

4-FLUTE END MILLS

E14

4 Helical Flutes

For profiling, slotting, & contouring



E14 • Radius

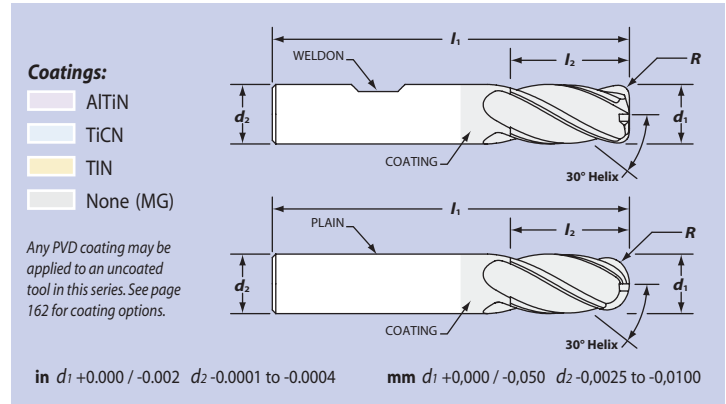


E14 • Square



E14B • Ball

Four flute end mills are versatile, general purpose tools for slotting, profiling and contour milling in applications where chip packing is not a problem. The increased core thickness of 4-flute tools results in less tool deflection and improved size accuracy, while the reduced chip load gives improved surface finishes.



	AlTiN Spector	TiCN Accelerator	MG Uncoated	TiN auCARB
Carbon & tool steels ≤ 48 HRC	✓✓✓	✓✓	✓	✓
Carbon & tool steels > 48 HRC	✓✓✓	✓✓	✓	✓
Stainless steels	✓✓	✓		✓
Cast irons	✓✓✓	✓✓	✓	✓

✓ Suitable ✓✓ Good ✓✓✓ Recommended

End designs

- Wide variety of corner radii available
- Square end for general machining and finishing
- Ball nose styles for contouring
- Center cutting

Shank designs

- Precision shanks fit all collets and most shrink-fit systems
- Many sizes offered with flats for end mill holders

Multiple lengths

- Long, extra long and extreme lengths for deep cavity milling
- Stub length for extra rigidity



