57	48	36	63598
5,4 mm	0.2126		6	95	57	48	36	63599
5,5 mm	0.2165	M6 X 0,5	6	95	57	48	36	63600
7/32	0.2188	1/4-32	6	95	57	48	36	51809
5,6 mm	0.2205		6	95	57	48	36	63601
5,7 mm	0.2244		6	95	57	48	36	63602
5,8 mm	0.2283		6	95	57	48	36	63603
5,9 mm	0.2323		6	95	57	48	36	63604
15/64	0.2344		6	95	57	48	36	51810
6,0 mm	0.2362	M7 X 1	6	95	57	48	36	63605
6,1 mm	0.2402		8	114	76	64	36	63606

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
6,2 mm	0.2441	M7 X 0,75	8	114	76	64	36	63607
6,3 mm	0.2480		8	114	76	64	36	63608
1/4	0.2500	5/16-18	8	114	76	64	36	51811
6,4 mm	0.2520		8	114	76	64	36	63609
6,5 mm	0.2559		8	114	76	64	36	63610
F	0.2570		8	114	76	64	36	51812
6,6 mm	0.2598	5/16-20	8	114	76	64	36	63611
6,7 mm	0.2638		8	114	76	64	36	63612
17/64	0.2657	M8 X 1,25	8	114	76	64	36	51813
6,8 mm	0.2677		8	114	76	64	36	63613
6,9 mm	0.2717	M8 X 1	8	114	76	64	36	63614
7,0 mm	0.2756		8	114	76	64	36	63615
7,1 mm	0.2795	5/16-32	8	114	76	64	36	63616
9/32	0.2812		8	114	76	64	36	51814
7,2 mm	0.2835	M8 X 0,75	8	114	76	64	36	63617
7,3 mm	0.2874		8	114	76	64	36	63618
7,4 mm	0.2913	M8 X 0,5	8	114	76	64	36	63619
7,5 mm	0.2953		8	114	76	64	36	63620
19/64	0.2969		8	114	76	64	36	51815
7,6 mm	0.2992		8	114	76	64	36	63621
7,7 mm	0.3031	M9 X 1,25	8	114	76	64	36	63622
7,8 mm	0.3071		8	114	76	64	36	63623
7,9 mm	0.3110	3/8-16	8	114	76	64	36	63624
5/16	0.3125		8	114	76	64	36	51816
8,0 mm	0.3150	M9 X 1	8	114	76	64	36	63625
8,1 mm	0.3189		10	142	95	80	40	63626
8,2 mm	0.3228	3/8-20	10	142	95	80	40	63627
8,3 mm	0.3268		10	142	95	80	40	63628
21/64	0.3281		10	142	95	80	40	51817
8,4 mm	0.3307		10	142	95	80	40	63629
Q	0.3320	3/8-24	10	142	95	80	40	51818
8,5 mm	0.3346		10	142	95	80	40	63630
8,6 mm	0.3386	M10 X 1,5	10	142	95	80	40	63631
8,7 mm	0.3425		10	142	95	80	40	63632
11/32	0.3438	3/8-32	10	142	95	80	40	51819
8,8 mm	0.3465		10	142	95	80	40	63633
8,9 mm	0.3504	M10 X 1,25	10	142	95	80	40	63634
9,0 mm	0.3543		10	142	95	80	40	63635
9,1 mm	0.3583	M10 X 1	10	142	95	80	40	63636
23/64	0.3594		10	142	95	80	40	51820
9,2 mm	0.3622	M10 X 0,75	10	142	95	80	40	63637
9,3 mm	0.3661		10	142	95	80	40	63638
U	0.3680	7/16-14	10	142	95	80	40	51821
9,4 mm	0.3701		10	142	95	80	40	63639
9,5 mm	0.3740	M11 / M10 X 0,5	10	142	95	80	40	63640
3/8	0.3750		10	142	95	80	40	51822
9,6 mm	0.3780		10	142	95	80	40	63641
9,7 mm	0.3819		10	142	95	80	40	63642
9,8 mm	0.3858		10	142	95	80	40	63643
9,9 mm	0.3898		10	142	95	80	40	63644

