

General Purpose End Mills



Milling

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Recomendaciones de Velocidad y Avance mostrados al final de esta sección.

SÉRIES	DESCRIPTION DE FRAISES À USAGE GÉNÉRAL	PAGE
3M	2 dents non rayonné longueur standard (métrique)	101
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1M	4 dents non rayonné longueur standard (métrique)	111
1XLM	4 dents non rayonné portée extra-longue (métrique)	111
1MCR	4 dents rayonné longueur standard (métrique)	111
1MB	4 dents à bout hémisphérique longueur standard (métrique)	113
1XLMB	4 dents à bout hémisphérique portée extra-longue (métrique)	113
14M	4 dents à double bouts plats court (métrique)	114
14MB	4 dents à double bouts hémisphériques court (métrique)	115
16M	4 dents non rayonné court (métrique)	116
54M	4 dents cisaillement élevé non rayonné longueur standard (métrique)	117
61M	Multi-dents à pas gros d'ébauche (métrique)	118
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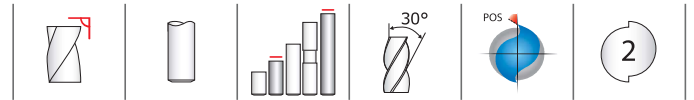
Les avances et les vitesses recommandées se trouvent à la fin du chapitre.

SERIE	BESCHREIBUNG DER STANDARD-SCHAFTFRÄSER	SEITE
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5MB	Schaftfräser mit 3 Schneiden, Standardlänge	110
5XLMB	Langloch-Schaftfräser mit 3 Schneiden	110
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14M	Schaftfräser mit 4 Schneiden, kurze Ausführung	114
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Schnittwertempfehlungen finden Sie am Ende dieses Abschnitts

METRIC

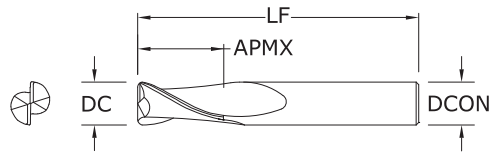
2 Flute Square End



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆



**3M•
3XLM**
METRIC SERIES

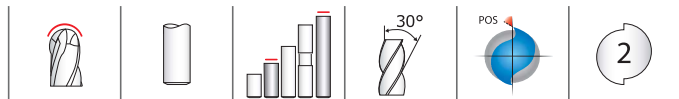
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	4,0	38,0	3,0	40305	48628	48650	48671	3M
1,5	4,5	38,0	3,0	40309	48629	48651	48672	3M
2,0	6,3	38,0	3,0	40313	48630	48652	48673	3M
2,5	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
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

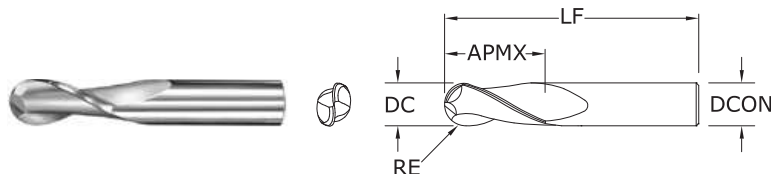
For patent information visit
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METRIC

2 Flute Ball End



**3MB•
3XLMB**
METRIC SERIES



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

RE = +0,000/-0,025

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

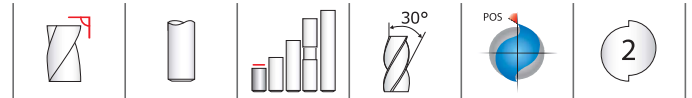
For patent
information visit
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mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	4,0	38,0	3,0	40306	48692	48714	48735	3MB
1,5	4,5	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)

METRIC

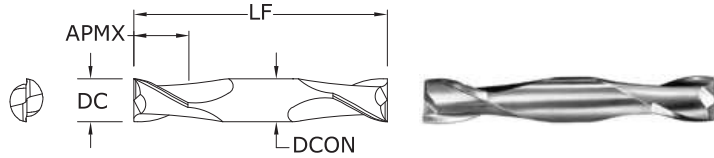
2 Flute Double End



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6



15M
METRIC SERIES

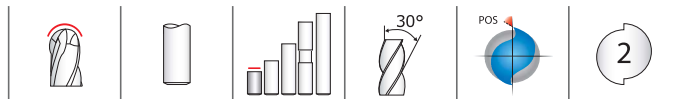
mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)
1,0	2,0	38,0	3,0	41505	49010	49031	49052
1,5	3,0	38,0	3,0	41509	49011	49032	49053
2,0	4,0	38,0	3,0	41513	49012	49033	49054
2,5	5,0	38,0	3,0	41517	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
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

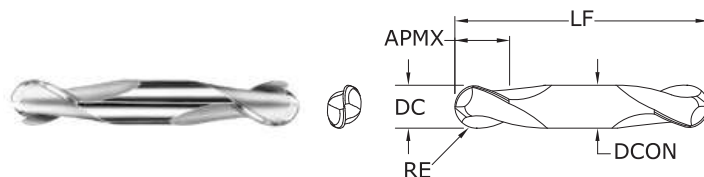
For patent information visit
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METRIC

2 Flute Double End Ball End



15MB
METRIC SERIES



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/0,025

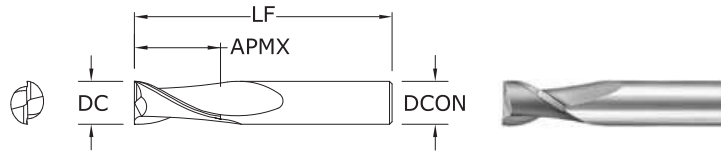
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

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)

For patent
information visit
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2 Flute Square End Stub