E14 Sets

Style	EDP Number	List Price
AlTiN	30522	177.34
TiCN	33659	176.56
MG	33651	144.82

E14B Sets

Style	EDP Number	List Price
AlTiN	39427	210.94
TiCN	33662	209.90
MG	33661	176.56

Contains one each of: 1/8, 3/16, 1/4, 5/16, 3/8, 1/2

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Inch sizes



Inch							Standard					Obsolete*		
d ₁ Cutter Dia	d ₂ Shank Dia	l ₂ Length of Cut	l ₁ Overall Length	R Corner Radius	Shank Style	Style Code	AITIN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price	TiN EDP Number	List Price
1/64	1/8	1/32	1-1/2	Square	Plain	SR	90661	14.93			90659	12.24		
		3/64	1-1/2	Square	Plain	RR	90662	14.93			90660	12.24		
1/32	1/8	1/16	1-1/2	Square	Plain	SR	30891	13.83			34698	11.33		
		1/16	1-1/2	Ball	Plain	SR	31774	16.85			31699	14.16		
		3/32	1-1/2	Square	Plain	RR	99345	13.83	34402	13.68	30701	11.33		
		3/32	1-1/2	Ball	Plain	RR	30559	16.85	34502	16.74	30901	14.16		
		1/8	1-1/2	Square	Plain	LR	90693	14.36			90692	11.67		
3/64	1/8	3/32	1-1/2	Square	Plain	SR	30892	13.70	30894	13.68	34701	11.01		
		3/32	1-1/2	Ball	Plain	SR	31775	16.85			31701	14.16		
		9/64	1-1/2	Square	Plain	RR	30537	13.83	34403	13.68	30703	11.33		
1/16	1/8	9/64	1-1/2	Ball	Plain	RR	30539	16.85			30903	14.16		
		1/8	1-1/2	Square	Plain	SR	30529	12.53	31530	12.38	31503	10.13		
		1/8	1-1/2	Ball	Plain	SR	30530	15.34			31703	12.75		
		3/16	1-1/2	Square	Plain	RR	30800	12.69	34404	12.58	30705	10.22	30706	12.58
5/64	1/8	3/16	1-1/2	Ball	Plain	RR	97852	15.55	34504	15.39	30905	12.80	30906	15.39
		1/4	1-1/2	Square	Plain	LR	90695	14.36			90694	11.67		
		1/4	1-1/2	Ball	Plain	RR	30506	12.69	34405	12.58	30707	10.22		
3/32	1/8	1/4	1-1/2	Ball	Plain	RR	30482	15.55			30907	12.80		
		3/16	1-1/2	Square	Plain	SR	31545	12.12	31531	12.01	31505	9.71		
7/64	1/8	3/16	1-1/2	Ball	Plain	SR	31700	14.61			31705	12.02		
		3/8	1-1/2	Square	Plain	RR	30531	12.27	34406	12.17	30709	9.78	30710	12.17
		3/8	1-1/2	Ball	Plain	RR	30992	14.82	34506	14.66	30909	12.20		
1/8	1/8	3/8	1-1/2	Square	Plain	RR	30458	12.27	34407	12.17	30711	9.78		
		3/8	1-1/2	Ball	Plain	RR	30405	14.82			30911	12.20		
