



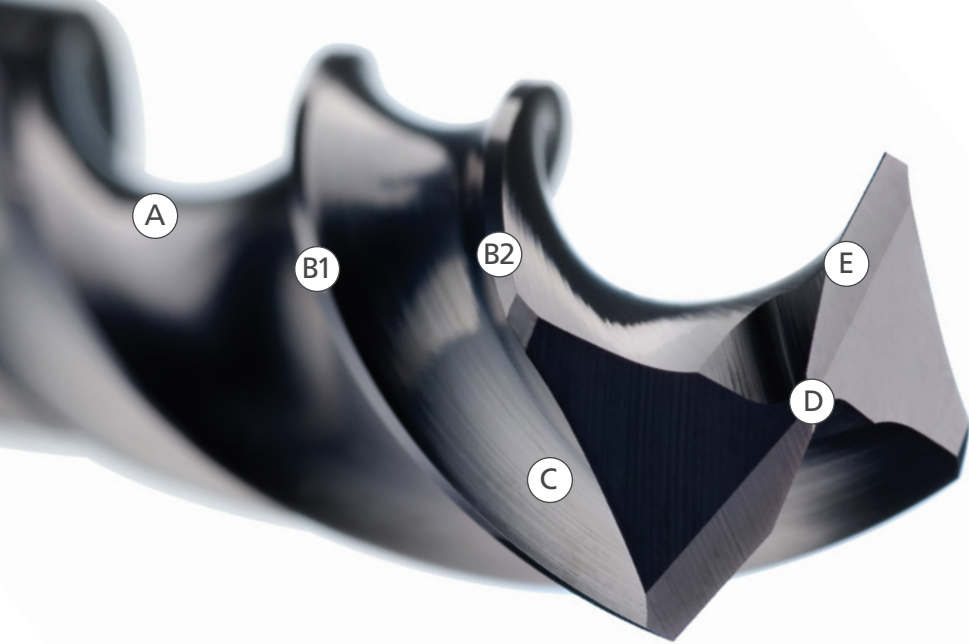
Drilling Solutions



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SERIES 135



HIGH PERFORMANCE CARBIDE DRILLS

The key features designed into the Hi-PerCarb Series 135 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 Hi-PerCarb Series 135 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

Ti-NAMITE A COATING

- improves resistance to heat and wear
- enhances tool life

- (B1) DOUBLE MARGIN DESIGN**
- improves accuracy and surface finish
- (B2)**
- 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. PRECISION. PASSION.
HI-PER CARB SERIES 135 DRILLS

PERFORMANCE.

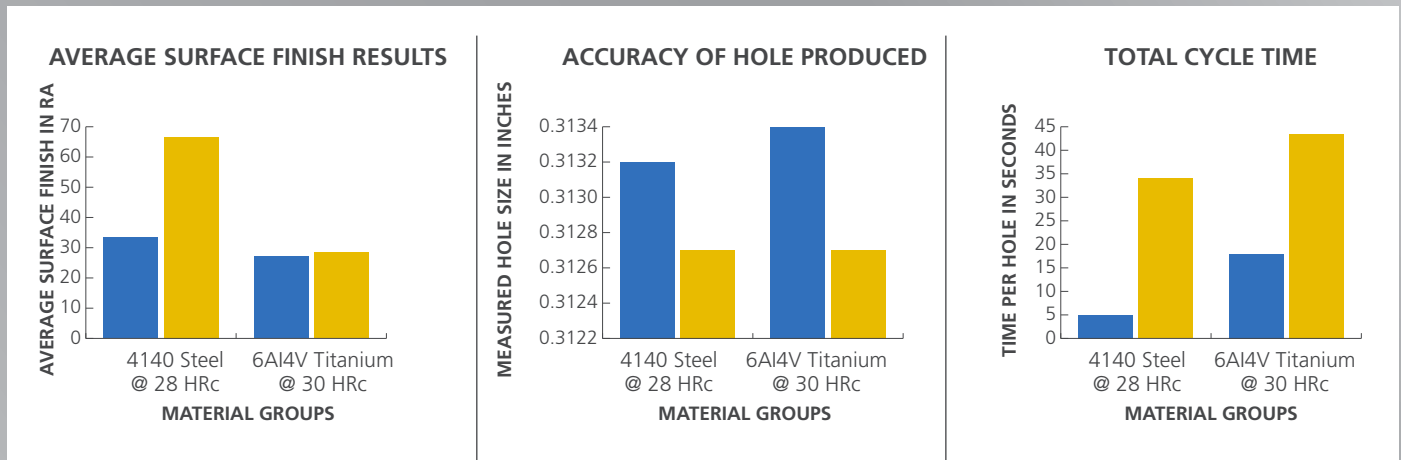
MACHINING ENVIRONMENT:

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



■ HI-PERCARB SERIES 135

■ SOLID CARBIDE DRILL AND REAMER

The second margin gives the Hi-PerCarb Series 135 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.

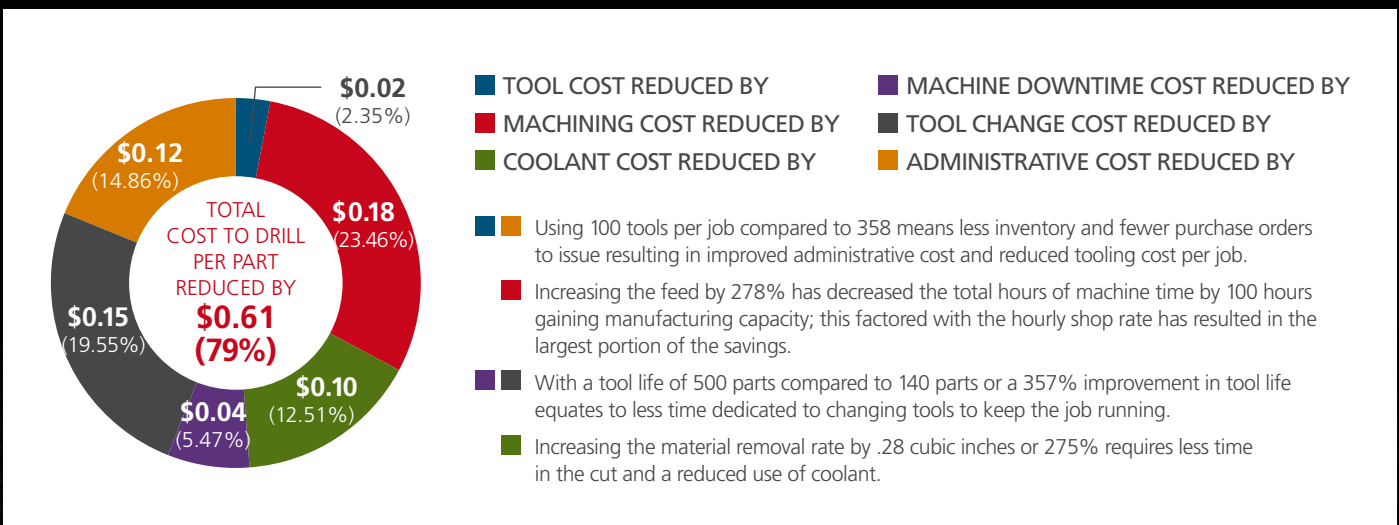
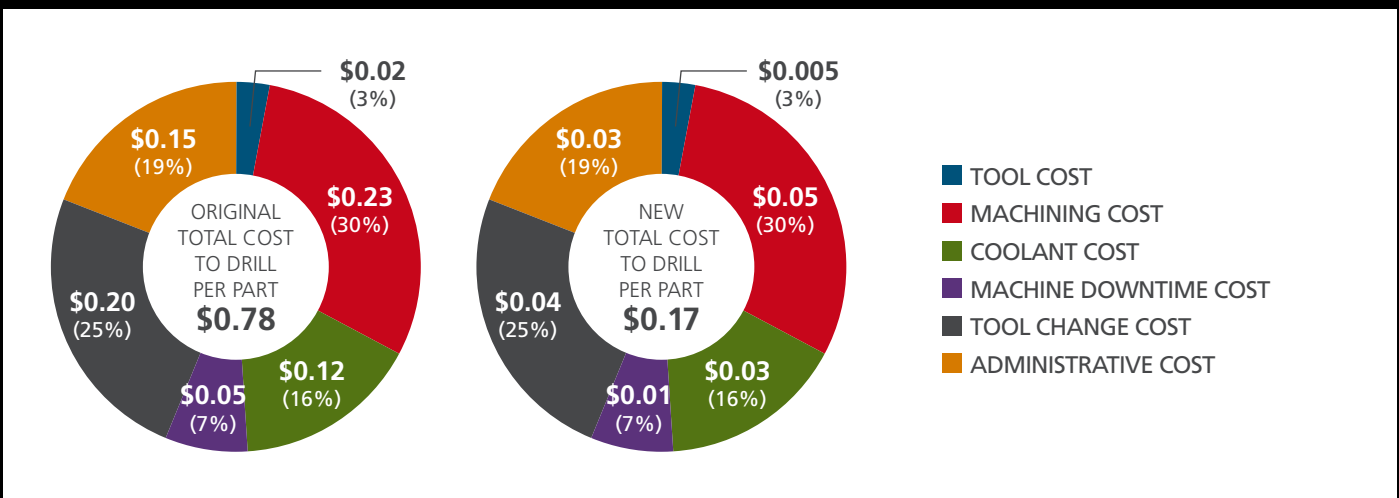
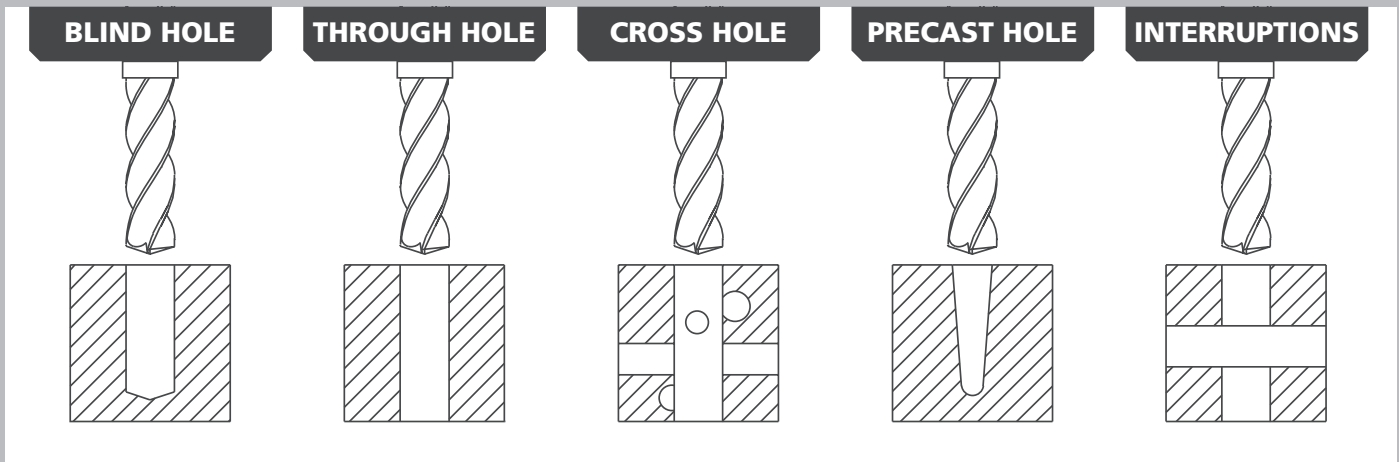
The stability of the double margin design and penetration capability of the point geometry allow the Hi-PerCarb Series 135 Drill to address demanding applications that would normally require reduced operating parameters or a two step process.

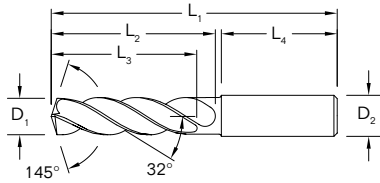
PASSION.

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	HI-PERCARB SERIES 135
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





TOLERANCES (inch)

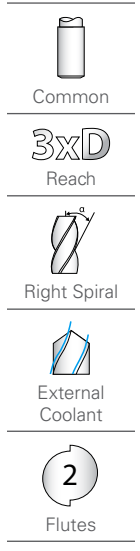
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Series 135 3xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
1/64	0.0156	0.40		1/8	1-1/2	1/8	5/64	1	51752*
1/32	0.0312	0.79		1/8	1-1/2	1/4	3/16	1	51269*
3/64	0.0469	1.19	1/16-64	1/8	1-1/2	3/8	5/16	1	51270*
1,25 mm	0.0492			3,0	38,0	9,5	8,0	25,0	64500*
1,45 mm	0.0571			3,0	38,0	9,5	8,0	25,0	64501*
#53	0.0595	1.51		1/8	1-1/2	3/8	5/16	1	64502*
1/16	0.0625	1.59	5/64-60	1/8	2	7/16	3/8	1-1/4	51271*
1,6 mm	0.0630			3,0	50,0	11,0	9,0	32,0	64503*
1,75 mm	0.0689			3,0	50,0	11,0	9,0	32,0	64504*
#50	0.0700	1.78		1/8	2	7/16	3/8	1-1/4	64505*
5/64	0.0781	1.98		1/8	2	1/2	7/16	1-1/4	51272*
#47	0.0785	1.99		1/8	2	1/2	7/16	1-1/4	64506*
2,05 mm	0.0807			3,0	50,0	12,0	11,0	32,0	64507*
#46	0.0810	2.06		1/8	2	1/2	7/16	1-1/4	64508*
#43	0.0890	2.26		1/8	2	1/2	7/16	1-1/4	64509*
#42	0.0935	2.37		1/8	2	1/2	7/16	1-1/4	64510*
3/32	0.0938	2.38	1/8-32	1/8	2	1/2	7/16	1-1/4	51273
#40	0.0980	2.49		1/8	2	9/16	1/2	1-1/4	51274
2,5 mm	0.0984			3,0	50,0	14,0	12,0	32,0	64511
#39	0.0995	2.53		1/8	2	9/16	1/2	1-1/4	51753
#38	0.1015	2.58	5-40	1/8	2	9/16	1/2	1-1/4	51754
#37	0.1040	2.64	5-44	1/8	2	9/16	1/2	1-1/4	51755
#36	0.1065	2.71	6-32	1/8	2	9/16	1/2	1-1/4	51756
7/64	0.1094	2.78		1/8	2	5/8	9/16	1-1/4	51275
#35	0.1100	2.79		1/8	2	5/8	9/16	1-1/4	51276
#34	0.1110	2.82		1/8	2	5/8	9/16	1-1/4	51277
#33	0.1130	2.87	6-40	1/8	2	5/8	9/16	1-1/4	51757
2,9 mm	0.1142			3,0	50,0	16,0	14,0	32,0	64512
#32	0.1160	2.95		1/8	2	5/8	9/16	1-1/4	51758
3,0 mm	0.1181			6,0	62,0	20,0	17,0	36,0	63155
#31	0.1200	3.05		1/8	2	5/8	9/16	1-1/4	51759
3,1 mm	0.1220			6,0	62,0	20,0	17,0	36,0	63741
1/8	0.1250	3.18		1/4	2-1/2	3/4	21/32	1-7/16	51330
3,2 mm	0.1260		M3,5 X 0,35	6,0	62,0	20,0	17,0	36,0	63156
#30	0.1285	3.26		1/4	2-1/2	3/4	21/32	1-7/16	51278
3,3 mm	0.1299		M4 X 0,7	6,0	62,0	20,0	17,0	36,0	63157
3,4 mm	0.1339			6,0	62,0	20,0	17,0	36,0	63158
#29	0.1360	3.45	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	6,0	62,0	20,0	17,0	36,0	63159
#28	0.1405	3.57	8-40	1/4	2-1/2	3/4	21/32	1-7/16	51760
9/64	0.1406	3.57		1/4	2-1/2	3/4	21/32	1-7/16	51332
3,6 mm	0.1417		M4 X 0,35	6,0	62,0	20,0	17,0	36,0	63160



*Single Margin

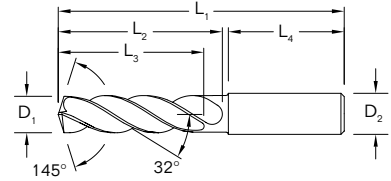
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

TOLERANCES (mm)

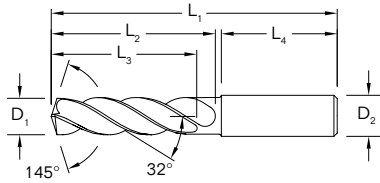
DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



-  Common
-  3xD Reach
-  Right Spiral
-  External Coolant
-  2 Flutes

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
#27	0.1440	3.66		1/4	2-1/2	3/4	21/32	1-7/16	51761
3,7 mm	0.1457		M4.5 X 0,75	6,0	62,0	20,0	17,0	36,0	63161
#26	0.1470	3.73	3/16-24	1/4	2-1/2	3/4	21/32	1-7/16	51762
#25	0.1495	3.80	10-24	1/4	2-5/8	7/8	23/32	1-7/16	51333
3,8 mm	0.1496			6,0	66,0	24,0	21,0	36,0	63742
#24	0.1520	3.86	10-28	1/4	2-5/8	7/8	23/32	1-7/16	51763
3,9 mm	0.1535			6,0	66,0	24,0	21,0	36,0	63743
#23	0.1540	3.91		1/4	2-5/8	7/8	23/32	1-7/16	51764
5/32	0.1562	3.97		1/4	2-5/8	7/8	23/32	1-7/16	51334
#22	0.1570	3.99	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	6,0	66,0	24,0	21,0	36,0	63162
#21	0.1590	4.04	10-32	1/4	2-5/8	7/8	23/32	1-7/16	51335
#20	0.1610	4.09	13/64-24	1/4	2-5/8	7/8	23/32	1-7/16	51279
4,1 mm	0.1614			6,0	66,0	24,0	21,0	36,0	63744
4,2 mm	0.1654		M5 / M5 X 0,75	6,0	66,0	24,0	21,0	36,0	63163
#19	0.1660	4.22		1/4	2-5/8	7/8	23/32	1-7/16	51766
4,3 mm	0.1693			6,0	66,0	24,0	21,0	36,0	63164
#18	0.1695	4.31		1/4	2-5/8	7/8	23/32	1-7/16	51767
11/64	0.1719	4.37		1/4	2-5/8	7/8	23/32	1-7/16	51336
#17	0.1730	4.39		1/4	2-5/8	7/8	23/32	1-7/16	51768
4,4 mm	0.1732			6,0	66,0	24,0	21,0	36,0	63745
#16	0.1770	4.50	12-24	1/4	2-5/8	7/8	23/32	1-7/16	51769
4,5 mm	0.1772		M5 X 0,5	6,0	66,0	24,0	21,0	36,0	63165
#15	0.1800	4.57		1/4	2-5/8	7/8	23/32	1-7/16	51770
4,6 mm	0.1811		12-28	6,0	66,0	24,0	21,0	36,0	63166
#14	0.1820	4.62		1/4	2-5/8	7/8	23/32	1-7/16	51771
#13	0.1850	4.70	12-32	1/4	2-5/8	7/8	23/32	1-7/16	51772
4,7 mm	0.1850			6,0	66,0	24,0	21,0	36,0	63746
3/16	0.1875	4.76		1/4	2-5/8	1	53/64	1-7/16	51337
#12	0.1890	4.80	7/32-32	1/4	2-5/8	1	53/64	1-7/16	51773
4,8 mm	0.1890			6,0	66,0	28,0	24,0	36,0	63167
#11	0.1910	4.85		1/4	2-5/8	1	53/64	1-7/16	51774
4,9 mm	0.1929			6,0	66,0	28,0	24,0	36,0	63747
#10	0.1935	4.91	14-20	1/4	2-5/8	1	53/64	1-7/16	51775
#9	0.1960	4.98		1/4	2-5/8	1	53/64	1-7/16	51776
5,0 mm	0.1969		M6 X 1	6,0	66,0	28,0	24,0	36,0	63168
#8	0.1990	5.05		1/4	2-5/8	1	53/64	1-7/16	51777
5,1 mm	0.2008			6,0	66,0	28,0	24,0	36,0	63748
#7	0.2010	5.11	1/4-20	1/4	2-5/8	1	53/64	1-7/16	51338
13/64	0.2031	5.16		1/4	2-5/8	1	53/64	1-7/16	51339
#6	0.2040	5.18		1/4	2-5/8	1	53/64	1-7/16	51778
5,2 mm	0.2047		M6 X 0,75	6,0	66,0	28,0	24,0	36,0	63749

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TOLERANCES (inch)

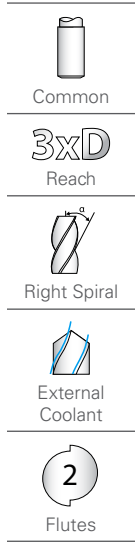
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Series 135 3xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
#5	0.2055	5.22		1/4	2-5/8	1	53/64	1-7/16	51779
5,25 mm	0.2067			6,0	66,0	28,0	24,0	36,0	63169
5,3 mm	0.2087			6,0	66,0	28,0	24,0	36,0	63170
#4	0.2090	5.31	1/4-24	1/4	2-5/8	1	53/64	1-7/16	51780
5,4 mm	0.2126			6,0	66,0	28,0	24,0	36,0	63750
#3	0.2130	5.41	1/4-28	1/4	2-5/8	1	53/64	1-7/16	51340
5,5 mm	0.2165		M6 X 0,5	6,0	66,0	28,0	24,0	36,0	63171
7/32	0.2188	5.56	1/4-32	1/4	2-5/8	1	53/64	1-7/16	51341
5,6 mm	0.2205			6,0	66,0	28,0	24,0	36,0	63751
#2	0.2210	5.61		1/4	2-5/8	1	53/64	1-7/16	51781
5,7 mm	0.2244			6,0	66,0	28,0	24,0	36,0	63752
#1	0.2280	5.79		1/4	2-5/8	1	53/64	1-7/16	51782
5,8 mm	0.2283			6,0	66,0	28,0	24,0	36,0	63172
5,9 mm	0.2323			6,0	66,0	28,0	24,0	36,0	63753
A	0.2340	5.94		1/4	2-5/8	1	53/64	1-7/16	51601
15/64	0.2344	5.95		1/4	2-5/8	1	53/64	1-7/16	51342
6,0	0.2362	6.00	M7 X 1	6,0	66,0	28,0	24,0	36,0	63173
B	0.2380	6.05		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51602
6,1 mm	0.2402			8,0	79,0	34,0	28,0	36,0	63754
C	0.2420	6.15		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51603
6,2 mm	0.2441			8,0	79,0	34,0	28,0	36,0	63755
D	0.2460	6.25		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51604
6,25 mm	0.2461		M7 X 0,75	8,0	79,0	34,0	28,0	36,0	63174
6,3 mm	0.2480			8,0	79,0	34,0	28,0	36,0	63756
1/4	0.2500	6.35		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51343
E	0.2500	6.35		1/4	3-1/8	1-5/16	1-3/64	1-7/16	51605
6,4 mm	0.2520			8,0	79,0	34,0	28,0	36,0	63175
6,5 mm	0.2559			8,0	79,0	34,0	28,0	36,0	63213
F	0.2570	6.53	5/16-18	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51344
6,6 mm	0.2598			8,0	79,0	34,0	28,0	36,0	63757
G	0.2610	6.63		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51606
6,7 mm	0.2638			8,0	79,0	34,0	28,0	36,0	63758
17/64	0.2656	6.75	5/16-20	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51345
H	0.2660	6.76		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51607
6,8 mm	0.2677		M8 X 1,25	8,0	79,0	34,0	28,0	36,0	63176
6,9 mm	0.2717			8,0	79,0	34,0	28,0	36,0	63759
I	0.2720	6.91	5/16-24	5/16	3-1/8	1-5/16	1-3/64	1-7/16	51346
7,0 mm	0.2756		M8 X 1	8,0	79,0	34,0	28,0	36,0	63177
J	0.2770	7.04		5/16	3-1/8	1-5/16	1-3/64	1-7/16	51608
7,1 mm	0.2795			8,0	79,0	41,0	34,0	36,0	63760
K	0.2810	7.14		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51609
9/32	0.2812	7.14	5/16-32	5/16	3-1/8	1-9/16	1-3/16	1-7/16	51347



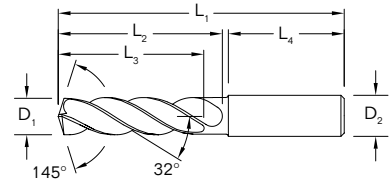
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

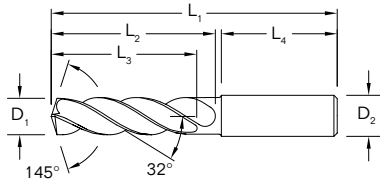
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



Common	3xD Reach	Right Spiral	External Coolant	2 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
					7,2 mm	0.2835			8,0	79,0	41,0	34,0	36,0	63761
					7,25 mm	0.2854		M8 X 0,75	8,0	79,0	41,0	34,0	36,0	63178
					7,3 mm	0.2874			8,0	79,0	41,0	34,0	36,0	63762
					L	0.2900	7.37		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51610
					7,4 mm	0.2913			8,0	79,0	41,0	34,0	36,0	63763
					M	0.2950	7.49		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51611
					7,5 mm	0.2953		M8 X 0,5	8,0	79,0	41,0	34,0	36,0	63179
					19/64	0.2969	7.54		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51348
					7,6 mm	0.2992			8,0	79,0	41,0	34,0	36,0	63764
					N	0.3020	7.67		5/16	3-1/8	1-9/16	1-3/16	1-7/16	51612
					7,7 mm	0.3031			8,0	79,0	41,0	34,0	36,0	63765
					7,8 mm	0.3071		M9 X 1,25	8,0	79,0	41,0	34,0	36,0	63180
					7,9 mm	0.3110			8,0	79,0	41,0	34,0	36,0	63766
					5/16	0.3125	7.94	3/8-16	5/16	3-1/8	1-9/16	1-3/16	1-7/16	51349
					8,0 mm	0.3150		M9 x 1	8,0	79,0	41,0	34,0	36,0	63181
					O	0.3160	8.03		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51613
					8,1 mm	0.3189			10,0	89,0	47,0	40,0	40,0	63767
					8,2 mm	0.3228			10,0	89,0	47,0	40,0	40,0	63768
					P	0.3230	8.20		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51614
					8,3 mm	0.3268			10,0	89,0	47,0	40,0	40,0	63769
					21/64	0.3281	8.33	3/8-20	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51350
					8,4 mm	0.3307			10,0	89,0	47,0	40,0	40,0	63182
					Q	0.3320	8.43	3/8-24	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51351
					8,5 mm	0.3346		M10 X 1,5	10,0	89,0	47,0	40,0	40,0	63183
					8,6 mm	0.3386			10,0	89,0	47,0	40,0	40,0	63770
					R	0.3390	8.61		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51615
					8,7 mm	0.3425			10,0	89,0	47,0	40,0	40,0	63771
					11/32	0.3438	8.73	3/8-32	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51352
					8,8 mm	0.3465		M10 X 1,25	10,0	89,0	47,0	40,0	40,0	63184
					S	0.3480	8.84		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51616
					8,9 mm	0.3504			10,0	89,0	47,0	40,0	40,0	63772
					9,0 mm	0.3543		M10 X 1	10,0	89,0	47,0	40,0	40,0	63185
					T	0.3580	9.09		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51617
					9,1 mm	0.3583			10,0	89,0	47,0	40,0	40,0	63773
					23/64	0.3594	9.13		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51353
					9,2 mm	0.3622		M10 X 0,75	10,0	89,0	47,0	40,0	40,0	63774
					9,25 mm	0.3642	9.25		10,0	89,0	47,0	40,0	40,0	63186
					9,3 mm	0.3661			10,0	89,0	47,0	40,0	40,0	63775
					U	0.3680	9.35	7/16-14	3/8	3-1/2	1-27/32	1-37/64	1-9/16	51354
					9,4 mm	0.3701			10,0	89,0	47,0	40,0	40,0	63776
					9,5 mm	0.3740		M10 X 0,5	10,0	89,0	47,0	40,0	40,0	63187
					3/8	0.3750	9.53		3/8	3-1/2	1-27/32	1-37/64	1-9/16	51355

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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Series 135 3xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
V	0.3770	9.58		1/2	3-1/2	1-27/32	1-37/64	1-9/16	51618
9,6 mm	0.3780			10,0	89,0	47,0	40,0	40,0	63777
9,7 mm	0.3819			10,0	89,0	47,0	40,0	40,0	63778
9,8 mm	0.3858			10,0	89,0	47,0	40,0	40,0	63779
W	0.3860			1/2	3-1/2	1-27/32	1-37/64	1-9/16	51619
9,9 mm	0.3898			10,0	89,0	47,0	40,0	40,0	63780
25/64	0.3906	9.92	7/16-20	1/2	3-1/2	1-27/32	1-37/64	1-9/16	51356
10,0 mm	0.3937			10,0	89,0	47,0	40,0	40,0	63188
X	0.3970	10.08	7/16-24	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51620
10,1 mm	0.3976			12,0	102,0	55,0	45,0	45,0	63781
10,2 mm	0.4016		M12 X 1,75	12,0	102,0	55,0	45,0	45,0	63189
Y	0.4040	10.26	7/16-28	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51621
10,3 mm	0.4055			12,0	102,0	55,0	45,0	45,0	63782
13/32	0.4062	10.32		1/2	4-1/16	2-3/16	1-51/64	1-49/64	51357
10,4 mm	0.4094			12,0	102,0	55,0	45,0	45,0	63783
Z	0.4130	10.49		1/2	4-1/16	2-3/16	1-51/64	1-49/64	51622
10,5 mm	0.4134		M12 X 1,5	12,0	102,0	55,0	45,0	45,0	63190
10,6 mm	0.4173			12,0	102,0	55,0	45,0	45,0	63784
10,7 mm	0.4213			12,0	102,0	55,0	45,0	45,0	63785
27/64	0.4219	10.72	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	12,0	102,0	55,0	45,0	45,0	63191
10,9 mm	0.4291			12,0	102,0	55,0	45,0	45,0	63786
11,0 mm	0.4331		M12 X 1	12,0	102,0	55,0	45,0	45,0	63192
11,1 mm	0.4370			12,0	102,0	55,0	45,0	45,0	63787
7/16	0.4375	11.11	1/4-18 NPT	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51359
11,2 mm	0.4409			12,0	102,0	55,0	45,0	45,0	63788
11,25 mm	0.4429			12,0	102,0	55,0	45,0	45,0	63193
11,3 mm	0.4449			12,0	102,0	55,0	45,0	45,0	63789
11,4 mm	0.4488			12,0	102,0	55,0	45,0	45,0	63790
11,5 mm	0.4528		M12 X 0,5	12,0	102,0	55,0	45,0	45,0	63194
29/64	0.4531	11.51	1/2-20	1/2	4-1/16	2-3/16	1-51/64	1-49/64	51360
11,6 mm	0.4567			12,0	102,0	55,0	45,0	45,0	63791
11,7 mm	0.4606			12,0	102,0	55,0	45,0	45,0	63792
11,8 mm	0.4646			12,0	102,0	55,0	45,0	45,0	63793
11,9 mm	0.4685			12,0	102,0	55,0	45,0	45,0	63794
15/32	0.4688	11.91	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	12,0	102,0	55,0	45,0	45,0	63195
31/64	0.4844	12.30	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	14,0	107,0	60,0	49,0	45,0	63196
1/2	0.5000	12.70		1/2	4-1/4	2-5/16	1-7/8	1-49/64	51363
12,8 mm	0.5039		M14 X 1,25	14,0	107,0	60,0	49,0	45,0	63197
13,0 mm	0.5118		M14 X 1	14,0	107,0	60,0	49,0	45,0	63198