CUTTING DIAMETER D ₁	DECIMAL EQUIVALENT	TAP SIZE REFERENCE ONLY	SHANK DIAMETER D ₂ mm	OVERALL LENGTH L ₁ mm	FLUTE LENGTH L ₂ mm	MIN. CLEARED LENGTH L ₃ mm	SHANK LENGTH L ₄ mm	EDP NUMBER
25/64	0.3906	7/16-20	10	142	95	80	40	51823
10,0 mm	0.3937		10	142	95	80	40	63645
10,1 mm	0.3976	M12 X 1,75	12	162	114	96	45	63646
10,2 mm	0.4016		12	162	114	96	45	63647
10,3 mm	0.4055		12	162	114	96	45	63648
13/32	0.4062		12	162	114	96	45	51824
10,4 mm	0.4094	M12 X 1,5	12	162	114	96	45	63649
10,5 mm	0.4134		12	162	114	96	45	63650
10,6 mm	0.4173		12	162	114	96	45	63651
10,7 mm	0.4213		12	162	114	96	45	63652
27/64	0.4219	1/2-13	12	162	114	96	45	51825
10,8 mm	0.4252	M12 X 1,25	12	162	114	96	45	63653
10,9 mm	0.4291		12	162	114	96	45	63654
11,0 mm	0.4331	M12 X 1	12	162	114	96	45	63655
11,1 mm	0.4370		12	162	114	96	45	63656
7/16	0.4375	1/4-18NPT	12	162	114	96	45	51826
11,2 mm	0.4409		12	162	114	96	45	63657
11,3 mm	0.4449	M12 X 0,5	12	162	114	96	45	63658
11,4 mm	0.4488		12	162	114	96	45	63659
11,5 mm	0.4528		12	162	114	96	45	63660
11,6 mm	0.4567		12	162	114	96	45	63661
11,7 mm	0.4606		12	162	114	96	45	63662
11,8 mm	0.4646		12	162	114	96	45	63663
11,9 mm	0.4685		12	162	114	96	45	63664
15/32	0.4688	1/2-28	12	162	114	96	45	51827
12,0 mm	0.4724	M14 X 2	12	162	114	96	45	63665
31/64	0.4844		14	178	133	112	45	51828
12,5 mm	0.4921	M14 X 1,5	14	178	133	112	45	63666
1/2	0.5000		14	178	133	112	45	51829
12,8 mm	0.5039	M14 X 1,25	14	178	133	112	45	63667
13,0 mm	0.5118		14	178	133	112	45	63668
33/64	0.5156	9/16-18	14	178	133	112	45	51830
13,5 mm	0.5315	5/8-11	14	178	133	112	45	63669
13,8 mm	0.5433		14	178	133	112	45	63670
14,0 mm	0.5512	M16 X 2	14	178	133	112	45	63671
9/16	0.5625		16	203	152	128	48	51831
14,5 mm	0.5709	M16 X 1,5	16	203	152	128	48	63672
37/64	0.5781		16	203	152	128	48	51832
14,8 mm	0.5827		16	203	152	128	48	63673
15,0 mm	0.5906		16	203	152	128	48	63674
15,5 mm	0.6102	M18 X 2,5	16	203	152	128	48	63675
15,8 mm	0.6220		16	203	152	128	48	63676
5/8	0.6250	11/16-16	16	203	152	128	48	51833
16,0 mm	0.6299		16	203	152	128	48	63677
21/32	0.6562	3/4-10	18	222	171	144	48	51834
11/16	0.6875	3/4-16	18	222	171	144	48	51835
3/4	0.7500	13/16-16	20	243	190	160	50	51836