		1/4	1-1/2	Square	Plain	SR	97871	11.18	31532	11.02	31507	8.78		
		1/4	1-1/2	Ball	Plain	SR	31747	13.73			31707	11.15		
		1/2	1-1/2	Square	Plain	RR	30521	11.23	34408	11.23	30713	9.00	30714	11.23
		1/2	1-1/2	.015	Plain	RR	97662	14.04	39626	13.94	39545	14.50		
		1/2	1-1/2	.020	Plain	RR	90523	14.04	39627	13.94	39546	14.50		
		1/2	1-1/2	Ball	Plain	RR	30997	13.83	34508	13.83	30913	11.46	30914	13.83
		5/8	2	Square	Plain	LL	62107	16.80			62105	13.67		
		5/8	2	Ball	Plain	LL	37897	19.24			37892	15.98		
9/64	3/16	3/4	2-1/4	Square	Plain	LL	30417	16.43	37710	16.43	37708	14.22		
		3/4	2-1/4	Ball	Plain	LL	37911	20.07	37910	20.02	37908	17.02		
5/32	3/16	1	3	Square	Plain	XX	97847	22.26	34110	22.15	34108	19.33		
		1	3	Ball	Plain	XX	97842	27.09	34310	26.99	34308	23.17		
		9/16	2	Square	Plain	RR	30500	16.59	34409	16.54	30715	13.44		
		9/16	2	Ball	Plain	RR	31044	20.38			30915	16.92		
11/64	3/16	5/16	2	Square	Plain	SR	39757	15.50	31533	15.50	31509	12.89		
		5/16	2	Ball	Plain	SR	30465	18.25			31709	15.50		
		9/16	2	Square	Plain	RR	30501	16.59	34410	16.54	30717	13.44		
		9/16	2	Ball	Plain	RR	30468	19.76	34510	19.71	30917	16.39		
3/16	3/16	5/8	2	Square	Plain	RR	30507	16.59	34411	16.54	30719	13.44		
		3/8	2	Square	Plain	SR	31548	14.92	31534	14.92	31511	12.11		
		3/8	2	Ball	Plain	SR	31746	17.58			31711	14.56		
		5/8	2	Square	Plain	RR	30520	15.50	34412	15.50	30721	12.67	30722	15.50
		5/8	2	.015	Plain	RR	39694	18.46	39628	18.46	39547	17.62		
		5/8	2	.020	Plain	RR	39695	18.46	39629	18.46	39548	17.62		
		5/8	2	.030	Plain	RR	39601	18.46	39630	18.46	39549	17.62		
		5/8	2	Ball	Plain	RR	30524	18.10	34512	18.10	30921	15.08	30922	18.10
3/4	2-1/2	Square	Plain	LL	37793	22.26	37714	22.10	37712	18.22				
3/4	2-1/2	Ball	Plain	LL	37915	23.97	37914	23.82	37912	21.80				

Style Code Reference

LL—Long LOC, Long OAL
 LR—Long LOC, Standard OAL
 RR—Regular LOC, Regular OAL
 SR—Short LOC, Regular OAL
 XX—X-Long LOC, X-Long OAL

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* Superseded by AITiN. Add TiN to any uncoated tool. See page 162.