- Common
- 3xD Reach
- Right Spiral
- External Coolant
- 2 Flutes

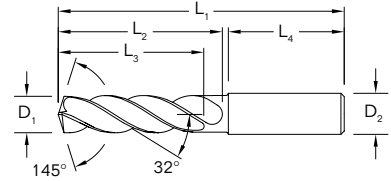
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

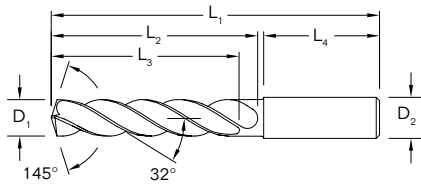
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



-  Common
-  3xD Reach
-  Right Spiral
-  External Coolant
-  2 Flutes

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
33/64	0.5156	13.10	9/16-18	5/8	4-1/4	2-5/16	1-7/8	1-49/64	51364
17/32	0.5312	13.49	5/8-11	5/8	4-1/4	2-5/16	1-7/8	1-49/64	51365
13,5 mm	0.5315			14,0	107,0	60,0	49,0	45,0	63199
35/64	0.5469	13.89	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	14,0	107,0	60,0	49,0	45,0	63200
9/16	0.5625	14.29		5/8	4-9/16	2-1/2	2	1-57/64	51366
14,5 mm	0.5709		M16 X 1,5	16,0	115,0	65,0	51,0	48,0	63201
37/64	0.5781	14.68	5/8-18	5/8	4-9/16	2-1/2	2	1-57/64	51367
15,0 mm	0.5906		M16 X 1	16,0	115,0	65,0	51,0	48,0	63202
19/32	0.5938	15.08	11/16-11	5/8	4-9/16	2-1/2	2	1-57/64	51784
39/64	0.6094	15.48	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	16,0	115,0	65,0	51,0	48,0	63203
5/8	0.6250	15.88	11/16-16	5/8	4-9/16	2-1/2	2	1-57/64	51368
16,0 mm	0.6299			16,0	115,0	65,0	51,0	48,0	63204
41/64	0.6406	16.27	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	18,0	123,0	73,0	58,0	48,0	63205
21/32	0.6562	16.67	3/4-10	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51369
17,0 mm	0.6693			18,0	123,0	73,0	58,0	48,0	63206
43/64	0.6719	17.07	3/4-12	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51787
11/16	0.6875	17.46	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	18,0	123,0	73,0	58,0	48,0	63207
45/64	0.7031	17.86	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			18,0	123,0	73,0	58,0	48,0	63208
23/32	0.7188	18.26		3/4	4-7/8	2-3/4	2-5/16	1-57/64	51789
18,5 mm	0.7283		M20 X 1,5	20,0	131,0	79,0	63,0	50,0	63209
47/64	0.7344	18.65	13/16-12	3/4	4-7/8	2-3/4	2-5/16	1-57/64	51790
19,0 mm	0.7480			20,0	131,0	79,0	63,0	50,0	63210
3/4	0.7500	19.05	13/16-16	3/4	5-1/4	3-1/16	2-7/16	1-31/32	51371
49/64	0.7656	19.45	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	20,0	131,0	79,0	63,0	50,0	63211
25/32	0.7812	19.84		7/8	6	3-11/16	2-11/16	2-1/8	51791
20,0 mm	0.7874			20,0	131,0	79,0	63,0	50,0	63212
51/64	0.7969	20.24	7/8-12	7/8	6	3-11/16	2-11/16	2-1/8	51792
20,5 mm	0.8071			22,0	150,0	93,0	73,0	53,0	64513
13/16	0.8125	20.64	7/8-14	7/8	6	3-11/16	2-11/16	2-1/8	51373
21,0 mm	0.8268			22,0	150,0	93,0	73,0	53,0	64514
22,0 mm	0.8661			22,0	150,0	93,0	73,0	53,0	64515
7/8	0.8750	22.23	15/16-16, 1-8	7/8	6	3-11/16	2-11/16	2-1/8	51374
59/64	0.9219	23.42	1-12	1	6	3-11/16	2-11/16	2-1/8	51375



TOLERANCES (inch)

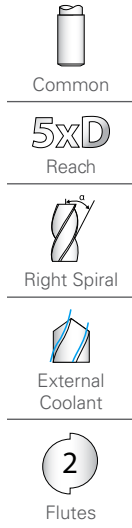
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Series 135 5xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
1/64	0.0156	0.40		1/8	1 1/2	5/32	7/64	1	52300*
1/32	0.0312	0.79		1/8	1 1/2	5/16	7/32	1	52301*
3/64	0.0469	1.19	1/16-64	1/8	1 1/2	25/64	19/64	1	52302*
1,25 mm	0.0492			3,0	38,0	10,0	7,5	25,0	64520*
1,45 mm	0.0571			3,0	38,0	10,0	7,5	25,0	64521*
#53	0.0595	1.51		1/8	1-1/2	25/64	19/64	1	64522*
1/16	0.0625	1.59	5/64-60	1/8	2	15/32	23/64	1-1/4	52303*
1,6 mm	0.0630			3,0	50,0	12,0	9,0	32,0	64523*
1,75 mm	0.0689			3,0	50,0	12,0	9,0	32,0	64524*
#50	0.0700	1.78		1/8	2	15/32	23/64	1-1/4	64525*
5/64	0.0781	1.98		1/8	2	35/64	27/64	1-1/4	52304*
#47	0.0785	1.99		1/8	2	35/64	27/64	1-1/4	64526*
2,05 mm	0.0807			3,0	50,0	14,0	11,0	32,0	64527*
#46	0.0810	2.06		1/8	2	35/64	27/64	1-1/4	64528*
#43	0.0890	2.26		1/8	2	19/32	15/32	1-1/4	64529*
#42	0.0935	2.37		1/8	2	5/8	1/2	1-1/4	64530*
3/32	0.0938	2.38	1/8-32	1/8	2	5/8	1/2	1-1/4	52305
#40	0.0980	2.49		1/8	2	43/64	17/32	1-1/4	52306
2,5 mm	0.0984			3,0	50,0	17,0	13,0	32,0	64531
#39	0.0995	2.53		1/8	2	43/64	17/32	1-1/4	52307
#38	0.1015	2.58	5-40	1/8	2	43/64	17/32	1-1/4	52308
#37	0.1040	2.64	5-44	1/8	2	45/64	9/16	1-1/4	52309
#36	0.1065	2.71	6-32	1/8	2	45/64	9/16	1-1/4	52310
7/64	0.1094	2.78		1/8	2	3/4	19/32	1-1/4	52311
#35	0.1100	2.79		1/8	2	3/4	19/32	1-1/4	52312
#34	0.1110	2.82		1/8	2	3/4	19/32	1-1/4	52313
#33	0.1130	2.87	6-40	1/8	2	3/4	19/32	1-1/4	52314
2,9 mm	0.1142			3,0	50,0	19,0	15,0	32,0	64532
#32	0.1160	2.95		1/8	2	3/4	39/64	1-1/4	52315
3,0 mm	0.1181			6,0	66,0	28,0	23,0	36,0	64100
#31	0.1200	3.05		1/8	2	3/4	39/64	1-1/4	52316
3,1 mm	0.1220			6,0	66,0	28,0	23,0	36,0	64101
1/8	0.1250	3.18		1/4	3	1	53/64	1-7/16	51580
3,2 mm	0.1260		M3,5 X 0,35	6,0	66,0	28,0	23,0	36,0	64102
#30	0.1285	3.26		1/4	3	1	53/64	1-7/16	51581
3,3 mm	0.1299		M4 X 0,7	6,0	66,0	28,0	23,0	36,0	64103
3,4 mm	0.1339		8-32,8-36	6,0	66,0	28,0	23,0	36,0	64104
#29	0.1360	3.45		1/4	3	1	53/64	1-7/16	51582
3,5 mm	0.1378			6,0	66,0	28,0	23,0	36,0	64105
#28	0.1405	3.57	8-40	1/4	3	1	53/64	1-7/16	52317
9/64	0.1406	3.57		1/4	3	1	53/64	1-7/16	51583
3,6 mm	0.1417		M4 X 0,35	6,0	66,0	28,0	23,0	36,0	64106



*Single Margin

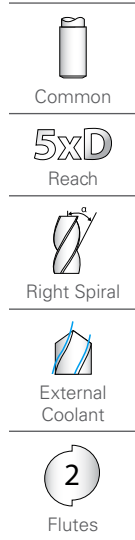
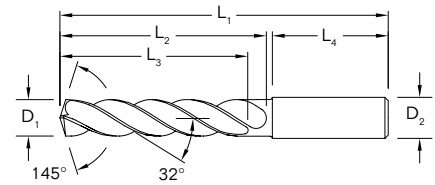
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

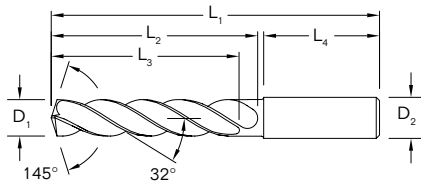
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
#27	0.1440	3.66		1/4	3	1	53/64	1-7/16	52318
3,7 mm	0.1457		M4.5 X 0,75	6,0	66,0	28,0	23,0	36,0	64107
#26	0.1470	3.73	3/16-24	1/4	3	1	53/64	1-7/16	52319
#25	0.1495	3.80	10-24	1/4	3-1/4	1-1/4	1-5/64	1-7/16	51584
3,8 mm	0.1496			6,0	74,0	36,0	29,0	36,0	64108
#24	0.1520	3.86	10-28	1/4	3-1/4	1-1/4	1-5/64	1-7/16	52321
3,9 mm	0.1535			6,0	74,0	36,0	29,0	36,0	64109
#23	0.1540	3.91		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52322
5/32	0.1562	3.97		1/4	3-1/4	1-1/4	1-5/64	1-7/16	51585
#22	0.1570	3.99	10-30	1/4	3-1/4	1-1/4	1-5/64	1-7/16	52323
4,0 mm	0.1575		M4,5 X 0,5	6,0	74,0	36,0	29,0	36,0	64110
#21	0.1590	4.04	10-32	1/4	3-1/4	1-1/4	1-5/64	1-7/16	51586
#20	0.1610	4.09	13/64-24	1/4	3-1/4	1-1/4	1-5/64	1-7/16	51587
4,1 mm	0.1614			6,0	74,0	36,0	29,0	36,0	64111
4,2 mm	0.1654		M5 / M5 X 0,75	6,0	74,0	36,0	29,0	36,0	64112
#19	0.1660	4.22		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52324
4,3 mm	0.1693			6,0	74,0	36,0	29,0	36,0	64113
#18	0.1695	4.31		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52325
11/64	0.1719	4.37		1/4	3-1/4	1-1/4	1-5/64	1-7/16	51588
#17	0.1730	4.39		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52326
4,4 mm	0.1732			6,0	74,0	36,0	29,0	36,0	64114
4,5 mm	0.1772		M5 X 0,5	6,0	74,0	36,0	29,0	36,0	64115
#15	0.1800	4.57		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52327
4,6 mm	0.1811		12-28	6,0	74,0	36,0	29,0	36,0	64116
#14	0.1820	4.62		1/4	3-1/4	1-1/4	1-5/64	1-7/16	52328
#13	0.1850	4.70	12-32	1/4	3-1/4	1-1/4	1-5/64	1-7/16	52329
4,7 mm	0.1850			6,0	74,0	36,0	29,0	36,0	64117
3/16	0.1875	4.76		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51589
#12	0.1890	4.80	7/32-32	1/4	3-1/4	1-3/4	1-37/64	1-7/16	52330
4,8 mm	0.1890			6,0	82,0	44,0	35,0	36,0	64118
4,9 mm	0.1929			6,0	82,0	44,0	35,0	36,0	64119
#10	0.1935	4.91	14-20	1/4	3-1/4	1-3/4	1-37/64	1-7/16	52331
#9	0.1960	4.98		1/4	3-1/4	1-3/4	1-37/64	1-7/16	52332
5,0 mm	0.1969		M6 X 1	6,0	82,0	44,0	35,0	36,0	64120
#8	0.1990	5.05		1/4	3-1/4	1-3/4	1-37/64	1-7/16	52333
5,1 mm	0.2008			6,0	82,0	44,0	35,0	36,0	64121
#7	0.2010	5.11	1/4-20	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51506
13/64	0.2031	5.16		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51507
#6	0.2040	5.18		1/4	3 1/4	1 3/4	1 37/64	1 7/16	52334
5,2 mm	0.2047		M6 X 0,75	6,0	82,0	44,0	35,0	36,0	64122
#5	0.2055	5.22		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51590
5,25 mm	0.2067			6,0	82,0	44,0	35,0	36,0	64123

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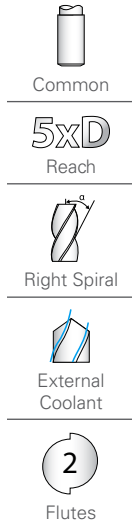
TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
5,3 mm	0.2087			6,0	82,0	44,0	35,0	36,0	64124
#4	0.2090	5.31	1/4-24	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51508
5,4 mm	0.2126			6,0	82,0	44,0	35,0	36,0	64125
#3	0.2130	5.41	1/4-28	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51509
5,5 mm	0.2165		M6 X 0,5	6,0	82,0	44,0	35,0	36,0	64126
7/32	0.2188	5.56	1/4-32	1/4	3-1/4	1-3/4	1-37/64	1-7/16	51510
5,6 mm	0.2205			6,0	82,0	44,0	35,0	36,0	64127
#2	0.2210	5.61		1/4	3-1/4	1-3/4	1-37/64	1-7/16	52335
5,7 mm	0.2244			6,0	82,0	44,0	35,0	36,0	64128
#1	0.2280	5.79		1/4	3-1/4	1-3/4	1-37/64	1-7/16	52336
5,8 mm	0.2283			6,0	82,0	44,0	35,0	36,0	64129
5,9 mm	0.2323			6,0	82,0	44,0	35,0	36,0	64130
A	0.2340	5.94		1/4	3-1/4	1-3/4	1-37/64	1-7/16	52337
15/64	0.2344	5.95		1/4	3-1/4	1-3/4	1-37/64	1-7/16	51591
6,0 mm	0.2362		M7 X 1	6,0	82,0	44,0	35,0	36,0	64131
B	0.2380	6.05		1/4	3 5/8	2-5/64	1-51/64	1-7/16	52338
6,1 mm	0.2402			8,0	91,0	53,0	43,0	36,0	64132
C	0.2420	6.15		1/4	3 5/8	2-5/64	1-51/64	1-7/16	52339
6,2 mm	0.2441			8,0	91,0	53,0	43,0	36,0	64133
D	0.2460	6.25		1/4	3 5/8	2-5/64	1-51/64	1-7/16	52340
6,25 mm	0.2461		M7 X 0,75	8,0	91,0	53,0	43,0	36,0	64134
6,3 mm	0.2480			8,0	91,0	53,0	43,0	36,0	64135
1/4	0.2500	6.35		1/4	3-5/8	2-5/64	1-51/64	1-7/16	51511
6,4 mm	0.2520			8,0	91,0	53,0	43,0	36,0	64136
6,5 mm	0.2559			8,0	91,0	53,0	43,0	36,0	64137
F	0.2570	6.53	5/16-18	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51512
6,6 mm	0.2598			8,0	91,0	53,0	43,0	36,0	64138
G	0.2610	6.63		5/16	3 5/8	2 5/64	1 51/64	1 7/16	52341
6,7 mm	0.2638			8,0	91,0	53,0	43,0	36,0	64139
17/64	0.2656	6.75	5/16-20	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51513
H	0.2660	6.76		5/16	3-5/8	2-5/64	1-51/64	1-7/16	52342
6,8 mm	0.2677		M8 X 1,25	8,0	91,0	53,0	43,0	36,0	64140
6,9 mm	0.2717			8,0	91,0	53,0	43,0	36,0	64141
I	0.2720	6.91	5/16-24	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51514
7,0 mm	0.2756		M8 X 1	8,0	91,0	53,0	43,0	36,0	64142
J	0.2770	7.04		5/16	3 5/8	2-5/64	1-51/64	1-7/16	52343
7,1 mm	0.2795			8,0	91,0	53,0	43,0	36,0	64143
K	0.2810	7.14		5/16	3 5/8	2-5/64	1-51/64	1-7/16	52344
9/32	0.2812	7.14	5/16-32	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51515
7,2 mm	0.2835			8,0	91,0	53,0	43,0	36,0	64144
7,25 mm	0.2854		M8 X 0,75	8,0	91,0	53,0	43,0	36,0	64145
7,3 mm	0.2874			8,0	91,0	53,0	43,0	36,0	64146



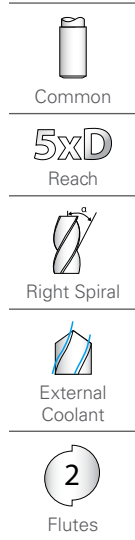
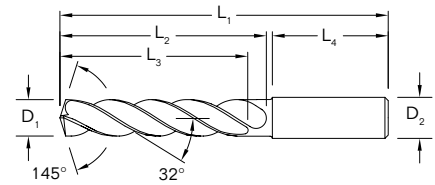
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181–.2362	+0.0016/+0.00063	h6
>.2362–.3937	+0.0024/+0.00083	h6
>.3937–.7087	+0.0028/+0.00098	h6
>.7087–1.1811	+0.0031/+0.00114	h6

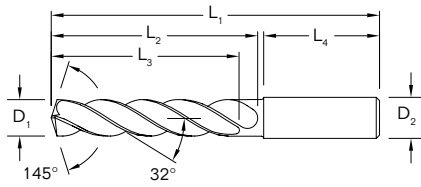
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
L	0.2900	7.37		5/16	3-5/8	2-5/64	1-51/64	1-7/16	52345
7,4 mm	0.2913			8,0	91,0	53,0	43,0	36,0	64147
M	0.2950	7.49		5/16	3-5/8	2-5/64	1-51/64	1-7/16	52346
7,5 mm	0.2953		M8 X 0,5	8,0	91,0	53,0	43,0	36,0	64148
19/64	0.2969	7.54		5/16	3-5/8	2-5/64	1-51/64	1-7/16	51516
7,6 mm	0.2992			8,0	91,0	53,0	43,0	36,0	64149
N	0.3020	7.67		5/16	3-5/8	2-5/64	1-51/64	1-7/16	52347
7,7 mm	0.3031			8,0	91,0	53,0	43,0	36,0	64150
7,8 mm	0.3071		M9 X 1,25	8,0	91,0	53,0	43,0	36,0	64151
7,9 mm	0.3110			8,0	91,0	53,0	43,0	36,0	64152
5/16	0.3125	7.94	3/8-16	5/16	3-5/8	2-5/64	1-51/64	1-7/16	51517
8,0 mm	0.3150		M9 X 1	8,0	91,0	53,0	43,0	36,0	64153
O	0.3160	8.03		3/8	4	2-13/32	2-1/8	1-9/16	52348
8,1 mm	0.3189			10,0	103,0	61,0	49,0	40,0	64154
8,2 mm	0.3228			10,0	103,0	61,0	49,0	40,0	64155
P	0.3230	8.20		3/8	4	2-13/32	2-1/8	1-9/16	51518
8,3 mm	0.3268			10,0	103,0	61,0	49,0	40,0	64156
21/64	0.3281	8.33	3/8-20	3/8	4	2-13/32	2-1/8	1-9/16	51519
8,4 mm	0.3307			10,0	103,0	61,0	49,0	40,0	64157
Q	0.3320	8.43	3/8-24	3/8	4	2-13/32	2-1/8	1-9/16	51520
8,5 mm	0.3346		M10 X 1,5	10,0	103,0	61,0	49,0	40,0	64158
8,6 mm	0.3386			10,0	103,0	61,0	49,0	40,0	64159
R	0.3390	8.61	3/8-32	3/8	4	2-13/32	2-1/8	1-9/16	52349
8,7 mm	0.3425		M10 X 1,25	10,0	103,0	61,0	49,0	40,0	64160
11/32	0.3438	8.73		3/8	4	2-13/32	2-1/8	1-9/16	51521
8,8 mm	0.3465			10,0	103,0	61,0	49,0	40,0	64161
S	0.3480	8.84		3/8	4	2-13/32	2-1/8	1-9/16	51522
8,9 mm	0.3504			10,0	103,0	61,0	49,0	40,0	64162
9,0 mm	0.3543		M10 X 1	10,0	103,0	61,0	49,0	40,0	64163
T	0.3580	9.09		3/8	4	2-13/32	2-1/8	1-9/16	52350
9,1 mm	0.3583			10,0	103,0	61,0	49,0	40,0	64164
23/64	0.3594	9.13		3/8	4	2-13/32	2-1/8	1-9/16	51523
9,2 mm	0.3622		M10 X 0,75	10,0	103,0	61,0	49,0	40,0	64165
9,25 mm	0.3642			10,0	103,0	61,0	49,0	40,0	64166
9,3 mm	0.3661			10,0	103,0	61,0	49,0	40,0	64167
U	0.3680	9.35	7/16-14	3/8	4	2-13/32	2-1/8	1-9/16	51524
9,4 mm	0.3701			10,0	103,0	61,0	49,0	40,0	64168
9,5 mm	0.3740		M10 X 0,5	10,0	103,0	61,0	49,0	40,0	64169
3/8	0.3750	9.53		3/8	4	2-13/32	2-1/8	1-9/16	51525
V	0.3770	9.58		1/2	4	2-13/32	2-1/8	1-9/16	52351
9,6 mm	0.3780			10,0	103,0	61,0	49,0	40,0	64170
9,7 mm	0.3819			10,0	103,0	61,0	49,0	40,0	64171

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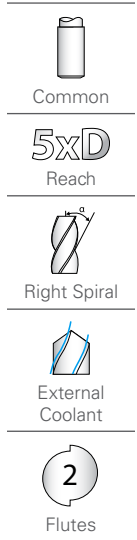
TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
9,8 mm	0.3858			10,0	103,0	61,0	49,0	40,0	64172
W	0.3860	9.80		1/2	4	2-13/32	2-1/8	1-9/16	51526
9,9 mm	0.3898			10,0	103,0	61,0	49,0	40,0	64173
25/64	0.3906	9.92	7/16-20	1/2	4	2-13/32	2-1/8	1-9/16	51527
10,0 mm	0.3937			10,0	103,0	61,0	49,0	40,0	64174
X	0.3970	10.08	7/16-24	1/2	4-11/16	2-3/4	2-23/64	1-49/64	52352
10,1 mm	0.3976			12,0	118,0	71,0	56,0	45,0	64175
10,2 mm	0.4016			12,0	118,0	71,0	56,0	45,0	64176
Y	0.4040	10.26	7/16-28	1/2	4-11/16	2-3/4	2-23/64	1-49/64	52353
10,3 mm	0.4055			12,0	118,0	71,0	56,0	45,0	64177
13/32	0.4062	10.32		1/2	4-11/16	2-3/4	2-23/64	1-49/64	51528
10,4 mm	0.4095			12,0	118,0	71,0	56,0	45,0	64178
Z	0.4130	10.49		1/2	4-11/16	2-3/4	2-23/64	1-49/64	52354
10,5 mm	0.4134		M12 X 1,5	12,0	118,0	71,0	56,0	45,0	64179
10,6 mm	0.4173			12,0	118,0	71,0	56,0	45,0	64180
10,7 mm	0.4213			12,0	118,0	71,0	56,0	45,0	64181
27/64	0.4219	10.72	1/2-13	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51529
10,8 mm	0.4252		M12 X 1,25	12,0	118,0	71,0	56,0	45,0	64182
10,9 mm	0.4291			12,0	118,0	71,0	56,0	45,0	64183
11,0 mm	0.4331			12,0	118,0	71,0	56,0	45,0	64184
11,1 mm	0.4370		M12 X 1	12,0	118,0	71,0	56,0	45,0	64185
7/16	0.4375	11.11	1/4-18 NPT	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51530
11,2 mm	0.4409			12,0	118,0	71,0	56,0	45,0	64186
11,25 mm	0.4429			12,0	118,0	71,0	56,0	45,0	64187
11,3 mm	0.4449			12,0	118,0	71,0	56,0	45,0	64188
11,4 mm	0.4488			12,0	118,0	71,0	56,0	45,0	64189
11,5 mm	0.4528		M12 X 0,5	12,0	118,0	71,0	56,0	45,0	64190
29/64	0.4531	11.51	1/2-20	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51531
11,6 mm	0.4567			12,0	118,0	71,0	56,0	45,0	64191
11,7 mm	0.4606			12,0	118,0	71,0	56,0	45,0	64192
11,8 mm	0.4646			12,0	118,0	71,0	56,0	45,0	64193
11,9 mm	0.4685			12,0	118,0	71,0	56,0	45,0	64194
15/32	0.4688	11.91	1/2-28	1/2	4-11/16	2-3/4	2-23/64	1-49/64	51532
12,0 mm	0.4724		M14 X 2	12,0	118,0	71,0	56,0	45,0	64195
31/64	0.4844	12.30	9/16-12	1/2	4-7/8	3-1/32	2-19/32	1-49/64	51533
12,5 mm	0.4921		M14 X 1,5	14,0	124,0	77,0	60,0	45,0	64196
1/2	0.5000	12.70		1/2	4-7/8	3-1/32	2-19/32	1-49/64	51534
12,8 mm	0.5039		M14 X 1,25	14,0	124,0	77,0	60,0	45,0	64197
13,0 mm	0.5118		M14 X 1	14,0	124,0	77,0	60,0	45,0	64198
33/64	0.5156	13.10	9/16-18	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51535
17/32	0.5312	13.49	5/8-11	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51536
13,5 mm	0.5315			14,0	124,0	77,0	60,0	45,0	64199



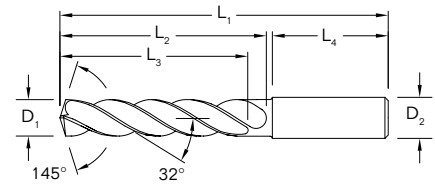
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181–.2362	+0.0016/+0.00063	h6
>.2362–.3937	+0.0024/+0.00083	h6
>.3937–.7087	+0.0028/+0.00098	h6
>.7087–1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6
> 18 - 30	+0,008/+0,029	h6



Common	5xD Reach	Right Spiral	External Coolant	2 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
					35/64	0.5469	13.89	5/8-12	5/8	4-7/8	3-1/32	2-19/32	1-49/64	51537
					14,0 mm	0.5512		M16 X 2	14,0	124,0	77,0	60,0	45,0	64200
					9/16	0.5625	14.29		5/8	5-1/4	3-1/4	2-3/4	1-57/64	51538
					14,5 mm	0.5709		M16 X 1,5	16,0	133,0	83,0	63,0	48,0	64201
					37/64	0.5781	14.68	5/8-18	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51539
					15,0 mm	0.5906		M16 X 1	16,0	133,0	83,0	63,0	48,0	64202
					19/32	0.5938	15.08	11/16-11	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51592
					39/64	0.6094	15.48	11/16-12	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51593
					15,5 mm	0.6102		M18 X 2,5	16,0	133,0	83,0	63,0	48,0	64203
					5/8	0.6250	15.88	11/16-16	5/8	5-1/4	3-1/4	2-3/4	1-57/64	51540
					16,0 mm	0.6299			16,0	133,0	83,0	63,0	48,0	64204
					41/64	0.6406	16.27	11/16-24	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51594
					16,5 mm	0.6496		M18 X 1,5	18,0	143,0	93,0	71,0	48,0	64205
					21/32	0.6562	16.67	3/4-10	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51541
					17,0 mm	0.6693			18,0	143,0	93,0	71,0	48,0	64206
					43/64	0.6719	17.07	3/4-12	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51595
					11/16	0.6875	17.46	3/4-16	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51542
					17,5 mm	0.6890		M20 X 2,5	18,0	143,0	93,0	71,0	48,0	64207
					45/64	0.7031	17.86	3/4-20, 1/2-14 NPT	3/4	5-5/8	3-5/8	3-3/16	1-57/64	51543
					18,0 mm	0.7087			18,0	143,0	93,0	71,0	48,0	64208
					23/32	0.7188	18.26		3/4	6	4	3-3/8	1-31/32	51596
					18,5 mm	0.7283		M20 X 1,5	20,0	153,0	101,0	77,0	50,0	64209
					47/64	0.7344	18.65	13/16-12	3/4	6	4	3-3/8	1-31/32	51544
					19,0 mm	0.7480			20,0	153,0	101,0	77,0	50,0	64210
					3/4	0.7500	19.05	13/16-16	3/4	6	4	3-3/8	1-31/32	51545
					49/64	0.7656	19.45	7/8-9	7/8	6	4	3-3/8	1-31/32	52355
					19,5 mm	0.7677		M22 X 2,5	20,0	153,0	101,0	77,0	50,0	64211
					25/32	0.7812	19.84		7/8	6	4	3-3/8	1-31/32	52356
					20,0 mm	0.7874			20,0	153,0	101,0	77,0	50,0	64212
					51/64	0.7969	20.24	7/8-12	7/8	6	4	3-3/8	1-31/32	52357
					20,5 mm	0.8071			22,0	153,0	101,0	77,0	50,0	64533
					13/16	0.8125	20.64	7/8-14	7/8	6-1/2	4-1/2	3-7/8	1-31/32	52358
					21,0 mm	0.8268			22,0	153,0	101,0	77,0	50,0	64534
					22,0 mm	0.8661			22,0	178,0	127,0	108,0	50,0	64535
					7/8	0.8750	22.23	15/16-16, 1-8	7/8	6-1/2	4-1/2	3-7/8	1-31/32	52359
					59/64	0.9219	23.42	1-12	1	7	5	4-3/8	2-1/8	52360



