

SGS FRESAS MD



TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000/-0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

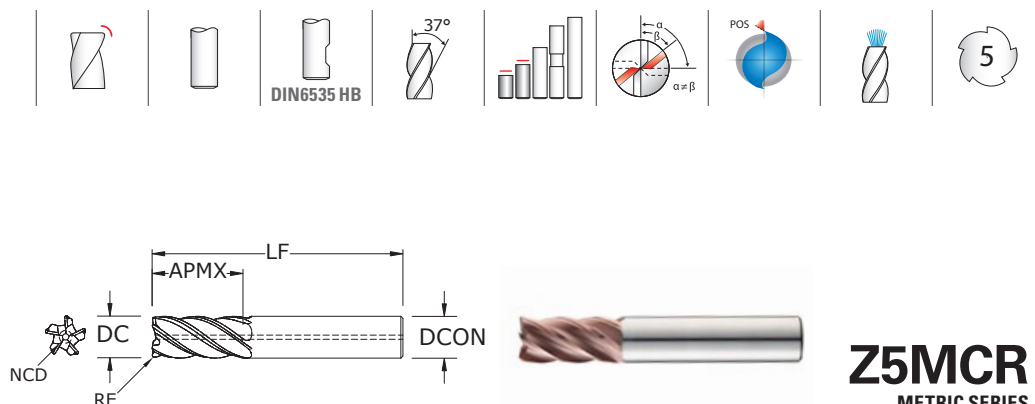
RE = +0,000/-0,050

>10-25 DIAMETER

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050



Z5MCR
METRIC SERIES

mm						EDP NO.					
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA)	Ti-NAMITE®-A (TA) W/FLAT	Ti-NAMITE®-A (TA) W/INTERNAL COOLANT	Ti-NAMITE®-M (TM)	Ti-NAMITE®-M (TM) W/FLAT	Ti-NAMITE®-M (TM) W/INTERNAL COOLANT
6,0	9,0	54,0	6,0	0,5	2,11	48000	—	—	47000	—	—
6,0	13,0	57,0	6,0	0,3	2,11	48001	—	—	47001	—	—
6,0	13,0	57,0	6,0	0,5	2,11	47120	—	—	47002	—	—
6,0	13,0	57,0	6,0	1,0	2,11	48002	—	—	47003	—	—
6,0	13,0	57,0	6,0	1,5	2,11	48003	—	—	47004	—	—
8,0	11,0	58,0	8,0	0,5	2,79	48004	—	—	47005	—	—
8,0	18,0	63,0	8,0	0,5	2,79	47121	—	—	47006	—	—
8,0	18,0	63,0	8,0	1,0	2,79	47122	—	—	47007	—	—
8,0	18,0	63,0	8,0	1,5	2,79	48005	—	—	47008	—	—
8,0	18,0	63,0	8,0	2,0	2,79	48006	—	—	47009	—	—
10,0	13,0	66,0	10,0	1,0	3,51	48007	—	—	47010	—	—
10,0	22,0	72,0	10,0	0,5	3,51	47123	—	—	47011	—	—
10,0	22,0	72,0	10,0	1,0	3,51	47124	—	—	47012	—	—
10,0	22,0	72,0	10,0	1,5	3,51	48008	—	—	47013	—	—
10,0	22,0	72,0	10,0	2,0	3,51	48009	—	—	47014	—	—
10,0	22,0	72,0	10,0	2,5	3,51	48010	—	—	47015	—	—
12,0	15,0	73,0	12,0	1,0	4,19	48011	48029	—	47016	47024	—
12,0	26,0	83,0	12,0	0,5	4,19	47125	47128	47160	47017	47025	47161
12,0	26,0	83,0	12,0	0,76	4,19	47126	47129	47162	47018	47026	47163
12,0	26,0	83,0	12,0	1,0	4,19	47127	47130	47164	47019	47027	47165
12,0	26,0	83,0	12,0	1,5	4,19	48012	48030	47166	47020	47028	47167
12,0	26,0	83,0	12,0	2,0	4,19	48013	48031	47168	47021	47029	47169
12,0	26,0	83,0	12,0	2,5	4,19	48014	48032	47170	47022	47030	47171
12,0	26,0	83,0	12,0	3,0	4,19	48015	48033	47172	47023	47031	47173
16,0	19,0	82,0	16,0	1,0	5,59	48016	48034	48056	47032	47039	47046
16,0	19,0	82,0	16,0	1,5	5,59	48070	—	—	48071	—	—
16,0	35,0	92,0	16,0	1,0	5,59	47131	48035	47134	47033	47040	47047
16,0	35,0	92,0	16,0	1,5	5,59	48017	48036	48057	47034	47041	47048

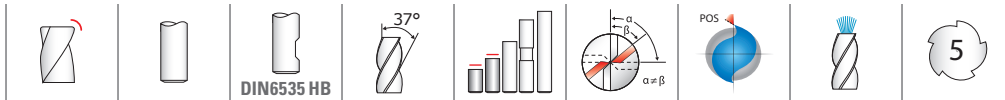
continued on next page

- An ideal balance of helix, indexing, flute depth, rake and relief
- Variable indexing for chatter suppression and patented edge geometry for shearing and strength
- Chatter-free geometry allows deep cutting and high speed machining
- Central coolant hole delivers coolant effectively to the cutting zone enhancing chip removal when pocketing or slotting
- Enhanced corner geometry with tight tolerance corner radii
- Excels at roughing, ramping, high speed machining and finishing in a variety of materials
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)

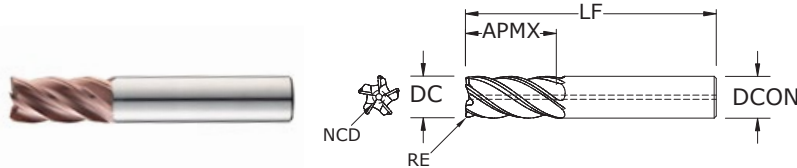
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit www.ksptpatents.com

METRIC Z-Carb-HPR



Z5MCR METRIC SERIES



TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000/-0,050

>6-10 DIAMETER

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>10-25 DIAMETER

DC = +0,000/-0,050

DCON = h_6

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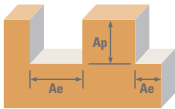
CONTINUED

- An ideal balance of helix, indexing, flute depth, rake and relief
- Variable indexing for chatter suppression and patented edge geometry for shearing and strength
- Chatter-free geometry allows deep cutting and high speed machining
- Central coolant hole delivers coolant effectively to the cutting zone enhancing chip removal when pocketing or slotting
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STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

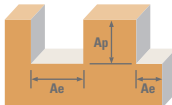
For patent
information visit
www.ksptpatents.com

mm						EDP NO.					
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON- CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA)	Ti-NAMITE®-A (TA) W/FLAT	Ti-NAMITE®-A (TA) W/INTERNAL COOLANT	Ti-NAMITE®-M (TM)	Ti-NAMITE®-M (TM) W/FLAT	Ti-NAMITE®-M (TM) W/INTERNAL COOLANT
16,0	35,0	92,0	16,0	2,0	5,59	47132	48037	47135	47035	47042	47049
16,0	35,0	92,0	16,0	2,5	5,59	48018	48038	48058	47036	47043	47050
16,0	35,0	92,0	16,0	3,0	5,59	47133	48039	47136	47037	47044	47051
16,0	35,0	92,0	16,0	4,0	5,59	48019	48040	48059	47038	47045	47052
20,0	23,0	92,0	20,0	1,0	7,01	48020	48041	48060	47053	47061	47069
20,0	43,0	104,0	20,0	1,0	7,01	47137	48042	47140	47054	47062	47070
20,0	43,0	104,0	20,0	1,5	7,01	48021	48043	48061	47055	47063	47071
20,0	43,0	104,0	20,0	2,0	7,01	47138	48044	47141	47056	47064	47072
20,0	43,0	104,0	20,0	2,5	7,01	48022	48045	48062	47057	47065	47073
20,0	43,0	104,0	20,0	3,0	7,01	47139	48046	47142	47058	47066	47074
20,0	43,0	104,0	20,0	4,0	7,01	48023	48047	48063	47059	47067	47075
20,0	43,0	104,0	20,0	5,0	7,01	48024	48048	48064	47060	47068	47076
25,0	28,0	100,0	25,0	1,0	8,76	48025	48049	48065	47077	47084	47091
25,0	53,0	121,0	25,0	1,0	8,76	47143	48050	47146	47078	47085	47092
25,0	53,0	121,0	25,0	2,0	8,76	47144	48051	47147	47079	47086	47093
25,0	53,0	121,0	25,0	2,5	8,76	48026	48052	48066	47080	47087	47094
25,0	53,0	121,0	25,0	3,0	8,76	47145	48053	47148	47081	47088	47095
25,0	53,0	121,0	25,0	4,0	8,76	48027	48054	48067	47082	47089	47096
25,0	53,0	121,0	25,0	5,0	8,76	48028	48055	48068	47083	47090	47097

Series Z5MCR Metric		Hardness			Vc (m/min)	DC • mm								
			Ae x DC	Ap x DC		6	8	10	12	16	20	25		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	169 (135-203)	RPM	8967	6725	5380	4484	3363	2690	2152
						Fz	0.029	0.049	0.061	0.074	0.087	0.099	0.108	
						Feed (mm/min)	1291	1650	1650	1668	1463	1327	1157	
		Slot 	1	≤ 1	134 (107-161)	RPM	7109	5332	4265	3555	2666	2133	1706	
						Fz	0.029	0.049	0.061	0.074	0.087	0.099	0.108	
						Feed (mm/min)	1024	1308	1308	1322	1160	1052	917	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Profile 	≤ 0.5	≤ 1.5	96 (77-115)	RPM	5089	3817	3054	2545	1909	1527	1221
						Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080	
						Feed (mm/min)	550	692	692	702	635	570	489	
		Slot 	1	≤ 1	76 (61-91)	RPM	4039	3029	2424	2020	1515	1212	969	
						Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080	
						Feed (mm/min)	436	549	549	557	504	452	388	
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Profile 	≤ 0.5	≤ 1.5	56 (45-68)	RPM	2989	2242	1793	1495	1121	897	717	
					Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.065		
					Feed (mm/min)	251	335	335	323	287	263	233		
	Slot 	1	≤ 1	44 (35-53)	RPM	2343	1757	1406	1171	879	703	562		
					Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.065		
					Feed (mm/min)	197	262	262	253	225	206	183		
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	149 (119-179)	RPM	7917	5938	4750	3958	2969	2375	1900
						Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080	
						Feed (mm/min)	855	1077	1077	1092	988	887	760	
		Slot 	1	≤ 1	119 (95-143)	RPM	6301	4726	3781	3151	2363	1890	1512	
						Fz	0.022	0.036	0.045	0.055	0.067	0.075	0.080	
						Feed (mm/min)	680	857	857	869	786	706	605	
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	104 (83-124)	RPM	5493	4120	3296	2747	2060	1648	1318
						Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063	
						Feed (mm/min)	461	615	615	593	527	483	412	
		Slot 	1	≤ 1	82 (66-99)	RPM	4362	3272	2617	2181	1636	1309	1047	
						Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063	
						Feed (mm/min)	366	489	489	471	419	384	327	
STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450	≤ 325 Bhn or ≤ 35 HRc	Profile 	≤ 0.5	≤ 1.5	94 (76-113)	RPM	5009	3756	3005	2504	1878	1503	1202	
					Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063		
					Feed (mm/min)	421	561	561	541	481	441	376		
	Slot 	1	≤ 1	76 (61-91)	RPM	4039	3029	2424	2020	1515	1212	969		
					Fz	0.017	0.030	0.037	0.043	0.051	0.059	0.063		
					Feed (mm/min)	339	452	452	436	388	355	303		
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile 	≤ 0.5	≤ 1.5	136 (109-163)	RPM	7190	5392	4314	3595	2696	2157	1726
						Fz	0.026	0.045	0.056	0.067	0.079	0.091	0.098	
						Feed (mm/min)	949	1208	1208	1208	1070	978	841	
		Slot 	1	≤ 1	108 (87-130)	RPM	5736	4302	3441	2868	2151	1721	1377	
						Fz	0.026	0.045	0.056	0.067	0.079	0.091	0.098	
						Feed (mm/min)	757	964	964	964	853	780	671	
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile 	≤ 0.5	≤ 1.5	104 (83-124)	RPM	5493	4120	3296	2747	2060	1648	1318
						Fz	0.020	0.034	0.043	0.050	0.059	0.067	0.073	
						Feed (mm/min)	554	703	703	692	606	549	478	
		Slot 	1	≤ 1	82 (66-99)	RPM	4362	3272	2617	2181	1636	1309	1047	
						Fz	0.020	0.034	0.043	0.050	0.059	0.067	0.073	
						Feed (mm/min)	440	558	558	550	482	436	380	

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Z-Carb-HPR

Series Z5MCR Metric	Hardness			Vc (m/min)	DC • mm								
		Ae x DC	Ap x DC		6	8	10	12	16	20	25		
S	HIGH TEMP ALLOYS (NICKEL , COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400		≤ 0.5	≤ 1.5	24 (20-29)	RPM	1293	969	776	646	485	388	310
						Fz	0.0160	0.0272	0.0340	0.0409	0.0478	0.0531	0.0599
						Feed (mm/min)	103	132	132	132	116	103	93
			1	≤ 1	20 (16-24)	RPM	1050	788	630	525	394	315	252
						Fz	0.0160	0.0272	0.0340	0.0409	0.0478	0.0531	0.0599
						Feed (mm/min)	84	107	107	107	94	84	75
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene		≤ 0.5	≤ 1.5	19 (15-23)	RPM	1002	751	601	501	376	301	240
						Fz	0.0112	0.0192	0.0239	0.0284	0.0333	0.0371	0.0420
						Feed (mm/min)	56	72	72	71	63	56	50
			1	≤ 1	15 (12-18)	RPM	808	606	485	404	303	242	194
						Fz	0.0112	0.0192	0.0239	0.0284	0.0333	0.0371	0.0420
						Feed (mm/min)	45	58	58	57	50	45	41
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si		≤ 0.5	≤ 1.5	66 (52-79)	RPM	3474	2605	2084	1737	1303	1042	834
						Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	333	417	417	417	367	333	292
			1	≤ 1	52 (41-62)	RPM	2747	2060	1648	1373	1030	824	659
						Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	264	330	330	330	290	264	231
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		≤ 0.5	≤ 1.5	23 (18-27)	RPM	1212	909	727	606	454	364	291
						Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.071
						Feed (mm/min)	116	145	145	145	128	116	103
			1	≤ 1	18 (15-22)	RPM	969	727	582	485	364	291	233
						Fz	0.019	0.032	0.040	0.048	0.056	0.064	0.071
						Feed (mm/min)	93	116	116	116	102	93	83

Bhn (Brinell) HRc (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x 5 x rpm

ramp up to 5 degrees using slotting speed and feed rates. Do not plunge.

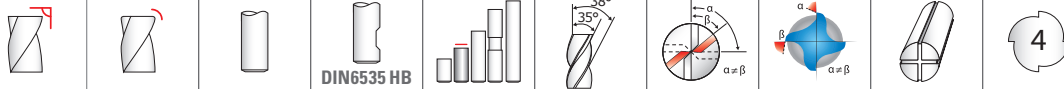
reduce speed and feed for materials harder than listed

reduce feed and Ae when finish milling (.02 x DC maximum)

feed rates listed have chip thinning adjustments included where applicable

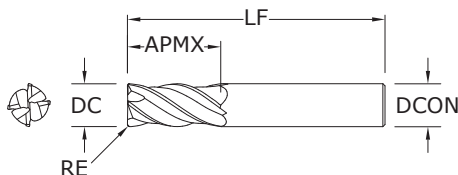
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)

Z-Carb-AP • Z-Carb



Z1MPCR • Z1M

METRIC SERIES



- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			CORNER RADIUS RE	EDP NO.			SERIES
		OVERALL LENGTH LF	SHANK DIAMETER DCON			Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT	JetStream	
1,0	3,0	57,0	6,0	0,1		46873*	—	—	Z1MPCR
1,5	4,5	57,0	6,0	0,1		46849*	—	—	Z1MPCR
2,0	6,0	57,0	6,0	0,2		46850*	—	—	Z1MPCR
2,5	7,0	57,0	6,0	0,2		46874*	—	—	Z1MPCR
3,0	8,0	57,0	6,0	—		46357	—	—	Z1M
3,0	8,0	57,0	6,0	0,3		46851	—	—	Z1MPCR
3,0	8,0	57,0	6,0	0,5		46880	—	—	Z1MPCR
4,0	11,0	57,0	6,0	—		46358	—	—	Z1M
4,0	11,0	57,0	6,0	0,3		46852	—	—	Z1MPCR
4,0	11,0	57,0	6,0	0,5		46881	—	—	Z1MPCR
5,0	13,0	57,0	6,0	—		46359	—	—	Z1M
5,0	13,0	57,0	6,0	0,3		46853	—	—	Z1MPCR
6,0	13,0	57,0	6,0	—		46360	—	—	Z1M
6,0	13,0	57,0	6,0	0,25		46882	—	—	Z1MPCR
6,0	13,0	57,0	6,0	0,5		46854	—	—	Z1MPCR
6,0	13,0	57,0	6,0	1,0		46855	—	—	Z1MPCR
6,0	13,0	57,0	6,0	1,5		46884	—	—	Z1MPCR
8,0	19,0	63,0	8,0	—		46362	—	—	Z1M
8,0	19,0	63,0	8,0	0,5		46856	—	—	Z1MPCR
8,0	19,0	63,0	8,0	1,0		46857	—	—	Z1MPCR
8,0	19,0	63,0	8,0	1,5		46886	—	—	Z1MPCR
8,0	19,0	63,0	8,0	2,0		46887	—	—	Z1MPCR
10,0	22,0	72,0	10,0	—		46364	—	—	Z1M
10,0	22,0	72,0	10,0	0,5		46858	—	—	Z1MPCR
10,0	22,0	72,0	10,0	1,0		46859	—	—	Z1MPCR
10,0	22,0	72,0	10,0	1,5		46889	—	—	Z1MPCR
10,0	22,0	72,0	10,0	2,0		46890	—	—	Z1MPCR
10,0	22,0	72,0	10,0	2,5		46891	—	—	Z1MPCR
12,0	26,0	83,0	12,0	—		46366	—	—	Z1M
12,0	26,0	83,0	12,0	0,5		46860	46909	—	Z1MPCR
12,0	26,0	83,0	12,0	0,75		46861	46910	46493	Z1MPCR
12,0	26,0	83,0	12,0	1,0		46893	46911	—	Z1MPCR

*Variable flute spacing. Helix and rake do not vary.

continued on next page

TOLERANCES (mm)

<3 DIAMETER

DC = $+0,012/-0,012$

DCON = h_6

RE = $+0,000/-0,025$

>3–6 DIAMETER

DC = $+0,000/-0,030$

DCON = h_6

RE = $+0,000/-0,050$

>6–10 DIAMETER

DC = $+0,000/-0,040$

DCON = h_6

RE = $+0,000/-0,050$

>10–25 DIAMETER

DC = $+0,000/-0,050$

DCON = h_6

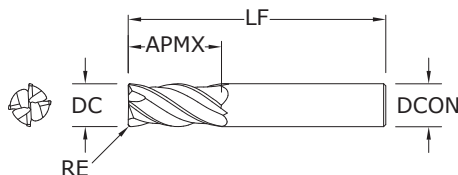
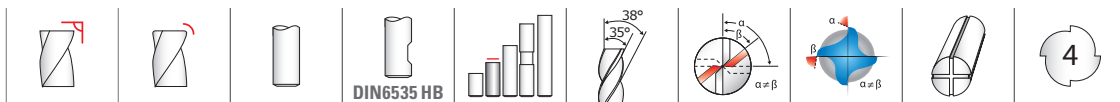
RE = $+0,000/-0,050$

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit
www.ksptpatents.com



METRIC Z-Carb-AP • Z-Carb



Z1MPCR • Z1M METRIC SERIES

TOLERANCES (mm)

<3 DIAMETER

DC = +0,012/-0,012

DCON = h_6

RE = +0,000/-0,025

>3-6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000/-0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

RE = +0,000/-0,050

>10-25 DIAMETER

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

STEELS

STAINLESS STEELS

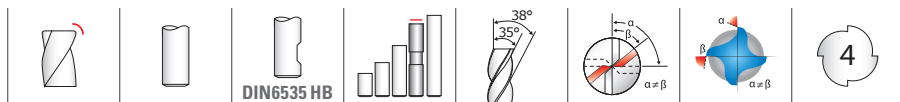
CAST IRON

HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

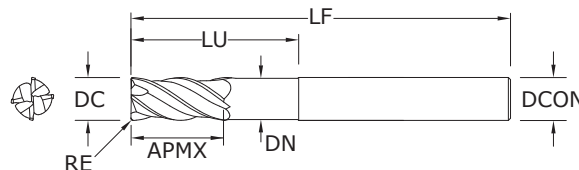
mm					EDP NO.		SERIES	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT	JetStream	
12,0	26,0	83,0	12,0	1,5	46894	46912	—	Z1MPCR
12,0	26,0	83,0	12,0	2,0	46895	46913	—	Z1MPCR
12,0	26,0	83,0	12,0	2,5	46896	46914	—	Z1MPCR
12,0	26,0	83,0	12,0	3,0	42718	46915	42719	Z1MPCR
14,0	26,0	83,0	14,0	—	46368	46506	—	Z1M
14,0	26,0	83,0	14,0	1,0	46862	46916	46494	Z1MPCR
16,0	32,0	92,0	16,0	—	46370	46507	—	Z1M
16,0	32,0	92,0	16,0	1,0	46863	46917	46495	Z1MPCR
16,0	32,0	92,0	16,0	1,5	46898	46918	—	Z1MPCR
16,0	32,0	92,0	16,0	2,0	46899	46919	—	Z1MPCR
16,0	32,0	92,0	16,0	2,5	46900	46920	—	Z1MPCR
16,0	32,0	92,0	16,0	3,0	46864	46921	42721	Z1MPCR
16,0	32,0	92,0	16,0	4,0	46867	46944	—	Z1MPCR
18,0	32,0	92,0	18,0	—	46372	46508	—	Z1M
20,0	38,0	104,0	20,0	—	46374	46509	—	Z1M
20,0	38,0	104,0	20,0	1,0	46865	46922	46497	Z1MPCR
20,0	38,0	104,0	20,0	1,5	46903	46923	—	Z1MPCR
20,0	38,0	104,0	20,0	2,0	46904	46924	—	Z1MPCR
20,0	38,0	104,0	20,0	2,5	46905	46925	—	Z1MPCR
20,0	38,0	104,0	20,0	3,0	42722	46926	42723	Z1MPCR
20,0	38,0	104,0	20,0	4,0	46868	46945	—	Z1MPCR
20,0	38,0	104,0	20,0	5,0	46869	46946	—	Z1MPCR
25,0	38,0	104,0	25,0	—	46376	46510	—	Z1M
25,0	38,0	104,0	25,0	1,0	46866	46927	46498	Z1MPCR

- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



Z1MPIC • Z1MPLC

METRIC SERIES



- Variable rake geometry alters and controls the cutting dynamic taking chatter suppression to an unprecedented level
- Unequal helix design changes the cutting angle to improve harmonics
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Long reach design allows for deeper and faster cuts
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	mm				EDP NO.	
			SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-X (TX)	Ti-NAMITE®-X (TX) W/FLAT
6,0	8,0	75,0	6,0	24,0	5,49	0,5	46821	—
8,0	10,0	75,0	8,0	32,0	7,49	1,0	46822	—
8,0	10,0	75,0	8,0	32,0	7,49	2,0	46823	—
10,0	12,0	100,0	10,0	40,0	9,50	1,0	46824	—
10,0	12,0	100,0	10,0	40,0	9,50	2,0	46825	—
12,0	15,0	100,0	12,0	48,0	11,48	1,0	46826	46928
12,0	15,0	100,0	12,0	48,0	11,48	1,5	46827	46929
12,0	15,0	100,0	12,0	48,0	11,48	2,0	46828	46930
12,0	15,0	100,0	12,0	48,0	11,48	3,0	46829	46931
12,0	26,0	83,0	12,0	36,0	11,48	2,5	—	42731
12,0	26,0	83,0	12,0	36,0	11,48	3,0	—	42732
12,0	26,0	83,0	12,0	36,0	11,48	4,0	—	42733
16,0	32,0	92,0	16,0	42,0	15,49	2,5	—	42734
16,0	32,0	92,0	16,0	42,0	15,49	4,0	—	42735
16,0	32,0	92,0	16,0	42,0	15,49	6,0	—	42736
16,0	20,0	115,0	16,0	65,0	15,49	1,0	46830	46932
16,0	20,0	115,0	16,0	65,0	15,49	1,5	46831	46933
16,0	20,0	115,0	16,0	65,0	15,49	2,0	46832	46934
16,0	20,0	115,0	16,0	65,0	15,49	3,0	46833	46935
16,0	20,0	115,0	16,0	65,0	15,49	4,0	46834	46936
16,0	20,0	115,0	16,0	65,0	15,49	5,0	46835	46937
20,0	24,0	140,0	20,0	80,0	19,48	1,0	46836	46938
20,0	24,0	140,0	20,0	80,0	19,48	1,5	46837	46939
20,0	24,0	140,0	20,0	80,0	19,48	2,0	46838	46940
20,0	24,0	140,0	20,0	80,0	19,48	3,0	46839	46941
20,0	24,0	140,0	20,0	80,0	19,48	4,0	46840	46942
20,0	24,0	140,0	20,0	80,0	19,48	5,0	46841	46943
20,0	38,0	104,0	20,0	52,0	19,48	2,5	—	42737
20,0	38,0	104,0	20,0	52,0	19,48	4,0	—	42738
20,0	38,0	104,0	20,0	52,0	19,48	6,0	—	42739

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000/-0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

RE = +0,000/-0,050

>10-20 DIAMETER

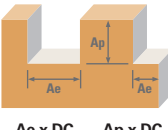
DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

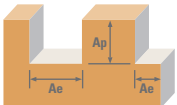
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent
information visit
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Series Z1M, Z1MPCR, Z1MPIC, Z1MPLC Metric				DC • mm											
Hardness		Ae x DC	Ap x DC	Vc (m/min)		1	3	6	8	10	12	16	20	25	
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	 Profile	≤ 0.5	≤ 1.5	169	RPM	53803	17934	8967	6725	5380	4484	3363	2690	2152
					(135-203)	Fz	0.0030	0.0109	0.029	0.049	0.061	0.074	0.087	0.099	0.108
					Feed (mm/min)	646	782	1040	1318	1313	1327	1170	1065	930	
		 Slot	1	≤ 1	134	RPM	42654	14218	7109	5332	4265	3555	2666	2133	1706
					(107-161)	Fz	0.0030	0.0109	0.029	0.049	0.061	0.074	0.087	0.099	0.108
					Feed (mm/min)	512	620	825	1045	1041	1052	928	845	737	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	 Profile	≤ 0.5	≤ 1.5	96	RPM	30537	10179	5089	3817	3054	2545	1909	1527	1221
					(77-115)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
					Feed (mm/min)	281	330	448	550	550	560	511	458	391	
		 Slot	1	≤ 1	76	RPM	24235	8078	4039	3029	2424	2020	1515	1212	969
					(61-91)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
					Feed (mm/min)	223	262	355	436	436	444	406	364	310	
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	 Profile	≤ 0.5	≤ 1.5	56	RPM	17934	5978	2989	2242	1793	1495	1121	897	717
					(45-68)	Fz	0.0018	0.0066	0.017	0.030	0.037	0.043	0.051	0.059	0.065
					Feed (mm/min)	129	158	203	269	265	257	229	212	187	
		 Slot	1	≤ 1	44	RPM	14057	4686	2343	1757	1406	1171	879	703	562
					(35-53)	Fz	0.0018	0.0066	0.017	0.030	0.037	0.043	0.051	0.059	0.065
					Feed (mm/min)	101	124	159	211	208	201	179	166	146	
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	 Profile	≤ 0.5	≤ 1.5	149	RPM	47501	15834	7917	5938	4750	3958	2969	2375	1900
					(119-179)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
					Feed (mm/min)	437	513	697	855	855	871	796	713	608	
		 Slot	1	≤ 1	119	RPM	37807	12602	6301	4726	3781	3151	2363	1890	1512
					(95-143)	Fz	0.0023	0.0081	0.022	0.036	0.045	0.055	0.067	0.075	0.080
					Feed (mm/min)	348	408	555	681	681	693	633	567	484	
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	 Profile	≤ 0.5	≤ 1.5	104	RPM	32960	10987	5493	4120	3296	2747	2060	1648	1318
					(83-124)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
					Feed (mm/min)	237	281	374	494	488	472	420	389	332	
		 Slot	1	≤ 1	82	RPM	26174	8725	4362	3272	2617	2181	1636	1309	1047
					(66-99)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
					Feed (mm/min)	188	223	297	393	387	375	334	309	264	
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	 Profile	≤ 0.5	≤ 1.5	94	RPM	30052	10017	5009	3756	3005	2504	1878	1503	1202
					(76-113)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
					Feed (mm/min)	216	256	341	451	445	431	383	355	303	
		 Slot	1	≤ 1	76	RPM	24235	8078	4039	3029	2424	2020	1515	1212	969
					(61-91)	Fz	0.0018	0.0064	0.017	0.030	0.037	0.043	0.051	0.059	0.063
					Feed (mm/min)	174	207	275	364	359	347	309	286	244	

continued on next page

Z-Carb-AP

Series Z1M, Z1MPCR, Z1MPIC, Z1MPLC Metric		Hardness			Vc (m/min)	DC • mm										
			Ae x DC	Ap x DC		1	3	6	8	10	12	16	20	25		
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	 Profile	≤ 0.5	≤ 1.5	136	RPM	43139	14380	7190	5392	4314	3595	2696	2157	1726
						(109-163)	Fz	0.0028	0.0099	0.026	0.045	0.056	0.067	0.079	0.091	0.098
						Feed (mm/min)	483	569	748	971	966	963	852	785	676	
			 Slot	1	≤ 1	108	RPM	34414	11471	5736	4302	3441	2868	2151	1721	1377
						(87-130)	Fz	0.0028	0.0099	0.026	0.045	0.056	0.067	0.079	0.091	0.098
						Feed (mm/min)	385	454	597	774	771	769	680	626	540	
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	 Profile	≤ 0.5	≤ 1.5	104	RPM	32960	10987	5493	4120	3296	2747	2060	1648	1318
						(83-124)	Fz	0.0020	0.0074	0.020	0.034	0.043	0.050	0.059	0.067	0.074
						Feed (mm/min)	264	325	439	560	567	549	486	442	390	
			 Slot	1	≤ 1	82	RPM	26174	8725	4362	3272	2617	2181	1636	1309	1047
						(66-99)	Fz	0.0020	0.0074	0.020	0.034	0.043	0.050	0.059	0.067	0.074
						Feed (mm/min)	209	258	349	445	450	436	386	351	310	
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	 Profile	≤ 0.5	≤ 1.5	24	RPM	7755	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.0018	0.0061	0.016	0.027	0.034	0.041	0.048	0.053	0.060
						Feed (mm/min)	56	63	83	105	105	106	93	82	74	
			 Slot	1	≤ 1	20	RPM	6301	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.0018	0.0061	0.016	0.027	0.034	0.041	0.048	0.053	0.060
						Feed (mm/min)	45	51	67	85	86	86	76	67	60	
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	 Profile	≤ 0.5	≤ 1.5	19	RPM	6010	2003	1002	751	601	501	376	301	240
						(15-23)	Fz	0.0013	0.0043	0.011	0.019	0.024	0.028	0.033	0.037	0.042
						Feed (mm/min)	31	34	44	57	58	56	50	44	40	
			 Slot	1	≤ 1	15	RPM	4847	1616	808	606	485	404	303	242	194
						(12-18)	Fz	0.0013	0.0043	0.011	0.019	0.024	0.028	0.033	0.037	0.042
						Feed (mm/min)	25	28	36	46	47	45	40	36	33	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	 Profile	≤ 0.5	≤ 1.5	66	RPM	20842	6947	3474	2605	2084	1737	1303	1042	834
						(52-79)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	167	197	264	333	333	333	292	267	233	
			 Slot	1	≤ 1	52	RPM	16480	5493	2747	2060	1648	1373	1030	824	659
						(41-62)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	132	156	209	264	264	264	231	211	185	
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	 Profile	≤ 0.5	≤ 1.5	23	RPM	7271	2424	1212	909	727	606	454	364	291
						(18-27)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	58	69	92	116	116	116	102	93	81	
			 Slot	1	≤ 1	18	RPM	5816	1939	969	727	582	485	364	291	233
						(15-22)	Fz	0.0020	0.0071	0.019	0.032	0.040	0.048	0.056	0.064	0.070
						Feed (mm/min)	47	55	74	93	93	93	81	74	65	

Bhn (Brinell) HRc (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x 4 x rpm

maximum Slotting Ap for Z1PCR <3mm diameter and all Z1MPLC / Z1MPLB is .25 x DC

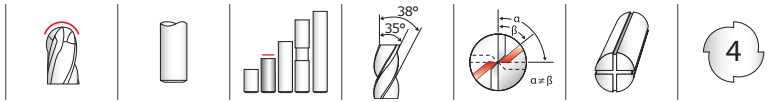
maximum Profile Ae for Z1PCR <3mm diameter and all Z1MPLC / Z1MPLB is .20 x DC

reduce speed and feed for materials harder than listed

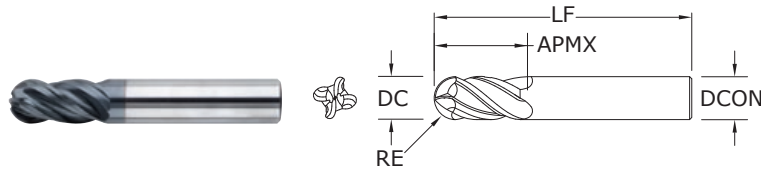
reduce feed and Ae when finish milling (.02 x DC maximum)

feed rates listed have chip thinning adjustments included where applicable

refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



Z1MB
METRIC SERIES



- Unequal helix design reduces damaging harmonics by changing the angle at which each cutting edge enters and exits the material
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Optimal material removal rates through increased feed and depths of cut
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials $\leq 45 \text{ HRc}$ ($\leq 420 \text{ Bhn}$)

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)	JetStream
3,0	8,0	57,0	6,0	46354	—
4,0	11,0	57,0	6,0	46355	—
5,0	13,0	57,0	6,0	46356	—
6,0	13,0	57,0	6,0	46343	—
8,0	19,0	63,0	8,0	46344	—
10,0	22,0	72,0	10,0	46345	—
12,0	26,0	83,0	12,0	46346	—
14,0	26,0	83,0	14,0	46347	46518
16,0	32,0	92,0	16,0	46348	46519
18,0	32,0	92,0	18,0	46349	46520
20,0	38,0	104,0	20,0	46350	46521
25,0	38,0	104,0	25,0	46351	46522

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

3–6 DIAMETER

DC = $+0,000/-0,030$
DCON = h_6

RE = $+0,000/-0,015$

>6–10 DIAMETER

DC = $+0,000/-0,040$

DCON = h_6

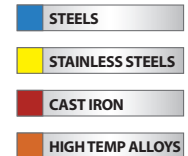
RE = $+0,000/-0,020$

>10–25 DIAMETER

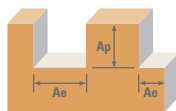
DC = $+0,000/-0,050$

DCON = h_6

RE = $+0,000/-0,025$



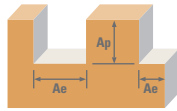
For patent
information visit
www.ksptpatents.com



Series Z1MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)	DC • mm								
						3	6	8	10	12	16	20	25	
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	Profile 	≤ 0.5	≤ 1.5	169	RPM	17934	8967	6725	5380	4484	3363	2690	2152
					(135-203)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.086	0.088
						Feed (mm/min)	654	861	1091	1090	1076	1067	927	753
		Slot 	1	≤ 1	134	RPM	14218	7109	5332	4265	3555	2666	2133	1706
					(107-161)	Fz	0.009	0.024	0.041	0.051	0.060	0.079	0.086	0.088
						Feed (mm/min)	519	682	865	864	853	846	735	597
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	Profile 	≤ 0.5	≤ 1.5	96	RPM	10179	5089	3817	3054	2545	1909	1527	1221
					(77-115)	Fz	0.007	0.019	0.030	0.037	0.046	0.061	0.067	0.068
						Feed (mm/min)	274	391	456	456	464	469	407	330
		Slot 	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	969
					(61-91)	Fz	0.007	0.019	0.030	0.037	0.046	0.061	0.067	0.068
						Feed (mm/min)	217	310	362	362	368	372	323	262
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile 	≤ 0.5	≤ 1.5	56	RPM	5978	2989	2242	1793	1495	1121	897	717
					(45-68)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	115	143	191	191	186	184	163	129
		Slot 	1	≤ 1	44	RPM	4686	2343	1757	1406	1171	879	703	562
					(35-53)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045
						Feed (mm/min)	90	112	150	150	146	144	127	101
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	Profile 	≤ 0.5	≤ 1.5	149	RPM	15834	7917	5938	4750	3958	2969	2375	1900
					(119-179)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
						Feed (mm/min)	456	532	709	709	684	699	608	475
		Slot 	1	≤ 1	119	RPM	12602	6301	4726	3781	3151	2363	1890	1512
					(95-143)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
						Feed (mm/min)	363	423	565	565	544	557	484	378
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	Profile 	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	1318
					(83-124)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	211	316	387	387	369	380	334	264
		Slot 	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309	1047
					(66-99)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	168	251	307	307	293	302	265	209
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	Profile 	≤ 0.5	≤ 1.5	94	RPM	10017	5009	3756	3005	2504	1878	1503	1202
					(76-113)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	192	288	353	353	337	346	305	240
		Slot 	1	≤ 1	76	RPM	8078	4039	3029	2424	2020	1515	1212	969
					(61-91)	Fz	0.005	0.014	0.023	0.029	0.034	0.046	0.051	0.050
						Feed (mm/min)	155	233	284	284	271	279	246	194

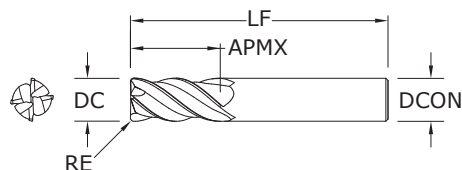
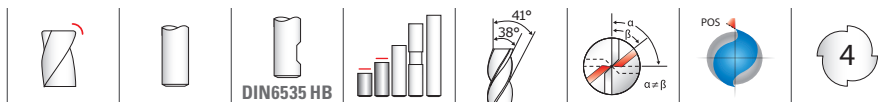
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METRIC Z-Carb



Series Z1MB Metric	Hardness		Ae x DC	Ap x DC	Vc (m/min)	DC • mm								
						3	6	8	10	12	16	20	25	
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	Profile 	≤ 0.5	≤ 1.5	136	RPM	14380	7190	5392	4314	3595	2696	2157	1726
					(109-163)	Fz	0.008	0.024	0.038	0.048	0.058	0.077	0.083	0.085
					Feed (mm/min)	483	690	828	828	828	828	713	587	
		Slot 	1	≤ 1	108	RPM	11471	5736	4302	3441	2868	2151	1721	1377
					(87-130)	Fz	0.008	0.024	0.038	0.048	0.058	0.077	0.083	0.085
					Feed (mm/min)	385	551	661	661	661	661	569	468	
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	Profile 	≤ 0.5	≤ 1.5	104	RPM	10987	5493	4120	3296	2747	2060	1648	1318
					(83-124)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
					Feed (mm/min)	316	369	492	492	475	485	422	330	
		Slot 	1	≤ 1	82	RPM	8725	4362	3272	2617	2181	1636	1309	1047
					(66-99)	Fz	0.007	0.017	0.030	0.037	0.043	0.059	0.064	0.063
					Feed (mm/min)	251	293	391	391	377	385	335	262	
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	Profile 	≤ 0.5	≤ 1.5	24	RPM	2585	1293	969	776	646	485	388	310
					(20-29)	Fz	0.005	0.010	0.017	0.021	0.024	0.033	0.037	0.038
					Feed (mm/min)	55	50	66	53	62	65	58	47	
		Slot 	1	≤ 1	20	RPM	2100	1050	788	630	525	394	315	252
					(16-24)	Fz	0.005	0.010	0.017	0.021	0.024	0.033	0.037	0.038
					Feed (mm/min)	40	40	54	54	50	52	47	38	
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	Profile 	≤ 0.5	≤ 1.5	19	RPM	2003	1002	751	601	501	376	301	240
					(15-23)	Fz	0.002	0.007	0.011	0.013	0.017	0.020	0.024	0.025
					Feed (mm/min)	19	29	32	32	34	31	29	24	
		Slot 	1	≤ 1	15	RPM	1583	792	594	475	396	297	238	190
					(12-18)	Fz	0.002	0.007	0.011	0.013	0.017	0.020	0.024	0.025
					Feed (mm/min)	15	23	25	25	27	24	23	19	
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	Profile 	≤ 0.5	≤ 1.5	66	RPM	6947	3474	2605	2084	1737	1303	1042	834	
				(52-79)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045	
				Feed (mm/min)	133	167	222	222	217	213	189	150		
	Slot 	1	≤ 1	52	RPM	5493	2747	2060	1648	1373	1030	824	659	
				(41-62)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045	
				Feed (mm/min)	105	132	176	176	171	169	149	119		
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	Profile 	≤ 0.5	≤ 1.5	23	RPM	2424	1212	909	727	606	454	364	291	
				(18-27)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045	
				Feed (mm/min)	47	58	78	78	76	74	66	52		
	Slot 	1	≤ 1	18	RPM	1939	969	727	582	485	364	291	233	
				(15-22)	Fz	0.005	0.012	0.021	0.027	0.031	0.041	0.045	0.045	
				Feed (mm/min)	37	47	62	62	60	60	53	42		

Bhn (Brinell) HRc (Rockwell C)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times 4 \times \text{rpm}$
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



ZH1MCRS •
ZH1MCR
METRIC SERIES

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000/-0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

RE = +0,000/-0,050

>10-20 DIAMETER

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

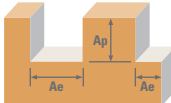
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
6,0	10,0	54,0	6,0	0,5	—	42712
6,0	13,0	57,0	6,0	0,5	46450	—
6,0	13,0	57,0	6,0	1,0	46451	—
6,0	13,0	57,0	6,0	1,5	46452	—
8,0	12,0	58,0	8,0	0,5	—	42713
8,0	19,0	63,0	8,0	0,5	46453	—
8,0	19,0	63,0	8,0	1,0	46454	—
8,0	19,0	63,0	8,0	1,5	46455	—
10,0	14,0	66,0	10,0	0,5	—	42714
10,0	22,0	72,0	10,0	0,5	46456	—
10,0	22,0	72,0	10,0	1,0	46457	—
10,0	22,0	72,0	10,0	1,5	46458	—
10,0	22,0	72,0	10,0	2,0	46459	—
12,0	16,0	73,0	12,0	0,7	—	42715
12,0	26,0	83,0	12,0	0,5	46460	46471
12,0	26,0	83,0	12,0	1,0	46461	46472
12,0	26,0	83,0	12,0	1,5	46462	46473
12,0	26,0	83,0	12,0	2,0	46463	46474
12,0	26,0	83,0	12,0	3,0	46464	46475
16,0	22,0	82,0	16,0	1,0	—	42716
16,0	32,0	92,0	16,0	1,5	46465	46476
16,0	32,0	92,0	16,0	2,0	46466	46477
16,0	32,0	92,0	16,0	3,0	46467	46478
16,0	32,0	92,0	16,0	4,0	46482	46483
20,0	26,0	92,0	20,0	1,0	—	42717
20,0	38,0	104,0	20,0	3,0	46468	46479
20,0	38,0	104,0	20,0	4,0	46469	46480
20,0	38,0	104,0	20,0	5,0	46470	46481

- The original Z-Carb design with an enhanced core and higher helix suited for the demands of high temperature alloys
- Unequal flute spacing helps to disrupt the rhythmic pattern created by the cutting edge helping to suppress damaging harmonics
- Optimal material removal rates through increased feed and depths of cut for difficult to machine materials
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

