

General Purpose End Mills



Milling

SERIES	GENERAL PURPOSE END MILLS DESCRIPTION	PAGE
16	4 Flute Square End Stub Fractional	180
16M	4 Flute Square End Stub Metric	210
1	4 Flute Square End Standard Length Fractional	181
1L	4 Flute Square End Long Reach Fractional	181
1EL	4 Flute Square End Extended Length Fractional	181
1M	4 Flute Square End Standard Length Metric	211
1XLM	4 Flute Square End Extra Long Reach Metric	211
14	4 Flute Double End Square Stub Fractional	185
14M	4 Flute Double End Square Stub Metric	213
1B	4 Flute Ball End Standard Length Fractional	186
1LB	4 Flute Ball End Long Reach Fractional	186
1ELB	4 Flute Ball End Extended Length Fractional	186
1MB	4 Flute Ball End Standard Length Metric	214
1XLMB	4 Flute Ball End Extra Long Reach Metric	214
14B	4 Flute Double End Ball Stub Fractional	188
14MB	4 Flute Double End Ball Stub Metric	215
1CR	4 Flute Corner Radius Standard Length Fractional	183
1MCR	4 Flute Corner Radius Standard Length Metric	212
54	4 Flute High Shear Square End Standard Length Fractional	197
54M	4 Flute High Shear Square End Standard Length Metric	223
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17M	2 Flute Square End Stub Metric	201
3	2 Flute Square End Standard Length Fractional	167
3L	2 Flute Square End Long Reach Fractional	167
3EL	2 Flute Square End Extended Length Fractional	167
3M	2 Flute Square End Standard Length Metric	202
3XLM	2 Flute Square End Extra Long Reach Metric	202
59	2 Flute Square End Long Reach Fractional	169
59M	2 Flute Square End Long Reach Metric	203
15	2 Flute Double End Square Stub Fractional	171
15M	2 Flute Double End Square Stub Metric	204
3B	2 Flute Ball End Standard Length Fractional	172
3LB	2 Flute Ball End Long Reach Fractional	172
3ELB	2 Flute Ball End Extended Length Fractional	172
3MB	2 Flute Ball End Standard Length Metric	205
3XLMB	2 Flute Ball End Extra Long Reach Metric	205
59B	2 Flute Ball End Long Reach Fractional	174
59MB	2 Flute Ball End Long Reach Metric	206
15B	2 Flute Double End Ball Stub Fractional	175
15MB	2 Flute Double End Ball Stub Metric	207
3CR	2 Flute Corner Radius Standard Length Fractional	170

Speed & Feed Recommendations listed after each series

SERIES	GENERAL PURPOSE END MILLS DESCRIPTION	PAGE
52	2 Flute High Shear Square End Standard Length Fractional	196
52M	2 Flute High Shear Square End Standard Length Metric	222
5	3 Flute Square End Standard Length Fractional	176
5M	3 Flute Square End Standard Length Metric	208
5XLM	3 Flute Square End Extra Long Reach Metric	208
5B	3 Flute Ball End Standard Length Fractional	177
5MB	3 Flute Ball End Standard Length Metric	209
5XLMB	3 Flute Ball End Extra Long Reach Metric	209
61	Multi-Flute Coarse Pitch Rougher Fractional	194
61M	Multi-Flute Coarse Pitch Rougher Metric	220
62	Multi-Flute Fine Pitch Rougher Fractional	192
62M	Multi-Flute Fine Pitch Rougher Metric	218
23	3 Flute Tapered Square End Standard Length Fractional	178
24	3 Flute Tapered Corner Radius Standard Length Fractional	179
End Mill Sets	2, 3, & 4 Flute Square End Series 1, 3, 5, 14, 15	199
	2, 3, & 4 Flute Ball End Series 1B, 3B, 5B, 14B, 15B	200

Speed & Feed Recommendations listed after each series

Fresado

SERIE	DESCRIPCIÓN DE FRESAS DE USO GENERAL	PÁGINA
16	4 filos, pieza de punta cuadrada, fraccional	180
16M	4 filos, pieza de punta cuadrada, métrico	210
1	4 filos, punta cuadrada, longitud estándar, fraccional	181
1L	4 filos, punta cuadrada, largo alcance, fraccional	181
1EL	4 filos, punta cuadrada, longitud extendida, fraccional	181
1M	4 filos, punta cuadrada, longitud estándar, métrico	211
1XLM	4 filos, punta cuadrada, alcance extralargo, métrico	211
14	4 filos, pieza doble de punta cuadrada, fraccional	185
14M	4 filos, pieza doble de punta cuadrada, métrico	213
1B	4 filos, punta esférica, longitud estándar, fraccional	186
1LB	4 filos, punta esférica, largo alcance, fraccional	186
1ELB	4 filos, punta esférica, longitud extendida, fraccional	186
1MB	4 filos, punta esférica, longitud estándar, métrico	214
1XLMB	4 filos, punta esférica, alcance extralargo, métrico	214
14B	4 filos, pieza doble de punta esférica, fraccional	188
14MB	4 filos, pieza doble de punta esférica, métrico	215
1CR	4 filos, radio angulado, longitud estándar, fraccional	183
1MCR	4 filos, radio angulado, longitud estándar, métrico	212

Recomendaciones de velocidades y avances mostradas tras cada serie

SERIE	DESCRIPCIÓN DE FRESAS DE USO GENERAL	PÁGINA
54	4 filos, alto rendimiento, punta cuadrada, longitud estándar, fraccional	197
54M	4 filos, alto rendimiento, punta cuadrada, longitud estándar, métrico	223
17	2 filos, pieza de punta cuadrada, fraccional	166
17M	2 filos, pieza de punta cuadrada, métrico	201
3	2 filos, punta cuadrada, longitud estándar, fraccional	167
3L	2 filos, punta cuadrada, largo alcance, fraccional	167
3EL	2 filos, punta cuadrada, longitud extendida, fraccional	167
3M	2 filos, punta cuadrada, longitud estándar, métrico	202
3XLM	2 filos, punta cuadrada, alcance extralargo, métrico	202
59	2 filos, punta cuadrada, largo alcance, fraccional	169
59M	2 filos, punta cuadrada, largo alcance, métrico	203
15	2 filos, pieza doble de punta cuadrada, fraccional	171
15M	2 filos, pieza doble de punta cuadrada, métrico	204
3B	2 filos, punta esférica, longitud estándar, fraccional	172
3LB	2 filos, punta esférica, largo alcance, fraccional	172
3ELB	2 filos, punta esférica, longitud extendida, fraccional	172
3MB	2 filos, punta esférica, longitud estándar, métrico	205
3XLMB	2 filos, punta esférica, alcance extralargo, métrico	205
59B	2 filos, punta esférica, largo alcance, fraccional	174
59MB	2 filos, punta esférica, largo alcance, métrico	206
15B	2 filos, pieza doble de punta esférica, fraccional	175
15MB	2 filos, pieza doble de punta esférica, métrico	207
3CR	2 filos, radio angulado, longitud estándar, fraccional	170
52	2 filos, alto rendimiento, punta cuadrada, longitud estándar, fraccional	196
52M	2 filos, alto rendimiento, punta cuadrada, longitud estándar, métrico	222
5	3 filos, punta cuadrada, longitud estándar, fraccional	176
5M	3 filos, punta cuadrada, longitud estándar, métrico	208
5XLM	3 filos, punta cuadrada, alcance extralargo, métrico	208
5B	3 filos, punta esférica, longitud estándar, fraccional	177
5MB	3 filos, punta esférica, longitud estándar, métrico	209
5XLMB	3 filos, punta esférica, alcance extralargo, métrico	209
61	Filo múltiple, paso grueso, desbastador, fraccional	194
61M	Filo múltiple, paso grueso, desbastador, métrico	220
62	Filo múltiple, paso fino, desbastador, fraccional	192
62M	Filo múltiple, paso fino, desbastador, métrico	218
23	3 filos, cónico, punta cuadrada, longitud estándar, fraccional	178
24	3 filos, cónico, radio angulado, longitud estándar, fraccional	179
Juegos de fresas	2, 3 y 4 filos, punta cuadrada, series 1, 3, 5, 14, 15	199
	2, 3 y 4 filos, punta esférica, series 1B, 3B, 5B, 14B, 15B	200

Recomendaciones de velocidades y avances mostradas tras cada serie

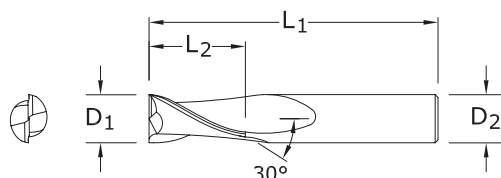
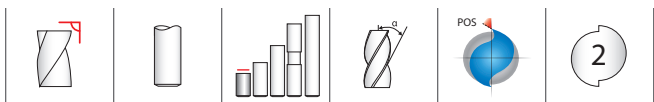
SERIES	DESCRIPTION DE FRAISES À USAGE GÉNÉRAL	PAGE
16	4 dents à bout plat court (fractionnel)	180
16M	4 dents à bout plat court (métrique)	210
1	4 dents à bout plat longueur standard (fractionnel)	181
1L	4 dents à bout plat longue portée (fractionnel)	181
1EL	4 dents à bout plat extra-long (fractionnel)	181
1M	4 dents à bout plat longueur standard (métrique)	211
1XLM	4 dents à bout plat portée extra-longue (métrique)	211
14	4 dents à double bouts plats court (fractionnel)	185
14M	4 dents à double bouts plats court (métrique)	213
1B	4 dents à bout hémisphérique longueur standard (fractionnel)	186
1LB	4 dents à bout hémisphérique longue portée (fractionnel)	186
1ELB	4 dents à bout hémisphérique extra-long (fractionnel)	186
1MB	4 dents à bout hémisphérique longueur standard (métrique)	214
1XLMB	4 dents à bout hémisphérique portée extra-longue (métrique)	214
14B	4 dents à double bouts hémisphériques court (fractionnel)	188
14MB	4 dents à double bouts hémisphériques court (métrique)	215
1CR	4 dents rayon en coin longueur standard (fractionnel)	183
1MCR	4 dents rayon en coin longueur standard (métrique)	212
54	4 dents cisaillement élevé à bout plat longueur standard (fractionnel)	197
54M	4 dents cisaillement élevé à bout plat longueur standard (métrique)	223
17	2 dents à bout plat court (fractionnel)	166
17M	2 dents à bout plat court (métrique)	201
3	2 dents à bout plat longueur standard (fractionnel)	167
3L	2 dents à bout plat longue portée (fractionnel)	167
3EL	2 dents à bout plat extra-long (fractionnel)	167
3M	2 dents à bout plat longueur standard (métrique)	202
3XLM	2 dents à bout plat portée extra-longue (métrique)	202
59	2 dents à bout plat longue portée (fractionnel)	169
59M	2 dents à bout plat longue portée (métrique)	203
15	2 dents à double bouts plats court (fractionnel)	171
15M	2 dents à double bouts plats court (métrique)	204
3B	2 dents à bout hémisphérique longueur standard (fractionnel)	172
3LB	2 dents à bout hémisphérique longue portée (fractionnel)	172
3ELB	2 dents à bout hémisphérique extra-long (fractionnel)	172
3MB	2 dents à bout hémisphérique longueur standard (métrique)	205
3XLMB	2 dents à bout hémisphérique portée extra-longue (métrique)	205
59B	2 dents à bout hémisphérique longue portée (fractionnel)	174
59MB	2 dents à bout hémisphérique longue portée (métrique)	206
15B	2 dents à double bouts hémisphériques court (fractionnel)	175
15MB	2 dents à double bouts hémisphériques court (métrique)	207
3CR	2 dents rayon en coin longueur standard (fractionnel)	170
52	2 dents cisaillement élevé à bout plat longueur standard (fractionnel)	196
52M	2 dents cisaillement élevé à bout plat longueur standard (métrique)	222

Recommandations de vitesse et avance indiquées après chaque série

SERIES	DESCRIPTION DE FRAISES À USAGE GÉNÉRAL	PAGE
5	3 dents à bout plat longueur standard (fractionnel)	176
5M	3 dents à bout plat longueur standard (métrique)	208
5XLM	3 dents à bout plat portée extra-longue (métrique)	208
5B	3 dents à bout hémisphérique longueur standard (fractionnel)	177
5MB	3 dents à bout hémisphérique longueur standard (métrique)	209
5XLMB	3 dents à bout hémisphérique portée extra-longue (métrique)	209
61	Multi-dents à pas gros d'ébauche (fractionnel)	194
61M	Multi-dents à pas gros d'ébauche (métrique)	220
62	Multi-dents à pas fin d'ébauche (fractionnel)	192
62M	Multi-dents à pas fin d'ébauche (métrique)	218
23	3 dents conique à bout plat longueur standard (fractionnel)	178
24	3 dents conique rayon en coin longueur standard (fractionnel)	179
Jeux de fraises	2, 3, & 4 Série goujure à bout plat 1,3,5,14,15	199
	2, 3, & 4 Série goujure à bout hémisphérique 15B, 15MB, 15B, 15MB, 15B, 15MB	200

Recommandations de vitesse et avance indiquées après chaque série

2 Flute Square End Stub



17

FRACTIONAL SERIES

TOLERANCES (inch)

D₁ = +0.0000/-0.0020

D₂ = h₆

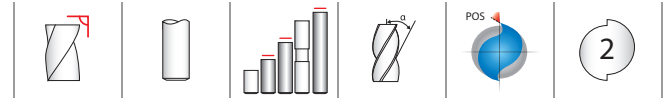
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