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Inch sizes



E14 end mills with Weldon® flats are available by request on items not already shown as standard with this feature. See page 160 for modification charges.

Inch • Continued							Standard					Obsolete*		
d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price	TiN EDP Number	List Price
3/16	3/16	1	4	Square	Plain	LE	62110	30.00			98521	25.67		
		1	4	Ball	Plain	LE	37898	33.85			93336	29.38		
		1-1/8	3	Square	Plain	XX	34115	25.69	34114	25.48	34112	22.00		
		1-1/8	3	Ball	Plain	XX	37938	30.32	34314	30.11	34312	26.35		
13/64	1/4	5/8	2-1/2	Square	Plain	RR	30469	21.06	34413	20.75	30723	16.78		
7/32	1/4	7/16	2	Square	Plain	SS	39759	19.45	31535	19.14	31513	14.49		
		5/8	2-1/2	Square	Plain	RR	30546	21.06	34414	20.75	30725	16.78		
		5/8	2-1/2	Ball	Plain	RR	31046	25.01	34514	24.70	30925	20.50		
15/64	1/4	3/4	2-1/2	Square	Plain	RR	30972	21.06	34415	20.75	30727	16.78		
1/4	1/4	1/2	2	Square	Plain	SS	31595	18.98	31536	18.67	31515	14.22		
		1/2	2	Ball	Plain	SS	31745	20.07			31715	17.11		
		3/4	2-1/2	Square	Plain	RR	98955	18.93	34416	18.93	30729	14.89	30730	18.93
		3/4	2-1/2	Square	Weldon	RR	39788	20.49	39779	20.38	39729	16.57	39730	20.38
		3/4	2-1/2	.015	Plain	RR	30519	23.19	39631	23.04	39504	19.29		
		3/4	2-1/2	.020	Plain	RR	39513	23.19			39505	19.29		
		3/4	2-1/2	.030	Plain	RR	39604	23.19	39633	23.04	39506	19.29		
		3/4	2-1/2	.045	Plain	RR	39696	23.19			39507	19.29		
		3/4	2-1/2	Ball	Plain	RR	30998	23.76	34516	23.76	30929	19.45	30930	23.76
		1	4	Square	Plain	LX	62111	34.68			62106	28.24		
		1	4	Ball	Plain	LX	37899	39.68			37893	33.05		
		1-1/8	3	Square	Plain	LL	99336	27.61	37718	27.61	37716	22.44		
		1-1/8	3	Ball	Plain	LL	37919	34.42	37918	34.37	37916	28.97		
		1-1/2	4	Square	Plain	XX	98978	33.59	34118	33.33	34116	27.33		
		1-1/2	4	Ball	Plain	XX	96411	39.42	34318	39.16	34316	32.52		
		1-1/2	6	Square	Plain	XE	39772	45.03			31163	37.67		
1-1/2	6	Ball	Plain	XE	97844	50.08			31363	42.43				
17/64	5/16	3/4	2-1/2	Square	Plain	RR	30976	32.19	34417	31.72	30731	26.20		
9/32	5/16	3/4	2-1/2	Square	Plain	RR	96156	32.19	34418	31.72	30733	26.20		
		3/4	2-1/2	Ball	Plain	RR	30464	37.18	34518	36.66	30933	31.03		
19/64	5/16	13/16	2-1/2	Square	Plain	RR	30979	32.19	34439	31.72	30735	26.20		
5/16	5/16	1/2	2	Square	Plain	SS	30534	26.26	31537	25.90	31517	19.42		
		1/2	2	Ball	Plain	SS	31744	29.69			31717	24.28		
		13/16	2-1/2	Square	Plain	RR	30898	26.99	34420	26.94	30737	21.04	30738	26.94
		13/16	2-1/2	Square	Weldon	RR	39789	28.55	39780	28.39	39737	22.80	91803	28.39
		13/16	2-1/2	.015	Plain	RR	39697	30.84	39635	30.47	39509	25.44		
		13/16	2-1/2	.020	Plain	RR	39698	30.84			39510	25.44		
		13/16	2-1/2	.030	Plain	RR	39700	30.84	39637	30.47	39511	25.44		
		13/16	2-1/2	.045	Plain	RR	39701	30.84			39512	25.44		
		13/16	2-1/2	Ball	Plain	RR	30525	31.98	34520	31.93	30937	25.82		
		1	4	Square	Plain	LX	62114	45.92			90696	37.47		
		1	4	Ball	Plain	LX	37900	52.94			37894	44.18		
		1-1/8	3	Square	Plain	LL	30461	37.60	37722	37.60	37720	29.89		
		1-1/8	3	Ball	Plain	LL	34323	43.52	37922	43.52	37920	35.84		
		1-5/8	4	Square	Plain	XX	34123	43.00	34122	42.54	34120	35.56		
1-5/8	4	Ball	Plain	XX	34361	53.40			34320	43.74				
21/64	3/8	1	2-1/2	Square	Plain	RR	31003	38.90		30739	31.67			
11/32	3/8	1	2-1/2	Square	Plain	RR	30463	38.90	34421	38.43	30741	31.67		
		1	2-1/2	Ball	Plain	RR	30408	43.73			30941	36.15		
23/64	3/8	1	2-1/2	Square	Plain	RR	31004	38.90		30743	31.67			