SPEED & FEED RECOMMENDATIONS

SERIES 140 5xD

SERIES 140 5xD FRACTIONAL	HARDNESS	SPEED	FEED (inch/rev)						
	BRINELL	sfm	1/8	3/16	1/4	3/8	1/2	5/8	3/4
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	440	0.0040	0.0060	0.0080	0.0120	0.0160	0.0200	0.0240
	> 200 ≤ 300	380	0.0035	0.0053	0.0070	0.0105	0.0140	0.0175	0.0210
	> 300 ≤ 420	180	0.0030	0.0045	0.0060	0.0090	0.0120	0.0150	0.0180
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	330	0.0030	0.0045	0.0060	0.0090	0.0120	0.0150	0.0180
	> 270 ≤ 370	240	0.0025	0.0038	0.0050	0.0075	0.0100	0.0125	0.0150
	> 370 ≤ 450	140	0.0018	0.0027	0.0035	0.0055	0.0070	0.0090	0.0110
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	240	0.0025	0.0038	0.0050	0.0075	0.0100	0.0125	0.0150
	> 250 ≤ 330	180	0.0018	0.0026	0.0035	0.0055	0.0070	0.0090	0.0110
	> 330 ≤ 450	90	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
■ CAST IRON Gray, Malleable, Ductile	≤ 200	440	0.0050	0.0075	0.0100	0.0150	0.0200	0.0250	0.0300
	> 200 ≤ 330	280	0.0045	0.0068	0.0090	0.0135	0.0180	0.0225	0.0270
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	220	0.0025	0.0038	0.0050	0.0075	0.0100	0.0125	0.0150
	> 250 ≤ 330	170	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	150	0.0018	0.0027	0.0035	0.0055	0.0070	0.0090	0.0110
	> 270 ≤ 370	120	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	200	0.0018	0.0027	0.0035	0.0055	0.0070	0.0090	0.0110
	> 280 ≤ 350	160	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
	> 350 ≤ 440	120	0.0013	0.0019	0.0025	0.0040	0.0050	0.0065	0.0080
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	100	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
	> 220 ≤ 330	70	0.0008	0.0012	0.0015	0.0025	0.0030	0.0040	0.0050
	> 330 ≤ 420	50	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	770	0.0055	0.0083	0.0110	0.0165	0.0220	0.0275	0.0330
	> 80	660	0.0050	0.0075	0.0100	0.0150	0.0200	0.0250	0.0300
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	550	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	> 140	440	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
rpm = sfm × 3.82 / D ₁					ipm = (inch/rev) × rpm				

SPEED & FEED RECOMMENDATIONS

SERIES 140 5xD

SERIES 140 5xD METRIC	HARDNESS	SPEED	FEED (mm/rev)						
	BRINELL	m/min	3	6	8	10	12	14	16
CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	134	0.145	0.195	0.255	0.320	0.385	0.450	0.515
	> 200 ≤ 300	116	0.125	0.170	0.225	0.280	0.340	0.395	0.450
	> 300 ≤ 420	55	0.110	0.145	0.190	0.240	0.290	0.335	0.385
ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	101	0.110	0.145	0.190	0.240	0.290	0.335	0.385
	> 270 ≤ 370	73	0.090	0.120	0.160	0.200	0.240	0.280	0.320
	> 370 ≤ 450	43	0.065	0.085	0.115	0.145	0.170	0.200	0.230
TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	73	0.090	0.120	0.160	0.200	0.240	0.280	0.320
	> 250 ≤ 330	55	0.065	0.085	0.115	0.145	0.170	0.200	0.230
	> 330 ≤ 450	27	0.035	0.050	0.065	0.080	0.095	0.110	0.130
CAST IRON Gray, Malleable, Ductile	≤ 200	134	0.180	0.240	0.320	0.400	0.485	0.560	0.640
	> 200 ≤ 330	85	0.165	0.215	0.290	0.360	0.435	0.505	0.575
STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	67	0.090	0.120	0.160	0.200	0.240	0.280	0.320
	> 250 ≤ 330	52	0.070	0.095	0.130	0.160	0.195	0.225	0.255
STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	46	0.065	0.085	0.115	0.145	0.170	0.200	0.230
	> 270 ≤ 370	37	0.055	0.070	0.095	0.120	0.145	0.170	0.190
TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	61	0.065	0.085	0.115	0.145	0.170	0.200	0.230
	> 280 ≤ 350	49	0.055	0.070	0.095	0.120	0.145	0.170	0.190
	> 350 ≤ 440	37	0.045	0.060	0.085	0.105	0.120	0.145	0.165
HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	30	0.035	0.050	0.065	0.080	0.095	0.110	0.130
	> 220 ≤ 330	21	0.030	0.035	0.050	0.065	0.070	0.090	0.105
	> 330 ≤ 420	15	0.020	0.025	0.030	0.040	0.050	0.055	0.065
ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	235	0.200	0.265	0.355	0.440	0.530	0.620	0.705
	> 80	201	0.180	0.240	0.320	0.400	0.485	0.560	0.640
COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	168	0.070	0.095	0.130	0.160	0.195	0.225	0.255
	> 140	134	0.070	0.095	0.130	0.160	0.195	0.225	0.255
rpm = (1000 × m/min) / (3.14 × D ₁)					mm/min = (mm/rev) × rpm				