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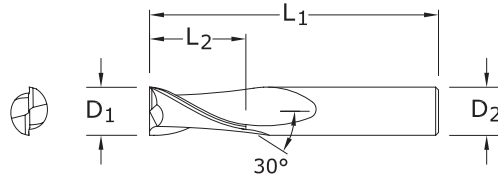
CUTTING DIAMETER D ₁	inch			EDP NO.				STOCK
	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/16	1/8	1-1/2	1/8	31701	31750	31303	31358	●
3/32	3/16	1-1/2	1/8	31703	31751	31304	31359	●
1/8	1/4	1-1/2	1/8	31705	31752	31305	31360	●
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	●

FRACTIONAL 2 Flute Square End



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$
 $D_2 = h_6$



3·3L·3EL

FRACTIONAL SERIES

inch				EDP NO.					STOCK	SERIES
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Di-NAMITE (Diamond)		
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	91266	●	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	91270	●	3
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	91274	●	3
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	91278	●	3
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
19/64	13/16	2-1/2	5/16	30337	39337	39537	30449	—	●	3
*5/16	13/16	2-1/2	5/16	30339	39339	39539	30450	91282	●	3
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
*3/8	1	2-1/2	3/8	30347	39347	39547	30454	91286	●	3
3/8	1-1/8	3	3/8	33307	31804	31814	31854	—	●	3L

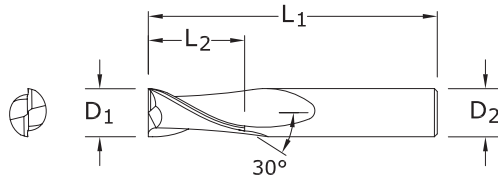
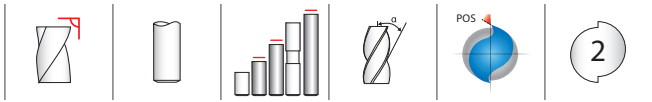
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- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

2 Flute Square End



3·3L·3EL
FRACTIONAL SERIES

TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

CONTINUED

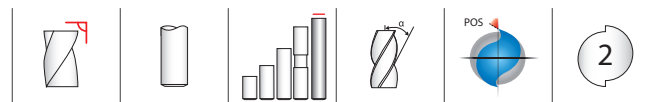
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
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- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
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CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.					STOCK	SERIES
				UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Di-NAMITE (Diamond)		
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
*1/2	1	3	1/2	30363	39363	39563	30462	91290	●	3
1/2	2	4-1/2	1/2	33311	31806	31816	31856	—	●	3L
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	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	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	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

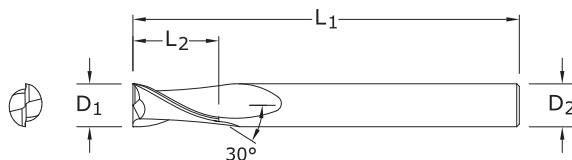
2 Flute Square End Long Reach



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$



59

FRACTIONAL SERIES

CUTTING DIAMETER D_1	inch			EDP NO.			STOCK
	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	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	●

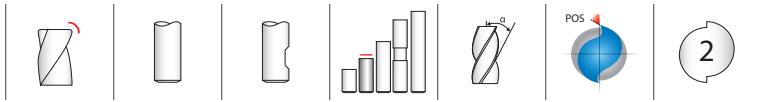
Neck Option Available

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

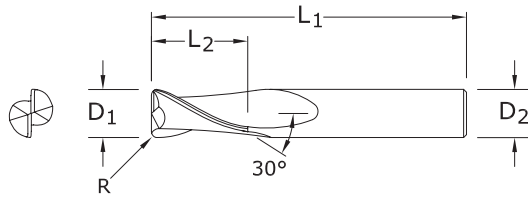
- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

2 Flute Corner Radius



3CR
FRACTIONAL SERIES



TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆
R = +0.0000/-0.0020

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

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

NOMINAL CUTTING DIA. D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIA. D ₂	CORNER RADIUS R	EDP NO.				STOCK
					UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/8*	1/2	1-1/2	1/8	.015	38201	38202	38315	38357	●
1/8*	1/2	1-1/2	1/8	.020	38203	38204	38316	38358	●
3/16*	5/8	2	3/16	.015	38209	38210	38317	38359	●
3/16*	5/8	2	3/16	.020	38211	38212	38318	38360	●
3/16*	5/8	2	3/16	.030	38213	38214	38319	38361	●
1/4*	3/4	2-1/2	1/4	.015	38219	38220	38320	38362	●
1/4*	3/4	2-1/2	1/4	.020	38221	38222	38321	38363	●
1/4*	3/4	2-1/2	1/4	.030	38223	38224	38322	38364	●
1/4*	3/4	2-1/2	1/4	.045	38225	38226	38323	38365	●
5/16*	13/16	2-1/2	5/16	.015	38231	38232	38324	38366	●
5/16*	13/16	2-1/2	5/16	.020	38233	38234	38325	38367	●
5/16*	13/16	2-1/2	5/16	.030	38235	38236	38326	38368	●
5/16*	13/16	2-1/2	5/16	.045	38237	38238	38327	38369	●
3/8	1	2-1/2	3/8	.015	38245	38246	38328	38370	●
3/8	1	2-1/2	3/8	.020	38247	38248	38329	38371	●
3/8	1	2-1/2	3/8	.030	38249	38250	38330	38372	●
3/8	1	2-1/2	3/8	.045	38251	38252	38331	38373	●
1/2	1	3	1/2	.015	38259	38260	38332	38374	●
1/2	1	3	1/2	.020	38261	38262	38333	38375	●
1/2	1	3	1/2	.030	38263	38264	38334	38376	●
1/2	1	3	1/2	.045	38265	38266	38335	38377	●
1/2	1	3	1/2	.060	38267	38268	38336	38378	●
5/8	1-1/4	3-1/2	5/8	.015	38273	38274	38337	38379	●
5/8	1-1/4	3-1/2	5/8	.020	38275	38276	38338	38380	●
5/8	1-1/4	3-1/2	5/8	.030	38277	38278	38339	38381	●
5/8	1-1/4	3-1/2	5/8	.045	38279	38280	38340	38382	●
5/8	1-1/4	3-1/2	5/8	.060	38281	38282	38341	38383	●
5/8	1-1/4	3-1/2	5/8	.090	38283	38284	38342	38384	●
3/4	1-1/2	4	3/4	.015	38287	38288	38343	38385	●
3/4	1-1/2	4	3/4	.020	38289	38290	38344	38386	●
3/4	1-1/2	4	3/4	.030	38291	38292	38345	38387	●
3/4	1-1/2	4	3/4	.045	38293	38294	38346	38388	●
3/4	1-1/2	4	3/4	.060	38295	38296	38347	38389	●
3/4	1-1/2	4	3/4	.090	38297	38298	38348	38390	●
3/4	1-1/2	4	3/4	.125	38299	38300	38349	38391	●
1	1-1/2	4	1	.015	38301	38302	38350	38392	●
1	1-1/2	4	1	.020	38303	38304	38351	38393	●
1	1-1/2	4	1	.030	38305	38306	38352	38394	●
1	1-1/2	4	1	.045	38307	38308	38353	38395	●
1	1-1/2	4	1	.060	38309	38310	38354	38396	●
1	1-1/2	4	1	.090	38311	38312	38355	38397	●
1	1-1/2	4	1	.125	38313	38314	38356	38398	●

*Without Flat

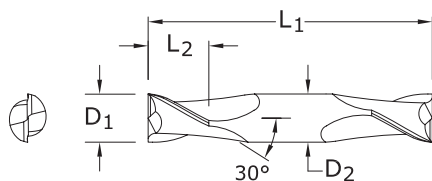
2 Flute Double End Mills



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$



15
FRACTIONAL SERIES

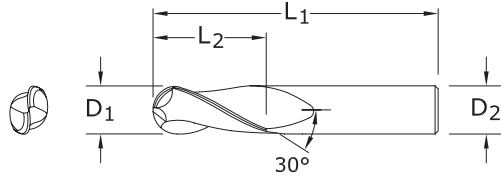
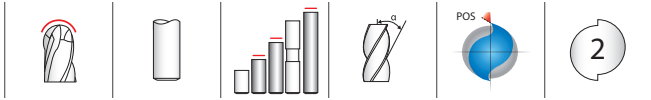
inch				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/32	1/16	1-1/2	1/8	31501	31541	39651	31316	●
3/64	3/32	1-1/2	1/8	31503	31543	39653	31317	●
1/16	1/8	1-1/2	1/8	31505	31545	39655	31318	●
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
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

● U.S. Stock Standard
 ■ NOT STOCKED—
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2 Flute Ball End



3B•3LB•3ELB

FRACTIONAL SERIES

TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

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

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

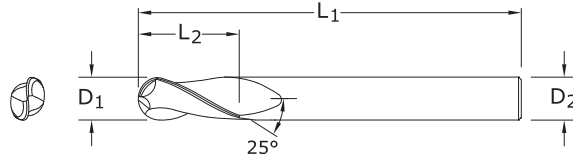
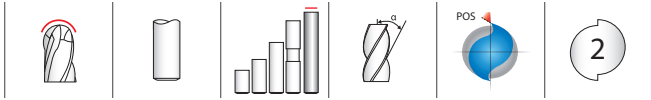
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.				STOCK	SERIES
				UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)		
1/64	1/32	1-1/2	1/8	30302	39302	39502	30471	●	3B
1/32	5/64	1-1/2	1/8	30304	39304	39504	30472	●	3B
3/64	7/64	1-1/2	1/8	30306	39306	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

continued on next page

3B•3LB•3ELB
FRACTIONAL SERIES

inch				EDP NO.				STOCK	SERIES	CONTINUED
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)			
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	
*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	

2 Flute Ball End Long Reach



TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

59B
FRACTIONAL SERIES

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

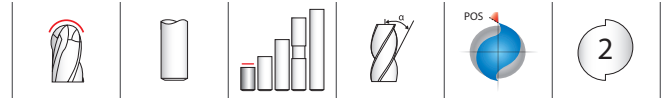
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.			STOCK
				Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/8	3/8	2-1/2	1/4	32210	32290	32200	●
3/16	9/16	3	1/4	32211	32291	32201	●
1/4	5/8	3-1/2	1/4	32212	32292	32202	●
5/16	11/16	4	5/16	32213	32293	32203	●
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

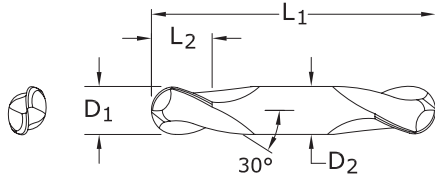
- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

FRACTIONAL 2 Flute Double End Ball End



TOLERANCES (inch)
 $D_1 = +0.0000/-0.0020$
 $D_2 = h_6$



15B
FRACTIONAL SERIES

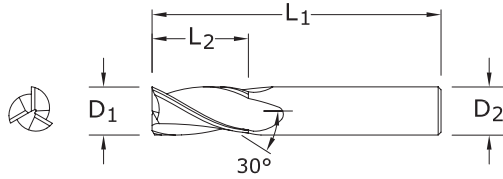
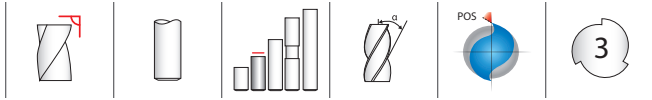
inch				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/32	1/16	1-1/2	1/8	31502	31542	39652	31337	●
3/64	3/32	1-1/2	1/8	31504	31544	39654	31338	●
1/16	1/8	1-1/2	1/8	31506	31546	39656	31339	●
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	39760	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	●

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

● U.S. Stock Standard
 ■ NOT STOCKED—
 Call for Delivery

For patent information
 visit www.kyocera-sgstoool.com/patents

3 Flute Square End



5 FRACTIONAL SERIES

TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

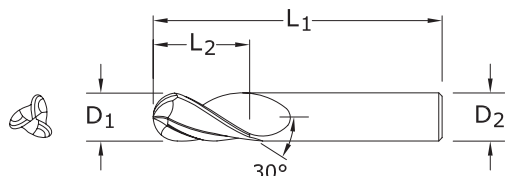
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
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inch				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	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	●

FRACTIONAL 3 Flute Ball End



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$

5B
FRACTIONAL SERIES

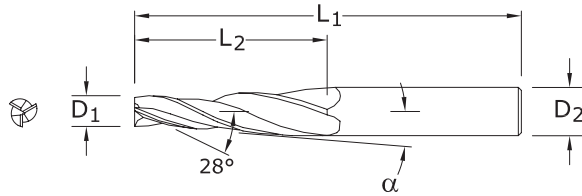
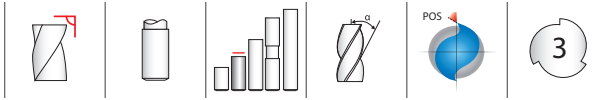
inch				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/64	1/32	1-1/2	1/8	30502	30851	30602	31130	●
1/32	5/64	1-1/2	1/8	30504	30852	30604	31131	●
3/64	7/64	1-1/2	1/8	30506	30853	30606	31132	●
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	●

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

- U.S. Stock Standard
- NOT STOCKED—
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Tapered Square End