Series 135 3xD Speed & Feed Recommendations

Series	135 3D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)							
				1/32	1/8	1/4	3/8	1/2	5/8	7/8	
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	385	RPM	47062	11766	5883	3922	2941	2353	1681
			(308-462)	Fr	0.0010	0.0038	0.0076	0.0115	0.0153	0.0191	0.0268
			Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
		≤ 275 Bhn or ≤ 28 HRc	350	RPM	42784	10696	5348	3565	2674	2139	1528
			(280-420)	Fr	0.0009	0.0036	0.0071	0.0107	0.0142	0.0178	0.0249
			Feed (ipm)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	
	≤ 425 Bhn or ≤ 45 HRc	200	RPM	24448	6112	3056	2037	1528	1222	873	
		(160-240)	Fr	0.0007	0.0029	0.0059	0.0088	0.0118	0.0147	0.0206	
		Feed (ipm)	18.0	18.0	18.0	18.0	18.0	18.0	18.0		
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	300	RPM	36672	9168	4584	3056	2292	1834	1310
			(240-360)	Fr	0.0007	0.0029	0.0059	0.0088	0.0118	0.0147	0.0206
			Feed (ipm)	27.0	27.0	27.0	27.0	27.0	27.0	27.0	
≤ 375 Bhn or ≤ 40 HRc		185	RPM	22614	5654	2827	1885	1413	1131	808	
		(148-222)	Fr	0.0006	0.0026	0.0051	0.0077	0.0103	0.0128	0.0180	
		Feed (ipm)	14.5	14.5	14.5	14.5	14.5	14.5	14.5		
≤ 450 Bhn or ≤ 48 HRc	130	RPM	15891	3973	1986	1324	993	795	568		
	(104-156)	Fr	0.0004	0.0018	0.0035	0.0053	0.0070	0.0088	0.0123		
	Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0			
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	130	RPM	15891	3973	1986	1324	993	795	568
			(104-156)	Fr	0.0007	0.0026	0.0053	0.0079	0.0106	0.0132	0.0185
			Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5	
		≤ 375 Bhn or ≤ 40 HRc	90	RPM	11002	2750	1375	917	688	550	393
			(72-108)	Fr	0.0003	0.0012	0.0023	0.0035	0.0047	0.0058	0.0081
			Feed (ipm)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	
≤ 475 Bhn or ≤ 50 HRc	75	RPM	9168	2292	1146	764	573	458	327		
	(60-90)	Fr	0.0002	0.0008	0.0016	0.0024	0.0031	0.0039	0.0055		
	Feed (ipm)	1.8	1.8	1.8	1.8	1.8	1.8	1.8			
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	320	RPM	39117	9779	4890	3260	2445	1956	1397
			(256-384)	Fr	0.0012	0.0046	0.0092	0.0138	0.0184	0.0230	0.0322
			Feed (ipm)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
		≤ 260 Bhn or ≤ 26 HRc	285	RPM	34838	8710	4355	2903	2177	1742	1244
			(228-342)	Fr	0.0011	0.0046	0.0092	0.0138	0.0184	0.0230	0.0321
			Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	275	RPM	33616	8404	4202	2801	2101	1681	1201
			(220-330)	Fr	0.0006	0.0026	0.0051	0.0077	0.0102	0.0128	0.0179
			Feed (ipm)	21.5	21.5	21.5	21.5	21.5	21.5	21.5	
		≤ 275 Bhn or ≤ 28 HRc	170	RPM	20781	5195	2598	1732	1299	1039	742
			(136-204)	Fr	0.0005	0.0020	0.0040	0.0061	0.0081	0.0101	0.0141
			Feed (ipm)	10.5	10.5	10.5	10.5	10.5	10.5	10.5	
STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	90	RPM	11002	2750	1375	917	688	550	393	
		(72-108)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140	
		Feed (ipm)	5.5	5.5	5.5	5.5	5.5	5.5	5.5		
≤ 375 Bhn or ≤ 40 HRc	65	RPM	7946	1986	993	662	497	397	284		
	(52-78)	Fr	0.0004	0.0018	0.0035	0.0053	0.0070	0.0088	0.0123		
	Feed (ipm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5			

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Series 135 3D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)							
			1/32	1/8	1/4	3/8	1/2	5/8	7/8	
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	55	RPM	6723	1681	840	560	420	336	240
		(44-66)	Fr	0.0002	0.0008	0.0015	0.0023	0.0031	0.0039	0.0054
	Feed (ipm)		1.3	1.3	1.3	1.3	1.3	1.3	1.3	
	≤ 400 Bhn or ≤ 43 HRc	30	RPM	3667	917	458	306	229	183	131
		(24-36)	Fr	0.0002	0.0007	0.0013	0.0020	0.0026	0.0033	0.0046
	Feed (ipm)		0.6	0.6	0.6	0.6	0.6	0.6	0.6	
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	135	RPM	16502	4126	2063	1375	1031	825	589
		(108-162)	Fr	0.0004	0.0018	0.0035	0.0053	0.0071	0.0088	0.0124
	Feed (ipm)		7.3	7.3	7.3	7.3	7.3	7.3	7.3	
	≤ 350 Bhn or ≤ 38 HRc	100	RPM	12224	3056	1528	1019	764	611	437
		(80-120)	Fr	0.0004	0.0016	0.0033	0.0049	0.0065	0.0082	0.0115
	Feed (ipm)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	
≤ 440 Bhn or ≤ 47 HRc	55	RPM	6723	1681	840	560	420	336	240	
	(44-66)	Fr	0.0003	0.0012	0.0024	0.0036	0.0048	0.0059	0.0083	
Feed (ipm)		2.0	2.0	2.0	2.0	2.0	2.0	2.0		
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	700	RPM	85568	21392	10696	7131	5348	4278	3056
		(560-840)	Fr	0.0012	0.0049	0.0098	0.0147	0.0196	0.0245	0.0344
	Feed (ipm)		105.0	105.0	105.0	105.0	105.0	105.0	105.0	
	≤ 150 Bhn or ≤ 7 HRc	600	RPM	73344	18336	9168	6112	4584	3667	2619
		(480-720)	Fr	0.0012	0.0050	0.0099	0.0149	0.0199	0.0248	0.0347
	Feed (ipm)		91.0	91.0	91.0	91.0	91.0	91.0	91.0	
COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	500	RPM	61120	15280	7640	5093	3820	3056	2183
		(400-600)	Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137
	Feed (ipm)		30.0	30.0	30.0	30.0	30.0	30.0	30.0	
	≤ 200 Bhn or ≤ 23 HRc	400	RPM	48896	12224	6112	4075	3056	2445	1746
		(320-480)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
	Feed (ipm)		24.5	24.5	24.5	24.5	24.5	24.5	24.5	

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Series 135 3xD Speed & Feed Recommendations

Series 135 3D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)									
			1.5	3	6	8	10	12	16	20		
P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	117	RPM	24882	12441	6220	4665	3732	3110	2333	1866	
		(94-141)	Fr	0.047	0.094	0.189	0.252	0.315	0.378	0.504	0.630	
			Feed (mm/min)	1175	1175	1175	1175	1175	1175	1175	1175	
	≤ 275 Bhn or ≤ 28 HRc	107	RPM	22620	11310	5655	4241	3393	2827	2121	1696	
		(85-128)	Fr	0.043	0.086	0.172	0.229	0.286	0.343	0.457	0.572	
			Feed (mm/min)	970	970	970	970	970	970	970	970	
	≤ 475 Bhn or ≤ 45 HRc	61	RPM	12926	6463	3231	2424	1939	1616	1212	969	
		(49-73)	Fr	0.036	0.071	0.142	0.190	0.237	0.285	0.380	0.475	
			Feed (mm/min)	460	460	460	460	460	460	460	460	
	H ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	91	RPM	19388	9694	4847	3635	2908	2424	1818	1454
			(73-110)	Fr	0.036	0.071	0.142	0.190	0.237	0.285	0.380	0.475
				Feed (mm/min)	690	690	690	690	690	690	690	690
≤ 375 Bhn or ≤ 40 HRc		56	RPM	11956	5978	2989	2242	1793	1495	1121	897	
		(45-68)	Fr	0.031	0.061	0.122	0.163	0.204	0.244	0.326	0.407	
			Feed (mm/min)	365	365	365	365	365	365	365	365	
≤ 450 Bhn or ≤ 48 HRc		40	RPM	8402	4201	2100	1575	1260	1050	788	630	
		(32-48)	Fr	0.021	0.042	0.083	0.111	0.139	0.167	0.222	0.278	
			Feed (mm/min)	175	175	175	175	175	175	175	175	
K TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	40	RPM	8402	4201	2100	1575	1260	1050	788	630
			(32-48)	Fr	0.032	0.063	0.126	0.168	0.210	0.252	0.336	0.421
				Feed (mm/min)	265	265	265	265	265	265	265	265
	≤ 375 Bhn or ≤ 40 HRc	27	RPM	5816	2908	1454	1091	872	727	545	436	
		(22-33)	Fr	0.014	0.028	0.055	0.073	0.092	0.110	0.147	0.183	
			Feed (mm/min)	80	80	80	80	80	80	80	80	
	≤ 475 Bhn or ≤ 50 HRc	23	RPM	4847	2424	1212	909	727	606	454	364	
		(18-27)	Fr	0.009	0.019	0.037	0.050	0.062	0.074	0.099	0.124	
			Feed (mm/min)	45	45	45	45	45	45	45	45	
	M CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	98	RPM	20681	10340	5170	3878	3102	2585	1939	1551
			(78-117)	Fr	0.055	0.110	0.220	0.293	0.366	0.439	0.585	0.732
				Feed (mm/min)	1135	1135	1135	1135	1135	1135	1135	1135
≤ 260 Bhn or ≤ 26 HRc		87	RPM	18419	9209	4605	3454	2763	2302	1727	1381	
		(69-104)	Fr	0.055	0.110	0.219	0.292	0.366	0.439	0.585	0.731	
			Feed (mm/min)	1010	1010	1010	1010	1010	1010	1010	1010	
M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F		≤ 185 Bhn or ≤ 9 HRc	84	RPM	17773	8886	4443	3332	2666	2222	1666	1333
			(67-101)	Fr	0.031	0.061	0.123	0.164	0.204	0.245	0.327	0.409
				Feed (mm/min)	545	545	545	545	545	545	545	545
		≤ 275 Bhn or ≤ 28 HRc	52	RPM	10987	5493	2747	2060	1648	1373	1030	824
			(41-62)	Fr	0.024	0.047	0.095	0.126	0.158	0.189	0.252	0.316
				Feed (mm/min)	260	260	260	260	260	260	260	260
	M STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	27	RPM	5816	2908	1454	1091	872	727	545	436
			(22-33)	Fr	0.023	0.046	0.093	0.124	0.155	0.186	0.248	0.309
				Feed (mm/min)	135	135	135	135	135	135	135	135
		≤ 375 Bhn or ≤ 40 HRc	20	RPM	4201	2100	1050	788	630	525	394	315
			(16-24)	Fr	0.020	0.040	0.081	0.108	0.135	0.162	0.216	0.270
				Feed (mm/min)	85	85	85	85	85	85	85	85

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Series 135 3D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)									
			1.5	3	6	8	10	12	16	20		
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	17	RPM	3555	1777	889	666	533	444	333	267	
		(13-20)	Fr	0.010	0.020	0.039	0.053	0.066	0.079	0.105	0.131	
			Feed (mm/min)	35	35	35	35	35	35	35	35	
	≤ 400 Bhn or ≤ 43 HRc	9	RPM	1939	969	485	364	291	242	182	145	
		(7-11)	Fr	0.008	0.015	0.031	0.041	0.052	0.062	0.083	0.103	
			Feed (mm/min)	15	15	15	15	15	15	15	15	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	41	RPM	8725	4362	2181	1636	1309	1091	818	654
			(33-49)	Fr	0.021	0.042	0.085	0.113	0.141	0.170	0.226	0.283
				Feed (mm/min)	185	185	185	185	185	185	185	185
		≤ 350 Bhn or ≤ 38 HRc	30	RPM	6463	3231	1616	1212	969	808	606	485
			(24-37)	Fr	0.019	0.039	0.077	0.103	0.129	0.155	0.206	0.258
				Feed (mm/min)	125	125	125	125	125	125	125	125
≤ 440 Bhn or ≤ 47 HRc		17	RPM	3555	1777	889	666	533	444	333	267	
		(13-20)	Fr	0.014	0.028	0.056	0.075	0.094	0.113	0.150	0.188	
			Feed (mm/min)	50	50	50	50	50	50	50	50	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	213	RPM	45239	22620	11310	8482	6786	5655	4241	3393
			(171-256)	Fr	0.059	0.119	0.238	0.317	0.396	0.476	0.634	0.793
				Feed (mm/min)	2690	2690	2690	2690	2690	2690	2690	2690
	≤ 150 Bhn or ≤ 7 HRc	183	RPM	38777	19388	9694	7271	5816	4847	3635	2908	
		(146-219)	Fr	0.060	0.120	0.240	0.320	0.400	0.480	0.640	0.799	
			Feed (mm/min)	2325	2325	2325	2325	2325	2325	2325	2325	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	152	RPM	32314	16157	8078	6059	4847	4039	3029	2424
			(122-183)	Fr	0.024	0.048	0.096	0.128	0.160	0.192	0.256	0.320
				Feed (mm/min)	776	776	776	776	776	776	776	776
		≤ 200 Bhn or ≤ 23 HRc	122	RPM	25851	12926	6463	4847	3878	3231	2424	1939
			(98-146)	Fr	0.024	0.049	0.097	0.130	0.162	0.195	0.260	0.325
				Feed (mm/min)	630	630	630	630	630	630	630	630

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (D₁ x 3.14)
- mm/min = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Series 135 5xD Speed & Feed Recommendations

Series 135 5D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)								
			1/32	1/8	1/4	3/8	1/2	5/8	7/8		
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	345 (276-414)	RPM	42173	10543	5272	3514	2636	2109	1506	
			Fr	0.0010	0.0040	0.0080	0.0120	0.0159	0.0199	0.0279	
			Feed (ipm)	42.0	42.0	42.0	42.0	42.0	42.0	42.0	
	≤ 275 Bhn or ≤ 28 HRc	310 (248-372)	RPM	37894	9474	4737	3158	2368	1895	1353	
			Fr	0.0009	0.0036	0.0072	0.0108	0.0144	0.0179	0.0251	
			Feed (ipm)	34.0	34.0	34.0	34.0	34.0	34.0	34.0	
	≤ 425 Bhn or ≤ 45 HRc	180 (144-216)	RPM	22003	5501	2750	1834	1375	1100	786	
			Fr	0.0007	0.0030	0.0060	0.0090	0.0120	0.0150	0.0210	
			Feed (ipm)	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	270 (216-324)	RPM	33005	8251	4126	2750	2063	1650	1179
				Fr	0.0008	0.0030	0.0061	0.0091	0.0121	0.0151	0.0212
				Feed (ipm)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
≤ 375 Bhn or ≤ 40 HRc		165 (132-198)	RPM	20170	5042	2521	1681	1261	1008	720	
			Fr	0.0006	0.0026	0.0052	0.0077	0.0103	0.0129	0.0180	
			Feed (ipm)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	
≤ 450 Bhn or ≤ 48 HRc		115 (92-138)	RPM	14058	3514	1757	1171	879	703	502	
			Fr	0.0004	0.0018	0.0035	0.0053	0.0071	0.0088	0.0123	
			Feed (ipm)	6.2	6.2	6.2	6.2	6.2	6.2	6.2	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	120 (96-144)	RPM	14669	3667	1834	1222	917	733	524
				Fr	0.0006	0.0026	0.0051	0.0077	0.0103	0.0128	0.0179
				Feed (ipm)	9.4	9.4	9.4	9.4	9.4	9.4	9.4
	≤ 375 Bhn or ≤ 40 HRc	80 (64-96)	RPM	9779	2445	1222	815	611	489	349	
			Fr	0.0003	0.0012	0.0024	0.0036	0.0047	0.0059	0.0083	
			Feed (ipm)	2.9	2.9	2.9	2.9	2.9	2.9	2.9	
	≤ 475 Bhn or ≤ 50 HRc	70 (56-84)	RPM	8557	2139	1070	713	535	428	306	
			Fr	0.0002	0.0008	0.0016	0.0024	0.0032	0.0040	0.0056	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	300 (240-360)	RPM	36672	9168	4584	3056	2292	1834	1310
				Fr	0.0011	0.0045	0.0089	0.0134	0.0179	0.0224	0.0313
				Feed (ipm)	41.0	41.0	41.0	41.0	41.0	41.0	41.0
≤ 260 Bhn or ≤ 26 HRc		265 (212-318)	RPM	32394	8098	4049	2699	2025	1620	1157	
			Fr	0.0011	0.0046	0.0091	0.0137	0.0183	0.0228	0.0320	
			Feed (ipm)	37.0	37.0	37.0	37.0	37.0	37.0	37.0	
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	250 (200-300)	RPM	30560	7640	3820	2547	1910	1528	1091	
			Fr	0.0006	0.0026	0.0051	0.0077	0.0102	0.0128	0.0179	
			Feed (ipm)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	
	≤ 275 Bhn or ≤ 28 HRc	150 (120-180)	RPM	18336	4584	2292	1528	1146	917	655	
			Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137	
			Feed (ipm)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	
STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	80 (64-96)	RPM	9779	2445	1222	815	611	489	349	
			Fr	0.0005	0.0020	0.0039	0.0059	0.0079	0.0098	0.0137	
			Feed (ipm)	4.8	4.8	4.8	4.8	4.8	4.8	4.8	
	≤ 375 Bhn or ≤ 40 HRc	55 (44-66)	RPM	6723	1681	840	560	420	336	240	
			Fr	0.0004	0.0018	0.0036	0.0054	0.0071	0.0089	0.0125	
			Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	

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Series 135 5D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)								
			1/32	1/8	1/4	3/8	1/2	5/8	7/8		
SUPER ALLOYS (Nickel, Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	40	RPM	4890	1222	611	407	306	244	175	
		(32-48)	Fr	0.0002	0.0008	0.0016	0.0025	0.0033	0.0041	0.0057	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	≤ 400 Bhn or ≤ 43 HRc	20	RPM	2445	611	306	204	153	122	87	
		(16-24)	Fr	0.0002	0.0007	0.0013	0.0020	0.0026	0.0033	0.0046	
			Feed (ipm)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	105	RPM	12835	3209	1604	1070	802	642	458
			(84-126)	Fr	0.0005	0.0018	0.0036	0.0054	0.0072	0.0090	0.0127
				Feed (ipm)	5.8	5.8	5.8	5.8	5.8	5.8	5.8
		≤ 350 Bhn or ≤ 38 HRc	80	RPM	9779	2445	1222	815	611	489	349
			(64-96)	Fr	0.0004	0.0016	0.0032	0.0048	0.0064	0.0080	0.0112
				Feed (ipm)	3.9	3.9	3.9	3.9	3.9	3.9	3.9
≤ 440 Bhn or ≤ 47 HRc		42	RPM	5134	1284	642	428	321	257	183	
		(34-50)	Fr	0.0003	0.0012	0.0025	0.0037	0.0050	0.0062	0.0087	
			Feed (ipm)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	635	RPM	77622	19406	9703	6469	4851	3881	2772
			(508-762)	Fr	0.0012	0.0049	0.0099	0.0148	0.0198	0.0247	0.0346
				Feed (ipm)	96.0	96.0	96.0	96.0	96.0	96.0	96.0
	≤ 150 Bhn or ≤ 7 HRc	540	RPM	66010	16502	8251	5501	4126	3300	2357	
		(432-648)	Fr	0.0012	0.0050	0.0099	0.0149	0.0199	0.0248	0.0348	
			Feed (ipm)	82.0	82.0	82.0	82.0	82.0	82.0	82.0	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	450	RPM	55008	13752	6876	4584	3438	2750	1965
			(360-540)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	27.5	27.5	27.5	27.5	27.5	27.5	27.5
		≤ 200 Bhn or ≤ 23 HRc	360	RPM	44006	11002	5501	3667	2750	2200	1572
			(288-432)	Fr	0.0005	0.0020	0.0040	0.0060	0.0080	0.0100	0.0140
				Feed (ipm)	22.0	22.0	22.0	22.0	22.0	22.0	22.0

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Series 135 5xD Speed & Feed Recommendations

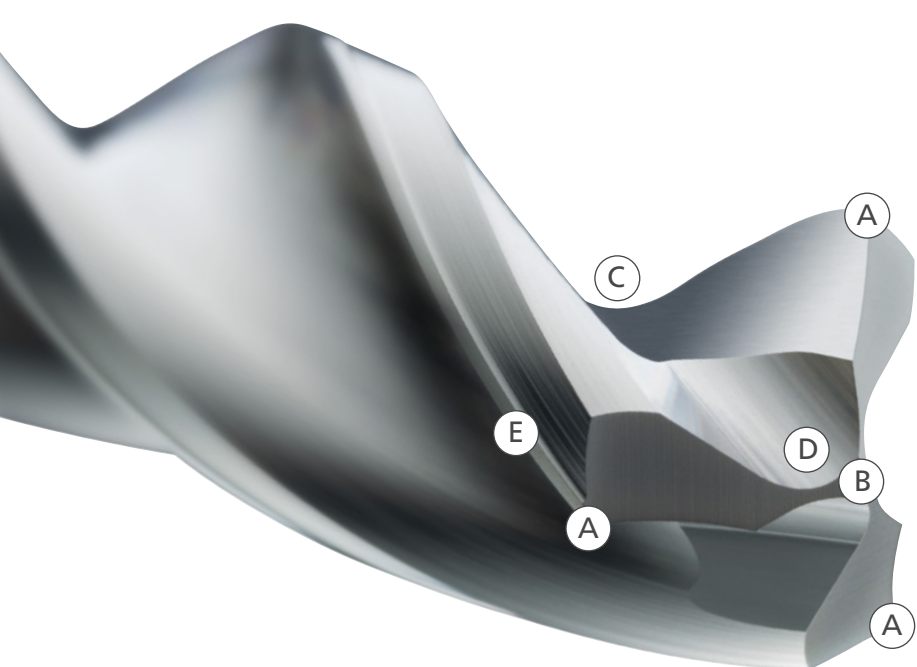
Series 135M 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)									
			1.5	3	6	8	10	12	16	20		
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	105	RPM	22297	11148	5574	4181	3344	2787	2090	1672	
		(84-126)	Fr	0.048	0.095	0.190	0.254	0.317	0.380	0.507	0.634	
			Feed (mm/min)	1060	1060	1060	1060	1060	1060	1060	1060	
	≤ 275 Bhn or ≤ 28 HRc	94	RPM	20035	10017	5009	3756	3005	2504	1878	1503	
		(76-113)	Fr	0.043	0.085	0.171	0.228	0.285	0.341	0.455	0.569	
			Feed (mm/min)	855	855	855	855	855	855	855	855	
	≤ 425 Bhn or ≤ 45 HRc	55	RPM	11633	5816	2908	2181	1745	1454	1091	872	
		(44-66)	Fr	0.036	0.071	0.143	0.190	0.238	0.285	0.381	0.476	
			Feed (mm/min)	415	415	415	415	415	415	415	415	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	82	RPM	17449	8725	4362	3272	2617	2181	1636	1309
			(66-99)	Fr	0.036	0.072	0.143	0.191	0.239	0.287	0.382	0.478
				Feed (mm/min)	625	625	625	625	625	625	625	625
≤ 375 Bhn or ≤ 40 HRc		50	RPM	10664	5332	2666	1999	1600	1333	1000	800	
		(40-60)	Fr	0.031	0.062	0.124	0.165	0.206	0.248	0.330	0.413	
			Feed (mm/min)	330	330	330	330	330	330	330	330	
≤ 450 Bhn or ≤ 48 HRc		35	RPM	7432	3716	1858	1394	1115	929	697	557	
		(28-42)	Fr	0.022	0.043	0.086	0.115	0.144	0.172	0.230	0.287	
			Feed (mm/min)	160	160	160	160	160	160	160	160	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	37	RPM	7755	3878	1939	1454	1163	969	727	582
			(29-44)	Fr	0.031	0.062	0.124	0.165	0.206	0.248	0.330	0.413
				Feed (mm/min)	240	240	240	240	240	240	240	240
	≤ 375 Bhn or ≤ 40 HRc	24	RPM	5170	2585	1293	969	776	646	485	388	
		(20-29)	Fr	0.015	0.029	0.058	0.077	0.097	0.116	0.155	0.193	
			Feed (mm/min)	75	75	75	75	75	75	75	75	
	≤ 475 Bhn or ≤ 50 HRc	21	RPM	4524	2262	1131	848	679	565	424	339	
		(17-26)	Fr	0.010	0.020	0.040	0.053	0.066	0.080	0.106	0.133	
			Feed (mm/min)	45	45	45	45	45	45	45	45	
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	91	RPM	19388	9694	4847	3635	2908	2424	1818	1454
			(73-110)	Fr	0.054	0.108	0.217	0.289	0.361	0.433	0.578	0.722
				Feed (mm/min)	1050	1050	1050	1050	1050	1050	1050	1050
≤ 260 Bhn or ≤ 26 HRc		81	RPM	17126	8563	4282	3211	2569	2141	1606	1284	
		(65-97)	Fr	0.055	0.109	0.218	0.291	0.364	0.437	0.582	0.728	
			Feed (mm/min)	935	935	935	935	935	935	935	935	
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	76	RPM	16157	8078	4039	3029	2424	2020	1515	1212	
		(61-91)	Fr	0.031	0.061	0.123	0.163	0.204	0.245	0.327	0.408	
			Feed (mm/min)	495	495	495	495	495	495	495	495	
	≤ 275 Bhn or ≤ 28 HRc	46	RPM	9694	4847	2424	1818	1454	1212	909	727	
		(37-55)	Fr	0.024	0.047	0.095	0.127	0.158	0.190	0.253	0.316	
			Feed (mm/min)	230	230	230	230	230	230	230	230	
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.023	0.046	0.093	0.124	0.155	0.186	0.248	0.309
				Feed (mm/min)	120	120	120	120	120	120	120	120
		≤ 375 Bhn or ≤ 40 HRc	17	RPM	3555	1777	889	666	533	444	333	267
			(13-20)	Fr	0.021	0.042	0.084	0.113	0.141	0.169	0.225	0.281
				Feed (mm/min)	75	75	75	75	75	75	75	75

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Series 135M 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)									
			1.5	3	6	8	10	12	16	20		
S SUPER ALLOYS (Nickel , Cobalt, Iron Base) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	12	RPM	2585	1293	646	485	388	323	242	194	
		(10-15)	Fr	0.010	0.019	0.039	0.052	0.064	0.077	0.103	0.129	
			Feed (mm/min)	25	25	25	25	25	25	25	25	
	≤ 400 Bhn or ≤ 43 HRc	6	RPM	1293	646	323	242	194	162	121	97	
		(5-7)	Fr	0.007	0.014	0.028	0.037	0.046	0.056	0.074	0.093	
			Feed (mm/min)	9	9	9	9	9	9	9	9	
	N TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	32	RPM	6786	3393	1696	1272	1018	848	636	509
			(26-38)	Fr	0.021	0.043	0.085	0.114	0.142	0.171	0.228	0.285
				Feed (mm/min)	145	145	145	145	145	145	145	145
		≤ 350 Bhn or ≤ 38 HRc	24	RPM	5170	2585	1293	969	776	646	485	388
			(20-29)	Fr	0.019	0.039	0.077	0.103	0.129	0.155	0.206	0.258
				Feed (mm/min)	100	100	100	100	100	100	100	100
≤ 440 Bhn or ≤ 47 HRc		13	RPM	2714	1357	679	509	407	339	254	204	
		(10-15)	Fr	0.015	0.029	0.059	0.079	0.098	0.118	0.157	0.196	
			Feed (mm/min)	40	40	40	40	40	40	40	40	
N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	194	RPM	41039	20519	10260	7695	6156	5130	3847	3078
			(155-232)	Fr	0.059	0.118	0.237	0.316	0.395	0.474	0.632	0.790
				Feed (mm/min)	2430	2430	2430	2430	2430	2430	2430	2430
	≤ 150 Bhn or ≤ 7 HRc	165	RPM	34899	17449	8725	6544	5235	4362	3272	2617	
		(132-198)	Fr	0.059	0.118	0.237	0.316	0.394	0.473	0.631	0.789	
			Feed (mm/min)	2065	2065	2065	2065	2065	2065	2065	2065	
	N Copper Alloys Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	137	RPM	29082	14541	7271	5453	4362	3635	2726	2181
			(110-165)	Fr	0.027	0.053	0.107	0.142	0.178	0.213	0.284	0.355
				Feed (mm/min)	775	775	775	775	775	775	775	775
		≤ 200 Bhn or ≤ 23 HRc	110	RPM	23266	11633	5816	4362	3490	2908	2181	1745
			(88-132)	Fr	0.027	0.054	0.108	0.144	0.181	0.217	0.289	0.361
				Feed (mm/min)	630	630	630	630	630	630	630	630

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (D₁ x 3.14)
- mm/min = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



SERIES 131N



HIGH PERFORMANCE CARBIDE DRILLS

The key features designed into the Hi-PerCarb Series 131N 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 Hi-PerCarb Series 131N Drill was uniquely engineered as a solution towards addressing the issues commonly encountered during high production drilling.