SPEED & FEED RECOMMENDATIONS

SERIES 140 8xD

SERIES 140 8xD FRACTIONAL	HARDNESS	SPEED	FEED (inch/rev)						
	BRINELL	sfm	1/8	3/16	1/4	3/8	1/2	5/8	3/4
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	420	0.0035	0.0053	0.0070	0.0105	0.0140	0.0175	0.0210
	> 200 ≤ 300	370	0.0030	0.0045	0.0060	0.0090	0.0120	0.0150	0.0180
	> 300 ≤ 420	170	0.0025	0.0038	0.0050	0.0075	0.0100	0.0125	0.0150
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	320	0.0025	0.0038	0.0050	0.0075	0.0100	0.0125	0.0150
	> 270 ≤ 370	230	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	> 370 ≤ 450	130	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	230	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	> 250 ≤ 330	160	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
	> 330 ≤ 450	80	0.0008	0.0013	0.0015	0.0025	0.0030	0.0040	0.0045
■ CAST IRON Gray, Malleable, Ductile	≤ 200	420	0.0045	0.0068	0.0090	0.0135	0.0180	0.0225	0.0270
	> 200 ≤ 330	270	0.0040	0.0060	0.0080	0.0120	0.0160	0.0200	0.0240
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	210	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
	> 250 ≤ 330	160	0.0018	0.0028	0.0035	0.0055	0.0070	0.0090	0.0105
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	130	0.0018	0.0028	0.0035	0.0055	0.0070	0.0090	0.0105
	> 270 ≤ 370	100	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	180	0.0015	0.0023	0.0030	0.0045	0.0060	0.0075	0.0090
	> 280 ≤ 350	140	0.0013	0.0020	0.0025	0.0040	0.0050	0.0065	0.0075
	> 350 ≤ 440	110	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	80	0.0008	0.0013	0.0015	0.0025	0.0030	0.0040	0.0045
	> 220 ≤ 330	50	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030
	> 330 ≤ 420	35	0.0005	0.0008	0.0010	0.0015	0.0020	0.0025	0.0030
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	730	0.0050	0.0075	0.0100	0.0150	0.0200	0.0250	0.0300
	> 80	630	0.0045	0.0068	0.0090	0.0135	0.0180	0.0225	0.0270
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	520	0.0018	0.0028	0.0035	0.0055	0.0070	0.0090	0.0105
	> 140	420	0.0018	0.0028	0.0035	0.0055	0.0070	0.0090	0.0105
rpm = sfm × 3.82 / D ₁					ipm = (inch/rev) × rpm				