23
FRACTIONAL SERIES

TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

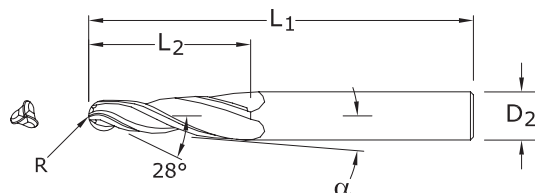
- STEELS
- STAINLESS STEELS
- CAST IRON
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- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
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SHANK DIAMETER D ₂	CENTER LINE ANGLE α	SMALL DIAMETER D ₁	inch		EDP NO.				STOCK
			LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	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	32388	32362	●
1/2	7°	1/4	1-1/4	4	32339	32388	32340	32363	●
1/2	10°	1/8	1	4	32341	32389	32342	32364	●

Tapered Radius End



TOLERANCES (inch)

$D_2 = h_6$
 $R = +0.0005/-0.0010$

24
 FRACTIONAL SERIES

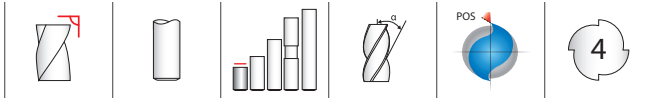
SHANK DIAMETER D_2	CENTER LINE ANGLE α	inch			EDP NO.				STOCK
		RADIUS R	LENGTH OF CUT L_2	OVERALL LENGTH L_1	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/4	1°	0.062	1-1/2	3	32402	32403	32445	32470	●
1/4	1°30'	0.062	1-1/2	3	32404	32405	32446	32471	●
1/4	2°	0.062	1-1/4	3	32406	32407	32447	32472	●
1/4	3°	0.062	1	3	32408	32409	32448	32473	●
1/4	5°	0.062	3/4	3	32410	32411	32449	32474	●
1/4	7°	0.062	1/2	3	32412	32413	32450	32475	●
1/4	10°	0.047	1/2	3	32414	32415	32451	32476	●
3/8	1°	0.093	1-3/4	3-1/2	32416	32417	32452	32477	●
3/8	1°30'	0.093	1-3/4	3-1/2	32418	32419	32453	32478	●
3/8	2°	0.093	1-3/4	3-1/2	32420	32421	32454	32479	●
3/8	3°	0.078	1-3/4	3-1/2	32422	32423	32455	32480	●
3/8	5°	0.062	1-1/2	3-1/2	32424	32425	32456	32481	●
3/8	7°	0.062	1	3-1/2	32426	32427	32457	32482	●
3/8	10°	0.062	3/4	3-1/2	32428	32429	32458	32483	●
1/2	1°	0.125	2	4	32430	32431	32459	32484	●
1/2	2°	0.125	2	4	32434	32435	32460	32485	●
1/2	3°	0.125	2	4	32436	32437	32461	32486	●
1/2	5°	0.125	1-1/4	4	32438	32439	32462	32487	●
1/2	7°	0.093	1-1/4	4	32440	32441	32463	32488	●
1/2	10°	0.062	1	4	32442	32443	32464	32489	●

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

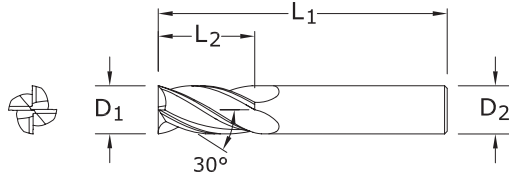
● U.S. Stock Standard
 ■ NOT STOCKED—
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4 Flute Square End Stub



16
FRACTIONAL SERIES



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$

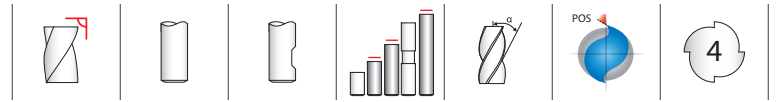
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

CUTTING DIAMETER D_1	inch			EDP NO.				STOCK
	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/16	1/8	1-1/2	1/8	31601	31650	31238	31251	●
3/32	3/16	1-1/2	1/8	31603	31651	31239	31252	●
1/8	1/4	1-1/2	1/8	31605	31652	31240	31253	●
5/32	5/16	2	3/16	31607	31653	31241	31254	●
3/16	3/8	2	3/16	31609	31654	31242	31255	●
7/32	7/16	2	1/4	31611	31655	31243	31256	●
1/4	1/2	2	1/4	31613	31656	31244	31257	●
5/16	1/2	2	5/16	31615	31657	31245	31258	●
3/8	5/8	2	3/8	31617	31658	31246	31259	●
7/16	5/8	2-1/2	7/16	31619	31659	31247	31260	●
1/2	5/8	2-1/2	1/2	31621	31660	31248	31261	●
5/8	3/4	3	5/8	31623	31661	31249	31262	●
3/4	1	3	3/4	31625	31662	31250	31263	●

- U.S. Stock Standard
- NOT STOCKED—
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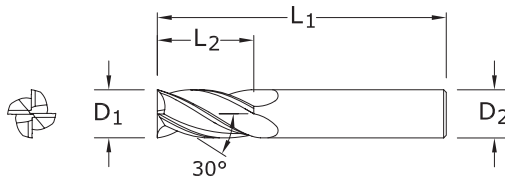
FRACTIONAL 4 Flute End Mills



TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$



1 · 1L · 1EL

FRACTIONAL SERIES

inch				EDP NO.							STOCK	SERIES
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	UNCOATED W/ FLAT	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Ti-NAMITE-A (AlTiN) W/FLAT	Di-NAMITE (Diamond)		
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	3/16	1-1/2	1/8	30107	—	39107	39007	30194	—	91268	●	1
5/64	3/16	1-1/2	1/8	30109	—	39109	39009	30195	—	—	●	1
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	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	—	91272	●	1
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	1/2	2	3/16	30119	—	39119	39019	30000	—	—	●	1
11/64	5/8	2	3/16	30121	—	39121	39021	30001	—	—	●	1
*3/16	5/8	2	3/16	30123	—	39123	39023	30002	—	91276	●	1
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	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	3/4	2-1/2	1/4	30131	—	39131	39031	30006	—	91280	●	1
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	13/16	2-1/2	5/16	30139	—	39139	39039	30010	—	91284	●	1
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

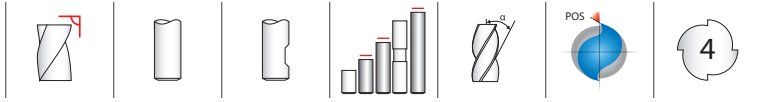
continued on next page

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

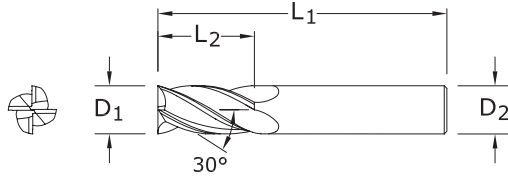
- U.S. Stock Standard
- NOT STOCKED—
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4 Flute End Mills



1·1L·1EL
FRACTIONAL SERIES



TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

CONTINUED

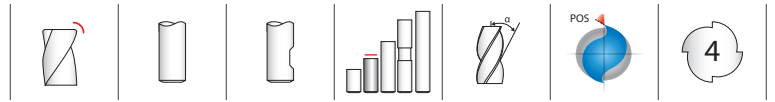
- STEELS
- STAINLESS STEELS
- CAST IRON
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- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
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CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.								STOCK	SERIES
				UNCOATED	UNCOATED W/ FLAT	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Ti-NAMITE-A (AlTiN) W/FLAT	Di-NAMITE (Diamond)			
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	1	2-1/2	3/8	30147	30179	39147	39047	30014	30379	91288	●	1	
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	
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	1	3	1/2	30163	30180	39163	39063	30022	30380	91292	●	1	
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	1-1/4	3-1/2	5/8	30167	30181	39167	39067	30024	30381	—	●	1	
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	1-1/2	4	3/4	30171	30182	39171	39071	30026	30382	—	●	1	
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	30183	39175	39075	30028	30383	—	●	1	
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	

FRACTIONAL 4 Flute Corner Radius

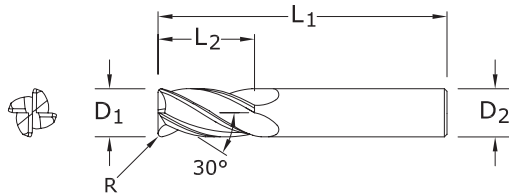


TOLERANCES (inch)

$D_1 = -0.0010/-0.0020$

$D_2 = h_6$

$R = +0.0000/-0.0020$



1CR
FRACTIONAL SERIES

CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIA. D_2	CORNER RADIUS R	EDP NO.				STOCK
					UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/8*	1/2	1-1/2	1/8	.015	38001	38002	38115	38157	●
1/8*	1/2	1-1/2	1/8	.020	38003	38004	38116	38158	●
3/16*	5/8	2	3/16	.015	38009	38010	38117	38159	●
3/16*	5/8	2	3/16	.020	38011	38012	38118	38160	●
3/16*	5/8	2	3/16	.030	38013	38014	38119	38161	●
1/4*	3/4	2-1/2	1/4	.015	38019	38020	38120	38162	●
1/4*	3/4	2-1/2	1/4	.020	38021	38022	38121	38163	●
1/4*	3/4	2-1/2	1/4	.030	38023	38024	38122	38164	●
1/4*	3/4	2-1/2	1/4	.045	38025	38026	38123	38165	●
5/16*	13/16	2-1/2	5/16	.015	38031	38032	38124	38166	●
5/16*	13/16	2-1/2	5/16	.020	38033	38034	38125	38167	●
5/16*	13/16	2-1/2	5/16	.030	38035	38036	38126	38168	●
5/16*	13/16	2-1/2	5/16	.045	38037	38038	38127	38169	●
3/8	1	2-1/2	3/8	.015	38045	38046	38128	38170	●
3/8	1	2-1/2	3/8	.020	38047	38048	38129	38171	●
3/8	1	2-1/2	3/8	.030	38049	38050	38130	38172	●
3/8	1	2-1/2	3/8	.045	38051	38052	38131	38173	●
1/2	1	3	1/2	.015	38059	38060	38132	38174	●
1/2	1	3	1/2	.020	38061	38062	38133	38175	●
1/2	1	3	1/2	.030	38063	38064	38134	38176	●
1/2	1	3	1/2	.045	38065	38066	38135	38177	●
1/2	1	3	1/2	.060	38067	38068	38136	38178	●
5/8	1-1/4	3-1/2	5/8	.015	38073	38074	38137	38179	●
5/8	1-1/4	3-1/2	5/8	.020	38075	38076	38138	38180	●
5/8	1-1/4	3-1/2	5/8	.030	38077	38078	38139	38181	●
5/8	1-1/4	3-1/2	5/8	.045	38079	38080	38140	38182	●
5/8	1-1/4	3-1/2	5/8	.060	38081	38082	38141	38183	●
5/8	1-1/4	3-1/2	5/8	.090	38083	38084	38142	38184	●
3/4	1-1/2	4	3/4	.015	38087	38088	38143	38185	●
3/4	1-1/2	4	3/4	.020	38089	38090	38144	38186	●

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

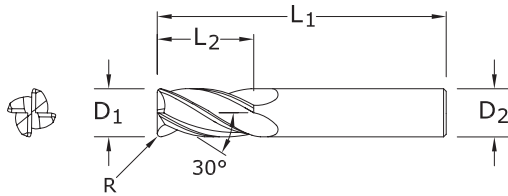
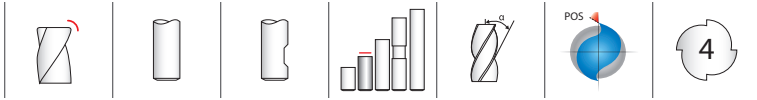
● U.S. Stock Standard
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*Without Flat

continued on next page

4 Flute Corner Radius



TOLERANCES (inch)

$D_1 = -0.0010/-0.0020$

$D_2 = h_6$

$R = +0.0000/-0.0020$

1CR
FRACTIONAL SERIES

CONTINUED

- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
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- U.S. Stock Standard
- NOT STOCKED—
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For patent information
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CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIA. D_2	CORNER RADIUS R	EDP NO.				STOCK
					UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
3/4	1-1/2	4	3/4	.030	38091	38092	38145	38187	●
3/4	1-1/2	4	3/4	.045	38093	38094	38146	38188	●
3/4	1-1/2	4	3/4	.060	38095	38096	38147	38189	●
3/4	1-1/2	4	3/4	.090	38097	38098	38148	38190	●
3/4	1-1/2	4	3/4	.125	38099	38100	38149	38191	●
1	1-1/2	4	1	.015	38101	38102	38150	38192	●
1	1-1/2	4	1	.020	38103	38104	38151	38193	●
1	1-1/2	4	1	.030	38105	38106	38152	38194	●
1	1-1/2	4	1	.045	38107	38108	38153	38195	●
1	1-1/2	4	1	.060	38109	38110	38154	38196	●
1	1-1/2	4	1	.090	38111	38112	38155	38197	●
1	1-1/2	4	1	.125	38113	38114	38156	38198	●

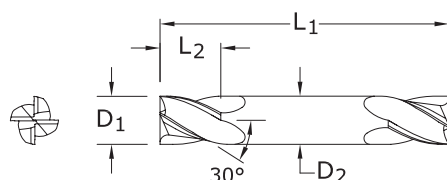
4 Flute Double End Mills



TOLERANCES (inch)

