

**HIGH
PERFORMANCE
CARBIDE
CUTTING
TOOLS**

2003-04 Product Line

*New, easier to use format
Including over 2,000 new items!*

®

**TOOL
CAR**



For nearly sixty years, Garr Tool Company has committed to manufacturing the highest quality carbide cutting tools possible, offering competitive prices, and providing unequaled customer service.

Our current manufacturing facility is 150,000 square feet of clean, efficient production space, housing state-of-the-art CNC grinding equipment run by conscientious operators. During 2001-2002, we invested in a 45,000 square foot addition that is dedicated entirely to the production of drills. We also added 21 new CNC grinders to increase our production capability. We will continue investing in new technology to meet the future needs of our customers.

We earned our reputation of having fast, reliable deliveries, and we will continue to earn your trust through fast, reliable service. Our standard catalog items are shipped from stock within 24 hours at a 99% fill rate. During 2001-2002, we added 43 new series with over 2,000 new EDPs. We also take pride in delivering special tools quoted to customer specification within two weeks. Our new website, www.garrtool.com, will enhance the level of customer service you have come to expect from us.

Our international network of distributors, as well as each of us at Garr Tool, look forward to servicing all of your carbide tooling requirements.

Standards

Every Garr Tool carbide cutting tool is manufactured from centerless ground premium submicron grain carbide unless otherwise noted. Each of our styles of end mills are made center cutting.

All Garr Tool products are proudly manufactured in the United States.

Altered Standards 48 Hour Delivery

Many special tooling needs can be satisfied by adding a flat, a corner radius or by making a minor diameter change to one of our standard tools. Garr Tool Company will ship altered standards within 48 hours. Call for pricing.

Solid Carbide Specials 2 Week Delivery

Blueprint and non-blueprint specials will be quoted within 24 hours. Uncoated tooling made from stock material will be manufactured to your specifications within two weeks.

Solid carbide cutting tools which are 1" or less in diameter and up to 12" in length can be produced from premium submicron grain carbide in the time it takes most manufacturers to quote and order material.

Let Garr Tool take care of your special tooling needs. We deliver.

Reconditioning Service

With our state-of-the-art reconditioning department, you can expect quality reground tools at competitive prices.

Let Garr Tool be your 'local' regrounding source.

GARR TOOL®

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Printed in the United States.

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**TIN
(Titanium Nitride)**

General purpose coating – low heat resistance. Good lubricity

**TICN
(Titanium Carbonitride)**

Good abrasion resistance. Recommended for aluminum, brass and bronze applications. Low heat resistance – good lubricity.

**TIALN
(Titanium Aluminum Nitride)**

Multilayer coating with good thermal stability for increased speeds and feeds. For semi-dry to dry cutting of most steels, high-nickel alloys, stainless steel and cast iron. Excellent heat resistance – good lubricity. For materials that are 40Rc and under.

**Balinit® X.TREME
(Titanium Aluminum Nitride)**

Single layer coating with excellent thermal stability. For dry cutting of hardened mold and die steels, A2, D2, P20, 4140, H13 and extremely abrasive materials such as graphite. Excellent heat resistance – great for materials 40Rc to 60Rc.

**Balinit® HARDLUBE**

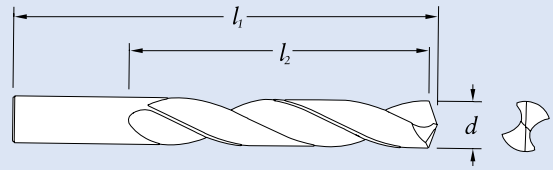
A multilayer coating with thermal stability and lubricating properties needed for drilling of steels, high-nickel alloys, stainless steel, cast iron, aluminum, brass and bronze. Excellent heat resistance – great lubricity.

**CRYSTALLINE DIAMOND**

Improved productivity in composites and non-ferrous metals. Excellent choice for cutting graphite, fiberglass, and silicon based aluminum. Can be added to a special for milling or drilling applications.

Series 1580H

140° high performance drill point

NEW
SERIES

3xD - 2 Flute

Balinit® HARDLUBE Coated

High Performance - High Penetration

Extended tool life and greater surface finishes through faster SFM rates

Up to 50% faster than standard carbide drills

30° helix for better chip evacuation

Honed cutting edge

High nickel, high temperature alloys, cobalt based alloys, stainless steels and tool steels



TOLERANCES

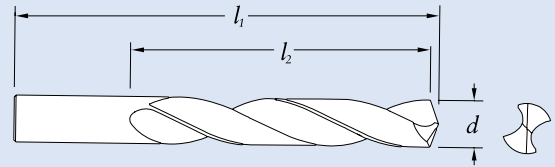
 $\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm) l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm) l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter [†]	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20301	3mm	.1181	46mm	16mm	24.04	22.99	21.95	20.90
20306	#31 (3.05mm)	.1200	1-13/16	5/8	24.28	23.22	22.17	21.11
20311	1/8 (3.17mm)	.1250	1-15/16	11/16	24.50	23.43	22.37	21.30
20316	#30 (3.26mm)	.1285	1-15/16	11/16	24.71	23.64	22.56	21.49
20321	#29 (3.45mm)	.1360	2-1/16	3/4	24.96	23.87	22.79	21.70
20326	3.5mm	.1378	52mm	19mm	25.20	24.10	23.01	21.91
20331	#28 (3.57mm)	.1405	2-1/16	3/4	25.43	24.32	23.22	22.11
20336	9/64 (3.57mm)	.1406	2-1/16	3/4	25.65	24.53	23.42	22.30
20341	#27 (3.67mm)	.1440	2-1/16	3/4	25.88	24.75	23.63	22.50
20346	#26 (3.73mm)	.1470	2-3/16	13/16	26.09	24.96	23.82	22.69
20351	#25 (3.80mm)	.1495	2-3/16	13/16	26.36	25.21	24.07	22.92
20356	#24 (3.86mm)	.1520	2-3/16	13/16	26.57	25.41	24.26	23.10
20361	#23 (3.91mm)	.1540	2-3/16	13/16	26.80	25.63	24.47	23.30
20366	5/32 (3.97mm)	.1562	2-3/16	13/16	27.01	25.84	24.66	23.49
20371	#22 (3.99mm)	.1570	2-3/16	13/16	27.26	26.07	24.89	23.70
20376	4mm	.1575	55.5mm	20.6mm	27.47	26.28	25.08	23.89
20381	#21 (4.04mm)	.1590	2-3/16	13/16	27.72	26.51	25.31	24.10
20386	#20 (4.09mm)	.1610	2-3/16	13/16	27.95	26.73	25.52	24.30
20391	#19 (4.22mm)	.1660	2-9/32	15/16	28.19	26.96	25.74	24.51
20396	#18 (4.30mm)	.1695	2-9/32	15/16	28.41	27.17	25.94	24.70
20401	11/64 (4.37mm)	.1719	2-9/32	15/16	28.65	27.40	26.16	24.91
20406	#17 (4.39mm)	.1730	2-9/32	15/16	28.88	27.62	26.37	25.11
20411	#16 (4.49mm)	.1770	2-9/32	15/16	29.08	27.82	26.55	25.29
20416	4.5mm	.1772	58mm	24mm	29.33	28.05	26.78	25.50
20421	#15 (4.57mm)	.1800	2-9/32	15/16	29.53	28.25	26.96	25.68
20426	#14 (4.62mm)	.1820	2-9/32	15/16	29.81	28.51	27.22	25.92
20431	#13 (4.70mm)	.1850	2-9/32	15/16	30.02	28.71	27.41	26.10
20436	3/16 (4.76mm)	.1875	2-13/32	1	30.26	28.94	27.63	26.31
20441	#12 (4.80mm)	.1890	2-13/32	1	30.48	29.15	27.83	26.50
20446	#11 (4.85mm)	.1910	2-13/32	1	30.76	29.42	28.09	26.75
20451	#10 (4.91mm)	.1935	2-13/32	1	30.94	29.59	28.25	26.90
20456	#9 (4.98mm)	.1960	2-13/32	1	31.17	29.81	28.46	27.10
20461	5mm	.1969	61mm	25mm	31.34	29.98	28.61	27.25
20466	#8 (5.05mm)	.1990	2-13/32	1	31.63	30.25	28.88	27.50
20471	#7 (5.10mm)	.2010	2-13/32	1	31.72	30.34	28.96	27.58
20476	13/64 (5.16mm)	.2031	2-13/32	1	31.94	30.55	29.16	27.77
20481	#6 (5.18mm)	.2040	2-13/32	1	32.15	30.75	29.35	27.96
20486	#5 (5.22mm)	.2055	2-13/32	1	32.38	30.97	29.56	28.16
20491	#4 (5.31mm)	.2090	2-13/32	1	32.59	31.17	29.76	28.34
20496	#3 (5.41mm)	.2130	2-5/8	1-3/32	32.80	31.37	29.95	28.52
20501	5.5mm	.2165	67mm	28mm	33.01	31.57	30.14	28.70
20506	7/32 (5.56mm)	.2188	2-5/8	1-3/32	33.29	31.84	30.40	28.95
20511	#2 (5.61mm)	.2210	2-5/8	1-3/32	33.53	32.07	30.61	29.16
20516	#1 (5.79mm)	.2280	2-5/8	1-3/32	33.78	32.31	30.84	29.37
20521	A (5.94mm)	.2340	2-5/8	1-3/32	34.01	32.53	31.05	29.57
20526	15/64 (5.95mm)	.2344	2-5/8	1-3/32	34.27	32.78	31.29	29.80

EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20531	6mm	.2362	67mm	28mm	34.51	33.01	31.51	30.01
20536	B (6.04mm)	.2380	2-3/4	1-7/32	34.74	33.23	31.72	30.21
20541	C (6.15mm)	.2420	2-3/4	1-7/32	35.02	33.50	31.97	30.45
20546	D (6.25mm)	.2460	2-3/4	1-7/32	35.22	33.69	32.16	30.63
20551	1/4 E (6.35mm)	.2500	2-3/4	1-7/32	35.52	33.98	32.43	30.89
20556	6.5mm	.2559	70mm	31mm	36.09	34.52	32.95	31.38
20561	F (6.53mm)	.2570	2-3/4	1-7/32	36.65	35.06	33.46	31.87
20566	G (6.63mm)	.2610	2-3/4	1-7/32	37.21	35.59	33.97	32.36
20571	17/64 (6.75mm)	.2656	2-15/16	1-11/32	37.78	36.14	34.49	32.85
20576	H (6.76mm)	.2660	2-15/16	1-11/32	38.34	36.67	35.01	33.34
20581	I (6.91mm)	.2720	2-15/16	1-11/32	38.90	37.21	35.52	33.83
20586	7mm	.2756	74.6mm	34mm	39.47	37.75	36.04	34.32
20591	J (7.03mm)	.2770	2-15/16	1-11/32	40.02	38.28	36.54	34.80
20596	K (7.14mm)	.2810	2-15/16	1-11/32	40.60	38.83	37.07	35.30
20601	9/32 (7.14mm)	.2812	2-15/16	1-11/32	41.16	39.37	37.58	35.79
20606	L (7.37mm)	.2900	2-15/16	1-11/32	41.72	39.91	38.09	36.28
20611	M (7.49mm)	.2950	2-15/16	1-11/32	42.53	40.68	38.83	36.98
20616	7.5mm	.2953	74.6mm	34mm	42.53	40.68	38.83	36.98
20621	19/64 (7.54mm)	.2969	3-3/32	1-15/32	42.90	41.03	39.17	37.30
20626	N (7.67mm)	.3020	3-3/32	1-15/32	44.83	42.88	40.93	38.98
20631	5/16 (7.94mm)	.3125	3-3/32	1-15/32	44.98	43.02	41.07	39.11
20636	8mm	.3150	78.6mm	37mm	47.74	45.66	43.59	41.51
20641	O (8.03mm)	.3160	3-3/32	1-15/32	47.74	45.66	43.59	41.51
20646	P (8.20mm)	.3230	3-3/32	1-15/32	48.09	46.00	43.91	41.82
20651	21/64 (8.33mm)	.3281	3-3/32	1-15/32	48.98	46.85	44.72	42.59
20656	Q (8.43mm)	.3320	3-3/32	1-15/32	49.86	47.69	45.52	43.36
20661	8.5mm	.3346	78.6mm	37mm	50.07	47.89	45.72	43.54
20666	R (8.61mm)	.3390	3-15/16	1-9/16	51.41	49.17	46.94	44.70
20671	11/32 (8.73mm)	.3438	3-15/16	1-9/16	52.54	50.26	47.97	45.69
20676	S (8.84mm)	.3480	3-15/16	1-9/16	54.28	51.92	49.56	47.20
20681	9mm	.3543	84mm	40mm	55.66	53.24	50.82	48.40
20686	T (9.09mm)	.3580	3-5/16	1-9/16	57.85	55.33	52.82	50.30
20691	23/64 (9.13mm)	.3594	3-5/16	1-9/16	58.20	55.67	53.14	50.61
20696	U (9.35mm)	.3680	3-5/16	1-9/16	61.23	58.57	55.91	53.24
20701	9.5mm	.3740	84mm	40mm	61.73	59.05	56.36	53.68
20706	3/8 (9.52mm)	.3750	3-1/2	1-11/16	62.11	59.41	56.71	54.01
20711	V (9.57mm)	.3770	3-1/2	1-11/16	64.49	61.69	58.88	56.08
20716	W (9.80mm)	.3860	3-1/2	1-11/16	65.62	62.77	59.91	57.06
20721	25/64 (9.92mm)	.3906	3-1/2	1-11/16	66.44	63.55	60.66	57.77
20726	10mm	.3937	89mm	43mm	68.45	65.47	62.50	59.52
20731	X (10.08mm)	.3970	3-1/2	1-11/16	70.13	67.08	64.03	60.98
20736	Y (10.26mm)	.4040	3-1/2	1-11/16	70.61	67.54	64.47	61.40
20741	13/32 (10.32mm)	.4062	3-1/2	1-11/16	72.78	69.62	66.45	63.29
20746	Z (10.49mm)	.4130	3-1/2	1-11/16	73.45	70.26	67.06	63.87
20751	10.5mm	.4134	89mm	43mm	73.45	70.26	67.06	63.87
20756	27/64 (10.72mm)	.4219	3-3/4	1-13/16	74.14	70.92	67.69	64.47
20761	11mm	.4331	95mm	46mm	79.59	76.13	72.67	69.21
20766	7/16 (11.11mm)	.4375	3-3/4	1-13/16	79.59	76.13	72.67	69.21
20771	11.5mm	.4528	95mm	46mm	85.43	81.72	78.00	74.29
20776	29/64 (11.51mm)	.4531	3-3/4	1-13/16	85.43	81.72	78.00	74.29
20781	15/32 (11.91mm)	.4688	4	1-15/16	89.76	85.86	81.95	78.05
20786	12mm	.4724	101.6mm	49mm	90.03	86.12	82.20	78.29
20791	31/64 (12.30mm)	.4844	4	1-15/16	90.64	86.70	82.76	78.82
20796	12.5mm	.4921	101.6mm	49mm	91.55	87.57	83.59	79.61
20801	1/2 (12.70mm)	.5000	4	1-15/16	92.13	88.12	84.12	80.11
20806	13mm	.5118	107mm	53mm	102.27	97.82	93.38	88.93
20811	33/64 (13.10mm)	.5156	4-7/32	2-3/32	104.67	100.12	95.57	91.02
20816	17/32 (13.49mm)	.5312	4-7/32	2-3/32	107.09	102.43	97.78	93.12
20821	13.5mm	.5315	109.5mm	56mm	109.50	104.74	99.98	95.22
20826	35/64 (13.89mm)	.5469	4-5/16	2-7/32	111.90	107.03	102.17	97.30
20831	14mm	.5512	109.5mm	56mm	114.33	109.36	104.39	99.42
20836	9/16 (14.29mm)	.5625	4-9/16	2-15/32	123.54	118.17	112.80	107.43
20841	14.5mm	.5709	116mm	63mm	125.86	120.39	114.92	109.44
20846	37/64 (14.68mm)	.5781	4-15/16	2-9/16	128.11	122.54	116.97	111.40
20851	15mm	.5906	125mm	65mm	130.47	124.80	119.12	113.45
20856	19/32 (15.08mm)	.5938	4-15/16	2-9/16	131.18	125.48	119.77	114.07
20861	39/64 (15.48mm)	.6094	5-1/16	2-13/16	131.84	126.11	120.38	114.64
20866	15.5mm	.6102	128.6mm	71mm	132.53	126.77	121.01	115.24
20871	5/8 (15.87mm)	.6250	5-1/4	3-1/8	133.18	127.39	121.60	115.81
20876	16mm	.6299	133mm	79mm	136.40	130.47	124.54	118.61

Series 1280H

140° high performance drill point

NEW
SERIES

5xD - 2 Flute

Balinit® HARDLUBE Coated

High Performance - High Penetration

Extended tool life and greater surface finishes
through faster SFM rates

Up to 50% faster than standard carbide drills

30° helix for better chip evacuation

Honed cutting edge

High nickel, high temperature alloys, cobalt based alloys,
stainless steels and tool steels

TOLERANCES

Ød +.0000 - .0005" (+0.0000 - 0.0127mm)

 l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

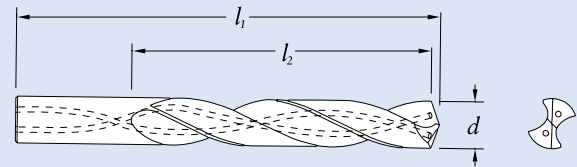
 l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
21301	3mm	.1181	51mm	19mm	25.12	24.03	22.94	21.84
21306	#31 (3.05mm)	.1200	2	3/4	25.32	24.22	23.12	22.02
21311	1/8 (3.17mm)	.1250	2	3/4	25.52	24.41	23.30	22.19
21316	#30 (3.26mm)	.1285	2-1/4	3/4	25.75	24.63	23.51	22.39
21321	#29 (3.45mm)	.1360	2-1/4	7/8	25.94	24.81	23.68	22.56
21326	3.5mm	.1378	57mm	22mm	26.14	25.00	23.87	22.73
21331	#28 (3.57mm)	.1405	2-1/4	7/8	26.36	25.21	24.07	22.92
21336	9/64 (3.57mm)	.1406	2-1/4	7/8	26.58	25.42	24.27	23.11
21341	#27 (3.67mm)	.1440	2-1/4	7/8	26.76	25.60	24.43	23.27
21346	#26 (3.73mm)	.1470	2-1/4	7/8	26.98	25.81	24.63	23.46
21351	#25 (3.80mm)	.1495	2-1/4	15/16	27.19	26.01	24.83	23.64
21356	#24 (3.86mm)	.1520	2-1/4	15/16	27.38	26.19	25.00	23.81
21361	#23 (3.91mm)	.1540	2-1/4	15/16	27.61	26.41	25.21	24.01
21366	5/32 (3.97mm)	.1562	2-1/2	15/16	27.81	26.60	25.39	24.18
21371	#22 (3.99mm)	.1570	2-1/2	15/16	28.01	26.79	25.57	24.36
21376	4mm	.1575	63.5mm	24mm	28.22	26.99	25.77	24.54
21381	#21 (4.04mm)	.1590	2-1/2	15/16	28.42	27.18	25.95	24.71
21386	#20 (4.09mm)	.1610	2-1/2	15/16	28.64	27.39	26.15	24.90
21391	#19 (4.22mm)	.1660	2-1/2	1	28.85	27.60	26.34	25.09
21396	#18 (4.30mm)	.1695	2-1/2	1	29.05	27.79	26.52	25.26
21401	11/64 (4.37mm)	.1719	2-1/2	1	29.26	27.99	26.72	25.44
21406	#17 (4.39mm)	.1730	2-1/2	1	29.45	28.17	26.89	25.61
21411	#16 (4.49mm)	.1770	2-1/2	1	29.67	28.38	27.09	25.80
21416	4.5mm	.1772	63.5mm	25mm	29.89	28.59	27.29	25.99
21421	#15 (4.57mm)	.1800	2-3/4	1	30.08	28.77	27.46	26.16
21426	#14 (4.62mm)	.1820	2-3/4	1	30.28	28.96	27.65	26.33
21431	#13 (4.70mm)	.1850	2-3/4	1-1/4	30.50	29.17	27.85	26.52
21436	3/16 (4.76mm)	.1875	2-3/4	1-1/4	30.72	29.38	28.05	26.71
21441	#12 (4.80mm)	.1890	2-3/4	1-1/4	30.91	29.57	28.22	26.88
21446	#11 (4.85mm)	.1910	2-3/4	1-1/4	31.11	29.76	28.40	27.05
21451	#10 (4.91mm)	.1935	2-3/4	1-1/4	31.33	29.97	28.61	27.24
21456	#9 (4.98mm)	.1960	3	1-5/16	31.52	30.15	28.78	27.41
21461	5mm	.1969	76mm	33mm	31.74	30.36	28.98	27.60
21466	#8 (5.05mm)	.1990	3	1-5/16	31.90	30.51	29.13	27.74
21471	#7 (5.10mm)	.2010	3	1-5/16	32.04	30.65	29.25	27.86
21476	13/64 (5.16mm)	.2031	3	1-5/16	32.28	30.88	29.47	28.07
21481	#6 (5.18mm)	.2040	3	1-3/8	32.52	31.11	29.69	28.28
21486	#5 (5.22mm)	.2055	3	1-3/8	32.74	31.32	29.89	28.47
21491	#4 (5.31mm)	.2090	3	1-3/8	32.95	31.52	30.08	28.65
21496	#3 (5.41mm)	.2130	3	1-3/8	33.17	31.73	30.29	28.84
21501	5.5mm	.2165	76mm	35mm	33.38	31.93	30.48	29.03
21506	7/32 (5.56mm)	.2188	3	1-3/8	33.60	32.14	30.68	29.22
21511	#2 (5.61mm)	.2210	3	1-3/8	34.32	32.83	31.34	29.84
21516	#1 (5.79mm)	.2280	3	1-3/8	34.49	32.99	31.49	29.99
21521	A (5.94mm)	.2340	3-1/4	1-1/2	35.01	33.49	31.97	30.44
21526	15/64 (5.95mm)	.2344	3-1/4	1-1/2	35.10	33.57	32.05	30.52

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
21531	6mm	.2362	82.5mm	38mm	35.21	33.68	32.15	30.62
21536	B (6.04mm)	.2380	3-1/4	1-5/8	35.31	33.77	32.24	30.70
21541	C (6.15mm)	.2420	3-1/4	1-5/8	35.55	34.00	32.46	30.91
21546	D (6.25mm)	.2460	3-1/4	1-5/8	35.78	34.22	32.67	31.11
21551	1/4 E (6.35mm)	.2500	3-1/4	1-5/8	35.98	34.42	32.85	31.29
21556	6.5mm	.2559	82.5mm	41mm	36.62	35.03	33.44	31.84
21561	F (6.53mm)	.2570	3-1/4	1-11/16	37.24	35.62	34.00	32.38
21566	G (6.63mm)	.2610	3-1/2	1-11/16	37.88	36.23	34.59	32.94
21571	17/64 (6.75mm)	.2656	3-1/2	1-11/16	38.50	36.83	35.15	33.48
21576	H (6.76mm)	.2660	3-1/2	1-11/16	39.16	37.46	35.75	34.05
21581	I (6.91mm)	.2720	3-1/2	1-11/16	39.78	38.05	36.32	34.59
21586	7mm	.2756	89mm	43mm	40.40	38.64	36.89	35.13
21591	J (7.03mm)	.2770	3-1/2	1-11/16	41.04	39.26	37.47	35.69
21596	K (7.14mm)	.2810	3-1/2	1-3/4	41.69	39.88	38.06	36.25
21601	9/32 (7.14mm)	.2812	3-1/2	1-3/4	42.32	40.48	38.64	36.80
21606	L (7.37mm)	.2900	3-1/2	1-3/4	42.90	41.03	39.17	37.30
21611	M (7.49mm)	.2950	3-3/4	1-3/4	43.52	41.63	39.74	37.84
21616	7.5mm	.2953	95mm	44mm	43.52	41.63	39.74	37.84
21621	19/64 (7.54mm)	.2969	3-3/4	1-7/8	43.94	42.03	40.12	38.21
21626	N (7.67mm)	.3020	3-3/4	1-7/8	45.69	43.70	41.72	39.73
21631	5/16 (7.94mm)	.3125	3-3/4	1-7/8	45.83	43.84	41.84	39.85
21636	8mm	.3150	95mm	48mm	48.61	46.50	44.38	42.27
21641	O (8.03mm)	.3160	3-3/4	1-7/8	48.61	46.50	44.38	42.27
21646	P (8.20mm)	.3230	3-3/4	2-3/32	48.78	46.66	44.54	42.42
21651	21/64 (8.33mm)	.3281	4	2-3/32	49.23	47.09	44.95	42.81
21656	Q (8.43mm)	.3320	4	2-3/32	50.21	48.03	45.84	43.66
21661	8.5mm	.3346	101.6mm	53mm	50.58	48.38	46.18	43.98
21666	R (8.61mm)	.3390	4	2-3/32	51.96	49.70	47.44	45.18
21671	11/32 (8.73mm)	.3438	4	2-3/16	53.79	51.45	49.11	46.77
21676	S (8.84mm)	.3480	4	2-3/16	55.89	53.46	51.03	48.60
21681	9mm	.3543	101.6mm	55.5mm	56.22	53.78	51.33	48.89
21686	T (9.09mm)	.3580	4-1/4	2-9/32	58.44	55.90	53.36	50.82
21691	23/64 (9.13mm)	.3594	4-1/4	2-9/32	58.79	56.23	53.68	51.12
21696	U (9.35mm)	.3680	4-1/4	2-9/32	64.87	62.05	59.23	56.41
21701	9.5mm	.3740	108mm	58mm	65.50	62.65	59.80	56.96
21706	3/8 (9.52mm)	.3750	4-1/4	2-3/8	66.16	63.28	60.41	57.53
21711	V (9.57mm)	.3770	4-1/4	2-3/8	67.78	64.83	61.89	58.94
21716	W (9.80mm)	.3860	4-1/2	2-3/8	68.98	65.98	62.98	59.98
21721	25/64 (9.92mm)	.3906	4-1/2	2-3/8	69.82	66.78	63.75	60.71
21726	10mm	.3937	114mm	60mm	71.91	68.78	65.66	62.53
21731	X (10.08mm)	.3970	4-1/2	2-1/2	73.57	70.37	67.17	63.97
21736	Y (10.26mm)	.4040	4-1/2	2-9/16	75.79	72.49	69.20	65.90
21741	13/32 (10.32mm)	.4062	4-1/2	2-9/16	76.44	73.12	69.79	66.47
21746	Z (10.49mm)	.4130	4-1/2	2-5/8	77.14	73.79	70.43	67.08
21751	10.5mm	.4134	114mm	67mm	77.14	73.79	70.43	67.08
21756	27/64 (10.72mm)	.4219	4-1/2	2-11/16	77.84	74.46	71.07	67.69
21761	11mm	.4331	114mm	68mm	83.52	79.89	76.26	72.63
21766	7/16 (11.11mm)	.4375	4-3/4	2-13/16	83.85	80.20	76.56	72.91
21771	11.5mm	.4528	121mm	71mm	89.61	85.71	81.82	77.92
21776	29/64 (11.51mm)	.4531	4-3/4	2-7/8	89.61	85.71	81.82	77.92
21781	15/32 (11.91mm)	.4688	4-3/4	2-7/8	94.12	90.03	85.94	81.84
21786	12mm	.4724	121mm	73mm	94.39	90.29	86.18	82.08
21791	31/64 (12.30mm)	.4844	5-5/16	3	95.44	91.29	87.14	82.99
21796	12.5mm	.4921	135mm	76mm	96.58	92.38	88.18	83.98
21801	1/2 (12.70mm)	.5000	5-3/8	3-1/16	96.78	92.57	88.36	84.16
21806	13mm	.5118	136.5mm	78mm	107.65	102.97	98.29	93.61
21811	33/64 (13.10mm)	.5156	5-3/8	3-1/8	110.17	105.38	100.59	95.80
21816	17/32 (13.49mm)	.5312	5-11/16	3-5/16	112.76	107.86	102.95	98.05
21821	13.5mm	.5315	144mm	84mm	115.25	110.24	105.23	100.22
21826	35/64 (13.89mm)	.5469	5-13/16	3-3/8	117.76	112.64	107.52	102.40
21831	14mm	.5512	148mm	86mm	120.30	115.07	109.84	104.61
21836	9/16 (14.29mm)	.5625	5-15/16	3-1/2	130.07	124.41	118.76	113.10
21841	14.5mm	.5709	151mm	89mm	132.46	126.70	120.94	115.18
21846	37/64 (14.68mm)	.5781	6	3-1/2	134.84	128.98	123.11	117.25
21851	15mm	.5906	152.4mm	90mm	137.36	131.39	125.42	119.44
21856	19/32 (15.08mm)	.5938	6	3-9/16	138.07	132.07	126.06	120.06
21861	39/64 (15.48mm)	.6094	6-3/16	3-11/16	149.62	143.11	136.61	130.11
21866	15.5mm	.6102	157mm	94mm	150.31	143.77	137.24	130.71
21871	5/8 (15.87mm)	.6250	6-5/16	3-3/4	151.02	144.45	137.89	131.32
21876	16mm	.6299	160mm	95mm	154.40	147.69	140.97	134.26

Series **1280KC**

140° high performance drill point

**NEW
SERIES**

5xD - 2 Flute Coolant Fed - TiCN Coated

High Performance - High Penetration

Coolant through capabilities for high pressure coolant systems

Minimum 500 psi of coolant recommended for proper usage

Up to 70% faster than standard carbide drills

30° helix for better chip evacuation

Honed cutting edge

High nickel, high temperature alloys, cobalt based alloys,
stainless steels and tool steels**TOLERANCES**

Ød +.0000 - .0005" (+0.0000 - 0.0127mm)

 l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

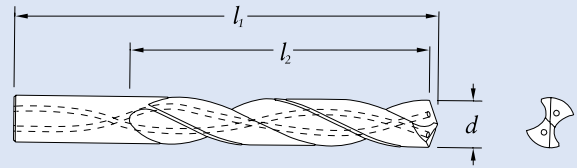
 l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
25571	7/32 (5.56mm)	.2188	3	1-3/8	47.12	45.07	43.02	40.97
25576	#2 (5.61mm)	.2210	3	1-3/8	47.91	45.83	43.74	41.66
25581	#1 (5.79mm)	.2280	3	1-3/8	48.09	46.00	43.91	41.82
25586	A (5.94mm)	.2340	3-1/4	1-1/2	53.97	51.62	49.28	46.93
25591	15/64 (5.95mm)	.2344	3-1/4	1-1/2	54.07	51.72	49.37	47.02
25596	6mm	.2362	82.5mm	38mm	54.20	51.84	49.49	47.13
25601	B (6.04mm)	.2380	3-1/4	1-5/8	55.97	53.54	51.10	48.67
25606	C (6.15mm)	.2420	3-1/4	1-5/8	56.24	53.79	51.35	48.90
25611	D (6.25mm)	.2460	3-1/4	1-5/8	56.49	54.03	51.58	49.12
25616	1/4 E (6.35mm)	.2500	3-1/4	1-5/8	56.72	54.25	51.79	49.32
25621	6.5mm	.2559	82.5mm	41mm	57.42	54.92	52.43	49.93
25626	F (6.53mm)	.2570	3-1/4	1-11/16	58.75	56.20	53.64	51.09
25631	G (6.63mm)	.2610	3-1/2	1-11/16	59.47	56.88	54.30	51.71
25636	17/64 (6.75mm)	.2656	3-1/2	1-11/16	60.16	57.54	54.93	52.31
25641	H (6.76mm)	.2660	3-1/2	1-11/16	60.88	58.23	55.59	52.94
25646	I (6.91mm)	.2720	3-1/2	1-11/16	60.95	58.30	55.65	53.00
25651	7mm	.2756	89mm	43mm	61.64	58.96	56.28	53.60
25656	J (7.03mm)	.2770	3-1/2	1-11/16	64.77	61.95	59.14	56.32
25661	K (7.14mm)	.2810	3-1/2	1-3/4	65.48	62.63	59.79	56.94
25666	9/32 (7.14mm)	.2812	3-1/2	1-3/4	66.19	63.31	60.43	57.56
25671	L (7.37mm)	.2900	3-1/2	1-3/4	66.49	63.60	60.71	57.82
25676	M (7.49mm)	.2950	3-3/4	1-3/4	66.88	63.97	61.06	58.16
25681	7.5mm	.2953	95mm	44mm	66.88	63.97	61.06	58.16
25686	19/64 (7.54mm)	.2969	3-3/4	1-7/8	71.44	68.33	65.23	62.12
25691	N (7.67mm)	.3020	3-3/4	1-7/8	73.06	69.88	66.71	63.53
25696	5/16 (7.94mm)	.3125	3-3/4	1-7/8	73.22	70.04	66.85	63.67
25701	8mm	.3150	95mm	48mm	76.31	72.99	69.67	66.36
25706	O (8.03mm)	.3160	3-3/4	1-7/8	77.00	73.65	70.30	66.96
25711	P (8.20mm)	.3230	3-3/4	2-3/32	77.20	73.84	70.49	67.13
25716	21/64 (8.33mm)	.3281	4	2-3/32	77.71	74.33	70.95	67.57
25721	Q (8.43mm)	.3320	4	2-3/32	78.15	74.75	71.35	67.96
25726	8.5mm	.3346	101.6mm	53mm	78.56	75.14	71.73	68.31
25731	R (8.61mm)	.3390	4	2-3/32	82.01	78.44	74.88	71.31
25736	11/32 (8.73mm)	.3438	4	2-3/16	84.04	80.39	76.73	73.08
25741	S (8.84mm)	.3480	4	2-3/16	85.93	82.19	78.46	74.72
25746	9mm	.3543	101.6mm	55.5mm	86.30	82.55	78.80	75.04
25751	T (9.09mm)	.3580	4-1/4	2-9/32	87.93	84.11	80.28	76.46
25756	23/64 (9.13mm)	.3594	4-1/4	2-9/32	88.26	84.42	80.58	76.75
25761	U (9.35mm)	.3680	4-1/4	2-9/32	93.55	89.48	85.41	81.35
25766	9.5mm	.3740	108mm	58mm	94.01	89.92	85.83	81.75
25771	3/8 (9.52mm)	.3750	4-1/4	2-3/8	96.34	92.15	87.96	83.77
25776	V (9.57mm)	.3770	4-1/4	2-3/8	96.65	92.45	88.25	84.04
25781	W (9.80mm)	.3860	4-1/2	2-3/8	97.72	93.47	89.22	84.97

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
25786	25/64 (9.92mm)	.3906	4-1/2	2-3/8	98.45	94.17	89.89	85.61
25791	10mm	.3937	114mm	60mm	99.35	95.03	90.71	86.39
25796	X (10.08mm)	.3970	4-1/2	2-1/2	103.82	99.31	94.79	90.28
25801	Y (10.26mm)	.4040	4-1/2	2-9/16	104.28	99.75	95.21	90.68
25806	13/32 (10.32mm)	.4062	4-1/2	2-9/16	106.28	101.66	97.04	92.42
25811	Z (10.49mm)	.4130	4-1/2	2-5/8	107.96	103.27	98.57	93.88
25816	10.5mm	.4134	114mm	67mm	107.96	103.27	98.57	93.88
25821	27/64 (10.72mm)	.4219	4-1/2	2-11/16	109.49	104.73	99.97	95.21
25826	11mm	.4331	114mm	68mm	113.42	108.49	103.56	98.63
25831	7/16 (11.11mm)	.4375	4-3/4	2-13/16	115.72	110.69	105.66	100.63
25836	11.5mm	.4528	121mm	71mm	119.85	114.64	109.43	104.22
25841	29/64 (11.51mm)	.4531	4-3/4	2-7/8	123.94	118.55	113.16	107.77
25846	15/32 (11.91mm)	.4688	4-3/4	2-7/8	126.78	121.27	115.76	110.24
25851	12mm	.4724	121mm	73mm	129.51	123.88	118.25	112.62
25856	31/64 (12.30mm)	.4844	5-5/16	3	138.20	132.19	126.18	120.17
25861	12.5mm	.4921	135mm	76mm	148.34	141.89	135.44	128.99
25866	1/2 (12.70mm)	.5000	5-3/8	3-1/16	149.74	143.23	136.72	130.21
25871	13mm	.5118	136.5mm	78mm	169.83	162.45	155.06	147.68
25876	33/64 (13.10mm)	.5156	5-3/8	3-1/8	176.99	169.29	161.60	153.91
25881	17/32 (13.49mm)	.5312	5-11/16	3-5/16	179.86	172.04	164.22	156.40
25886	13.5mm	.5315	144mm	84mm	182.63	174.69	166.75	158.81
25891	35/64 (13.89mm)	.5469	5-13/16	3-3/8	192.64	184.26	175.89	167.51
25896	14mm	.5512	148mm	86mm	195.47	186.97	178.47	169.97
25901	9/16 (14.29mm)	.5625	5-15/16	3-1/2	211.86	202.65	193.44	184.23
25906	14.5mm	.5709	151mm	89mm	213.53	204.25	194.96	185.68
25911	37/64 (14.68mm)	.5781	6	3-1/2	214.10	204.79	195.48	186.17
25916	15mm	.5906	152.4mm	90mm	216.89	207.46	198.03	188.60
25921	19/32 (15.08mm)	.5938	6	3-9/16	222.54	212.86	203.19	193.51
25926	39/64 (15.48mm)	.6094	6-3/16	3-11/16	250.44	239.55	228.66	217.78
25931	15.5mm	.6102	157mm	94mm	251.13	240.21	229.29	218.38
25936	5/8 (15.87mm)	.6250	6-5/16	3-3/4	258.07	246.85	235.63	224.41
25941	16mm	.6299	160mm	95mm	261.45	250.08	238.71	227.35

Series **1880KC**

140° high performance drill point

**NEW
SERIES**

7xD - 2 Flute Coolant Fed - TiCN Coated

High Performance - High Penetration

Coolant through capabilities for high pressure coolant systems

Minimum 500 psi of coolant recommended for proper usage

Up to 70% faster than standard carbide drills

30° helix for better chip evacuation

Honed cutting edge

High nickel, high temperature alloys, cobalt based alloys,
stainless steels and tool steels**TOLERANCES** $\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm) l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm) l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

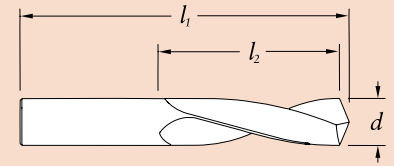
EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
26571	7/32 (5.56mm)	.2188	4	2	50.85	48.64	46.43	44.22
26576	#2 (5.61mm)	.2210	4	2	51.65	49.40	47.16	44.91
26581	#1 (5.79mm)	.2280	4-1/8	2-1/8	59.18	56.61	54.03	51.46
26586	A (5.94mm)	.2340	4-1/8	2-1/8	62.48	59.76	57.05	54.33
26591	15/64 (5.95mm)	.2344	4-1/8	2-1/8	62.58	59.86	57.14	54.42
26596	6mm	.2362	105mm	55mm	62.71	59.98	57.26	54.53
26601	B (6.04mm)	.2380	4-1/8	2-1/8	65.44	62.59	59.75	56.90
26606	C (6.15mm)	.2420	4-1/4	2-1/4	65.70	62.84	59.99	57.13
26611	D (6.25mm)	.2460	4-1/4	2-1/4	65.95	63.08	60.21	57.35
26616	1/4 E (6.35mm)	.2500	4-1/4	2-1/4	66.18	63.30	60.42	57.55
26621	6.5mm	.2559	108mm	58mm	66.88	63.97	61.06	58.16
26626	F (6.53mm)	.2570	4-3/8	2-3/8	69.45	66.43	63.41	60.39
26631	G (6.63mm)	.2610	4-3/8	2-3/8	70.16	67.11	64.06	61.01
26636	17/64 (6.75mm)	.2656	4-3/8	2-3/8	70.85	67.77	64.69	61.61
26641	H (6.76mm)	.2660	4-3/8	2-3/8	71.58	68.47	65.36	62.24
26646	I (6.91mm)	.2720	4-3/8	2-3/8	71.65	68.53	65.42	62.30
26651	7mm	.2756	111mm	61mm	72.34	69.19	66.05	62.90
26656	J (7.03mm)	.2770	4-3/8	2-3/8	75.99	72.69	69.38	66.08
26661	K (7.14mm)	.2810	4-7/16	2-7/16	76.71	73.37	70.04	66.70
26666	9/32 (7.14mm)	.2812	4-7/16	2-7/16	77.42	74.05	70.69	67.32
26671	L (7.37mm)	.2900	4-7/16	2-7/16	77.72	74.34	70.96	67.58
26676	M (7.49mm)	.2950	4-7/16	2-7/16	78.11	74.71	71.32	67.92
26681	7.5mm	.2953	116mm	66mm	78.11	74.71	71.32	67.92
26686	19/64 (7.54mm)	.2969	4-9/16	2-9/16	84.32	80.65	76.99	73.32
26691	N (7.67mm)	.3020	4-9/16	2-9/16	85.94	82.20	78.47	74.73
26696	5/16 (7.94mm)	.3125	4-11/16	2-9/16	86.10	82.36	78.61	74.87
26701	8mm	.3150	119mm	69mm	89.19	85.31	81.43	77.56
26706	O (8.03mm)	.3160	4-11/16	2-11/16	90.69	86.75	82.80	78.86
26711	P (8.20mm)	.3230	4-11/16	2-11/16	90.88	86.93	82.98	79.03
26716	21/64 (8.33mm)	.3281	4-11/16	2-11/16	91.39	87.42	83.44	79.47
26721	Q (8.43mm)	.3320	4-15/16	2-15/16	91.84	87.85	83.85	79.86
26726	8.5mm	.3346	125mm	75mm	92.24	88.23	84.22	80.21
26731	R (8.61mm)	.3390	4-15/16	2-15/16	96.61	92.41	88.21	84.01
26736	11/32 (8.73mm)	.3438	4-15/16	2-15/16	98.65	94.36	90.07	85.78
26741	S (8.84mm)	.3480	5	3	100.53	96.16	91.79	87.42
26746	9mm	.3543	127mm	77mm	100.90	96.51	92.13	87.74
26751	T (9.09mm)	.3580	5	3	110.72	105.91	101.09	96.28
26756	23/64 (9.13mm)	.3594	5	3	111.12	106.29	101.46	96.63
26761	U (9.35mm)	.3680	5	3	117.56	112.45	107.34	102.23
26766	9.5mm	.3740	130mm	80mm	118.30	113.16	108.01	102.87
26771	3/8 (9.52mm)	.3750	5-1/8	3-1/8	121.42	116.14	110.86	105.58
26776	V (9.57mm)	.3770	5-1/8	3-1/8	123.33	117.97	112.61	107.24
26781	W (9.80mm)	.3860	5-1/8	3-1/8	123.75	118.37	112.99	107.61

EDP#	<i>d</i> Diameter*	Decimal Equivalent	<i>l₁</i> Overall Length	<i>l₂</i> Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
26786	25/64 (9.92mm)	.3906	5-1/4	3-1/4	124.50	119.09	113.67	108.26
26791	10mm	.3937	133mm	83mm	126.95	121.43	115.91	110.39
26796	X (10.08mm)	.3970	5-1/4	3-1/4	131.17	125.47	119.76	114.06
26801	Y (10.26mm)	.4040	5-3/8	3-3/8	133.77	127.95	122.14	116.32
26806	13/32 (10.32mm)	.4062	5-3/8	3-3/8	134.53	128.68	122.83	116.98
26811	Z (10.49mm)	.4130	5-3/8	3-3/8	136.76	130.81	124.87	118.92
26816	10.5mm	.4134	137mm	86mm	136.76	130.81	124.87	118.92
26821	27/64 (10.72mm)	.4219	5-7/16	3-7/16	138.46	132.44	126.42	120.40
26826	11mm	.4331	138mm	88mm	143.82	137.57	131.31	125.06
26831	7/16 (11.11mm)	.4375	5-7/16	3-7/16	146.89	140.50	134.12	127.73
26836	11.5mm	.4528	141mm	91mm	152.12	145.51	138.89	132.28
26841	29/64 (11.51mm)	.4531	5-9/16	3-13/16	156.87	150.05	143.23	136.41
26846	15/32 (11.91mm)	.4688	5-9/16	3-13/16	160.79	153.80	146.81	139.82
26851	12mm	.4724	141mm	98mm	164.92	157.75	150.58	143.41
26856	31/64 (12.30mm)	.4844	5-9/16	3-13/16	169.20	161.84	154.49	147.13
26861	12.5mm	.4921	152mm	102mm	170.14	162.74	155.34	147.95
26866	1/2 (12.70mm)	.5000	6	4	170.76	163.34	155.91	148.49
26871	13mm	.5118	152mm	102mm	178.77	171.00	163.22	155.45
26876	33/64 (13.10mm)	.5156	6	4	186.29	178.19	170.09	161.99
26881	17/32 (13.49mm)	.5312	6-1/8	4-1/8	189.32	181.09	172.86	164.63
26886	13.5mm	.5315	156mm	105mm	192.25	183.89	175.53	167.17
26891	35/64 (13.89mm)	.5469	6-1/8	4-1/8	202.78	193.96	185.15	176.33
26896	14mm	.5512	156mm	105mm	205.76	196.81	187.87	178.92
26901	9/16 (14.29mm)	.5625	6-1/4	4-3/8	223.02	213.32	203.63	193.93
26906	14.5mm	.5709	159mm	109mm	224.77	215.00	205.22	195.45
26911	37/64 (14.68mm)	.5781	6-1/4	4-3/8	225.37	215.57	205.77	195.97
26916	15mm	.5906	162mm	112mm	228.31	218.38	208.46	198.53
26921	19/32 (15.08mm)	.5938	6-3/8	4-3/8	234.24	224.06	213.87	203.69
26926	39/64 (15.48mm)	.6094	6-7/16	4-7/16	263.61	252.15	240.69	229.23
26931	15.5mm	.6102	164mm	113mm	264.34	252.85	241.35	229.86
26936	5/8 (15.87mm)	.6250	6-9/16	4-9/16	271.65	259.84	248.03	236.22
26941	16mm	.6299	167mm	117mm	275.22	263.25	251.29	239.32

Series 1510

135° primary/secondary drill point

NEW
SERIES



3xD - 2 Flute

Titanium, inconel, hastalloy and waspalloy

Heavy web for extra rigidity and added strength

Thinned point

15° helix



TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

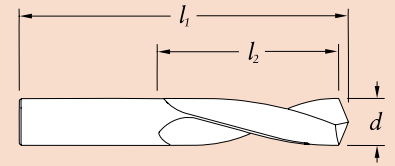
EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
19070	1/16 (1.59mm)	.0625	1-5/8	5/8	5.20	4.97	4.75	4.52
19075	#52 (1.61mm)	.0635	1-11/16	11/16	5.28	5.05	4.82	4.59
19080	#51 (1.70mm)	.0670	1-11/16	11/16	5.36	5.13	4.89	4.66
19085	#50 (1.78mm)	.0700	1-11/16	11/16	5.49	5.25	5.01	4.77
19090	#49 (1.85mm)	.0730	1-11/16	11/16	5.62	5.38	5.13	4.89
19095	#48 (1.93mm)	.0760	1-11/16	11/16	5.81	5.56	5.30	5.05
19100	5/64 (1.98mm)	.0781	1-11/16	11/16	6.03	5.77	5.51	5.24
19105	#47 (1.99mm)	.0785	1-3/4	3/4	6.23	5.96	5.69	5.42
19115	2mm	.0787	44.5mm	19mm	6.33	6.05	5.78	5.50
19120	#46 (2.06mm)	.0810	1-3/4	3/4	6.43	6.15	5.87	5.59
19125	#45 (2.08mm)	.0820	1-3/4	3/4	6.62	6.33	6.04	5.76
19130	#44 (2.18mm)	.0860	1-3/4	3/4	6.84	6.54	6.25	5.95
19135	#43 (2.26mm)	.0890	1-3/4	3/4	7.04	6.73	6.43	6.12
19140	#42 (2.37mm)	.0935	1-3/4	3/4	7.13	6.82	6.51	6.20
19145	3/32 (2.38mm)	.0938	1-3/4	3/4	7.30	6.98	6.67	6.35
19150	#41 (2.44mm)	.0960	1-13/16	13/16	7.36	7.04	6.72	6.40
19155	#40 (2.49mm)	.0980	1-13/16	13/16	7.46	7.14	6.81	6.49
19160	2.5mm	.0984	46mm	21mm	7.51	7.18	6.86	6.53
19165	#39 (2.53mm)	.0995	1-13/16	13/16	7.54	7.21	6.88	6.56
19170	#38 (2.58mm)	.1015	1-13/16	13/16	7.61	7.28	6.95	6.62
19175	#37 (2.64mm)	.1040	1-13/16	13/16	7.67	7.34	7.00	6.67
19180	#36 (2.71mm)	.1065	1-13/16	13/16	7.73	7.39	7.06	6.72
19185	7/64 (2.78mm)	.1094	1-13/16	13/16	7.77	7.43	7.09	6.76
19190	#35 (2.79mm)	.1100	1-7/8	7/8	7.82	7.48	7.14	6.80
19195	#34 (2.82mm)	.1110	1-7/8	7/8	7.91	7.57	7.22	6.88
19200	#33 (2.87mm)	.1130	1-7/8	7/8	7.97	7.62	7.28	6.93
19205	#32 (2.95mm)	.1160	1-7/8	7/8	8.03	7.68	7.33	6.98
19210	3mm	.1181	48mm	22mm	8.11	7.76	7.40	7.05
19215	#31 (3.05mm)	.1200	1-7/8	7/8	8.18	7.82	7.47	7.11
19220	1/8 (3.17mm)	.1250	1-7/8	7/8	8.27	7.91	7.55	7.19
19225	#30 (3.26mm)	.1285	1-15/16	15/16	8.49	8.12	7.75	7.38
19230	#29 (3.45mm)	.1360	1-15/16	15/16	8.71	8.33	7.95	7.57
19235	3.5mm	.1378	49mm	24mm	8.99	8.60	8.21	7.82
19240	#28 (3.57mm)	.1405	1-15/16	15/16	9.11	8.71	8.32	7.92
19245	9/64 (3.57mm)	.1406	1-15/16	15/16	9.20	8.80	8.40	8.00
19250	#27 (3.66mm)	.1440	2-1/16	1	10.02	9.58	9.15	8.71
19255	#26 (3.73mm)	.1470	2-1/16	1	10.12	9.68	9.24	8.80
19260	#25 (3.80mm)	.1495	2-1/16	1	10.25	9.80	9.36	8.91
19265	#24 (3.86mm)	.1520	2-1/16	1	10.27	9.82	9.38	8.93
19270	#23 (3.91mm)	.1540	2-1/16	1	10.34	9.89	9.44	8.99
19275	5/32 (3.97mm)	.1562	2-1/16	1	10.40	9.95	9.50	9.04
19280	#22 (3.99mm)	.1570	2-1/8	1-1/16	11.05	10.57	10.09	9.61
19285	4mm	.1575	54mm	27mm	11.19	10.70	10.22	9.73
19290	#21 (4.04mm)	.1590	2-1/8	1-1/16	11.33	10.84	10.34	9.85
19295	#20 (4.09mm)	.1610	2-1/8	1-1/16	11.42	10.92	10.43	9.93
19300	#19 (4.22mm)	.1660	2-1/8	1-1/16	11.88	11.36	10.85	10.33
19305	#18 (4.30mm)	.1695	2-1/8	1-1/16	12.02	11.50	10.97	10.45
19310	11/64 (4.37mm)	.1719	2-1/8	1-1/16	12.26	11.73	11.19	10.66
19315	#17 (4.39mm)	.1730	2-3/16	1-1/8	12.44	11.90	11.36	10.82
19320	#16 (4.49mm)	.1770	2-3/16	1-1/8	12.58	12.03	11.49	10.94
19325	4.5mm	.1772	56mm	29mm	12.64	12.09	11.54	10.99
19330	#15 (4.57mm)	.1800	2-3/16	1-1/8	12.70	12.15	11.60	11.04

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
19335	#14 (4.62mm)	.1820	2-3/16	1-1/8	12.98	12.42	11.85	11.29
19340	#13 (4.70mm)	.1850	2-3/16	1-1/8	13.09	12.52	11.95	11.38
19345	3/16 (4.76mm)	.1875	2-3/16	1-1/8	13.13	12.56	11.99	11.42
19350	#12 (4.80mm)	.1890	2-1/4	1-3/16	13.57	12.98	12.39	11.80
19355	#11 (4.85mm)	.1910	2-1/4	1-3/16	13.73	13.13	12.54	11.94
19360	#10 (4.91mm)	.1935	2-1/4	1-3/16	14.36	13.74	13.11	12.49
19365	#9 (4.98mm)	.1960	2-1/4	1-3/16	14.73	14.09	13.45	12.81
19370	5mm	.1969	57mm	30mm	14.81	14.17	13.52	12.88
19375	#8 (5.05mm)	.1990	2-1/4	1-3/16	14.92	14.27	13.62	12.97
19380	#7 (5.10mm)	.2010	2-1/4	1-3/16	15.36	14.69	14.02	13.36
19385	13/64 (5.16mm)	.2031	2-1/4	1-3/16	15.47	14.80	14.12	13.45
19390	#6 (5.18mm)	.2040	2-3/8	1-1/4	15.79	15.10	14.42	13.73
19395	#5 (5.22mm)	.2055	2-3/8	1-1/4	16.11	15.41	14.71	14.01
19400	#4 (5.31mm)	.2090	2-3/8	1-1/4	16.40	15.69	14.97	14.26
19405	#3 (5.41mm)	.2130	2-3/8	1-1/4	16.69	15.96	15.24	14.51
19410	5.5mm	.2165	60mm	32mm	16.81	16.08	15.35	14.62
19415	7/32 (5.56mm)	.2188	2-3/8	1-1/4	16.94	16.20	15.47	14.73
19420	#2 (5.61mm)	.2210	2-7/16	1-5/16	17.34	16.59	15.83	15.08
19425	#1 (5.79mm)	.2280	2-7/16	1-5/16	17.46	16.70	15.94	15.18
19430	A (5.94mm)	.2340	2-7/16	1-5/16	17.49	16.73	15.97	15.21
19435	15/64 (5.95mm)	.2344	2-7/16	1-5/16	17.53	16.77	16.01	15.24
19440	6mm	.2362	63.5mm	35mm	17.58	16.82	16.05	15.29
19445	B (6.04mm)	.2380	2-1/2	1-3/8	17.65	16.88	16.12	15.35
19450	C (6.15mm)	.2420	2-1/2	1-3/8	17.78	17.01	16.23	15.46
19455	D (6.25mm)	.2460	2-1/2	1-3/8	17.92	17.14	16.36	15.58
19460	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	18.03	17.25	16.46	15.68
19465	6.5mm	.2559	67mm	37mm	18.47	17.67	16.86	16.06
19470	F (6.53mm)	.2570	2-5/8	1-7/16	18.86	18.04	17.22	16.40
19475	G (6.63mm)	.2610	2-5/8	1-7/16	19.24	18.40	17.57	16.73
19480	17/64 (6.75mm)	.2656	2-5/8	1-7/16	19.63	18.78	17.92	17.07
19485	H (6.76mm)	.2660	2-11/16	1-1/2	20.19	19.31	18.43	17.56
19490	I (6.91mm)	.2720	2-11/16	1-1/2	20.42	19.53	18.64	17.76
19495	7mm	.2756	68mm	38mm	20.60	19.70	18.81	17.91
19500	J (7.03mm)	.2770	2-11/16	1-1/2	20.78	19.88	18.97	18.07
19505	K (7.14mm)	.2810	2-11/16	1-1/2	20.96	20.05	19.14	18.23
19510	9/32 (7.14mm)	.2812	2-11/16	1-1/2	21.07	20.15	19.24	18.32
19515	L (7.37mm)	.2900	2-3/4	1-9/16	21.85	20.90	19.95	19.00
19520	M (7.49mm)	.2950	2-3/4	1-9/16	23.38	22.36	21.35	20.33
19525	7.5mm	.2953	70mm	40mm	23.38	22.36	21.35	20.33
19530	19/64 (7.54mm)	.2969	2-3/4	1-9/16	23.51	22.49	21.47	20.44
19535	N (7.67mm)	.3020	2-13/16	1-5/8	24.77	23.69	22.62	21.54
19540	5/16 (7.94mm)	.3125	2-13/16	1-5/8	24.86	23.78	22.70	21.62
19545	8mm	.3150	75mm	43mm	26.67	25.51	24.35	23.19
19550	O (8.03mm)	.3160	2-15/16	1-11/16	26.67	25.51	24.35	23.19
19555	P (8.20mm)	.3230	2-15/16	1-11/16	26.90	25.73	24.56	23.39
19560	21/64 (8.33mm)	.3281	2-15/16	1-11/16	27.07	25.89	24.72	23.54
19565	Q (8.43mm)	.3320	3	1-11/16	27.69	26.49	25.28	24.08
19570	8.5mm	.3346	76mm	43mm	27.96	26.74	25.53	24.31
19575	R (8.61mm)	.3390	3	1-11/16	28.83	27.58	26.32	25.07
19580	11/32 (8.73mm)	.3438	3	1-11/16	30.00	28.70	27.39	26.09
19585	S (8.84mm)	.3480	3-1/16	1-3/4	30.41	29.09	27.77	26.44
19590	9mm	.3543	78mm	44mm	30.60	29.27	27.94	26.61
19595	T (9.09mm)	.3580	3-1/16	1-3/4	30.71	29.37	28.04	26.70
19600	23/64 (9.13mm)	.3594	3-1/16	1-3/4	30.92	29.58	28.23	26.89
19605	U (9.35mm)	.3680	3-1/8	1-13/16	33.87	32.40	30.92	29.45
19610	9.5mm	.3740	79mm	46mm	34.19	32.70	31.22	29.73
19615	3/8 (9.52mm)	.3750	3-1/8	1-13/16	34.45	32.95	31.45	29.96
19620	V (9.57mm)	.3770	3-1/4	1-7/8	35.12	33.59	32.07	30.54
19625	W (9.80mm)	.3860	3-1/4	1-7/8	35.86	34.30	32.74	31.18
19630	25/64 (9.92mm)	.3906	3-1/4	1-7/8	36.39	34.81	33.23	31.64
19635	10mm	.3937	84mm	49mm	37.70	36.06	34.42	32.78
19640	X (10.08mm)	.3970	3-5/16	1-15/16	38.80	37.11	35.43	33.74
19645	Y (10.26mm)	.4040	3-5/16	1-15/16	39.11	37.41	35.71	34.01
19650	13/32 (10.32mm)	.4062	3-5/16	1-15/16	40.53	38.77	37.01	35.24
19655	Z (10.49mm)	.4130	3-3/8	2	40.96	39.18	37.40	35.62
19660	10.5mm	.4134	86mm	51mm	40.96	39.18	37.40	35.62
19665	27/64 (10.72mm)	.4219	3-3/8	2	41.41	39.61	37.81	36.01
19670	11mm	.4331	87mm	52mm	44.98	43.02	41.07	39.11
19675	7/16 (11.11mm)	.4375	3-7/16	2-1/16	44.98	43.02	41.07	39.11
19680	11.5mm	.4528	90.5mm	54mm	48.78	46.66	44.54	42.42
19685	29/64 (11.51mm)	.4531	3-9/16	2-1/8	48.78	46.66	44.54	42.42
19690	15/32 (11.91mm)	.4688	3-5/8	2-1/8	51.60	49.36	47.11	44.87
19695	12mm	.4724	94mm	56mm	51.78	49.53	47.28	45.03
19700	31/64 (12.30mm)	.4844	3-11/16	2-3/16	52.19	49.92	47.65	45.38
19705	12.5mm	.4921	95mm	56mm	52.77	50.48	48.18	45.89
19710	1/2 (12.70mm)	.5000	3-3/4	2-1/4	53.15	50.84	48.53	46.22

Series 1510H

135° primary/secondary drill point

NEW
SERIES



3xD - 2 Flute Balinit® HARDLUBE Coated

Titanium, inconel, hastalloy and waspalloy

Excellent heat resistance / lubricity

Up to 40% faster than uncoated

Heavy web for extra rigidity and added strength

Thinned point

15° helix



TOLERANCES

Ød +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

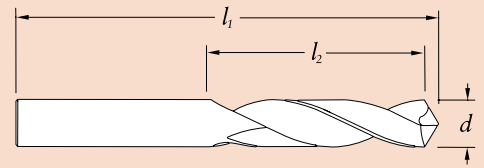
l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
19071	1/16 (1.59mm)	.0625	1-5/8	5/8	6.59	6.30	6.02	5.73
19076	#52 (1.61mm)	.0635	1-11/16	11/16	6.67	6.38	6.09	5.80
19081	#51 (1.70mm)	.0670	1-11/16	11/16	6.75	6.46	6.16	5.87
19086	#50 (1.78mm)	.0700	1-11/16	11/16	6.88	6.58	6.28	5.98
19091	#49 (1.85mm)	.0730	1-11/16	11/16	7.02	6.71	6.41	6.10
19096	#48 (1.93mm)	.0760	1-11/16	11/16	7.20	6.89	6.57	6.26
19101	5/64 (1.98mm)	.0781	1-11/16	11/16	7.42	7.10	6.77	6.45
19106	#47 (1.99mm)	.0785	1-3/4	3/4	7.62	7.29	6.96	6.63
19116	2mm	.0787	44.5mm	19mm	7.72	7.38	7.05	6.71
19121	#46 (2.06mm)	.0810	1-3/4	3/4	7.82	7.48	7.14	6.80
19126	#45 (2.08mm)	.0820	1-3/4	3/4	8.02	7.67	7.32	6.97
19131	#44 (2.18mm)	.0860	1-3/4	3/4	8.23	7.87	7.51	7.16
19136	#43 (2.26mm)	.0890	1-3/4	3/4	8.43	8.06	7.70	7.33
19141	#42 (2.37mm)	.0935	1-3/4	3/4	8.52	8.15	7.78	7.41
19146	3/32 (2.38mm)	.0938	1-3/4	3/4	8.69	8.31	7.93	7.56
19151	#41 (2.44mm)	.0960	1-13/16	13/16	8.75	8.37	7.99	7.61
19156	#40 (2.49mm)	.0980	1-13/16	13/16	8.86	8.47	8.09	7.70
19161	2.5mm	.0984	46mm	21mm	8.90	8.51	8.13	7.74
19166	#39 (2.53mm)	.0995	1-13/16	13/16	8.94	8.55	8.16	7.77
19171	#38 (2.58mm)	.1015	1-13/16	13/16	9.00	8.61	8.22	7.83
19176	#37 (2.64mm)	.1040	1-13/16	13/16	9.06	8.67	8.27	7.88
19181	#36 (2.71mm)	.1065	1-13/16	13/16	9.12	8.72	8.33	7.93
19186	7/64 (2.78mm)	.1094	1-13/16	13/16	9.17	8.77	8.37	7.97
19191	#35 (2.79mm)	.1100	1-7/8	7/8	9.21	8.81	8.41	8.01
19196	#34 (2.82mm)	.1110	1-7/8	7/8	9.30	8.90	8.49	8.09
19201	#33 (2.87mm)	.1130	1-7/8	7/8	9.36	8.95	8.55	8.14
19206	#32 (2.95mm)	.1160	1-7/8	7/8	9.42	9.01	8.60	8.19
19211	3mm	.1181	48mm	22mm	9.50	9.09	8.67	8.26
19216	#31 (3.05mm)	.1200	1-7/8	7/8	9.57	9.15	8.74	8.32
19221	1/8 (3.17mm)	.1250	1-7/8	7/8	9.66	9.24	8.82	8.40
19226	#30 (3.26mm)	.1285	1-15/16	15/16	9.88	9.45	9.02	8.59
19231	#29 (3.45mm)	.1360	1-15/16	15/16	10.10	9.66	9.22	8.78
19236	3.5mm	.1378	49mm	24mm	10.38	9.93	9.48	9.03
19241	#28 (3.57mm)	.1405	1-15/16	15/16	10.50	10.04	9.59	9.13
19246	9/64 (3.57mm)	.1406	1-15/16	15/16	10.59	10.13	9.67	9.21
19251	#27 (3.66mm)	.1440	2-1/16	1	11.41	10.91	10.42	9.92
19256	#26 (3.73mm)	.1470	2-1/16	1	11.51	11.01	10.51	10.01
19261	#25 (3.80mm)	.1495	2-1/16	1	11.64	11.13	10.63	10.12
19266	#24 (3.86mm)	.1520	2-1/16	1	11.66	11.15	10.65	10.14
19271	#23 (3.91mm)	.1540	2-1/16	1	11.73	11.22	10.71	10.20
19276	5/32 (3.97mm)	.1562	2-1/16	1	11.79	11.28	10.76	10.25
19281	#22 (3.99mm)	.1570	2-1/8	1-1/16	12.44	11.90	11.36	10.82
19286	4mm	.1575	54mm	27mm	12.58	12.03	11.49	10.94
19291	#21 (4.04mm)	.1590	2-1/8	1-1/16	12.72	12.17	11.61	11.06
19296	#20 (4.09mm)	.1610	2-1/8	1-1/16	12.81	12.25	11.70	11.14
19301	#19 (4.22mm)	.1660	2-1/8	1-1/16	13.27	12.69	12.12	11.54
19306	#18 (4.30mm)	.1695	2-1/8	1-1/16	13.41	12.83	12.24	11.66
19311	11/64 (4.37mm)	.1719	2-1/8	1-1/16	13.65	13.06	12.46	11.87
19316	#17 (4.39mm)	.1730	2-3/16	1-1/8	13.83	13.23	12.63	12.03
19321	#16 (4.49mm)	.1770	2-3/16	1-1/8	13.97	13.36	12.76	12.15
19326	4.5mm	.1772	56mm	29mm	14.03	13.42	12.81	12.20
19331	#15 (4.57mm)	.1800	2-3/16	1-1/8	14.09	13.48	12.86	12.25
19336	#14 (4.62mm)	.1820	2-3/16	1-1/8	14.38	13.75	13.13	12.50

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
19341	#13 (4.70mm)	.1850	2-3/16	1-1/8	14.48	13.85	13.22	12.59
19346	3/16 (4.76mm)	.1875	2-3/16	1-1/8	14.52	13.89	13.26	12.63
19351	#12 (4.80mm)	.1890	2-1/4	1-3/16	15.97	15.28	14.58	13.89
19356	#11 (4.85mm)	.1910	2-1/4	1-3/16	16.13	15.43	14.73	14.03
19361	#10 (4.91mm)	.1935	2-1/4	1-3/16	16.77	16.04	15.31	14.58
19366	#9 (4.98mm)	.1960	2-1/4	1-3/16	17.14	16.39	15.65	14.90
19371	5mm	.1969	57mm	30mm	17.22	16.47	15.72	14.97
19376	#8 (5.05mm)	.1990	2-1/4	1-3/16	17.32	16.57	15.81	15.06
19381	#7 (5.10mm)	.2010	2-1/4	1-3/16	17.77	17.00	16.22	15.45
19386	13/64 (5.16mm)	.2031	2-1/4	1-3/16	17.87	17.09	16.32	15.54
19391	#6 (5.18mm)	.2040	2-3/8	1-1/4	18.19	17.40	16.61	15.82
19396	#5 (5.22mm)	.2055	2-3/8	1-1/4	18.52	17.71	16.91	16.10
19401	#4 (5.31mm)	.2090	2-3/8	1-1/4	18.80	17.98	17.17	16.35
19406	#3 (5.41mm)	.2130	2-3/8	1-1/4	19.09	18.26	17.43	16.60
19411	5.5mm	.2165	60mm	32mm	19.22	18.38	17.55	16.71
19416	7/32 (5.56mm)	.2188	2-3/8	1-1/4	19.34	18.50	17.66	16.82
19421	#2 (5.61mm)	.2210	2-7/16	1-5/16	19.75	18.89	18.03	17.17
19426	#1 (5.79mm)	.2280	2-7/16	1-5/16	19.86	19.00	18.13	17.27
19431	A (5.94mm)	.2340	2-7/16	1-5/16	19.90	19.03	18.17	17.30
19436	15/64 (5.95mm)	.2344	2-7/16	1-5/16	19.93	19.06	18.20	17.33
19441	6mm	.2362	63.5mm	35mm	19.99	19.12	18.25	17.38
19446	B (6.04mm)	.2380	2-1/2	1-3/8	20.06	19.19	18.32	17.44
19451	C (6.15mm)	.2420	2-1/2	1-3/8	20.18	19.30	18.43	17.55
19456	D (6.25mm)	.2460	2-1/2	1-3/8	20.32	19.44	18.55	17.67
19461	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	20.44	19.55	18.66	17.77
19466	6.5mm	.2559	67mm	37mm	22.74	21.75	20.76	19.77
19471	F (6.53mm)	.2570	2-5/8	1-7/16	23.13	22.12	21.12	20.11
19476	G (6.63mm)	.2610	2-5/8	1-7/16	23.51	22.49	21.47	20.44
19481	17/64 (6.75mm)	.2656	2-5/8	1-7/16	23.90	22.86	21.82	20.78
19486	H (6.76mm)	.2660	2-11/16	1-1/2	24.46	23.40	22.33	21.27
19491	I (6.91mm)	.2720	2-11/16	1-1/2	24.69	23.62	22.54	21.47
19496	7mm	.2756	68mm	38mm	24.86	23.78	22.70	21.62
19501	J (7.03mm)	.2770	2-11/16	1-1/2	25.05	23.96	22.87	21.78
19506	K (7.14mm)	.2810	2-11/16	1-1/2	25.23	24.13	23.04	21.94
19511	9/32 (7.14mm)	.2812	2-11/16	1-1/2	25.33	24.23	23.13	22.03
19516	L (7.37mm)	.2900	2-3/4	1-9/16	26.12	24.98	23.85	22.71
19521	M (7.49mm)	.2950	2-3/4	1-9/16	27.65	26.45	25.25	24.04
19526	7.5mm	.2953	70mm	40mm	27.65	26.45	25.25	24.04
19531	19/64 (7.54mm)	.2969	2-3/4	1-9/16	27.77	26.56	25.36	24.15
19536	N (7.67mm)	.3020	2-13/16	1-5/8	29.04	27.78	26.51	25.25
19541	5/16 (7.94mm)	.3125	2-13/16	1-5/8	29.13	27.86	26.60	25.33
19546	8mm	.3150	75mm	43mm	30.94	29.59	28.25	26.90
19551	O (8.03mm)	.3160	2-15/16	1-11/16	30.94	29.59	28.25	26.90
19556	P (8.20mm)	.3230	2-15/16	1-11/16	31.17	29.81	28.46	27.10
19561	21/64 (8.33mm)	.3281	2-15/16	1-11/16	31.34	29.98	28.61	27.25
19566	Q (8.43mm)	.3320	3	1-11/16	31.96	30.57	29.18	27.79
19571	8.5mm	.3346	76mm	43mm	32.22	30.82	29.42	28.02
19576	R (8.61mm)	.3390	3	1-11/16	33.10	31.66	30.22	28.78
19581	11/32 (8.73mm)	.3438	3	1-11/16	34.27	32.78	31.29	29.80
19586	S (8.84mm)	.3480	3-1/16	1-3/4	36.19	34.62	33.04	31.47
19591	9mm	.3543	78mm	44mm	36.39	34.81	33.23	31.64
19596	T (9.09mm)	.3580	3-1/16	1-3/4	36.49	34.90	33.32	31.73
19601	23/64 (9.13mm)	.3594	3-1/16	1-3/4	36.71	35.11	33.52	31.92
19606	U (9.35mm)	.3680	3-1/8	1-13/16	39.65	37.93	36.20	34.48
19611	9.5mm	.3740	79mm	46mm	39.97	38.23	36.49	34.76
19616	3/8 (9.52mm)	.3750	3-1/8	1-13/16	40.24	38.49	36.74	34.99
19621	V (9.57mm)	.3770	3-1/4	1-7/8	41.75	39.93	38.12	36.30
19626	W (9.80mm)	.3860	3-1/4	1-7/8	42.48	40.63	38.79	36.94
19631	25/64 (9.92mm)	.3906	3-1/4	1-7/8	43.01	41.14	39.27	37.40
19636	10mm	.3937	84mm	49mm	44.32	42.39	40.47	38.54
19641	X (10.08mm)	.3970	3-5/16	1-15/16	45.43	43.45	41.48	39.50
19646	Y (10.26mm)	.4040	3-5/16	1-15/16	45.74	43.75	41.76	39.77
19651	13/32 (10.32mm)	.4062	3-5/16	1-15/16	47.14	45.09	43.04	40.99
19656	Z (10.49mm)	.4130	3-3/8	2	47.59	45.52	43.45	41.38
19661	10.5mm	.4134	86mm	51mm	47.59	45.52	43.45	41.38
19666	27/64 (10.72mm)	.4219	3-3/8	2	48.04	45.95	43.86	41.77
19671	11mm	.4331	87mm	52mm	51.60	49.36	47.11	44.87
19676	7/16 (11.11mm)	.4375	3-7/16	2-1/16	51.60	49.36	47.11	44.87
19681	11.5mm	.4528	90.5mm	54mm	55.41	53.00	50.59	48.18
19686	29/64 (11.51mm)	.4531	3-9/16	2-1/8	55.41	53.00	50.59	48.18
19691	15/32 (11.91mm)	.4688	3-5/8	2-1/8	58.22	55.69	53.16	50.63
19696	12mm	.4724	94mm	56mm	58.41	55.87	53.33	50.79
19701	31/64 (12.30mm)	.4844	3-11/16	2-3/16	58.81	56.25	53.70	51.14
19706	12.5mm	.4921	95mm	56mm	59.40	56.82	54.23	51.65
19711	1/2 (12.70mm)	.5000	3-3/4	2-1/4	59.78	57.18	54.58	51.98

Series 1520

135° 4-facet drill point

NEW
SERIES


3xD - 2 Flute

Self-centering point

Stainless steel alloys, mild steels and titanium alloys

No spotting required in most applications

25° helix



TOLERANCES

 $\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)

 l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

 l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

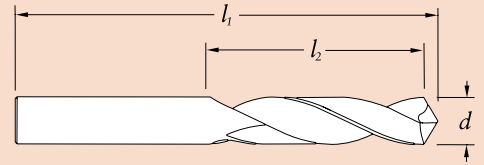
EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
77165	1/16 (1.59mm)	.0625	1-5/8	5/8	4.93	4.72	4.50	4.29
77170	#52 (1.61mm)	.0635	1-11/16	11/16	5.01	4.79	4.57	4.36
77175	#51 (1.70mm)	.0670	1-11/16	11/16	5.09	4.87	4.65	4.43
77180	#50 (1.78mm)	.0700	1-11/16	11/16	5.21	4.98	4.76	4.53
77185	#49 (1.85mm)	.0730	1-11/16	11/16	5.35	5.12	4.88	4.65
77190	#48 (1.93mm)	.0760	1-11/16	11/16	5.52	5.28	5.04	4.80
77195	5/64 (1.98mm)	.0781	1-11/16	11/16	5.73	5.48	5.23	4.98
77200	#47 (1.99mm)	.0785	1-3/4	3/4	5.92	5.66	5.41	5.15
77205	2mm	.0787	44.5mm	19mm	6.01	5.75	5.49	5.23
77210	#46 (2.06mm)	.0810	1-3/4	3/4	6.11	5.84	5.58	5.31
77215	#45 (2.08mm)	.0820	1-3/4	3/4	6.29	6.02	5.74	5.47
77220	#44 (2.18mm)	.0860	1-3/4	3/4	6.50	6.22	5.93	5.65
77225	#43 (2.26mm)	.0890	1-3/4	3/4	6.68	6.39	6.10	5.81
77230	#42 (2.37mm)	.0935	1-3/4	3/4	6.77	6.48	6.18	5.89
77235	3/32 (2.38mm)	.0938	1-3/4	3/4	6.93	6.63	6.33	6.03
77240	#41 (2.44mm)	.0960	1-13/16	13/16	6.99	6.69	6.38	6.08
77245	#40 (2.49mm)	.0980	1-13/16	13/16	7.10	6.79	6.48	6.17
77250	2.5mm	.0984	46mm	21mm	7.13	6.82	6.51	6.20
77255	#39 (2.53mm)	.0995	1-13/16	13/16	7.16	6.85	6.54	6.23
77260	#38 (2.58mm)	.1015	1-13/16	13/16	7.23	6.92	6.60	6.29
77265	#37 (2.64mm)	.1040	1-13/16	13/16	7.28	6.96	6.65	6.33
77270	#36 (2.71mm)	.1065	1-13/16	13/16	7.34	7.02	6.70	6.38
77275	7/64 (2.78mm)	.1094	1-13/16	13/16	7.38	7.06	6.74	6.42
77280	#35 (2.79mm)	.1100	1-7/8	7/8	7.43	7.11	6.78	6.46
77285	#34 (2.82mm)	.1110	1-7/8	7/8	7.52	7.19	6.87	6.54
77290	#33 (2.87mm)	.1130	1-7/8	7/8	7.57	7.24	6.91	6.58
77295	#32 (2.95mm)	.1160	1-7/8	7/8	7.62	7.29	6.96	6.63
77300	3mm	.1181	48mm	22mm	7.71	7.37	7.04	6.70
77305	#31 (3.05mm)	.1200	1-7/8	7/8	7.76	7.42	7.09	6.75
77310	1/8 (3.17mm)	.1250	1-7/8	7/8	7.85	7.51	7.17	6.83
77315	#30 (3.26mm)	.1285	1-15/16	15/16	8.06	7.71	7.36	7.01
77320	#29 (3.45mm)	.1360	1-15/16	15/16	8.27	7.91	7.55	7.19
77325	3.5mm	.1378	49mm	24mm	8.54	8.17	7.80	7.43
77330	#28 (3.57mm)	.1405	1-15/16	15/16	8.65	8.27	7.90	7.52
77335	9/64 (3.57mm)	.1406	1-15/16	15/16	8.74	8.36	7.98	7.60
77340	#27 (3.66mm)	.1440	2-1/16	1	9.51	9.10	8.68	8.27
77345	#26 (3.73mm)	.1470	2-1/16	1	9.61	9.19	8.77	8.36
77350	#25 (3.80mm)	.1495	2-1/16	1	9.73	9.31	8.88	8.46
77355	#24 (3.86mm)	.1520	2-1/16	1	9.75	9.33	8.90	8.48
77360	#23 (3.91mm)	.1540	2-1/16	1	9.82	9.39	8.97	8.54
77365	5/32 (3.97mm)	.1562	2-1/16	1	9.88	9.45	9.02	8.59
77370	#22 (3.99mm)	.1570	2-1/8	1-1/16	10.50	10.04	9.59	9.13
77375	4mm	.1575	54mm	27mm	10.63	10.17	9.71	9.24
77380	#21 (4.04mm)	.1590	2-1/8	1-1/16	10.76	10.29	9.82	9.36
77385	#20 (4.09mm)	.1610	2-1/8	1-1/16	10.84	10.37	9.90	9.43
77390	#19 (4.22mm)	.1660	2-1/8	1-1/16	11.28	10.79	10.30	9.81
77395	#18 (4.30mm)	.1695	2-1/8	1-1/16	11.42	10.92	10.43	9.93
77400	11/64 (4.37mm)	.1719	2-1/8	1-1/16	11.65	11.14	10.64	10.13
77405	#17 (4.39mm)	.1730	2-3/16	1-1/8	11.82	11.31	10.79	10.28
77410	#16 (4.49mm)	.1770	2-3/16	1-1/8	11.95	11.43	10.91	10.39
77415	4.5mm	.1772	56mm	29mm	12.01	11.49	10.97	10.44