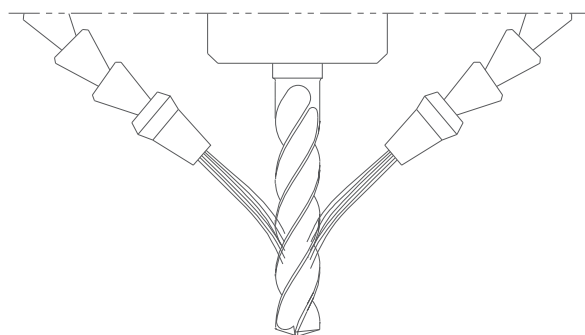
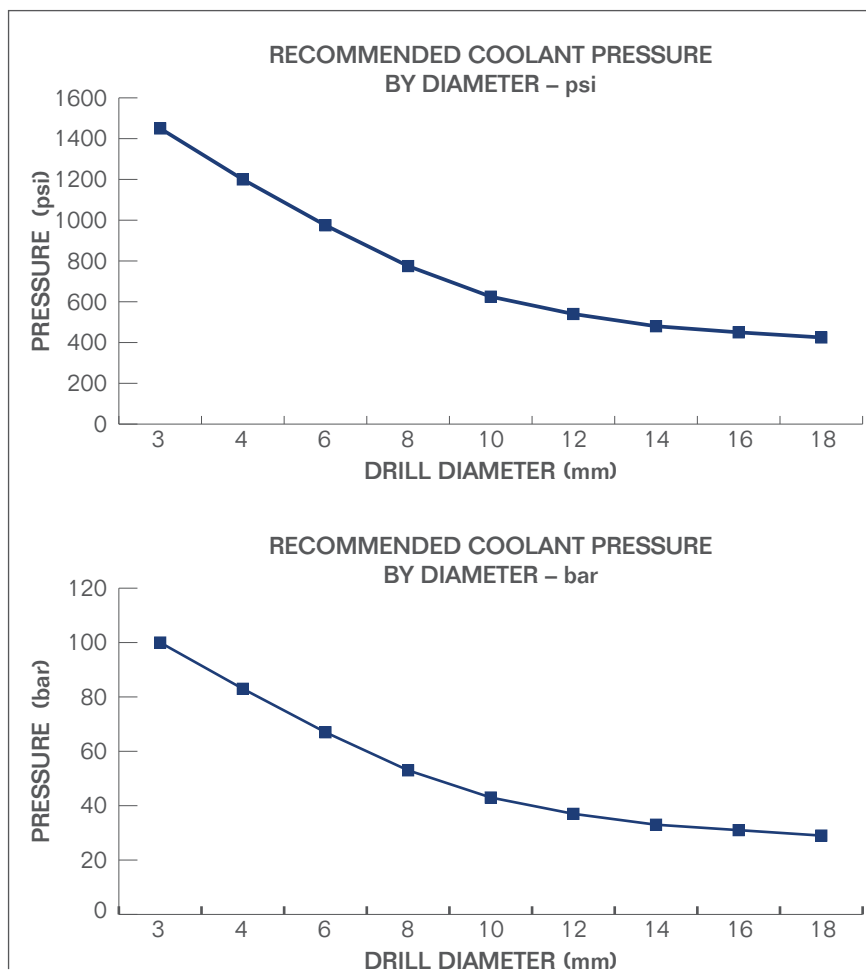
SPEED & FEED RECOMMENDATIONS