D₁ = +0.0000/-0.0020

D₂ = h₆



14
FRACTIONAL SERIES

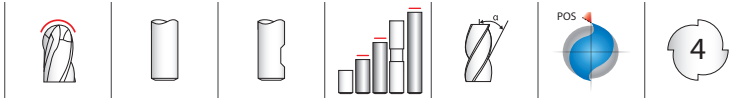
inch				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/32	1/16	1-1/2	1/8	31401	31441	39601	31170	●
3/64	3/32	1-1/2	1/8	31403	31443	39603	31171	●
1/16	1/8	1-1/2	1/8	31405	31445	39605	31172	●
5/64	1/8	1-1/2	1/8	31407	31447	39607	31173	●
3/32	3/16	1-1/2	1/8	31409	31449	39609	31174	●
7/64	3/16	1-1/2	1/8	31411	31451	39611	31175	●
*1/8	1/4	1-1/2	1/8	31413	31453	39613	31176	●
9/64	5/16	2	3/16	31415	31455	39615	31177	●
5/32	5/16	2	3/16	31417	31457	39617	31178	●
11/64	5/16	2	3/16	31419	31459	39619	31179	●
*3/16	3/8	2	3/16	31421	31461	39621	31180	●
13/64	1/2	2-1/2	1/4	31423	31463	39623	31181	●
7/32	1/2	2-1/2	1/4	31425	31465	39625	31182	●
15/64	1/2	2-1/2	1/4	31427	31467	39627	31183	●
*1/4	1/2	2-1/2	1/4	31429	31469	39629	31184	●
9/32	1/2	2-1/2	5/16	31431	31471	39631	31185	●
*5/16	1/2	2-1/2	5/16	31433	31473	39633	31186	●
*3/8	9/16	2-1/2	3/8	31435	31475	39635	31187	●
7/16	9/16	2-3/4	7/16	31437	31477	39637	31188	●
*1/2	5/8	3	1/2	31439	31479	39639	31189	●
*Series 14 Set				31489	31481	39641	31190	●

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

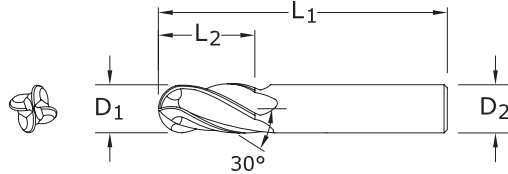
● U.S. Stock Standard
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4 Flute Ball End



1B•1LB•1ELB
FRACTIONAL SERIES



TOLERANCES (inch)

D₁ = +0.0000/-0.0020

D₂ = h₆

- STEELS
- STAINLESS STEELS
- CAST IRON
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- NOT STOCKED—
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inch				EDP NO.							STOCK	SERIES
CUTTING DIA. D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIA. D ₂	UNCOATED	UNCOATED W/FLAT	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Ti-NAMITE-A (AlTiN) W/FLAT	Di-NAMITE (Diamond)		
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	—	91269	●	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	30069	—	39178	39078	—	—	—	●	1B
1/8	1/2	1-1/2	1/8	30116	—	39116	39016	30038	—	91273	●	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	—	91277	●	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	—	91281	●	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	—	91285	●	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

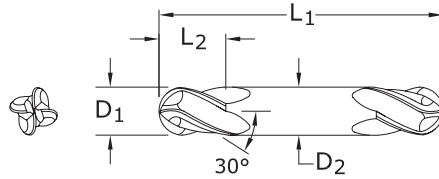
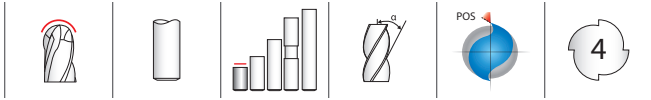
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1B•1LB•1ELB
FRACTIONAL SERIES

inch				EDP NO.								STOCK	SERIES
CUTTING DIA. D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIA. D ₂	UNCOATED	UNCOATED W/FLAT	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	Ti-NAMITE-A (AlTiN) W/FLAT	Di-NAMITE (Diamond)			
*3/8	1	2-1/2	3/8	30148	30184	39148	39048	30054	30384	91289	●	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	30185	39164	39064	30062	30385	91293	●	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	30186	39168	39068	30064	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	30187	39172	39072	30066	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	30188	39176	39076	30068	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	

CONTINUED

4 Flute Double End Ball End



TOLERANCES (inch)

D₁ = +0.0000/-0.0020
D₂ = h₆

14B

FRACTIONAL SERIES

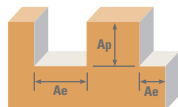
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES







- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstool.com/patents

inch				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1/32	1/16	1-1/2	1/8	31402	31442	39602	31218	●
3/64	3/32	1-1/2	1/8	31404	31444	39604	31219	●
1/16	1/8	1-1/2	1/8	31406	31446	39606	31220	●
5/64	1/8	1-1/2	1/8	31408	31448	39608	31221	●
3/32	3/16	1-1/2	1/8	31410	31450	39610	31222	●
7/64	3/16	1-1/2	1/8	31412	31452	39612	31223	●
*1/8	1/4	1-1/2	1/8	31414	31454	39614	31224	●
9/64	5/16	2	3/16	31416	31456	39616	31225	●
5/32	5/16	2	3/16	31418	31458	39618	31226	●
11/64	5/16	2	3/16	31420	31460	39620	31227	●
*3/16	3/8	2	3/16	31422	31462	39622	31228	●
13/64	1/2	2-1/2	1/4	31424	31464	39624	31229	●
7/32	1/2	2-1/2	1/4	31426	31466	39626	31230	●
15/64	1/2	2-1/2	1/4	31428	31468	39628	31231	●
*1/4	1/2	2-1/2	1/4	31430	31470	39630	31232	●
9/32	1/2	2-1/2	5/16	31432	31472	39632	31233	●
*5/16	1/2	2-1/2	5/16	31434	31474	39634	31234	●
*3/8	9/16	2-1/2	3/8	31436	31476	39636	31235	●
7/16	9/16	2-3/4	7/16	31438	31478	39638	31236	●
*1/2	5/8	3	1/2	31440	31480	39640	31237	●
*Series 14B Set				31490	31482	39642	31217	●

2 Flute: Square & Ball End 4 Flute: Square & Ball End



Diamond 1, 1B, 3, 3B Fractional	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)								
				1/8	1/4	5/16	3/8	1/2				
GRAPHITE Ultrafine, Superfine	Profile  ≤ 0.25	≤ 1.5	720	RPM	22003	11002	8801	7334	5501			
			(576-864)	Fz	0.0009	0.0023	0.0036	0.0043	0.0058			
				Feed 2 flutes (ipm)	38.3	50.6	63.4	63.1	63.8			
				Feed 3 flutes (ipm)	76.6	101.2	126.7	126.2	127.6			
			Slot  ≤ 1	≤ 1	580	RPM	17725	8862	7090	5908	4431	
					(464-696)	Fz	0.0075	0.0020	0.0031	0.0038	0.0050	
	Feed 2 flutes (ipm)	265.9				35.4	44.0	44.9	44.3			
	Feed 3 flutes (ipm)	531.7				70.9	87.9	89.8	88.6			
	COMPOSITES FRP, CFRP, GRP	Profile  ≤ 0.25			≤ 1.5	385	RPM	11766	5883	4706	3922	2941
						(308-462)	Fz	0.0005	0.0014	0.0022	0.0026	0.0035
			Feed 2 flutes (ipm)	12.2			16.5	20.7	20.4	20.6		
			Feed 3 flutes (ipm)	24.5			32.9	41.4	40.8	41.2		
Slot  ≤ 1			≤ 1	350		RPM	10696	5348	4278	3565	2674	
				(280-420)		Fz	0.0005	0.0012	0.0019	0.0023	0.0030	
		Feed 2 flutes (ipm)			9.6	12.8	16.3	16.4	16.0			
		Feed 3 flutes (ipm)			19.3	25.7	32.5	32.8	32.1			
		PLASTICS Polycarbonate, PVC, Polypropylene		Profile  ≤ 0.25	≤ 1.5	1200	RPM	36672	18336	14669	12224	9168
						(960-1440)	Fz	0.0009	0.0023	0.0036	0.0043	0.0058
Feed 2 flutes (ipm)			63.8				84.3	105.6	105.1	106.3		
Feed 3 flutes (ipm)			127.6				168.7	211.2	210.3	212.7		
Slot  ≤ 1	≤ 1		960			RPM	29338	14669	11735	9779	7334	
			(768-1152)			Fz	0.0008	0.0020	0.0031	0.0038	0.0050	
				Feed 2 flutes (ipm)	44.0	58.7	72.8	74.3	73.3			
				Feed 3 flutes (ipm)	88.0	117.4	145.5	148.6	146.7			

rpm = (Vc x 3.82) / D₁
 ipm = Fz x number of flutes x rpm
 finish cuts typically require reduced feed and cut depths (.02 x D maximum)
 refer to the SGS Tool Wizard for complete technical information (www.kyocera-sgstool.com)

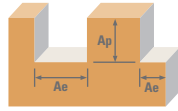
FRACTIONAL

2 Flute: Square, Double, Stub, Long, Ball, Corner Radius

3 Flute: Square, Ball, Tapered

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

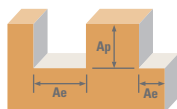
Tapered: Square, Radius



Series	Hardness	Flutes	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)										
						1/64	1/32	1/16	1/8	1/4	3/8	1/2	3/4	1		
P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(368-552)	460	RPM	112461	56230	28115	14058	7029	4686	3514	2343	1757	
					Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028		
					Feed (ipm)	6.7	6.7	7.3	8.4	11.2	14.1	14.1	11.2	9.8		
		Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(268-402)	335	RPM	81901	40950	20475	10238	5119	3413	2559	1706	1280	
					Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028		
					Feed (ipm)	4.9	4.9	5.3	6.1	8.2	10.2	10.2	8.2	7.2		
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(268-402)	335	RPM	81901	40950	20475	10238	5119	3413	2559	1706	1280
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	3.3	4.1	3.7	4.1	6.1	7.5	7.7	6.1	5.4	
			Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(196-294)	245	RPM	59898	29949	14974	7487	3744	2496	1872	1248	936
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	2.4	3.0	2.7	3.0	4.5	5.5	5.6	4.5	3.9	
H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		≤ 250 Bhn or ≤ 24 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(252-378)	315	RPM	77011	38506	19253	9626	4813	3209	2407	1604	1203
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	3.1	3.9	3.5	3.9	5.8	7.1	7.2	5.8	5.1	
			Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(184-276)	230	RPM	56230	28115	14058	7029	3514	2343	1757	1171	879
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	2.2	2.8	2.5	2.8	4.2	5.2	5.3	4.2	3.7	
	K CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(268-402)	335	RPM	81901	40950	20475	10238	5119	3413	2559	1706	1280
						Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028	
						Feed (ipm)	4.9	4.9	5.3	6.1	8.2	10.2	10.2	8.2	7.2	
			Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(196-294)	245	RPM	59898	29949	14974	7487	3744	2496	1872	1248	936
						Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028	
						Feed (ipm)	3.6	3.6	3.9	4.5	6.0	7.5	7.5	6.0	5.2	
M STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F		≤ 275 Bhn or ≤ 28 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(296-444)	370	RPM	90458	45229	22614	11307	5654	3769	2827	1885	1413
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	3.6	4.5	4.1	4.5	6.8	8.3	8.5	6.8	5.9	
			Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(216-324)	270	RPM	66010	33005	16502	8251	4126	2750	2063	1375	1031
						Fz	0.00002	0.00005	0.00009	0.0002	0.0006	0.0011	0.0015	0.0018	0.0021	
						Feed (ipm)	2.6	3.3	3.0	3.3	5.0	6.1	6.2	5.0	4.3	
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4 PH, 15-5, 13-4, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile	2 ≤ 0.50 ≤ 1.5 3 ≤ 0.25 ≤ 1.5 4 ≤ 0.25 ≤ 1.5	(204-306)	255	RPM	62342	31171	15586	7793	3896	2598	1948	1299	974
						Fz	0.00002	0.00004	0.00008	0.0002	0.0005	0.0009	0.0012	0.0014	0.0017	
						Feed (ipm)	2.5	2.5	2.5	2.6	3.9	4.7	4.7	3.6	3.3	
			Slot	2 1 ≤ 1 3 1 ≤ 0.5 4 1 ≤ 0.4	(148-222)	185	RPM	45229	22614	11307	5654	2827	1885	1413	942	707
						Fz	0.00002	0.00004	0.00008	0.0002	0.0005	0.0009	0.0012	0.0014	0.0017	
						Feed (ipm)	1.8	1.8	1.8	1.9	2.8	3.4	3.4	2.6	2.4	

continued on next page

2 Flute: Square, Double, Stub, Long, Ball, Corner Radius
 3 Flute: Square, Ball, Tapered
 4 Flute: Square, Double, Stub, Ball, Corner Radius
 Tapered: Square, Radius



Series
 1, 3, 5, 14, 15, 16,
 17, 23, 24, 59
 Fractional

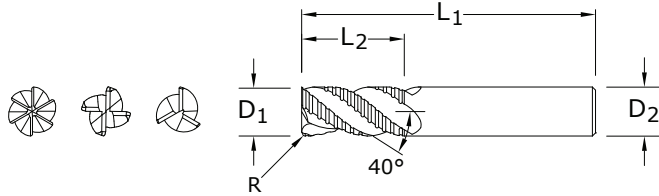
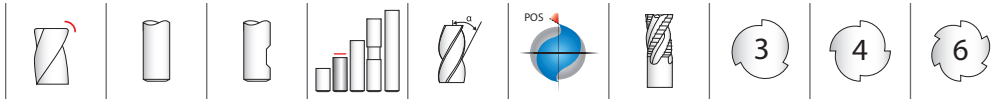
Diameter (D₁)
 (inch)