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* Superseded by AlTiN. Add TiN to any uncoated tool. See page 162.

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Inch sizes



Inch • Continued							Standard					Obsolete*		
d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price	TiN EDP Number	List Price
3/8	3/8	5/8	2	Square	Plain	SS	31549	31.62	31538	31.10	31519	24.22		
		5/8	2	Ball	Plain	SS	31749	34.06			31719	28.53		
		1	2-1/2	Square	Plain	RR	98244	32.50	34424	32.24	30745	26.22	30746	32.24
		1	2-1/2	Square	Weldon	RR	39790	33.90	39781	33.90	39745	28.14	39746	33.90
		1	2-1/2	.015	Plain	RR	37443	37.23	37550	37.08	37383	30.34		
		1	2-1/2	.015	Weldon	RR	97665	39.00	39639	38.95	39514	32.26		
		1	2-1/2	.020	Plain	RR	37444	37.23			37384	30.34		
		1	2-1/2	.020	Weldon	RR	39715	39.00			39515	32.26		
		1	2-1/2	.030	Plain	RR	37445	37.23	37552	37.08	37385	30.34		
		1	2-1/2	.030	Weldon	RR	39605	39.00	39641	38.95	39516	32.26		
		1	2-1/2	.045	Plain	RR	37446	37.23			37386	30.34		
		1	2-1/2	.045	Weldon	RR	39598	39.00			39517	32.26		
		1	2-1/2	.060	Plain	RR	37447	37.23			37387	30.34		
		1	2-1/2	.060	Weldon	RR	39702	39.00			39614	32.26		
		1	2-1/2	.090	Plain	RR	37448	37.23			37388	30.34		
		1	2-1/2	.090	Weldon	RR	39703	39.00			39619	32.26		
		1	2-1/2	Ball	Plain	RR	98262	37.96	34524	37.65	30945	31.39		
		1	4	Square	Plain	RX	62115	50.49			90698	41.09		
		1	4	Ball	Plain	RX	37901	58.14			37895	48.39		
		1-1/8	3	Square	Plain	LL	37727	43.37	37726	42.90	37724	34.89	37725	42.90
1-1/8	3	Square	Weldon	LL	39168	44.36			39164	36.81				
1-1/8	3	Ball	Plain	LL	37927	51.38	37926	50.80	37924	44.23	37925	50.80		
1-1/2	6	Square	Plain	LE	97850	69.89			31135	59.80				
1-1/2	6	Ball	Plain	LE	97845	77.32			31335	67.15				
1-3/4	4	Square	Plain	XX	34136	49.14	34126	49.09	34124	40.82	34125	49.09		
1-3/4	4	Square	Weldon	XX	39175	51.90			39124	42.74				
1-3/4	4	Ball	Plain	XX	34335	58.66	34326	58.60	34324	48.39				
25/64	7/16	1	2-3/4	Square	Plain	RR	31024	46.96		30747	38.71			
13/32	7/16	1	2-3/4	Square	Plain	RR	31026	46.96	98261	46.38	30749	38.71		
		1	2-3/4	Ball	Plain	RR	31000	54.24		30949	45.52			
27/64	7/16	1	2-3/4	Square	Plain	RR	31028	46.96		30751	38.71			
7/16	7/16	5/8	2-1/2	Square	Plain	SS	39768	42.90			31521	33.60		
		1	2-3/4	Square	Plain	RR	31040	42.38	34430	42.12	30772	33.89	37754	42.12
		1	2-3/4	Ball	Plain	RR	31052	49.24	34530	48.98	30900	40.28		
		2	4	Square	Plain	LL	37731	68.12	37730	67.50	37728	56.78		
		2	4	Ball	Plain	LL	30485	78.99	37930	78.31	37928	67.26		
		3	6	Square	Plain	XX	34160	87.62	34130	87.05	34128	75.44		
29/64	1/2	1	3	Square	Plain	RR	30475	61.52		30755	51.22			
15/32	1/2	1	3	Square	Plain	RR	31030	61.52		30757	51.22			
		1	3	Ball	Plain	RR	30481	74.67		30957	63.55			
31/64	1/2	1	3	Square	Plain	RR	99106	61.52		30759	51.22			
1/2	1/2	5/8	2-1/2	Square	Plain	SS	31546	50.18	31540	49.56	31523	40.84		
		5/8	2-1/2	Ball	Plain	SS	31743	53.46			31723	48.00		
		1	3	Square	Plain	RR	98245	51.95	34432	51.27	30761	42.89	30762	51.27
		1	3	Square	Weldon	RR	39791	53.92	39782	53.35	39761	45.13	39762	53.35
		1	3	.015	Plain	RR	37449	60.42	37571	60.42	37389	46.47		
		1	3	.015	Weldon	RR	97710	62.30	39643	62.30	39518	48.71		
		1	3	.020	Plain	RR	37450	60.42			37390	46.47		
		1	3	.020	Weldon	RR	30560	62.30			39519	48.71		
		1	3	.030	Plain	RR	37451	60.42	37573	60.42	37391	46.47		
		1	3	.030	Weldon	RR	39704	62.30	39645	62.30	39520	48.71		