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
77420	#15 (4.57mm)	.1800	2-3/16	1-1/8	12.06	11.54	11.01	10.49
77425	#14 (4.62mm)	.1820	2-3/16	1-1/8	12.34	11.80	11.27	10.73
77430	#13 (4.70mm)	.1850	2-3/16	1-1/8	12.43	11.89	11.35	10.81
77435	3/16 (4.76mm)	.1875	2-3/16	1-1/8	12.48	11.94	11.39	10.85
77440	#12 (4.80mm)	.1890	2-1/4	1-3/16	12.89	12.33	11.77	11.21
77445	#11 (4.85mm)	.1910	2-1/4	1-3/16	13.04	12.47	11.91	11.34
77450	#10 (4.91mm)	.1935	2-1/4	1-3/16	13.65	13.06	12.46	11.87
77455	#9 (4.98mm)	.1960	2-1/4	1-3/16	14.00	13.39	12.78	12.17
77460	5mm	.1969	57mm	30mm	14.08	13.47	12.86	12.24
77465	#8 (5.05mm)	.1990	2-1/4	1-3/16	14.17	13.55	12.94	12.32
77470	#7 (5.10mm)	.2010	2-1/4	1-3/16	14.59	13.96	13.32	12.69
77475	13/64 (5.16mm)	.2031	2-1/4	1-3/16	14.70	14.06	13.42	12.78
77480	#6 (5.18mm)	.2040	2-3/8	1-1/4	15.00	14.35	13.70	13.04
77485	#5 (5.22mm)	.2055	2-3/8	1-1/4	15.31	14.64	13.98	13.31
77490	#4 (5.31mm)	.2090	2-3/8	1-1/4	15.58	14.90	14.23	13.55
77495	#3 (5.41mm)	.2130	2-3/8	1-1/4	15.85	15.16	14.47	13.78
77500	5.5mm	.2165	60mm	32mm	15.97	15.28	14.58	13.89
77505	7/32 (5.56mm)	.2188	2-3/8	1-1/4	16.09	15.39	14.69	13.99
77510	#2 (5.61mm)	.2210	2-7/16	1-5/16	16.48	15.76	15.05	14.33
77515	#1 (5.79mm)	.2280	2-7/16	1-5/16	16.58	15.86	15.14	14.42
77520	A (5.94mm)	.2340	2-7/16	1-5/16	16.62	15.90	15.17	14.45
77525	15/64 (5.95mm)	.2344	2-7/16	1-5/16	16.65	15.93	15.20	14.48
77530	6mm	.2362	63.5mm	35mm	16.71	15.98	15.26	14.53
77535	B (6.04mm)	.2380	2-1/2	1-3/8	16.77	16.04	15.31	14.58
77540	C (6.15mm)	.2420	2-1/2	1-3/8	16.89	16.16	15.42	14.69
77545	D (6.25mm)	.2460	2-1/2	1-3/8	17.02	16.28	15.54	14.80
77550	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	17.14	16.39	15.65	14.90
77555	6.5mm	.2559	67mm	37mm	17.55	16.79	16.02	15.26
77560	F (6.53mm)	.2570	2-5/8	1-7/16	17.92	17.14	16.36	15.58
77565	G (6.63mm)	.2610	2-5/8	1-7/16	18.27	17.48	16.68	15.89
77570	17/64 (6.75mm)	.2656	2-5/8	1-7/16	18.65	17.84	17.03	16.22
77575	H (6.76mm)	.2660	2-11/16	1-1/2	19.18	18.35	17.51	16.68
77580	I (6.91mm)	.2720	2-11/16	1-1/2	19.40	18.56	17.71	16.87
77585	7mm	.2756	68mm	38mm	19.56	18.71	17.86	17.01
77590	J (7.03mm)	.2770	2-11/16	1-1/2	19.75	18.89	18.03	17.17
77595	K (7.14mm)	.2810	2-11/16	1-1/2	19.92	19.05	18.19	17.32
77600	9/32 (7.14mm)	.2812	2-11/16	1-1/2	20.02	19.15	18.28	17.41
77605	L (7.37mm)	.2900	2-3/4	1-9/16	20.76	19.86	18.95	18.05
77610	M (7.49mm)	.2950	2-3/4	1-9/16	22.21	21.24	20.28	19.31
77615	7.5mm	.2953	70mm	40mm	22.21	21.24	20.28	19.31
77620	19/64 (7.54mm)	.2969	2-3/4	1-9/16	22.33	21.36	20.39	19.42
77625	N (7.67mm)	.3020	2-13/16	1-5/8	23.53	22.51	21.48	20.46
77630	5/16 (7.94mm)	.3125	2-13/16	1-5/8	23.62	22.59	21.57	20.54
77635	8mm	.3150	75mm	43mm	25.33	24.23	23.13	22.03
77640	O (8.03mm)	.3160	2-15/16	1-11/16	25.33	24.23	23.13	22.03
77645	P (8.20mm)	.3230	2-15/16	1-11/16	25.55	24.44	23.33	22.22
77650	21/64 (8.33mm)	.3281	2-15/16	1-11/16	25.71	24.59	23.47	22.36
77655	Q (8.43mm)	.3320	3	1-11/16	26.31	25.17	24.02	22.88
77660	8.5mm	.3346	76mm	43mm	26.55	25.40	24.24	23.09
77665	R (8.61mm)	.3390	3	1-11/16	27.39	26.20	25.01	23.82
77670	11/32 (8.73mm)	.3438	3	1-11/16	28.51	27.27	26.03	24.79
77675	S (8.84mm)	.3480	3-1/16	1-3/4	28.89	27.63	26.38	25.12
77680	9mm	.3543	78mm	44mm	29.07	27.81	26.54	25.28
77685	T (9.09mm)	.3580	3-1/16	1-3/4	29.18	27.91	26.64	25.37
77690	23/64 (9.13mm)	.3594	3-1/16	1-3/4	29.38	28.10	26.83	25.55
77695	U (9.35mm)	.3680	3-1/8	1-13/16	32.18	30.78	29.38	27.98
77700	9.5mm	.3740	79mm	46mm	32.48	31.07	29.66	28.24
77705	3/8 (9.52mm)	.3750	3-1/8	1-13/16	32.73	31.31	29.88	28.46
77710	V (9.57mm)	.3770	3-1/4	1-7/8	33.36	31.91	30.46	29.01
77715	W (9.80mm)	.3860	3-1/4	1-7/8	34.06	32.58	31.10	29.62
77720	25/64 (9.92mm)	.3906	3-1/4	1-7/8	34.57	33.07	31.56	30.06
77725	10mm	.3937	84mm	49mm	35.81	34.25	32.70	31.14
77730	X (10.08mm)	.3970	3-5/16	1-15/16	36.86	35.26	33.65	32.05
77735	Y (10.26mm)	.4040	3-5/16	1-15/16	37.16	35.54	33.93	32.31
77740	13/32 (10.32mm)	.4062	3-5/16	1-15/16	38.50	36.83	35.15	33.48
77745	Z (10.49mm)	.4130	3-3/8	2	38.92	37.23	35.54	33.84
77750	10.5mm	.4134	86mm	51mm	38.92	37.23	35.54	33.84
77755	27/64 (10.72mm)	.4219	3-3/8	2	39.34	37.63	35.92	34.21
77760	11mm	.4331	87mm	52mm	42.72	40.86	39.01	37.15
77765	7/16 (11.11mm)	.4375	3-7/16	2-1/16	42.72	40.86	39.01	37.15
77770	11.5mm	.4528	90.5mm	54mm	46.35	44.33	42.32	40.30
77775	29/64 (11.51mm)	.4531	3-9/16	2-1/8	46.35	44.33	42.32	40.30
77780	15/32 (11.91mm)	.4688	3-5/8	2-1/8	49.02	46.89	44.76	42.63
77785	12mm	.4724	94mm	56mm	49.20	47.06	44.92	42.78
77790	31/64 (12.30mm)	.4844	3-11/16	2-3/16	49.58	47.42	45.27	43.11
77795	12.5mm	.4921	95mm	56mm	50.14	47.96	45.78	43.60
77800	1/2 (12.70mm)	.5000	3-3/4	2-1/4	50.50	48.30	46.11	43.91

Series 1520H

135° 4-facet drill point

NEW
SERIES



3xD - 2 Flute Balinit® HARDLUBE Coated

Self-centering point
Stainless steel alloys, mild steels and titanium alloys
Excellent heat resistance / lubricity
No spotting required in most applications
25° helix



TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 -0.0127mm)

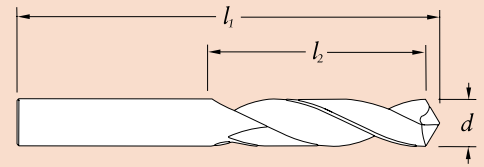
l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
77166	1/16 (1.59mm)	.0625	1-5/8	5/8	6.33	6.05	5.78	5.50
77171	#52 (1.61mm)	.0635	1-11/16	11/16	6.41	6.13	5.85	5.57
77176	#51 (1.70mm)	.0670	1-11/16	11/16	6.49	6.21	5.93	5.64
77181	#50 (1.78mm)	.0700	1-11/16	11/16	6.60	6.31	6.03	5.74
77186	#49 (1.85mm)	.0730	1-11/16	11/16	6.74	6.45	6.15	5.86
77191	#48 (1.93mm)	.0760	1-11/16	11/16	6.91	6.61	6.31	6.01
77196	5/64 (1.98mm)	.0781	1-11/16	11/16	7.12	6.81	6.50	6.19
77201	#47 (1.99mm)	.0785	1-3/4	3/4	7.31	6.99	6.67	6.36
77206	2mm	.0787	44.5mm	19mm	7.41	7.09	6.77	6.44
77211	#46 (2.06mm)	.0810	1-3/4	3/4	7.50	7.17	6.85	6.52
77216	#45 (2.08mm)	.0820	1-3/4	3/4	7.68	7.35	7.01	6.68
77221	#44 (2.18mm)	.0860	1-3/4	3/4	7.89	7.55	7.20	6.86
77226	#43 (2.26mm)	.0890	1-3/4	3/4	8.07	7.72	7.37	7.02
77231	#42 (2.37mm)	.0935	1-3/4	3/4	8.17	7.81	7.46	7.10
77236	3/32 (2.38mm)	.0938	1-3/4	3/4	8.33	7.97	7.61	7.24
77241	#41 (2.44mm)	.0960	1-13/16	13/16	8.38	8.02	7.65	7.29
77246	#40 (2.49mm)	.0980	1-13/16	13/16	8.49	8.12	7.75	7.38
77251	2.5mm	.0984	46mm	21mm	8.52	8.15	7.78	7.41
77256	#39 (2.53mm)	.0995	1-13/16	13/16	8.56	8.19	7.82	7.44
77261	#38 (2.58mm)	.1015	1-13/16	13/16	8.63	8.25	7.88	7.50
77266	#37 (2.64mm)	.1040	1-13/16	13/16	8.67	8.29	7.92	7.54
77271	#36 (2.71mm)	.1065	1-13/16	13/16	8.73	8.35	7.97	7.59
77276	7/64 (2.78mm)	.1094	1-13/16	13/16	8.77	8.39	8.01	7.63
77281	#35 (2.79mm)	.1100	1-7/8	7/8	8.82	8.44	8.05	7.67
77286	#34 (2.82mm)	.1110	1-7/8	7/8	8.91	8.52	8.14	7.75
77291	#33 (2.87mm)	.1130	1-7/8	7/8	8.96	8.57	8.18	7.79
77296	#32 (2.95mm)	.1160	1-7/8	7/8	9.02	8.63	8.24	7.84
77301	3mm	.1181	48mm	22mm	9.10	8.70	8.31	7.91
77306	#31 (3.05mm)	.1200	1-7/8	7/8	9.15	8.75	8.35	7.96
77311	1/8 (3.17mm)	.1250	1-7/8	7/8	9.25	8.85	8.45	8.04
77316	#30 (3.26mm)	.1285	1-15/16	15/16	9.45	9.04	8.63	8.22
77321	#29 (3.45mm)	.1360	1-15/16	15/16	9.66	9.24	8.82	8.40
77326	3.5mm	.1378	49mm	24mm	9.94	9.51	9.08	8.64
77331	#28 (3.57mm)	.1405	1-15/16	15/16	10.04	9.60	9.17	8.73
77336	9/64 (3.57mm)	.1406	1-15/16	15/16	10.13	9.69	9.25	8.81
77341	#27 (3.66mm)	.1440	2-1/16	1	10.90	10.43	9.95	9.48
77346	#26 (3.73mm)	.1470	2-1/16	1	11.01	10.53	10.05	9.57
77351	#25 (3.80mm)	.1495	2-1/16	1	11.12	10.64	10.15	9.67
77356	#24 (3.86mm)	.1520	2-1/16	1	11.14	10.66	10.17	9.69
77361	#23 (3.91mm)	.1540	2-1/16	1	11.21	10.72	10.24	9.75
77366	5/32 (3.97mm)	.1562	2-1/16	1	11.27	10.78	10.29	9.80
77371	#22 (3.99mm)	.1570	2-1/8	1-1/16	11.89	11.37	10.86	10.34
77376	4mm	.1575	54mm	27mm	12.02	11.50	10.97	10.45
77381	#21 (4.04mm)	.1590	2-1/8	1-1/16	12.16	11.63	11.10	10.57
77386	#20 (4.09mm)	.1610	2-1/8	1-1/16	12.24	11.71	11.18	10.64
77391	#19 (4.22mm)	.1660	2-1/8	1-1/16	12.67	12.12	11.57	11.02
77396	#18 (4.30mm)	.1695	2-1/8	1-1/16	12.81	12.25	11.70	11.14
77401	11/64 (4.37mm)	.1719	2-1/8	1-1/16	13.04	12.47	11.91	11.34
77406	#17 (4.39mm)	.1730	2-3/16	1-1/8	13.21	12.64	12.06	11.49
77411	#16 (4.49mm)	.1770	2-3/16	1-1/8	13.34	12.76	12.18	11.60
77416	4.5mm	.1772	56mm	29mm	13.40	12.82	12.23	11.65

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
77421	#15 (4.57mm)	.1800	2-3/16	1-1/8	13.46	12.87	12.29	11.70
77426	#14 (4.62mm)	.1820	2-3/16	1-1/8	13.73	13.13	12.54	11.94
77431	#13 (4.70mm)	.1850	2-3/16	1-1/8	13.82	13.22	12.62	12.02
77436	3/16 (4.76mm)	.1875	2-3/16	1-1/8	13.87	13.27	12.66	12.06
77441	#12 (4.80mm)	.1890	2-1/4	1-3/16	15.30	14.63	13.97	13.30
77446	#11 (4.85mm)	.1910	2-1/4	1-3/16	15.44	14.77	14.10	13.43
77451	#10 (4.91mm)	.1935	2-1/4	1-3/16	16.05	15.35	14.65	13.96
77456	#9 (4.98mm)	.1960	2-1/4	1-3/16	16.40	15.69	14.97	14.26
77461	5mm	.1969	57mm	30mm	16.48	15.76	15.05	14.33
77466	#8 (5.05mm)	.1990	2-1/4	1-3/16	16.57	15.85	15.13	14.41
77471	#7 (5.10mm)	.2010	2-1/4	1-3/16	17.00	16.26	15.52	14.78
77476	13/64 (5.16mm)	.2031	2-1/4	1-3/16	17.10	16.36	15.61	14.87
77481	#6 (5.18mm)	.2040	2-3/8	1-1/4	17.40	16.64	15.89	15.13
77486	#5 (5.22mm)	.2055	2-3/8	1-1/4	17.71	16.94	16.17	15.40
77491	#4 (5.31mm)	.2090	2-3/8	1-1/4	17.99	17.21	16.43	15.64
77496	#3 (5.41mm)	.2130	2-3/8	1-1/4	18.25	17.46	16.66	15.87
77501	5.5mm	.2165	60mm	32mm	18.38	17.58	16.78	15.98
77506	7/32 (5.56mm)	.2188	2-3/8	1-1/4	18.49	17.69	16.88	16.08
77511	#2 (5.61mm)	.2210	2-7/16	1-5/16	18.88	18.06	17.24	16.42
77516	#1 (5.79mm)	.2280	2-7/16	1-5/16	18.99	18.16	17.34	16.51
77521	A (5.94mm)	.2340	2-7/16	1-5/16	19.02	18.19	17.37	16.54
77526	15/64 (5.95mm)	.2344	2-7/16	1-5/16	19.06	18.23	17.40	16.57
77531	6mm	.2362	63.5mm	35mm	19.11	18.28	17.45	16.62
77536	B (6.04mm)	.2380	2-1/2	1-3/8	19.17	18.34	17.50	16.67
77541	C (6.15mm)	.2420	2-1/2	1-3/8	19.30	18.46	17.62	16.78
77546	D (6.25mm)	.2460	2-1/2	1-3/8	19.42	18.58	17.73	16.89
77551	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	19.54	18.69	17.84	16.99
77556	6.5mm	.2559	67mm	37mm	21.82	20.87	19.92	18.97
77561	F (6.53mm)	.2570	2-5/8	1-7/16	22.18	21.22	20.25	19.29
77566	G (6.63mm)	.2610	2-5/8	1-7/16	22.54	21.56	20.58	19.60
77571	17/64 (6.75mm)	.2656	2-5/8	1-7/16	22.92	21.92	20.93	19.93
77576	H (6.76mm)	.2660	2-11/16	1-1/2	23.45	22.43	21.41	20.39
77581	I (6.91mm)	.2720	2-11/16	1-1/2	23.67	22.64	21.61	20.58
77586	7mm	.2756	68mm	38mm	23.83	22.79	21.76	20.72
77591	J (7.03mm)	.2770	2-11/16	1-1/2	24.01	22.97	21.92	20.88
77596	K (7.14mm)	.2810	2-11/16	1-1/2	24.18	23.13	22.08	21.03
77601	9/32 (7.14mm)	.2812	2-11/16	1-1/2	24.29	23.23	22.18	21.12
77606	L (7.37mm)	.2900	2-3/4	1-9/16	25.02	23.93	22.84	21.76
77611	M (7.49mm)	.2950	2-3/4	1-9/16	26.47	25.32	24.17	23.02
77616	7.5mm	.2953	70mm	40mm	26.47	25.32	24.17	23.02
77621	19/64 (7.54mm)	.2969	2-3/4	1-9/16	26.60	25.44	24.29	23.13
77626	N (7.67mm)	.3020	2-13/16	1-5/8	27.80	26.59	25.38	24.17
77631	5/16 (7.94mm)	.3125	2-13/16	1-5/8	27.89	26.68	25.46	24.25
77636	8mm	.3150	75mm	43mm	29.60	28.31	27.03	25.74
77641	O (8.03mm)	.3160	2-15/16	1-11/16	29.60	28.31	27.03	25.74
77646	P (8.20mm)	.3230	2-15/16	1-11/16	29.82	28.52	27.23	25.93
77651	21/64 (8.33mm)	.3281	2-15/16	1-11/16	29.98	28.68	27.37	26.07
77656	Q (8.43mm)	.3320	3	1-11/16	30.58	29.25	27.92	26.59
77661	8.5mm	.3346	76mm	43mm	30.82	29.48	28.14	26.80
77666	R (8.61mm)	.3390	3	1-11/16	31.66	30.28	28.91	27.53
77671	11/32 (8.73mm)	.3438	3	1-11/16	32.78	31.35	29.93	28.50
77676	S (8.84mm)	.3480	3-1/16	1-3/4	34.67	33.16	31.66	30.15
77681	9mm	.3543	78mm	44mm	34.85	33.33	31.82	30.30
77686	T (9.09mm)	.3580	3-1/16	1-3/4	34.96	33.44	31.92	30.40
77691	23/64 (9.13mm)	.3594	3-1/16	1-3/4	35.17	33.64	32.11	30.58
77696	U (9.35mm)	.3680	3-1/8	1-13/16	37.96	36.31	34.66	33.01
77701	9.5mm	.3740	79mm	46mm	38.26	36.60	34.93	33.27
77706	3/8 (9.52mm)	.3750	3-1/8	1-13/16	38.51	36.84	35.16	33.49
77711	V (9.57mm)	.3770	3-1/4	1-7/8	39.99	38.25	36.51	34.77
77716	W (9.80mm)	.3860	3-1/4	1-7/8	40.69	38.92	37.15	35.38
77721	25/64 (9.92mm)	.3906	3-1/4	1-7/8	41.19	39.40	37.61	35.82
77726	10mm	.3937	84mm	49mm	42.44	40.59	38.75	36.90
77731	X (10.08mm)	.3970	3-5/16	1-15/16	43.48	41.59	39.70	37.81
77736	Y (10.26mm)	.4040	3-5/16	1-15/16	43.78	41.88	39.97	38.07
77741	13/32 (10.32mm)	.4062	3-5/16	1-15/16	45.13	43.17	41.21	39.24
77746	Z (10.49mm)	.4130	3-3/8	2	45.54	43.56	41.58	39.60
77751	10.5mm	.4134	86mm	51mm	45.54	43.56	41.58	39.60
77756	27/64 (10.72mm)	.4219	3-3/8	2	45.97	43.97	41.97	39.97
77761	11mm	.4331	87mm	52mm	49.35	47.20	45.06	42.91
77766	7/16 (11.11mm)	.4375	3-7/16	2-1/16	49.35	47.20	45.06	42.91
77771	11.5mm	.4528	90.5mm	54mm	52.97	50.67	48.36	46.06
77776	29/64 (11.51mm)	.4531	3-9/16	2-1/8	52.97	50.67	48.36	46.06
77781	15/32 (11.91mm)	.4688	3-5/8	2-1/8	55.65	53.23	50.81	48.39
77786	12mm	.4724	94mm	56mm	55.82	53.39	50.97	48.54
77791	31/64 (12.30mm)	.4844	3-11/16	2-3/16	56.20	53.76	51.31	48.87
77796	12.5mm	.4921	95mm	56mm	56.76	54.29	51.82	49.36
77801	1/2 (12.70mm)	.5000	3-3/4	2-1/4	57.12	54.64	52.15	49.67

Series 1200 118° cam drill point
Series 1205 135° 4-facet drill point



5xD - 2 Flute *NEW SIZES

SERIES 1200

General purpose jobber drill

25° helix

(1/8" diameter and smaller – 118° 4-facet point)



SERIES 1205

Self-centering point

Stainless steel alloys, mild steels and titanium alloys

No spotting required in most applications

Adaptability when converting from high-speed steel

TOLERANCES

Ød +.0000 –.0005" (+0.0000 –0.0127mm)

l_1 1/8" dia & under: +.125 –.062" (3mm dia & under: +3.175 –1.588mm)
Over 1/8" dia: +.125 –.125" (Over 3mm dia: +3.175 –3.175mm)

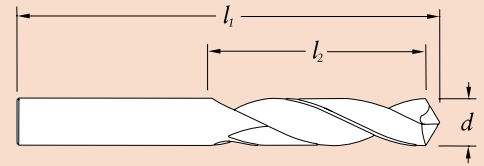
l_2 1/8" dia & under: +.125 –.062" (3mm dia & under: +3.175 –1.588mm)
Over 1/8" dia: +.125 –.125" (Over 3mm dia: +3.175 –3.175mm)

118° EDP#	135° EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
56165	89165	1/16 (1.59mm)	.0625	1-1/2	3/4	4.93	4.72	4.50	4.29
56170	89170	#52 (1.61mm)	.0635	1-1/2	3/4	5.01	4.79	4.57	4.36
56175	89175	#51 (1.70mm)	.0670	1-1/2	3/4	5.09	4.87	4.65	4.43
56180	89180	#50 (1.78mm)	.0700	1-3/4	7/8	5.21	4.98	4.76	4.53
56185	89185	#49 (1.85mm)	.0730	1-3/4	7/8	5.35	5.12	4.88	4.65
56190	89190	#48 (1.93mm)	.0760	1-3/4	7/8	5.52	5.28	5.04	4.80
56195	89195	5/64 (1.98mm)	.0781	1-3/4	7/8	5.73	5.48	5.23	4.98
56200	89200	#47 (1.99mm)	.0785	1-3/4	7/8	5.92	5.66	5.41	5.15
56205	89205	2mm	.0787	44mm	22mm	6.01	5.75	5.49	5.23
56210	89210	#46 (2.06mm)	.0810	1-3/4	7/8	6.11	5.84	5.58	5.31
56215	89215	#45 (2.08mm)	.0820	1-3/4	7/8	6.29	6.02	5.74	5.47
56220	89220	#44 (2.18mm)	.0860	2	1	6.50	6.22	5.93	5.65
56225	89225	#43 (2.26mm)	.0890	2	1	6.68	6.39	6.10	5.81
56230	89230	#42 (2.37mm)	.0935	2	1	6.77	6.48	6.18	5.89
56235	89235	3/32 (2.38mm)	.0938	2	1	6.93	6.63	6.33	6.03
56240	89240	#41 (2.44mm)	.0960	2	1	6.99	6.69	6.38	6.08
56245	89245	#40 (2.49mm)	.0980	2	1	7.10	6.79	6.48	6.17
56250	89250	2.5mm	.0984	57mm	32mm	7.13	6.82	6.51	6.20
56255	89255	#39 (2.53mm)	.0995	2-1/4	1-1/4	7.16	6.85	6.54	6.23
56260	89260	#38 (2.58mm)	.1015	2-1/4	1-1/4	7.26	6.94	6.63	6.31
56265	89265	#37 (2.64mm)	.1040	2-1/4	1-1/4	7.35	7.03	6.71	6.39
56270	89270	#36 (2.71mm)	.1065	2-1/4	1-1/4	7.44	7.12	6.79	6.47
56275	89275	7/64 (2.78mm)	.1094	2-1/4	1-1/4	7.57	7.24	6.91	6.58
56280	89280	#35 (2.79mm)	.1100	2-1/4	1-1/4	7.65	7.32	6.98	6.65
56285	89285	#34 (2.82mm)	.1110	2-1/4	1-1/4	7.74	7.40	7.07	6.73
56290	89290	#33 (2.87mm)	.1130	2-1/4	1-1/4	7.88	7.54	7.19	6.85
56295	89295	#32 (2.95mm)	.1160	2-1/4	1-1/4	7.97	7.62	7.28	6.93
56300	89300	3mm	.1181	57mm	32mm	8.05	7.70	7.35	7.00
56305	89305	#31 (3.05mm)	.1200	2-1/4	1-1/4	8.11	7.76	7.40	7.05
56310	89310	1/8 (3.17mm)	.1250	2-1/4	1-1/4	8.20	7.84	7.49	7.13
56315	89315	#30 (3.26mm)	.1285	2-1/4	1-1/4	8.41	8.04	7.68	7.31
56320	89320	#29 (3.45mm)	.1360	2-1/2	1-3/8	8.67	8.29	7.92	7.54
56325	89325	3.5mm	.1378	63mm	35mm	8.95	8.56	8.17	7.78
56330	89330	#28 (3.57mm)	.1405	2-1/2	1-3/8	9.05	8.66	8.26	7.87
56335	89335	9/64 (3.57mm)	.1406	2-1/2	1-3/8	9.14	8.74	8.35	7.95
56340	89340	#27 (3.66mm)	.1440	2-1/2	1-3/8	9.51	9.10	8.68	8.27
56345	89345	#26 (3.73mm)	.1470	2-1/2	1-3/8	9.61	9.19	8.77	8.36
56350	89350	#25 (3.80mm)	.1495	2-1/2	1-3/8	9.73	9.31	8.88	8.46
56355	89355	#24 (3.86mm)	.1520	2-1/2	1-3/8	9.75	9.33	8.90	8.48
56360	89360	#23 (3.91mm)	.1540	2-1/2	1-3/8	9.82	9.39	8.97	8.54
56365	89365	5/32 (3.97mm)	.1562	2-1/2	1-3/8	9.88	9.45	9.02	8.59
56370	89370	#22 (3.99mm)	.1570	2-1/2	1-3/8	10.50	10.04	9.59	9.13
56375	89375	4mm	.1575	63mm	35mm	10.63	10.17	9.71	9.24
56380	89380	#21 (4.04mm)	.1590	2-1/2	1-3/8	10.76	10.29	9.82	9.36
56385	89385	#20 (4.09mm)	.1610	2-1/2	1-3/8	10.84	10.37	9.90	9.43
56390	89390	#19 (4.22mm)	.1660	2-3/4	1-5/8	11.28	10.79	10.30	9.81
56395	89395	#18 (4.30mm)	.1695	2-3/4	1-5/8	11.42	10.92	10.43	9.93
56400	89400	11/64 (4.37mm)	.1719	2-3/4	1-5/8	11.65	11.14	10.64	10.13
56405	89405	#17 (4.39mm)	.1730	2-3/4	1-5/8	11.82	11.31	10.79	10.28
56410	89410	#16 (4.49mm)	.1770	2-3/4	1-5/8	11.95	11.43	10.91	10.39
56415	89415	4.5mm	.1772	70mm	41mm	12.01	11.49	10.97	10.44
56420	89420	#15 (4.57mm)	.1800	2-3/4	1-5/8	12.06	11.54	11.01	10.49
56425	89425	#14 (4.62mm)	.1820	2-3/4	1-5/8	12.34	11.80	11.27	10.73
56430	89430	#13 (4.70mm)	.1850	2-3/4	1-5/8	12.43	11.89	11.35	10.81
56435	89435	3/16 (4.76mm)	.1875	2-3/4	1-5/8	12.48	11.94	11.39	10.85
56440	89440	#12 (4.80mm)	.1890	2-3/4	1-5/8	12.89	12.33	11.77	11.21
56445	89445	#11 (4.85mm)	.1910	2-3/4	1-5/8	13.04	12.47	11.91	11.34

118° cam drill point Series 1200
135° 4-facet drill point Series 1205

118° EDP#	135° EDP#	d Diameter†	Decimal Equivalent	l ₁ Overall Length	l ₂ Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
56450	89450	#10 (4.91mm)	.1935	2-3/4	1-5/8	13.65	13.06	12.46	11.87
56455	89455	#9 (4.98mm)	.1960	3	1-3/4	14.00	13.39	12.78	12.17
56460	89460	5mm	.1969	76mm	44mm	14.08	13.47	12.86	12.24
56465	89465	#8 (5.05mm)	.1990	3	1-3/4	14.17	13.55	12.94	12.32
56470	89470	#7 (5.10mm)	.2010	3	1-3/4	14.59	13.96	13.32	12.69
56475	89475	13/64 (5.16mm)	.2031	3	1-3/4	14.70	14.06	13.42	12.78
56480	89480	#6 (5.18mm)	.2040	3	1-3/4	15.00	14.35	13.70	13.04
56485	89485	#5 (5.22mm)	.2055	3	1-3/4	15.31	14.64	13.98	13.31
56490	89490	#4 (5.31mm)	.2090	3	1-3/4	15.58	14.90	14.23	13.55
56495	89495	#3 (5.41mm)	.2130	3	1-3/4	15.85	15.16	14.47	13.78
56500	89500	5.5mm	.2165	76mm	44mm	15.97	15.28	14.58	13.89
56505	89505	7/32 (5.56mm)	.2188	3	1-3/4	16.09	15.39	14.69	13.99
56510	89510	#2 (5.61mm)	.2210	3	1-3/4	16.48	15.76	15.05	14.33
56515	89515	#1 (5.79mm)	.2280	3	1-3/4	16.58	15.86	15.14	14.42
56520	89520	A (5.94mm)	.2340	3-1/4	2	16.77	16.04	15.31	14.58
56525	89525	15/64 (5.95mm)	.2344	3-1/4	2	16.82	16.09	15.36	14.63
56530	89530	6mm	.2362	82mm	50mm	16.88	16.15	15.41	14.68
56535	89535	B (6.04mm)	.2380	3-1/4	2	16.94	16.20	15.47	14.73
56540	89540	C (6.15mm)	.2420	3-1/4	2	17.07	16.33	15.59	14.84
56545	89545	D (6.25mm)	.2460	3-1/4	2	17.19	16.44	15.70	14.95
56550	89550	1/4 E (6.35mm)	.2500	3-1/4	2	17.31	16.56	15.80	15.05
56555	89555	6.5mm	.2559	82mm	50mm	17.73	16.96	16.19	15.42
56560	89560	F (6.53mm)	.2570	3-1/4	2	18.10	17.31	16.53	15.74
56565	89565	G (6.63mm)	.2610	3-1/2	2-1/8	18.47	17.67	16.86	16.06
56570	89570	17/64 (6.75mm)	.2656	3-1/2	2-1/8	18.84	18.02	17.20	16.38
56575	89575	H (6.76mm)	.2660	3-1/2	2-1/8	19.38	18.54	17.69	16.85
56580	89580	I (6.91mm)	.2720	3-1/2	2-1/8	19.60	18.75	17.90	17.04
56585	89585	7mm	.2756	88mm	54mm	19.76	18.90	18.04	17.18
56590	89590	J (7.03mm)	.2770	3-1/2	2-1/8	19.93	19.06	18.20	17.33
56595	89595	K (7.14mm)	.2810	3-1/2	2-1/8	20.11	19.24	18.36	17.49
56600	89600	9/32 (7.14mm)	.2812	3-1/2	2-1/8	20.23	19.35	18.47	17.59
56605	89605	L (7.37mm)	.2900	3-1/2	2-1/8	20.96	20.05	19.14	18.23
56610	89610	M (7.49mm)	.2950	3-3/4	2-3/8	22.43	21.45	20.48	19.50
56615	89615	7.5mm	.2953	95mm	60mm	22.43	21.45	20.48	19.50
56620	89620	19/64 (7.54mm)	.2969	3-3/4	2-3/8	22.43	21.45	20.48	19.50
56625	89625	N (7.67mm)	.3020	3-3/4	2-3/8	23.77	22.74	21.70	20.67
56630	89630	5/16 (7.94mm)	.3125	3-3/4	2-3/8	23.86	22.82	21.79	20.75
56635	89635	8mm	.3150	95mm	60mm	25.60	24.49	23.37	22.26
56640	89640	O (8.03mm)	.3160	3-3/4	2-3/8	25.60	24.49	23.37	22.26
56645	89645	P (8.20mm)	.3230	3-3/4	2-3/8	25.60	24.49	23.37	22.26
56650	89650	21/64 (8.33mm)	.3281	4	2-1/2	25.98	24.85	23.72	22.59
56655	89655	Q (8.43mm)	.3320	4	2-1/2	26.58	25.42	24.27	23.11
56660	89660	8.5mm	.3346	101mm	63mm	26.82	25.65	24.49	23.32
56665	89665	R (8.61mm)	.3390	4	2-1/2	27.67	26.47	25.26	24.06
56670	89670	11/32 (8.73mm)	.3438	4	2-1/2	28.80	27.55	26.30	25.04
56675	89675	S (8.84mm)	.3480	4	2-1/2	28.89	27.63	26.38	25.12
56680	89680	9mm	.3543	101mm	63mm	29.07	27.81	26.54	25.28
56685	89685	T (9.09mm)	.3580	4-1/4	2-3/4	29.33	28.05	26.78	25.50
56690	89690	23/64 (9.13mm)	.3594	4-1/4	2-3/4	29.53	28.25	26.96	25.68
56695	89695	U (9.35mm)	.3680	4-1/4	2-3/4	33.52	32.06	30.61	29.15
56700	89700	9.5mm	.3740	107mm	70mm	33.83	32.36	30.89	29.42
56705	89705	3/8 (9.52mm)	.3750	4-1/4	2-3/4	34.10	32.62	31.13	29.65
56710	89710	V (9.57mm)	.3770	4-1/4	2-3/4	34.74	33.23	31.72	30.21
56715	89715	W (9.80mm)	.3860	4-1/2	2-7/8	35.48	33.94	32.39	30.85
56720	89720	25/64 (9.92mm)	.3906	4-1/2	2-7/8	36.01	34.44	32.88	31.31
56725	89725	10mm	.3937	114mm	73mm	37.31	35.69	34.07	32.44
56730	89730	X (10.08mm)	.3970	4-1/2	2-7/8	38.40	36.73	35.06	33.39
56735	89735	Y (10.26mm)	.4040	4-1/2	2-7/8	38.71	37.03	35.34	33.66
56740	89740	13/32 (10.32mm)	.4062	4-1/2	2-7/8	40.11	38.37	36.62	34.88
56745	89745	Z (10.49mm)	.4130	4-1/2	2-7/8	40.54	38.78	37.01	35.25
56750	89750	10.5mm	.4134	114mm	73mm	40.54	38.78	37.01	35.25
56755	89755	27/64 (10.72mm)	.4219	4-1/2	2-7/8	40.99	39.21	37.43	35.64
56760	89760	11mm	.4331	114mm	73mm	44.51	42.57	40.64	38.70
56765	89765	7/16 (11.11mm)	.4375	4-1/2	2-7/8	44.51	42.57	40.64	38.70
56770	89770	11.5mm	.4528	120mm	76mm	48.28	46.18	44.08	41.98
56775	89775	29/64 (11.51mm)	.4531	4-3/4	3	48.28	46.18	44.08	41.98
56780	89780	15/32 (11.91mm)	.4688	4-3/4	3	51.07	48.85	46.63	44.41
56785	89785	12mm	.4724	120mm	76mm	51.24	49.01	46.78	44.56
56790	89790	31/64 (12.30mm)	.4844	4-3/4	3	51.24	49.01	46.78	44.56
56795	89795	12.5mm	.4921	120mm	76mm	52.60	50.31	48.03	45.74
56800	89800	1/2 (12.70mm)	.5000	4-3/4	3	52.60	50.31	48.03	45.74
*	-	89805	.5118	127mm	83mm	66.09	63.22	60.34	57.47
*	-	89810	.5156	5	3-1/4	67.86	64.91	61.96	59.01
*	-	89815	.5312	5	3-1/4	69.63	66.60	63.57	60.55
*	-	89820	.5315	127mm	83mm	71.40	68.30	65.19	62.09
*	-	89825	.5469	5	3-1/4	73.17	69.99	66.81	63.63
*	-	89830	.5512	127mm	83mm	74.96	71.70	68.44	65.18
*	-	89835	.5625	5	3-1/4	81.74	78.19	74.63	71.08
*	-	89840	.5709	127mm	83mm	83.44	79.81	76.18	72.56
*	-	89845	.5781	5-1/4	3-1/2	85.15	81.45	77.75	74.04
*	-	89850	.5906	133mm	89mm	86.88	83.10	79.32	75.55
*	-	89855	.5938	5-1/4	3-1/2	87.38	83.58	79.78	75.98
*	-	89860	.6094	5-1/4	3-1/2	87.87	84.05	80.23	76.41
*	-	89865	.6102	133mm	89mm	88.37	84.53	80.69	76.84
*	-	89870	.6250	5-1/4	3-1/2	88.86	85.00	81.13	77.27
*	-	89875	.6299	133mm	89mm	91.23	87.26	83.30	79.33

Series 1200H 118° cam drill point
Series 1205H 135° 4-facet drill point



5xD - 2 Flute Balinit® HARDLUBE Coated

***NEW
SIZES**



SERIES 1200H

General purpose jobber drill
Excellent heat resistance / lubricity
Up to 40% faster than uncoated
25° helix
(1/8" diameter and smaller – 118° 4-facet point)

SERIES 1205H

Self-centering point
Stainless steel alloys, mild steels and titanium alloys
Excellent heat resistance / lubricity
Up to 40% faster than uncoated
No spotting required in most applications
Adaptability when converting from high-speed steel
25° helix

TOLERANCES

$\varnothing d$	+0.0000 – 0.0005" (+0.0000 – 0.0127mm)
l_1	1/8" dia & under: +.125 – .062" (3mm dia & under: +3.175 – 1.588mm) Over 1/8" dia: +.125 – .125" (Over 3mm dia: +3.175 – 3.175mm)
l_2	1/8" dia & under: +.125 – .062" (3mm dia & under: +3.175 – 1.588mm) Over 1/8" dia: +.125 – .125" (Over 3mm dia: +3.175 – 3.175mm)

118° EDP#	135° EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
56166	89166	1/16 (1.59mm)	.0625	1-1/2	3/4	6.33	6.05	5.78	5.50
56171	89171	#52 (1.61mm)	.0635	1-1/2	3/4	6.41	6.13	5.85	5.57
56176	89176	#51 (1.70mm)	.0670	1-1/2	3/4	6.49	6.21	5.93	5.64
56181	89181	#50 (1.78mm)	.0700	1-3/4	7/8	6.60	6.31	6.03	5.74
56186	89186	#49 (1.85mm)	.0730	1-3/4	7/8	6.75	6.46	6.16	5.87
56191	89191	#48 (1.93mm)	.0760	1-3/4	7/8	6.91	6.61	6.31	6.01
56196	89196	5/64 (1.98mm)	.0781	1-3/4	7/8	7.13	6.82	6.51	6.20
56201	89201	#47 (1.99mm)	.0785	1-3/4	7/8	7.33	7.01	6.69	6.37
56206	89206	2mm	.0787	44mm	22mm	7.41	7.09	6.77	6.44
56211	89211	#46 (2.06mm)	.0810	1-3/4	7/8	7.51	7.18	6.86	6.53
56216	89216	#45 (2.08mm)	.0820	1-3/4	7/8	7.69	7.36	7.02	6.69
56221	89221	#44 (2.18mm)	.0860	2	1	7.90	7.56	7.21	6.87
56226	89226	#43 (2.26mm)	.0890	2	1	8.08	7.73	7.38	7.03
56231	89231	#42 (2.37mm)	.0935	2	1	8.17	7.81	7.46	7.10
56236	89236	3/32 (2.38mm)	.0938	2	1	8.33	7.97	7.61	7.24
56241	89241	#41 (2.44mm)	.0960	2	1	8.40	8.03	7.67	7.30
56246	89246	#40 (2.49mm)	.0980	2	1	8.50	8.13	7.76	7.39
56251	89251	2.5mm	.0984	57mm	32mm	8.52	8.15	7.78	7.41
56256	89256	#39 (2.53mm)	.0995	2-1/4	1-1/4	8.56	8.19	7.82	7.44
56261	89261	#38 (2.58mm)	.1015	2-1/4	1-1/4	8.66	8.28	7.91	7.53
56266	89266	#37 (2.64mm)	.1040	2-1/4	1-1/4	8.74	8.36	7.98	7.60
56271	89271	#36 (2.71mm)	.1065	2-1/4	1-1/4	8.84	8.46	8.07	7.69
56276	89276	7/64 (2.78mm)	.1094	2-1/4	1-1/4	8.97	8.58	8.19	7.80
56281	89281	#35 (2.79mm)	.1100	2-1/4	1-1/4	9.05	8.66	8.26	7.87
56286	89286	#34 (2.82mm)	.1110	2-1/4	1-1/4	9.13	8.73	8.34	7.94
56291	89291	#33 (2.87mm)	.1130	2-1/4	1-1/4	9.28	8.88	8.47	8.07
56296	89296	#32 (2.95mm)	.1160	2-1/4	1-1/4	9.36	8.95	8.55	8.14
56301	89301	3mm	.1181	57mm	32mm	9.44	9.03	8.62	8.21
56306	89306	#31 (3.05mm)	.1200	2-1/4	1-1/4	9.51	9.10	8.68	8.27
56311	89311	1/8 (3.17mm)	.1250	2-1/4	1-1/4	9.59	9.17	8.76	8.34
56316	89316	#30 (3.26mm)	.1285	2-1/4	1-1/4	9.81	9.38	8.96	8.53
56321	89321	#29 (3.45mm)	.1360	2-1/2	1-3/8	10.07	9.63	9.19	8.76
56326	89326	3.5mm	.1378	63mm	35mm	10.35	9.90	9.45	9.00
56331	89331	#28 (3.57mm)	.1405	2-1/2	1-3/8	10.45	10.00	9.54	9.09
56336	89336	9/64 (3.57mm)	.1406	2-1/2	1-3/8	10.55	10.09	9.63	9.17
56341	89341	#27 (3.66mm)	.1440	2-1/2	1-3/8	10.91	10.44	9.96	9.49
56346	89346	#26 (3.73mm)	.1470	2-1/2	1-3/8	11.01	10.53	10.05	9.57
56351	89351	#25 (3.80mm)	.1495	2-1/2	1-3/8	11.12	10.64	10.15	9.67
56356	89356	#24 (3.86mm)	.1520	2-1/2	1-3/8	11.16	10.67	10.19	9.70
56361	89361	#23 (3.91mm)	.1540	2-1/2	1-3/8	11.22	10.73	10.24	9.76
56366	89366	5/32 (3.97mm)	.1562	2-1/2	1-3/8	11.27	10.78	10.29	9.80
56371	89371	#22 (3.99mm)	.1570	2-1/2	1-3/8	11.89	11.37	10.86	10.34
56376	89376	4mm	.1575	63mm	35mm	12.03	11.51	10.98	10.46
56381	89381	#21 (4.04mm)	.1590	2-1/2	1-3/8	12.16	11.63	11.10	10.57
56386	89386	#20 (4.09mm)	.1610	2-1/2	1-3/8	12.24	11.71	11.18	10.64
56391	89391	#19 (4.22mm)	.1660	2-3/4	1-5/8	12.68	12.13	11.58	11.03
56396	89396	#18 (4.30mm)	.1695	2-3/4	1-5/8	12.81	12.25	11.70	11.14
56401	89401	11/64 (4.37mm)	.1719	2-3/4	1-5/8	13.04	12.47	11.91	11.34
56406	89406	#17 (4.39mm)	.1730	2-3/4	1-5/8	13.23	12.65	12.08	11.50
56411	89411	#16 (4.49mm)	.1770	2-3/4	1-5/8	13.34	12.76	12.18	11.60
56416	89416	4.5mm	.1772	70mm	41mm	13.41	12.83	12.24	11.66
56421	89421	#15 (4.57mm)	.1800	2-3/4	1-5/8	13.46	12.87	12.29	11.70
56426	89426	#14 (4.62mm)	.1820	2-3/4	1-5/8	13.73	13.13	12.54	11.94
56431	89431	#13 (4.70mm)	.1850	2-3/4	1-5/8	13.83	13.23	12.63	12.03
56436	89436	3/16 (4.76mm)	.1875	2-3/4	1-5/8	13.88	13.28	12.67	12.07
56441	89441	#12 (4.80mm)	.1890	2-3/4	1-5/8	15.30	14.63	13.97	13.30
56446	89446	#11 (4.85mm)	.1910	2-3/4	1-5/8	15.44	14.77	14.10	13.43

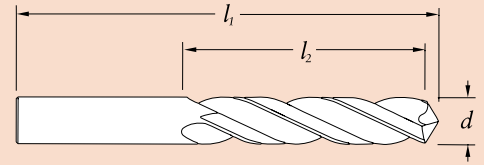
118° cam drill point Series 1200H
135° 4-facet drill point Series 1205H

118° EDP#	135° EDP#	d Diameter†	Decimal Equivalent	l ₁ Overall Length	l ₂ Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
56451	89451	#10 (4.91mm)	.1935	2-3/4	1-5/8	16.05	15.35	14.65	13.96
56456	89456	#9 (4.98mm)	.1960	3	1-3/4	16.40	15.69	14.97	14.26
56461	89461	5mm	.1969	76mm	44mm	16.48	15.76	15.05	14.33
56466	89466	#8 (5.05mm)	.1990	3	1-3/4	16.56	15.84	15.12	14.40
56471	89471	#7 (5.10mm)	.2010	3	1-3/4	16.99	16.25	15.51	14.77
56476	89476	13/64 (5.16mm)	.2031	3	1-3/4	17.10	16.36	15.61	14.87
56481	89481	#6 (5.18mm)	.2040	3	1-3/4	17.40	16.64	15.89	15.13
56486	89486	#5 (5.22mm)	.2055	3	1-3/4	17.71	16.94	16.17	15.40
56491	89491	#4 (5.31mm)	.2090	3	1-3/4	17.99	17.21	16.43	15.64
56496	89496	#3 (5.41mm)	.2130	3	1-3/4	18.25	17.46	16.66	15.87
56501	89501	5.5mm	.2165	76mm	44mm	18.37	17.57	16.77	15.97
56506	89506	7/32 (5.56mm)	.2188	3	1-3/4	18.48	17.68	16.87	16.07
56511	89511	#2 (5.61mm)	.2210	3	1-3/4	18.87	18.05	17.23	16.41
56516	89516	#1 (5.79mm)	.2280	3	1-3/4	18.98	18.15	17.33	16.50
56521	89521	A (5.94mm)	.2340	3-1/4	2	19.25	18.41	17.58	16.74
56526	89526	15/64 (5.95mm)	.2344	3-1/4	2	19.31	18.47	17.63	16.79
56531	89531	6mm	.2362	82mm	50mm	19.37	18.53	17.69	16.84
56536	89536	B (6.04mm)	.2380	3-1/4	2	19.42	18.58	17.73	16.89
56541	89541	C (6.15mm)	.2420	3-1/4	2	19.55	18.70	17.85	17.00
56546	89546	D (6.25mm)	.2460	3-1/4	2	19.68	18.82	17.97	17.11
56551	89551	1/4 E (6.35mm)	.2500	3-1/4	2	19.79	18.93	18.07	17.21
56556	89556	6.5mm	.2559	82mm	50mm	22.28	21.31	20.34	19.37
56561	89561	F (6.53mm)	.2570	3-1/4	2	22.66	21.67	20.69	19.70
56566	89566	G (6.63mm)	.2610	3-1/2	2-1/8	23.01	22.01	21.01	20.01
56571	89571	17/64 (6.75mm)	.2656	3-1/2	2-1/8	23.39	22.37	21.36	20.34
56576	89576	H (6.76mm)	.2660	3-1/2	2-1/8	23.93	22.89	21.85	20.81
56581	89581	I (6.91mm)	.2720	3-1/2	2-1/8	24.15	23.10	22.05	21.00
56586	89586	7mm	.2756	88mm	54mm	24.31	23.25	22.20	21.14
56591	89591	J (7.03mm)	.2770	3-1/2	2-1/8	24.48	23.42	22.35	21.29
56596	89596	K (7.14mm)	.2810	3-1/2	2-1/8	24.66	23.59	22.52	21.44
56601	89601	9/32 (7.14mm)	.2812	3-1/2	2-1/8	24.77	23.69	22.62	21.54
56606	89606	L (7.37mm)	.2900	3-1/2	2-1/8	25.52	24.41	23.30	22.19
56611	89611	M (7.49mm)	.2950	3-3/4	2-3/8	26.98	25.81	24.63	23.46
56616	89616	7.5mm	.2953	95mm	60mm	26.98	25.81	24.63	23.46
56621	89621	19/64 (7.54mm)	.2969	3-3/4	2-3/8	26.98	25.81	24.63	23.46
56626	89626	N (7.67mm)	.3020	3-3/4	2-3/8	28.32	27.09	25.86	24.63
56631	89631	5/16 (7.94mm)	.3125	3-3/4	2-3/8	28.42	27.18	25.95	24.71
56636	89636	8mm	.3150	95mm	60mm	30.14	28.83	27.52	26.21
56641	89641	O (8.03mm)	.3160	3-3/4	2-3/8	30.14	28.83	27.52	26.21
56646	89646	P (8.20mm)	.3230	3-3/4	2-3/8	30.14	28.83	27.52	26.21
56651	89651	21/64 (8.33mm)	.3281	4	2-1/2	30.52	29.19	27.87	26.54
56656	89656	Q (8.43mm)	.3320	4	2-1/2	31.13	29.78	28.42	27.07
56661	89661	8.5mm	.3346	101mm	63mm	31.36	30.00	28.63	27.27
56666	89666	R (8.61mm)	.3390	4	2-1/2	32.21	30.81	29.41	28.01
56671	89671	11/32 (8.73mm)	.3438	4	2-1/2	33.35	31.90	30.45	29.00
56676	89676	S (8.84mm)	.3480	4	2-1/2	34.66	33.15	31.65	30.14
56681	89681	9mm	.3543	101mm	63mm	34.86	33.34	31.83	30.31
56686	89686	T (9.09mm)	.3580	4-1/4	2-3/4	36.24	34.66	33.09	31.51
56691	89691	23/64 (9.13mm)	.3594	4-1/4	2-3/4	36.46	34.87	33.29	31.70
56696	89696	U (9.35mm)	.3680	4-1/4	2-3/4	40.45	38.69	36.93	35.17
56701	89701	9.5mm	.3740	107mm	70mm	40.74	38.97	37.20	35.43
56706	89706	3/8 (9.52mm)	.3750	4-1/4	2-3/4	41.02	39.24	37.45	35.67
56711	89711	V (9.57mm)	.3770	4-1/4	2-3/4	42.02	40.19	38.37	36.54
56716	89716	W (9.80mm)	.3860	4-1/2	2-7/8	42.77	40.91	39.05	37.19
56721	89721	25/64 (9.92mm)	.3906	4-1/2	2-7/8	43.29	41.41	39.53	37.64
56726	89726	10mm	.3937	114mm	73mm	44.59	42.65	40.71	38.77
56731	89731	X (10.08mm)	.3970	4-1/2	2-7/8	45.67	43.68	41.70	39.71
56736	89736	Y (10.26mm)	.4040	4-1/2	2-7/8	45.99	43.99	41.99	39.99
56741	89741	13/32 (10.32mm)	.4062	4-1/2	2-7/8	47.39	45.33	43.27	41.21
56746	89746	Z (10.49mm)	.4130	4-1/2	2-7/8	47.83	45.75	43.67	41.59
56751	89751	10.5mm	.4134	114mm	73mm	47.83	45.75	43.67	41.59
56756	89756	27/64 (10.72mm)	.4219	4-1/2	2-7/8	48.27	46.17	44.07	41.97
56761	89761	11mm	.4331	114mm	73mm	51.78	49.53	47.28	45.03
56766	89766	7/16 (11.11mm)	.4375	4-1/2	2-7/8	51.78	49.53	47.28	45.03
56771	89771	11.5mm	.4528	120mm	76mm	55.56	53.14	50.73	48.31
56776	89776	29/64 (11.51mm)	.4531	4-3/4	3	55.56	53.14	50.73	48.31
56781	89781	15/32 (11.91mm)	.4688	4-3/4	3	58.35	55.81	53.28	50.74
56786	89786	12mm	.4724	120mm	76mm	58.52	55.98	53.43	50.89
56791	89791	31/64 (12.30mm)	.4844	4-3/4	3	58.52	55.98	53.43	50.89
56796	89796	12.5mm	.4921	120mm	76mm	59.88	57.28	54.67	52.07
56801	89801	1/2 (12.70mm)	.5000	4-3/4	3	59.88	57.28	54.67	52.07
*	89806	13mm	.5118	127mm	83mm	75.36	72.08	68.81	65.53
*	89811	33/64 (13.10mm)	.5156	5	3-1/4	77.13	73.78	70.42	67.07
*	89816	17/32 (13.49mm)	.5312	5	3-1/4	78.90	75.47	72.04	68.61
*	89821	13.5mm	.5315	127mm	83mm	80.67	77.16	73.65	70.15
*	89826	35/64 (13.89mm)	.5469	5	3-1/4	82.44	78.86	75.27	71.69
*	89831	14mm	.5512	127mm	83mm	84.23	80.57	76.91	73.24
*	89836	9/16 (14.29mm)	.5625	5	3-1/4	91.01	87.05	83.10	79.14
*	89841	14.5mm	.5709	127mm	83mm	92.71	88.68	84.65	80.62
*	89846	37/64 (14.68mm)	.5781	5-1/4	3-1/2	94.42	90.31	86.21	82.10
*	89851	15mm	.5906	133mm	89mm	96.14	91.96	87.78	83.60
*	89856	19/32 (15.08mm)	.5938	5-1/4	3-1/2	96.66	92.46	88.25	84.05
*	89861	39/64 (15.48mm)	.6094	5-1/4	3-1/2	97.14	92.92	88.69	84.47
*	89866	15.5mm	.6102	133mm	89mm	97.64	93.39	89.15	84.90
*	89871	5/8 (15.87mm)	.6250	5-1/4	3-1/2	98.13	93.86	89.60	85.33
*	89876	16mm	.6299	133mm	89mm	100.50	96.13	91.76	87.39

Series 1120

150° self-centering drill point

NEW
SERIES



3xD - 3 Flute



Near reamer finishes

Cast aluminum, cast iron and materials with high silicon content

Stub length reduces deflection and vibration

Tighter tolerance holes

Improved roundness and straightness

25° helix

TOLERANCES

Ød +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

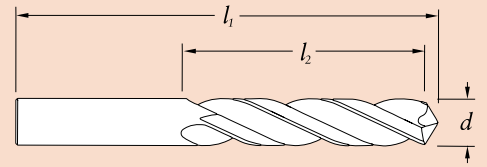
EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
78275	7/64 (2.78mm)	.1094	1-13/16	13/16	8.84	8.46	8.07	7.69
78280	#35 (2.79mm)	.1100	1-7/8	7/8	8.94	8.55	8.16	7.77
78285	#34 (2.82mm)	.1110	1-7/8	7/8	9.05	8.66	8.26	7.87
78290	#33 (2.87mm)	.1130	1-7/8	7/8	9.21	8.81	8.41	8.01
78295	#32 (2.95mm)	.1160	1-7/8	7/8	9.34	8.93	8.53	8.12
78300	3mm	.1181	48mm	22mm	9.42	9.01	8.60	8.19
78305	#31 (3.05mm)	.1200	1-7/8	7/8	9.49	9.08	8.66	8.25
78310	1/8 (3.17mm)	.1250	1-7/8	7/8	9.61	9.19	8.77	8.36
78315	#30 (3.26mm)	.1285	1-15/16	15/16	9.86	9.43	9.00	8.57
78320	#29 (3.45mm)	.1360	1-15/16	15/16	10.12	9.68	9.24	8.80
78325	3.5mm	.1378	49mm	24mm	10.45	10.00	9.54	9.09
78330	#28 (3.57mm)	.1405	1-15/16	15/16	10.58	10.12	9.66	9.20
78335	9/64 (3.57mm)	.1406	1-15/16	15/16	10.71	10.24	9.78	9.31
78340	#27 (3.66mm)	.1440	2-1/16	1	11.55	11.05	10.55	10.04
78345	#26 (3.73mm)	.1470	2-1/16	1	11.70	11.19	10.68	10.17
78350	#25 (3.80mm)	.1495	2-1/16	1	11.81	11.30	10.78	10.27
78355	#24 (3.86mm)	.1520	2-1/16	1	11.83	11.32	10.80	10.29
78360	#23 (3.91mm)	.1540	2-1/16	1	11.94	11.42	10.90	10.38
78365	5/32 (3.97mm)	.1562	2-1/16	1	11.99	11.47	10.95	10.43
78370	#22 (3.99mm)	.1570	2-1/8	1-1/16	12.75	12.20	11.64	11.09
78375	4mm	.1575	54mm	27mm	12.75	12.20	11.64	11.09
78380	#21 (4.04mm)	.1590	2-1/8	1-1/16	13.05	12.48	11.92	11.35
78385	#20 (4.09mm)	.1610	2-1/8	1-1/16	13.05	12.48	11.92	11.35
78390	#19 (4.22mm)	.1660	2-1/8	1-1/16	13.16	12.59	12.02	11.44
78395	#18 (4.30mm)	.1695	2-1/8	1-1/16	13.24	12.66	12.09	11.51
78400	11/64 (4.37mm)	.1719	2-1/8	1-1/16	13.33	12.75	12.17	11.59
78405	#17 (4.39mm)	.1730	2-3/16	1-1/8	13.94	13.33	12.73	12.12
78410	#16 (4.49mm)	.1770	2-3/16	1-1/8	14.09	13.48	12.86	12.25
78415	4.5mm	.1772	56mm	29mm	14.16	13.54	12.93	12.31
78420	#15 (4.57mm)	.1800	2-3/16	1-1/8	14.23	13.61	12.99	12.37
78425	#14 (4.62mm)	.1820	2-3/16	1-1/8	14.55	13.92	13.28	12.65
78430	#13 (4.70mm)	.1850	2-3/16	1-1/8	14.63	13.99	13.36	12.72
78435	3/16 (4.76mm)	.1875	2-3/16	1-1/8	14.63	13.99	13.36	12.72
78440	#12 (4.80mm)	.1890	2-1/4	1-3/16	14.74	14.10	13.46	12.82
78445	#11 (4.85mm)	.1910	2-1/4	1-3/16	14.90	14.25	13.60	12.96
78450	#10 (4.91mm)	.1935	2-1/4	1-3/16	15.61	14.93	14.25	13.57
78455	#9 (4.98mm)	.1960	2-1/4	1-3/16	15.99	15.29	14.60	13.90
78460	5mm	.1969	57mm	30mm	16.09	15.39	14.69	13.99
78465	#8 (5.05mm)	.1990	2-1/4	1-3/16	16.20	15.50	14.79	14.09
78470	#7 (5.10mm)	.2010	2-1/4	1-3/16	16.69	15.96	15.24	14.51
78475	13/64 (5.16mm)	.2031	2-1/4	1-3/16	17.32	16.57	15.81	15.06
78480	#6 (5.18mm)	.2040	2-3/8	1-1/4	17.42	16.66	15.91	15.15
78485	#5 (5.22mm)	.2055	2-3/8	1-1/4	17.50	16.74	15.98	15.22
78490	#4 (5.31mm)	.2090	2-3/8	1-1/4	17.80	17.03	16.25	15.48
78495	#3 (5.41mm)	.2130	2-3/8	1-1/4	18.11	17.32	16.54	15.75
78500	5.5mm	.2165	60mm	32mm	18.25	17.46	16.66	15.87

EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
78505	7/32 (5.56mm)	.2188	2-3/8	1-1/4	18.40	17.60	16.80	16.00
78510	#2 (5.61mm)	.2210	2-7/16	1-5/16	18.85	18.03	17.21	16.39
78515	#1 (5.79mm)	.2280	2-7/16	1-5/16	18.94	18.12	17.29	16.47
78520	A (5.94mm)	.2340	2-7/16	1-5/16	19.04	18.21	17.38	16.56
78525	15/64 (5.95mm)	.2344	2-7/16	1-5/16	19.14	18.31	17.48	16.64
78530	6mm	.2362	63.5mm	35mm	19.19	18.36	17.52	16.69
78535	B (6.04mm)	.2380	2-1/2	1-3/8	19.27	18.43	17.59	16.76
78540	C (6.15mm)	.2420	2-1/2	1-3/8	19.41	18.57	17.72	16.88
78545	D (6.25mm)	.2460	2-1/2	1-3/8	19.54	18.69	17.84	16.99
78550	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	19.68	18.82	17.97	17.11
78555	6.5mm	.2559	67mm	37mm	20.17	19.29	18.42	17.54
78560	F (6.53mm)	.2570	2-5/8	1-7/16	20.59	19.69	18.80	17.90
78565	G (6.63mm)	.2610	2-5/8	1-7/16	20.90	19.99	19.08	18.17
78570	17/64 (6.75mm)	.2656	2-5/8	1-7/16	21.31	20.38	19.46	18.53
78575	H (6.76mm)	.2660	2-11/16	1-1/2	21.93	20.98	20.02	19.07
78580	I (6.91mm)	.2720	2-11/16	1-1/2	22.20	21.23	20.27	19.30
78585	7mm	.2756	68mm	38mm	22.36	21.39	20.42	19.44
78590	J (7.03mm)	.2770	2-11/16	1-1/2	22.55	21.57	20.59	19.61
78595	K (7.14mm)	.2810	2-11/16	1-1/2	22.76	21.77	20.78	19.79
78600	9/32 (7.14mm)	.2812	2-11/16	1-1/2	23.56	22.54	21.51	20.49
78605	L (7.37mm)	.2900	2-3/4	1-9/16	24.44	23.38	22.31	21.25
78610	M (7.49mm)	.2950	2-3/4	1-9/16	25.14	24.05	22.95	21.86
78615	7.5mm	.2953	70mm	40mm	25.14	24.05	22.95	21.86
78620	19/64 (7.54mm)	.2969	2-3/4	1-9/16	25.14	24.05	22.95	21.86
78625	N (7.67mm)	.3020	2-13/16	1-5/8	26.14	25.00	23.87	22.73
78630	5/16 (7.94mm)	.3125	2-13/16	1-5/8	26.25	25.11	23.97	22.83
78635	8mm	.3150	75mm	43mm	28.15	26.93	25.70	24.48
78640	O (8.03mm)	.3160	2-15/16	1-11/16	28.15	26.93	25.70	24.48
78645	P (8.20mm)	.3230	2-15/16	1-11/16	28.15	26.93	25.70	24.48
78650	21/64 (8.33mm)	.3281	2-15/16	1-11/16	29.38	28.10	26.83	25.55
78655	Q (8.43mm)	.3320	3	1-11/16	30.07	28.76	27.46	26.15
78660	8.5mm	.3346	76mm	43mm	30.35	29.03	27.71	26.39
78665	R (8.61mm)	.3390	3	1-11/16	31.28	29.92	28.56	27.20
78670	11/32 (8.73mm)	.3438	3	1-11/16	32.58	31.16	29.75	28.33
78675	S (8.84mm)	.3480	3-1/16	1-3/4	35.08	33.55	32.03	30.50
78680	9mm	.3543	78mm	44mm	35.31	33.77	32.24	30.70
78685	T (9.09mm)	.3580	3-1/16	1-3/4	35.42	33.88	32.34	30.80
78690	23/64 (9.13mm)	.3594	3-1/16	1-3/4	35.71	34.16	32.60	31.05
78695	U (9.35mm)	.3680	3-1/8	1-13/16	38.12	36.46	34.81	33.15
78700	9.5mm	.3740	79mm	46mm	38.78	37.09	35.41	33.72
78705	3/8 (9.52mm)	.3750	3-1/8	1-13/16	38.78	37.09	35.41	33.72
78710	V (9.57mm)	.3770	3-1/4	1-7/8	39.24	37.53	35.83	34.12
78715	W (9.80mm)	.3860	3-1/4	1-7/8	41.79	39.97	38.16	36.34
78720	25/64 (9.92mm)	.3906	3-1/4	1-7/8	42.40	40.56	38.71	36.87
78725	10mm	.3937	84mm	49mm	43.93	42.02	40.11	38.20
78730	X (10.08mm)	.3970	3-5/16	1-15/16	45.24	43.27	41.31	39.34
78735	Y (10.26mm)	.4040	3-5/16	1-15/16	45.59	43.61	41.63	39.64
78740	13/32 (10.32mm)	.4062	3-5/16	1-15/16	47.24	45.19	43.13	41.08
78745	Z (10.49mm)	.4130	3-3/8	2	47.73	45.65	43.58	41.50
78750	10.5mm	.4134	86mm	51mm	47.73	45.65	43.58	41.50
78755	27/64 (10.72mm)	.4219	3-3/8	2	48.28	46.18	44.08	41.98
78760	11mm	.4331	87mm	52mm	51.88	49.62	47.37	45.11
78765	7/16 (11.11mm)	.4375	3-7/16	2-1/16	51.88	49.62	47.37	45.11
78770	11.5mm	.4528	90.5mm	54mm	56.28	53.83	51.39	48.94
78775	29/64 (11.51mm)	.4531	3-9/16	2-1/8	56.28	53.83	51.39	48.94
78780	15/32 (11.91mm)	.4688	3-5/8	2-1/8	59.55	56.96	54.37	51.78
78785	12mm	.4724	94mm	56mm	59.73	57.13	54.54	51.94
78790	31/64 (12.30mm)	.4844	3-11/16	2-3/16	59.94	57.33	54.73	52.12
78795	12.5mm	.4921	95mm	56mm	60.96	58.31	55.66	53.01
78800	1/2 (12.70mm)	.5000	3-3/4	2-1/4	61.31	58.64	55.98	53.31

Series 1120H

150° self-centering drill point

NEW
SERIES



3xD - 3 Flute Balinit® HARDLUBE Coated



Near reamer finishes
Cast aluminum, cast iron and materials with high silicon content
Excellent heat resistance / lubricity
Up to 40% faster than uncoated
Stub length reduces deflection and vibration
Tighter tolerance holes
Improved roundness and straightness
25° helix

TOLERANCES

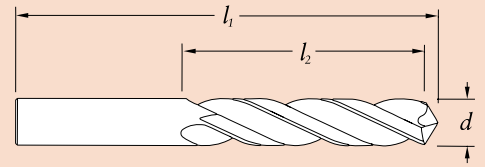
$\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)
 l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)
 l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
78276	7/64 (2.78mm)	.1094	1-13/16	13/16	10.24	9.79	9.35	8.90
78281	#35 (2.79mm)	.1100	1-7/8	7/8	10.33	9.88	9.43	8.98
78286	#34 (2.82mm)	.1110	1-7/8	7/8	10.44	9.99	9.53	9.08
78291	#33 (2.87mm)	.1130	1-7/8	7/8	10.60	10.14	9.68	9.22
78296	#32 (2.95mm)	.1160	1-7/8	7/8	10.73	10.26	9.80	9.33
78301	3mm	.1181	48mm	22mm	10.81	10.34	9.87	9.40
78306	#31 (3.05mm)	.1200	1-7/8	7/8	10.88	10.41	9.93	9.46
78311	1/8 (3.17mm)	.1250	1-7/8	7/8	11.01	10.53	10.05	9.57
78316	#30 (3.26mm)	.1285	1-15/16	15/16	11.25	10.76	10.27	9.78
78321	#29 (3.45mm)	.1360	1-15/16	15/16	11.51	11.01	10.51	10.01
78326	3.5mm	.1378	49mm	24mm	11.85	11.33	10.82	10.30
78331	#28 (3.57mm)	.1405	1-15/16	15/16	11.97	11.45	10.93	10.41
78336	9/64 (3.57mm)	.1406	1-15/16	15/16	12.10	11.57	11.05	10.52
78341	#27 (3.66mm)	.1440	2-1/16	1	12.94	12.38	11.81	11.25
78346	#26 (3.73mm)	.1470	2-1/16	1	13.09	12.52	11.95	11.38
78351	#25 (3.80mm)	.1495	2-1/16	1	13.20	12.63	12.05	11.48
78356	#24 (3.86mm)	.1520	2-1/16	1	13.23	12.65	12.08	11.50
78361	#23 (3.91mm)	.1540	2-1/16	1	13.33	12.75	12.17	11.59
78366	5/32 (3.97mm)	.1562	2-1/16	1	13.39	12.81	12.23	11.64
78371	#22 (3.99mm)	.1570	2-1/8	1-1/16	14.15	13.53	12.92	12.30
78376	4mm	.1575	54mm	27mm	14.15	13.53	12.92	12.30
78381	#21 (4.04mm)	.1590	2-1/8	1-1/16	14.44	13.81	13.18	12.56
78386	#20 (4.09mm)	.1610	2-1/8	1-1/16	14.44	13.81	13.18	12.56
78391	#19 (4.22mm)	.1660	2-1/8	1-1/16	14.55	13.92	13.28	12.65
78396	#18 (4.30mm)	.1695	2-1/8	1-1/16	14.63	13.99	13.36	12.72
78401	11/64 (4.37mm)	.1719	2-1/8	1-1/16	14.72	14.08	13.44	12.80
78406	#17 (4.39mm)	.1730	2-3/16	1-1/8	15.33	14.66	14.00	13.33
78411	#16 (4.49mm)	.1770	2-3/16	1-1/8	15.48	14.81	14.13	13.46
78416	4.5mm	.1772	56mm	29mm	15.55	14.87	14.20	13.52
78421	#15 (4.57mm)	.1800	2-3/16	1-1/8	15.62	14.94	14.26	13.58
78426	#14 (4.62mm)	.1820	2-3/16	1-1/8	15.94	15.25	14.55	13.86
78431	#13 (4.70mm)	.1850	2-3/16	1-1/8	16.02	15.32	14.63	13.93
78436	3/16 (4.76mm)	.1875	2-3/16	1-1/8	16.02	15.32	14.63	13.93
78441	#12 (4.80mm)	.1890	2-1/4	1-3/16	17.15	16.40	15.66	14.91
78446	#11 (4.85mm)	.1910	2-1/4	1-3/16	17.31	16.56	15.80	15.05
78451	#10 (4.91mm)	.1935	2-1/4	1-3/16	18.01	17.23	16.44	15.66
78456	#9 (4.98mm)	.1960	2-1/4	1-3/16	18.39	17.59	16.79	15.99
78461	5mm	.1969	57mm	30mm	18.49	17.69	16.88	16.08
78466	#8 (5.05mm)	.1990	2-1/4	1-3/16	18.61	17.80	16.99	16.18
78471	#7 (5.10mm)	.2010	2-1/4	1-3/16	19.09	18.26	17.43	16.60
78476	13/64 (5.16mm)	.2031	2-1/4	1-3/16	19.72	18.86	18.01	17.15
78481	#6 (5.18mm)	.2040	2-3/8	1-1/4	19.83	18.97	18.11	17.24
78486	#5 (5.22mm)	.2055	2-3/8	1-1/4	19.91	19.04	18.18	17.31
78491	#4 (5.31mm)	.2090	2-3/8	1-1/4	20.21	19.33	18.45	17.57
78496	#3 (5.41mm)	.2130	2-3/8	1-1/4	20.52	19.63	18.74	17.84
78501	5.5mm	.2165	60mm	32mm	20.65	19.75	18.85	17.96