Series	Hardness	Flutes	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)											
						1/64	1/32	1/16	1/8	1/4	3/8	1/2	3/4	1			
S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, 718, Incoloy 800, Monel 400, Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	65	RPM	15891	7946	3973	1986	993	662	497	331	248		
						Fz	0.00002	0.00003	0.00006	0.0002	0.0004	0.0008	0.0010	0.0012	0.0014		
						Feed (ipm)	0.6	0.5	0.5	0.7	0.7	1.1	1.0	0.8	0.7		
		Slot	2 1 ≤ 1	3 1 ≤ 0.5	4 1 ≤ 0.4	45	RPM	11002	5501	2750	1375	688	458	344	229	172	
							Fz	0.00002	0.00003	0.00006	0.0002	0.0004	0.0008	0.0010	0.0012	0.0014	
							Feed (ipm)	0.4	0.3	0.3	0.5	0.5	0.7	1.1	1.0	0.8	0.7
	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	180	RPM	44006	22003	11002	5501	2750	1834	1375	917	688	
							Fz	0.00002	0.00004	0.00008	0.0002	0.0005	0.0009	0.0012	0.0014	0.0017	
							Feed (ipm)	1.8	1.8	1.8	2.2	2.8	3.3	3.3	2.6	2.3	
			Slot	2 1 ≤ 1	3 1 ≤ 0.5	4 1 ≤ 0.4	130	RPM	31782	15891	7946	3973	1986	1324	993	662	497
								Fz	0.00002	0.00004	0.00008	0.0002	0.0005	0.0009	0.0012	0.0014	0.0017
								Feed (ipm)	1.3	1.3	1.3	1.6	2.0	2.4	2.4	1.9	1.7
N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 150 Bhn or ≤ 7 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	880	RPM	215142	107571	53786	26893	13446	8964	6723	4482	3362		
						Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056		
						Feed (ipm)	25.8	28.0	26.9	32.3	43.0	53.8	53.8	43.0	37.6		
		Slot	2 1 ≤ 1	3 1 ≤ 0.5	640	RPM	156467	78234	39117	19558	9779	6519	4890	3260	2445		
						Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056		
						Feed (ipm)	18.8	20.3	19.6	23.5	31.3	39.1	39.1	31.3	27.4		
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	485	RPM	118573	59286	29643	14822	7411	4941	3705	2470	1853	
							Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028	
							Feed (ipm)	7.1	7.1	7.7	8.9	11.9	14.8	14.8	11.9	10.4	
			Slot	2 1 ≤ 1	3 1 ≤ 0.5	350	RPM	85568	42784	21392	10696	5348	3565	2674	1783	1337	
							Fz	0.00003	0.00006	0.00013	0.0003	0.0008	0.0015	0.0020	0.0024	0.0028	
							Feed (ipm)	5.1	5.1	5.6	6.4	8.6	10.7	10.7	8.6	7.5	
N PLASTICS Polycarbonate, PVC, Polypropylene	≤ 140 Bhn or ≤ 3 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	880	RPM	215142	107571	53786	26893	13446	8964	6723	4482	3362		
						Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056		
						Feed (ipm)	25.8	28.0	26.9	32.3	43.0	53.8	53.8	43.0	37.6		
		Slot	2 1 ≤ 1	3 1 ≤ 0.5	640	RPM	156467	78234	39117	19558	9779	6519	4890	3260	2445		
						Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056		
						Feed (ipm)	18.8	20.3	19.6	23.5	31.3	39.1	39.1	31.3	27.4		
	GRAPHITE	≤ 140 Bhn or ≤ 3 HRc	Profile	2 ≤ 0.50 ≤ 1.5	3 ≤ 0.25 ≤ 1.5	660	RPM	161357	80678	40339	20170	10085	6723	5042	3362	2521	
							Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056	
							Feed (ipm)	19.4	21.0	20.2	24.2	32.3	40.3	40.3	32.3	28.2	
			Slot	2 1 ≤ 1	3 1 ≤ 0.5	480	RPM	117350	58675	29338	14669	7334	4890	3667	2445	1834	
							Fz	0.00006	0.00013	0.00025	0.0006	0.0016	0.0030	0.0040	0.0048	0.0056	
							Feed (ipm)	14.1	15.3	14.7	17.6	23.5	29.3	29.3	23.5	20.5	

Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 3.82) / D₁
 ipm = Fz x number of flutes x rpm
 reduce speed and feed for materials harder than listed
 for tapered end mills, base the speed on the largest diameter contacting
 the workpiece and the feed on the smallest diameter

limit cut depths of long and extra long flute mills to .05 x D₁ when slotting
 or profiling
 reduce feed and Ae when finish milling (.02 x D₁ maximum)
 refer to the SGS Tool Wizard for complete technical information
 (www.kyocera-sgstool.com)

Single End Roughers



62 FRACTIONAL SERIES

TOLERANCES (inch)

$D_1 = +0.0000/-0.0040$

$D_2 = h_6$

$R = +0.0050/-0.0050$

CUTTING DIA. D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	inch			NO. OF FLUTES	EDP NO.			STOCK
			SHANK DIA. D_2	CORNER RADIUS R			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

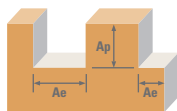
HIGH TEMP ALLOYS









TITANIUM

- U.S. Stock Standard
- NOT STOCKED— Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

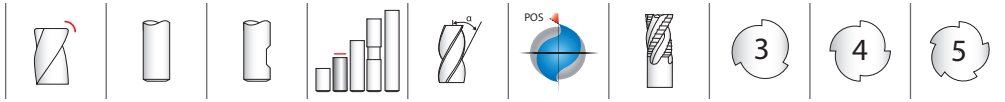
Single End Roughers



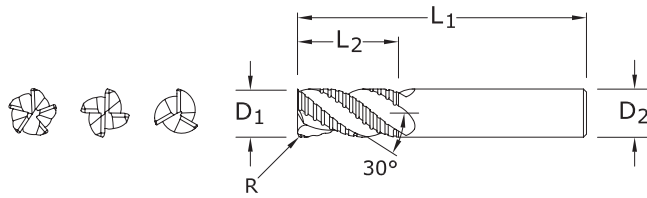
Series 62	Fractional	Hardness	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)						
						1/4	3/8	1/2	3/4	1		
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	405	RPM	6188	4126	3094	2063	1547
						(324-486)	Fz	0.0006	0.0011	0.0015	0.0019	0.0021
						Feed (ipm)	11.1	13.6	18.6	15.7	19.5	
			Slot 	1	≤ 1	325	RPM	4966	3311	2483	1655	1242
						(260-390)	Fz	0.0006	0.0011	0.0015	0.0019	0.0021
						Feed (ipm)	8.9	10.9	14.9	12.6	15.6	
	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4PH, 15-5PH, 13-4PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	280	RPM	4278	2852	2139	1426	1070
						(224-336)	Fz	0.0005	0.0009	0.0012	0.0015	0.0017
						Feed (ipm)	6.4	7.7	10.3	8.6	10.9	
			Slot 	1	≤ 1	225	RPM	3438	2292	1719	1146	860
						(180-270)	Fz	0.0005	0.0009	0.0012	0.0015	0.0017
						Feed (ipm)	5.2	6.2	8.3	6.9	8.8	
S	SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy 800, Monel 400, Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc	Profile 	≤ 0.5	≤ 1.5	70	RPM	1070	713	535	357	267
						(56-84)	Fz	0.0004	0.0008	0.0010	0.0013	0.0014
						Feed (ipm)	1.3	1.7	2.1	1.9	2.2	
			Slot 	1	≤ 1	56	RPM	856	570	428	285	214
						(45-67)	Fz	0.0004	0.0008	0.0010	0.0013	0.0014
						Feed (ipm)	1.0	1.4	1.7	1.5	1.8	
	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al3Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc	Profile 	≤ 0.5	≤ 1.5	155	RPM	2368	1579	1184	789	592
						(124-186)	Fz	0.0005	0.0009	0.0012	0.0015	0.0017
						Feed (ipm)	3.6	4.3	5.7	4.7	6.0	
			Slot 	1	≤ 1	195	RPM	2980	1986	1490	993	745
						(156-234)	Fz	0.0005	0.0009	0.0012	0.0015	0.0017
						Feed (ipm)	4.5	5.4	7.2	6.0	7.6	

Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 3.82) / D₁
 ipm = 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



61 FRACTIONAL SERIES



TOLERANCES (inch)

$D_1 = +0.0000/-0.0040$

$D_2 = h_6$

$R = +0.0050/-0.0050$

CUTTING DIA. D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	inch			NO. OF FLUTES	EDP NO.			STOCK
			SHANK DIA. D_2	CORNER RADIUS R			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	●

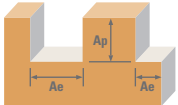
*Without Flat





- STEELS
- CAST IRON
- HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—
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For patent information
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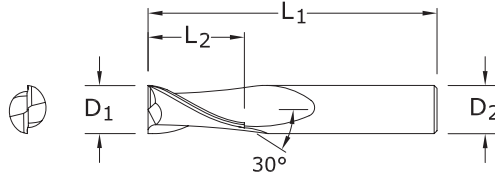
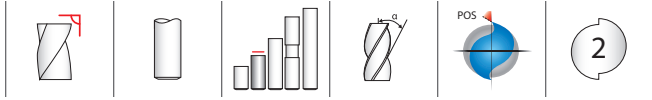
Single End Roughers



Series 61	Fractional	Hardness	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)						
						1/4	3/8	1/2	3/4	1		
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile 	≤ 0.5	≤ 1.5	500	RPM	7640	5093	3820	2547	1910
						(400-600)	Fz	0.0006	0.0011	0.0014	0.0017	0.0020
							Feed (ipm)	13.8	16.8	21.4	17.3	19.1
						400	RPM	6112	4075	3056	2037	1528
						(320-480)	Fz	0.0006	0.0011	0.0014	0.0017	0.0020
							Feed (ipm)	11.0	13.4	17.1	13.9	15.3
	ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HR	Profile 	≤ 0.5	≤ 1.5	365	RPM	5577	3718	2789	1859	1394
						(292-438)	Fz	0.0004	0.0008	0.0011	0.0013	0.0015
							Feed (ipm)	6.7	8.9	12.3	9.7	10.5
						295	RPM	4508	3005	2254	1503	1127
						(236-354)	Fz	0.0004	0.0008	0.0011	0.0013	0.0015
							Feed (ipm)	5.4	7.2	9.9	7.8	8.5
H	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc	Profile 	≤ 0.5	≤ 1.5	345	RPM	5272	3514	2636	1757	1318
						(276-414)	Fz	0.0006	0.0009	0.0015	0.0018	0.0021
							Feed (ipm)	9.5	9.5	15.8	12.7	13.8
						275	RPM	4202	2801	2101	1401	1051
						(220-330)	Fz	0.0006	0.0009	0.0015	0.0018	0.0021
							Feed (ipm)	7.6	7.6	12.6	10.1	11.0
K	CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile 	≤ 0.5	≤ 1.5	365	RPM	5577	3718	2789	1859	1394
						(292-438)	Fz	0.0008	0.0015	0.0020	0.0024	0.0028
							Feed (ipm)	13.4	16.7	22.3	17.8	19.5
						295	RPM	4508	3005	2254	1503	1127
						(236-354)	Fz	0.0008	0.0015	0.0020	0.0024	0.0028
							Feed (ipm)	10.8	13.5	18.0	14.4	15.8

Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 3.82) / D₁
 ipm = 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)

2 Flute High Shear End Mills



52
FRACTIONAL SERIES

TOLERANCES (inch)

$D_1 = +0.0000/-0.0020$

$D_2 = h_6$

CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	EDP NO.		STOCK
				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	●

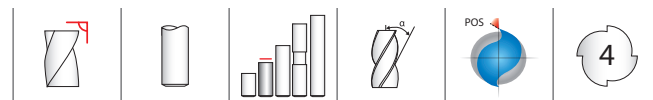
NON-FERROUS

PLASTICS/COMPOSITES

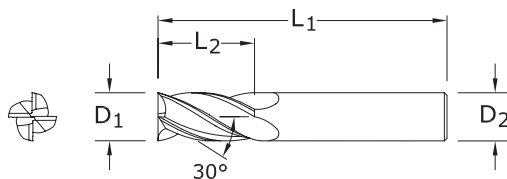
- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

4 Flute High Shear End Mills



TOLERANCES (inch)
D1 = +0.0000/-0.0020
D2 = h₆



54
FRACTIONAL SERIES

CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.		STOCK
				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	●

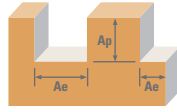
NON-FERROUS
 PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
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 visit www.kyocera-sgstool.com/patents