TOLERANCES (mm)
 $DC = +0,000/-0,050$
 $DCON = h_6$

17M
METRIC SERIES

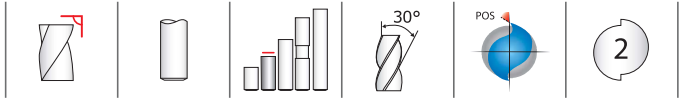
mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)
1,0	2,0	38,0	3,0	41705	49262	49283	49304
1,5	3,0	38,0	3,0	41709	49263	49284	49305
2,0	4,0	38,0	3,0	41713	49264	49285	49306
2,5	5,0	38,0	3,0	41717	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
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

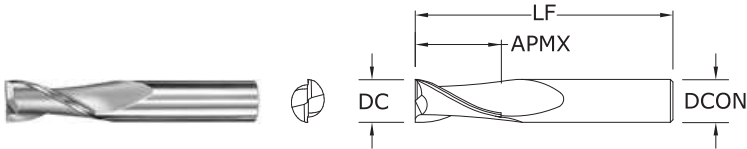
For patent information visit
www.ksptpatents.com

METRIC

2 Flute High Shear



52M
METRIC SERIES



TOLERANCES (mm)

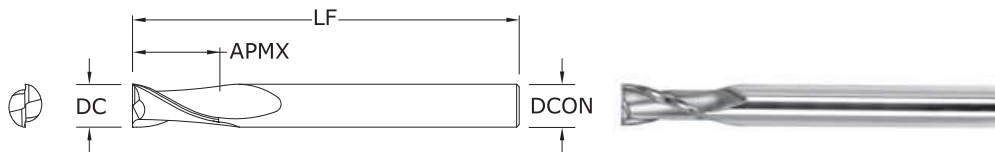
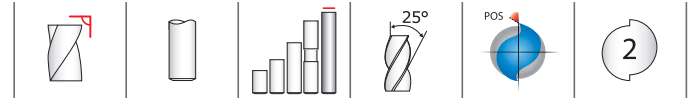
DC = +0,000/-0,050
DCON = h₆

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
- PLASTICS/COMPOSITES

For patent
information visit
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2 Flute Square End Long Reach


TOLERANCES (mm)
 $DC = +0,000/-0,050$
 $DCON = h_6$
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

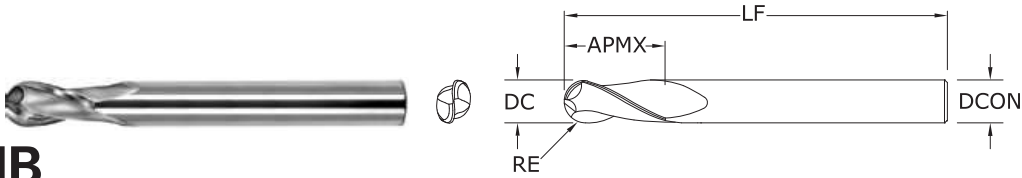
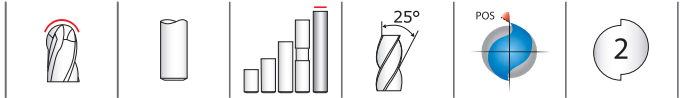
Neck Option Available

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

For patent
information visit
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METRIC

2 Flute Ball End Long Reach



59MB
METRIC SERIES

TOLERANCES (mm)

DC = +0,000/-0,050
DCON = h₆
RE = +0,000/-0,025

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

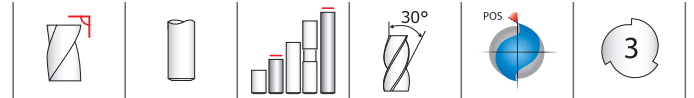
mm				EDP NO.			
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)
3,0	9,0	60,0	6,0	43900	49622	49632	49642
4,0	12,0	70,0	6,0	43901	49623	49633	49643
6,0	15,0	80,0	6,0	43902	49624	49634	49644
8,0	20,0	89,0	8,0	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)

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METRIC

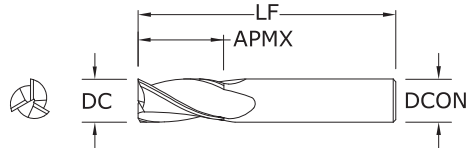
3 Flute Square End



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆



**5M•
5XLM**
METRIC SERIES

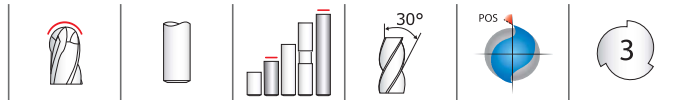
mm				EDP NO.				SERIES
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	4,0	38,0	3,0	40505	48756	48778	48799	5M
1,5	4,5	38,0	3,0	40509	48757	48779	48800	5M
2,0	6,3	38,0	3,0	40513	48758	48780	48801	5M
2,5	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

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

For patent information visit
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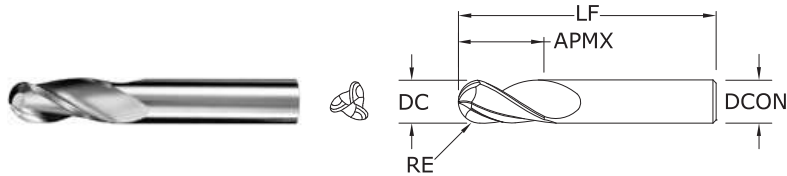
METRIC

3 Flute Ball End



5MB• 5XLMB

METRIC SERIES



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

RE = +0,000/-0,025

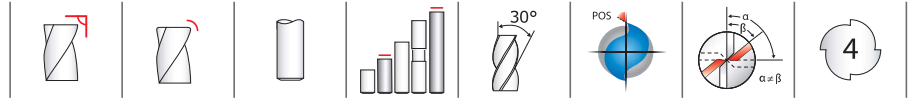
STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

For patent
information visit
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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	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)