EDP#	d Diameter [†]	Decimal Equivalent	l ₁ Overall Length	l ₂ Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
78506	7/32 (5.56mm)	.2188	2-3/8	1-1/4	20.80	19.90	18.99	18.09
78511	#2 (5.61mm)	.2210	2-7/16	1-5/16	21.25	20.33	19.40	18.48
78516	#1 (5.79mm)	.2280	2-7/16	1-5/16	21.34	20.41	19.48	18.56
78521	A (5.94mm)	.2340	2-7/16	1-5/16	21.45	20.52	19.58	18.65
78526	15/64 (5.95mm)	.2344	2-7/16	1-5/16	21.54	20.60	19.67	18.73
78531	6mm	.2362	63.5mm	35mm	21.60	20.66	19.72	18.78
78536	B (6.04mm)	.2380	2-1/2	1-3/8	21.67	20.73	19.79	18.84
78541	C (6.15mm)	.2420	2-1/2	1-3/8	21.82	20.87	19.92	18.97
78546	D (6.25mm)	.2460	2-1/2	1-3/8	21.94	20.99	20.03	19.08
78551	1/4 E (6.35mm)	.2500	2-1/2	1-3/8	22.08	21.12	20.16	19.20
78556	6.5mm	.2559	67mm	37mm	24.44	23.38	22.31	21.25
78561	F (6.53mm)	.2570	2-5/8	1-7/16	24.85	23.77	22.69	21.61
78566	G (6.63mm)	.2610	2-5/8	1-7/16	25.16	24.07	22.97	21.88
78571	17/64 (6.75mm)	.2656	2-5/8	1-7/16	25.58	24.47	23.36	22.24
78576	H (6.76mm)	.2660	2-11/16	1-1/2	26.20	25.06	23.92	22.78
78581	I (6.91mm)	.2720	2-11/16	1-1/2	26.46	25.31	24.16	23.01
78586	7mm	.2756	68mm	38mm	26.62	25.46	24.31	23.15
78591	J (7.03mm)	.2770	2-11/16	1-1/2	26.82	25.65	24.49	23.32
78596	K (7.14mm)	.2810	2-11/16	1-1/2	27.03	25.85	24.68	23.50
78601	9/32 (7.14mm)	.2812	2-11/16	1-1/2	27.83	26.62	25.41	24.20
78606	L (7.37mm)	.2900	2-3/4	1-9/16	28.70	27.45	26.20	24.96
78611	M (7.49mm)	.2950	2-3/4	1-9/16	29.41	28.13	26.85	25.57
78616	7.5mm	.2953	70mm	40mm	29.41	28.13	26.85	25.57
78621	19/64 (7.54mm)	.2969	2-3/4	1-9/16	29.41	28.13	26.85	25.57
78626	N (7.67mm)	.3020	2-13/16	1-5/8	30.41	29.09	27.77	26.44
78631	5/16 (7.94mm)	.3125	2-13/16	1-5/8	30.52	29.19	27.87	26.54
78636	8mm	.3150	75mm	43mm	32.42	31.01	29.60	28.19
78641	O (8.03mm)	.3160	2-15/16	1-11/16	32.42	31.01	29.60	28.19
78646	P (8.20mm)	.3230	2-15/16	1-11/16	32.42	31.01	29.60	28.19
78651	21/64 (8.33mm)	.3281	2-15/16	1-11/16	33.65	32.19	30.72	29.26
78656	Q (8.43mm)	.3320	3	1-11/16	34.34	32.85	31.35	29.86
78661	8.5mm	.3346	76mm	43mm	34.62	33.11	31.61	30.10
78666	R (8.61mm)	.3390	3	1-11/16	35.55	34.00	32.46	30.91
78671	11/32 (8.73mm)	.3438	3	1-11/16	36.85	35.25	33.65	32.04
78676	S (8.84mm)	.3480	3-1/16	1-3/4	41.70	39.89	38.07	36.26
78681	9mm	.3543	78mm	44mm	41.93	40.11	38.28	36.46
78686	T (9.09mm)	.3580	3-1/16	1-3/4	42.04	40.21	38.38	36.56
78691	23/64 (9.13mm)	.3594	3-1/16	1-3/4	42.33	40.49	38.65	36.81
78696	U (9.35mm)	.3680	3-1/8	1-13/16	44.75	42.80	40.86	38.91
78701	9.5mm	.3740	79mm	46mm	45.40	43.43	41.45	39.48
78706	3/8 (9.52mm)	.3750	3-1/8	1-13/16	45.40	43.43	41.45	39.48
78711	V (9.57mm)	.3770	3-1/4	1-7/8	45.86	43.87	41.87	39.88
78716	W (9.80mm)	.3860	3-1/4	1-7/8	48.42	46.31	44.21	42.10
78721	25/64 (9.92mm)	.3906	3-1/4	1-7/8	49.02	46.89	44.76	42.63
78726	10mm	.3937	84mm	49mm	50.55	48.35	46.15	43.96
78731	X (10.08mm)	.3970	3-5/16	1-15/16	51.87	49.61	47.36	45.10
78736	Y (10.26mm)	.4040	3-5/16	1-15/16	52.21	49.94	47.67	45.40
78741	13/32 (10.32mm)	.4062	3-5/16	1-15/16	53.87	51.53	49.19	46.84
78746	Z (10.49mm)	.4130	3-3/8	2	54.35	51.99	49.62	47.26
78751	10.5mm	.4134	86mm	51mm	54.35	51.99	49.62	47.26
78756	27/64 (10.72mm)	.4219	3-3/8	2	54.90	52.51	50.13	47.74
78761	11mm	.4331	87mm	52mm	58.50	55.96	53.41	50.87
78766	7/16 (11.11mm)	.4375	3-7/16	2-1/16	58.50	55.96	53.41	50.87
78771	11.5mm	.4528	90.5mm	54mm	62.91	60.17	57.44	54.70
78776	29/64 (11.51mm)	.4531	3-9/16	2-1/8	62.91	60.17	57.44	54.70
78781	15/32 (11.91mm)	.4688	3-5/8	2-1/8	66.17	63.29	60.42	57.54
78786	12mm	.4724	94mm	56mm	66.36	63.47	60.59	57.70
78791	31/64 (12.30mm)	.4844	3-11/16	2-3/16	66.56	63.67	60.77	57.88
78796	12.5mm	.4921	95mm	56mm	67.59	64.65	61.71	58.77
78801	1/2 (12.70mm)	.5000	3-3/4	2-1/4	67.93	64.98	62.02	59.07

Series 1100

150° self-centering drill point



5xD - 3 Flute



Near reamer finishes

Cast aluminum, cast iron and materials with high silicon content

Tighter tolerance holes

Improved roundness and straightness

25° helix

TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
90275	7/64 (2.78mm)	.1094	2-1/4	1-1/4	9.19	8.79	8.39	7.99
90280	#35 (2.79mm)	.1100	2-1/4	1-1/4	9.28	8.88	8.47	8.07
90285	#34 (2.82mm)	.1110	2-1/4	1-1/4	9.40	8.99	8.58	8.17
90290	#33 (2.87mm)	.1130	2-1/4	1-1/4	9.56	9.14	8.73	8.31
90295	#32 (2.95mm)	.1160	2-1/4	1-1/4	9.68	9.26	8.84	8.42
90300	3mm	.1181	57mm	32mm	9.76	9.34	8.91	8.49
90305	#31 (3.05mm)	.1200	2-1/4	1-1/4	9.83	9.40	8.98	8.55
90310	1/8 (3.17mm)	.1250	2-1/4	1-1/4	9.96	9.53	9.09	8.66
90315	#30 (3.26mm)	.1285	2-1/4	1-1/4	10.20	9.76	9.31	8.87
90320	#29 (3.45mm)	.1360	2-1/2	1-3/8	10.52	10.06	9.61	9.15
90325	3.5mm	.1378	63mm	35mm	10.86	10.39	9.92	9.44
90330	#28 (3.57mm)	.1405	2-1/2	1-3/8	10.98	10.50	10.03	9.55
90335	9/64 (3.57mm)	.1406	2-1/2	1-3/8	11.11	10.63	10.14	9.66
90340	#27 (3.66mm)	.1440	2-1/2	1-3/8	11.55	11.05	10.55	10.04
90345	#26 (3.73mm)	.1470	2-1/2	1-3/8	11.70	11.19	10.68	10.17
90350	#25 (3.80mm)	.1495	2-1/2	1-3/8	11.81	11.30	10.78	10.27
90355	#24 (3.86mm)	.1520	2-1/2	1-3/8	11.83	11.32	10.80	10.29
90360	#23 (3.91mm)	.1540	2-1/2	1-3/8	11.94	11.42	10.90	10.38
90365	5/32 (3.97mm)	.1562	2-1/2	1-3/8	11.99	11.47	10.95	10.43
90370	#22 (3.99mm)	.1570	2-1/2	1-3/8	12.75	12.20	11.64	11.09
90375	4mm	.1575	63mm	35mm	12.75	12.20	11.64	11.09
90380	#21 (4.04mm)	.1590	2-1/2	1-3/8	13.05	12.48	11.92	11.35
90385	#20 (4.09mm)	.1610	2-1/2	1-3/8	13.05	12.48	11.92	11.35
90390	#19 (4.22mm)	.1660	2-3/4	1-5/8	13.16	12.59	12.02	11.44
90395	#18 (4.30mm)	.1695	2-3/4	1-5/8	13.24	12.66	12.09	11.51
90400	11/64 (4.37mm)	.1719	2-3/4	1-5/8	13.33	12.75	12.17	11.59
90405	#17 (4.39mm)	.1730	2-3/4	1-5/8	13.94	13.33	12.73	12.12
90410	#16 (4.49mm)	.1770	2-3/4	1-5/8	14.09	13.48	12.86	12.25
90415	4.5mm	.1772	70mm	41mm	14.16	13.54	12.93	12.31
90420	#15 (4.57mm)	.1800	2-3/4	1-5/8	14.23	13.61	12.99	12.37
90425	#14 (4.62mm)	.1820	2-3/4	1-5/8	14.55	13.92	13.28	12.65
90430	#13 (4.70mm)	.1850	2-3/4	1-5/8	14.63	13.99	13.36	12.72
90435	3/16 (4.76mm)	.1875	2-3/4	1-5/8	14.63	13.99	13.36	12.72
90440	#12 (4.80mm)	.1890	2-3/4	1-5/8	14.74	14.10	13.46	12.82
90445	#11 (4.85mm)	.1910	2-3/4	1-5/8	14.90	14.25	13.60	12.96
90450	#10 (4.91mm)	.1935	2-3/4	1-5/8	15.61	14.93	14.25	13.57
90455	#9 (4.98mm)	.1960	3	1-3/4	15.99	15.29	14.60	13.90
90460	5mm	.1969	76mm	44mm	16.09	15.39	14.69	13.99
90465	#8 (5.05mm)	.1990	3	1-3/4	16.20	15.50	14.79	14.09
90470	#7 (5.10mm)	.2010	3	1-3/4	16.69	15.96	15.24	14.51
90475	13/64 (5.16mm)	.2031	3	1-3/4	17.32	16.57	15.81	15.06
90480	#6 (5.18mm)	.2040	3	1-3/4	17.42	16.66	15.91	15.15
90485	#5 (5.22mm)	.2055	3	1-3/4	17.50	16.74	15.98	15.22
90490	#4 (5.31mm)	.2090	3	1-3/4	17.80	17.03	16.25	15.48
90495	#3 (5.41mm)	.2130	3	1-3/4	18.11	17.32	16.54	15.75
90500	5.5mm	.2165	76mm	44mm	18.25	17.46	16.66	15.87

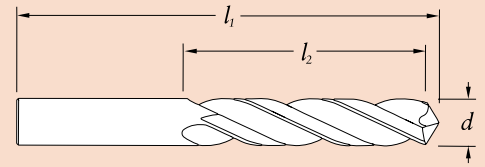
Series 1100

150° self-centering drill point

EDP#	d Diameter [†]	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
90505	7/32 (5.56mm)	.2188	3	1-3/4	18.40	17.60	16.80	16.00
90510	#2 (5.61mm)	.2210	3	1-3/4	18.85	18.03	17.21	16.39
90515	#1 (5.79mm)	.2280	3	1-3/4	18.94	18.12	17.29	16.47
90520	A (5.94mm)	.2340	3-1/4	2	19.15	18.32	17.48	16.65
90525	15/64 (5.95mm)	.2344	3-1/4	2	19.23	18.39	17.56	16.72
90530	6mm	.2362	82mm	50mm	19.29	18.45	17.61	16.77
90535	B (6.04mm)	.2380	3-1/4	2	19.37	18.53	17.69	16.84
90540	C (6.15mm)	.2420	3-1/4	2	19.50	18.65	17.80	16.96
90545	D (6.25mm)	.2460	3-1/4	2	19.64	18.79	17.93	17.08
90550	1/4 E (6.35mm)	.2500	3-1/4	2	19.78	18.92	18.06	17.20
90555	6.5mm	.2559	82mm	50mm	20.27	19.39	18.51	17.63
90560	F (6.53mm)	.2570	3-1/4	2	20.69	19.79	18.89	17.99
90565	G (6.63mm)	.2610	3-1/2	2-1/8	21.77	20.82	19.88	18.93
90570	17/64 (6.75mm)	.2656	3-1/2	2-1/8	22.20	21.23	20.27	19.30
90575	H (6.76mm)	.2660	3-1/2	2-1/8	22.84	21.85	20.85	19.86
90580	I (6.91mm)	.2720	3-1/2	2-1/8	23.12	22.11	21.11	20.10
90585	7mm	.2756	88mm	54mm	23.29	22.28	21.26	20.25
90590	J (7.03mm)	.2770	3-1/2	2-1/8	23.49	22.47	21.45	20.43
90595	K (7.14mm)	.2810	3-1/2	2-1/8	23.70	22.67	21.64	20.61
90600	9/32 (7.14mm)	.2812	3-1/2	2-1/8	24.55	23.48	22.42	21.35
90605	L (7.37mm)	.2900	3-1/2	2-1/8	25.46	24.35	23.25	22.14
90610	M (7.49mm)	.2950	3-3/4	2-3/8	27.03	25.85	24.68	23.50
90615	7.5mm	.2953	95mm	60mm	27.03	25.85	24.68	23.50
90620	19/64 (7.54mm)	.2969	3-3/4	2-3/8	27.03	25.85	24.68	23.50
90625	N (7.67mm)	.3020	3-3/4	2-3/8	27.23	26.05	24.86	23.68
90630	5/16 (7.94mm)	.3125	3-3/4	2-3/8	27.27	26.08	24.90	23.71
90635	8mm	.3150	95mm	60mm	29.26	27.99	26.72	25.44
90640	O (8.03mm)	.3160	3-3/4	2-3/8	29.26	27.99	26.72	25.44
90645	P (8.20mm)	.3230	3-3/4	2-3/8	29.26	27.99	26.72	25.44
90650	21/64 (8.33mm)	.3281	4	2-1/2	30.61	29.28	27.95	26.62
90655	Q (8.43mm)	.3320	4	2-1/2	31.33	29.97	28.61	27.24
90660	8.5mm	.3346	101mm	63mm	31.61	30.24	28.86	27.49
90665	R (8.61mm)	.3390	4	2-1/2	32.59	31.17	29.76	28.34
90670	11/32 (8.73mm)	.3438	4	2-1/2	33.94	32.46	30.99	29.51
90675	S (8.84mm)	.3480	4	2-1/2	35.08	33.55	32.03	30.50
90680	9mm	.3543	101mm	63mm	35.31	33.77	32.24	30.70
90685	T (9.09mm)	.3580	4-1/4	2-3/4	35.60	34.05	32.50	30.96
90690	23/64 (9.13mm)	.3594	4-1/4	2-3/4	35.88	34.32	32.76	31.20
90695	U (9.35mm)	.3680	4-1/4	2-3/4	38.32	36.65	34.99	33.32
90700	9.5mm	.3740	107mm	70mm	38.97	37.28	35.58	33.89
90705	3/8 (9.52mm)	.3750	4-1/4	2-3/4	38.97	37.28	35.58	33.89
90710	V (9.57mm)	.3770	4-1/4	2-3/4	40.46	38.70	36.94	35.18
90715	W (9.80mm)	.3860	4-1/2	2-7/8	43.08	41.21	39.33	37.46
90720	25/64 (9.92mm)	.3906	4-1/2	2-7/8	43.71	41.81	39.91	38.01
90725	10mm	.3937	114mm	73mm	45.30	43.33	41.36	39.39
90730	X (10.08mm)	.3970	4-1/2	2-7/8	46.64	44.61	42.58	40.56
90735	Y (10.26mm)	.4040	4-1/2	2-7/8	47.00	44.96	42.91	40.87
90740	13/32 (10.32mm)	.4062	4-1/2	2-7/8	48.71	46.59	44.47	42.36
90745	Z (10.49mm)	.4130	4-1/2	2-7/8	49.21	47.07	44.93	42.79
90750	10.5mm	.4134	114mm	73mm	49.21	47.07	44.93	42.79
90755	27/64 (10.72mm)	.4219	4-1/2	2-7/8	49.77	47.61	45.44	43.28
90760	11mm	.4331	114mm	73mm	54.04	51.69	49.34	46.99
90765	7/16 (11.11mm)	.4375	4-1/2	2-7/8	54.04	51.69	49.34	46.99
90770	11.5mm	.4528	120mm	76mm	58.63	56.08	53.53	50.98
90775	29/64 (11.51mm)	.4531	4-3/4	3	58.63	56.08	53.53	50.98
90780	15/32 (11.91mm)	.4688	4-3/4	3	62.03	59.33	56.64	53.94
90785	12mm	.4724	120mm	76mm	62.22	59.51	56.81	54.10
90790	31/64 (12.30mm)	.4844	4-3/4	3	62.22	59.51	56.81	54.10
90795	12.5mm	.4921	120mm	76mm	63.87	61.09	58.32	55.54
90800	1/2 (12.70mm)	.5000	4-3/4	3	63.87	61.09	58.32	55.54

Series 1100H

150° self-centering drill point



5xD - 3 Flute Balinit® HARDLUBE Coated



Near reamer finishes

Cast aluminum, cast iron and materials with high silicon content

Tighter tolerance holes

Improved roundness and straightness

Excellent heat resistance / lubricity

Up to 40% faster than uncoated

25° helix

TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 -0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
90276	7/64 (2.78mm)	.1094	2-1/4	1-1/4	10.58	10.12	9.66	9.20
90281	#35 (2.79mm)	.1100	2-1/4	1-1/4	10.68	10.22	9.75	9.29
90286	#34 (2.82mm)	.1110	2-1/4	1-1/4	10.80	10.33	9.86	9.39
90291	#33 (2.87mm)	.1130	2-1/4	1-1/4	10.96	10.48	10.01	9.53
90296	#32 (2.95mm)	.1160	2-1/4	1-1/4	11.07	10.59	10.11	9.63
90301	3mm	.1181	57mm	32mm	11.16	10.67	10.19	9.70
90306	#31 (3.05mm)	.1200	2-1/4	1-1/4	11.24	10.75	10.26	9.77
90311	1/8 (3.17mm)	.1250	2-1/4	1-1/4	11.35	10.86	10.36	9.87
90316	#30 (3.26mm)	.1285	2-1/4	1-1/4	11.60	11.10	10.59	10.09
90321	#29 (3.45mm)	.1360	2-1/2	1-3/8	11.93	11.41	10.89	10.37
90326	3.5mm	.1378	63mm	35mm	12.26	11.73	11.19	10.66
90331	#28 (3.57mm)	.1405	2-1/2	1-3/8	12.39	11.85	11.31	10.77
90336	9/64 (3.57mm)	.1406	2-1/2	1-3/8	12.50	11.96	11.41	10.87
90341	#27 (3.66mm)	.1440	2-1/2	1-3/8	12.95	12.39	11.82	11.26
90346	#26 (3.73mm)	.1470	2-1/2	1-3/8	13.10	12.53	11.96	11.39
90351	#25 (3.80mm)	.1495	2-1/2	1-3/8	13.21	12.64	12.06	11.49
90356	#24 (3.86mm)	.1520	2-1/2	1-3/8	13.23	12.65	12.08	11.50
90361	#23 (3.91mm)	.1540	2-1/2	1-3/8	13.34	12.76	12.18	11.60
90366	5/32 (3.97mm)	.1562	2-1/2	1-3/8	13.39	12.81	12.23	11.64
90371	#22 (3.99mm)	.1570	2-1/2	1-3/8	14.15	13.53	12.92	12.30
90376	4mm	.1575	63mm	35mm	14.15	13.53	12.92	12.30
90381	#21 (4.04mm)	.1590	2-1/2	1-3/8	14.46	13.83	13.20	12.57
90386	#20 (4.09mm)	.1610	2-1/2	1-3/8	14.46	13.83	13.20	12.57
90391	#19 (4.22mm)	.1660	2-3/4	1-5/8	14.56	13.93	13.29	12.66
90396	#18 (4.30mm)	.1695	2-3/4	1-5/8	14.64	14.00	13.37	12.73
90401	11/64 (4.37mm)	.1719	2-3/4	1-5/8	14.72	14.08	13.44	12.80
90406	#17 (4.39mm)	.1730	2-3/4	1-5/8	15.33	14.66	14.00	13.33
90411	#16 (4.49mm)	.1770	2-3/4	1-5/8	15.49	14.82	14.14	13.47
90416	4.5mm	.1772	70mm	41mm	15.56	14.88	14.21	13.53
90421	#15 (4.57mm)	.1800	2-3/4	1-5/8	15.63	14.95	14.27	13.59
90426	#14 (4.62mm)	.1820	2-3/4	1-5/8	15.95	15.26	14.56	13.87
90431	#13 (4.70mm)	.1850	2-3/4	1-5/8	16.02	15.32	14.63	13.93
90436	3/16 (4.76mm)	.1875	2-3/4	1-5/8	16.02	15.32	14.63	13.93
90441	#12 (4.80mm)	.1890	2-3/4	1-5/8	17.14	16.39	15.65	14.90
90446	#11 (4.85mm)	.1910	2-3/4	1-5/8	17.30	16.55	15.80	15.04
90451	#10 (4.91mm)	.1935	2-3/4	1-5/8	18.01	17.23	16.44	15.66
90456	#9 (4.98mm)	.1960	3	1-3/4	18.39	17.59	16.79	15.99
90461	5mm	.1969	76mm	44mm	18.48	17.68	16.87	16.07
90466	#8 (5.05mm)	.1990	3	1-3/4	18.60	17.79	16.98	16.17
90471	#7 (5.10mm)	.2010	3	1-3/4	19.09	18.26	17.43	16.60
90476	13/64 (5.16mm)	.2031	3	1-3/4	19.71	18.85	18.00	17.14
90481	#6 (5.18mm)	.2040	3	1-3/4	19.83	18.97	18.11	17.24
90486	#5 (5.22mm)	.2055	3	1-3/4	19.90	19.03	18.17	17.30
90491	#4 (5.31mm)	.2090	3	1-3/4	20.21	19.33	18.45	17.57
90496	#3 (5.41mm)	.2130	3	1-3/4	20.52	19.63	18.74	17.84
90501	5.5mm	.2165	76mm	44mm	20.65	19.75	18.85	17.96

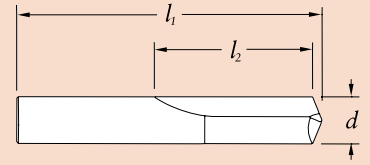
Series 1100H

150° self-centering drill point

EDP#	d Diameter*	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
90506	7/32 (5.56mm)	.2188	3	1-3/4	20.80	19.90	18.99	18.09
90511	#2 (5.61mm)	.2210	3	1-3/4	21.24	20.32	19.39	18.47
90516	#1 (5.79mm)	.2280	3	1-3/4	21.34	20.41	19.48	18.56
90521	A (5.94mm)	.2340	3-1/4	2	21.63	20.69	19.75	18.81
90526	15/64 (5.95mm)	.2344	3-1/4	2	21.70	20.76	19.81	18.87
90531	6mm	.2362	82mm	50mm	21.77	20.82	19.88	18.93
90536	B (6.04mm)	.2380	3-1/4	2	21.85	20.90	19.95	19.00
90541	C (6.15mm)	.2420	3-1/4	2	21.98	21.02	20.07	19.11
90546	D (6.25mm)	.2460	3-1/4	2	22.13	21.17	20.21	19.24
90551	1/4 E (6.35mm)	.2500	3-1/4	2	22.26	21.29	20.32	19.36
90556	6.5mm	.2559	82mm	50mm	24.83	23.75	22.67	21.59
90561	F (6.53mm)	.2570	3-1/4	2	25.23	24.13	23.04	21.94
90566	G (6.63mm)	.2610	3-1/2	2-1/8	26.32	25.18	24.03	22.89
90571	17/64 (6.75mm)	.2656	3-1/2	2-1/8	26.75	25.59	24.42	23.26
90576	H (6.76mm)	.2660	3-1/2	2-1/8	27.38	26.19	25.00	23.81
90581	I (6.91mm)	.2720	3-1/2	2-1/8	27.67	26.47	25.26	24.06
90586	7mm	.2756	88mm	54mm	27.84	26.63	25.42	24.21
90591	J (7.03mm)	.2770	3-1/2	2-1/8	28.05	26.83	25.61	24.39
90596	K (7.14mm)	.2810	3-1/2	2-1/8	28.26	27.03	25.80	24.57
90601	9/32 (7.14mm)	.2812	3-1/2	2-1/8	29.11	27.84	26.58	25.31
90606	L (7.37mm)	.2900	3-1/2	2-1/8	30.02	28.71	27.41	26.10
90611	M (7.49mm)	.2950	3-3/4	2-3/8	31.58	30.21	28.83	27.46
90616	7.5mm	.2953	95mm	60mm	31.58	30.21	28.83	27.46
90621	19/64 (7.54mm)	.2969	3-3/4	2-3/8	31.58	30.21	28.83	27.46
90626	N (7.67mm)	.3020	3-3/4	2-3/8	31.79	30.41	29.03	27.64
90631	5/16 (7.94mm)	.3125	3-3/4	2-3/8	31.82	30.44	29.05	27.67
90636	8mm	.3150	95mm	60mm	33.81	32.34	30.87	29.40
90641	O (8.03mm)	.3160	3-3/4	2-3/8	33.81	32.34	30.87	29.40
90646	P (8.20mm)	.3230	3-3/4	2-3/8	33.81	32.34	30.87	29.40
90651	21/64 (8.33mm)	.3281	4	2-1/2	35.16	33.63	32.10	30.57
90656	Q (8.43mm)	.3320	4	2-1/2	35.88	34.32	32.76	31.20
90661	8.5mm	.3346	101mm	63mm	36.16	34.59	33.02	31.44
90666	R (8.61mm)	.3390	4	2-1/2	37.15	35.53	33.92	32.30
90671	11/32 (8.73mm)	.3438	4	2-1/2	38.49	36.82	35.14	33.47
90676	S (8.84mm)	.3480	4	2-1/2	40.86	39.08	37.31	35.53
90681	9mm	.3543	101mm	63mm	41.09	39.30	37.52	35.73
90686	T (9.09mm)	.3580	4-1/4	2-3/4	42.52	40.67	38.82	36.97
90691	23/64 (9.13mm)	.3594	4-1/4	2-3/4	42.79	40.93	39.07	37.21
90696	U (9.35mm)	.3680	4-1/4	2-3/4	45.23	43.26	41.30	39.33
90701	9.5mm	.3740	107mm	70mm	45.89	43.89	41.90	39.90
90706	3/8 (9.52mm)	.3750	4-1/4	2-3/4	45.89	43.89	41.90	39.90
90711	V (9.57mm)	.3770	4-1/4	2-3/4	47.74	45.66	43.59	41.51
90716	W (9.80mm)	.3860	4-1/2	2-7/8	50.36	48.17	45.98	43.79
90721	25/64 (9.92mm)	.3906	4-1/2	2-7/8	50.99	48.77	46.56	44.34
90726	10mm	.3937	114mm	73mm	52.57	50.28	48.00	45.71
90731	X (10.08mm)	.3970	4-1/2	2-7/8	53.92	51.58	49.23	46.89
90736	Y (10.26mm)	.4040	4-1/2	2-7/8	54.28	51.92	49.56	47.20
90741	13/32 (10.32mm)	.4062	4-1/2	2-7/8	55.99	53.56	51.12	48.69
90746	Z (10.49mm)	.4130	4-1/2	2-7/8	56.48	54.02	51.57	49.11
90751	10.5mm	.4134	114mm	73mm	56.48	54.02	51.57	49.11
90756	27/64 (10.72mm)	.4219	4-1/2	2-7/8	57.05	54.57	52.09	49.61
90761	11mm	.4331	114mm	73mm	61.31	58.64	55.98	53.31
90766	7/16 (11.11mm)	.4375	4-1/2	2-7/8	61.31	58.64	55.98	53.31
90771	11.5mm	.4528	120mm	76mm	65.91	63.04	60.18	57.31
90776	29/64 (11.51mm)	.4531	4-3/4	3	65.91	63.04	60.18	57.31
90781	15/32 (11.91mm)	.4688	4-3/4	3	69.31	66.30	63.28	60.27
90786	12mm	.4724	120mm	76mm	69.49	66.47	63.45	60.43
90791	31/64 (12.30mm)	.4844	4-3/4	3	69.49	66.47	63.45	60.43
90796	12.5mm	.4921	120mm	76mm	71.15	68.06	64.96	61.87
90801	1/2 (12.70mm)	.5000	4-3/4	3	71.15	68.06	64.96	61.87

Series 1500

135° primary/secondary drill point



3xD - Hard Metal Straight Flute



Materials 40 Rc and higher

High nickel, cobalt based and powdered metal

2 straight flute design provides excellent rigidity

TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 -0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 -1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 -3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
59165	1/16 (1.59mm)	.0625	1-1/2	5/8	7.07	6.76	6.46	6.15
59180	#50 (1.78mm)	.0700	1-1/2	3/4	7.07	6.76	6.46	6.15
59185	#49 (1.85mm)	.0730	1-1/2	3/4	7.07	6.76	6.46	6.15
59190	#48 (1.93mm)	.0760	1-1/2	3/4	7.07	6.76	6.46	6.15
59195	5/64 (1.98mm)	.0781	1-1/2	3/4	7.07	6.76	6.46	6.15
59200	#47 (1.99mm)	.0785	2	7/8	7.07	6.76	6.46	6.15
39000	2mm	.0787	50mm	22mm	7.07	6.76	6.46	6.15
59210	#46 (2.06mm)	.0810	2	7/8	7.07	6.76	6.46	6.15
59215	#45 (2.08mm)	.0820	2	7/8	7.07	6.76	6.46	6.15
59220	#44 (2.18mm)	.0860	2	7/8	7.07	6.76	6.46	6.15
59225	#43 (2.26mm)	.0890	2	7/8	7.07	6.76	6.46	6.15
59230	#42 (2.37mm)	.0935	2	7/8	7.07	6.76	6.46	6.15
59235	3/32 (2.38mm)	.0938	2	7/8	7.07	6.76	6.46	6.15
59240	#41 (2.44mm)	.0960	2	7/8	8.05	7.70	7.35	7.00
59245	#40 (2.49mm)	.0980	2	7/8	8.05	7.70	7.35	7.00
39050	2.5mm	.0984	50mm	22mm	8.05	7.70	7.35	7.00
59255	#39 (2.53mm)	.0995	2	7/8	8.05	7.70	7.35	7.00
59260	#38 (2.58mm)	.1015	2	7/8	8.05	7.70	7.35	7.00
59265	#37 (2.64mm)	.1040	2	7/8	8.05	7.70	7.35	7.00
59270	#36 (2.71mm)	.1065	2	7/8	8.05	7.70	7.35	7.00
59275	7/64 (2.78mm)	.1094	2	1	8.05	7.70	7.35	7.00
59280	#35 (2.79mm)	.1100	2	1	8.37	8.01	7.64	7.28
59285	#34 (2.82mm)	.1110	2	1	8.37	8.01	7.64	7.28
59290	#33 (2.87mm)	.1130	2	1	8.37	8.01	7.64	7.28
59295	#32 (2.95mm)	.1160	2	1	8.37	8.01	7.64	7.28
39100	3mm	.1181	50mm	25mm	8.37	8.01	7.64	7.28
59305	#31 (3.05mm)	.1200	2	1	8.37	8.01	7.64	7.28
59310	1/8 (3.17mm)	.1250	2	1	7.72	7.38	7.05	6.71
59315	#30 (3.26mm)	.1285	2	1	9.11	8.71	8.32	7.92
59320	#29 (3.45mm)	.1360	2	1-1/8	9.11	8.71	8.32	7.92
39150	3.5mm	.1378	50mm	28mm	9.11	8.71	8.32	7.92
59330	#28 (3.57mm)	.1405	2	1-1/8	9.11	8.71	8.32	7.92
59335	9/64 (3.57mm)	.1406	2	1-1/8	9.11	8.71	8.32	7.92
59340	#27 (3.66mm)	.1440	2	1-1/8	9.35	8.94	8.54	8.13
59345	#26 (3.73mm)	.1470	2	1-1/8	9.83	9.40	8.98	8.55
59350	#25 (3.80mm)	.1495	2	1-1/8	9.83	9.40	8.98	8.55
59355	#24 (3.86mm)	.1520	2	1-1/8	9.83	9.40	8.98	8.55
59360	#23 (3.91mm)	.1540	2	1-1/8	9.83	9.40	8.98	8.55
59365	5/32 (3.97mm)	.1562	2-1/2	1-1/8	9.83	9.40	8.98	8.55
59370	#22 (3.99mm)	.1570	2-1/2	1-1/8	10.65	10.19	9.72	9.26
39200	4mm	.1575	63mm	28mm	10.65	10.19	9.72	9.26
59380	#21 (4.04mm)	.1590	2-1/2	1-1/8	10.89	10.42	9.94	9.47
59385	#20 (4.09mm)	.1610	2-1/2	1-1/8	10.89	10.42	9.94	9.47

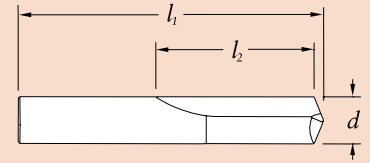
Series 1500

135° primary/secondary drill point

EDP#		<i>d</i> Diameter [†]	Decimal Equivalent	<i>l</i> ₁ Overall Length	<i>l</i> ₂ Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
59390	#19	(4.22mm)	.1660	2-1/2	1-1/8	11.30	10.81	10.32	9.83
59395	#18	(4.30mm)	.1695	2-1/2	1-3/16	11.30	10.81	10.32	9.83
59400	11/64	(4.37mm)	.1719	2-1/2	1-3/16	11.30	10.81	10.32	9.83
59405	#17	(4.39mm)	.1730	2-1/2	1-3/16	11.55	11.05	10.55	10.04
59410	#16	(4.49mm)	.1770	2-1/2	1-3/16	11.55	11.05	10.55	10.04
39250		4.5mm	.1772	63mm	28mm	11.55	11.05	10.55	10.04
59420	#15	(4.57mm)	.1800	2-1/2	1-3/16	11.55	11.05	10.55	10.04
59425	#14	(4.62mm)	.1820	2-1/2	1-3/16	12.19	11.66	11.13	10.60
59430	#13	(4.70mm)	.1850	2-1/2	1-3/16	12.19	11.66	11.13	10.60
59435	3/16	(4.76mm)	.1875	2-1/2	1-3/16	11.71	11.20	10.69	10.18
59440	#12	(4.80mm)	.1890	2-1/2	1-3/16	12.11	11.58	11.06	10.53
59445	#11	(4.85mm)	.1910	2-1/2	1-3/16	12.11	11.58	11.06	10.53
59450	#10	(4.91mm)	.1935	2-1/2	1-1/4	12.83	12.27	11.71	11.16
59455	#9	(4.98mm)	.1960	2-1/2	1-1/4	12.83	12.27	11.71	11.16
39300		5mm	.1969	63mm	32mm	12.83	12.27	11.71	11.16
59465	#8	(5.05mm)	.1990	2-1/2	1-1/4	13.25	12.67	12.10	11.52
59470	#7	(5.10mm)	.2010	2-1/2	1-1/4	13.25	12.67	12.10	11.52
59475	13/64	(5.16mm)	.2031	2-1/2	1-1/4	13.25	12.67	12.10	11.52
59480	#6	(5.18mm)	.2040	2-1/2	1-1/4	13.98	13.37	12.76	12.16
59485	#5	(5.22mm)	.2055	2-1/2	1-1/4	13.98	13.37	12.76	12.16
59490	#4	(5.31mm)	.2090	2-1/2	1-1/4	13.98	13.37	12.76	12.16
59495	#3	(5.41mm)	.2130	2-1/2	1-1/4	13.98	13.37	12.76	12.16
39350		5.5mm	.2165	63mm	32mm	13.98	13.37	12.76	12.16
59505	7/32	(5.56mm)	.2188	2-1/2	1-1/2	13.98	13.37	12.76	12.16
59510	#2	(5.61mm)	.2210	2-1/2	1-1/2	14.96	14.31	13.66	13.01
59515	#1	(5.79mm)	.2280	2-1/2	1-1/2	14.96	14.31	13.66	13.01
59525	15/64	(5.95mm)	.2344	2-1/2	1-1/2	16.66	15.94	15.21	14.49
39400		6mm	.2362	63mm	38mm	16.66	15.94	15.21	14.49
59550	1/4	(6.35mm)	.2500	2-1/2	1-1/2	15.69	15.01	14.33	13.64
39450		6.5mm	.2559	63mm	38mm	19.02	18.19	17.37	16.54
59570	17/64	(6.75mm)	.2656	2-1/2	1-1/2	19.02	18.19	17.37	16.54
39500		7mm	.2756	63mm	38mm	19.50	18.65	17.80	16.96
59600	9/32	(7.14mm)	.2812	2-1/2	1-1/2	19.50	18.65	17.80	16.96
39520		7.5mm	.2953	63mm	41mm	20.48	19.59	18.70	17.81
59620	19/64	(7.54mm)	.2969	2-1/2	1-5/8	20.48	19.59	18.70	17.81
59630	5/16	(7.94mm)	.3125	2-1/2	1-5/8	20.48	19.59	18.70	17.81
39540		8mm	.3150	63mm	41mm	21.55	20.61	19.68	18.74
59650	21/64	(8.33mm)	.3281	3	1-5/8	22.18	21.22	20.25	19.29
39560		8.5mm	.3346	76mm	41mm	24.78	23.70	22.63	21.55
59670	11/32	(8.73mm)	.3438	3	1-5/8	24.78	23.70	22.63	21.55
39580		9mm	.3543	76mm	41mm	26.90	25.73	24.56	23.39
59690	23/64	(9.13mm)	.3594	3	1-3/4	26.90	25.73	24.56	23.39
39600		9.5mm	.3740	76mm	41mm	29.34	28.06	26.79	25.51
59705	3/8	(9.52mm)	.3750	3	1-3/4	29.34	28.06	26.79	25.51
59720	25/64	(9.92mm)	.3906	3	1-3/4	33.15	31.71	30.27	28.83
39620		10mm	.3937	76mm	44mm	33.15	31.71	30.27	28.83
59740	13/32	(10.32mm)	.4062	3	1-3/4	37.05	35.44	33.83	32.22
39640		10.5mm	.4134	76mm	44mm	38.77	37.08	35.40	33.71
59755	27/64	(10.72mm)	.4219	3	1-3/4	40.80	39.03	37.25	35.48
39660		11mm	.4331	76mm	44mm	41.53	39.72	37.92	36.11
59765	7/16	(11.11mm)	.4375	3	1-3/4	41.53	39.72	37.92	36.11
39680		11.5mm	.4528	76mm	44mm	42.73	40.87	39.01	37.16
59775	29/64	(11.51mm)	.4531	3	1-3/4	43.55	41.66	39.76	37.87
59780	15/32	(11.91mm)	.4688	3	1-3/4	43.55	41.66	39.76	37.87
39700		12mm	.4724	76mm	44mm	43.55	41.66	39.76	37.87
59790	31/64	(12.30mm)	.4844	3	1-3/4	43.55	41.66	39.76	37.87
39720		12.5mm	.4921	76mm	44mm	44.53	42.59	40.66	38.72
59800	1/2	(12.70mm)	.5000	3	1-3/4	44.53	42.59	40.66	38.72

Series 1500H

135° primary/secondary drill point



3xD - Hard Metal Straight Flute Balinit® HARDLUBE Coated



Materials 40 Rc and higher

High nickel, cobalt based and powdered metal

Excellent heat resistance / lubricity

Up to 40% faster than uncoated

2 straight flute design provides excellent rigidity

TOLERANCES

Ød +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
59166	1/16 (1.59mm)	.0625	1-1/2	5/8	8.48	8.11	7.74	7.37
59181	#50 (1.78mm)	.0700	1-1/2	3/4	8.48	8.11	7.74	7.37
59186	#49 (1.85mm)	.0730	1-1/2	3/4	8.48	8.11	7.74	7.37
59191	#48 (1.93mm)	.0760	1-1/2	3/4	8.48	8.11	7.74	7.37
59196	5/64 (1.98mm)	.0781	1-1/2	3/4	8.48	8.11	7.74	7.37
59201	#47 (1.99mm)	.0785	2	7/8	8.48	8.11	7.74	7.37
39001	2mm	.0787	50mm	22mm	8.48	8.11	7.74	7.37
59211	#46 (2.06mm)	.0810	2	7/8	8.48	8.11	7.74	7.37
59216	#45 (2.08mm)	.0820	2	7/8	8.48	8.11	7.74	7.37
59221	#44 (2.18mm)	.0860	2	7/8	8.48	8.11	7.74	7.37
59226	#43 (2.26mm)	.0890	2	7/8	8.48	8.11	7.74	7.37
59231	#42 (2.37mm)	.0935	2	7/8	8.48	8.11	7.74	7.37
59236	3/32 (2.38mm)	.0938	2	7/8	8.48	8.11	7.74	7.37
59241	#41 (2.44mm)	.0960	2	7/8	9.44	9.03	8.62	8.21
59246	#40 (2.49mm)	.0980	2	7/8	9.44	9.03	8.62	8.21
39051	2.5mm	.0984	50mm	22mm	9.44	9.03	8.62	8.21
59256	#39 (2.53mm)	.0995	2	7/8	9.44	9.03	8.62	8.21
59261	#38 (2.58mm)	.1015	2	7/8	9.44	9.03	8.62	8.21
59266	#37 (2.64mm)	.1040	2	7/8	9.44	9.03	8.62	8.21
59271	#36 (2.71mm)	.1065	2	7/8	9.44	9.03	8.62	8.21
59276	7/64 (2.78mm)	.1094	2	1	9.44	9.03	8.62	8.21
59281	#35 (2.79mm)	.1100	2	1	9.78	9.35	8.93	8.50
59286	#34 (2.82mm)	.1110	2	1	9.78	9.35	8.93	8.50
59291	#33 (2.87mm)	.1130	2	1	9.78	9.35	8.93	8.50
59296	#32 (2.95mm)	.1160	2	1	9.78	9.35	8.93	8.50
39101	3mm	.1181	50mm	25mm	9.78	9.35	8.93	8.50
59306	#31 (3.05mm)	.1200	2	1	9.78	9.35	8.93	8.50
59311	1/8 (3.17mm)	.1250	2	1	9.12	8.72	8.33	7.93
59316	#30 (3.26mm)	.1285	2	1	10.50	10.04	9.59	9.13
59321	#29 (3.45mm)	.1360	2	1-1/8	10.50	10.04	9.59	9.13
39151	3.5mm	.1378	50mm	28mm	10.50	10.04	9.59	9.13
59331	#28 (3.57mm)	.1405	2	1-1/8	10.50	10.04	9.59	9.13
59336	9/64 (3.57mm)	.1406	2	1-1/8	10.50	10.04	9.59	9.13
59341	#27 (3.66mm)	.1440	2	1-1/8	10.74	10.27	9.81	9.34
59346	#26 (3.73mm)	.1470	2	1-1/8	11.24	10.75	10.26	9.77
59351	#25 (3.80mm)	.1495	2	1-1/8	11.24	10.75	10.26	9.77
59356	#24 (3.86mm)	.1520	2	1-1/8	11.24	10.75	10.26	9.77
59361	#23 (3.91mm)	.1540	2	1-1/8	11.24	10.75	10.26	9.77
59366	5/32 (3.97mm)	.1562	2-1/2	1-1/8	11.24	10.75	10.26	9.77
59371	#22 (3.99mm)	.1570	2-1/2	1-1/8	12.04	11.52	10.99	10.47
39201	4mm	.1575	63mm	28mm	12.04	11.52	10.99	10.47
59381	#21 (4.04mm)	.1590	2-1/2	1-1/8	12.29	11.76	11.22	10.69
59386	#20 (4.09mm)	.1610	2-1/2	1-1/8	12.29	11.76	11.22	10.69

Series 1500H

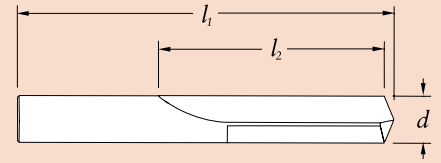
135° primary/secondary drill point

EDP#		d Diameter [†]	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
59391	#19	(4.22mm)	.1660	2-1/2	1-1/8	12.70	12.15	11.60	11.04
59396	#18	(4.30mm)	.1695	2-1/2	1-3/16	12.70	12.15	11.60	11.04
59401	11/64	(4.37mm)	.1719	2-1/2	1-3/16	12.70	12.15	11.60	11.04
59406	#17	(4.39mm)	.1730	2-1/2	1-3/16	12.95	12.39	11.82	11.26
59411	#16	(4.49mm)	.1770	2-1/2	1-3/16	12.95	12.39	11.82	11.26
39251		4.5mm	.1772	63mm	28mm	12.95	12.39	11.82	11.26
59421	#15	(4.57mm)	.1800	2-1/2	1-3/16	12.95	12.39	11.82	11.26
59426	#14	(4.62mm)	.1820	2-1/2	1-3/16	13.58	12.99	12.40	11.81
59431	#13	(4.70mm)	.1850	2-1/2	1-3/16	13.58	12.99	12.40	11.81
59436	3/16	(4.76mm)	.1875	2-1/2	1-3/16	13.11	12.54	11.97	11.40
59441	#12	(4.80mm)	.1890	2-1/2	1-3/16	14.50	13.87	13.24	12.61
59446	#11	(4.85mm)	.1910	2-1/2	1-3/16	14.50	13.87	13.24	12.61
59451	#10	(4.91mm)	.1935	2-1/2	1-1/4	15.23	14.57	13.91	13.24
59456	#9	(4.98mm)	.1960	2-1/2	1-1/4	15.23	14.57	13.91	13.24
39301		5mm	.1969	63mm	32mm	15.23	14.57	13.91	13.24
59466	#8	(5.05mm)	.1990	2-1/2	1-1/4	15.64	14.96	14.28	13.60
59471	#7	(5.10mm)	.2010	2-1/2	1-1/4	15.64	14.96	14.28	13.60
59476	13/64	(5.16mm)	.2031	2-1/2	1-1/4	15.64	14.96	14.28	13.60
59481	#6	(5.18mm)	.2040	2-1/2	1-1/4	16.38	15.67	14.96	14.24
59486	#5	(5.22mm)	.2055	2-1/2	1-1/4	16.38	15.67	14.96	14.24
59491	#4	(5.31mm)	.2090	2-1/2	1-1/4	16.38	15.67	14.96	14.24
59496	#3	(5.41mm)	.2130	2-1/2	1-1/4	16.38	15.67	14.96	14.24
39351		5.5mm	.2165	63mm	32mm	16.38	15.67	14.96	14.24
59506	7/32	(5.56mm)	.2188	2-1/2	1-1/2	16.38	15.67	14.96	14.24
59511	#2	(5.61mm)	.2210	2-1/2	1-1/2	17.37	16.61	15.86	15.10
59516	#1	(5.79mm)	.2280	2-1/2	1-1/2	17.37	16.61	15.86	15.10
59526	15/64	(5.95mm)	.2344	2-1/2	1-1/2	19.06	18.23	17.40	16.57
39401		6mm	.2362	63mm	38mm	19.06	18.23	17.40	16.57
59551	1/4	(6.35mm)	.2500	2-1/2	1-1/2	18.09	17.30	16.52	15.73
39451		6.5mm	.2559	63mm	38mm	23.30	22.29	21.27	20.26
59571	17/64	(6.75mm)	.2656	2-1/2	1-1/2	23.30	22.29	21.27	20.26
39501		7mm	.2756	63mm	38mm	23.77	22.74	21.70	20.67
59601	9/32	(7.14mm)	.2812	2-1/2	1-1/2	23.77	22.74	21.70	20.67
39521		7.5mm	.2952	63mm	41mm	24.76	23.68	22.61	21.53
59621	19/64	(7.54mm)	.2969	2-1/2	1-5/8	24.76	23.68	22.61	21.53
59631	5/16	(7.94mm)	.3125	2-1/2	1-5/8	24.76	23.68	22.61	21.53
39541		8mm	.3150	63mm	41mm	25.83	24.71	23.58	22.46
59651	21/64	(8.33mm)	.3281	3	1-5/8	26.45	25.30	24.15	23.00
39561		8.5mm	.3346	76mm	41mm	29.06	27.80	26.53	25.27
59671	11/32	(8.73mm)	.3438	3	1-5/8	29.06	27.80	26.53	25.27
39581		9mm	.3543	76mm	41mm	31.44	30.07	28.71	27.34
59691	23/64	(9.13mm)	.3594	3	1-3/4	31.44	30.07	28.71	27.34
39601		9.5mm	.3740	76mm	41mm	33.89	32.42	30.94	29.47
59706	3/8	(9.52mm)	.3750	3	1-3/4	33.89	32.42	30.94	29.47
59721	25/64	(9.92mm)	.3906	3	1-3/4	38.08	36.42	34.77	33.11
39621		10mm	.3937	76mm	44mm	38.08	36.42	34.77	33.11
59741	13/32	(10.32mm)	.4062	3	1-3/4	41.98	40.15	38.33	36.50
39641		10.5mm	.4134	76mm	44mm	43.70	41.80	39.90	38.00
59756	27/64	(10.72mm)	.4219	3	1-3/4	45.74	43.75	41.76	39.77
39661		11mm	.4331	76mm	44mm	46.46	44.44	42.42	40.40
59766	7/16	(11.11mm)	.4375	3	1-3/4	46.46	44.44	42.42	40.40
39681		11.5mm	.4528	76mm	44mm	47.66	45.59	43.52	41.44
59776	29/64	(11.51mm)	.4531	3	1-3/4	48.48	46.37	44.26	42.16
59781	15/32	(11.91mm)	.4688	3	1-3/4	48.48	46.37	44.26	42.16
39701		12mm	.4724	76mm	44mm	48.48	46.37	44.26	42.16
59791	31/64	(12.30mm)	.4844	3	1-3/4	48.48	46.37	44.26	42.16
39721		12.5mm	.4921	76mm	44mm	49.45	47.30	45.15	43.00
59801	1/2	(12.70mm)	.5000	3	1-3/4	49.45	47.30	45.15	43.00

Series 1700

135° 4-facet drill point

NEW
SERIES



3.5xD - 2 Straight Flute Double Margin

Fast drilling in aircraft alloys, cast aluminums and materials with high silicon content

Strong core geometry with double margins for chip breakage and clearance

'G' style flutes



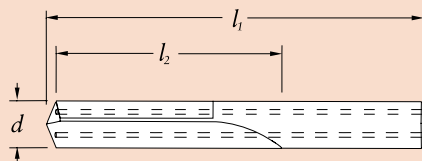
TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)

L_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

L_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	L_1 Overall Length	L_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
57460	1/8 (3.17mm)	.1250	3-1/4	1-1/4	12.49	11.95	11.40	10.86
57470	4mm	.1575	86mm	35mm	14.26	13.64	13.02	12.40
57480	3/16 (4.76mm)	.1875	3-5/8	1-5/8	16.23	15.52	14.82	14.11
57490	5mm	.1969	95mm	44mm	17.49	16.73	15.97	15.21
57500	6mm	.2362	101mm	51mm	20.09	19.22	18.34	17.47
57510	1/4 (6.35mm)	.2500	4	2	20.59	19.69	18.80	17.90
57520	5/16 (7.94mm)	.3125	4-3/8	2-3/8	31.40	30.03	28.67	27.30
57530	8mm	.3150	111mm	60mm	33.38	31.93	30.48	29.03
57540	3/8 (9.52mm)	.3750	4-3/4	2-3/4	41.30	39.50	37.71	35.91
57550	10mm	.3937	124mm	73mm	47.68	45.61	43.53	41.46
57560	7/16 (11.11mm)	.4375	5-1/8	3-1/8	61.77	59.08	56.40	53.71
57570	12mm	.4724	136mm	86mm	64.62	61.81	59.00	56.19
57580	1/2 (12.70mm)	.5000	5-1/2	3-1/2	66.26	63.38	60.50	57.62
57590	14mm	.5512	150mm	100mm	89.80	85.90	81.99	78.09
57600	9/16 (14.29mm)	.5625	6	4	97.42	93.18	88.95	84.71
57610	15mm	.5906	157mm	106mm	113.63	108.69	103.75	98.81
57620	5/8 (15.87mm)	.6250	6-3/8	4-3/8	116.37	111.31	106.25	101.19
57630	16mm	.6299	164mm	113mm	119.04	113.86	108.69	103.51



**NEW
SERIES**

Series **1700K**
135° 4-facet drill point

DRILLS



6xD - 2 Straight Flute Double Margin Coolant Fed

Fast drilling in aircraft alloys, cast aluminums
and materials with high silicon content

Coolant fed for accelerated feed rates and chip clearance

Strong core geometry with double margins
for chip breakage and clearance

'G' style flutes

TOLERANCES

$\varnothing d$ +.0000 - .0005" (+0.0000 - 0.0127mm)

l_1 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

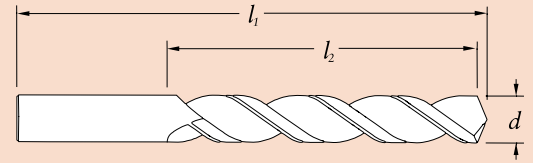
l_2 1/8" dia & under: +.125 - .062" (3mm dia & under: +3.175 - 1.588mm)
Over 1/8" dia: +.125 - .125" (Over 3mm dia: +3.175 - 3.175mm)

EDP#	d Diameter ¹	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
57710	6mm	.2362	110mm	59mm	57.30	54.81	52.32	49.83
57720	1/4 (6.35mm)	.2500	4-1/2	2-1/2	59.32	56.74	54.16	51.58
57730	5/16 (7.94mm)	.3125	5	3	68.52	65.54	62.56	59.58
57740	8mm	.3150	129mm	78mm	68.92	65.92	62.93	59.93
57750	3/8 (9.52mm)	.3750	5-1/2	3-1/2	74.89	71.63	68.38	65.12
57760	10mm	.3937	144mm	94mm	82.90	79.30	75.69	72.09
57770	7/16 (11.11mm)	.4375	6	4	109.22	104.47	99.72	94.97
57780	12mm	.4724	160mm	110mm	154.28	147.57	140.86	134.16
57790	1/2 (12.70mm)	.5000	6-1/2	4-1/2	156.76	149.94	143.13	136.31
57800	14mm	.5512	154mm	129mm	211.20	202.02	192.83	183.65
57810	9/16 (14.29mm)	.5625	7-1/8	5-1/8	243.87	233.27	222.66	212.06
57820	15mm	.5906	187mm	137mm	250.11	239.24	228.36	217.49
57830	5/8 (15.87mm)	.6250	7-5/8	5-5/8	253.82	242.78	231.75	220.71
57840	16mm	.6299	195mm	144mm	257.82	246.61	235.40	224.19

Series 1800H

135° 4-facet drill point

NEW
SERIES



8xD - 2 Parabolic Flute Balinit® HARDLUBE Coated

Deep holes in soft non-ferrous material (aluminum, brass, bronze)
Wide open flutes and higher helix remove chips quickly
35° helix



TOLERANCES

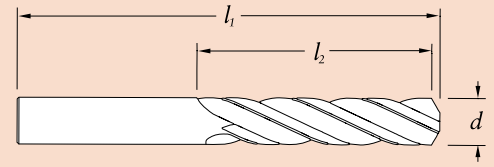
Ød +.0000 - .0005" (+0.0000 - 0.0127mm)
l₁ +.125 - .125" (+3.175 - 3.175mm)
l₂ +.125 - .125" (+3.175 - 3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l ₁ Overall Length	l ₂ Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
22436	3/16 (4.76mm)	.1875	3-13/16	2-5/16	17.22	16.47	15.72	14.97
22441	#12 (4.80mm)	.1890	3-13/16	2-5/16	17.62	16.85	16.09	15.32
22446	#11 (4.85mm)	.1910	3-13/16	2-5/16	18.02	17.24	16.45	15.67
22451	#10 (4.91mm)	.1935	3-15/16	2-7/16	18.42	17.62	16.82	16.02
22456	#9 (4.98mm)	.1960	3-15/16	2-7/16	18.83	18.01	17.19	16.37
22461	5mm	.1969	100mm	62mm	19.23	18.39	17.56	16.72
22466	#8 (5.05mm)	.1990	3-15/16	2-7/16	19.56	18.71	17.86	17.01
22471	#7 (5.10mm)	.2010	3-15/16	2-7/16	19.90	19.03	18.17	17.30
22476	13/64 (5.16mm)	.2031	3-15/16	2-7/16	20.23	19.35	18.47	17.59
22481	#6 (5.18mm)	.2040	3-15/16	2-7/16	20.56	19.67	18.77	17.88
22486	#5 (5.22mm)	.2055	4	2-1/2	20.90	19.99	19.08	18.17
22491	#4 (5.31mm)	.2090	4	2-1/2	21.23	20.31	19.38	18.46
22496	#3 (5.41mm)	.2130	4	2-1/2	21.56	20.62	19.69	18.75
22501	5.5mm	.2165	102mm	64mm	21.90	20.95	20.00	19.04
22506	7/32 (5.56mm)	.2188	4	2-1/2	22.23	21.26	20.30	19.33
22511	#2 (5.61mm)	.2210	4	2-1/2	22.56	21.58	20.60	19.62
22516	#1 (5.79mm)	.2280	4-1/8	2-5/8	22.90	21.90	20.91	19.91
22521	A (5.94mm)	.2340	4-1/8	2-5/8	23.23	22.22	21.21	20.20
22526	15/64 (5.95mm)	.2344	4-1/8	2-5/8	23.56	22.54	21.51	20.49
22531	6mm	.2362	105mm	67mm	23.94	22.90	21.86	20.82
22536	B (6.04mm)	.2380	4-1/8	2-5/8	24.07	23.02	21.98	20.93
22541	C (6.15mm)	.2420	4-1/4	2-3/4	24.20	23.15	22.10	21.04
22546	D (6.25mm)	.2460	4-1/4	2-3/4	24.32	23.26	22.21	21.15
22551	1/4 E (6.35mm)	.2500	4-1/4	2-3/4	24.44	23.38	22.31	21.25
22556	6.5mm	.2559	108mm	70mm	25.25	24.15	23.05	21.96
22561	F (6.53mm)	.2570	4-3/8	2-7/8	26.32	25.18	24.03	22.89
22566	G (6.63mm)	.2610	4-3/8	2-7/8	27.03	25.85	24.68	23.50
22571	17/64 (6.75mm)	.2656	4-3/8	2-7/8	27.82	26.61	25.40	24.19
22576	H (6.76mm)	.2660	4-3/8	2-7/8	28.73	27.48	26.23	24.98
22581	I (6.91mm)	.2720	4-3/8	2-7/8	29.59	28.30	27.02	25.73
22586	7mm	.2756	111mm	73mm	30.48	29.15	27.83	26.50
22591	J (7.03mm)	.2770	4-3/8	2-7/8	31.15	29.80	28.44	27.09
22596	K (7.14mm)	.2810	4-7/16	2-15/16	31.82	30.44	29.05	27.67
22601	9/32 (7.14mm)	.2812	4-7/16	2-15/16	32.52	31.11	29.69	28.28
22606	L (7.37mm)	.2900	4-7/16	2-15/16	33.22	31.78	30.33	28.89
22611	M (7.49mm)	.2950	4-7/16	2-15/16	33.89	32.42	30.94	29.47
22616	7.5mm	.2953	116mm	78mm	34.56	33.06	31.55	30.05
22621	19/64 (7.54mm)	.2969	4-9/16	3-1/16	34.63	33.12	31.62	30.11
22626	N (7.67mm)	.3020	4-9/16	3-1/16	34.70	33.19	31.68	30.17
22631	5/16 (7.94mm)	.3125	4-11/16	3-3/16	34.73	33.22	31.71	30.20
22636	8mm	.3150	119mm	81mm	36.72	35.12	33.53	31.93
22641	O (8.03mm)	.3160	4-11/16	3-3/16	37.56	35.93	34.29	32.66
22646	P (8.20mm)	.3230	4-11/16	3-3/16	38.40	36.73	35.06	33.39

EDP#	<i>d</i> Diameter ¹	Decimal Equivalent	<i>l₁</i> Overall Length	<i>l₂</i> Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
22651	21/64 (8.33mm)	.3281	4-11/16	3-3/16	39.24	37.53	35.83	34.12
22656	Q (8.43mm)	.3320	4-15/16	3-7/16	40.11	38.37	36.62	34.88
22661	8.5mm	.3346	125mm	87mm	40.94	39.16	37.38	35.60
22666	R (8.61mm)	.3390	4-15/16	3-7/16	42.23	40.39	38.56	36.72
22671	11/32 (8.73mm)	.3438	4-15/16	3-7/16	43.49	41.60	39.71	37.82
22676	S (8.84mm)	.3480	5	3-1/2	44.80	42.85	40.90	38.96
22681	9mm	.3543	127mm	89mm	46.09	44.09	42.08	40.08
22686	T (9.09mm)	.3580	5	3-1/2	46.28	44.27	42.26	40.24
22691	23/64 (9.13mm)	.3594	5	3-1/2	46.47	44.45	42.43	40.41
22696	U (9.35mm)	.3680	5	3-1/2	46.64	44.61	42.58	40.56
22701	9.5mm	.3740	130mm	92mm	46.83	44.79	42.76	40.72
22706	3/8 (9.52mm)	.3750	5-1/8	3-5/8	47.04	44.99	42.95	40.90
22711	V (9.57mm)	.3770	5-1/8	3-5/8	48.60	46.49	44.37	42.26
22716	W (9.80mm)	.3860	5-1/8	3-5/8	50.14	47.96	45.78	43.60
22721	25/64 (9.92mm)	.3906	5-1/4	3-3/4	51.73	49.48	47.23	44.98
22726	10mm	.3937	133mm	95mm	53.27	50.95	48.64	46.32
22731	X (10.08mm)	.3970	5-1/4	3-3/4	55.28	52.88	50.47	48.07
22736	Y (10.26mm)	.4040	5-3/8	3-7/8	57.27	54.78	52.29	49.80
22741	13/32 (10.32mm)	.4062	5-3/8	3-7/8	59.31	56.73	54.15	51.57
22746	Z (10.49mm)	.4130	5-3/8	3-7/8	62.49	59.77	57.06	54.34
22751	10.5mm	.4134	137mm	98mm	62.49	59.77	57.06	54.34
22756	27/64 (10.72mm)	.4219	5-7/16	3-15/16	65.34	62.50	59.66	56.82
22761	11mm	.4331	138mm	100mm	67.36	64.43	61.50	58.57
22766	7/16 (11.11mm)	.4375	5-7/16	3-15/16	67.36	64.43	61.50	58.57
22771	11.5mm	.4528	141mm	103mm	68.31	65.34	62.37	59.40
22776	29/64 (11.51mm)	.4531	5-9/16	4-5/16	68.31	65.34	62.37	59.40
22781	15/32 (11.91mm)	.4688	5-9/16	4-5/16	69.25	66.24	63.23	60.22
22786	12mm	.4724	141mm	110mm	70.21	67.16	64.10	61.05
22791	31/64 (12.30mm)	.4844	5-9/16	4-5/16	70.21	67.16	64.10	61.05
22796	12.5mm	.4921	152mm	114mm	71.85	68.73	65.60	62.48
22801	1/2 (12.70mm)	.5000	6	4-1/2	71.85	68.73	65.60	62.48
22806	13mm	.5118	152mm	114mm	85.59	81.87	78.15	74.43
22811	33/64 (13.10mm)	.5156	6	4-1/2	90.82	86.87	82.92	78.97
22816	17/32 (13.49mm)	.5312	6-1/8	4-5/8	96.05	91.87	87.70	83.52
22821	13.5mm	.5315	156mm	117mm	96.05	91.87	87.70	83.52
22826	35/64 (13.89mm)	.5469	6-1/8	4-5/8	101.29	96.89	92.48	88.08
22831	14mm	.5512	156mm	117mm	106.48	101.85	97.22	92.59
22836	9/16 (14.29mm)	.5625	6-1/4	4-3/4	114.09	109.13	104.17	99.21
22841	14.5mm	.5709	159mm	121mm	117.83	112.71	107.58	102.46
22846	37/64 (14.68mm)	.5781	6-1/4	4-3/4	118.44	113.29	108.14	102.99
22851	15mm	.5906	162mm	124mm	121.51	116.23	110.94	105.66
22856	19/32 (15.08mm)	.5938	6-3/8	4-7/8	121.51	116.23	110.94	105.66
22861	39/64 (15.48mm)	.6094	6-7/16	4-15/16	122.88	117.54	112.19	106.85
22866	15.5mm	.6102	164mm	125mm	122.88	117.54	112.19	106.85
22871	5/8 (15.87mm)	.6250	6-9/16	5-1/16	124.25	118.85	113.45	108.04
22876	16mm	.6299	167mm	129mm	126.91	121.39	115.87	110.36

Series 4000

60° lead chamfer

NEW
SERIES


Core - 4 Flute

Cored applications only

Get to finish diameter when too much material remains for reamer

60° lead chamfer allows easy follow through from existing hole

30° helix



TOLERANCES

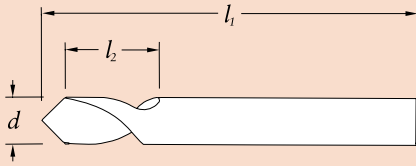
$\varnothing d$ +.0000 –.0005" (+0.0000 –0.0127mm)

l_1 +.125 –.125" (+3.175 –3.175mm)

l_2 +.125 –.125" (+3.175 –3.175mm)

EDP#	d Diameter†	Decimal Equivalent	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
58500	3/16 (4.76mm)	.1875	4	2-1/2	15.80	15.11	14.43	13.74
58510	5mm	.1969	102mm	64mm	16.20	15.50	14.79	14.09
58520	6mm	.2362	102mm	64mm	17.46	16.70	15.94	15.18
58530	1/4 (6.35mm)	.2500	4	2-1/2	17.51	16.75	15.99	15.23
58540	7mm	.2756	102mm	64mm	21.70	20.76	19.81	18.87
58550	5/16 (7.94mm)	.3125	4	2-1/2	23.86	22.82	21.79	20.75
58560	8mm	.3150	102mm	64mm	24.04	22.99	21.95	20.90
58570	9mm	.3543	127mm	89mm	33.01	31.57	30.14	28.70
58580	3/8 (9.52mm)	.3750	5	3-1/2	36.85	35.25	33.65	32.04
58590	10mm	.3937	127mm	89mm	42.40	40.56	38.71	36.87
58600	11mm	.4331	127mm	89mm	45.77	43.78	41.79	39.80
58610	7/16 (11.11mm)	.4375	5	3-1/2	46.26	44.25	42.24	40.23
58620	12mm	.4724	127mm	89mm	51.73	49.48	47.23	44.98
58630	1/2 (12.70mm)	.5000	5	3-1/2	53.53	51.20	48.88	46.55
58640	13mm	.5118	152mm	114mm	66.76	63.86	60.95	58.05
58650	14mm	.5512	152mm	114mm	75.72	72.43	69.14	65.84
58660	9/16 (14.29mm)	.5625	6	4-1/2	82.57	78.98	75.39	71.80
58670	15mm	.5906	152mm	114mm	87.76	83.94	80.13	76.31
58680	5/8 (15.87mm)	.6250	6	4-1/2	89.76	85.86	81.95	78.05
58690	16mm	.6299	152mm	114mm	92.15	88.14	84.14	80.13

Series 1600
90° or 120° cam drill point



N/C Spotting - 2 Flute

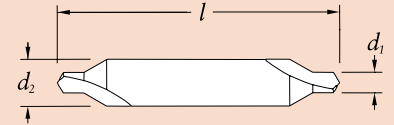
Spotting to stabilize long drills
Rough, angled or spherical surfaces
No O.D. clearance for locating on true position

TOLERANCES

$\varnothing d$ $+0.0000 -0.0005"$ ($+0.0000 -0.0127\text{mm}$)
 l_1 $+.125 -.125"$ ($+3.175 -3.175\text{mm}$)

EDP#	d Diameter'	Decimal Equivalent	Point Angle (included)	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
91510	3mm	.1181	90°	50mm	10mm	9.14	8.74	8.35	7.95
91000	1/8 (3.17mm)	.1250	90°	2	3/8	9.14	8.74	8.35	7.95
91520	4mm	.1575	90°	50mm	12mm	11.96	11.44	10.92	10.40
91010	3/16 (4.76mm)	.1875	90°	3	3/4	11.96	11.44	10.92	10.40
91530	5mm	.1969	90°	63mm	15mm	12.58	12.03	11.49	10.94
91540	6mm	.2362	90°	63mm	20mm	14.20	13.58	12.97	12.35
91020	1/4 (6.35mm)	.2500	90°	3	3/4	14.20	13.58	12.97	12.35
91550	8mm	.3150	90°	76mm	25mm	17.18	16.43	15.69	14.94
91030	3/8 (9.52mm)	.3750	90°	3	1	18.63	17.82	17.01	16.20
91560	10mm	.3937	90°	88mm	25mm	25.71	24.59	23.47	22.36
91570	12mm	.4724	90°	101mm	30mm	30.90	29.56	28.21	26.87
91040	1/2 (12.70mm)	.5000	90°	4	1	32.14	30.74	29.35	27.95
91580	3mm	.1181	120°	50mm	10mm	9.14	8.74	8.35	7.95
91100	1/8 (3.17mm)	.1250	120°	2	3/8	9.14	8.74	8.35	7.95
91590	4mm	.1575	120°	50mm	12mm	11.96	11.44	10.92	10.40
91110	3/16 (4.76mm)	.1875	120°	3	3/4	11.96	11.44	10.92	10.40
91600	5mm	.1969	120°	63mm	15mm	12.58	12.03	11.49	10.94
91610	6mm	.2362	120°	63mm	20mm	14.20	13.58	12.97	12.35
91120	1/4 (6.35mm)	.2500	120°	3	3/4	14.20	13.58	12.97	12.35
91620	8mm	.3150	120°	76mm	25mm	17.18	16.43	15.69	14.94
91130	3/8 (9.52mm)	.3750	120°	3	1	18.63	17.82	17.01	16.20
91630	10mm	.3937	120°	88mm	25mm	25.71	24.59	23.47	22.36
91640	12mm	.4724	120°	101mm	30mm	30.90	29.56	28.21	26.87
91140	1/2 (12.70mm)	.5000	120°	4	1	32.14	30.74	29.35	27.95

Series 1400 118° cam drill point



Combined Drill and Countersinks



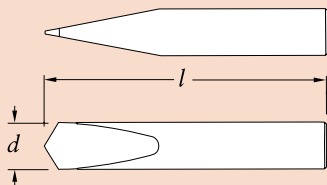
Center drilling applications
60° included countersink angle

TOLERANCES

$\varnothing d_1$ $+0.003 -0.000"$ (0.076–0.000mm)
 $\varnothing d_2$ $+0.0000 -0.0005"$ (+0.000–0.0127mm)

EDP#	Number	d_1 Drill Diameter†	Decimal Equivalent	d_2 Shank Diameter	l Overall Length	1 - 11	12 - 24	25 - 49	50 - 100
58030	1	3/64 (1.19mm)	.0469	1/8	1-1/2	10.27	9.82	9.38	8.93
58040	2	5/64 (1.98mm)	.0781	3/16	2	16.16	15.46	14.75	14.05
58050	3	7/64 (2.78mm)	.1094	1/4	2	18.41	17.61	16.81	16.01
58060	4	1/8 (3.17mm)	.1250	5/16	2-1/8	25.77	24.65	23.53	22.41
58070	5	3/16 (4.76mm)	.1875	7/16	2-3/4	36.81	35.21	33.61	32.01
58080	6	7/32 (5.56mm)	.2188	1/2	3	49.00	46.87	44.74	42.61
58090	7	1/4 (6.35mm)	.2500	5/8	3-1/8	65.58	62.73	59.88	57.03
58100	8	5/16 (7.94mm)	.3125	3/4	3-3/8	83.38	79.75	76.13	72.50





Series 1300 118° drill point

Spade

Shallow hole drilling/burnishing
to a depth of 1 to 1.5 times the diameter

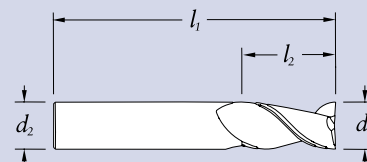
TOLERANCES

$\varnothing d$ +.0000 - .0005" (0.0000-0.0127mm)

EDP#	d Diameter [†]	Decimal Equivalent	Web Thickness	l Overall Length	1 - 11	12 - 24	25 - 49	50 - 100
57030	1/16 (1.59mm)	.0625	.010	1-1/2	5.00	4.78	4.57	4.35
57040	5/64 (1.98mm)	.0781	.010	1-1/2	5.27	5.04	4.81	4.58
57050	3/32 (2.38mm)	.0938	.015	1-1/2	5.27	5.04	4.81	4.58
57060	7/64 (2.78mm)	.1094	.015	1-1/2	5.83	5.58	5.32	5.07
57070	1/8 (3.17mm)	.1250	.015	1-1/2	5.83	5.58	5.32	5.07
57080	5/32 (3.97mm)	.1562	.020	1-1/2	6.11	5.84	5.58	5.31
57090	3/16 (4.76mm)	.1875	.020	2	6.53	6.25	5.96	5.68
57100	7/32 (5.56mm)	.2188	.025	2	8.98	8.59	8.20	7.81
57110	1/4 (6.35mm)	.2500	.025	2	10.49	10.03	9.58	9.12
57120	9/32 (7.14mm)	.2812	.030	2	12.10	11.57	11.05	10.52
57130	5/16 (7.94mm)	.3125	.030	2	14.61	13.97	13.34	12.70
57140	11/32 (8.73mm)	.3438	.035	2-1/2	15.81	15.12	14.44	13.75
57150	3/8 (9.52mm)	.3750	.035	2-1/2	17.03	16.29	15.55	14.81
57160	13/32 (10.32mm)	.4062	.045	2-1/2	20.30	19.42	18.53	17.65
57170	7/16 (11.11mm)	.4375	.050	2-1/2	22.75	21.76	20.77	19.78
57180	15/32 (11.91mm)	.4688	.055	2-1/2	26.24	25.10	23.96	22.82
57190	1/2 (12.70mm)	.5000	.060	3	28.57	27.33	26.09	24.84

Series 242M (fractional)

Series 842M (metric)



2 Flute 45° Helix ***NEW SIZES**



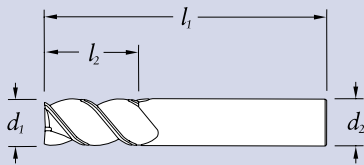
High performance machining of aluminum and titanium
Rigid work holding, machine stability and part integrity are critical!
Excellent choice for slotting
Polished cylindrical O.D. margin reduces chatter
Sharp corners
Can be modified with a corner radius
Run at maximum RPM (minimum of 6,000 RPM)
1% of diameter for chip load

TOLERANCES

$\varnothing d_1$ +.000 - .001" (+0.000 - 0.025mm)

$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
09010	6mm	.2362	6mm	50mm	12mm	10.48	10.02	9.57	9.11
09020	6mm	.2362	6mm	63mm	25mm	11.27	10.78	10.29	9.80
09030	6mm	.2362	6mm	101mm	50mm	20.42	19.53	18.64	17.76
85200	1/4 (6.35mm)	.2500	1/4	2	1/2	9.94	9.51	9.08	8.64
85220	1/4 (6.35mm)	.2500	1/4	2-1/2	1	10.74	10.27	9.81	9.34
85240	1/4 (6.35mm)	.2500	1/4	4	2	19.40	18.56	17.71	16.87
85300	5/16 (7.94mm)	.3125	5/16	3	1-1/8	22.67	21.68	20.70	19.71
* 09240	8mm	.3150	8mm	63mm	20mm	15.82	15.13	14.44	13.76
09040	8mm	.3150	8mm	76mm	30mm	23.89	22.85	21.81	20.77
09050	8mm	.3150	8mm	101mm	50mm	26.65	25.49	24.33	23.17
85400	3/8 (9.52mm)	.3750	3/8	2	5/8	16.80	16.07	15.34	14.61
85420	3/8 (9.52mm)	.3750	3/8	2-1/2	1	18.76	17.94	17.13	16.31
85440	3/8 (9.52mm)	.3750	3/8	4	2	28.03	26.81	25.59	24.37
09060	10mm	.3937	10mm	50mm	16mm	19.54	18.69	17.84	16.99
09070	10mm	.3937	10mm	63mm	25mm	22.84	21.85	20.85	19.86
09080	10mm	.3937	10mm	101mm	50mm	35.72	34.17	32.61	31.06
09090	12mm	.4724	12mm	63mm	20mm	29.18	27.91	26.64	25.37
09100	12mm	.4724	12mm	76mm	32mm	31.56	30.19	28.82	27.44
09110	12mm	.4724	12mm	101mm	50mm	43.48	41.59	39.70	37.81
85500	1/2 (12.70mm)	.5000	1/2	2-1/2	3/4	27.57	26.37	25.17	23.97
85520	1/2 (12.70mm)	.5000	1/2	3	1-1/4	30.05	28.74	27.44	26.13
85540	1/2 (12.70mm)	.5000	1/2	4	2	41.02	39.24	37.45	35.67
85600	5/8 (15.87mm)	.6250	5/8	3-1/2	1-5/8	57.95	55.43	52.91	50.39
85620	5/8 (15.87mm)	.6250	5/8	6	3	84.54	80.86	77.19	73.51
09120	16mm	.6299	16mm	88mm	41mm	60.85	58.20	55.56	52.91
09130	16mm	.6299	16mm	152mm	76mm	84.54	80.86	77.19	73.51
09140	18mm	.7087	18mm	101mm	44mm	89.23	85.35	81.47	77.59
85700	3/4 (19.05mm)	.7500	3/4	4	1-3/4	84.97	81.28	77.58	73.89
85720	3/4 (19.05mm)	.7500	3/4	6	3	134.68	128.82	122.97	117.11
* 09350	20mm	.7874	20mm	101mm	38mm	113.44	108.51	103.58	98.64
09150	20mm	.7874	20mm	152mm	76mm	141.88	135.71	129.54	123.37
09160	25mm	.9843	25mm	101mm	44mm	131.79	126.06	120.33	114.60
09170	25mm	.9843	25mm	152mm	76mm	218.62	209.11	199.61	190.11
85800	1 (25.40mm)	1.000	1	4	1-3/4	127.11	121.58	116.06	110.53
85820	1 (25.40mm)	1.000	1	6	3	228.97	219.01	209.06	199.11

**TOLERANCES** $\varnothing d_1$ $+.000$ $-.002$ " $(+0.000 - 0.050\text{mm})$ $\varnothing d_2$ $-.0001$ $-.0004$ " $(-0.0025 - 0.0100\text{mm})$ ***NEW
SIZES****3 Flute 50° Helix**

High performance machining of stainless steel and aluminum
Rigid work holding, machine stability and part integrity are critical!