- A TRI-MARGIN DESIGN**
 - improved hole stability over two-flute designs
 - superior surface finish, roundness and hole cylindricity
 - unsurpassed hole size control
- B SELF-STABILIZING POINT**
 - pyramid design stabilizes the drill on contact with the workpiece
- C OPEN FLUTE STRUCTURE**
 - efficiently transports chips while maintaining strength at high feed rates
- D SCULPTED GASH**
 - allows chips to easily flow away from the drill center
 - reduced cutting forces over competitive three-flute designs
- E MINIMAL MARGIN DESIGN**
 - reduces frictional heat generated by excessive margin contact with the workpiece
 - parallel design maintains contact width as margin wears for performance consistency

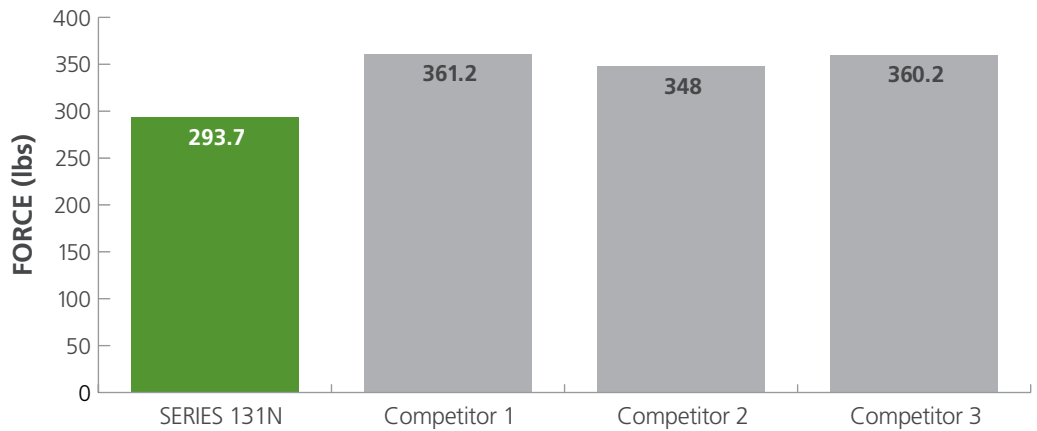
Now available with 3XD and 5XD Coated and Uncoated Options!

PERFORMANCE. PRECISION. PASSION.
HI-PERCARB SERIES 131N ALUMINUM DRILLS

PERFORMANCE.

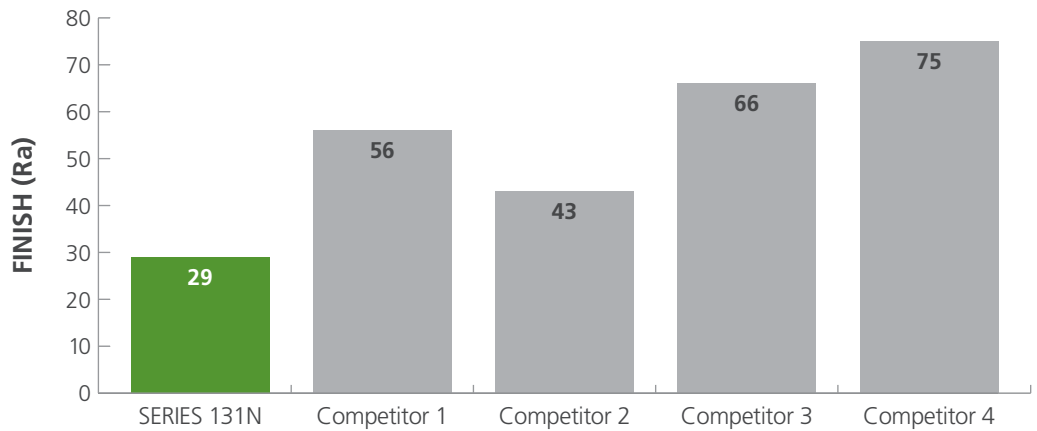
FORCE COMPARISON

Series 131N drills with 15-20% less force than the top competitors



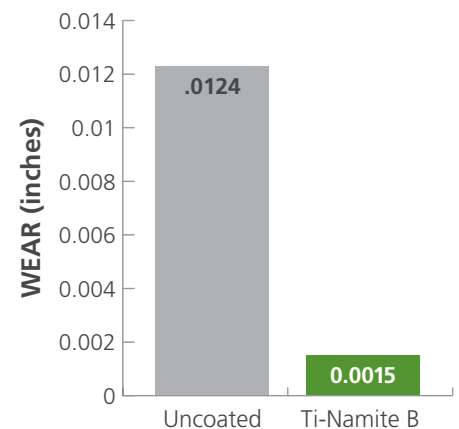
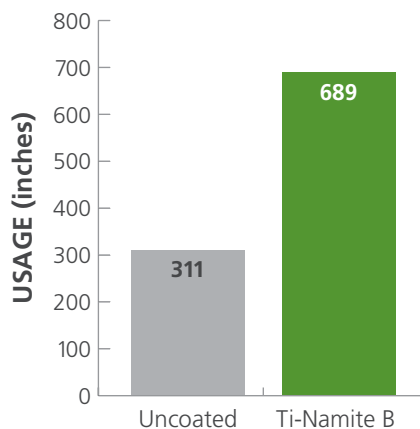
SURFACE FINISH COMPARISON

Series 131N drill results in improvement of hole finishes 30-60% over leading competitors



USAGE & WEAR COMPARISONS

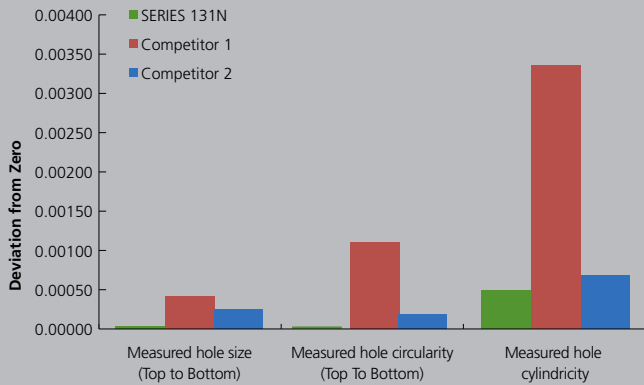
Ti-NAMITE B coating significantly improves wear resistance, which is particularly beneficial when drilling high silicon aluminum alloys



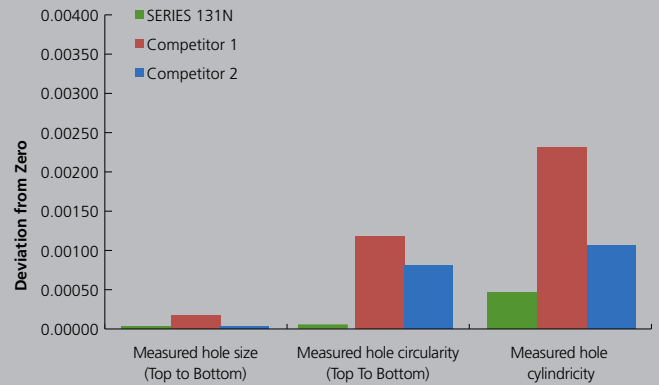
PRECISION.

SERIES 131N 3 Flute Drill vs. Competition 2 Flute Drill in 2024 Aluminum

4847 RPM
65 INCHES PER MINUTE



6786 RPM
100 INCHES PER MINUTE

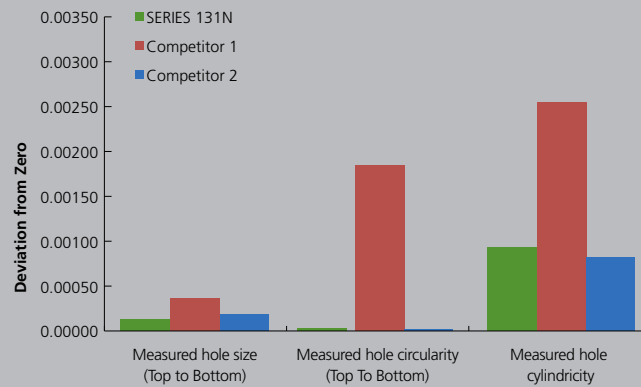


PASSION.

Lab Results Indicate the Hi-PerCarb Series 131N Drill outperforms the competition in measured hole quality at a variety of speed and feed rates.



**9530 RPM
200 INCHES PER MINUTE**



Now also available uncoated!

Ti-NAMITE-B

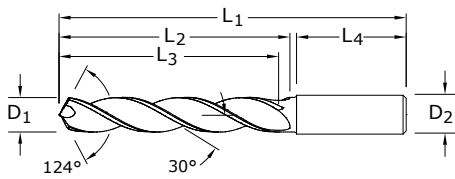
This ceramic based coating ensures a smooth surface and a low affinity to cold welding or edge build-up, which makes it optimal for aluminum and copper applications. It has high toughness and high hardness.

Microhardness: 4000 HV

Oxidation Temperature: 850°C / 1562°F

Coefficient of Friction: 0.45

Thickness: 1-2 Microns (based on tool diameter)



TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

New Expanded Tools

Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
3,0 mm	0.1181			6,0	62,0	20,0	14,0	36,0	64600	67600
3,1 mm	0.1220			6,0	62,0	20,0	14,0	36,0	64601	67601
1/8	0.1250	3.18		6,0	62,0	20,0	14,0	36,0	54600	54700
3,2 mm	0.1260		M3,5 X 0,35	6,0	62,0	20,0	14,0	36,0	64602	67602
3,3 mm	0.1299		M4 X 0,7	6,0	62,0	20,0	14,0	36,0	64603	67603
3,4 mm	0.1339			6,0	62,0	20,0	14,0	36,0	64604	67604
#29	0.1360	3.45	8-32,8-36	6,0	62,0	20,0	14,0	36,0	54601	54701
3,5 mm	0.1378		M4 X 0,5	6,0	62,0	20,0	14,0	36,0	64605	67605
9/64	0.1406	3.57		6,0	62,0	20,0	14,0	36,0	54602	54702
3,6 mm	0.1417		M4 X 0,35	6,0	62,0	20,0	14,0	36,0	64606	67606
3,7 mm	0.1457		M4,5 X 0,75	6,0	62,0	20,0	14,0	36,0	64607	67607
3,8 mm	0.1496		10-24	6,0	66,0	24,0	17,0	36,0	64608	67608
3,9 mm	0.1535			6,0	66,0	24,0	17,0	36,0	64609	67609
5/32	0.1562	3.97		6,0	66,0	24,0	17,0	36,0	54603	54703
4,0 mm	0.1575		M4,5 X 0,5	6,0	66,0	24,0	17,0	36,0	64610	67610
#21	0.1590	4.04	10-32	6,0	66,0	24,0	17,0	36,0	54604	54704
4,1 mm	0.1614			6,0	66,0	24,0	17,0	36,0	64611	67611
4,2 mm	0.1654		M5 / M5 x 0,75	6,0	66,0	24,0	17,0	36,0	64612	67612
4,3 mm	0.1693			6,0	66,0	24,0	17,0	36,0	64613	67613
11/64	0.1719	4.37		6,0	66,0	24,0	17,0	36,0	54605	54705
4,4 mm	0.1732		12-24	6,0	66,0	24,0	17,0	36,0	64614	67614
4,5 mm	0.1772		M5 X 0,5	6,0	66,0	24,0	17,0	36,0	64615	67615
4,6 mm	0.1811		12-28	6,0	66,0	24,0	17,0	36,0	64616	67616
4,7 mm	0.1850		12-32	6,0	66,0	24,0	17,0	36,0	64617	67617
3/16	0.1875	4.76		6,0	66,0	28,0	20,0	36,0	54606	54706
4,8 mm	0.1890		7/32-32	6,0	66,0	28,0	20,0	36,0	64618	67618
4,9 mm	0.1929			6,0	66,0	28,0	20,0	36,0	64619	67619
5,0 mm	0.1969		M6 X 1	6,0	66,0	28,0	20,0	36,0	64620	67620
5,1 mm	0.2008		1/4-20	6,0	66,0	28,0	20,0	36,0	64621	67621
13/64	0.2031	5.16		6,0	66,0	28,0	20,0	36,0	54607	54707
5,2 mm	0.2047		M6 X 0,75	6,0	66,0	28,0	20,0	36,0	64622	67622
5,3 mm	0.2087			6,0	66,0	28,0	20,0	36,0	64623	67623
5,4 mm	0.2126			6,0	66,0	28,0	20,0	36,0	64624	67624
5,5 mm	0.2165		M6 X 0,5	6,0	66,0	28,0	20,0	36,0	64625	67625
7/32	0.2188	5.56	1/4-32	6,0	66,0	28,0	20,0	36,0	54608	54708
5,6 mm	0.2205			6,0	66,0	28,0	20,0	36,0	64626	67626
5,7 mm	0.2244			6,0	66,0	28,0	20,0	36,0	64627	67627
5,8 mm	0.2283			6,0	66,0	28,0	20,0	36,0	64628	67628
5,9 mm	0.2323			6,0	66,0	28,0	20,0	36,0	64629	67629
15/64	0.2344	5.95		6,0	66,0	28,0	20,0	36,0	54609	54709

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Common



Right Spiral



External Coolant



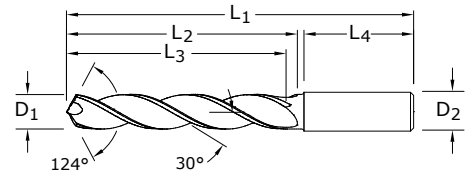
3 Flutes

TOLERANCES (inch)






DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181–.2362	+0.0016/+0.00063	h6
>.2362–.3937	+0.0024/+0.00083	h6
>.3937–.7087	+0.0028/+0.00098	h6
>.7087–1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

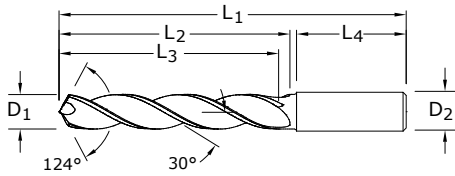
DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



New Expanded Tools

	Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
 Common	6,0 mm	0.2362		M7 X 1	6,0	66,0	28,0	20,0	36,0	64630	67630
 3xD Reach	6,1 mm	0.2402			8,0	79,0	34,0	24,0	36,0	64631	67631
	6,2 mm	0.2441		M7 X 0,75	8,0	79,0	34,0	24,0	36,0	64632	67632
	6,3 mm	0.2480			8,0	79,0	34,0	24,0	36,0	64633	67633
 Right Spiral	1/4	0.2500	6.35		8,0	79,0	34,0	24,0	36,0	54610	54710
	6,4 mm	0.2520			8,0	79,0	34,0	24,0	36,0	64634	67634
	6,5 mm	0.2559			8,0	79,0	34,0	24,0	36,0	64635	67635
 External Coolant	F	0.2570	6.53	5/16-18	8,0	79,0	34,0	24,0	36,0	54611	54711
	6,6 mm	0.2598			8,0	79,0	34,0	24,0	36,0	64636	67636
	6,7 mm	0.2638			8,0	79,0	34,0	24,0	36,0	64637	67637
	17/64	0.2656	6.75	5/16-20	8,0	79,0	34,0	24,0	36,0	54612	54712
 3 Flutes	6,8 mm	0.2677		M8 X 1,25	8,0	79,0	34,0	24,0	36,0	64638	67638
	6,9 mm	0.2717		5/16-24	8,0	79,0	34,0	24,0	36,0	64639	67639
	7,0 mm	0.2756		M8 X 1	8,0	79,0	34,0	24,0	36,0	64640	67640
	7,1 mm	0.2795			8,0	79,0	41,0	29,0	36,0	64641	67641
	9/32	0.2812	7.14	5/16-32	8,0	79,0	41,0	29,0	36,0	54613	54713
	7,2 mm	0.2835		M8 X 0,75	8,0	79,0	41,0	29,0	36,0	64642	67642
	7,3 mm	0.2874			8,0	79,0	41,0	29,0	36,0	64643	67643
	7,4 mm	0.2913			8,0	79,0	41,0	29,0	36,0	64644	67644
	7,5 mm	0.2953		M8 X 0,5	8,0	79,0	41,0	29,0	36,0	64645	67645
	19/64	0.2969	7.54		8,0	79,0	41,0	29,0	36,0	54614	54714
	7,6 mm	0.2992			8,0	79,0	41,0	29,0	36,0	64646	67646
	7,7 mm	0.3031			8,0	79,0	41,0	29,0	36,0	64647	67647
	7,8 mm	0.3071		M9 X 1,25	8,0	79,0	41,0	29,0	36,0	64648	67648
	7,9 mm	0.3110			8,0	79,0	41,0	29,0	36,0	64649	67649
	5/16	0.3125	7.94	3/8-16	8,0	79,0	41,0	29,0	36,0	54615	54715
	8,0 mm	0.3150		M9 X 1	8,0	79,0	41,0	29,0	36,0	64650	67650
	8,1 mm	0.3189			10,0	89,0	47,0	35,0	40,0	64651	67651
	8,2 mm	0.3228			10,0	89,0	47,0	35,0	40,0	64652	67652
	8,3 mm	0.3268			10,0	89,0	47,0	35,0	40,0	64653	67653
	21/64	0.3281	8.33	3/8-20	10,0	89,0	47,0	35,0	40,0	54616	54716
	8,4 mm	0.3307			10,0	89,0	47,0	35,0	40,0	64654	67654
	Q	0.3320	8.43	3/8-24	10,0	89,0	47,0	35,0	40,0	54617	54717
	8,5 mm	0.3346		M10 X 1,5	10,0	89,0	47,0	35,0	40,0	64655	67655
	8,6 mm	0.3386			10,0	89,0	47,0	35,0	40,0	64656	67656
	8,7 mm	0.3425			10,0	89,0	47,0	35,0	40,0	64657	67657
	11/32	0.3438	8.73	3/8-32	10,0	89,0	47,0	35,0	40,0	54618	54718
	8,8 mm	0.3465		M10 X 1,25	10,0	89,0	47,0	35,0	40,0	64658	67658
	8,9 mm	0.3504			10,0	89,0	47,0	35,0	40,0	64659	67659
	9,0 mm	0.3543		M10 X 1	10,0	89,0	47,0	35,0	40,0	64660	67660

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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

New Expanded Tools

Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
9,1 mm	0.3583			10,0	89,0	47,0	35,0	40,0	64661	67661
23/64	0.3594	9.13		10,0	89,0	47,0	35,0	40,0	54619	54719
9,2 mm	0.3622		M10 X 0,75	10,0	89,0	47,0	35,0	40,0	64662	67662
9,3 mm	0.3661			10,0	89,0	47,0	35,0	40,0	64663	67663
U	0.3680	9.35	7/16-14	10,0	89,0	47,0	35,0	40,0	54620	54720
9,4 mm	0.3701			10,0	89,0	47,0	35,0	40,0	64664	67664
9,5 mm	0.3740		M11 / M10 X 0,5	10,0	89,0	47,0	35,0	40,0	64665	67665
3/8	0.3750	9.53		10,0	89,0	47,0	35,0	40,0	54621	54721
9,6 mm	0.3780			10,0	89,0	47,0	35,0	40,0	64666	67666
9,7 mm	0.3819			10,0	89,0	47,0	35,0	40,0	64667	67667
9,8 mm	0.3858			10,0	89,0	47,0	35,0	40,0	64668	67668
9,9 mm	0.3898			10,0	89,0	47,0	35,0	40,0	64669	67669
25/64	0.3906	9.92	7/16-20	10,0	89,0	47,0	35,0	40,0	54622	54722
10,0 mm	0.3937			10,0	89,0	47,0	35,0	40,0	64670	67670
10,1 mm	0.3976			12,0	102,0	55,0	40,0	45,0	64671	67671
10,2 mm	0.4016		M12 X 1,75	12,0	102,0	55,0	40,0	45,0	64672	67672
10,3 mm	0.4055			12,0	102,0	55,0	40,0	45,0	64673	67673
13/32	0.4062	10.32		12,0	102,0	55,0	40,0	45,0	54623	54723
10,4 mm	0.4094			12,0	102,0	55,0	40,0	45,0	64674	67674
10,5 mm	0.4134		M12 X 1,5	12,0	102,0	55,0	40,0	45,0	64675	67675
10,6 mm	0.4173			12,0	102,0	55,0	40,0	45,0	64676	67676
10,7 mm	0.4213			12,0	102,0	55,0	40,0	45,0	64677	67677
27/64	0.4219	10.72	1/2-13	12,0	102,0	55,0	40,0	45,0	54624	54724
10,8 mm	0.4252		M12 X 1,25	12,0	102,0	55,0	40,0	45,0	64678	67678
10,9 mm	0.4291			12,0	102,0	55,0	40,0	45,0	64679	67679
11,0 mm	0.4331		M12 X 1	12,0	102,0	55,0	40,0	45,0	64680	67680
11,1 mm	0.4370			12,0	102,0	55,0	40,0	45,0	64681	67681
7/16	0.4375	11.11	1/4-18NPT	12,0	102,0	55,0	40,0	45,0	54625	54725
11,2 mm	0.4409			12,0	102,0	55,0	40,0	45,0	64682	67682
11,3 mm	0.4449			12,0	102,0	55,0	40,0	45,0	64683	67683
11,4 mm	0.4488			12,0	102,0	55,0	40,0	45,0	64684	67684
11,5 mm	0.4528		M12 X 0,5	12,0	102,0	55,0	40,0	45,0	64685	67685
11,6 mm	0.4567			12,0	102,0	55,0	40,0	45,0	64686	67686
11,7 mm	0.4606			12,0	102,0	55,0	40,0	45,0	64687	67687
11,8 mm	0.4646			12,0	102,0	55,0	40,0	45,0	64688	67688
11,9 mm	0.4685			12,0	102,0	55,0	40,0	45,0	64689	67689
15/32	0.4688	11.91	1/2-28	12,0	102,0	55,0	40,0	45,0	54626	54726
12,0 mm	0.4724		M14 X 2	12,0	102,0	55,0	40,0	45,0	64690	67690
31/64	0.4844	12.30	9/16-12	14,0	107,0	60,0	43,0	45,0	54627	54727
12,5 mm	0.4921		M14 X 1,5	14,0	107,0	60,0	43,0	45,0	64691	67691

(continued on next page)



Common



3XD Reach



Right Spiral



External Coolant



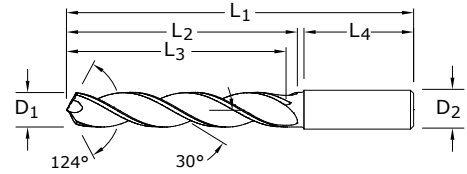
3 Flutes

TOLERANCES (inch)






DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181-.2362	+0.0016/+0.0063	h6
>.2362-.3937	+0.0024/+0.0083	h6
>.3937-.7087	+0.0028/+0.0098	h6
>.7087-1.1811	+0.0031/+0.0114	h6

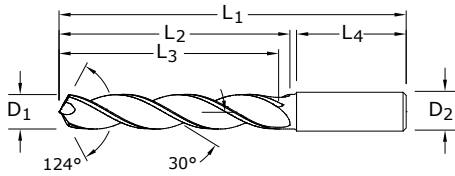
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



New Expanded Tools

	Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
 Common	1/2	0.5000	12.70		14,0	107,0	60,0	43,0	45,0	54628	54728
 3xD Reach	12,8 mm	0.5039		M14 X 1,25	14,0	107,0	60,0	43,0	45,0	64692	67692
	13,0 mm	0.5118		M14 X 1	14,0	107,0	60,0	43,0	45,0	64693	67693
	33/64	0.5156	13.10	9/16-18	14,0	107,0	60,0	43,0	45,0	54629	54729
 Right Spiral	13,5 mm	0.5315		5/8-11	14,0	107,0	60,0	43,0	45,0	64694	67694
	13,8 mm	0.5433			14,0	107,0	60,0	43,0	45,0	64695	67695
	14,0 mm	0.5512		M16 X 2	14,0	107,0	60,0	43,0	45,0	64696	67696
 External Coolant	9/16	0.5625	14.29		16,0	115,0	65,0	45,0	48,0	54630	54730
	14,5 mm	0.5709		M16 X 1,5	16,0	115,0	65,0	45,0	48,0	64697	67697
	37/64	0.5781	14.68	5/8-18	16,0	115,0	65,0	45,0	48,0	54631	54731
	14,8 mm	0.5827			16,0	115,0	65,0	45,0	48,0	64698	67698
 3 Flutes	15,0 mm	0.5906		M16 X 1	16,0	115,0	65,0	45,0	48,0	64699	67699
	15,5 mm	0.6102		M18 X 2,5	16,0	115,0	65,0	45,0	48,0	64700	67700
	15,8 mm	0.6220			16,0	115,0	65,0	45,0	48,0	64701	67701
	5/8	0.6250	15.88	11/16-16	16,0	115,0	65,0	45,0	48,0	54632	54732
	16,0 mm	0.6299			16,0	115,0	65,0	45,0	48,0	64702	67702
	21/32	0.6562	16.67	3/4-10	18,0	123,0	73,0	51,0	48,0	54633	54733
	11/16	0.6875	17.46	3/4-16	18,0	123,0	73,0	51,0	48,0	54634	54734
	3/4	0.7500	19.05	13/16-16	20,0	131,0	79,0	55,0	50,0	54635	54735



TOLERANCES (inch)		
DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)		
DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

New Expanded Tools

Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
3,0 mm	0.1181			6,0	66,0	28,0	23,0	36,0	65000	64800
3,1 mm	0.1220			6,0	66,0	28,0	23,0	36,0	65001	64801
1/8	0.1250	3.18		6,0	66,0	28,0	23,0	36,0	55000	54800
3,2 mm	0.1260		M3,5 X 0,35	6,0	66,0	28,0	23,0	36,0	65002	64802
3,3 mm	0.1299		M4 X 0,7	6,0	66,0	28,0	23,0	36,0	65003	64803
3,4 mm	0.1339			6,0	66,0	28,0	23,0	36,0	65004	64804
#29	0.1360	3.45	8-32,8-36	6,0	66,0	28,0	23,0	36,0	55001	54801
3,5 mm	0.1378		M4 X 0,5	6,0	66,0	28,0	23,0	36,0	65005	64805
9/64	0.1406	3.57		6,0	66,0	28,0	23,0	36,0	55002	54802
3,6 mm	0.1417		M4 X 0,35	6,0	66,0	28,0	23,0	36,0	65006	64806
3,7 mm	0.1457		M4,5 X 0,75	6,0	66,0	28,0	23,0	36,0	65007	64807
3,8 mm	0.1496		10-24	6,0	74,0	36,0	29,0	36,0	65008	64808
3,9 mm	0.1535			6,0	74,0	36,0	29,0	36,0	65009	64809
5/32	0.1562	3.97		6,0	74,0	36,0	29,0	36,0	55003	54803
4,0 mm	0.1575		M4,5 X 0,5	6,0	74,0	36,0	29,0	36,0	65010	64810
#21	0.1590	4.04	10-32	6,0	74,0	36,0	29,0	36,0	55004	54804
4,1 mm	0.1614			6,0	74,0	36,0	29,0	36,0	65011	64811
4,2 mm	0.1654		M5 / M5 x 0,75	6,0	74,0	36,0	29,0	36,0	65012	64812
4,3 mm	0.1693			6,0	74,0	36,0	29,0	36,0	65013	64813
11/64	0.1719	4.37		6,0	74,0	36,0	29,0	36,0	55005	54805
4,4 mm	0.1732		12-24	6,0	74,0	36,0	29,0	36,0	65014	64814
4,5 mm	0.1772		M5 X 0,5	6,0	74,0	36,0	29,0	36,0	65015	64815
4,6 mm	0.1811		12-28	6,0	74,0	36,0	29,0	36,0	65016	64816
4,7 mm	0.1850		12-32	6,0	74,0	36,0	29,0	36,0	65017	64817
3/16	0.1875	4.76		6,0	82,0	44,0	35,0	36,0	55006	54806
4,8 mm	0.1890		7/32-32	6,0	82,0	44,0	35,0	36,0	65018	64818
4,9 mm	0.1929			6,0	82,0	44,0	35,0	36,0	65019	64819
5,0 mm	0.1969		M6 X 1	6,0	82,0	44,0	35,0	36,0	65020	64820
5,1 mm	0.2008		1/4-20	6,0	82,0	44,0	35,0	36,0	65021	64821
13/64	0.2031	5.16		6,0	82,0	44,0	35,0	36,0	55007	54807
5,2 mm	0.2047		M6 X 0,75	6,0	82,0	44,0	35,0	36,0	65022	64822
5,3 mm	0.2087			6,0	82,0	44,0	35,0	36,0	65023	64823
5,4 mm	0.2126			6,0	82,0	44,0	35,0	36,0	65024	64824
5,5 mm	0.2165		M6 X 0,5	6,0	82,0	44,0	35,0	36,0	65025	64825
7/32	0.2188	5.56	1/4-32	6,0	82,0	44,0	35,0	36,0	55008	54808
5,6 mm	0.2205			6,0	82,0	44,0	35,0	36,0	65026	64826
5,7 mm	0.2244			6,0	82,0	44,0	35,0	36,0	65027	64827
5,8 mm	0.2283			6,0	82,0	44,0	35,0	36,0	65028	64828
5,9 mm	0.2323			6,0	82,0	44,0	35,0	36,0	65029	64829
15/64	0.2344	5.95		6,0	82,0	44,0	35,0	36,0	55009	54809