Z-Carb-HTA

Series ZH1MCRS, ZH1MCR Metric	Hardness			Vc (m/min)	DC • mm				
		Ae x DC	Ap x DC		6	10	12	20	
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	 Profile ≤ 0.5 ≤ 1.5		26	RPM	1373	824	687	412
				(21-31)	Fz	0.017	0.032	0.041	0.053
					Feed (mm/min)	93	105	113	87
		 Slot 1 ≤ 1		21	RPM	1131	679	565	339
				(17-26)	Fz	0.017	0.032	0.041	0.053
					Feed (mm/min)	77	87	93	72
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	 Profile ≤ 0.5 ≤ 1.5		21	RPM	1131	679	565	339
				(17-26)	Fz	0.012	0.024	0.029	0.037
					Feed (mm/min)	54	65	66	50
		 Slot 1 ≤ 1		17	RPM	889	533	444	267
				(13-20)	Fz	0.012	0.024	0.029	0.037
					Feed (mm/min)	43	51	52	39
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	 Profile ≤ 0.5 ≤ 1.5		66	RPM	3474	2084	1737	1042
				(52-79)	Fz	0.019	0.041	0.049	0.057
					Feed (mm/min)	264	342	340	238
		 Slot 1 ≤ 1		52	RPM	2747	1648	1373	824
				(41-62)	Fz	0.019	0.041	0.049	0.057
					Feed (mm/min)	209	270	269	188
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	 Profile ≤ 0.5 ≤ 1.5		23	RPM	1212	727	606	364	
			(18-27)	Fz	0.019	0.041	0.049	0.057	
				Feed (mm/min)	92	119	119	83	
	 Slot 1 ≤ 1		18	RPM	969	582	485	291	
			(15-22)	Fz	0.019	0.041	0.049	0.057	
				Feed (mm/min)	74	95	95	66	

Bhn (Brinell) HRc (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

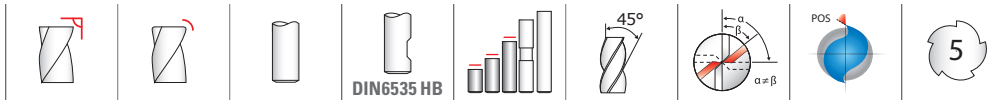
ipm = Fz x 4 x rpm

reduce speed and feed for materials harder than listed

reduce feed and Ae when finish milling (.02 x DC maximum)

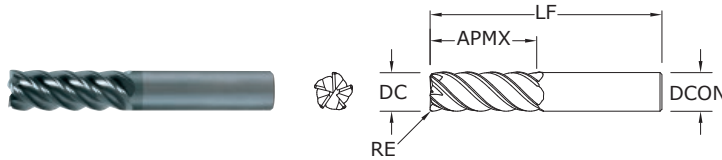
feed rates listed have chip thinning adjustments included where applicable

refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



55M • 55MCR

METRIC SERIES



- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

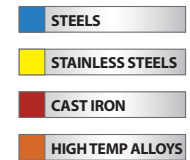
CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.	
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
6,0	12,0	50,0	6,0	—	42606	—
6,0	12,0	50,0	6,0	0,5	42660	—
6,0	19,0	63,0	6,0	—	42607	—
6,0	19,0	63,0	6,0	0,25	42661	—
6,0	19,0	63,0	6,0	0,5	42662	—
6,0	19,0	63,0	6,0	1,0	42663	—
6,0	19,0	63,0	6,0	1,5	42664	—
6,0	25,0	75,0	6,0	—	42608	—
6,0	25,0	75,0	6,0	0,5	42665	—
8,0	12,0	50,0	8,0	—	42609	—
8,0	12,0	50,0	8,0	0,5	42666	—
8,0	20,0	63,0	8,0	—	42610	—
8,0	20,0	63,0	8,0	0,5	42667	—
8,0	20,0	63,0	8,0	1,0	42668	—
8,0	20,0	63,0	8,0	1,5	42669	—
8,0	20,0	63,0	8,0	2,0	42670	—
8,0	25,0	75,0	8,0	—	42611	—
8,0	25,0	75,0	8,0	0,5	42671	—
10,0	16,0	50,0	10,0	—	42612	—
10,0	16,0	50,0	10,0	0,5	42672	—
10,0	22,0	75,0	10,0	—	42622	42613
10,0	22,0	75,0	10,0	0,5	42673	—
10,0	22,0	75,0	10,0	1,0	42674	—
10,0	22,0	75,0	10,0	1,5	42675	—
10,0	22,0	75,0	10,0	2,0	42676	—
10,0	22,0	75,0	10,0	2,5	42677	—
10,0	38,0	100,0	10,0	—	42614	—
10,0	38,0	100,0	10,0	0,5	42678	—
12,0	19,0	63,0	12,0	—	42615	—
12,0	19,0	63,0	12,0	0,5	42679	—
12,0	25,0	75,0	12,0	—	42616	42623
12,0	25,0	75,0	12,0	0,5	42680	—
12,0	25,0	75,0	12,0	1,0	42681	—
12,0	25,0	75,0	12,0	1,5	42682	—
12,0	25,0	75,0	12,0	2,0	42683	—
12,0	25,0	75,0	12,0	2,5	42684	—

TOLERANCES (inch)

DC = +0.0000/−0.0020

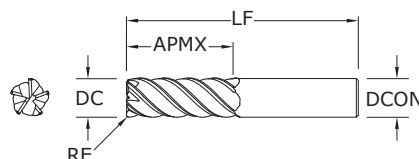
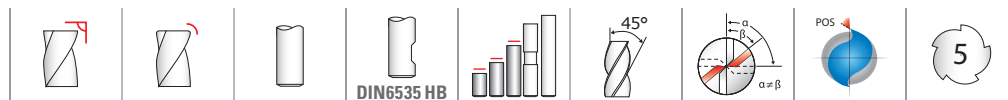
DCON = h_6

RE = +0.0000/−0.0020



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continued on next page



**55M •
55MCR**
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

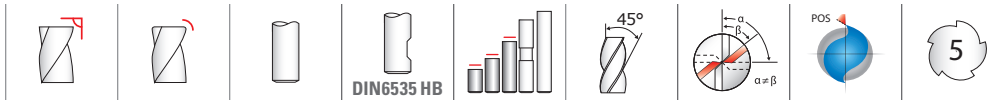
STEELS
STAINLESS STEELS
CAST IRON
HIGHTEMP ALLOYS

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CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.	
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
12,0	25,0	75,0	12,0	3,0	42685	—
12,0	50,0	100,0	12,0	—	42617	—
12,0	50,0	100,0	12,0	0,5	42686	—
12,0	50,0	100,0	12,0	3,0	42630	—
12,0	50,0	100,0	12,0	4,0	42631	—
16,0	32,0	89,0	16,0	—	42618	42624
16,0	32,0	89,0	16,0	1,0	42687	—
16,0	32,0	89,0	16,0	1,5	42688	—
16,0	32,0	89,0	16,0	2,0	42689	—
16,0	32,0	89,0	16,0	2,5	42690	—
16,0	32,0	89,0	16,0	3,0	42691	—
16,0	32,0	89,0	16,0	4,0	42692	—
16,0	50,0	100,0	16,0	—	42626	—
16,0	50,0	100,0	16,0	2,0	42656	—
16,0	50,0	100,0	16,0	2,5	42657	—
16,0	50,0	100,0	16,0	3,0	42658	—
16,0	50,0	100,0	16,0	4,0	42659	—
16,0	50,0	100,0	16,0	5,0	42628	—
16,0	75,0	150,0	16,0	—	42619	—
16,0	75,0	150,0	16,0	1,0	42693	—
16,0	75,0	150,0	16,0	3,0	42632	—
16,0	75,0	150,0	16,0	4,0	42633	—
20,0	38,0	100,0	20,0	—	42620	42625
20,0	38,0	100,0	20,0	1,0	42694	—
20,0	38,0	100,0	20,0	1,5	42695	—
20,0	38,0	100,0	20,0	2,0	42696	—
20,0	38,0	100,0	20,0	2,5	42697	—
20,0	38,0	100,0	20,0	3,0	42698	—
20,0	38,0	100,0	20,0	4,0	42699	—
20,0	38,0	100,0	20,0	5,0	42700	—
20,0	38,0	100,0	20,0	6,0	42648	—
20,0	50,0	100,0	20,0	—	42627	—
20,0	50,0	100,0	20,0	2,0	42649	—
20,0	50,0	100,0	20,0	2,5	42650	—
20,0	50,0	100,0	20,0	3,0	42651	—
20,0	50,0	100,0	20,0	4,0	42652	—

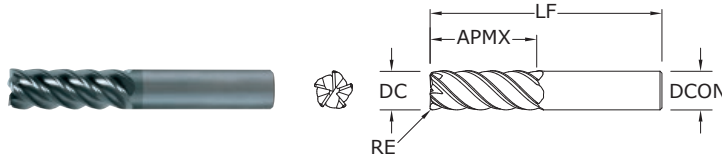
- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)

continued on next page



55M • 55MCR

METRIC SERIES

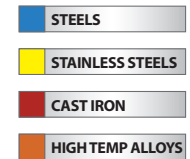


- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

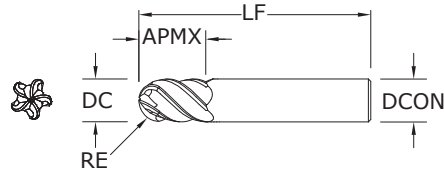
CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.	
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)	Ti-NAMITE®-A (AlTiN) W/FLAT
20,0	50,0	100,0	20,0	5,0	42653	—
20,0	50,0	100,0	20,0	6,0	42654	—
20,0	75,0	150,0	20,0	—	42621	—
20,0	75,0	150,0	20,0	1,0	42701	—
20,0	75,0	150,0	20,0	2,0	42702	—
20,0	75,0	150,0	20,0	3,0	42703	—
20,0	75,0	150,0	20,0	4,0	42704	—
20,0	75,0	150,0	20,0	5,0	42705	—
20,0	75,0	150,0	20,0	6,0	42655	—

TOLERANCES (mm)

DC = $+0,000/-0,050$
 DCON = h_6
 RE = $+0,000/-0,050$



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55MB
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

STEELS

STAINLESS STEELS

CAST IRON

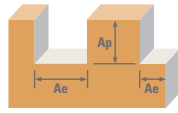
HIGHTEMP ALLOYS

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information visit
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mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-A (AlTiN)
6,0	13,0	57,0	6,0	42750
8,0	19,0	63,0	8,0	42751
10,0	22,0	72,0	10,0	42752
12,0	26,0	83,0	12,0	42753
16,0	32,0	92,0	16,0	42754
20,0	38,0	104,0	20,0	42755

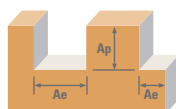
RE = 1/2 Cutting Diameter (DC)

- Unequal indexing, high helix and an ideal rake and relief combination for unmatched finishing capability
- The choice when peak finish quality is the requirement
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



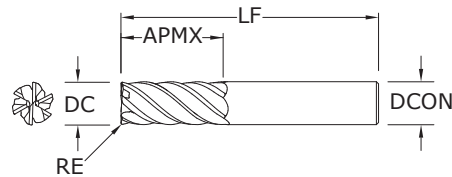
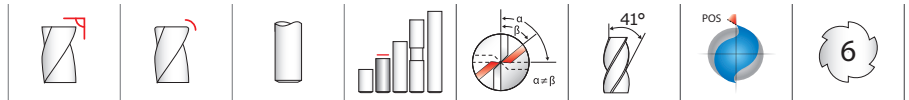
Series 55M, 55MCR, 55MB				Vc		DC • mm						
Metric	Hardness			(m/min)		6	8	10	12	16	20	
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	Profile 	≤ 0.25	≤ 1.5	117	RPM	6220	4665	3732	3110	2333	1866
					(94-141)	Fz	0.022	0.036	0.061	0.070	0.072	0.085
						Feed (mm/min)	672	846	1145	1082	836	796
		HSM 	≤ 0.05	≤ 2	192	RPM	10179	7634	6107	5089	3817	3054
					(154-230)	Fz	0.043	0.073	0.123	0.137	0.141	0.154
						Feed (mm/min)	2198	2769	3746	3481	2687	2345
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	Profile 	≤ 0.25	≤ 1.5	99	RPM	5251	3938	3151	2626	1969	1575
					(79-119)	Fz	0.017	0.028	0.045	0.053	0.054	0.064
						Feed (mm/min)	441	546	571	693	529	504
		HSM 	≤ 0.05	≤ 2	162	RPM	8563	6422	5138	4282	3211	2569
					(129-194)	Fz	0.034	0.055	0.091	0.103	0.105	0.128
						Feed (mm/min)	1438	1781	2329	2209	1685	1644
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile 	≤ 0.25	≤ 1.5	53	RPM	2827	2121	1696	1414	1060	848
					(43-64)	Fz	0.012	0.021	0.035	0.038	0.044	0.048
						Feed (mm/min)	170	226	294	271	231	204
		HSM 	≤ 0.05	≤ 2	88	RPM	4686	3514	2811	2343	1757	1406
					(71-106)	Fz	0.024	0.041	0.067	0.077	0.084	0.093
						Feed (mm/min)	562	712	937	900	742	656
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	Profile 	≤ 0.25	≤ 1.5	113	RPM	5978	4484	3587	2989	2242	1793
					(90-135)	Fz	0.017	0.028	0.045	0.053	0.059	0.064
						Feed (mm/min)	502	622	813	789	660	574
		HSM 	≤ 0.05	≤ 2	171	RPM	9048	6786	5429	4524	3393	2714
					(137-205)	Fz	0.034	0.055	0.091	0.103	0.113	0.128
						Feed (mm/min)	1520	1882	2461	2334	1911	1737
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	Profile 	≤ 0.25	≤ 1.5	78	RPM	4120	3090	2472	2060	1545	1236
					(62-93)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
						Feed (mm/min)	297	396	527	494	415	379
		HSM 	≤ 0.05	≤ 2	117	RPM	6220	4665	3732	3110	2333	1866
					(94-141)	Fz	0.031	0.051	0.085	0.096	0.105	0.120
						Feed (mm/min)	970	1194	1592	1493	1224	1120
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	Profile 	≤ 0.25	≤ 1.5	72	RPM	3797	2848	2278	1898	1424	1139
					(57-86)	Fz	0.014	0.021	0.037	0.041	0.046	0.051
						Feed (mm/min)	273	304	425	387	328	289
		HSM 	≤ 0.05	≤ 2	108	RPM	5736	4302	3441	2868	2151	1721
					(87-130)	Fz	0.026	0.045	0.075	0.082	0.092	0.104
						Feed (mm/min)	757	964	1285	1170	991	895

continued on next page



Series 55M, 55MCR, 55MB Metric		Ae Ap		Vc (m/min)		DC • mm							
Hardness		Ae x DC	Ap x DC			6	8	10	12	16	20		
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile 	≤ 0.25	≤ 1.5	143	RPM	7594	5695	4556	3797	2848	2278
						(115-172)	Fz	0.022	0.036	0.061	0.070	0.077	0.085
						Feed (mm/min)	820	1033	1397	1321	1093	972	
		HSM 	≤ 0.05	≤ 2	215	RPM	11391	8543	6834	5695	4271	3417	
					(172-258)	Fz	0.043	0.073	0.123	0.137	0.151	0.171	
					Feed (mm/min)	2460	3099	4192	3895	3226	2916		
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Profile 	≤ 0.25	≤ 1.5	110	RPM	5816	4362	3490	2908	2181	1745
						(88-132)	Fz	0.017	0.028	0.045	0.053	0.059	0.064
						Feed (mm/min)	489	605	791	768	642	558	
		HSM 	≤ 0.05	≤ 2	165	RPM	8725	6544	5235	4362	3272	2617	
					(132-198)	Fz	0.034	0.055	0.091	0.103	0.113	0.128	
					Feed (mm/min)	1466	1815	2373	2251	1843	1675		
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Profile 	≤ 0.25	≤ 1.5	21	RPM	1131	848	679	565	424	339
						(17-26)	Fz	0.014	0.021	0.037	0.041	0.046	0.051
						Feed (mm/min)	81	90	127	115	98	86	
		HSM 	≤ 0.05	≤ 2	33	RPM	1729	1297	1037	864	648	519	
					(26-39)	Fz	0.026	0.045	0.075	0.082	0.092	0.104	
					Feed (mm/min)	228	290	387	353	299	270		
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Profile 	≤ 0.25	≤ 1.5	17	RPM	889	666	533	444	333	267
						(13-20)	Fz	0.010	0.017	0.027	0.031	0.036	0.040
						Feed (mm/min)	43	57	71	69	60	53	
		HSM 	≤ 0.05	≤ 2	26	RPM	1373	1030	824	687	515	412	
					(21-31)	Fz	0.019	0.032	0.056	0.062	0.069	0.077	
					Feed (mm/min)	132	165	231	214	178	159		
S	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Profile 	≤ 0.25	≤ 1.5	72	RPM	3797	2848	2278	1898	1424	1139
						(57-86)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
						Feed (mm/min)	273	365	486	456	383	349	
		HSM 	≤ 0.05	≤ 2	119	RPM	6301	4726	3781	3151	2363	1890	
					(95-143)	Fz	0.031	0.051	0.085	0.096	0.105	0.120	
					Feed (mm/min)	983	1210	1613	1512	1240	1134		
	TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Profile 	≤ 0.25	≤ 1.5	26	RPM	1373	1030	824	687	515	412
						(21-31)	Fz	0.014	0.026	0.043	0.048	0.054	0.061
						Feed (mm/min)	99	132	176	165	138	126	
		HSM 	≤ 0.05	≤ 2	43	RPM	2262	1696	1357	1131	848	679	
					(34-51)	Fz	0.031	0.051	0.085	0.096	0.108	0.120	
					Feed (mm/min)	353	434	579	543	456	407		

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times 5 \times \text{rpm}$
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 reduce Ap to 1 x DC (maximum) when profile milling with long or extra long flute length tools
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com)



51M • 51MCR

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

STEELS

STAINLESS STEELS

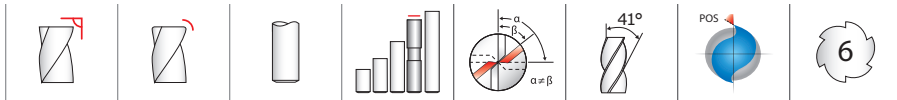
CAST IRON

HIGHTEMP ALLOYS

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information visit
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	mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	—	45100
6,0	19,0	63,0	6,0	0,5	45112
6,0	19,0	63,0	6,0	1,0	45170
6,0	19,0	63,0	6,0	1,5	45171
8,0	20,0	63,0	8,0	—	45101
8,0	20,0	63,0	8,0	0,5	45113
8,0	20,0	63,0	8,0	1,0	45114
8,0	20,0	63,0	8,0	1,2	45150
8,0	20,0	63,0	8,0	1,5	45172
8,0	20,0	63,0	8,0	2,0	45173
10,0	22,0	75,0	10,0	—	45102
10,0	22,0	75,0	10,0	0,5	45174
10,0	22,0	75,0	10,0	1,0	45115
10,0	22,0	75,0	10,0	1,5	45116
10,0	22,0	75,0	10,0	2,0	45117
10,0	22,0	75,0	10,0	2,5	45175
12,0	26,0	83,0	12,0	—	45103
12,0	26,0	83,0	12,0	0,5	45176
12,0	26,0	83,0	12,0	0,76	45177
12,0	26,0	83,0	12,0	1,0	45118
12,0	26,0	83,0	12,0	1,5	45119
12,0	26,0	83,0	12,0	2,0	45120
12,0	26,0	83,0	12,0	2,5	45178
12,0	26,0	83,0	12,0	3,0	45179
16,0	32,0	92,0	16,0	—	45104
16,0	32,0	92,0	16,0	1,0	45121
16,0	32,0	92,0	16,0	1,5	45122
16,0	32,0	92,0	16,0	2,0	45123
16,0	32,0	92,0	16,0	2,5	45180
16,0	32,0	92,0	16,0	3,0	45181
16,0	32,0	92,0	16,0	4,0	45182
20,0	38,0	104,0	20,0	—	45105
20,0	38,0	104,0	20,0	1,0	45124
20,0	38,0	104,0	20,0	1,5	45125
20,0	38,0	104,0	20,0	2,0	45126
20,0	38,0	104,0	20,0	2,5	45183
20,0	38,0	104,0	20,0	3,0	45184
20,0	38,0	104,0	20,0	4,0	45185
20,0	38,0	104,0	20,0	5,0	45186

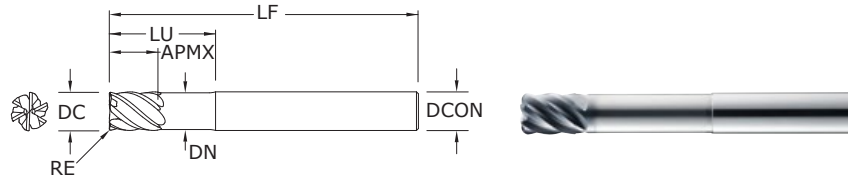
- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Eccentric relief provides superior strength and smoother surface finish
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



51ML • 51MLC

METRIC SERIES

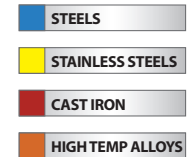
- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Eccentric relief provides superior strength and smoother surface finish
- Necked design with blended diameter transitions provide clearance to reach
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)



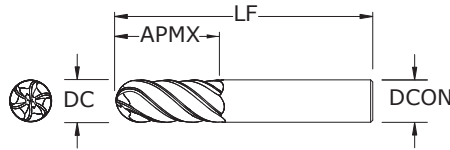
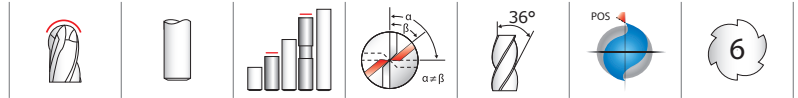
mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-X (TX)
6,0	8,0	75,0	6,0	32,0	5,69	—	45106
6,0	8,0	75,0	6,0	32,0	5,69	0,5	45127
6,0	8,0	75,0	6,0	32,0	5,69	1,0	45187
6,0	8,0	75,0	6,0	32,0	5,69	1,5	45188
8,0	10,0	75,0	8,0	32,0	7,59	—	45107
8,0	10,0	75,0	8,0	32,0	7,59	0,5	45128
8,0	10,0	75,0	8,0	32,0	7,59	1,0	45129
8,0	10,0	75,0	8,0	32,0	7,59	1,5	45189
8,0	10,0	75,0	8,0	32,0	7,59	2,0	45190
10,0	12,0	100,0	10,0	40,0	9,50	—	45108
10,0	12,0	100,0	10,0	40,0	9,50	0,5	45191
10,0	12,0	100,0	10,0	40,0	9,50	1,0	45130
10,0	12,0	100,0	10,0	40,0	9,50	1,5	45131
10,0	12,0	100,0	10,0	40,0	9,50	2,0	45132
10,0	12,0	100,0	10,0	40,0	9,50	2,5	45192
12,0	15,0	100,0	12,0	48,0	11,38	—	45109
12,0	15,0	100,0	12,0	48,0	11,38	0,5	45193
12,0	15,0	100,0	12,0	48,0	11,38	0,76	45194
12,0	15,0	100,0	12,0	48,0	11,38	1,0	45133
12,0	15,0	100,0	12,0	48,0	11,38	1,5	45134
12,0	15,0	100,0	12,0	48,0	11,38	2,0	45135
12,0	15,0	100,0	12,0	48,0	11,38	2,5	45195
12,0	15,0	100,0	12,0	48,0	11,38	3,0	45196
16,0	20,0	115,0	16,0	65,0	15,19	—	45110
16,0	20,0	115,0	16,0	65,0	15,19	1,0	45136
16,0	20,0	115,0	16,0	65,0	15,19	1,5	45137
16,0	20,0	115,0	16,0	65,0	15,19	2,0	45138
16,0	20,0	115,0	16,0	65,0	15,19	2,5	45197
16,0	20,0	115,0	16,0	65,0	15,19	3,0	45198
16,0	20,0	115,0	16,0	65,0	15,19	4,0	45199
20,0	24,0	150,0	20,0	80,0	19,00	—	45111
20,0	24,0	150,0	20,0	80,0	19,00	1,0	45139
20,0	24,0	150,0	20,0	80,0	19,00	1,5	45140
20,0	24,0	150,0	20,0	80,0	19,00	2,0	45141
20,0	24,0	150,0	20,0	80,0	19,00	2,5	45200
20,0	24,0	150,0	20,0	80,0	19,00	3,0	45201
20,0	24,0	150,0	20,0	80,0	19,00	4,0	45202
20,0	24,0	150,0	20,0	80,0	19,00	5,0	45203

TOLERANCES (mm)

DC = $+0,000/-0,050$
DCON = h_6
RE = $+0,000/-0,050$



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51MB

METRIC SERIES

TOLERANCES (mm)

6,0–10,0 DIAMETER
 DC = +0,000/–0,040
 DCON = h₆
 RE = +0,000/–0,025

12,0–20,0 DIAMETER
 DC = +0,000/–0,050
 DCON = h₆
 RE = +0,000/–0,025

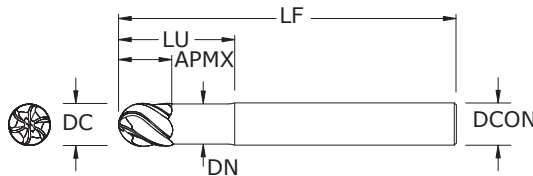
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

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 information visit
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mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	45204
8,0	20,0	63,0	8,0	45206
10,0	22,0	75,0	10,0	45208
12,0	26,0	83,0	12,0	45210
16,0	32,0	92,0	16,0	45212
20,0	38,0	104,0	20,0	45214

RE=1/2 Cutting Diameter (DC)

- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Faceted relief provides superior strength and smoother surface finish
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



51MLB

METRIC SERIES

TOLERANCES (mm)

6,0–10,0 DIAMETER
 DC = +0,000/–0,040
 DCON = h₆
 RE = +0,000/–0,025

12,0–20,0 DIAMETER
 DC = +0,000/–0,050
 DCON = h₆
 RE = +0,000/–0,025

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

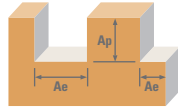
For patent
 information visit
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mm						EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	Ti-NAMITE®-X (TX)
6,0	8,0	75,0	6,0	32,0	5,68	45205
8,0	10,0	75,0	8,0	32,0	7,58	45207
10,0	12,0	100,0	10,0	40,0	9,49	45209
12,0	15,0	100,0	12,0	48,0	11,37	45211
16,0	20,0	115,0	16,0	65,0	15,18	45213
20,0	24,0	150,0	20,0	80,0	18,99	45215

RE=1/2 Cutting Diameter (DC)

- Engineered for High Speed Milling using Trochoidal and Peel Milling techniques
- Faceted relief provides superior strength and smoother surface finish
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)

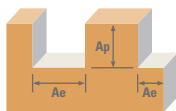
Series
51M, 51MCR,
51ML, 51MLC,
51MB, 51MLB
Metric



51ML, 51MLC, 51MB, 51MLB Metric		Hardness			Vc (m/min)	DC • mm								
			Ae x DC	Ap x DC		6	8	10	12	16	20			
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc		≤ 0.1	≤ 1	219	RPM	11633	8725	6980	5816	4362	3490	
						(176-263)	Fz	0.048	0.075	0.093	0.120	0.141	0.163	
						Feed (mm/min)	3350	3909	3909	4188	3685	3406		
		≤ 275 Bhn or ≤ 28 HRc		≤ 0.05	≤ 2	279	RPM	14784	11088	8870	7392	5544	4435	
						(223-335)	Fz	0.067	0.113	0.141	0.168	0.197	0.227	
						Feed (mm/min)	5960	7523	7522	7450	6557	6032		
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc		≤ 0.1	≤ 1	149	RPM	7917	5938	4750	3958	2969	2375	
						(119-179)	Fz	0.036	0.062	0.077	0.091	0.108	0.123	
						Feed (mm/min)	1710	2204	2204	2166	1915	1748		
		≤ 375 Bhn or ≤ 40 HRc		≤ 0.05	≤ 2	189	RPM	10017	7513	6010	5009	3756	3005	
						(151-227)	Fz	0.050	0.083	0.104	0.125	0.146	0.165	
						Feed (mm/min)	3029	3751	3750	3750	3289	2981		
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc		≤ 0.1	≤ 1	73	RPM	3878	2908	2327	1939	1454	1163	
						(59-88)	Fz	0.029	0.049	0.061	0.072	0.087	0.099	
						Feed (mm/min)	670	856	856	838	759	689		
		≤ 375 Bhn or ≤ 40 HRc		≤ 0.05	≤ 2	93	RPM	4928	3696	2957	2464	1848	1478	
						(74-112)	Fz	0.041	0.068	0.085	0.101	0.118	0.133	
						Feed (mm/min)	1206	1514	1514	1490	1306	1183		
	M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc		≤ 0.1	≤ 1	155	RPM	8240	6180	4944	4120	3090	2472
							(140-171)	Fz	0.036	0.060	0.075	0.091	0.105	0.120
							Feed (mm/min)	1780	2215	2215	2254	1946	1780	
			≤ 275 Bhn or ≤ 28 HRc		≤ 0.05	≤ 2	198	RPM	10502	7877	6301	5251	3938	3151
							(178-218)	Fz	0.050	0.081	0.101	0.122	0.143	0.163
							Feed (mm/min)	3176	3832	3831	3856	3387	3075	
STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L		≤ 275 Bhn or ≤ 28 HRc		≤ 0.1	≤ 1	107	RPM	5655	4241	3393	2827	2121	1696	
						(96-117)	Fz	0.029	0.049	0.061	0.072	0.084	0.096	
						Feed (mm/min)	977	1249	1249	1221	1075	977		
		≤ 275 Bhn or ≤ 28 HRc		≤ 0.05	≤ 2	137	RPM	7271	5453	4362	3635	2726	2181	
						(123-151)	Fz	0.041	0.068	0.085	0.101	0.118	0.133	
						Feed (mm/min)	1780	2234	2234	2198	1926	1745		
STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450		≤ 325 Bhn or ≤ 35 HRc		≤ 0.1	≤ 1	99	RPM	5251	3938	3151	2626	1969	1575	
						(89-109)	Fz	0.029	0.049	0.061	0.072	0.084	0.096	
						Feed (mm/min)	907	1160	1159	1134	998	907		
		≤ 325 Bhn or ≤ 35 HRc		≤ 0.05	≤ 2	125	RPM	6624	4968	3975	3312	2484	1987	
						(112-137)	Fz	0.041	0.068	0.085	0.101	0.118	0.133	
						Feed (mm/min)	1621	2035	2035	2003	1755	1590		

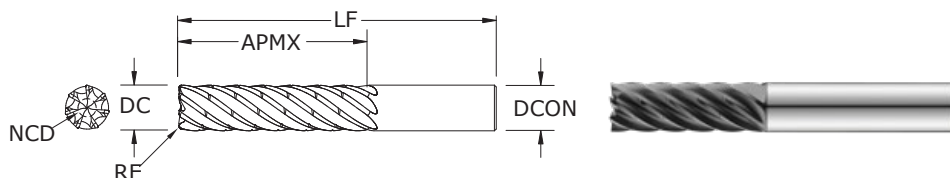
continued on next page

Series
51M, 51MCR,
51ML, 51MLC,
51MB, 51MLB
Metric



51ML, 51MLC, 51MB, 51MLB Metric				Vc (m/min)		DC • mm						
Hardness		Ae x DC	Ap x DC			6	8	10	12	16	20	
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	 Profile	≤ 0.25	≤ 1.5	575	RPM	9290	6968	5574	4645	3484	2787
					(460-690)	Fz	0.043	0.075	0.093	0.108	0.128	0.147
						Feed (mm/min)	2408	3122	3122	3010	2675	2453
		 HSM	≤ 0.05	≤ 2	730	RPM	11795	8846	7077	5897	4423	3538
					(584-876)	Fz	0.060	0.100	0.125	0.154	0.179	0.203
						Feed (mm/min)	4246	5322	5322	5434	4755	4303
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	 Profile	≤ 0.25	≤ 1.5	430	RPM	6947	5211	4168	3474	2605	2084
					(344-516)	Fz	0.043	0.075	0.093	0.108	0.128	0.147
						Feed (mm/min)	1801	2335	2334	2251	2001	1834
		 HSM	≤ 0.05	≤ 2	545	RPM	8806	6604	5283	4403	3302	2642
					(436-654)	Fz	0.060	0.100	0.125	0.154	0.179	0.203
						Feed (mm/min)	3170	3974	3973	4057	3550	3212
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	 Profile	≤ 0.1	≤ 1	32	RPM	1696	1272	1018	848	636	509
					(26-38)	Fz	0.034	0.058	0.072	0.086	0.100	0.115
						Feed (mm/min)	342	440	440	440	381	350
		 HSM	≤ 0.05	≤ 2	40	RPM	2100	1575	1260	1050	788	630
					(32-48)	Fz	0.038	0.077	0.096	0.115	0.136	0.155
						Feed (mm/min)	484	726	726	726	641	585
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	 Profile	≤ 0.1	≤ 1	24	RPM	1293	969	776	646	485	388
					(20-29)	Fz	0.024	0.038	0.048	0.060	0.069	0.077
						Feed (mm/min)	186	223	223	233	201	180
		 HSM	≤ 0.05	≤ 2	30	RPM	1616	1212	969	808	606	485
					(24-37)	Fz	0.031	0.053	0.067	0.082	0.095	0.109
						Feed (mm/min)	302	388	388	395	344	318
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	 Profile	≤ 0.1	≤ 1	85	RPM	4524	3393	2714	2262	1696	1357
					(68-102)	Fz	0.024	0.038	0.048	0.060	0.069	0.077
						Feed (mm/min)	651	782	782	814	704	630
		 HSM	≤ 0.05	≤ 2	108	RPM	5736	4302	3441	2868	2151	1721
					(87-130)	Fz	0.031	0.053	0.067	0.082	0.095	0.109
						Feed (mm/min)	1074	1377	1377	1404	1222	1129
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	 Profile	≤ 0.1	≤ 1	47	RPM	2504	1878	1503	1252	939	751	
				(38-57)	Fz	0.024	0.038	0.048	0.060	0.069	0.077	
					Feed (mm/min)	361	433	433	451	389	349	
	 HSM	≤ 0.05	≤ 2	61	RPM	3231	2424	1939	1616	1212	969	
				(49-73)	Fz	0.031	0.053	0.067	0.082	0.095	0.109	
					Feed (mm/min)	605	776	776	791	689	636	

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times 6 \times \text{rpm}$
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



**77 •
77CR**
FRACTIONAL SERIES

TOLERANCES (inch)

1/4 DIAMETER

DC = +0.0000/-0.0012

DCON = h_6

RE = +0.000 / -0.002

>1/4-3/8 DIAMETER

DC = +0.0000/-0.0016

DCON = h_6

RE = +0.000 / -0.002

>3/8-1 DIAMETER

DC = +0.0000/-0.0020

DCON = h_6

RE = +0.000 / -0.002

STEELS

STAINLESS STEELS

CAST IRON

HIGHTEMP ALLOYS

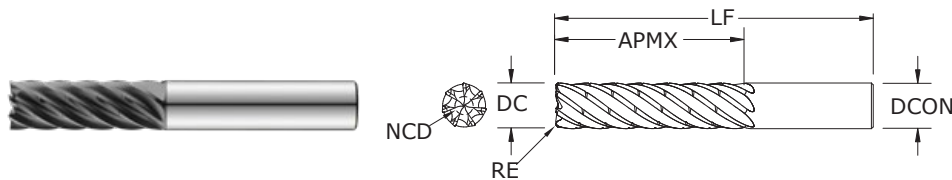
For patent
information visit
www.ksptpatents.com

inch						EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON- CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA) EDP NO.	Ti-NAMITE®-A (TA) EDP NO. CHIP BREAKER	Ti-NAMITE®-M (TM) EDP NO.	Ti-NAMITE®-M (TM) EDP NO. CHIP BREAKER
5/8	1-7/8	4	5/8	—	0.2113	77220	77222	77221	77223
5/8	1-7/8	4	5/8	.030	0.2113	77224	77226	77225	77227
5/8	1-7/8	4	5/8	.060	0.2113	77228	77230	77229	77231
5/8	2-1/2	4-1/2	5/8	—	0.2113	77232	77234	77233	77235
5/8	2-1/2	4-1/2	5/8	.030	0.2113	77236	77238	77237	77239
5/8	2-1/2	4-1/2	5/8	.060	0.2113	77240	77242	77241	77243
3/4	1-7/8	4	3/4	—	0.2535	77244	77246	77245	77247
3/4	1-7/8	4	3/4	.030	0.2535	77248	77250	77249	77251
3/4	1-7/8	4	3/4	.060	0.2535	77252	77254	77253	77255
3/4	1-7/8	4	3/4	.120	0.2535	77256	77258	77257	77259
3/4	2-1/4	4-1/2	3/4	—	0.2535	77260	77262	77261	77263
3/4	2-1/4	4-1/2	3/4	.030	0.2535	77264	77266	77265	77267
3/4	2-1/4	4-1/2	3/4	.060	0.2535	77268	77270	77269	77271
3/4	2-1/4	4-1/2	3/4	.120	0.2535	77272	77274	77273	77275
3/4	3	5-1/4	3/4	—	0.2535	77276	77278	77277	77279
3/4	3	5-1/4	3/4	.030	0.2535	77280	77282	77281	77283
3/4	3	5-1/4	3/4	.060	0.2535	77284	77286	77285	77287
3/4	3	5-1/4	3/4	.120	0.2535	77288	77290	77289	77291
1	2-1/2	5-1/2	1	—	0.3380	77292	77294	77293	77295
1	2-1/2	5-1/2	1	.030	0.3380	77296	77298	77297	77299
1	2-1/2	5-1/2	1	.060	0.3380	77300	77302	77301	77303
1	2-1/2	5-1/2	1	.120	0.3380	77304	77306	77305	77307
1	3	6	1	—	0.3380	77308	77310	77309	77311
1	3	6	1	.030	0.3380	77312	77314	77313	77315
1	3	6	1	.060	0.3380	77316	77318	77317	77319
1	3	6	1	.120	0.3380	77320	77322	77321	77323
1	4	7	1	—	0.3380	77324	77326	77325	77327
1	4	7	1	.030	0.3380	77328	77330	77329	77331
1	4	7	1	.060	0.3380	77332	77334	77333	77335
1	4	7	1	.120	0.3380	77336	77338	77337	77339

CONTINUED



**77M •
77MCR**
METRIC SERIES



- Specializes in deep axial trochoidal and high-speed milling applications
- Optimized core improves rigidity, chip flow and reduces deflection
- Chip Breaker design breaks up chips from the long flute length allowing for better chip flow and evacuation in deep pocketing operations
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

mm						EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON-CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA) EDP NO.	Ti-NAMITE®-A (TA) EDP NO. CHIP BREAKER	Ti-NAMITE®-M (TM) EDP NO.	Ti-NAMITE®-M (TM) EDP NO. CHIP BREAKER
6,0	15,0	63,0	6,0	—	2,03	74300	74302	74301	74303
6,0	15,0	63,0	6,0	0,3	2,03	74304	74306	74305	74307
6,0	15,0	63,0	6,0	0,5	2,03	74308	74310	74309	74311
6,0	18,0	63,0	6,0	—	2,03	74316	74318	74317	74319
6,0	18,0	63,0	6,0	0,3	2,03	74320	74322	74321	74323
6,0	18,0	63,0	6,0	0,5	2,03	74324	74326	74325	74327
6,0	24,0	75,0	6,0	—	2,03	74332	74334	74333	74335
6,0	24,0	75,0	6,0	0,3	2,03	74336	74338	74337	74339
6,0	24,0	75,0	6,0	0,5	2,03	74340	74342	74341	74343
8,0	20,0	75,0	8,0	—	2,71	74348	74350	74349	74351
8,0	20,0	75,0	8,0	0,5	2,71	74352	74354	74353	74355
8,0	20,0	75,0	8,0	1,0	2,71	74356	74358	74357	74359
8,0	20,0	75,0	8,0	2,0	2,71	74360	74362	74361	74363
8,0	24,0	75,0	8,0	—	2,71	74364	74366	74365	74367
8,0	24,0	75,0	8,0	0,5	2,71	74368	74370	74369	74371
8,0	24,0	75,0	8,0	1,0	2,71	74372	74374	74373	74375
8,0	24,0	75,0	8,0	2,0	2,71	74376	74378	74377	74379
8,0	32,0	85,0	8,0	—	2,71	74380	74382	74381	74383
8,0	32,0	85,0	8,0	0,5	2,71	74384	74386	74385	74387
8,0	32,0	85,0	8,0	1,0	2,71	74388	74390	74389	74391
8,0	32,0	85,0	8,0	2,0	2,71	74392	74394	74393	74395
10,0	25,0	75,0	10,0	—	3,38	74396	74398	74397	74399
10,0	25,0	75,0	10,0	0,5	3,38	74400	74402	74401	74403
10,0	25,0	75,0	10,0	1,0	3,38	74404	74406	74405	74407
10,0	30,0	80,0	10,0	—	3,38	74408	74410	74409	74411
10,0	30,0	80,0	10,0	0,5	3,38	74412	74414	74413	74415
10,0	30,0	80,0	10,0	1,0	3,38	74416	74418	74417	74419
10,0	40,0	100,0	10,0	—	3,38	74420	74422	74421	74423
10,0	40,0	100,0	10,0	0,5	3,38	74424	74426	74425	74427
10,0	40,0	100,0	10,0	1,0	3,38	74428	74430	74429	74431
12,0	30,0	83,0	12,0	—	4,06	74432	74434	74433	74435
12,0	30,0	83,0	12,0	0,5	4,06	74436	74438	74437	74439
12,0	30,0	83,0	12,0	1,0	4,06	74440	74442	74441	74443
12,0	30,0	83,0	12,0	2,0	4,06	74600	74601	74602	74603
12,0	30,0	83,0	12,0	3,0	4,06	74604	74605	74606	74607
12,0	36,0	83,0	12,0	—	4,06	74444	74446	74445	74447
12,0	36,0	83,0	12,0	0,5	4,06	74448	74450	74449	74451
12,0	36,0	83,0	12,0	1,0	4,06	74452	74454	74453	74455
12,0	36,0	83,0	12,0	2,0	4,06	74608	74609	74610	74611
12,0	36,0	83,0	12,0	3,0	4,06	74612	74613	74614	74615
12,0	48,0	100,0	12,0	—	4,06	74456	74458	74457	74459
12,0	48,0	100,0	12,0	0,5	4,06	74460	74462	74461	74463
12,0	48,0	100,0	12,0	1,0	4,06	74464	74466	74465	74467
12,0	48,0	100,0	12,0	2,0	4,06	74616	74617	74618	74619
12,0	48,0	100,0	12,0	3,0	4,06	74620	74621	74622	74623
16,0	40,0	92,0	16,0	—	5,41	74468	74470	74469	74471

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000 / -0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

RE = +0,000 / -0,050

>10-25 DIAMETER

DC = +0,000/-0,050

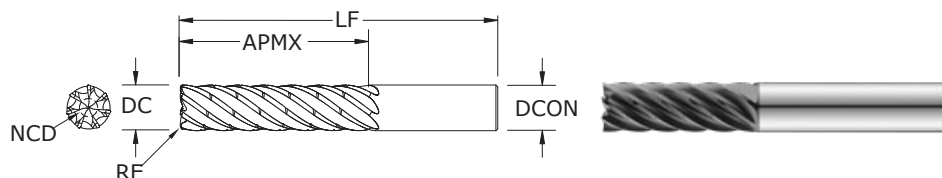
DCON = h_6

RE = +0,000 / -0,050

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

For patent information visit
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continued on next page