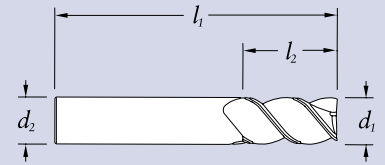
Slots aluminum at an axial depth of 25% of diameter

Sharp corners

Can be modified with a corner radius

EDP#	d_1 Flute Diameter ^r	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 86150	3/16 (4.76mm)	.1875	3/16	2	5/16	8.90	8.51	8.13	7.74
* 86160	3/16 (4.76mm)	.1875	3/16	2	9/16	8.90	8.51	8.13	7.74
* 86180	3/16 (4.76mm)	.1875	3/16	3	1	15.87	15.18	14.49	13.80
* 10400	5mm	.1969	5mm	50mm	8mm	9.89	9.46	9.03	8.60
* 10410	5mm	.1969	5mm	50mm	14mm	9.89	9.46	9.03	8.60
10010	6mm	.2362	6mm	50mm	12mm	10.48	10.02	9.57	9.11
10020	6mm	.2362	6mm	63mm	19mm	11.27	10.78	10.29	9.80
10030	6mm	.2362	6mm	76mm	32mm	19.35	18.51	17.67	16.83
86200	1/4 (6.35mm)	.2500	1/4	2	1/2	9.94	9.51	9.08	8.64
86220	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	10.74	10.27	9.81	9.34
86240	1/4 (6.35mm)	.2500	1/4	3	1-1/4	18.39	17.59	16.79	15.99
* 86260	5/16 (7.94mm)	.3125	5/16	2	7/16	13.60	13.01	12.42	11.83
* 86270	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	15.07	14.41	13.76	13.10
* 86280	5/16 (7.94mm)	.3125	5/16	4	1-1/4	25.31	24.21	23.11	22.01
* 10420	8mm	.3150	8mm	50mm	11mm	14.33	13.71	13.08	12.46
10040	8mm	.3150	8mm	63mm	20mm	15.82	15.13	14.44	13.76
10050	8mm	.3150	8mm	76mm	32mm	23.89	22.85	21.81	20.77
86300	3/8 (9.52mm)	.3750	3/8	2	1/2	16.80	16.07	15.34	14.61
86320	3/8 (9.52mm)	.3750	3/8	2-1/2	1	18.76	17.94	17.13	16.31
86340	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	28.03	26.81	25.59	24.37
10060	10mm	.3937	10mm	50mm	12mm	19.54	18.69	17.84	16.99
10070	10mm	.3937	10mm	76mm	25mm	27.70	26.50	25.29	24.09
10080	10mm	.3937	10mm	88mm	38mm	34.89	33.37	31.86	30.34
* 86360	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	22.90	21.90	20.91	19.91
* 86370	7/16 (11.11mm)	.4375	7/16	2-3/4	1	22.90	21.90	20.91	19.91
* 86380	7/16 (11.11mm)	.4375	7/16	4	2	38.56	36.88	35.21	33.53
10090	12mm	.4724	12mm	63mm	16mm	29.18	27.91	26.64	25.37
10100	12mm	.4724	12mm	76mm	25mm	31.56	30.19	28.82	27.44
10110	12mm	.4724	12mm	101mm	50mm	43.48	41.59	39.70	37.81
86400	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	27.72	26.51	25.31	24.10
86420	1/2 (12.70mm)	.5000	1/2	3	1	30.05	28.74	27.44	26.13
86440	1/2 (12.70mm)	.5000	1/2	4	2	41.02	39.24	37.45	35.67
* 10430	14mm	.5512	14mm	63mm	16mm	45.66	43.67	41.69	39.70
* 10440	14mm	.5512	14mm	76mm	25mm	49.39	47.24	45.10	42.95
* 10450	14mm	.5512	14mm	101mm	50mm	59.72	57.12	54.53	51.93
* 86460	9/16 (14.29mm)	.5625	9/16	3	7/8	49.58	47.42	45.27	43.11
* 86470	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	51.32	49.09	46.86	44.63
* 86480	9/16 (14.29mm)	.5625	9/16	6	2-1/2	77.87	74.48	71.10	67.71
86500	5/8 (15.87mm)	.6250	5/8	3	7/8	53.00	50.70	48.39	46.09
86520	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	57.95	55.43	52.91	50.39
86540	5/8 (15.87mm)	.6250	5/8	6	2-1/2	84.54	80.86	77.19	73.51
10120	16mm	.6299	16mm	76mm	20mm	55.78	53.35	50.93	48.50
10130	16mm	.6299	16mm	88mm	32mm	60.85	58.20	55.56	52.91
10140	16mm	.6299	16mm	152mm	63mm	84.54	80.86	77.19	73.51
10160	18mm	.7087	18mm	101mm	38mm	89.21	85.33	81.45	77.57
10170	18mm	.7087	18mm	152mm	76mm	127.11	121.58	116.06	110.53
86600	3/4 (19.05mm)	.7500	3/4	3-1/2	1	84.97	81.28	77.58	73.89
86620	3/4 (19.05mm)	.7500	3/4	4	1-1/2	84.97	81.28	77.58	73.89
86640	3/4 (19.05mm)	.7500	3/4	6	3	134.68	128.82	122.97	117.11
* 10460	20mm	.7874	20mm	76mm	22mm	103.37	98.88	94.38	89.89
10180	20mm	.7874	20mm	101mm	38mm	113.44	108.51	103.58	98.64
10190	20mm	.7874	20mm	152mm	76mm	141.88	135.71	129.54	123.37
* 10470	25mm	.9843	25mm	76mm	28mm	117.46	112.35	107.25	102.14
* 10480	25mm	.9843	25mm	101mm	50mm	131.79	126.06	120.33	114.60
* 10490	25mm	.9843	25mm	152mm	82mm	218.63	209.12	199.62	190.11
* 86700	1 (25.40mm)	1.000	1	3	1-1/8	131.17	125.47	119.76	114.06
* 86720	1 (25.40mm)	1.000	1	4	2	127.11	121.58	116.06	110.53
* 86740	1 (25.40mm)	1.000	1	6	3-1/4	228.98	219.02	209.07	199.11

Series 253MT (fractional)



3 Flute 50° Helix

TIN Coated

***NEW
SIZES**

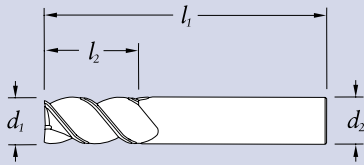


High performance machining of aluminum
Rigid work holding, machine stability and part integrity are critical!
Improved lubricity - 10% faster than uncoated
Slots aluminum at an axial depth of 25% of diameter
Sharp corners
Can be modified with a corner radius

TOLERANCES

 $\varnothing d_1 +.000 - .002" (+0.000 - 0.050\text{mm})$
 $\varnothing d_2 -.0001 -.0004" (-0.0025 - 0.0100\text{mm})$

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 86153	3/16 (4.76mm)	.1875	3/16	2	5/16	9.95	9.52	9.08	8.65
* 86163	3/16 (4.76mm)	.1875	3/16	2	9/16	9.95	9.52	9.08	8.65
* 86183	3/16 (4.76mm)	.1875	3/16	3	1	17.38	16.62	15.87	15.11
86203	1/4 (6.35mm)	.2500	1/4	2	1/2	11.45	10.95	10.45	9.96
86223	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	12.88	12.32	11.76	11.20
86243	1/4 (6.35mm)	.2500	1/4	3	1-1/4	20.52	19.63	18.74	17.84
* 86263	5/16 (7.94mm)	.3125	5/16	2	7/16	15.90	15.21	14.52	13.83
* 86273	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	17.93	17.15	16.37	15.59
* 86283	5/16 (7.94mm)	.3125	5/16	4	1-1/4	28.99	27.73	26.47	25.21
86303	3/8 (9.52mm)	.3750	3/8	2	1/2	19.10	18.27	17.44	16.61
86323	3/8 (9.52mm)	.3750	3/8	2-1/2	1	21.62	20.68	19.74	18.80
86343	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	30.89	29.55	28.20	26.86
* 86363	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	26.36	25.21	24.07	22.92
* 86373	7/16 (11.11mm)	.4375	7/16	2-3/4	1	26.36	25.21	24.07	22.92
* 86383	7/16 (11.11mm)	.4375	7/16	4	2	43.00	41.13	39.26	37.39
86403	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	31.15	29.80	28.44	27.09
86423	1/2 (12.70mm)	.5000	1/2	3	1	33.51	32.05	30.60	29.14
86443	1/2 (12.70mm)	.5000	1/2	4	2	45.46	43.48	41.51	39.53
* 86463	9/16 (14.29mm)	.5625	9/16	3	7/8	54.71	52.33	49.95	47.57
* 86473	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	56.66	54.20	51.73	49.27
* 86483	9/16 (14.29mm)	.5625	9/16	6	2-1/2	85.35	81.64	77.93	74.22
86503	5/8 (15.87mm)	.6250	5/8	3	7/8	58.12	55.59	53.07	50.54
86523	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	63.28	60.53	57.78	55.03
86543	5/8 (15.87mm)	.6250	5/8	6	2-1/2	92.03	88.03	84.03	80.03
86603	3/4 (19.05mm)	.7500	3/4	3-1/2	1	91.08	87.12	83.16	79.20
86623	3/4 (19.05mm)	.7500	3/4	4	1-1/2	91.08	87.12	83.16	79.20
86643	3/4 (19.05mm)	.7500	3/4	6	3	143.24	137.01	130.78	124.56
* 86703	1 (25.40mm)	1.000	1	3	1-1/8	140.33	134.23	128.13	122.03
* 86723	1 (25.40mm)	1.000	1	4	2	137.79	131.80	125.81	119.82
* 86743	1 (25.40mm)	1.000	1	6	3-1/4	243.93	233.32	222.72	212.11

***NEW
SIZES****3 Flute 50° Helix
TICN Coated**

High performance machining of stainless steel and aluminum
Rigid work holding, machine stability and part integrity are critical!

Improved abrasion resistance / lubricity

Up to 25% faster than uncoated

Slots stainless steel and aluminum at an axial depth of 25% of diameter

Sharp corners

Can be modified with a corner radius

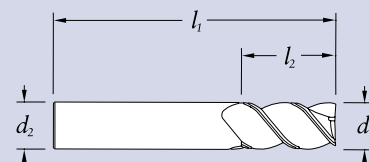
TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)

$\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 86154	3/16 (4.76mm)	.1875	3/16	2	5/16	10.48	10.02	9.57	9.11
* 86164	3/16 (4.76mm)	.1875	3/16	2	9/16	10.48	10.02	9.57	9.11
* 86184	3/16 (4.76mm)	.1875	3/16	3	1	18.09	17.30	16.52	15.73
86204	1/4 (6.35mm)	.2500	1/4	2	1/2	12.16	11.63	11.10	10.57
86224	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.95	13.34	12.74	12.13
86244	1/4 (6.35mm)	.2500	1/4	3	1-1/4	21.59	20.65	19.71	18.77
* 86264	5/16 (7.94mm)	.3125	5/16	2	7/16	17.07	16.33	15.59	14.84
* 86274	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	19.35	18.51	17.67	16.83
* 86284	5/16 (7.94mm)	.3125	5/16	4	1-1/4	30.64	29.31	27.98	26.64
86304	3/8 (9.52mm)	.3750	3/8	2	1/2	20.27	19.39	18.51	17.63
86324	3/8 (9.52mm)	.3750	3/8	2-1/2	1	22.23	21.26	20.30	19.33
86344	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	33.35	31.90	30.45	29.00
* 86364	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	28.05	26.83	25.61	24.39
* 86374	7/16 (11.11mm)	.4375	7/16	2-3/4	1	28.05	26.83	25.61	24.39
* 86384	7/16 (11.11mm)	.4375	7/16	4	2	44.98	43.02	41.07	39.11
86404	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	32.86	31.43	30.00	28.57
86424	1/2 (12.70mm)	.5000	1/2	3	1	35.19	33.66	32.13	30.60
86444	1/2 (12.70mm)	.5000	1/2	4	2	47.45	45.39	43.32	41.26
* 86464	9/16 (14.29mm)	.5625	9/16	3	7/8	56.48	54.02	51.57	49.11
* 86474	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	59.34	56.76	54.18	51.60
* 86484	9/16 (14.29mm)	.5625	9/16	6	2-1/2	89.10	85.23	81.35	77.48
86504	5/8 (15.87mm)	.6250	5/8	3	7/8	59.90	57.30	54.69	52.09
86524	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	65.96	63.09	60.22	57.36
86544	5/8 (15.87mm)	.6250	5/8	6	2-1/2	95.78	91.62	87.45	83.29
86604	3/4 (19.05mm)	.7500	3/4	3-1/2	1	94.14	90.05	85.95	81.86
86624	3/4 (19.05mm)	.7500	3/4	4	1-1/2	94.14	90.05	85.95	81.86
86644	3/4 (19.05mm)	.7500	3/4	6	3	147.51	141.10	134.68	128.27
* 86704	1 (25.40mm)	1.000	1	3	1-1/8	143.99	137.73	131.47	125.21
* 86724	1 (25.40mm)	1.000	1	4	2	140.89	134.76	128.64	122.51
* 86744	1 (25.40mm)	1.000	1	6	3-1/4	247.12	236.38	225.63	214.89

Series 253MA (fractional)
Series 853MA (metric)



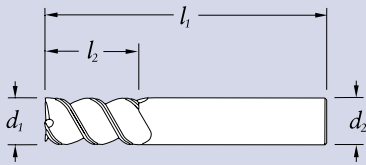
3 Flute 50° Helix ***NEW SIZES** TiAlN Coated



High performance machining of stainless steel
Rigid work holding, machine stability and part integrity are critical!
Dry or semi-dry machining
Up to 40% faster than uncoated
Slots stainless steel at an axial depth of 25% of diameter
Sharp corners
Can be modified with a corner radius

TOLERANCES
 $\varnothing d_1 +.000 - .002" (+0.000 - 0.050\text{mm})$
 $\varnothing d_2 -.0001 -.0004" (-0.0025 - 0.0100\text{mm})$

EDP#	Flute Diameter ¹	Decimal Equivalent	Shank Diameter	Overall Length	Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 86157	3/16 (4.76mm)	.1875	3/16	2	5/16	10.70	10.23	9.77	9.30
* 86167	3/16 (4.76mm)	.1875	3/16	2	9/16	10.70	10.23	9.77	9.30
* 86187	3/16 (4.76mm)	.1875	3/16	3	1	18.66	17.85	17.04	16.23
* 10407	5mm	.1969	5mm	50mm	8mm	12.68	12.13	11.58	11.03
* 10417	5mm	.1969	5mm	50mm	14mm	12.68	12.13	11.58	11.03
10017	6mm	.2362	6mm	50mm	12mm	13.27	12.69	12.12	11.54
10027	6mm	.2362	6mm	63mm	19mm	14.96	14.31	13.66	13.01
10037	6mm	.2362	6mm	76mm	32mm	23.05	22.05	21.05	20.04
86207	1/4 (6.35mm)	.2500	1/4	2	1/2	12.73	12.18	11.62	11.07
86227	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.44	13.81	13.18	12.56
86247	1/4 (6.35mm)	.2500	1/4	3	1-1/4	22.08	21.12	20.16	19.20
* 86267	5/16 (7.94mm)	.3125	5/16	2	7/16	17.60	16.83	16.07	15.30
* 86277	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	20.60	19.70	18.81	17.91
* 86287	5/16 (7.94mm)	.3125	5/16	4	1-1/4	32.35	30.94	29.54	28.13
* 10427	8mm	.3150	8mm	50mm	11mm	18.32	17.52	16.73	15.93
10047	8mm	.3150	8mm	63mm	20mm	21.34	20.41	19.48	18.56
10057	8mm	.3150	8mm	76mm	32mm	29.41	28.13	26.85	25.57
86307	3/8 (9.52mm)	.3750	3/8	2	1/2	20.80	19.90	18.99	18.09
86327	3/8 (9.52mm)	.3750	3/8	2-1/2	1	24.30	23.24	22.19	21.13
86347	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	35.06	33.54	32.01	30.49
10067	10mm	.3937	10mm	50mm	12mm	24.07	23.02	21.98	20.93
10077	10mm	.3937	10mm	76mm	25mm	33.99	32.51	31.03	29.56
10087	10mm	.3937	10mm	88mm	38mm	43.04	41.17	39.30	37.43
* 86367	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	29.20	27.93	26.66	25.39
* 86377	7/16 (11.11mm)	.4375	7/16	2-3/4	1	29.20	27.93	26.66	25.39
* 86387	7/16 (11.11mm)	.4375	7/16	4	2	46.70	44.67	42.64	40.61
10097	12mm	.4724	12mm	63mm	16mm	35.47	33.93	32.39	30.84
10107	12mm	.4724	12mm	76mm	25mm	37.85	36.20	34.56	32.91
10117	12mm	.4724	12mm	101mm	50mm	51.64	49.39	47.15	44.90
86407	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	34.01	32.53	31.05	29.57
86427	1/2 (12.70mm)	.5000	1/2	3	1	36.34	34.76	33.18	31.60
86447	1/2 (12.70mm)	.5000	1/2	4	2	49.17	47.03	44.89	42.76
* 10437	14mm	.5512	14mm	63mm	16mm	52.96	50.66	48.35	46.05
* 10447	14mm	.5512	14mm	76mm	25mm	56.70	54.23	51.77	49.30
* 10457	14mm	.5512	14mm	101mm	50mm	68.82	65.83	62.84	59.84
* 86467	9/16 (14.29mm)	.5625	9/16	3	7/8	56.87	54.40	51.92	49.45
* 86477	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	60.42	57.79	55.17	52.54
* 86487	9/16 (14.29mm)	.5625	9/16	6	2-1/2	91.39	87.42	83.44	79.47
86507	5/8 (15.87mm)	.6250	5/8	3	7/8	60.29	57.67	55.05	52.43
86527	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	67.05	64.13	61.22	58.30
86547	5/8 (15.87mm)	.6250	5/8	6	2-1/2	98.06	93.80	89.53	85.27
10127	16mm	.6299	16mm	76mm	20mm	63.07	60.33	57.59	54.84
10137	16mm	.6299	16mm	88mm	32mm	69.95	66.91	63.87	60.83
10147	16mm	.6299	16mm	152mm	63mm	98.06	93.80	89.53	85.27
10167	18mm	.7087	18mm	101mm	38mm	99.95	95.60	91.26	86.91
10177	18mm	.7087	18mm	152mm	76mm	142.76	136.55	130.35	124.14
86607	3/4 (19.05mm)	.7500	3/4	3-1/2	1	95.71	91.55	87.39	83.23
86627	3/4 (19.05mm)	.7500	3/4	4	1-1/2	95.71	91.55	87.39	83.23
86647	3/4 (19.05mm)	.7500	3/4	6	3	150.34	143.80	137.27	130.73
* 10467	20mm	.7874	20mm	76mm	22mm	115.92	110.88	105.84	100.80
10187	20mm	.7874	20mm	101mm	38mm	129.31	123.69	118.07	112.44
10197	20mm	.7874	20mm	152mm	76mm	162.20	155.15	148.10	141.04
* 10477	25mm	.9843	25mm	76mm	28mm	130.02	124.37	118.71	113.06
* 10487	25mm	.9843	25mm	101mm	50mm	147.66	141.24	134.82	128.40
* 10497	25mm	.9843	25mm	152mm	82mm	238.95	228.56	218.17	207.78
* 86707	1 (25.40mm)	1.000	1	3	1-1/8	144.93	138.63	132.33	126.03
* 86727	1 (25.40mm)	1.000	1	4	2	142.98	136.76	130.55	124.33
* 86747	1 (25.40mm)	1.000	1	6	3-1/4	249.31	238.47	227.63	216.79



3 Flute 60° Helix

High performance profiling of steels, stainless steel
and high-temperature alloys

Rigid work holding, machine stability and part integrity are critical!

Modified end gash - will not cut square corner

Can be modified with a corner radius

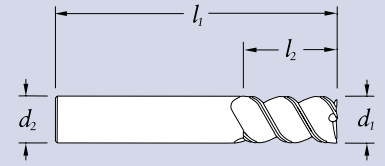
TOLERANCES

$\varnothing d_1$ $+0.000 -0.002$ " ($+0.000 -0.050$ mm)

$\varnothing d_2$ $-0.0001 -0.0004$ " ($-0.0025 -0.0100$ mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
23510	6mm	.2362	6mm	63mm	13mm	11.27	10.78	10.29	9.80
23010	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	10.74	10.27	9.81	9.34
23020	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	15.07	14.41	13.76	13.10
23520	8mm	.3150	8mm	63mm	19mm	15.82	15.13	14.44	13.76
23030	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	18.76	17.94	17.13	16.31
23530	10mm	.3937	10mm	63mm	22mm	22.84	21.85	20.85	19.86
23040	7/16 (11.11mm)	.4375	7/16	2-1/2	1	22.90	21.90	20.91	19.91
23540	12mm	.4724	12mm	76mm	26mm	31.56	30.19	28.82	27.44
23050	1/2 (12.70mm)	.5000	1/2	3	1	30.05	28.74	27.44	26.13
23060	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	57.95	55.43	52.91	50.39
23550	16mm	.6299	16mm	88mm	32mm	60.85	58.20	55.56	52.91
23070	3/4 (19.05mm)	.7500	3/4	4	1-1/2	84.97	81.28	77.58	73.89
23560	20mm	.7874	20mm	101mm	38mm	113.44	108.51	103.58	98.64
23080	1 (25.40mm)	1.000	1	4	1-1/2	127.11	121.58	116.06	110.53

Series 263MT (fractional)



3 Flute 60° Helix TIN Coated

High performance profiling of steels, stainless steel and high-temperature alloys

Rigid work holding, machine stability and part integrity are critical!

Improved lubricity - 10% faster than uncoated

Modified end gash - will not cut square corner

Can be modified with a corner radius

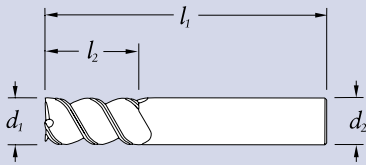


TOLERANCES

$\varnothing d_1$ $+0.000 -0.002$ " ($+0.000 -0.050$ mm)

$\varnothing d_2$ $-0.0001 -0.0004$ " ($-0.0025 -0.0100$ mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
23013	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	12.88	12.32	11.76	11.20
23023	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	17.93	17.15	16.37	15.59
23033	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	21.62	20.68	19.74	18.80
23043	7/16 (11.11mm)	.4375	7/16	2-1/2	1	26.37	25.22	24.08	22.93
23053	1/2 (12.70mm)	.5000	1/2	3	1	33.51	32.05	30.60	29.14
23063	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	63.28	60.53	57.78	55.03
23073	3/4 (19.05mm)	.7500	3/4	4	1-1/2	91.08	87.12	83.16	79.20
23083	1 (25.40mm)	1.000	1	4	1-1/2	137.78	131.79	125.80	119.81



3 Flute 60° Helix TICN Coated

High performance profiling of steels, stainless steel
and high-temperature alloys

Rigid work holding, machine stability and part integrity are critical!

Improved abrasion resistance / lubricity

Up to 25% faster than uncoated

Modified end gash - will not cut square corner

Can be modified with a corner radius

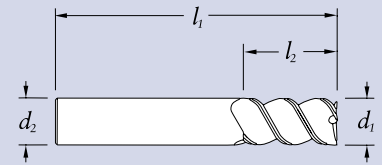
TOLERANCES

$\varnothing d_1$ $+.000$ $-.002$ " $(+0.000 -0.050\text{mm})$

$\varnothing d_2$ $-.0001$ $-.0004$ " $(-0.0025 -0.0100\text{mm})$

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
23014	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.95	13.34	12.74	12.13
23024	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	19.35	18.51	17.67	16.83
23034	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	23.05	22.05	21.05	20.04
23044	7/16 (11.11mm)	.4375	7/16	2-1/2	1	28.05	26.83	25.61	24.39
23054	1/2 (12.70mm)	.5000	1/2	3	1	35.19	33.66	32.13	30.60
23064	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	65.96	63.09	60.22	57.36
23074	3/4 (19.05mm)	.7500	3/4	4	1-1/2	94.14	90.05	85.95	81.86
23084	1 (25.40mm)	1.000	1	4	1-1/2	140.88	134.75	128.63	122.51

Series 263MA (fractional)
Series 863MA (metric)



3 Flute 60° Helix TiAlN Coated

High performance profiling of steels, stainless steel
and high-temperature alloys

Rigid work holding, machine stability and part integrity are critical!

Dry or semi-dry machining

Up to 40% faster than uncoated

Modified end gash - will not cut square corner

Can be modified with a corner radius



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
23517	6mm	.2362	6mm	63mm	13mm	14.96	14.31	13.66	13.01
23017	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.44	13.81	13.18	12.56
23027	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	20.60	19.70	18.81	17.91
23527	8mm	.3150	8mm	63mm	19mm	21.34	20.41	19.48	18.56
23037	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	24.30	23.24	22.19	21.13
23537	10mm	.3937	10mm	63mm	22mm	29.13	27.86	26.60	25.33
23047	7/16 (11.11mm)	.4375	7/16	2-1/2	1	29.20	27.93	26.66	25.39
23547	12mm	.4724	12mm	76mm	26mm	37.85	36.20	34.56	32.91
23057	1/2 (12.70mm)	.5000	1/2	3	1	36.34	34.76	33.18	31.60
23067	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	67.05	64.13	61.22	58.30
23557	16mm	.6299	16mm	88mm	32mm	69.95	66.91	63.87	60.83
23077	3/4 (19.05mm)	.7500	3/4	4	1-1/2	95.71	91.55	87.39	83.23
23567	20mm	.7874	20mm	101mm	38mm	129.31	123.69	118.07	112.44
23087	1 (25.40mm)	1.000	1	4	1-1/2	142.98	136.76	130.55	124.33



5 Flute 45° Helix

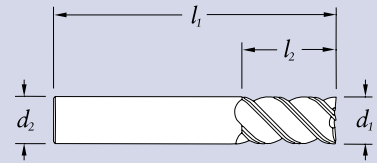
High performance milling in steels, stainless steel and exotics
Rigid work holding, machine stability and part integrity are critical!
Improved finishes in titanium
Heavy core
Sharp corners

TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
52100	3/16 (4.76mm)	.1875	3/16	2	5/16	8.90	8.51	8.13	7.74
52120	3/16 (4.76mm)	.1875	3/16	2	9/16	8.90	8.51	8.13	7.74
40100	5mm	.1969	5mm	50mm	8mm	9.89	9.46	9.03	8.60
40120	5mm	.1969	5mm	50mm	14mm	9.89	9.46	9.03	8.60
40200	6mm	.2362	6mm	50mm	10mm	10.48	10.02	9.57	9.11
40220	6mm	.2362	6mm	63mm	20mm	11.27	10.78	10.29	9.80
40240	6mm	.2362	6mm	101mm	32mm	20.42	19.53	18.64	17.76
52200	1/4 (6.35mm)	.2500	1/4	2	3/8	9.94	9.51	9.08	8.64
52220	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	10.74	10.27	9.81	9.34
52240	1/4 (6.35mm)	.2500	1/4	4	1-1/4	19.40	18.56	17.71	16.87
52300	5/16 (7.94mm)	.3125	5/16	2	7/16	13.60	13.01	12.42	11.83
52320	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	15.07	14.41	13.76	13.10
52340	5/16 (7.94mm)	.3125	5/16	4	1-1/4	25.31	24.21	23.11	22.01
40300	8mm	.3150	8mm	50mm	11mm	14.33	13.71	13.08	12.46
40320	8mm	.3150	8mm	63mm	21mm	15.82	15.13	14.44	13.76
40340	8mm	.3150	8mm	101mm	32mm	26.65	25.49	24.33	23.17
52400	3/8 (9.52mm)	.3750	3/8	2	1/2	16.80	16.07	15.34	14.61
52420	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	18.76	17.94	17.13	16.31
52440	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	28.03	26.81	25.59	24.37
40400	10mm	.3937	10mm	50mm	12mm	19.54	18.69	17.84	16.99
40420	10mm	.3937	10mm	63mm	22mm	22.84	21.85	20.85	19.86
40440	10mm	.3937	10mm	88mm	38mm	34.89	33.37	31.86	30.34
52500	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	22.90	21.90	20.91	19.91
52520	7/16 (11.11mm)	.4375	7/16	2-3/4	1	22.90	21.90	20.91	19.91
52540	7/16 (11.11mm)	.4375	7/16	4	2	38.56	36.88	35.21	33.53
40500	12mm	.4724	12mm	63mm	16mm	29.18	27.91	26.64	25.37
40520	12mm	.4724	12mm	76mm	32mm	31.56	30.19	28.82	27.44
40540	12mm	.4724	12mm	101mm	50mm	43.48	41.59	39.70	37.81
52600	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	27.72	26.51	25.31	24.10
52620	1/2 (12.70mm)	.5000	1/2	3	1-1/4	30.05	28.74	27.44	26.13
52640	1/2 (12.70mm)	.5000	1/2	4	2	41.02	39.24	37.45	35.67
52700	5/8 (15.87mm)	.6250	5/8	3	3/4	53.00	50.70	48.39	46.09
52720	5/8 (15.87mm)	.6250	5/8	3-1/2	1-5/8	57.95	55.43	52.91	50.39
52740	5/8 (15.87mm)	.6250	5/8	6	2-1/2	84.54	80.86	77.19	73.51
40600	16mm	.6299	16mm	76mm	20mm	55.78	53.35	50.93	48.50
40620	16mm	.6299	16mm	88mm	41mm	60.85	58.20	55.56	52.91
40640	16mm	.6299	16mm	152mm	63mm	84.54	80.86	77.19	73.51
52800	3/4 (19.05mm)	.7500	3/4	3	7/8	76.21	72.90	69.58	66.27
52820	3/4 (19.05mm)	.7500	3/4	4	1-5/8	84.97	81.28	77.58	73.89
52840	3/4 (19.05mm)	.7500	3/4	6	3-1/4	134.68	128.82	122.97	117.11
40700	20mm	.7874	20mm	76mm	22mm	103.37	98.88	94.38	89.89
40720	20mm	.7874	20mm	101mm	41mm	113.44	108.51	103.58	98.64
40740	20mm	.7874	20mm	152mm	82mm	141.88	135.71	129.54	123.37
40800	25mm	.9843	25mm	76mm	28mm	117.46	112.35	107.25	102.14
40820	25mm	.9843	25mm	101mm	50mm	131.79	126.06	120.33	114.60
40840	25mm	.9843	25mm	152mm	82mm	218.62	209.11	199.61	190.11
52900	1 (25.40mm)	1.000	1	3	1-1/8	131.17	125.47	119.76	114.06
52920	1 (25.40mm)	1.000	1	4	2	127.11	121.58	116.06	110.53
52940	1 (25.40mm)	1.000	1	6	3-1/4	228.97	219.01	209.06	199.11

Series 255MC (fractional)



5 Flute 45° Helix TICN Coated



High performance milling in steels, stainless steel and exotics
 Rigid work holding, machine stability and part integrity are critical!
 Improved abrasion resistance / lubricity
 Up to 25% faster than uncoated
 Improved finishes in titanium
 Heavy core
 Sharp corners

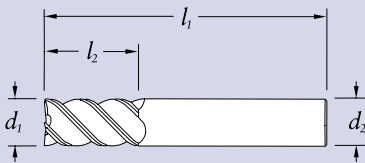
TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
52104	3/16 (4.76mm)	.1875	3/16	2	5/16	10.48	10.02	9.57	9.11
52124	3/16 (4.76mm)	.1875	3/16	2	9/16	10.48	10.02	9.57	9.11
52204	1/4 (6.35mm)	.2500	1/4	2	3/8	12.16	11.63	11.10	10.57
52224	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.95	13.34	12.74	12.13
52244	1/4 (6.35mm)	.2500	1/4	4	1-1/4	22.87	21.88	20.88	19.89
52304	5/16 (7.94mm)	.3125	5/16	2	7/16	17.07	16.33	15.59	14.84
52324	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	19.35	18.51	17.67	16.83
52344	5/16 (7.94mm)	.3125	5/16	4	1-1/4	30.64	29.31	27.98	26.64
52404	3/8 (9.52mm)	.3750	3/8	2	1/2	20.27	19.39	18.51	17.63
52424	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	23.05	22.05	21.05	20.04
52444	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	33.35	31.90	30.45	29.00
52504	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	28.05	26.83	25.61	24.39
52524	7/16 (11.11mm)	.4375	7/16	2-3/4	1	28.05	26.83	25.61	24.39
52544	7/16 (11.11mm)	.4375	7/16	4	2	44.98	43.02	41.07	39.11
52604	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	32.86	31.43	30.00	28.57
52624	1/2 (12.70mm)	.5000	1/2	3	1-1/4	35.19	33.66	32.13	30.60
52644	1/2 (12.70mm)	.5000	1/2	4	2	47.45	45.39	43.32	41.26
52704	5/8 (15.87mm)	.6250	5/8	3	3/4	59.90	57.30	54.69	52.09
52724	5/8 (15.87mm)	.6250	5/8	3-1/2	1-5/8	65.96	63.09	60.22	57.36
52744	5/8 (15.87mm)	.6250	5/8	6	2-1/2	95.78	91.62	87.45	83.29
52804	3/4 (19.05mm)	.7500	3/4	3	7/8	84.71	81.03	77.34	73.66
52824	3/4 (19.05mm)	.7500	3/4	4	1-5/8	94.14	90.05	85.95	81.86
52844	3/4 (19.05mm)	.7500	3/4	6	3-1/4	147.51	141.10	134.68	128.27
52904	1 (25.40mm)	1.000	1	3	1-1/8	143.99	137.73	131.47	125.21
52924	1 (25.40mm)	1.000	1	4	2	140.88	134.75	128.63	122.51
52944	1 (25.40mm)	1.000	1	6	3-1/4	247.12	236.38	225.63	214.89

(fractional) Series 255MA
(metric) Series 855MA

HIGH PERFORMANCE
END MILLS



5 Flute 45° Helix TIALN Coated

High performance milling in steels, stainless steel and exotics
Rigid work holding, machine stability and part integrity are critical!

Dry or semi-dry machining
Up to 40% faster than uncoated
Improved finishes in titanium

Heavy core
Sharp corners

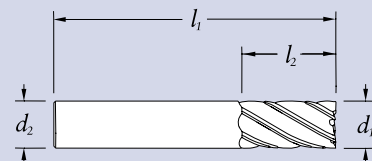
TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
52107	3/16 (4.76mm)	.1875	3/16	2	5/16	10.70	10.23	9.77	9.30
52127	3/16 (4.76mm)	.1875	3/16	2	9/16	10.70	10.23	9.77	9.30
40107	5mm	.1969	5mm	50mm	8mm	12.68	12.13	11.58	11.03
40127	5mm	.1969	5mm	50mm	14mm	12.68	12.13	11.58	11.03
40207	6mm	.2362	6mm	50mm	10mm	13.27	12.69	12.12	11.54
40227	6mm	.2362	6mm	63mm	20mm	14.96	14.31	13.66	13.01
40247	6mm	.2362	6mm	101mm	32mm	24.76	23.68	22.61	21.53
52207	1/4 (6.35mm)	.2500	1/4	2	3/8	12.73	12.18	11.62	11.07
52227	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.44	13.81	13.18	12.56
52247	1/4 (6.35mm)	.2500	1/4	4	1-1/4	23.74	22.71	21.68	20.64
52307	5/16 (7.94mm)	.3125	5/16	2	7/16	17.60	16.83	16.07	15.30
52327	5/16 (7.94mm)	.3125	5/16	2-1/2	13/16	20.60	19.70	18.81	17.91
52347	5/16 (7.94mm)	.3125	5/16	4	1-1/4	32.35	30.94	29.54	28.13
40307	8mm	.3150	8mm	50mm	11mm	18.32	17.52	16.73	15.93
40327	8mm	.3150	8mm	63mm	21mm	21.34	20.41	19.48	18.56
40347	8mm	.3150	8mm	101mm	32mm	33.68	32.22	30.75	29.29
52407	3/8 (9.52mm)	.3750	3/8	2	1/2	20.80	19.90	18.99	18.09
52427	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	24.30	23.24	22.19	21.13
52447	3/8 (9.52mm)	.3750	3/8	3-1/2	1-1/2	35.06	33.54	32.01	30.49
40407	10mm	.3937	10mm	50mm	12mm	24.07	23.02	21.98	20.93
40427	10mm	.3937	10mm	63mm	22mm	29.13	27.86	26.60	25.33
40447	10mm	.3937	10mm	88mm	38mm	43.04	41.17	39.30	37.43
52507	7/16 (11.11mm)	.4375	7/16	2-1/2	9/16	29.20	27.93	26.66	25.39
52527	7/16 (11.11mm)	.4375	7/16	2-3/4	1	29.20	27.93	26.66	25.39
52547	7/16 (11.11mm)	.4375	7/16	4	2	46.70	44.67	42.64	40.61
40507	12mm	.4724	12mm	63mm	16mm	35.47	33.93	32.39	30.84
40527	12mm	.4724	12mm	76mm	32mm	37.85	36.20	34.56	32.91
40547	12mm	.4724	12mm	101mm	50mm	51.64	49.39	47.15	44.90
52607	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	34.01	32.53	31.05	29.57
52627	1/2 (12.70mm)	.5000	1/2	3	1-1/4	36.34	34.76	33.18	31.60
52647	1/2 (12.70mm)	.5000	1/2	4	2	49.17	47.03	44.89	42.76
52707	5/8 (15.87mm)	.6250	5/8	3	3/4	60.29	57.67	55.05	52.43
52727	5/8 (15.87mm)	.6250	5/8	3-1/2	1-5/8	67.05	64.13	61.22	58.30
52747	5/8 (15.87mm)	.6250	5/8	6	2-1/2	98.06	93.80	89.53	85.27
40607	16mm	.6299	16mm	76mm	20mm	63.07	60.33	57.59	54.84
40627	16mm	.6299	16mm	88mm	41mm	69.95	66.91	63.87	60.83
40647	16mm	.6299	16mm	152mm	63mm	98.06	93.80	89.53	85.27
52807	3/4 (19.05mm)	.7500	3/4	3	7/8	84.95	81.26	77.56	73.87
52827	3/4 (19.05mm)	.7500	3/4	4	1-5/8	95.71	91.55	87.39	83.23
52847	3/4 (19.05mm)	.7500	3/4	6	3-1/4	150.34	143.80	137.27	130.73
40707	20mm	.7874	20mm	76mm	22mm	115.92	110.88	105.84	100.80
40727	20mm	.7874	20mm	101mm	41mm	129.31	123.69	118.07	112.44
40747	20mm	.7874	20mm	152mm	82mm	162.20	155.15	148.10	141.04
40807	25mm	.9843	25mm	76mm	28mm	130.02	124.37	118.71	113.06
40827	25mm	.9843	25mm	101mm	50mm	147.66	141.24	134.82	128.40
40847	25mm	.9843	25mm	152mm	82mm	238.94	228.55	218.16	207.78
52907	1 (25.40mm)	1.000	1	3	1-1/8	144.93	138.63	132.33	126.03
52927	1 (25.40mm)	1.000	1	4	2	142.98	136.76	130.55	124.33
52947	1 (25.40mm)	1.000	1	6	3-1/4	249.31	238.47	227.63	216.79

Series 246M (fractional)
Series 846M (metric)



6 Flute 40° Helix

High performance finishing tool
Rigid work holding, machine stability and part integrity are critical!
Excellent durability

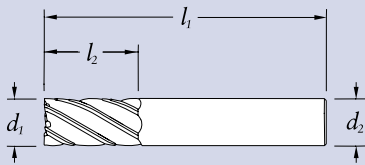


TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)

$\varnothing d_2$ $-.0001 -.0004"$ ($-0.0025 -0.0100\text{mm}$)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
51110	3/16 (4.76mm)	.1875	3/16	2	5/8	8.90	8.51	8.13	7.74
51510	5mm	.1969	5mm	50mm	16mm	9.89	9.46	9.03	8.60
51520	6mm	.2362	6mm	63mm	20mm	11.27	10.78	10.29	9.80
51150	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	10.74	10.27	9.81	9.34
51190	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	15.07	14.41	13.76	13.10
51530	8mm	.3150	8mm	63mm	22mm	15.82	15.13	14.44	13.76
51230	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	18.76	17.94	17.13	16.31
51540	10mm	.3937	10mm	63mm	25mm	22.84	21.85	20.85	19.86
51270	7/16 (11.11mm)	.4375	7/16	2-1/2	1	22.90	21.90	20.91	19.91
51550	12mm	.4724	12mm	76mm	25mm	31.56	30.19	28.82	27.44
51310	1/2 (12.70mm)	.5000	1/2	3	1	30.05	28.74	27.44	26.13
51330	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	57.95	55.43	52.91	50.39
51560	16mm	.6299	16mm	88mm	32mm	60.85	58.20	55.56	52.91
51350	3/4 (19.05mm)	.7500	3/4	4	1-1/2	84.97	81.28	77.58	73.89
51570	20mm	.7874	20mm	101mm	38mm	113.44	108.51	103.58	98.64
51580	25mm	.9843	25mm	101mm	38mm	131.79	126.06	120.33	114.60
51370	1 (25.40mm)	1.000	1	4	1-1/2	127.11	121.58	116.06	110.53
51400	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	371.09	354.96	338.82	322.69
51430	1-1/4 (31.75mm)	1.250	1-1/4	6	3	485.76	464.64	443.52	422.40



6 Flute 40° Helix TICN Coated

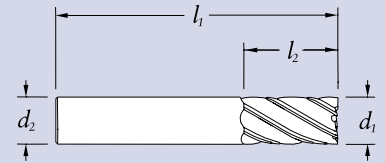
High performance finishing tool
Rigid work holding, machine stability and part integrity are critical!
Improved abrasion resistance / lubricity
Up to 25% faster than uncoated
Excellent durability

TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
51114	3/16 (4.76mm)	.1875	3/16	2	5/8	10.48	10.02	9.57	9.11
51154	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.95	13.34	12.74	12.13
51194	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	19.35	18.51	17.67	16.83
51234	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	23.05	22.05	21.05	20.04
51274	7/16 (11.11mm)	.4375	7/16	2-1/2	1	28.05	26.83	25.61	24.39
51314	1/2 (12.70mm)	.5000	1/2	3	1	35.19	33.66	32.13	30.60
51334	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	65.96	63.09	60.22	57.36
51354	3/4 (19.05mm)	.7500	3/4	4	1-1/2	94.14	90.05	85.95	81.86
51374	1 (25.40mm)	1.000	1	4	1-1/2	143.49	137.25	131.01	124.77
51404	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	393.33	376.23	359.13	342.03
51434	1-1/4 (31.75mm)	1.250	1-1/4	6	3	510.91	488.70	466.48	444.27

Series 246MA (fractional)
Series 846MA (metric)



6 Flute 40° Helix TiAlN Coated

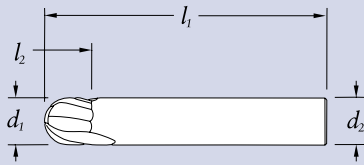
High performance finishing tool
Rigid work holding, machine stability and part integrity are critical!
Dry or semi-dry machining
Up to 40% faster than uncoated
Excellent durability



TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)
 $\varnothing d_2$ $-.0001 -.0004"$ ($-0.0025 -0.0100\text{mm}$)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
51117	3/16 (4.76mm)	.1875	3/16	2	5/8	10.70	10.23	9.77	9.30
51517	5mm	.1969	5mm	50mm	16mm	12.68	12.13	11.58	11.03
51527	6mm	.2362	6mm	63mm	20mm	14.96	14.31	13.66	13.01
51157	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.44	13.81	13.18	12.56
51197	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	20.60	19.70	18.81	17.91
51537	8mm	.3150	8mm	63mm	22mm	21.34	20.41	19.48	18.56
51237	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	24.30	23.24	22.19	21.13
51547	10mm	.3937	10mm	63mm	25mm	29.13	27.86	26.60	25.33
51277	7/16 (11.11mm)	.4375	7/16	2-1/2	1	29.20	27.93	26.66	25.39
51557	12mm	.4724	12mm	76mm	25mm	37.85	36.20	34.56	32.91
51317	1/2 (12.70mm)	.5000	1/2	3	1	36.34	34.76	33.18	31.60
51337	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	67.05	64.13	61.22	58.30
51567	16mm	.6299	16mm	88mm	32mm	69.95	66.91	63.87	60.83
51357	3/4 (19.05mm)	.7500	3/4	4	1-1/2	95.71	91.55	87.39	83.23
51577	20mm	.7874	20mm	101mm	38mm	129.31	123.69	118.07	112.44
51587	25mm	.9843	25mm	101mm	38mm	147.66	141.24	134.82	128.40
51377	1 (25.40mm)	1.000	1	4	1-1/2	142.98	136.76	130.55	124.33
51407	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	397.11	379.84	362.58	345.31
51437	1-1/4 (31.75mm)	1.250	1-1/4	6	3	511.78	489.53	467.28	445.03



2 Flute - Die Mold Cutters *Balinit*® X.TREME Coated

High performance machining in the die mold industry
Rigid work holding, machine stability and part integrity are critical!

Carbide tested and selected for specific application

Radius tolerance +.0000-.0005" (+0.0000-0.0127mm)

5mm (.1969") diameter and smaller have 5° taper to shank

High Rc materials

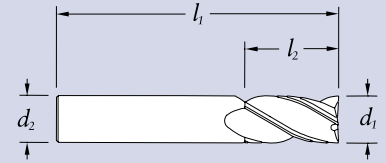
Can be modified with a neck

15° helix - rhs/rhc

TOLERANCES

$\varnothing d_1$ +.000 - .001" (+0.000 - 0.025mm)
 $\varnothing d_2$ -.0001 - .0003" (-0.0025 - 0.0076mm)

EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
14210	1/32 (0.79mm)	.0312	1/4	3	1/32	40.19	38.44	36.70	34.95
15210	1mm	.0394	6mm	75mm	1mm	40.19	38.44	36.70	34.95
15220	1.5mm	.0591	6mm	75mm	1.5mm	40.19	38.44	36.70	34.95
14220	1/16 (1.59mm)	.0625	1/4	3	1/16	40.19	38.44	36.70	34.95
15230	2mm	.0787	6mm	75mm	2mm	40.19	38.44	36.70	34.95
14230	3/32 (2.38mm)	.0938	1/4	3	3/32	40.19	38.44	36.70	34.95
15240	3mm	.1181	6mm	75mm	3mm	39.27	37.56	35.86	34.15
14240	1/8 (3.17mm)	.1250	1/4	3	1/8	39.27	37.56	35.86	34.15
15250	4mm	.1575	6mm	75mm	4mm	38.70	37.02	35.33	33.65
14250	3/16 (4.76mm)	.1875	1/4	3	3/16	38.70	37.02	35.33	33.65
15260	5mm	.1969	6mm	75mm	5mm	38.70	37.02	35.33	33.65
15270	6mm	.2362	6mm	75mm	6mm	37.89	36.24	34.60	32.95
14260	1/4 (6.35mm)	.2500	1/4	3	1/4	37.89	36.24	34.60	32.95
14270	5/16 (7.94mm)	.3125	5/16	4	5/16	46.40	44.38	42.37	40.35
15280	8mm	.3150	8mm	101mm	8mm	46.40	44.38	42.37	40.35
14280	3/8 (9.52mm)	.3750	3/8	4	3/8	51.35	49.12	46.88	44.65
15290	10mm	.3937	10mm	101mm	10mm	55.55	53.13	50.72	48.30
15300	12mm	.4724	12mm	101mm	12mm	67.28	64.35	61.43	58.50
14290	1/2 (12.70mm)	.5000	1/2	4	1/2	74.92	71.66	68.40	65.15



Standard Length Diamond Coated - 30° Helix

Crystalline coating

Up to 17 times tool life versus uncoated end mills

Graphite, fiber-reinforced plastics, carbon fiber and high silicon aluminum

Grade C-2 carbide

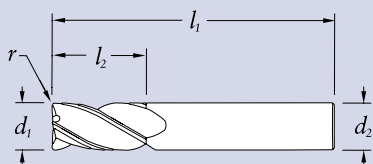


TOLERANCES

$\varnothing d_1$ $+0.000 -0.002$ " ($+0.000 -0.050$ mm)

$\varnothing d_2$ $-0.0001 -0.0004$ " ($-0.0025 -0.0100$ mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
10018	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	48.77	46.65	44.53	42.41
10028	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	48.77	46.65	44.53	42.41
10038	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	47.22	45.17	43.11	41.06
10058	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	46.38	44.36	42.35	40.33
10078	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	43.82	41.91	40.01	38.10
10118	3/16 (4.76mm)	.1875	3/16	2	5/8	70.04	66.99	63.95	60.90
10158	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	82.34	78.76	75.18	71.60
10198	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	98.50	94.22	89.93	85.65
10238	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	110.38	105.58	100.78	95.98
10318	1/2 (12.70mm)	.5000	1/2	3	1	134.12	128.29	122.46	116.63



**NEW
SERIES**

4 Flute Series **210RD**

HIGH PERFORMANCE
END MILLS



Standard Length - Corner Radius Diamond Coated - 30° Helix

Crystalline coating

Up to 17 times tool life versus uncoated end mills

Graphite, fiber-reinforced plastics, carbon fiber and high silicon aluminum

For stronger corners and part radius

Grade C-2 carbide

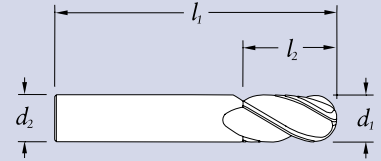
TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000-0.050mm)

$\varnothing d_2$ -.0001 -.0004" (-0.0025-0.0100mm)

r +.001 -.001" (+0.025-0.025mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	r Corner Radius	1 - 11	12 - 24	25 - 49	50 - 100
80018	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	.015	60.72	58.08	55.44	52.80
80028	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	.020	60.72	58.08	55.44	52.80
80058	3/16 (4.76mm)	.1875	3/16	2	5/8	.015	87.75	83.93	80.12	76.30
80068	3/16 (4.76mm)	.1875	3/16	2	5/8	.020	87.75	83.93	80.12	76.30
80108	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	.015	93.63	89.56	85.49	81.42
80118	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	.020	93.63	89.56	85.49	81.42
80128	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	.030	93.63	89.56	85.49	81.42
80248	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	.020	117.77	112.65	107.53	102.41
80258	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	.030	117.77	112.65	107.53	102.41
80328	1/2 (12.70mm)	.5000	1/2	3	1	.030	143.42	137.18	130.95	124.71
80348	1/2 (12.70mm)	.5000	1/2	3	1	.060	143.42	137.18	130.95	124.71



Standard Length - Ball End Diamond Coated - 30° Helix

Crystalline coating

Up to 17 times tool life versus uncoated end mills

Graphite, fiber-reinforced plastics, carbon fiber and high silicon aluminum

Radius tolerance $+0.000-0.001"$ ($+0.000-0.025\text{mm}$)

Grade C-2 carbide

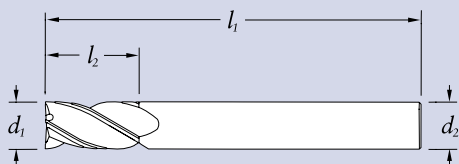


TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000-0.050\text{mm}$)

$\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025-0.0100\text{mm}$)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
15018	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	65.94	63.07	60.21	57.34
15028	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	65.94	63.07	60.21	57.34
15038	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	64.39	61.59	58.79	55.99
15058	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	63.28	60.53	57.78	55.03
15078	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	60.72	58.08	55.44	52.80
15118	3/16 (4.76mm)	.1875	3/16	2	5/8	87.75	83.93	80.12	76.30
15158	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	93.63	89.56	85.49	81.42
15198	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	105.46	100.87	96.29	91.70
15238	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	117.77	112.65	107.53	102.41
15318	1/2 (12.70mm)	.5000	1/2	3	1	143.42	137.18	130.95	124.71



**NEW
SERIES**

4 Flute Series **610D**

HIGH PERFORMANCE
END MILLS



Extra Length Diamond Coated - 30° Helix

Crystalline coating

Up to 17 times tool life versus uncoated end mills

Graphite, fiber-reinforced plastics, carbon fiber and high silicon aluminum

Can be modified with a neck in 48 hours

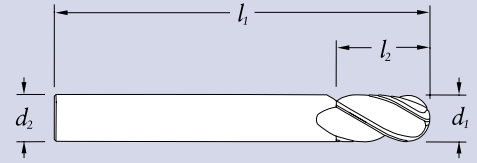
Grade C-2 carbide

TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ $(+0.000-0.050\text{mm})$

$\varnothing d_2$ $-0.0001 -0.0004"$ $(-0.0025-0.0100\text{mm})$

EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
38038	1/8 (3.17mm)	.1250	1/8	3	1	67.16	64.24	61.32	58.40
38048	3/16 (4.76mm)	.1875	3/16	4	1	89.86	85.95	82.05	78.14
38058	1/4 (6.35mm)	.2500	1/4	3	1	96.27	92.08	87.90	83.71
38068	1/4 (6.35mm)	.2500	1/4	4	1	99.98	95.63	91.29	86.94
38078	1/4 (6.35mm)	.2500	1/4	6	1-1/2	114.43	109.45	104.48	99.50
38098	5/16 (7.94mm)	.3125	5/16	4	1	117.21	112.11	107.02	101.92
38128	3/8 (9.52mm)	.3750	3/8	4	1	130.53	124.85	119.18	113.50
38138	3/8 (9.52mm)	.3750	3/8	6	1-1/2	144.26	137.99	131.72	125.44
38168	1/2 (12.70mm)	.5000	1/2	4	1	164.21	157.07	149.93	142.79
38178	1/2 (12.70mm)	.5000	1/2	4	2	164.21	157.07	149.93	142.79



Extra Length - Ball End Diamond Coated - 30° Helix

Crystalline coating

Up to 17 times tool life versus uncoated end mills

Graphite, fiber-reinforced plastics, carbon fiber and high silicon aluminum

Radius tolerance $+0.000-0.001$ " ($+0.000-0.025$ mm)

Can be modified with a neck in 48 hours

Grade C-2 carbide



TOLERANCES

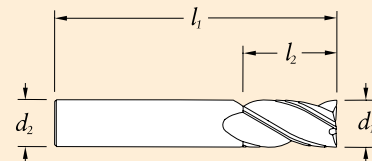
$\varnothing d_1$ $+0.000 -0.002$ " ($+0.000-0.050$ mm)

$\varnothing d_2$ $-0.0001 -0.0004$ " ($-0.0025-0.0100$ mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
40038	1/8 (3.17mm)	.1250	1/8	3	1	82.03	78.46	74.90	71.33
40048	3/16 (4.76mm)	.1875	3/16	4	1	102.06	97.62	93.18	88.75
40058	1/4 (6.35mm)	.2500	1/4	3	1	108.47	103.75	99.04	94.32
40068	1/4 (6.35mm)	.2500	1/4	4	1	112.18	107.30	102.42	97.55
40078	1/4 (6.35mm)	.2500	1/4	6	1-1/2	124.55	119.13	113.72	108.30
40098	5/16 (7.94mm)	.3125	5/16	4	1	129.41	123.78	118.16	112.53
40128	3/8 (9.52mm)	.3750	3/8	4	1	142.73	136.52	130.32	124.11
40138	3/8 (9.52mm)	.3750	3/8	6	1-1/2	151.02	144.45	137.89	131.32
40168	1/2 (12.70mm)	.5000	1/2	4	1	174.33	166.75	159.17	151.59
40178	1/2 (12.70mm)	.5000	1/2	4	2	174.33	166.75	159.17	151.59

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Series 160M & 860M 2 Flute
Series 170M & 870M 4 Flute
(fractional) (metric)



Stub Length 30° Helix

***NEW SIZES**

Shorter flute length for rigidity
Extremely versatile



TOLERANCES

.030" diameter and smaller

$\varnothing d_1$ $+.0004$ $-.0004$ " ($+0.0100$ -0.0100 mm)

$\varnothing d_2$ $-.0001$ $-.0003$ " (-0.0025 -0.0076 mm)

l_2 $+.004$ $-.004$ " ($+0.100$ -0.100 mm)

1/32" diameter and larger

$\varnothing d_1$ $+.000$ $-.002$ " ($+0.000$ -0.050 mm)

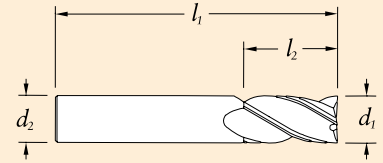
$\varnothing d_2$ $-.0001$ $-.0004$ " (-0.0025 -0.0100 mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 01200	—	.0050 (0.13mm)	.0050	1/8	1-1/2	.008	15.47	14.80	14.12	13.45
* 01210	—	.0060 (0.15mm)	.0060	1/8	1-1/2	.009	15.47	14.80	14.12	13.45
* 01220	—	.0070 (0.18mm)	.0070	1/8	1-1/2	.011	14.56	13.93	13.29	12.66
* 01230	—	.0080 (0.20mm)	.0080	1/8	1-1/2	.012	14.56	13.93	13.29	12.66
* 01240	—	.0090 (0.23mm)	.0090	1/8	1-1/2	.014	13.74	13.14	12.55	11.95
* 01250	—	.0100 (0.25mm)	.0100	1/8	1-1/2	.015	13.74	13.14	12.55	11.95
* 01260	—	.0110 (0.28mm)	.0110	1/8	1-1/2	.017	12.72	12.17	11.61	11.06
* 01270	—	.0120 (0.30mm)	.0120	1/8	1-1/2	.018	12.72	12.17	11.61	11.06
* 01280	—	.0130 (0.33mm)	.0130	1/8	1-1/2	.020	12.65	12.10	11.55	11.00
* 01290	—	.0140 (0.36mm)	.0140	1/8	1-1/2	.021	12.65	12.10	11.55	11.00
* 01300	—	.0150 (0.38mm)	.0150	1/8	1-1/2	.023	12.65	12.10	11.55	11.00
* 01310	—	.0160 (0.41mm)	.0160	1/8	1-1/2	.024	12.48	11.94	11.39	10.85
* 01320	—	.0170 (0.43mm)	.0170	1/8	1-1/2	.026	12.48	11.94	11.39	10.85
* 01330	—	.0180 (0.46mm)	.0180	1/8	1-1/2	.027	12.25	11.72	11.18	10.65
* 01340	—	.0190 (0.48mm)	.0190	1/8	1-1/2	.029	12.25	11.72	11.18	10.65
* 01350	—	.0200 (0.51mm)	.0200	1/8	1-1/2	.030	12.25	11.72	11.18	10.65
* 01360	—	.0210 (0.53mm)	.0210	1/8	1-1/2	.032	12.25	11.72	11.18	10.65
* 01370	—	.0220 (0.56mm)	.0220	1/8	1-1/2	.033	12.11	11.58	11.06	10.53
* 01380	—	.0230 (0.58mm)	.0230	1/8	1-1/2	.035	12.11	11.58	11.06	10.53
* 01390	—	.0240 (0.61mm)	.0240	1/8	1-1/2	.036	12.11	11.58	11.06	10.53
* 01400	—	.0250 (0.64mm)	.0250	1/8	1-1/2	.038	11.42	10.92	10.43	9.93
* 01410	—	.0260 (0.66mm)	.0260	1/8	1-1/2	.039	11.42	10.92	10.43	9.93
* 01420	—	.0270 (0.69mm)	.0270	1/8	1-1/2	.041	10.24	9.79	9.35	8.90
* 01430	—	.0280 (0.71mm)	.0280	1/8	1-1/2	.042	10.24	9.79	9.35	8.90
* 01440	—	.0290 (0.74mm)	.0290	1/8	1-1/2	.044	10.24	9.79	9.35	8.90
* 01450	—	.0300 (0.76mm)	.0300	1/8	1-1/2	.045	10.24	9.79	9.35	8.90
01010	02010	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	7.45	7.13	6.80	6.48
01510	02510	1mm	.0394	3mm	38mm	2mm	7.83	7.49	7.15	6.81
01020	02020	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	7.45	7.13	6.80	6.48
01520	02520	1.5mm	.0591	3mm	38mm	3mm	7.83	7.49	7.15	6.81
01030	02030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	5.91	5.65	5.40	5.14
01530	02530	2mm	.0787	3mm	38mm	4mm	6.22	5.95	5.68	5.41
01040	02040	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	5.60	5.36	5.11	4.87
01540	02540	2.5mm	.0984	3mm	38mm	5mm	5.88	5.62	5.37	5.11
01550	02550	3mm	.1181	3mm	38mm	6mm	5.74	5.49	5.24	4.99
01050	02050	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	5.44	5.20	4.97	4.73
01560	02560	3.5mm	.1378	4mm	50mm	7mm	8.04	7.69	7.34	6.99
01060	02060	5/32 (3.97mm)	.1562	3/16	2	5/16	7.64	7.31	6.98	6.64
01570	02570	4mm	.1575	4mm	50mm	8mm	7.60	7.27	6.94	6.61
01580	02580	4.5mm	.1772	5mm	50mm	9.5mm	10.09	9.65	9.21	8.77

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
01070	02070	3/16 (4.76mm)	.1875	3/16	2	3/8	7.23	6.92	6.60	6.29
01590	02590	5mm	.1969	5mm	50mm	10mm	9.40	8.99	8.58	8.17
01080	02080	7/32 (5.56mm)	.2188	1/4	2	7/16	9.59	9.17	8.76	8.34
01600	02600	6mm	.2362	6mm	50mm	12mm	9.96	9.53	9.09	8.66
01090	02090	1/4 (6.35mm)	.2500	1/4	2	1/2	9.45	9.04	8.63	8.22
01610	02610	7mm	.2756	7mm	50mm	12mm	12.95	12.39	11.82	11.26
01100	02100	5/16 (7.94mm)	.3125	5/16	2	1/2	12.93	12.37	11.81	11.24
01620	02620	8mm	.3150	8mm	50mm	12mm	13.60	13.01	12.42	11.83
01630	02630	9mm	.3543	9mm	50mm	14mm	16.80	16.07	15.34	14.61
01110	02110	3/8 (9.52mm)	.3750	3/8	2	5/8	15.97	15.28	14.58	13.89
01640	02640	10mm	.3937	10mm	50mm	16mm	18.56	17.75	16.95	16.14
01650	02650	11mm	.4331	11mm	63mm	19mm	21.69	20.75	19.80	18.86
01120	02120	7/16 (11.11mm)	.4375	7/16	2-1/2	5/8	19.75	18.89	18.03	17.17
01660	02660	12mm	.4724	12mm	63mm	19mm	27.72	26.51	25.31	24.10
01130	02130	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	26.34	25.19	24.05	22.90
01140	02140	5/8 (15.87mm)	.6250	5/8	3	3/4	50.35	48.16	45.97	43.78
01670	02670	16mm	.6299	16mm	76mm	19mm	52.98	50.68	48.37	46.07
01150	02150	3/4 (19.05mm)	.7500	3/4	3	1	72.40	69.25	66.10	62.96
01680	02680	20mm	.7874	20mm	76mm	25mm	98.20	93.93	89.66	85.39
01690	02690	25mm	.9843	25mm	76mm	25mm	111.60	106.75	101.90	97.04
-	02160	1 (25.40mm)	1.000	1	3	1	124.60	119.18	113.76	108.35

Series 160MA & 860MA 2 Flute
 Series 170MA & 870MA 4 Flute
 (fractional) (metric)

NEW SERIES



Stub Length 30° Helix - TiAlN Coated

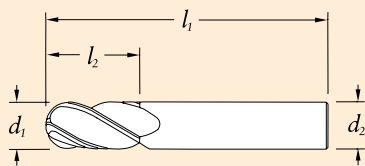
Shorter flute length for rigidity
 Dry or semi-dry machining
 Up to 40% faster than uncoated
 Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)
 $\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
01017	02017	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	9.25	8.85	8.45	8.04
01517	02517	1mm	.0394	3mm	38mm	2mm	9.63	9.21	8.79	8.37
01027	02027	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	9.25	8.85	8.45	8.04
01527	02527	1.5mm	.0591	3mm	38mm	3mm	9.63	9.21	8.79	8.37
01037	02037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	7.71	7.37	7.04	6.70
01537	02537	2mm	.0787	3mm	38mm	4mm	8.02	7.67	7.32	6.97
01047	02047	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	7.39	7.07	6.75	6.43
01547	02547	2.5mm	.0984	3mm	38mm	5mm	7.67	7.34	7.00	6.67
01557	02557	3mm	.1181	3mm	38mm	6mm	7.53	7.20	6.88	6.55
01057	02057	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	7.23	6.92	6.60	6.29
01567	02567	3.5mm	.1378	4mm	50mm	7mm	9.83	9.40	8.98	8.55
01067	02067	5/32 (3.97mm)	.1562	3/16	2	5/16	9.43	9.02	8.61	8.20
01577	02577	4mm	.1575	4mm	50mm	8mm	9.40	8.99	8.58	8.17
01587	02587	4.5mm	.1772	5mm	50mm	9.5mm	12.88	12.32	11.76	11.20
01077	02077	3/16 (4.76mm)	.1875	3/16	2	3/8	9.03	8.64	8.24	7.85
01597	02597	5mm	.1969	5mm	50mm	10mm	12.19	11.66	11.13	10.60
01087	02087	7/32 (5.56mm)	.2188	1/4	2	7/16	12.39	11.85	11.31	10.77
01607	02607	6mm	.2362	6mm	50mm	12mm	12.75	12.20	11.64	11.09
01097	02097	1/4 (6.35mm)	.2500	1/4	2	1/2	12.25	11.72	11.18	10.65
01617	02617	7mm	.2756	7mm	50mm	12mm	16.94	16.20	15.47	14.73
01107	02107	5/16 (7.94mm)	.3125	5/16	2	1/2	16.92	16.18	15.45	14.71
01627	02627	8mm	.3150	8mm	50mm	12mm	17.60	16.83	16.07	15.30
01637	02637	9mm	.3543	9mm	50mm	14mm	20.79	19.89	18.98	18.08
01117	02117	3/8 (9.52mm)	.3750	3/8	2	5/8	19.96	19.09	18.22	17.36
01647	02647	10mm	.3937	10mm	50mm	16mm	23.09	22.09	21.08	20.08
01657	02657	11mm	.4331	11mm	63mm	19mm	27.98	26.76	25.55	24.33
01127	02127	7/16 (11.11mm)	.4375	7/16	2-1/2	5/8	26.04	24.91	23.78	22.64
01667	02667	12mm	.4724	12mm	63mm	19mm	34.01	32.53	31.05	29.57
01137	02137	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	32.63	31.21	29.79	28.37
01147	02147	5/8 (15.87mm)	.6250	5/8	3	3/4	57.64	55.13	52.63	50.12
01677	02677	16mm	.6299	16mm	76mm	19mm	60.27	57.65	55.03	52.41
01157	02157	3/4 (19.05mm)	.7500	3/4	3	1	81.14	77.61	74.08	70.56
01687	02687	20mm	.7874	20mm	76mm	25mm	111.96	107.09	102.22	97.36
01697	02697	25mm	.9843	25mm	76mm	25mm	125.36	119.91	114.46	109.01
–	02167	1 (25.40mm)	1.000	1	3	1	138.37	132.35	126.34	120.32



2 Flute Series 180M & 980M
4 Flute Series 190M & 990M
(fractional) (metric)

END MILLS



***NEW
SIZES**

Stub Length - Ball End 30° Helix

Shorter flute length for rigidity
Radius tolerance $+0.000-0.001"$ ($+0.000-0.025\text{mm}$)
Extremely versatile

TOLERANCES

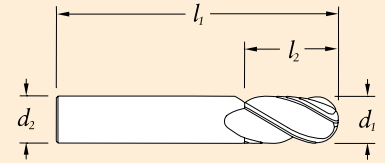
.030" diameter and smaller
 $\varnothing d_1$ $+.0004-.0004"$ ($+0.0100-0.0100\text{mm}$)
 $\varnothing d_2$ $-.0001-.0003"$ ($-0.0025-0.0076\text{mm}$)
 l_2 $+.004-.004"$ ($+0.100-0.100\text{mm}$)

1/32" diameter and larger
 $\varnothing d_1$ $+.000-.002"$ ($+0.000-0.050\text{mm}$)
 $\varnothing d_2$ $-.0001-.0004"$ ($-0.0025-0.0100\text{mm}$)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ⁱ	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 03250	—	.0100 (0.25mm)	.0100	1/8	1-1/2	.015	15.79	15.10	14.42	13.73
* 03300	—	.0150 (0.38mm)	.0150	1/8	1-1/2	.023	15.72	15.04	14.35	13.67
* 03350	—	.0200 (0.51mm)	.0200	1/8	1-1/2	.030	15.30	14.63	13.97	13.30
* 03400	—	.0250 (0.64mm)	.0250	1/8	1-1/2	.038	14.79	14.15	13.50	12.86
* 03450	—	.0300 (0.76mm)	.0300	1/8	1-1/2	.045	12.74	12.19	11.63	11.08
03010	04010	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	9.45	9.04	8.63	8.22
03510	04510	1mm	.0394	3mm	38mm	2mm	9.92	9.49	9.06	8.63
03020	04020	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	9.45	9.04	8.63	8.22
03520	04520	1.5mm	.0591	3mm	38mm	3mm	9.92	9.49	9.06	8.63
03030	04030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	6.96	6.66	6.35	6.05
03530	04530	2mm	.0787	3mm	38mm	4mm	7.33	7.01	6.69	6.37
03040	04040	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	6.58	6.29	6.01	5.72
03540	04540	2.5mm	.0984	3mm	38mm	5mm	6.91	6.61	6.31	6.01
03550	04550	3mm	.1181	3mm	38mm	6mm	6.74	6.45	6.15	5.86
03050	04050	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	6.41	6.13	5.85	5.57
03560	04560	3.5mm	.1378	4mm	50mm	7mm	9.44	9.03	8.62	8.21
03060	04060	5/32 (3.97mm)	.1562	3/16	2	5/16	8.97	8.58	8.19	7.80
03570	04570	4mm	.1575	4mm	50mm	8mm	8.96	8.57	8.18	7.79
03580	04580	4.5mm	.1772	5mm	50mm	9.5mm	11.85	11.33	10.82	10.30
03070	04070	3/16 (4.76mm)	.1875	3/16	2	3/8	8.51	8.14	7.77	7.40
03590	04590	5mm	.1969	5mm	50mm	10mm	11.16	10.67	10.19	9.70
03080	04080	7/32 (5.56mm)	.2188	1/4	2	7/16	11.29	10.80	10.31	9.82
03600	04600	6mm	.2362	6mm	50mm	12mm	11.72	11.21	10.70	10.19
03090	04090	1/4 (6.35mm)	.2500	1/4	2	1/2	11.12	10.64	10.15	9.67
03610	04610	7mm	.2756	7mm	50mm	12mm	15.34	14.67	14.01	13.34
03100	04100	5/16 (7.94mm)	.3125	5/16	2	1/2	15.20	14.54	13.88	13.22
03620	04620	8mm	.3150	8mm	50mm	12mm	16.00	15.30	14.61	13.91
03630	04630	9mm	.3543	9mm	50mm	14mm	19.77	18.91	18.05	17.19
03110	04110	3/8 (9.52mm)	.3750	3/8	2	5/8	18.78	17.96	17.15	16.33
03640	04640	10mm	.3937	10mm	50mm	16mm	21.84	20.89	19.94	18.99
03650	04650	11mm	.4331	11mm	63mm	19mm	25.12	24.03	22.94	21.84
03120	04120	7/16 (11.11mm)	.4375	7/16	2-1/2	5/8	23.23	22.22	21.21	20.20
03660	04660	12mm	.4724	12mm	63mm	19mm	32.59	31.17	29.76	28.34
03130	04130	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	30.97	29.62	28.28	26.93
03140	04140	5/8 (15.87mm)	.6250	5/8	3	3/4	59.25	56.67	54.10	51.52
03670	04670	16mm	.6299	16mm	76mm	19mm	62.36	59.65	56.94	54.23
03150	04150	3/4 (19.05mm)	.7500	3/4	3	1	85.20	81.50	77.79	74.09
03680	04680	20mm	.7874	20mm	76mm	25mm	115.53	110.51	105.48	100.46
03690	04690	25mm	.9843	25mm	76mm	25mm	131.30	125.59	119.88	114.17

Series 180MA & 980MA 2 Flute
Series 190MA & 990MA 4 Flute
(fractional) (metric)

NEW SERIES



Stub Length - Ball End TiAlN Coated - 30° Helix

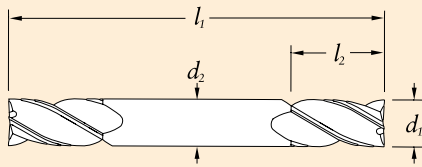
Shorter flute length for rigidity
Dry or semi-dry machining
Up to 40% faster than uncoated
Radius tolerance $+0.000$ – 0.001 " ($+0.000$ – 0.025 mm)
Extremely versatile



TOLERANCES

$\varnothing d_1$ $+0.000$ – 0.002 " ($+0.000$ – 0.050 mm)
 $\varnothing d_2$ -0.0001 – 0.0004 " (-0.0025 – 0.0100 mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
03017	04017	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	11.25	10.76	10.27	9.78
03517	04517	1mm	.0394	3mm	38mm	2mm	11.72	11.21	10.70	10.19
03027	04027	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	11.25	10.76	10.27	9.78
03527	04527	1.5mm	.0591	3mm	38mm	3mm	11.72	11.21	10.70	10.19
03037	04037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	8.75	8.37	7.99	7.61
03537	04537	2mm	.0787	3mm	38mm	4mm	9.12	8.72	8.33	7.93
03047	04047	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	8.37	8.01	7.64	7.28
03547	04547	2.5mm	.0984	3mm	38mm	5mm	8.71	8.33	7.95	7.57
03557	04557	3mm	.1181	3mm	38mm	6mm	8.53	8.16	7.79	7.42
03057	04057	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	8.20	7.84	7.49	7.13
03567	04567	3.5mm	.1378	4mm	50mm	7mm	11.24	10.75	10.26	9.77
03067	04067	5/32 (3.97mm)	.1562	3/16	2	5/16	10.76	10.29	9.82	9.36
03577	04577	4mm	.1575	4mm	50mm	8mm	10.75	10.28	9.82	9.35
03587	04587	4.5mm	.1772	5mm	50mm	9.5mm	14.64	14.00	13.37	12.73
03077	04077	3/16 (4.76mm)	.1875	3/16	2	3/8	10.30	9.85	9.40	8.96
03597	04597	5mm	.1969	5mm	50mm	10mm	13.95	13.34	12.74	12.13
03087	04087	7/32 (5.56mm)	.2188	1/4	2	7/16	14.09	13.48	12.86	12.25
03607	04607	6mm	.2362	6mm	50mm	12mm	14.51	13.88	13.25	12.62
03097	04097	1/4 (6.35mm)	.2500	1/4	2	1/2	13.92	13.31	12.71	12.10
03617	04617	7mm	.2756	7mm	50mm	12mm	19.33	18.49	17.65	16.81
03107	04107	5/16 (7.94mm)	.3125	5/16	2	1/2	19.19	18.36	17.52	16.69
03627	04627	8mm	.3150	8mm	50mm	12mm	19.99	19.12	18.25	17.38
03637	04637	9mm	.3543	9mm	50mm	14mm	23.76	22.73	21.69	20.66
03117	04117	3/8 (9.52mm)	.3750	3/8	2	5/8	22.77	21.78	20.79	19.80
03647	04647	10mm	.3937	10mm	50mm	16mm	26.37	25.22	24.08	22.93
03657	04657	11mm	.4331	11mm	63mm	19mm	31.41	30.04	28.68	27.31
03127	04127	7/16 (11.11mm)	.4375	7/16	2-1/2	5/8	29.52	28.24	26.95	25.67
03667	04667	12mm	.4724	12mm	63mm	19mm	38.88	37.19	35.50	33.81
03137	04137	1/2 (12.70mm)	.5000	1/2	2-1/2	5/8	37.26	35.64	34.02	32.40
03147	04147	5/8 (15.87mm)	.6250	5/8	3	3/4	66.54	63.65	60.75	57.86
03677	04677	16mm	.6299	16mm	76mm	19mm	69.66	66.63	63.60	60.57
03157	04157	3/4 (19.05mm)	.7500	3/4	3	1	93.94	89.86	85.77	81.69
03687	04687	20mm	.7874	20mm	76mm	25mm	129.29	123.67	118.05	112.43
03697	04697	25mm	.9843	25mm	76mm	25mm	145.06	138.75	132.45	126.14