4 Flute Square End • 4 Flute Corner Radius

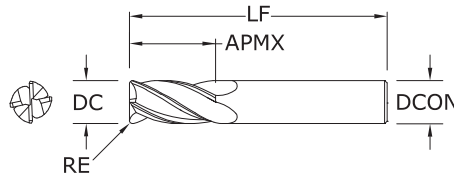


TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050



1M • 1XLM • 1MCR
METRIC SERIES

CUTTING DIAMETER DC	LENGTH OF CUT APMX	mm			EDP NO.				SERIES
		OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	4,0	38,0	—	3,0	40105	48500	48522	48543	1M
1,5	4,5	38,0	—	3,0	40109	48501	48523	48544	1M
2,0	6,3	38,0	—	3,0	40113	48502	48524	48545	1M
2,5	9,5	38,0	—	3,0	40117	48503	48525	48546	1M
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	12,0	50,0	—	4,0	40125	48505	48527	48548	1M
4,0	14,0	50,0	—	4,0	40129	48506	48528	48549	1M
4,0	25,0	75,0	—	4,0	43103	49389	49402	49415	1XLM
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
4,5	16,0	50,0	—	6,0	40133	48507	48529	48550	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	16,0	50,0	—	6,0	40137	48508	48530	48551	1M
5,0	25,0	75,0	—	5,0	43107	49391	49404	49417	1XLM
6,0	19,0	50,0	—	6,0	40141	48509	48531	48552	1M
6,0	25,0	75,0	—	6,0	43105	49390	49403	49416	1XLM
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
6,0	19,0	50,0	1,00	6,0	—	—	—	40012	1MCR
7,0	19,0	63,0	—	8,0	40145	48510	48532	48553	1M
8,0	20,0	63,0	—	8,0	40149	48511	48533	48554	1M
8,0	25,0	75,0	—	8,0	43115	49392	49405	49418	1XLM
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
9,0	22,0	75,0	—	10,0	40153	48512	48534	48555	1M
10,0	22,0	75,0	—	10,0	40157	48513	48535	48556	1M
10,0	38,0	100,0	—	10,0	43125	49393	49406	49419	1XLM
10,0	22,0	75,0	0,50	10,0	—	—	—	40021	1MCR

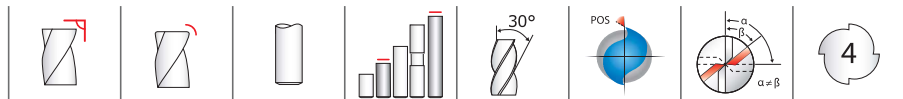
continued on next page

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

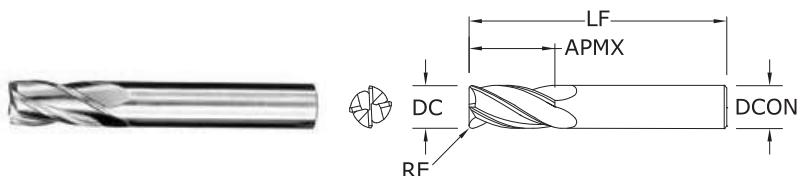
For patent
information visit
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METRIC

4 Flute Square End • 4 Flute Corner Radius



**1M • 1XLM •
1MCR**
METRIC SERIES



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

RE = +0,000/-0,050

CONTINUED

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

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information visit
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CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	CORNER RADIUS RE	SHANK DIAMETER DCON	EDP NO.				SERIES
					UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
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
11,0	25,0	75,0	—	12,0	40161	48514	48536	48557	1M
12,0	25,0	75,0	—	12,0	41665	48515	48537	48558	1M
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
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
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	75,0	150,0	—	16,0	43165	49397	49410	49423	1XLM
16,0	32,0	89,0	0,50	16,0	—	—	—	40035	1MCR
16,0	32,0	89,0	1,00	16,0	—	—	—	40037	1MCR
16,0	32,0	89,0	1,50	16,0	—	—	—	40038	1MCR
16,0	32,0	89,0	2,00	16,0	—	—	—	40039	1MCR
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

METRIC 4 Flute Ball End

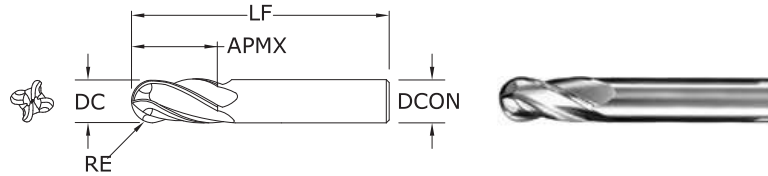


TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h_6

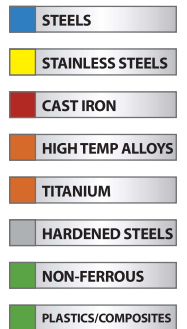
RE = +0,000/-0,025



**1MB.
1XLMB**
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	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

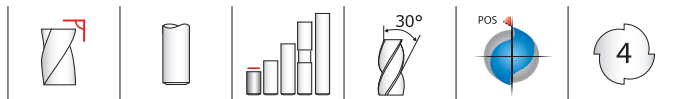
RE = 1/2 Cutting Diameter (DC)



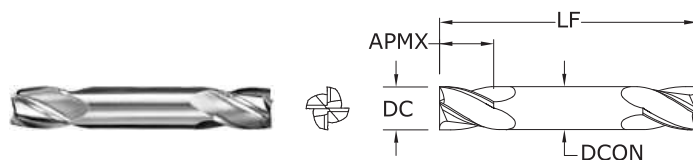
For patent information visit
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METRIC

4 Flute Double End



14M
METRIC SERIES



TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

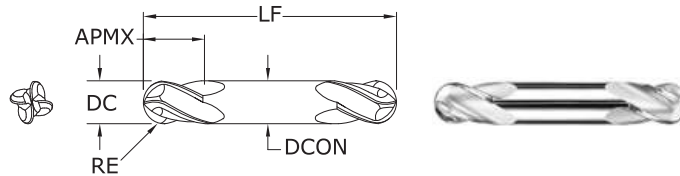
For patent
information visit
www.ksptpatents.com