Style Code Reference

LE—Long LOC, Extreme OAL
 LL—Long LOC, Long OAL
 LX—Long LOC, X-Long OAL
 RR—Regular LOC, Regular OAL
 RX—Regular LOC, X-Long OAL
 SS—Short LOC, Short OAL
 XE—X-Long LOC, Extreme OAL
 XX—X-Long LOC, X-Long OAL

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* Superseded by AlTiN. Add TiN to any uncoated tool. See page 162.

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Inch sizes



E14 end mills with Weldon® flats are available by request on items not already shown as standard with this feature. See page 160 for modification charges.

Inch • Continued								Standard					Obsolete*	
d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AITiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price	TiN EDP Number	List Price
1/2	1/2	1	3	.045	Plain	RR	37452	60.42			37392	46.47		
		1	3	.045	Weldon	RR	39600	62.30			39521	48.71		
		1	3	.060	Plain	RR	37453	60.42	37575	60.42	37393	46.47		
		1	3	.060	Weldon	RR	39597	62.30	39647	62.30	39522	48.71		
		1	3	.090	Plain	RR	37454	60.42			37394	46.47		
		1	3	.090	Weldon	RR	39705	62.30			96599	48.71		
		1	3	.120	Plain	RR	37455	60.42			37395	46.47		
		1	3	.120	Weldon	RR	39706	62.30			39621	48.71		
		1	3	Ball	Plain	RR	97922	64.74	34532	63.86	30961	55.31	30962	63.86
		1	4	Square	Plain	RL	62160	73.32			97332	60.67		
		1	4	Ball	Plain	RL	37902	81.48			37896	68.45		
		1-1/2	6	Square	Plain	LX	31150	101.19			31147	87.33		
		1-1/2	6	Ball	Plain	LX	97846	110.66			31347	96.66		
		2	4	Square	Plain	LL	37735	72.49	37734	72.49	37732	60.67	37733	72.49
		2	4	Square	Weldon	LL	39169	75.35			96334	62.91		
		2	4	Ball	Plain	LL	37935	82.26	37934	82.26	37932	68.51		
		3	6	Square	Plain	XX	34135	100.88	34134	100.20	34132	87.33	34133	100.20
		3	6	Square	Weldon	XX	39176	102.91			39132	89.57		
		3	6	Ball	Plain	XX	30473	113.00	34334	112.22	34332	96.96		
		4	6	Square	Weldon	EX	39408	111.59			39400	98.24		
9/16	9/16	1-1/4	3-1/2	Square	Plain	RR	30996	89.39	34436	88.19	30763	76.00	30764	88.19
		1-1/4	3-1/2	Square	Weldon	RR	39792	91.78			39763	78.80		
		1-1/4	3-1/2	Ball	Plain	RR	30409	100.36			30963	86.76		
5/8	5/8	3/4	3	Square	Plain	SS	39771	93.29			31525	78.33		
		1-1/4	3-1/2	Square	Plain	RR	30555	97.50	34440	96.30	30765	82.67	30766	96.30
		1-1/4	3-1/2	Square	Weldon	RR	39793	99.84	39784	98.70	39765	85.47	39766	98.70
		1-1/4	3-1/2	.030	Plain	RR	37458	107.28			37398	86.25		
		1-1/4	3-1/2	.030	Weldon	RR	39709	109.72			39524	89.05		
		1-1/4	3-1/2	.060	Plain	RR	37460	107.28			37400	86.25		
		1-1/4	3-1/2	.060	Weldon	RR	39544	109.72			39526	89.05		
		1-1/4	3-1/2	.090	Plain	RR	37461	107.28			37401	86.25		
		1-1/4	3-1/2	.090	Weldon	RR	39608	109.72			39527	89.05		
		1-1/4	3-1/2	Ball	Plain	RR	30991	109.25	34540	108.00	30965	94.00		
		2	6	Square	Plain	LX	31130	146.80			90160	123.93		
		2	6	Ball	Plain	LX	37868	165.41			31350	141.48		
		2-1/4	5	Square	Plain	LL	30561	141.96	37742	140.87	37740	116.78	37741	140.87
		2-1/4	5	Square	Weldon	LL	39170	144.35			39740	119.58	39166	140.50
		2-1/4	5	Ball	Plain	LL	30486	166.35			37940	147.27		
3	6	Square	Plain	XX	34143	146.38	34142	145.18	34140	123.93	34141	145.18		
3	6	Square	Weldon	XX	39177	148.77			39173	126.73	39141	144.82		
3	6	Ball	Plain	XX	30488	167.08			34340	141.91				
4	6	Square	Weldon	EX	39409	164.22			39401	142.18				
11/16	3/4	1-1/2	4	Square	Plain	RR	31032	156.73			30767	131.33		
		1-1/2	4	Ball	Plain	RR	31050	180.70			30967	153.64		
3/4	3/4	1	3	Square	Plain	SS	30435	133.74	31542	132.08	31527	111.87		
		1-1/2	4	Square	Plain	RR	98956	142.69	34448	141.02	30769	121.11	30770	141.02
		1-1/2	4	Square	Weldon	RR	39794	145.70	39785	144.09	39769	124.31	39770	144.09
		1-1/2	4	.015	Plain	RR	37462	151.89			37402	124.41		
		1-1/2	4	.015	Weldon	RR	39711	154.65			39533	127.61		
		1-1/2	4	.020	Plain	RR	37463	151.89			37403	124.41		
1-1/2	4	.020	Weldon	RR	39712	154.65			39534	127.61				

continued on next page

* Superseded by AITiN. Add TiN to any uncoated tool. See page 162.

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Inch sizes



Style Code Reference
 EE—Extreme LOC, Extreme OAL
 EX—Extreme LOC, X-Long OAL
 LL—Long LOC, Long OAL
 LX—Long LOC, X-Long OAL
 RL—Regular LOC, Long OAL
 RR—Regular LOC, Regular OAL
 SS—Short LOC, Short OAL
 XX—X-Long LOC, X-Long OAL