2 Flute Series 165M & 865M

4 Flute Series 175M & 875M
(fractional) (metric)

END MILLS

Stub Length - Double End 30° Helix

Shorter flute length for rigidity
Extremely versatile

TOLERANCES

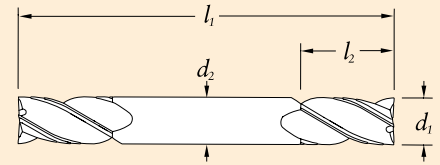
$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
05010	06010	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	13.39	12.81	12.23	11.64
05510	06510	1mm	.0394	3mm	38mm	2mm	14.10	13.49	12.87	12.26
05020	06020	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	13.39	12.81	12.23	11.64
05520	06520	1.5mm	.0591	3mm	38mm	3mm	14.10	13.49	12.87	12.26
05030	06030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	13.39	12.81	12.23	11.64
05530	06530	2mm	.0787	3mm	38mm	4mm	14.10	13.49	12.87	12.26
05040	06040	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	13.39	12.81	12.23	11.64
05540	06540	2.5mm	.0984	3mm	38mm	5mm	14.10	13.49	12.87	12.26
05550	06550	3mm	.1181	3mm	38mm	6mm	8.74	8.36	7.98	7.60
05050	06050	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	8.30	7.94	7.58	7.22
05560	06560	3.5mm	.1378	4mm	50mm	7mm	15.53	14.85	14.18	13.50
05060	06060	5/32 (3.97mm)	.1562	3/16	2	5/16	14.74	14.10	13.46	12.82
05570	06570	4mm	.1575	4mm	50mm	8mm	12.66	12.11	11.56	11.01
05580	06580	4.5mm	.1772	5mm	63mm	9.5mm	18.10	17.31	16.53	15.74
05070	06070	3/16 (4.76mm)	.1875	3/16	2	3/8	12.03	11.51	10.98	10.46
05590	06590	5mm	.1969	5mm	63mm	10mm	15.99	15.29	14.60	13.90
05080	06080	7/32 (5.56mm)	.2188	1/4	2-1/2	1/2	17.19	16.44	15.70	14.95
05600	06600	6mm	.2362	6mm	63mm	12mm	16.48	15.76	15.05	14.33
05090	06090	1/4 (6.35mm)	.2500	1/4	2-1/2	1/2	15.65	14.97	14.29	13.61
05610	06610	7mm	.2756	7mm	63mm	12mm	19.86	19.00	18.13	17.27
05100	06100	5/16 (7.94mm)	.3125	5/16	2-1/2	1/2	19.48	18.63	17.79	16.94
05620	06620	8mm	.3150	8mm	63mm	12mm	20.50	19.61	18.72	17.83
05630	06630	9mm	.3543	9mm	76mm	14mm	22.85	21.86	20.86	19.87
05110	06110	3/8 (9.52mm)	.3750	3/8	2-1/2	1/2	20.72	19.82	18.92	18.02
05640	06640	10mm	.3937	10mm	76mm	14mm	29.97	28.67	27.36	26.06
05650	06650	11mm	.4331	11mm	76mm	14mm	32.00	30.61	29.22	27.83
05120	06120	7/16 (11.11mm)	.4375	7/16	2-3/4	9/16	29.66	28.37	27.08	25.79
05660	06660	12mm	.4724	12mm	76mm	16mm	37.06	35.45	33.84	32.23
05130	06130	1/2 (12.70mm)	.5000	1/2	3	5/8	35.21	33.68	32.15	30.62
05140	06140	5/8 (15.87mm)	.6250	5/8	4	3/4	69.48	66.46	63.44	60.42
05670	06670	16mm	.6299	16mm	101mm	19mm	73.14	69.96	66.78	63.60
05150	06150	3/4 (19.05mm)	.7500	3/4	4	1	95.69	91.53	87.37	83.21
05680	06680	20mm	.7874	20mm	101mm	25mm	153.95	147.26	140.56	133.87

Series **165MA & 865MA** 2 Flute
 Series **175MA & 875MA** 4 Flute
 (fractional) (metric)

NEW SERIES



Stub Length - Double End TIALN Coated - 30° Helix

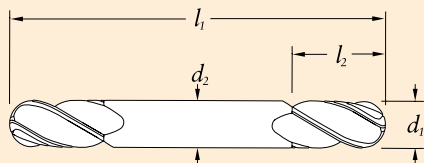
Shorter flute length for rigidity
 Dry or semi-dry machining
 Up to 40% faster than uncoated
 Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
05017	06017	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	16.08	15.38	14.68	13.98
05517	06517	1mm	.0394	3mm	38mm	2mm	16.79	16.06	15.33	14.60
05027	06027	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	16.08	15.38	14.68	13.98
05527	06527	1.5mm	.0591	3mm	38mm	3mm	16.79	16.06	15.33	14.60
05037	06037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	16.08	15.38	14.68	13.98
05537	06537	2mm	.0787	3mm	38mm	4mm	16.79	16.06	15.33	14.60
05047	06047	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	16.08	15.38	14.68	13.98
05547	06547	2.5mm	.0984	3mm	38mm	5mm	16.79	16.06	15.33	14.60
05557	06557	3mm	.1181	3mm	38mm	6mm	11.43	10.93	10.44	9.94
05057	06057	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	10.99	10.51	10.03	9.56
05567	06567	3.5mm	.1378	4mm	50mm	7mm	18.22	17.43	16.64	15.84
05067	06067	5/32 (3.97mm)	.1562	3/16	2	5/16	17.43	16.67	15.91	15.16
05577	06577	4mm	.1575	4mm	50mm	8mm	15.35	14.68	14.02	13.35
05587	06587	4.5mm	.1772	5mm	63mm	9.5mm	23.64	22.61	21.58	20.56
05077	06077	3/16 (4.76mm)	.1875	3/16	2	3/8	14.72	14.08	13.44	12.80
05597	06597	5mm	.1969	5mm	63mm	10mm	21.53	20.59	19.66	18.72
05087	06087	7/32 (5.56mm)	.2188	1/4	2-1/2	1/2	22.74	21.75	20.76	19.77
05607	06607	6mm	.2362	6mm	63mm	12mm	22.02	21.06	20.11	19.15
05097	06097	1/4 (6.35mm)	.2500	1/4	2-1/2	1/2	21.19	20.27	19.35	18.43
05617	06617	7mm	.2756	7mm	63mm	12mm	28.16	26.94	25.71	24.49
05107	06107	5/16 (7.94mm)	.3125	5/16	2-1/2	1/2	27.78	26.57	25.36	24.16
05627	06627	8mm	.3150	8mm	63mm	12mm	28.81	27.56	26.30	25.05
05637	06637	9mm	.3543	9mm	76mm	14mm	31.15	29.80	28.44	27.09
05117	06117	3/8 (9.52mm)	.3750	3/8	2-1/2	1/2	29.03	27.77	26.51	25.24
05647	06647	10mm	.3937	10mm	76mm	14mm	39.41	37.70	35.98	34.27
05657	06657	11mm	.4331	11mm	76mm	14mm	41.45	39.65	37.85	36.04
05127	06127	7/16 (11.11mm)	.4375	7/16	2-3/4	9/16	39.10	37.40	35.70	34.00
05667	06667	12mm	.4724	12mm	76mm	16mm	46.51	44.49	42.47	40.44
05137	06137	1/2 (12.70mm)	.5000	1/2	3	5/8	44.65	42.71	40.77	38.83
05147	06147	5/8 (15.87mm)	.6250	5/8	4	3/4	83.13	79.52	75.90	72.29
05677	06677	16mm	.6299	16mm	101mm	19mm	86.79	83.02	79.24	75.47
05157	06157	3/4 (19.05mm)	.7500	3/4	4	1	111.80	106.94	102.08	97.22
05687	06687	20mm	.7874	20mm	101mm	25mm	177.76	170.03	162.30	154.57



2 Flute Series 185M & 985M

4 Flute Series 195M & 995M

(fractional)

(metric)

Stub Length - Double End Ball End - 30° Helix

Shorter flute length for rigidity

Radius tolerance +.000–.001" (+0.000–0.025mm)

Extremely versatile

TOLERANCES

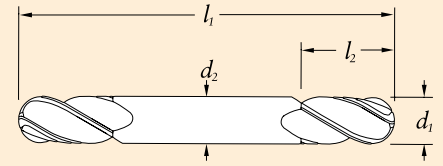
$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)

$\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
07010	08010	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	15.73	15.05	14.36	13.68
07510	08510	1mm	.0394	3mm	38mm	2mm	16.56	15.84	15.12	14.40
07020	08020	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	15.73	15.05	14.36	13.68
07520	08520	1.5mm	.0591	3mm	38mm	3mm	16.56	15.84	15.12	14.40
07030	08030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	15.73	15.05	14.36	13.68
07530	08530	2mm	.0787	3mm	38mm	4mm	16.56	15.84	15.12	14.40
07040	08040	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	15.73	15.05	14.36	13.68
07540	08540	2.5mm	.0984	3mm	38mm	5mm	16.56	15.84	15.12	14.40
07550	08550	3mm	.1181	3mm	38mm	6mm	10.28	9.83	9.39	8.94
07050	08050	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	9.76	9.34	8.91	8.49
07560	08560	3.5mm	.1378	4mm	50mm	7mm	18.24	17.45	16.65	15.86
07060	08060	5/32 (3.97mm)	.1562	3/16	2	5/16	17.33	16.58	15.82	15.07
07570	08570	4mm	.1575	4mm	50mm	8mm	14.90	14.25	13.60	12.96
07580	08580	4.5mm	.1772	5mm	63mm	9.5mm	21.29	20.36	19.44	18.51
07070	08070	3/16 (4.76mm)	.1875	3/16	2	3/8	14.16	13.54	12.93	12.31
07590	08590	5mm	.1969	5mm	63mm	10mm	18.89	18.07	17.25	16.43
07080	08080	7/32 (5.56mm)	.2188	1/4	2-1/2	1/2	20.23	19.35	18.47	17.59
07600	08600	6mm	.2362	6mm	63mm	12mm	19.39	18.55	17.70	16.86
07090	08090	1/4 (6.35mm)	.2500	1/4	2-1/2	1/2	18.42	17.62	16.82	16.02
07610	08610	7mm	.2756	7mm	63mm	12mm	23.49	22.47	21.45	20.43
07100	08100	5/16 (7.94mm)	.3125	5/16	2-1/2	1/2	22.92	21.92	20.93	19.93
07620	08620	8mm	.3150	8mm	63mm	12mm	24.14	23.09	22.04	20.99
07630	08630	9mm	.3543	9mm	76mm	14mm	26.69	25.53	24.37	23.21
07110	08110	3/8 (9.52mm)	.3750	3/8	2-1/2	1/2	24.38	23.32	22.26	21.20
07640	08640	10mm	.3937	10mm	76mm	14mm	35.49	33.95	32.40	30.86
07650	08650	11mm	.4331	11mm	76mm	14mm	37.52	35.89	34.26	32.63
07120	08120	7/16 (11.11mm)	.4375	7/16	2-3/4	9/16	34.89	33.37	31.86	30.34
07660	08660	12mm	.4724	12mm	76mm	16mm	43.62	41.72	39.83	37.93
07130	08130	1/2 (12.70mm)	.5000	1/2	3	5/8	41.43	39.63	37.83	36.03
07140	08140	5/8 (15.87mm)	.6250	5/8	4	3/4	81.73	78.18	74.62	71.07
07670	08670	16mm	.6299	16mm	101mm	19mm	86.03	82.29	78.55	74.81
07150	08150	3/4 (19.05mm)	.7500	3/4	4	1	112.57	107.68	102.78	97.89
07680	08680	20mm	.7874	20mm	101mm	25mm	181.14	173.26	165.39	157.51

Series **185MA & 985MA** 2 Flute
 Series **195MA & 995MA** 4 Flute
 (fractional) (metric)

NEW
SERIES



Stub Length - Double End TiAlN Coated - Ball End 30° Helix

Shorter flute length for rigidity
 Dry or semi-dry machining
 Up to 40% faster than uncoated
 Radius tolerance +.000–.001" (+0.000–0.025mm)
 Extremely versatile



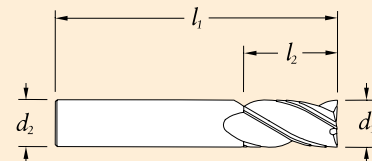
TOLERANCES

$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)
 $\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
07017	08017	1/32 (0.79mm)	.0312	1/8	1-1/2	1/16	18.42	17.62	16.82	16.02
07517	08517	1mm	.0394	3mm	38mm	2mm	19.25	18.41	17.58	16.74
07027	08027	3/64 (1.19mm)	.0469	1/8	1-1/2	3/32	18.42	17.62	16.82	16.02
07527	08527	1.5mm	.0591	3mm	38mm	3mm	19.25	18.41	17.58	16.74
07037	08037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/8	18.42	17.62	16.82	16.02
07537	08537	2mm	.0787	3mm	38mm	4mm	19.25	18.41	17.58	16.74
07047	08047	3/32 (2.38mm)	.0938	1/8	1-1/2	3/16	18.42	17.62	16.82	16.02
07547	08547	2.5mm	.0984	3mm	38mm	5mm	19.25	18.41	17.58	16.74
07557	08557	3mm	.1181	3mm	38mm	6mm	12.97	12.41	11.84	11.28
07057	08057	1/8 (3.17mm)	.1250	1/8	1-1/2	1/4	12.45	11.91	11.37	10.83
07567	08567	3.5mm	.1378	4mm	50mm	7mm	20.93	20.02	19.11	18.20
07067	08067	5/32 (3.97mm)	.1562	3/16	2	5/16	20.02	19.15	18.28	17.41
07577	08577	4mm	.1575	4mm	50mm	8mm	17.60	16.83	16.07	15.30
07587	08587	4.5mm	.1772	5mm	63mm	9.5mm	26.83	25.66	24.50	23.33
07077	08077	3/16 (4.76mm)	.1875	3/16	2	3/8	16.85	16.12	15.38	14.65
07597	08597	5mm	.1969	5mm	63mm	10mm	24.44	23.38	22.31	21.25
07087	08087	7/32 (5.56mm)	.2188	1/4	2-1/2	1/2	25.77	24.65	23.53	22.41
07607	08607	6mm	.2362	6mm	63mm	12mm	24.93	23.85	22.76	21.68
07097	08097	1/4 (6.35mm)	.2500	1/4	2-1/2	1/2	23.97	22.93	21.89	20.84
07617	08617	7mm	.2756	7mm	63mm	12mm	31.80	30.42	29.03	27.65
07107	08107	5/16 (7.94mm)	.3125	5/16	2-1/2	1/2	31.22	29.86	28.51	27.15
07627	08627	8mm	.3150	8mm	63mm	12mm	32.44	31.03	29.62	28.21
07637	08637	9mm	.3543	9mm	76mm	14mm	34.99	33.47	31.95	30.43
07117	08117	3/8 (9.52mm)	.3750	3/8	2-1/2	1/2	32.68	31.26	29.84	28.42
07647	08647	10mm	.3937	10mm	76mm	14mm	44.93	42.98	41.02	39.07
07657	08657	11mm	.4331	11mm	76mm	14mm	46.97	44.93	42.89	40.84
07127	08127	7/16 (11.11mm)	.4375	7/16	2-3/4	9/16	44.33	42.40	40.48	38.55
07667	08667	12mm	.4724	12mm	76mm	16mm	53.06	50.75	48.45	46.14
07137	08137	1/2 (12.70mm)	.5000	1/2	3	5/8	50.88	48.67	46.46	44.24
07147	08147	5/8 (15.87mm)	.6250	5/8	4	3/4	95.38	91.23	87.09	82.94
07677	08677	16mm	.6299	16mm	101mm	19mm	99.68	95.35	91.01	86.68
07157	08157	3/4 (19.05mm)	.7500	3/4	4	1	128.69	123.09	117.50	111.90
07687	08687	20mm	.7874	20mm	101mm	25mm	204.94	196.03	187.12	178.21

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Series 220M & 820M 2 Flute
Series 223M & 823M 3 Flute
Series 230M & 830M 4 Flute
(fractional) (metric)



Standard Length 30° Helix ***NEW SIZES**

Extremely versatile



TOLERANCES

.030" diameter and smaller
 $\varnothing d_1$ +.0004 - .0004" (+0.0100 - 0.0100mm)
 $\varnothing d_2$ -.0001 - .0003" (-0.0025 - 0.0076mm)
 l_2 +.004 - .004" (+0.100 - 0.100mm)
1/32" diameter and larger
 $\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 11500	-	-	.0050 (0.13mm)	.0050	1/8	1-1/2	.015	15.47	14.80	14.12	13.45
* 11510	-	-	.0060 (0.15mm)	.0060	1/8	1-1/2	.018	15.47	14.80	14.12	13.45
* 11520	-	-	.0070 (0.18mm)	.0070	1/8	1-1/2	.021	14.56	13.93	13.29	12.66
* 11530	-	-	.0080 (0.20mm)	.0080	1/8	1-1/2	.024	14.56	13.93	13.29	12.66
* 11540	-	-	.0090 (0.23mm)	.0090	1/8	1-1/2	.027	13.74	13.14	12.55	11.95
* 11550	-	* 13550	.0100 (0.25mm)	.0100	1/8	1-1/2	.030	13.74	13.14	12.55	11.95
* 11560	-	-	.0110 (0.28mm)	.0110	1/8	1-1/2	.033	12.72	12.17	11.61	11.06
* 11570	-	-	.0120 (0.30mm)	.0120	1/8	1-1/2	.036	12.72	12.17	11.61	11.06
* 11580	-	-	.0130 (0.33mm)	.0130	1/8	1-1/2	.039	12.65	12.10	11.55	11.00
* 11590	-	-	.0140 (0.36mm)	.0140	1/8	1-1/2	.042	12.65	12.10	11.55	11.00
* 11600	-	* 13600	.0150 (0.38mm)	.0150	1/8	1-1/2	.045	12.65	12.10	11.55	11.00
* 11610	-	-	.0160 (0.41mm)	.0160	1/8	1-1/2	.048	12.48	11.94	11.39	10.85
* 11620	-	-	.0170 (0.43mm)	.0170	1/8	1-1/2	.051	12.48	11.94	11.39	10.85
* 11630	-	-	.0180 (0.46mm)	.0180	1/8	1-1/2	.054	12.25	11.72	11.18	10.65
* 11640	-	-	.0190 (0.48mm)	.0190	1/8	1-1/2	.057	12.25	11.72	11.18	10.65
* 11650	-	* 13650	.0200 (0.51mm)	.0200	1/8	1-1/2	.060	12.25	11.72	11.18	10.65
* 11660	-	-	.0210 (0.53mm)	.0210	1/8	1-1/2	.063	12.25	11.72	11.18	10.65
* 11670	-	-	.0220 (0.56mm)	.0220	1/8	1-1/2	.066	12.11	11.58	11.06	10.53
* 11680	-	-	.0230 (0.58mm)	.0230	1/8	1-1/2	.069	12.11	11.58	11.06	10.53
* 11690	-	-	.0240 (0.61mm)	.0240	1/8	1-1/2	.072	12.11	11.58	11.06	10.53
* 11700	-	* 13700	.0250 (0.64mm)	.0250	1/8	1-1/2	.075	11.42	10.92	10.43	9.93
* 11710	-	-	.0260 (0.66mm)	.0260	1/8	1-1/2	.078	11.42	10.92	10.43	9.93
* 11720	-	-	.0270 (0.69mm)	.0270	1/8	1-1/2	.081	10.24	9.79	9.35	8.90
* 11730	-	-	.0280 (0.71mm)	.0280	1/8	1-1/2	.084	10.24	9.79	9.35	8.90
* 11740	-	-	.0290 (0.74mm)	.0290	1/8	1-1/2	.087	10.24	9.79	9.35	8.90
* 11750	-	* 13750	.0300 (0.76mm)	.0300	1/8	1-1/2	.090	10.24	9.79	9.35	8.90
11010	12010	13010	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	7.45	7.13	6.80	6.48
45010	37010	46010	1mm	.0394	3mm	38mm	4mm	7.83	7.49	7.15	6.81
11020	12020	13020	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	7.45	7.13	6.80	6.48
45020	37020	46020	1.5mm	.0591	3mm	38mm	6mm	7.83	7.49	7.15	6.81
11030	12030	13030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	6.91	6.61	6.31	6.01
11040	12040	13040	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	6.91	6.61	6.31	6.01
45030	37030	46030	2mm	.0787	3mm	38mm	8mm	7.26	6.94	6.63	6.31
11050	12050	13050	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	6.54	6.26	5.97	5.69
45040	37040	46040	2.5mm	.0984	3mm	38mm	12mm	6.87	6.57	6.27	5.97
11060	12060	13060	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	6.54	6.26	5.97	5.69
45050	37050	46050	3mm	.1181	3mm	38mm	12mm	6.34	6.06	5.79	5.51
11070	12070	13070	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	6.04	5.78	5.51	5.25
45060	37060	46060	3.5mm	.1378	4mm	50mm	12mm	9.38	8.97	8.56	8.16
11080	12080	13080	9/64 (3.57mm)	.1406	3/16	2	9/16	8.92	8.53	8.14	7.76
11090	12090	13090	5/32 (3.97mm)	.1562	3/16	2	9/16	8.92	8.53	8.14	7.76

2 Flute Series 220M & 820M

3 Flute Series 223M & 823M

4 Flute Series 230M & 830M

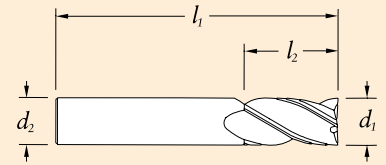
(fractional)

(metric)

END MILLS

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ⁱ	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
45070	37070	46070	4mm	.1575	4mm	50mm	14mm	8.89	8.50	8.12	7.73
11100	12100	13100	11/64 (4.37mm)	.1719	3/16	2	9/16	8.92	8.53	8.14	7.76
45080	37080	46080	4.5mm	.1772	5mm	50mm	14mm	9.38	8.97	8.56	8.16
11110	12110	13110	3/16 (4.76mm)	.1875	3/16	2	5/8	8.46	8.09	7.72	7.36
45090	37090	46090	5mm	.1969	5mm	63mm	16mm	10.38	9.93	9.48	9.03
11120	12120	13120	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	11.21	10.72	10.24	9.75
11130	12130	13130	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	11.21	10.72	10.24	9.75
11140	12140	13140	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	11.21	10.72	10.24	9.75
45100	37100	46100	6mm	.2362	6mm	63mm	19mm	10.71	10.24	9.78	9.31
11150	12150	13150	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	10.20	9.76	9.31	8.87
11160	12160	13160	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	17.89	17.11	16.33	15.56
45110	37110	46110	7mm	.2756	7mm	63mm	22mm	14.71	14.07	13.43	12.79
11170	12170	13170	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	17.89	17.11	16.33	15.56
11180	12180	13180	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	17.89	17.11	16.33	15.56
11190	12190	13190	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	14.31	13.69	13.07	12.44
45120	37120	46120	8mm	.3150	8mm	63mm	22mm	15.03	14.38	13.72	13.07
11200	12200	13200	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	21.19	20.27	19.35	18.43
11210	12210	13210	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	21.19	20.27	19.35	18.43
45130	37130	46130	9mm	.3543	9mm	63mm	22mm	18.71	17.90	17.08	16.27
11220	12220	13220	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	21.19	20.27	19.35	18.43
11230	12230	13230	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	17.83	17.05	16.28	15.50
11240	12240	13240	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	25.35	24.25	23.15	22.04
45140	37140	46140	10mm	.3937	10mm	63mm	25mm	21.69	20.75	19.80	18.86
11250	12250	13250	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	25.35	24.25	23.15	22.04
11260	12260	13260	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	25.35	24.25	23.15	22.04
45150	37150	46150	11mm	.4331	11mm	76mm	25mm	22.84	21.85	20.85	19.86
11270	12270	13270	7/16 (11.11mm)	.4375	7/16	2-1/2	1	21.75	20.80	19.86	18.91
11280	12280	13280	29/64 (11.51mm)	.4531	1/2	3	1	34.13	32.65	31.16	29.68
11290	12290	13290	15/32 (11.91mm)	.4688	1/2	3	1	34.13	32.65	31.16	29.68
45160	37160	46160	12mm	.4724	12mm	76mm	25mm	29.98	28.68	27.37	26.07
11300	12300	13300	31/64 (12.30mm)	.4844	1/2	3	1	34.13	32.65	31.16	29.68
11310	12310	13310	1/2 (12.70mm)	.5000	1/2	3	1	28.55	27.31	26.07	24.83
45170	37170	46170	14mm	.5512	14mm	88mm	32mm	51.19	48.96	46.74	44.51
11320	12320	13320	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	48.76	46.64	44.52	42.40
11330	12330	13330	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	55.05	52.66	50.26	47.87
45180	37180	46180	16mm	.6299	16mm	88mm	38mm	57.81	55.30	52.78	50.27
11340	12340	13340	11/16 (17.46mm)	.6875	3/4	4	1-1/2	91.68	87.69	83.71	79.72
45190	37190	46190	18mm	.7087	18mm	101mm	38mm	84.76	81.07	77.39	73.70
11350	12350	13350	3/4 (19.05mm)	.7500	3/4	4	1-1/2	80.71	77.20	73.69	70.18
45200	37200	46200	20mm	.7874	20mm	101mm	38mm	107.77	103.08	98.40	93.71
45210	37210	46210	22mm	.8661	22mm	101mm	38mm	119.75	114.54	109.34	104.13
11360	12360	13360	7/8 (22.22mm)	.8750	7/8	4	1-1/2	116.15	111.10	106.05	101.00
45220	37220	46220	25mm	.9843	25mm	101mm	38mm	125.20	119.76	114.31	108.87
11370	12370	13370	1 (25.40mm)	1.000	1	4	1-1/2	120.75	115.50	110.25	105.00
-	-	13390	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	352.54	337.21	321.88	306.56

Series 220MT 2 Flute
Series 230MT 4 Flute
(fractional)



Standard Length TIN Coated - 30° Helix

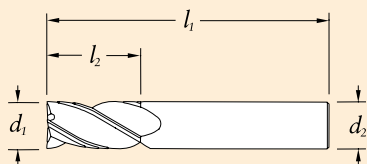
Extremely versatile
Improved lubricity - 10% faster than uncoated



TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)
 $\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
11073	13073	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	7.10	6.79	6.48	6.17
11113	13113	3/16 (4.76mm)	.1875	3/16	2	5/8	9.51	9.10	8.68	8.27
11153	13153	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	12.34	11.80	11.27	10.73
11193	13193	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	17.17	16.42	15.68	14.93
11233	13233	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	20.69	19.79	18.89	17.99
11273	13273	7/16 (11.11mm)	.4375	7/16	2-1/2	1	25.22	24.12	23.03	21.93
11313	13313	1/2 (12.70mm)	.5000	1/2	3	1	32.02	30.63	29.24	27.84
11333	13333	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	60.39	57.76	55.14	52.51
11353	13353	3/4 (19.05mm)	.7500	3/4	4	1-1/2	86.83	83.05	79.28	75.50
11373	13373	1 (25.40mm)	1.000	1	4	1-1/2	131.43	125.72	120.00	114.29



2 Flute Series 220MC
3 Flute Series 223MC
4 Flute Series 230MC
(fractional)

END MILLS

Standard Length TICN Coated - 30° Helix

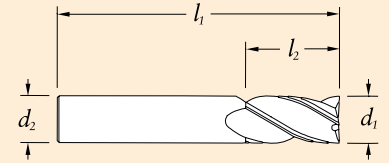
Extremely versatile
Improved abrasion resistance / lubricity
Up to 25% faster than uncoated

TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
11014	12014	13014	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	9.04	8.65	8.25	7.86
11024	12024	13024	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	9.04	8.65	8.25	7.86
11034	12034	13034	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	8.50	8.13	7.76	7.39
11044	12044	13044	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	8.50	8.13	7.76	7.39
11054	12054	13054	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	8.12	7.77	7.41	7.06
11064	12064	13064	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	8.12	7.77	7.41	7.06
11074	12074	13074	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	7.62	7.29	6.96	6.63
11084	12084	13084	9/64 (3.57mm)	.1406	3/16	2	9/16	10.50	10.04	9.59	9.13
11094	12094	13094	5/32 (3.97mm)	.1562	3/16	2	9/16	10.50	10.04	9.59	9.13
11104	12104	13104	11/64 (4.37mm)	.1719	3/16	2	9/16	10.50	10.04	9.59	9.13
11114	12114	13114	3/16 (4.76mm)	.1875	3/16	2	5/8	10.04	9.60	9.17	8.73
11124	12124	13124	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	14.42	13.79	13.17	12.54
11134	12134	13134	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	14.42	13.79	13.17	12.54
11144	12144	13144	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	14.42	13.79	13.17	12.54
11154	12154	13154	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.41	12.83	12.24	11.66
11164	12164	13164	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	22.18	21.22	20.25	19.29
11174	12174	13174	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	22.18	21.22	20.25	19.29
11184	12184	13184	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	22.18	21.22	20.25	19.29
11194	12194	13194	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	18.60	17.79	16.98	16.17
11204	12204	13204	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	25.48	24.37	23.26	22.16
11214	12214	13214	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	25.48	24.37	23.26	22.16
11224	12224	13224	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	25.48	24.37	23.26	22.16
11234	12234	13234	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	22.11	21.15	20.19	19.23
11244	12244	13244	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	30.49	29.16	27.84	26.51
11254	12254	13254	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	30.49	29.16	27.84	26.51
11264	12264	13264	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	30.49	29.16	27.84	26.51
11274	12274	13274	7/16 (11.11mm)	.4375	7/16	2-1/2	1	26.90	25.73	24.56	23.39
11284	12284	13284	29/64 (11.51mm)	.4531	1/2	3	1	39.28	37.57	35.86	34.16
11294	12294	13294	15/32 (11.91mm)	.4688	1/2	3	1	39.28	37.57	35.86	34.16
11304	12304	13304	31/64 (12.30mm)	.4844	1/2	3	1	39.28	37.57	35.86	34.16
11314	12314	13314	1/2 (12.70mm)	.5000	1/2	3	1	33.70	32.23	30.77	29.30
11324	12324	13324	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	56.78	54.31	51.84	49.37
11334	12334	13334	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	63.07	60.33	57.59	54.84
11344	12344	13344	11/16 (17.46mm)	.6875	3/4	4	1-1/2	100.84	96.46	92.07	87.69
11354	12354	13354	3/4 (19.05mm)	.7500	3/4	4	1-1/2	89.88	85.97	82.06	78.16
11364	12364	13364	7/8 (22.22mm)	.8750	7/8	4	1-1/2	129.92	124.27	118.62	112.97
11374	12374	13374	1 (25.40mm)	1.000	1	4	1-1/2	134.52	128.67	122.82	116.97
-	-	13394	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	374.79	358.49	342.20	325.91

Series 220MA & 820MA 2 Flute
 Series 223MA & 823MA 3 Flute
 Series 230MA & 830MA 4 Flute
 (fractional) (metric)



Standard Length TIALN Coated - 30° Helix

Extremely versatile
 Dry or semi-dry machining
 Up to 40% faster than uncoated



TOLERANCES

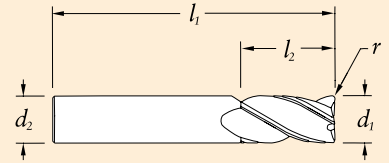
$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
11017	12017	13017	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	9.25	8.85	8.45	8.04
45017	37017	46017	1mm	.0394	3mm	38mm	4mm	9.25	8.85	8.45	8.04
11027	12027	13027	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	9.25	8.85	8.45	8.04
45027	37027	46027	1.5mm	.0591	3mm	38mm	6mm	9.25	8.85	8.45	8.04
11037	12037	13037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	8.71	8.33	7.95	7.57
11047	12047	13047	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	8.71	8.33	7.95	7.57
45037	37037	46037	2mm	.0787	3mm	38mm	8mm	8.67	8.29	7.92	7.54
11057	12057	13057	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	8.33	7.97	7.61	7.24
45047	37047	46047	2.5mm	.0984	3mm	38mm	12mm	8.28	7.92	7.56	7.20
11067	12067	13067	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	8.33	7.97	7.61	7.24
45057	37057	46057	3mm	.1181	3mm	38mm	12mm	7.75	7.41	7.08	6.74
11077	12077	13077	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	7.83	7.49	7.15	6.81
45067	37067	46067	3.5mm	.1378	4mm	50mm	12mm	11.17	10.68	10.20	9.71
11087	12087	13087	9/64 (3.57mm)	.1406	3/16	2	9/16	10.71	10.24	9.78	9.31
11097	12097	13097	5/32 (3.97mm)	.1562	3/16	2	9/16	10.71	10.24	9.78	9.31
45077	37077	46077	4mm	.1575	4mm	50mm	14mm	10.68	10.22	9.75	9.29
11107	12017	13107	11/64 (4.37mm)	.1719	3/16	2	9/16	10.71	10.24	9.78	9.31
45087	37087	46087	4.5mm	.1772	5mm	50mm	14mm	12.18	11.65	11.12	10.59
11117	12117	13117	3/16 (4.76mm)	.1875	3/16	2	5/8	10.25	9.80	9.36	8.91
45097	37097	46097	5mm	.1969	5mm	63mm	16mm	14.08	13.47	12.86	12.24
11127	12127	13127	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	14.92	14.27	13.62	12.97
11137	12137	13137	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	14.92	14.27	13.62	12.97
11147	12147	13147	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	14.92	14.27	13.62	12.97
45107	37107	46107	6mm	.2362	6mm	63mm	19mm	14.41	13.78	13.16	12.53
11157	12157	13157	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.90	13.30	12.69	12.09
11167	12167	13167	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	23.43	22.41	21.39	20.37
45117	37117	46117	7mm	.2756	7mm	63mm	22mm	20.24	19.36	18.48	17.60
11177	12177	13177	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	23.43	22.41	21.39	20.37
11187	12187	13187	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	23.43	22.41	21.39	20.37
11197	12197	13197	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	19.85	18.99	18.12	17.26
45127	37127	46127	8mm	.3150	8mm	63mm	22mm	20.57	19.68	18.78	17.89
11207	12207	13207	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	26.73	25.57	24.41	23.24
11217	12217	13217	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	26.73	25.57	24.41	23.24
45137	37137	46137	9mm	.3543	9mm	63mm	22mm	24.25	23.20	22.14	21.09
11227	12227	13227	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	26.73	25.57	24.41	23.24
11237	12237	13237	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	23.36	22.34	21.33	20.31
11247	12247	13247	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	31.64	30.26	28.89	27.51
45147	37147	46147	10mm	.3937	10mm	63mm	25mm	27.98	26.76	25.55	24.33
11257	12257	13257	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	31.64	30.26	28.89	27.51
11267	12267	13267	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	31.64	30.26	28.89	27.51
45157	37157	46157	11mm	.4331	11mm	76mm	25mm	29.13	27.86	26.60	25.33

2 Flute Series 220MA & 820MA
 3 Flute Series 223MA & 823MA
 4 Flute Series 230MA & 830MA
 (fractional) (metric)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ⁱ	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
11277	12277	13277	7/16 (11.11mm)	.4375	7/16	2-1/2	1	28.05	26.83	25.61	24.39
11287	12287	13287	29/64 (11.51mm)	.4531	1/2	3	1	40.43	38.67	36.91	35.16
11297	12297	13297	15/32 (11.91mm)	.4688	1/2	3	1	40.43	38.67	36.91	35.16
45167	37167	46167	12mm	.4724	12mm	76mm	25mm	36.27	34.69	33.12	31.54
11307	12307	13307	31/64 (12.30mm)	.4844	1/2	3	1	40.43	38.67	36.91	35.16
11317	12317	13317	1/2 (12.70mm)	.5000	1/2	3	1	34.85	33.33	31.82	30.30
45177	37177	46177	14mm	.5512	14mm	88mm	32mm	60.29	57.67	55.05	52.43
11327	12327	13327	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	57.86	55.34	52.83	50.31
11337	12337	13337	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	64.16	61.37	58.58	55.79
45187	37187	46187	16mm	.6299	16mm	88mm	38mm	66.92	64.01	61.10	58.19
11347	12347	13347	11/16 (17.46mm)	.6875	3/4	4	1-1/2	102.42	97.97	93.51	89.06
45197	37197	46197	18mm	.7087	18mm	101mm	38mm	95.50	91.35	87.20	83.04
11357	12357	13357	3/4 (19.05mm)	.7500	3/4	4	1-1/2	91.46	87.48	83.51	79.53
45207	37207	46207	20mm	.7874	20mm	101mm	38mm	123.64	118.26	112.89	107.51
45217	37217	46217	22mm	.8661	22mm	101mm	38mm	135.62	129.72	123.83	117.93
11367	12367	13367	7/8 (22.22mm)	.8750	7/8	4	1-1/2	132.02	126.28	120.54	114.80
45227	37227	46227	25mm	.9843	25mm	101mm	38mm	141.07	134.94	128.80	122.67
11377	12377	13377	1 (25.40mm)	1.000	1	4	1-1/2	136.62	130.68	124.74	118.80
-	-	13397	1-1/4 (31.75mm)	1.250	1-1/4	4-1/2	2	375.54	359.21	342.88	326.56

Series 220R 2 Flute
Series 230R 4 Flute
(fractional)



Standard Length - Corner Radius 30° Helix

Extremely versatile
For stronger corners / part radius



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000-0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025-0.0100mm)
 r +.001 - .001" (+0.025-0.025mm)

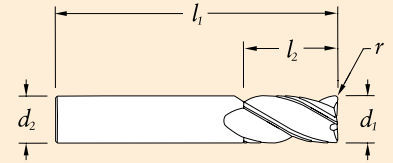
2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
79600	80600	3/32 (2.38mm)	.0938	.010	1/8	1-1/2	3/8	8.53	8.16	7.79	7.42
79610	80610	3/32 (2.38mm)	.0938	.015	1/8	1-1/2	3/8	8.53	8.16	7.79	7.42
79620	80620	3/32 (2.38mm)	.0938	.020	1/8	1-1/2	3/8	8.53	8.16	7.79	7.42
79000	80000	1/8 (3.17mm)	.1250	.010	1/8	1-1/2	1/2	7.74	7.40	7.07	6.73
79010	80010	1/8 (3.17mm)	.1250	.015	1/8	1-1/2	1/2	7.74	7.40	7.07	6.73
79020	80020	1/8 (3.17mm)	.1250	.020	1/8	1-1/2	1/2	7.74	7.40	7.07	6.73
79030	80030	1/8 (3.17mm)	.1250	.030	1/8	1-1/2	1/2	7.74	7.40	7.07	6.73
79040	80040	3/16 (4.76mm)	.1875	.010	3/16	2	5/8	10.20	9.76	9.31	8.87
79050	80050	3/16 (4.76mm)	.1875	.015	3/16	2	5/8	10.20	9.76	9.31	8.87
79060	80060	3/16 (4.76mm)	.1875	.020	3/16	2	5/8	10.20	9.76	9.31	8.87
79070	80070	3/16 (4.76mm)	.1875	.030	3/16	2	5/8	10.20	9.76	9.31	8.87
79100	80100	1/4 (6.35mm)	.2500	.015	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
79110	80110	1/4 (6.35mm)	.2500	.020	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
79120	80120	1/4 (6.35mm)	.2500	.030	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
79130	80130	1/4 (6.35mm)	.2500	.045	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
79140	80140	1/4 (6.35mm)	.2500	.060	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
79160	80160	5/16 (7.94mm)	.3125	.015	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
79170	80170	5/16 (7.94mm)	.3125	.020	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
79180	80180	5/16 (7.94mm)	.3125	.030	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
79190	80190	5/16 (7.94mm)	.3125	.045	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
79200	80200	5/16 (7.94mm)	.3125	.060	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
79230	80230	3/8 (9.52mm)	.3750	.015	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
79240	80240	3/8 (9.52mm)	.3750	.020	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
79250	80250	3/8 (9.52mm)	.3750	.030	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
79260	80260	3/8 (9.52mm)	.3750	.045	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
79270	80270	3/8 (9.52mm)	.3750	.060	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
79300	80300	1/2 (12.70mm)	.5000	.015	1/2	3	1	37.85	36.20	34.56	32.91
79310	80310	1/2 (12.70mm)	.5000	.020	1/2	3	1	37.85	36.20	34.56	32.91
79320	80320	1/2 (12.70mm)	.5000	.030	1/2	3	1	37.85	36.20	34.56	32.91
79330	80330	1/2 (12.70mm)	.5000	.045	1/2	3	1	37.85	36.20	34.56	32.91
79340	80340	1/2 (12.70mm)	.5000	.060	1/2	3	1	37.85	36.20	34.56	32.91
79350	80350	1/2 (12.70mm)	.5000	.090	1/2	3	1	37.85	36.20	34.56	32.91
79360	80360	1/2 (12.70mm)	.5000	.125	1/2	3	1	37.85	36.20	34.56	32.91
79370	80370	5/8 (15.87mm)	.6250	.015	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
79380	80380	5/8 (15.87mm)	.6250	.020	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
79390	80390	5/8 (15.87mm)	.6250	.030	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
79400	80400	5/8 (15.87mm)	.6250	.045	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
79410	80410	5/8 (15.87mm)	.6250	.060	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
79420	80420	5/8 (15.87mm)	.6250	.090	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
79440	80440	3/4 (19.05mm)	.7500	.015	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79450	80450	3/4 (19.05mm)	.7500	.020	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79460	80460	3/4 (19.05mm)	.7500	.030	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79470	80470	3/4 (19.05mm)	.7500	.045	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79480	80480	3/4 (19.05mm)	.7500	.060	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79490	80490	3/4 (19.05mm)	.7500	.090	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79500	80500	3/4 (19.05mm)	.7500	.125	3/4	4	1-1/2	90.07	86.15	82.24	78.32
79510	80510	1 (25.40mm)	1.000	.015	1	4	1-1/2	156.23	149.44	142.64	135.85
79520	80520	1 (25.40mm)	1.000	.020	1	4	1-1/2	156.23	149.44	142.64	135.85
79530	80530	1 (25.40mm)	1.000	.030	1	4	1-1/2	156.23	149.44	142.64	135.85
79540	80540	1 (25.40mm)	1.000	.045	1	4	1-1/2	156.23	149.44	142.64	135.85
79550	80550	1 (25.40mm)	1.000	.060	1	4	1-1/2	156.23	149.44	142.64	135.85
79560	80560	1 (25.40mm)	1.000	.090	1	4	1-1/2	156.23	149.44	142.64	135.85
79570	80570	1 (25.40mm)	1.000	.125	1	4	1-1/2	156.23	149.44	142.64	135.85



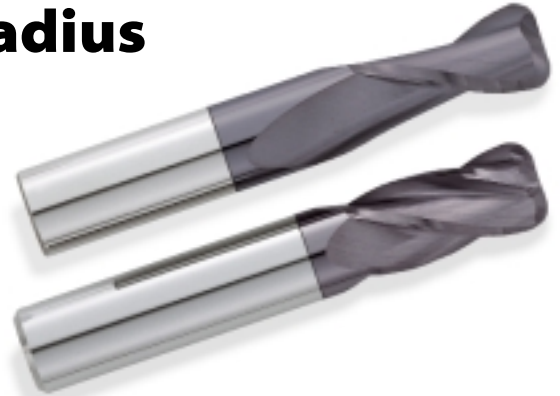
Series 220RA 2 Flute
 Series 230RA & 830RA 4 Flute
 (fractional) (metric)

NEW SERIES



Standard Length - Corner Radius TiAlN Coated - 30° Helix

Extremely versatile
 Dry or semi-dry machining
 Up to 40% faster than uncoated
 For stronger corners / part radius



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)
 r +.001 -.001 (+0.025 - 0.025mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
79607	80607	3/32 (2.38mm)	.0938	.010	1/8	1-1/2	3/8	10.32	9.87	9.42	8.97
79617	80617	3/32 (2.38mm)	.0938	.015	1/8	1-1/2	3/8	10.32	9.87	9.42	8.97
79627	80627	3/32 (2.38mm)	.0938	.020	1/8	1-1/2	3/8	10.32	9.87	9.42	8.97
79007	80007	1/8 (3.17mm)	.1250	.010	1/8	1-1/2	1/2	9.53	9.12	8.70	8.29
79017	80017	1/8 (3.17mm)	.1250	.015	1/8	1-1/2	1/2	9.53	9.12	8.70	8.29
79027	80027	1/8 (3.17mm)	.1250	.020	1/8	1-1/2	1/2	9.53	9.12	8.70	8.29
79037	80037	1/8 (3.17mm)	.1250	.030	1/8	1-1/2	1/2	9.53	9.12	8.70	8.29
79047	80047	3/16 (4.76mm)	.1875	.010	3/16	2	5/8	11.99	11.47	10.95	10.43
79057	80057	3/16 (4.76mm)	.1875	.015	3/16	2	5/8	11.99	11.47	10.95	10.43
79067	80067	3/16 (4.76mm)	.1875	.020	3/16	2	5/8	11.99	11.47	10.95	10.43
79077	80077	3/16 (4.76mm)	.1875	.030	3/16	2	5/8	11.99	11.47	10.95	10.43
-	24127	5mm	.1969	0.5mm	5mm	63mm	16mm	16.68	15.95	15.23	14.50
-	24177	6mm	.2362	0.5mm	6mm	63mm	19mm	17.01	16.27	15.53	14.79
-	24187	6mm	.2362	0.8mm	6mm	63mm	19mm	17.01	16.27	15.53	14.79
-	24197	6mm	.2362	1.0mm	6mm	63mm	19mm	17.01	16.27	15.53	14.79
-	24207	6mm	.2362	1.5mm	6mm	63mm	19mm	17.01	16.27	15.53	14.79
-	24217	6mm	.2362	2.0mm	6mm	63mm	19mm	17.01	16.27	15.53	14.79
79107	80107	1/4 (6.35mm)	.2500	.015	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
79117	80117	1/4 (6.35mm)	.2500	.020	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
79127	80127	1/4 (6.35mm)	.2500	.030	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
79137	80137	1/4 (6.35mm)	.2500	.045	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
79147	80147	1/4 (6.35mm)	.2500	.060	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
79167	80167	5/16 (7.94mm)	.3125	.015	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
79177	80177	5/16 (7.94mm)	.3125	.020	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
79187	80187	5/16 (7.94mm)	.3125	.030	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
79197	80197	5/16 (7.94mm)	.3125	.045	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
79207	80207	5/16 (7.94mm)	.3125	.060	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
-	24227	8mm	.3150	0.5mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24237	8mm	.3150	0.8mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24247	8mm	.3150	1.0mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24257	8mm	.3150	1.5mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24267	8mm	.3150	2.0mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24277	8mm	.3150	2.5mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
-	24287	8mm	.3150	3.0mm	8mm	63mm	22mm	22.99	21.99	20.99	19.99
79237	80237	3/8 (9.52mm)	.3750	.015	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50
79247	80247	3/8 (9.52mm)	.3750	.020	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50
79257	80257	3/8 (9.52mm)	.3750	.030	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50
79267	80267	3/8 (9.52mm)	.3750	.045	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50
79277	80277	3/8 (9.52mm)	.3750	.060	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50



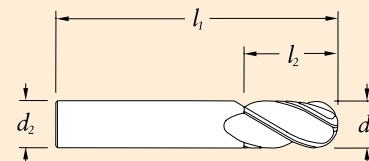
2 Flute Series 220RA

4 Flute Series 230RA & 830RA

(fractional) (metric)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
-	24297	10mm	.3937	0.5mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24307	10mm	.3937	0.8mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24317	10mm	.3937	1.0mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24327	10mm	.3937	1.5mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24337	10mm	.3937	2.0mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24347	10mm	.3937	2.5mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24357	10mm	.3937	3.0mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24367	10mm	.3937	3.2mm	10mm	63mm	25mm	31.25	29.89	28.53	27.17
-	24377	12mm	.4724	0.5mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24387	12mm	.4724	0.8mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24397	12mm	.4724	1.0mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24407	12mm	.4724	1.5mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24417	12mm	.4724	2.0mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24427	12mm	.4724	2.5mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24437	12mm	.4724	3.0mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
-	24447	12mm	.4724	3.2mm	12mm	76mm	25mm	46.03	44.03	42.03	40.03
79307	80307	1/2 (12.70mm)	.5000	.015	1/2	3	1	44.15	42.23	40.31	38.39
79317	80317	1/2 (12.70mm)	.5000	.020	1/2	3	1	44.15	42.23	40.31	38.39
79327	80327	1/2 (12.70mm)	.5000	.030	1/2	3	1	44.15	42.23	40.31	38.39
79337	80337	1/2 (12.70mm)	.5000	.045	1/2	3	1	44.15	42.23	40.31	38.39
79347	80347	1/2 (12.70mm)	.5000	.060	1/2	3	1	44.15	42.23	40.31	38.39
79357	80357	1/2 (12.70mm)	.5000	.090	1/2	3	1	44.15	42.23	40.31	38.39
79367	80367	1/2 (12.70mm)	.5000	.125	1/2	3	1	44.15	42.23	40.31	38.39
79377	80377	5/8 (15.87mm)	.6250	.015	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
79387	80387	5/8 (15.87mm)	.6250	.020	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
79397	80397	5/8 (15.87mm)	.6250	.030	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
79407	80407	5/8 (15.87mm)	.6250	.045	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
79417	80417	5/8 (15.87mm)	.6250	.060	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
79427	80427	5/8 (15.87mm)	.6250	.090	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
-	24457	16mm	.6299	0.5mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24467	16mm	.6299	1.0mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24477	16mm	.6299	2.0mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24487	16mm	.6299	2.5mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24497	16mm	.6299	3.0mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24507	16mm	.6299	4.0mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
-	24517	16mm	.6299	5.0mm	16mm	88mm	38mm	73.36	70.17	66.98	63.79
79447	80447	3/4 (19.05mm)	.7500	.015	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79457	80457	3/4 (19.05mm)	.7500	.020	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79467	80467	3/4 (19.05mm)	.7500	.030	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79477	80477	3/4 (19.05mm)	.7500	.045	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79487	80487	3/4 (19.05mm)	.7500	.060	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79497	80497	3/4 (19.05mm)	.7500	.090	3/4	4	1-1/2	100.81	96.43	92.04	87.66
79507	80507	3/4 (19.05mm)	.7500	.125	3/4	4	1-1/2	100.81	96.43	92.04	87.66
-	24527	20mm	.7874	0.5mm	20mm	101mm	38mm	142.67	136.47	130.26	124.06
-	24537	20mm	.7874	1.0mm	20mm	101mm	38mm	142.67	136.47	130.26	124.06
-	24547	20mm	.7874	2.0mm	20mm	101mm	38mm	142.67	136.47	130.26	124.06
-	24557	20mm	.7874	3.0mm	20mm	101mm	38mm	142.67	136.47	130.26	124.06
-	24567	20mm	.7874	5.0mm	20mm	101mm	38mm	142.67	136.47	130.26	124.06
79517	80517	1 (25.40mm)	1.000	.015	1	4	1-1/2	172.11	164.63	157.14	149.66
79527	80527	1 (25.40mm)	1.000	.020	1	4	1-1/2	172.11	164.63	157.14	149.66
79537	80537	1 (25.40mm)	1.000	.030	1	4	1-1/2	172.11	164.63	157.14	149.66
79547	80547	1 (25.40mm)	1.000	.045	1	4	1-1/2	172.11	164.63	157.14	149.66
79557	80557	1 (25.40mm)	1.000	.060	1	4	1-1/2	172.11	164.63	157.14	149.66
79567	80567	1 (25.40mm)	1.000	.090	1	4	1-1/2	172.11	164.63	157.14	149.66
79577	80577	1 (25.40mm)	1.000	.125	1	4	1-1/2	172.11	164.63	157.14	149.66

Series 320M & 920M 2 Flute
 Series 323M & 923M 3 Flute
 Series 330M & 930M 4 Flute
 (fractional) (metric)



Standard Length - Ball End 30° Helix

***NEW SIZES**

Extremely versatile

Radius tolerance +.000-.001" (+0.000-0.025mm)



TOLERANCES

.030" diameter and smaller

$\varnothing d_1$ +.0004 - .0004" (+0.0100 - 0.0100mm)

$\varnothing d_2$ -.0001 - .0003" (-0.0025 - 0.0076mm)

l_2 +.004 - .004" (+0.100 - 0.100mm)

1/32" diameter and larger

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

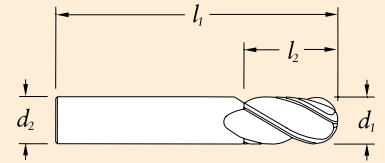
$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
* 16550	-	-	.0100 (0.25mm)	.0100	1/8	1-1/2	.030	15.79	15.10	14.42	13.73
* 16600	-	-	.0150 (0.38mm)	.0150	1/8	1-1/2	.045	15.72	15.04	14.35	13.67
* 16650	-	-	.0200 (0.51mm)	.0200	1/8	1-1/2	.060	15.30	14.63	13.97	13.30
* 16700	-	-	.0250 (0.64mm)	.0250	1/8	1-1/2	.075	14.79	14.15	13.50	12.86
* 16750	-	-	.0300 (0.76mm)	.0300	1/8	1-1/2	.090	12.74	12.19	11.63	11.08
16010	17010	18010	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	9.45	9.04	8.63	8.22
47010	38010	48010	1mm	.0394	3mm	38mm	4mm	9.92	9.49	9.06	8.63
16020	17020	18020	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	9.45	9.04	8.63	8.22
47020	38020	48020	1.5mm	.0591	3mm	38mm	6mm	9.92	9.49	9.06	8.63
16030	17030	18030	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	8.92	8.53	8.14	7.76
16040	17040	18040	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	8.92	8.53	8.14	7.76
47030	38030	48030	2mm	.0787	3mm	38mm	8mm	9.36	8.95	8.55	8.14
16050	17050	18050	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	8.53	8.16	7.79	7.42
47040	38040	48040	2.5mm	.0984	3mm	38mm	12mm	8.96	8.57	8.18	7.79
16060	17060	18060	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	8.53	8.16	7.79	7.42
47050	38050	48050	3mm	.1181	3mm	38mm	12mm	8.13	7.78	7.42	7.07
16070	17070	18070	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	7.74	7.40	7.07	6.73
47060	38060	48060	3.5mm	.1378	4mm	50mm	12mm	11.95	11.43	10.91	10.39
16080	17080	18080	9/64 (3.57mm)	.1406	3/16	2	9/16	11.36	10.87	10.37	9.88
16090	17090	18090	5/32 (3.97mm)	.1562	3/16	2	9/16	11.36	10.87	10.37	9.88
47070	38070	48070	4mm	.1575	4mm	50mm	14mm	10.71	10.24	9.78	9.31
16100	17100	18100	11/64 (4.37mm)	.1719	3/16	2	9/16	11.36	10.87	10.37	9.88
47080	38080	48080	4.5mm	.1772	5mm	50mm	14mm	11.95	11.43	10.91	10.39
16110	17110	18110	3/16 (4.76mm)	.1875	3/16	2	5/8	10.20	9.76	9.31	8.87
47090	38090	48090	5mm	.1969	5mm	63mm	16mm	12.98	12.42	11.85	11.29
16120	17120	18120	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	13.21	12.64	12.06	11.49
16130	17130	18130	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	13.21	12.64	12.06	11.49
16140	17140	18140	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	13.21	12.64	12.06	11.49
47100	38100	48100	6mm	.2362	6mm	63mm	19mm	13.31	12.73	12.15	11.57
16150	17150	18150	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	12.66	12.11	11.56	11.01
16160	17160	18160	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	19.83	18.97	18.11	17.24
47110	38110	48110	7mm	.2756	7mm	63mm	22mm	17.09	16.35	15.60	14.86
16170	17170	18170	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	19.83	18.97	18.11	17.24
16180	17180	18180	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	19.83	18.97	18.11	17.24
16190	17190	18190	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	16.62	15.90	15.17	14.45
47120	38120	48120	8mm	.3150	8mm	63mm	22mm	17.47	16.71	15.95	15.19
16200	17200	18200	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	23.74	22.71	21.68	20.64
16210	17210	18210	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	23.74	22.71	21.68	20.64
47130	38130	48130	9mm	.3543	9mm	63mm	22mm	21.36	20.43	19.50	18.57

2 Flute Series 320M & 920M
 3 Flute Series 323M & 923M
 4 Flute Series 330M & 930M
 (fractional) (metric)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
16220	17220	18220	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	23.74	22.71	21.68	20.64
16230	17230	18230	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	20.33	19.45	18.56	17.68
16240	17240	18240	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	29.20	27.93	26.66	25.39
47140	38140	48140	10mm	.3937	10mm	63mm	25mm	24.96	23.87	22.79	21.70
16250	17250	18250	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	29.20	27.93	26.66	25.39
16260	17260	18260	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	29.20	27.93	26.66	25.39
47150	38150	48150	11mm	.4331	11mm	76mm	25mm	26.27	25.13	23.99	22.84
16270	17270	18270	7/16 (11.11mm)	.4375	7/16	2-1/2	1	25.02	23.93	22.84	21.76
16280	17280	18280	29/64 (11.51mm)	.4531	1/2	3	1	41.84	40.02	38.20	36.38
16290	17290	18290	15/32 (11.91mm)	.4688	1/2	3	1	41.84	40.02	38.20	36.38
47160	38160	48160	12mm	.4724	12mm	76mm	25mm	39.74	38.01	36.28	34.56
16300	17300	18300	31/64 (12.30mm)	.4844	1/2	3	1	41.84	40.02	38.20	36.38
16310	17310	18310	1/2 (12.70mm)	.5000	1/2	3	1	37.85	36.20	34.56	32.91
47170	38170	48170	14mm	.5512	14mm	88mm	32mm	57.86	55.34	52.83	50.31
16320	17320	18320	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	55.11	52.71	50.32	47.92
16330	17330	18330	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	61.20	58.54	55.88	53.22
47180	38180	48180	16mm	.6299	16mm	88mm	38mm	64.25	61.46	58.66	55.87
16340	17340	18340	11/16 (17.46mm)	.6875	3/4	4	1-1/2	101.88	97.45	93.02	88.59
47190	38190	48190	18mm	.7087	18mm	101mm	38mm	94.56	90.45	86.34	82.23
16350	17350	18350	3/4 (19.05mm)	.7500	3/4	4	1-1/2	90.07	86.15	82.24	78.32
47200	38200	48200	20mm	.7874	20mm	101mm	38mm	126.80	121.29	115.77	110.26
47210	38210	48210	22mm	.8661	22mm	101mm	38mm	140.86	134.74	128.61	122.49
16360	17360	18360	7/8 (22.22mm)	.8750	7/8	4	1-1/2	144.29	138.02	131.74	125.47
47220	38220	48220	25mm	.9843	25mm	101mm	38mm	147.65	141.23	134.81	128.39
16370	17370	18370	1 (25.40mm)	1.000	1	4	1-1/2	156.23	149.44	142.64	135.85

Series 320MT 2 Flute
Series 330MT 4 Flute
(fractional)



Standard Length - Ball End TIN Coated - 30° Helix

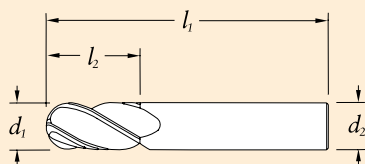
Extremely versatile
Improved lubricity - 10% faster than uncoated
Radius tolerance $+0.000$ – $-.001$ " ($+0.000$ – 0.025 mm)



TOLERANCES

$\varnothing d_1$ $+0.000$ – $-.002$ " ($+0.000$ – 0.050 mm)
 $\varnothing d_2$ $-.0001$ – $-.0004$ " ($-.00025$ – 0.0100 mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
16073	18073	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	8.79	8.41	8.03	7.64
16113	18113	3/16 (4.76mm)	.1875	3/16	2	5/8	11.26	10.77	10.28	9.79
16153	18153	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.80	14.16	13.51	12.87
16193	18193	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	19.48	18.63	17.79	16.94
16233	18233	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	23.20	22.19	21.18	20.17
16273	18273	7/16 (11.11mm)	.4375	7/16	2-1/2	1	28.49	27.25	26.01	24.77
16313	18313	1/2 (12.70mm)	.5000	1/2	3	1	41.32	39.52	37.73	35.93
16333	18333	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	66.54	63.65	60.75	57.86
16353	18353	3/4 (19.05mm)	.7500	3/4	4	1-1/2	96.17	91.99	87.81	83.63
16373	18373	1 (25.40mm)	1.000	1	4	1-1/2	166.91	159.65	152.40	145.14



2 Flute Series 320MC
3 Flute Series 323MC
4 Flute Series 330MC
(fractional)

END MILLS

Standard Length - Ball End TICN Coated - 30° Helix

Extremely versatile

Improved abrasion resistance / lubricity

Up to 25% faster than uncoated

Radius tolerance +.000-.001" (+0.000-0.025mm)

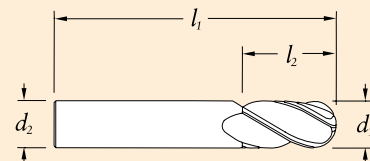
TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
16014	17014	18014	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	11.03	10.55	10.07	9.59
16024	17024	18024	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	11.03	10.55	10.07	9.59
16034	17034	18034	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	10.50	10.04	9.59	9.13
16044	17044	18044	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	10.50	10.04	9.59	9.13
16054	17054	18054	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	10.11	9.67	9.23	8.79
16064	17064	18064	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	10.11	9.67	9.23	8.79
16074	17074	18074	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	9.32	8.91	8.51	8.10
16084	17084	18084	9/64 (3.57mm)	.1406	3/16	2	9/16	12.95	12.39	11.82	11.26
16094	17094	18094	5/32 (3.97mm)	.1562	3/16	2	9/16	12.95	12.39	11.82	11.26
16104	17104	18104	11/64 (4.37mm)	.1719	3/16	2	9/16	12.95	12.39	11.82	11.26
16114	17114	18114	3/16 (4.76mm)	.1875	3/16	2	5/8	11.78	11.27	10.76	10.24
16124	17124	18124	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	16.41	15.70	14.98	14.27
16134	17134	18134	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	16.41	15.70	14.98	14.27
16144	17144	18144	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	16.41	15.70	14.98	14.27
16154	17154	18154	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	15.87	15.18	14.49	13.80
16164	17164	18164	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	24.12	23.07	22.02	20.97
16174	17174	18174	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	24.12	23.07	22.02	20.97
16184	17184	18184	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	24.12	23.07	22.02	20.97
16194	17194	18194	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	20.92	20.01	19.10	18.19
16204	17204	18204	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	28.03	26.81	25.59	24.37
16214	17214	18214	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	28.03	26.81	25.59	24.37
16224	17224	18224	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	28.03	26.81	25.59	24.37
16234	17234	18234	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	24.62	23.55	22.48	21.41
16244	17244	18244	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	34.34	32.85	31.35	29.86
16254	17254	18254	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	34.34	32.85	31.35	29.86
16264	17264	18264	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	34.34	32.85	31.35	29.86
16274	17274	18274	7/16 (11.11mm)	.4375	7/16	2-1/2	1	30.16	28.85	27.54	26.23
16284	17284	18284	29/64 (11.51mm)	.4531	1/2	3	1	46.99	44.95	42.90	40.86
16294	17294	18294	15/32 (11.91mm)	.4688	1/2	3	1	46.99	44.95	42.90	40.86
16304	17304	18304	31/64 (12.30mm)	.4844	1/2	3	1	46.99	44.95	42.90	40.86
16314	17314	18314	1/2 (12.70mm)	.5000	1/2	3	1	43.00	41.13	39.26	37.39
16324	17324	18324	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	63.12	60.38	57.63	54.89
16334	17334	18334	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	69.22	66.21	63.20	60.19
16344	17344	18344	11/16 (17.46mm)	.6875	3/4	4	1-1/2	111.04	106.21	101.38	96.56
16354	17354	18354	3/4 (19.05mm)	.7500	3/4	4	1-1/2	99.23	94.92	90.60	86.29
16364	17364	18364	7/8 (22.22mm)	.8750	7/8	4	1-1/2	158.06	151.19	144.32	137.44
16374	17374	18374	1 (25.40mm)	1.000	1	4	1-1/2	170.00	162.61	155.22	147.83

Series 320MA & 920MA 2 Flute
Series 323MA & 923MA 3 Flute
Series 330MA & 930MA 4 Flute
(fractional) (metric)



Standard Length - Ball End TIALN Coated - 30° Helix

Extremely versatile
Dry or semi-dry machining
Up to 40% faster than uncoated
Radius tolerance +.000–.001" (+0.000–0.025mm)



TOLERANCES

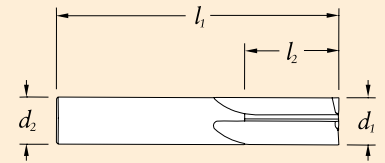
$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)
 $\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
16017	17017	18017	1/32 (0.79mm)	.0312	1/8	1-1/2	3/32	11.24	10.75	10.26	9.77
47017	38017	48017	1mm	.0394	3mm	38mm	4mm	11.34	10.85	10.35	9.86
16027	17027	18027	3/64 (1.19mm)	.0469	1/8	1-1/2	1/8	11.24	10.75	10.26	9.77
47027	38027	48027	1.5mm	.0591	3mm	38mm	6mm	11.34	10.85	10.35	9.86
16037	17037	18037	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	10.71	10.24	9.78	9.31
16047	17047	18047	5/64 (1.98mm)	.0781	1/8	1-1/2	1/4	10.71	10.24	9.78	9.31
47037	38037	48037	2mm	.0787	3mm	38mm	8mm	10.78	10.31	9.84	9.37
16057	17057	18057	3/32 (2.38mm)	.0938	1/8	1-1/2	3/8	10.32	9.87	9.42	8.97
47047	38047	48047	2.5mm	.0984	3mm	38mm	12mm	10.36	9.91	9.46	9.01
16067	17067	18067	7/64 (2.78mm)	.1094	1/8	1-1/2	3/8	10.32	9.87	9.42	8.97
47057	38057	48057	3mm	.1181	3mm	38mm	12mm	9.55	9.13	8.72	8.30
16077	17077	18077	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	9.53	9.12	8.70	8.29
47067	38067	48067	3.5mm	.1378	4mm	50mm	12mm	13.73	13.13	12.54	11.94
16087	17087	18087	9/64 (3.57mm)	.1406	3/16	2	9/16	13.16	12.59	12.02	11.44
16097	17097	18097	5/32 (3.97mm)	.1562	3/16	2	9/16	13.16	12.59	12.02	11.44
47077	38077	48077	4mm	.1575	4mm	50mm	14mm	12.50	11.96	11.41	10.87
16107	17107	18107	11/64 (4.37mm)	.1719	3/16	2	9/16	13.16	12.59	12.02	11.44
47087	38087	48087	4.5mm	.1772	5mm	50mm	14mm	14.73	14.09	13.45	12.81
16117	17117	18117	3/16 (4.76mm)	.1875	3/16	2	5/8	11.99	11.47	10.95	10.43
47097	38097	48097	5mm	.1969	5mm	63mm	16mm	16.68	15.95	15.23	14.50
16127	17127	18127	13/64 (5.16mm)	.2031	1/4	2-1/2	5/8	16.91	16.17	15.44	14.70
16137	17137	18137	7/32 (5.56mm)	.2188	1/4	2-1/2	5/8	16.91	16.17	15.44	14.70
16147	17147	18147	15/64 (5.95mm)	.2344	1/4	2-1/2	3/4	16.91	16.17	15.44	14.70
47107	38107	48107	6mm	.2362	6mm	63mm	19mm	17.01	16.27	15.53	14.79
16157	17157	18157	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	16.36	15.65	14.94	14.23
16167	17167	18167	17/64 (6.75mm)	.2656	5/16	2-1/2	7/8	25.37	24.27	23.16	22.06
47117	38117	48117	7mm	.2756	7mm	63mm	22mm	22.61	21.63	20.64	19.66
16177	17177	18177	9/32 (7.14mm)	.2812	5/16	2-1/2	7/8	25.37	24.27	23.16	22.06
16187	17187	18187	19/64 (7.54mm)	.2969	5/16	2-1/2	7/8	25.37	24.27	23.16	22.06
16197	17197	18197	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	22.16	21.20	20.23	19.27
47127	38127	48127	8mm	.3150	8mm	63mm	22mm	22.99	21.99	20.99	19.99
16207	17207	18207	21/64 (8.33mm)	.3281	3/8	2-1/2	7/8	29.28	28.01	26.73	25.46
16217	17217	18217	11/32 (8.73mm)	.3438	3/8	2-1/2	7/8	29.28	28.01	26.73	25.46
47137	38137	48137	9mm	.3543	9mm	63mm	22mm	26.88	25.71	24.54	23.37
16227	17227	18227	23/64 (9.13mm)	.3594	3/8	2-1/2	7/8	29.28	28.01	26.73	25.46
16237	17237	18237	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	25.88	24.75	23.63	22.50
16247	17247	18247	25/64 (9.92mm)	.3906	7/16	2-1/2	7/8	35.49	33.95	32.40	30.86
47147	38147	48147	10mm	.3937	10mm	63mm	25mm	31.25	29.89	28.53	27.17
16257	17257	18257	13/32 (10.32mm)	.4062	7/16	2-1/2	7/8	35.49	33.95	32.40	30.86

2 Flute Series 320MA & 920MA
 3 Flute Series 323MA & 923MA
 4 Flute Series 330MA & 930MA
 (fractional) (metric)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
16267	17267	18267	27/64 (10.72mm)	.4219	7/16	2-1/2	7/8	35.49	33.95	32.40	30.86
47157	38157	48157	11mm	.4331	11mm	76mm	25mm	32.56	31.14	29.73	28.31
16277	17277	18277	7/16 (11.11mm)	.4375	7/16	2-1/2	1	31.31	29.95	28.59	27.23
16287	17287	18287	29/64 (11.51mm)	.4531	1/2	3	1	48.14	46.05	43.95	41.86
16297	17297	18297	15/32 (11.91mm)	.4688	1/2	3	1	48.14	46.05	43.95	41.86
47167	38167	48167	12mm	.4724	12mm	76mm	25mm	46.03	44.03	42.03	40.03
16307	17307	18307	31/64 (12.30mm)	.4844	1/2	3	1	48.14	46.05	43.95	41.86
16317	17317	18317	1/2 (12.70mm)	.5000	1/2	3	1	44.15	42.23	40.31	38.39
47177	38177	48177	14mm	.5512	14mm	88mm	32mm	66.96	64.05	61.14	58.23
16327	17327	18327	9/16 (14.29mm)	.5625	9/16	3-1/2	1-1/4	64.20	61.41	58.62	55.83
16337	17337	18337	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	70.30	67.24	64.19	61.13
47187	38187	48187	16mm	.6299	16mm	88mm	38mm	73.36	70.17	66.98	63.79
16347	17347	18347	11/16 (17.46mm)	.6875	3/4	4	1-1/2	112.62	107.72	102.83	97.93
47197	38197	48197	18mm	.7087	18mm	101mm	38mm	105.31	100.73	96.15	91.57
16357	17357	18357	3/4 (19.05mm)	.7500	3/4	4	1-1/2	100.81	96.43	92.04	87.66
47207	38207	48207	20mm	.7874	20mm	101mm	38mm	142.67	136.47	130.26	124.06
47217	38217	48217	22mm	.8661	22mm	101mm	38mm	156.73	149.92	143.10	136.29
16367	17367	18367	7/8 (22.22mm)	.8750	7/8	4	1-1/2	160.16	153.20	146.23	139.27
47227	38227	48227	25mm	.9843	25mm	101mm	38mm	163.52	156.41	149.30	142.19
16377	17377	18377	1 (25.40mm)	1.000	1	4	1-1/2	172.11	164.63	157.14	149.66

Series 222M 2 Flute

Series 234M 4 Flute
(fractional)

Standard Length Straight Flute

For cutting high Rc materials
Helps to hold perpendicularity

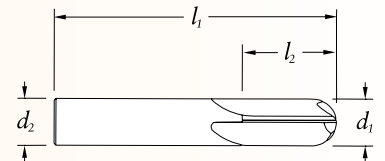
TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)
 $\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)



2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
81070	82070	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	6.70	6.41	6.12	5.83
81110	82110	3/16 (4.76mm)	.1875	3/16	2	5/8	9.40	8.99	8.58	8.17
81150	82150	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	11.34	10.85	10.35	9.86
81190	82190	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	15.89	15.20	14.51	13.82
81230	82230	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	19.81	18.95	18.09	17.23
81270	82270	7/16 (11.11mm)	.4375	7/16	2-1/2	1	24.16	23.11	22.06	21.01
81310	82310	1/2 (12.70mm)	.5000	1/2	3	1	31.69	30.31	28.93	27.56
81330	82330	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	61.17	58.51	55.85	53.19
81350	82350	3/4 (19.05mm)	.7500	3/4	4	1-1/2	89.68	85.78	81.88	77.98
81370	82370	1 (25.40mm)	1.000	1	4	1-1/2	147.56	141.14	134.73	128.31

Series 322M 2 Flute

Series 334M 4 Flute
(fractional)

Standard Length - Ball End Straight Flute

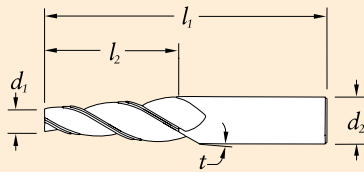
For cutting high Rc materials
Helps to hold perpendicularity
Radius tolerance $+0.000 -0.001"$ ($+0.000 -0.025\text{mm}$)

TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)
 $\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)



2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
83070	84070	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	8.59	8.22	7.84	7.47
83110	84110	3/16 (4.76mm)	.1875	3/16	2	5/8	11.34	10.85	10.35	9.86
83150	84150	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	14.06	13.45	12.84	12.23
83190	84190	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	18.46	17.66	16.85	16.05
83230	84230	3/8 (9.52mm)	.3750	3/8	2-1/2	7/8	22.59	21.61	20.63	19.64
83270	84270	7/16 (11.11mm)	.4375	7/16	2-1/2	1	27.81	26.60	25.39	24.18
83310	84310	1/2 (12.70mm)	.5000	1/2	3	1	42.06	40.23	38.40	36.57
83330	84330	5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	68.01	65.05	62.10	59.14
83350	84350	3/4 (19.05mm)	.7500	3/4	4	1-1/2	100.08	95.73	91.38	87.03
83370	84370	1 (25.40mm)	1.000	1	4	1-1/2	173.58	166.03	158.49	150.94

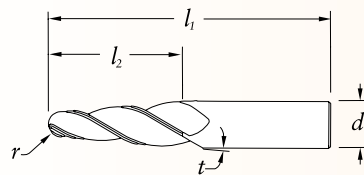

TOLERANCES

$\varnothing d_1$ +.003 –.000" (+0.076 –0.000mm)
 $\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