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	41405	48884	48905	48926
1,5	3,0	38,0	3,0	41409	48885	48906	48927
2,0	4,0	38,0	3,0	41413	48886	48907	48928
2,5	5,0	38,0	3,0	41417	48887	48908	48929
3,0	6,0	38,0	3,0	41421	48888	48909	48930
3,5	7,0	50,0	4,0	41425	48889	48910	48931
4,0	8,0	50,0	4,0	41429	48890	48911	48932
4,5	9,5	63,0	4,5	41433	48891	48912	48933
5,0	10,0	63,0	5,0	41437	48892	48913	48934
6,0	12,0	63,0	6,0	41441	48893	48914	48935
7,0	12,0	63,0	8,0	41445	48894	48915	48936
8,0	12,0	63,0	8,0	41449	48895	48916	48937
9,0	14,0	75,0	9,0	41453	48896	48917	48938
10,0	14,0	75,0	10,0	41457	48897	48918	48939
11,0	14,0	75,0	12,0	41461	48898	48919	48940
12,0	16,0	75,0	12,0	41465	48899	48920	48941

4 Flute Double End Ball End


TOLERANCES (mm)

DC = +0,000/-0,050

 DCON = h_6

14MB
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	41406	48947	48968	48989
1,5	3,0	38,0	3,0	41410	48948	48969	48990
2,0	4,0	38,0	3,0	41414	48949	48970	48991
2,5	5,0	38,0	3,0	41418	48950	48971	48992
3,0	6,0	38,0	3,0	41422	48951	48972	48993
3,5	7,0	50,0	4,0	41426	48952	48973	48994
4,0	8,0	50,0	4,0	41430	48953	48974	48995
4,5	9,5	63,0	4,5	41434	48954	48975	48996
5,0	10,0	63,0	5,0	41438	48955	48976	48997
6,0	12,0	63,0	6,0	41442	48956	48977	48998
7,0	12,0	63,0	8,0	41446	48957	48978	48999
8,0	12,0	63,0	8,0	41450	48958	48979	49000
9,0	14,0	75,0	9,0	41454	48959	48980	49001
10,0	14,0	75,0	10,0	41458	48960	48981	49002
11,0	14,0	75,0	12,0	41462	48961	48982	49003
12,0	16,0	75,0	12,0	41466	48962	48983	49004

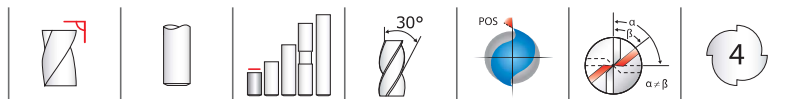
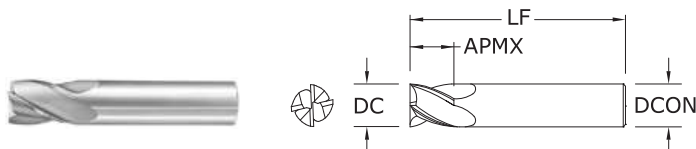
RE = 1/2 Cutting Diameter (DC)

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

 For patent information visit
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METRIC

4 Flute Square End Stub


16M
 METRIC SERIES


TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

STEELS
STAINLESS STEELS
CAST IRON
HIGH TEMP ALLOYS
TITANIUM
HARDENED STEELS
NON-FERROUS
PLASTICS/COMPOSITES

 For patent
 information visit
www.kspatents.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	41605	49136	49157	49178
1,5	3,0	38,0	3,0	41609	49137	49158	49179
2,0	4,0	38,0	3,0	41613	49138	49159	49180
2,5	5,0	38,0	3,0	41617	49139	49160	49181
3,0	6,0	38,0	3,0	41621	49140	49161	49182
3,5	7,0	50,0	4,0	41625	49141	49162	49183
4,0	8,0	50,0	4,0	41629	49142	49163	49184
4,5	9,5	50,0	4,5	41633	49143	49164	49185
5,0	10,0	50,0	5,0	41637	49144	49165	49186
6,0	12,0	50,0	6,0	41641	49145	49166	49187
7,0	12,0	50,0	8,0	41645	49146	49167	49188
8,0	12,0	50,0	8,0	41649	49147	49168	49189
9,0	14,0	50,0	9,0	41653	49148	49169	49190
10,0	16,0	50,0	10,0	41657	49149	49170	49191
11,0	19,0	63,0	12,0	41661	49150	49171	49192
12,0	19,0	63,0	12,0	40165	49151	49172	49193

METRIC

4 Flute High Shear

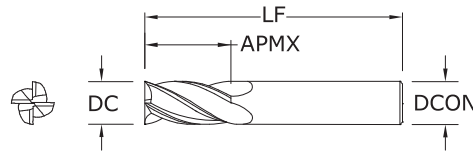


TOLERANCES (mm)

DC = +0,000/-0,050

DCON = h₆

RE = +0,000/-0,025



54M
METRIC SERIES

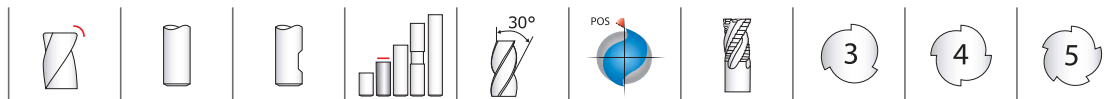
mm				EDP NO.	
CUTTING DIAMETER DC	LENGTH OF CUT APMX	OVERALL LENGTH LF	SHANK DIAMETER DCON	UNCOATED	Ti-NAMITE-C (TiCN)
3,0	8,0	38,0	3,0	45477	45478
3,5	10,0	57,0	6,0	45479	45480
4,0	11,0	57,0	6,0	45481	45482
4,5	11,0	57,0	6,0	45483	45484
5,0	13,0	57,0	6,0	45485	45486
6,0	13,0	57,0	6,0	45487	45488
8,0	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
PLASTICS/COMPOSITES