**77M •
77MCR**
METRIC SERIES

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h_6

RE = +0,000 / -0,050

>6-10 DIAMETER

DC = +0,000/-0,040

DCON = h_6

RE = +0,000 / -0,050

>10-25 DIAMETER

DC = +0,000/-0,050

DCON = h_6

RE = +0,000 / -0,050

STEELS

STAINLESS STEELS

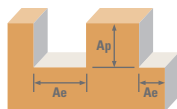
CAST IRON

HIGH TEMP ALLOYS

For patent
information visit
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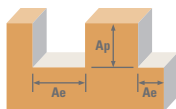
mm						EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON- CUTTING CENTER DIAMETER NCD	Ti-NAMITE®-A (TA) EDP NO.	Ti-NAMITE®-A (TA) EDP NO. CHIP BREAKER	Ti-NAMITE®-M (TM) EDP NO.	Ti-NAMITE®-M (TM) EDP NO. CHIP BREAKER
16,0	40,0	92,0	16,0	0,5	5,41	74472	74474	74473	74475
16,0	40,0	92,0	16,0	1,0	5,41	74476	74478	74477	74479
16,0	40,0	92,0	16,0	2,0	5,41	74624	74625	74626	74627
16,0	40,0	92,0	16,0	3,0	5,41	74628	74629	74630	74631
16,0	48,0	100,0	16,0	—	5,41	74480	74482	74481	74483
16,0	48,0	100,0	16,0	0,5	5,41	74484	74486	74485	74487
16,0	48,0	100,0	16,0	1,0	5,41	74488	74490	74489	74491
16,0	48,0	100,0	16,0	2,0	5,41	74632	74633	74634	74635
16,0	48,0	100,0	16,0	3,0	5,41	74636	74637	74638	74639
16,0	64,0	115,0	16,0	—	5,41	74492	74494	74493	74495
16,0	64,0	115,0	16,0	0,5	5,41	74496	74498	74497	74499
16,0	64,0	115,0	16,0	1,0	5,41	74500	74502	74501	74503
16,0	64,0	115,0	16,0	2,0	5,41	74640	74641	74642	74643
16,0	64,0	115,0	16,0	3,0	5,41	74644	74645	74646	74647
20,0	50,0	100,0	20,0	—	6,76	74504	74506	74505	74507
20,0	50,0	100,0	20,0	0,5	6,76	74508	74510	74509	74511
20,0	50,0	100,0	20,0	1,0	6,76	74512	74514	74513	74515
20,0	50,0	100,0	20,0	2,0	6,76	74516	74518	74517	74519
20,0	50,0	100,0	20,0	3,0	6,76	74648	74649	74650	74651
20,0	50,0	100,0	20,0	4,0	6,76	74652	74653	74654	74655
20,0	60,0	115,0	20,0	—	6,76	74520	74522	74521	74523
20,0	60,0	115,0	20,0	0,5	6,76	74524	74526	74525	74527
20,0	60,0	115,0	20,0	1,0	6,76	74528	74530	74529	74531
20,0	60,0	115,0	20,0	2,0	6,76	74532	74534	74533	74535
20,0	60,0	115,0	20,0	3,0	6,76	74656	74657	74658	74659
20,0	60,0	115,0	20,0	4,0	6,76	74660	74661	74662	74663
20,0	80,0	140,0	20,0	—	6,76	74536	74538	74537	74539
20,0	80,0	140,0	20,0	0,5	6,76	74540	74542	74541	74543
20,0	80,0	140,0	20,0	1,0	6,76	74544	74546	74545	74547
20,0	80,0	140,0	20,0	2,0	6,76	74548	74550	74549	74551
20,0	80,0	140,0	20,0	3,0	6,76	74664	74665	74666	74667
20,0	80,0	140,0	20,0	4,0	6,76	74668	74669	74670	74671
25,0	63,0	135,0	25,0	—	8,45	74552	74554	74553	74555
25,0	63,0	135,0	25,0	1,0	8,45	74556	74558	74557	74559
25,0	63,0	135,0	25,0	2,0	8,45	74560	74562	74561	74563
25,0	63,0	135,0	25,0	3,0	8,45	74564	74566	74565	74567
25,0	75,0	150,0	25,0	—	8,45	74568	74570	74569	74571
25,0	75,0	150,0	25,0	1,0	8,45	74572	74574	74573	74575
25,0	75,0	150,0	25,0	2,0	8,45	74576	74578	74577	74579
25,0	75,0	150,0	25,0	3,0	8,45	74580	74582	74581	74583
25,0	100,0	170,0	25,0	—	8,45	74584	74586	74585	74587
25,0	100,0	170,0	25,0	1,0	8,45	74588	74590	74589	74591
25,0	100,0	170,0	25,0	2,0	8,45	74592	74594	74593	74595
25,0	100,0	170,0	25,0	3,0	8,45	74596	74598	74597	74599

CONTINUED



Series 77M, 77MCR Metric		Hardness	Ae Ap		Vc (m/min)	DC • mm									
			Ae x DC	Ap x DC		6	8	10	12	16	20	25			
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc		HSM	2.5xD	284 (227-341)	RPM	12208	9156	7325	6104	4578	3662	2930	
					≤ 0.2 ≤ APMX	Fz	0.0413	0.0411	0.0640	0.0711	0.0889	0.1013	0.1050		
					Feed (mm/min)	3529	2634	3282	3038	2849	2597	2154			
				HSM	3xD	257 (206-308)	Fz	0.0347	0.0461	0.0717	0.0797	0.0996	0.1135	0.1176	
					≤ 0.15 ≤ APMX	Feed (mm/min)	2965	2955	3676	3405	3192	2910	2412		
					Feed (mm/min)	3094	3076	3830	3546	3323	3030	1885			
			HSM	4xD	230 (184-276)	Fz	0.0362	0.0480	0.0747	0.0830	0.1037	0.1182	0.0919		
				≤ 0.1 ≤ APMX	Feed (mm/min)	3094	3076	3830	3546	3323	3030	1885			
				RPM	8068	6051	4841	4034	3025	2420	1936				
				Fz	0.0213	0.0285	0.0512	0.0610	0.0711	0.0827	0.0875				
				Feed (mm/min)	1203	1207	1735	1723	1506	1401	1186				
				Fz	0.0239	0.0319	0.0574	0.0683	0.0797	0.0926	0.0980				
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc		HSM	3xD	138 (111-166)	Fz	0.0239	0.0319	0.0574	0.0683	0.0797	0.0926	0.0980	
					≤ 0.15 ≤ APMX	Feed (mm/min)	1350	1351	1945	1929	1688	1569	1328		
					Feed (mm/min)	1406	1406	2023	2008	1758	1633	1384			
				HSM	4xD	152 (122-182)	Fz	0.0249	0.0332	0.0597	0.0711	0.0830	0.0964	0.1021	
					≤ 0.1 ≤ APMX	Feed (mm/min)	1406	1406	2023	2008	1758	1633	1384		
					RPM	4087	3065	2452	2044	1533	1226	981			
		TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc		HSM	2.5xD	83 (66-100)	Fz	0.0140	0.0183	0.0294	0.0356	0.0457	0.0560	0.0625
						≤ 0.2 ≤ APMX	Feed (mm/min)	401	393	505	509	490	481	429	
						Feed (mm/min)	449	440	566	569	549	538	481		
					HSM	3xD	86 (69-103)	Fz	0.0157	0.0205	0.0330	0.0398	0.0512	0.0627	0.0700
						≤ 0.15 ≤ APMX	Feed (mm/min)	449	440	566	569	549	538	481	
						Feed (mm/min)	466	457	590	594	572	560	501		
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc		HSM	2.5xD	197 (158-236)	RPM	9660	7245	5796	4830	3623	2898	2318	
					≤ 0.2 ≤ APMX	Fz	0.0216	0.0285	0.0448	0.0533	0.0635	0.0747	0.0800		
					Feed (mm/min)	1461	1445	1818	1803	1610	1515	1298			
				HSM	3xD	204 (163-245)	Fz	0.0242	0.0319	0.0502	0.0598	0.0711	0.0837	0.0896	
					≤ 0.15 ≤ APMX	Feed (mm/min)	1636	1618	2037	2022	1803	1698	1454		
					Feed (mm/min)	1704	1684	2122	2104	1879	1767	1514			
			HSM	4xD	182 (146-218)	Fz	0.0252	0.0332	0.0523	0.0622	0.0741	0.0871	0.0933		
				≤ 0.1 ≤ APMX	Feed (mm/min)	1704	1684	2122	2104	1879	1767	1514			
				RPM	6369	4777	3822	3185	2389	1911	1529				
				Fz	0.0168	0.0221	0.0371	0.0432	0.0584	0.0693	0.0750				
				Feed (mm/min)	749	739	993	963	976	927	803				
				Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840				
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc		HSM	3xD	134 (107-161)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840	
					≤ 0.15 ≤ APMX	Feed (mm/min)	838	829	1113	1079	1095	1039	899		
					Feed (mm/min)	874	863	1158	1124	1140	1082	936			
				HSM	4xD	120 (96-144)	Fz	0.0196	0.0258	0.0433	0.0504	0.0682	0.0809	0.0875	
					≤ 0.1 ≤ APMX	Feed (mm/min)	874	863	1158	1124	1140	1082	936		
					RPM	6104	4578	3662	3052	2289	1831	1465			
		STAINLESS STEELS (PH) 13-8 PH, 15-5PH, 17-4 PH, CUSTOM 450	≤ 325 Bhn or ≤ 35 HRc		HSM	2.5xD	124 (99-149)	Fz	0.0168	0.0221	0.0371	0.0432	0.0584	0.0693	0.0750
						≤ 0.2 ≤ APMX	Feed (mm/min)	718	708	952	923	936	888	769	
						Feed (mm/min)	803	795	1066	1034	1050	996	861		
					HSM	3xD	129 (103-155)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840
						≤ 0.15 ≤ APMX	Feed (mm/min)	803	795	1066	1034	1050	996	861	
						Feed (mm/min)	837	827	1110	1077	1093	1037	897		

continued on next page



Series 77M, 77MCR						DC • mm									
Metric	Hardness	Ae x DC		Ap x DC	Vc (m/min)		6	8	10	12	16	20	25		
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc		HSM	2.5xD	218 (174-262)	RPM	10722	8041	6433	5361	4021	3217	2573	
							Fz	0.0239	0.0315	0.0474	0.0559	0.0762	0.0880	0.0925	
							Feed (mm/min)	1794	1773	2135	2098	2145	1981	1666	
				HSM	3xD	225 (180-270)	Fz	0.0268	0.0353	0.0531	0.0626	0.0854	0.0986	0.1036	
							Feed (mm/min)	2011	1987	2391	2349	2404	2220	1866	
								HSM	4xD	202 (162-242)	Fz	0.0279	0.0368	0.0553	0.0652
		Feed (mm/min)	2094	2071	2490	2447					2502	2312	1944		
		CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc		HSM	2.5xD					130 (104-156)	RPM	6369	4777	3822
							Fz	0.0168	0.0221	0.0371		0.0432	0.0584	0.0693	0.0750
							Feed (mm/min)	749	739	993		963	976	927	803
					HSM	3xD	134 (107-161)	Fz	0.0188	0.0248	0.0416	0.0484	0.0655	0.0777	0.0840
								Feed (mm/min)	838	829	1113	1079	1095	1039	899
								HSM	4xD	120 (96-144)	Fz	0.0196	0.0258	0.0433	0.0504
		Feed (mm/min)	874	863	1158	1124	1140				1082	936			
		HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc		HSM	2.5xD	41 (33-49)				RPM	2017	1513	1210	1008
	Fz							0.0140	0.0183	0.0294	0.0356	0.0457	0.0560	0.0625	
	Feed (mm/min)							198	194	249	251	242	237	212	
				HSM	3xD	43 (34-52)	Fz	0.0157	0.0205	0.0330	0.0398	0.0512	0.0627	0.0700	
							Feed (mm/min)	222	217	280	281	271	266	237	
								HSM	4xD	38 (30-46)	Fz	0.0163	0.0213	0.0344	0.0415
	Feed (mm/min)		230	226	291	293					282	277	247		
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene		≤ 400 Bhn or ≤ 43 HRc		HSM	2.5xD					26 (21-31)	RPM	1274	955	764
							Fz	0.0114	0.0152	0.0243		0.0305	0.0381	0.0480	0.0550
							Feed (mm/min)	102	102	130		136	127	128	118
				HSM	3xD	27 (22-32)	Fz	0.0128	0.0171	0.0273	0.0342	0.0427	0.0538	0.0616	
							Feed (mm/min)	114	114	146	152	143	144	132	
							HSM	4xD	24 (19-29)	Fz	0.0133	0.0178	0.0284	0.0356	0.0445
Feed (mm/min)	119		119	152	159	149				150	137				
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc			HSM	2.5xD	88 (70-106)				RPM	4352	3264	2611	2176	1632
		Fz					0.0191	0.0254	0.0397	0.0483	0.0635	0.0747	0.0800		
		Feed (mm/min)					582	580	726	736	725	683	585		
			HSM	3xD	91 (73-109)	Fz	0.0213	0.0285	0.0445	0.0541	0.0711	0.0837	0.0896		
						Feed (mm/min)	649	651	813	824	812	765	655		
							HSM	4xD	82 (66-98)	Fz	0.0222	0.0296	0.0463	0.0563	0.0741
Feed (mm/min)	676	676	846	858	847					796	682				
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc		HSM	2.5xD	52 (42-62)					RPM	2548	1911	1529	1274	955
						Fz	0.0163	0.0254	0.0397	0.0483	0.0635	0.0747	0.0800		
						Feed (mm/min)	291	340	425	431	425	400	342		
			HSM	3xD	54 (43-65)	Fz	0.0182	0.0285	0.0445	0.0541	0.0711	0.0837	0.0896		
						Feed (mm/min)	325	381	476	482	476	448	384		
							HSM	4xD	48 (38-58)	Fz	0.0190	0.0296	0.0463	0.0563	0.0741
Feed (mm/min)	339	396	495	502	496					466	399				

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 rpm = (Vc x 1000) / (DC x 3.14)
 mm/min = Fz x 7 x rpm
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com)



**66M •
66MCR**
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

STEELS

STAINLESS STEELS

CAST IRON

HIGH TEMP ALLOYS

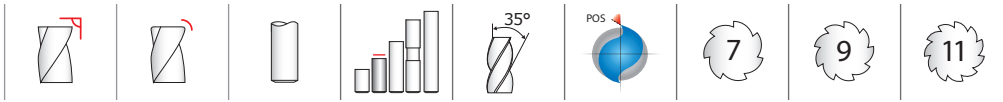
For patent
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mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON- CUTTING CENTER DIAMETER NCD	NO. OF FLUTES	Ti-NAMITE®-X (TX)
6,0	19,0	63,0	6,0	—	1,63	7	46620
6,0	19,0	63,0	8,0	0,5	1,63	7	46627
6,0	19,0	63,0	6,0	1,0	1,63	7	46628
8,0	20,0	63,0	8,0	—	1,78	7	46621
8,0	20,0	63,0	8,0	0,5	1,78	7	46629
8,0	20,0	63,0	8,0	1,0	1,78	7	46630
8,0	20,0	63,0	8,0	1,5	1,78	7	46631
10,0	22,0	75,0	10,0	—	2,03	7	46622
10,0	22,0	75,0	10,0	0,5	2,03	7	46632
10,0	22,0	75,0	10,0	1,0	2,03	7	46633
10,0	22,0	75,0	10,0	1,5	2,03	7	46634
10,0	22,0	75,0	10,0	2,0	2,03	7	46635
12,0	26,0	83,0	12,0	—	3,45	9	46623
12,0	26,0	83,0	12,0	1,0	3,45	9	46636
12,0	26,0	83,0	12,0	1,5	3,45	9	46637
12,0	26,0	83,0	12,0	2,0	3,45	9	46638
12,0	26,0	83,0	12,0	2,5	3,45	9	46639
12,0	26,0	83,0	12,0	3,0	3,45	9	46640
16,0	32,0	92,0	16,0	—	2,92	9	46624
16,0	32,0	92,0	16,0	1,0	2,92	9	46641
16,0	32,0	92,0	16,0	1,5	2,92	9	46642
16,0	32,0	92,0	16,0	2,0	2,92	9	46643
16,0	32,0	92,0	16,0	2,5	2,92	9	46644
16,0	32,0	92,0	16,0	3,0	2,92	9	46645
16,0	32,0	92,0	16,0	4,0	2,92	9	46646
20,0	38,0	104,0	20,0	—	4,57	11	46625
20,0	38,0	104,0	20,0	1,0	4,57	11	46647
20,0	38,0	104,0	20,0	1,5	4,57	11	46648
20,0	38,0	104,0	20,0	2,0	4,57	11	46649
20,0	38,0	104,0	20,0	2,5	4,57	11	46650
20,0	38,0	104,0	20,0	3,0	4,57	11	46651
20,0	38,0	104,0	20,0	4,0	4,57	11	46652

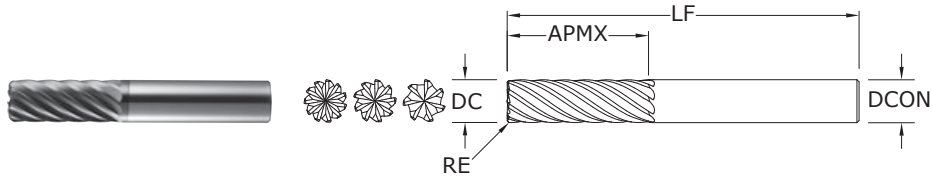
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Neck Option Available

- Heavy core and rigid design allow for straight walls
- High flute count design results in smoother cutting performance and enhanced tool life in precise finishing applications
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



**66M •
66MCR**
METRIC SERIES



CONTINUED

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NON- CUTTING CENTER DIAMETER NCD	NO. OF FLUTES	Ti-NAMITE®-X (TX)
20,0	38,0	104,0	20,0	5,0	4,57	11	46653
25,0	38,0	104,0	25,0	—	7,49	11	46626
25,0	38,0	104,0	25,0	1,0	7,49	11	46654
25,0	38,0	104,0	25,0	1,5	7,49	11	46655
25,0	38,0	104,0	25,0	2,0	7,49	11	46656
25,0	38,0	104,0	25,0	2,5	7,49	11	46657
25,0	38,0	104,0	25,0	3,0	7,49	11	46658
25,0	38,0	104,0	25,0	4,0	7,49	11	46659
25,0	38,0	104,0	25,0	5,0	7,49	11	46660

Neck Option Available

TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

RE = +0,000/-0,050

STEELS

STAINLESS STEELS

CAST IRON

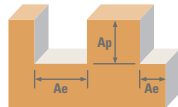
HIGH TEMP ALLOYS

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Series 66M, 66MCR Metric		Hardness		Ae x DC		Ap x DC		Vc (m/min)		DC • mm						
										6	8	10	12	16	20	25
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	Profile	≤ 0.05	≤ 1	194	RPM	(155-232)	Fz	Feed (mm/min)	10260	7695	6156	5130	3847	3078	2462
										0.029	0.047	0.059	0.072	0.095	0.101	0.105
										2068	2528	2528	3324	3280	3431	2844
		Finish	≤ 0.02	≤ 2	232	RPM	(186-279)	Fz	Feed (mm/min)	12312	9234	7387	6156	4617	3693	2955
										0.023	0.038	0.047	0.058	0.076	0.081	0.084
										1985	2427	2427	3191	3149	3294	2730
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	Profile	≤ 0.05	≤ 1	110	RPM	(88-132)	Fz	Feed (mm/min)	5816	4362	3490	2908	2181	1745	1396
										0.022	0.036	0.045	0.055	0.074	0.080	0.080
										879	1108	1107	1445	1457	1536	1229
		Finish	≤ 0.02	≤ 2	132	RPM	(105-158)	Fz	Feed (mm/min)	6980	5235	4188	3490	2617	2094	1675
										0.017	0.029	0.036	0.044	0.059	0.064	0.064
										844	1063	1063	1387	1399	1474	1179
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile	≤ 0.05	≤ 1	88	RPM	(71-106)	Fz	Feed (mm/min)	4686	3514	2811	2343	1757	1406	1125
										0.014	0.026	0.032	0.038	0.051	0.056	0.055
										472	630	630	810	810	866	680
		Finish	≤ 0.02	≤ 2	106	RPM	(85-127)	Fz	Feed (mm/min)	5623	4217	3374	2811	2108	1687	1349
										0.012	0.020	0.026	0.031	0.041	0.045	0.044
										453	605	605	777	777	831	653
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	Profile	≤ 0.05	≤ 1	171	RPM	(137-205)	Fz	Feed (mm/min)	9048	6786	5429	4524	3393	2714	2171
										0.022	0.036	0.045	0.055	0.074	0.080	0.080
										1368	1723	1723	2247	2267	2389	1911
		Finish	≤ 0.02	≤ 2	137	RPM	(109-164)	Fz	Feed (mm/min)	7238	5429	4343	3619	2714	2171	1737
										0.017	0.029	0.036	0.044	0.059	0.064	0.064
										875	1103	1103	1438	1451	1529	1223
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	Profile	≤ 0.05	≤ 1	117	RPM	(94-141)	Fz	Feed (mm/min)	6220	4665	3732	3110	2333	1866	1493
										0.017	0.030	0.037	0.043	0.059	0.064	0.065
										731	975	975	1209	1236	1314	1067
		Finish	≤ 0.02	≤ 2	141	RPM	(113-169)	Fz	Feed (mm/min)	7465	5598	4479	3732	2799	2239	1791
										0.013	0.024	0.030	0.035	0.047	0.051	0.052
										702	17	936	1161	1187	1261	1025
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	Profile	≤ 0.05	≤ 1	108	RPM	(87-130)	Fz	Feed (mm/min)	5736	4302	3441	2868	2151	1721	1377
										0.017	0.030	0.037	0.043	0.059	0.064	0.065
										674	899	899	1115	1140	1211	984
		Finish	≤ 0.02	≤ 2	130	RPM	(104-156)	Fz	Feed (mm/min)	6883	5162	4130	3441	2581	2065	1652
										0.013	0.024	0.030	0.035	0.047	0.051	0.052
										647	863	863	1070	1094	1163	945

continued on next page

Multi-Carb



Series 66M, 66MCR	Metric	Hardness			Vc (m/min)	DC • mm								
			Ae x DC	Ap x DC		6	8	10	12	16	20	25		
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc		≤ 0.05	≤ 1	215	RPM	11391	8543	6834	5695	4271	3417	2734
						(172-258)	Fz	0.029	0.047	0.059	0.072	0.095	0.101	0.105
						Feed (mm/min)	2296	2807	2807	3690	3641	3809	3158	
				≤ 0.02	≤ 2	258	RPM	13669	10252	8201	6834	5126	4101	3281
						(206-309)	Fz	0.023	0.038	0.047	0.058	0.076	0.081	0.084
						Feed (mm/min)	2204	2695	2694	3543	3496	3657	3031	
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc		≤ 0.05	≤ 1	165	RPM	8725	6544	5235	4362	3272	2617	2094
						(132-198)	Fz	0.022	0.036	0.045	0.055	0.074	0.080	0.080
						Feed (mm/min)	1319	1661	1661	2167	2186	2303	1843	
				≤ 0.02	≤ 2	198	RPM	10470	7852	6282	5235	3926	3141	2513
						(158-237)	Fz	0.017	0.029	0.036	0.044	0.059	0.064	0.064
						Feed (mm/min)	1266	1595	1595	2080	2099	2211	1769	
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc		≤ 0.05	≤ 1	32	RPM	1696	1272	1018	848	636	509	407
						(26-38)	Fz	0.017	0.030	0.037	0.043	0.059	0.064	0.065
						Feed (mm/min)	199	266	213	330	337	358	291	
				≤ 0.02	≤ 2	38	RPM	2036	1527	1221	1018	763	611	489
						(31-46)	Fz	0.013	0.024	0.030	0.035	0.047	0.051	0.052
						Feed (mm/min)	192	255	255	317	324	344	279	
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc		≤ 0.05	≤ 1	26	RPM	1373	1030	824	687	515	412	330
						(21-31)	Fz	0.012	0.019	0.024	0.026	0.036	0.040	0.040
						Feed (mm/min)	115	138	138	163	166	181	145	
				≤ 0.02	≤ 2	31	RPM	1648	1236	989	824	618	494	396
						(25-37)	Fz	0.010	0.015	0.019	0.021	0.029	0.032	0.032
						Feed (mm/min)	111	133	133	157	159	174	139	
TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc		≤ 0.05	≤ 1	119	RPM	6301	4726	3781	3151	2363	1890	1512	
					(95-143)	Fz	0.019	0.032	0.040	0.050	0.067	0.072	0.073	
					Feed (mm/min)	847	1059	1059	1429	1415	1497	1206		
			≤ 0.02	≤ 2	143	RPM	7561	5671	4537	3781	2836	2268	1815	
					(114-171)	Fz	0.015	0.026	0.032	0.040	0.053	0.058	0.058	
					Feed (mm/min)	813	1016	1016	1372	1359	1437	1158		
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc		≤ 0.05	≤ 1	43	RPM	2262	1696	1357	1131	848	679	543	
					(34-51)	Fz	0.019	0.032	0.040	0.050	0.067	0.072	0.073	
					Feed (mm/min)	304	380	380	513	508	537	433		
			≤ 0.02	≤ 2	51	RPM	2714	2036	1629	1357	1018	814	651	
					(41-61)	Fz	0.015	0.026	0.032	0.040	0.053	0.058	0.058	
					Feed (mm/min)	292	365	365	492	488	516	416		

Bhn (Brinell) HRc (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x number of flutes x rpm

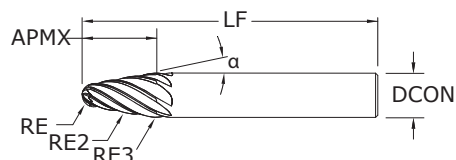
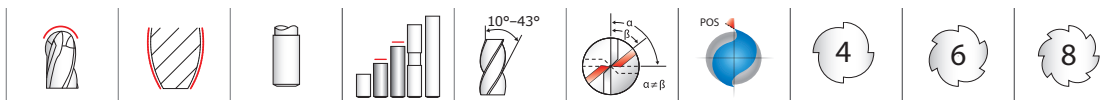
reduce speed and feed for materials harder than listed

feed rates listed have chip thinning adjustments included where applicable

refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



METRIC Multi-Carb



67B
METRIC SERIES

TOLERANCES (mm)

DCON = h_6

RE = $+0,010/-0,010$

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

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information visit
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mm								EDP NO.
SHANK DIAMETER DCON	LENGTH OF CUT APMX	OVERALL LENGTH LF	CENTERLINE ANGLE α	TIP RADIUS RE	TAPERED RADIUS RE2	BLENDED RADIUS RE3	NO. OF FLUTES	Ti-NAMITE®-H (TH)
6,0	9,5	58,0	17.5°	1,0	250,0	3,0	4	45700
6,0	8,0	58,0	17.5°	1,5	250,0	3,0	4	45701
8,0	10,5	80,0	20.0°	1,5	250,0	4,0	4	45702
8,0	9,5	80,0	20.0°	2,0	250,0	4,0	4	45703
10,0	12,5	89,0	20.0°	2,0	250,0	5,0	6	45704
10,0	11,5	89,0	20.0°	2,5	250,0	5,0	6	45705
12,0	13,5	100,0	20.0°	3,0	250,0	6,0	8	45706
12,0	14,4	100,0	20.0°	2,5	250,0	6,0	8	45707
12,0	20,0	100,0	14.0°	2,0	60,0	6,0	6	45708
16,0	31,0	109,0	12.5°	2,0	1000,0	5,0	6	45709
16,0	27,5	109,0	12.5°	3,0	1000,0	5,0	8	45710
16,0	24,0	109,0	12.5°	4,0	1000,0	5,0	8	45711
16,0	21,0	109,0	15.0°	4,0	1000,0	5,0	8	45712
16,0	18,5	109,0	20.0°	4,0	1500,0	8,0	8	45713
16,0	28,5	109,0	10.0°	4,0	1000,0	5,0	8	45714
16,0	19,0	109,0	20.0°	3,0	750,0	5,0	8	45715
16,0	15,0	109,0	30.0°	2,0	750,0	3,0	6	45716
16,0	18,5	109,0	20.0°	3,0	60,0	5,0	8	45717

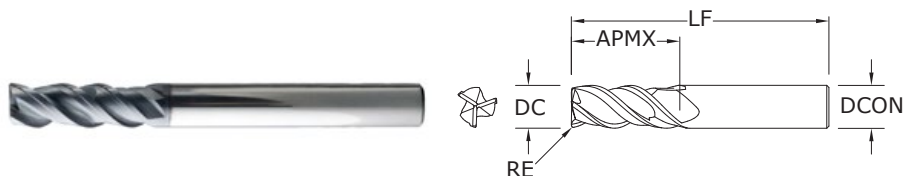
- Designed to significantly improve traditional ball end applications
- Highly efficient at finishing and semi-finishing profiling
- Main application areas include profiling and pocket milling
- Especially suited to machining deep pockets and hard-to-reach areas without using long-reach tools
- Their versatility also allows for machining profiles and blends with one tool
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



33MCR

METRIC SERIES

- Specially engineered step core design provides stability for aggressive ramping and rigidity when flutes are completely engaged
- Open design at axial end accommodates material flow and load reduction during machining operations
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 45 HRC (≤ 420 Bhn)



mm					EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	Ti-NAMITE®-A (AlTiN)
3,0	9,0	57,0	6,0	0,3	43445
3,0	9,0	57,0	6,0	0,5	43470
4,0	12,0	57,0	6,0	0,3	43446
4,0	12,0	57,0	6,0	0,5	43471
5,0	15,0	57,0	6,0	0,3	43447
5,0	15,0	57,0	6,0	0,5	43472
6,0	18,0	57,0	6,0	0,5	43448
6,0	18,0	57,0	6,0	1,0	43473
6,0	18,0	57,0	6,0	1,5	43474
6,0	18,0	57,0	6,0	2,0	43475
8,0	20,0	63,0	8,0	0,5	43449
8,0	20,0	63,0	8,0	1,0	43476
8,0	20,0	63,0	8,0	1,5	43477
8,0	20,0	63,0	8,0	2,0	43478
10,0	27,0	72,0	10,0	0,5	43450
10,0	27,0	72,0	10,0	1,0	43479
10,0	27,0	72,0	10,0	1,5	43480
10,0	27,0	72,0	10,0	2,0	43481
10,0	27,0	72,0	10,0	2,5	43482
12,0	30,0	83,0	12,0	0,5	43451
12,0	30,0	83,0	12,0	1,0	43483
12,0	30,0	83,0	12,0	1,5	43484
12,0	30,0	83,0	12,0	2,0	43485
12,0	30,0	83,0	12,0	2,5	43486
12,0	30,0	83,0	12,0	3,0	43487
12,0	30,0	83,0	12,0	4,0	43488
16,0	38,0	92,0	16,0	1,0	43452
16,0	38,0	92,0	16,0	1,5	43489
16,0	38,0	92,0	16,0	2,0	43490
16,0	38,0	92,0	16,0	2,5	43491
16,0	38,0	92,0	16,0	3,0	43492
16,0	38,0	92,0	16,0	4,0	43493
20,0	46,0	104,0	20,0	1,0	43453
20,0	46,0	104,0	20,0	2,0	43494
20,0	46,0	104,0	20,0	2,5	43495
20,0	46,0	104,0	20,0	3,0	43496
20,0	46,0	104,0	20,0	4,0	43497

TOLERANCES (mm)

3-6 DIAMETER

DC = $+0,000/-0,030$ DCON = h_6 RE = $+0,000/-0,050$

>6-10 DIAMETER

DC = $+0,000/-0,040$ DCON = h_6 RE = $+0,000/-0,050$

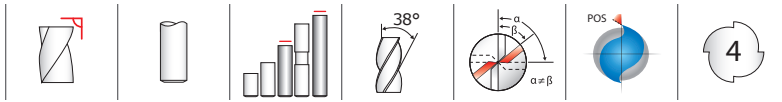
>10-20 DIAMETER

DC = $+0,000/-0,050$ DCON = h_6 RE = $+0,000/-0,050$

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS

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METRIC Series 7



7M METRIC SERIES

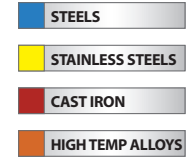
- Variable pitch allows for improved chatter suppression along with improved surface finish and enhanced tool life
- Raised land and increased core diameter designed to enhance tool life and decrease tool deflection
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)



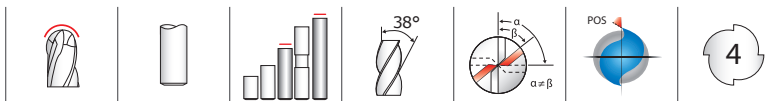
mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
3,0	25,0	75,0	3,0	70551
4,0	25,0	75,0	4,0	70552
5,0	25,0	75,0	5,0	70553
6,0	25,0	75,0	6,0	70554
8,0	25,0	75,0	8,0	70555
10,0	38,0	100,0	10,0	70556
12,0	50,0	100,0	12,0	70557
12,0	75,0	150,0	12,0	70558
14,0	75,0	150,0	14,0	70559
16,0	75,0	150,0	16,0	70560
18,0	75,0	150,0	18,0	70561
20,0	75,0	150,0	20,0	70562
25,0	75,0	150,0	25,0	70563

TOLERANCES (mm)

DC = $+0,000/+0,050$
DCON = h_6



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7MB METRIC SERIES

- Variable pitch allows for improved chatter suppression along with improved surface finish and enhanced tool life
- Raised land and increased core diameter designed to enhance tool life and decrease tool deflection
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 45 HRc (≤ 420 Bhn)

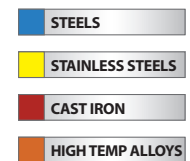


mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
3,0	25,0	75,0	3,0	70527
4,0	25,0	75,0	4,0	70529
5,0	25,0	75,0	5,0	70531
6,0	25,0	75,0	6,0	70533
8,0	25,0	75,0	8,0	70535
10,0	38,0	100,0	10,0	70537
12,0	50,0	100,0	12,0	70539
12,0	75,0	150,0	12,0	70540
14,0	75,0	150,0	14,0	70542
16,0	75,0	150,0	16,0	70544
18,0	75,0	150,0	18,0	70546
20,0	75,0	150,0	20,0	70548
25,0	75,0	150,0	25,0	70550

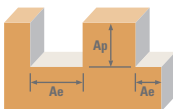
RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

DC = $+0,000/+0,050$
DCON = h_6
RE = $+0,000/-0,025$



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Series 7M, 7MB Metric	Hardness		Ae Ae x DC Ae Ap x DC		Vc (m/min)	DC • mm									
			3	6		8	10	12	16	20	25				
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 275 Bhn or ≤ 28 HRc	Finish 	≤ 0.02	≤ 2	146	RPM	15511	7755	5816	4653	3878	2908	2327	1861
						(117-176)	Fz	0.0166	0.043	0.075	0.093	0.110	0.125	0.147	0.160
							Feed (mm/min)	1030	1334	1745	1731	1706	1454	1368	1191
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 375 Bhn or ≤ 40 HRc	Finish 	≤ 0.02	≤ 2	84	RPM	8886	4443	3332	2666	2222	1666	1333	1066
						(67-101)	Fz	0.0122	0.034	0.051	0.069	0.082	0.091	0.109	0.120
							Feed (mm/min)	434	604	680	736	729	606	581	512
	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	Finish 	≤ 0.02	≤ 2	70	RPM	7432	3716	2787	2230	1858	1394	1115	892
						(56-84)	Fz	0.0070	0.019	0.040	0.043	0.048	0.057	0.064	0.070
							Feed (mm/min)	208	282	446	384	357	318	285	250
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Finish 	≤ 0.02	≤ 2	128	RPM	13572	6786	5089	4072	3393	2545	2036	1629
						(102-154)	Fz	0.0086	0.024	0.040	0.048	0.058	0.065	0.077	0.087
							Feed (mm/min)	467	651	814	782	787	662	627	567
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L	≤ 275 Bhn or ≤ 28 HRc	Finish 	≤ 0.02	≤ 2	88	RPM	9371	4686	3514	2811	2343	1757	1406	1125
						(71-106)	Fz	0.0082	0.022	0.037	0.045	0.048	0.060	0.072	0.078
							Feed (mm/min)	307	412	520	506	450	422	405	351
	STAINLESS STEELS (PH) 13-8 PH, 15-5 PH, 17-4 PH, Custom 450	≤ 325 Bhn or ≤ 35 HRc	Finish 	≤ 0.02	≤ 2	81	RPM	8563	4282	3211	2569	2141	1606	1284	1028
						(65-97)	Fz	0.0070	0.019	0.029	0.040	0.048	0.055	0.064	0.070
							Feed (mm/min)	240	325	372	411	411	353	329	288
K	CAST IRONS (LOW & MEDIUM ALLOY) Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Finish 	≤ 0.02	≤ 2	184	RPM	19550	9775	7331	5865	4887	3666	2932	2346
						(148-221)	Fz	0.0132	0.036	0.052	0.075	0.089	0.099	0.117	0.130
							Feed (mm/min)	1032	1408	1525	1759	1740	1452	1372	1220
	CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile	≤ 260 Bhn or ≤ 26 HRc	Finish 	≤ 0.02	≤ 2	142	RPM	15026	7513	5635	4508	3756	2817	2254	1803
						(113-170)	Fz	0.0132	0.036	0.052	0.075	0.089	0.099	0.117	0.130
							Feed (mm/min)	793	1082	1172	1352	1337	1116	1055	938
S	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400	≤ 300 Bhn or ≤ 32 HRc	Finish 	≤ 0.02	≤ 2	24	RPM	2585	1293	969	776	646	485	388	310
						(20-29)	Fz	0.0072	0.019	0.029	0.037	0.046	0.053	0.061	0.085
							Feed (mm/min)	74	98	112	90	119	103	95	105
	HIGH TEMP ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 718, X-750, Incoloy, Waspaloy, Hastelloy, Rene	≤ 400 Bhn or ≤ 43 HRc	Finish 	≤ 0.02	≤ 2	20	RPM	2100	1050	788	630	525	394	315	252
						(16-24)	Fz	0.0075	0.016	0.021	0.030	0.038	0.044	0.051	0.070
							Feed (mm/min)	63	67	66	76	80	69	64	71
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si	≤ 350 Bhn or ≤ 38 HRc	Finish 	≤ 0.02	≤ 2	91	RPM	9694	4847	3635	2908	2424	1818	1454	1163
						(73-110)	Fz	0.0091	0.024	0.040	0.050	0.060	0.070	0.080	0.088
							Feed (mm/min)	353	465	51	59	582	509	465	409
TITANIUM ALLOYS (DIFFICULT) Ti10V2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al	≤ 420 Bhn or ≤ 45 HRc	Finish 	≤ 0.02	≤ 2	32	RPM	3393	1696	1272	1018	848	636	509	407	
					(26-38)	Fz	0.0082	0.019	0.029	0.037	0.046	0.053	0.061	0.085	
						Feed (mm/min)	111	129	148	151	156	135	124	138	

Bhn (Brinell) HRc (Rockwell C)

rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x 4 x rpm

reduce speed and feed for materials harder than listed

feed rates listed have chip thinning adjustments included where applicable

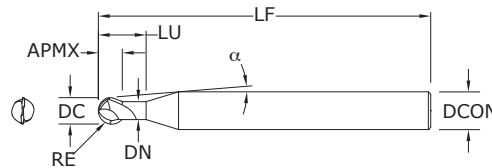
refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



56B

FRACTIONAL SERIES

- Short flute length and rigid design to reduce deflection
- S-Gash Ball geometry minimizes load and heat produced during the cutting process, ultimately enhancing tool life
- Ideal for machining complex contoured shapes in hardened steels
- Recommended for materials 35 to 60 HRc (327 to 654 Bhn)



inch							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CENTER LINE ANGLE α	REACH LU	NECK DIAMETER DN	Ti-NAMITE [®] -X (TX)
1/32	1/32	3	1/4	8°20'	1/16	.025	93272
1/16	1/16	3	1/4	7°40'	1/8	.055	93273
3/32	3/32	3	1/4	6°50'	3/16	.085	93274
1/8	1/8	3	1/4	6°	1/4	.114	93275
3/16	3/16	3	1/4	3°35'	3/8	.171	93276
1/4	1/4	3-1/2	1/4	—	1/2	.230	93277
5/16	5/16	4	5/16	—	5/8	.292	93278
3/8	3/8	4	3/8	—	3/4	.355	93279
1/2	1/2	4-1/2	1/2	—	1	.480	93280
5/8	5/8	5-1/2	5/8	—	1-1/4	.610	93281
3/4	3/4	6-1/2	3/4	—	1-1/2	.735	93282

Extended Neck Option Available, contact your local KSPT representative for more information.
RE = 1/2 Cutting Diameter (DC)

TOLERANCES (inch)

1/32–3/32 DIAMETER

DC = +0.0000/–0.0010

DCON = h_6

RE = +0.0000/–0.0005

>3/32–1/4 DIAMETER

DC = +0.0000/–0.0012

DCON = h_6

RE = +0.0000/–0.0006

>1/4–3/8 DIAMETER

DC = +0.0000/–0.0016

DCON = h_6

RE = +0.0000/–0.0008

>3/8–3/4 DIAMETER

DC = +0.0000/–0.0020

DCON = h_6

RE = +0.0000/–0.0010

STEELS

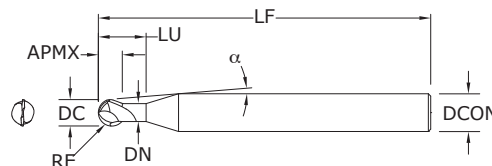
HARDENED STEELS

For patent information visit
www.ksptpatents.com

56MB

METRIC SERIES

- Short flute length and rigid design to reduce deflection
- S-Gash Ball geometry minimizes load and heat produced during the cutting process, ultimately enhancing tool life
- Ideal for machining complex contoured shapes in hardened steels
- Recommended for materials 35 to 60 HRc (327 to 654 Bhn)



mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CENTER LINE ANGLE α	REACH LU	NECK DIAMETER DN	Ti-NAMITE [®] -X (TX)
1,0	1,0	76,0	6,0	8°10'	2,0	0,91	91349
1,5	1,5	76,0	6,0	7°45'	3,0	1,37	91350
2,0	2,0	76,0	6,0	7°10'	4,0	1,83	91351
2,5	2,5	76,0	6,0	6°35'	5,0	2,29	91352
3,0	3,0	76,0	6,0	6°	6,0	2,72	91353
4,0	4,0	76,0	6,0	4°30'	8,0	3,63	91354
5,0	5,0	89,0	6,0	2°30'	10,0	4,55	91355
6,0	6,0	89,0	6,0	—	12,0	5,49	91356
8,0	8,0	102,0	8,0	—	16,0	7,49	91357
10,0	10,0	102,0	10,0	—	20,0	9,47	91358
12,0	12,0	114,0	12,0	—	24,0	11,48	91359
16,0	16,0	140,0	16,0	—	32,0	15,62	91360
20,0	20,0	165,0	20,0	—	40,0	19,61	91361

Extended Neck Option Available, contact your local KSPT representative for more information.
RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

1–2,5 DIAMETER

DC = +0,000/–0,025

DCON = h_6

RE = +0,000/–0,0013

>2,5–6 DIAMETER

DC = +0,000/–0,030

DCON = h_6

RE = +0,000/–0,0013

>6–10 DIAMETER

DC = +0,000/–0,040

DCON = h_6

RE = +0,000/–0,0020

>10–20 DIAMETER

DC = +0,000/–0,050

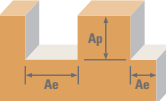
DCON = h_6

RE = +0,000/–0,0025

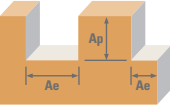
STEELS

HARDENED STEELS

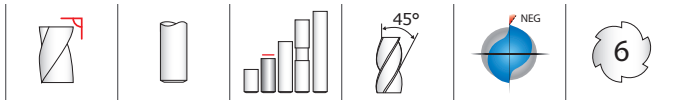
For patent information visit
www.ksptpatents.com

Series 56B				DC • in											
Fractional	Hardness	Ae x DC	Ap x DC	Vc (sfm)		1/32	1/16	1/8	3/16	1/4	3/8	1/2	3/4		
P	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	Rough 	≤ 0.4	≤ 0.1	625	RPM	76400	38200	19100	12733	9550	6367	4775	3183	
					(500-750)	Fz	0.0006	0.0015	0.0030	0.0040	0.0050	0.0080	0.0100	0.0120	
		HSM 	≤ 0.4	≤ 0.03	950	RPM	116128	58064	29032	19355	14516	9677	7258	4839	
					(760-1140)	Fz	0.0007	0.0017	0.0033	0.0044	0.0060	0.0088	0.0110	0.0130	
														Feed (ipm)	163
H	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	Rough 	≤ 0.4	≤ 0.05	750	RPM	91680	45840	22920	15280	11460	7640	5730	3820	
					(600-900)	Fz	0.0005	0.0011	0.0023	0.0030	0.0038	0.0060	0.0075	0.0085	
		HSM 	≤ 0.4	≤ 0.02	1150	RPM	140576	70288	35144	23429	17572	11715	8786	5857	
					(920-1380)	Fz	0.0006	0.0012	0.0025	0.0033	0.0042	0.0066	0.0082	0.0100	
														Feed (ipm)	92
														Feed (ipm)	169
														Feed (ipm)	169
														Feed (ipm)	169
														Feed (ipm)	169
														Feed (ipm)	169

Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 $\text{rpm} = \text{Vc} \times 3.82 / \text{DC}$
 $\text{ipm} = \text{Fz} \times 2 \times \text{rpm}$
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com)

Series 56MB Metric		Hardness			Vc (m/min)	DC • mm									
			Ae x DC	Ap x DC		1	1.5	3	5	6	10	12	20		
P	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 375 Bhn or ≤ 40 HRc	 Rough	≤ 0.4	≤ 0.1	191	RPM	60748	40498	20249	12150	10125	6075	5062	3037
						(153-229)	Fz	0.015	0.038	0.076	0.102	0.127	0.203	0.254	0.305
			 HSM	≤ 0.4	≤ 0.03	290	RPM	92235	61490	46117	18447	15372	9223	7686	4612
		(232-348)				Fz	0.018	0.043	0.084	0.112	0.117	0.224	0.279	0.330	
		Feed (mm/min)				3320	5288	7748	4132	3597	4132	4289	3044		
		H	TOOL STEELS MOLD AND DIE STEEL 300M, 4340, 52100, HP-9-4-20, M50, A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 475 Bhn or ≤ 50 HRc	 Rough	≤ 0.4	≤ 0.05	229	RPM	72833	48556	24278	14567	12139	7283
(183-275)	Fz							0.013	0.028	0.058	0.076	0.097	0.152	0.191	0.216
 HSM	≤ 0.4				≤ 0.02	351	RPM	111636	74424	37212	22327	18606	11164	9303	5582
				(281-421)		Fz	0.015	0.030	0.064	0.084	0.107	0.168	0.208	0.254	
				Feed (mm/min)		3349	4465	4763	3751	3982	3751	3870	2836		
 Rough	≤ 655 Bhn or ≤ 60 HRc			≤ 0.4	≤ 0.04	152	RPM	48344	32229	16115	9669	8057	4834	4029	2417
						(122-182)	Fz	0.010	0.020	0.043	0.058	0.074	0.114	0.145	0.160
						Feed (mm/min)	967	1289	1386	1122	1192	1102	1168	773	
	 HSM			≤ 0.4	≤ 0.01	305	RPM	97005	64670	32335	19401	16168	9701	8084	4850
						(244-366)	Fz	0.013	0.023	0.048	0.064	0.081	0.127	0.160	0.180
						Feed (mm/min)	2522	2975	3104	2483	2619	2464	2587	1746	

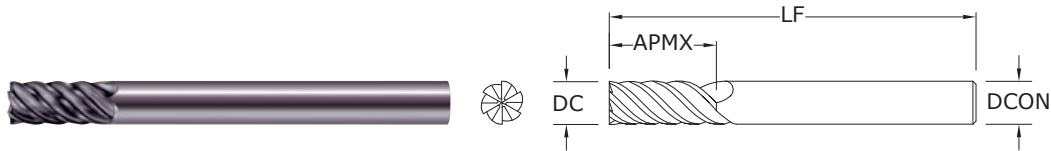
Bhn (Brinell) HRc (Rockwell C) HSM (High Speed Machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times 2 \times \text{rpm}$
 reduce speed and feed for materials harder than listed
 reduce feed and Ae when finish milling (.02 x DC maximum)
 feed rates listed have chip thinning adjustments included where applicable
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com)



57

FRACTIONAL SERIES

- Ideal in Trochoidal milling applications in hardened steels and dry machining
- Short flute length and large core design to reduce deflection
- Unsurpassed edge strength with extreme negative rake and eccentric relief
- Recommended for materials 45 to 65 HRc (421 to 739 Bhn)



inch				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
1/4	17/32	3-1/2	1/4	36140
5/16	11/16	4	5/16	36141
3/8	13/16	4	3/8	36142
1/2	1-3/32	4-1/2	1/2	36143

Neck Option Available

TOLERANCES (inch)

1/4 DIAMETER

DC = +0.0000/-0.0012

DCON = h₆

5/16 DIAMETER

DC = +0.0000/-0.0016

DCON = h₆

3/8 DIAMETER

DC = +0.0000/-0.0016

DCON = h₆

1/2 DIAMETER

DC = +0.0000/-0.0020

DCON = h₆

STEELS

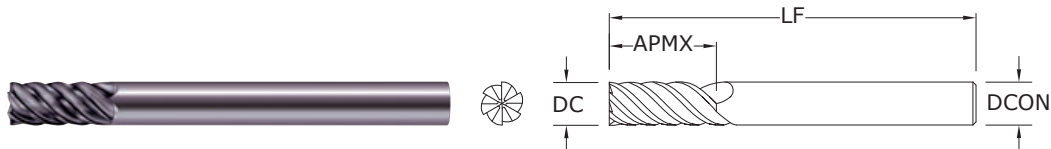
HARDENED STEELS

For patent
information visit
www.ksptpatents.com

57M

METRIC SERIES

- Ideal in Trochoidal milling applications in hardened steels and dry machining
- Short flute length and large core design to reduce deflection
- Unsurpassed edge strength with extreme negative rake and eccentric relief
- Recommended for materials 45 to 65 HRc (421 to 739 Bhn)



mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-X (TX)
6,0	13,0	89,0	6,0	46140
8,0	18,0	102,0	8,0	46141
10,0	22,0	102,0	10,0	46142
12,0	26,0	114,0	12,0	46143
16,0	32,0	140,0	16,0	46145
20,0	38,0	165,0	20,0	46147

Neck Option Available

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,030

DCON = h₆

8 DIAMETER

DC = +0,000/-0,040

DCON = h₆

10 DIAMETER

DC = +0,000/-0,040

DCON = h₆

12-20 DIAMETER

DC = +0,000/-0,050

DCON = h₆

STEELS

HARDENED STEELS

For patent
information visit
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High Performance Aluminum End Mills



Milling

HIGH PERFORMANCE ALUMINUM END MILLS	SERIES	DESCRIPTION	PAGE	S&F PAGE
S-Carb APR® & APF®	43APR-3	3 Flute Advanced Productivity Rougher Fractional	133	134
	43APR-3	3 Flute Advanced Productivity Rougher Metric	135	137
	43APR-4	4 Flute Advanced Productivity Rougher Metric	136	137
	43APF	4 Flute Advanced Productivity Finisher Fractional	138	139
	43MAPF	4 Flute Advanced Productivity Finisher Metric	140	141
S-Carb APF-B®	43APF-B	Multi-Flute Advanced Productivity Finisher Metric	142	143
S-Carb® (3 Flute)	43	3 Flute Non-Ferrous Square End Fractional	144	156
	43CR	3 Flute Non-Ferrous Corner Radius Fractional	144	156
	43L	3 Flute Non-Ferrous Square End Long Reach Fractional	148	156
	43LC	3 Flute Non-Ferrous Corner Radius End Long Reach Fractional	148	156
	43EC	3 Flute Non-Ferrous Square End Extra Long Reach Fractional	151	156
	43B	3 Flute Non-Ferrous Ball End Fractional	152	156
	43LB	3 Flute Non-Ferrous Ball End Long Reach Fractional	153	156
	43EB	3 Flute Non-Ferrous Ball End Extra Long Reach Fractional	153	156
	43M	3 Flute Non-Ferrous Square End Metric (Unpolished Flutes)	157	165
	43M	3 Flute Non-Ferrous Square End Metric (Polished Flutes)	157	165
	43MCR	3 Flute Non-Ferrous Corner Radius Metric (Unpolished Flutes)	157	165
	43MCR	3 Flute Non-Ferrous Corner Radius Metric (Polished Flutes)	157	165
	43MCR	3 Flute Non-Ferrous Corner Radius 4xD Metric (Polished Flutes)	157	165
	43ML	3 Flute Non-Ferrous Square End Long Reach Metric	160	165
	43MLC	3 Flute Non-Ferrous Long Reach Corner Radius Metric (Unpolished Flutes)	160	165
	43MLC	3 Flute Non-Ferrous Long Reach Corner Radius Metric (Polished Flutes)	160	165
	43MB	3 Flute Non-Ferrous Ball End Metric (Polished Flutes)	162	165
S-Carb® Rougher (3 Flute)	43CB	3 Flute Rougher Non-Ferrous Chip Breaker Fractional	154	156
	43LCB	3 Flute Rougher Non-Ferrous Chip Breaker Long Reach Fractional	155	156
	43MCB	3 Flute Rougher Non-Ferrous Chip Breaker Metric	164	165
S-Carb® (2 Flute)	47	2 Flute Non-Ferrous Square End Fractional	166	169
	47L	2 Flute Non-Ferrous Square End Long Reach Fractional	167	169
	47B	2 Flute Non-Ferrous Ball End Fractional	168	169
	47LB	2 Flute Non-Ferrous Ball End Long Reach Fractional	168	169
	47M	2 Flute Non-Ferrous Square End Metric	170	172
	47ML	2 Flute Non-Ferrous Square End Long Reach Metric	170	172
	47MB	2 Flute Non-Ferrous Ball End Metric	171	172
	47MLB	2 Flute Non-Ferrous Ball End Long Reach Metric	171	172
Ski-Carb	44	2 Flute Non-Ferrous Materials Square End Fractional	173	174
	44M	2 Flute Non-Ferrous Materials Square End Metric	173	174
	45	2 Flute Non-Ferrous Materials Long Reach Corner Radius Fractional	176	177

Speed & Feed Recommendations listed after each series

FRESAS DE ALTO RENDIMIENTO PARA ALUMINIO	SERIE	DESCRIPCIÓN	PÁGINA	S&F PÁGINA
S-Carb APR® y APF®	43APR-3	3 filos, productividad avanzada, desbastador, fraccional	133	134
	43APR-3	3 filos, productividad avanzada, desbastador, métrico	135	137
	43APR-4	4 filos, productividad avanzada, desbastador, métrico	136	137
	43APF	4 filos, productividad avanzada, acabador, fraccional	138	139
	43MAPF	4 filos, productividad avanzada, acabador, métrico	140	141
S-Carb APF-B®	43APF-B	Fresa Cónica Circular Multi-Filos tipo Barril, métrica	142	143
S-Carb® (3 filos)	43	3 filos, no férrico, punta cuadrada, fraccional	144	156
	43CR	3 filos, no férrico, radio angulado, fraccional	144	156
	43L	3 filos, no férrico, punta cuadrada, largo alcance, fraccional	148	156
	43LC	3 filos, no férricos, largo alcance, radio angulado, fraccional	148	156
	43EC	3 filos, no férrico, punta cuadrada, alcance extralargo, fraccional	151	156
	43B	3 filos, no férrico, punta esférica, fraccional	152	156
	43LB	3 filos, no férrico, punta esférica, largo alcance, fraccional	153	156
	43EB	3 filos, no férrico, punta esférica, alcance extralargo, fraccional	153	156
	43M	3 filos, no férrico, punta cuadrada, métrico (filos no pulidos)	157	165
	43M	3 filos, no férrico, punta cuadrada, métrico (filos pulidos)	157	165
	43MCR	3 filos, no férrico, radio angulado, métrico (filos no pulidos)	157	165
	43MCR	3 filos, no férrico, radio angulado, métrico (filos pulidos)	157	165
	43MCR	3 filos, no férrico, radio angulado 4xD, métrico (filos pulidos)	157	165
	43ML	3 filos, no férrico, punta cuadrada, largo alcance, métrico	160	165
	43MLC	3 filos, no férrico, largo alcance, radio angulado, métrico (filos no pulidos)	160	165
	43MLC	3 filos, no férrico, largo alcance, radio angulado, métrico (filos pulidos)	160	165
	43MB	3 filos, no férrico, punta esférica, métrico (filos pulidos)	162	165
Desbastador S-Carb® (3 filos)	43CB	3 filos, desbastador, no férrico, rompevirutas, fraccional	154	156
	43LCB	3 filos, desbastador, no férrico, rompevirutas, largo alcance, fraccional	155	156
	43MCB	3 filos, desbastador, no férrico, rompevirutas, métrico	164	165
S-Carb® (2 filos)	47	2 filos, no férrico, punta cuadrada, fraccional	166	169
	47L	2 filos, no férrico, punta cuadrada, largo alcance, fraccional	167	169
	47B	2 filos, no férrico, punta esférica, fraccional	168	169
	47LB	2 filos, no férrico, punta esférica, largo alcance, fraccional	168	169
	47M	2 filos, no férrico, punta cuadrada, métrico	170	172
	47ML	2 filos, no férrico, punta cuadrada, largo alcance, métrico	170	172
	47MB	2 filos, no férrico, punta esférica, métrico	171	172
	47MLB	2 filos, no férrico, punta esférica, largo alcance, métrico	171	172
Ski-Carb	44	2 filos, materiales no férricos, punta cuadrada, fraccional	173	174
	44M	2 filos, materiales no férricos, punta cuadrada, métrico	173	174
	45	2 filos, materiales no férricos, largo alcance, radio angulado, fraccional	176	177

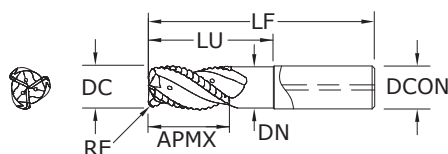
Recomendaciones de velocidades y avances mostradas tras cada serie

FRAISE HAUTE PERFORMANCE POUR ALUMINIUM	SÉRIES	DESCRIPTION	PAGE	S&F PAGE
S-Carb APR®/APF®	43APR-3	3 dents productivité avancée d'ébauche (fractionnel)	133	134
	43APR-3	3 dents productivité avancée d'ébauche (métrique)	135	137
	43APR-4	4 dents productivité avancée d'ébauche (métrique)	136	137
	43APF	4 dents productivité avancée de finition (fractionnel)	138	139
	43MAPF	4 dents productivité avancée de finition (métrique)	140	141
S-Carb APF-B®	43APF-B	Fraise multi dents finition pour productivité avancée cotes (métrique)	142	143
S-Carb® (3 dents)	43	3 dents non-ferreux non rayonné (fractionnel)	144	156
	43CR	3 dents non-ferreux rayonné (fractionnel)	144	156
	43L	3 dents non-ferreux non rayonné longue portée (fractionnel)	148	156
	43LC	3 dents non-ferreux longue portée rayonné (fractionnel)	148	156
	43EC	3 dents non-ferreux non rayonné portée extra-longue (fractionnel)	151	156
	43B	3 dents non-ferreux à bout hémisphérique (fractionnel)	152	156
	43LB	3 dents non-ferreux à bout hémisphérique longue portée (fractionnel)	153	156
	43EB	3 dents non-ferreux à bout hémisphérique portée extra-longue (fractionnel)	153	156
	43M	3 dents non-ferreux non rayonné (métrique) (goujures non polies)	157	165
	43M	3 dents non-ferreux non rayonné (métrique) (goujures polies)	157	165
	43MCR	3 dents matériaux non-ferreux rayonné (métrique) (goujures non polies)	157	165
	43MCR	3 dents matériaux non-ferreux rayonné (métrique) (goujures polies)	157	165
	43MCR	3 dents matériaux non-ferreux rayonné 4xD (métrique) (goujures polies)	157	165
	43MLC	3 dents non-ferreux longue portée rayonné (métrique) (goujures non polies)	160	165
	43MLC	3 dents non-ferreux longue portée rayonné (métrique) (goujures polies)	160	165
	43ML	3 dents non-ferreux non rayonné longue portée (métrique)	160	165
	43MB	3 dents non-ferreux à bout hémisphérique (métrique) (goujures polies)	162	165
	43CB	3 dents d'ébauche non-ferreux brise-copeaux (fractionnel)	154	156
	43LCB	3 dents d'ébauche non-ferreux brise-copeaux longue portée (fractionnel)	155	156
	43MCB	3 dents d'ébauche non-ferreux brise-copeaux (métrique)	164	165
S-Carb® (2 dents)	47	2 dents non-ferreux non rayonné (fractionnel)	166	169
	47L	2 dents non-ferreux non rayonné longue portée (fractionnel)	167	169
	47B	2 dents non-ferreux à bout hémisphérique (fractionnel)	168	169
	47LB	2 dents non-ferreux à bout hémisphérique longue portée (fractionnel)	168	169
	47M	2 dents non-ferreux non rayonné (métrique)	170	172
	47ML	2 dents non-ferreux non rayonné longue portée (métrique)	170	172
	47MB	2 dents non-ferreux à bout hémisphérique (métrique)	171	172
	47MLB	2 dents non-ferreux à bout hémisphérique longue portée (métrique)	171	172
Ski-Carb	44	2 dents matériaux non-ferreux non rayonné (fractionnel)	173	174
	44M	2 dents matériaux non-ferreux non rayonné (métrique)	173	174
	45	2 dents matériaux non-ferreux longue portée rayonné (fractionnel)	176	177

Recommandations de vitesse et avance indiquées après chaque série

HOCHLEISTUNGSSCHAFTFRÄSER FÜR ALUMINIUM	SERIE	BESCHREIBUNG	SEITE	S&F SEITE
S-Carb APR® & APF®	43APR-3	Hochleistungs-Schruppfräser mit 3 Schneiden	133	134
	43APR-3	Hochleistungs-Schruppfräser mit 3 Schneiden (Erweiterung)	135	137
	43APR-4	Hochleistungs-Schruppfräser mit 4 Schneiden	136	137
	43APF	Zölliger Hochleistungs-Schlichtfräser mit 4 Schneiden	138	139
	43MAPF	Hochleistungs-Schlichtfräser mit 4 Schneiden	140	141
S-Carb APF-B®	43APF-B	Metrischer mehrschneidiger Hochleistungsschlichtfräser	142	143
S-Carb® (3 Schneiden)	43	Zölliger NE-Schaftfräser mit 3 Schneiden ohne Eckenradien	144	156
	43CR	Zölliger NE-Fräser mit 3 Schneiden und Eckenradien	144	156
	43L	Zölliger NE-Langloch-Schaftfräser mit 3 Schneiden ohne Eckenradien	148	156
	43LC	Zölliger Langlochfräser mit 3 Schneiden und Eckenradien	148	156
	43EC	Zölliger NE-Superlangloch-Schaftfräser mit 3 Schneiden ohne Eckenradien	151	156
	43B	Zölliger NE-Radiusschaftfräser mit 3 Schneiden	152	156
	43LB	Zölliger NE-Langloch-Radiusschaftfräser mit 3 Schneiden	153	156
	43EB	Zölliger NE-Superlangloch-Radiusschaftfräser mit 3 Schneiden	153	156
	43M	NE-Schaftfräser mit 3 unpolierten Schneiden ohne Eckenradien	157	165
	43M	NE-Schaftfräser mit 3 polierten Schneiden ohne Eckenradien	157	165
	43MCR	NE-Fräser mit 3 unpolierten Schneiden und Eckenradien	157	165
	43MCR	NE-Fräser mit 3 polierten Schneiden und Eckenradien	157	165
	43MCR	NE-Fräser 4xD mit 3 polierten Schneiden und Eckenradien	157	165
	43ML	NE-Langloch-Schaftfräser mit 3 Schneiden ohne Eckenradien	160	165
	43MLC	NE-Langlochfräser mit 3 unpolierten Schneiden und Eckenradien	160	165
	43MLC	NE-Langlochfräser mit 3 polierten Schneiden und Eckenradien	160	165
	43MB	NE-Radiusschaftfräser mit 3 polierten Schneiden	162	165
	43CB	Zölliger NE-Schruppfräser mit 3 Schneiden und Spanbrechern	154	156
	43LCB	Zölliger NE-Langloch-Schruppfräser mit 3 Spanteilernuten	155	156
	43MCB	NE-Schruppfräser mit 3 Schneiden und Spanbrechern	164	165
S-Carb® Schruppfräser (3 Schneiden)	47	Zölliger NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	166	169
	47L	Zölliger NE-Langloch-Schaftfräser mit 2 Schneiden ohne Eckenradien	167	169
	47B	Zölliger NE-Radiusschaftfräser mit 2 Schneiden	168	169
	47LB	Zölliger NE-Langloch-Radiusschaftfräser mit 2 Schneiden	168	169
	47M	NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	170	172
	47ML	NE-Langloch-Schaftfräser mit 2 Schneiden ohne Eckenradien	170	172
	47MB	NE-Radiusschaftfräser mit 2 Schneiden	171	172
	47MLB	NE-Langloch-Radiusschaftfräser mit 2 Schneiden	171	172
Ski-Carb	44	Zölliger NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	173	174
	44M	NE-Schaftfräser mit 2 Schneiden ohne Eckenradien	173	174
	45	Zölliger Langlochfräser mit 2 Schneidenn und Eckenradien für Nichteisenmetalle	176	177

Empfehlungen für Drehzahl & Vorschub im Anhang zu jeder Serie



43APR-3

METRIC SERIES

TOLERANCES (mm)

12–25 DIAMETER

DC = $-0,010/-0,100$

DCON = h_6

RE = $+/-0,05$

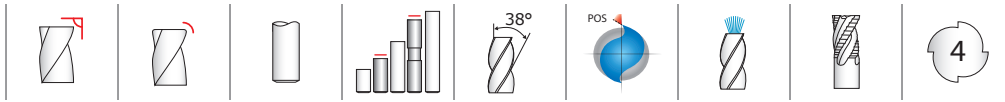
NON-FERROUS

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information visit
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mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB ₂)
12,0	26,0	83,0	12,0	39,0	11,40	1,0	44976*
12,0	26,0	83,0	12,0	39,0	11,40	2,0	44977*
12,0	26,0	83,0	12,0	39,0	11,40	3,0	44978*
12,0	26,0	83,0	12,0	39,0	11,40	4,0	44979*
12,0	26,0	95,0	12,0	—	—	—	44975*
16,0	35,0	92,0	16,0	—	—	—	44980*
16,0	35,0	92,0	16,0	51,0	15,20	2,0	44981*
16,0	35,0	92,0	16,0	51,0	15,20	3,0	44982*
16,0	35,0	92,0	16,0	51,0	15,20	4,0	44983*
16,0	35,0	108,0	16,0	67,0	15,20	2,0	44985*
16,0	35,0	108,0	16,0	67,0	15,20	3,0	44986*
16,0	35,0	108,0	16,0	67,0	15,20	4,0	44987*
16,0	35,0	124,0	16,0	—	—	—	44984*
20,0	35,0	86,0	20,0	—	—	—	44990
20,0	35,0	86,0	20,0	45,0	19,00	3,0	44991
20,0	35,0	86,0	20,0	45,0	19,00	4,0	44992
20,0	35,0	106,0	20,0	—	—	—	44993*
20,0	35,0	106,0	20,0	65,0	19,00	2,0	44994*
20,0	35,0	106,0	20,0	65,0	19,00	3,0	44995*
20,0	35,0	106,0	20,0	65,0	19,00	4,0	44996*
20,0	35,0	106,0	20,0	65,0	19,00	5,0	44997*
20,0	35,0	145,0	20,0	—	—	—	45020*
20,0	35,0	125,0	20,0	84,0	19,00	2,0	45021*
20,0	35,0	125,0	20,0	84,0	19,00	3,0	45022*
20,0	35,0	125,0	20,0	84,0	19,00	4,0	45023*
25,0	43,0	108,0	25,0	—	—	—	44998
25,0	43,0	108,0	25,0	60,0	23,75	2,0	44999
25,0	43,0	108,0	25,0	60,0	23,75	3,0	45000
25,0	43,0	108,0	25,0	60,0	23,75	4,0	45001
25,0	35,0	140,0	25,0	—	—	—	45002*
25,0	35,0	140,0	25,0	80,0	23,75	3,0	45003*
25,0	35,0	140,0	25,0	90,0	23,75	3,0	45004*
25,0	35,0	151,0	25,0	105,0	23,75	3,0	45025*
25,0	35,0	176,0	25,0	—	—	—	45024*

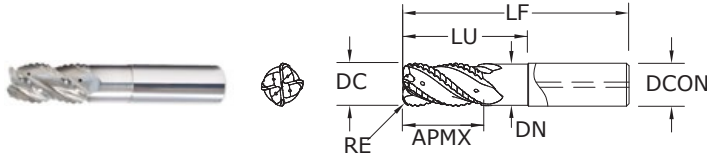
*Variable Helix

- Ultra high-productivity rougher for Aluminum alloys, specifically for aircraft components
- Designed for machine tools with capability of 12 L³ per minute material removal rates
- New 3 flute variable geometry with side exit coolant holes
- Open fluting for deep slotting and profiling
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



43APR-4

METRIC SERIES



- Ultra high-productivity rougher for Aluminum alloys, specifically for aircraft components
- Designed for machine tools with capability of 12 L³ per minute material removal rates
- 4 flute variable geometry with side exit coolant holes
- Open fluting for deep slotting and profiling
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB₂)
20,0	35,0	86,0	20,0	—	19,00	—	45005
20,0	35,0	86,0	20,0	45,0	19,00	3,0	45006
20,0	35,0	86,0	20,0	45,0	19,00	4,0	45007
20,0	35,0	106,0	20,0	—	19,00	—	45008
20,0	35,0	106,0	20,0	65,0	19,00	2,0	45009
20,0	35,0	106,0	20,0	65,0	19,00	3,0	45010
20,0	35,0	106,0	20,0	65,0	19,00	4,0	45011
20,0	35,0	106,0	20,0	65,0	19,00	5,0	45012
25,0	43,0	108,0	25,0	—	23,75	—	45013
25,0	43,0	108,0	25,0	60,0	23,75	2,0	45014
25,0	43,0	108,0	25,0	60,0	23,75	3,0	45015
25,0	43,0	108,0	25,0	60,0	23,75	4,0	45016
25,0	35,0	140,0	25,0	—	23,75	—	45017
25,0	35,0	140,0	25,0	80,0	23,75	3,0	45018
25,0	35,0	140,0	25,0	90,0	23,75	3,0	45019

TOLERANCES (mm)

20–25 DIAMETER

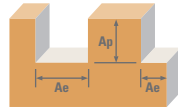
DC = -0,010/-0,100

DCON = h₆

RE = ±0,050

NON-FERROUS

For patent information visit
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Series 43APR-3 43APR-4 Metric		Ae x DC Ap x DC		Vc (m/min)		DC • mm				
						APR-3		APR-4		
						20	25	20	25	
N	ALUMINIUM ALLOYS 6068, 7075		1	≤ 1	1600	RPM	25461	20369	25461	20369
					(300-2100)	Fz	0.14	0.15	0.12	0.13
						Feed (mm/min)	10694	9166	12222	10592
			≤ 0.5	≤ 1.5	1800	RPM	28644	22915	28644	22915
					(300-2100)	Fz	0.16	0.17	0.14	0.15
						Feed (mm/min)	13749	11687	16041	13749
			≤ 0.25	≤ 2	2100	RPM	33418	26735	33418	26735
					(300-2100)	Fz	0.19	0.20	0.16	0.17
						Feed (mm/min)	19048	16041	21388	18180

Series 43APR-3 43APR-4 Metric		DC • mm								
		Ae x DC	Ap x DC	Vc (m/min)	APR-3 LONG					
					12	16	20	25		
N	ALUMINIUM ALLOYS 6068, 7075		1	≤ 1	1600	RPM	26522	19892	15913	12731
					(300-2100)	Fz	0.10	0.11	0.12	0.13
						Feed (mm/min)	7957	6564	5729	4965
			≤ 0.5	≤ 1.5	1800	RPM	31827	23870	19096	15277
					(300-2100)	Fz	0.12	0.13	0.14	0.15
						Feed (mm/min)	11458	9309	8020	6875
			≤ 0.25	≤ 2	2100	RPM	37131	27849	22279	17823
					(300-2100)	Fz	0.14	0.15	0.16	0.17
						Feed (mm/min)	15595	12532	10694	9090

RPM stated may be outside of most machine tools in the smaller sizes, adjust the surface speed but maintain the Fz

For best results use the peak power of the specific machine torque chart.

Typically 10kw is required to remove 1 litre of material (MMR).

Eg. >> (Ae x Ap x Feed) / 1000000 >> Therefore Full slotting Ø25: 25 x 25 x 7333 = 4.58 Litres so it needs a min of 46Kw.

Larger cuts and chip load consume more power.

Review the power chart of each machine to determine MAX power for ultimate performance.

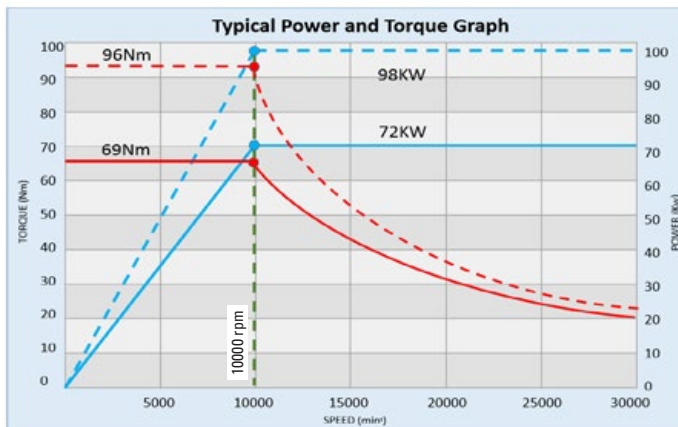
Example below shows peak power @ 10,000 rpm.

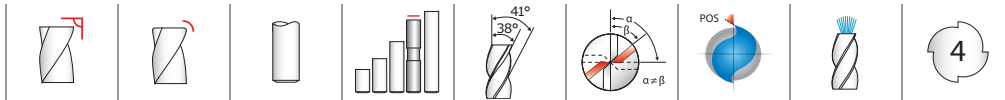
The APR-4 design is for ultimate metal removal but typically requires more power, and is also better suited to horizontal machines.

The new coolant supply is designed for MQL as well as normal emulsion coolant on the same data.

Ensure max MQL flow prior to cutting.

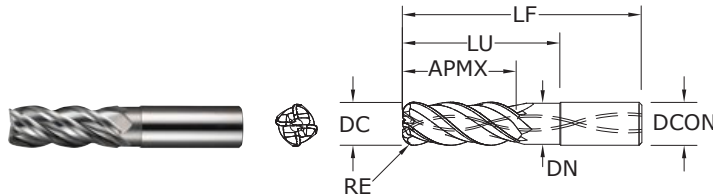
Refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com).





43MAPF

METRIC SERIES



- Ultra high-productivity finisher for Aluminum alloys, specifically for aircraft components
- Two levels of chatter suppression: variable helix and indexing
- Designed for single axial pass semi-finishing and finishing
- Polished flutes maximize chip evacuation and provides enhanced finish
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)

mm							EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	Ti-NAMITE®-B (TiB ₂)
6,0	24,0	58,0	6,0	30,0	5,70	—	44627
8,0	32,0	64,0	8,0	40,0	7,60	—	44628
10,0	40,0	80,0	10,0	50,0	9,50	—	44629
12,0	30,0	83,0	12,0	40,0	11,40	—	44630
12,0	30,0	83,0	12,0	40,0	11,40	2,0	44745
12,0	30,0	83,0	12,0	40,0	11,40	3,0	44746
12,0	30,0	83,0	12,0	40,0	11,40	4,0	44747
12,0	30,0	83,0	12,0	50,0	11,40	0,5	44641
12,0	30,0	83,0	12,0	50,0	11,40	5,0	44642
12,0	48,0	100,0	12,0	62,0	11,40	—	44631
12,0	48,0	100,0	12,0	62,0	11,40	2,0	44748
12,0	48,0	100,0	12,0	62,0	11,40	3,0	44749
12,0	48,0	100,0	12,0	62,0	11,40	4,0	44750
16,0	40,0	92,0	16,0	51,0	15,20	—	44634
16,0	40,0	92,0	16,0	51,0	15,20	2,0	44751
16,0	40,0	92,0	16,0	51,0	15,20	3,0	44752
16,0	40,0	92,0	16,0	51,0	15,20	4,0	44753
16,0	42,0	93,0	16,0	51,0	15,20	5,0	44643
16,0	64,0	125,0	16,0	82,0	15,20	—	44635
16,0	64,0	125,0	16,0	82,0	15,20	2,0	44754
16,0	64,0	125,0	16,0	82,0	15,20	3,0	44755
16,0	64,0	125,0	16,0	82,0	15,20	4,0	44756
20,0	50,0	108,0	20,0	63,0	19,00	—	44636
20,0	50,0	108,0	20,0	63,0	19,00	3,0	44757
20,0	50,0	108,0	20,0	63,0	19,00	4,0	44758
20,0	50,0	108,0	20,0	63,0	19,00	5,0	44759
20,0	80,0	150,0	20,0	102,0	19,00	—	44637
20,0	80,0	150,0	20,0	102,0	19,00	3,0	44760
20,0	80,0	150,0	20,0	102,0	19,00	4,0	44761
20,0	80,0	150,0	20,0	102,0	19,00	5,0	44762
25,0	63,0	130,0	25,0	79,0	23,75	—	44638
25,0	63,0	130,0	25,0	79,0	23,75	3,0	44763
25,0	63,0	130,0	25,0	79,0	23,75	4,0	44764
25,0	63,0	130,0	25,0	79,0	23,75	5,0	44765
25,0	100,0	175,0	25,0	120,0	23,75	—	44639
25,0	100,0	175,0	25,0	120,0	23,75	3,0	44766
25,0	100,0	175,0	25,0	120,0	23,75	4,0	44767
25,0	100,0	175,0	25,0	120,0	23,75	5,0	44768

Available on request: • JetStream Technology

TOLERANCES (mm)

6–25 DIAMETER

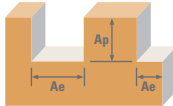
DC = $-0,010/-0,050$

DCON = h_6

RE = $+0,03/-0,03$

NON-FERROUS

For patent information visit
www.ksptpatents.com

Series 43MAPF Metric		Hardness			Vc (m/min)	DC • mm								
			Ae x DC	Ap x DC		6	8	10	12	16	20	25		
N	ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 88 HRb		≤ 0.1	≤ 2.5	800	RPM	42440	31830	25464	21220	15915	12732	10186
						(640-960)	Fz	0.050	0.055	0.060	0.070	0.100	0.140	0.170
							Feed (mm/min)	8488	7003	6111	5942	6366	7130	6926
		≤ 150 Bhn or ≤ 88 HRb		≤ 0.1	≤ 4	800	RPM	42440	31830	25464	21220	15915	12732	10186
						(640-960)	Fz	0.040	0.045	0.050	0.050	0.070	0.100	0.120
							Feed (mm/min)	6790	5729	5093	4244	4456	5093	4889
	ALUMINUM ALLOYS (LITHIUM)* 2090, 2091, 2099, 2195, 2199, 2297, 8090	≤ 150 Bhn or ≤ 88 HRb		≤ 0.1	≤ 2.5	600	RPM	31830	23873	19098	15915	11936	9549	7639
						(480-720)	Fz	0.050	0.055	0.060	0.070	0.100	0.140	0.170
							Feed (mm/min)	6366	5252	4584	4456	4774	5347	5195
		≤ 150 Bhn or ≤ 88 HRb		≤ 0.1	≤ 4	600	RPM	31830	23873	19098	15915	11936	9549	7639
						(480-720)	Fz	0.040	0.045	0.050	0.050	0.070	0.100	0.120
							Feed (mm/min)	5093	4297	3820	3183	3342	3820	3667

Bhn (Brinell) HRb (Rockwell B)

surface speed is dependent on machine spindle and fixturing

balancing is recommended at ultra high surface speeds

*tool life may be reduced when machining Lithium Alloys

$\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$

$\text{mm/min} = \text{Fz} \times 4 \times \text{rpm}$

maximum recommended depths shown

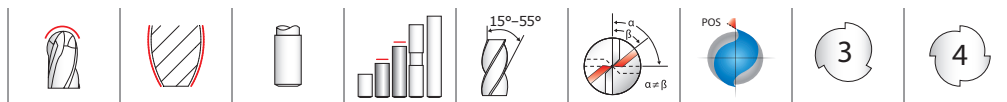
reduce speed and feed for materials harder than listed

finish cuts typically require reduced feed and cutting depths of 0.02 X DC maximum

ramp angle = 6° (feed rate = 50%)

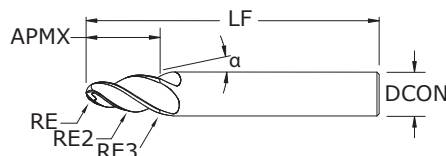
plunging not recommended

refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



APF-B

METRIC SERIES



- Designed to significantly improve traditional ball end applications
- Highly efficient at finishing and semi-finishing profiling
- Main application areas include profiling and pocket milling
- Especially suited to machining deep pockets and hard-to-reach areas without using long-reach tools
- Their versatility also allows for machining profiles and blends with one tool
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)

SHANK DIAMETER DCON	LENGTH OF CUT APMX	OVERALL LENGTH LF	mm				NO. OF FLUTES	EDP NO. Ti-NAMITE®-B (TiB ₂)
			CENTERLINE ANGLE α	TIP RADIUS RE	TAPERED RADIUS RE2	BLENDED RADIUS RE3		
6,0	9,5	58,0	17.5°	1,0	250,0	3,0	3	45718
6,0	8,0	58,0	17.5°	1,5	250,0	3,0	3	45719
8,0	10,5	80,0	20°	1,5	250,0	4,0	3	45720
8,0	9,5	80,0	20°	2,0	250,0	4,0	3	45721
10,0	12,5	89,0	20°	2,0	250,0	5,0	3	45722
10,0	11,5	89,0	20°	2,5	250,0	5,0	3	45723
12,0	13,5	100,0	20°	3,0	250,0	6,0	4	45724
12,0	14,4	100,0	20°	2,5	250,0	6,0	4	45725
12,0	20,0	100,0	14°	2,0	60,0	6,0	4	45726
16,0	31,0	109,0	12.5°	2,0	1000,0	5,0	4	45727
16,0	27,5	109,0	12.5°	3,0	1000,0	5,0	4	45728
16,0	24,0	109,0	12.5°	4,0	1000,0	5,0	4	45729
16,0	21,0	109,0	15°	4,0	1000,0	5,0	4	45730
16,0	18,5	109,0	20°	4,0	1500,0	8,0	4	45731
16,0	28,5	109,0	10°	4,0	1000,0	5,0	4	45732
16,0	19,0	109,0	20°	3,0	750,0	5,0	4	45733
16,0	15,0	109,0	30°	2,0	750,0	3,0	4	45734
16,0	18,5	109,0	20°	3,0	60,0	5,0	4	45735

TOLERANCES (mm)

DCON = h_6 RE = $-0,010/-0,010$

NON-FERROUS

For patent
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www.ksptpatents.com

			DCON	6		8		10		12		16	
			Ae max	0,20	0,45	0,25	0,55	0,30	0,60	0,35	0,65	0,40	0,70
			Diameter	3,0	6,0	4,0	8,0	5,0	10,0	6,0	12,0	8,0	16,0
													
Metric	Hardness (HRb)	Vc (m/min)	Cut Zone	RE	RE2	RE	RE2	RE	RE2	RE	RE2	RE	RE2
N Aluminum	≤88	510	RPM	54111	27056	40583	20292	32467	16233	27056	13528	20292	10146
		(388-632)	Fz	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080	0,042	0,100
			Feed (mm/min)	2706	3247	2536	3044	2435	2922	3607	4329	3382	4058
	≥88	330	RPM	35013	17507	26260	13130	21008	10504	17507	8753	13130	6565
		(284-376)	Fz	0,013	0,030	0,017	0,040	0,021	0,050	0,025	0,060	0,033	0,080
			Feed (mm/min)	1313	1576	1313	1576	1313	1576	1751	2101	1751	2101

$rpm = (Vc \times 1000) / (DC \times 3.14)$

$Feed = Fz \times \text{No. of flutes} \times rpm$

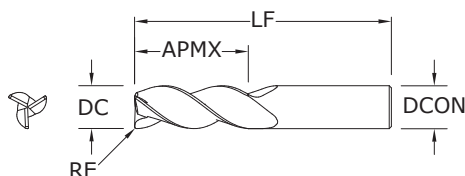
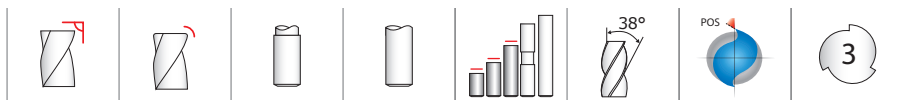
Adjust speed and feed cutting

Adjust rates according to cutting area of tool being used

Avoid using tip of the tool where possible due to reduced chip space

Be aware of max cut Ae, especially on the lower portion of the tool

Refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)



43M •
43MCR
METRIC SERIES

TOLERANCES (mm)

≤6 DIAMETER

DC = +0,000/-0,008

DCON = h₆

RE = +0,000/-0,050

>6-10 DIAMETER

DC = +0,000/-0,009

DCON = h₆

RE = +0,000/-0,050

>10-18 DIAMETER

DC = +0,000/-0,011

DCON = h₆

RE = +0,000/-0,050

>18-20 DIAMETER

DC = +0,000/-0,013

DCON = h₆

RE = +0,000/-0,050

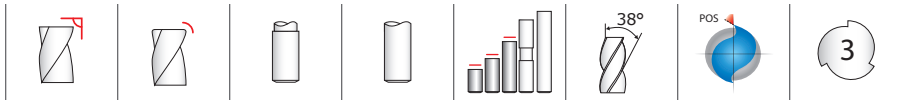
NON-FERROUS

For patent
information visit
www.ksptpatents.com

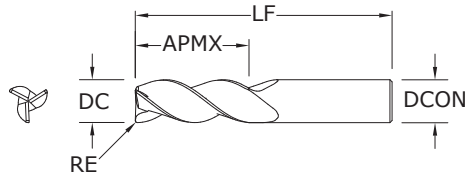
mm					EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB ₂)
3,0	8,0	52,0	6,0	—	—	44890
4,0	11,0	55,0	6,0	—	—	44891
5,0	13,0	57,0	6,0	—	—	44892
6,0	13,0	57,0	6,0	—	44701	44715
6,0	13,0	57,0	6,0	1,5	—	44732
6,0	13,0	57,0	6,0	0,5	—	44902
6,0	13,0	57,0	6,0	1,0	—	44894
6,0	13,0	72,0	6,0	—	44702	44716
6,0	13,0	72,0	6,0	0,8	—	44842
6,0	13,0	72,0	6,0	1,2	—	44843
6,0	24,0	75,0	6,0	—	—	44893
6,0	24,0	75,0	6,0	0,5	—	44844
6,0	24,0	75,0	6,0	1,0	—	44845
8,0	19,0	63,0	8,0	—	44703	44717
8,0	19,0	63,0	8,0	0,3	—	44846
8,0	19,0	63,0	8,0	0,5	—	44847
8,0	19,0	63,0	8,0	1,0	—	44848
8,0	19,0	63,0	8,0	1,5	—	44849
8,0	32,0	75,0	8,0	—	—	44895
8,0	32,0	75,0	8,0	0,5	—	44850
8,0	32,0	75,0	8,0	1,0	—	44851
8,0	32,0	75,0	8,0	1,5	—	44852
8,0	32,0	75,0	8,0	2,0	—	44853
10,0	22,0	72,0	10,0	—	44705	44719
10,0	22,0	72,0	10,0	0,3	—	44854
10,0	22,0	72,0	10,0	0,5	—	44855
10,0	22,0	72,0	10,0	1,0	—	44856
10,0	22,0	72,0	10,0	1,5	—	44857
10,0	40,0	100,0	10,0	—	—	44896
10,0	40,0	100,0	10,0	0,5	—	44858

continued on next page

- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Symmetrical end gashing for excellent balance at high speeds and aggressive plunging capability
- Open fluting for deep slotting and profiling
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