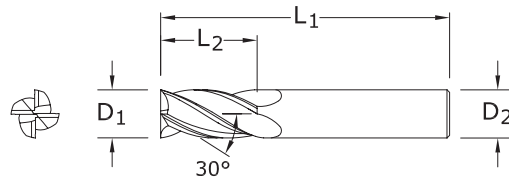
2 Flute: High Shear End Mills

4 Flute: High Shear End Mills



Series 52, 54 Fractional	Hardness	Flutes	Ae x D ₁	Ap x D ₁	Vc (sfm)	Diameter (D ₁) (inch)							
						1/8	1/4	3/8	1/2	3/4	1		
ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 7 HRc	Profile 	2	≤ 0.3	≤ 1.5	1360	RPM	41562	20781	13854	10390	6927	5195
						(1088-1632)	Fz	0.00069	0.0018	0.0034	0.0046	0.0055	0.0064
						Feed (ipm)	57.4	74.8	94.2	95.6	76.2	66.5	
		4	≤ 0.3	≤ 1.5	1090	RPM	33310	16655	11103	8328	5552	4164	
					(872-1308)	Fz	0.00063	0.0017	0.0032	0.0042	0.0050	0.0059	
					Feed (ipm)	42.0	56.6	71.1	70.0	55.5	49.1		
	≤ 125 Bhn or ≤ 77 HRb	Profile 	2	≤ 0.3	≤ 1.5	510	RPM	15586	7793	5195	3896	2598	1948
						(408-612)	Fz	0.00069	0.0018	0.0034	0.0046	0.0055	0.0064
						Feed (ipm)	21.5	28.1	35.3	35.8	28.6	24.9	
		4	≤ 0.3	≤ 1.5	410	RPM	12530	6265	4177	3132	2088	1566	
					(328-492)	Fz	0.00063	0.0017	0.0032	0.0042	0.0050	0.0059	
					Feed (ipm)	15.8	21.3	26.7	26.3	20.9	18.5		
≤ 140 Bhn or ≤ 3 HRc	Profile 	2	≤ 0.3	≤ 1.5	590	RPM	18030	9015	6010	4508	3005	2254	
					(472-708)	Fz	0.00039	0.0010	0.0020	0.0026	0.0031	0.0037	
					Feed (ipm)	14.1	18.0	24.0	23.4	18.6	16.7		
	4	≤ 0.3	≤ 1.5	475	RPM	14516	7258	4839	3629	2419	1815		
				(380-570)	Fz	0.00036	0.0010	0.0018	0.0024	0.0029	0.0034		
				Feed (ipm)	10.5	14.5	17.4	17.4	14.0	12.3			
≤ 200 Bhn or ≤ 23 HRc	Profile 	2	≤ 0.3	≤ 1.5	235	RPM	7182	3591	2394	1795	1197	898	
					(188-282)	Fz	0.00039	0.0010	0.0020	0.0026	0.0031	0.0037	
					Feed (ipm)	5.6	7.2	9.6	9.3	7.4	6.6		
	4	≤ 0.3	≤ 1.5	190	RPM	5806	2903	1935	1452	968	726		
				(152-228)	Fz	0.00036	0.0010	0.0018	0.0024	0.0029	0.0034		
				Feed (ipm)	4.2	5.8	7.0	7.0	5.6	4.9			
PLASTICS ABS, Polycarbonate, PVC, Polypropylene	Profile 	2	≤ 0.3	≤ 1.5	1600	RPM	48896	24448	16299	12224	8149	6112	
					(1280-1920)	Fz	0.00110	0.0030	0.0056	0.0074	0.0089	0.0100	
					Feed (ipm)	107.6	146.7	182.5	180.9	145.1	122.2		
	4	≤ 0.3	≤ 1.5	1280	RPM	39117	19558	13039	9779	6519	4890		
				(1024-1536)	Fz	0.00100	0.0027	0.0051	0.0068	0.0082	0.0095		
				Feed (ipm)	78.2	105.6	133.0	133.0	106.9	92.9			
PLASTICS Fiberglass, Glass Filled	Profile 	2	≤ 0.3	≤ 1.5	720	RPM	22003	11002	7334	5501	3667	2750	
					(576-864)	Fz	0.00082	0.0022	0.0041	0.0055	0.0065	0.0076	
					Feed (ipm)	36.1	48.4	60.1	60.5	47.7	41.8		
	4	≤ 0.3	≤ 1.5	575	RPM	17572	8786	5857	4393	2929	2197		
				(460-690)	Fz	0.00075	0.0020	0.0037	0.0050	0.0060	0.0070		
				Feed (ipm)	26.4	35.1	43.3	43.9	35.1	30.8			
4	1	≤ 0.25			52.7	70.3	86.7	87.9	70.3	61.5			

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 rpm = (Vc x 3.82) / D₁
 ipm = 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 D₁ maximum)
 refer to the SGS Tool Wizard for complete technical information (www.kyocera-sgstool.com)



CUTTING DIAMETER D_1	SINGLE END LENGTH OF CUT L_2	DOUBLE END LENGTH OF CUT L_1	OVERALL LENGTH L_1	SHANK DIAMETER D_2
1/8	1/2	1/4	1-1/2	1/8
3/16	5/8	3/8	2	3/16
1/4	3/4	1/2	2-1/2	1/4
5/16	13/16	1/2	2-1/2	5/16
3/8	1	9/16	2-1/2	3/8
1/2	1	5/8	3	1/2

Square End

FRACTIONAL SERIES

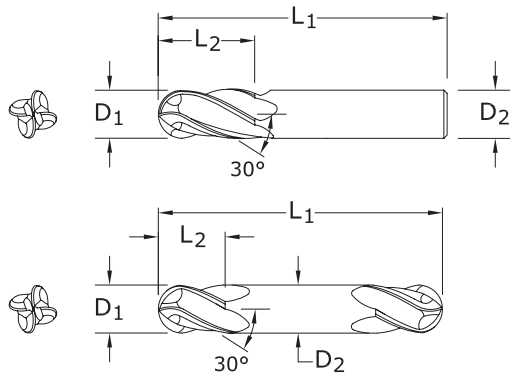
DESCRIPTION	EDP NO.				STOCK
	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
Series 1 – 4 Flute, Single End	30189	39189	39089	30030	●
Series 3 – 2 Flute, Single End	30389	39389	39589	30470	●
Series 5 – 3 Flute, Single End	30589	39789	30810	30850	●
Series 14 – 4 Flute, Double End	31489	31481	39641	31190	●
Series 15 – 2 Flute, Double End	31589	31581	39691	31336	●



- U.S. Stock Standard
- NOT STOCKED—
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End Mills Sets



CUTTING DIAMETER D ₁	SINGLE END LENGTH OF CUT L ₂	DOUBLE END LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂
1/8	1/2	1/4	1-1/2	1/8
3/16	5/8	3/8	2	3/16
1/4	3/4	1/2	2-1/2	1/4
5/16	13/16	1/2	2-1/2	5/16
3/8	1	9/16	2-1/2	3/8
1/2	1	5/8	3	1/2

Ball End

FRACTIONAL SERIES

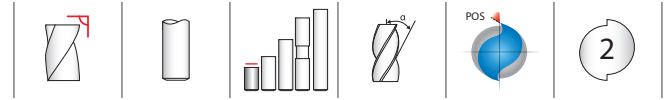


- U.S. Stock Standard
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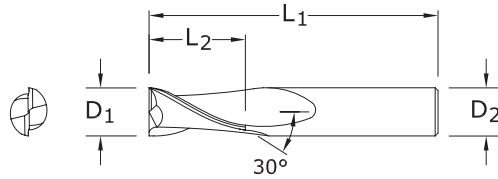
DESCRIPTION	EDP NO.				STOCK
	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
Series 1B – 4 Flute, Single End	30190	39109	39090	30070	●
Series 3B – 2 Flute, Single End	30390	39390	39590	30600	●
Series 5B – 3 Flute, Single End	30590	30900	30944	31169	●
Series 14B – 4 Flute, Double End	31490	31482	39642	31217	●
Series 15B – 2 Flute, Double End	31590	31582	39692	31357	●

2 Flute Square End Stub



TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$



17M
 METRIC SERIES

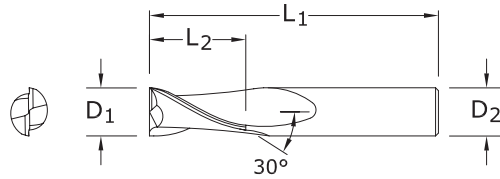
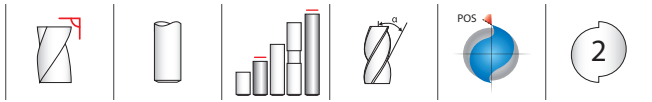
mm				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	2,0	38,0	3,0	41705	49262	49283	49304	●
1,5	3,0	38,0	3,0	41709	49263	49284	49305	●
2,0	4,0	38,0	3,0	41713	49264	49285	49306	●
2,5	5,0	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

● U.S. Stock Standard
 ■ NOT STOCKED—
 Call for Delivery

For patent information
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2 Flute Square End



3M•3XLM
METRIC SERIES

TOLERANCES (mm)
D₁ = +0,000/-0,050
D₂ = h₆

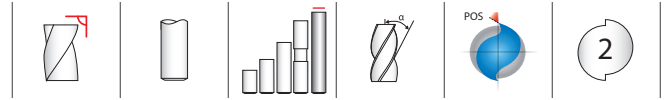
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

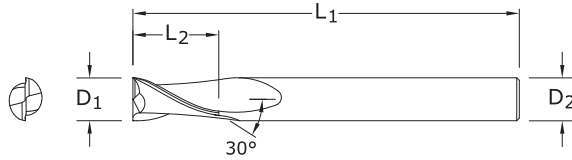
mm				EDP NO.				STOCK	SERIES
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)		
1,0	4,0	38,0	3,0	40305	48628	48650	48671	●	3M
1,5	4,5	38,0	3,0	40309	48629	48651	48672	●	3M
2,0	6,3	38,0	3,0	40313	48630	48652	48673	●	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

2 Flute Square End Long Reach



TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$



59M
 METRIC SERIES

mm				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	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

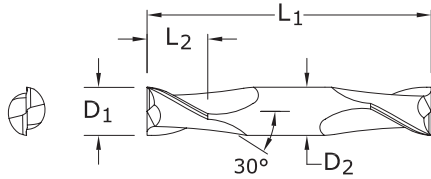
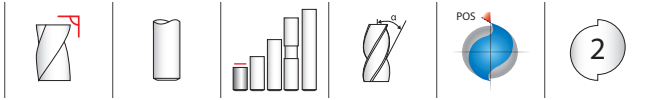
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

METRIC

2 Flute Double End Mills



15M
METRIC SERIES

TOLERANCES (mm)

D₁ = +0,000/-0,050

D₂ = h₆

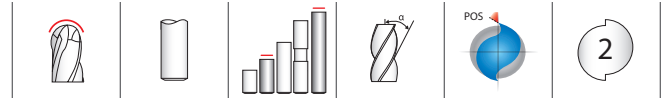
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstool.com/patents

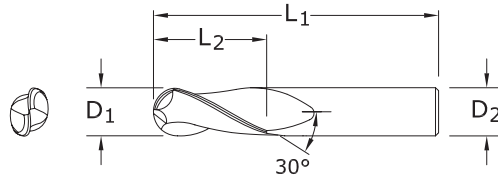
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.				STOCK
				UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	2,0	38,0	3,0	41505	49010	49031	49052	●
1,5	3,0	38,0	3,0	41509	49011	49032	49053	●
2,0	4,0	38,0	3,0	41513	49012	49033	49054	●
2,5	5,0	38,0	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	●

2 Flute Ball End



TOLERANCES (mm)

D₁ = +0,000/-0,050
D₂ = h₆



3MB•3XLMB

METRIC SERIES

mm				EDP NO.				STOCK	SERIES
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	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

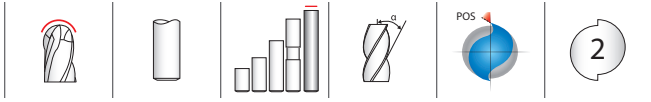
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

● U.S. Stock Standard
■ NOT STOCKED—
Call for Delivery

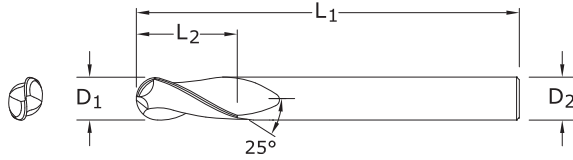
For patent information
visit www.kyocera-sgstoool.com/patents

METRIC

2 Flute Ball End Long Reach



59MB
METRIC SERIES



TOLERANCES (mm)

$D_1 = +0,000/-0,050$

$D_2 = h_6$

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

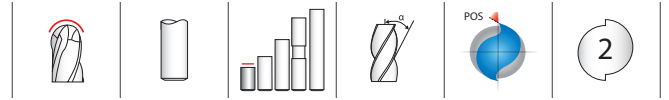
mm				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
3,0	9,0	60,0	6,0	43900	49622	49632	49642	●
4,0	12,0	70,0	6,0	43901	49623	49633	49643	●
6,0	15,0	80,0	6,0	43902	49624	49634	49644	●
8,0	20,0	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

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

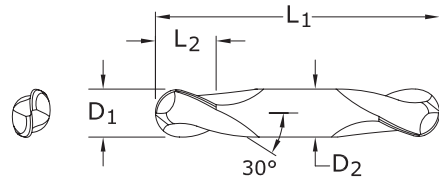
For patent information
visit www.kyocera-sgstool.com/patents

2 Flute Double End Ball End



TOLERANCES (mm)

D₁ = +0,000/-0,050
D₂ = h₆



15MB
METRIC SERIES

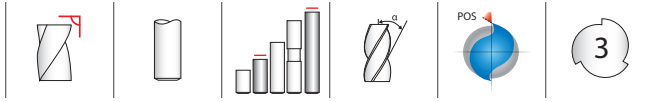
mm				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	2,0	38,0	3,0	41506	49073	49094	49115	●
1,5	3,0	38,0	3,0	41510	49074	49095	49116	●
2,0	4,0	38,0	3,0	41514	49075	49096	49117	●
2,5	5,0	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	●

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

● U.S. Stock Standard
■ NOT STOCKED—
Call for Delivery

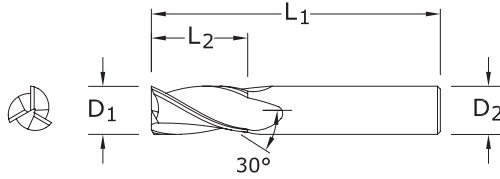
For patent information
visit www.kyocera-sgstoool.com/patents