Standard Length - Tapered 30° Helix

Excellent for holding draft angles in die and mold applications

EDP#	d_2 Shank Diameter	t Taper Per Side	d_1 Tip Diameter†	l_1 Overall Length	l_2 Approximate Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
49010	1/4	1°	1/8 (3.17mm)	3	1-1/2	21.98	21.02	20.07	19.11
49020	1/4	1° 30'	1/8 (3.17mm)	3	1-1/2	21.98	21.02	20.07	19.11
49030	1/4	2°	1/8 (3.17mm)	3	1	21.98	21.02	20.07	19.11
49040	1/4	3°	1/8 (3.17mm)	3	1	21.98	21.02	20.07	19.11
49050	1/4	5°	1/8 (3.17mm)	3	3/4	21.98	21.02	20.07	19.11
49060	1/4	7°	1/8 (3.17mm)	3	1/2	21.98	21.02	20.07	19.11
49070	3/8	1°	3/16 (4.76mm)	3-1/2	1-3/4	33.01	31.57	30.14	28.70
49080	3/8	1° 30'	3/16 (4.76mm)	3-1/2	1-3/4	33.01	31.57	30.14	28.70
49090	3/8	2°	3/16 (4.76mm)	3-1/2	1-3/4	33.01	31.57	30.14	28.70
49100	3/8	3°	5/32 (3.97mm)	3-1/2	1-3/4	33.01	31.57	30.14	28.70
49110	3/8	5°	1/8 (3.17mm)	3-1/2	1-1/2	33.01	31.57	30.14	28.70
49120	3/8	7°	5/32 (3.97mm)	3-1/2	3/4	33.01	31.57	30.14	28.70
49130	1/2	3°	1/4 (6.35mm)	4	2	45.47	43.49	41.52	39.54
49140	1/2	5°	1/4 (6.35mm)	4	1-1/4	45.47	43.49	41.52	39.54
49150	1/2	7°	3/16 (4.76mm)	4	1-1/4	45.47	43.49	41.52	39.54


TOLERANCES

r +.003 –.000" (+0.076 –0.000mm)
 $\varnothing d$ –.0001 –.0004" (–0.0025 –0.0100mm)

3 Flute Series 373M (fractional)

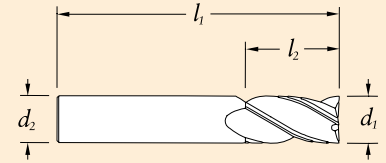
Standard Length - Tapered Ball End - 30° Helix

Excellent for holding draft angles in die and mold applications

EDP#	d Shank Diameter	t Taper Per Side	r Tip Radius†	l_1 Overall Length	l_2 Approximate Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
50010	1/4	1°	.062 (1.57mm)	3	1-1/2	24.38	23.32	22.26	21.20
50020	1/4	1° 30'	.062 (1.57mm)	3	1-1/2	24.38	23.32	22.26	21.20
50030	1/4	2°	.062 (1.57mm)	3	1	24.38	23.32	22.26	21.20
50040	1/4	3°	.062 (1.57mm)	3	1	24.38	23.32	22.26	21.20
50050	1/4	5°	.062 (1.57mm)	3	3/4	24.38	23.32	22.26	21.20
50060	1/4	7°	.062 (1.57mm)	3	1/2	24.38	23.32	22.26	21.20
50070	3/8	1°	.093 (2.36mm)	3-1/2	1-3/4	36.65	35.06	33.46	31.87
50080	3/8	1° 30'	.093 (2.36mm)	3-1/2	1-3/4	36.65	35.06	33.46	31.87
50090	3/8	2°	.093 (2.36mm)	3-1/2	1-3/4	36.65	35.06	33.46	31.87
50100	3/8	3°	.078 (1.98mm)	3-1/2	1-3/4	36.65	35.06	33.46	31.87
50110	3/8	5°	.062 (1.57mm)	3-1/2	1-1/2	36.65	35.06	33.46	31.87
50120	3/8	7°	.078 (1.98mm)	3-1/2	3/4	36.65	35.06	33.46	31.87
50130	1/2	3°	.125 (3.18mm)	4	2	52.26	49.99	47.72	45.44
50140	1/2	5°	.125 (3.18mm)	4	1-1/4	52.26	49.99	47.72	45.44
50150	1/2	7°	.093 (2.36mm)	4	1-1/4	52.26	49.99	47.72	45.44

Series 280M 2 Flute

Series 290M 4 Flute
(fractional)



Standard Length N/C Tolerance - 30° Helix

Excellent for keyways

Tight tolerance for precision machining

For use when matching tools are necessary

TOLERANCES

$\varnothing d_1$ +.001 –.000" (+0.025–0.000mm)

$\varnothing d_2$ –.0001 –.0004" (–0.0025–0.0100mm)

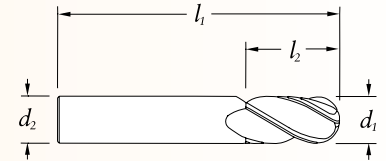


2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
25010	26010	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	9.82	9.39	8.97	8.54
25020	26020	3/32 (2.38mm)	.0938	1/8	1-1/2	5/16	9.30	8.90	8.49	8.09
25030	26030	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	9.03	8.64	8.24	7.85
25040	26040	3/16 (4.76mm)	.1875	3/16	2	9/16	12.01	11.49	10.97	10.44
25050	26050	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	13.81	13.21	12.61	12.01
25060	26060	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	19.77	18.91	18.05	17.19
25070	26070	* 3/8 (9.53mm)	.3750	3/8	2-1/2	7/8	25.37	24.27	23.16	22.06
25080	26080	* 7/16 (11.11mm)	.4375	7/16	2-1/2	1	30.95	29.60	28.26	26.91
25090	26090	* 1/2 (12.70mm)	.5000	1/2	3	1	40.63	38.86	37.10	35.33
25100	26100	* 5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	72.34	69.19	66.05	62.90
25110	26110	* 3/4 (19.05mm)	.7500	3/4	4	1-1/2	108.17	103.47	98.76	94.06
25120	26120	* 1 (25.40mm)	1.000	1	4	1-1/2	183.71	175.72	167.73	159.75

* Tools with weldon flats

Series 380M 2 Flute

Series 390M 4 Flute
(fractional)



Standard Length - Ball End N/C Tolerance - 30° Helix

Excellent for keyways

Tight tolerance for precision machining

For use when matching tools are necessary

Radius tolerance +.0005–.0000" (+0.0127–0.0000mm)

TOLERANCES

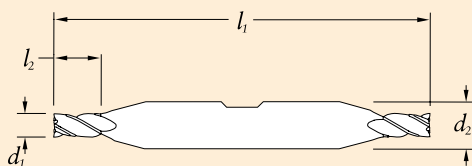
$\varnothing d_1$ +.001 –.000" (+0.025–0.000mm)

$\varnothing d_2$ –.0001 –.0004" (–0.0025–0.0100mm)



2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
27010	28010	1/16 (1.59mm)	.0625	1/8	1-1/2	1/4	11.30	10.81	10.32	9.83
27020	28020	3/32 (2.38mm)	.0938	1/8	1-1/2	5/16	10.71	10.24	9.78	9.31
27030	28030	1/8 (3.17mm)	.1250	1/8	1-1/2	1/2	10.38	9.93	9.48	9.03
27040	28040	3/16 (4.76mm)	.1875	3/16	2	9/16	13.81	13.21	12.61	12.01
27050	28050	1/4 (6.35mm)	.2500	1/4	2-1/2	3/4	15.89	15.20	14.51	13.82
27060	28060	5/16 (7.94mm)	.3125	5/16	2-1/2	7/8	22.72	21.73	20.74	19.76
27070	28070	* 3/8 (9.53mm)	.3750	3/8	2-1/2	7/8	29.18	27.91	26.64	25.37
27080	28080	* 7/16 (11.11mm)	.4375	7/16	2-1/2	1	35.58	34.03	32.49	30.94
27090	28090	* 1/2 (12.70mm)	.5000	1/2	3	1	46.74	44.71	42.68	40.64
27100	28100	* 5/8 (15.87mm)	.6250	5/8	3-1/2	1-1/4	83.21	79.59	75.97	72.36
27110	28110	* 3/4 (19.05mm)	.7500	3/4	4	1-1/2	124.40	118.99	113.58	108.17
27120	28120	* 1 (25.40mm)	1.000	1	4	1-1/2	211.26	202.07	192.89	183.71

* Tools with weldon flats



2 Flute Series 425M

4 Flute Series 435M

(fractional)

END MILLS

Standard Length - Double End 3/8" Shank - 30° Helix



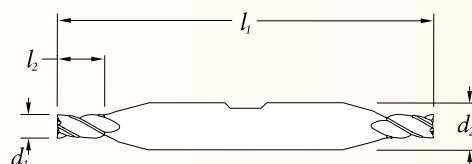
TOLERANCES

$\varnothing d_1$ $+0.000 -0.002$ " $(+0.000 -0.050\text{mm})$

$\varnothing d_2$ $-0.0001 -0.0004$ " $(-0.0025 -0.0100\text{mm})$

Common 3/8" diameter shank with weldon flat
For strength and adaptability when converting
from high-speed steel

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
33010	34010	1/8 (3.17mm)	.1250	3/8	3	3/8	26.27	25.13	23.99	22.84
33020	34020	5/32 (3.97mm)	.1562	3/8	3	7/16	26.27	25.13	23.99	22.84
33030	34030	3/16 (4.76mm)	.1875	3/8	3	1/2	26.27	25.13	23.99	22.84
33040	34040	7/32 (5.56mm)	.2188	3/8	3	9/16	26.27	25.13	23.99	22.84
33050	34050	1/4 (6.35mm)	.2500	3/8	3	5/8	26.27	25.13	23.99	22.84
33060	34060	9/32 (7.14mm)	.2812	3/8	4	11/16	30.18	28.87	27.56	26.24
33070	34070	5/16 (7.94mm)	.3125	3/8	4	3/4	30.18	28.87	27.56	26.24
33080	34080	11/32 (8.73mm)	.3438	3/8	4	3/4	30.18	28.87	27.56	26.24
33090	34090	3/8 (9.52mm)	.3750	3/8	4	3/4	30.18	28.87	27.56	26.24



NEW
SERIES

2 Flute Series 425MA

4 Flute Series 435MA

(fractional)

Standard Length - Double End - 3/8" Shank TIALN Coated - 30° Helix



TOLERANCES

$\varnothing d_1$ $+0.000 -0.002$ " $(+0.000 -0.050\text{mm})$

$\varnothing d_2$ $-0.0001 -0.0004$ " $(-0.0025 -0.0100\text{mm})$

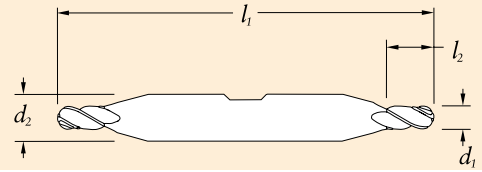
Common 3/8" diameter shank with weldon flat
For strength and adaptability when converting
from high-speed steel

Dry or semi-dry machining

Up to 40% faster than uncoated

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
33017	34017	1/8 (3.17mm)	.1250	3/8	3	3/8	34.58	33.08	31.57	30.07
33027	34027	5/32 (3.97mm)	.1562	3/8	3	7/16	34.58	33.08	31.57	30.07
33037	34037	3/16 (4.76mm)	.1875	3/8	3	1/2	34.58	33.08	31.57	30.07
33047	34047	7/32 (5.56mm)	.2188	3/8	3	9/16	34.58	33.08	31.57	30.07
33057	34057	1/4 (6.35mm)	.2500	3/8	3	5/8	34.58	33.08	31.57	30.07
33067	34067	9/32 (7.14mm)	.2812	3/8	4	11/16	40.72	38.95	37.18	35.41
33077	34077	5/16 (7.94mm)	.3125	3/8	4	3/4	40.72	38.95	37.18	35.41
33087	34087	11/32 (8.73mm)	.3438	3/8	4	3/4	40.72	38.95	37.18	35.41
33097	34097	3/8 (9.52mm)	.3750	3/8	4	3/4	40.72	38.95	37.18	35.41

Series 525M 2 Flute
Series 535M 4 Flute
(fractional)



Standard Length - Double End 3/8" Shank - Ball End 30° Helix

Common 3/8" diameter shank with weldon flat
For strength and adaptability when converting
from high-speed steel
Radius tolerance $+0.000$ – $-.001$ " ($+0.000$ – 0.025 mm)

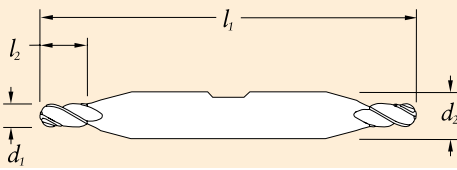


TOLERANCES

$\varnothing d_1$ $+0.000$ – $-.002$ " ($+0.000$ – 0.050 mm)

$\varnothing d_2$ $-.0001$ – $-.0004$ " (-0.0025 – 0.0100 mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
35010	36010	1/8 (3.17mm)	.1250	3/8	3	3/8	30.90	29.56	28.21	26.87
35020	36020	5/32 (3.97mm)	.1562	3/8	3	7/16	30.90	29.56	28.21	26.87
35030	36030	3/16 (4.76mm)	.1875	3/8	3	1/2	30.90	29.56	28.21	26.87
35040	36040	7/32 (5.56mm)	.2188	3/8	3	9/16	30.90	29.56	28.21	26.87
35050	36050	1/4 (6.35mm)	.2500	3/8	3	5/8	30.90	29.56	28.21	26.87
35060	36060	9/32 (7.14mm)	.2812	3/8	4	11/16	35.50	33.96	32.41	30.87
35070	36070	5/16 (7.94mm)	.3125	3/8	4	3/4	35.50	33.96	32.41	30.87
35080	36080	11/32 (8.73mm)	.3438	3/8	4	3/4	35.50	33.96	32.41	30.87
35090	36090	3/8 (9.52mm)	.3750	3/8	4	3/4	35.50	33.96	32.41	30.87



**NEW
SERIES**

2 Flute Series **525MA**

4 Flute Series **535MA**
(fractional)

END MILLS



Standard Length - Double End 3/8" Shank - Ball End TIALN Coated - 30° Helix

Common 3/8" diameter shank with weldon flat
For strength and adaptability when converting
from high-speed steel

Dry or semi-dry machining

Up to 40% faster than uncoated

Radius tolerance +.000–.001" (+0.000–0.025mm)

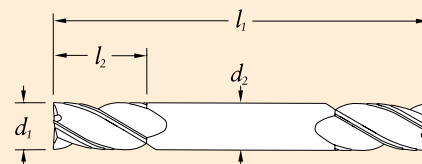
TOLERANCES

$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)

$\varnothing d_2$ –.0001 –.0004" (–.0.0025–0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
35017	36017	1/8 (3.17mm)	.1250	3/8	3	3/8	39.20	37.50	35.79	34.09
35027	36027	5/32 (3.97mm)	.1562	3/8	3	7/16	39.20	37.50	35.79	34.09
35037	36037	3/16 (4.76mm)	.1875	3/8	3	1/2	39.20	37.50	35.79	34.09
35047	36047	7/32 (5.56mm)	.2188	3/8	3	9/16	39.20	37.50	35.79	34.09
35057	36057	1/4 (6.35mm)	.2500	3/8	3	5/8	39.20	37.50	35.79	34.09
35067	36067	9/32 (7.14mm)	.2812	3/8	4	11/16	46.05	44.05	42.05	40.04
35077	36077	5/16 (7.94mm)	.3125	3/8	4	3/4	46.05	44.05	42.05	40.04
35087	36087	11/32 (8.73mm)	.3438	3/8	4	3/4	46.05	44.05	42.05	40.04
35097	36097	3/8 (9.52mm)	.3750	3/8	4	3/4	46.05	44.05	42.05	40.04

Series 420M & 440M 2 Flute
Series 430M & 450M 4 Flute
(fractional) (metric)



Standard Length - Double End 30° Helix

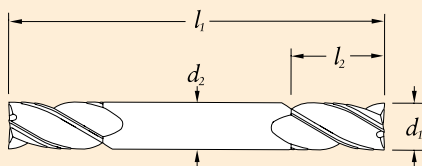
Extremely versatile



TOLERANCES

$\varnothing d_1$ $+0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)
 $\varnothing d_2$ $-0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
29010	30010	1/32 (0.79mm)	.0312	1/8	2	3/32	15.90	15.21	14.52	13.83
29510	30510	1mm	.0394	3mm	50mm	4mm	16.74	16.01	15.28	14.56
29020	30020	3/64 (1.19mm)	.0469	1/8	2	1/8	15.90	15.21	14.52	13.83
29520	30520	1.5mm	.0591	3mm	50mm	5mm	16.74	16.01	15.28	14.56
29030	30030	1/16 (1.59mm)	.0625	1/8	2	3/16	15.90	15.21	14.52	13.83
29530	30530	2mm	.0787	3mm	50mm	6mm	16.74	16.01	15.28	14.56
29040	30040	3/32 (2.38mm)	.0938	1/8	2	1/4	15.90	15.21	14.52	13.83
29540	30540	2.5mm	.0984	3mm	50mm	7mm	16.74	16.01	15.28	14.56
29550	30550	3mm	.1181	3mm	50mm	8mm	12.09	11.56	11.04	10.51
29050	30050	1/8 (3.17mm)	.1250	1/8	2	3/8	11.49	10.99	10.49	9.99
29560	30560	3.5mm	.1378	4mm	63mm	9.5mm	17.28	16.53	15.78	15.03
29060	30060	5/32 (3.97mm)	.1562	3/16	2-1/2	7/16	16.42	15.71	14.99	14.28
29570	30570	4mm	.1575	4mm	63mm	10mm	14.46	13.83	13.20	12.57
29580	30580	4.5mm	.1772	5mm	63mm	12mm	19.25	18.41	17.58	16.74
29070	30070	3/16 (4.76mm)	.1875	3/16	2-1/2	1/2	13.74	13.14	12.55	11.95
29590	30590	5mm	.1969	5mm	63mm	12mm	16.78	16.05	15.32	14.59
29080	30080	7/32 (5.56mm)	.2188	1/4	2-1/2	9/16	18.29	17.49	16.70	15.90
29600	30600	6mm	.2362	6mm	63mm	16mm	17.53	16.77	16.01	15.24
29090	30090	1/4 (6.35mm)	.2500	1/4	2-1/2	5/8	16.65	15.93	15.20	14.48
29610	30610	7mm	.2756	7mm	88mm	19mm	22.03	21.07	20.11	19.16
29100	30100	5/16 (7.94mm)	.3125	5/16	3-1/2	3/4	21.75	20.80	19.86	18.91
29620	30620	8mm	.3150	8mm	88mm	19mm	22.89	21.89	20.90	19.90
29630	30630	9mm	.3543	9mm	88mm	19mm	29.57	28.28	27.00	25.71
29110	30110	3/8 (9.52mm)	.3750	3/8	3-1/2	3/4	28.09	26.87	25.65	24.43
29640	30640	10mm	.3937	10mm	88mm	19mm	39.30	37.59	35.88	34.17
29650	30650	11mm	.4331	11mm	101mm	22mm	42.01	40.18	38.36	36.53
29120	30120	7/16 (11.11mm)	.4375	7/16	4	7/8	39.91	38.17	36.44	34.70
29660	30660	12mm	.4724	12mm	101mm	25mm	47.22	45.17	43.11	41.06
29130	30130	1/2 (12.70mm)	.5000	1/2	4	1	44.85	42.90	40.95	39.00
29140	30140	9/16 (14.29mm)	.5625	9/16	6	1-1/4	85.33	81.62	77.91	74.20
29150	30150	5/8 (15.87mm)	.6250	5/8	6	1-1/4	109.65	104.88	100.11	95.35
29670	30670	16mm	.6299	16mm	152mm	32mm	115.41	110.39	105.37	100.36
29160	30160	3/4 (19.05mm)	.7500	3/4	6	1-1/2	151.55	144.96	138.37	131.78
29680	30680	20mm	.7874	20mm	152mm	38mm	217.09	207.65	198.21	188.77
29170	30170	7/8 (22.22mm)	.8750	7/8	6	1-1/2	247.92	237.14	226.36	215.58
29690	30690	25mm	.9843	25mm	152mm	38mm	285.07	272.68	260.28	247.89
29180	30180	1 (25.40mm)	1.000	1	6	1-1/2	270.81	259.04	247.26	235.49



**NEW
SERIES**

2 Flute Series **420MA** & **440MA**

4 Flute Series **430MA** & **450MA**

(fractional)

(metric)

END MILLS



Standard Length - Double End TIALN Coated - 30° Helix

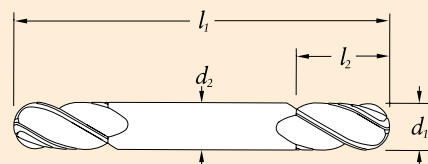
Extremely versatile
Dry or semi-dry machining
Up to 40% faster than uncoated

TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-.00025 - 0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
29017	30017	1/32 (0.79mm)	.0312	1/8	2	3/32	18.60	17.79	16.98	16.17
29517	30517	1mm	.0394	3mm	50mm	4mm	19.44	18.59	17.75	16.90
29027	30027	3/64 (1.19mm)	.0469	1/8	2	1/8	18.60	17.79	16.98	16.17
29527	30527	1.5mm	.0591	3mm	50mm	5mm	19.44	18.59	17.75	16.90
29037	30037	1/16 (1.59mm)	.0625	1/8	2	3/16	18.60	17.79	16.98	16.17
29537	30537	2mm	.0787	3mm	50mm	6mm	19.44	18.59	17.75	16.90
29047	30047	3/32 (2.38mm)	.0938	1/8	2	1/4	18.60	17.79	16.98	16.17
29547	30547	2.5mm	.0984	3mm	50mm	7mm	19.44	18.59	17.75	16.90
29557	30557	3mm	.1181	3mm	50mm	8mm	14.78	14.14	13.49	12.85
29057	30057	1/8 (3.17mm)	.1250	1/8	2	3/8	14.18	13.56	12.95	12.33
29567	30567	3.5mm	.1378	4mm	63mm	9.5mm	21.47	20.54	19.60	18.67
29067	30067	5/32 (3.97mm)	.1562	3/16	2-1/2	7/16	20.61	19.71	18.82	17.92
29577	30577	4mm	.1575	4mm	63mm	10mm	18.64	17.83	17.02	16.21
29587	30587	4.5mm	.1772	5mm	63mm	12mm	24.79	23.71	22.63	21.56
29077	30077	3/16 (4.76mm)	.1875	3/16	2-1/2	1/2	17.93	17.15	16.37	15.59
29597	30597	5mm	.1969	5mm	63mm	12mm	22.32	21.35	20.38	19.41
29087	30087	7/32 (5.56mm)	.2188	1/4	2-1/2	9/16	23.83	22.79	21.76	20.72
29607	30607	6mm	.2362	6mm	63mm	16mm	23.07	22.07	21.06	20.06
29097	30097	1/4 (6.35mm)	.2500	1/4	2-1/2	5/8	22.21	21.24	20.28	19.31
29617	30617	7mm	.2756	7mm	88mm	19mm	32.58	31.16	29.75	28.33
29107	30107	5/16 (7.94mm)	.3125	5/16	3-1/2	3/4	32.29	30.89	29.48	28.08
29627	30627	8mm	.3150	8mm	88mm	19mm	33.43	31.98	30.52	29.07
29637	30637	9mm	.3543	9mm	88mm	19mm	40.11	38.37	36.62	34.88
29117	30117	3/8 (9.52mm)	.3750	3/8	3-1/2	3/4	38.64	36.96	35.28	33.60
29647	30647	10mm	.3937	10mm	88mm	19mm	51.52	49.28	47.04	44.80
29657	30657	11mm	.4331	11mm	101mm	22mm	54.23	51.87	49.51	47.16
29127	30127	7/16 (11.11mm)	.4375	7/16	4	7/8	52.13	49.86	47.60	45.33
29667	30667	12mm	.4724	12mm	101mm	25mm	59.44	56.86	54.27	51.69
29137	30137	1/2 (12.70mm)	.5000	1/2	4	1	57.07	54.59	52.11	49.63
29147	30147	9/16 (14.29mm)	.5625	9/16	6	1-1/4	105.62	101.03	96.44	91.84
29157	30157	5/8 (15.87mm)	.6250	5/8	6	1-1/4	129.94	124.29	118.64	112.99
29677	30677	16mm	.6299	16mm	152mm	32mm	135.70	129.80	123.90	118.00
29167	30167	3/4 (19.05mm)	.7500	3/4	6	1-1/2	175.03	167.42	159.81	152.20
29687	30687	20mm	.7874	20mm	152mm	38mm	247.57	236.81	226.04	215.28
29177	30177	7/8 (22.22mm)	.8750	7/8	6	1-1/2	278.40	266.30	254.19	242.09
29697	30697	25mm	.9843	25mm	152mm	38mm	315.56	301.84	288.12	274.40
29187	30187	1 (25.40mm)	1.000	1	6	1-1/2	301.29	288.19	275.09	261.99

Series 520M & 540M 2 Flute
Series 530M & 550M 4 Flute
(fractional) (metric)



Standard Length - Double End Ball End - 30° Helix

Extremely versatile

Radius tolerance $+0.000-0.001"$ ($+0.000-0.025\text{mm}$)

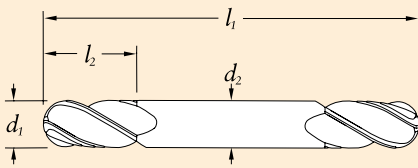


TOLERANCES

$\varnothing d_1$ $+0.000-0.002"$ ($+0.000-0.050\text{mm}$)

$\varnothing d_2$ $-0.0001-0.0004"$ ($-0.0025-0.0100\text{mm}$)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
31010	32010	1/32 (0.79mm)	.0312	1/8	2	3/32	18.30	17.50	16.71	15.91
31510	32510	1mm	.0394	3mm	50mm	4mm	19.25	18.41	17.58	16.74
31020	32020	3/64 (1.19mm)	.0469	1/8	2	1/8	18.30	17.50	16.71	15.91
31520	32520	1.5mm	.0591	3mm	50mm	5mm	19.25	18.41	17.58	16.74
31030	32030	1/16 (1.59mm)	.0625	1/8	2	3/16	18.30	17.50	16.71	15.91
31530	32530	2mm	.0787	3mm	50mm	6mm	19.25	18.41	17.58	16.74
31040	32040	3/32 (2.38mm)	.0938	1/8	2	1/4	18.30	17.50	16.71	15.91
31540	32540	2.5mm	.0984	3mm	50mm	7mm	19.25	18.41	17.58	16.74
31550	32550	3mm	.1181	3mm	50mm	8mm	13.90	13.30	12.69	12.09
31050	32050	1/8 (3.17mm)	.1250	1/8	2	3/8	13.20	12.63	12.05	11.48
31560	32560	3.5mm	.1378	4mm	63mm	9.5mm	19.88	19.02	18.15	17.29
31060	32060	5/32 (3.97mm)	.1562	3/16	2-1/2	7/16	18.88	18.06	17.24	16.42
31570	32570	4mm	.1575	4mm	63mm	10mm	17.02	16.28	15.54	14.80
31580	32580	4.5mm	.1772	5mm	63mm	12mm	22.15	21.19	20.22	19.26
31070	32070	3/16 (4.76mm)	.1875	3/16	2-1/2	1/2	16.17	15.47	14.76	14.06
31590	32590	5mm	.1969	5mm	63mm	12mm	19.45	18.60	17.76	16.91
31080	32080	7/32 (5.56mm)	.2188	1/4	2-1/2	9/16	21.03	20.12	19.20	18.29
31600	32600	6mm	.2362	6mm	63mm	16mm	20.21	19.33	18.45	17.57
31090	32090	1/4 (6.35mm)	.2500	1/4	2-1/2	5/8	19.19	18.36	17.52	16.69
31610	32610	7mm	.2756	7mm	88mm	19mm	25.48	24.37	23.26	22.16
31100	32100	5/16 (7.94mm)	.3125	5/16	3-1/2	3/4	25.01	23.92	22.84	21.75
31620	32620	8mm	.3150	8mm	88mm	19mm	26.34	25.19	24.05	22.90
31630	32630	9mm	.3543	9mm	88mm	19mm	34.03	32.55	31.07	29.59
31110	32110	3/8 (9.52mm)	.3750	3/8	3-1/2	3/4	32.33	30.92	29.52	28.11
31640	32640	10mm	.3937	10mm	88mm	19mm	45.61	43.63	41.64	39.66
31650	32650	11mm	.4331	11mm	101mm	22mm	48.31	46.21	44.11	42.01
31120	32120	7/16 (11.11mm)	.4375	7/16	4	7/8	45.90	43.90	41.91	39.91
31660	32660	12mm	.4724	12mm	101mm	25mm	54.29	51.93	49.57	47.21
31130	32130	1/2 (12.70mm)	.5000	1/2	4	1	51.58	49.34	47.09	44.85
31140	32140	9/16 (14.29mm)	.5625	9/16	6	1-1/4	98.16	93.89	89.62	85.36
31150	32150	5/8 (15.87mm)	.6250	5/8	6	1-1/4	126.07	120.59	115.11	109.63
31670	32670	16mm	.6299	16mm	152mm	32mm	132.71	126.94	121.17	115.40
31160	32160	3/4 (19.05mm)	.7500	3/4	6	1-1/2	174.32	166.74	159.16	151.58
31680	32680	20mm	.7874	20mm	152mm	38mm	251.11	240.19	229.27	218.36
31170	32170	7/8 (22.22mm)	.8750	7/8	6	1-1/2	284.92	272.53	260.14	247.76
31690	32690	25mm	.9843	25mm	152mm	38mm	327.82	313.57	299.31	285.06
31180	32180	1 (25.40mm)	1.000	1	6	1-1/2	311.43	297.89	284.35	270.81



NEW SERIES

2 Flute Series **520MA** & **540MA**
4 Flute Series **530MA** & **550MA**
(fractional) (metric)

END MILLS



Standard Length - Double End Ball End - TiAlN Coated 30° Helix

Extremely versatile
Dry or semi-dry machining
Up to 40% faster than uncoated
Radius tolerance +.000-.001" (+0.000-0.025mm)

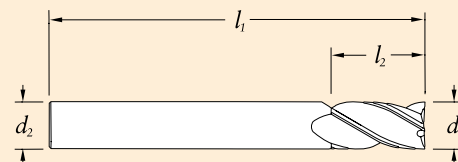
TOLERANCES

$\varnothing d_1$ +.000-.002" (+0.000-0.050mm)
 $\varnothing d_2$ -.0001-.0004" (-.00025-0.0100mm)

2 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
31017	32017	1/32 (0.79mm)	.0312	1/8	2	3/32	20.99	20.08	19.16	18.25
31517	32517	1mm	.0394	3mm	50mm	4mm	21.94	20.99	20.03	19.08
31027	32027	3/64 (1.19mm)	.0469	1/8	2	1/8	20.99	20.08	19.16	18.25
31527	32527	1.5mm	.0591	3mm	50mm	5mm	21.94	20.99	20.03	19.08
31037	32037	1/16 (1.59mm)	.0625	1/8	2	3/16	20.99	20.08	19.16	18.25
31537	32537	2mm	.0787	3mm	50mm	6mm	21.94	20.99	20.03	19.08
31047	32047	3/32 (2.38mm)	.0938	1/8	2	1/4	20.99	20.08	19.16	18.25
31547	32547	2.5mm	.0984	3mm	50mm	7mm	21.94	20.99	20.03	19.08
31557	32557	3mm	.1181	3mm	50mm	8mm	16.59	15.87	15.15	14.43
31057	32057	1/8 (3.17mm)	.1250	1/8	2	3/8	15.89	15.20	14.51	13.82
31567	32567	3.5mm	.1378	4mm	63mm	9.5mm	24.07	23.02	21.98	20.93
31067	32067	5/32 (3.97mm)	.1562	3/16	2-1/2	7/16	23.07	22.07	21.06	20.06
31577	32577	4mm	.1575	4mm	63mm	10mm	21.21	20.29	19.37	18.44
31587	32587	4.5mm	.1772	5mm	63mm	12mm	27.69	26.49	25.28	24.08
31077	32077	3/16 (4.76mm)	.1875	3/16	2-1/2	1/2	20.36	19.47	18.59	17.70
31597	32597	5mm	.1969	5mm	63mm	12mm	24.99	23.90	22.82	21.73
31087	32087	7/32 (5.56mm)	.2188	1/4	2-1/2	9/16	26.58	25.42	24.27	23.11
31607	32607	6mm	.2362	6mm	63mm	16mm	25.75	24.63	23.51	22.39
31097	32097	1/4 (6.35mm)	.2500	1/4	2-1/2	5/8	24.74	23.66	22.59	21.51
31617	32617	7mm	.2756	7mm	88mm	19mm	36.03	34.46	32.90	31.33
31107	32107	5/16 (7.94mm)	.3125	5/16	3-1/2	3/4	35.56	34.01	32.47	30.92
31627	32627	8mm	.3150	8mm	88mm	19mm	36.88	35.28	33.67	32.07
31637	32637	9mm	.3543	9mm	88mm	19mm	44.57	42.63	40.69	38.76
31117	32117	3/8 (9.52mm)	.3750	3/8	3-1/2	3/4	42.87	41.01	39.14	37.28
31647	32647	10mm	.3937	10mm	88mm	19mm	57.83	55.32	52.80	50.29
31657	32657	11mm	.4331	11mm	101mm	22mm	60.54	57.91	55.28	52.64
31127	32127	7/16 (11.11mm)	.4375	7/16	4	7/8	58.12	55.59	53.07	50.54
31667	32667	12mm	.4724	12mm	101mm	25mm	66.52	63.63	60.74	57.84
31137	32137	1/2 (12.70mm)	.5000	1/2	4	1	63.80	61.03	58.25	55.48
31147	32147	9/16 (14.29mm)	.5625	9/16	6	1-1/4	118.44	113.29	108.14	102.99
31157	32157	5/8 (15.87mm)	.6250	5/8	6	1-1/4	146.36	140.00	133.63	127.27
31677	32677	16mm	.6299	16mm	152mm	32mm	153.00	146.35	139.70	133.04
31167	32167	3/4 (19.05mm)	.7500	3/4	6	1-1/2	197.80	189.20	180.60	172.00
31687	32687	20mm	.7874	20mm	152mm	38mm	281.60	269.36	257.11	244.87
31177	32177	7/8 (22.22mm)	.8750	7/8	6	1-1/2	315.41	301.70	287.98	274.27
31697	32697	25mm	.9843	25mm	152mm	38mm	358.31	342.73	327.15	311.58
31187	32187	1 (25.40mm)	1.000	1	6	1-1/2	341.92	327.05	312.19	297.32

Series 620M & 640M 2 Flute
Series 623M & 643M 3 Flute
Series 630M & 650M 4 Flute
(fractional) (metric)

NEW
SERIES



Extra Length 30° Helix

Extended reach

Can be modified with a neck within 48 hours

Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 -.0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
92010	93010	94010	3mm	.1181	3mm	50mm	16mm	8.46	8.09	7.72	7.36
92020	93020	94020	3mm	.1181	3mm	76mm	20mm	14.38	13.75	13.13	12.50
92030	93030	94030	3mm	.1181	3mm	76mm	25mm	14.38	13.75	13.13	12.50
41010	54510	42010	1/8 (3.17mm)	.1250	1/8	2	5/8	8.86	8.47	8.09	7.70
41020	54520	42020	1/8 (3.17mm)	.1250	1/8	3	3/4	13.66	13.07	12.47	11.88
41030	54530	42030	1/8 (3.17mm)	.1250	1/8	3	1	13.66	13.07	12.47	11.88
92040	93040	94040	4mm	.1575	4mm	50mm	16mm	8.89	8.50	8.12	7.73
92050	93050	94050	4mm	.1575	4mm	76mm	20mm	14.71	14.07	13.43	12.79
92060	93060	94060	4mm	.1575	4mm	76mm	25mm	14.71	14.07	13.43	12.79
41040	54540	42040	3/16 (4.76mm)	.1875	3/16	3	1	15.08	14.42	13.77	13.11
41050	54550	42050	3/16 (4.76mm)	.1875	3/16	3	1-1/8	15.08	14.42	13.77	13.11
41060	54560	42060	3/16 (4.76mm)	.1875	3/16	4	1	16.64	15.92	15.19	14.47
92070	93070	94070	5mm	.1969	5mm	50mm	16mm	10.45	10.00	9.54	9.09
92080	93080	94080	5mm	.1969	5mm	76mm	20mm	15.87	15.18	14.49	13.80
92090	93090	94090	5mm	.1969	5mm	76mm	25mm	15.87	15.18	14.49	13.80
92100	93100	94100	6mm	.2362	6mm	76mm	25mm	18.39	17.59	16.79	15.99
92110	93110	94110	6mm	.2362	6mm	101mm	25mm	19.40	18.56	17.71	16.87
92120	93120	94120	6mm	.2362	6mm	101mm	32mm	19.40	18.56	17.71	16.87
92130	93130	94130	6mm	.2362	6mm	152mm	38mm	26.25	25.11	23.97	22.83
41070	54570	42070	1/4 (6.35mm)	.2500	1/4	3	1	17.46	16.70	15.94	15.18
41080	54580	42080	1/4 (6.35mm)	.2500	1/4	4	1	18.43	17.63	16.83	16.03
41090	54590	42090	1/4 (6.35mm)	.2500	1/4	4	1-1/2	18.43	17.63	16.83	16.03
41100	54600	42100	1/4 (6.35mm)	.2500	1/4	6	1-1/2	24.93	23.85	22.76	21.68
41110	54610	42110	5/16 (7.94mm)	.3125	5/16	3	1	21.55	20.61	19.68	18.74
41120	54620	42120	5/16 (7.94mm)	.3125	5/16	4	1	24.06	23.01	21.97	20.92
41130	54630	42130	5/16 (7.94mm)	.3125	5/16	4	1-5/8	24.06	23.01	21.97	20.92
41140	54640	42140	5/16 (7.94mm)	.3125	5/16	6	1-1/2	35.67	34.12	32.57	31.02
92140	93140	94140	8mm	.3150	8mm	76mm	25mm	22.69	21.70	20.72	19.73
92150	93150	94150	8mm	.3150	8mm	101mm	25mm	25.31	24.21	23.11	22.01
92160	93160	94160	8mm	.3150	8mm	101mm	41mm	25.31	24.21	23.11	22.01
92170	93170	94170	8mm	.3150	8mm	152mm	50mm	36.58	34.99	33.40	31.81
41150	54650	42150	3/8 (9.52mm)	.3750	3/8	3	1	24.24	23.19	22.13	21.08
41160	54660	42160	3/8 (9.52mm)	.3750	3/8	4	1	26.62	25.46	24.31	23.15
41170	54670	42170	3/8 (9.52mm)	.3750	3/8	4	2	26.62	25.46	24.31	23.15
41180	54680	42180	3/8 (9.52mm)	.3750	3/8	6	1-1/2	38.79	37.10	35.42	33.73
41190	54690	42190	3/8 (9.52mm)	.3750	3/8	6	3	38.79	37.10	35.42	33.73

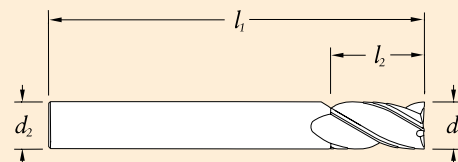


2 Flute Series 620M & 640M
 3 Flute Series 623M & 643M
 4 Flute Series 630M & 650M
 (fractional) (metric)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
92180	93180	94180	10mm	.3937	10mm	76mm	25mm	26.32	25.18	24.03	22.89
92190	93190	94190	10mm	.3937	10mm	101mm	25mm	33.93	32.45	30.98	29.50
92200	93200	94200	10mm	.3937	10mm	101mm	50mm	33.93	32.45	30.98	29.50
92210	93210	94210	10mm	.3937	10mm	152mm	38mm	44.63	42.69	40.75	38.81
92220	93220	94220	10mm	.3937	10mm	152mm	76mm	44.63	42.69	40.75	38.81
41200	54700	42200	7/16 (11.11mm)	.4375	7/16	4	1	36.63	35.04	33.44	31.85
41210	54710	42210	7/16 (11.11mm)	.4375	7/16	4	2	36.63	35.04	33.44	31.85
41220	54720	42220	7/16 (11.11mm)	.4375	7/16	6	1-1/2	48.70	46.58	44.47	42.35
41230	54730	42230	7/16 (11.11mm)	.4375	7/16	6	3	48.70	46.58	44.47	42.35
92230	93230	94230	12mm	.4724	12mm	101mm	25mm	41.32	39.52	37.73	35.93
92240	93240	94240	12mm	.4724	12mm	101mm	50mm	41.32	39.52	37.73	35.93
92250	93250	94250	12mm	.4724	12mm	152mm	50mm	56.35	53.90	51.45	49.00
92260	93260	94260	12mm	.4724	12mm	152mm	76mm	56.35	53.90	51.45	49.00
41240	54740	42240	1/2 (12.70mm)	.5000	1/2	4	1	38.97	37.28	35.58	33.89
41250	54750	42250	1/2 (12.70mm)	.5000	1/2	4	2	38.97	37.28	35.58	33.89
41260	54760	42260	1/2 (12.70mm)	.5000	1/2	6	1-1/2	56.35	53.90	51.45	49.00
41270	54770	42270	1/2 (12.70mm)	.5000	1/2	6	3	56.35	53.90	51.45	49.00
92270	93270	94270	14mm	.5512	14mm	101mm	25mm	56.73	54.26	51.80	49.33
92280	93280	94280	14mm	.5512	14mm	101mm	50mm	56.73	54.26	51.80	49.33
92290	93290	94290	14mm	.5512	14mm	152mm	50mm	73.96	70.74	67.53	64.31
92300	93300	94300	14mm	.5512	14mm	152mm	76mm	73.96	70.74	67.53	64.31
41280	54780	42280	9/16 (14.29mm)	.5625	9/16	6	2	73.97	70.75	67.54	64.32
41290	54790	42290	9/16 (14.29mm)	.5625	9/16	6	3	73.97	70.75	67.54	64.32
41300	54800	42300	5/8 (15.87mm)	.6250	5/8	6	2	80.32	76.83	73.34	69.84
41310	54810	42310	5/8 (15.87mm)	.6250	5/8	6	3	80.32	76.83	73.34	69.84
92310	93310	94310	16mm	.6299	16mm	152mm	50mm	80.32	76.83	73.34	69.84
92320	93320	94320	16mm	.6299	16mm	152mm	76mm	80.32	76.83	73.34	69.84
92330	93330	94330	18mm	.7087	18mm	152mm	50mm	120.75	115.50	110.25	105.00
92340	93340	94340	18mm	.7087	18mm	152mm	76mm	120.75	115.50	110.25	105.00
41320	54820	42320	3/4 (19.05mm)	.7500	3/4	6	2	127.94	122.38	116.81	111.25
41330	54830	42330	3/4 (19.05mm)	.7500	3/4	6	3	127.94	122.38	116.81	111.25
92350	93350	94350	20mm	.7874	20mm	152mm	50mm	134.78	128.92	123.06	117.20
92360	93360	94360	20mm	.7874	20mm	152mm	76mm	134.78	128.92	123.06	117.20
92370	93370	94370	25mm	.9843	25mm	152mm	50mm	207.69	198.66	189.63	180.60
92380	93380	94380	25mm	.9843	25mm	152mm	76mm	207.69	198.66	189.63	180.60
41340	54840	42340	1 (25.40mm)	1.000	1	6	2	217.51	208.05	198.60	189.14
41350	54850	42350	1 (25.40mm)	1.000	1	6	3	217.51	208.05	198.60	189.14
-	-	42360	1 (25.40mm)	1.000	1	6	4	228.95	219.00	209.04	199.09
-	-	42390	1-1/4 (31.75mm)	1.250	1-1/4	6	3	461.47	441.41	421.34	401.28

Series 620MC 2 Flute
 Series 623MC 3 Flute
 Series 630MC 4 Flute
 (fractional)

NEW
 SERIES



Extra Length TiCN Coated - 30° Helix

Extended reach

Can be modified with a neck within 48 hours

Improved abrasion resistance / lubricity

Up to 25% faster than uncoated

Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

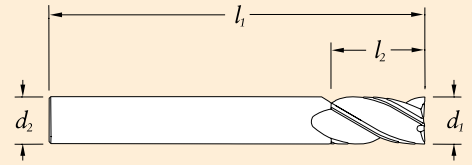
$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
41014	54514	42014	1/8 (3.17mm)	.1250	1/8	2	5/8	10.43	9.98	9.52	9.07
41024	54524	42024	1/8 (3.17mm)	.1250	1/8	3	3/4	15.59	14.91	14.23	13.56
41034	54534	42034	1/8 (3.17mm)	.1250	1/8	3	1	15.59	14.91	14.23	13.56
41044	54544	42044	3/16 (4.76mm)	.1875	3/16	3	1	17.30	16.55	15.80	15.04
41054	54554	42054	3/16 (4.76mm)	.1875	3/16	3	1-1/8	17.30	16.55	15.80	15.04
41064	54564	42064	3/16 (4.76mm)	.1875	3/16	4	1	19.21	18.37	17.54	16.70
41074	54574	42074	1/4 (6.35mm)	.2500	1/4	3	1	20.67	19.77	18.87	17.97
41084	54584	42084	1/4 (6.35mm)	.2500	1/4	4	1	21.90	20.95	20.00	19.04
41094	54594	42094	1/4 (6.35mm)	.2500	1/4	4	1-1/2	21.90	20.95	20.00	19.04
41104	54604	42104	1/4 (6.35mm)	.2500	1/4	6	1-1/2	30.94	29.59	28.25	26.90
41114	54614	42114	5/16 (7.94mm)	.3125	5/16	3	1	25.84	24.72	23.59	22.47
41124	54624	42124	5/16 (7.94mm)	.3125	5/16	4	1	29.37	28.09	26.82	25.54
41134	54634	42134	5/16 (7.94mm)	.3125	5/16	4	1-5/8	29.37	28.09	26.82	25.54
41144	54644	42144	5/16 (7.94mm)	.3125	5/16	6	1-1/2	42.86	41.00	39.13	37.27
41154	54654	42154	3/8 (9.52mm)	.3750	3/8	3	1	28.53	27.29	26.05	24.81
41164	54664	42164	3/8 (9.52mm)	.3750	3/8	4	1	31.96	30.57	29.18	27.79
41174	54674	42174	3/8 (9.52mm)	.3750	3/8	4	2	31.96	30.57	29.18	27.79
41184	54684	42184	3/8 (9.52mm)	.3750	3/8	6	1-1/2	45.99	43.99	41.99	39.99
41194	54694	42194	3/8 (9.52mm)	.3750	3/8	6	3	45.99	43.99	41.99	39.99
41204	54704	42204	7/16 (11.11mm)	.4375	7/16	4	1	43.06	41.19	39.32	37.44
41214	54714	42214	7/16 (11.11mm)	.4375	7/16	4	2	43.06	41.19	39.32	37.44
41224	54724	42224	7/16 (11.11mm)	.4375	7/16	6	1-1/2	57.81	55.30	52.78	50.27
41234	54734	42234	7/16 (11.11mm)	.4375	7/16	6	3	57.81	55.30	52.78	50.27
41244	54744	42244	1/2 (12.70mm)	.5000	1/2	4	1	45.39	43.42	41.44	39.47
41254	54754	42254	1/2 (12.70mm)	.5000	1/2	4	2	45.39	43.42	41.44	39.47
41264	54764	42264	1/2 (12.70mm)	.5000	1/2	6	1-1/2	65.45	62.60	59.76	56.91
41274	54774	42274	1/2 (12.70mm)	.5000	1/2	6	3	65.45	62.60	59.76	56.91
41284	54784	42284	9/16 (14.29mm)	.5625	9/16	6	2	85.20	81.50	77.79	74.09
41294	54794	42294	9/16 (14.29mm)	.5625	9/16	6	3	85.20	81.50	77.79	74.09
41304	54804	42304	5/8 (15.87mm)	.6250	5/8	6	2	91.55	87.57	83.59	79.61
41314	54814	42314	5/8 (15.87mm)	.6250	5/8	6	3	91.55	87.57	83.59	79.61
41324	54824	42324	3/4 (19.05mm)	.7500	3/4	6	2	140.77	134.65	128.53	122.41
41334	54834	42334	3/4 (19.05mm)	.7500	3/4	6	3	140.77	134.65	128.53	122.41
41344	54844	42344	1 (25.40mm)	1.000	1	6	2	235.67	225.42	215.18	204.93
41354	54854	42354	1 (25.40mm)	1.000	1	6	3	235.67	225.42	215.18	204.93
-	-	42364	1 (25.40mm)	1.000	1	6	4	247.10	236.36	225.61	214.87
-	-	42394	1-1/4 (31.75mm)	1.250	1-1/4	6	3	486.63	465.47	444.31	423.16

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Series 620MA & 640MA 2 Flute
Series 623MA & 643MA 3 Flute
Series 630MA & 650MA 4 Flute
(fractional) (metric)

NEW
SERIES



Extra Length TIALN Coated - 30° Helix

Extended reach

Can be modified with a neck within 48 hours

Dry or semi-dry machining

Up to 40% faster than uncoated

Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

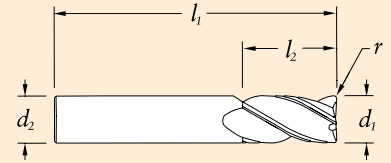
2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
92017	93017	94017	3mm	.1181	3mm	50mm	16mm	9.88	9.45	9.02	8.59
92027	93027	94027	3mm	.1181	3mm	76mm	20mm	16.17	15.47	14.76	14.06
92037	93037	94037	3mm	.1181	3mm	76mm	25mm	16.17	15.47	14.76	14.06
41017	54517	42017	1/8 (3.17mm)	.1250	1/8	2	5/8	10.65	10.19	9.72	9.26
41027	54527	42027	1/8 (3.17mm)	.1250	1/8	3	3/4	15.86	15.17	14.48	13.79
41037	54537	42037	1/8 (3.17mm)	.1250	1/8	3	1	15.86	15.17	14.48	13.79
92047	93047	94047	4mm	.1575	4mm	50mm	16mm	10.68	10.22	9.75	9.29
92057	93057	94057	4mm	.1575	4mm	76mm	20mm	17.49	16.73	15.97	15.21
92067	93067	94067	4mm	.1575	4mm	76mm	25mm	17.49	16.73	15.97	15.21
41047	54547	42047	3/16 (4.76mm)	.1875	3/16	3	1	17.87	17.09	16.32	15.54
41057	54557	42057	3/16 (4.76mm)	.1875	3/16	3	1-1/8	17.87	17.09	16.32	15.54
41067	54567	42067	3/16 (4.76mm)	.1875	3/16	4	1	19.90	19.03	18.17	17.30
92077	93077	94077	5mm	.1969	5mm	50mm	16mm	13.24	12.66	12.09	11.51
92087	93087	94087	5mm	.1969	5mm	76mm	20mm	19.56	18.71	17.86	17.01
92097	93097	94097	5mm	.1969	5mm	76mm	25mm	19.56	18.71	17.86	17.01
92107	93107	94107	6mm	.2362	6mm	76mm	25mm	22.08	21.12	20.16	19.20
92117	93117	94117	6mm	.2362	6mm	101mm	25mm	23.74	22.71	21.68	20.64
92127	93127	94127	6mm	.2362	6mm	101mm	32mm	23.74	22.71	21.68	20.64
92137	93137	94137	6mm	.2362	6mm	152mm	38mm	32.36	30.95	29.55	28.14
41077	54577	42077	1/4 (6.35mm)	.2500	1/4	3	1	21.16	20.24	19.32	18.40
41087	54587	42087	1/4 (6.35mm)	.2500	1/4	4	1	22.77	21.78	20.79	19.80
41097	54597	42097	1/4 (6.35mm)	.2500	1/4	4	1-1/2	22.77	21.78	20.79	19.80
41107	54607	42107	1/4 (6.35mm)	.2500	1/4	6	1-1/2	31.05	29.70	28.35	27.00
41117	54617	42117	5/16 (7.94mm)	.3125	5/16	3	1	27.09	25.91	24.73	23.56
41127	54627	42127	5/16 (7.94mm)	.3125	5/16	4	1	31.08	29.73	28.38	27.03
41137	54637	42137	5/16 (7.94mm)	.3125	5/16	4	1-5/8	31.08	29.73	28.38	27.03
41147	54647	42147	5/16 (7.94mm)	.3125	5/16	6	1-1/2	45.30	43.33	41.36	39.39
92147	93147	94147	8mm	.3150	8mm	76mm	25mm	28.21	26.98	25.76	24.53
92157	93157	94157	8mm	.3150	8mm	101mm	25mm	32.35	30.94	29.54	28.13
92167	93167	94167	8mm	.3150	8mm	101mm	41mm	32.35	30.94	29.54	28.13
92177	93177	94177	8mm	.3150	8mm	152mm	50mm	46.22	44.21	42.20	40.19
41157	54657	42157	3/8 (9.52mm)	.3750	3/8	3	1	29.79	28.49	27.20	25.90
41167	54667	42167	3/8 (9.52mm)	.3750	3/8	4	1	33.66	32.20	30.73	29.27
41177	54677	42177	3/8 (9.52mm)	.3750	3/8	4	2	33.66	32.20	30.73	29.27
41187	54687	42187	3/8 (9.52mm)	.3750	3/8	6	1-1/2	48.42	46.31	44.21	42.10
41197	54697	42197	3/8 (9.52mm)	.3750	3/8	6	3	48.42	46.31	44.21	42.10



2 Flute Series 620MA & 640MA
 3 Flute Series **623MA** & 643MA
 4 Flute Series 630MA & 650MA
 (fractional) (metric)

END MILLS

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
92187	93187	94187	10mm	.3937	10mm	76mm	25mm	32.61	31.19	29.77	28.36
92197	93197	94197	10mm	.3937	10mm	101mm	25mm	42.08	40.25	38.42	36.59
92207	93207	94207	10mm	.3937	10mm	101mm	50mm	42.08	40.25	38.42	36.59
92217	93217	94217	10mm	.3937	10mm	152mm	38mm	56.09	53.65	51.21	48.77
92227	93227	94227	10mm	.3937	10mm	152mm	76mm	56.09	53.65	51.21	48.77
41207	54707	42207	7/16 (11.11mm)	.4375	7/16	4	1	44.78	42.83	40.89	38.94
41217	54717	42217	7/16 (11.11mm)	.4375	7/16	4	2	44.78	42.83	40.89	38.94
41227	54727	42227	7/16 (11.11mm)	.4375	7/16	6	1-1/2	60.16	57.54	54.93	52.31
41237	54737	42237	7/16 (11.11mm)	.4375	7/16	6	3	60.16	57.54	54.93	52.31
92237	93237	94237	12mm	.4724	12mm	101mm	25mm	49.46	47.31	45.16	43.01
92247	93247	94247	12mm	.4724	12mm	101mm	50mm	49.46	47.31	45.16	43.01
92257	93257	94257	12mm	.4724	12mm	152mm	50mm	67.80	64.85	61.90	58.96
92267	93267	94267	12mm	.4724	12mm	152mm	76mm	67.80	64.85	61.90	58.96
41247	54747	42247	1/2 (12.70mm)	.5000	1/2	4	1	47.12	45.07	43.02	40.97
41257	54757	42257	1/2 (12.70mm)	.5000	1/2	4	2	47.12	45.07	43.02	40.97
41267	54767	42267	1/2 (12.70mm)	.5000	1/2	6	1-1/2	67.80	64.85	61.90	58.96
41277	54777	42277	1/2 (12.70mm)	.5000	1/2	6	3	67.80	64.85	61.90	58.96
92277	93277	94277	14mm	.5512	14mm	101mm	25mm	65.83	62.97	60.11	57.24
92287	93287	94287	14mm	.5512	14mm	101mm	50mm	65.83	62.97	60.11	57.24
92297	93297	94297	14mm	.5512	14mm	152mm	50mm	87.48	83.68	79.87	76.07
92307	93307	94307	14mm	.5512	14mm	152mm	76mm	87.48	83.68	79.87	76.07
41287	54787	42287	9/16 (14.29mm)	.5625	9/16	6	2	87.48	83.68	79.87	76.07
41297	54797	42297	9/16 (14.29mm)	.5625	9/16	6	3	87.48	83.68	79.87	76.07
41307	54807	42307	5/8 (15.87mm)	.6250	5/8	6	2	93.84	89.76	85.68	81.60
41317	54817	42317	5/8 (15.87mm)	.6250	5/8	6	3	93.84	89.76	85.68	81.60
92317	93317	94317	16mm	.6299	16mm	152mm	50mm	93.84	89.76	85.68	81.60
92327	93327	94327	16mm	.6299	16mm	152mm	76mm	93.84	89.76	85.68	81.60
92337	93337	94337	18mm	.7087	18mm	152mm	50mm	136.40	130.47	124.54	118.61
92347	93347	94347	18mm	.7087	18mm	152mm	76mm	136.40	130.47	124.54	118.61
41327	54827	42327	3/4 (19.05mm)	.7500	3/4	6	2	143.60	137.36	131.11	124.87
41337	54837	42337	3/4 (19.05mm)	.7500	3/4	6	3	143.60	137.36	131.11	124.87
92357	93357	94357	20mm	.7874	20mm	152mm	50mm	155.10	148.36	141.61	134.87
92367	93367	94367	20mm	.7874	20mm	152mm	76mm	155.10	148.36	141.61	134.87
92377	93377	94377	25mm	.9843	25mm	152mm	50mm	228.01	218.10	208.18	198.27
92387	93387	94387	25mm	.9843	25mm	152mm	76mm	228.01	218.10	208.18	198.27
41347	54847	42347	1 (25.40mm)	1.000	1	6	2	237.83	227.49	217.15	206.81
41357	54857	42357	1 (25.40mm)	1.000	1	6	3	237.83	227.49	217.15	206.81
-	-	42367	1 (25.40mm)	1.000	1	6	4	249.27	238.43	227.59	216.76
-	-	42397	1-1/4 (31.75mm)	1.250	1-1/4	6	3	487.50	466.30	445.11	423.92



Extra Length - Corner Radius 30° Helix



Extended reach

Can be modified with a neck within 48 hours

For stronger corners / part radius

Extremely versatile

TOLERANCES

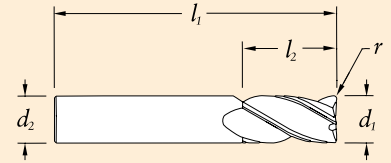
$\varnothing d_1$ +.000 – .002" (+0.000 – 0.050mm)

$\varnothing d_2$ –.0001 – .0004" (–0.0025 – 0.0100mm)

r +.001 – .001" (+0.025 – 0.025mm)

EDP#	d_1 Flute Diameter†	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20100	1/8 (3.17mm)	.1250	.010	1/8	3	1	16.08	15.38	14.68	13.98
20110	1/8 (3.17mm)	.1250	.015	1/8	3	1	16.08	15.38	14.68	13.98
20120	1/8 (3.17mm)	.1250	.020	1/8	3	1	16.08	15.38	14.68	13.98
20130	1/8 (3.17mm)	.1250	.030	1/8	3	1	16.08	15.38	14.68	13.98
20140	1/8 (3.18mm)	.1250	.045	1/8	3	1	16.08	15.38	14.68	13.98
20150	3/16 (4.76mm)	.1875	.010	3/16	3	1	17.73	16.96	16.19	15.42
20160	3/16 (4.76mm)	.1875	.015	3/16	3	1	17.73	16.96	16.19	15.42
20170	3/16 (4.76mm)	.1875	.020	3/16	3	1	17.73	16.96	16.19	15.42
20180	3/16 (4.76mm)	.1875	.030	3/16	3	1	17.73	16.96	16.19	15.42
20190	3/16 (4.76mm)	.1875	.045	3/16	3	1	17.73	16.96	16.19	15.42
20200	3/16 (4.76mm)	.1875	.060	3/16	3	1	17.73	16.96	16.19	15.42
20210	3/16 (4.76mm)	.1875	.010	3/16	4	1	19.09	18.26	17.43	16.60
20220	3/16 (4.76mm)	.1875	.015	3/16	4	1	19.09	18.26	17.43	16.60
20230	3/16 (4.76mm)	.1875	.020	3/16	4	1	19.09	18.26	17.43	16.60
20240	3/16 (4.76mm)	.1875	.030	3/16	4	1	19.09	18.26	17.43	16.60
20250	3/16 (4.76mm)	.1875	.045	3/16	4	1	19.09	18.26	17.43	16.60
20260	3/16 (4.76mm)	.1875	.060	3/16	4	1	19.09	18.26	17.43	16.60
20270	1/4 (6.35mm)	.2500	.010	1/4	3	1	20.53	19.64	18.74	17.85
20280	1/4 (6.35mm)	.2500	.020	1/4	3	1	20.53	19.64	18.74	17.85
20290	1/4 (6.35mm)	.2500	.030	1/4	3	1	20.53	19.64	18.74	17.85
20300	1/4 (6.35mm)	.2500	.045	1/4	3	1	20.53	19.64	18.74	17.85
20310	1/4 (6.35mm)	.2500	.060	1/4	3	1	20.53	19.64	18.74	17.85
20320	1/4 (6.35mm)	.2500	.010	1/4	4	1	21.60	20.66	19.72	18.78
20330	1/4 (6.35mm)	.2500	.020	1/4	4	1	21.60	20.66	19.72	18.78
20340	1/4 (6.35mm)	.2500	.030	1/4	4	1	21.60	20.66	19.72	18.78
20350	1/4 (6.35mm)	.2500	.045	1/4	4	1	21.60	20.66	19.72	18.78
20360	1/4 (6.35mm)	.2500	.060	1/4	4	1	21.60	20.66	19.72	18.78
20370	1/4 (6.35mm)	.2500	.010	1/4	6	1-1/2	28.08	26.86	25.64	24.42
20380	1/4 (6.35mm)	.2500	.020	1/4	6	1-1/2	28.08	26.86	25.64	24.42
20390	1/4 (6.35mm)	.2500	.030	1/4	6	1-1/2	28.08	26.86	25.64	24.42
20400	1/4 (6.35mm)	.2500	.045	1/4	6	1-1/2	28.08	26.86	25.64	24.42
20410	1/4 (6.35mm)	.2500	.060	1/4	6	1-1/2	28.08	26.86	25.64	24.42
20420	5/16 (7.94mm)	.3125	.010	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20430	5/16 (7.94mm)	.3125	.020	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20440	5/16 (7.94mm)	.3125	.030	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20450	5/16 (7.94mm)	.3125	.045	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20460	5/16 (7.94mm)	.3125	.060	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20470	5/16 (7.94mm)	.3125	.090	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20480	5/16 (7.94mm)	.3125	.125	5/16	4	1-5/8	28.30	27.07	25.84	24.61
20490	3/8 (9.52mm)	.3750	.010	3/8	4	1	31.31	29.95	28.59	27.23
20500	3/8 (9.52mm)	.3750	.020	3/8	4	1	31.31	29.95	28.59	27.23
20510	3/8 (9.52mm)	.3750	.030	3/8	4	1	31.31	29.95	28.59	27.23

EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20520	3/8 (9.52mm)	.3750	.045	3/8	4	1	31.31	29.95	28.59	27.23
20530	3/8 (9.52mm)	.3750	.060	3/8	4	1	31.31	29.95	28.59	27.23
20540	3/8 (9.52mm)	.3750	.090	3/8	4	1	31.31	29.95	28.59	27.23
20550	3/8 (9.52mm)	.3750	.125	3/8	4	1	31.31	29.95	28.59	27.23
20560	3/8 (9.52mm)	.3750	.010	3/8	4	2	31.31	29.95	28.59	27.23
20570	3/8 (9.52mm)	.3750	.020	3/8	4	2	31.31	29.95	28.59	27.23
20580	3/8 (9.52mm)	.3750	.030	3/8	4	2	31.31	29.95	28.59	27.23
20590	3/8 (9.52mm)	.3750	.045	3/8	4	2	31.31	29.95	28.59	27.23
20600	3/8 (9.52mm)	.3750	.060	3/8	4	2	31.31	29.95	28.59	27.23
20610	3/8 (9.52mm)	.3750	.090	3/8	4	2	31.31	29.95	28.59	27.23
20620	3/8 (9.52mm)	.3750	.125	3/8	4	2	31.31	29.95	28.59	27.23
20630	3/8 (9.52mm)	.3750	.010	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20640	3/8 (9.52mm)	.3750	.020	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20650	3/8 (9.52mm)	.3750	.030	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20660	3/8 (9.52mm)	.3750	.045	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20670	3/8 (9.52mm)	.3750	.060	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20680	3/8 (9.52mm)	.3750	.090	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20690	3/8 (9.52mm)	.3750	.125	3/8	6	1-1/2	42.99	41.12	39.25	37.38
20700	1/2 (12.70mm)	.5000	.015	1/2	4	1	44.02	42.11	40.19	38.28
20710	1/2 (12.70mm)	.5000	.020	1/2	4	1	44.02	42.11	40.19	38.28
20720	1/2 (12.70mm)	.5000	.030	1/2	4	1	44.02	42.11	40.19	38.28
20730	1/2 (12.70mm)	.5000	.045	1/2	4	1	44.02	42.11	40.19	38.28
20740	1/2 (12.70mm)	.5000	.060	1/2	4	1	44.02	42.11	40.19	38.28
20750	1/2 (12.70mm)	.5000	.090	1/2	4	1	44.02	42.11	40.19	38.28
20760	1/2 (12.70mm)	.5000	.125	1/2	4	1	44.02	42.11	40.19	38.28
20770	1/2 (12.70mm)	.5000	.015	1/2	4	2	44.02	42.11	40.19	38.28
20780	1/2 (12.70mm)	.5000	.020	1/2	4	2	44.02	42.11	40.19	38.28
20790	1/2 (12.70mm)	.5000	.030	1/2	4	2	44.02	42.11	40.19	38.28
20800	1/2 (12.70mm)	.5000	.045	1/2	4	2	44.02	42.11	40.19	38.28
20810	1/2 (12.70mm)	.5000	.060	1/2	4	2	44.02	42.11	40.19	38.28
20820	1/2 (12.70mm)	.5000	.090	1/2	4	2	44.02	42.11	40.19	38.28
20830	1/2 (12.70mm)	.5000	.125	1/2	4	2	44.02	42.11	40.19	38.28
20840	1/2 (12.70mm)	.5000	.015	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20850	1/2 (12.70mm)	.5000	.020	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20860	1/2 (12.70mm)	.5000	.030	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20870	1/2 (12.70mm)	.5000	.045	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20880	1/2 (12.70mm)	.5000	.060	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20890	1/2 (12.70mm)	.5000	.090	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20900	1/2 (12.70mm)	.5000	.125	1/2	6	1-1/2	62.35	59.64	56.93	54.22
20910	5/8 (15.87mm)	.6250	.010	5/8	6	2	91.68	87.69	83.71	79.72
20920	5/8 (15.87mm)	.6250	.015	5/8	6	2	91.68	87.69	83.71	79.72
20930	5/8 (15.87mm)	.6250	.020	5/8	6	2	91.68	87.69	83.71	79.72
20940	5/8 (15.87mm)	.6250	.030	5/8	6	2	91.68	87.69	83.71	79.72
20950	5/8 (15.87mm)	.6250	.045	5/8	6	2	91.68	87.69	83.71	79.72
20960	5/8 (15.87mm)	.6250	.060	5/8	6	2	91.68	87.69	83.71	79.72
20970	5/8 (15.87mm)	.6250	.090	5/8	6	2	91.68	87.69	83.71	79.72
20980	5/8 (15.87mm)	.6250	.125	5/8	6	2	91.68	87.69	83.71	79.72
20990	3/4 (19.05mm)	.7500	.015	3/4	6	3	150.45	143.91	137.37	130.83
21000	3/4 (19.05mm)	.7500	.020	3/4	6	3	150.45	143.91	137.37	130.83
21010	3/4 (19.05mm)	.7500	.030	3/4	6	3	150.45	143.91	137.37	130.83
21020	3/4 (19.05mm)	.7500	.045	3/4	6	3	150.45	143.91	137.37	130.83
21030	3/4 (19.05mm)	.7500	.060	3/4	6	3	150.45	143.91	137.37	130.83
21040	3/4 (19.05mm)	.7500	.090	3/4	6	3	150.45	143.91	137.37	130.83
21050	3/4 (19.05mm)	.7500	.125	3/4	6	3	150.45	143.91	137.37	130.83
21060	1 (25.40mm)	1.000	.015	1	6	3	255.85	244.73	233.60	222.48
21070	1 (25.40mm)	1.000	.020	1	6	3	255.85	244.73	233.60	222.48
21080	1 (25.40mm)	1.000	.030	1	6	3	255.85	244.73	233.60	222.48
21090	1 (25.40mm)	1.000	.045	1	6	3	255.85	244.73	233.60	222.48
21100	1 (25.40mm)	1.000	.060	1	6	3	255.85	244.73	233.60	222.48
21110	1 (25.40mm)	1.000	.090	1	6	3	255.85	244.73	233.60	222.48
21120	1 (25.40mm)	1.000	.125	1	6	3	255.85	244.73	233.60	222.48



Extra Length - Corner Radius TiAlN Coated - 30° Helix



Extended reach

Can be modified with a neck within 48 hours

For stronger corners / part radius

Dry or semi-dry machining

Up to 40% faster than uncoated

Extremely versatile

TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)

$\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

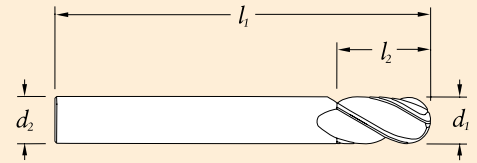
r +.001 - .001" (+0.025 - 0.025mm)

EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20107	1/8 (3.17mm)	.1250	.010	1/8	3	1	18.27	17.48	16.68	15.89
20117	1/8 (3.17mm)	.1250	.015	1/8	3	1	18.27	17.48	16.68	15.89
20127	1/8 (3.17mm)	.1250	.020	1/8	3	1	18.27	17.48	16.68	15.89
20137	1/8 (3.17mm)	.1250	.030	1/8	3	1	18.27	17.48	16.68	15.89
20147	1/8 (3.17mm)	.1250	.045	1/8	3	1	18.27	17.48	16.68	15.89
20157	3/16 (4.76mm)	.1875	.010	3/16	3	1	20.52	19.63	18.74	17.84
20167	3/16 (4.76mm)	.1875	.015	3/16	3	1	20.52	19.63	18.74	17.84
20177	3/16 (4.76mm)	.1875	.020	3/16	3	1	20.52	19.63	18.74	17.84
20187	3/16 (4.76mm)	.1875	.030	3/16	3	1	20.52	19.63	18.74	17.84
20197	3/16 (4.76mm)	.1875	.045	3/16	3	1	20.52	19.63	18.74	17.84
20207	3/16 (4.76mm)	.1875	.060	3/16	3	1	20.52	19.63	18.74	17.84
20217	3/16 (4.76mm)	.1875	.010	3/16	4	1	22.34	21.37	20.40	19.43
20227	3/16 (4.76mm)	.1875	.015	3/16	4	1	22.34	21.37	20.40	19.43
20237	3/16 (4.76mm)	.1875	.020	3/16	4	1	22.34	21.37	20.40	19.43
20247	3/16 (4.76mm)	.1875	.030	3/16	4	1	22.34	21.37	20.40	19.43
20257	3/16 (4.76mm)	.1875	.045	3/16	4	1	22.34	21.37	20.40	19.43
20267	3/16 (4.76mm)	.1875	.060	3/16	4	1	22.34	21.37	20.40	19.43
20277	1/4 (6.35mm)	.2500	.010	1/4	3	1	24.23	23.18	22.12	21.07
20287	1/4 (6.35mm)	.2500	.020	1/4	3	1	24.23	23.18	22.12	21.07
20297	1/4 (6.35mm)	.2500	.030	1/4	3	1	24.23	23.18	22.12	21.07
20307	1/4 (6.35mm)	.2500	.045	1/4	3	1	24.23	23.18	22.12	21.07
20317	1/4 (6.35mm)	.2500	.060	1/4	3	1	24.23	23.18	22.12	21.07
20327	1/4 (6.35mm)	.2500	.010	1/4	4	1	25.94	24.81	23.68	22.56
20337	1/4 (6.35mm)	.2500	.020	1/4	4	1	25.94	24.81	23.68	22.56
20347	1/4 (6.35mm)	.2500	.030	1/4	4	1	25.94	24.81	23.68	22.56
20357	1/4 (6.35mm)	.2500	.045	1/4	4	1	25.94	24.81	23.68	22.56
20367	1/4 (6.35mm)	.2500	.060	1/4	4	1	25.94	24.81	23.68	22.56
20377	1/4 (6.35mm)	.2500	.010	1/4	6	1-1/2	34.19	32.70	31.22	29.73
20387	1/4 (6.35mm)	.2500	.020	1/4	6	1-1/2	34.19	32.70	31.22	29.73
20397	1/4 (6.35mm)	.2500	.030	1/4	6	1-1/2	34.19	32.70	31.22	29.73
20407	1/4 (6.35mm)	.2500	.045	1/4	6	1-1/2	34.19	32.70	31.22	29.73
20417	1/4 (6.35mm)	.2500	.060	1/4	6	1-1/2	34.19	32.70	31.22	29.73
20427	5/16 (7.94mm)	.3125	.010	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20437	5/16 (7.94mm)	.3125	.020	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20447	5/16 (7.94mm)	.3125	.030	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20457	5/16 (7.94mm)	.3125	.045	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20467	5/16 (7.94mm)	.3125	.060	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20477	5/16 (7.94mm)	.3125	.090	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20487	5/16 (7.94mm)	.3125	.125	5/16	4	1-5/8	35.34	33.80	32.27	30.73
20497	3/8 (9.52mm)	.3750	.010	3/8	4	1	38.34	36.67	35.01	33.34
20507	3/8 (9.52mm)	.3750	.020	3/8	4	1	38.34	36.67	35.01	33.34
20517	3/8 (9.52mm)	.3750	.030	3/8	4	1	38.34	36.67	35.01	33.34

EDP#	d_1 Flute Diameter ¹	Decimal Equivalent	r Corner Radius	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
20527	3/8 (9.52mm)	.3750	.045	3/8	4	1	38.34	36.67	35.01	33.34
20537	3/8 (9.52mm)	.3750	.060	3/8	4	1	38.34	36.67	35.01	33.34
20547	3/8 (9.52mm)	.3750	.090	3/8	4	1	38.34	36.67	35.01	33.34
20557	3/8 (9.52mm)	.3750	.125	3/8	4	1	38.34	36.67	35.01	33.34
20567	3/8 (9.52mm)	.3750	.010	3/8	4	2	38.34	36.67	35.01	33.34
20577	3/8 (9.52mm)	.3750	.020	3/8	4	2	38.34	36.67	35.01	33.34
20587	3/8 (9.52mm)	.3750	.030	3/8	4	2	38.34	36.67	35.01	33.34
20597	3/8 (9.52mm)	.3750	.045	3/8	4	2	38.34	36.67	35.01	33.34
20607	3/8 (9.52mm)	.3750	.060	3/8	4	2	38.34	36.67	35.01	33.34
20617	3/8 (9.52mm)	.3750	.090	3/8	4	2	38.34	36.67	35.01	33.34
20627	3/8 (9.52mm)	.3750	.125	3/8	4	2	38.34	36.67	35.01	33.34
20637	3/8 (9.52mm)	.3750	.010	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20647	3/8 (9.52mm)	.3750	.020	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20657	3/8 (9.52mm)	.3750	.030	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20667	3/8 (9.52mm)	.3750	.045	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20677	3/8 (9.52mm)	.3750	.060	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20687	3/8 (9.52mm)	.3750	.090	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20697	3/8 (9.52mm)	.3750	.125	3/8	6	1-1/2	53.08	50.77	48.46	46.16
20707	1/2 (12.70mm)	.5000	.015	1/2	4	1	52.18	49.91	47.64	45.37
20717	1/2 (12.70mm)	.5000	.020	1/2	4	1	52.18	49.91	47.64	45.37
20727	1/2 (12.70mm)	.5000	.030	1/2	4	1	52.18	49.91	47.64	45.37
20737	1/2 (12.70mm)	.5000	.045	1/2	4	1	52.18	49.91	47.64	45.37
20747	1/2 (12.70mm)	.5000	.060	1/2	4	1	52.18	49.91	47.64	45.37
20757	1/2 (12.70mm)	.5000	.090	1/2	4	1	52.18	49.91	47.64	45.37
20767	1/2 (12.70mm)	.5000	.125	1/2	4	1	52.18	49.91	47.64	45.37
20777	1/2 (12.70mm)	.5000	.015	1/2	4	2	52.18	49.91	47.64	45.37
20787	1/2 (12.70mm)	.5000	.020	1/2	4	2	52.18	49.91	47.64	45.37
20797	1/2 (12.70mm)	.5000	.030	1/2	4	2	52.18	49.91	47.64	45.37
20807	1/2 (12.70mm)	.5000	.045	1/2	4	2	52.18	49.91	47.64	45.37
20817	1/2 (12.70mm)	.5000	.060	1/2	4	2	52.18	49.91	47.64	45.37
20827	1/2 (12.70mm)	.5000	.090	1/2	4	2	52.18	49.91	47.64	45.37
20837	1/2 (12.70mm)	.5000	.125	1/2	4	2	52.18	49.91	47.64	45.37
20847	1/2 (12.70mm)	.5000	.015	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20857	1/2 (12.70mm)	.5000	.020	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20867	1/2 (12.70mm)	.5000	.030	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20877	1/2 (12.70mm)	.5000	.045	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20887	1/2 (12.70mm)	.5000	.060	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20897	1/2 (12.70mm)	.5000	.090	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20907	1/2 (12.70mm)	.5000	.125	1/2	6	1-1/2	73.80	70.59	67.38	64.17
20917	5/8 (15.87mm)	.6250	.010	5/8	6	2	105.19	100.62	96.04	91.47
20927	5/8 (15.87mm)	.6250	.015	5/8	6	2	105.19	100.62	96.04	91.47
20937	5/8 (15.87mm)	.6250	.020	5/8	6	2	105.19	100.62	96.04	91.47
20947	5/8 (15.87mm)	.6250	.030	5/8	6	2	105.19	100.62	96.04	91.47
20957	5/8 (15.87mm)	.6250	.045	5/8	6	2	105.19	100.62	96.04	91.47
20967	5/8 (15.87mm)	.6250	.060	5/8	6	2	105.19	100.62	96.04	91.47
20977	5/8 (15.87mm)	.6250	.090	5/8	6	2	105.19	100.62	96.04	91.47
20987	5/8 (15.87mm)	.6250	.125	5/8	6	2	105.19	100.62	96.04	91.47
20997	3/4 (19.05mm)	.7500	.015	3/4	6	3	166.11	158.89	151.67	144.44
21007	3/4 (19.05mm)	.7500	.020	3/4	6	3	166.11	158.89	151.67	144.44
21017	3/4 (19.05mm)	.7500	.030	3/4	6	3	166.11	158.89	151.67	144.44
21027	3/4 (19.05mm)	.7500	.045	3/4	6	3	166.11	158.89	151.67	144.44
21037	3/4 (19.05mm)	.7500	.060	3/4	6	3	166.11	158.89	151.67	144.44
21047	3/4 (19.05mm)	.7500	.090	3/4	6	3	166.11	158.89	151.67	144.44
21057	3/4 (19.05mm)	.7500	.125	3/4	6	3	166.11	158.89	151.67	144.44
21067	1 (25.40mm)	1.000	.015	1	6	3	276.18	264.17	252.16	240.16
21077	1 (25.40mm)	1.000	.020	1	6	3	276.18	264.17	252.16	240.16
21087	1 (25.40mm)	1.000	.030	1	6	3	276.18	264.17	252.16	240.16
21097	1 (25.40mm)	1.000	.045	1	6	3	276.18	264.17	252.16	240.16
21107	1 (25.40mm)	1.000	.060	1	6	3	276.18	264.17	252.16	240.16
21117	1 (25.40mm)	1.000	.090	1	6	3	276.18	264.17	252.16	240.16
21127	1 (25.40mm)	1.000	.125	1	6	3	276.18	264.17	252.16	240.16