**43M •
43MCR**
METRIC SERIES



CONTINUED

CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.	
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB ₂)
10,0	40,0	100,0	10,0	1,0	—	44859
10,0	40,0	100,0	10,0	1,5	—	44860
10,0	40,0	100,0	10,0	2,0	—	44861
12,0	26,0	83,0	12,0	—	44708	44722
12,0	26,0	83,0	12,0	1,5	44814	44733
12,0	26,0	83,0	12,0	2,0	44815	44826
12,0	26,0	83,0	12,0	2,5	44816	44827
12,0	26,0	83,0	12,0	3,0	44817	44734
12,0	48,0	100,0	12,0	—	—	44897
12,0	48,0	100,0	12,0	0,5	—	44862
12,0	48,0	100,0	12,0	1,0	—	44863
12,0	48,0	100,0	12,0	1,5	—	44864
12,0	48,0	100,0	12,0	2,0	—	44865
12,0	48,0	100,0	12,0	2,5	—	44866
12,0	48,0	100,0	12,0	3,0	—	44867
14,0	30,0	89,0	14,0	—	—	44898
14,0	30,0	89,0	14,0	1,0	—	44868
14,0	30,0	89,0	14,0	2,0	—	44869
14,0	30,0	89,0	14,0	3,0	—	44870
16,0	32,0	92,0	16,0	—	44711	44725
16,0	32,0	92,0	16,0	1,5	44818	44735
16,0	32,0	92,0	16,0	2,0	44819	44828
16,0	32,0	92,0	16,0	2,5	44820	44829
16,0	32,0	92,0	16,0	3,0	44821	44736
16,0	32,0	92,0	16,0	4,0	—	44871
16,0	64,0	125,0	16,0	—	—	44900
16,0	64,0	125,0	16,0	0,5	—	44872
16,0	64,0	125,0	16,0	1,0	—	44873
16,0	64,0	125,0	16,0	1,5	—	44874
16,0	64,0	125,0	16,0	2,0	—	44875
16,0	64,0	125,0	16,0	2,5	—	44876
16,0	64,0	125,0	16,0	3,0	—	44877

continued on next page

TOLERANCES (mm)

≤6 DIAMETER

DC = +0,000/–0,008

DCON = h₆

RE = +0,000/–0,050

>6–10 DIAMETER

DC = +0,000/–0,009

DCON = h₆

RE = +0,000/–0,050

>10–18 DIAMETER

DC = +0,000/–0,011

DCON = h₆

RE = +0,000/–0,050

>18–20 DIAMETER

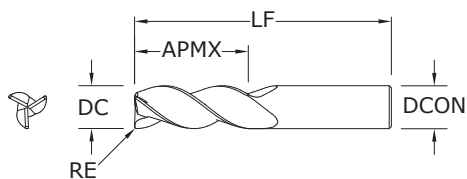
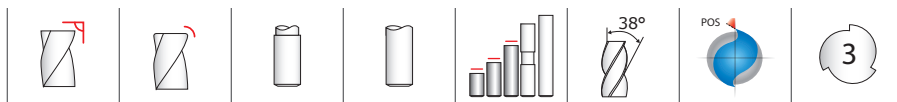
DC = +0,000/–0,013

DCON = h₆

RE = +0,000/–0,050

NON-FERROUS

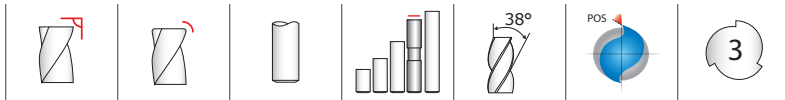
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**43M •
43MCR**
METRIC SERIES

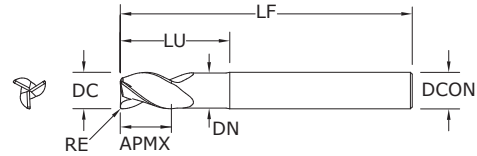
CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.	
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB ₂)
16,0	64,0	125,0	16,0	4,0	—	44878
20,0	38,0	104,0	20,0	—	44714	44728
20,0	38,0	104,0	20,0	2,0	44822	44830
20,0	38,0	104,0	20,0	2,5	44823	44831
20,0	38,0	104,0	20,0	3,0	44824	44737
20,0	38,0	104,0	20,0	4,0	—	44879
20,0	80,0	150,0	20,0	—	—	44901
20,0	80,0	150,0	20,0	0,5	—	44880
20,0	80,0	150,0	20,0	1,0	—	44881
20,0	80,0	150,0	20,0	1,5	—	44882
20,0	80,0	150,0	20,0	2,0	—	44883
20,0	80,0	150,0	20,0	2,5	—	44884
20,0	80,0	150,0	20,0	3,0	—	44885
20,0	80,0	150,0	20,0	4,0	—	44886
25,0	50,0	125,0	25,0	—	—	44731

CONTINUED



43ML • 43MLC

METRIC SERIES



- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Symmetrical end gashing for excellent balance at high speeds and aggressive plunging capability
- Open fluting for deep slotting and profiling
- Necked design with blended diameter transitions provide clearance to reach
- Enhanced corner geometry with tight tolerance corner radii
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	mm				CORNER RADIUS RE	EDP NO.	
			SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN			UNCOATED	Ti-NAMITE®-B (TiB ₂)
6,0	10,0	63,0	6,0	20,0	5,49	0,5		44769	44789
6,0	10,0	63,0	6,0	20,0	5,49	1,0		44770	44790
6,0	10,0	75,0	6,0	20,0	5,49	—		—	42706
6,0	13,0	72,0	6,0	30,0	5,49	0,5		44771	44791
6,0	13,0	72,0	6,0	30,0	5,49	1,0		44772	44792
8,0	12,0	75,0	8,0	25,0	7,49	—		—	42707
8,0	12,0	75,0	8,0	25,0	7,49	0,3		44773	44793
8,0	12,0	75,0	8,0	25,0	7,49	0,5		44774	44794
8,0	12,0	75,0	8,0	25,0	7,49	0,8		—	44950
8,0	12,0	75,0	8,0	25,0	7,49	1,0		44775	44795
8,0	12,0	75,0	8,0	25,0	7,49	1,2		—	44951
8,0	12,0	75,0	8,0	25,0	7,49	1,5		44776	44796
8,0	12,0	75,0	8,0	25,0	7,49	1,6		—	44952
10,0	14,0	100,0	10,0	35,0	9,48	—		—	42708
10,0	14,0	100,0	10,0	35,0	9,48	0,3		44777	44797
10,0	14,0	100,0	10,0	35,0	9,48	0,5		44778	44798
10,0	14,0	100,0	10,0	35,0	9,48	1,0		44779	44799
10,0	14,0	100,0	10,0	35,0	9,48	1,5		44780	44800
10,0	14,0	100,0	10,0	35,0	9,50	0,8		—	44953
10,0	14,0	100,0	10,0	35,0	9,50	1,2		—	44954
10,0	14,0	100,0	10,0	35,0	9,50	1,6		—	44955
10,0	14,0	100,0	10,0	35,0	9,50	2,4		—	44956
12,0	16,0	100,0	12,0	40,0	11,48	—		—	42709
12,0	16,0	100,0	12,0	40,0	11,48	0,5		44781	44801
12,0	16,0	100,0	12,0	40,0	11,48	0,8		—	44957
12,0	16,0	100,0	12,0	40,0	11,48	1,0		44782	44802
12,0	16,0	100,0	12,0	40,0	11,48	1,2		—	44958
12,0	16,0	100,0	12,0	40,0	11,48	1,5		44783	44803
12,0	16,0	100,0	12,0	40,0	11,48	1,6		—	44959
12,0	16,0	100,0	12,0	40,0	11,48	2,0		44784	44804
12,0	16,0	100,0	12,0	40,0	11,48	2,4		—	44960
12,0	16,0	100,0	12,0	40,0	11,48	2,5		44832	44839
12,0	16,0	100,0	12,0	40,0	11,48	3,0		44833	44738
12,0	16,0	100,0	12,0	40,0	11,48	4,0		44834	44741

continued on next page

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,008
DCON = h₆

>6-10 DIAMETER

DC = +0,000/-0,009
DCON = h₆
RE = +0,000/-0,050

>10-18 DIAMETER

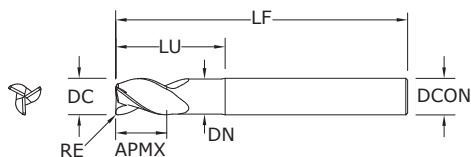
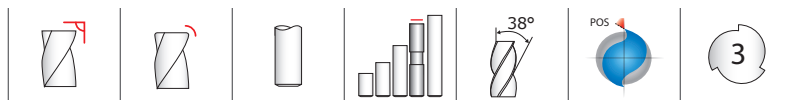
DC = +0,000/-0,011
DCON = h₆
RE = +0,000/-0,050

>18-20 DIAMETER

DC = +0,000/-0,013
DCON = h₆
RE = +0,000/-0,050

NON-FERROUS

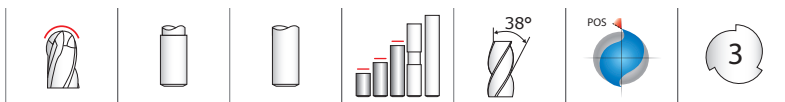
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**43ML •
43MLC**
METRIC SERIES

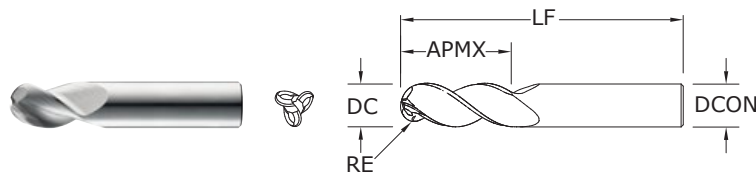
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	mm				EDP NO.	
			SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	CORNER RADIUS RE	UNCOATED	Ti-NAMITE®-B (TiB ₂)
14,0	18,0	125,0	14,0	45,0	13,49	—	—	44899
14,0	18,0	125,0	14,0	45,0	13,49	1,0	—	44961
14,0	18,0	125,0	14,0	45,0	13,49	2,0	—	44962
14,0	18,0	125,0	14,0	45,0	13,49	3,0	—	44963
14,0	18,0	125,0	14,0	45,0	13,49	4,0	—	44964
16,0	20,0	125,0	16,0	50,0	15,47	—	—	42710
16,0	20,0	125,0	16,0	50,0	15,47	2,0	44785	44805
16,0	20,0	125,0	16,0	50,0	15,47	2,5	44835	44840
16,0	20,0	125,0	16,0	50,0	15,47	3,0	44836	44739
16,0	20,0	125,0	16,0	50,0	15,47	4,0	44786	44806
16,0	20,0	125,0	16,0	50,0	15,49	0,8	—	44965
16,0	20,0	125,0	16,0	50,0	15,49	1,2	—	44966
16,0	20,0	125,0	16,0	50,0	15,49	1,6	—	44967
16,0	20,0	125,0	16,0	50,0	15,49	2,4	—	44968
16,0	20,0	125,0	16,0	50,0	15,49	3,2	—	44969
20,0	25,0	150,0	20,0	65,0	19,46	—	—	42711
20,0	25,0	150,0	20,0	65,0	19,46	2,0	44787	44807
20,0	25,0	150,0	20,0	65,0	19,46	2,4	—	44973
20,0	25,0	150,0	20,0	65,0	19,46	2,5	44837	44841
20,0	25,0	150,0	20,0	65,0	19,46	3,0	44838	44740
20,0	25,0	150,0	20,0	65,0	19,46	4,0	44788	44808
20,0	25,0	150,0	20,0	65,0	19,48	0,8	—	44970
20,0	25,0	150,0	20,0	65,0	19,48	1,2	—	44971
20,0	25,0	150,0	20,0	65,0	19,48	1,6	—	44972
20,0	25,0	150,0	20,0	65,0	19,48	3,2	—	44974

CONTINUED



43MB

METRIC SERIES



- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Open fluting for deep slotting and profiling
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)

mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE®-B (TiB ₂)
3,0	4,5	57,0	6,0	44916
4,0	6,0	57,0	6,0	44919
5,0	7,5	57,0	6,0	44922
6,0	9,0	57,0	6,0	44925
8,0	12,0	63,0	8,0	44928
10,0	15,0	75,0	10,0	44931
12,0	18,0	83,0	12,0	44934
16,0	24,0	100,0	16,0	44937
20,0	30,0	108,0	20,0	44940
25,0	37,5	127,0	25,0	44943

RE = 1/2 Cutting Diameter (DC)

TOLERANCES (mm)

3 DIAMETER

DC = +0,000/-0,006

DCON = h₆

RE = +0,0127/-0,0127

>3-6 DIAMETER

DC = +0,000/-0,008

DCON = h₆

RE = +0,0127/-0,0127

>6-10 DIAMETER

DC = +0,000/-0,009

DCON = h₆

RE = +0,0127/-0,0127

>10-18 DIAMETER

DC = +0,000/-0,011

DCON = h₆

RE = +0,0127/-0,0127

>18-25 DIAMETER

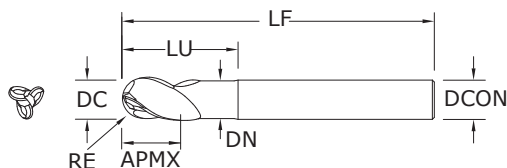
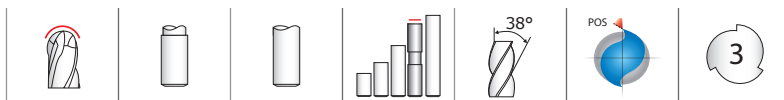
DC = +0,000/-0,013

DCON = h₆

RE = +0,0127/-0,0127

NON-FERROUS

For patent
information visit
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43MB

METRIC SERIES

TOLERANCES (mm)

3 DIAMETER

DC = +0,000/-0,006

DCON = h_6

RE = +0,0127/-0,0127

>3-6 DIAMETER

DC = +0,000/-0,008

DCON = h_6

RE = +0,0127/-0,0127

>6-10 DIAMETER

DC = +0,000/-0,009

DCON = h_6

RE = +0,0127/-0,0127

>10-18 DIAMETER

DC = +0,000/-0,011

DCON = h_6

RE = +0,0127/-0,0127

>18-25 DIAMETER

DC = +0,000/-0,013

DCON = h_6

RE = +0,0127/-0,0127

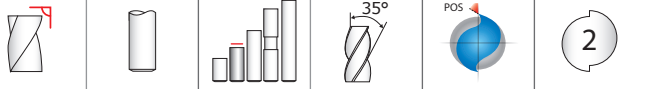
NON-FERROUS

For patent
information visit
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mm						EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	Ti-NAMITE®-B (TiB ₂)
3,0	6,0	57,0	6,0	10,0	2,74	44917
3,0	9,0	57,0	6,0	16,0	2,74	44918
4,0	8,0	57,0	6,0	13,0	3,73	44920
4,0	12,0	57,0	6,0	21,0	3,73	44921
5,0	10,0	63,0	6,0	16,0	4,50	44923
5,0	15,0	63,0	6,0	26,0	4,50	44924
6,0	12,0	63,0	6,0	19,0	5,49	44926
6,0	18,0	75,0	6,0	31,0	5,49	44927
8,0	16,0	75,0	8,0	25,0	7,49	44929
8,0	24,0	83,0	8,0	41,0	7,49	44930
10,0	20,0	83,0	10,0	31,0	9,50	44932
10,0	30,0	100,0	10,0	51,0	9,50	44933
12,0	24,0	100,0	12,0	37,0	11,48	44935
12,0	36,0	130,0	12,0	61,0	11,48	44936
16,0	32,0	130,0	16,0	49,0	15,49	44938
16,0	48,0	150,0	16,0	81,0	15,49	44939
20,0	40,0	130,0	20,0	61,0	19,48	44941
20,0	60,0	150,0	20,0	101,0	19,48	44942
25,0	50,0	152,0	25,0	76,0	24,49	44944
25,0	75,0	170,0	25,0	126,0	24,49	44945

RE = 1/2 Cutting Diameter (DC)

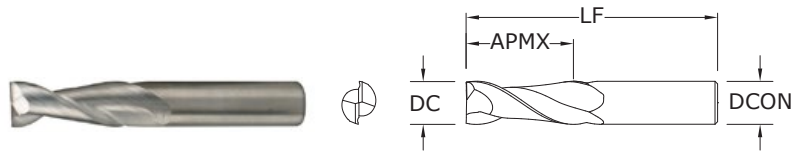
- Circular land allows for increased control at various speed and feed rates and reduces chatter
- Open fluting for deep slotting and profiling
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



47M

METRIC SERIES

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-B (TiB ₂)
3,0	8,0	38,0	3,0	44550	44587
4,0	11,0	50,0	4,0	44551	44588
5,0	13,0	50,0	5,0	44552	44589
6,0	13,0	57,0	6,0	44553	44590
8,0	19,0	63,0	8,0	44554	44591
10,0	22,0	72,0	10,0	44555	44592
12,0	26,0	83,0	12,0	44556	44593
14,0	26,0	83,0	14,0	44557	44594
16,0	32,0	92,0	16,0	44558	44595
20,0	38,0	104,0	20,0	44559	44596
25,0	38,0	104,0	25,0	44560	44597

TOLERANCES (mm)

3 DIAMETER

DC = +0,000/-0,006
DCON = h₆

>3-6 DIAMETER

DC = +0,000/-0,008
DCON = h₆

>6-10 DIAMETER

DC = +0,000/-0,009
DCON = h₆

>10-18 DIAMETER

DC = +0,000/-0,012
DCON = h₆

>18-25 DIAMETER

DC = +0,000/-0,013
DCON = h₆

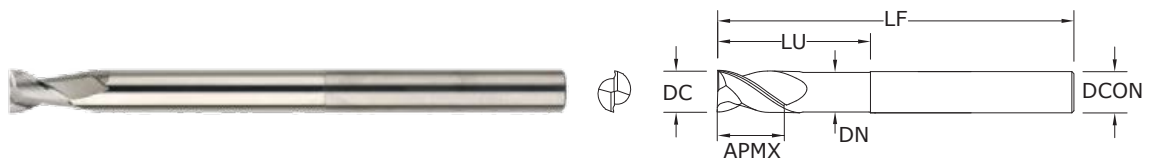
NON-FERROUS

For patent information visit
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47ML

METRIC SERIES

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Necked design with blended diameter transitions provide clearance to reach
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	UNCOATED	Ti-NAMITE®-B (TiB ₂)
6,0	10,0	100,0	6,0	54,0	5,62	44561	44609
8,0	12,0	100,0	8,0	54,0	7,62	44562	44610
10,0	12,0	100,0	10,0	54,0	9,62	44563	44611
12,0	16,0	150,0	12,0	80,0	11,62	44564	44612
16,0	20,0	150,0	16,0	80,0	15,62	44565	44613
20,0	25,0	150,0	20,0	80,0	19,62	44566	44614

TOLERANCES (mm)

6 DIAMETER

DC = +0,000/-0,008
DCON = h₆

>6-10 DIAMETER

DC = +0,000/-0,009
DCON = h₆

>10-18 DIAMETER

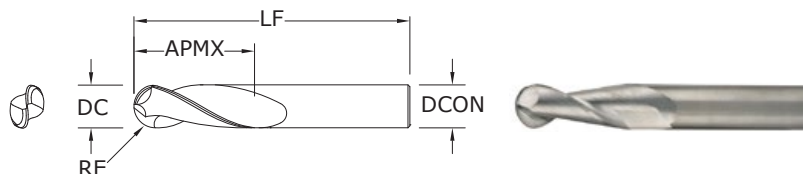
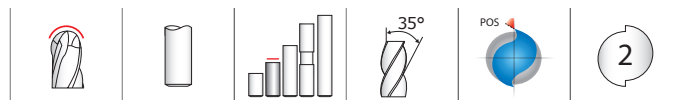
DC = +0,000/-0,011
DCON = h₆

>18-20 DIAMETER

DC = +0,000/-0,013
DCON = h₆

NON-FERROUS

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47MB
METRIC SERIES

TOLERANCES (mm)

3 DIAMETER
DC = +0,000/-0,006
DCON = h_6
RE = +0,0127/-0,0127

>3-6 DIAMETER
DC = +0,000/-0,008
DCON = h_6
RE = +0,0127/-0,0127

>6-10 DIAMETER
DC = +0,000/-0,009
DCON = h_6
RE = +0,0127/-0,0127

>10-18 DIAMETER
DC = +0,000/-0,012
DCON = h_6
RE = +0,0127/-0,0127

>18-25 DIAMETER
DC = +0,000/-0,013
DCON = h_6
RE = +0,0127/-0,0127

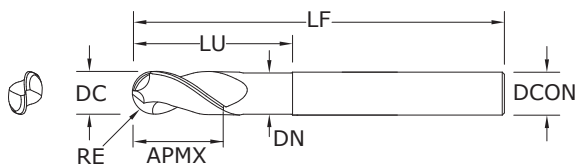
NON-FERROUS

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mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-B (TiB ₂)
3,0	8,0	38,0	3,0	44570	44598
4,0	11,0	50,0	4,0	44571	44599
5,0	13,0	50,0	5,0	44572	44600
6,0	13,0	57,0	6,0	44573	44601
8,0	19,0	63,0	8,0	44574	44602
10,0	22,0	72,0	10,0	44575	44603
12,0	26,0	83,0	12,0	44576	44604
14,0	26,0	83,0	14,0	44577	44605
16,0	32,0	92,0	16,0	44578	44606
20,0	37,3	104,0	20,0	44579	44607
25,0	38,0	104,0	25,0	44580	44608

RE = 1/2 Cutting Diameter (DC)

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



47MLB
METRIC SERIES

TOLERANCES (mm)

6 DIAMETER
DC = +0,000/-0,008
DCON = h_6
RE = +0,0127/-0,0127

>6-10 DIAMETER
DC = +0,000/-0,009
DCON = h_6
RE = +0,0127/-0,0127

>10-18 DIAMETER
DC = +0,000/-0,011
DCON = h_6
RE = +0,0127/-0,0127

>18-20 DIAMETER
DC = +0,000/-0,013
DCON = h_6
RE = +0,0127/-0,0127

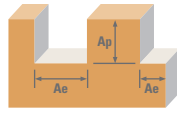
NON-FERROUS

For patent
information visit
www.ksptpatents.com

mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	REACH LU	NECK DIAMETER DN	UNCOATED	Ti-NAMITE®-B (TiB ₂)
6,0	10,0	100,0	6,0	54,0	5,62	44581	44615
8,0	12,0	100,0	8,0	54,0	7,62	44582	44616
10,0	12,0	100,0	10,0	54,0	9,62	44583	44617
12,0	16,0	150,0	12,0	80,0	11,62	44584	44618
16,0	20,0	150,0	16,0	80,0	15,62	44585	44619
20,0	25,0	150,0	20,0	80,0	19,62	44586	44620

RE = 1/2 Cutting Diameter (DC)

- Circular land reduces edge aggressiveness for varied speed and feed rates
- 2 Flutes effectively manage the large size and volume of chips produced during the aggressive machining process
- Excellent balance at high speeds and aggressive plunging capability
- Necked design with blended diameter transitions provide clearance to reach
- Ball end design ideal for finishing operations in complex workpieces
- Recommended for materials ≤ 150 Bhn (≤ 7 HRC)



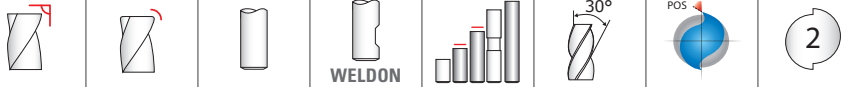
Series 47M, 47MB, 47ML, 47MLB Metric					DC • mm										
Hardness		Ae x DC	Ap x DC	Vc (m/min)		3	6	10	12	16	20	25			
ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6073, 7075	≤ 150 Bhn or ≤ 88 HRb	 Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243		
					(392-588)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213		
					Feed (mm/min)	2247	3121	3746	3745	3246	2913	2653			
		 Profile	≤ 0.5	≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771		
					(488-732)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213		
					Feed (mm/min)	2797	3885	4663	4662	4041	3627	3303			
	≤ 125 Bhn or ≤ 77 HRb	 HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804		
					(804-1206)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488		
					Feed (mm/min)	10754	14083	17925	17924	15364	14084	12484			
		ALUMINUM DIE CAST ALLOYS (HIGH SILICONE) A-390, A-392, B- 390	≤ 125 Bhn or ≤ 77 HRb	 Slot	1	≤ 1	185	RPM	19641	9820	5892	4910	3683	2946	2357
							(148-222)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213
							Feed (mm/min)	848	1178	1414	1414	1226	1100	1002	
 Profile	≤ 0.5			≤ 1.5	230	RPM	24418	12209	7326	6105	4578	3663	2930		
					(184-276)	Fz	0.022	0.060	0.120	0.144	0.166	0.187	0.213		
					Feed (mm/min)	1055	1465	1758	1758	1524	1367	1245			
≤ 140 Bhn or ≤ 3 HRc	 HSM		≤ 0.05	≤ 2	380	RPM	40343	20172	12103	10086	7564	6052	4841		
					(304-456)	Fz	0.050	0.132	0.280	0.336	0.384	0.440	0.488		
					Feed (mm/min)	4066	5325	6778	6777	5809	5325	4720			
	COPPER ALLOYS Aluminum Bronze Brass Naval Brass Red Brass		≤ 140 Bhn or ≤ 3 HRc	 Slot	1	≤ 1	265	RPM	28134	14067	8440	7034	5275	4220	3376
							(212-318)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	1080	1350	1801	1688	1485	1350	1182	
 Profile		≤ 0.5		≤ 1.5	330	RPM	35035	17518	10511	8759	6569	5255	4204		
					(264-396)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175		
					Feed (mm/min)	1345	1682	2242	2102	1850	1682	1472			
≤ 200 Bhn or ≤ 23 HRc		 HSM	≤ 0.05	≤ 2	545	RPM	57861	28930	17358	14465	10849	8679	6943		
					(436-654)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400		
					Feed (mm/min)	4721	6248	7869	7984	6943	6480	5555			
		COPPER ALLOYS Beryllium Copper C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc	 Slot	1	≤ 1	105	RPM	11148	5574	3344	2787	2090	1672	1338
							(84-126)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175
							Feed (mm/min)	428	535	713	669	589	535	468	
 Profile	≤ 0.5			≤ 1.5	130	RPM	13802	6901	4141	3450	2588	2070	1656		
					(104-156)	Fz	0.019	0.048	0.107	0.120	0.141	0.160	0.175		
					Feed (mm/min)	530	662	883	828	729	662	580			
≤ 200 Bhn or ≤ 23 HRc	 HSM		≤ 0.05	≤ 2	215	RPM	22826	11413	6848	5706	4280	3424	2739		
					(172-258)	Fz	0.041	0.108	0.227	0.276	0.320	0.373	0.400		
					Feed (mm/min)	1862	2465	3104	3150	2739	2556	2191			
	PLASTICS ABS, Polycarbonate, PVC, Polypropylene			 Slot	1	≤ 1	490	RPM	52022	26011	15607	13005	9754	7803	6243
							(392-588)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350
							Feed (mm/min)	3745	4994	6243	6242	5493	4994	4370	
 Profile		≤ 0.5		≤ 1.5	610	RPM	64762	32381	19429	16190	12143	9714	7771		
					(488-732)	Fz	0.036	0.096	0.200	0.240	0.282	0.320	0.350		
					Feed (mm/min)	4662	6217	7771	7771	6839	6217	5440			
		 HSM	≤ 0.05	≤ 2	1005	RPM	106698	53349	32009	26674	20006	16005	12804		
					(804-1206)	Fz	0.082	0.216	0.453	0.552	0.640	0.733	0.800		
					Feed (mm/min)	17412	23045	29022	29446	25607	23473	20487			

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B) HSM (High Speed Machining)
 $rpm = (Vc \times 1000) / (DC \times 3.14)$
 $mm/min = Fz \times 2 \times rpm$
 reduce speed and feed for materials harder than listed
 reduce cut depth and feed by 50% for long flute and long reach tools
 reduce feed and Ae when finish milling (.02 x DC maximum)
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgtool.com)

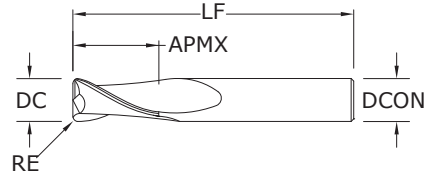
General Application End Mills



2 Flute Square End • 2 Flute Corner Radius



**3•3L•
3EL•3CR**
FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000/-0.001

DCON = h_6

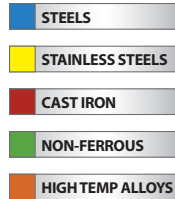
≥1/8 DIAMETER

DC = +0.000/-0.002

3CR DC = -0.001/-0.002

DCON = h_6

RE = +0.000/-0.002

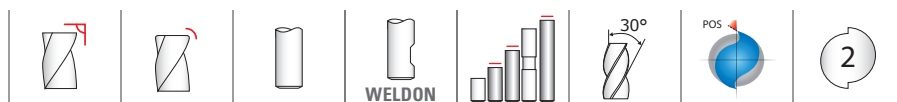


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CUTTING DIAMETER DC	LENGTH OF CUT APMX	inch			CORNER RADIUS RE	WELDON FLAT	EDP NO.				SERIES
		OVERALL LENGTH LF	SHANK DIAMETER DCON				UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1/64	1/32	1-1/2	1/8	—	—		30301	39301	39501	30397	3
1/32	5/64	1-1/2	1/8	—	—		30303	39303	39503	30398	3
3/64	7/64	1-1/2	1/8	—	—		30305	39305	39505	30399	3
*1/16	3/16	1-1/2	1/8	—	—		30307	39307	39507	30400	3
5/64	3/16	1-1/2	1/8	—	—		30309	39309	39509	30435	3
3/32	9/32	1-1/2	1/8	—	—		30311	39311	39511	30436	3
7/64	3/8	1-1/2	1/8	—	—		30313	39313	39513	30437	3
1/8	3/8	1-1/2	1/8	—	—		30377	39377	39577	30469	3
*1/8	1/2	1-1/2	1/8	—	—		30315	39315	39515	30438	3
1/8	1/2	1-1/2	1/8	.015	—		38201	38202	38315	38357	3CR
1/8	1/2	1-1/2	1/8	.020	—		38203	38204	38316	38358	3CR
1/8	3/4	2-1/4	1/8	—	—		33341	31800	31810	31850	3L
1/8	1	3	1/8	—	—		33343	31938	31948	31958	3EL
9/64	1/2	2	3/16	—	—		30317	39317	39517	30439	3
5/32	1/2	2	3/16	—	—		30319	39319	39519	30440	3
11/64	5/8	2	3/16	—	—		30321	39321	39521	30441	3
*3/16	5/8	2	3/16	—	—		30323	39323	39523	30442	3
3/16	5/8	2	3/16	.015	—		38209	38210	38317	38359	3CR
3/16	5/8	2	3/16	.020	—		38211	38212	38318	38360	3CR
3/16	5/8	2	3/16	.030	—		38213	38214	38319	38361	3CR
3/16	3/4	2-1/2	3/16	—	—		33301	31820	31825	31851	3L
3/16	1-1/8	3	3/16	—	—		33321	31939	31949	31959	3EL
13/64	5/8	2-1/2	1/4	—	—		30325	39325	39525	30443	3
7/32	5/8	2-1/2	1/4	—	—		30327	39327	39527	30444	3
15/64	3/4	2-1/2	1/4	—	—		30329	39329	39529	30445	3
*1/4	3/4	2-1/2	1/4	—	—		30331	39331	39531	30446	3
1/4	3/4	2-1/2	1/4	.015	—		38219	38220	38320	38362	3CR
1/4	3/4	2-1/2	1/4	.020	—		38221	38222	38321	38363	3CR
1/4	3/4	2-1/2	1/4	.030	—		38223	38224	38322	38364	3CR
1/4	3/4	2-1/2	1/4	.045	—		38225	38226	38323	38365	3CR
1/4	1-1/8	3	1/4	—	—		33303	31802	31812	31852	3L
1/4	1-1/2	4	1/4	—	—		33323	31940	31950	31960	3EL
17/64	3/4	2-1/2	5/16	—	—		30333	39333	39533	30447	3
9/32	3/4	2-1/2	5/16	—	—		30335	39335	39535	30448	3

continued on next page

2 Flute Square End • 2 Flute Corner Radius



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

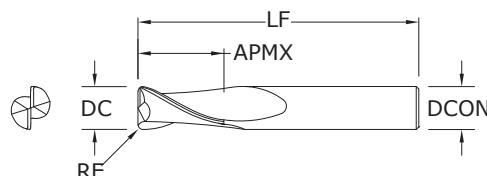
≥1/8 DIAMETER

DC = +0.000 / -0.002

3CR DC = -0.001 / -0.002

DCON = h_6

RE = +0.000 / -0.002



**3•3L•
3EL•3CR**
FRACTIONAL SERIES

inch						EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	WELDON FLAT	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
19/64	13/16	2-1/2	5/16	—		30337	39337	39537	30449	3
*15/16	13/16	2-1/2	5/16	—		30339	39339	39539	30450	3
5/16	13/16	2-1/2	5/16	.015		38231	38232	38324	38366	3CR
5/16	13/16	2-1/2	5/16	.020		38233	38234	38325	38367	3CR
5/16	13/16	2-1/2	5/16	.030		38235	38236	38326	38368	3CR
5/16	13/16	2-1/2	5/16	.045		38237	38238	38327	38369	3CR
5/16	1-1/8	3	5/16	—		33305	31821	31826	31853	3L
5/16	1-5/8	4	5/16	—		33325	31941	31951	31961	3EL
21/64	1	2-1/2	3/8	—		30341	39341	39541	30451	3
11/32	1	2-1/2	3/8	—		30343	39343	39543	30452	3
23/64	1	2-1/2	3/8	—		30345	39345	39545	30453	3
*13/8	1	2-1/2	3/8	—		30347	39347	39547	30454	3
3/8	1	2-1/2	3/8	.015	•	38245	38246	38328	38370	3CR
3/8	1	2-1/2	3/8	.020	•	38247	38248	38329	38371	3CR
3/8	1	2-1/2	3/8	.030	•	38249	38250	38330	38372	3CR
3/8	1	2-1/2	3/8	.045	•	38251	38252	38331	38373	3CR
3/8	1-1/8	3	3/8	—		33307	31804	31814	31854	3L
3/8	1-3/4	4	3/8	—		33327	31942	31952	31962	3EL
25/64	1	2-3/4	7/16	—		30349	39349	39549	30455	3
13/32	1	2-3/4	7/16	—		30351	39351	39551	30456	3
27/64	1	2-3/4	7/16	—		30353	39353	39553	30457	3
7/16	1	2-3/4	7/16	—		30355	39355	39555	30458	3
7/16	2	4-1/2	7/16	—		33309	31822	31827	31855	3L
7/16	3	6	7/16	—		33329	31943	31953	31963	3EL
29/64	1	3	1/2	—		30357	39357	39557	30459	3
15/32	1	3	1/2	—		30359	39359	39559	30460	3
31/64	1	3	1/2	—		30361	39361	39561	30461	3
*11/2	1	3	1/2	—		30363	39363	39563	30462	3
1/2	1	3	1/2	.015	•	38259	38260	38332	38374	3CR
1/2	1	3	1/2	.020	•	38261	38262	38333	38375	3CR
1/2	1	3	1/2	.030	•	38263	38264	38334	38376	3CR
1/2	1	3	1/2	.045	•	38265	38266	38335	38377	3CR
1/2	1	3	1/2	.060	•	38267	38268	38336	38378	3CR
1/2	2	4-1/2	1/2	—		33311	31806	31816	31856	3L

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CONTINUED

STEELS

STAINLESS STEELS

CAST IRON

NON-FERROUS

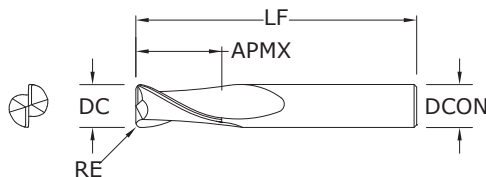
HIGH TEMP ALLOYS

For patent information visit
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2 Flute Square End • 2 Flute Corner Radius



**3•3L•
3EL•3CR**
FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000/-0.001

DCON = h_6

≥1/8 DIAMETER

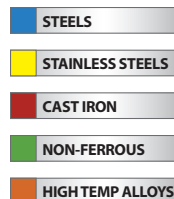
DC = +0.000/-0.002

3CR DC = -0.001/-0.002

DCON = h_6

RE = +0.000/-0.002

CONTINUED

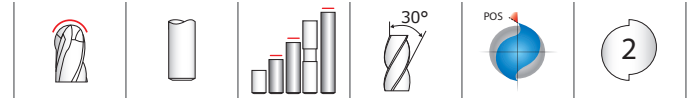


For patent
information visit
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CUTTING DIAMETER DC	LENGTH OF CUT APMX	inch				WELDON FLAT	EDP NO.				SERIES
		OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE			UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1/2	3	6	1/2	—			33331	31944	31954	31964	3EL
9/16	1-1/8	3-1/2	9/16	—			30365	39365	39565	30463	3
5/8	1-1/4	3-1/2	5/8	—			30367	39367	39567	30464	3
5/8	1-1/4	3-1/2	5/8	.015	•		38273	38274	38337	38379	3CR
5/8	1-1/4	3-1/2	5/8	.020	•		38275	38276	38338	38380	3CR
5/8	1-1/4	3-1/2	5/8	.030	•		38277	38278	38339	38381	3CR
5/8	1-1/4	3-1/2	5/8	.045	•		38279	38280	38340	38382	3CR
5/8	1-1/4	3-1/2	5/8	.060	•		38281	38282	38341	38383	3CR
5/8	1-1/4	3-1/2	5/8	.090	•		38283	38284	38342	38384	3CR
5/8	2-1/4	5	5/8	—			33313	31823	31817	31857	3L
5/8	3	6	5/8	—			33333	31945	31955	31965	3EL
11/16	1-3/8	4	3/4	—			30369	39369	39569	30465	3
3/4	1-1/2	4	3/4	—			30371	39371	39571	30466	3
3/4	1-1/2	4	3/4	.015	•		38287	38288	38343	38385	3CR
3/4	1-1/2	4	3/4	.020	•		38289	38290	38344	38386	3CR
3/4	1-1/2	4	3/4	.030	•		38291	38292	38345	38387	3CR
3/4	1-1/2	4	3/4	.045	•		38293	38294	38346	38388	3CR
3/4	1-1/2	4	3/4	.060	•		38295	38296	38347	38389	3CR
3/4	1-1/2	4	3/4	.090	•		38297	38298	38348	38390	3CR
3/4	1-1/2	4	3/4	.125	•		38299	38300	38349	38391	3CR
3/4	2-1/4	5	3/4	—			33315	31808	31818	31858	3L
3/4	3	6	3/4	—			33335	31946	31956	31966	3EL
7/8	1-1/2	4	7/8	—			30373	39373	39573	30467	3
1	1-1/2	4	1	—			30375	39375	39575	30468	3
1	1-1/2	4	1	.015	•		38301	38302	38350	38392	3CR
1	1-1/2	4	1	.020	•		38303	38304	38351	38393	3CR
1	1-1/2	4	1	.030	•		38305	38306	38352	38394	3CR
1	1-1/2	4	1	.045	•		38307	38308	38353	38395	3CR
1	1-1/2	4	1	.060	•		38309	38310	38354	38396	3CR
1	1-1/2	4	1	.090	•		38311	38312	38355	38397	3CR
1	1-1/2	4	1	.125	•		38313	38314	38356	38398	3CR
1	2-1/4	5	1	—			33317	31824	31819	31859	3L
1	3	6	1	—			33337	31947	31957	31967	3EL
*Series 3 Set				—			30389	39389	39589	30470	3

† Di-NAMITE® coating offered standard for this configuration. Please contact your KSPT Representative for more information.