3 Flute Square End



5M • 5XLM

METRIC SERIES



TOLERANCES (mm)

D₁ = +0,000/-0,050
D₂ = h₆

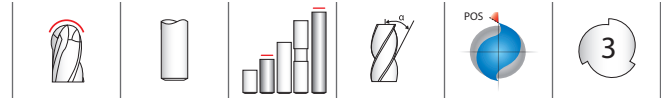
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstoool.com/patents

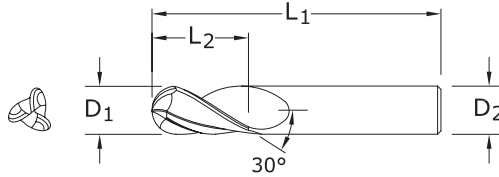
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	EDP NO.				STOCK	SERIES
				UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)		
1,0	4,0	38,0	3,0	40505	48756	48778	48799	●	5M
1,5	4,5	38,0	3,0	40509	48757	48779	48800	●	5M
2,0	6,3	38,0	3,0	40513	48758	48780	48801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

3 Flute Ball End



TOLERANCES (mm)

D₁ = +0,000/-0,050
D₂ = h₆



5MB • 5XLMB

METRIC SERIES

mm				EDP NO.				STOCK	SERIES
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	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

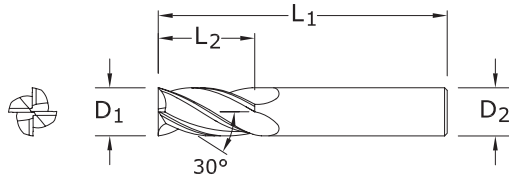
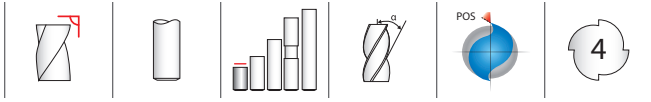
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

● U.S. Stock Standard
■ NOT STOCKED—
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METRIC

4 Flute Square End Stub



16M
METRIC SERIES

TOLERANCES (mm)

D₁ = +0,000/-0,050

D₂ = h₆

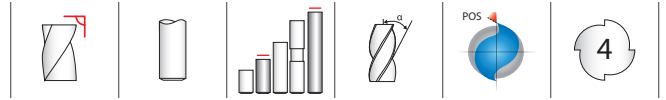
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
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- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

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mm				EDP NO.				STOCK
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED EDP NO.	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	●

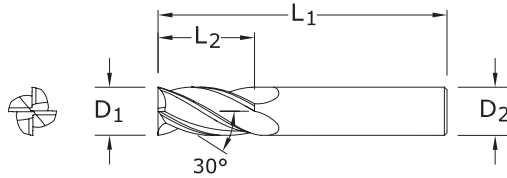
METRIC 4 Flute End Mills



TOLERANCES (mm)

$D_1 = +0,000/-0,050$

$D_2 = h_6$



1M • 1XLM

METRIC SERIES

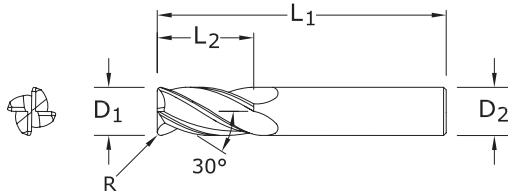
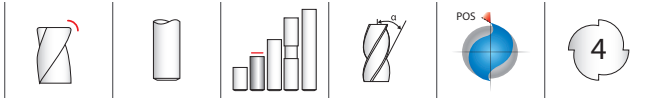
mm				EDP NO.				STOCK	SERIES
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED EDP NO.	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)		
1,0	4,0	38,0	3,0	40105	48500	48522	48543	●	1M
1,5	4,5	38,0	3,0	40109	48501	48523	48544	●	1M
2,0	6,3	38,0	3,0	40113	48502	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
4,5	16,0	50,0	6,0	40133	48507	48529	48550	●	1M
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
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
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
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
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
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

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

- U.S. Stock Standard
- NOT STOCKED—
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4 Flute Corner Radius



1MCR
METRIC SERIES

TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$
 $R = +0,000/-0,050$

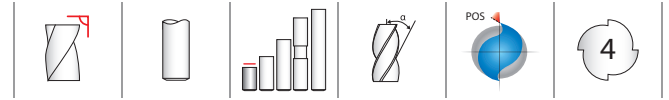
- STEELS
- STAINLESS STEELS
- CAST IRON
- HIGH TEMP ALLOYS
- TITANIUM
- HARDENED STEELS
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

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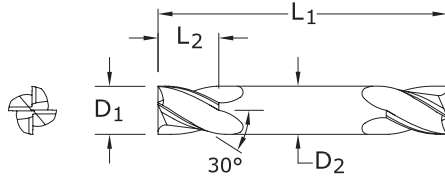
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	mm			SHANK DIAMETER D_2	EDP NO.	STOCK
		OVERALL LENGTH L_1	CORNER RADIUS R	Ti-NAMITE-A (AlTiN)			
4,0	14,0	50,0	0,25	4,0	40000	●	
4,0	14,0	50,0	0,50	4,0	40001	●	
4,0	14,0	50,0	1,00	4,0	40003	●	
5,0	16,0	50,0	0,25	6,0	40004	●	
5,0	16,0	50,0	0,50	6,0	40005	●	
5,0	16,0	50,0	1,00	6,0	40007	●	
6,0	19,0	50,0	0,25	6,0	40009	●	
6,0	19,0	50,0	0,50	6,0	40010	●	
6,0	19,0	50,0	0,75	6,0	40011	●	
6,0	19,0	50,0	1,00	6,0	40012	●	
8,0	20,0	63,0	0,50	8,0	40015	●	
8,0	20,0	63,0	0,75	8,0	40016	●	
8,0	20,0	63,0	1,00	8,0	40017	●	
8,0	20,0	63,0	1,50	8,0	40019	●	
8,0	20,0	63,0	2,00	8,0	40020	●	
10,0	22,0	75,0	0,50	10,0	40021	●	
10,0	22,0	75,0	1,00	10,0	40023	●	
10,0	22,0	75,0	1,50	10,0	40024	●	
10,0	22,0	75,0	2,00	10,0	40025	●	
12,0	25,0	75,0	0,50	12,0	40028	●	
12,0	25,0	75,0	1,00	12,0	40030	●	
12,0	25,0	75,0	1,50	12,0	40031	●	
12,0	25,0	75,0	2,00	12,0	40032	●	
16,0	32,0	89,0	0,50	16,0	40035	●	
16,0	32,0	89,0	1,00	16,0	40037	●	
16,0	32,0	89,0	1,50	16,0	40038	●	
16,0	32,0	89,0	2,00	16,0	40039	●	

4 Flute Double End Mills



TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$



14M
 METRIC SERIES

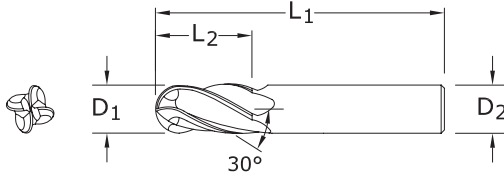
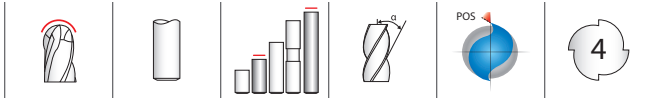
mm				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	UNCOATED	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
1,0	2,0	38,0	3,0	41405	48884	48905	48926	●
1,5	3,0	38,0	3,0	41409	48885	48906	48927	●
2,0	4,0	38,0	3,0	41413	48886	48907	48928	●
2,5	5,0	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	●

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

● U.S. Stock Standard
 ■ NOT STOCKED—
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4 Flute Ball End



1MB•1XLMB
METRIC SERIES

TOLERANCES (mm)

D₁ = +0,000/-0,050
D₂ = h₆

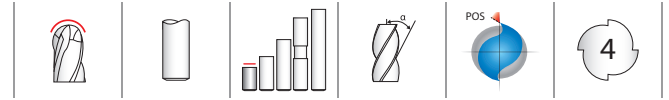
- STEELS
- STAINLESS STEELS
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- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
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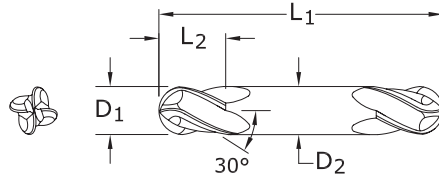
mm				EDP NO.				STOCK	SERIES
CUTTING DIAMETER D ₁	LENGTH OF CUT L ₂	OVERALL LENGTH L ₁	SHANK DIAMETER D ₂	UNCOATED EDP NO.	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)		
1,0	4,0	38,0	3,0	40106	48564	48586	48607	●	1MB
1,5	4,5	38,0	3,0	40110	48565	48587	48608	●	1MB
2,0	6,3	38,0	3,0	40114	48566	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

4 Flute Double End Ball End



TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$



14MB
 METRIC SERIES

mm				EDP NO.				STOCK
CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	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	●

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

● U.S. Stock Standard
 ■ NOT STOCKED—
 Call for Delivery

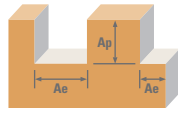
For patent information
 visit www.kyocera-sgtool.com/patents

METRIC

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

3 Flute: Square, Long Reach, Ball

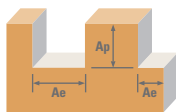
4 Flute: Square, Double, Stub, Long Reach, Ball, Corner Radius



Series	Hardness	Flutes	Ae x D ₁	Ap x D ₁	V _c (m/min)	Diameter (D ₁) (mm)											
						0.4	0.75	1.5	3	6	10	12	20	25			
CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile	2 ≤ 0.50 ≤ 1.5	112-168	140	RPM	111483	59458	29729	14864	7432	4459	3716	2230	1784		
					Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070			
					Feed (mm/min)	178	178	184	208	282	357	357	285	250			
						268	268	276	312	424	535	535	428	375			
						357	357	369	416	565	713	713	571	499			
					102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299		
		Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070						
		Feed (mm/min)	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						
		ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	Profile	2 ≤ 0.50 ≤ 1.5	82-123	102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299
							Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052	
Feed (mm/min)	81						104	95	130	152	188	195	156	135			
	122						156	143	195	227	283	292	234	203			
	162						208	191	260	303	377	390	312	270			
75	RPM						59377	31668	15834	7917	3958	2375	1979	1188	950		
Fz	0.0005			0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052						
Feed (mm/min)	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						
TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250 Bhn or ≤ 24 HRc			Profile	2 ≤ 0.50 ≤ 1.5	77-115	96	RPM	76342	40715	20358	10179	5089	3054	2545	1527	1221
							Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052	
		Feed (mm/min)	76				98	90	122	143	177	183	147	127			
			115				147	134	183	214	266	275	220	191			
			153				195	179	244	285	354	366	293	254			
		70	RPM				55741	29729	14864	7432	3716	2230	1858	1115	892		
		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						
			111	143	131	178	208	259	268	214	186						
		CAST IRONS Gray, Malleable, Ductile	≤ 220 Bhn or ≤ 19 HRc	Profile	2 ≤ 0.50 ≤ 1.5	82-123	102	RPM	81189	43301	21650	10825	5413	3248	2706	1624	1299
							Fz	0.0008	0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070	
Feed (mm/min)	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			
75	RPM						59377	31668	15834	7917	3958	2375	1979	1188	950		
Fz	0.0008			0.0015	0.0031	0.007	0.019	0.040	0.048	0.064	0.070						
Feed (mm/min)	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						
STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F 440F	≤ 275 Bhn or ≤ 28 HRc			Profile	2 ≤ 0.50 ≤ 1.5	90-135	113	RPM	89671	47825	23912	11956	5978	3587	2989	1793	1435
							Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052	
		Feed (mm/min)	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			
		82	RPM				65436	34899	17449	8725	4362	2617	2181	1309	1047		
		Fz	0.0005	0.0012	0.0022	0.006	0.014	0.029	0.036	0.048	0.052						
		Feed (mm/min)	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						
		STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4 PH, 15-5, 13-4, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile	2 ≤ 0.50 ≤ 1.5	62-93	78	RPM	61800	32960	16480	8240	4120	2472	2060	1236	989
							Fz	0.0005	0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042	
Feed (mm/min)	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			
56	RPM						44836	23912	11956	5978	2989	1793	1495	897	717		
Fz	0.0005			0.0010	0.0019	0.004	0.012	0.024	0.029	0.037	0.042						
Feed (mm/min)	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						