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Common



Right Spiral



External Coolant



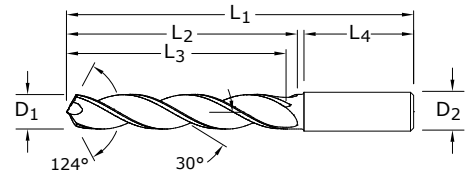
3 Flutes

TOLERANCES (inch)






DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181-.2362	+0.0016/+0.0063	h6
>.2362-.3937	+0.0024/+0.0083	h6
>.3937-.7087	+0.0028/+0.0098	h6
>.7087-1.1811	+0.0031/+0.0114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

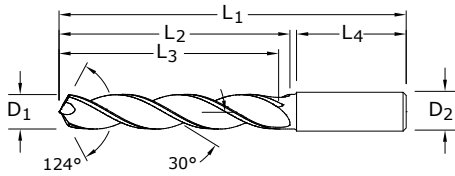


New Expanded Tools

	Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
 Common	6,0 mm	0.2362		M7 X 1	6,0	82,0	44,0	35,0	36,0	65030	64830
 5xD Reach	6,1 mm	0.2402			8,0	91,0	53,0	43,0	36,0	65031	64831
	6,2 mm	0.2441		M7 X 0,75	8,0	91,0	53,0	43,0	36,0	65032	64832
	6,3 mm	0.2480			8,0	91,0	53,0	43,0	36,0	65033	64833
 Right Spiral	1/4	0.2500	6.35		8,0	91,0	53,0	43,0	36,0	55010	54810
	6,4 mm	0.2520			8,0	91,0	53,0	43,0	36,0	65034	64834
	6,5 mm	0.2559			8,0	91,0	53,0	43,0	36,0	65035	64835
 External Coolant	F	0.2570	6.53	5/16-18	8,0	91,0	53,0	43,0	36,0	55011	54811
	6,6 mm	0.2598			8,0	91,0	53,0	43,0	36,0	65036	64836
	6,7 mm	0.2638			8,0	91,0	53,0	43,0	36,0	65037	64837
	17/64	0.2656	6.75	5/16-20	8,0	91,0	53,0	43,0	36,0	55012	54812
	6,8 mm	0.2677		M8 X 1,25	8,0	91,0	53,0	43,0	36,0	65038	64838
 3 Flutes	6,9 mm	0.2717		5/16-24	8,0	91,0	53,0	43,0	36,0	65039	64839
	7,0 mm	0.2756		M8 X 1	8,0	91,0	53,0	43,0	36,0	65040	64840
	7,1 mm	0.2795			8,0	91,0	53,0	43,0	36,0	65041	64841
	9/32	0.2812	7.14	5/16-32	8,0	91,0	53,0	43,0	36,0	55013	54813
	7,2 mm	0.2835		M8 X 0,75	8,0	91,0	53,0	43,0	36,0	65042	64842
	7,3 mm	0.2874			8,0	91,0	53,0	43,0	36,0	65043	64843
	7,4 mm	0.2913			8,0	91,0	53,0	43,0	36,0	65044	64844
	7,5 mm	0.2953		M8 X 0,5	8,0	91,0	53,0	43,0	36,0	65045	64845
	19/64	0.2969	7.54		8,0	91,0	53,0	43,0	36,0	55014	54814
	7,6 mm	0.2992			8,0	91,0	53,0	43,0	36,0	65046	64846
	7,7 mm	0.3031			8,0	91,0	53,0	43,0	36,0	65047	64847
	7,8 mm	0.3071		M9 X 1,25	8,0	91,0	53,0	43,0	36,0	65048	64848
	7,9 mm	0.3110			8,0	91,0	53,0	43,0	36,0	65049	64849
	5/16	0.3125	7.94	3/8-16	8,0	91,0	53,0	43,0	36,0	55015	54815
	8,0 mm	0.3150		M9 X 1	8,0	91,0	53,0	43,0	36,0	65050	64850
	8,1 mm	0.3189			10,0	103,0	61,0	49,0	40,0	65051	64851
	8,2 mm	0.3228			10,0	103,0	61,0	49,0	40,0	65052	64852
	8,3 mm	0.3268			10,0	103,0	61,0	49,0	40,0	65053	64853
	21/64	0.3281	8.33	3/8-20	10,0	103,0	61,0	49,0	40,0	55016	54816
	8,4 mm	0.3307			10,0	103,0	61,0	49,0	40,0	65054	64854
	Q	0.3320	8.43	3/8-24	10,0	103,0	61,0	49,0	40,0	55017	54817
	8,5 mm	0.3346		M10 X 1,5	10,0	103,0	61,0	49,0	40,0	65055	64855
	8,6 mm	0.3386			10,0	103,0	61,0	49,0	40,0	65056	64856
	8,7 mm	0.3425			10,0	103,0	61,0	49,0	40,0	65057	64857
	11/32	0.3438	8.73	3/8-32	10,0	103,0	61,0	49,0	40,0	55018	54818
	8,8 mm	0.3465		M10 X 1,25	10,0	103,0	61,0	49,0	40,0	65058	64858
	8,9 mm	0.3504			10,0	103,0	61,0	49,0	40,0	65059	64859
	9,0 mm	0.3543		M10 X 1	10,0	103,0	61,0	49,0	40,0	65060	64860

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Series 131N 5XD Fractional & Metric



TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

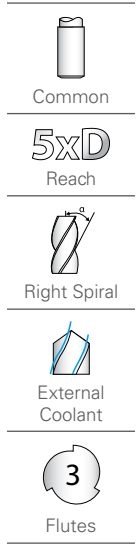
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

New Expanded Tools

Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
9,1 mm	0.3583			10,0	103,0	61,0	49,0	40,0	65061	64861
23/64	0.3594	9.13		10,0	103,0	61,0	49,0	40,0	55019	54819
9,2 mm	0.3622		M10 X 0,75	10,0	103,0	61,0	49,0	40,0	65062	64862
9,3 mm	0.3661			10,0	103,0	61,0	49,0	40,0	65063	64863
U	0.3680	9.35	7/16-14	10,0	103,0	61,0	49,0	40,0	55020	54820
9,4 mm	0.3701			10,0	103,0	61,0	49,0	40,0	65064	64864
9,5 mm	0.3740		M11 / M10 X 0,5	10,0	103,0	61,0	49,0	40,0	65065	64865
3/8	0.3750	9.53		10,0	103,0	61,0	49,0	40,0	55021	54821
9,6 mm	0.3780			10,0	103,0	61,0	49,0	40,0	65066	64866
9,7 mm	0.3819			10,0	103,0	61,0	49,0	40,0	65067	64867
9,8 mm	0.3858			10,0	103,0	61,0	49,0	40,0	65068	64868
9,9 mm	0.3898			10,0	103,0	61,0	49,0	40,0	65069	64869
25/64	0.3906	9.92	7/16-20	10,0	103,0	61,0	49,0	40,0	55022	54822
10,0 mm	0.3937			10,0	103,0	61,0	49,0	40,0	65070	64870
10,1 mm	0.3976			12,0	118,0	71,0	56,0	45,0	65071	64871
10,2 mm	0.4016		M12 X 1,75	12,0	118,0	71,0	56,0	45,0	65072	64872
10,3 mm	0.4055			12,0	118,0	71,0	56,0	45,0	65073	64873
13/32	0.4062	10.32		12,0	118,0	71,0	56,0	45,0	55023	54823
10,4 mm	0.4094			12,0	118,0	71,0	56,0	45,0	65074	64874
10,5 mm	0.4134		M12 X 1,5	12,0	118,0	71,0	56,0	45,0	65075	64875
10,6 mm	0.4173			12,0	118,0	71,0	56,0	45,0	65076	64876
10,7 mm	0.4213			12,0	118,0	71,0	56,0	45,0	65077	64877
27/64	0.4219	10.72	1/2-13	12,0	118,0	71,0	56,0	45,0	55024	54824
10,8 mm	0.4252		M12 X 1,25	12,0	118,0	71,0	56,0	45,0	65078	64878
10,9 mm	0.4291			12,0	118,0	71,0	56,0	45,0	65079	64879
11,0 mm	0.4331		M12 X 1	12,0	118,0	71,0	56,0	45,0	65080	64880
11,1 mm	0.4370			12,0	118,0	71,0	56,0	45,0	65081	64881
7/16	0.4375	11.11	1/4-18NPT	12,0	118,0	71,0	56,0	45,0	55025	54825
11,2 mm	0.4409			12,0	118,0	71,0	56,0	45,0	65082	64882
11,3 mm	0.4449			12,0	118,0	71,0	56,0	45,0	65083	64883
11,4 mm	0.4488			12,0	118,0	71,0	56,0	45,0	65084	64884
11,5 mm	0.4528		M12 X 0,5	12,0	118,0	71,0	56,0	45,0	65085	64885
11,6 mm	0.4567			12,0	118,0	71,0	56,0	45,0	65086	64886
11,7 mm	0.4606			12,0	118,0	71,0	56,0	45,0	65087	64887
11,8 mm	0.4646			12,0	118,0	71,0	56,0	45,0	65088	64888
11,9 mm	0.4685			12,0	118,0	71,0	56,0	45,0	65089	64889
15/32	0.4688	11.91	1/2-28	12,0	118,0	71,0	56,0	45,0	55026	54826
12,0 mm	0.4724		M14 X 2	12,0	118,0	71,0	56,0	45,0	65090	64890
31/64	0.4844	12.30	9/16-12	14,0	124,0	77,0	60,0	45,0	55027	54827
12,5 mm	0.4921		M14 X 1,5	14,0	124,0	77,0	60,0	45,0	65091	64891

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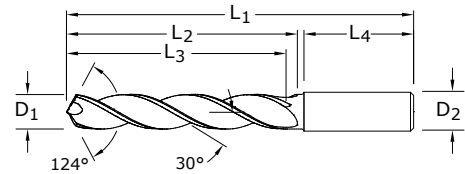


TOLERANCES (inch)






DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



New Expanded Tools

	Cutting Diameter D ₁	Decimal Equiv.	Metric Equiv.	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Uncoated EDP No.	Ti-NAMITE-B (TB) EDP No.
 Common	1/2	0.5000	12.70		14,0	124,0	77,0	60,0	45,0	55028	54828
 5xD Reach	12,8 mm	0.5039		M14 X 1,25	14,0	124,0	77,0	60,0	45,0	65092	64892
	13,0 mm	0.5118		M14 X 1	14,0	124,0	77,0	60,0	45,0	65093	64893
	33/64	0.5156	13.10	9/16-18	14,0	124,0	77,0	60,0	45,0	55029	54829
 Right Spiral	13,5 mm	0.5315		5/8-11	14,0	124,0	77,0	60,0	45,0	65094	64894
	13,8 mm	0.5433			14,0	124,0	77,0	60,0	45,0	65095	64895
	14,0 mm	0.5512		M16 X 2	14,0	124,0	77,0	60,0	45,0	65096	64896
 External Coolant	9/16	0.5625	14.29		16,0	133,0	83,0	63,0	48,0	55030	54830
	14,5 mm	0.5709		M16 X 1,5	16,0	133,0	83,0	63,0	48,0	65097	64897
	37/64	0.5781	14.68	5/8-18	16,0	133,0	83,0	63,0	48,0	55031	54831
	14,8 mm	0.5827			16,0	133,0	83,0	63,0	48,0	65098	64898
 3 Flutes	15,0 mm	0.5906		M16 X 1	16,0	133,0	83,0	63,0	48,0	65099	64899
	15,5 mm	0.6102		M18 X 2,5	16,0	133,0	83,0	63,0	48,0	65100	64900
	15,8 mm	0.6220			16,0	133,0	83,0	63,0	48,0	65101	64901
	5/8	0.6250	15.88	11/16-16	16,0	133,0	83,0	63,0	48,0	55032	54832
	16,0 mm	0.6299			16,0	133,0	83,0	63,0	48,0	65102	64902
	21/32	0.6562	16.67	3/4-10	18,0	143,0	93,0	71,0	48,0	55033	54833
	11/16	0.6875	17.46	3/4-16	18,0	143,0	93,0	71,0	48,0	55034	54834
	3/4	0.7500	19.05	13/16-16	20,0	153,0	101,0	77,0	50,0	55035	54835

Series 131N 5XD Fractional & Metric



Series 131N 3D& 5D Fractional	Hardness	Vc (sfm)		Diameter (D ₁) (inch)						
				1/8	3/16	1/4	3/8	1/2	5/8	3/4
ALUMINUM ALLOYS < 12% SI 6061, 2024, 7075	≤ 150 Bhn or ≤ 7 HRc	800 (640-960)	RPM	24448	16299	12224	8149	6112	4890	4075
			Fr	0.0055	0.0083	0.0110	0.0166	0.0221	0.0276	0.0331
			Feed (ipm)	135	135	135	135	135	135	135
ALUMINUM ALLOYS > 12% SI A356.0, 390.0, 319.0	≤ 125 Bhn or ≤ 77 HRb	600 (480-720)	RPM	18336	12224	9168	6112	4584	3667	3056
			Fr	0.0055	0.0082	0.0109	0.0164	0.0218	0.0273	0.0327
			Feed (ipm)	100	100	100	100	100	100	100
COPPER ALLOYS Alum Bronze, Muntz Brass, Navel Brass	≤ 175 Bhn or ≤ 16 HRc	550 (440-660)	RPM	16808	11205	8404	5603	4202	3362	2801
			Fr	0.0020	0.0030	0.0040	0.0061	0.0081	0.0101	0.0121
			Feed (ipm)	34	34	34	34	34	34	34
PLASTICS Acrylic, PVC, Polypropylene		450 (360-540)	RPM	13752	9168	6876	4584	3438	2750	2292
			Fr	0.0025	0.0037	0.0049	0.0074	0.0099	0.0124	0.0148
			Feed (ipm)	34	34	34	34	34	34	34

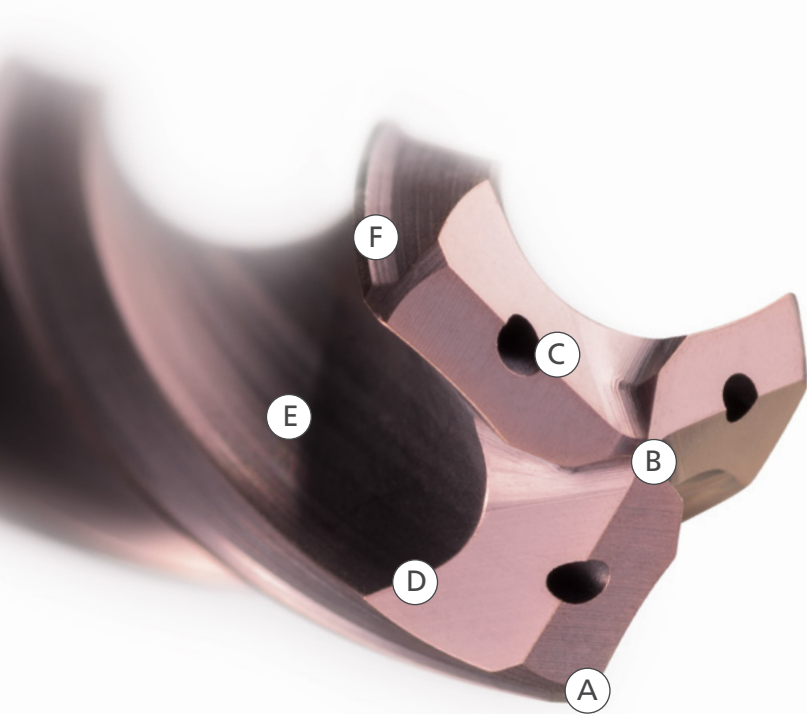
Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Series 131N 3D& 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)							
			3	6	8	10	12	14	16	
N	ALUMINUM ALLOYS < 12% SI 6061, 2024, 7075	244	RPM	25851	12926	9694	7755	6463	5540	4847
		(195-293)	Fr	0.133	0.265	0.354	0.442	0.531	0.619	0.708
			Feed (mm/min)	3430	3430	3430	3430	3430	3430	3430
	ALUMINUM ALLOYS > 12% SI A356.0, 390.0, 319.0	183	RPM	19388	9694	7271	5816	4847	4155	3635
		(146-219)	Fr	0.131	0.262	0.349	0.437	0.524	0.611	0.699
			Feed (mm/min)	2540	2540	2540	2540	2540	2540	2540
	COPPER ALLOYS Alum Bronze, Muntz Brass, Navel Brass	168	RPM	17773	8886	6665	5332	4443	3808	3332
		(134-201)	Fr	0.049	0.097	0.130	0.162	0.194	0.227	0.259
			Feed (mm/min)	864	864	864	864	864	864	864
	PLASTICS Acrylic, PVC, Polypropylene	137	RPM	14541	7271	5453	4362	3635	3116	2726
		(110-165)	Fr	0.059	0.119	0.158	0.198	0.238	0.277	0.317
			Feed (mm/min)	864	864	864	864	864	864	864

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- $rpm = (Vc \times 1000) / (D_1 \times 3.14)$
- $mm/min = Fr \times RPM$
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



SERIES 141K

- (A) TRI-MARGIN DESIGN**
- improved hole stability over two-flute designs
 - superior surface finish, roundness, and hole cylindricity
 - unsurpassed hole size control

- (B) SELF-STABILIZING POINT AND OPEN FLUTE STRUCTURE**
- pyramid design stabilizes the drill on contact with the workpiece
 - engineered flute shape efficiently transports chip volume without sacrificing strength

- (C) COOLANT THROUGH TOOLING**
- puts coolant as close to cut as possible for consistent chip flushing, maximum cooling, and highest productivity

- (D) EDGE AND CORNER PROTECTION**
- corner chamfers provide strength and reduce breakout when drilling through holes in cast iron
 - automated edge treatment process extends tool life by eliminating microscopic imperfections in the cutting edges

- (E) APPLICATION SPECIFIC COATING AND PREMIUM CARBIDE**
- Ti-Namite M is a state-of-the-art nano-composite surface coating that maximizes wear resistance in abrasive cast irons
 - 141K drills are manufactured from premium certified carbide to further ensure the highest level of quality, performance, and longevity

- (F) MINIMAL MARGIN DESIGN**
- a narrow margin reduces frictional heat generated by excessive contact with the workpiece, and the parallel design helps to maintain a consistent contact width as the margins wear



HIGH PERFORMANCE CARBIDE DRILLS

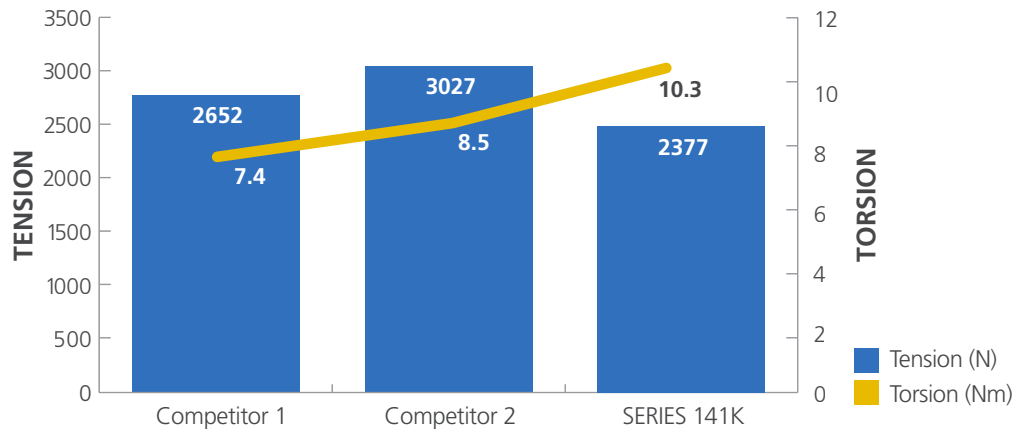
The key features designed into the Hi-PerCarb Series 141K Drill allow the product to offer application benefits not only beyond that of standard carbide drills, but also other High Performance drills. Each feature of the Hi-PerCarb Series 141K Drill was uniquely engineered as a solution towards addressing the issues commonly encountered during high production drilling.

PERFORMANCE. PRECISION. PASSION.
HI-PERCARB SERIES 141K CAST IRON DRILLS

PERFORMANCE.

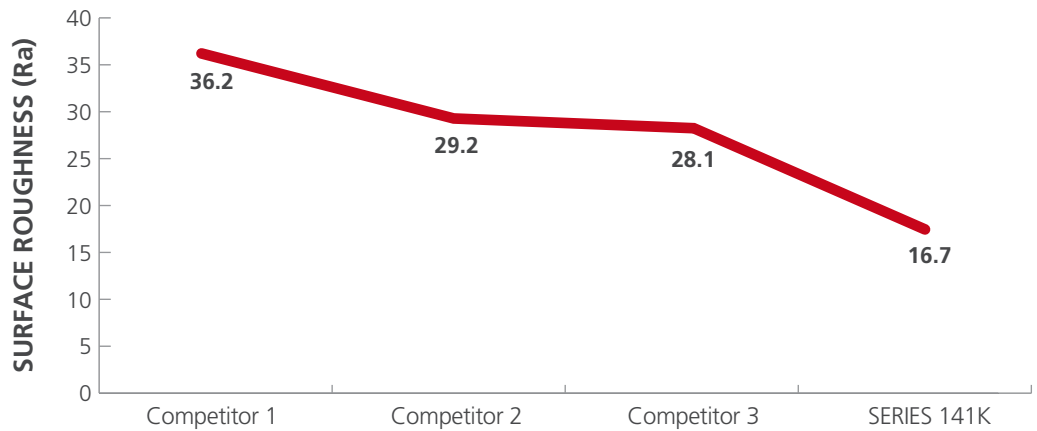
FORCE COMPARISON

Series 141K drills with 20% less force than the top competitors



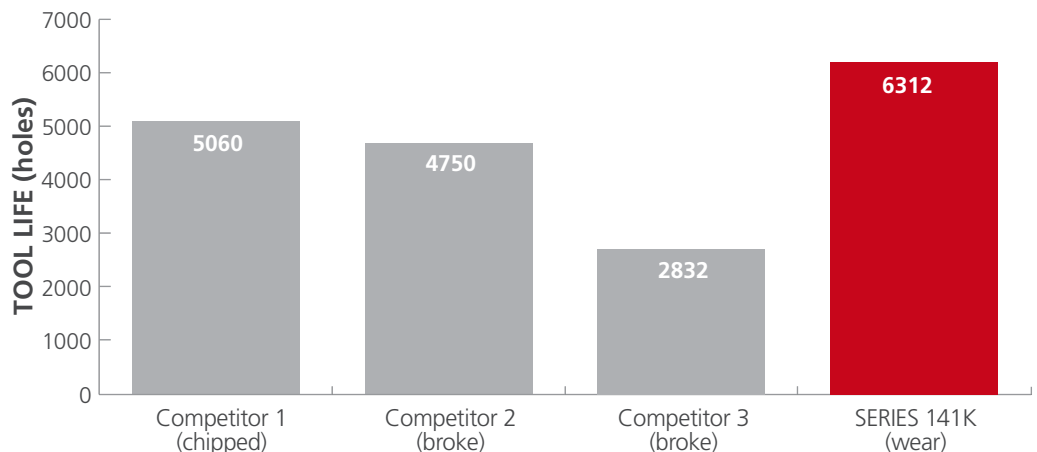
SURFACE FINISH COMPARISON

Series 141K drill results in improvement of hole finishes 40-50% over leading competitors



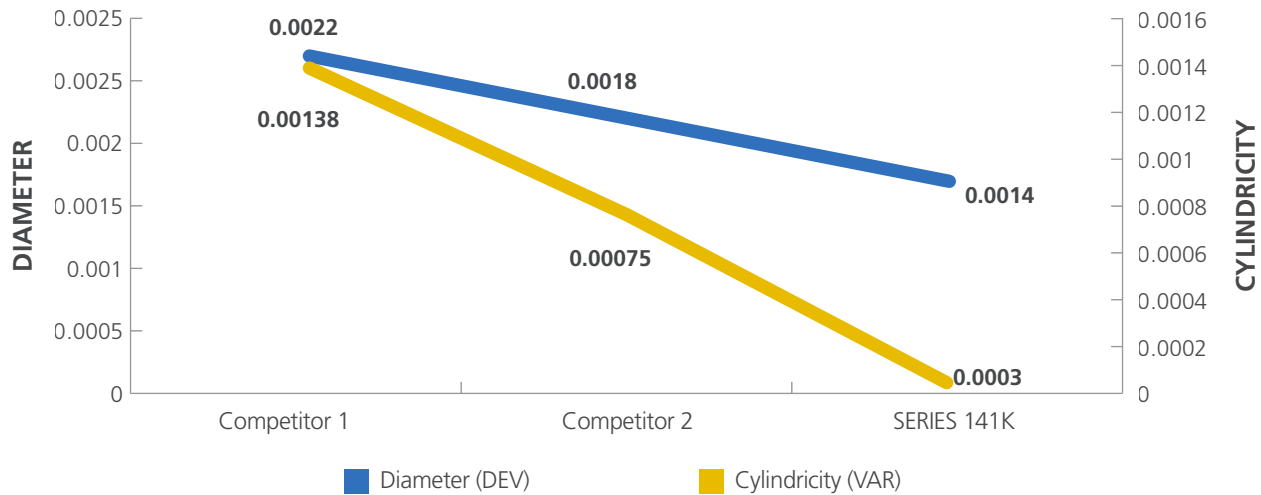
USAGE & WEAR COMPARISONS

Series 141K drill results in 50% tool life improvement over a range of leading competitors



PRECISION.

SERIES 141K Hole Size Comparison vs. Competition in Class 40 Cast Iron



PASSION.

Lab Results Indicate the Hi-PerCarb Series 141K Drill outperforms the competition in measured hole quality at a variety of speed and feed rates.

Ti-NAMITE-M

Features of Ti-Namite-M include high wear resistance, reduced friction, and excellent prevention of cutting edge build up. This coating allows superior material removal rates and tool life when used in high performance operations in Cast Iron and Steel and with difficult to machine materials like Titanium.