Inch • Continued								Standard					Obsolete*	
d ₁ Cutter Dia	d ₂ Shank Dia	l ₂ Length of Cut	l ₁ Overall Length	R Corner Radius	Shank Style	Style Code	AITiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price	TiN EDP Number	List Price
3/4	3/4	1-1/2	4	.030	Plain	RR	37464	151.89			37404	124.41		
		1-1/2	4	.030	Weldon	RR	39603	154.65			39535	127.61		
		1-1/2	4	.045	Plain	RR	37465	151.89			37405	124.41		
		1-1/2	4	.045	Weldon	RR	39602	154.65			39536	127.61		
		1-1/2	4	.060	Plain	RR	37466	151.89			37406	124.41		
		1-1/2	4	.060	Weldon	RR	97575	154.65			39530	127.61		
		1-1/2	4	.090	Plain	RR	37467	151.89			37407	124.41		
		1-1/2	4	.090	Weldon	RR	39713	154.65			39531	127.61		
		1-1/2	4	.120	Plain	RR	37468	151.89			37408	124.41		
		1-1/2	4	.120	Weldon	RR	39714	154.65			39623	127.61		
		1-1/2	4	.125	Plain	RR	37469	151.89			37409	124.41		
		1-1/2	4	.125	Weldon	RR	39732	154.65			39532	127.61		
		1-1/2	4	Ball	Plain	RR	95757	156.31	34548	154.60	30969	137.96		
		2	6	Square	Plain	LX	31132	230.41			31126	192.80		
		2	6	Ball	Plain	LX	37869	266.55			31352	223.13		
		2-1/4	5	Square	Plain	LL	37751	186.21	37750	184.60	37748	155.56	37749	184.60
		2-1/4	5	Square	Weldon	LL	39171	188.34			39748	158.76	96874	181.38
		2-1/4	5	Ball	Plain	LL	37937	224.02			37948	202.21		
		3	6	Square	Plain	XX	34151	224.69	34150	223.03	34148	192.80	34149	223.03
		3	6	Square	Weldon	XX	39178	227.76			39148	196.00	96011	222.09
3	6	Ball	Plain	XX	30474	256.78			34348	229.50				
4	6-1/2	Square	Weldon	EX	39410	256.41			39402	224.60				
13/16	7/8	1-1/2	4	Square	Plain	RR	31034	222.35			30771	193.73		
7/8	7/8	1-1/2	4	Square	Plain	RR	30523	206.75	34456	204.78	30773	178.13		
		1-1/2	4	Square	Weldon	RR	39795	210.34			39773	181.73		
		1-1/2	4	Ball	Plain	RR	30527	248.09			30973	217.95		
15/16	1	1-1/2	4	Square	Plain	RR	31038	292.55			30775	258.67		
1	1	1-1/2	4	Square	Plain	RR	98957	215.02	34464	212.89	30777	187.78	30778	212.89
		1-1/2	4	Square	Weldon	RR	39796	218.61			39777	191.46		
		1-1/2	4	.030	Plain	RR	37472	242.89			37412	190.53		
		1-1/2	4	.030	Weldon	RR	39595	246.48			39539	194.21		
		1-1/2	4	.045	Plain	RR	37473	242.89			37413	190.53		
		1-1/2	4	.045	Weldon	RR	39718	246.48			39540	194.21		
		1-1/2	4	.060	Plain	RR	37474	242.89			37414	190.53		
		1-1/2	4	.060	Weldon	RR	39596	246.48			39541	194.21		
		1-1/2	4	.090	Plain	RR	37475	242.89			37415	190.53		
		1-1/2	4	.090	Weldon	RR	39719	246.48			39542	194.21		
		1-1/2	4	.120	Plain	RR	37476	242.89			37416	190.53		
		1-1/2	4	.120	Weldon	RR	39720	246.48			39692	194.21		
		1-1/2	4	.125	Plain	RR	37477	242.89			37417	190.53		
		1-1/2	4	.125	Weldon	RR	39606	246.48			39543	194.21		
		1-1/2	4	Ball	Plain	RR	30528	266.03			30977	237.62		
		2-1/4	5	Square	Plain	LL	37767	346.06	37766	343.98	37764	295.18		
		2-1/4	5	Square	Weldon	LL	39172	349.70			39964	298.86		
		2-1/4	5	Ball	Plain	LL	37967	416.21			37964	369.29		
		3	6	Square	Plain	XX	34167	373.36	34166	371.23	34164	329.11		
		3	6	Square	Weldon	XX	39365	376.95			96625	332.79		
3	6	Ball	Plain	XX	30476	420.78			34364	382.06				
4-1/8	7	Square	Weldon	EE	39411	488.20			39403	444.04	34094	480.81		
1-1/8	1	2	4-1/2	Square	Weldon	RR	34087	545.38			39412	482.80		
1-1/4	1-1/4	2	4-1/2	Square	Plain	RR					31178	513.87		

* Superseded by AITiN. Add TiN to any uncoated tool. See page 162.