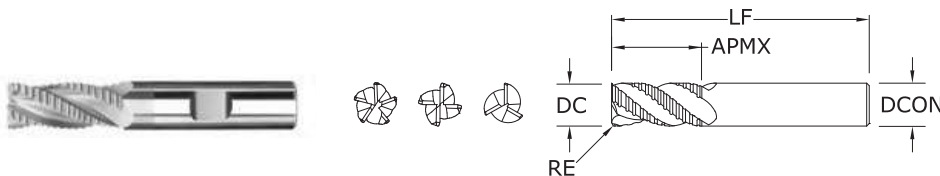
For patent information visit
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METRIC

Single End Roughers (Coarse Pitch)



61M
METRIC SERIES



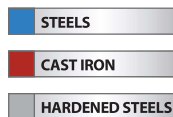
TOLERANCES h10 (mm)

DC = +0,000 / -0,100

DCON = h₆

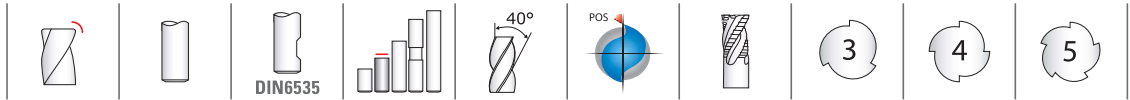
RE = +0,127 / -0,127

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



For patent
information visit
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Single End Roughers (Fine Pitch)

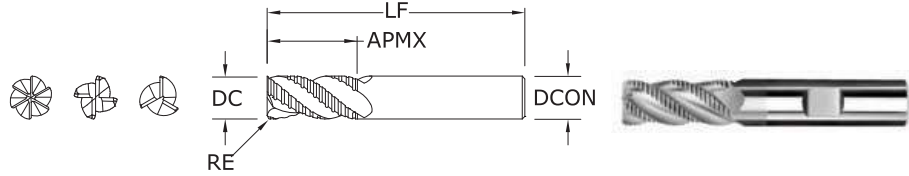


TOLERANCES h10 (mm)

DC = +0,000 / -0,100

DCON = h₆

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
- TITANIUM

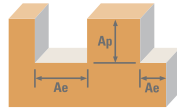
For patent information visit www.ksptpatents.com

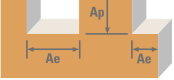
METRIC

2 Flute: Square, Double, Stub, Long Reach, Ball

3 Flute: Square, Long Reach, Ball

4 Flute: Square, Double, Stub, Long Reach, Ball, Corner Radius



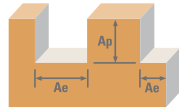
Series 1M, 3M, 5M, 14M, 15M, 16M, 17M, 59M Metric						Vc (m/min)	DC • mm										
Hardness	Flutes	Ae x DC	Ap x DC	0.4	0.75		1.5	3	6	10	12	20	25				
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536 ≤ 175 Bhn or ≤ 7 HRc		Profile			140	RPM	111483	59458	29729	14864	7432	4459	3716	2230	1784	
			2	≤ 0.50	≤ 1.5	(112-168)	Feed (mm/min)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
								178	178	184	208	282	357	357	285	250	
								268	268	276	312	424	535	535	428	375	
		3	≤ 0.25	≤ 1.5	357	357	369	416	565	713	713	571	499				
		4	≤ 0.25	≤ 1.5	102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299		
			Slot	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070				
				130	130	134	152	206	260	260	208	182					
				195	195	201	227	309	390	390	312	273					
			260	260	268	303	411	520	520	416	364						
		2	1	≤ 1	(82-123)	Feed (mm/min)	130	130	134	152	206	260	260	208	182		
		3	1	≤ 0.5			195	195	201	227	309	390	390	312	273		
4	1	≤ 0.4	260	260			268	303	411	520	520	416	364				
M	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100 ≤ 275 Bhn or ≤ 28 HRc		Profile			102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299	
			2	≤ 0.50	≤ 1.5	(82-123)	Feed (mm/min)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
								81	104	95	130	152	188	195	156	135	
								122	156	143	195	227	283	292	234	203	
		3	≤ 0.25	≤ 1.5	162	208	191	260	303	377	390	312	270				
		4	≤ 0.25	≤ 1.5	75	RPM	59377	31668	15834	7917	3958	2375	1979	1188	950		
			Slot	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052				
				59	76	70	95	111	138	143	114	99					
				119	152	139	190	222	276	285	228	198					
			119	152	139	190	222	276	285	228	198						
		2	1	≤ 1	(60-90)	Feed (mm/min)	59	76	70	95	111	138	143	114	99		
		3	1	≤ 0.5			119	152	139	190	222	276	285	228	198		
4	1	≤ 0.4	119	152			139	190	222	276	285	228	198				
K	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F ≤ 275 Bhn or ≤ 28 HRc		Profile			113	RPM	89671	47825	23912	11956	5978	3587	2989	1793	1435	
			2	≤ 0.50	≤ 1.5	(90-135)	Feed (mm/min)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052
								90	115	105	143	167	208	215	172	149	
								135	172	158	215	251	312	323	258	224	
		179	230	210	287	335	416	430	344	298							
		4	≤ 0.25	≤ 1.5	82	RPM	65436	34899	17449	8725	4362	2617	2181	1309	1047		
			Slot	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052				
				65	84	77	105	122	152	157	126	109					
				98	126	115	157	183	228	236	188	163					
			131	168	154	209	244	304	314	251	218						
		2	1	≤ 1	(66-99)	Feed (mm/min)	65	84	77	105	122	152	157	126	109		
		3	1	≤ 0.5			98	126	115	157	183	228	236	188	163		
4	1	≤ 0.4	131	168			154	209	244	304	314	251	218				
N	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4 PH, 15-5, 13-4, Custom 450 ≤ 275 Bhn or ≤ 28 HRc		Profile			78	RPM	61800	32960	16480	8240	4120	2472	2060	1236	989	
			2	≤ 0.50	≤ 1.5	(62-93)	Feed (mm/min)	Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
								62	66	63	66	99	119	119	91	83	
								93	99	94	99	148	178	179	137	125	
		124	132	125	132	198	237	239	183	166							
		4	≤ 0.25	≤ 1.5	56	RPM	44836	23912	11956	5978	2989	1793	1495	897	717		
			Slot	Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042				
				45	48	45	48	72	86	87	66	60					
				67	72	68	72	108	129	130	100	90					
			90	96	91	96	143	172	173	133	121						
		2	1	≤ 1	(45-68)	Feed (mm/min)	45	48	45	48	72	86	87	66	60		
		3	1	≤ 0.5			67	72	68	72	108	129	130	100	90		
4	1	≤ 0.4	90	96			91	96	143	172	173	133	121				
K	CAST IRONS Gray, Malleable, Ductile ≤ 220 Bhn or ≤ 19 HRc		Profile			102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299	
			2	≤ 0.50	≤ 1.5	(82-123)	Feed (mm/min)	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070
								130	130	134	152	206	260	260	208	182	
								195	195	201	227	309	390	390	312	273	
		3	≤ 0.25	≤ 1.5	260	260	268	303	411	520	520	416	364				
		4	≤ 0.25	≤ 1.5	75	RPM	59377	31668	15834	7917	3958	2375	1979	1188	950		
			Slot	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070				
				95	95	98	111	150	190	190	152	133					
				143	143	147	166	226	285	285	228	200					
			190	190	196	222	301	380	380	304	266						
		2	1	≤ 1	(60-90)	Feed (mm/min)	95	95	98	111	150	190	190	152	133		
		3	1	≤ 0.5			143	143	147	166	226	285	285	228	200		
4	1	≤ 0.4	190	190			196	222	301	380	380	304	266				
N	ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075 ≤ 150 Bhn or ≤ 7 HRc		Profile			268	RPM	213272	113745	56872	28436	14218	8531	7109	4265	3412	
			2	≤ 0.50	≤ 1.5	(215-322)	Feed (mm/min)	Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
								640	728	682	796	1081	1365	1365	1092	955	
								960	1092	1024	1194	1621	2047	2047	1638	1433	
		3	≤ 0.25	≤ 1.5	195	RPM	155107	82724	41362	20681	10340	6204	5170	3102	2482		
			Slot	Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140				
				465	529	496	579	786	993	993	794	695					
				698	794	745	869	1179	1489	1489	1191	1042					
			2	1	≤ 1	(156-234)	Feed (mm/min)	465	529	496	579	786	993	993	794	695	
		3	1	≤ 0.5	698			794	745	869	1179	1489	1489	1191	1042		
		698	794	745	869			1179	1489	1489	1191	1042					