Hardness (HV): 3600

Oxidation Temperature: 1150°C / 2100°F

Coefficient of Friction: 0.45

Thickness: 1-4 Microns (based on tool diameter)

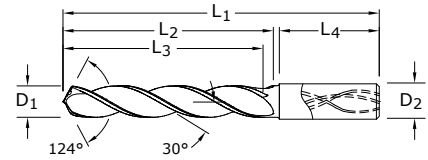


TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

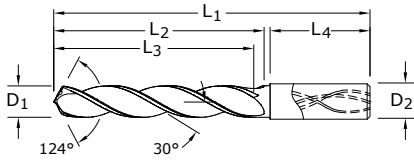
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



Common	5xD Reach	Right Spiral	Internal Coolant	3 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-M (TM) EDP No.
					3,0 mm	0.1181			6,0	66,0	28,0	23,0	36,0	65160
					3,1 mm	0.1220			6,0	66,0	28,0	23,0	36,0	65161
					1/8	0.1250	3.18		6,0	66,0	28,0	23,0	36,0	55160
					3,2 mm	0.1260		M3,5 X 0,35	6,0	66,0	28,0	23,0	36,0	65162
					3,3 mm	0.1299		M4 X 0,7	6,0	66,0	28,0	23,0	36,0	65163
					3,4 mm	0.1339			6,0	66,0	28,0	23,0	36,0	65164
					#29	0.1360	3.45	8-32,8-36	6,0	66,0	28,0	23,0	36,0	55161
					3,5 mm	0.1378		M4 X 0,5	6,0	66,0	28,0	23,0	36,0	65165
					9/64	0.1406	3.57		6,0	66,0	28,0	23,0	36,0	55162
					3,6 mm	0.1417		M4 X 0,35	6,0	66,0	28,0	23,0	36,0	65166
					3,7 mm	0.1457		M4,5 X 0,75	6,0	66,0	28,0	23,0	36,0	65167
					3,8 mm	0.1496		10-24	6,0	74,0	36,0	29,0	36,0	65168
					3,9 mm	0.1535			6,0	74,0	36,0	29,0	36,0	65169
					5/32	0.1562	3.97		6,0	74,0	36,0	29,0	36,0	55163
					4,0 mm	0.1575		M4,5 X 0,5	6,0	74,0	36,0	29,0	36,0	65170
					#21	0.1590	4.04	10-32	6,0	74,0	36,0	29,0	36,0	55164
					4,1 mm	0.1614			6,0	74,0	36,0	29,0	36,0	65171
					4,2 mm	0.1654		M5 / M5 x 0,75	6,0	74,0	36,0	29,0	36,0	65172
					4,3 mm	0.1693			6,0	74,0	36,0	29,0	36,0	65173
					11/64	0.1719	4.37		6,0	74,0	36,0	29,0	36,0	55165
					4,4 mm	0.1732		12-24	6,0	74,0	36,0	29,0	36,0	65174
					4,5 mm	0.1772		M5 X 0,5	6,0	74,0	36,0	29,0	36,0	65175
					4,6 mm	0.1811		12-28	6,0	74,0	36,0	29,0	36,0	65176
					4,7 mm	0.1850		12-32	6,0	74,0	36,0	29,0	36,0	65177
					3/16	0.1875	4.76		6,0	82,0	44,0	35,0	36,0	55166
					4,8 mm	0.1890		7/32-32	6,0	82,0	44,0	35,0	36,0	65178
					4,9 mm	0.1929			6,0	82,0	44,0	35,0	36,0	65179
					5,0 mm	0.1969		M6 X 1	6,0	82,0	44,0	35,0	36,0	65180
					5,1 mm	0.2008		1/4-20	6,0	82,0	44,0	35,0	36,0	65181
					13/64	0.2031	5.16		6,0	82,0	44,0	35,0	36,0	55167
					5,2 mm	0.2047		M6 X 0,75	6,0	82,0	44,0	35,0	36,0	65182
					5,3 mm	0.2087			6,0	82,0	44,0	35,0	36,0	65183
					5,4 mm	0.2126			6,0	82,0	44,0	35,0	36,0	65184
					5,5 mm	0.2165		M6 X 0,5	6,0	82,0	44,0	35,0	36,0	65185
					7/32	0.2188	5.56	1/4-32	6,0	82,0	44,0	35,0	36,0	55168
					5,6 mm	0.2205			6,0	82,0	44,0	35,0	36,0	65186
					5,7 mm	0.2244			6,0	82,0	44,0	35,0	36,0	65187
					5,8 mm	0.2283			6,0	82,0	44,0	35,0	36,0	65188
					5,9 mm	0.2323			6,0	82,0	44,0	35,0	36,0	65189
					15/64	0.2344	5.95		6,0	82,0	44,0	35,0	36,0	55169

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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Series 141K 5xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-M (TM) EDP No.
6,0 mm	0.2362		M7 X 1	6,0	82,0	44,0	35,0	36,0	65190
6,1 mm	0.2402			8,0	91,0	53,0	43,0	36,0	65191
6,2 mm	0.2441		M7 X 0,75	8,0	91,0	53,0	43,0	36,0	65192
6,3 mm	0.2480			8,0	91,0	53,0	43,0	36,0	65193
1/4	0.2500	6.35		8,0	91,0	53,0	43,0	36,0	55170
6,4 mm	0.2520			8,0	91,0	53,0	43,0	36,0	65194
6,5 mm	0.2559			8,0	91,0	53,0	43,0	36,0	65195
F	0.2570	6.53	5/16-18	8,0	91,0	53,0	43,0	36,0	55171
6,6 mm	0.2598			8,0	91,0	53,0	43,0	36,0	65196
6,7 mm	0.2638			8,0	91,0	53,0	43,0	36,0	65197
17/64	0.2656	6.75	5/16-20	8,0	91,0	53,0	43,0	36,0	55172
6,8 mm	0.2677		M8 X 1,25	8,0	91,0	53,0	43,0	36,0	65198
6,9 mm	0.2717		5/16-24	8,0	91,0	53,0	43,0	36,0	65199
7,0 mm	0.2756		M8 X 1	8,0	91,0	53,0	43,0	36,0	65200
7,1 mm	0.2795			8,0	91,0	53,0	43,0	36,0	65201
9/32	0.2812	7.14	5/16-32	8,0	91,0	53,0	43,0	36,0	55173
7,2 mm	0.2835		M8 X 0,75	8,0	91,0	53,0	43,0	36,0	65202
7,3 mm	0.2874			8,0	91,0	53,0	43,0	36,0	65203
7,4 mm	0.2913			8,0	91,0	53,0	43,0	36,0	65204
7,5 mm	0.2953		M8 X 0,5	8,0	91,0	53,0	43,0	36,0	65205
19/64	0.2969	7.54		8,0	91,0	53,0	43,0	36,0	55174
7,6 mm	0.2992			8,0	91,0	53,0	43,0	36,0	65206
7,7 mm	0.3031			8,0	91,0	53,0	43,0	36,0	65207
7,8 mm	0.3071		M9 X 1,25	8,0	91,0	53,0	43,0	36,0	65208
7,9 mm	0.3110			8,0	91,0	53,0	43,0	36,0	65209
5/16	0.3125	7.94	3/8-16	8,0	91,0	53,0	43,0	36,0	55175
8,0 mm	0.3150		M9 X 1	8,0	91,0	53,0	43,0	36,0	65210
8,1 mm	0.3189			10,0	103,0	61,0	49,0	40,0	65211
8,2 mm	0.3228			10,0	103,0	61,0	49,0	40,0	65212
8,3 mm	0.3268			10,0	103,0	61,0	49,0	40,0	65213
21/64	0.3281	8.33	3/8-20	10,0	103,0	61,0	49,0	40,0	55176
8,4 mm	0.3307			10,0	103,0	61,0	49,0	40,0	65214
Q	0.3320	8.43	3/8-24	10,0	103,0	61,0	49,0	40,0	55177
8,5 mm	0.3346		M10 X 1,5	10,0	103,0	61,0	49,0	40,0	65215
8,6 mm	0.3386			10,0	103,0	61,0	49,0	40,0	65216
8,7 mm	0.3425			10,0	103,0	61,0	49,0	40,0	65217
11/32	0.3438	8.73	3/8-32	10,0	103,0	61,0	49,0	40,0	55178
8,8 mm	0.3465		M10 X 1,25	10,0	103,0	61,0	49,0	40,0	65218
8,9 mm	0.3504			10,0	103,0	61,0	49,0	40,0	65219
9,0 mm	0.3543		M10 X 1	10,0	103,0	61,0	49,0	40,0	65220

-  Common
-  5xD Reach
-  Right Spiral
-  Internal Coolant
-  3 Flutes

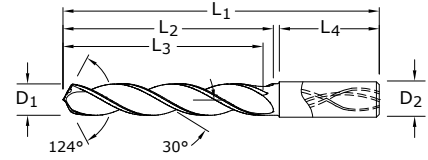
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

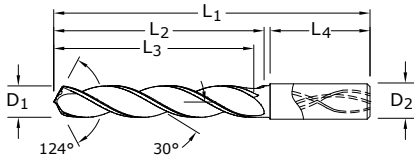
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



Common	5xD Reach	Right Spiral	Internal Coolant	3 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-M (TM) EDP No.
					9,1 mm	0.3583			10,0	103,0	61,0	49,0	40,0	65221
					23/64	0.3594	9.13		10,0	103,0	61,0	49,0	40,0	55179
					9,2 mm	0.3622		M10 X 0,75	10,0	103,0	61,0	49,0	40,0	65222
					9,3 mm	0.3661			10,0	103,0	61,0	49,0	40,0	65223
					U	0.3680	9.35	7/16-14	10,0	103,0	61,0	49,0	40,0	55180
					9,4 mm	0.3701			10,0	103,0	61,0	49,0	40,0	65224
					9,5 mm	0.3740		M11 / M10 X 0,5	10,0	103,0	61,0	49,0	40,0	65225
					3/8	0.3750	9.53		10,0	103,0	61,0	49,0	40,0	55181
					9,6 mm	0.3780			10,0	103,0	61,0	49,0	40,0	65226
					9,7 mm	0.3819			10,0	103,0	61,0	49,0	40,0	65227
					9,8 mm	0.3858			10,0	103,0	61,0	49,0	40,0	65228
					9,9 mm	0.3898			10,0	103,0	61,0	49,0	40,0	65229
					25/64	0.3906	9.92	7/16-20	10,0	103,0	61,0	49,0	40,0	55182
					10,0 mm	0.3937			10,0	103,0	61,0	49,0	40,0	65230
					10,1 mm	0.3976			12,0	118,0	71,0	56,0	45,0	65231
					10,2 mm	0.4016		M12 X 1,75	12,0	118,0	71,0	56,0	45,0	65232
					10,3 mm	0.4055			12,0	118,0	71,0	56,0	45,0	65233
					13/32	0.4062	10.32		12,0	118,0	71,0	56,0	45,0	55183
					10,4 mm	0.4094			12,0	118,0	71,0	56,0	45,0	65234
					10,5 mm	0.4134		M12 X 1,5	12,0	118,0	71,0	56,0	45,0	65235
					10,6 mm	0.4173			12,0	118,0	71,0	56,0	45,0	65236
					10,7 mm	0.4213			12,0	118,0	71,0	56,0	45,0	65237
					27/64	0.4219	10.72	1/2-13	12,0	118,0	71,0	56,0	45,0	55184
					10,8 mm	0.4252		M12 X 1,25	12,0	118,0	71,0	56,0	45,0	65238
					10,9 mm	0.4291			12,0	118,0	71,0	56,0	45,0	65239
					11,0 mm	0.4331		M12 X 1	12,0	118,0	71,0	56,0	45,0	65240
					11,1 mm	0.4370			12,0	118,0	71,0	56,0	45,0	65241
					7/16	0.4375	11.11	1/4-18NPT	12,0	118,0	71,0	56,0	45,0	55185
					11,2 mm	0.4409			12,0	118,0	71,0	56,0	45,0	65242
					11,3 mm	0.4449			12,0	118,0	71,0	56,0	45,0	65243
					11,4 mm	0.4488			12,0	118,0	71,0	56,0	45,0	65244
					11,5 mm	0.4528		M12 X 0,5	12,0	118,0	71,0	56,0	45,0	65245
					11,6 mm	0.4567			12,0	118,0	71,0	56,0	45,0	65246
					11,7 mm	0.4606			12,0	118,0	71,0	56,0	45,0	65247
					11,8 mm	0.4646			12,0	118,0	71,0	56,0	45,0	65248
					11,9 mm	0.4685			12,0	118,0	71,0	56,0	45,0	65249
					15/32	0.4688	11.91	1/2-28	12,0	118,0	71,0	56,0	45,0	55186
					12,0 mm	0.4724		M14 X 2	12,0	118,0	71,0	56,0	45,0	65250
					31/64	0.4844	12.30	9/16-12	14,0	124,0	77,0	60,0	45,0	55187
					12,5 mm	0.4921		M14 X 1,5	14,0	124,0	77,0	60,0	45,0	65251

(continued on next page)







TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.00047	h6
>.1181-.2362	+0.0016/+0.00063	h6
>.2362-.3937	+0.0024/+0.00083	h6
>.3937-.7087	+0.0028/+0.00098	h6
>.7087-1.1811	+0.0031/+0.00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-M (TM) EDP No.
1/2	0.5000	12.70		14,0	124,0	77,0	60,0	45,0	55188
12,8 mm	0.5039		M14 X 1,25	14,0	124,0	77,0	60,0	45,0	65252
13,0 mm	0.5118		M14 X 1	14,0	124,0	77,0	60,0	45,0	65253
33/64	0.5156	13.10	9/16-18	14,0	124,0	77,0	60,0	45,0	55189
13,5 mm	0.5315		5/8-11	14,0	124,0	77,0	60,0	45,0	65254
13,8 mm	0.5433			14,0	124,0	77,0	60,0	45,0	65255
14,0 mm	0.5512		M16 X 2	14,0	124,0	77,0	60,0	45,0	65256
9/16	0.5625	14.29		16,0	133,0	83,0	63,0	48,0	55190
14,5 mm	0.5709		M16 X 1,5	16,0	133,0	83,0	63,0	48,0	65257
37/64	0.5781	14.68	5/8-18	16,0	133,0	83,0	63,0	48,0	55191
14,8 mm	0.5827			16,0	133,0	83,0	63,0	48,0	65258
15,0 mm	0.5906		M16 X 1	16,0	133,0	83,0	63,0	48,0	65259
15,5 mm	0.6102		M18 X 2,5	16,0	133,0	83,0	63,0	48,0	65260
15,8 mm	0.6220			16,0	133,0	83,0	63,0	48,0	65261
5/8	0.6250	15.88	11/16-16	16,0	133,0	83,0	63,0	48,0	55192
16,0 mm	0.6299			16,0	133,0	83,0	63,0	48,0	65262
21/32	0.6562	16.67	3/4-10	18,0	143,0	93,0	71,0	48,0	55193
11/16	0.6875	17.46	3/4-16	18,0	143,0	93,0	71,0	48,0	55194
3/4	0.7500	19.05	13/16-16	20,0	153,0	101,0	77,0	50,0	55195

-  Common
-  5xD Reach
-  Right Spiral
-  Internal Coolant
-  3 Flutes

Series 141K 5D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	
GRAY CAST IRON FERRITIC ASTM A48: CLASS 20 SAE J431C: GRADE 1800	≤ 150 Bhn or ≤ 80 HRb	450 (360-540)	RPM	13752	9168	6876	4584	3438	2750	2292
			Fr	0.0049	0.0074	0.0099	0.0148	0.0198	0.0247	0.0297
			Feed (ipm)	68	68	68	68	68	68	68
GRAY CAST IRON PEARLITIC ASTM A48: CLASS 30, 35, 40 SAE J431C: GRADE 3000	≤ 220 Bhn or ≤ 19 HRc	375 (300-450)	RPM	11460	7640	5730	3820	2865	2292	1910
			Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236
			Feed (ipm)	45	45	45	45	45	45	45
COMPACTED GRAPHITE IRON	≤ 250 Bhn or ≤ 25 HRc	325 (260-390)	RPM	9932	6621	4966	3311	2483	1986	1655
			Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236
			Feed (ipm)	39	39	39	39	39	39	39
MALLEABLE CAST IRON FERRITIC ASTM A220: GRADE 40010 SAE J158: GRADE M4504	≤ 160 Bhn or ≤ 3 HRc	450 (360-540)	RPM	13752	9168	6876	4584	3438	2750	2292
			Fr	0.0049	0.0074	0.0099	0.0148	0.0198	0.0247	0.0297
			Feed (ipm)	68	68	68	68	68	68	68
MALLEABLE CAST IRON MARTENSITE ASTM A220: GRADE 90001 SAE J158: GRADE M8501	≤ 320 Bhn or ≤ 34 HRc	250 (200-300)	RPM	7640	5093	3820	2547	1910	1528	1273
			Fr	0.0031	0.0047	0.0063	0.0094	0.0126	0.0157	0.0188
			Feed (mm/min)	24	24	24	24	24	24	24

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x rpm
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Series 141K 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)							
			3	6	8	10	12	14	16	
GRAY CAST IRON FERRITIC ASTM A48: CLASS 20 SAE J431C: GRADE 1800	≤ 150 Bhn or ≤ 80 HRb	137 (110-165)	RPM	14541	7271	5453	4362	3635	3116	2726
			Fr	0.119	0.237	0.316	0.395	0.475	0.554	0.633
			Feed (mm/min)	1725	1725	1725	1725	1725	1725	1725
GRAY CAST IRON PEARLITIC ASTM A48: CLASS 30, 35, 40 SAE J431C: GRADE 3000	≤ 220 Bhn or ≤ 19 HRc	114 (91-137)	RPM	12118	6059	4544	3635	3029	2597	2272
			Fr	0.094	0.189	0.252	0.315	0.378	0.441	0.504
			Feed (mm/min)	1145	1145	1145	1145	1145	1145	1145
COMPACTED GRAPHITE IRON	≤ 250 Bhn or ≤ 25 HRc	99 (79-119)	RPM	10502	5251	3938	3151	2626	2250	1969
			Fr	0.094	0.189	0.251	0.314	0.377	0.440	0.503
			Feed (mm/min)	990	990	990	990	990	990	990
MALLEABLE CAST IRON FERRITIC ASTM A220: GRADE 40010 SAE J158: GRADE M4504	≤ 160 Bhn or ≤ 3 HRc	137 (110-165)	RPM	14541	7271	5453	4362	3635	3116	2726
			Fr	0.119	0.237	0.316	0.395	0.475	0.554	0.633
			Feed (mm/min)	1725	1725	1725	1725	1725	1725	1725
MALLEABLE CAST IRON MARTENSITE ASTM A220: GRADE 90001 SAE J158: GRADE M8501	≤ 320 Bhn or ≤ 34 HRc	76 (61-91)	RPM	8078	4039	3029	2424	2020	1731	1515
			Fr	0.076	0.151	0.201	0.252	0.302	0.352	0.403
			Feed (mm/min)	610	610	610	610	610	610	610

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (D₁ x 3.14)
- mm/min = Fr x rpm
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



SERIES 140

- (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
- (B) HIGH PERFORMANCE FLUTE DESIGN**
 - optimized open fluting
 - improved surface finish through effective chip evacuation
- (C) 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
- (D) HIGH PENETRATION 140° POINT GEOMETRY**
 - split point geometry for improved drill penetration and accuracy
 - cam relief drill point
 - self centering design with high penetration capabilities
- (E) ENGINEERED CUTTING EDGES**
 - precisely ground with a curvature that allows efficient chip creation and control
 - controlled edge honing for longevity
 - negative corner position strengthens and protects

High Performance Internal Coolant Drills

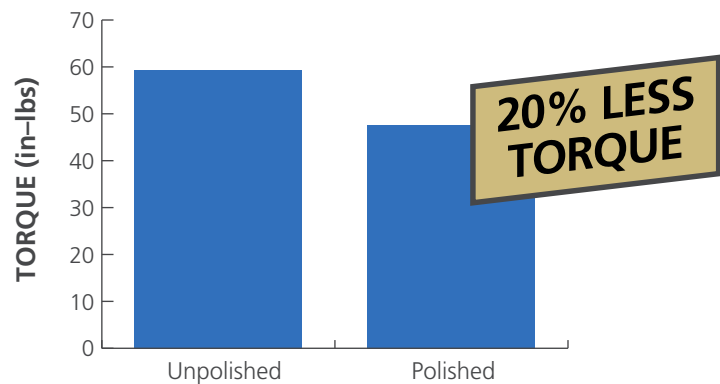
The design of the ICe-Carb® Series 140 was created to bring to the end user the ability to achieve high performance results with high production demands. The internal coolant design allows for better control of machining temperatures during these types of applications, while the geometry features provide effective and efficient chip creation and removal. The results of the ICe-Carb® Series 140 design are reduced cutting loads, increased operating parameters and enhanced tool life.

PERFORMANCE. PRECISION. PASSION.
ICE-CARB® SERIES 140 INTERNAL COOLANT DRILLS

PERFORMANCE.

The cutting edges of the ICe-Carb® Series 140 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 ICe-Carb® Series 140 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.

ICe-CARB® SERIES 140 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

PASSION.

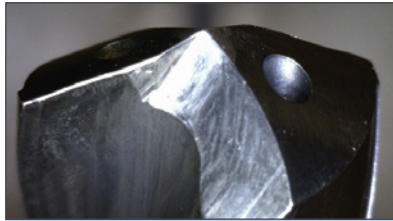
Controlling temperatures during the cutting process certainly helps to improve the operating parameters and tool life a tool is capable of achieving. All of the high performance features of the ICe-Carb® Series 140 are engineered to work together to create the most efficient total cutting performance beyond what simply having coolant through the tool can offer. The flute profile compliments the coolant through design of the ICe-Carb® Series 140 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 ICe-CARB® SERIES 140 8xD VS. COMPETITOR 1

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

CONDITION OF DRILLS AFTER 175 HOLES

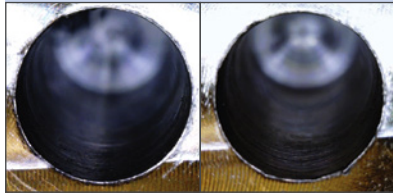
ICe-CARB® SERIES 140



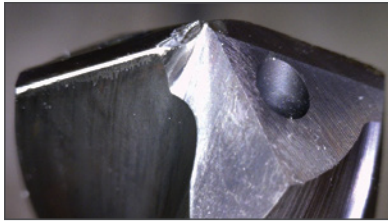
No damage found, good condition to continue using; .375" Ø throughout depth with good finish

FIRST HOLE

LAST HOLE



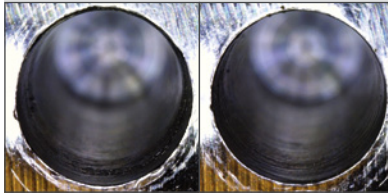
COMPETITOR 1



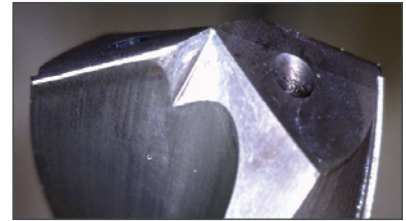
Point severely chipped with wear on margins; Coating loss below cutting lips; .375" Ø held but surface finish deteriorating

FIRST HOLE

LAST HOLE



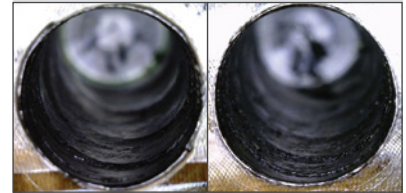
COMPETITOR 2



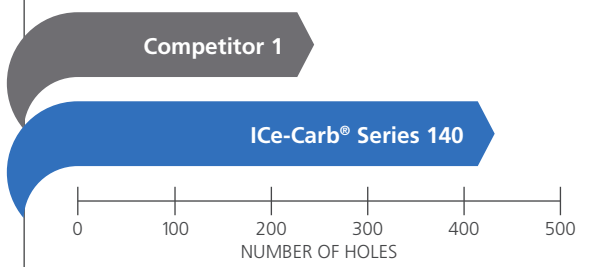
Better condition than Competitor 1 but unacceptable holes; Holes out of round, oversized to .385" Ø and tapered to .392" Ø with heavy swirl marks

FIRST HOLE

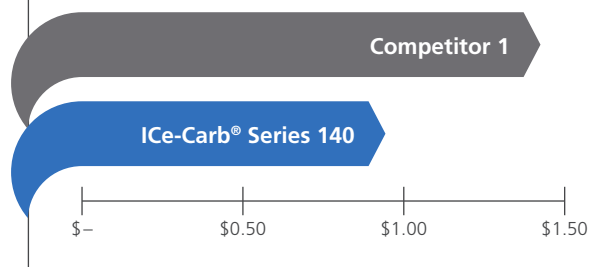
LAST HOLE

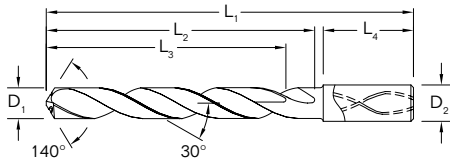


TOOL LIFE



COST PER PART





TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Series 140 5xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
3,0 mm	0.1181			6,0	66,0	28,0	23,0	36,0	63901
3,1 mm	0.1220			6,0	66,0	28,0	23,0	36,0	63902
1/8	0.1250	3.18		6,0	66,0	28,0	23,0	36,0	51901
3,2 mm	0.1260		M3,5 X 0,35	6,0	66,0	28,0	23,0	36,0	63903
3,3 mm	0.1299		M4 X 0,7	6,0	66,0	28,0	23,0	36,0	63904
3,4 mm	0.1339			6,0	66,0	28,0	23,0	36,0	63905
#29	0.1360	3.45	8-32,8-36	6,0	66,0	28,0	23,0	36,0	51902
3,5 mm	0.1378		M4 X 0,5	6,0	66,0	28,0	23,0	36,0	63906
9/64	0.1406	3.57		6,0	66,0	28,0	23,0	36,0	51903
3,6 mm	0.1417		M4 X 0,35	6,0	66,0	28,0	23,0	36,0	63907
3,7 mm	0.1457		M4,5 X 0,75	6,0	66,0	28,0	23,0	36,0	63908
3,8 mm	0.1496		10-24	6,0	74,0	36,0	29,0	36,0	51904
3,9 mm	0.1535			6,0	74,0	36,0	29,0	36,0	63909
5/32	0.1562	3.97		6,0	74,0	36,0	29,0	36,0	51905
4,0 mm	0.1575		M4,5 X 0,5	6,0	74,0	36,0	29,0	36,0	63910
#21	0.1590	4.04	10-32	6,0	74,0	36,0	29,0	36,0	51906
4,1 mm	0.1614			6,0	74,0	36,0	29,0	36,0	63911
4,2 mm	0.1654		M5 / M5 x 0,75	6,0	74,0	36,0	29,0	36,0	63912
4,3 mm	0.1693			6,0	74,0	36,0	29,0	36,0	63913
11/64	0.1719	4.37		6,0	74,0	36,0	29,0	36,0	51907
4,4 mm	0.1732		12-24	6,0	74,0	36,0	29,0	36,0	63914
4,5 mm	0.1772		M5 X 0,5	6,0	74,0	36,0	29,0	36,0	63915
4,6 mm	0.1811		12-28	6,0	74,0	36,0	29,0	36,0	63916
4,7 mm	0.1850		12-32	6,0	74,0	36,0	29,0	36,0	63917
3/16	0.1875	4.76		6,0	82,0	44,0	35,0	36,0	51908
4,8 mm	0.1890		7/32-32	6,0	82,0	44,0	35,0	36,0	63918
4,9 mm	0.1929			6,0	82,0	44,0	35,0	36,0	63919
5,0 mm	0.1969		M6 X 1	6,0	82,0	44,0	35,0	36,0	63920
5,1 mm	0.2008		1/4-20	6,0	82,0	44,0	35,0	36,0	63900
13/64	0.2031	5.16		6,0	82,0	44,0	35,0	36,0	51910
5,2 mm	0.2047		M6 X 0,75	6,0	82,0	44,0	35,0	36,0	63921
5,3 mm	0.2087			6,0	82,0	44,0	35,0	36,0	63922
5,4 mm	0.2126			6,0	82,0	44,0	35,0	36,0	63998
5,5 mm	0.2165		M6 X 0,5	6,0	82,0	44,0	35,0	36,0	63923
7/32	0.2188	5.56	1/4-32	6,0	82,0	44,0	35,0	36,0	51912
5,6 mm	0.2205			6,0	82,0	44,0	35,0	36,0	63924
5,7 mm	0.2244			6,0	82,0	44,0	35,0	36,0	63925
5,8 mm	0.2283			6,0	82,0	44,0	35,0	36,0	63926
5,9 mm	0.2323			6,0	82,0	44,0	35,0	36,0	63927
15/64	0.2344	5.95		6,0	82,0	44,0	35,0	36,0	51913

- Common
- 5xD Reach
- Right Spiral
- Internal Coolant
- 2 Flutes

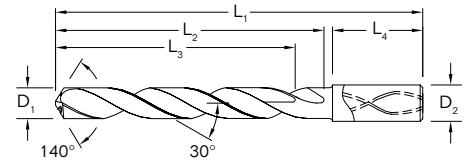
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181-.2362	+0.0016/+0.0063	h6
>.2362-.3937	+0.0024/+0.0083	h6
>.3937-.7087	+0.0028/+0.0098	h6
>.7087-1.1811	+0.0031/+0.0114	h6

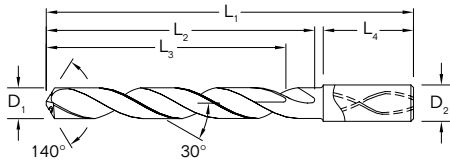
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



Common	5xD Reach	Right Spiral	Internal Coolant	2 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
					6,0 mm	0.2362		M7 X 1	6,0	82,0	44,0	35,0	36,0	63928
					6,1 mm	0.2402			8,0	91,0	53,0	43,0	36,0	63929
					6,2 mm	0.2441		M7 X 0,75	8,0	91,0	53,0	43,0	36,0	63930
					6,3 mm	0.2480			8,0	91,0	53,0	43,0	36,0	63931
					1/4	0.2500	6.35		8,0	91,0	53,0	43,0	36,0	51914
					6,4 mm	0.2520			8,0	91,0	53,0	43,0	36,0	63932
					6,5 mm	0.2559			8,0	91,0	53,0	43,0	36,0	63933
					F	0.2570	6.53	5/16-18	8,0	91,0	53,0	43,0	36,0	51915
					6,6 mm	0.2598			8,0	91,0	53,0	43,0	36,0	63934
					6,7 mm	0.2638			8,0	91,0	53,0	43,0	36,0	63935
					17/64	0.2656	6.75	5/16-20	8,0	91,0	53,0	43,0	36,0	51916
					6,8 mm	0.2677		M8 X 1,25	8,0	91,0	53,0	43,0	36,0	63936
					6,9 mm	0.2717		5/16-24	8,0	91,0	53,0	43,0	36,0	63999
					7,0 mm	0.2756		M8 X 1	8,0	91,0	53,0	43,0	36,0	63937
					7,1 mm	0.2795			8,0	91,0	53,0	43,0	36,0	63938
					9/32	0.2812	7.14	5/16-32	8,0	91,0	53,0	43,0	36,0	51918
					7,2 mm	0.2835		M8 X 0,75	8,0	91,0	53,0	43,0	36,0	63939
					7,3 mm	0.2874			8,0	91,0	53,0	43,0	36,0	63940
					7,4 mm	0.2913			8,0	91,0	53,0	43,0	36,0	63941
					7,5 mm	0.2953		M8 X 0,5	8,0	91,0	53,0	43,0	36,0	63942
					19/64	0.2969	7.54		8,0	91,0	53,0	43,0	36,0	51919
					7,6 mm	0.2992			8,0	91,0	53,0	43,0	36,0	63943
					7,7 mm	0.3031			8,0	91,0	53,0	43,0	36,0	63944
					7,8 mm	0.3071		M9 X 1,25	8,0	91,0	53,0	43,0	36,0	63945
					7,9 mm	0.3110			8,0	91,0	53,0	43,0	36,0	63946
					5/16	0.3125	7.94	3/8-16	8,0	91,0	53,0	43,0	36,0	51920
					8,0 mm	0.3150		M9 X 1	8,0	91,0	53,0	43,0	36,0	63947
					8,1 mm	0.3189			10,0	103,0	61,0	49,0	40,0	63948
					8,2 mm	0.3228			10,0	103,0	61,0	49,0	40,0	63949
					8,3 mm	0.3268			10,0	103,0	61,0	49,0	40,0	63950
					21/64	0.3281	8.33	3/8-20	10,0	103,0	61,0	49,0	40,0	51921
					8,4 mm	0.3307			10,0	103,0	61,0	49,0	40,0	63951
					Q	0.3320	8.43	3/8-24	10,0	103,0	61,0	49,0	40,0	51922
					8,5 mm	0.3346		M10 X 1,5	10,0	103,0	61,0	49,0	40,0	63952
					8,6 mm	0.3386			10,0	103,0	61,0	49,0	40,0	63953
					8,7 mm	0.3425			10,0	103,0	61,0	49,0	40,0	63954
					11/32	0.3438	8.73	3/8-32	10,0	103,0	61,0	49,0	40,0	51923
					8,8 mm	0.3465		M10 X 1,25	10,0	103,0	61,0	49,0	40,0	63955
					8,9 mm	0.3504			10,0	103,0	61,0	49,0	40,0	63956
					9,0 mm	0.3543		M10 X 1	10,0	103,0	61,0	49,0	40,0	63957

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TOLERANCES (inch)