Series 720M & 740M 2 Flute
 Series 723M & 743M 3 Flute
 Series 730M & 750M 4 Flute
 (fractional) (metric)

NEW SERIES



Extra Length - Ball End 30° Helix

Extended reach

Can be modified with a neck within 48 hours

Radius tolerance +.000–.001" (+0.000–0.025mm)

Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 –.002" (+0.000 –0.050mm)

$\varnothing d_2$ –.0001 –.0004" (–0.0025 –0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
97010	98010	99010	3mm	.1181	3mm	50mm	16mm	10.28	9.83	9.39	8.94
97020	98020	99020	3mm	.1181	3mm	76mm	20mm	16.92	16.18	15.45	14.71
97030	98030	99030	3mm	.1181	3mm	76mm	25mm	16.92	16.18	15.45	14.71
43010	55510	44010	1/8 (3.17mm)	.1250	1/8	2	5/8	10.42	9.97	9.51	9.06
43020	55520	44020	1/8 (3.17mm)	.1250	1/8	3	3/4	16.08	15.38	14.68	13.98
43030	55530	44030	1/8 (3.17mm)	.1250	1/8	3	1	16.08	15.38	14.68	13.98
97040	98040	99040	4mm	.1575	4mm	50mm	16mm	10.71	10.24	9.78	9.31
97050	98050	99050	4mm	.1575	4mm	76mm	20mm	17.28	16.53	15.78	15.03
97060	98060	99060	4mm	.1575	4mm	76mm	25mm	17.28	16.53	15.78	15.03
43040	55540	44040	3/16 (4.76mm)	.1875	3/16	3	1	17.73	16.96	16.19	15.42
43050	55550	44050	3/16 (4.76mm)	.1875	3/16	3	1-1/8	17.73	16.96	16.19	15.42
43060	55560	44060	3/16 (4.76mm)	.1875	3/16	4	1	19.09	18.26	17.43	16.60
97070	98070	99070	5mm	.1969	5mm	50mm	16mm	12.39	11.85	11.31	10.77
97080	98080	99080	5mm	.1969	5mm	76mm	20mm	18.66	17.85	17.04	16.23
97090	98090	99090	5mm	.1969	5mm	76mm	25mm	18.66	17.85	17.04	16.23
97100	98100	99100	6mm	.2362	6mm	76mm	25mm	21.61	20.67	19.73	18.79
97110	98110	99110	6mm	.2362	6mm	101mm	25mm	22.74	21.75	20.76	19.77
97120	98120	99120	6mm	.2362	6mm	101mm	32mm	22.74	21.75	20.76	19.77
97130	98130	99130	6mm	.2362	6mm	152mm	38mm	29.56	28.27	26.99	25.70
43070	55570	44070	1/4 (6.35mm)	.2500	1/4	3	1	20.53	19.64	18.74	17.85
43080	55580	44080	1/4 (6.35mm)	.2500	1/4	4	1	21.60	20.66	19.72	18.78
43090	55590	44090	1/4 (6.35mm)	.2500	1/4	4	1-1/2	21.60	20.66	19.72	18.78
43100	55600	44100	1/4 (6.35mm)	.2500	1/4	6	1-1/2	28.08	26.86	25.64	24.42
43110	55610	44110	5/16 (7.94mm)	.3125	5/16	3	1	25.36	24.26	23.15	22.05
43120	55620	44120	5/16 (7.94mm)	.3125	5/16	4	1	28.30	27.07	25.84	24.61
43130	55630	44130	5/16 (7.94mm)	.3125	5/16	4	1-5/8	28.30	27.07	25.84	24.61
43140	55640	44140	5/16 (7.94mm)	.3125	5/16	6	1-1/2	41.98	40.15	38.33	36.50
97140	98140	99140	8mm	.3150	8mm	76mm	25mm	26.69	25.53	24.37	23.21
97150	98150	99150	8mm	.3150	8mm	101mm	25mm	29.79	28.49	27.20	25.90
97160	98160	99160	8mm	.3150	8mm	101mm	41mm	29.79	28.49	27.20	25.90
97170	98170	99170	8mm	.3150	8mm	152mm	50mm	43.08	41.21	39.33	37.46
43150	55650	44150	3/8 (9.52mm)	.3750	3/8	3	1	28.53	27.29	26.05	24.81
43160	55660	44160	3/8 (9.52mm)	.3750	3/8	4	1	31.31	29.95	28.59	27.23
43170	55670	44170	3/8 (9.52mm)	.3750	3/8	4	2	31.31	29.95	28.59	27.23
43180	55680	44180	3/8 (9.52mm)	.3750	3/8	6	1-1/2	43.45	41.56	39.67	37.78
43190	55690	44190	3/8 (9.52mm)	.3750	3/8	6	3	43.45	41.56	39.67	37.78
97180	98180	99180	10mm	.3937	10mm	76mm	25mm	30.83	29.49	28.15	26.81
97190	98190	99190	10mm	.3937	10mm	101mm	25mm	40.40	38.64	36.89	35.13
97200	98200	99200	10mm	.3937	10mm	101mm	50mm	40.40	38.64	36.89	35.13
97210	98210	99210	10mm	.3937	10mm	152mm	38mm	51.97	49.71	47.45	45.19
97220	98220	99220	10mm	.3937	10mm	152mm	76mm	51.97	49.71	47.45	45.19



2 Flute Series 720M & 740M

3 Flute Series 723M & 743M

4 Flute Series 730M & 750M

(fractional)

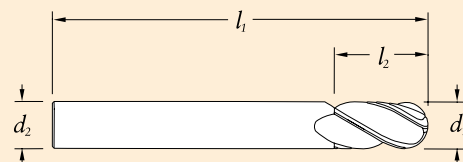
(metric)

END MILLS

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter [†]	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
43200	55700	44200	7/16 (11.11mm)	.4375	7/16	4	1	43.10	41.23	39.35	37.48
43210	55710	44210	7/16 (11.11mm)	.4375	7/16	4	2	43.10	41.23	39.35	37.48
43220	55720	44220	7/16 (11.11mm)	.4375	7/16	6	1-1/2	56.02	53.58	51.15	48.71
43230	55730	44230	7/16 (11.11mm)	.4375	7/16	6	3	56.02	53.58	51.15	48.71
97230	98230	99230	12mm	.4724	12mm	101mm	25mm	46.38	44.36	42.35	40.33
97240	98240	99240	12mm	.4724	12mm	101mm	50mm	46.38	44.36	42.35	40.33
97250	98250	99250	12mm	.4724	12mm	152mm	50mm	62.34	59.63	56.92	54.21
97260	98260	99260	12mm	.4724	12mm	152mm	76mm	62.34	59.63	56.92	54.21
43240	55740	44240	1/2 (12.70mm)	.5000	1/2	4	1	44.02	42.11	40.19	38.28
43250	55750	44250	1/2 (12.70mm)	.5000	1/2	4	2	44.02	42.11	40.19	38.28
43260	55760	44260	1/2 (12.70mm)	.5000	1/2	6	1-1/2	62.35	59.64	56.93	54.22
43270	55770	44270	1/2 (12.70mm)	.5000	1/2	6	3	62.35	59.64	56.93	54.22
97270	98270	99270	14mm	.5512	14mm	101mm	25mm	64.10	61.31	58.53	55.74
97280	98280	99280	14mm	.5512	14mm	101mm	50mm	64.10	61.31	58.53	55.74
97290	98290	99290	14mm	.5512	14mm	152mm	50mm	87.01	83.23	79.44	75.66
97300	98300	99300	14mm	.5512	14mm	152mm	76mm	87.01	83.23	79.44	75.66
43280	55780	44280	9/16 (14.29mm)	.5625	9/16	6	2	87.00	83.22	79.43	75.65
43290	55790	44290	9/16 (14.29mm)	.5625	9/16	6	3	87.00	83.22	79.43	75.65
43300	55800	44300	5/8 (15.87mm)	.6250	5/8	6	2	91.68	87.69	83.71	79.72
43310	55810	44310	5/8 (15.87mm)	.6250	5/8	6	3	91.68	87.69	83.71	79.72
97310	98310	99310	16mm	.6299	16mm	152mm	50mm	91.67	87.68	83.70	79.71
97320	98320	99320	16mm	.6299	16mm	152mm	76mm	91.67	87.68	83.70	79.71
97330	98330	99330	18mm	.7087	18mm	152mm	50mm	141.02	134.89	128.76	122.63
97340	98340	99340	18mm	.7087	18mm	152mm	76mm	141.02	134.89	128.76	122.63
43320	55820	44320	3/4 (19.05mm)	.7500	3/4	6	2	150.45	143.91	137.37	130.83
43330	55830	44330	3/4 (19.05mm)	.7500	3/4	6	3	150.45	143.91	137.37	130.83
97350	98350	99350	20mm	.7874	20mm	152mm	50mm	155.05	148.31	141.57	134.83
97360	98360	99360	20mm	.7874	20mm	152mm	76mm	155.05	148.31	141.57	134.83
97370	98370	99370	25mm	.9843	25mm	152mm	50mm	246.03	235.33	224.64	213.94
97380	98380	99380	25mm	.9843	25mm	152mm	76mm	246.03	235.33	224.64	213.94
43340	55840	44340	1 (25.40mm)	1.000	1	6	2	255.85	244.73	233.60	222.48
43350	55850	44350	1 (25.40mm)	1.000	1	6	3	255.85	244.73	233.60	222.48

Series 720MC 2 Flute
 Series 723MC 3 Flute
 Series 730MC 4 Flute
 (fractional)

NEW
 SERIES



Extra Length - Ball End TiCN Coated - 30° Helix

Extended reach

Can be modified with a neck within 48 hours

Radius tolerance $+0.000-0.001"$ ($+0.000-0.025\text{mm}$)

Improved abrasion resistance / lubricity

Up to 25% faster than uncoated

Extremely versatile



TOLERANCES

$\varnothing d_1 +0.000 -0.002"$ ($+0.000 -0.050\text{mm}$)

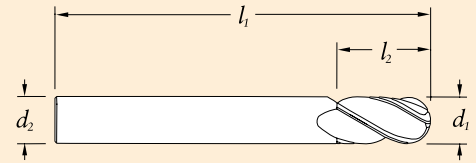
$\varnothing d_2 -0.0001 -0.0004"$ ($-0.0025 -0.0100\text{mm}$)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
43014	55514	44014	1/8 (3.17mm)	.1250	1/8	2	5/8	11.99	11.47	10.95	10.43
43024	55524	44024	1/8 (3.17mm)	.1250	1/8	3	3/4	18.01	17.23	16.44	15.66
43034	55534	44034	1/8 (3.17mm)	.1250	1/8	3	1	18.01	17.23	16.44	15.66
43044	55544	44044	3/16 (4.76mm)	.1875	3/16	3	1	19.94	19.07	18.21	17.34
43054	55554	44054	3/16 (4.76mm)	.1875	3/16	3	1-1/8	19.94	19.07	18.21	17.34
43064	55564	44064	3/16 (4.76mm)	.1875	3/16	4	1	21.65	20.71	19.77	18.83
43074	55574	44074	1/4 (6.35mm)	.2500	1/4	3	1	23.74	22.71	21.68	20.64
43084	55584	44084	1/4 (6.35mm)	.2500	1/4	4	1	25.07	23.98	22.89	21.80
43094	55594	44094	1/4 (6.35mm)	.2500	1/4	4	1-1/2	25.07	23.98	22.89	21.80
43104	55604	44104	1/4 (6.35mm)	.2500	1/4	6	1-1/2	34.07	32.59	31.11	29.63
43114	55614	44114	5/16 (7.94mm)	.3125	5/16	3	1	29.66	28.37	27.08	25.79
43124	55624	44124	5/16 (7.94mm)	.3125	5/16	4	1	33.63	32.17	30.71	29.24
43134	55634	44134	5/16 (7.94mm)	.3125	5/16	4	1-5/8	33.63	32.17	30.71	29.24
43144	55644	44144	5/16 (7.94mm)	.3125	5/16	6	1-1/2	49.17	47.03	44.89	42.76
43154	55654	44154	3/8 (9.52mm)	.3750	3/8	3	1	32.82	31.39	29.97	28.54
43164	55664	44164	3/8 (9.52mm)	.3750	3/8	4	1	36.64	35.05	33.45	31.86
43174	55674	44174	3/8 (9.52mm)	.3750	3/8	4	2	36.64	35.05	33.45	31.86
43184	55684	44184	3/8 (9.52mm)	.3750	3/8	6	1-1/2	50.65	48.45	46.25	44.04
43194	55694	44194	3/8 (9.52mm)	.3750	3/8	6	3	50.65	48.45	46.25	44.04
43204	55704	44204	7/16 (11.11mm)	.4375	7/16	4	1	49.53	47.38	45.22	43.07
43214	55714	44214	7/16 (11.11mm)	.4375	7/16	4	2	49.53	47.38	45.22	43.07
43224	55724	44224	7/16 (11.11mm)	.4375	7/16	6	1-1/2	65.12	62.29	59.46	56.63
43234	55734	44234	7/16 (11.11mm)	.4375	7/16	6	3	65.12	62.29	59.46	56.63
43244	55744	44244	1/2 (12.70mm)	.5000	1/2	4	1	50.45	48.26	46.06	43.87
43254	55754	44254	1/2 (12.70mm)	.5000	1/2	4	2	50.45	48.26	46.06	43.87
43264	55764	44264	1/2 (12.70mm)	.5000	1/2	6	1-1/2	71.45	68.34	65.24	62.13
43274	55774	44274	1/2 (12.70mm)	.5000	1/2	6	3	71.45	68.34	65.24	62.13
43284	55784	44284	9/16 (14.29mm)	.5625	9/16	6	2	98.24	93.97	89.70	85.43
43294	55794	44294	9/16 (14.29mm)	.5625	9/16	6	3	98.24	93.97	89.70	85.43
43304	55804	44304	5/8 (15.87mm)	.6250	5/8	6	2	102.91	98.44	93.96	89.49
43314	55814	44314	5/8 (15.87mm)	.6250	5/8	6	3	102.91	98.44	93.96	89.49
43324	55824	44324	3/4 (19.05mm)	.7500	3/4	6	2	163.29	156.19	149.09	141.99
43334	55834	44334	3/4 (19.05mm)	.7500	3/4	6	3	163.29	156.19	149.09	141.99
43344	55844	44344	1 (25.40mm)	1.000	1	6	2	274.01	262.10	250.18	238.27
43354	55854	44354	1 (25.40mm)	1.000	1	6	3	274.01	262.10	250.18	238.27

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Series 720MA & 740MA 2 Flute
 Series 723MA & 743MA 3 Flute
 Series 730MA & 750MA 4 Flute
 (fractional) (metric)

NEW
SERIES



Extra Length - Ball End TiAlN Coated - 30° Helix

Extended reach
 Can be modified with a neck within 48 hours
 Radius tolerance +.000-.001" (+0.000-0.025mm)
 Dry or semi-dry machining
 Up to 40% faster than uncoated
 Extremely versatile



TOLERANCES

$\varnothing d_1$ +.000 - .002" (+0.000 - 0.050mm)
 $\varnothing d_2$ -.0001 - .0004" (-0.0025 - 0.0100mm)

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter†	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
97017	98017	99017	3mm	.1181	3mm	50mm	16mm	11.70	11.19	10.68	10.17
97027	98027	99027	3mm	.1181	3mm	76mm	20mm	18.71	17.90	17.08	16.27
97037	98037	99037	3mm	.1181	3mm	76mm	25mm	18.71	17.90	17.08	16.27
43017	55517	44017	1/8 (3.17mm)	.1250	1/8	2	5/8	12.20	11.67	11.14	10.61
43027	55527	44027	1/8 (3.17mm)	.1250	1/8	3	3/4	18.27	17.48	16.68	15.89
43037	55537	44037	1/8 (3.17mm)	.1250	1/8	3	1	18.27	17.48	16.68	15.89
97047	98047	99047	4mm	.1575	4mm	50mm	16mm	12.50	11.96	11.41	10.87
97057	98057	99057	4mm	.1575	4mm	76mm	20mm	20.08	19.21	18.33	17.46
97067	98067	99067	4mm	.1575	4mm	76mm	25mm	20.08	19.21	18.33	17.46
43047	55547	44047	3/16 (4.76mm)	.1875	3/16	3	1	20.52	19.63	18.74	17.84
43057	55557	44057	3/16 (4.76mm)	.1875	3/16	3	1-1/8	20.52	19.63	18.74	17.84
43067	55567	44067	3/16 (4.76mm)	.1875	3/16	4	1	22.34	21.37	20.40	19.43
97077	98077	99077	5mm	.1969	5mm	50mm	16mm	15.18	14.52	13.86	13.20
97087	98087	99087	5mm	.1969	5mm	76mm	20mm	22.36	21.39	20.42	19.44
97097	98097	99097	5mm	.1969	5mm	76mm	25mm	22.36	21.39	20.42	19.44
97107	98107	99107	6mm	.2362	6mm	76mm	25mm	25.30	24.20	23.10	22.00
97117	98117	99117	6mm	.2362	6mm	101mm	25mm	27.07	25.89	24.72	23.54
97127	98127	99127	6mm	.2362	6mm	101mm	32mm	27.07	25.89	24.72	23.54
97137	98137	99137	6mm	.2362	6mm	152mm	38mm	35.66	34.11	32.56	31.01
43077	55577	44077	1/4 (6.35mm)	.2500	1/4	3	1	24.23	23.18	22.12	21.07
43087	55587	44087	1/4 (6.35mm)	.2500	1/4	4	1	25.94	24.81	23.68	22.56
43097	55597	44097	1/4 (6.35mm)	.2500	1/4	4	1-1/2	25.94	24.81	23.68	22.56
43107	55607	44107	1/4 (6.35mm)	.2500	1/4	6	1-1/2	34.19	32.70	31.22	29.73
43117	55617	44117	5/16 (7.94mm)	.3125	5/16	3	1	30.90	29.56	28.21	26.87
43127	55627	44127	5/16 (7.94mm)	.3125	5/16	4	1	35.34	33.80	32.27	30.73
43137	55637	44137	5/16 (7.94mm)	.3125	5/16	4	1-5/8	35.34	33.80	32.27	30.73
43147	55647	44147	5/16 (7.94mm)	.3125	5/16	6	1-1/2	51.60	49.36	47.11	44.87
97147	98147	99147	8mm	.3150	8mm	76mm	25mm	32.21	30.81	29.41	28.01
97157	98157	99157	8mm	.3150	8mm	101mm	25mm	36.81	35.21	33.61	32.01
97167	98167	99167	8mm	.3150	8mm	101mm	41mm	36.81	35.21	33.61	32.01
97177	98177	99177	8mm	.3150	8mm	152mm	50mm	52.70	50.41	48.12	45.83
43157	55657	44157	3/8 (9.52mm)	.3750	3/8	3	1	34.07	32.59	31.11	29.63
43167	55667	44167	3/8 (9.52mm)	.3750	3/8	4	1	38.34	36.67	35.01	33.34
43177	55677	44177	3/8 (9.52mm)	.3750	3/8	4	2	38.34	36.67	35.01	33.34
43187	55687	44187	3/8 (9.52mm)	.3750	3/8	6	1-1/2	53.08	50.77	48.46	46.16
43197	55697	44197	3/8 (9.52mm)	.3750	3/8	6	3	53.08	50.77	48.46	46.16
97187	98187	99187	10mm	.3937	10mm	76mm	25mm	37.13	35.52	33.90	32.29
97197	98197	99197	10mm	.3937	10mm	101mm	25mm	48.54	46.43	44.32	42.21
97207	98207	99207	10mm	.3937	10mm	101mm	50mm	48.54	46.43	44.32	42.21
97217	98217	99217	10mm	.3937	10mm	152mm	38mm	63.41	60.65	57.90	55.14
97227	98227	99227	10mm	.3937	10mm	152mm	76mm	63.41	60.65	57.90	55.14



2 Flute Series 720MA & 740MA
 3 Flute Series 723MA & 743MA
 4 Flute Series 730MA & 750MA
 (fractional) (metric)

END MILLS

2 Flute EDP#	3 Flute EDP#	4 Flute EDP#	d_1 Flute Diameter ⁱ	Decimal Equivalent	d_2 Shank Diameter	l_1 Overall Length	l_2 Flute Length	1 - 11	12 - 24	25 - 49	50 - 100
43207	55707	44207	7/16 (11.11mm)	.4375	7/16	4	1	51.26	49.03	46.80	44.57
43217	55717	44217	7/16 (11.11mm)	.4375	7/16	4	2	51.26	49.03	46.80	44.57
43227	55727	44227	7/16 (11.11mm)	.4375	7/16	6	1-1/2	67.47	64.54	61.60	58.67
43237	55737	44237	7/16 (11.11mm)	.4375	7/16	6	3	67.47	64.54	61.60	58.67
97237	98237	99237	12mm	.4724	12mm	101mm	25mm	54.52	52.15	49.78	47.41
97247	98247	99247	12mm	.4724	12mm	101mm	50mm	54.52	52.15	49.78	47.41
97257	98257	99257	12mm	.4724	12mm	152mm	50mm	73.80	70.59	67.38	64.17
97267	98267	99267	12mm	.4724	12mm	152mm	76mm	73.80	70.59	67.38	64.17
43247	55747	44247	1/2 (12.70mm)	.5000	1/2	4	1	52.18	49.91	47.64	45.37
43257	55757	44257	1/2 (12.70mm)	.5000	1/2	4	2	52.18	49.91	47.64	45.37
43267	55767	44267	1/2 (12.70mm)	.5000	1/2	6	1-1/2	73.80	70.59	67.38	64.17
43277	55777	44277	1/2 (12.70mm)	.5000	1/2	6	3	73.80	70.59	67.38	64.17
97277	98277	99277	14mm	.5512	14mm	101mm	25mm	73.21	70.03	66.84	63.66
97287	98287	99287	14mm	.5512	14mm	101mm	50mm	73.21	70.03	66.84	63.66
97297	98297	99297	14mm	.5512	14mm	152mm	50mm	100.52	96.15	91.78	87.41
97307	98307	99307	14mm	.5512	14mm	152mm	76mm	100.52	96.15	91.78	87.41
43287	55787	44287	9/16 (14.29mm)	.5625	9/16	6	2	100.52	96.15	91.78	87.41
43297	55797	44297	9/16 (14.29mm)	.5625	9/16	6	3	100.52	96.15	91.78	87.41
43307	55807	44307	5/8 (15.87mm)	.6250	5/8	6	2	105.19	100.62	96.04	91.47
43317	55817	44317	5/8 (15.87mm)	.6250	5/8	6	3	105.19	100.62	96.04	91.47
97317	98317	99317	16mm	.6299	16mm	152mm	50mm	105.19	100.62	96.04	91.47
97327	98327	99327	16mm	.6299	16mm	152mm	76mm	105.19	100.62	96.04	91.47
97337	98337	99337	18mm	.7087	18mm	152mm	50mm	156.68	149.87	143.06	136.24
97347	98347	99347	18mm	.7087	18mm	152mm	76mm	156.68	149.87	143.06	136.24
43327	55827	44327	3/4 (19.05mm)	.7500	3/4	6	2	166.11	158.89	151.67	144.44
43337	55837	44337	3/4 (19.05mm)	.7500	3/4	6	3	166.11	158.89	151.67	144.44
97357	98357	99357	20mm	.7874	20mm	152mm	50mm	175.38	167.75	160.13	152.51
97367	98367	99367	20mm	.7874	20mm	152mm	76mm	175.38	167.75	160.13	152.51
97377	98377	99377	25mm	.9843	25mm	152mm	50mm	266.35	254.77	243.19	231.61
97387	98387	99387	25mm	.9843	25mm	152mm	76mm	266.35	254.77	243.19	231.61
43347	55847	44347	1 (25.40mm)	1.000	1	6	2	276.18	264.17	252.16	240.16
43357	55857	44357	1 (25.40mm)	1.000	1	6	3	276.18	264.17	252.16	240.16

Cylindrical Shape Standard Carbide Rotary Files

1/4" Steel Shanks

A – Aluminum Cut
D – Double Cut
* – Solid Carbide



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
60010	* SA-14	3/16 (4.76mm)	.1875	5/8	1/4	6.62	6.33	6.04	5.76
60012	* SA-14D	3/16 (4.76mm)	.1875	5/8	1/4	6.62	6.33	6.04	5.76
60020	* SA-1	1/4 (6.35mm)	.2500	5/8	1/4	5.88	5.62	5.37	5.11
60021	* SA-1A	1/4 (6.35mm)	.2500	5/8	1/4	7.39	7.07	6.75	6.43
60022	* SA-1D	1/4 (6.35mm)	.2500	5/8	1/4	5.88	5.62	5.37	5.11
60030	SA-2	5/16 (7.94mm)	.3125	3/4	1/4	8.23	7.87	7.51	7.16
60032	SA-2D	5/16 (7.94mm)	.3125	3/4	1/4	8.23	7.87	7.51	7.16
60040	SA-3	3/8 (9.52mm)	.3750	3/4	1/4	8.87	8.48	8.10	7.71
60041	SA-3A	3/8 (9.52mm)	.3750	3/4	1/4	11.93	11.41	10.89	10.37
60042	SA-3D	3/8 (9.52mm)	.3750	3/4	1/4	8.87	8.48	8.10	7.71
60050	SA-4	7/16 (11.11mm)	.4375	1	1/4	12.24	11.71	11.18	10.64
60052	SA-4D	7/16 (11.11mm)	.4375	1	1/4	12.24	11.71	11.18	10.64
60060	SA-5	1/2 (12.70mm)	.5000	1	1/4	13.06	12.49	11.92	11.36
60061	SA-5A	1/2 (12.70mm)	.5000	1	1/4	16.92	16.18	15.45	14.71
60062	SA-5D	1/2 (12.70mm)	.5000	1	1/4	13.06	12.49	11.92	11.36
60070	SA-6	5/8 (15.87mm)	.6250	1	1/4	15.82	15.13	14.44	13.76
60071	SA-6A	5/8 (15.87mm)	.6250	1	1/4	22.72	21.73	20.74	19.76
60072	SA-6D	5/8 (15.87mm)	.6250	1	1/4	15.82	15.13	14.44	13.76
60080	SA-7	3/4 (19.05mm)	.7500	1	1/4	25.04	23.95	22.86	21.77
60081	SA-7A	3/4 (19.05mm)	.7500	1	1/4	30.04	28.73	27.43	26.12
60082	SA-7D	3/4 (19.05mm)	.7500	1	1/4	25.04	23.95	22.86	21.77
60090	SA-9	1 (25.40mm)	1.000	1	1/4	32.17	30.77	29.37	27.97
60091	SA-9A	1 (25.40mm)	1.000	1	1/4	38.59	36.91	35.23	33.56
60092	SA-9D	1 (25.40mm)	1.000	1	1/4	32.17	30.77	29.37	27.97

Basic Cut Styles Available



Standard Cut



Chipbreaker Cut


Double Cut
(D)

Diamond Cut
(add 20%)

Aluminum Cut
(A)

End Cut
(add 10%)

Double Cut and Aluminum Cut rotary files are in stock where indicated by (D) and (A) in the catalog tables.



Cylindrical-Radius Shape Standard Carbide Rotary Files

A – Aluminum Cut

D – Double Cut

* – Solid Carbide

1/4" Steel Shanks

EDP#	Tool Number	Flute Diameter [†]	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
61010	*SC-14	3/16 (4.76mm)	.1875	5/8	1/4	7.48	7.15	6.83	6.50
61012	*SC-14D	3/16 (4.76mm)	.1875	5/8	1/4	7.48	7.15	6.83	6.50
61020	*SC-1	1/4 (6.35mm)	.2500	5/8	1/4	7.05	6.74	6.44	6.13
61021	*SC-1A	1/4 (6.35mm)	.2500	5/8	1/4	8.61	8.24	7.86	7.49
61022	*SC-1D	1/4 (6.35mm)	.2500	5/8	1/4	7.05	6.74	6.44	6.13
61030	SC-2	5/16 (7.94mm)	.3125	3/4	1/4	8.23	7.87	7.51	7.16
61032	SC-2D	5/16 (7.94mm)	.3125	3/4	1/4	8.23	7.87	7.51	7.16
61040	SC-3	3/8 (9.52mm)	.3750	3/4	1/4	9.61	9.19	8.77	8.36
61041	SC-3A	3/8 (9.52mm)	.3750	3/4	1/4	16.63	15.91	15.18	14.46
61042	SC-3D	3/8 (9.52mm)	.3750	3/4	1/4	9.61	9.19	8.77	8.36
61050	SC-4	7/16 (11.11mm)	.4375	1	1/4	13.88	13.28	12.67	12.07
61052	SC-4D	7/16 (11.11mm)	.4375	1	1/4	13.88	13.28	12.67	12.07
61060	SC-5	1/2 (12.70mm)	.5000	1	1/4	14.39	13.76	13.14	12.51
61061	SC-5A	1/2 (12.70mm)	.5000	1	1/4	21.89	20.94	19.99	19.03
61062	SC-5D	1/2 (12.70mm)	.5000	1	1/4	14.39	13.76	13.14	12.51
61070	SC-6	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
61071	SC-6A	5/8 (15.87mm)	.6250	1	1/4	29.97	28.67	27.36	26.06
61072	SC-6D	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
61080	SC-7	3/4 (19.05mm)	.7500	1	1/4	28.30	27.07	25.84	24.61
61081	SC-7A	3/4 (19.05mm)	.7500	1	1/4	41.62	39.81	38.00	36.19
61082	SC-7D	3/4 (19.05mm)	.7500	1	1/4	28.30	27.07	25.84	24.61

Ball Shape Standard Carbide Rotary Files

1/4" Steel Shanks

A – Aluminum Cut

D – Double Cut

* – Solid Carbide



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
62010	* SD-14	3/16 (4.76mm)	.1875	—	1/4	7.48	7.15	6.83	6.50
62012	* SD-14D	3/16 (4.76mm)	.1875	—	1/4	7.48	7.15	6.83	6.50
62020	* SD-1	1/4 (6.35mm)	.2500	—	1/4	7.48	7.15	6.83	6.50
62021	* SD-1A	1/4 (6.35mm)	.2500	—	1/4	11.87	11.35	10.84	10.32
62022	* SD-1D	1/4 (6.35mm)	.2500	—	1/4	7.48	7.15	6.83	6.50
62030	SD-2	5/16 (7.94mm)	.3125	—	1/4	7.05	6.74	6.44	6.13
62032	SD-2D	5/16 (7.94mm)	.3125	—	1/4	7.05	6.74	6.44	6.13
62040	SD-3	3/8 (9.52mm)	.3750	—	1/4	7.64	7.31	6.98	6.64
62041	SD-3A	3/8 (9.52mm)	.3750	—	1/4	12.37	11.83	11.29	10.76
62042	SD-3D	3/8 (9.52mm)	.3750	—	1/4	7.64	7.31	6.98	6.64
62050	SD-4	7/16 (11.11mm)	.4375	—	1/4	11.11	10.63	10.14	9.66
62052	SD-4D	7/16 (11.11mm)	.4375	—	1/4	11.11	10.63	10.14	9.66
62060	SD-5	1/2 (12.70mm)	.5000	—	1/4	11.45	10.95	10.45	9.96
62061	SD-5A	1/2 (12.70mm)	.5000	—	1/4	15.32	14.65	13.99	13.32
62062	SD-5D	1/2 (12.70mm)	.5000	—	1/4	11.45	10.95	10.45	9.96
62070	SD-6	5/8 (15.87mm)	.6250	—	1/4	12.81	12.25	11.70	11.14
62071	SD-6A	5/8 (15.87mm)	.6250	—	1/4	19.92	19.05	18.19	17.32
62072	SD-6D	5/8 (15.87mm)	.6250	—	1/4	12.81	12.25	11.70	11.14
62080	SD-7	3/4 (19.05mm)	.7500	—	1/4	18.24	17.45	16.65	15.86
62082	SD-7D	3/4 (19.05mm)	.7500	—	1/4	18.24	17.45	16.65	15.86
62090	SD-9	1 (25.40mm)	1.000	—	1/4	33.84	32.37	30.90	29.43
62092	SD-9D	1 (25.40mm)	1.000	—	1/4	33.84	32.37	30.90	29.43



Egg Shape Standard Carbide Rotary Files

A – Aluminum Cut

D – Double Cut

* – Solid Carbide

1/4" Steel Shanks

EDP#	Tool Number	Flute Diameter ¹	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
63010	*SE-1	1/4 (6.35mm)	.2500	3/8	1/4	7.69	7.36	7.02	6.69
63012	*SE-1D	1/4 (6.35mm)	.2500	3/8	1/4	7.69	7.36	7.02	6.69
63020	SE-3	3/8 (9.52mm)	.3750	5/8	1/4	10.68	10.22	9.75	9.29
63021	SE-3A	3/8 (9.52mm)	.3750	5/8	1/4	15.48	14.81	14.13	13.46
63022	SE-3D	3/8 (9.52mm)	.3750	5/8	1/4	10.68	10.22	9.75	9.29
63030	SE-5	1/2 (12.70mm)	.5000	7/8	1/4	13.67	13.08	12.48	11.89
63031	SE-5A	1/2 (12.70mm)	.5000	7/8	1/4	22.23	21.26	20.30	19.33
63032	SE-5D	1/2 (12.70mm)	.5000	7/8	1/4	13.67	13.08	12.48	11.89
63040	SE-6	5/8 (15.87mm)	.6250	1	1/4	20.09	19.22	18.34	17.47
63041	SE-6A	5/8 (15.87mm)	.6250	1	1/4	32.99	31.56	30.12	28.69
63042	SE-6D	5/8 (15.87mm)	.6250	1	1/4	20.09	19.22	18.34	17.47
63050	SE-7	3/4 (19.05mm)	.7500	1	1/4	27.67	26.47	25.26	24.06
63052	SE-7D	3/4 (19.05mm)	.7500	1	1/4	27.67	26.47	25.26	24.06

Series SF



Tree-Radius Shape Standard Carbide Rotary Files

A – Aluminum Cut

D – Double Cut

* – Solid Carbide

1/4" Steel Shanks

EDP#	Tool Number	Flute Diameter ¹	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
64010	*SF-1	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
64011	*SF-1A	1/4 (6.35mm)	.2500	5/8	1/4	11.87	11.35	10.84	10.32
64012	*SF-1D	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
64020	SF-3	3/8 (9.52mm)	.3750	3/4	1/4	9.27	8.87	8.46	8.06
64021	SF-3A	3/8 (9.52mm)	.3750	3/4	1/4	14.96	14.31	13.66	13.01
64022	SF-3D	3/8 (9.52mm)	.3750	3/4	1/4	9.27	8.87	8.46	8.06
64030	SF-5	1/2 (12.70mm)	.5000	1	1/4	13.88	13.28	12.67	12.07
64031	SF-5A	1/2 (12.70mm)	.5000	1	1/4	21.16	20.24	19.32	18.40
64032	SF-5D	1/2 (12.70mm)	.5000	1	1/4	13.88	13.28	12.67	12.07
64040	SF-6	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
64041	SF-6A	5/8 (15.87mm)	.6250	1	1/4	29.42	28.14	26.86	25.58
64042	SF-6D	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
64050	SF-14	3/4 (19.05mm)	.7500	1-1/4	1/4	29.62	28.33	27.04	25.76
64052	SF-14D	3/4 (19.05mm)	.7500	1-1/4	1/4	29.62	28.33	27.04	25.76

Tree-Pointed Shape Standard Carbide Rotary Files

1/4" Steel Shanks

D – Double Cut
* – Solid Carbide



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
65010	* SG-1	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
65012	* SG-1D	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
65020	SG-3	3/8 (9.52mm)	.3750	3/4	1/4	9.89	9.46	9.03	8.60
65022	SG-3D	3/8 (9.52mm)	.3750	3/4	1/4	9.89	9.46	9.03	8.60
65030	SG-13	1/2 (12.70mm)	.5000	3/4	1/4	13.24	12.66	12.09	11.51
65032	SG-13D	1/2 (12.70mm)	.5000	3/4	1/4	13.24	12.66	12.09	11.51
65040	SG-5	1/2 (12.70mm)	.5000	1	1/4	13.69	13.09	12.50	11.90
65042	SG-5D	1/2 (12.70mm)	.5000	1	1/4	13.69	13.09	12.50	11.90
65050	SG-6	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
65052	SG-6D	5/8 (15.87mm)	.6250	1	1/4	19.22	18.38	17.55	16.71
65060	SG-7	3/4 (19.05mm)	.7500	1	1/4	25.42	24.31	23.21	22.10
65062	SG-7D	3/4 (19.05mm)	.7500	1	1/4	25.42	24.31	23.21	22.10

Series SH

Flame Shape Standard Carbide Rotary Files

1/4" Steel Shanks

D – Double Cut



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
66010	SH-2	5/16 (7.94mm)	.3125	3/4	1/4	9.40	8.99	8.58	8.17
66012	SH-2D	5/16 (7.94mm)	.3125	3/4	1/4	9.40	8.99	8.58	8.17
66020	SH-5	1/2 (12.70mm)	.5000	1-1/4	1/4	19.22	18.38	17.55	16.71
66022	SH-5D	1/2 (12.70mm)	.5000	1-1/4	1/4	19.22	18.38	17.55	16.71
66030	SH-6	5/8 (15.87mm)	.6250	1-7/16	1/4	25.20	24.10	23.01	21.91
66032	SH-6D	5/8 (15.87mm)	.6250	1-7/16	1/4	25.20	24.10	23.01	21.91
66040	SH-7	3/4 (19.05mm)	.7500	1-5/8	1/4	30.97	29.62	28.28	26.93
66042	SH-7D	3/4 (19.05mm)	.7500	1-5/8	1/4	30.97	29.62	28.28	26.93



(60° included angle) Taper Shape Standard Carbide Rotary Files

D – Double Cut

** – Solid Carbide/Double End

1/4" Steel Shanks

EDP#	Tool Number	Flute Diameter ¹	Decimal Equivalent	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
67010	** SJ-1	1/4 (6.35mm)	.2500	1/4	9.67	9.25	8.83	8.41
67012	** SJ-1D	1/4 (6.35mm)	.2500	1/4	9.67	9.25	8.83	8.41
67020	SJ-3	3/8 (9.52mm)	.3750	1/4	8.12	7.77	7.41	7.06
67022	SJ-3D	3/8 (9.52mm)	.3750	1/4	8.12	7.77	7.41	7.06
67030	SJ-5	1/2 (12.70mm)	.5000	1/4	10.02	9.58	9.15	8.71
67032	SJ-5D	1/2 (12.70mm)	.5000	1/4	10.02	9.58	9.15	8.71
67040	SJ-6	5/8 (15.87mm)	.6250	1/4	13.35	12.77	12.19	11.61
67042	SJ-6D	5/8 (15.87mm)	.6250	1/4	13.35	12.77	12.19	11.61
67050	SJ-7	3/4 (19.05mm)	.7500	1/4	17.51	16.75	15.99	15.23
67052	SJ-7D	3/4 (19.05mm)	.7500	1/4	17.51	16.75	15.99	15.23
67060	SJ-8	7/8 (22.22mm)	.8750	1/4	26.50	25.35	24.20	23.04
67062	SJ-8D	7/8 (22.22mm)	.8750	1/4	26.50	25.35	24.20	23.04
67070	SJ-9	1 (25.40mm)	1.000	1/4	28.09	26.87	25.65	24.43
67072	SJ-9D	1 (25.40mm)	1.000	1/4	28.09	26.87	25.65	24.43

Series SK



(90° included angle) Taper Shape Standard Carbide Rotary Files

D – Double Cut

** – Solid Carbide/Double End

1/4" Steel Shanks

EDP#	Tool Number	Flute Diameter ¹	Decimal Equivalent	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
68010	** SK-1	1/4 (6.35mm)	.2500	1/4	9.67	9.25	8.83	8.41
68012	** SK-1D	1/4 (6.35mm)	.2500	1/4	9.67	9.25	8.83	8.41
68020	SK-3	3/8 (9.52mm)	.3750	1/4	8.12	7.77	7.41	7.06
68022	SK-3D	3/8 (9.52mm)	.3750	1/4	8.12	7.77	7.41	7.06
68030	SK-5	1/2 (12.70mm)	.5000	1/4	10.02	9.58	9.15	8.71
68032	SK-5D	1/2 (12.70mm)	.5000	1/4	10.02	9.58	9.15	8.71
68040	SK-6	5/8 (15.87mm)	.6250	1/4	13.35	12.77	12.19	11.61
68042	SK-6D	5/8 (15.87mm)	.6250	1/4	13.35	12.77	12.19	11.61
68050	SK-7	3/4 (19.05mm)	.7500	1/4	17.51	16.75	15.99	15.23
68052	SK-7D	3/4 (19.05mm)	.7500	1/4	17.51	16.75	15.99	15.23
68060	SK-8	7/8 (22.22mm)	.8750	1/4	26.50	25.35	24.20	23.04
68062	SK-8D	7/8 (22.22mm)	.8750	1/4	26.50	25.35	24.20	23.04
68070	SK-9	1 (25.40mm)	1.000	1/4	28.09	26.87	25.65	24.43
68072	SK-9D	1 (25.40mm)	1.000	1/4	28.09	26.87	25.65	24.43

Cone-Radius Shape (14° included angle) Standard Carbide Rotary Files

1/4" Steel Shanks

A – Aluminum Cut

D – Double Cut

* – Solid Carbide



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
69010	* SL-1	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
69012	* SL-1D	1/4 (6.35mm)	.2500	5/8	1/4	7.69	7.36	7.02	6.69
69020	SL-2	5/16 (7.94mm)	.3125	7/8	1/4	9.19	8.79	8.39	7.99
69022	SL-2D	5/16 (7.94mm)	.3125	7/8	1/4	9.19	8.79	8.39	7.99
69030	SL-3	3/8 (9.52mm)	.3750	1-1/16	1/4	10.89	10.42	9.94	9.47
69031	SL-3A	3/8 (9.52mm)	.3750	1-1/16	1/4	18.15	17.36	16.57	15.78
69032	SL-3D	3/8 (9.52mm)	.3750	1-1/16	1/4	10.89	10.42	9.94	9.47
69040	SL-4	1/2 (12.70mm)	.5000	1-1/8	1/4	13.24	12.66	12.09	11.51
69041	SL-4A	1/2 (12.70mm)	.5000	1-1/8	1/4	22.49	21.51	20.53	19.56
69042	SL-4D	1/2 (12.70mm)	.5000	1-1/8	1/4	13.24	12.66	12.09	11.51
69050	SL-5	5/8 (15.87mm)	.6250	1-3/16	1/4	26.06	24.93	23.79	22.66
69051	SL-5A	5/8 (15.87mm)	.6250	1-3/16	1/4	32.02	30.63	29.24	27.84
69052	SL-5D	5/8 (15.87mm)	.6250	1-3/16	1/4	26.06	24.93	23.79	22.66
69060	SL-7	3/4 (19.05mm)	.7500	1-1/2	1/4	34.39	32.89	31.40	29.90
69062	SL-7D	3/4 (19.05mm)	.7500	1-1/2	1/4	34.39	32.89	31.40	29.90

Series SM

Cone-Flat Shape (no radius) Standard Carbide Rotary Files

1/4" Steel Shanks

D – Double Cut

* – Solid Carbide



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Included Angle	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
70010	* SM-1	1/4 (6.35mm)	.2500	1/2	22°	1/4	7.69	7.36	7.02	6.69
70012	* SM-1D	1/4 (6.35mm)	.2500	1/2	22°	1/4	7.69	7.36	7.02	6.69
70020	SM-4	3/8 (9.52mm)	.3750	5/8	28°	1/4	10.89	10.42	9.94	9.47
70022	SM-4D	3/8 (9.52mm)	.3750	5/8	28°	1/4	10.89	10.42	9.94	9.47
70030	SM-5	1/2 (12.70mm)	.5000	7/8	28°	1/4	13.67	13.08	12.48	11.89
70032	SM-5D	1/2 (12.70mm)	.5000	7/8	28°	1/4	13.67	13.08	12.48	11.89
70040	SM-6	5/8 (15.87mm)	.6250	1	31°	1/4	18.16	17.37	16.58	15.79
70042	SM-6D	5/8 (15.87mm)	.6250	1	31°	1/4	18.16	17.37	16.58	15.79



Inverted Cone Shape Standard Carbide Rotary Files

D – Double Cut
* – Solid Carbide

1/4" Steel Shanks

ROTARY FILES

EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Included Angle	Shank Diameter	1 - 11	12 - 24	25 - 49	50 - 100
71010	* SN-1	1/4 (6.35mm)	.2500	5/16	10°	1/4	7.69	7.36	7.02	6.69
71012	* SN-1D	1/4 (6.35mm)	.2500	5/16	10°	1/4	7.69	7.36	7.02	6.69
71020	SN-2	3/8 (9.52mm)	.3750	3/8	13°	1/4	9.61	9.19	8.77	8.36
71022	SN-2D	3/8 (9.52mm)	.3750	3/8	13°	1/4	9.61	9.19	8.77	8.36
71030	SN-3	1/2 (12.70mm)	.5000	1/2	16°	1/4	13.24	12.66	12.09	11.51
71032	SN-3D	1/2 (12.70mm)	.5000	1/2	16°	1/4	13.24	12.66	12.09	11.51
71040	SN-5	5/8 (15.87mm)	.6250	5/8	19°	1/4	18.16	17.37	16.58	15.79
71042	SN-5D	5/8 (15.87mm)	.6250	5/8	19°	1/4	18.16	17.37	16.58	15.79
71050	SN-8	3/4 (19.05mm)	.7500	3/4	21°	1/4	21.90	20.95	20.00	19.04
71052	SN-8D	3/4 (19.05mm)	.7500	3/4	21°	1/4	21.90	20.95	20.00	19.04

3/16" Diameter

Solid Carbide Rotary Files

3/16" Shanks

D – Double Cut



EDP#	Tool Number	Flute Diameter [†]	Decimal Equivalent	Flute Length	Included Angle	Overall Length	1 - 11	12 - 24	25 - 49	50 - 100
72010	SA-81	3/16 (4.76mm)	.1875	5/8	—	2	8.42	8.05	7.69	7.32
72012	SA-81D	3/16 (4.76mm)	.1875	5/8	—	2	8.42	8.05	7.69	7.32
72020	SC-81	3/16 (4.76mm)	.1875	5/8	—	2	8.42	8.05	7.69	7.32
72022	SC-81D	3/16 (4.76mm)	.1875	5/8	—	2	8.42	8.05	7.69	7.32
72030	SD-81	3/16 (4.76mm)	.1875	—	—	2	8.42	8.05	7.69	7.32
72032	SD-81D	3/16 (4.76mm)	.1875	—	—	2	8.42	8.05	7.69	7.32
72040	SE-81	3/16 (4.76mm)	.1875	9/32	—	2	8.42	8.05	7.69	7.32
72042	SE-81D	3/16 (4.76mm)	.1875	9/32	—	2	8.42	8.05	7.69	7.32
72050	SF-81	3/16 (4.76mm)	.1875	1/2	—	2	8.42	8.05	7.69	7.32
72052	SF-81D	3/16 (4.76mm)	.1875	1/2	—	2	8.42	8.05	7.69	7.32
72060	SG-81	3/16 (4.76mm)	.1875	1/2	—	2	8.42	8.05	7.69	7.32
72062	SG-81D	3/16 (4.76mm)	.1875	1/2	—	2	8.42	8.05	7.69	7.32
72070	SJ-81	3/16 (4.76mm)	.1875	—	60°	2	8.42	8.05	7.69	7.32
72072	SJ-81D	3/16 (4.76mm)	.1875	—	60°	2	8.42	8.05	7.69	7.32
72080	SK-81	3/16 (4.76mm)	.1875	—	90°	2	8.42	8.05	7.69	7.32
72082	SK-81D	3/16 (4.76mm)	.1875	—	90°	2	8.42	8.05	7.69	7.32
72090	SL-81	3/16 (4.76mm)	.1875	1/2	14°	2	8.42	8.05	7.69	7.32
72092	SL-81D	3/16 (4.76mm)	.1875	1/2	14°	2	8.42	8.05	7.69	7.32
72100	SM-81	3/16 (4.76mm)	.1875	5/8	12°	2	8.42	8.05	7.69	7.32
72102	SM-81D	3/16 (4.76mm)	.1875	5/8	12°	2	8.42	8.05	7.69	7.32
72110	SN-81	3/16 (4.76mm)	.1875	1/4	10°	2	8.42	8.05	7.69	7.32
72112	SN-81D	3/16 (4.76mm)	.1875	1/4	10°	2	8.42	8.05	7.69	7.32

Carbide Rotary Files

1/8" Steel Shanks

D – Double Cut

ROTARY FILES



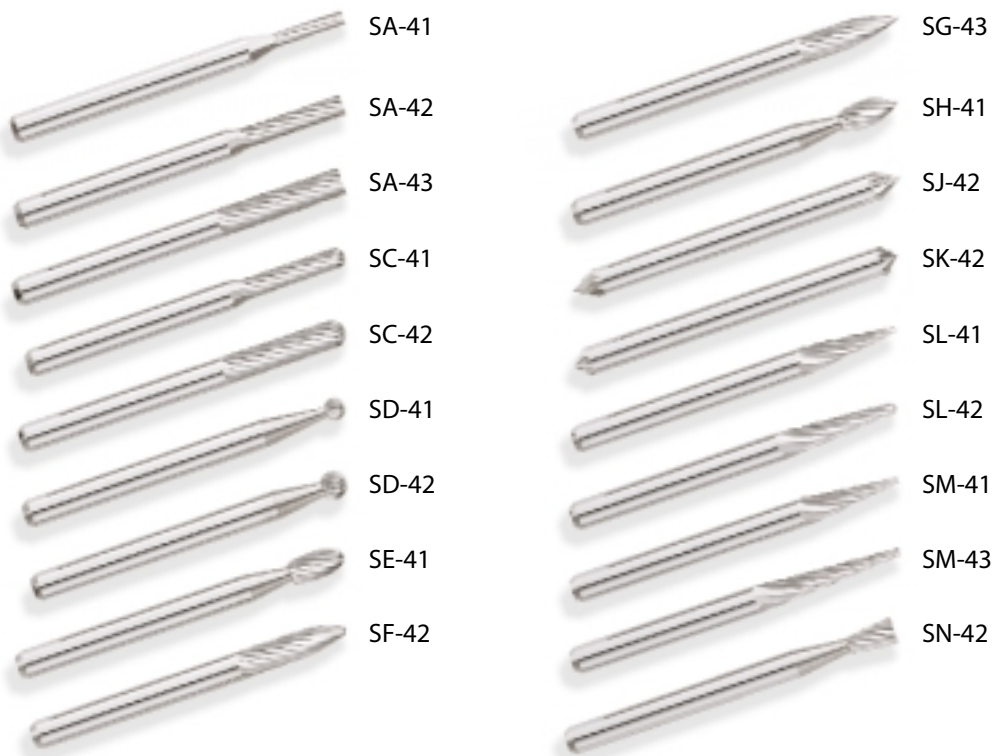
EDP#	Tool Number	Flute Diameter'	Decimal Equivalent	Flute Length	Included Angle	1 - 11	12 - 24	25 - 49	50 - 100
73010	SA-51	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73012	SA-51D	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73020	SB-51	1/4 (6.35mm)	.2500	3/16	—	8.04	7.69	7.34	6.99
73022	SB-51D	1/4 (6.35mm)	.2500	3/16	—	8.04	7.69	7.34	6.99
73030	SC-51	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73032	SC-51D	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73040	SD-51	1/4 (6.35mm)	.2500	—	—	8.04	7.69	7.34	6.99
73042	SD-51D	1/4 (6.35mm)	.2500	—	—	8.04	7.69	7.34	6.99
73050	SE-51	1/4 (6.35mm)	.2500	3/8	—	8.04	7.69	7.34	6.99
73052	SE-51D	1/4 (6.35mm)	.2500	3/8	—	8.04	7.69	7.34	6.99
73060	SF-51	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73062	SF-51D	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73070	SG-51	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73072	SG-51D	1/4 (6.35mm)	.2500	1/2	—	8.04	7.69	7.34	6.99
73080	SM-51	1/4 (6.35mm)	.2500	1/2	22°	8.04	7.69	7.34	6.99
73082	SM-51D	1/4 (6.35mm)	.2500	1/2	22°	8.04	7.69	7.34	6.99
73090	SN-51	1/4 (6.35mm)	.2500	1/4	10°	8.04	7.69	7.34	6.99
73092	SN-51D	1/4 (6.35mm)	.2500	1/4	10°	8.04	7.69	7.34	6.99

1/8" Diameter

Solid Carbide Rotary Files

1/8" Shanks

D – Double Cut



EDP#	Tool Number	Flute Diameter†	Decimal Equivalent	Flute Length	Included Angle	Overall Length	1 - 11	12 - 24	25 - 49	50 - 100
74010	SA-41	1/16 (1.59mm)	.0625	1/4	—	1-1/2	4.76	4.55	4.35	4.14
74012	SA-41D	1/16 (1.59mm)	.0625	1/4	—	1-1/2	4.76	4.55	4.35	4.14
74020	SA-42	3/32 (2.38mm)	.0938	7/16	—	1-1/2	4.76	4.55	4.35	4.14
74022	SA-42D	3/32 (2.38mm)	.0938	7/16	—	1-1/2	4.76	4.55	4.35	4.14
74030	SA-43	1/8 (3.17mm)	.1250	9/16	—	1-1/2	4.76	4.55	4.35	4.14
74032	SA-43D	1/8 (3.17mm)	.1250	9/16	—	1-1/2	4.76	4.55	4.35	4.14
74040	SC-41	3/32 (2.38mm)	.0938	7/16	—	1-1/2	4.76	4.55	4.35	4.14
74042	SC-41D	3/32 (2.38mm)	.0938	7/16	—	1-1/2	4.76	4.55	4.35	4.14
74050	SC-42	1/8 (3.17mm)	.1250	9/16	—	1-1/2	4.76	4.55	4.35	4.14
74052	SC-42D	1/8 (3.17mm)	.1250	9/16	—	1-1/2	4.76	4.55	4.35	4.14
74060	SD-41	3/32 (2.38mm)	.0938	—	—	1-1/2	4.76	4.55	4.35	4.14
74062	SD-41D	3/32 (2.38mm)	.0938	—	—	1-1/2	4.76	4.55	4.35	4.14
74070	SD-42	1/8 (3.17mm)	.1250	—	—	1-1/2	4.76	4.55	4.35	4.14
74072	SD-42D	1/8 (3.17mm)	.1250	—	—	1-1/2	4.76	4.55	4.35	4.14
74080	SE-41	1/8 (3.17mm)	.1250	7/32	—	1-1/2	4.76	4.55	4.35	4.14
74082	SE-41D	1/8 (3.17mm)	.1250	7/32	—	1-1/2	4.76	4.55	4.35	4.14
74090	SF-42	1/8 (3.17mm)	.1250	1/2	—	1-1/2	4.76	4.55	4.35	4.14
74092	SF-42D	1/8 (3.17mm)	.1250	1/2	—	1-1/2	4.76	4.55	4.35	4.14
74100	SG-43	1/8 (3.17mm)	.1250	3/8	—	1-1/2	4.76	4.55	4.35	4.14
74102	SG-43D	1/8 (3.17mm)	.1250	3/8	—	1-1/2	4.76	4.55	4.35	4.14
74110	SH-41	1/8 (3.17mm)	.1250	1/4	—	1-1/2	4.76	4.55	4.35	4.14
74112	SH-41D	1/8 (3.17mm)	.1250	1/4	—	1-1/2	4.76	4.55	4.35	4.14
74120	SJ-42	1/8 (3.17mm)	.1250	—	60°	1-1/2	4.76	4.55	4.35	4.14
74122	SJ-42D	1/8 (3.17mm)	.1250	—	60°	1-1/2	4.76	4.55	4.35	4.14
74130	SK-42	1/8 (3.17mm)	.1250	—	90°	1-1/2	4.76	4.55	4.35	4.14
74132	SK-42D	1/8 (3.17mm)	.1250	—	90°	1-1/2	4.76	4.55	4.35	4.14
74140	SL-41	1/8 (3.17mm)	.1250	3/8	14°	1-1/2	4.76	4.55	4.35	4.14
74142	SL-41D	1/8 (3.17mm)	.1250	3/8	14°	1-1/2	4.76	4.55	4.35	4.14
74150	SL-42	1/8 (3.17mm)	.1250	1/2	8°	1-1/2	4.76	4.55	4.35	4.14
74152	SL-42D	1/8 (3.17mm)	.1250	1/2	8°	1-1/2	4.76	4.55	4.35	4.14
74160	SM-41	1/8 (3.17mm)	.1250	3/8	12°	1-1/2	4.76	4.55	4.35	4.14
74162	SM-41D	1/8 (3.17mm)	.1250	3/8	12°	1-1/2	4.76	4.55	4.35	4.14
74170	SM-43	1/8 (3.17mm)	.1250	5/8	7°	1-1/2	4.76	4.55	4.35	4.14
74172	SM-43D	1/8 (3.17mm)	.1250	5/8	7°	1-1/2	4.76	4.55	4.35	4.14
74180	SN-42	1/8 (3.17mm)	.1250	3/16	10°	1-1/2	4.76	4.55	4.35	4.14
74182	SN-42D	1/8 (3.17mm)	.1250	3/16	10°	1-1/2	4.76	4.55	4.35	4.14

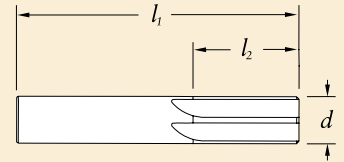


Solid Carbide Grinding Burrs

Standard 45° lead chamfer
Head diameter tolerance +.002 -.002

EDP#	Fractional Head Diameter ⁱ	Decimal Head Diameter	Head Length	Shank Diameter	Neck Length	Overall Length	1 - 11	12 - 24	25 - 49	50 - 100	
76010		(1.22mm)	.0480	1/8	1/8	1/2	1-1/2	11.35	10.86	10.36	9.87
75010	1/16	(1.59mm)	.0625	1/8	1/8	3/8	1-1/2	11.35	10.86	10.36	9.87
76020		(2.01mm)	.0790	1/8	1/8	1/2	1-1/2	11.35	10.86	10.36	9.87
75020	3/32	(2.38mm)	.0938	5/32	1/8	3/8	1-1/2	11.35	10.86	10.36	9.87
76030		(2.79mm)	.1100	5/32	1/8	5/8	1-1/2	11.35	10.86	10.36	9.87
75030	1/8	(3.17mm)	.1250	3/16	1/8	5/8	1-1/2	10.78	10.31	9.84	9.37
76040		(3.58mm)	.1410	3/16	3/16	3/4	2	15.97	15.28	14.58	13.89
75040	5/32	(3.97mm)	.1562	1/4	3/16	3/4	2	15.97	15.28	14.58	13.89
76050		(4.37mm)	.1720	7/32	3/16	3/4	2	15.97	15.28	14.58	13.89
75050	3/16	(4.76mm)	.1875	1/4	3/16	3/4	2	14.38	13.75	13.13	12.50
76060		(5.16mm)	.2030	1/4	1/4	3/4	2	16.48	15.76	15.05	14.33
75060	7/32	(5.56mm)	.2188	1/4	1/4	3/4	2	16.48	15.76	15.05	14.33
76070		(5.97mm)	.2350	5/16	1/4	3/4	2	16.48	15.76	15.05	14.33
75070	1/4	(6.35mm)	.2500	5/16	1/4	3/4	2	14.96	14.31	13.66	13.01
76080		(7.62mm)	* .3000	3/8	1/4	—	2-1/2	24.15	23.10	22.05	21.00
75080	* 5/16	(7.94mm)	.3125	3/8	1/4	—	2-1/2	24.15	23.10	22.05	21.00
76090		(9.14mm)	* .3600	1/2	1/4	—	2-1/2	25.77	24.65	23.53	22.41
75090	* 3/8	(9.52mm)	.3750	1/2	1/4	—	2-1/2	25.77	24.65	23.53	22.41
76100		(10.74mm)	* .4230	1/2	1/4	—	2-1/2	28.05	26.83	25.61	24.39
75100	* 7/16	(11.11mm)	.4375	1/2	1/4	—	2-1/2	28.05	26.83	25.61	24.39
76110		(12.32mm)	* .4850	1/2	1/4	—	2-1/2	28.88	27.62	26.37	25.11

* carbide shanks brazed to carbide heads



Standard Reamers Solid Carbide

Straight – RHC Flutes

Standard 45° Lead Chamfer

Shank diameter is .003" -.005" smaller than fluted diameter except where indicated by (*)

(*) – no plunge on shank



DIAMETER TOLERANCES

.0625 -.2500" Inclusive: +.0002–.0000
(1.59mm - 6.35mm Inclusive: +0.0050–0.0000)
.2501 -.5000" Inclusive: +.0003–.0000
(6.353mm - 12.700mm Inclusive: +0.0076–0.0000)

EDP#	d Flute Diameter†	Decimal Equivalent	l ₁ Overall Length	l ₂ Flute Length	Number of Flutes	1 - 11	12 - 24	25 - 49	50 - 100
96000	* 1/16 (1.59mm)	.0625	1-1/2	3/8	4	9.04	8.65	8.25	7.86
96020	* 5/64 (1.98mm)	.0781	1-3/4	1/2	4	9.04	8.65	8.25	7.86
96040	3/32 (2.38mm)	.0938	2	1/2	4	9.86	9.43	9.00	8.57
96060	7/64 (2.78mm)	.1094	2-1/4	5/8	4	11.09	10.61	10.13	9.64
96080	1/8 (3.17mm)	.1250	2-1/4	5/8	4	11.17	10.68	10.20	9.71
96100	9/64 (3.57mm)	.1406	2-1/2	3/4	4	12.90	12.34	11.78	11.22
96120	5/32 (3.97mm)	.1562	2-1/2	3/4	4	13.96	13.35	12.75	12.14
96140	11/64 (4.37mm)	.1719	2-3/4	7/8	4	15.53	14.85	14.18	13.50
96160	3/16 (4.76mm)	.1875	2-3/4	7/8	4	16.15	15.45	14.75	14.04
96180	13/64 (5.16mm)	.2031	3	1	4	18.65	17.84	17.03	16.22
96200	7/32 (5.56mm)	.2188	3	1	4	18.65	17.84	17.03	16.22
96220	15/64 (5.95mm)	.2344	3	1	4	21.77	20.82	19.88	18.93
96240	1/4 (6.35mm)	.2500	3	1	4	22.59	21.61	20.63	19.64
96280	9/32 (7.14mm)	.2812	3-1/4	1-1/8	6	26.29	25.15	24.00	22.86
96320	5/16 (7.94mm)	.3125	3-1/4	1-1/8	6	28.67	27.42	26.18	24.93
96400	3/8 (9.52mm)	.3750	3-1/2	1-1/4	6	38.53	36.85	35.18	33.50
96480	7/16 (11.11mm)	.4375	3-3/4	1-3/8	6	48.42	46.31	44.21	42.10
96560	1/2 (12.70mm)	.5000	4	1-1/2	6	54.63	52.25	49.88	47.50

Straight – RHC
RHS – RHC
LHS – RHC

Special Reamers Solid Carbide 2 Week delivery

Shank diameter is .003" -.005" smaller than
fluted diameter except where indicated by (*)
All reamers are furnished with a standard 45° lead chamfer
(*) – no plunge on shank



DIAMETER TOLERANCES

.0625 - .2500" Inclusive: +.0002–.0000
(1.59mm - 6.35mm Inclusive: +0.0050–0.0000)
.2501 - .5000" Inclusive: +.0003–.0000
(6.353mm - 12.700mm Inclusive: +0.0076–0.0000)

Diameter Range	Flute Length	Number of Flutes	Overall Length
* .0625 - .0850	1/2	4	1-3/4
.0851 - .1000	5/8	4	2
.1001 - .1150	5/8	4	2-1/4
.1151 - .1300	5/8	4	2-1/4
.1301 - .1450	3/4	4	2-1/2
.1451 - .1600	3/4	4	2-1/2
.1601 - .1750	7/8	4	2-3/4
.1751 - .1950	7/8	4	2-3/4
.1951 - .2250	1	4	3
.2251 - .2550	1	4	3
.2551 - .2850	1-1/8	6	3-1/4
.2851 - .3200	1-1/8	6	3-1/4
.3201 - .3500	1-1/4	6	3-1/2
.3501 - .3850	1-1/4	6	3-1/2
.3851 - .4450	1-1/2	6	4
.4451 - .5000	1-1/2	6	4

Centerless Ground

Premium submicron grain



DIAMETER TOLERANCES

+0.0000-0.0005" (+0.0000-0.0127mm)

EDP#	Diameter ¹	Decimal Equivalent	Overall Length	1-11	12-24	25-49	50-100
95010	3mm	.1181	38mm	1.41	1.35	1.29	1.23
53010	1/8 (3.17mm)	.1250	1-1/2	1.36	1.30	1.24	1.18
53020	1/8 (3.17mm)	.1250	2	2.37	2.27	2.16	2.06
53030	1/8 (3.17mm)	.1250	3	2.65	2.53	2.42	2.30
53040	1/8 (3.17mm)	.1250	4	4.54	4.34	4.15	3.95
53050	1/8 (3.17mm)	.1250	6	7.13	6.82	6.51	6.20
53060	1/8 (3.17mm)	.1250	12	16.04	15.34	14.65	13.95
95070	4mm	.1575	50.8mm	3.48	3.33	3.18	3.03
53070	3/16 (4.76mm)	.1875	2	3.00	2.87	2.74	2.61
53080	3/16 (4.76mm)	.1875	2-1/2	4.22	4.04	3.85	3.67
53090	3/16 (4.76mm)	.1875	3	5.89	5.63	5.38	5.12
53100	3/16 (4.76mm)	.1875	4	7.18	6.87	6.56	6.24
53110	3/16 (4.76mm)	.1875	6	10.72	10.25	9.79	9.32
53120	3/16 (4.76mm)	.1875	12	18.29	17.49	16.70	15.90
95130	5mm	.1969	63.5mm	4.50	4.30	4.11	3.91
95190	6mm	.2362	63.5mm	4.83	4.62	4.41	4.20
53130	1/4 (6.35mm)	.2500	2	3.97	3.80	3.62	3.45
53140	1/4 (6.35mm)	.2500	2-1/2	4.60	4.40	4.20	4.00
53150	1/4 (6.35mm)	.2500	3	7.23	6.92	6.60	6.29
53160	1/4 (6.35mm)	.2500	4	11.42	10.92	10.43	9.93
53170	1/4 (6.35mm)	.2500	6	15.33	14.66	14.00	13.33
53180	1/4 (6.35mm)	.2500	12	29.12	27.85	26.59	25.32
53190	5/16 (7.94mm)	.3125	2-1/2	7.41	7.09	6.77	6.44
53200	5/16 (7.94mm)	.3125	3	12.13	11.60	11.08	10.55
53210	5/16 (7.94mm)	.3125	4	13.86	13.26	12.65	12.05
53220	5/16 (7.94mm)	.3125	6	22.59	21.61	20.63	19.64
53230	5/16 (7.94mm)	.3125	12	38.11	36.45	34.80	33.14
95250	8mm	.3150	63.5mm	7.41	7.09	6.77	6.44
53240	3/8 (9.52mm)	.3750	2-1/2	9.99	9.56	9.12	8.69
53250	3/8 (9.52mm)	.3750	3	13.41	12.83	12.24	11.66
53260	3/8 (9.52mm)	.3750	3-1/2	14.31	13.69	13.07	12.44
53270	3/8 (9.52mm)	.3750	4	15.70	15.02	14.33	13.65
53280	3/8 (9.52mm)	.3750	6	26.70	25.54	24.38	23.22
53290	3/8 (9.52mm)	.3750	12	44.29	42.36	40.44	38.51
95320	10mm	.3937	69.85mm	10.96	10.48	10.01	9.53
53300	7/16 (11.11mm)	.4375	2-1/2	12.22	11.69	11.16	10.63
53310	7/16 (11.11mm)	.4375	3	16.01	15.31	14.62	13.92
53320	7/16 (11.11mm)	.4375	4	22.02	21.06	20.11	19.15
53330	7/16 (11.11mm)	.4375	6	31.94	30.55	29.16	27.77
53340	7/16 (11.11mm)	.4375	12	65.77	62.91	60.05	57.19
95380	12mm	.4724	76.2mm	17.45	16.69	15.93	15.17
53350	1/2 (12.70mm)	.5000	3	16.36	15.65	14.94	14.23
53360	1/2 (12.70mm)	.5000	4	22.56	21.58	20.60	19.62
53370	1/2 (12.70mm)	.5000	6	38.03	36.38	34.72	33.07
53380	1/2 (12.70mm)	.5000	12	84.56	80.88	77.21	73.53
53390	5/8 (15.87mm)	.6250	3-1/2	31.61	30.24	28.86	27.49
53400	5/8 (15.87mm)	.6250	4	43.88	41.97	40.06	38.16
53410	5/8 (15.87mm)	.6250	6	69.43	66.41	63.39	60.37
53420	5/8 (15.87mm)	.6250	12	147.64	141.22	134.80	128.38
95440	16mm	.6299	88.9mm	31.61	30.24	28.86	27.49
53430	3/4 (19.05mm)	.7500	4	46.90	44.86	42.82	40.78
53440	3/4 (19.05mm)	.7500	6	92.51	88.49	84.47	80.44
53450	3/4 (19.05mm)	.7500	12	177.01	169.31	161.62	153.92
95490	20mm	.7874	101.6mm	59.04	56.47	53.91	51.34
95530	25mm	.9843	101.6mm	73.67	70.47	67.26	64.06
53460	1 (25.40mm)	1.000	4	71.86	68.74	65.61	62.49
53470	1 (25.40mm)	1.000	6	160.59	153.61	146.63	139.64
53480	1 (25.40mm)	1.000	12	282.96	270.66	258.35	246.05



Centerless Ground Engraving Split Single End Solid Carbide

For use in engraving and single flute milling
Ready to be finished - blank is non-cutting
Premium submicron grain

DIAMETER TOLERANCES

+0.0000-0.0005" (+0.0000-0.0127mm)

THICKNESS TOLERANCES

+0.001-0.000" (+0.025-0.000mm) from centerline

EDP#	Diameter [†]		Decimal Equivalent	Overall Length	Length of Split	1-11	12-24	25-49	50-100
54010	1/8	(3.17mm)	.1250	1-1/2	3/8	2.48	2.37	2.26	2.16
54020	1/8	(3.17mm)	.1250	2	3/8	3.50	3.35	3.20	3.04
54030	1/8	(3.17mm)	.1250	3	3/8	3.90	3.73	3.56	3.39
54040	1/8	(3.17mm)	.1250	4	3/8	5.68	5.43	5.19	4.94
54050	1/8	(3.17mm)	.1250	6	3/8	8.29	7.93	7.57	7.21
54060	3/16	(4.76mm)	.1875	2	1/2	4.74	4.53	4.33	4.12
54070	3/16	(4.76mm)	.1875	2-1/2	1/2	5.96	5.70	5.44	5.18
54080	3/16	(4.76mm)	.1875	3	1/2	7.64	7.31	6.98	6.64
54090	3/16	(4.76mm)	.1875	4	1/2	8.92	8.53	8.14	7.76
54100	3/16	(4.76mm)	.1875	6	1/2	12.45	11.91	11.37	10.83
54110	1/4	(6.35mm)	.2500	2	1/2	6.67	6.38	6.09	5.80
54120	1/4	(6.35mm)	.2500	2-1/2	1/2	7.29	6.97	6.66	6.34
54130	1/4	(6.35mm)	.2500	3	1/2	9.94	9.51	9.08	8.64
54140	1/4	(6.35mm)	.2500	4	1/2	14.13	13.52	12.90	12.29
54150	1/4	(6.35mm)	.2500	6	1/2	18.04	17.26	16.47	15.69
54160	5/16	(7.94mm)	.3125	2-1/2	1/2	10.29	9.84	9.40	8.95
54170	5/16	(7.94mm)	.3125	3	1/2	15.02	14.37	13.71	13.06
54180	5/16	(7.94mm)	.3125	4	1/2	16.73	16.00	15.28	14.55
54190	5/16	(7.94mm)	.3125	6	1/2	25.46	24.35	23.25	22.14
54200	3/8	(9.52mm)	.3750	2-1/2	1/2	13.93	13.32	12.72	12.11
54210	3/8	(9.52mm)	.3750	3	1/2	17.33	16.58	15.82	15.07
54220	3/8	(9.52mm)	.3750	4	1/2	19.63	18.78	17.92	17.07
54230	3/8	(9.52mm)	.3750	6	1/2	30.64	29.31	27.98	26.64
54240	7/16	(11.11mm)	.4375	2-1/2	5/8	16.58	15.86	15.14	14.42
54250	7/16	(11.11mm)	.4375	3	5/8	20.36	19.47	18.59	17.70
54260	7/16	(11.11mm)	.4375	4	5/8	26.38	25.23	24.09	22.94
54270	7/16	(11.11mm)	.4375	6	5/8	36.29	34.71	33.13	31.56
54280	1/2	(12.70mm)	.5000	3	5/8	22.18	21.22	20.25	19.29
54290	1/2	(12.70mm)	.5000	4	5/8	28.39	27.16	25.92	24.69
54300	1/2	(12.70mm)	.5000	6	5/8	43.86	41.95	40.05	38.14

Centerless Ground Engraving Split Double End Solid Carbide

For use in engraving and single flute milling
Ready to be finished - blank is non-cutting
Premium submicron grain



DIAMETER TOLERANCES

+.0000-.0005" (+0.0000-0.0127mm)

THICKNESS TOLERANCES

+.001-.000" (+0.025-0.000mm) from centerline

EDP#	Diameter†		Decimal Equivalent	Overall Length	Length of Split	1-11	12-24	25-49	50-100
55010	1/8	(3.17mm)	.1250	1-1/2	3/8	3.63	3.47	3.31	3.16
55020	1/8	(3.17mm)	.1250	2	3/8	4.63	4.43	4.23	4.03
55030	1/8	(3.17mm)	.1250	3	3/8	5.04	4.82	4.60	4.38
55040	1/8	(3.17mm)	.1250	4	3/8	6.83	6.53	6.24	5.94
55050	1/8	(3.17mm)	.1250	6	3/8	9.38	8.97	8.56	8.16
55060	3/16	(4.76mm)	.1875	2	1/2	6.49	6.21	5.93	5.64
55070	3/16	(4.76mm)	.1875	2-1/2	1/2	7.69	7.36	7.02	6.69
55080	3/16	(4.76mm)	.1875	3	1/2	9.37	8.96	8.56	8.15
55090	3/16	(4.76mm)	.1875	4	1/2	10.67	10.21	9.74	9.28
55100	3/16	(4.76mm)	.1875	6	1/2	14.20	13.58	12.97	12.35
55110	1/4	(6.35mm)	.2500	2	1/2	9.37	8.96	8.56	8.15
55120	1/4	(6.35mm)	.2500	2-1/2	1/2	9.99	9.56	9.12	8.69
55130	1/4	(6.35mm)	.2500	3	1/2	12.63	12.08	11.53	10.98
55140	1/4	(6.35mm)	.2500	4	1/2	16.82	16.09	15.36	14.63
55150	1/4	(6.35mm)	.2500	6	1/2	20.73	19.83	18.93	18.03
55160	5/16	(7.94mm)	.3125	2-1/2	1/2	13.17	12.60	12.02	11.45
55170	5/16	(7.94mm)	.3125	3	1/2	17.88	17.10	16.33	15.55
55180	5/16	(7.94mm)	.3125	4	1/2	19.62	18.77	17.91	17.06
55190	5/16	(7.94mm)	.3125	6	1/2	28.32	27.09	25.86	24.63
55200	3/8	(9.52mm)	.3750	2-1/2	1/2	17.84	17.06	16.29	15.51
55210	3/8	(9.52mm)	.3750	3	1/2	21.25	20.33	19.40	18.48
55220	3/8	(9.52mm)	.3750	4	1/2	23.54	22.52	21.49	20.47
55230	3/8	(9.52mm)	.3750	6	1/2	34.55	33.05	31.55	30.04
55240	7/16	(11.11mm)	.4375	2-1/2	5/8	20.93	20.02	19.11	18.20
55250	7/16	(11.11mm)	.4375	3	5/8	24.73	23.65	22.58	21.50
55260	7/16	(11.11mm)	.4375	4	5/8	30.73	29.39	28.06	26.72
55270	7/16	(11.11mm)	.4375	6	5/8	40.64	38.87	37.11	35.34
55280	1/2	(12.70mm)	.5000	3	5/8	28.03	26.81	25.59	24.37
55290	1/2	(12.70mm)	.5000	4	5/8	34.21	32.72	31.24	29.75
55300	1/2	(12.70mm)	.5000	6	5/8	49.70	47.54	45.38	43.22

Speed & Feed Recommendations For *Balinit*® X.TREME Die Mold Cutters

Fractional Diameter	FINISHING		CHIPLOAD PER TOOTH	
	RPM	RPM		
	40-50 Rockwell	50-60 Rockwell	40-50 Rockwell	50-60 Rockwell
1/32"	20,000 - 40,000	20,000 - 40,000	.0004" - .0005"	.0003" - .0004"
1/16"	20,000 - 40,000	20,000 - 40,000	.0008" - .0010"	.0005" - .0010"
3/32"	20,000 - 40,000	20,000 - 40,000	.0010" - .0015"	.0008" - .0015"
1/8"	20,000 - 40,000	20,000 - 30,000	.0015" - .0020"	.0010" - .0015"
3/16"	20,000 - 35,000	16,000 - 20,000	.0025" - .0030"	.0015" - .0025"
1/4"	15,000 - 25,000	12,000 - 15,000	.0030" - .0040"	.0020" - .0030"
5/16"	15,000 - 20,000	9,000 - 12,000	.0035" - .0050"	.0025" - .0040"
3/8"	12,000 - 15,000	8,000 - 10,000	.0045" - .0060"	.0030" - .0045"
1/2"	9,000 - 12,000	6,000 - 7,500	.0060" - .0080"	.0040" - .0060"

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

Metric Diameter	FINISHING		CHIPLOAD PER TOOTH (mm)	
	RPM	RPM		
	40-50 Rockwell	50-60 Rockwell	40-50 Rockwell	50-60 Rockwell
1mm	20,000 - 40,000	20,000 - 40,000	0.010 - 0.013	0.008 - 0.010
1.5mm	20,000 - 40,000	20,000 - 40,000	0.020 - 0.025	0.013 - 0.025
2mm	20,000 - 40,000	20,000 - 40,000	0.025 - 0.038	0.020 - 0.038
3mm	20,000 - 40,000	20,000 - 30,000	0.038 - 0.051	0.025 - 0.038
4 - 5mm	20,000 - 35,000	16,000 - 20,000	0.064 - 0.076	0.038 - 0.064
6mm	15,000 - 25,000	12,000 - 15,000	0.076 - 0.102	0.051 - 0.076
8mm	15,000 - 20,000	9,000 - 12,000	0.089 - 0.127	0.064 - 0.102
10mm	12,000 - 15,000	8,000 - 10,000	0.114 - 0.152	0.076 - 0.114
12mm	9,000 - 12,000	6,000 - 7,500	0.152 - 0.203	0.102 - 0.152

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

AXIAL DEPTH OF CUT

40-50 Rockwell = 5% of tool diameter

50-60 Rockwell = 3 - 4% of tool diameter

RADIAL STEP OVER

20% - 40% of tool diameter

High pressure air is recommended for clearing chips away from the cut.