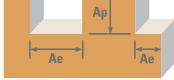
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2 Flute: Square, Double, Stub, Long Reach, Ball

3 Flute: Square, Long Reach, Ball

4 Flute: Square, Double, Stub, Long Reach, Ball, Corner Radius



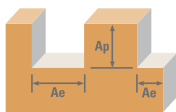
Series 1M, 3M, 5M, 14M, 15M, 16M, 17M, 59M Metric								DC • mm										
	Hardness	Flutes	Ae x DC	Ap x DC	Vc (m/min)													
						0.4	0.75	1.5	3	6	10	12	20	25				
N	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	Profile 	2	≤ 0.50	≤ 1.5	(118-177)	RPM	117542	62689	31344	15672	7836	4702	3918	2351	1881		
							Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070		
							Feed (mm/min)	188	188	194	219	298	376	376	301	263		
								282	282	292	329	447	564	564	451	395		
			4	≤ 0.25	≤ 1.5		376	376	389	439	596	752	752	602	527			
							RPM	84824	45239	22620	11310	5655	3393	2827	1696	1357		
		Slot 	2	1	≤ 1	Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070			
						Feed (mm/min)	136	136	140	158	215	271	271	217	190			
							204	204	210	238	322	407	407	326	285			
						4	1	≤ 0.4	271	271	280	317	430	543	543	434	380	
			RPM	213272	113745				56872	28436	14218	8531	7109	4265	3412			
			PLASTICS Polycarbonate, PVC, Polypropylene	Profile 	2	≤ 0.50	≤ 1.5	(215-322)	Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
	Feed (mm/min)	640							728	682	796	1081	1365	1365	1092	955		
		960							1092	1024	1194	1621	2047	2047	1638	1433		
	4	≤ 0.25							≤ 1.5	1280	1456	1365	1592	2161	2730	2730	2184	1911
					RPM	155107	82724			41362	20681	10340	6204	5170	3102	2482		
	Slot 	2			1	≤ 1	Fz		0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140	
				Feed (mm/min)			465	529	496	579	786	993	993	794	695			
							698	794	745	869	1179	1489	1489	1191	1042			
				4			1	≤ 0.4	931	1059	993	1158	1572	1985	1985	1588	1390	
		RPM			159954	85309			42654	21327	10664	6398	5332	3199	2559			
		GRAPHITE		Profile 	2	≤ 0.50	≤ 1.5	(161-241)	Fz	0.0015	0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140
	Feed (mm/min)								480	546	512	597	810	1024	1024	819	717	
			720						819	768	896	1216	1536	1536	1228	1075		
4	≤ 0.25		≤ 1.5						960	1092	1024	1194	1621	2047	2047	1638	1433	
					RPM	116330	62043		31021	15511	7755	4653	3878	2327	1861			
Slot 	2		1		≤ 1	Fz	0.0015		0.0032	0.0060	0.014	0.038	0.080	0.096	0.128	0.140		
				Feed (mm/min)		349	397	372	434	589	745	745	596	521				
						523	596	558	651	884	1117	1117	893	782				
				4		1	≤ 0.4	698	794	745	869	1179	1489	1489	1191	1042		
	RPM		15753		8402			4201	2100	1050	630	525	315	252				
	S		SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, 718, Incoloy 800, Monel 400, Rene, Waspalloy	Profile 	2	≤ 0.50	≤ 1.5	(16-24)	Fz	0.0005	0.0007	0.0014	0.004	0.010	0.021	0.024	0.032	0.035
Feed (mm/min)									16	12	12	17	21	26	25	20	18	
		24							18	18	25	32	40	38	30	26		
4		≤ 0.25							≤ 1.5	32	24	24	34	42	53	50	40	35
					RPM	10906	5816			2908	1454	727	436	364	218	174		
Slot 		2			1	≤ 1	Fz		0.0005	0.0007	0.0014	0.004	0.010	0.021	0.024	0.032	0.035	
				Feed (mm/min)			11	8	8	12	15	18	17	14	12			
							16	12	12	17	22	27	26	21	18			
				4			1	≤ 0.4	22	16	16	23	29	37	35	28	24	
		RPM			43624	23266			11633	5816	2908	1745	1454	872	698			
		TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al		Profile 	2	≤ 0.50	≤ 1.5	(44-66)	Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042
Feed (mm/min)									44	47	44	47	70	84	84	65	59	
			65						70	66	70	105	126	127	97	88		
4			≤ 0.25						≤ 1.5	87	93	88	93	140	168	169	129	117
					RPM	31506	16803			8402	4201	2100	1260	1050	630	504		
Slot 			2		1	≤ 1	Fz		0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042	
				Feed (mm/min)			32	34	32	34	50	60	61	47	42			
							47	50	48	50	76	91	91	70	64			
				4			1	≤ 0.4	63	67	64	67	101	121	122	93	85	
			RPM		76342	40715			20358	10179	5089	3054	2545	1527	1221			
			H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	Profile 	2	≤ 0.50	≤ 1.5	(77-115)	Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048
Feed (mm/min)										76	98	90	122	143	177	183	147	127
		115								147	134	183	214	266	275	220	191	
4		≤ 0.25								≤ 1.5	153	195	179	244	285	354	366	293
	RPM					55741	29729	14864			7432	3716	2230	1858	1115	892		
Slot 	2	1				≤ 1	Fz	0.0005		0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052	
					Feed (mm/min)		56	71	65	89	104	129	134	107	93			
							84	107	98	134	156	194	201	161	139			
					4		1	< 0.4	111	143	131	178	208	259	268	214	186	
	RPM	55741				29729			14864	7432	3716	2230	1858	1115	892			