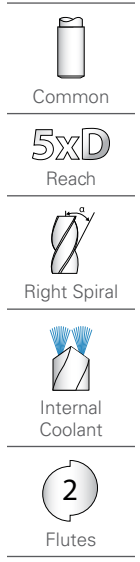
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Series 140 5xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
9,1 mm	0.3583			10,0	103,0	61,0	49,0	40,0	63958
23/64	0.3594	9.13		10,0	103,0	61,0	49,0	40,0	51924
9,2 mm	0.3622		M10 X 0,75	10,0	103,0	61,0	49,0	40,0	63959
9,3 mm	0.3661			10,0	103,0	61,0	49,0	40,0	63960
U	0.3680	9.35	7/16-14	10,0	103,0	61,0	49,0	40,0	51925
9,4 mm	0.3701			10,0	103,0	61,0	49,0	40,0	63961
9,5 mm	0.3740		M11 / M10 X 0,5	10,0	103,0	61,0	49,0	40,0	63962
3/8	0.3750	9.53		10,0	103,0	61,0	49,0	40,0	51926
9,6 mm	0.3780			10,0	103,0	61,0	49,0	40,0	63963
9,7 mm	0.3819			10,0	103,0	61,0	49,0	40,0	63964
9,8 mm	0.3858			10,0	103,0	61,0	49,0	40,0	63965
9,9 mm	0.3898			10,0	103,0	61,0	49,0	40,0	63966
25/64	0.3906	9.92	7/16-20	10,0	103,0	61,0	49,0	40,0	51927
10,0 mm	0.3937			10,0	103,0	61,0	49,0	40,0	63967
10,1 mm	0.3976			12,0	118,0	71,0	56,0	45,0	63968
10,2 mm	0.4016		M12 X 1,75	12,0	118,0	71,0	56,0	45,0	63969
10,3 mm	0.4055			12,0	118,0	71,0	56,0	45,0	63970
13/32	0.4062	10.32		12,0	118,0	71,0	56,0	45,0	51928
10,4 mm	0.4094			12,0	118,0	71,0	56,0	45,0	63971
10,5 mm	0.4134		M12 X 1,5	12,0	118,0	71,0	56,0	45,0	63972
10,6 mm	0.4173			12,0	118,0	71,0	56,0	45,0	63973
10,7 mm	0.4213			12,0	118,0	71,0	56,0	45,0	63974
27/64	0.4219	10.72	1/2-13	12,0	118,0	71,0	56,0	45,0	51929
10,8 mm	0.4252		M12 X 1,25	12,0	118,0	71,0	56,0	45,0	63975
10,9 mm	0.4291			12,0	118,0	71,0	56,0	45,0	63976
11,0 mm	0.4331		M12 X 1	12,0	118,0	71,0	56,0	45,0	63977
11,1 mm	0.4370			12,0	118,0	71,0	56,0	45,0	63978
7/16	0.4375	11.11	1/4-18NPT	12,0	118,0	71,0	56,0	45,0	51930
11,2 mm	0.4409			12,0	118,0	71,0	56,0	45,0	63979
11,3 mm	0.4449			12,0	118,0	71,0	56,0	45,0	63980
11,4 mm	0.4488			12,0	118,0	71,0	56,0	45,0	63981
11,5 mm	0.4528		M12 X 0,5	12,0	118,0	71,0	56,0	45,0	64000
11,6 mm	0.4567			12,0	118,0	71,0	56,0	45,0	63982
11,7 mm	0.4606			12,0	118,0	71,0	56,0	45,0	63983
11,8 mm	0.4646			12,0	118,0	71,0	56,0	45,0	63984
11,9 mm	0.4685			12,0	118,0	71,0	56,0	45,0	63985
15/32	0.4688	11.91	1/2-28	12,0	118,0	71,0	56,0	45,0	51932
12,0 mm	0.4724		M14 X 2	12,0	118,0	71,0	56,0	45,0	63986
31/64	0.4844	12.30	9/16-12	14,0	124,0	77,0	60,0	45,0	51933
12,5 mm	0.4921		M14 X 1,5	14,0	124,0	77,0	60,0	45,0	63987



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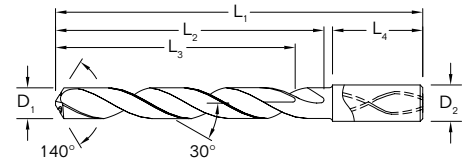


TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181-.2362	+0.0016/+0.0063	h6
>.2362-.3937	+0.0024/+0.0083	h6
>.3937-.7087	+0.0028/+0.0098	h6
>.7087-1.1811	+0.0031/+0.0114	h6

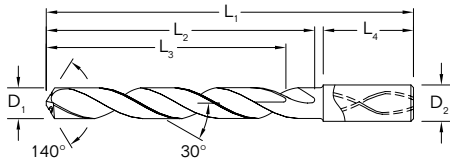
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
Common	1/2	0.5000	12.70		14,0	124,0	77,0	60,0	45,0	51934
5xD Reach	12,8 mm	0.5039		M14 X 1,25	14,0	124,0	77,0	60,0	45,0	63988
	13,0 mm	0.5118		M14 X 1	14,0	124,0	77,0	60,0	45,0	63989
Right Spiral	33/64	0.5156	13.10	9/16-18	14,0	124,0	77,0	60,0	45,0	51935
	13,5 mm	0.5315		5/8-11	14,0	124,0	77,0	60,0	45,0	64001
	13,8 mm	0.5433			14,0	124,0	77,0	60,0	45,0	63990
	14,0 mm	0.5512		M16 X 2	14,0	124,0	77,0	60,0	45,0	63991
Internal Coolant	9/16	0.5625	14.29		16,0	133,0	83,0	63,0	48,0	51937
	14,5 mm	0.5709		M16 X 1,5	16,0	133,0	83,0	63,0	48,0	63992
	37/64	0.5781	14.68	5/8-18	16,0	133,0	83,0	63,0	48,0	51938
	14,8 mm	0.5827			16,0	133,0	83,0	63,0	48,0	63993
2 Flutes	15,0 mm	0.5906		M16 X 1	16,0	133,0	83,0	63,0	48,0	63994
	15,5 mm	0.6102		M18 X 2,5	16,0	133,0	83,0	63,0	48,0	63995
	15,8 mm	0.6220			16,0	133,0	83,0	63,0	48,0	63996
	5/8	0.6250	15.88	11/16-16	16,0	133,0	83,0	63,0	48,0	51939
	16,0 mm	0.6299			16,0	133,0	83,0	63,0	48,0	63997
	21/32	0.6562	16.67	3/4-10	18,0	143,0	93,0	71,0	48,0	51940
	11/16	0.6875	17.46	3/4-16	18,0	143,0	93,0	71,0	48,0	51941
	3/4	0.7500	19.05	13/16-16	20,0	153,0	101,0	77,0	50,0	51942

Series 140 5xD — Fractional & Metric



TOLERANCES (inch)

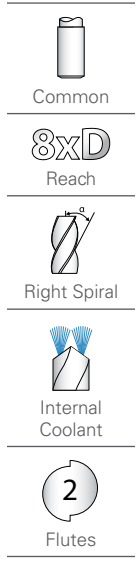
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Series 140 8xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
3,0 mm	0.1181			6,0	72,0	34,0	29,0	36,0	63575
3,1 mm	0.1220			6,0	72,0	34,0	29,0	36,0	63576
1/8	0.1250	3.18		6,0	72,0	34,0	29,0	36,0	51801
3,2 mm	0.1260		M3,5 X 0,35	6,0	72,0	34,0	29,0	36,0	63577
3,3 mm	0.1299		M4 X 0,7	6,0	72,0	34,0	29,0	36,0	63578
3,4 mm	0.1339			6,0	72,0	34,0	29,0	36,0	63579
#29	0.1360	3.45	8-32,8-36	6,0	72,0	34,0	29,0	36,0	51802
3,5 mm	0.1378		M4 X 0,5	6,0	72,0	34,0	29,0	36,0	63580
9/64	0.1406	3.57		6,0	72,0	34,0	29,0	36,0	51803
3,6 mm	0.1417		M4 X 0,35	6,0	72,0	34,0	29,0	36,0	63581
3,7 mm	0.1457		M4,5 X 0,75	6,0	72,0	34,0	29,0	36,0	63582
3,8 mm	0.1496		10-24	6,0	81,0	43,0	36,0	36,0	63583
3,9 mm	0.1535			6,0	81,0	43,0	36,0	36,0	63584
5/32	0.1562	3.97		6,0	81,0	43,0	36,0	36,0	51804
4,0 mm	0.1575		M4,5 X 0,5	6,0	81,0	43,0	36,0	36,0	63585
#21	0.1590	4.04	10-32	6,0	81,0	43,0	36,0	36,0	51805
4,1 mm	0.1614			6,0	81,0	43,0	36,0	36,0	63586
4,2 mm	0.1654		M5 / M5 X 0,75	6,0	81,0	43,0	36,0	36,0	63587
4,3 mm	0.1693			6,0	81,0	43,0	36,0	36,0	63588
11/64	0.1719	4.37		6,0	81,0	43,0	36,0	36,0	51806
4,4 mm	0.1732		12-24	6,0	81,0	43,0	36,0	36,0	63589
4,5 mm	0.1772		M5 X 0,5	6,0	81,0	43,0	36,0	36,0	63590
4,6 mm	0.1811		12-28	6,0	81,0	43,0	36,0	36,0	63591
4,7 mm	0.1850		12-32	6,0	81,0	43,0	36,0	36,0	63592
3/16	0.1875	4.76		6,0	95,0	57,0	48,0	36,0	51807
4,8 mm	0.1890		7/32-32	6,0	95,0	57,0	48,0	36,0	63593
4,9 mm	0.1929			6,0	95,0	57,0	48,0	36,0	63594
5,0 mm	0.1969		M6 X 1	6,0	95,0	57,0	48,0	36,0	63595
5,1 mm	0.2008		1/4-20	6,0	95,0	57,0	48,0	36,0	63596
13/64	0.2031	5.16		6,0	95,0	57,0	48,0	36,0	51808
5,2 mm	0.2047		M6 X 0,75	6,0	95,0	57,0	48,0	36,0	63597
5,3 mm	0.2087			6,0	95,0	57,0	48,0	36,0	63598
5,4 mm	0.2126			6,0	95,0	57,0	48,0	36,0	63599
5,5 mm	0.2165		M6 X 0,5	6,0	95,0	57,0	48,0	36,0	63600
7/32	0.2188	5.56	1/4-32	6,0	95,0	57,0	48,0	36,0	51809
5,6 mm	0.2205			6,0	95,0	57,0	48,0	36,0	63601
5,7 mm	0.2244			6,0	95,0	57,0	48,0	36,0	63602
5,8 mm	0.2283			6,0	95,0	57,0	48,0	36,0	63603
5,9 mm	0.2323			6,0	95,0	57,0	48,0	36,0	63604
15/64	0.2344	5.95		6,0	95,0	57,0	48,0	36,0	51810



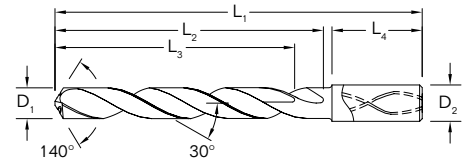
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TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181–.2362	+0.0016/+0.0063	h6
>.2362–.3937	+0.0024/+0.0083	h6
>.3937–.7087	+0.0028/+0.0098	h6
>.7087–1.1811	+0.0031/+0.0114	h6

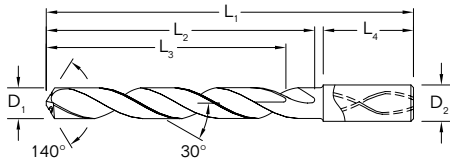
TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



Common	8xD Reach	Right Spiral	Internal Coolant	2 Flutes	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
					6,0 mm	0.2362		M7 X 1	6,0	95,0	57,0	48,0	36,0	63605
					6,1 mm	0.2402			8,0	114,0	76,0	64,0	36,0	63606
					6,2 mm	0.2441		M7 X 0,75	8,0	114,0	76,0	64,0	36,0	63607
					6,3 mm	0.2480			8,0	114,0	76,0	64,0	36,0	63608
					1/4	0.2500	6.35		8,0	114,0	76,0	64,0	36,0	51811
					6,4 mm	0.2520			8,0	114,0	76,0	64,0	36,0	63609
					6,5 mm	0.2559			8,0	114,0	76,0	64,0	36,0	63610
					F	0.2570	6.53	5/16-18	8,0	114,0	76,0	64,0	36,0	51812
					6,6 mm	0.2598			8,0	114,0	76,0	64,0	36,0	63611
					6,7 mm	0.2638			8,0	114,0	76,0	64,0	36,0	63612
					17/64	0.2656	6.75	5/16-20	8,0	114,0	76,0	64,0	36,0	51813
					6,8 mm	0.2677		M8 X 1,25	8,0	114,0	76,0	64,0	36,0	63613
					6,9 mm	0.2717			8,0	114,0	76,0	64,0	36,0	63614
					7,0 mm	0.2756		M8 X 1	8,0	114,0	76,0	64,0	36,0	63615
					7,1 mm	0.2795			8,0	114,0	76,0	64,0	36,0	63616
					9/32	0.2812	7.14	5/16-32	8,0	114,0	76,0	64,0	36,0	51814
					7,2 mm	0.2835		M8 X 0,75	8,0	114,0	76,0	64,0	36,0	63617
					7,3 mm	0.2874			8,0	114,0	76,0	64,0	36,0	63618
					7,4 mm	0.2913			8,0	114,0	76,0	64,0	36,0	63619
					7,5 mm	0.2953		M8 X 0,5	8,0	114,0	76,0	64,0	36,0	63620
					19/64	0.2969	7.54		8,0	114,0	76,0	64,0	36,0	51815
					7,6 mm	0.2992			8,0	114,0	76,0	64,0	36,0	63621
					7,7 mm	0.3031			8,0	114,0	76,0	64,0	36,0	63622
					7,8 mm	0.3071		M9 X 1,25	8,0	114,0	76,0	64,0	36,0	63623
					7,9 mm	0.3110			8,0	114,0	76,0	64,0	36,0	63624
					5/16	0.3125	7.94	3/8-16	8,0	114,0	76,0	64,0	36,0	51816
					8,0 mm	0.3150		M9 X 1	8,0	114,0	76,0	64,0	36,0	63625
					8,1 mm	0.3189			10,0	142,0	95,0	80,0	40,0	63626
					8,2 mm	0.3228			10,0	142,0	95,0	80,0	40,0	63627
					8,3 mm	0.3268			10,0	142,0	95,0	80,0	40,0	63628
					21/64	0.3281	8.33	3/8-20	10,0	142,0	95,0	80,0	40,0	51817
					8,4 mm	0.3307			10,0	142,0	95,0	80,0	40,0	63629
					Q	0.3320	8.43	3/8-24	10,0	142,0	95,0	80,0	40,0	51818
					8,5 mm	0.3346		M10 X 1,5	10,0	142,0	95,0	80,0	40,0	63630
					8,6 mm	0.3386			10,0	142,0	95,0	80,0	40,0	63631
					8,7 mm	0.3425			10,0	142,0	95,0	80,0	40,0	63632
					11/32	0.3438	8.73	3/8-32	10,0	142,0	95,0	80,0	40,0	51819
					8,8 mm	0.3465		M10 X 1,25	10,0	142,0	95,0	80,0	40,0	63633
					8,9 mm	0.3504			10,0	142,0	95,0	80,0	40,0	63634
					9,0 mm	0.3543		M10 X 1	10,0	142,0	95,0	80,0	40,0	63635

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TOLERANCES (inch)

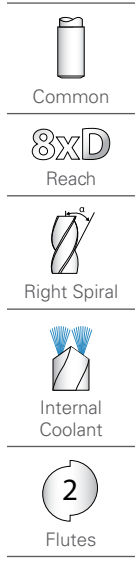
DIAMETER	D ₁	D ₂
≤ .1181	+ .00008/+ .00047	h6
> .1181–.2362	+ .00016/+ .00063	h6
> .2362–.3937	+ .00024/+ .00083	h6
> .3937–.7087	+ .00028/+ .00098	h6
> .7087–1.1811	+ .00031/+ .00114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6

Series 140 8xD Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AITiN) EDP No.
9,1 mm	0.3583			10,0	142,0	95,0	80,0	40,0	63636
23/64	0.3594	9.13		10,0	142,0	95,0	80,0	40,0	51820
9,2 mm	0.3622		M10 X 0,75	10,0	142,0	95,0	80,0	40,0	63637
9,3 mm	0.3661			10,0	142,0	95,0	80,0	40,0	63638
U	0.3680	9.35	7/16-14	10,0	142,0	95,0	80,0	40,0	51821
9,4 mm	0.3701			10,0	142,0	95,0	80,0	40,0	63639
9,5 mm	0.3740		M11 / M10 X 0,5	10,0	142,0	95,0	80,0	40,0	63640
3/8	0.3750	9.53		10,0	142,0	95,0	80,0	40,0	51822
9,6 mm	0.3780			10,0	142,0	95,0	80,0	40,0	63641
9,7 mm	0.3819			10,0	142,0	95,0	80,0	40,0	63642
9,8 mm	0.3858			10,0	142,0	95,0	80,0	40,0	63643
9,9 mm	0.3898			10,0	142,0	95,0	80,0	40,0	63644
25/64	0.3906	9.92	7/16-20	10,0	142,0	95,0	80,0	40,0	51823
10,0 mm	0.3937			10,0	142,0	95,0	80,0	40,0	63645
10,1 mm	0.3976			12,0	162,0	114,0	96,0	45,0	63646
10,2 mm	0.4016		M12 X 1,75	12,0	162,0	114,0	96,0	45,0	63647
10,3 mm	0.4055			12,0	162,0	114,0	96,0	45,0	63648
13/32	0.4062	10.32		12,0	162,0	114,0	96,0	45,0	51824
10,4 mm	0.4094			12,0	162,0	114,0	96,0	45,0	63649
10,5 mm	0.4134		M12 X 1,5	12,0	162,0	114,0	96,0	45,0	63650
10,6 mm	0.4173			12,0	162,0	114,0	96,0	45,0	63651
10,7 mm	0.4213			12,0	162,0	114,0	96,0	45,0	63652
27/64	0.4219	10.72	1/2-13	12,0	162,0	114,0	96,0	45,0	51825
10,8 mm	0.4252		M12 X 1,25	12,0	162,0	114,0	96,0	45,0	63653
10,9 mm	0.4291			12,0	162,0	114,0	96,0	45,0	63654
11,0 mm	0.4331		M12 X 1	12,0	162,0	114,0	96,0	45,0	63655
11,1 mm	0.4370			12,0	162,0	114,0	96,0	45,0	63656
7/16	0.4375	11.11	1/4-18NPT	12,0	162,0	114,0	96,0	45,0	51826
11,2 mm	0.4409			12,0	162,0	114,0	96,0	45,0	63657
11,3 mm	0.4449			12,0	162,0	114,0	96,0	45,0	63658
11,4 mm	0.4488			12,0	162,0	114,0	96,0	45,0	63659
11,5 mm	0.4528		M12 X 0,5	12,0	162,0	114,0	96,0	45,0	63660
11,6 mm	0.4567			12,0	162,0	114,0	96,0	45,0	63661
11,7 mm	0.4606			12,0	162,0	114,0	96,0	45,0	63662
11,8 mm	0.4646			12,0	162,0	114,0	96,0	45,0	63663
11,9 mm	0.4685			12,0	162,0	114,0	96,0	45,0	63664
15/32	0.4688	11.91	1/2-28	12,0	162,0	114,0	96,0	45,0	51827
12,0 mm	0.4724		M14 X 2	12,0	162,0	114,0	96,0	45,0	63665
31/64	0.4844	12.30	9/16-12	14,0	178,0	133,0	112,0	45,0	51828
12,5 mm	0.4921		M14 X 1,5	14,0	178,0	133,0	112,0	45,0	63666



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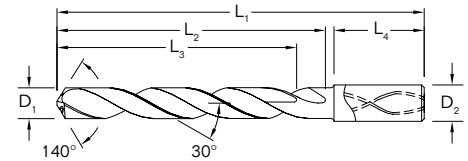


TOLERANCES (inch)

DIAMETER	D ₁	D ₂
≤.1181	+0.0008/+0.0047	h6
>.1181-.2362	+0.0016/+0.0063	h6
>.2362-.3937	+0.0024/+0.0083	h6
>.3937-.7087	+0.0028/+0.0098	h6
>.7087-1.1811	+0.0031/+0.0114	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
≤ 3	+0,002/+0,012	h6
> 3 - 6	+0,004/+0,016	h6
> 6 - 10	+0,006/+0,021	h6
> 10 - 18	+0,007/+0,025	h6



	Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Tap Size Reference Only	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂	Min. Cleared Length L ₃	Shank Length L ₄	Ti-NAMITE-A (AlTiN) EDP No.
Common	1/2	0.5000	12.70		14,0	178,0	133,0	112,0	45,0	51829
8xD Reach	12,8 mm	0.5039		M14 X 1,25	14,0	178,0	133,0	112,0	45,0	63667
	13,0 mm	0.5118		M14 X 1	14,0	178,0	133,0	112,0	45,0	63668
	33/64	0.5156	13.10	9/16-18	14,0	178,0	133,0	112,0	45,0	51830
Right Spiral	13,5 mm	0.5315		5/8-11	14,0	178,0	133,0	112,0	45,0	63669
	13,8 mm	0.5433			14,0	178,0	133,0	112,0	45,0	63670
	14,0 mm	0.5512		M16 X 2	14,0	178,0	133,0	112,0	45,0	63671
Internal Coolant	9/16	0.5625	14.29		16,0	203,0	152,0	128,0	48,0	51831
	14,5 mm	0.5709		M16 X 1,5	16,0	203,0	152,0	128,0	48,0	63672
	37/64	0.5781	14.68	5/8-18	16,0	203,0	152,0	128,0	48,0	51832
	14,8 mm	0.5827			16,0	203,0	152,0	128,0	48,0	63673
2 Flutes	15,0 mm	0.5906		M16 X 1	16,0	203,0	152,0	128,0	48,0	63674
	15,5 mm	0.6102		M18 X 2,5	16,0	203,0	152,0	128,0	48,0	63675
	15,8 mm	0.6220			16,0	203,0	152,0	128,0	48,0	63676
	5/8	0.6250	15.88	11/16-16	16,0	203,0	152,0	128,0	48,0	51833
	16,0 mm	0.6299			16,0	203,0	152,0	128,0	48,0	63677
	21/32	0.6562	16.67	3/4-10	18,0	222,0	171,0	144,0	48,0	51834
	11/16	0.6875	17.46	3/4-16	18,0	222,0	171,0	144,0	48,0	51835
	3/4	0.7500	19.05	13/16-16	20,0	243,0	190,0	160,0	50,0	51836

Series 140 8xD — Fractional & Metric



Series 140 5D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)								
			1/8	3/16	1/4	3/8	1/2	5/8	3/4		
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	425 (340-510)	RPM	12988	8659	6494	4329	3247	2598	2165	
			Fr	0.0039	0.0059	0.0079	0.0118	0.0157	0.0196	0.0236	
			Feed (ipm)	51.0	51.0	51.0	51.0	51.0	51.0	51.0	
	≤ 275 Bhn or ≤ 28 HRc	380 (304-456)	RPM	11613	7742	5806	3871	2903	2323	1935	
			Fr	0.0035	0.0053	0.0071	0.0106	0.0141	0.0177	0.0212	
			Feed (ipm)	41.0	41.0	41.0	41.0	41.0	41.0	41.0	
	≤ 425 Bhn or ≤ 45 HRc	220 (176-264)	RPM	6723	4482	3362	2241	1681	1345	1121	
			Fr	0.0030	0.0045	0.0059	0.0089	0.0119	0.0149	0.0178	
			Feed (ipm)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	330 (264-396)	RPM	10085	6723	5042	3362	2521	2017	1681
				Fr	0.0030	0.0045	0.0059	0.0089	0.0119	0.0149	0.0178
				Feed (ipm)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
≤ 375 Bhn or ≤ 40 HRc		200 (160-240)	RPM	6112	4075	3056	2037	1528	1222	1019	
			Fr	0.0025	0.0038	0.0051	0.0076	0.0101	0.0127	0.0152	
			Feed (ipm)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	
≤ 450 Bhn or ≤ 48 HRc		140 (112-168)	RPM	4278	2852	2139	1426	1070	856	713	
			Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0090	0.0108	
			Feed (ipm)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	145 (116-174)	RPM	4431	2954	2216	1477	1108	886	739
				Fr	0.0026	0.0039	0.0052	0.0078	0.0104	0.0130	0.0156
				Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5
	≤ 375 Bhn or ≤ 40 HRc	95 (76-114)	RPM	2903	1935	1452	968	726	581	484	
			Fr	0.0012	0.0018	0.0024	0.0036	0.0048	0.0060	0.0072	
			Feed (ipm)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
	≤ 475 Bhn or ≤ 50 HRc	85 (68-102)	RPM	2598	1732	1299	866	649	520	433	
			Fr	0.0008	0.0012	0.0015	0.0023	0.0031	0.0038	0.0046	
			Feed (ipm)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	360 (288-432)	RPM	11002	7334	5501	3667	2750	2200	1834
				Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273
				Feed (ipm)	50.0	50.0	50.0	50.0	50.0	50.0	50.0
≤ 260 Bhn or ≤ 26 HRc		335 (268-402)	RPM	10238	6825	5119	3413	2559	2048	1706	
			Fr	0.0045	0.0068	0.0091	0.0136	0.0182	0.0227	0.0273	
			Feed (ipm)	46.5	46.5	46.5	46.5	46.5	46.5	46.5	
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	305 (244-366)	RPM	9321	6214	4660	3107	2330	1864	1553	
			Fr	0.0026	0.0039	0.0051	0.0077	0.0103	0.0129	0.0154	
			Feed (ipm)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	
	≤ 275 Bhn or ≤ 28 HRc	195 (156-234)	RPM	5959	3973	2980	1986	1490	1192	993	
			Fr	0.0020	0.0030	0.0040	0.0060	0.0081	0.0101	0.0121	
			Feed (ipm)	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	150 (120-180)	RPM	4584	3056	2292	1528	1146	917	764	
			Fr	0.0020	0.0030	0.0040	0.0060	0.0079	0.0099	0.0119	
			Feed (ipm)	9.1	9.1	9.1	9.1	9.1	9.1	9.1	
	≤ 375 Bhn or ≤ 40 HRc	110 (88-132)	RPM	3362	2241	1681	1121	840	672	560	
			Fr	0.0018	0.0027	0.0036	0.0054	0.0071	0.0089	0.0107	
			Feed (ipm)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

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Series 140 5D Fractional	Hardness	Vc (sfm)	Diameter (D ₁) (inch)								
			1/8	3/16	1/4	3/8	1/2	5/8	3/4		
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	95	RPM	2903	1935	1452	968	726	581	484	
		(76-114)	Fr	0.0008	0.0012	0.0016	0.0024	0.0032	0.0040	0.0048	
			Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
	≤ 400 Bhn or ≤ 43 HRc	50	RPM	1528	1019	764	509	382	306	255	
		(40-60)	Fr	0.0007	0.0010	0.0013	0.0020	0.0026	0.0033	0.0039	
			Feed (ipm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	215	RPM	6570	4380	3285	2190	1643	1314	1095
			(172-258)	Fr	0.0018	0.0026	0.0035	0.0053	0.0070	0.0088	0.0105
				Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5
		≤ 350 Bhn or ≤ 38 HRc	160	RPM	4890	3260	2445	1630	1222	978	815
			(128-192)	Fr	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096
				Feed (ipm)	7.8	7.8	7.8	7.8	7.8	7.8	7.8
≤ 440 Bhn or ≤ 47 HRc		85	RPM	2598	1732	1299	866	649	520	433	
		(68-102)	Fr	0.0012	0.0018	0.0024	0.0036	0.0048	0.0060	0.0072	
			Feed (ipm)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	770	RPM	23531	15687	11766	7844	5883	4706	3922
			(616-924)	Fr	0.0049	0.0073	0.0098	0.0147	0.0195	0.0244	0.0293
				Feed (ipm)	115.0	115.0	115.0	115.0	115.0	115.0	115.0
	≤ 150 Bhn or ≤ 7 HRc	660	RPM	20170	13446	10085	6723	5042	4034	3362	
		(528-792)	Fr	0.0050	0.0074	0.0099	0.0149	0.0198	0.0248	0.0297	
			Feed (ipm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	550	RPM	16808	11205	8404	5603	4202	3362	2801
			(440-660)	Fr	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
				Feed (ipm)	33.5	33.5	33.5	33.5	33.5	33.5	33.5
		≤ 200 Bhn or ≤ 23 HRc	440	RPM	13446	8964	6723	4482	3362	2689	2241
			(352-528)	Fr	0.0020	0.0030	0.0040	0.0060	0.0080	0.0100	0.0120
				Feed (ipm)	27.0	27.0	27.0	27.0	27.0	27.0	27.0