Coolant is not recommended for *Balinit*® X.TREME Die Mold Cutters.

GARR TOOL End Mill Selector Fractional

Material	TYPE	Rc HARDNESS	SFM FOR SUGGESTED ENDMILL									
			220M, 320M, 160M, 165M, 180M, 185M, 420M, 425M, 440M, 540M, 820M, 860M, 865M, 920M, 980M, 985M	210D, 310D, 210RD, 610D, 710D	620M, 640M, 720M, 740M	223M, 323M, 823M, 923M	170M, 175M, 190M, 195M, 230M, 330M, 430M, 435M, 450M, 550M, 830M, 870M, 875M, 930M, 980M, 995M	630M, 623M, 643M, 650M, 730M, 723M, 743M, 750M, 630R	242M, 842M	246M, 846M	253M, 263M, 853M, 863M	255M, 855M
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	- -	- -	- -	175 - 225 125 - 175	175 - 225 125 - 175	150 - 200 100 - 150	- -	225 - 275 150 - 200	250 - 300 150 - 200	250 - 300 150 - 200
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	- -	- -	- -	175 - 225 125 - 175	175 - 225 125 - 175	150 - 200 100 - 150	- -	225 - 275 150 - 200	250 - 300 150 - 200	250 - 300 150 - 200
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	- -	- -	- -	175 - 225 125 - 175	175 - 225 125 - 175	150 - 200 100 - 150	- -	225 - 275 150 - 200	250 - 300 150 - 200	250 - 300 150 - 200
MONEL	Monel-65% Nickel		175 - 300	-	125 - 175	175 - 300	175 - 300	125 - 175	-	200 - 250	225 - 350	225 - 350
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		200 - 300	-	125 - 250	200 - 300	200 - 300	125 - 250	500 min.	250 - 400	250 - 400	250 - 400
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	- -	- -	- -	150 - 250 125 - 175	150 - 250 125 - 175	100 - 150 80 - 150	- -	200 - 350 150 - 250	200 - 350 150 - 250	200 - 350 150 - 250
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	- -	- -	- -	200 - 275 150 - 200	200 - 250 150 - 200	125 - 175 100 - 150	- -	250 - 350 175 - 275	250 - 350 175 - 275	250 - 350 175 - 275
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	- -	- -	- -	90 - 125 80 - 120	90 - 125 80 - 120	80 - 120 60 - 90	- -	125 - 200 90 - 125	100 - 175 80 - 120	125 - 200 90 - 125
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	- -	- -	- -	150 - 250 125 - 175	150 - 250 125 - 175	100 - 150 80 - 150	- -	200 - 350 150 - 250	200 - 350 150 - 250	200 - 350 150 - 250
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	- -	- -	- -	150 - 200 90 - 125	175 - 225 100 - 150	125 - 175 80 - 120	- -	225 - 300 125 - 200	200 - 275 100 - 175	225 - 300 125 - 200
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	- -	- -	- -	175 - 225 100 - 150	200 - 250 125 - 175	150 - 200 100 - 150	- -	250 - 350 150 - 200	250 - 350 150 - 200	250 - 350 150 - 200
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	- -	- -	- -	175 - 225 100 - 150	200 - 250 125 - 175	150 - 200 100 - 150	- -	250 - 350 150 - 200	250 - 350 150 - 200	250 - 350 150 - 200
DUCTILE	Ductile Cast Irons		250 - 350	-	200 - 300	300 - 400	300 - 400	200 - 300	-	200 - 300	350 - 450	300 - 400
CAST IRONS	Gray Cast Irons		225 - 325	-	175 - 250	250 - 350	250 - 350	175 - 250	-	175 - 250	300 - 400	250 - 350
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		500 min.	-	500 min.	500 min.	500 min.	500 min.	500 min.	-	500 min.	500 min.
MAGNESIUM			500 min.	-	500 min.	500 min.	500 min.	500 min.	500 min.	-	500 min.	500 min.
COPPER, COPPER ALLOYS			400 - 500	-	250 - 350	300 - 450	300 - 400	250 - 350	400 - 500	-	400 - 500	250 - 350
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		300 - 400	-	200 - 300	275 - 375	250 - 350	200 - 300	300 - 400	-	300 - 400	-
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		250 - 1000	250 - 1000	250 - 1000	250 - 1000	250 - 1000	250 - 1000	250 - 1000	-	-	-

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

ADD 10% FOR TIN COATING
ADD 25% FOR TICN COATING
ADD 40% FOR TIALN COATING

Metric **GARR TOOL** End Mill Selector

Material	TYPE	Rc HARDNESS	SMM FOR SUGGESTED ENDMILL									
			220M, 320M, 160M, 165M, 180M, 185M, 420M, 425M, 440M, 540M, 820M, 860M, 865M, 920M, 980M, 985M	210D, 310D, 210RD, 610D, 710D	620M, 640M, 720M, 740M	223M, 323M, 823M, 923M	170M, 175M, 190M, 195M, 230M, 330M, 430M, 435M, 450M, 550M, 830M, 870M, 875M, 930M, 980M, 995M	630M, 623M, 643M, 650M, 730M, 723M, 743M, 750M, 630R	242M, 842M	246M, 846M	253M, 263M, 853M, 863M	255M, 855M
COBALT BASE ALLOYS	Stellite, HS-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	- -	- -	- -	53 - 68 38 - 53	53 - 68 38 - 53	45 - 60 30 - 45	- -	68 - 84 45 - 60	76 - 90 45 - 60	76 - 90 45 - 60
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	- -	- -	- -	53 - 68 38 - 53	53 - 68 38 - 53	45 - 60 30 - 45	- -	68 - 84 45 - 60	76 - 90 45 - 60	76 - 90 45 - 60
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	- -	- -	- -	53 - 68 38 - 53	53 - 68 38 - 53	45 - 60 30 - 45	- -	68 - 84 45 - 60	76 - 90 45 - 60	76 - 90 45 - 60
MONEL	Monel-65% Nickel		53 - 90	-	38 - 53	53 - 90	53 - 90	38 - 53	-	60 - 76	68 - 106	68 - 106
TITANIUM ALLOYS	Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		60 - 90	-	38 - 76	60 - 90	60 - 90	38 - 76	150 min.	76 - 120	76 - 120	76 - 120
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	- -	- -	- -	45 - 76 38 - 53	45 - 76 38 - 53	30 - 45 24 - 45	- -	60 - 106 45 - 76	60 - 106 45 - 76	60 - 106 45 - 76
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	- -	- -	- -	60 - 84 45 - 60	60 - 76 45 - 60	38 - 53 30 - 45	- -	76 - 106 53 - 84	76 - 106 53 - 84	76 - 106 53 - 84
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	- -	- -	- -	27 - 38 24 - 36	27 - 38 24 - 36	24 - 36 18 - 27	- -	38 - 60 27 - 38	30 - 53 24 - 36	38 - 60 27 - 38
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	- -	- -	- -	45 - 76 38 - 53	45 - 76 38 - 53	30 - 45 24 - 45	- -	60 - 106 45 - 76	60 - 106 45 - 76	60 - 106 45 - 76
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	- -	- -	- -	45 - 60 27 - 38	53 - 68 30 - 45	38 - 53 24 - 37	- -	68 - 90 38 - 60	60 - 84 30 - 53	68 - 90 38 - 60
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	- -	- -	- -	53 - 68 30 - 45	60 - 76 38 - 53	45 - 60 30 - 45	- -	76 - 106 45 - 60	76 - 106 45 - 60	76 - 106 45 - 60
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	- -	- -	- -	53 - 68 30 - 45	60 - 76 38 - 53	45 - 60 30 - 45	- -	76 - 106 45 - 60	76 - 106 45 - 60	76 - 106 45 - 60
DUCTILE	Ductile Cast Irons		76 - 106	-	60 - 90	90 - 120	90 - 120	60 - 90	-	60 - 90	106 - 137	90 - 120
CAST IRONS	Gray Cast Irons		68 - 100	-	53 - 76	76 - 106	76 - 106	53 - 76	-	53 - 76	90 - 120	76 - 106
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		150 min.	-	150 min.	150 min.	150 min.	150 min.	150 min.	-	150 min.	150 min.
MAGNESIUM			150 min.	-	150 min.	150 min.	150 min.	150 min.	150 min.	-	150 min.	150 min.
COPPER, COPPER ALLOYS			120 - 150	-	76 - 106	90 - 137	90 - 120	76 - 106	120 - 150	-	120 - 150	76 - 106
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		90 - 120	-	60 - 90	84 - 115	76 - 106	60 - 90	90 - 120	-	90 - 120	-
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		76 - 305	76 - 305	76 - 305	76 - 305	76 - 305	76 - 305	76 - 305	-	-	-

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

ADD 10% FOR TIN COATING
ADD 25% FOR TICN COATING
ADD 40% FOR TIALN COATING

GARR TOOL Milling Guide Fractional

Material	TYPE	Rc HARDNESS	SUGGESTED CHIPLOAD PER TOOTH					
			Milling SFM	UP TO 1/8"	1/8" - 1/4"	1/4" - 1/2"	1/2" - 1"	1" - 1-1/4"
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	150 - 300 100 - 200	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	150 - 300 100 - 200	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	150 - 300 125 - 200	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
MONEL	Monel-65% Nickel		150 - 350	.0007" - .0015"	.0010" - .0025"	.0015" - .0040"	.0030" - .0050"	.0040" - .0060"
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		125 - 400	.0007" - .0015"	.0010" - .0025"	.0015" - .0040"	.0030" - .0050"	.0040" - .0060"
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	150 - 350 100 - 250	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
STAINLESS STEEL (Austentic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	150 - 350 125 - 275	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
STAINLESS STEEL (Austentic)	304L, 316L	Under 32 Over 32	80 - 200 60 - 125	.0005" - .0008" .0003" - .0005"	.0008" - .0015" .0005" - .0010"	.0010" - .0020" .0010" - .0015"	.0015" - .0030" .0010" - .0020"	.0020" - .0040" .0015" - .0030"
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	150 - 350 125 - 275	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	125 - 300 80 - 200	.0005" - .0010" .0003" - .0005"	.0008" - .0020" .0005" - .0015"	.0010" - .0030" .0010" - .0020"	.0020" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	175 - 350 125 - 200	.0007" - .0015" .0005" - .0010"	.0010" - .0025" .0008" - .0020"	.0015" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"	.0040" - .0060" .0030" - .0050"
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	175 - 350 125 - 200	.0007" - .0015" .0005" - .0010"	.0010" - .0025" .0008" - .0020"	.0015" - .0040" .0010" - .0030"	.0030" - .0050" .0020" - .0040"	.0040" - .0060" .0030" - .0050"
DUCTILE	Ductile Cast Irons		150 - 400	.0010" - .0020"	.0015" - .0040"	.0020" - .0060"	.0030" - .0100"	.0050" - .0100"
CAST IRONS	Gray Cast Irons		125 - 350	.0010" - .0020"	.0015" - .0040"	.0020" - .0060"	.0030" - .0100"	.0050" - .0100"
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		500 min.	.0010" - .0020"	.0015" - .0040"	.0020" - .0060"	.0030" - .0150"	.0050" - .0150"
MAGNESIUM			500 min.	.0010" - .0020"	.0015" - .0040"	.0020" - .0060"	.0030" - .0100"	.0050" - .0100"
COPPER, COPPER ALLOYS			200 - 500	.0007" - .0015"	.0010" - .0025"	.0015" - .0035"	.0020" - .0080"	.0040" - .0100"
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		200 - 400	.0007" - .0015"	.0010" - .0025"	.0015" - .0035"	.0020" - .0080"	.0040" - .0100"
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		250 - 1000	.0010" - .0020"	.0015" - .0040"	.0020" - .0060"	.0030" - .0100"	.0050" - .0100"

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

Metric **GARR TOOL** Milling Guide

Material	TYPE	Rc HARDNESS	SUGGESTED CHIPLOAD PER TOOTH (mm)				
			Milling SMM	UP TO 3mm	3mm - 6mm	6mm - 12mm	12mm - 25mm
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	45 - 90 30 - 60	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	45 - 90 30 - 60	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	45 - 90 38 - 60	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
MONEL	Monel-65% Nickel		45 - 106	0.018 - 0.038	0.025 - 0.064	0.038 - 0.102	0.076 - 0.127
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		38 - 120	0.018 - 0.038	0.025 - 0.064	0.038 - 0.102	0.076 - 0.127
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	45 - 106 30 - 76	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	45 - 106 38 - 84	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	27 - 60 24 - 38	0.013 - 0.020 0.008 - 0.013	0.020 - 0.038 0.013 - 0.025	0.025 - 0.050 0.025 - 0.038	0.038 - 0.076 0.025 - 0.050
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	45 - 106 30 - 76	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	38 - 90 24 - 60	0.013 - 0.025 0.007 - 0.013	0.020 - 0.050 0.013 - 0.038	0.025 - 0.076 0.025 - 0.050	0.050 - 0.102 0.025 - 0.076
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	53 - 106 38 - 60	0.018 - 0.038 0.013 - 0.025	0.025 - 0.064 0.020 - 0.050	0.038 - 0.102 0.025 - 0.076	0.076 - 0.127 0.050 - 0.102
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	53 - 106 38 - 60	0.018 - 0.038 0.013 - 0.025	0.025 - 0.064 0.020 - 0.050	0.038 - 0.102 0.025 - 0.076	0.076 - 0.127 0.050 - 0.102
DUCTILE	Ductile Cast Irons		45 - 120	0.025 - 0.050	0.038 - 0.102	0.050 - 0.152	0.076 - 0.254
CAST IRONS	Gray Cast Irons		38 - 106	0.025 - 0.050	0.038 - 0.102	0.050 - 0.152	0.076 - 0.254
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		150 min.	0.025 - 0.050	0.038 - 0.102	0.050 - 0.152	0.076 - 0.381
MAGNESIUM			150 min.	0.025 - 0.050	0.038 - 0.102	0.050 - 0.152	0.076 - 0.254
COPPER, COPPER ALLOYS			60 - 150	0.018 - 0.038	0.025 - 0.064	0.038 - 0.089	0.050 - 0.203
BRASS, BRONZE	Brass, Alum/Bronze, Low Silicon Bronze		60 - 120	0.018 - 0.038	0.025 - 0.064	0.038 - 0.089	0.050 - 0.203
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		76 - 305	0.025 - 0.050	0.038 - 0.102	0.050 - 0.152	0.076 - 0.254

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

GARR TOOL High Performance Drilling Guide

Fractional

Material	TYPE	RECOMMENDED SFM BY SERIES			CHIPLOAD PER FLUTE			
		Rc HARDNESS	1580H 1280H	1280KC 1880KC	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	225 180	300 240	.0015" - .0025" .0010" - .0020"	.0025" - .0035" .0020" - .0030"	.0030" - .0040" .0030" - .0035"	.0035" - .0045" .0035" - .0040"
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	225 180	300 240	.0015" - .0025" .0010" - .0020"	.0025" - .0035" .0020" - .0030"	.0030" - .0040" .0030" - .0035"	.0035" - .0045" .0035" - .0040"
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
MONEL	Monel-65% Nickel		225	300	.0015" - .0025"	.0020" - .0030"	.0025" - .0035"	.0030" - .0040"
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		350	425	.0015" - .0025"	.0025" - .0035"	.0030" - .0040"	.0035" - .0045"
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	300 225	375 300	.0020" - .0030" .0015" - .0020"	.0030" - .0035" .0020" - .0025"	.0035" - .0040" .0025" - .0030"	.0040" - .0050" .0030" - .0040"
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	175 100	225 150	.0015" - .0020" .0008" - .0015"	.0020" - .0025" .0015" - .0020"	.0025" - .0030" .0025" - .0035"	.0030" - .0040" .0035" - .0040"
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	300 240	375 300	.0020" - .0030" .0010" - .0020"	.0030" - .0035" .0020" - .0030"	.0035" - .0040" .0030" - .0035"	.0040" - .0050" .0035" - .0040"
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		600	700	.0040" - .0050"	.0040" - .0050"	.0050" - .0060"	.0070" - .0080"
			625	750	.0040" - .0050"	.0040" - .0050"	.0050" - .0060"	.0070" - .0080"
			700	850	.0050" - .0060"	.0070" - .0080"	.0090" - .0100"	.0090" - .0100"
			300	450	.0040" - .0050"	.0040" - .0050"	.0050" - .0060"	.0070" - .0080"
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		700	850	.0050" - .0060"	.0070" - .0080"	.0090" - .0100"	.0090" - .0100"
MAGNESIUM			600	725	.0050" - .0060"	.0070" - .0080"	.0090" - .0100"	.0090" - .0100"
COPPER	Copper Alloys		600	725	.0040" - .0050"	.0040" - .0050"	.0050" - .0060"	.0070" - .0080"
BRASS	Short Chips Long Chips		600	725	.0050" - .0060"	.0070" - .0080"	.0090" - .0100"	.0090" - .0100"
			475	600	.0040" - .0050"	.0060" - .0070"	.0080" - .0090"	.0080" - .0090"
BRONZE	Short Chips Long Chips		400	525	.0040" - .0050"	.0040" - .0050"	.0060" - .0070"	.0080" - .0090"
			275	325	.0030" - .0040"	.0030" - .0040"	.0050" - .0060"	.0070" - .0080"

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS

min. 500 psi for coolant fed drills

GARR TOOL High Performance Drilling Guide

Metric

Material	TYPE	RECOMMENDED SMM BY SERIES			CHIPLOAD PER FLUTE (mm)			
		Rc HARDNESS	1580H 1280H	1280KC 1880KC	3mm - 6mm	6mm - 10mm	10mm - 13mm	13mm - 16mm
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	70 55	90 70	0.035 - 0.060 0.025 - 0.050	0.060 - 0.085 0.050 - 0.075	0.075 - 0.100 0.075 - 0.085	0.085 - 0.110 0.085 - 0.100
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	70 55	90 70	0.035 - 0.060 0.025 - 0.050	0.060 - 0.085 0.050 - 0.075	0.075 - 0.100 0.075 - 0.085	0.085 - 0.110 0.085 - 0.100
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
MONEL	Monel-65% Nickel		70	90	0.035 - 0.060	0.050 - 0.075	0.060 - 0.085	0.075 - 0.100
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		105	130	0.035 - 0.060	0.060 - 0.085	0.075 - 0.100	0.085 - 0.110
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
STAINLESS STEEL (Austentic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.035 - 0.050	0.075 - 0.085 0.050 - 0.060	0.085 - 0.100 0.060 - 0.075	0.100 - 0.125 0.075 - 0.100
STAINLESS STEEL (Austentic)	304L, 316L	Under 32 Over 32	55 30	70 45	0.035 - 0.050 0.020 - 0.035	0.050 - 0.060 0.035 - 0.050	0.060 - 0.075 0.060 - 0.085	0.075 - 0.100 0.085 - 0.100
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	90 70	115 90	0.050 - 0.075 0.025 - 0.050	0.075 - 0.085 0.050 - 0.075	0.085 - 0.100 0.075 - 0.085	0.100 - 0.125 0.085 - 0.100
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		90	215	0.100 - 0.125	0.100 - 0.125	0.125 - 0.150	0.175 - 0.200
			190	225	0.100 - 0.125	0.100 - 0.125	0.125 - 0.150	0.175 - 0.200
			215	260	0.125 - 0.150	0.175 - 0.200	0.225 - 0.250	0.225 - 0.250
			90	135	0.100 - 0.125	0.100 - 0.125	0.125 - 0.150	0.175 - 0.200
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded		215	260	0.125 - 0.150	0.175 - 0.200	0.225 - 0.250	0.225 - 0.250
MAGNESIUM			185	220	0.125 - 0.150	0.175 - 0.200	0.225 - 0.250	0.225 - 0.250
COPPER	Copper Alloys		185	220	0.100 - 0.125	0.100 - 0.125	0.125 - 0.150	0.175 - 0.200
BRASS	Short Chips Long Chips		185	220	0.125 - 0.150	0.175 - 0.200	0.225 - 0.250	0.225 - 0.250
			145	180	0.100 - 0.125	0.150 - 0.175	0.200 - 0.225	0.200 - 0.225
BRONZE	Short Chips Long Chips		120	160	0.100 - 0.125	0.100 - 0.125	0.150 - 0.175	0.200 - 0.225
			85	100	0.060 - 0.085	0.075 - 0.100	0.125 - 0.150	0.175 - 0.200

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS

min. 500 psi for coolant fed drills

GARR TOOL Drill Selector Fractional

Material	TYPE	RECOMMENDED SFM BY SERIES						
		Rc HARDNESS	1100, 1120, 4000	1200, 1205, 1520, 1600, 1400	1500, 1510, 1300	1700	1700K	1800H
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	80 - 120 -	100 - 150 80 - 110	100 - 150 80 - 110	- -	- -	- -
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	100 - 125 -	125 - 150 100 - 125	125 - 175 100 - 125	- -	- -	- -
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	150 - 175 -	150 - 200 150 - 175	175 - 200 150 - 200	- -	- -	- -
MONEL	Monel-65% Nickel		-	100 - 150	100 - 150	-	-	-
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		125 - 175	150 - 200	150 - 200	-	-	-
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	*125 - 150 -	125 - 175 80 - 125	150 - 200 100 - 150	- -	- -	- -
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	*125 - 150 -	100 - 175 100 - 125	150 - 200 125 - 150	- -	- -	- -
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	*100 - 125 -	80 - 100 60 - 90	90 - 125 80 - 100	- -	- -	- -
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	*125 - 150 -	100 - 150 80 - 125	125 - 175 100 - 140	- -	- -	- -
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	*125 - 150 -	100 - 175 80 - 130	125 - 175 80 - 130	- -	- -	- -
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	*125 - 150 -	125 - 175 100 - 150	125 - 175 100 - 150	- -	- -	- -
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	*125 - 150 -	125 - 175 100 - 125	150 - 200 100 - 175	- -	- -	- -
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		200 - 400	125 - 200	150 - 250	175 - 300	200 - 400	-
			175 - 300	100 - 200	150 - 250	175 - 300	200 - 400	-
			200 - 400	150 - 300	-	250 - 400	300 - 450	500 - 700
			150 - 200	125 - 175	-	150 - 250	175 - 300	-
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Extruded		*300	250 - 500	-	-	-	500 - 700
MAGNESIUM			*300	200 - 500	-	-	-	200 - 400
COPPER	Copper Alloys		*300	150 - 300	-	-	-	-
BRASS	Short Chips Long Chips		-	150 - 300	-	-	-	200 - 400
			-	125 - 200	-	-	-	200 - 400
BRONZE	Short Chips Long Chips		-	150 - 300	-	-	-	200 - 400
			-	125 - 200	-	-	-	200 - 400
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		200	150 - 300	150 - 300	-	-	-

NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS

INCREASE SPEEDS AND FEEDS 20% - 40% FOR HARDLUBE (EXCEPT FOR 1800H)

* CORED APPLICATION ONLY

Metric **GARR TOOL Drill Selector Guide**

Material	TYPE	RECOMMENDED SMM BY SERIES (mm)						
		Rc HARDNESS	1100, 1120, 4000	1200, 1205, 1520, 1600, 1400	1500, 1510, 1300	1700	1700K	1800H
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	24 - 37 -	30 - 45 25 - 35	30 - 45 25 - 35	- -	- -	- -
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	30 - 38 -	38 - 45 30 - 38	38 - 53 30 - 38	- -	- -	- -
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	45 - 53 -	45 - 60 45 - 53	53 - 60 45 - 60	- -	- -	- -
MONEL	Monel-65% Nickel		-	30 - 45	30 - 45	-	-	-
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		38 - 53	45 - 60	45 - 60	-	-	-
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	*38 - 45 -	38 - 53 24 - 38	45 - 60 30 - 45	- -	- -	- -
STAINLESS STEEL (Austentic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	*38 - 45 -	30 - 53 30 - 38	45 - 60 38 - 45	- -	- -	- -
STAINLESS STEEL (Austentic)	304L, 316L	Under 32 Over 32	*30 - 38 -	25 - 30 18 - 27	27 - 38 25 - 30	- -	- -	- -
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	*38 - 45 -	30 - 45 24 - 38	38 - 53 30 - 45	- -	- -	- -
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	*38 - 45 -	30 - 53 24 - 40	38 - 53 24 - 40	- -	- -	- -
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	*38 - 45 -	38 - 53 30 - 45	38 - 53 30 - 45	- -	- -	- -
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	*38 - 45 -	38 - 53 30 - 38	45 - 60 30 - 53	- -	- -	- -
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		60 - 120 50 - 90 60 - 120 45 - 60	38 - 60 30 - 60 45 - 90 38 - 53	45 - 76 45 - 76 - -	50 - 90 50 - 90 75 - 120 45 - 75	60 - 120 60 - 120 90 - 135 50 - 90	- - 150 - 210 -
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Extruded		*90	76 - 150	-	-	-	150 - 210
MAGNESIUM			*90	60 - 150	-	-	-	60 - 120
COPPER	Copper Alloys		*90	45 - 90	-	-	-	-
BRASS	Short Chips Long Chips		- -	45 - 90 38 - 60	- -	- -	- -	60 - 120 60 - 120
BRONZE	Short Chips Long Chips		- -	45 - 90 38 - 60	- -	- -	- -	60 - 120 60 - 120
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		60	45 - 90	45 - 90	-	-	-

NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS
INCREASE SPEEDS AND FEEDS 20% - 40% FOR HARDLUBE (EXCEPT FOR 1800H)

* CORED APPLICATION ONLY

GARR TOOL Drilling Guide Fractional

Material	TYPE	Rc HARDNESS	CHIPLOAD PER FLUTE				
			1/16" - 1/8"	1/8" - 1/4"	1/4" - 3/8"	3/8" - 1/2"	1/2" - 5/8"
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	.0004" - .0010" .0004" - .0010"	.0008" - .0020" .0005" - .0010"	.0015" - .0025" .0010" - .0015"	.0020" - .0040" .0010" - .0020"	.0025" - .0050" .0015" - .0030"
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	.0005" - .0015" .0004" - .0010"	.0010" - .0015" .0008" - .0015"	.0015" - .0025" .0010" - .0015"	.0020" - .0040" .0015" - .0030"	.0025" - .0050" .0020" - .0040"
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	.0010" - .0015" .0008" - .0015"	.0010" - .0020" .0010" - .0020"	.0015" - .0025" .0015" - .0035"	.0020" - .0040" .0020" - .0050"	.0025" - .0050" .0030" - .0060"
MONEL	Monel-65% Nickel		.0004" - .0010"	.0008" - .0015"	.0010" - .0015"	.0015" - .0030"	.0020" - .0040"
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		.0008" - .0015"	.0010" - .0020"	.0015" - .0030"	.0020" - .0040"	.0025" - .0050"
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	.0005" - .0015" .0004" - .0010"	.0010" - .0020" .0008" - .0015"	.0015" - .0035" .0010" - .0015"	.0020" - .0040" .0015" - .0030"	.0025" - .0050" .0020" - .0040"
STAINLESS STEEL (Austenitic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	.0005" - .0015" .0004" - .0010"	.0010" - .0020" .0008" - .0015"	.0015" - .0035" .0010" - .0015"	.0020" - .0040" .0015" - .0030"	.0025" - .0050" .0020" - .0040"
STAINLESS STEEL (Austenitic)	304L, 316L	Under 32 Over 32	.0004" - .0010" .0003" - .0008"	.0008" - .0015" .0005" - .0010"	.0010" - .0015" .0010" - .0015"	.0015" - .0030" .0010" - .0020"	.0020" - .0040" .0015" - .0030"
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	.0005" - .0015" .0004" - .0010"	.0010" - .0020" .0008" - .0015"	.0015" - .0035" .0010" - .0015"	.0020" - .0040" .0015" - .0030"	.0025" - .0050" .0020" - .0040"
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	.0005" - .0015" .0005" - .0015"	.0010" - .0020" .0010" - .0020"	.0015" - .0025" .0010" - .0020"	.0015" - .0030" .0015" - .0030"	.0020" - .0040" .0020" - .0040"
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	.0010" - .0015" .0005" - .0015"	.0015" - .0025" .0010" - .0020"	.0020" - .0030" .0010" - .0025"	.0020" - .0040" .0015" - .0030"	.0025" - .0050" .0020" - .0040"
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	.0010" - .0015" .0005" - .0015"	.0015" - .0025" .0010" - .0020"	.0020" - .0030" .0010" - .0025"	.0020" - .0040" .0015" - .0035"	.0025" - .0050" .0020" - .0040"
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
			.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
			.0010" - .0020"	.0015" - .0040"	.0020" - .0050"	.0030" - .0060"	.0035" - .0070"
			.0008" - .0015"	.0010" - .0020"	.0015" - .0030"	.0020" - .0040"	.0025" - .0050"
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Extruded		.0010" - .0020"	.0015" - .0040"	.0020" - .0050"	.0030" - .0060"	.0035" - .0070"
MAGNESIUM			.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
COPPER	Copper Alloys		.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
BRASS	Short Chips Long Chips		.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
			.0008" - .0015"	.0010" - .0020"	.0015" - .0030"	.0020" - .0040"	.0025" - .0050"
BRONZE	Short Chips Long Chips		.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"
			.0008" - .0015"	.0010" - .0020"	.0015" - .0030"	.0020" - .0040"	.0025" - .0050"
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		.0010" - .0020"	.0010" - .0030"	.0015" - .0035"	.0025" - .0040"	.0030" - .0050"

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS

Metric **GARR TOOL Drilling Guide**

Material	TYPE	Rc HARDNESS	CHIPLOAD PER FLUTE (mm)				
			2mm - 3mm	3mm - 6mm	6mm - 10mm	10mm - 13mm	13mm - 16mm
COBALT BASE ALLOYS	Stellite, Hs-21, Haynes 25/188, X-40, L-605	Under 32 Over 32	0.010 - 0.025 0.010 - 0.025	0.020 - 0.050 0.013 - 0.025	0.038 - 0.064 0.025 - 0.038	0.050 - 0.102 0.025 - 0.050	0.063 - 0.127 0.038 - 0.076
NICKEL BASE ALLOYS	Inconel-625/718, Waspalloy, Rene, Hastalloy	Under 32 Over 32	0.013 - 0.038 0.010 - 0.025	0.025 - 0.038 0.020 - 0.038	0.038 - 0.064 0.025 - 0.038	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.050 - 0.102
IRON BASE ALLOYS	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	Under 32 Over 32	0.025 - 0.038 0.020 - 0.038	0.025 - 0.050 0.025 - 0.050	0.038 - 0.089 0.038 - 0.064	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.076 - 0.152
MONEL	Monel-65% Nickel		0.010 - 0.025	0.020 - 0.038	0.025 - 0.038	0.038 - 0.076	0.050 - 0.102
TITANIUM ALLOYS	Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si		0.020 - 0.038	0.025 - 0.050	0.038 - 0.076	0.050 - 0.102	0.063 - 0.127
STAINLESS STEEL (Precipitation)	13/8, 15/5, 17-4, AM-350/355	Under 32 Over 32	0.013 - 0.038 0.010 - 0.025	0.025 - 0.050 0.020 - 0.038	0.038 - 0.090 0.025 - 0.038	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.050 - 0.102
STAINLESS STEEL (Austentic)	200 Series, 302, 303, 304, 316	Under 32 Over 32	0.013 - 0.038 0.010 - 0.025	0.025 - 0.050 0.020 - 0.038	0.038 - 0.090 0.025 - 0.038	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.050 - 0.102
STAINLESS STEEL (Austentic)	304L, 316L	Under 32 Over 32	0.010 - 0.025 0.008 - 0.020	0.020 - 0.038 0.013 - 0.025	0.025 - 0.038 0.025 - 0.038	0.038 - 0.076 0.025 - 0.050	0.050 - 0.102 0.038 - 0.076
STAINLESS STEEL (Martensitic)	403, 410, 416, 440	Under 32 Over 32	0.013 - 0.038 0.010 - 0.025	0.025 - 0.050 0.020 - 0.038	0.038 - 0.090 0.025 - 0.038	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.050 - 0.102
HIGH STRENGTH TOOL STEELS	4140, 4340, 6150, 5210, A2, D2, P20, H11, H13, S2, O1	Under 32 Over 32	0.013 - 0.038 0.010 - 0.025	0.025 - 0.050 0.025 - 0.050	0.038 - 0.064 0.025 - 0.050	0.050 - 0.102 0.038 - 0.076	0.050 - 0.102 0.050 - 0.102
MEDIUM ALLOY STEELS	200, 250, 300	Under 32 Over 32	0.025 - 0.038 0.013 - 0.038	0.038 - 0.064 0.025 - 0.050	0.050 - 0.076 0.025 - 0.064	0.050 - 0.102 0.038 - 0.076	0.063 - 0.127 0.050 - 0.102
CARBON STEELS	1000's, 1100's, 1300's	Under 32 Over 32	0.025 - 0.038 0.013 - 0.038	0.038 - 0.064 0.025 - 0.050	0.050 - 0.076 0.025 - 0.064	0.050 - 0.102 0.038 - 0.090	0.063 - 0.127 0.050 - 0.102
CAST	Ductile Cast Irons Gray Cast Irons Aluminum Steel		0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
			0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
			0.025 - 0.050	0.025 - 0.102	0.050 - 0.127	0.076 - 0.152	0.089 - 0.178
			0.020 - 0.038	0.025 - 0.050	0.038 - 0.076	0.050 - 0.102	0.063 - 0.127
ALUMINUM	2014, 2024, 6061-(T1-T6), 7075, Extruded		0.025 - 0.050	0.025 - 0.102	0.050 - 0.127	0.076 - 0.152	0.089 - 0.178
MAGNESIUM			0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
COPPER	Copper Alloys		0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
BRASS	Short Chips		0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
	Long Chips		0.020 - 0.038	0.025 - 0.050	0.038 - 0.076	0.050 - 0.102	0.063 - 0.127
BRONZE	Short Chips		0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127
	Long Chips		0.020 - 0.038	0.025 - 0.050	0.038 - 0.076	0.050 - 0.102	0.063 - 0.127
COMPOSITES	G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics		0.025 - 0.050	0.025 - 0.076	0.038 - 0.090	0.064 - 0.102	0.076 - 0.127

NOTE-ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS

S.F.M. (S.M.M.)/R.P.M. Conversion Charts

S.F.M./R.P.M. Fractional

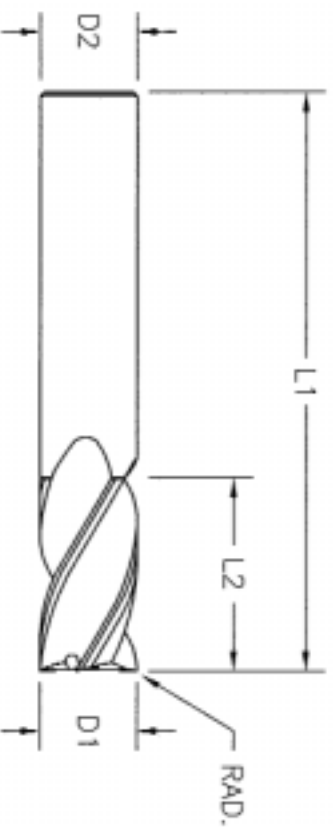
DIA S.F.M.	1/16" R.P.M.	3/32" R.P.M.	1/8" R.P.M.	5/32" R.P.M.	3/16" R.P.M.	7/32" R.P.M.	1/4" R.P.M.	5/16" R.P.M.	3/8" R.P.M.	7/16" R.P.M.	1/2" R.P.M.	5/8" R.P.M.	3/4" R.P.M.	7/8" R.P.M.	1" R.P.M.
50	3,050	2,040	1,530	1,220	1,020	875	765	610	510	440	380	310	250	220	190
75	4,580	3,060	2,290	1,830	1,530	1,310	1,150	920	760	660	570	460	380	330	285
100	6,100	4,080	3,050	2,450	2,040	1,750	1,530	1,220	1,020	870	760	610	510	440	385
125	7,630	5,100	3,820	3,050	2,550	2,180	1,920	1,530	1,270	1,100	950	770	630	550	475
150	9,150	6,120	4,570	3,670	3,060	2,620	2,290	1,830	1,530	1,310	1,140	920	760	660	575
175	10,680	7,140	5,350	4,270	3,570	3,060	2,680	2,140	1,780	1,540	1,330	1,080	880	770	665
200	12,200	8,150	6,100	4,900	4,070	3,500	3,100	2,450	2,000	1,750	1,500	1,200	1,000	875	750
300	18,500	12,200	9,200	7,300	6,100	5,250	4,600	3,700	3,100	2,600	2,300	1,800	1,500	1,300	1,100
400	24,500	16,300	12,200	9,800	8,150	7,000	6,100	4,900	4,100	3,500	3,050	2,450	2,050	1,750	1,525
500	30,500	20,400	15,300	12,200	10,200	8,700	7,600	6,100	5,100	4,400	3,800	3,100	2,500	2,200	1,900
750	45,800	36,700	22,900	18,300	15,300	13,100	11,500	9,200	7,600	6,550	5,700	4,600	3,800	3,770	2,850
1,000	—	40,800	30,600	24,500	20,400	17,500	15,300	12,200	10,200	8,750	7,650	6,100	5,100	4,400	3,800
1,500	—	—	45,900	36,700	30,600	26,200	22,900	18,300	15,300	13,150	11,300	9,200	7,600	6,500	5,700
2,000	—	—	—	49,000	40,800	35,000	30,600	24,400	20,400	17,500	15,300	12,200	10,200	8,700	7,600
3,000	—	—	—	—	—	52,500	45,900	36,600	30,600	26,250	22,900	18,300	15,300	13,100	11,400
4,000	—	—	—	—	—	—	—	48,800	40,800	35,000	30,600	24,400	20,400	17,500	15,200
5,000	—	—	—	—	—	—	—	—	51,000	43,700	38,200	30,600	25,500	21,800	19,000

S.M.M./R.P.M. Metric

DIA S.M.M.	1mm R.P.M.	2mm R.P.M.	3mm R.P.M.	4mm R.P.M.	5mm R.P.M.	6mm R.P.M.	8mm R.P.M.	10mm R.P.M.	12mm R.P.M.	14mm R.P.M.	16mm R.P.M.	18mm R.P.M.	20mm R.P.M.	22mm R.P.M.	25mm R.P.M.
15	4,800	2,400	1,600	1,200	960	800	600	480	400	340	300	265	240	220	190
22	7,000	3,500	2,300	1,750	1,400	1,170	875	700	585	500	440	390	350	320	280
30	10,000	4,800	3,200	2,400	1,900	1,590	1,200	955	800	685	600	530	480	440	380
38	12,100	6,000	4,000	3,025	2,420	2,020	1,515	1,210	1,000	870	760	670	600	550	485
45	14,300	7,200	4,800	3,600	2,870	2,390	1,790	1,430	1,200	1,020	900	800	710	650	575
53	16,880	8,440	5,630	4,220	3,375	2,815	2,110	1,690	1,400	1,200	1,055	940	845	770	675
60	19,110	9,550	6,370	4,780	3,825	3,185	2,390	1,910	1,590	1,365	1,200	1,060	955	870	765
90	28,700	14,350	9,550	7,165	5,735	4,780	3,585	2,870	2,390	2,050	1,790	1,590	1,430	1,300	1,150
120	38,200	19,100	12,750	9,550	7,645	6,370	4,780	3,820	3,185	2,730	2,490	2,120	1,910	1,740	1,530
150	47,770	23,885	15,925	11,950	9,550	7,965	5,970	4,780	3,980	3,410	2,990	2,650	2,390	2,170	1,900
230	—	36,625	24,400	18,315	14,650	12,210	9,150	7,325	6,100	5,230	4,580	4,070	3,660	3,330	2,930
300	—	47,770	31,850	23,885	19,110	15,925	11,950	9,550	7,960	6,825	5,970	5,300	4,780	4,340	3,820
450	—	—	47,770	35,830	28,660	23,885	17,915	14,330	11,950	10,240	8,960	7,960	7,170	6,510	5,730
600	—	—	—	47,770	38,220	31,850	23,885	19,100	15,920	13,650	12,000	10,600	9,550	8,685	7,600
900	—	—	—	—	—	47,770	35,830	28,660	23,885	20,475	17,900	15,900	14,330	13,030	11,500
1,200	—	—	—	—	—	—	47,770	38,210	31,850	27,300	23,885	21,230	19,100	17,370	15,300
1,500	—	—	—	—	—	—	—	47,770	39,810	34,120	29,860	26,540	23,885	21,710	19,100

Fractional **Speed & Feed Recommendations** For Diamond Coated End Mills

DIAMETER	SFM	CHIPLOAD PER TOOTH	RPM	FEED (IN/MIN)
1/32" - 1/16"	300 - 600	.0005" / .0010"	15,000 - 35,000	30 - 140
1/16" - 1/8"	300 - 1,000	.0008" / .0015"	9,000 - 31,000	28 - 190
1/8" - 3/16"	300 - 1,000	.0010" / .0020"	4,000 - 31,000	16 - 250
3/16" - 1/4"	300 - 1,200	.0010" / .0020"	3,500 - 25,000	14 - 200
1/4" - 5/16"	300 - 1,500	.0020" / .0040"	3,500 - 23,000	27 - 350
5/16" - 3/8"	300 - 1,700	.0020" / .0040"	3,000 - 20,000	24 - 325
3/8" - 1/2"	300 - 2,000	.0030" / .0050"	2,000 - 20,000	24 - 400



D1: _____ TOL: _____

D2: _____ TOL: _____

L1: _____

L2: _____

RAD: _____ TOL: _____

NO. FLUTES: _____

SPIRAL (RH/LH/STR): _____

CUT (RH/LH): _____

HELIX ANGLE: _____

SINGLE END/DOUBLE END: _____

COATING: _____

MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
ALMA, MICHIGAN

SCALE: _____ DRAWN BY: _____

DATE: _____ DATE: _____

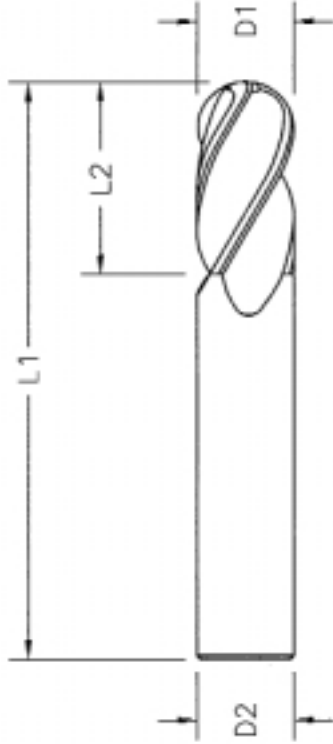
TITLE: _____

END MILL

REVISIONS

CUSTOMER: _____ DWG NO.: _____

D1: _____ TOL: _____
 D2: _____ TOL: _____
 L1: _____
 L2: _____
 NO. FLUTES: _____
 SPIRAL (RH/LH/STR): _____
 CUT (RH/LH): _____
 HELIX ANGLE: _____
 SINGLE END/DOUBLE END: _____
 COATING: _____
 MAT'L BEING CUT: _____



DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
 A L M A , M I C H I G A N

SCALE:

DRAWN BY:

APPR. BY:

DATE:

DATE:

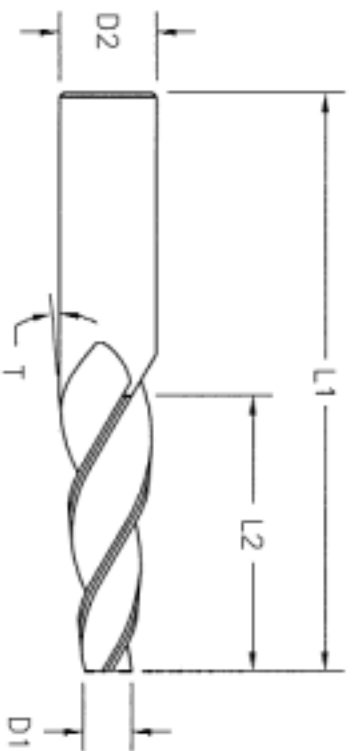
TITLE:

BALL END MILL

CUSTOMER:

DWG NO.:

REVISIONS



D1: _____ TOL: _____
 D2: _____ TOL: _____
 L1: _____
 L2: _____
 NO. FLUTES (RHS/RHC): _____
 HELIX ANGLE: _____
 T (TAPER/SIDE): _____
 COATING: _____
 MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
 A L M A , M I C H I G A N

SCALE:	DRAWN BY:	APPR. BY:
DATE:		DATE:

TITLE: TAPERED END MILL

REVISIONS

CUSTOMER:	DWG NO.:

R: _____ TOL: _____

D: _____ TOL: _____

L1: _____

L2: _____

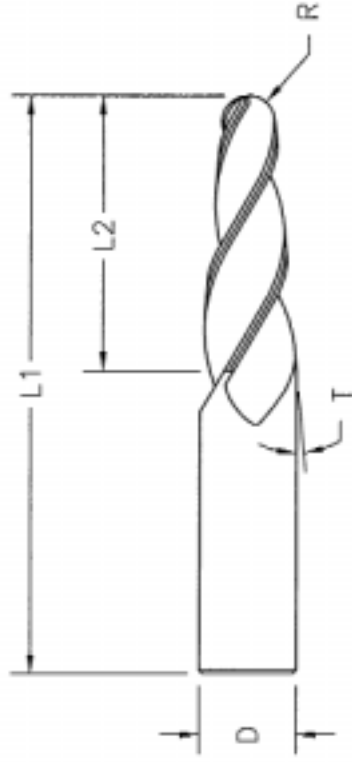
NO. FLUTES (RHS/RHC): _____

HELIX ANGLE: _____

T (TAPER/SIDE): _____

COATING: _____

MAT'L BEING CUT: _____



DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
A L M A , M I C H I G A N

SCALE:

DRAWN BY:

APPR. BY:

DATE:

DATE:

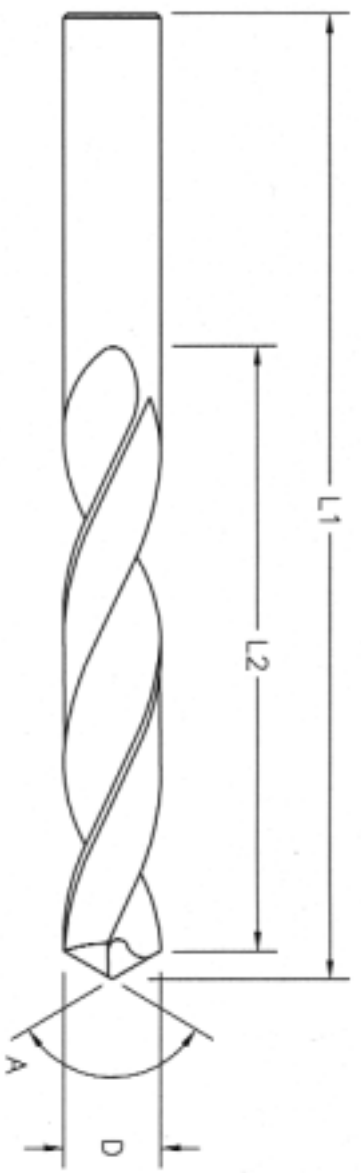
TITLE:

TAPERED BALL END MILL

REVISIONS

CUSTOMER:

DWG NO.:



D: _____ TOL: _____
 L1: _____
 L2: _____
 NO. FLUTES: _____
 HELIX ANGLE (RHS): _____
 BACKTAPER: _____
 A (DRILL POINT ANGLE): _____
 COATING: _____
 COOLANT FED (Y / N): _____
 MAT'L BEING CUT: _____

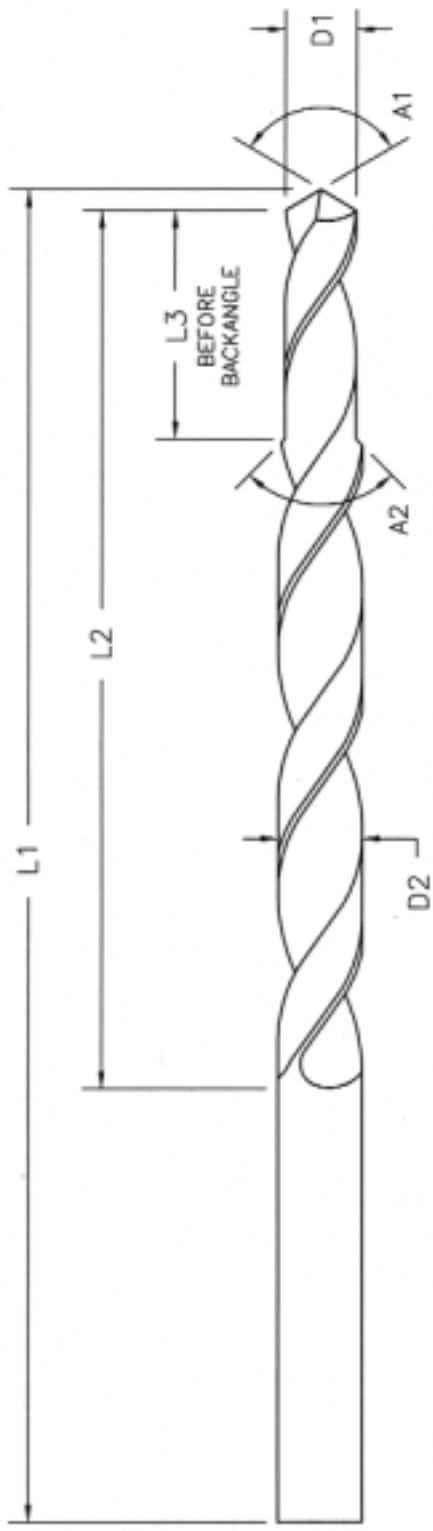
DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
 ALMA, MICHIGAN

REVISIONS

DRILL

SCALE: DRAWN BY: APPR. BY:			
DATE:		DATE:	
TITLE:			
CUSTOMER:		DWG NO.:	



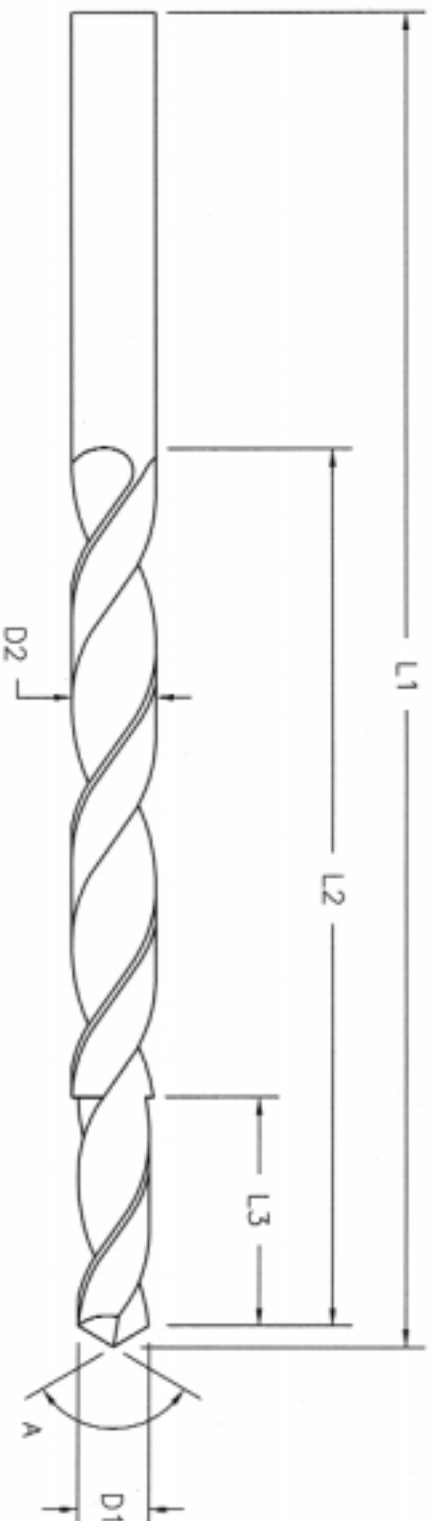
D1: _____ TOL: _____
 D2: _____ TOL: _____
 L1: _____
 L2: _____
 L3: _____
 NO. FLUTES: _____
 HELIX ANGLE (RHS): _____
 BACKTAPER: _____
 A1 DRILL POINT ANGLE: _____
 A2 STEP ANGLE (INCL): _____
 COATING: _____
 COOLANT FED (Y / N): _____
 MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
 A L M A , M I C H I G A N

SCALE:	DRAWN BY:	APPR. BY:
DATE:	DATE:	
TITLE: STEP DRILL		
CUSTOMER:	DWG NO.:	

REVISIONS



D1: _____ TOL: _____

D2: _____ TOL: _____

L1: _____

L2: _____

L3: _____

NO. FLUTES: _____

HELIX ANGLE (RHS): _____

BACKTAPER: _____

A (DRILL POINT ANGLE): _____

COATING: _____

COOLANT FED (Y / N): _____

MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
ALMA, MICHIGAN

SCALE:

DRAWN BY:

APPR. BY:

DATE:

DATE:

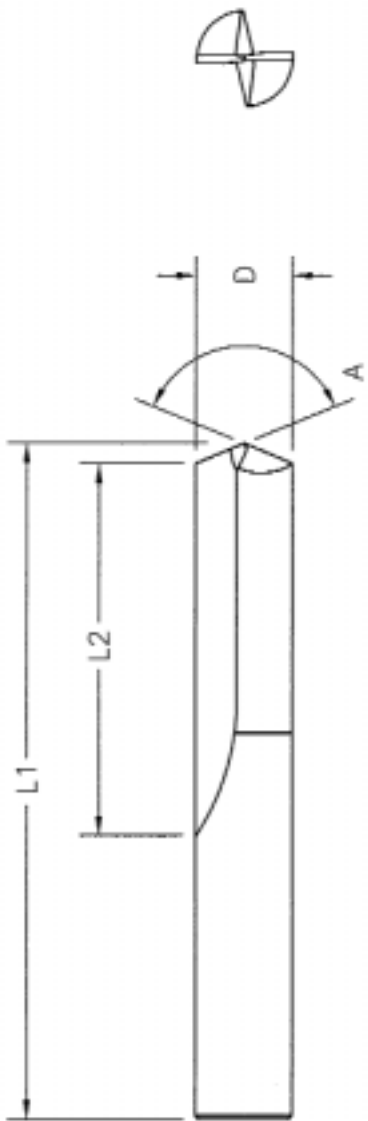
TITLE:

DRILL COUNTERBORE

REVISIONS

CUSTOMER:

DWG. NO.:



D: _____ TOL: _____
 L1: _____
 L2: _____
 A (DRILL POINT ANGLE): _____
 COATING: _____
 COOLANT FED (Y / N): _____
 MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

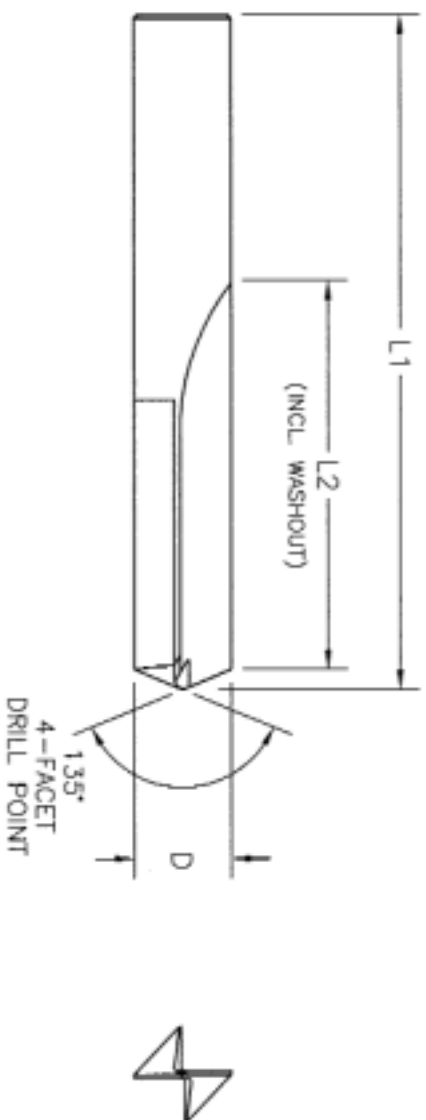
GARR TOOL®
 A L M A , M I C H I G A N

SCALE:	DRAWN BY:	APPR. BY:
DATE:	DATE:	

TITLE:	STRAIGHT FLUTE DRILL (2 FLUTES)
--------	---------------------------------

CUSTOMER:	DWG NO.:
-----------	----------

REVISIONS



D: _____ TOL: _____

L1: _____

L2: _____

COATING: _____

COOLANT FED (Y / N): _____

MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

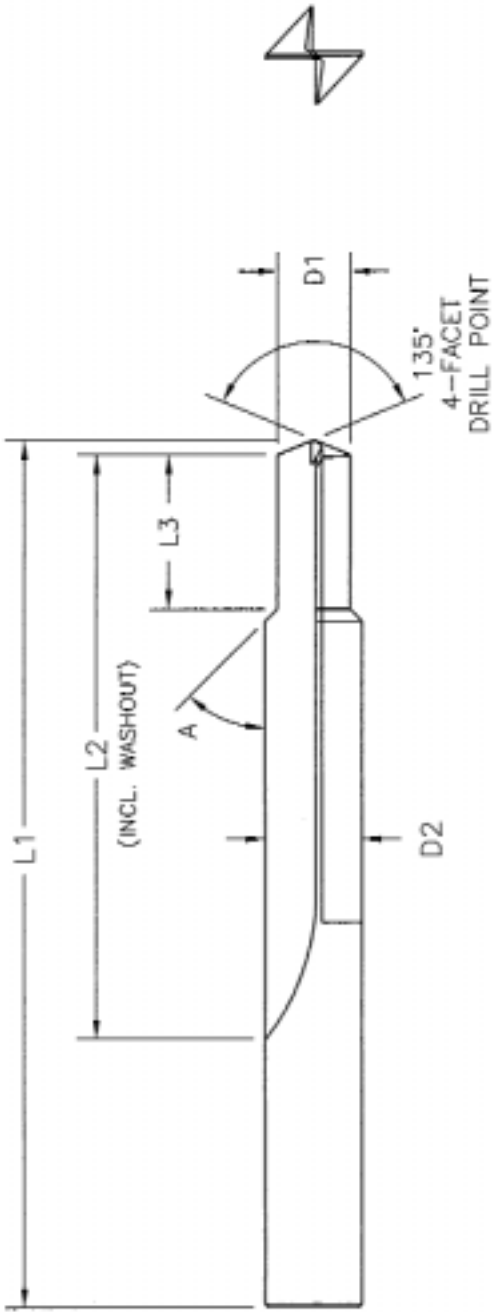
GARR TOOL
ALMA, MICHIGAN

SCALE:	DRAWN BY:	APPR. BY:
DATE:		DATE:

TITLE: DOUBLE MARGIN STRAIGHT FLUTE DRILL

REVISIONS

CUSTOMER:	DWG NO.:



D1: _____ TOL: _____

D2: _____ TOL: _____

L1: _____

L2: _____

L3: _____

A (STEP ANGLE/PER SIDE): _____

COATING: _____

COOLANT FED (Y / N): _____

MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL
A L M A , M I C H I G A N

SCALE:

DRAWN BY:

APPR. BY:

DATE:

DATE:

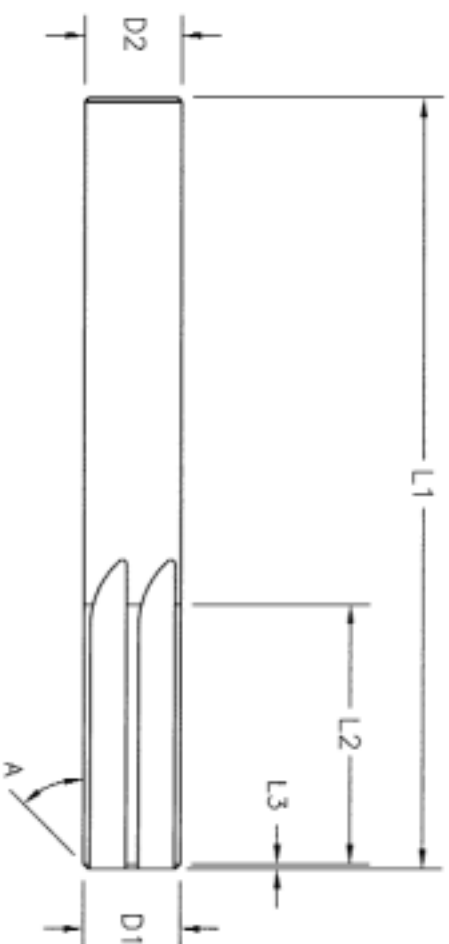
TITLE:

DOUBLE MARGIN STRAIGHT FLUTE STEP DRILL

CUSTOMER:

DWG NO.:

REVISIONS



D1: _____ TOL: _____
D2: _____ TOL: _____
L1: _____
L2: _____
L3 (CHAMFER LENGTH): _____
A (CHAMFER ANGLE): _____
NO. FLUTES: _____
SPIRAL (RH/LH/STR): _____
CUT (RH/LH): _____
HELIX ANGLE: _____
END CUT STYLE: _____
COATING: _____
MAT'L BEING CUT: _____

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
ALMA, MICHIGAN

REVISIONS

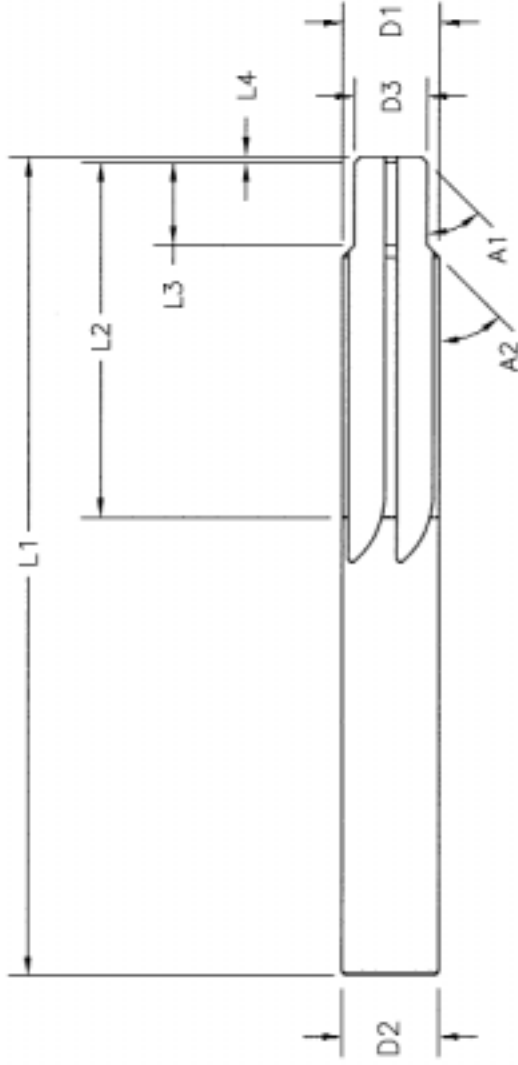
SCALE:	DRAWN BY:	APPR. BY:
DATE:		DATE:
TITLE:		

REAMER

CUSTOMER:

DWG NO.:

D1: _____ TOL: _____
 D2: _____ TOL: _____
 D3: _____ TOL: _____
 L1: _____
 L2: _____
 L3: _____
 L4 (CHAMFER LENGTH): _____
 A1 (CHAMFER ANGLE): _____
 A2 (STEP ANGLE): _____
 NO. FLUTES: _____
 SPIRAL (RH/LH/STR): _____
 CUT (RH/LH): _____
 HELIX ANGLE: _____
 END CUT STYLE: _____
 COATING: _____
 MAT'L BEING CUT: _____



DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
 TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
 A L M A, M I C H I G A N

SCALE: _____
 DATE: _____
 TITLE: _____

DRAWN BY: _____
 APPR. BY: _____
 DATE: _____

STEP REAMER

CUSTOMER: _____

DWG NO.: _____

REVISIONS

DIMENSIONS NOT SHOWN TO BE GARR TOOL STANDARDS
TOLERANCES ARE BEFORE ANY COATING IS APPLIED

GARR TOOL®
ALMA, MICHIGAN

SCALE:

DRAWN BY:

APPR. BY:

DATE:

DATE:

TITLE:

REVISIONS

CUSTOMER:

DWG NO.:

Decimal Equivalent Chart

Catalog Dia.	Decimal Equiv.	Catalog Dia.	Decimal Equiv.	Catalog Dia.	Decimal Equiv.	Catalog Dia.	Decimal Equiv.	Catalog Dia.	Decimal Equiv.
No. 80	.0135	No. 49	.0730	4.10mm	.1614	6.80mm	.2677	27/64	.4219
.35mm	.0138	1.90mm	.0748	4.20mm	.1654	6.90mm	.2717	11.0mm	.4331
No. 79	.0145	No. 48	.0760	No. 19	.1660	I	.2720	7/16	.4375
1/64	.0156	1.95mm	.0768	4.25mm	.1673	7.00mm	.2756	11.5mm	.4528
.40mm	.0158	5/64	.0781	4.30mm	.1693	J	.2770	29/64	.4531
No. 78	.0160	No. 47	.0785	No. 18	.1695	7.10mm	.2795	15/32	.4688
.45mm	.0177	2.00mm	.0787	11/64	.1719	K	.2810	12.0mm	.4724
No. 77	.0180	2.05mm	.0807	No. 17	.1730	9/32	.2812	31/64	.4844
.50mm	.0197	No. 46	.0810	4.40mm	.1732	7.20mm	.2835	12.5mm	.4921
No. 76	.0200	No. 45	.0820	No. 16	.1770	7.25mm	.2854	1/2	.5000
No. 75	.0210	2.10mm	.0827	4.50mm	.1772	7.30mm	.2874	13.0mm	.5118
.55mm	.0217	2.15mm	.0846	No. 15	.1800	L	.2900	33/64	.5156
No. 74	.0225	No. 44	.0860	4.60mm	.1811	7.40mm	.2913	17/32	.5312
.60mm	.0236	2.20mm	.0866	No. 14	.1820	M	.2950	13.5mm	.5315
No. 73	.0240	2.25mm	.0886	No. 13	.1850	7.50mm	.2953	35/64	.5469
No. 72	.0250	No. 43	.0890	4.70mm	.1850	19/64	.2969	14.0mm	.5512
.65mm	.0256	2.30mm	.0906	4.75mm	.1870	7.60mm	.2992	9/16	.5625
No. 71	.0260	2.35mm	.0925	3/16	.1875	N	.3020	14.5mm	.5709
.70mm	.0276	No. 42	.0935	4.80mm	.1890	7.70mm	.3031	37/64	.5781
No. 70	.0280	3/32	.0938	No. 12	.1890	7.75mm	.3051	15.0mm	.5906
No. 69	.0292	2.40mm	.0945	No. 11	.1910	7.80mm	.3071	19/32	.5938
.75mm	.0295	No. 41	.0960	4.90mm	.1929	7.90mm	.3110	39/64	.6094
No. 68	.0310	2.45mm	.0965	No. 10	.1935	5/16	.3125	15.5mm	.6102
1/32	.0312	No. 40	.0980	No. 9	.1960	8.00mm	.3150	5/8	.6250
.80mm	.0315	2.50mm	.0984	5.00mm	.1969	O	.3160	16.0mm	.6299
No. 67	.0320	No. 39	.0995	No. 8	.1990	8.10mm	.3189	41/64	.6406
No. 66	.0330	No. 38	.1015	5.10mm	.2008	8.20mm	.3228	16.5mm	.6496
.85mm	.0335	2.60mm	.1024	No. 7	.2010	P	.3230	21/32	.6562
No. 65	.0350	No. 37	.1040	13/64	.2031	8.25mm	.3248	17.0mm	.6693
.90mm	.0354	2.70mm	.1063	No. 6	.2040	8.30mm	.3268	43/64	.6719
No. 64	.0360	No. 36	.1065	5.20mm	.2047	21/64	.3281	11/16	.6875
No. 63	.0370	2.75mm	.1083	No. 5	.2055	8.40mm	.3307	17.5mm	.6890
.95mm	.0374	7/64	.1094	5.25mm	.2067	Q	.3320	45/64	.7031
No. 62	.0380	No. 35	.1100	5.30mm	.2087	8.50mm	.3346	18.0mm	.7087
No. 61	.0390	2.80mm	.1102	No. 4	.2090	8.60mm	.3386	23/32	.7188
1.00mm	.0394	No. 34	.1110	5.40mm	.2126	R	.3390	18.5mm	.7283
No. 60	.0400	No. 33	.1130	No. 3	.2130	8.70mm	.3425	47/64	.7344
No. 59	.0410	2.90mm	.1142	5.50mm	.2165	11/32	.3438	19.0mm	.7480
1.05mm	.0413	No. 32	.1160	7/32	.2188	8.75mm	.3445	3/4	.7500
No. 58	.0420	3.00mm	.1181	5.60mm	.2205	8.80mm	.3465	49/64	.7656
No. 57	.0430	No. 31	.1200	No. 2	.2210	S	.3480	19.5mm	.7677
1.10mm	.0433	3.10mm	.1220	5.70mm	.2244	8.90mm	.3504	25/32	.7812
1.15mm	.0453	1/8	.1250	5.75mm	.2264	9.00mm	.3543	20.0mm	.7874
No. 56	.0465	3.20mm	.1260	No. 1	.2280	T	.3580	51/64	.7969
3/64	.0469	3.25mm	.1280	5.80mm	.2283	9.10mm	.3583	20.5mm	.8071
1.20mm	.0472	No. 30	.1285	5.90mm	.2323	23/64	.3594	13/16	.8125
1.25mm	.0492	3.30mm	.1299	A	.2340	9.20mm	.3622	21.0mm	.8268
1.30mm	.0512	3.40mm	.1339	15/64	.2344	9.25mm	.3642	53/64	.8281
No. 55	.0520	No. 29	.1360	6.00mm	.2362	9.30mm	.3661	27/32	.8438
1.35mm	.0531	3.50mm	.1378	B	.2380	U	.3680	21.5mm	.8465
No. 54	.0550	No. 28	.1405	6.10mm	.2402	9.40mm	.3701	55/64	.8594
1.40mm	.0551	9/64	.1406	C	.2420	9.50mm	.3740	22.0mm	.8661
1.45mm	.0571	3.60mm	.1417	6.20mm	.2441	3/8	.3750	7/8	.8750
1.50mm	.0591	No. 27	.1440	D	.2460	V	.3770	22.5mm	.8858
No. 53	.0595	3.70mm	.1457	6.25mm	.2461	9.60mm	.3780	57/64	.8906
1.55mm	.0610	No. 26	.1470	6.30mm	.2480	9.70mm	.3819	23.0mm	.9055
1/16	.0625	3.75mm	.1476	1/4	.2500	9.75mm	.3839	29/32	.9062
1.60mm	.0630	No. 25	.1495	E	.2500	9.80mm	.3858	59/64	.9219
No. 52	.0635	3.80mm	.1496	6.40mm	.2520	W	.3860	23.5mm	.9252
1.65mm	.0650	No. 24	.1520	6.50mm	.2559	9.90mm	.3898	15/16	.9375
1.70mm	.0669	3.90mm	.1535	F	.2570	25/64	.3906	24.0mm	.9449
No. 51	.0670	No. 23	.1540	6.60mm	.2598	10.0mm	.3937	61/64	.9531
1.75mm	.0689	5/32	.1562	G	.2610	X	.3970	24.5mm	.9646
No. 50	.0700	No. 22	.1570	6.70mm	.2638	Y	.4040	31/32	.9688
1.80mm	.0709	4.00mm	.1575	17/64	.2656	13/32	.4062	25.0mm	.9843
1.85mm	.0728	No. 21	.1590	6.75mm	.2657	Z	.4130	63/64	.9844
		No. 20	.1610	H	.2660	10.5mm	.4134	1	1.0000

GARR TOOL

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