Bhn (Brinell) HRC (Rockwell C)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fz} \times \text{number of flutes} \times \text{rpm}$
 reduce speed and feed for materials harder than listed

limit cut depths of long and extra long flute mills to .05 x DC when slotting or profiling
 reduce feed and Ae when finish milling (.02 x DC maximum)
 refer to the SGS Tool Wizard® for complete technical information
 (www.kyocera-sgstool.com)

2 Flute: High Shear

4 Flute: High Shear

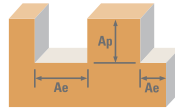


Series 52M, 54M Metric					DC • mm								
Hardness	Flutes	Ae x DC	Ap x DC	Vc (m/min)	3	6	10	12	20	25			
ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 7 HRc		Profile		415	RPM	43947	21973	13184	10987	6592	5274	
					(332-497)	Fz	0.0166	0.043	0.091	0.110	0.147	0.160	
						Feed (mm/min)	1459	1890	2399	2417	1938	1688	
			2	≤ 0.3	≤ 1.5		2918	3779	4799	4834	3876	3375	
		4	≤ 0.3	≤ 1.5	332	RPM	35222	17611	10567	8806	5283	4227	
			Slot		(266-399)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148	
						Feed (mm/min)	1064	1444	1796	1779	1405	1251	
			2	1	≤ 1		2127	2888	3593	3557	2811	2502	
	4		1	≤ 0.25									
	ALUMINUM DIE CAST ALLOYS (HIGH SILICON) A-390, A-392, B-390	≤ 125 Bhn or ≤ 77 HRb		Profile		155	RPM	16480	8240	4944	4120	2472	1978
						(124-187)	Fz	0.0166	0.043	0.091	0.110	0.147	0.160
							Feed (mm/min)	547	709	900	906	727	633
				2	≤ 0.3	≤ 1.5		1094	1417	1800	1813	1454	1266
			4	≤ 0.3	≤ 1.5	125	RPM	13249	6624	3975	3312	1987	1590
				Slot		(100-150)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148
							Feed (mm/min)	400	543	676	669	529	471
2				1	≤ 1	800		1086	1351	1338	1057	941	
4		1		≤ 0.25									
COPPER ALLOYS Aluminum Bronze, Muntz Brass, Naval, Brass, Red Brass		≤ 140 Bhn or ≤ 3 HRc		Profile		180	RPM	19065	9533	5720	4766	2860	2288
						(144-216)	Fz	0.0094	0.024	0.053	0.062	0.083	0.093
							Feed (mm/min)	358	458	606	591	475	426
				2	≤ 0.3	≤ 1.5		717	915	1213	1182	949	851
			4	≤ 0.3	≤ 1.5	145	RPM	15349	7675	4605	3837	2302	1842
				Slot		(116-174)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085
							Feed (mm/min)	264	368	442	445	355	313
	2			1	≤ 1	528		737	884	890	709	626	
	4	1		≤ 0.25									
	COPPER ALLOYS Beryllium Copper, C110, Manganese Bronze, Tin Bronze	≤ 200 Bhn or ≤ 23 HRc		Profile		72	RPM	7594	3797	2278	1898	1139	911
						(57-86)	Fz	0.0094	0.024	0.053	0.062	0.083	0.093
							Feed (mm/min)	143	182	241	235	189	169
				2	≤ 0.3	≤ 1.5		286	365	483	471	378	339
			4	≤ 0.3	≤ 1.5	58	RPM	6140	3070	1842	1535	921	737
				Slot		(46-69)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085
							Feed (mm/min)	106	147	177	178	142	125
2				1	≤ 1	211		295	354	356	284	250	
4		1		≤ 0.25									