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Series 140M 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)								
			3	6	8	10	12	14	16		
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	130 (104-155)	RPM	13733	6867	5150	4120	3433	2943	2575	
			Fr	0.095	0.189	0.252	0.316	0.379	0.442	0.505	
			Feed (mm/min)	1300	1300	1300	1300	1300	1300	1300	
	≤ 275 Bhn or ≤ 28 HRc	116 (93-139)	RPM	12279	6140	4605	3684	3070	2631	2302	
			Fr	0.086	0.171	0.228	0.285	0.342	0.399	0.456	
			Feed (mm/min)	1050	1050	1050	1050	1050	1050	1050	
	≤ 425 Bhn or ≤ 45 HRc	67 (54-80)	RPM	7109	3555	2666	2133	1777	1523	1333	
			Fr	0.071	0.142	0.189	0.237	0.284	0.332	0.379	
			Feed (mm/min)	505	505	505	505	505	505	505	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	101 (80-121)	RPM	10664	5332	3999	3199	2666	2285	1999
				Fr	0.071	0.143	0.190	0.238	0.285	0.333	0.380
				Feed (mm/min)	760	760	760	760	760	760	760
≤ 375 Bhn or ≤ 40 HRc		61 (49-73)	RPM	6463	3231	2424	1939	1616	1385	1212	
			Fr	0.062	0.124	0.165	0.206	0.248	0.289	0.330	
			Feed (mm/min)	400	400	400	400	400	400	400	
≤ 450 Bhn or ≤ 48 HRc		43 (34-51)	RPM	4524	2262	1696	1357	1131	969	848	
			Fr	0.043	0.086	0.115	0.144	0.172	0.201	0.230	
			Feed (mm/min)	195	195	195	195	195	195	195	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	44 (35-53)	RPM	4686	2343	1757	1406	1171	1004	879
				Fr	0.061	0.122	0.162	0.203	0.243	0.284	0.324
				Feed (mm/min)	285	285	285	285	285	285	285
	≤ 375 Bhn or ≤ 40 HRc	29 (23-35)	RPM	3070	1535	1151	921	767	658	576	
			Fr	0.029	0.059	0.078	0.098	0.117	0.137	0.156	
			Feed (mm/min)	90	90	90	90	90	90	90	
	≤ 475 Bhn or ≤ 50 HRc	26 (21-31)	RPM	2747	1373	1030	824	687	589	515	
			Fr	0.018	0.036	0.049	0.061	0.073	0.085	0.097	
			Feed (mm/min)	50	50	50	50	50	50	50	
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	110 (88-132)	RPM	11633	5816	4362	3490	2908	2493	2181
				Fr	0.109	0.218	0.291	0.364	0.437	0.509	0.582
				Feed (mm/min)	1270	1270	1270	1270	1270	1270	1270
≤ 260 Bhn or ≤ 26 HRc		102 (82-123)	RPM	10825	5413	4059	3248	2706	2320	2030	
			Fr	0.109	0.218	0.291	0.363	0.436	0.509	0.581	
			Feed (mm/min)	1180	1180	1180	1180	1180	1180	1180	
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	93 (74-112)	RPM	9856	4928	3696	2957	2464	2112	1848	
			Fr	0.061	0.123	0.164	0.205	0.246	0.286	0.327	
			Feed (mm/min)	605	605	605	605	605	605	605	
	≤ 275 Bhn or ≤ 28 HRc	59 (48-71)	RPM	6301	3151	2363	1890	1575	1350	1181	
			Fr	0.048	0.095	0.127	0.159	0.190	0.222	0.254	
			Feed (mm/min)	300	300	300	300	300	300	300	
STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	46 (37-55)	RPM	4847	2424	1818	1454	1212	1039	909	
			Fr	0.047	0.095	0.127	0.158	0.190	0.221	0.253	
			Feed (mm/min)	230	230	230	230	230	230	230	
	≤ 375 Bhn or ≤ 40 HRc	34 (27-40)	RPM	3555	1777	1333	1066	889	762	666	
			Fr	0.042	0.084	0.113	0.141	0.169	0.197	0.225	
			Feed (mm/min)	150	150	150	150	150	150	150	

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Series 140M 5D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)								
			3	6	8	10	12	14	16		
S SUPER ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	29	RPM	3070	1535	1151	921	767	658	576	
		(23-35)	Fr	0.020	0.039	0.052	0.065	0.078	0.091	0.104	
			Feed (mm/min)	60	60	60	60	60	60	60	
	≤ 400 Bhn or ≤ 43 HRc	15	RPM	1616	808	606	485	404	346	303	
		(12-18)	Fr	0.015	0.031	0.041	0.052	0.062	0.072	0.083	
			Feed (mm/min)	25	25	25	25	25	25	25	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	66	RPM	6947	3474	2605	2084	1737	1489	1303
			(52-79)	Fr	0.040	0.079	0.106	0.132	0.158	0.185	0.211
				Feed (mm/min)	275	275	275	275	275	275	275
		≤ 350 Bhn or ≤ 38 HRc	49	RPM	5170	2585	1939	1551	1293	1108	969
			(39-59)	Fr	0.039	0.077	0.103	0.129	0.155	0.181	0.206
				Feed (mm/min)	200	200	200	200	200	200	200
≤ 440 Bhn or ≤ 47 HRc		26	RPM	2747	1373	1030	824	687	589	515	
		(21-31)	Fr	0.029	0.058	0.078	0.097	0.117	0.136	0.155	
			Feed (mm/min)	80	80	80	80	80	80	80	
N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	235	RPM	24882	12441	9331	7465	6220	5332	4665
			(188-282)	Fr	0.118	0.237	0.316	0.395	0.473	0.552	0.631
				Feed (mm/min)	2945	2945	2945	2945	2945	2945	2945
	≤ 150 Bhn or ≤ 7 HRc	201	RPM	21327	10664	7998	6398	5332	4570	3999	
		(161-241)	Fr	0.119	0.238	0.318	0.397	0.476	0.556	0.635	
			Feed (mm/min)	2540	2540	2540	2540	2540	2540	2540	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	168	RPM	17773	8886	6665	5332	4443	3808	3332
			(134-201)	Fr	0.048	0.096	0.128	0.159	0.191	0.223	0.255
				Feed (mm/min)	850	850	850	850	850	850	850
		≤ 200 Bhn or ≤ 23 HRc	134	RPM	14218	7109	5332	4265	3555	3047	2666
			(107-161)	Fr	0.048	0.096	0.128	0.161	0.193	0.225	0.257
				Feed (mm/min)	685	685	685	685	685	685	685

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (D₁ x 3.14)
- mm/min = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



**Series
140 8D
Fractional**

**Diameter (D₁)
(inch)**

Hardness	Vc (sfm)	Diameter (D ₁) (inch)									
		1/8	3/16	1/4	3/8	1/2	5/8	3/4			
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	405	RPM	12377	8251	6188	4126	3094	2475	2063	
		(324-486)	Fr	0.0036	0.0053	0.0071	0.0107	0.0142	0.0178	0.0213	
			Feed (ipm)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	
	≤ 275 Bhn or ≤ 28 HRc	370	RPM	11307	7538	5654	3769	2827	2261	1885	
		(296-444)	Fr	0.0030	0.0045	0.0060	0.0090	0.0120	0.0150	0.0180	
			Feed (ipm)	34.0	34.0	34.0	34.0	34.0	34.0	34.0	
	≤ 425 Bhn or ≤ 45 HRc	210	RPM	6418	4278	3209	2139	1604	1284	1070	
		(168-252)	Fr	0.0026	0.0039	0.0051	0.0077	0.0103	0.0129	0.0154	
			Feed (ipm)	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	320	RPM	9779	6519	4890	3260	2445	1956	1630
			(256-384)	Fr	0.0026	0.0038	0.0051	0.0077	0.0102	0.0128	0.0153
				Feed (ipm)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
≤ 375 Bhn or ≤ 40 HRc		190	RPM	5806	3871	2903	1935	1452	1161	968	
		(152-228)	Fr	0.0020	0.0030	0.0040	0.0059	0.0079	0.0099	0.0119	
			Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
≤ 450 Bhn or ≤ 48 HRc		135	RPM	4126	2750	2063	1375	1031	825	688	
		(108-162)	Fr	0.0016	0.0024	0.0032	0.0047	0.0063	0.0079	0.0095	
			Feed (ipm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc	140	RPM	4278	2852	2139	1426	1070	856	713
			(112-168)	Fr	0.0020	0.0030	0.0040	0.0060	0.0079	0.0099	0.0119
				Feed (ipm)	8.5	8.5	8.5	8.5	8.5	8.5	8.5
	≤ 375 Bhn or ≤ 40 HRc	90	RPM	2750	1834	1375	917	688	550	458	
		(72-108)	Fr	0.0011	0.0016	0.0022	0.0033	0.0044	0.0055	0.0065	
			Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	≤ 475 Bhn or ≤ 50 HRc	80	RPM	2445	1630	1222	815	611	489	407	
		(64-96)	Fr	0.0006	0.0009	0.0012	0.0018	0.0025	0.0031	0.0037	
			Feed (ipm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	350	RPM	10696	7131	5348	3565	2674	2139	1783
			(280-420)	Fr	0.0037	0.0056	0.0075	0.0112	0.0150	0.0187	0.0224
				Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0
≤ 260 Bhn or ≤ 26 HRc		310	RPM	9474	6316	4737	3158	2368	1895	1579	
		(248-372)	Fr	0.0039	0.0059	0.0078	0.0117	0.0156	0.0195	0.0234	
			Feed (ipm)	37.0	37.0	37.0	37.0	37.0	37.0	37.0	
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc	290	RPM	8862	5908	4431	2954	2216	1772	1477	
		(232-348)	Fr	0.0020	0.0030	0.0039	0.0059	0.0079	0.0099	0.0118	
			Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5	17.5	
	≤ 275 Bhn or ≤ 28 HRc	180	RPM	5501	3667	2750	1834	1375	1100	917	
		(144-216)	Fr	0.0018	0.0027	0.0036	0.0055	0.0073	0.0091	0.0109	
			Feed (ipm)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	130	RPM	3973	2649	1986	1324	993	795	662
			(104-156)	Fr	0.0018	0.0026	0.0035	0.0053	0.0070	0.0088	0.0106
				Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
		≤ 375 Bhn or ≤ 40 HRc	95	RPM	2903	1935	1452	968	726	581	484
			(76-114)	Fr	0.0016	0.0023	0.0031	0.0047	0.0062	0.0078	0.0093
				Feed (ipm)	4.5	4.5	4.5	4.5	4.5	4.5	4.5

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Series 140 8D Fractional	Hardness	Vc (sfm)		Diameter (D ₁) (inch)							
				1/8	3/16	1/4	3/8	1/2	5/8	3/4	
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	65 (52-78)	RPM	1986	1324	993	662	497	397	331	
			Fr	0.0009	0.0013	0.0017	0.0026	0.0034	0.0043	0.0051	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	≤ 400 Bhn or ≤ 43 HRc	35 (28-42)	RPM	1070	713	535	357	267	214	178	
			Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0028	0.0034	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	185 (148-222)	RPM	5654	3769	2827	1885	1413	1131	942
				Fr	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096
				Feed (ipm)	9.0	9.0	9.0	9.0	9.0	9.0	9.0
		≤ 350 Bhn or ≤ 38 HRc	140 (112-168)	RPM	4278	2852	2139	1426	1070	856	713
				Fr	0.0012	0.0018	0.0023	0.0035	0.0047	0.0058	0.0070
				Feed (ipm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
≤ 440 Bhn or ≤ 47 HRc		75 (60-90)	RPM	2292	1528	1146	764	573	458	382	
			Fr	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060	
			Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	730 (584-876)	RPM	22309	14873	11154	7436	5577	4462	3718	
			Fr	0.0045	0.0067	0.0090	0.0134	0.0179	0.0224	0.0269	
			Feed (ipm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
	≤ 150 Bhn or ≤ 7 HRc	635 (508-762)	RPM	19406	12937	9703	6469	4851	3881	3234	
			Fr	0.0046	0.0070	0.0093	0.0139	0.0186	0.0232	0.0278	
			Feed (ipm)	90.0	90.0	90.0	90.0	90.0	90.0	90.0	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	255 (204-306)	RPM	7793	5195	3896	2598	1948	1559	1299
				Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0090	0.0108
				Feed (ipm)	14.0	14.0	14.0	14.0	14.0	14.0	14.0
≤ 200 Bhn or ≤ 23 HRc		235 (188-282)	RPM	7182	4788	3591	2394	1795	1436	1197	
			Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0091	0.0109	
			Feed (ipm)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = Vc x 3.82 / D₁
- ipm = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Series 140 8xD — Speed & Feed Recommendations



Series
140M 8D
Metric

Diameter (D₁)
(mm)

Hardness	Vc (m/min)		Diameter (D ₁) (mm)								
			3	6	8	10	12	14	16		
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc (100-170)	123	RPM	13087	6544	4908	3926	3272	2804	2454	
		Fr	0.085	0.171	0.228	0.285	0.342	0.399	0.455		
		Feed (mm/min)	1118	1118	1118	1118	1118	1118	1118		
	≤ 275 Bhn or ≤ 28 HRc (90-135)	113	RPM	11956	5978	4484	3587	2989	2562	2242	
		Fr	0.072	0.144	0.193	0.241	0.289	0.337	0.385		
		Feed (mm/min)	864	864	864	864	864	864	864		
	≤ 425 Bhn or ≤ 45 HRc (51-77)	64	RPM	6786	3393	2545	2036	1696	1454	1272	
		Fr	0.062	0.124	0.165	0.206	0.247	0.288	0.329		
		Feed (mm/min)	419	419	419	419	419	419	419		
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc (78-117)	98	RPM	10340	5170	3878	3102	2585	2216	1939
			Fr	0.061	0.123	0.164	0.205	0.246	0.287	0.328	
			Feed (mm/min)	635	635	635	635	635	635	635	
≤ 375 Bhn or ≤ 40 HRc (46-69)		58	RPM	6140	3070	2302	1842	1535	1316	1151	
		Fr	0.048	0.095	0.127	0.159	0.190	0.222	0.254		
		Feed (mm/min)	292	292	292	292	292	292	292		
≤ 450 Bhn or ≤ 48 HRc (33-49)		41	RPM	4362	2181	1636	1309	1091	935	818	
		Fr	0.038	0.076	0.101	0.126	0.151	0.177	0.202		
		Feed (mm/min)	165	165	165	165	165	165	165		
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 200 Bhn or ≤ 13 HRc (34-51)	43	RPM	4524	2262	1696	1357	1131	969	848
			Fr	0.048	0.095	0.127	0.159	0.191	0.223	0.255	
			Feed (mm/min)	216	216	216	216	216	216	216	
	≤ 375 Bhn or ≤ 40 HRc (22-33)	27	RPM	2908	1454	1091	872	727	623	545	
		Fr	0.026	0.052	0.070	0.087	0.105	0.122	0.140		
		Feed (mm/min)	76	76	76	76	76	76	76		
	≤ 475 Bhn or ≤ 50 HRc (20-29)	24	RPM	2585	1293	969	776	646	554	485	
		Fr	0.015	0.029	0.039	0.049	0.059	0.069	0.079		
		Feed (mm/min)	38	38	38	38	38	38	38		
	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc (85-128)	107	RPM	11310	5655	4241	3393	2827	2424	2121
			Fr	0.090	0.180	0.240	0.299	0.359	0.419	0.479	
			Feed (mm/min)	1016	1016	1016	1016	1016	1016	1016	
≤ 260 Bhn or ≤ 26 HRc (76-113)		94	RPM	10017	5009	3756	3005	2504	2147	1878	
		Fr	0.094	0.188	0.250	0.313	0.375	0.438	0.500		
		Feed (mm/min)	940	940	940	940	940	940	940		
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 185 Bhn or ≤ 9 HRc (71-106)	88	RPM	9371	4686	3514	2811	2343	2008	1757	
		Fr	0.047	0.095	0.126	0.158	0.190	0.221	0.253		
		Feed (mm/min)	445	445	445	445	445	445	445		
	≤ 275 Bhn or ≤ 28 HRc (44-66)	55	RPM	5816	2908	2181	1745	1454	1246	1091	
		Fr	0.044	0.087	0.116	0.146	0.175	0.204	0.233		
		Feed (mm/min)	254	254	254	254	254	254	254		
	STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc (32-48)	40	RPM	4201	2100	1575	1260	1050	900	788
			Fr	0.042	0.085	0.113	0.141	0.169	0.198	0.226	
			Feed (mm/min)	178	178	178	178	178	178	178	
		≤ 375 Bhn or ≤ 40 HRc (23-35)	29	RPM	3070	1535	1151	921	767	658	576
			Fr	0.037	0.074	0.099	0.124	0.149	0.174	0.199	
			Feed (mm/min)	114	114	114	114	114	114	114	

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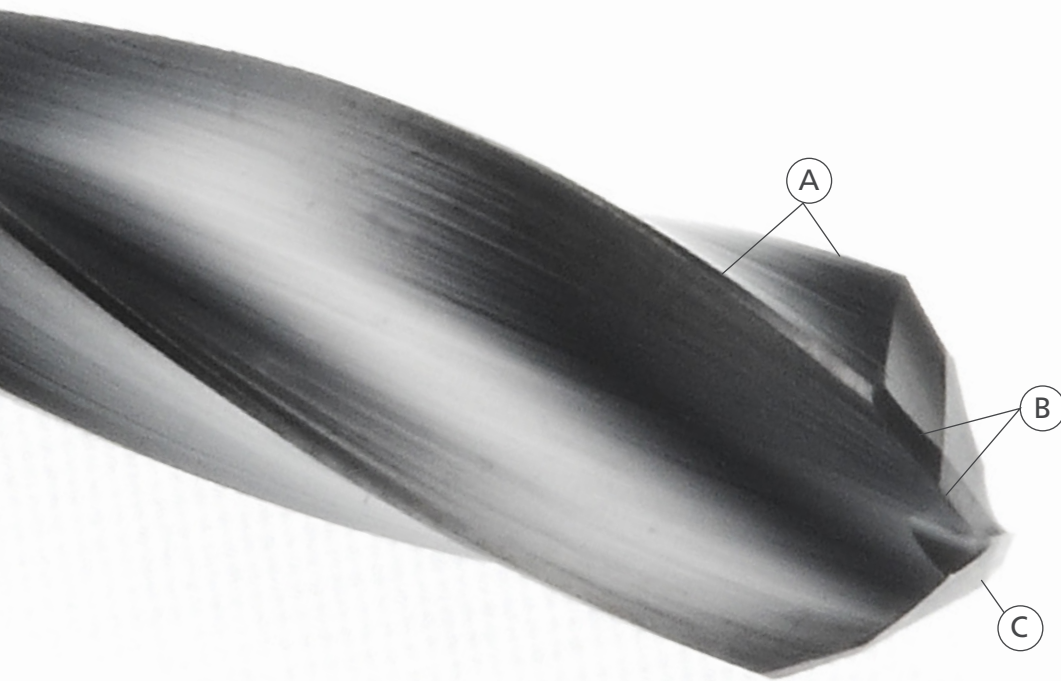
Series 140 8xD Speed & Feed Recommendations



Series 140M 8D Metric	Hardness	Vc (m/min)	Diameter (D ₁) (mm)								
			3	6	8	10	12	14	16		
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	20	RPM	2100	1050	788	630	525	450	394	
		(16-24)	Fr	0.021	0.041	0.055	0.069	0.082	0.096	0.110	
			Feed (mm/min)	43	43	43	43	43	43	43	
	≤ 400 Bhn or ≤ 43 HRc	11	RPM	1131	565	424	339	283	242	212	
		(9-13)	Fr	0.013	0.027	0.036	0.045	0.054	0.063	0.072	
			Feed (mm/min)	15	15	15	15	15	15	15	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	56	RPM	5978	2989	2242	1793	1495	1281	1121
			(45-68)	Fr	0.038	0.076	0.102	0.127	0.153	0.178	0.204
				Feed (mm/min)	229	229	229	229	229	229	229
		≤ 350 Bhn or ≤ 38 HRc	43	RPM	4524	2262	1696	1357	1131	969	848
			(34-51)	Fr	0.028	0.056	0.075	0.094	0.112	0.131	0.150
				Feed (mm/min)	127	127	127	127	127	127	127
≤ 440 Bhn or ≤ 47 HRc		23	RPM	2424	1212	909	727	606	519	454	
		(18-27)	Fr	0.024	0.048	0.064	0.080	0.096	0.112	0.129	
			Feed (mm/min)	58	58	58	58	58	58	58	
ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075		≤ 80 Bhn or ≤ 47 HRb	223	RPM	23589	11795	8846	7077	5897	5055	4423
			(178-267)	Fr	0.108	0.215	0.287	0.359	0.431	0.502	0.574
				Feed (mm/min)	2540	2540	2540	2540	2540	2540	2540
	≤ 150 Bhn or ≤ 7 HRc	194	RPM	20519	10260	7695	6156	5130	4397	3847	
		(155-232)	Fr	0.111	0.223	0.297	0.371	0.446	0.520	0.594	
			Feed (mm/min)	2286	2286	2286	2286	2286	2286	2286	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	78	RPM	8240	4120	3090	2472	2060	1766	1545
			(62-93)	Fr	0.043	0.086	0.115	0.144	0.173	0.201	0.230
				Feed (mm/min)	356	356	356	356	356	356	356
		≤ 200 Bhn or ≤ 23 HRc	72	RPM	7594	3797	2848	2278	1898	1627	1424
			(57-86)	Fr	0.043	0.087	0.116	0.145	0.174	0.203	0.232
				Feed (mm/min)	330	330	330	330	330	330	330

Note:

- Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
- rpm = (Vc x 1000) / (D₁ x 3.14)
- mm/min = Fr x RPM
- reduce speed and feed for materials harder than listed
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



SERIES 120



SERIES 120 COMPOSITE DRILL

The key features of the 8 Facet Double Angle Series 120 drill design offers application benefits beyond that of other high performance drills in its category. Each feature of this 8 facet design was engineered as a solution towards addressing the issues commonly encountered during Composite drilling. This unique High Performance design successfully creates an accurate hole without splintering or delamination.

- A** DOUBLE MARGIN CONSTRUCTION
- improves drill stability for better hole finish and size control
 - allows coolant to reach the point for improved hole quality and extended tool life
- B** DOUBLE ANGLE POINT
- minimizes workpiece delamination on drill entry and exit
 - redistributes loads along multiple cutting edges for improved performance
- C** NOTCHED POINT
- reduces cutting forces at the drill center for enhanced performance and tool life
 - manufactured exclusively with Di-NAMITE® coating for even wear, extended tool life, and improved finishes.

PERFORMANCE. PRECISION. PASSION.
SERIES 120 COMPOSITE DRILL

PERFORMANCE.

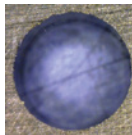
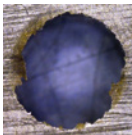
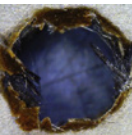
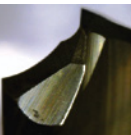
- Double margin design stabilized the drill for greater hole accuracy and improved surface finish in final hole.
- Minimized delamination at hole entry/exit.
- Manufactured exclusively with Di-NAMITE® coating for even wear, extended tool life and improved finishes.

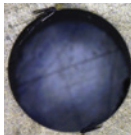
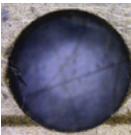
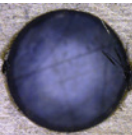

PRECISION.


A test was conducted of our CFRP drill to determine the necessity of coating when drilling Carbon Fiber material. Fifty holes were drilled using a special size .190" CFRP drill. The tool's design produces acceptable quality holes; but as shown in the photos, early edge wear on the uncoated drill resulted in holes with frayed edges. The diamond coated drill produced all 50 holes with little to no fraying and edge wear was 38% less than the uncoated drills.

The geometry of the 8 Facet drill with the Di-NAMITE® coating is a necessity for additional tool life and productivity when manufacturing Carbon Fiber material.

SPEED	FEED	DIAMETER	HOLE DEPTH	WORKPIECE	MACHINE TYPE	COOLANT
5,000 rpm	5.0 ipm	.190"	.240"	CFRP	Vertical Machining Center	none

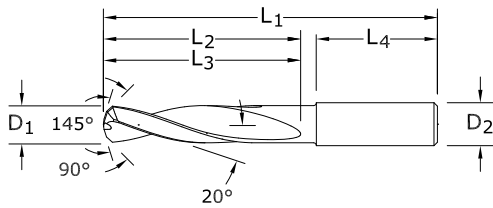
TOOL NO.	TYPE DESCRIPTION	TIR IN MACHINE	USAGE
1	.190" CFRP drill uncoated	.0001"	50 holes
INSPECTION NOTES Good hole quality for 1st 3 holes. fraying starting by 3rd hole, .0021" wear			
1ST HOLE	3RD HOLE	50TH HOLE	AFTER 50 HOLES
			

TOOL NO.	TYPE DESCRIPTION	TIR IN MACHINE	USAGE
2	.190" CFRP drill diamond	.0002"	50 holes
INSPECTION NOTES Good hole quality all 50 holes slight fraying, .0013" wear			
1ST HOLE	25TH HOLE	50TH HOLE	AFTER 50 HOLES
			



PASSION.

- The compound angle creates 4 cutting edges along the drill point.
- Distinct double angle prevents abrasiveness of the Composite from localizing along the point and diminishing tool life.



TOLERANCES (inch)

DIAMETER	D ₁	D ₂
#40-1/2	+0.0000 / -0.0005	h6

TOLERANCES (mm)

DIAMETER	D ₁	D ₂
2,7-12	+0,000 / -0,013	h6

Series 120 Fractional & Metric

Cutting Diameter D ₁	Decimal Equivalent	Metric Equivalent	Shank Diameter D ₂	Overall Length L ₁	Flute Length L ₂ / L ₃	Shank Length L ₄	Di-NAMITE® (Diamond) EDP No.
#40	0.0980	2.49	1/8	2	9/16	1-1/4	50000
2,7 mm	0.1063		6,0	63,0	20,0	32,0	50001
3,0 mm	0.1181		6,0	63,0	20,0	36,0	50002
1/8	0.1250	3.18	1/4	2-1/2	3/4	1-7/16	50003
3,2 mm	0.1260		6,0	63,0	20,0	36,0	50004
#30	0.1285	3.26	1/4	2-1/2	3/4	1-7/16	50005
#28	0.1405	3.57	1/4	2-1/2	3/4	1-7/16	50006
#22	0.1570	3.99	1/4	2-5/8	7/8	1-7/16	50007
#21	0.1590	4.04	1/4	2-5/8	7/8	1-7/16	50008
4,1 mm	0.1614		6,0	66,0	24,0	36,0	50009
#19	0.1660	4.22	1/4	2-5/8	7/8	1-7/16	50010
11/64	0.1719	4.37	1/4	2-5/8	7/8	1-7/16	50011
3/16	0.1875	4.76	1/4	2-5/8	1	1-7/16	50012
#11	0.1910	4.85	1/4	2-5/8	1	1-7/16	50013
#8	0.1990	5.05	1/4	2-5/8	1	1-7/16	50014
#7	0.2010	5.11	1/4	2-5/8	1	1-7/16	50015
#2	0.2210	5.61	1/4	2-5/8	1	1-7/16	50016
6,0 mm	0.2362		6,0	66,0	28,0	36,0	50017
1/4	0.2500	6.35	1/4	3-1/8	1-5/16	1-7/16	50018
.2510	0.2510	6.38	5/16	3-1/8	1-5/16	1-7/16	50019
F	0.2570	6.53	5/16	3-1/8	1-5/16	1-7/16	50020
I	0.2720	6.91	5/16	3-1/8	1-5/16	1-7/16	50021
J	0.2770	7.04	5/16	3-1/8	1-5/16	1-7/16	50022
K	0.2810	7.14	5/16	3-1/8	1-9/16	1-7/16	50023
5/16	0.3125	7.94	5/16	3-1/8	1-9/16	1-7/16	50024
8,0 mm	0.3150		8,0	79,0	41,0	36,0	50025
3/8	0.3750	9.53	3/8	3-1/2	1-27/32	1-9/16	50026
V	0.3770	9.58	1/2	3-1/2	1-27/32	1-9/16	50027
10,0 mm	0.3937		10,0	89,0	47,0	40,0	50028
7/16	0.4375	11.11	1/2	4-1/16	2-3/16	1-9/16	50029
12,0 mm	0.4724		12,0	102,0	55,0	45,0	50030
1/2	0.5000	12.70	1/2	4-1/4	2-5/16	1-3/4	50031

- Common
- 3xD Reach
- Right Spiral
- External Coolant
- 2 Flutes

Series 120 Fractional	Vc (sfm)		Diameter (D ₁) (inch)						
			1/8	3/16	1/4	5/16	3/8	7/16	1/2
N CFRP, AFRP (Carbon Fiber, Aramid Fiber)	320	RPM	9779	6519	4890	3912	3260	2794	2445
	(256-384)	Fr	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024
		Feed (ipm)	5.9	5.9	5.9	5.9	5.9	5.9	5.9
N GFRP (Fiberglass)	240	RPM	7334	4890	3667	2934	2445	2096	1834
	(192-288)	Fr	0.0006	0.0009	0.0012	0.0015	0.0018	0.0021	0.0024
		Feed (ipm)	4.4	4.4	4.4	4.4	4.4	4.4	4.4
N CARBON, GRAPHITE	400	RPM	12224	8149	6112	4890	4075	3493	3056
	(320-480)	Fr	0.0008	0.0012	0.0016	0.0020	0.0024	0.0028	0.0032
		Feed (ipm)	9.8	9.8	9.8	9.8	9.8	9.8	9.8

Note:

- $rpm = Vc \times 3.82 / D_1$
- $ipm = Fr \times RPM$
- adjust speed and / or feed based on resin type and / or fiber structure
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Series 120 Metric	Vc (m/min)		Diameter (D ₁) (mm)						
			2.5	3	4	6	8	10	12
N CFRP, AFRP (Carbon Fiber, Aramid Fiber)	100	RPM	12722	10602	7951	5301	3976	3181	2650
	(80-120)	Fr	0.012	0.014	0.019	0.028	0.038	0.047	0.057
		Feed (mm/min)	150	150	150	150	150	150	150
N GFRP (Fiberglass)	75	RPM	9542	7951	5963	3976	2982	2385	1988
	(65-90)	Fr	0.012	0.014	0.019	0.029	0.039	0.048	0.058
		Feed (mm/min)	115	115	115	115	115	115	115
N CARBON, GRAPHITE	120	RPM	15266	12722	9542	6361	4771	3817	3181
	(96-144)	Fr	0.015	0.018	0.025	0.037	0.049	0.062	0.074
		Feed (mm/min)	235	235	235	235	235	235	235

Note:

- $rpm = (Vc \times 1000) / (D_1 \times 3.14)$
- $mm/min = Fr \times RPM$
- adjust speed and / or feed based on resin type and / or fiber structure
- refer to the KYOCERA SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

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KYOCERA SGS Precision Tools is an ISO-certified leader of round solid carbide cutting tool technology for the aerospace, metalworking, and automotive industries with manufacturing sites in the United States and United Kingdom. Our global network of Sales Representatives, Industrial Distributors, and Agents blanket the world selling into more than 60 countries.

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Brand names such as Z-Carb, S-Carb®, V-Carb, Hi-PerCarb, Multi-Carb have become synonymous with high performance tooling in the machining and metalworking industry.

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