SERIES 140 8xD

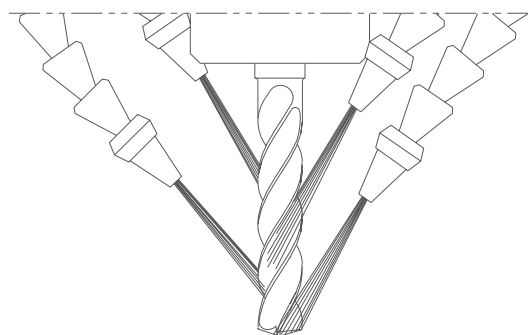
SERIES 140 8xD METRIC	HARDNESS	SPEED	FEED (mm/rev)						
	BRINELL	m/min	3	6	8	10	12	14	16
■ CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 200	128	0.125	0.170	0.225	0.280	0.340	0.395	0.450
	> 200 ≤ 300	113	0.110	0.145	0.190	0.240	0.290	0.335	0.385
	> 300 ≤ 420	52	0.090	0.120	0.160	0.200	0.240	0.280	0.320
■ ALLOY STEEL 4140, 4150, 4320, 4340, 5120, 5150, 8630, 86L20, 50100, 52100	≤ 270	98	0.090	0.120	0.160	0.200	0.240	0.280	0.320
	> 270 ≤ 370	70	0.070	0.095	0.130	0.160	0.195	0.225	0.255
	> 370 ≤ 450	40	0.055	0.070	0.095	0.120	0.145	0.170	0.190
■ TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	70	0.070	0.095	0.130	0.160	0.195	0.225	0.255
	> 250 ≤ 330	49	0.055	0.070	0.095	0.120	0.145	0.170	0.190
	> 330 ≤ 450	24	0.030	0.035	0.050	0.065	0.070	0.090	0.105
■ CAST IRON Gray, Malleable, Ductile	≤ 200	128	0.165	0.215	0.290	0.360	0.435	0.505	0.575
	> 200 ≤ 330	82	0.145	0.195	0.255	0.320	0.385	0.450	0.515
■ STAINLESS free machining 303, 416, 420F, 430F, 440F	≤ 250	64	0.070	0.095	0.130	0.160	0.195	0.225	0.255
	> 250 ≤ 330	49	0.065	0.085	0.115	0.145	0.170	0.200	0.230
■ STAINLESS difficult 304, 316, 321, 15-5ph, 17-4PH, Nitronic 32	≤ 270	40	0.065	0.085	0.115	0.145	0.170	0.200	0.230
	> 270 ≤ 370	30	0.055	0.070	0.095	0.120	0.145	0.170	0.190
■ TITANIUM TiCODE-12, Ti-6Al4V, Ti-5Al-5V-5Mo-3Cr, Ti-7Al4Mo, Ti8Al1Mo1V	≤ 280	55	0.055	0.070	0.095	0.120	0.145	0.170	0.190
	> 280 ≤ 350	43	0.050	0.060	0.085	0.105	0.120	0.145	0.165
	> 350 ≤ 440	34	0.035	0.050	0.065	0.080	0.095	0.110	0.130
■ HIGH TEMPERATURE ALLOY A-286, Hastelloy, Haynes, Incoloy, Inconel, Rene, Waspalloy	≤ 220	24	0.030	0.035	0.050	0.065	0.070	0.090	0.105
	> 220 ≤ 330	15	0.020	0.025	0.030	0.040	0.050	0.055	0.065
	> 330 ≤ 420	11	0.020	0.025	0.030	0.040	0.050	0.055	0.065
■ ALUMINUM 2017, 2024, 356, 6061, 7075	≤ 80	223	0.180	0.240	0.320	0.400	0.485	0.560	0.640
	> 80	192	0.165	0.215	0.290	0.360	0.435	0.505	0.575
■ COPPER ALLOY Alum Bronze, C110, Muntz Brass	≤ 140	158	0.065	0.085	0.115	0.145	0.170	0.200	0.230
	> 140	128	0.065	0.085	0.115	0.145	0.170	0.200	0.230
rpm = (1000 × m/min) / (3.14 × D ₁)					mm/min = (mm/rev) × rpm				

COOLANT RECOMMENDATIONS

- Coolant works to mobilize chips away from the cut zone, reduce the heat created during the cutting process and minimize friction.
- It is important to optimize the coolant pressure and position in order to gain the full benefits coolant offers the cutting process.
- Proper coolant application promotes greater operating parameters, greater material removal rates, improved surface finishes, predictable tool life, reduced power consumption and reduced cycle times.
- Pressure is important, but more importantly is consistency of the pressure and application onto the tool; intermittent cooling of carbide leads to thermal stressing of the material and the formation of "microcracks."
- Proper cleanliness and filtration of coolants is important in order for the coolant to maintain its beneficial properties, and also to avoid a reduction in coolant pressure or the possibility of clogging the coolant channels in coolant through drills.



**LARGE TIP – LOW VELOCITY
NO COVERAGE AT MAXIMUM DEPTH**



**SMALL TIP – HIGH VELOCITY
COMPLETE COVERAGE**

- Reducing the nozzle size helps maximize the cooling benefits of the unique double margin design on the Hi-PerCarb drill by increasing velocity. Aim the nozzles in line with the secondary flute located between the two margins as well as the flute for best results.

About SGS Tool Company



Z-Carb. S-Carb. Ski-Carb. Hi-PerCarb. In the machining/metalworking industry, these SGS brand names have become synonymous with high performance tooling. We're proud to have pioneered some of the world's most advanced cutting technology right here in our Northeast Ohio manufacturing campus. With sales offices in over 60 countries, SGS high performance end mills, drills, burs, routers, and reamers are increasing productivity and reducing cost around the world. And here's why:

- Incredible batch-to-batch consistency
- Metallurgical lab dedicated to testing and rigorous quality control
- ISO-certified quality procedures
- Substantial R&D facilities continually developing new products and assisting customers with specific challenges
- Patented geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality—even at extreme parameters
- Specialists in extreme and demanding product applications
- Experienced Field Sales Engineers who work to optimize a tool for your particular application
- Dedicated multi-lingual customer service representatives