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2 Flute: High Shear

4 Flute: High Shear



Series 52M, 54M Metric		Hardness	Flutes			Vc (m/min)	DC • mm						
				Ae x DC	Ap x DC		3	6	10	12	20	25	
N	PLASTICS ABS, Polycarbonate, PVC, Polypropylene					488	RPM	51702	25851	15511	12926	7755	6204
						(390-585)	Fz	0.0264	0.072	0.149	0.178	0.237	0.250
			2	≤ 0.3	≤ 1.5		Feed (mm/min)	2730	3723	4622	4601	3676	3102
			4	≤ 0.3	≤ 1.5			5460	7445	9244	9203	7352	6204
						390	RPM	41362	20681	12409	10340	6204	4963
						(312-468)	Fz	0.0240	0.065	0.136	0.163	0.210	0.238
			2	1	≤ 1		Feed (mm/min)	1985	2689	3375	3371	2606	2363
			4	1	≤ 0,25			3971	5377	6750	6742	5212	4725
	PLASTICS Fiberglass, Glass Filled					219	RPM	23266	11633	6980	5816	3490	2792
						(176-263)	Fz	0.0197	0.053	0.109	0.132	0.173	0.190
			2	≤ 0.3	≤ 1.5		Feed (mm/min)	917	1233	1522	1536	1208	1061
			4	≤ 0.3	≤ 1.5			1833	2466	3043	3071	2415	2122
						175	RPM	18580	9290	5574	4645	2787	2230
						(140-210)	Fz	0.0180	0.048	0.101	0.120	0.160	0.175
			2	1	≤ 1		Feed (mm/min)	669	892	1126	1115	892	780
			4	1	≤ 0,25			1338	1784	2252	2230	1784	1561

Bhn (Brinell) HRC (Rockwell C) HRB (Rockwell B)

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

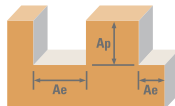
mm/min = Fz x number of flutes x rpm

reduce speed and feed for materials harder than listed

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

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

Single End Roughers (Coarse Pitch)

Series 61M Metric		Hardness			Vc (m/min)	DC • mm						
			Ae x DC	Ap x DC		6	10	12	20	25		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	 Profile	≤ 0.5	≤ 1.5	152	RPM	8078	4847	4039	2424	1939
						(122-183)	Fz	0.014	0.029	0.034	0.045	0.050
						Feed (mm/min)	339	422	549	436	485	
			 Slot	1	≤ 1	122	RPM	6463	3878	3231	1939	1551
						(98-146)	Fz	0.014	0.029	0.034	0.045	0.050
						Feed (mm/min)	271	337	439	349	388	
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HR	 Profile	≤ 0.5	≤ 1.5	111	RPM	5897	3538	2949	1769	1415
						(89-134)	Fz	0.010	0.021	0.026	0.035	0.038
						Feed (mm/min)	177	223	307	248	269	
			 Slot	1	≤ 1	90	RPM	4766	2860	2383	1430	1144
						(72-108)	Fz	0.010	0.021	0.026	0.035	0.038
						Feed (mm/min)	143	180	248	200	217	
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	 Profile	≤ 0.5	≤ 1.5	111	RPM	5897	3538	2949	1769	1415
						(89-134)	Fz	0.019	0.040	0.048	0.064	0.070
						Feed (mm/min)	336	425	566	453	495	
			 Slot	1	≤ 1	90	RPM	4766	2860	2383	1430	1144
						(72-108)	Fz	0.019	0.040	0.048	0.064	0.070
						Feed (mm/min)	272	343	458	366	400	
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	 Profile	≤ 0.5	≤ 1.5	105	RPM	5574	3344	2787	1672	1338
						(84-126)	Fz	0.014	0.024	0.036	0.048	0.053
						Feed (mm/min)	234	241	401	321	355	
			 Slot	1	≤ 1	84	RPM	4443	2666	2222	1333	1066
						(67-101)	Fz	0.014	0.024	0.036	0.048	0.053
						Feed (mm/min)	187	192	320	256	283	

Bhn (Brinell) HRc (Rockwell C)

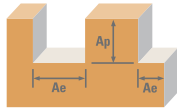
rpm = (Vc x 1000) / (DC x 3.14)

mm/min = Fz x number of flutes x rpm

reduce speed and feed for materials harder than listed

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

Single End Roughers (Fine Pitch)



Series 62M Metric	Hardness			Vc (m/min)	DC • mm							
		Ae x DC	Ap x DC		6	10	12	20	25			
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc		≤ 0.5	≤ 1.5	123	RPM	6544	3926	3272	1963	1570
						(99-148)	Fz	0.014	0.029	0.036	0.051	0.053
							Feed (mm/min)	283	345	471	398	495
			1	≤ 1	99	RPM	5251	3151	2626	1575	1260	
					(79-119)	Fz	0.014	0.029	0.036	0.051	0.053	
						Feed (mm/min)	227	277	378	319	397	
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4PH, 15-5PH, 13-4PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc		≤ 0.5	≤ 1.5	85	RPM	4524	2714	2262	1357	1086
						(68-102)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	163	195	261	217	277
			1	≤ 1	69	RPM	3635	2181	1818	1091	872	
					(55-82)	Fz	0.012	0.024	0.029	0.040	0.043	
						Feed (mm/min)	131	157	209	174	222	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc		≤ 0.5	≤ 1.5	21	RPM	1131	679	565	339	271
						(17-26)	Fz	0.010	0.021	0.024	0.035	0.035
							Feed (mm/min)	33	43	54	47	57
			1	≤ 1	17	RPM	905	543	452	271	217	
					(14-20)	Fz	0.010	0.021	0.024	0.035	0.035	
						Feed (mm/min)	26	35	43	38	46	
	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc		≤ 0.5	≤ 1.5	47	RPM	2504	1503	1252	751	601
						(38-57)	Fz	0.012	0.024	0.029	0.040	0.043
							Feed (mm/min)	90	108	144	120	153
			1	≤ 1	59	RPM	3151	1890	1575	945	756	
					(48-71)	Fz	0.012	0.024	0.029	0.040	0.043	
						Feed (mm/min)	113	136	181	151	193	

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

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