FRACTIONAL 2 Flute Ball End



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

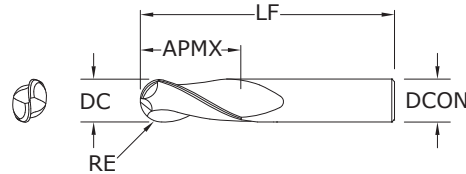
RE = +0.000 / -0.0005

≥1/8 DIAMETER

DC = +0.000 / -0.002

DCON = h_6

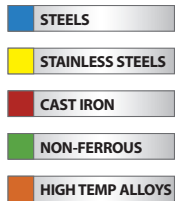
RE = +0.000 / -0.001



**3B•3LB•
3ELB**
FRACTIONAL SERIES

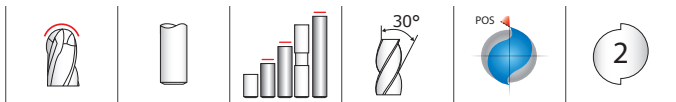
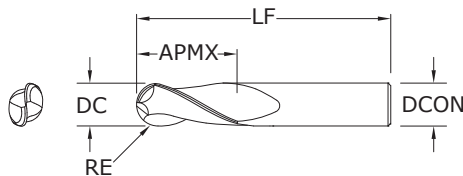
inch				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1/64	1/32	1-1/2	1/8	30302	39302	39502	30471	3B
1/32	5/64	1-1/2	1/8	30304	39304	39504	30472	3B
3/64	7/64	1-1/2	1/8	30306	39306	39506	30473	3B
1/16	3/16	1-1/2	1/8	30308	39308	39508	30474	3B
5/64	3/16	1-1/2	1/8	30310	39310	39510	30475	3B
3/32	9/32	1-1/2	1/8	30312	39312	39512	30476	3B
7/64	3/8	1-1/2	1/8	30314	39314	39514	30477	3B
1/8	3/8	1-1/2	1/8	30378	39378	39578	30599	3B
*1/8	1/2	1-1/2	1/8	30316	39316	39516	30478	3B
1/8	3/4	2-1/4	1/8	33342	31830	31840	31890	3LB
1/8	1	3	1/8	33344	31968	31978	31988	3ELB
9/64	1/2	2	3/16	30318	39318	39518	30479	3B
5/32	1/2	2	3/16	30320	39320	39520	30480	3B
11/64	5/8	2	3/16	30322	39322	39522	30481	3B
*3/16	5/8	2	3/16	30324	39324	39524	30482	3B
3/16	3/4	2-1/2	3/16	33302	31831	31841	31891	3LB
3/16	1-1/8	3	3/16	33322	31969	31979	31989	3ELB
13/64	5/8	2-1/2	1/4	30326	39326	39526	30483	3B
7/32	5/8	2-1/2	1/4	30328	39328	39528	30484	3B
15/64	3/4	2-1/2	1/4	30330	39330	39530	30485	3B
*1/4	3/4	2-1/2	1/4	30332	39332	39532	30486	3B
1/4	1-1/8	3	1/4	33304	31832	31842	31892	3LB
1/4	1-1/2	4	1/4	33324	31970	31980	31990	3ELB
17/64	3/4	2-1/2	5/16	30334	39334	39534	30487	3B
9/32	3/4	2-1/2	5/16	30336	39336	39536	30488	3B
19/64	13/16	2-1/2	5/16	30338	39338	39538	30489	3B
*5/16	13/16	2-1/2	5/16	30340	39340	39540	30490	3B
5/16	1-1/8	3	5/16	33306	31833	31843	31893	3LB
5/16	1-5/8	4	5/16	33326	31971	31981	31991	3ELB
21/64	1	2-1/2	3/8	30342	39342	39542	30491	3B
11/32	1	2-1/2	3/8	30344	39344	39544	30492	3B
23/64	1	2-1/2	3/8	30346	39346	39546	30493	3B

continued on next page



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information visit
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2 Flute Ball End


**3B•3LB•
3ELB**
FRACTIONAL SERIES


TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

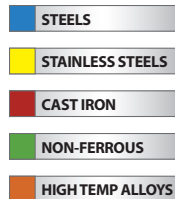
RE = +0.000 / -0.0005

≥1/8 DIAMETER

DC = +0.000 / -0.002

DCON = h_6

RE = +0.000 / -0.001

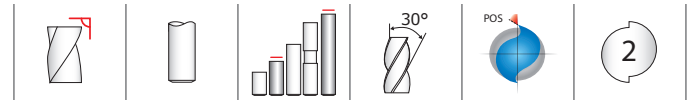


For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	EDP NO.				SERIES
				UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
*3/8	1	2-1/2	3/8	30348	39348	39548	30494	3B
3/8	1-1/8	3	3/8	33308	31834	31844	31894	3LB
3/8	1-3/4	4	3/8	33328	31972	31982	31992	3ELB
25/64	1	2-3/4	7/16	30350	39350	39550	30495	3B
13/32	1	2-3/4	7/16	30352	39352	39552	30496	3B
27/64	1	2-3/4	7/16	30354	39354	39554	30497	3B
7/16	1	2-3/4	7/16	30356	39356	39556	30498	3B
7/16	2	4-1/2	7/16	33310	31835	31845	31895	3LB
7/16	3	6	7/16	33330	31973	31983	31993	3ELB
29/64	1	3	1/2	30358	39358	39558	30499	3B
15/32	1	3	1/2	30360	39360	39560	30500	3B
31/64	1	3	1/2	30362	39362	39562	30591	3B
*1/2	1	3	1/2	30364	39364	39564	30592	3B
1/2	2	4-1/2	1/2	33312	31836	31846	31896	3LB
1/2	3	6	1/2	33332	31974	31984	31994	3ELB
9/16	1-1/8	3-1/2	9/16	30366	39366	39566	30593	3B
5/8	1-1/4	3-1/2	5/8	30368	39368	39568	30594	3B
5/8	2-1/4	5	5/8	33314	31837	31847	31897	3LB
5/8	3	6	5/8	33334	31975	31985	31995	3ELB
11/16	1-3/8	4	3/4	30370	39370	39570	30595	3B
3/4	1-1/2	4	3/4	30372	39372	39572	30596	3B
3/4	2-1/4	5	3/4	33316	31838	31848	31898	3LB
3/4	3	6	3/4	33336	31976	31986	31996	3ELB
7/8	1-1/2	4	7/8	30374	39374	39574	30597	3B
1	1-1/2	4	1	30376	39376	39576	30598	3B
1	2-1/4	5	1	33318	31839	31849	31899	3LB
1	3	6	1	33338	31977	31987	31997	3ELB
*Series 3B Set				30390	39390	39590	30600	3B

RE = 1/2 Cutting Diameter (DC)

2 Flute Square End



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000/-0.0254

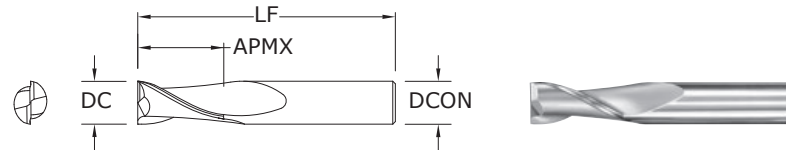
DCON = h_6

≥3 DIAMETER

DC = +0,0000/-0.0508

DCON = h_6

RE = +0,0000/-0.0508



**3M·
3XLM**
METRIC SERIES

mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40305	48628	48650	48671	3M
1,5	4,5	38,0	3,0	40309	48629	48651	48672	3M
2,0	6,3	38,0	3,0	40313	48630	48652	48673	3M
2,5	9,5	38,0	3,0	40317	48631	48653	48674	3M
3,0	12,0	38,0	3,0	40321	48632	48654	48675	3M
3,0	25,0	75,0	3,0	43301	49427	49440	49453	3XLM
3,5	12,0	50,0	4,0	40325	48633	48655	48676	3M
4,0	14,0	50,0	4,0	40329	48634	48656	48677	3M
4,0	25,0	75,0	4,0	43303	49428	49441	49454	3XLM
4,5	16,0	50,0	6,0	40333	48635	48657	48678	3M
5,0	16,0	50,0	6,0	40337	48636	48658	48679	3M
5,0	25,0	75,0	5,0	43307	49430	49443	49456	3XLM
6,0	19,0	50,0	6,0	40341	48637	48659	48680	3M
6,0	25,0	75,0	6,0	43305	49429	49442	49455	3XLM
7,0	19,0	63,0	8,0	40345	48638	48660	48681	3M
8,0	20,0	63,0	8,0	40349	48639	48661	48682	3M
8,0	25,0	75,0	8,0	43315	49431	49444	49457	3XLM
9,0	22,0	75,0	10,0	40353	48640	48662	48683	3M
10,0	22,0	75,0	10,0	40357	48641	48663	48684	3M
10,0	38,0	100,0	10,0	43325	49432	49445	49458	3XLM
11,0	25,0	75,0	12,0	40361	48642	48664	48685	3M
12,0	25,0	75,0	12,0	40365	48643	48665	48686	3M
12,0	50,0	100,0	12,0	43335	49433	49446	49459	3XLM
12,0	75,0	150,0	12,0	43345	49434	49447	49460	3XLM
14,0	32,0	89,0	14,0	40369	48644	48666	48687	3M
14,0	75,0	150,0	14,0	43355	49435	49448	49461	3XLM
16,0	32,0	89,0	16,0	40373	48645	48667	48688	3M
16,0	75,0	150,0	16,0	43365	49436	49449	49462	3XLM
18,0	38,0	100,0	18,0	40377	48646	48668	48689	3M
18,0	75,0	150,0	18,0	43375	49437	49450	49463	3XLM
20,0	38,0	100,0	20,0	40381	48647	48669	48690	3M
20,0	75,0	150,0	20,0	43385	49438	49451	49464	3XLM
25,0	38,0	100,0	25,0	40385	48648	48670	48691	3M
25,0	75,0	150,0	25,0	43395	49439	49452	49465	3XLM

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

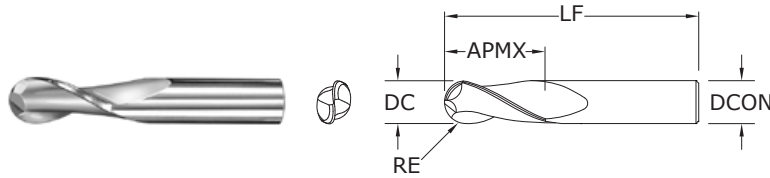
For patent information visit
www.ksptpatents.com

2 Flute Ball End



3MB• 3XLMB

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0,0254

DCON = h_6

RE = +0,0000 / -0,0127

≥3 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6

RE = +0,0000 / -0,0254

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40306	48692	48714	48735	3MB
1,5	4,5	38,0	3,0	40310	48693	48715	48736	3MB
2,0	6,3	38,0	3,0	40314	48694	48716	48737	3MB
2,5	9,5	38,0	3,0	40318	48695	48717	48738	3MB
3,0	12,0	38,0	3,0	40322	48696	48718	48739	3MB
3,0	25,0	75,0	3,0	43302	49544	49557	49570	3XLMB
3,5	12,0	50,0	4,0	40326	48697	48719	48740	3MB
4,0	14,0	50,0	4,0	40330	48698	48720	48741	3MB
4,0	25,0	75,0	4,0	43304	49545	49558	49571	3XLMB
4,5	16,0	50,0	6,0	40334	48699	48721	48742	3MB
5,0	16,0	50,0	6,0	40338	48700	48722	48743	3MB
5,0	25,0	75,0	5,0	43308	49547	49560	49573	3XLMB
6,0	19,0	50,0	6,0	40342	48701	48723	48744	3MB
6,0	25,0	75,0	6,0	43306	49546	49559	49572	3XLMB
7,0	19,0	63,0	8,0	40346	48702	48724	48745	3MB
8,0	20,0	63,0	8,0	40350	48703	48725	48746	3MB
8,0	25,0	75,0	8,0	43316	49548	49561	49574	3XLMB
9,0	22,0	75,0	10,0	40354	48704	48726	48747	3MB
10,0	22,0	75,0	10,0	40358	48705	48727	48748	3MB
10,0	38,0	100,0	10,0	43326	49549	49562	49575	3XLMB
11,0	25,0	75,0	12,0	40362	48706	48728	48749	3MB
12,0	25,0	75,0	12,0	40366	48707	48729	48750	3MB
12,0	50,0	100,0	12,0	43336	49550	49563	49576	3XLMB
12,0	75,0	150,0	12,0	43346	49551	49564	49577	3XLMB
14,0	32,0	89,0	14,0	40370	48708	48730	48751	3MB
14,0	75,0	150,0	14,0	43356	49552	49565	49578	3XLMB
16,0	32,0	89,0	16,0	40374	48709	48731	48752	3MB
16,0	75,0	150,0	16,0	43366	49553	49566	49579	3XLMB
18,0	38,0	100,0	18,0	40378	48710	48732	48753	3MB
18,0	75,0	150,0	18,0	43376	49554	49567	49580	3XLMB
20,0	38,0	100,0	20,0	40382	48711	48733	48754	3MB
20,0	75,0	150,0	20,0	43386	49555	49568	49581	3XLMB
25,0	38,0	100,0	25,0	40386	48712	48734	48755	3MB
25,0	75,0	150,0	25,0	43396	49556	49569	49582	3XLMB

RE = 1/2 Cutting Diameter (DC)

FRACTIONAL 2 Flute Double End

TOLERANCES (inch)

<1/8 DIAMETER

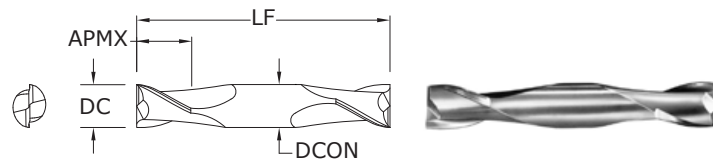
DC = +0.000/-0.001

DCON = h_6

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6



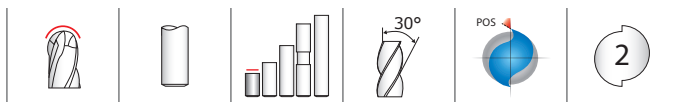
15
FRACTIONAL SERIES

inch				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/32	1/16	1-1/2	1/8	31501	31541	39651	31316
3/64	3/32	1-1/2	1/8	31503	31543	39653	31317
1/16	1/8	1-1/2	1/8	31505	31545	39655	31318
5/64	1/8	1-1/2	1/8	31507	31547	39657	31319
3/32	3/16	1-1/2	1/8	31509	31549	39659	31320
7/64	3/16	1-1/2	1/8	31511	31551	39661	31321
*1/8	1/4	1-1/2	1/8	31513	31553	39663	31322
9/64	5/16	2	3/16	31515	31555	39665	31323
5/32	5/16	2	3/16	31517	31557	39667	31324
11/64	5/16	2	3/16	31519	31559	39669	31325
*3/16	3/8	2	3/16	31521	31561	39671	31326
13/64	1/2	2-1/2	1/4	31523	31563	39673	31327
7/32	1/2	2-1/2	1/4	31525	31565	39675	31328
15/64	1/2	2-1/2	1/4	31527	31567	39677	31329
*1/4	1/2	2-1/2	1/4	31529	31569	39679	31330
9/32	1/2	2-1/2	5/16	31531	31571	39681	31331
*5/16	1/2	2-1/2	5/16	31533	31573	39683	31332
*3/8	9/16	2-1/2	3/8	31535	31575	39685	31333
7/16	9/16	2-3/4	7/16	31537	31577	39687	31334
*1/2	5/8	3	1/2	31539	31579	39689	31335
*Series 15 Set				31589	31581	39691	31336

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

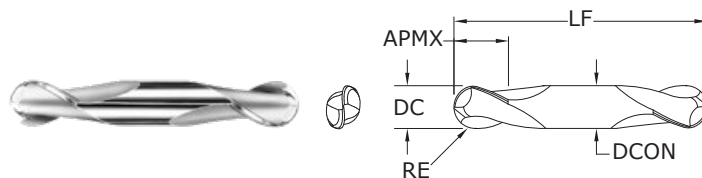
For patent information visit
www.ksptpatents.com

2 Flute Double End Ball End



15B

FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

RE = +0.000 / -0.0005

≥1/8 DIAMETER

DC = +0.000 / -0.002

DCON = h_6

RE = +0.000 / -0.001

STEELS

STAINLESS STEELS

CAST IRON

NON-FERROUS

HIGH TEMP ALLOYS

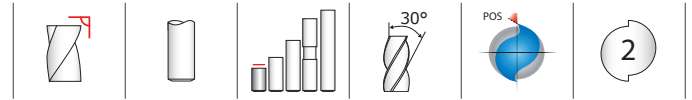
For patent
information visit
www.ksptpatents.com

inch				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/32	1/16	1-1/2	1/8	31502	31542	39652	31337
3/64	3/32	1-1/2	1/8	31504	31544	39654	31338
1/16	1/8	1-1/2	1/8	31506	31546	39656	31339
5/64	1/8	1-1/2	1/8	31508	31548	39658	31340
3/32	3/16	1-1/2	1/8	31510	31550	39660	31341
7/64	3/16	1-1/2	1/8	31512	31552	39662	31342
*1/8	1/4	1-1/2	1/8	31514	31554	39664	31343
9/64	5/16	2	3/16	31516	31556	39666	31344
5/32	5/16	2	3/16	31518	31558	39668	31345
11/64	5/16	2	3/16	31520	31560	39670	31346
*3/16	3/8	2	3/16	31522	31562	39672	31347
13/64	1/2	2-1/2	1/4	31524	31564	39674	31348
7/32	1/2	2-1/2	1/4	31526	31566	39676	31349
15/64	1/2	2-1/2	1/4	31528	31568	39678	31350
*1/4	1/2	2-1/2	1/4	31530	31570	39680	31351
9/32	1/2	2-1/2	5/16	31532	31572	39682	31352
*5/16	1/2	2-1/2	5/16	31534	31574	39684	31353
*3/8	9/16	2-1/2	3/8	31536	31576	39686	31354
7/16	9/16	2-3/4	7/16	31538	31578	39688	31355
*1/2	5/8	3	1/2	31540	31580	39690	31356
*Series 15B Set				31590	31582	39692	31357

RE = 1/2 Cutting Diameter (DC)

METRIC

2 Flute Double End



TOLERANCES (mm)

<3 DIAMETER

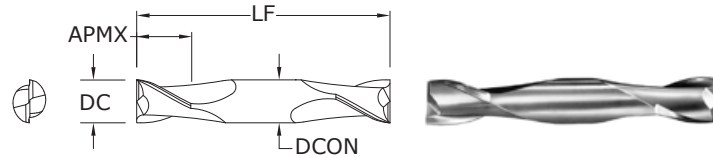
DC = +0,0000 / -0,0254

DCON = h_6

≥3 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6



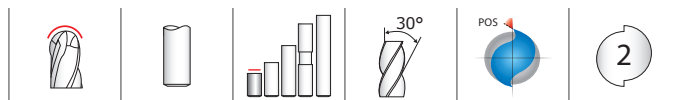
15M
METRIC SERIES

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41505	49010	49031	49052
1,5	3,0	38,0	3,0	41509	49011	49032	49053
2,0	4,0	38,0	3,0	41513	49012	49033	49054
2,5	5,0	38,0	3,0	41517	49013	49034	49055
3,0	6,0	38,0	3,0	41521	49014	49035	49056
3,5	7,0	50,0	4,0	41525	49015	49036	49057
4,0	8,0	50,0	4,0	41529	49016	49037	49058
4,5	9,5	63,0	4,5	41533	49017	49038	49059
5,0	10,0	63,0	5,0	41537	49018	49039	49060
6,0	12,0	63,0	6,0	41541	49019	49040	49061
7,0	12,0	63,0	8,0	41545	49020	49041	49062
8,0	12,0	63,0	8,0	41549	49021	49042	49063
9,0	14,0	75,0	9,0	41553	49022	49043	49064
10,0	14,0	75,0	10,0	41557	49023	49044	49065
11,0	14,0	75,0	12,0	41561	49024	49045	49066
12,0	16,0	75,0	12,0	41565	49025	49046	49067

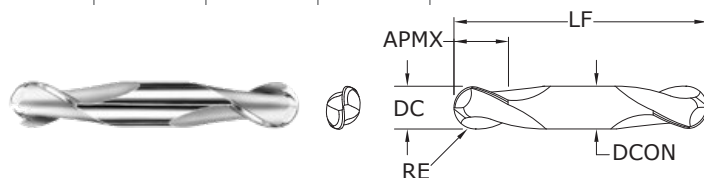
STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

2 Flute Double End Ball End



15MB
METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0.0254

DCON = h_6

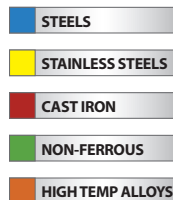
RE = +0,0000 / -0.0127

≥3 DIAMETER

DC = +0,0000 / -0.0508

DCON = h_6

RE = +0,0000 / -0.0254



For patent
information visit
www.ksptpatents.com

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41506	49073	49094	49115
1,5	3,0	38,0	3,0	41510	49074	49095	49116
2,0	4,0	38,0	3,0	41514	49075	49096	49117
2,5	5,0	38,0	3,0	41518	49076	49097	49118
3,0	6,0	38,0	3,0	41522	49077	49098	49119
3,5	7,0	50,0	4,0	41526	49078	49099	49120
4,0	8,0	50,0	4,0	41530	49079	49100	49121
4,5	9,5	63,0	4,5	41534	49080	49101	49122
5,0	10,0	63,0	5,0	41538	49081	49102	49123
6,0	12,0	63,0	6,0	41542	49082	49103	49124
7,0	12,0	63,0	8,0	41546	49083	49104	49125
8,0	12,0	63,0	8,0	41550	49084	49105	49126
9,0	14,0	75,0	9,0	41554	49085	49106	49127
10,0	14,0	75,0	10,0	41558	49086	49107	49128
11,0	14,0	75,0	12,0	41562	49087	49108	49129
12,0	16,0	75,0	12,0	41566	49088	49109	49130

RE = 1/2 Cutting Diameter (DC)

2 Flute Square End Stub

TOLERANCES (inch)

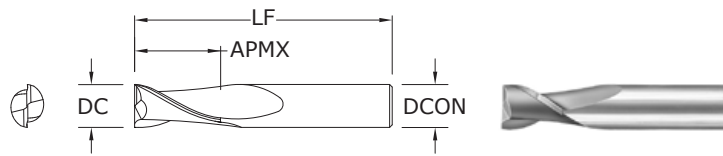
<1/8 DIAMETER

DC = +0.000/-0.001

DCON = h_6

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6 

17

FRACTIONAL SERIES

inch				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/16	1/8	1-1/2	1/8	31701	31750	31303	31358
3/32	3/16	1-1/2	1/8	31703	31751	31304	31359
1/8	1/4	1-1/2	1/8	31705	31752	31305	31360
5/32	5/16	2	3/16	31707	31753	31306	31361
3/16	3/8	2	3/16	31709	31754	31307	31362
7/32	7/16	2	1/4	31711	31755	31308	31363
1/4	1/2	2	1/4	31713	31756	31309	31364
5/16	1/2	2	5/16	31715	31757	31310	31365
3/8	5/8	2	3/8	31717	31758	31311	31366
7/16	5/8	2-1/2	7/16	31719	31759	31312	31367
1/2	5/8	2-1/2	1/2	31721	31760	31313	31368
5/8	3/4	3	5/8	31723	31761	31314	31369
3/4	1	3	3/4	31725	31762	31315	31370

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent information visit
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TOLERANCES (mm)

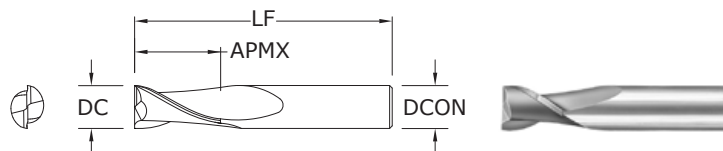
<3 DIAMETER

DC = +0.0000/-0.0254

DCON = h_6

≥3 DIAMETER

DC = +0.0000/-0.0508

DCON = h_6 

17M

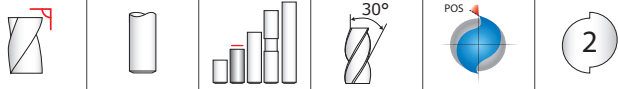
METRIC SERIES

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1,0	2,0	38,0	3,0	41705	49262	49283	49304
1,5	3,0	38,0	3,0	41709	49263	49284	49305
2,0	4,0	38,0	3,0	41713	49264	49285	49306
2,5	5,0	38,0	3,0	41717	49265	49286	49307
3,0	6,0	38,0	3,0	41721	49266	49287	49308
3,5	7,0	50,0	4,0	41725	49267	49288	49309
4,0	8,0	50,0	4,0	41729	49268	49289	49310
4,5	9,5	50,0	4,5	41733	49269	49290	49311
5,0	10,0	50,0	5,0	41737	49270	49291	49312
6,0	12,0	50,0	6,0	41741	49271	49292	49313
7,0	12,0	50,0	8,0	41745	49272	49293	49314
8,0	12,0	50,0	8,0	41749	49273	49294	49315
9,0	14,0	50,0	9,0	41753	49274	49295	49316
10,0	16,0	50,0	10,0	41757	49275	49296	49317
11,0	19,0	63,0	12,0	41761	49276	49297	49318
12,0	19,0	63,0	12,0	41765	49277	49298	49319

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

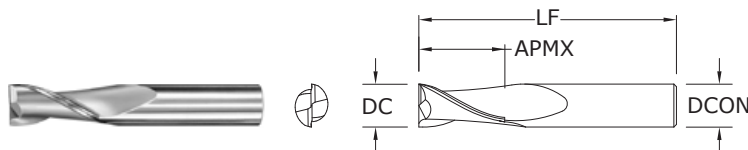
For patent information visit
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2 Flute High Shear



52

FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

≥1/8 DIAMETER

DC = +0.000 / -0.002

DCON = h_6

inch

EDP NO.

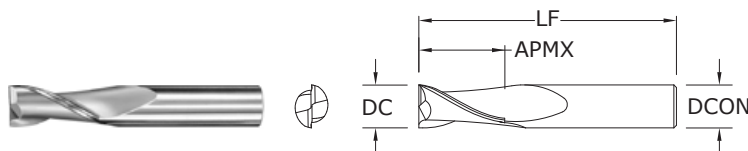
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
1/16	3/16	1-1/2	1/8	35273	35300
3/32	3/8	1-1/2	1/8	35275	35301
1/8	7/16	1-1/2	1/8	35277	35302
5/32	9/16	2	3/16	35278	35303
3/16	9/16	2	3/16	35279	35304
7/32	5/8	2-1/2	1/4	35280	35305
1/4	3/4	2-1/2	1/4	35281	35306
9/32	3/4	2-1/2	5/16	35282	35307
5/16	13/16	2-1/2	5/16	35283	35308
3/8	7/8	2-1/2	3/8	35285	35309
7/16	1	2-3/4	7/16	35287	35310
1/2	1	3	1/2	35289	35311
9/16	1-1/8	3-1/2	9/16	35291	35312
5/8	1-1/4	3-1/2	5/8	35293	35313
3/4	1-1/2	4	3/4	35295	35314
1	1-1/2	4	1	35297	35315

NON-FERROUS

For patent
information visit
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52M

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0.0000 / -0.0254

DCON = h_6

≥3 DIAMETER

DC = +0.0000 / -0.0508

DCON = h_6

mm

EDP NO.

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
3,0	7,0	38,0	3,0	45277	49829
3,5	7,0	57,0	6,0	45279	49830
4,0	8,0	57,0	6,0	45281	49831
4,5	8,0	57,0	6,0	45283	49832
5,0	10,0	57,0	6,0	45285	49833
6,0	10,0	57,0	6,0	45287	49834
8,0	16,0	63,0	8,0	45289	49835
10,0	19,0	72,0	10,0	45291	49836
12,0	22,0	83,0	12,0	45293	49837
14,0	22,0	83,0	14,0	45295	49838
16,0	26,0	92,0	16,0	45297	49839
20,0	32,0	104,0	20,0	45299	49840

NON-FERROUS

For patent
information visit
www.ksptpatents.com

2 Flute Square End Long Reach

TOLERANCES (inch)

1/8–1/4 DIAMETER

DC = +0.0000 / -0.0012

DCON = h_6

>1/4–3/8 DIAMETER

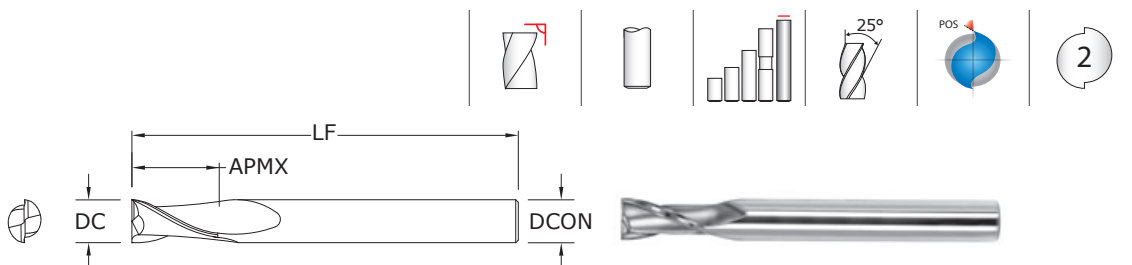
DC = +0.0000 / -0.0016

DCON = h_6

>3/8–3/4 DIAMETER

DC = +0.0000 / -0.0020

DCON = h_6



59

FRACTIONAL SERIES

inch				EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/8	3/8	2-1/2	1/4	32280	32260	32270
3/16	9/16	3	1/4	32281	32261	32271
1/4	5/8	3-1/2	1/4	32282	32262	32272
5/16	11/16	4	5/16	32283	32263	32273
3/8	7/8	4	3/8	32284	32264	32274
1/2	1	4-1/2	1/2	32285	32265	32275
5/8	1-1/8	5	5/8	32286	32266	32276
3/4	1-3/8	5-1/4	3/4	32287	32267	32277

Neck Option Available

STEELS

STAINLESS STEELS

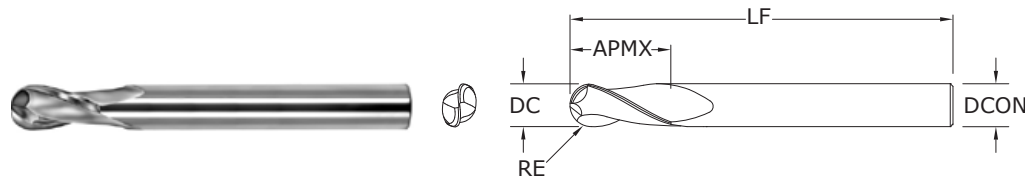
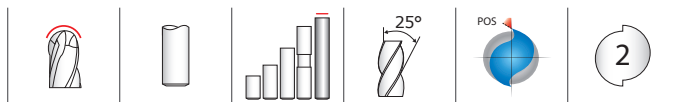
CAST IRON

NON-FERROUS

HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

2 Flute Ball End Long Reach



59B

FRACTIONAL SERIES

TOLERANCES (inch)

1/8–1/4 DIAMETER

DC = +0.0000/–0.0012

DCON = h_6

RE = +0.0000/–0.0006

>1/4–3/8 DIAMETER

DC = +0.0000/–0.0016

DCON = h_6

RE = +0.0000/–0.0008

>3/8–3/4 DIAMETER

DC = +0.0000/–0.0020

DCON = h_6

RE = +0.0000/–0.0010

STEELS

STAINLESS STEELS

CAST IRON

NON-FERROUS

HIGH TEMP ALLOYS

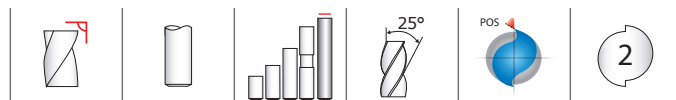
For patent
information visit
www.ksptpatents.com

inch				EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/8	3/8	2-1/2	1/4	32210	32290	32200
3/16	9/16	3	1/4	32211	32291	32201
1/4	5/8	3-1/2	1/4	32212	32292	32202
5/16	11/16	4	5/16	32213	32293	32203
3/8	7/8	4	3/8	32214	32294	32204
1/2	1	4-1/2	1/2	32215	32295	32205
5/8	1-1/8	5	5/8	32216	32296	32206
3/4	1-3/8	5-1/4	3/4	32217	32297	32207

Neck Option Available

RE = 1/2 Cutting Diameter (DC)

2 Flute Square End Long Reach



TOLERANCES (mm)

3-6 DIAMETER

DC = +0,0000 / -0,0254

DCON = h_6

>6-10 DIAMETER

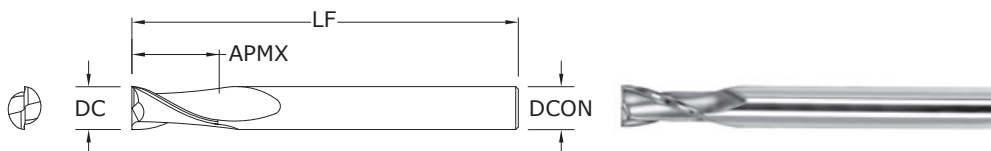
DC = +0,0000 / -0,0406

DCON = h_6

>10-20 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6



59M

METRIC SERIES

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
3,0	9,0	60,0	6,0	43910	43920	43930	43950
4,0	12,0	70,0	6,0	43911	43921	43931	43951
6,0	15,0	80,0	6,0	43912	43922	43932	43952
8,0	20,0	89,0	8,0	43913	43923	43933	43953
10,0	25,0	100,0	10,0	43914	43924	43934	43954
12,0	30,0	110,0	12,0	43915	43925	43935	43955
14,0	35,0	120,0	16,0	43916	43926	43936	43956
16,0	40,0	120,0	16,0	43917	43927	43937	43957
18,0	40,0	130,0	20,0	43918	43928	43938	43958
20,0	45,0	130,0	20,0	43919	43929	43939	43959

Neck Option Available

STEELS

STAINLESS STEELS

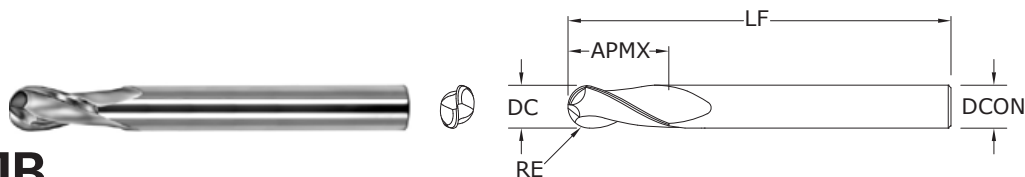
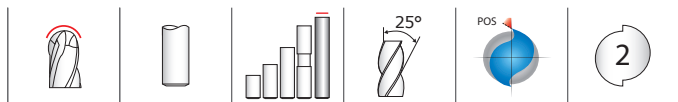
CAST IRON

NON-FERROUS

HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

2 Flute Ball End Long Reach



59MB
METRIC SERIES

TOLERANCES (mm)

3–6 DIAMETER

DC = +0,0000 / -0,0254

DCON = h_6

RE = +0,0000 / -0,0127

>6–10 DIAMETER

DC = +0,0000 / -0,0406

DCON = h_6

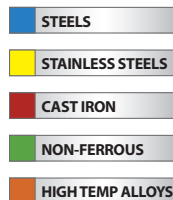
RE = +0,0000 / -0,0203

>10–20 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6

RE = +0,0000 / -0,0254



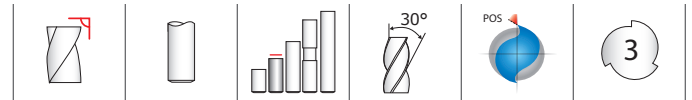
For patent
information visit
www.ksptpatents.com

mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
3,0	9,0	60,0	6,0	43900	49622	49632	49642
4,0	12,0	70,0	6,0	43901	49623	49633	49643
6,0	15,0	80,0	6,0	43902	49624	49634	49644
8,0	20,0	89,0	8,0	43903	49625	49635	49645
10,0	25,0	100,0	10,0	43904	49626	49636	49646
12,0	30,0	110,0	12,0	43905	49627	49637	49647
14,0	35,0	120,0	16,0	43906	49628	49638	49648
16,0	40,0	120,0	16,0	43907	49629	49639	49649
18,0	40,0	130,0	20,0	43908	49630	49640	49650
20,0	45,0	130,0	20,0	43909	49631	49641	49651

Neck Option Available

RE = 1/2 Cutting Diameter (DC)

FRACTIONAL 3 Flute Square End



TOLERANCES (inch)

<1/8 DIAMETER

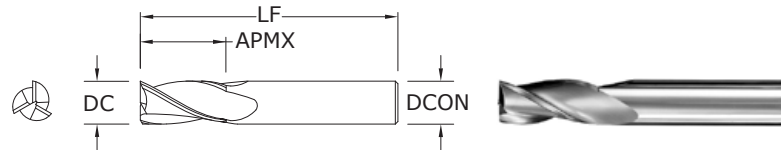
DC = +0.000/-0.001

DCON = h_6

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6



5

FRACTIONAL SERIES

inch				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/64	1/32	1-1/2	1/8	30501	39701	30771	30811
1/32	5/64	1-1/2	1/8	30503	39703	30772	30812
3/64	7/64	1-1/2	1/8	30505	39705	30773	30813
1/16	3/16	1-1/2	1/8	30507	39707	30774	30814
5/64	3/16	1-1/2	1/8	30509	39709	30775	30815
3/32	9/32	1-1/2	1/8	30511	39711	30776	30816
7/64	3/8	1-1/2	1/8	30513	39713	30777	30817
1/8	3/8	1-1/2	1/8	30577	39777	30809	30849
*1/8	1/2	1-1/2	1/8	30515	39715	30778	30818
9/64	1/2	2	3/16	30517	39717	30779	30819
5/32	1/2	2	3/16	30519	39719	30780	30820
11/64	5/8	2	3/16	30521	39721	30781	30821
*3/16	5/8	2	3/16	30523	39723	30782	30822
13/64	5/8	2-1/2	1/4	30525	39725	30783	30823
7/32	5/8	2-1/2	1/4	30527	39727	30784	30824
15/64	3/4	2-1/2	1/4	30529	39729	30785	30825
*1/4	3/4	2-1/2	1/4	30531	39731	30786	30826
17/64	3/4	2-1/2	5/16	30533	39733	30787	30827
9/32	3/4	2-1/2	5/16	30535	39735	30788	30828
19/64	13/16	2-1/2	5/16	30537	39737	30789	30829
*5/16	13/16	2-1/2	5/16	30539	39739	30790	30830
21/64	1	2-1/2	3/8	30541	39741	30791	30831
11/32	1	2-1/2	3/8	30543	39743	30792	30832
23/64	1	2-1/2	3/8	30545	39745	30793	30833
*3/8	1	2-1/2	3/8	30547	39747	30794	30834
25/64	1	2-3/4	7/16	30549	39749	30795	30835
13/32	1	2-3/4	7/16	30551	39751	30796	30836
27/64	1	2-3/4	7/16	30553	39753	30797	30837
7/16	1	2-3/4	7/16	30555	39755	30798	30838
29/64	1	3	1/2	30557	39757	30799	30839
15/32	1	3	1/2	30559	39759	30800	30840
31/64	1	3	1/2	30561	39761	30801	30841
*1/2	1	3	1/2	30563	39763	30802	30842
9/16	1-1/8	3-1/2	9/16	30565	39765	30803	30843
5/8	1-1/4	3-1/2	5/8	30567	39767	30804	30844
11/16	1-3/8	4	3/4	30569	39769	30805	30845
3/4	1-1/2	4	3/4	30571	39771	30806	30846
7/8	1-1/2	4	7/8	30573	39773	30807	30847
1	1-1/2	4	1	30575	39775	30808	30848
*Series 5 Set				30589	39789	30810	30850

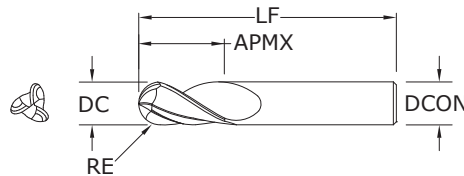
- STEELS
- STAINLESS STEELS
- CAST IRON
- NON-FERROUS
- HIGH TEMP ALLOYS

For patent information visit
www.ksptpatents.com

3 Flute Ball End

**5B**

FRACTIONAL SERIES

**TOLERANCES (inch)****<1/8 DIAMETER**

DC = +0.000/-0.001

DCON = h_6

RE = +0.000/-0.0005

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6

RE = +0.000/-0.001

STEELS

STAINLESS STEELS

CAST IRON

NON-FERROUS

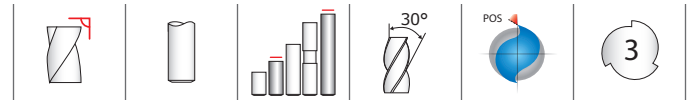
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

inch				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/64	1/32	1-1/2	1/8	30502	30851	30602	31130
1/32	5/64	1-1/2	1/8	30504	30852	30604	31131
3/64	7/64	1-1/2	1/8	30506	30853	30606	31132
1/16	3/16	1-1/2	1/8	30508	30854	30608	31133
5/64	3/16	1-1/2	1/8	30510	30855	30610	31134
3/32	9/32	1-1/2	1/8	30512	30856	30612	31135
7/64	3/8	1-1/2	1/8	30514	30857	30902	31136
1/8	3/8	1-1/2	1/8	30578	30889	30943	31168
*1/8	1/2	1-1/2	1/8	30516	30858	30904	31137
9/64	1/2	2	3/16	30518	30859	30906	31138
5/32	1/2	2	3/16	30520	30860	30908	31139
11/64	5/8	2	3/16	30522	30861	30910	31140
*3/16	5/8	2	3/16	30524	30862	30912	31141
13/64	5/8	2-1/2	1/4	30526	30863	30914	31142
7/32	5/8	2-1/2	1/4	30528	30864	30916	31143
15/64	3/4	2-1/2	1/4	30530	30865	30918	31144
*1/4	3/4	2-1/2	1/4	30532	30866	30920	31145
17/64	3/4	2-1/2	5/16	30534	30867	30921	31146
9/32	3/4	2-1/2	5/16	30536	30868	30922	31147
19/64	13/16	2-1/2	5/16	30538	30869	30923	31148
*5/16	13/16	2-1/2	5/16	30540	30870	30924	31149
21/64	1	2-1/2	3/8	30542	30871	30925	31150
11/32	1	2-1/2	3/8	30544	30872	30926	31151
23/64	1	2-1/2	3/8	30546	30873	30927	31152
*3/8	1	2-1/2	3/8	30548	30874	30928	31153
25/64	1	2-3/4	7/16	30550	30875	30929	31154
13/32	1	2-3/4	7/16	30552	30876	30930	31155
27/64	1	2-3/4	7/16	30554	30877	30931	31156
7/16	1	2-3/4	7/16	30556	30878	30932	31157
29/64	1	3	1/2	30558	30879	30933	31158
15/32	1	3	1/2	30560	30880	30934	31159
31/64	1	3	1/2	30562	30881	30935	31160
*1/2	1	3	1/2	30564	30882	30936	31161
9/16	1-1/8	3-1/2	9/16	30566	30883	30937	31162
5/8	1-1/4	3-1/2	5/8	30568	30884	30938	31163
11/16	1-3/8	4	3/4	30570	30885	30939	31164
3/4	1-1/2	4	3/4	30572	30886	30940	31165
7/8	1-1/2	4	7/8	30574	30887	30941	31166
1	1-1/2	4	1	30576	30888	30942	31167
*Series 5B Set				30590	30900	30944	31169

RE = 1/2 Cutting Diameter (DC)

3 Flute Square End



TOLERANCES (mm)

<3 DIAMETER

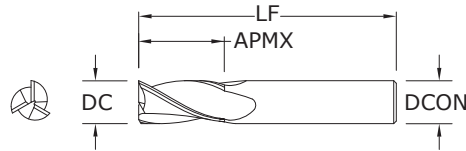
DC = +0,0000/-0,0254

DCON = h_6

≥3 DIAMETER

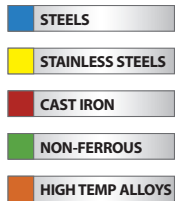
DC = +0,0000/-0,0508

DCON = h_6



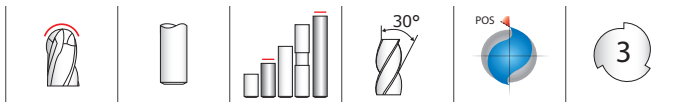
**5M•
5XLM**
METRIC SERIES

mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40505	48756	48778	48799	5M
1,5	4,5	38,0	3,0	40509	48757	48779	48800	5M
2,0	6,3	38,0	3,0	40513	48758	48780	48801	5M
2,5	9,5	38,0	3,0	40517	48759	48781	48802	5M
3,0	12,0	38,0	3,0	40521	48760	48782	48803	5M
3,0	25,0	75,0	3,0	43501	49466	49479	49492	5XLM
3,5	12,0	50,0	4,0	40525	48761	48783	48804	5M
4,0	14,0	50,0	4,0	40529	48762	48784	48805	5M
4,0	25,0	75,0	4,0	43503	49467	49480	49493	5XLM
4,5	16,0	50,0	6,0	40533	48763	48785	48806	5M
5,0	16,0	50,0	6,0	40537	48764	48786	48807	5M
5,0	25,0	75,0	5,0	43507	49469	49482	49495	5XLM
6,0	19,0	50,0	6,0	40541	48765	48787	48808	5M
6,0	25,0	75,0	6,0	43505	49468	49481	49494	5XLM
7,0	19,0	63,0	8,0	40545	48766	48788	48809	5M
8,0	20,0	63,0	8,0	40549	48767	48789	48810	5M
8,0	25,0	75,0	8,0	43515	49470	49483	49496	5XLM
9,0	22,0	75,0	10,0	40553	48768	48790	48811	5M
10,0	22,0	75,0	10,0	40557	48769	48791	48812	5M
10,0	38,0	100,0	10,0	43525	49471	49484	49497	5XLM
11,0	25,0	75,0	12,0	40561	48770	48792	48813	5M
12,0	25,0	75,0	12,0	40565	48771	48793	48814	5M
12,0	50,0	100,0	12,0	43535	49472	49485	49498	5XLM
12,0	75,0	150,0	12,0	43545	49473	49486	49499	5XLM
14,0	32,0	89,0	14,0	40569	48772	48794	48815	5M
14,0	75,0	150,0	14,0	43555	49474	49487	49500	5XLM
16,0	32,0	89,0	16,0	40573	48773	48795	48816	5M
16,0	75,0	150,0	16,0	43565	49475	49488	49501	5XLM
18,0	38,0	100,0	18,0	40577	48774	48796	48817	5M
18,0	75,0	150,0	18,0	43575	49476	49489	49502	5XLM
20,0	38,0	100,0	20,0	40581	48775	48797	48818	5M
20,0	75,0	150,0	20,0	43585	49477	49490	49503	5XLM
25,0	38,0	100,0	25,0	40585	48776	48798	48819	5M
25,0	75,0	150,0	25,0	43595	49478	49491	49504	5XLM



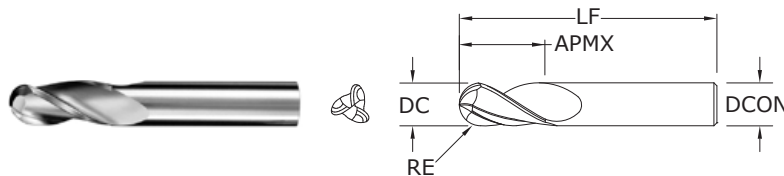
For patent information visit
www.ksptpatents.com

3 Flute Ball End



5MB• 5XLMB

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0.0254

DCON = h_8

RE = +0,0000 / -0.0127

≥3 DIAMETER

DC = +0,0000 / -0.0508

DCON = h_8

RE = +0,0000 / -0.0254

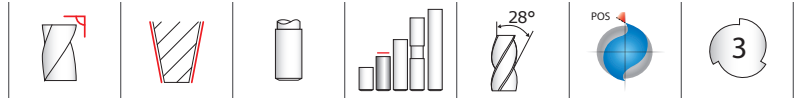
STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	EDP NO.				SERIES
				UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40506	48820	48842	48863	5MB
1,5	4,5	38,0	3,0	40510	48821	48843	48864	5MB
2,0	6,3	38,0	3,0	40514	48822	48844	48865	5MB
2,5	9,5	38,0	3,0	40518	48823	48845	48866	5MB
3,0	12,0	38,0	3,0	40522	48824	48846	48867	5MB
3,0	25,0	75,0	3,0	43502	49583	49596	49609	5XLMB
3,5	12,0	50,0	4,0	40526	48825	48847	48868	5MB
4,0	14,0	50,0	4,0	40530	48826	48848	48869	5MB
4,0	25,0	75,0	4,0	43504	49584	49597	49610	5XLMB
4,5	16,0	50,0	6,0	40534	48827	48849	48870	5MB
5,0	16,0	50,0	6,0	40538	48828	48850	48871	5MB
5,0	25,0	75,0	5,0	43508	49586	49599	49612	5XLMB
6,0	19,0	50,0	6,0	40542	48829	48851	48872	5MB
6,0	25,0	75,0	6,0	43506	49585	49598	49611	5XLMB
7,0	19,0	63,0	8,0	40546	48830	48852	48873	5MB
8,0	20,0	63,0	8,0	40550	48831	48853	48874	5MB
8,0	25,0	75,0	8,0	43516	49587	49600	49613	5XLMB
9,0	22,0	75,0	10,0	40554	48832	48854	48875	5MB
10,0	22,0	75,0	10,0	40558	48833	48855	48876	5MB
10,0	38,0	100,0	10,0	43526	49588	49601	49614	5XLMB
11,0	25,0	75,0	12,0	40562	48834	48856	48877	5MB
12,0	25,0	75,0	12,0	40566	48835	48857	48878	5MB
12,0	50,0	100,0	12,0	43536	49589	49602	49615	5XLMB
12,0	75,0	150,0	12,0	43546	49590	49603	49616	5XLMB
14,0	32,0	89,0	14,0	40570	48836	48858	48879	5MB
14,0	75,0	150,0	14,0	43556	49591	49604	49617	5XLMB
16,0	32,0	89,0	16,0	40574	48837	48859	48880	5MB
16,0	75,0	150,0	16,0	43566	49592	49605	49618	5XLMB
18,0	38,0	100,0	18,0	40578	48838	48860	48881	5MB
18,0	75,0	150,0	18,0	43576	49593	49606	49619	5XLMB
20,0	38,0	100,0	20,0	40582	48839	48861	48882	5MB
20,0	75,0	150,0	20,0	43586	49594	49607	49620	5XLMB
25,0	38,0	100,0	25,0	40586	48840	48862	48883	5MB
25,0	75,0	150,0	25,0	43596	49595	49608	49621	5XLMB