continued on next page

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

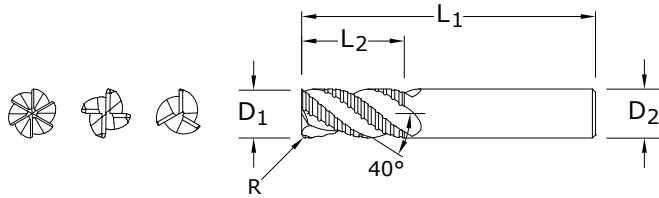
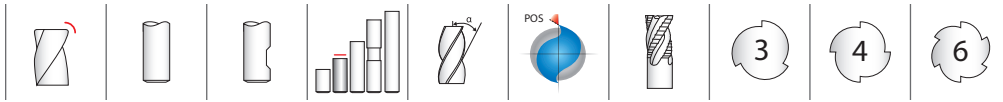
Series	Hardness	Flutes	Ae x D ₁	Ap x D ₁	V _c (m/min)	Diameter (D ₁) (mm)											
						0.4	0.75	1.5	3	6	10	12	20	25			
SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, 718, Incoloy 800, Monel 400, Rene, Waspalloy	≤ 300 Bhn or ≤ 32 HRc	Profile	2	≤ 0.50	≤ 1.5	20	RPM	15753	8402	4201	2100	1050	630	525	315	252	
							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	
		Slot	2	1	≤ 1		14	RPM	10906	5816	2908	1454	727	436	364	218	174
								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
	≤ 350 Bhn or ≤ 38 HRc	Profile	2	≤ 0.50	≤ 1.5	55		RPM	43624	23266	11633	5816	2908	1745	1454	872	698
								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
		Slot	2	1	≤ 1		40	RPM	31506	16803	8402	4201	2100	1260	1050	630	504
								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
≤ 150 Bhn or ≤ 7 HRc	Profile	2	≤ 0.50	≤ 1.5	268	RPM		213272	113745	56872	28436	14218	8531	7109	4265	3412	
						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	
	Slot	2	1	≤ 1		195	RPM	155107	82724	41362	20681	10340	6204	5170	3102	2482	
							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	
COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	Profile	2	≤ 0.50	≤ 1.5		148	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
		Slot	2	1	≤ 1	195		RPM	84824	45239	22620	11310	5655	3393	2827	1696	1357
								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
	≤ 140 Bhn or ≤ 3 HRc	Profile	2	≤ 0.50	≤ 1.5		268	RPM	213272	113745	56872	28436	14218	8531	7109	4265	3412
								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
		Slot	2	1	≤ 1	195		RPM	155107	82724	41362	20681	10340	6204	5170	3102	2482
								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
PLASTICS Polycarbonate, PVC, Polypropylene	≤ 140 Bhn or ≤ 3 HRc	Profile	2	≤ 0.50	≤ 1.5		201	RPM	159954	85309	42654	21327	10664	6398	5332	3199	2559
								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
		Slot	2	1	≤ 1	146		RPM	116330	62043	31021	15511	7755	4653	3878	2327	1861
								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
	≤ 140 Bhn or ≤ 3 HRc	Profile	2	≤ 0.50	≤ 1.5		201	RPM	159954	85309	42654	21327	10664	6398	5332	3199	2559
								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
		Slot	2	1	≤ 1	146		RPM	116330	62043	31021	15511	7755	4653	3878	2327	1861
								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
≤ 140 Bhn or ≤ 3 HRc	Profile	2	≤ 0.50	≤ 1.5	201		RPM	159954	85309	42654	21327	10664	6398	5332	3199	2559	
							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	
	Slot	2	1	≤ 1		146	RPM	116330	62043	31021	15511	7755	4653	3878	2327	1861	
							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	

Bhn (Brinell) HRc (Rockwell C)
 rpm = (V_c x 1000) / (D₁ x 3.14)
 mm/min = Fz x number of flutes x rpm
 reduce speed and feed for materials harder than listed

limit cut depths of long and extra long flute mills to .05 x D₁ when slotting or profiling
 reduce feed and Ae when finish milling (.02 x D₁ maximum)
 refer to the SGS Tool Wizard for complete technical information
 (www.kyocera-sgstool.com)

METRIC

Single End Roughers



62M
METRIC SERIES

TOLERANCES h10 (mm)

$D_1 = +0,000 / -0,100$

$D_2 = h_6$

$R = +0,127 / -0,127$

mm						EDP NO.			STOCK
CUTTING DIA. D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIA. D_2	CORNER RADIUS R	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	6	46231	46230	46233	●

STAINLESS STEELS

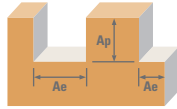
HIGH TEMP ALLOYS





TITANIUM

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information
visit www.kyocera-sgstool.com/patents

Single End Roughers

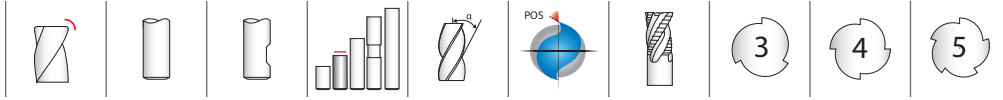


Series 62M Metric	Hardness	Ae x D ₁	Ap x D ₁	Vc (m/min)	Diameter (D ₁) (mm)													
					6	10	12	20	25									
M	STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 0.5	≤ 1.5	123	RPM	6544	3926	3272	1963	1570						
						(99-148)	Fz	0.014	0.029	0.036	0.051	0.053						
							Feed (mm/min)	283	345	471	398	495						
						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						
						S	STAINLESS STEELS (DIFFICULT) 304, 304L, 316, 316L, 17-4PH, 15-5PH, 13-4PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	Profile 	≤ 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
												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	Profile 	≤ 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
												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						
						S	TITANIUM ALLOYS Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al3Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti152 Cr3Sn3Al	≤ 350 Bhn or ≤ 38 HRc	Profile 	≤ 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
												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						

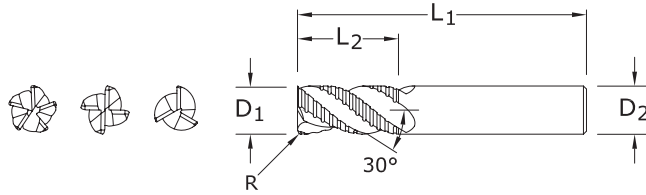
Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 1000) / (D₁ x 3.14)
 mm/min = Fz x number of flutes x rpm
 reduce speed and feed for materials harder than listed
 refer to the SGS Tool Wizard for complete technical information (www.kyocera-sgstool.com)

METRIC

Single End Roughers



61M METRIC SERIES



TOLERANCES h10 (mm)

$D_1 = +0,000 / -0,100$

$D_2 = h_6$

$R = +0,127 / -0,127$

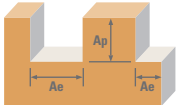
mm						EDP NO.			STOCK
CUTTING DIA. D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIA. D_2	CORNER RADIUS R	NO. OF FLUTES	Ti-NAMITE (TiN)	Ti-NAMITE-C (TiCN)	Ti-NAMITE-A (AlTiN)	
6,0	19,0	63,0	6,0	1,14	3	46107	46106	46110	●
8,0	19,0	63,0	8,0	1,14	3	46109	46108	46111	●
10,0	22,0	72,0	10,0	1,52	3	46113	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	●









- STEELS
- CAST IRON
- HARDENED STEELS

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

Single End Roughers

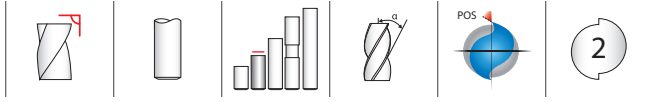


Series 61M Metric	Hardness	Ae x D ₁	Ap x D ₁	Vc (m/min)	Diameter (D ₁) (mm)							
					6	10	12	20	25			
P	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	Profile 	≤ 0.5	≤ 1.5	152	RPM	8078	4847	4039	2424	1939
						(122-183)	Fz	0.014	0.029	0.034	0.045	0.050
						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	
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	
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	

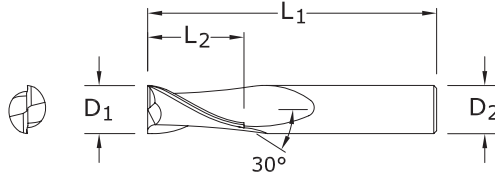
Bhn (Brinell) HRc (Rockwell C)
 rpm = (Vc x 1000) / (D₁ x 3.14)
 mm/min = Fz x number of flutes x rpm
 reduce speed and feed for materials harder than listed
 refer to the SGS Tool Wizard for complete technical information (www.kyocera-sgstool.com)

METRIC

2 Flute High Shear End Mills



52M
METRIC SERIES



TOLERANCES (mm)

$D_1 = +0,000/-0,050$

$D_2 = h_6$

CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	EDP NO.		STOCK
				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	●

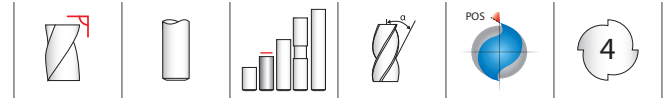
NON-FERROUS

PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

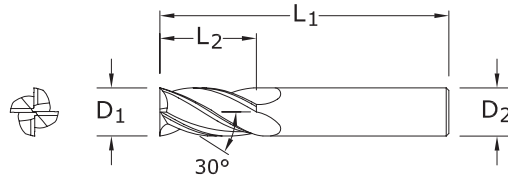
For patent information
visit www.kyocera-sgstoool.com/patents

4 Flute High Shear End Mills



TOLERANCES (mm)

$D_1 = +0,000/-0,050$
 $D_2 = h_6$



54M
 METRIC SERIES

CUTTING DIAMETER D_1	LENGTH OF CUT L_2	OVERALL LENGTH L_1	SHANK DIAMETER D_2	EDP NO.		STOCK
				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	●

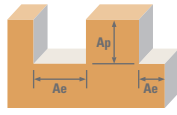
- NON-FERROUS
- PLASTICS/COMPOSITES

- U.S. Stock Standard
- NOT STOCKED—
Call for Delivery

For patent information visit www.kyocera-sgstool.com/patents

2 Flute: High Shear End Mills

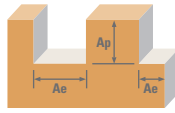
4 Flute: High Shear End Mills







Series 52M, 54M Metric	Hardness	Flutes	Ae x D ₁	Ap x D ₁	Vc (m/min)	Diameter (D ₁) (mm)							
						3	6	10	12	20	25		
ALUMINUM ALLOYS 2024, 5052, 5086, 6061, 6063, 7075	≤ 150 Bhn or ≤ 7 HRc	Profile 	2	≤ 0.3	≤ 1.5	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
		4	≤ 0.3	≤ 1.5	332	RPM	35222	17611	10567	8806	5283	4227	
					(266-399)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148	
						Feed (mm/min)	1064	1444	1796	1779	1405	1251	
	Slot 	2	1	≤ 1	125	RPM	16480	8240	4944	4120	2472	1978	
						(100-150)	Fz	0.0166	0.043	0.091	0.110	0.147	0.160
							Feed (mm/min)	547	709	900	906	727	633
		4	1	≤ 0.25	(100-150)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148	
						Feed (mm/min)	400	543	676	669	529	471	
					800	1086	1351	1338	1057	941			
ALUMINUM DIE CAST ALLOYS (HIGH SILICON) A-390, A-392, B-390	≤ 125 Bhn or ≤ 77 HRb	Profile 	2	≤ 0.3	≤ 1.5	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
		4	≤ 0.3	≤ 1.5	(100-150)	Fz	0.0151	0.041	0.085	0.101	0.133	0.148	
						Feed (mm/min)	400	543	676	669	529	471	
					800	1086	1351	1338	1057	941			
	Slot 	2	1	≤ 1	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
		4	≤ 0.3	≤ 1.5	(116-174)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085	
						Feed (mm/min)	264	368	442	445	355	313	
					528	737	884	890	709	626			
COPPER ALLOYS Aluminum Bronze, Muntz Brass, Naval, Brass, Red Brass	≤ 140 Bhn or ≤ 3 HRc	Profile 	2	≤ 0.3	≤ 1.5	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
		4	≤ 0.3	≤ 1.5	(46-69)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085	
						Feed (mm/min)	106	147	177	178	142	125	
					211	295	354	356	284	250			
	Slot 	2	1	≤ 1	58	RPM	6140	3070	1842	1535	921	737	
						(46-69)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085
							Feed (mm/min)	286	365	483	471	378	339
		4	1	≤ 0.25	(46-69)	Fz	0.0086	0.024	0.048	0.058	0.077	0.085	
						Feed (mm/min)	106	147	177	178	142	125	
					211	295	354	356	284	250			

continued on next page

2 Flute: High Shear End Mills 4 Flute: High Shear End Mills



Series 52M, 54M Metric	Hardness	Flutes	Ae x D ₁	Ap x D ₁	Vc (m/min)	Diameter (D ₁) (mm)							
						3	6	10	12	20	25		
PLASTICS ABS, Polycarbonate, PVC, Polypropylene	Profile 	2	≤ 0.3	≤ 1.5	488	RPM	51702	25851	15511	12926	7755	6204	
					Fz	0.0264	0.072	0.149	0.178	0.237	0.250		
		4	≤ 0.3	≤ 1.5	(390-585)	Feed (mm/min)	2730	3723	4622	4601	3676	3102	
					5460	7445	9244	9203	7352	6204			
	Slot 	2	1	≤ 1	390	RPM	41362	20681	12409	10340	6204	4963	
					Fz	0.0240	0.065	0.136	0.163	0.210	0.238		
		4	1	≤ 0.25	(312-468)	Feed (mm/min)	1985	2689	3375	3371	2606	2363	
					3971	5377	6750	6742	5212	4725			
	PLASTICS Fiberglass, Glass Filled	Profile 	2	≤ 0.3	≤ 1.5	219	RPM	23266	11633	6980	5816	3490	2792
						Fz	0.0197	0.053	0.109	0.132	0.173	0.190	
4			≤ 0.3	≤ 1.5	(176-263)	Feed (mm/min)	917	1233	1522	1536	1208	1061	
					1833	2466	3043	3071	2415	2122			
Slot 		2	1	≤ 1	175	RPM	18580	9290	5574	4645	2787	2230	
					Fz	0.0180	0.048	0.101	0.120	0.160	0.175		
		4	1	≤ 0.25	(140-210)	Feed (mm/min)	669	892	1126	1115	892	780	
					1338	1784	2252	2230	1784	1561			

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 rpm = (Vc x 1000) / (D₁ 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 D₁ maximum)
 refer to the SGS Tool Wizard for complete technical information (www.kyocera-sgstool.com)