RE = 1/2 Cutting Diameter (DC)

FRACTIONAL Tapered Square End

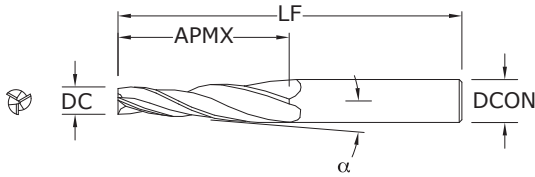


TOLERANCES (inch)

DC = +0.001 / -0.002

DCON = h_6

α = +10' / -10'



23

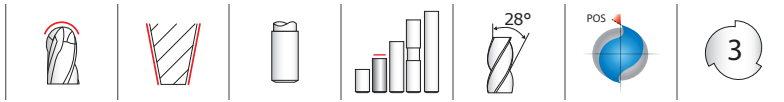
FRACTIONAL SERIES

inch					EDP NO.			
SHANK DIAMETER DCON	CENTER LINE ANGLE α	SMALL DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/4	1°	1/8	1-1/2	3	32301	32370	32302	32345
1/4	1°30'	1/8	1-1/2	3	32303	32371	32304	32346
1/4	2°	1/8	1-1/4	3	32305	32372	32306	32347
1/4	3°	1/8	1	3	32307	32373	32308	32348
1/4	5°	1/8	3/4	3	32309	32374	32310	32349
1/4	7°	1/8	1/2	3	32311	32375	32312	32350
1/4	10°	3/32	1/2	3	32313	32376	32314	32351
3/8	1°	3/16	1-3/4	3-1/2	32315	32377	32316	32352
3/8	1°30'	3/16	1-3/4	3-1/2	32317	32378	32318	32353
3/8	2°	3/16	1-3/4	3-1/2	32319	32379	32320	32354
3/8	3°	5/32	1-3/4	3-1/2	32321	32380	32322	32355
3/8	5°	1/8	1-1/2	3-1/2	32323	32381	32324	32356
3/8	7°	1/8	1	3-1/2	32325	32382	32326	32357
3/8	10°	1/8	3/4	3-1/2	32327	32383	32328	32358
1/2	1°	1/4	2	4	32329	32384	32330	32359
1/2	2°	1/4	2	4	32333	32385	32334	32360
1/2	3°	1/4	2	4	32335	32386	32336	32361
1/2	5°	1/4	1-1/4	4	32337	32387	32338	32362
1/2	7°	3/16	1-1/4	4	32339	32388	32340	32363
1/2	10°	1/8	1	4	32341	32389	32342	32364

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

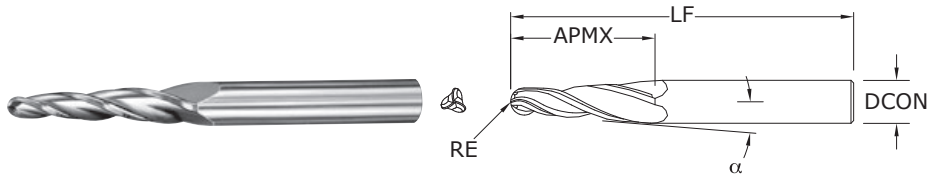
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Tapered Ball End



24

FRACTIONAL SERIES



TOLERANCES (inch)

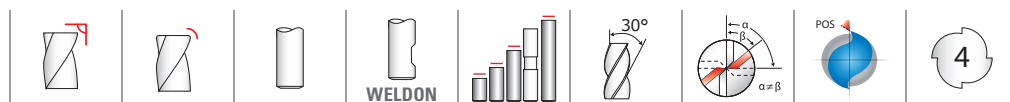
DCON = h_6
 RE = $+0.0000/-0.0010$
 α = $+10' / -10'$

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

SHANK DIAMETER DCON	CENTER LINE ANGLE α	inch			EDP NO.			
		RADIUS RE	LENGTH OF CUT APMX	OVERALL LENGTH LF	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
1/4	1°	.062	1-1/2	3	32402	32403	32445	32470
1/4	1°30'	.062	1-1/2	3	32404	32405	32446	32471
1/4	2°	.062	1-1/4	3	32406	32407	32447	32472
1/4	3°	.062	1	3	32408	32409	32448	32473
1/4	5°	.062	3/4	3	32410	32411	32449	32474
1/4	7°	.062	1/2	3	32412	32413	32450	32475
1/4	10°	.047	1/2	3	32414	32415	32451	32476
3/8	1°	.093	1-3/4	3-1/2	32416	32417	32452	32477
3/8	1°30'	.093	1-3/4	3-1/2	32418	32419	32453	32478
3/8	2°	.093	1-3/4	3-1/2	32420	32421	32454	32479
3/8	3°	.078	1-3/4	3-1/2	32422	32423	32455	32480
3/8	5°	.062	1-1/2	3-1/2	32424	32425	32456	32481
3/8	7°	.062	1	3-1/2	32426	32427	32457	32482
3/8	10°	.062	3/4	3-1/2	32428	32429	32458	32483
1/2	1°	.125	2	4	32430	32431	32459	32484
1/2	2°	.125	2	4	32434	32435	32460	32485
1/2	3°	.125	2	4	32436	32437	32461	32486
1/2	5°	.125	1-1/4	4	32438	32439	32462	32487
1/2	7°	.093	1-1/4	4	32440	32441	32463	32488
1/2	10°	.062	1	4	32442	32443	32464	32489

4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

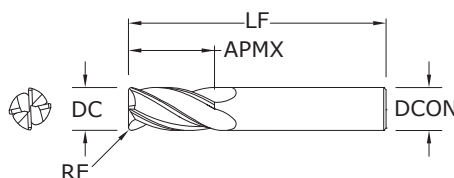
≥1/8 DIAMETER

DC = +0.000 / -0.002

1CR DC = -0.001 / -0.002

DCON = h_6

RE = +0.000 / -0.002



1 • 1L • 1EL •
1CR • 16
 FRACTIONAL SERIES

inch						EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	WELDON FLAT	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1/64	1/32	1-1/2	1/8	—		30101	39101	39001	30191	1
1/32	5/64	1-1/2	1/8	—		30103	39103	39003	30192	1
3/64	7/64	1-1/2	1/8	—		30105	39105	39005	30193	1
1/16	1/8	1-1/2	1/8	—		31601	31650	31238	31251	16
† 1/16	3/16	1-1/2	1/8	—		30107	39107	39007	30194	1
5/64	3/16	1-1/2	1/8	—		30109	39109	39009	30195	1
3/32	3/16	1-1/2	1/8	—		31603	31651	31239	31252	16
3/32	9/32	1-1/2	1/8	—		30111	39111	39011	30196	1
7/64	3/8	1-1/2	1/8	—		30113	39113	39013	30197	1
1/8	1/4	1-1/2	1/8	—		31605	31652	31240	31253	16
1/8	3/8	1-1/2	1/8	—		30177	39177	39077	30029	1
*† 1/8	1/2	1-1/2	1/8	—		30115	39115	39015	30198	1
1/8	1/2	1-1/2	1/8	.015		38001	38002	38115	38157	1CR
1/8	1/2	1-1/2	1/8	.020		38003	38004	38116	38158	1CR
1/8	3/4	2-1/4	1/8	—		33141	31727	31737	31747	1L
1/8	1	3	1/8	—		33143	31860	31870	31880	1EL
9/64	1/2	2	3/16	—		30117	39117	39017	30199	1
5/32	5/16	2	3/16	—		31607	31653	31241	31254	16
5/32	1/2	2	3/16	—		30119	39119	39019	30000	1
11/64	5/8	2	3/16	—		30121	39121	39021	30001	1
3/16	3/8	2	3/16	—		31609	31654	31242	31255	16
*† 3/16	5/8	2	3/16	—		30123	39123	39023	30002	1
3/16	5/8	2	3/16	.015		38009	38010	38117	38159	1CR
3/16	5/8	2	3/16	.020		38011	38012	38118	38160	1CR
3/16	5/8	2	3/16	.030		38013	38014	38119	38161	1CR
3/16	3/4	2-1/2	3/16	—		33101	31728	31738	31748	1L
3/16	1-1/8	3	3/16	—		33121	31861	31871	31881	1EL
13/64	5/8	2-1/2	1/4	—		30125	39125	39025	30003	1
7/32	7/16	2	1/4	—		31611	31655	31243	31256	16
7/32	5/8	2-1/2	1/4	—		30127	39127	39027	30004	1
15/64	3/4	2-1/2	1/4	—		30129	39129	39029	30005	1
1/4	1/2	2	1/4	—		31613	31656	31244	31257	16
*† 1/4	3/4	2-1/2	1/4	—		30131	39131	39031	30006	1
1/4	3/4	2-1/2	1/4	—	•	30300	—	—	—	1

STEELS

STAINLESS STEELS

CAST IRON

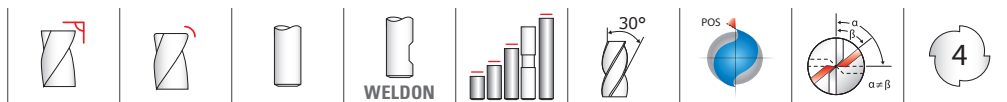
NON-FERROUS

HIGH TEMP ALLOYS

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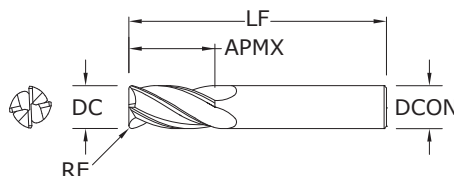
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4 Flute Square End • 4 Flute Corner Radius



**1•1L•1EL •
1CR • 16**

FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

≥1/8 DIAMETER

DC = +0.000 / -0.002

1CR DC = -0.001 / -0.002

DCON = h_6

RE = +0.000 / -0.002

CONTINUED

STEELS

STAINLESS STEELS

CAST IRON

NON-FERROUS

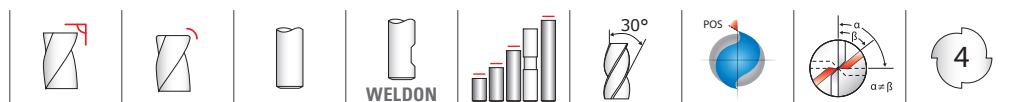
HIGH TEMP ALLOYS

For patent
information visit
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CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	WELDON FLAT	EDP NO.				SERIES
						UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1/4	3/4	2-1/2	1/4	.015		38019	38020	38120	38162	1CR
1/4	3/4	2-1/2	1/4	.020		38021	38022	38121	38163	1CR
1/4	3/4	2-1/2	1/4	.030		38023	38024	38122	38164	1CR
1/4	3/4	2-1/2	1/4	.045		38025	38026	38123	38165	1CR
1/4	1-1/8	3	1/4	—		33103	31729	31739	31749	1L
1/4	1-1/2	4	1/4	—		33123	31862	31872	31882	1EL
17/64	3/4	2-1/2	5/16	—		30133	39133	39033	30007	1
9/32	3/4	2-1/2	5/16	—		30135	39135	39035	30008	1
19/64	13/16	2-1/2	5/16	—		30137	39137	39037	30009	1
5/16	1/2	2	5/16	—		31615	31657	31245	31258	16
*1/5	13/16	2-1/2	5/16	—		30139	39139	39039	30010	1
5/16	13/16	2-1/2	5/16	.015		38031	38032	38124	38166	1CR
5/16	13/16	2-1/2	5/16	.020		38033	38034	38125	38167	1CR
5/16	13/16	2-1/2	5/16	.030		38035	38036	38126	38168	1CR
5/16	13/16	2-1/2	5/16	.045		38037	38038	38127	38169	1CR
5/16	1-1/8	3	5/16	—		33105	31730	31740	31763	1L
5/16	1-5/8	4	5/16	—		33125	31863	31873	31883	1EL
21/64	1	2-1/2	3/8	—		30141	39141	39041	30011	1
11/32	1	2-1/2	3/8	—		30143	39143	39043	30012	1
23/64	1	2-1/2	3/8	—		30145	39145	39045	30013	1
3/8	5/8	2	3/8	—		31617	31658	31246	31259	16
*1/3	1	2-1/2	3/8	—		30147	39147	39047	30014	1
3/8	1	2-1/2	3/8	—	•	30179	—	—	30379	1
3/8	1	2-1/2	3/8	.015	•	38045	38046	38128	38170	1CR
3/8	1	2-1/2	3/8	.020	•	38047	38048	38129	38171	1CR
3/8	1	2-1/2	3/8	.030	•	38049	38050	38130	38172	1CR
3/8	1	2-1/2	3/8	.045	•	38051	38052	38131	38173	1CR
3/8	1-1/8	3	3/8	—		33107	31731	31741	31764	1L
3/8	1-3/4	4	3/8	—		33127	31864	31874	31884	1EL
25/64	1	2-3/4	7/16	—		30149	39149	39049	30015	1
13/32	1	2-3/4	7/16	—		30151	39151	39051	30016	1
27/64	1	2-3/4	7/16	—		30153	39153	39053	30017	1

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4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

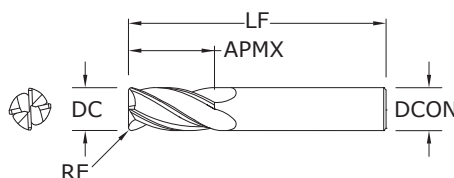
≥1/8 DIAMETER

DC = +0.000 / -0.002

1CR DC = -0.001 / -0.002

DCON = h_6

RE = +0.000 / -0.002



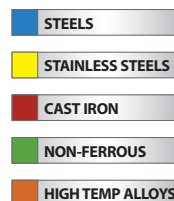
1 • 1L • 1EL •
1CR • 16

FRACTIONAL SERIES

inch						EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	WELDON FLAT	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
7/16	5/8	2-1/2	7/16	—		31619	31659	31247	31260	16
7/16	1	2-3/4	7/16	—		30155	39155	39055	30018	1
7/16	2	4-1/2	7/16	—		33109	31732	31742	31765	1L
7/16	3	6	7/16	—		33129	31865	31875	31885	1EL
29/64	1	3	1/2	—		30157	39157	39057	30019	1
15/32	1	3	1/2	—		30159	39159	39059	30020	1
31/64	1	3	1/2	—		30161	39161	39061	30021	1
1/2	5/8	2-1/2	1/2	—		31621	31660	31248	31261	16
*1/2	1	3	1/2	—		30163	39163	39063	30022	1
1/2	1	3	1/2	—	•	30180	—	—	30380	1
1/2	1	3	1/2	.015	•	38059	38060	38132	38174	1CR
1/2	1	3	1/2	.020	•	38061	38062	38133	38175	1CR
1/2	1	3	1/2	.030	•	38063	38064	38134	38176	1CR
1/2	1	3	1/2	.045	•	38065	38066	38135	38177	1CR
1/2	1	3	1/2	.060	•	38067	38068	38136	38178	1CR
1/2	2	4-1/2	1/2	—		33111	31733	31743	31766	1L
1/2	3	6	1/2	—		33131	31866	31876	31886	1EL
9/16	1-1/8	3-1/2	9/16	—		30165	39165	39065	30023	1
5/8	3/4	3	5/8	—		31623	31661	31249	31262	16
5/8	1-1/4	3-1/2	5/8	—		30167	39167	39067	30024	1
5/8	1-1/4	3-1/2	5/8	—	•	30181	—	—	30381	1
5/8	1-1/4	3-1/2	5/8	.015	•	38073	38074	38137	38179	1CR
5/8	1-1/4	3-1/2	5/8	.020	•	38075	38076	38138	38180	1CR
5/8	1-1/4	3-1/2	5/8	.030	•	38077	38078	38139	38181	1CR
5/8	1-1/4	3-1/2	5/8	.045	•	38079	38080	38140	38182	1CR
5/8	1-1/4	3-1/2	5/8	.060	•	38081	38082	38141	38183	1CR
5/8	1-1/4	3-1/2	5/8	.090	•	38083	38084	38142	38184	1CR
5/8	2-1/4	5	5/8	—		33113	31734	31744	31767	1L
5/8	3	6	5/8	—		33133	31867	31877	31887	1EL
11/16	1-3/8	4	3/4	—		30169	39169	39069	30025	1
3/4	1	3	3/4	—		31625	31662	31250	31263	16
3/4	1-1/2	4	3/4	—		30171	39171	39071	30026	1

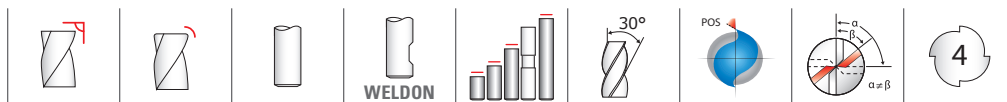
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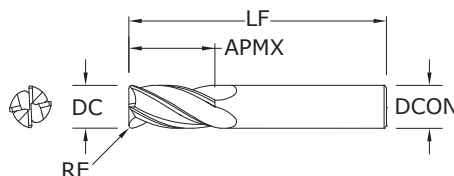
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4 Flute Square End • 4 Flute Corner Radius



**1•1L•1EL •
1CR • 16**

FRACTIONAL SERIES



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000 / -0.001

DCON = h_6

≥1/8 DIAMETER

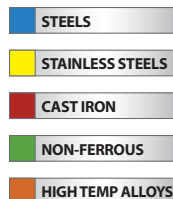
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1CR DC = -0.001 / -0.002

DCON = h_6

RE = +0.000 / -0.002

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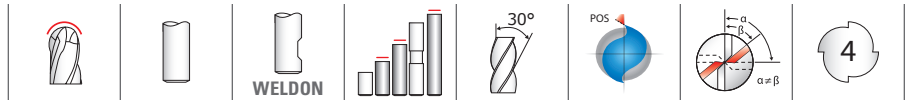


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inch						EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	WELDON FLAT	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
3/4	1-1/2	4	3/4	—	•	30182	—	—	30382	1
3/4	1-1/2	4	3/4	.015	•	38087	38088	38143	38185	1CR
3/4	1-1/2	4	3/4	.020	•	38089	38090	38144	38186	1CR
3/4	1-1/2	4	3/4	.030	•	38091	38092	38145	38187	1CR
3/4	1-1/2	4	3/4	.045	•	38093	38094	38146	38188	1CR
3/4	1-1/2	4	3/4	.060	•	38095	38096	38147	38189	1CR
3/4	1-1/2	4	3/4	.090	•	38097	38098	38148	38190	1CR
3/4	1-1/2	4	3/4	.125	•	38099	38100	38149	38191	1CR
3/4	2-1/4	5	3/4	—		33115	31735	31745	31768	1L
3/4	3	6	3/4	—		33135	31868	31878	31888	1EL
7/8	1-1/2	4	7/8	—		30173	39173	39073	30027	1
1	1-1/2	4	1	—		30175	39175	39075	30028	1
1	1-1/2	4	1	—		30183	—	—	30383	1
1	1-1/2	4	1	.015	•	38101	38102	38150	38192	1CR
1	1-1/2	4	1	.020	•	38103	38104	38151	38193	1CR
1	1-1/2	4	1	.030	•	38105	38106	38152	38194	1CR
1	1-1/2	4	1	.045	•	38107	38108	38153	38195	1CR
1	1-1/2	4	1	.060	•	38109	38110	38154	38196	1CR
1	1-1/2	4	1	.090	•	38111	38112	38155	38197	1CR
1	1-1/2	4	1	.125	•	38113	38114	38156	38198	1CR
1	2-1/4	5	1	—		33117	31736	31746	31769	1L
1	3	6	1	—		33137	31869	31879	31889	1EL
*Series 1 Set						30189	39189	39089	30030	1

† Di-NAMITE® coating offered standard for this configuration. Please contact your KSPT Representative for more information.

FRACTIONAL 4 Flute Ball End



TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000/-0.001

DCON = h_6

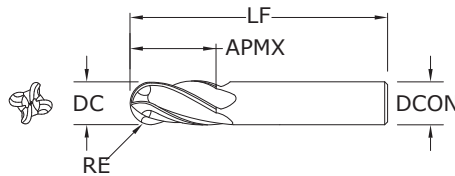
RE = +0.000/-0.0005

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6

RE = +0.000/-0.001

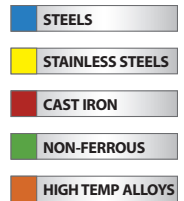


**1B • 1LB •
1ELB**
FRACTIONAL SERIES

inch					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	WELDON FLAT	UNCOATED	TI-NAMITE® (TiN)	TI-NAMITE®-C (TiCN)	TI-NAMITE®-A (AlTiN)	
1/64	1/32	1-1/2	1/8		30102	39102	39002	30031	1B
1/32	5/64	1-1/2	1/8		30104	39104	39004	30032	1B
3/64	7/64	1-1/2	1/8		30106	39106	39006	30033	1B
*1/16	3/16	1-1/2	1/8		30108	39108	39008	30034	1B
5/64	3/16	1-1/2	1/8		30110	39110	39010	30035	1B
3/32	9/32	1-1/2	1/8		30112	39112	39012	30036	1B
7/64	3/8	1-1/2	1/8		30114	39114	39014	30037	1B
*1/8	3/8	1-1/2	1/8		30178	39178	39078	30069	1B
*1/8	1/2	1-1/2	1/8		30116	39116	39016	30038	1B
1/8	3/4	2-1/4	1/8		33142	31770	31780	31790	1LB
1/8	1	3	1/8		33144	31900	31918	31928	1ELB
9/64	1/2	2	3/16		30118	39118	39018	30039	1B
5/32	1/2	2	3/16		30120	39120	39020	30040	1B
11/64	5/8	2	3/16		30122	39122	39022	30041	1B
*3/16	5/8	2	3/16		30124	39124	39024	30042	1B
3/16	3/4	2-1/2	3/16		33102	31771	31781	31791	1LB
3/16	1-1/8	3	3/16		33122	31902	31919	31929	1ELB
13/64	5/8	2-1/2	1/4		30126	39126	39026	30043	1B
7/32	5/8	2-1/2	1/4		30128	39128	39028	30044	1B
15/64	3/4	2-1/2	1/4		30130	39130	39030	30045	1B
*1/4	3/4	2-1/2	1/4		30132	39132	39032	30046	1B
1/4	1-1/8	3	1/4		33104	31772	31782	31792	1LB
1/4	1-1/2	4	1/4		33124	31904	31920	31930	1ELB
17/64	3/4	2-1/2	5/16		30134	39134	39034	30047	1B
9/32	3/4	2-1/2	5/16		30136	39136	39036	30048	1B
19/64	13/16	2-1/2	5/16		30138	39138	39038	30049	1B
*5/16	13/16	2-1/2	5/16		30140	39140	39040	30050	1B
5/16	1-1/8	3	5/16		33106	31773	31783	31793	1LB
5/16	1-5/8	4	5/16		33126	31906	31921	31931	1ELB
21/64	1	2-1/2	3/8		30142	39142	39042	30051	1B
11/32	1	2-1/2	3/8		30144	39144	39044	30052	1B
23/64	1	2-1/2	3/8		30146	39146	39046	30053	1B

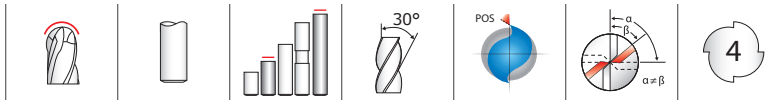
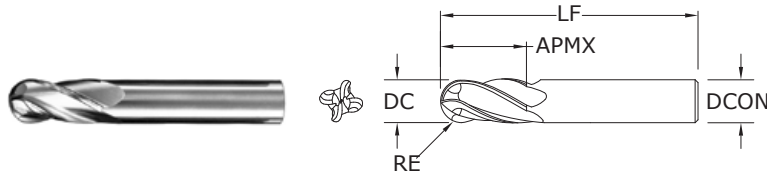
RE = 1/2 Cutting Diameter (DC)

continued on next page



For patent information visit
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4 Flute Ball End


**1B•1LB•
1ELB**
FRACTIONAL SERIES


TOLERANCES (inch)

<1/8 DIAMETER

DC = +0.000/-0.001

DCON = h_6

RE = +0.000/-0.0005

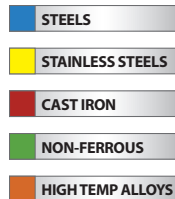
≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h_6

RE = +0.000/-0.001

CONTINUED



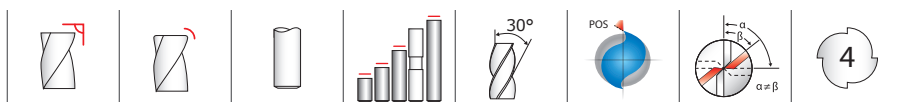
For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	inch			WELDON FLAT	EDP NO.				SERIES
		OVERALL LENGTH LF	SHANK DIAMETER DCON			UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
*1/3/8	1	2-1/2	3/8			30148	39148	39048	30054	1B
3/8	1	2-1/2	3/8	•		30184	—	—	30384	1B
3/8	1-1/8	3	3/8			33108	31774	31784	31794	1LB
3/8	1-3/4	4	3/8			33128	31908	31922	31932	1ELB
25/64	1	2-3/4	7/16			30150	39150	39050	30055	1B
13/32	1	2-3/4	7/16			30152	39152	39052	30056	1B
27/64	1	2-3/4	7/16			30154	39154	39054	30057	1B
7/16	1	2-3/4	7/16			30156	39156	39056	30058	1B
7/16	2	4-1/2	7/16			33110	31775	31785	31795	1LB
7/16	3	6	7/16			33130	31910	31923	31933	1ELB
29/64	1	3	1/2			30158	39158	39058	30059	1B
15/32	1	3	1/2			30160	39160	39060	30060	1B
31/64	1	3	1/2			30162	39162	39062	30061	1B
*1/2	1	3	1/2			30164	39164	39064	30062	1B
1/2	1	3	1/2	•		30185	—	—	30385	1B
1/2	2	4-1/2	1/2			33112	31776	31786	31796	1LB
1/2	3	6	1/2			33132	31912	31924	31934	1ELB
9/16	1-1/8	3-1/2	9/16			30166	39166	39066	30063	1B
5/8	1-1/4	3-1/2	5/8			30168	39168	39068	30064	1B
5/8	1-1/4	3-1/2	5/8	•		30186	—	—	30386	1B
5/8	2-1/4	5	5/8			33114	31777	31787	31797	1LB
5/8	3	6	5/8			33134	31914	31925	31935	1ELB
11/16	1-3/8	4	3/4			30170	39170	39070	30065	1B
3/4	1-1/2	4	3/4			30172	39172	39072	30066	1B
3/4	1-1/2	4	3/4	•		30187	—	—	30387	1B
3/4	2-1/4	5	3/4			33116	31778	31788	31798	1LB
3/4	3	6	3/4			33136	31916	31926	31936	1ELB
7/8	1-1/2	4	7/8			30174	39174	39074	30067	1B
1	1-1/2	4	1			30176	39176	39076	30068	1B
1	1-1/2	4	1	•		30188	—	—	30388	1B
1	2-1/4	5	1			33118	31779	31789	31799	1LB
1	3	6	1			33138	31917	31927	31937	1ELB
*Series 1B Set						30190	39190	39090	30070	1B

RE = 1/2 Cutting Diameter (DC)

† Di-NAMITE® coating offered standard for this configuration. Please contact your KSPT Representative for more information.

4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0,0254

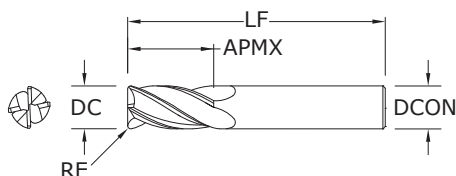
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≥3 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6

RE = +0,0000 / -0,0508

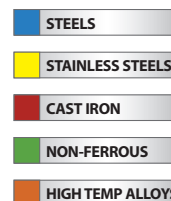


1M • 1XLM • 1MCR • 16M

METRIC SERIES

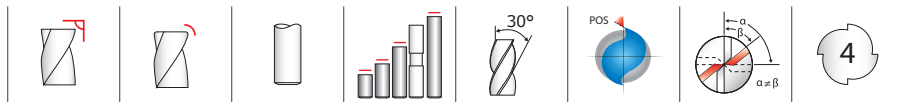
mm					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	2,0	38,0	—	3,0	41605	49136	49157	49178	16M
1,0	4,0	38,0	—	3,0	40105	48500	48522	48543	1M
1,5	3,0	38,0	—	3,0	41609	49137	49158	49179	16M
1,5	4,5	38,0	—	3,0	40109	48501	48523	48544	1M
2,0	4,0	38,0	—	3,0	41613	49138	49159	49180	16M
2,0	6,3	38,0	—	3,0	40113	48502	48524	48545	1M
2,5	5,0	38,0	—	3,0	41617	49139	49160	49181	16M
2,5	9,5	38,0	—	3,0	40117	48503	48525	48546	1M
3,0	6,0	38,0	—	3,0	41621	49140	49161	49182	16M
3,0	12,0	38,0	—	3,0	40121	48504	48526	48547	1M
3,0	25,0	75,0	—	3,0	43101	49388	49401	49414	1XLM
3,5	7,0	50,0	—	4,0	41625	49141	49162	49183	16M
3,5	12,0	50,0	—	4,0	40125	48505	48527	48548	1M
4,0	8,0	50,0	—	4,0	41629	49142	49163	49184	16M
4,0	14,0	50,0	—	4,0	40129	48506	48528	48549	1M
4,0	14,0	50,0	0,25	4,0	—	—	—	40000	1MCR
4,0	14,0	50,0	0,50	4,0	—	—	—	40001	1MCR
4,0	14,0	50,0	1,00	4,0	—	—	—	40003	1MCR
4,0	25,0	75,0	—	4,0	43103	49389	49402	49415	1XLM
4,5	9,5	50,0	—	4,5	41633	49143	49164	49185	16M
4,5	16,0	50,0	—	6,0	40133	48507	48529	48550	1M
5,0	10,0	50,0	—	5,0	41637	49144	49165	49186	16M
5,0	16,0	50,0	—	6,0	40137	48508	48530	48551	1M
5,0	16,0	50,0	0,25	6,0	—	—	—	40004	1MCR
5,0	16,0	50,0	0,50	6,0	—	—	—	40005	1MCR
5,0	16,0	50,0	1,00	6,0	—	—	—	40007	1MCR
5,0	25,0	75,0	—	5,0	43107	49391	49404	49417	1XLM
6,0	12,0	50,0	—	6,0	41641	49145	49166	49187	16M
6,0	19,0	50,0	—	6,0	40141	48509	48531	48552	1M
6,0	19,0	50,0	0,25	6,0	—	—	—	40009	1MCR
6,0	19,0	50,0	0,50	6,0	—	—	—	40010	1MCR
6,0	19,0	50,0	0,75	6,0	—	—	—	40011	1MCR

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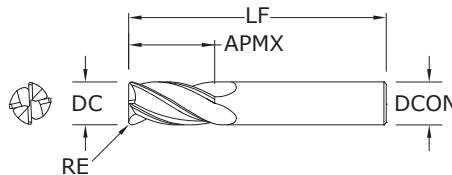
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4 Flute Square End • 4 Flute Corner Radius



**1M • 1XLM •
1MCR • 16M**

METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000/-0,0254

DCON = h_6

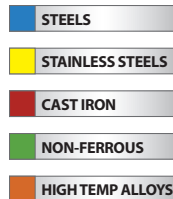
≥3 DIAMETER

DC = +0,0000/-0,0508

DCON = h_6

RE = +0,0000/-0,0508

CONTINUED

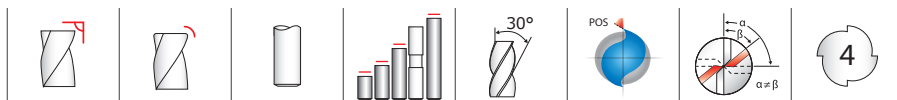


For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			SHANK DIAMETER DCON	EDP NO.				SERIES
		OVERALL LENGTH LF	CORNER RADIUS RE			UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
6,0	19,0	50,0	1,00		6,0	—	—	—	40012	1MCR
6,0	25,0	75,0	—		6,0	43105	49390	49403	49416	1XLM
7,0	12,0	50,0			8,0	41645	49146	49167	49188	16M
7,0	19,0	63,0	—		8,0	40145	48510	48532	48553	1M
8,0	12,0	50,0			8,0	41649	49147	49168	49189	16M
8,0	20,0	63,0	—		8,0	40149	48511	48533	48554	1M
8,0	20,0	63,0	0,50		8,0	—	—	—	40015	1MCR
8,0	20,0	63,0	0,75		8,0	—	—	—	40016	1MCR
8,0	20,0	63,0	1,00		8,0	—	—	—	40017	1MCR
8,0	20,0	63,0	1,50		8,0	—	—	—	40019	1MCR
8,0	20,0	63,0	2,00		8,0	—	—	—	40020	1MCR
8,0	25,0	75,0	—		8,0	43115	49392	49405	49418	1XLM
9,0	14,0	50,0			9,0	41653	49148	49169	49190	16M
9,0	22,0	75,0	—		10,0	40153	48512	48534	48555	1M
10,0	16,0	50,0			10,0	41657	49149	49170	49191	16M
10,0	22,0	75,0	—		10,0	40157	48513	48535	48556	1M
10,0	22,0	75,0	0,50		10,0	—	—	—	40021	1MCR
10,0	22,0	75,0	1,00		10,0	—	—	—	40023	1MCR
10,0	22,0	75,0	1,50		10,0	—	—	—	40024	1MCR
10,0	22,0	75,0	2,00		10,0	—	—	—	40025	1MCR
10,0	38,0	100,0	—		10,0	43125	49393	49406	49419	1XLM
11,0	19,0	63,0			12,0	41661	49150	49171	49192	16M
11,0	25,0	75,0	—		12,0	40161	48514	48536	48557	1M
12,0	19,0	63,0			12,0	40165	49151	49172	49193	16M
12,0	25,0	75,0	—		12,0	41665	48515	48537	48558	1M
12,0	25,0	75,0	0,50		12,0	—	—	—	40028	1MCR
12,0	25,0	75,0	1,00		12,0	—	—	—	40030	1MCR
12,0	25,0	75,0	1,50		12,0	—	—	—	40031	1MCR
12,0	25,0	75,0	2,00		12,0	—	—	—	40032	1MCR
12,0	50,0	100,0	—		12,0	43135	49394	49407	49420	1XLM
12,0	75,0	150,0	—		12,0	43145	49395	49408	49421	1XLM
14,0	32,0	89,0	—		14,0	40169	48516	48538	48559	1M
14,0	75,0	150,0	—		14,0	43155	49396	49409	49422	1XLM
16,0	32,0	89,0	—		16,0	40173	48517	48539	48560	1M
16,0	32,0	89,0	0,50		16,0	—	—	—	40035	1MCR
16,0	32,0	89,0	1,00		16,0	—	—	—	40037	1MCR

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4 Flute Square End • 4 Flute Corner Radius



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0,0254

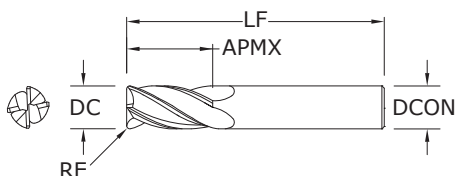
DCON = h_6

≥3 DIAMETER

DC = +0,0000 / -0,0508

DCON = h_6

RE = +0,0000 / -0,0508

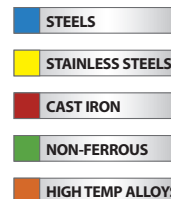


**1M • 1XLM •
1MCR • 16M**

METRIC SERIES

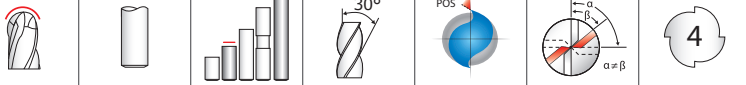
mm					EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
16,0	32,0	89,0	1,50	16,0	—	—	—	40038	1MCR
16,0	32,0	89,0	2,00	16,0	—	—	—	40039	1MCR
16,0	75,0	150,0	—	16,0	43165	49397	49410	49423	1XLM
18,0	38,0	100,0	—	18,0	40177	48518	48540	48561	1M
18,0	75,0	150,0	—	18,0	43175	49398	49411	49424	1XLM
20,0	38,0	100,0	—	20,0	40181	48519	48541	48562	1M
20,0	75,0	150,0	—	20,0	43185	49399	49412	49425	1XLM
25,0	38,0	100,0	—	25,0	40185	48520	48542	48563	1M
25,0	75,0	150,0	—	25,0	43195	49400	49413	49426	1XLM

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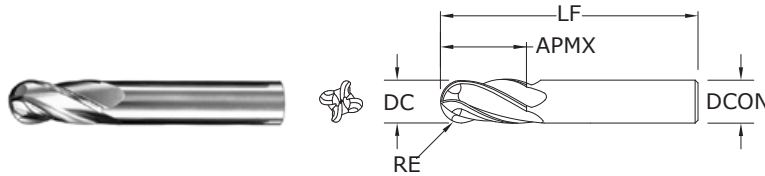


For patent information visit
www.ksptpatents.com

4 Flute Ball End



**1MB•
1XLMB**
METRIC SERIES



TOLERANCES (mm)

<3 DIAMETER

DC = +0,0000 / -0.0254

DCON = h_6

RE = +0,0000 / -0.0127

≥3 DIAMETER

DC = +0,0000 / -0.0508

DCON = h_6

RE = +0,0000 / -0.0254

STEELS
STAINLESS STEELS
CAST IRON
NON-FERROUS
HIGH TEMP ALLOYS

For patent
information visit
www.ksptpatents.com

mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)	
1,0	4,0	38,0	3,0	40106	48564	48586	48607	1MB
1,5	4,5	38,0	3,0	40110	48565	48587	48608	1MB
2,0	6,3	38,0	3,0	40114	48566	48588	48609	1MB
2,5	9,5	38,0	3,0	40118	48567	48589	48610	1MB
3,0	12,0	38,0	3,0	40122	48568	48590	48611	1MB
3,0	25,0	75,0	3,0	43102	49505	49518	49531	1XLMB
3,5	12,0	50,0	4,0	40126	48569	48591	48612	1MB
4,0	14,0	50,0	4,0	40130	48570	48592	48613	1MB
4,0	25,0	75,0	4,0	43104	49506	49519	49532	1XLMB
4,5	16,0	50,0	6,0	40134	48571	48593	48614	1MB
5,0	16,0	50,0	6,0	40138	48572	48594	48615	1MB
5,0	25,0	75,0	5,0	43108	49508	49521	49534	1XLMB
6,0	19,0	50,0	6,0	40142	48573	48595	48616	1MB
6,0	25,0	75,0	6,0	43106	49507	49520	49533	1XLMB
7,0	19,0	63,0	8,0	40146	48574	48596	48617	1MB
8,0	20,0	63,0	8,0	40150	48575	48597	48618	1MB
8,0	25,0	75,0	8,0	43116	49509	49522	49535	1XLMB
9,0	22,0	75,0	10,0	40154	48576	48598	48619	1MB
10,0	22,0	75,0	10,0	40158	48577	48599	48620	1MB
10,0	38,0	100,0	10,0	43126	49510	49523	49536	1XLMB
11,0	25,0	75,0	12,0	40162	48578	48600	48621	1MB
12,0	25,0	75,0	12,0	40166	48579	48601	48622	1MB
12,0	50,0	100,0	12,0	43136	49511	49524	49537	1XLMB
12,0	75,0	150,0	12,0	43146	49512	49525	49538	1XLMB
14,0	32,0	89,0	14,0	40170	48580	48602	48623	1MB
14,0	75,0	150,0	14,0	43156	49513	49526	49539	1XLMB
16,0	32,0	89,0	16,0	40174	48581	48603	48624	1MB
16,0	75,0	150,0	16,0	43166	49514	49527	49540	1XLMB
18,0	38,0	100,0	18,0	40178	48582	48604	48625	1MB
18,0	75,0	150,0	18,0	43176	49515	49528	49541	1XLMB
20,0	38,0	100,0	20,0	40182	48583	48605	48626	1MB
20,0	75,0	150,0	20,0	43186	49516	49529	49542	1XLMB
25,0	38,0	100,0	25,0	40186	48584	48606	48627	1MB
25,0	75,0	150,0	25,0	43196	49517	49530	49543	1XLMB

RE = 1/2 Cutting Diameter (DC)

FRACTIONAL & METRIC 4 Flute High Shear



TOLERANCES (inch)

<1/8 DIAMETER

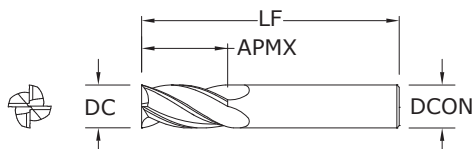
DC = +0.000/-0.001

DCON = h₆

≥1/8 DIAMETER

DC = +0.000/-0.002

DCON = h₆



54
FRACTIONAL SERIES

inch				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
1/16	3/16	1-1/2	1/8	35473	35500
3/32	3/8	1-1/2	1/8	35475	35501
1/8	7/16	1-1/2	1/8	35477	35502
5/32	9/16	2	3/16	35478	35503
3/16	9/16	2	3/16	35479	35504
7/32	5/8	2-1/2	1/4	35480	35505
1/4	3/4	2-1/2	1/4	35481	35506
9/32	3/4	2-1/2	5/16	35482	35507
5/16	13/16	2-1/2	5/16	35483	35508
3/8	7/8	2-1/2	3/8	35485	35509
7/16	1	2-3/4	7/16	35487	35510
1/2	1	3	1/2	35489	35511
9/16	1-1/8	3-1/2	9/16	35491	35512
5/8	1-1/4	3-1/2	5/8	35493	35513
3/4	1-1/2	4	3/4	35495	35514
1	1-1/2	4	1	35497	35515

NON-FERROUS

For patent information visit
www.ksptpatents.com

TOLERANCES (mm)

<3 DIAMETER

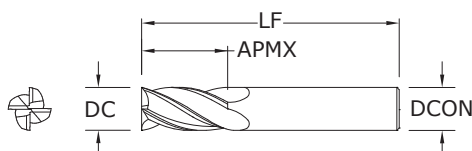
DC = +0,0000/-0,0254

DCON = h₆

≥3 DIAMETER

DC = +0,0000/-0,0508

DCON = h₆



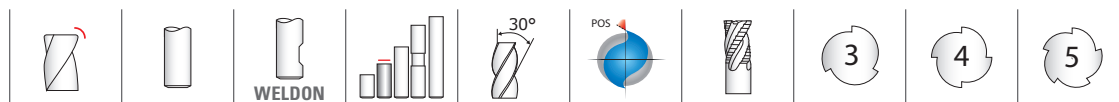
54M
METRIC SERIES

mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE®-C (TiCN)
3,0	8,0	38,0	3,0	45477	45478
3,5	10,0	57,0	6,0	45479	45480
4,0	11,0	57,0	6,0	45481	45482
4,5	11,0	57,0	6,0	45483	45484
5,0	13,0	57,0	6,0	45485	45486
6,0	13,0	57,0	6,0	45487	45488
8,0	19,0	63,0	8,0	45489	45490
10,0	22,0	72,0	10,0	45491	45492
12,0	26,0	83,0	12,0	45493	45494
14,0	26,0	83,0	14,0	45495	45496
16,0	32,0	92,0	16,0	45497	45498
20,0	38,0	104,0	20,0	45499	45500

NON-FERROUS

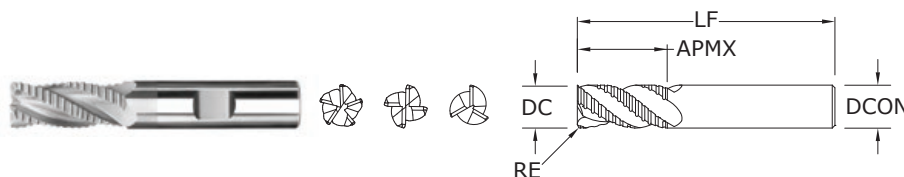
For patent information visit
www.ksptpatents.com

Single End Roughers (Coarse Pitch)



61

FRACTIONAL SERIES



TOLERANCES (inch)

DC = +0.0000/-0.0040

DCON = h_6

RE = +0.0050/-0.0050

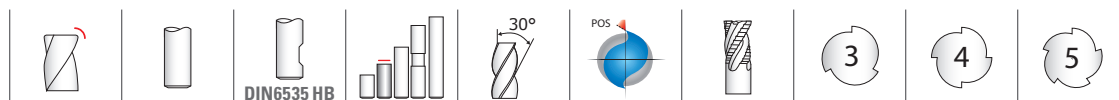
STEELS

CAST IRON

For patent
information visit
www.ksptpatents.com

inch						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
*1/4	3/4	2-1/2	1/4	.045	3	36107	36106	36110
*5/16	3/4	2-1/2	5/16	.045	3	36109	36108	36111
3/8	7/8	2-1/2	3/8	.060	3	36113	36112	36114
1/2	1	3	1/2	.060	4	36117	36116	36118
5/8	1-1/4	3-1/2	5/8	.060	4	36121	36120	36122
3/4	1-5/8	4	3/4	.060	4	36125	36124	36126
1	1-3/4	4	1	.060	5	36129	36128	36130

*Without Flat



61M

METRIC SERIES



TOLERANCES (mm)

DC = +0,000 / -0,100

DCON = h_6

RE = +0,127/-0,127

STEELS

CAST IRON

For patent
information visit
www.ksptpatents.com

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
6,0	19,0	63,0	6,0	1,14	3	46107	46106	46110
8,0	19,0	63,0	8,0	1,14	3	46109	46108	46111
10,0	22,0	72,0	10,0	1,52	3	46113	46112	46114
12,0	26,0	83,0	12,0	1,52	4	46117	46116	46118
16,0	32,0	92,0	16,0	1,52	4	46121	46120	46122
20,0	38,0	104,0	20,0	1,52	4	46129	46128	46132
25,0	44,0	104,0	25,0	1,52	5	46131	46130	46133

Single End Roughers (Fine Pitch)

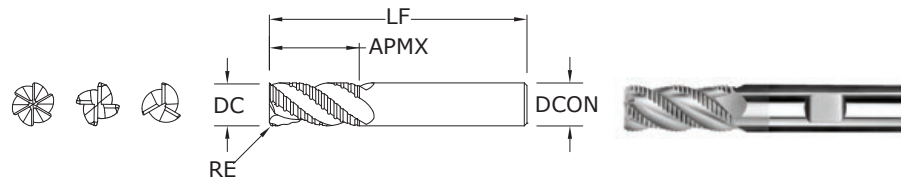


TOLERANCES (inch)

DC = +0.0000/-0.0040

DCON = h_6

RE = +0.0050/-0.0050



62

FRACTIONAL SERIES

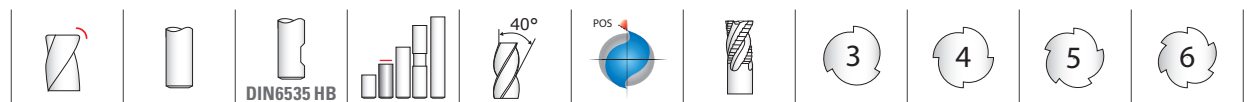
inch						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
*1/4	3/4	2-1/2	1/4	.045	3	36207	36206	36210
*5/16	3/4	2-1/2	5/16	.045	3	36209	36208	36211
3/8	7/8	2-1/2	3/8	.060	3	36213	36212	36214
1/2	1	3	1/2	.060	4	36217	36216	36218
5/8	1-1/4	3-1/2	5/8	.060	4	36221	36220	36222
3/4	1-5/8	4	3/4	.060	4	36225	36224	36226
1	1-3/4	4	1	.060	6	36229	36228	36230

*Without Flat

STAINLESS STEELS

HIGH TEMP ALLOYS

For patent information visit
www.ksptpatents.com

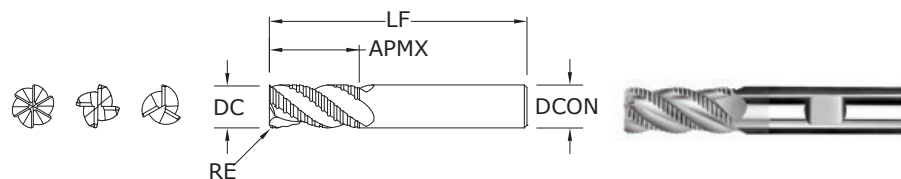


TOLERANCES (mm)

DC = +0,000 / -0,100

DCON = h_6

RE = +0,127/-0,127



62M

METRIC SERIES

mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	CORNER RADIUS RE	NO. OF FLUTES	Ti-NAMITE® (TiN)	Ti-NAMITE®-C (TiCN)	Ti-NAMITE®-A (AlTiN)
6,0	19,0	63,0	6,0	1,14	3	46207	46206	46210
8,0	19,0	63,0	8,0	1,14	3	46209	46208	46211
10,0	22,0	72,0	10,0	1,52	3	46213	46212	46214
12,0	26,0	83,0	12,0	1,52	4	46217	46216	46218
16,0	32,0	92,0	16,0	1,52	4	46221	46220	46222
20,0	38,0	104,0	20,0	1,52	4	46229	46228	46232
25,0	44,0	104,0	25,0	1,52	5	46231	46230	46233

STAINLESS STEELS

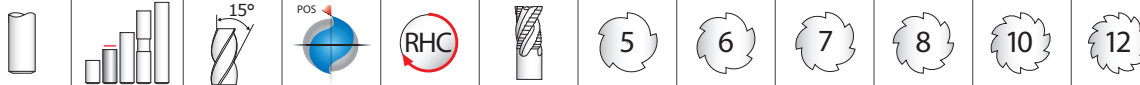
HIGH TEMP ALLOYS

For patent information visit
www.ksptpatents.com

Routers



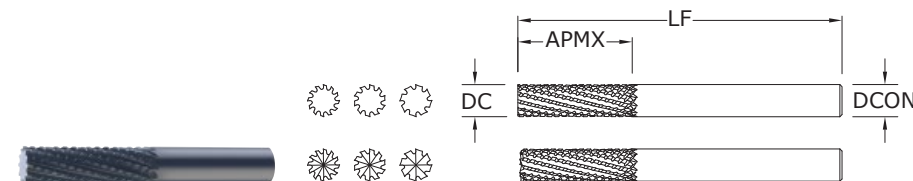
Carbon Composite



20-CCR

FRACTIONAL SERIES

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



inch						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Di-NAMITE® (Diamond)
1/4	1	2-1/2	1/4	8	No End Cutting	72930	73013
1/4	1	2-1/2	1/4	8	End Cutting	72947	73012
5/16	1	2-1/2	5/16	10	No End Cutting	72948	73026
5/16	1	2-1/2	5/16	10	End Cutting	72949	73014
3/8	1-1/8	2-1/2	3/8	12	No End Cutting	72950	73028
3/8	1-1/8	2-1/2	3/8	12	End Cutting	72951	73027
1/2	1-1/2	3-1/2	1/2	12	No End Cutting	72952	73041
1/2	1-1/2	3-1/2	1/2	12	End Cutting	72953	73029

TOLERANCES (inch)

DC = +.000/- .005

DCON = h₆

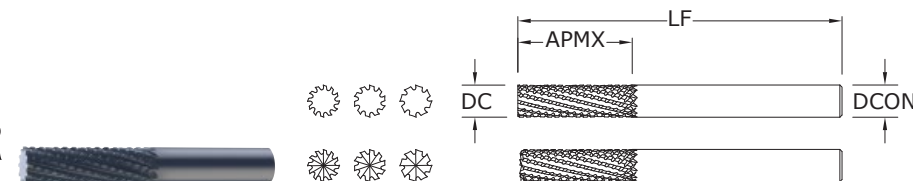
NON-FERROUS

For patent
information visit
www.ksptpatents.com

20M-CCR

METRIC SERIES

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Ti-NAMITE-B (TiB ₂)	Di-NAMITE® (Diamond)
2,0	6,0	38,0	3,0	5	End Cutting	82930	83100	83070
3,0	10,0	38,0	3,0	6	End Cutting	82931	83101	83071
4,0	12,0	50,0	4,0	7	End Cutting	82932	83102	83072
5,0	15,0	50,0	6,0	8	End Cutting	82933	83103	83073
6,0	25,0	63,0	6,0	8	No End Cutting	82966	83104	83027
6,0	25,0	63,0	6,0	8	End Cutting	82967	83105	83026
8,0	25,0	63,0	8,0	10	No End Cutting	82968	83106	83029
8,0	25,0	63,0	8,0	10	End Cutting	82969	83107	83028
10,0	28,0	63,0	10,0	12	No End Cutting	82970	83108	83042
10,0	28,0	63,0	10,0	12	End Cutting	82971	83109	83041
12,0	38,0	89,0	12,0	12	No End Cutting	82972	83110	83044
12,0	38,0	89,0	12,0	12	End Cutting	82973	83111	83043

TOLERANCES (mm)

DC = +0,000/-0,130

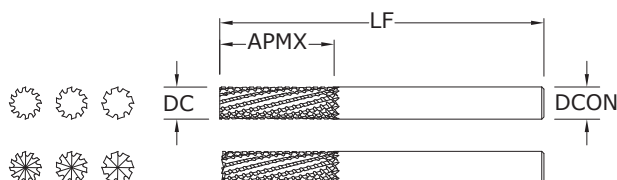
DCON = h₆

NON-FERROUS

For patent
information visit
www.ksptpatents.com



FRACTIONAL & METRIC Carbon Composite



20-CCR-LHC FRACTIONAL SERIES

TOLERANCES (inch)

DC = +.000/- .005

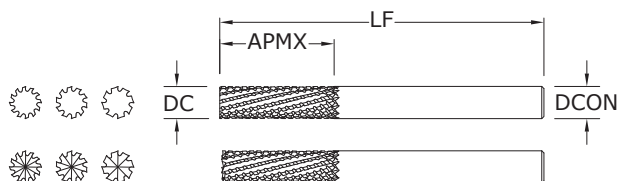
DCON = h_6

NON-FERROUS

For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	EDP NO.	
						UNCOATED	Di-NAMITE® (Diamond)
1/4	1	2-1/2	1/4	8	No End Cutting	73070	73078
1/4	1	2-1/2	1/4	8	End Cutting	73071	73079
5/16	1	2-1/2	5/16	10	No End Cutting	73072	73080
5/16	1	2-1/2	5/16	10	End Cutting	73073	73081
3/8	1-1/8	2-1/2	3/8	12	No End Cutting	73074	73082
3/8	1-1/8	2-1/2	3/8	12	End Cutting	73075	73083

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



20M-CCR-LHC METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,130

DCON = h_6

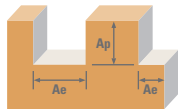
NON-FERROUS

For patent
information visit
www.ksptpatents.com

CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	EDP NO.	
						UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	8	No End Cutting	83220	83230
6,0	25,0	63,0	6,0	8	End Cutting	83221	83231
8,0	25,0	63,0	8,0	10	No End Cutting	83222	83232
8,0	25,0	63,0	8,0	10	End Cutting	83223	83233
10,0	28,0	63,0	10,0	12	No End Cutting	83224	83234
10,0	28,0	63,0	10,0	12	End Cutting	83225	83235

- Multi-flute design and positive geometry to shear with minimal pressure and delamination
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics

Carbon Composite



Series 20 Fractional			Vc (sfm)	DC • in						
	Ae x DC	Ap x DC			1/4	5/16	3/8	1/2		
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)		1	≤ 1	400 (320-480)	RPM	6112	4890	4075	3056
						Fr	0.0049	0.0094	0.0135	0.0180
						Feed (ipm)	30	46	55	55
			≤ 0.5	≤ 1.5	500 (400-600)	RPM	7640	6112	5093	3820
						Fr	0.0049	0.0094	0.0135	0.0180
						Feed (ipm)	38	58	69	69
			≤ 0.05	≤ 2	825 (660-990)	RPM	12606	10085	8404	6303
						Fr	0.0111	0.0215	0.0309	0.0413
						Feed (ipm)	140	217	260	260
	GFRP (FIBERGLASS)		1	≤ 1	320 (256-384)	RPM	4890	3912	3260	2445
						Fr	0.0049	0.0095	0.0135	0.0180
						Feed (ipm)	24	37	44	44
			≤ 0.5	≤ 1.5	400 (320-480)	RPM	6112	4890	4075	3056
						Fr	0.0049	0.0095	0.0135	0.0180
						Feed (ipm)	30	46	55	55
			≤ 0.05	≤ 2	660 (528-792)	RPM	10085	8068	6723	5042
						Fr	0.0110	0.0214	0.0311	0.0414
						Feed (ipm)	111	173	209	209
	CARBON, GRAPHITE		1	≤ 1	480 (384-576)	RPM	7334	5868	4890	3667
						Fr	0.0064	0.0124	0.0180	0.0240
						Feed (ipm)	47	73	88	88
			≤ 0.5	≤ 1.5	600 (480-720)	RPM	9168	7334	6112	4584
						Fr	0.0064	0.0124	0.0180	0.0240
						Feed (ipm)	59	91	110	110
			≤ 0.05	≤ 2	990 (792-1188)	RPM	15127	12102	10085	7564
						Fr	0.0147	0.0287	0.0412	0.0549
						Feed (ipm)	223	347	415	415
	PLASTICS		1	≤ 1	665 (640-690)	RPM	10161	8129	6774	5081
						Fr	0.0077	0.0150	0.0217	0.0241
						Feed (ipm)	78	122	147	147
			≤ 0.5	≤ 1.5	1000 (800-1200)	RPM	15280	12224	10187	7640
						Fr	0.0077	0.0150	0.0217	0.0241
						Feed (ipm)	118	183	221	184
			≤ 0.05	≤ 2	1650 (1320-1980)	RPM	25212	20170	16808	12606
						Fr	0.0147	0.0287	0.0413	0.0551
						Feed (ipm)	370	579	694	694

HSM (high speed machining)

rpm = Vc x 3.82 / DC

ipm = Fr x rpm

adjust parameters based on resin type and fiber structure

reduce speed when overheating causes melting or damage to resin

reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths

rates shown are for use without coolant; rates may be increased with coolant

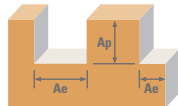
dust collection is vital when machining dry

diamond coating will increase tool life in graphite and composite materials

refer to the SGS Tool Wizard® for complete technical information

(www.kyocera-sgstool.com)

Carbon Composite

Series 20M Metric				Vc (m/min)	DC • mm						
	Ae x DC	Ap x DC			3	6	8	10	12		
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)		1	≤ 1	120 (96-164)	RPM	12722	6361	4771	3817	3181
						Fr	0.055	0.113	0.243	0.366	0.439
						Feed (mm/min)	700	720	1160	1395	1395
			≤ 0.5	≤ 1.5	150 (120-180)	RPM	15903	7951	5963	4771	3976
						Fr	0.055	0.113	0.243	0.366	0.439
						Feed (mm/min)	875	900	1450	1744	1744
			≤ 0.05	≤ 2	250 (200-300)	RPM	26504	13252	9939	7951	6626
						Fr	0.126	0.260	0.556	0.833	1.000
						Feed (mm/min)	3350	3450	5527	6625	6625
	GFRP (FIBERGLASS)		1	≤ 1	100 (80-120)	RPM	10602	5301	3976	3181	2650
						Fr	0.054	0.111	0.236	0.357	0.428
						Feed (mm/min)	570	587	940	1135	1135
			≤ 0.5	≤ 1.5	120 (96-164)	RPM	12722	6361	4771	3817	3181
						Fr	0.054	0.111	0.236	0.357	0.428
						Feed (mm/min)	684	704	1128	1362	1362
			≤ 0.05	≤ 2	200 (160-240)	RPM	21203	10602	7951	6361	5301
						Fr	0.124	0.261	0.557	1.011	1.213
						Feed (mm/min)	2629	2765	4430	6430	6430
	CARBON, GRAPHITE		1	≤ 1	145 (116-174)	RPM	15372	7686	5765	4612	3843
						Fr	0.069	0.152	0.323	0.482	0.579
						Feed (mm/min)	1061	1165	1860	2224	2224
			≤ 0.5	≤ 1.5	185 (148-222)	RPM	19613	9807	7355	5884	4903
						Fr	0.069	0.152	0.323	0.482	0.579
						Feed (mm/min)	1353	1486	2373	2838	2838
			≤ 0.05	≤ 2	300 (240-360)	RPM	31805	15903	11927	9542	7951
						Fr	0.159	0.348	0.740	1.109	1.331
						Feed (mm/min)	5057	5535	8820	10580	10580
	PLASTICS		1	≤ 1	245 (196-294)	RPM	25974	12987	9740	7792	6494
						Fr	0.069	0.150	0.319	0.477	0.572
						Feed (mm/min)	1792	1945	3107	3717	3717
			≤ 0.5	≤ 1.5	305 (244-366)	RPM	32335	16168	12126	9701	8084
						Fr	0.069	0.150	0.319	0.477	0.572
						Feed (mm/min)	2231	2421	3868	4627	4627
			≤ 0.05	≤ 2	505 (404-606)	RPM	53538	26769	20077	16062	13385
						Fr	0.159	0.344	0.732	1.097	1.316
						Feed (mm/min)	8513	9220	14690	17617	17617

HSM (high speed machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fr} \times \text{rpm}$
 adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths
 rates shown are for use without coolant; rates may be increased with coolant
 dust collection is vital when machining dry
 diamond coating will increase tool life in graphite and composite materials
 refer to the SGS Tool Wizard® for complete technical information
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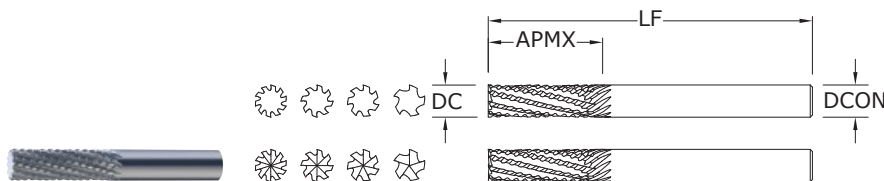
Coarse Cut Carbon Composite



31-CCR

FRACTIONAL SERIES

- Fewer, deeper flutes to prevent clogging in heavy routing
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



inch						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Di-NAMITE® (Diamond)
1/4	1	2-1/2	1/4	5	End Cutting	72954	72955
1/4	1	2-1/2	1/4	5	No End Cutting	72956	72957
5/16	1	2-1/2	5/16	7	End Cutting	72958	72959
5/16	1	2-1/2	5/16	7	No End Cutting	72960	72961
3/8	1-1/8	2-1/2	3/8	8	End Cutting	72962	72963
3/8	1-1/8	2-1/2	3/8	8	No End Cutting	72964	72965
1/2	1-1/2	3-1/2	1/2	10	End Cutting	72966	72967
1/2	1-1/2	3-1/2	1/2	10	No End Cutting	72968	72969

TOLERANCES (inch)

DC = +.000/- .005

DCON = h₆

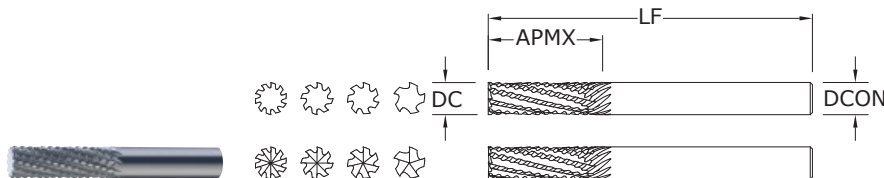
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31M-CCR

METRIC SERIES

- Fewer, deeper flutes to prevent clogging in heavy routing
- Unique clearance grind minimizes contact between tool diameter and workpiece eliminating friction
- Left hand flutes engineered to control the fibers within CFRP, preventing excessive fiber breakout
- Excels at trimming and profiling difficult and abrasive fiber filled plastics



mm						EDP NO.		
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	NO. OF FLUTES	END STYLE	UNCOATED	Ti-NAMITE-B (TiB ₂)	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	5	End Cutting	82974	83200	82982
6,0	25,0	63,0	6,0	5	No End Cutting	82975	83201	82983
8,0	25,0	63,0	8,0	7	End Cutting	82976	83202	82984
8,0	25,0	63,0	8,0	7	No End Cutting	82977	83203	82985
10,0	28,0	63,0	10,0	8	End Cutting	82978	83204	82986
10,0	28,0	63,0	10,0	8	No End Cutting	82979	83205	82987
12,0	38,0	89,0	12,0	10	End Cutting	82980	83206	82988
12,0	38,0	89,0	12,0	10	No End Cutting	82981	83207	82989

TOLERANCES (mm)

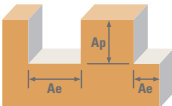
DC = +0,000/-0,130

DCON = h₆

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information visit
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Coarse Cut Carbon Composite

Series 31 Fractional				Vc (sfm)	DC • in					
		Ae x DC	Ap x DC			1/4	5/16	3/8	1/2	
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)		1	≤ 1	400	RPM	6112	4890	4075	3056
					(320-480)	Fr	0.0029	0.0065	0.0088	0.0147
						Feed (ipm)	18	32	36	45
			≤ 0.5	≤ 1.5	500	RPM	7640	6112	5093	3820
					(400-600)	Fr	0.0029	0.0065	0.0088	0.0147
						Feed (ipm)	23	40	45	56
			≤ 0.05	≤ 2	825	RPM	12606	10085	8404	6303
					(660-990)	Fr	0.0069	0.0151	0.0206	0.0344
						Feed (ipm)	87	152	173	217
	GFRP (FIBERGLASS)		1	≤ 1	320	RPM	4890	3912	3260	2445
					(256-384)	Fr	0.0031	0.0066	0.0089	0.0147
						Feed (ipm)	15	26	29	36
			≤ 0.5	≤ 1.5	400	RPM	6112	4890	4075	3056
					(320-480)	Fr	0.0031	0.0066	0.0089	0.0147
						Feed (ipm)	19	33	36	45
			≤ 0.05	≤ 2	660	RPM	10085	8068	6723	5042
					(528-792)	Fr	0.0069	0.0150	0.0205	0.0343
						Feed (ipm)	70	121	138	173
	CARBON, GRAPHITE		1	≤ 1	480	RPM	7334	5868	4890	3667
					(384-576)	Fr	0.0040	0.0087	0.0119	0.0199
						Feed (ipm)	29	51	58	73
			≤ 0.5	≤ 1.5	600	RPM	9168	7334	6112	4584
					(480-720)	Fr	0.0040	0.0087	0.0119	0.0199
						Feed (ipm)	36	64	73	91
			≤ 0.05	≤ 2	990	RPM	15127	12102	10085	7564
					(792-1188)	Fr	0.0092	0.0201	0.0275	0.0459
						Feed (ipm)	139	243	277	347
	PLASTICS		1	≤ 1	800	RPM	12224	9779	8149	6112
					(640-690)	Fr	0.0040	0.0087	0.0119	0.0200
						Feed (ipm)	49	85	97	122
			≤ 0.5	≤ 1.5	1000	RPM	15280	12224	10187	7640
					(800-1200)	Fr	0.0040	0.0087	0.0119	0.0200
						Feed (ipm)	61	106	121	153
			≤ 0.05	≤ 2	1650	RPM	25212	20170	16808	12606
					(1320-1980)	Fr	0.0092	0.0201	0.0275	0.0459
						Feed (ipm)	232	405	462	578

HSM (high speed machining)

rpm = Vc x 3.82 / DC

ipm = Fr x rpm

adjust parameters based on resin type and fiber structure

reduce speed when overheating causes melting or damage to resin

reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths

rates shown are for use without coolant; rates may be increased with coolant

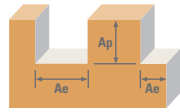
dust collection is vital when machining dry

diamond coating will increase tool life in graphite and composite materials

refer to the SGS Tool Wizard® for complete technical information

(www.kyocera-sgtool.com)

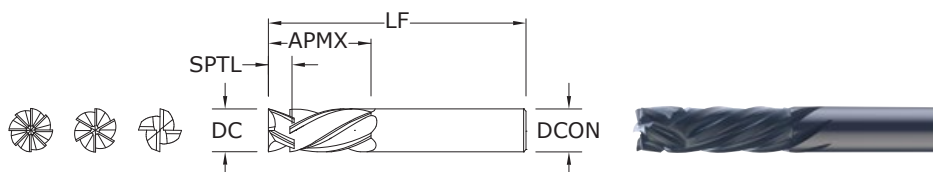
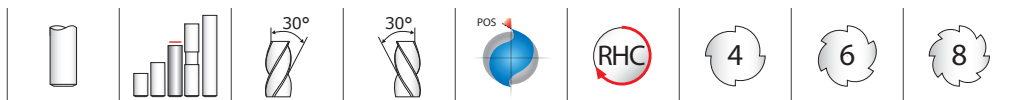
Coarse Cut Carbon Composite



Series 31M Metric			Vc (m/min)	DC • mm						
	Ae x DC	Ap x DC		6	8	10	12			
CFRP, AFRP (CARBON FIBER, ARAMID FIBER)		1	≤ 1	120	RPM	6361	4771	3817	3181	
				(96-164)	Fr	0.071	0.170	0.244	0.366	
					Feed (mm/min)	450	810	930	1165	
		≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976	
				(120-180)	Fr	0.071	0.170	0.244	0.366	
					Feed (mm/min)	563	1013	1163	1456	
		≤ 0.05	≤ 2	250	RPM	13252	9939	7951	6626	
				(200-300)	Fr	0.162	0.388	0.555	0.832	
					Feed (mm/min)	2150	3860	4415	5515	
	GFRP (FIBERGLASS)		1	≤ 1	100	RPM	5301	3976	3181	2650
					(80-120)	Fr	0.069	0.165	0.237	0.357
						Feed (mm/min)	365	655	755	945
		≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181	
				(96-164)	Fr	0.069	0.165	0.237	0.357	
					Feed (mm/min)	438	786	906	1134	
		≤ 0.05	≤ 2	200	RPM	10602	7951	6361	5301	
				(160-240)	Fr	0.163	0.390	0.557	0.834	
					Feed (mm/min)	1725	3100	3540	4420	
CARBON, GRAPHITE			1	≤ 1	145	RPM	7686	5765	4612	3843
					(116-174)	Fr	0.095	0.226	0.321	0.483
						Feed (mm/min)	728	1300	1480	1855
		≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903	
				(148-222)	Fr	0.095	0.226	0.321	0.483	
					Feed (mm/min)	929	1659	1888	2367	
		≤ 0.05	≤ 2	300	RPM	15903	11927	9542	7951	
				(240-360)	Fr	0.217	0.517	0.739	1.111	
					Feed (mm/min)	3450	6170	7050	8830	
	PLASTICS		1	≤ 1	245	RPM	12987	9740	7792	6494
					(196-294)	Fr	0.094	0.223	0.318	0.477
						Feed (mm/min)	1215	2175	2475	3100
		≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084	
				(244-366)	Fr	0.094	0.223	0.318	0.477	
					Feed (mm/min)	1513	2708	3081	3859	
		≤ 0.05	≤ 2	505	RPM	26769	20077	16062	13385	
				(404-606)	Fr	0.215	0.512	0.731	1.098	
					Feed (mm/min)	5760	10280	11745	14700	

HSM (high speed machining)
 $rpm = (Vc \times 1000) / (DC \times 3.14)$
 $mm/min = Fr \times rpm$
 adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths
 rates shown are for use without coolant; rates may be increased with coolant
 dust collection is vital when machining dry
 diamond coating will increase tool life in graphite and composite materials
 refer to the SGS Tool Wizard® for complete technical information
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TOLERANCES (inch)

DC = +.000/-.003

DCON = h₆

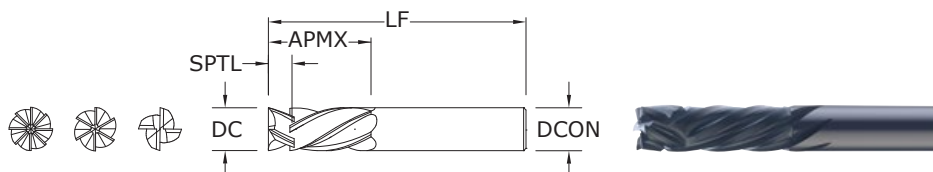
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inch						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	SPLIT LENGTH SPTL	NO. OF FLUTES	UNCOATED	Di-NAMITE® (Diamond)
1/4	1	2-1/2	1/4	11/64	4	72970	72971
5/16	1	2-1/2	5/16	7/32	4	72972	72973
3/8	1-1/8	2-1/2	3/8	17/64	6	72974	72975
1/2	1-1/2	3-1/2	1/2	23/64	8	72976	72977

25
FRACTIONAL SERIES

- Compression-style helixes direct cutting forces inward, eliminating fiber breakout and delamination
- Primary/secondary relief grind for reduced friction and pressure
- Rigid, heavy core



TOLERANCES (mm)

DC = +0,000/-0,080

DCON = h₆

NON-FERROUS

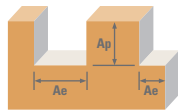
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information visit
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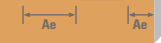
mm						EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	SPLIT LENGTH SPTL	NO. OF FLUTES	UNCOATED	Di-NAMITE® (Diamond)
6,0	25,0	63,0	6,0	4,10	4	82990	82991
8,0	25,0	63,0	8,0	5,58	4	82992	82993
10,0	28,0	63,0	10,0	7,05	6	82994	82995
12,0	38,0	89,0	12,0	8,60	8	82996	82997

25M
METRIC SERIES

- Compression-style helixes direct cutting forces inward, eliminating fiber breakout and delamination
- Primary/secondary relief grind for reduced friction and pressure
- Rigid, heavy core

Compression



Series 25 Fractional				Vc (sfm)		DC • in				
		1/4 5/16 3/8 1/2								
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	 Profile	≤ 0.5	≤ 1.5	500	RPM	7640	6112	5093	3820
					(400-600)	Fz	0.0016	0.0030	0.0040	0.0048
						Feed (ipm)	49	73	122	147
		 HSM	≤ 0.05	≤ 2	825	RPM	12606	10085	8404	6303
					(660-990)	Fz	0.0037	0.0069	0.0092	0.0110
						Feed (ipm)	187	278	464	555
	GFRP (FIBERGLASS)	 Profile	≤ 0.5	≤ 1.5	400	RPM	6112	4890	4075	3056
					(320-480)	Fz	0.0016	0.0030	0.0040	0.0048
						Feed (ipm)	39	59	98	117
		 HSM	≤ 0.05	≤ 2	660	RPM	10085	8068	6723	5042
					(528-792)	Fz	0.0037	0.0069	0.0092	0.0110
						Feed (ipm)	149	223	371	444
	CARBON, GRAPHITE	 Profile	≤ 0.5	≤ 1.5	600	RPM	9168	7334	6112	4584
					(480-720)	Fz	0.0020	0.0038	0.0050	0.0060
						Feed (ipm)	73	111	183	220
		 HSM	≤ 0.05	≤ 2	990	RPM	15127	12102	10085	7564
					(792-1188)	Fz	0.0046	0.0086	0.0115	0.0138
						Feed (ipm)	278	416	696	835
PLASTICS	 Profile	≤ 0.5	≤ 1.5	1000	RPM	15280	12224	10187	7640	
				(800-1200)	Fz	0.0020	0.0038	0.0050	0.0060	
					Feed (ipm)	122	186	306	367	
	 HSM	≤ 0.05	≤ 2	1650	RPM	25212	20170	16808	12606	
				(1320-1980)	Fz	0.0046	0.0086	0.0115	0.0138	
					Feed (ipm)	464	694	1160	1392	
MACHINABLE CERAMICS MACHINABLE GLASS	 Profile	≤ 0.5	≤ 1.5	50	RPM	764	611	509	382	
				(40-60)	Fz	0.0008	0.0015	0.0020	0.0024	
					Feed (ipm)	2.4	3.7	6.1	7.3	
	 HSM	≤ 0.05	≤ 2	85	RPM	1299	1039	866	649	
				(68-102)	Fz	0.0018	0.0034	0.0046	0.0055	
					Feed (ipm)	9.4	14.1	23.9	28.6	

HSM (high speed machining)

$\text{rpm} = \text{Vc} \times 3.82 / \text{DC}$

$\text{ipm} = \text{Fz} \times \text{number of flutes} \times \text{rpm}$

adjust parameters based on resin type and fiber structure

reduce speed when overheating causes melting or damage to resin

reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths

rates shown are for use without coolant; rates may be increased with coolant

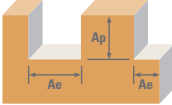
dust collection is vital when machining dry

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Compression



Series 25M Metric		Ae x DC	Ap x DC	Vc (m/min)	DC • mm				
					6	8	10	12	
CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	Profile 	≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976
				(96-164)	Fz	0.040	0.065	0.075	0.100
					Feed (mm/min)	1272	1550	2147	3181
	HSM 	≤ 0.05	≤ 2	250	RPM	13252	9939	7951	6626
				(200-300)	Fz	0.095	0.145	0.175	0.235
					Feed (mm/min)	5036	5765	8349	12457
GFRP (FIBERGLASS)	Profile 	≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181
				(96-164)	Fz	0.040	0.065	0.075	0.100
					Feed (mm/min)	1018	1240	1717	2544
	HSM 	≤ 0.05	≤ 2	200	RPM	10602	7951	6361	5301
				(160-240)	Fz	0.095	0.145	0.175	0.235
					Feed (mm/min)	4029	4612	6679	9966
N CARBON, GRAPHITE	Profile 	≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903
				(148-222)	Fz	0.050	0.080	0.095	0.125
					Feed (mm/min)	1961	2354	3354	4903
	HSM 	≤ 0.05	≤ 2	300	RPM	15903	11927	9542	7951
				(240-360)	Fz	0.115	0.185	0.220	0.290
					Feed (mm/min)	7315	8826	12595	18447
PLASTICS	Profile 	≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084
				(244-366)	Fz	0.050	0.080	0.095	0.125
					Feed (mm/min)	3234	3880	5529	8084
	HSM 	≤ 0.05	≤ 2	505	RPM	26769	20077	16062	13385
				(404-606)	Fz	0.115	0.185	0.220	0.290
					Feed (mm/min)	12314	14857	21201	31052
MACHINABLE CERAMICS MACHINABLE GLASS	Profile 	≤ 0.5	≤ 1.5	15	RPM	795	596	477	398
				(12-18)	Fz	0.020	0.035	0.045	0.050
					Feed (mm/min)	64	83	129	159
	HSM 	≤ 0.05	≤ 2	25	RPM	1325	994	795	663
				(20-30)	Fz	0.045	0.075	0.085	0.115
					Feed (mm/min)	239	298	406	610

HSM (high speed machining)

$\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$

$\text{mm/min} = \text{Fz} \times \text{number of flutes} \times \text{rpm}$

adjust parameters based on resin type and fiber structure

reduce speed when overheating causes melting or damage to resin

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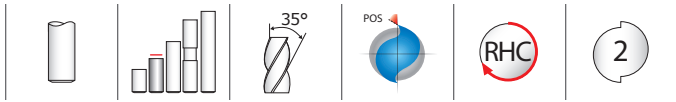
dust collection is vital when machining dry

diamond coating will increase tool life in graphite and composite materials

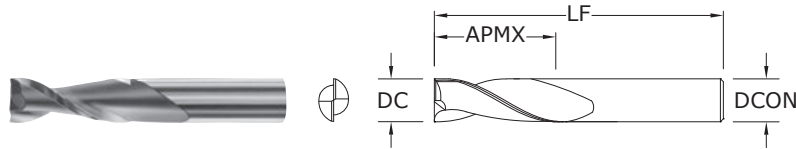
refer to the SGS Tool Wizard® for complete technical information

(www.kyocera-sgstool.com)

Up Cut

**21**

FRACTIONAL SERIES



inch				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
1/8	1/2	2	1/4	90001
5/32	5/8	2-1/2	1/4	90005
3/16	3/4	2-1/2	1/4	90009
1/4	3/4	2-1/2	1/4	90013
1/4	1	2-1/2	1/4	90017
5/16	1	2-1/2	5/16	90021
5/16	1	3	1/2	90025
3/8	1	2-1/2	3/8	90029
3/8	1-1/4	3	1/2	90033
1/2	1-1/4	3	1/2	90037
1/2	1-1/2	3-1/2	1/2	90041
1/2	2	4	1/2	90045
5/8	2	4-1/2	5/8	90049
3/4	2	4-1/2	3/4	90053

TOLERANCES (inch)

DC = +.000/- .003

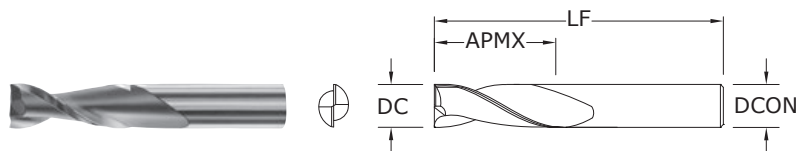
DCON = h₆

NON-FERROUS

For patent
information visit
www.ksptpatents.com

21M

METRIC SERIES



mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	90101
4,0	16,0	63,0	6,0	90107
5,0	19,0	63,0	6,0	90109
6,0	25,0	63,0	6,0	90113
8,0	25,0	63,0	8,0	90121
10,0	31,0	75,0	10,0	90129
12,0	31,0	75,0	12,0	90137

TOLERANCES (mm)

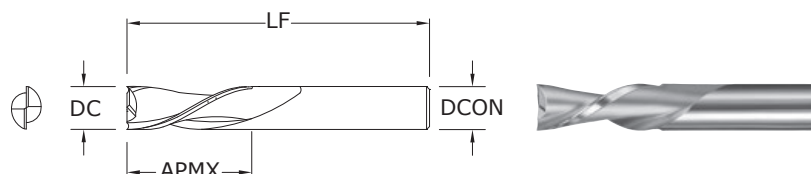
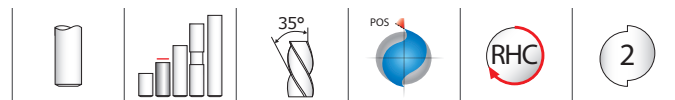
DC = +0,000/-0,080

DCON = h₆

NON-FERROUS

For patent
information visit
www.ksptpatents.com

Down Cut



22

FRACTIONAL SERIES

TOLERANCES (inch)

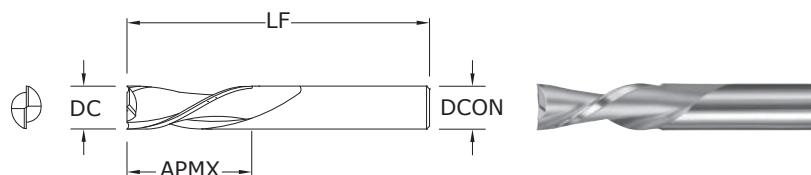
DC = +.000/-0.003

DCON = h_6

NON-FERROUS

For patent
information visit
www.ksptpatents.com

inch				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
1/8	1/2	2	1/4	91001
5/32	5/8	2-1/2	1/4	91005
3/16	3/4	2-1/2	1/4	91009
1/4	3/4	2-1/2	1/4	91013
1/4	1	2-1/2	1/4	91017
5/16	1	2-1/2	5/16	91021
5/16	1	3	1/2	91025
3/8	1	2-1/2	3/8	91029
3/8	1-1/4	3	1/2	91033
1/2	1-1/4	3	1/2	91037
1/2	1-1/2	3-1/2	1/2	91041
1/2	2	4	1/2	91045
5/8	2	4-1/2	5/8	91049
3/4	2	4-1/2	3/4	91053



22M

METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,080

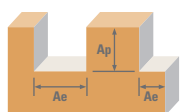
DCON = h_6

NON-FERROUS

For patent
information visit
www.ksptpatents.com

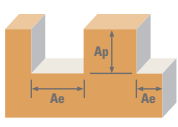
mm				EDP NO.
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED
3,0	13,0	50,0	6,0	91101
4,0	16,0	63,0	6,0	91107
5,0	19,0	63,0	6,0	91109
6,0	25,0	63,0	6,0	91113
8,0	25,0	63,0	8,0	91121
10,0	31,0	75,0	10,0	91129
12,0	31,0	75,0	12,0	91137

Up Cut Down Cut



Series 21, 22 Fractional						Vc (sfm)	DC • in				
		Ae x DC	Ap x DC	1/8	1/4		3/8	1/2	3/4		
HARDWOODS		1	≤ 1	1550	RPM	47368	23684	15789	11842	7895	
				(1240-1860)	Fz	0.0008	0.0015	0.0025	0.0030	0.0045	
					Feed (ipm)	76	71	79	71	71	
		≤ 0.5	≤ 1.5	1550	RPM	47368	23684	15789	11842	7895	
				(1240-1860)	Fz	0.0008	0.0015	0.0025	0.0030	0.0045	
					Feed (ipm)	76	71	79	71	71	
	SOFTWOODS		1	≤ 1	1950	RPM	59592	29796	19864	14898	9932
					(1560-2340)	Fz	0.0010	0.0020	0.0030	0.0035	0.0055
						Feed (ipm)	119	119	119	104	109
			≤ 0.5	≤ 1.5	1950	RPM	59592	29796	19864	14898	9932
					(1560-2340)	Fz	0.0010	0.0020	0.0030	0.0035	0.0055
						Feed (ipm)	119	119	119	104	109
PLYWOODS		1	≤ 1	1950	RPM	59592	29796	19864	14898	9932	
				(1560-2340)	Fz	0.0013	0.0025	0.0040	0.0050	0.0075	
					Feed (ipm)	155	149	159	149	149	
		≤ 0.5	≤ 1.5	1950	RPM	59592	29796	19864	14898	9932	
				(1560-2340)	Fz	0.0013	0.0025	0.0040	0.0050	0.0075	
					Feed (ipm)	155	149	159	149	149	
N PLASTICS		1	≤ 1	1950	RPM	59592	29796	19864	14898	9932	
				(1560-2340)	Fz	0.0008	0.0017	0.0025	0.0035	0.0050	
					Feed (ipm)	95	101	99	104	99	
		≤ 0.5	≤ 1.5	1950	RPM	59592	29796	19864	14898	9932	
				(1560-2340)	Fz	0.0008	0.0017	0.0025	0.0035	0.0050	
					Feed (ipm)	95	101	99	104	99	

rpm = Vc x 3.82 / DC
ipm = Fz x 2 x rpm



Series 21M, 22M Metric		Ae x DC Ap x DC		Vc (m/min)		DC • mm				
						3	6	10	12	20
HARDWOODS	Slot 	1	≤ 1	470	RPM	49828	24914	14948	12457	7474
				(376-564)	Fz	0.020	0.040	0.065	0.075	0.115
					Feed (mm/min)	1993	1993	1943	1869	1719
	Profile 	≤ 0.5	≤ 1.5	470	RPM	49828	24914	8155	4241	1509
				(376-564)	Fz	0.020	0.040	0.065	0.075	0.115
					Feed (mm/min)	1993	1993	1060	636	347
	Slot 	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
				(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
					Feed (mm/min)	3181	3181	2862	2862	2672
	Profile 	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467
				(480-720)	Fz	0.025	0.050	0.075	0.090	0.140
					Feed (mm/min)	3181	3181	2862	2862	84971
PLYWOODS	Slot 	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
				(480-720)	Fz	0.030	0.065	0.100	0.125	0.190
					Feed (mm/min)	3817	4135	3817	3976	3626
	Profile 	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	303467
				(480-720)	Fz	0.030	0.065	0.100	0.125	0.190
					Feed (mm/min)	3817	4135	3817	3976	115318
N PLASTICS	Slot 	1	≤ 1	600	RPM	63610	31805	19083	15903	9542
				(480-720)	Fz	0.020	0.040	0.065	0.090	0.125
					Feed (mm/min)	2544	2544	2481	2862	2385
	Profile 	≤ 0.5	≤ 1.5	600	RPM	63610	31805	19083	15903	9542
				(480-720)	Fz	0.020	0.040	0.065	0.090	0.125
					Feed (mm/min)	2544	2544	2481	2862	2385

rpm = (Vc x 1000) / (DC x 3.14)
mm/min = Fz x 2 x rpm