Additional large diameter end mills available with 6-Flutes. Refer to series E16 on page 69.

GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Metric sizes



Metric E14 end mills with DIN 6535 HB (Weldon®) flats are available by request. See page 160 for modification charges.

Metric							Standard					
d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price
1	3	2	38	Square	Plain	SR	39722	13.70	32175	13.40	38788	11.01
		2	38	Ball	Plain	SR	39862	18.12			38881	15.96
		3	38	Square	Plain	RR	32202	13.93	32141	13.63	31471	11.24
		3	38	Ball	Plain	RR	39835	18.26			32641	16.10
1,5	3	3	38	Square	Plain	SR	39723	13.70	32177	13.40	38789	11.01
		3	38	Ball	Plain	SR	39863	17.74			38882	15.58
		4,5	38	Square	Plain	RR	32204	13.93	32142	13.63	31472	11.24
		4,5	38	Ball	Plain	RR	39836	17.18			32642	15.02
		6	38	Square	Plain	RR	30252	14.12			38607	11.43
		6	38	Ball	Plain	RR	62570	17.74			38617	15.58
2	3	4	38	Square	Plain	SR	39724	11.94	32178	11.82	38790	9.78
		4	38	Ball	Plain	SR	39864	13.73			38883	11.57
		6,3	38	Square	Plain	RR	32208	12.05	32143	11.93	31473	9.89
		6,3	38	Ball	Plain	RR	39838	13.85			32643	11.69
		9	38	Square	Plain	RR	30253	12.16	32101	12.04	38608	10.00
		9	38	Ball	Plain	RR	62571	15.05			38618	12.89
2,5	3	5	38	Square	Plain	SR	39725	11.49			38791	9.33
		5	38	Ball	Plain	SR	39867	13.12			38884	10.96
		9,5	38	Square	Plain	RR	32212	11.83			31474	9.67
		9,5	38	Ball	Plain	RR	39839	14.73			32644	12.57
3	3	6	38	Square	Plain	SR	39726	10.94			38792	8.78
		6	38	Ball	Plain	SR	39868	12.41			38885	10.25
		9	38	Square	Plain	RR	99284	11.16			36560	9.00
		12	38	Square	Plain	RR	32214	11.38	32145	11.26	31475	9.22
		12	38	0,3	Plain	RR	37478	16.88			37418	14.72
		12	38	Ball	Plain	RR	39841	14.00			32645	11.84
		19	57	Square	Plain	LL	39804	17.42			30125	14.22
		19	57	Ball	Plain	LL	39880	20.09			38894	16.89
		25	75	Square	Plain	XX	32301	23.26			30040	19.22
		25	75	Ball	Plain	XX	39892	26.65			32326	22.61
3,5	4	7	50	Square	Plain	SR	39728	15.80			38793	12.56
		14	50	Square	Plain	RR	32216	16.35			31476	13.11
		14	50	Ball	Plain	RR	39842	19.94			32646	16.70
4	4	8	50	Square	Plain	SR	39731	15.24			38794	12.00
		8	50	Ball	Plain	SR	39871	17.45			38887	14.21
		11	50	Square	Plain	RR	36585	15.80			36561	12.56
		11	50	0,4	Plain	RR	37479	21.02			37419	17.78
		14	50	Square	Plain	RR	32218	16.46	32147	16.26	31477	13.22
		14	50	Ball	Plain	RR	39843	19.18			32647	15.94
		19	63	Square	Plain	LL	39805	21.63			30126	17.67
		19	63	Ball	Plain	LL	39881	24.61			38895	20.65
		31	75	Square	Plain	XX	32302	25.01			30043	20.33
		31	75	Ball	Plain	XX	39893	28.56			32329	23.88
4,5	5	16	50	Square	Plain	RR	32222	17.88			31478	13.56
		16	50	Ball	Plain	RR	39844	21.53			32648	17.21
5	5	10	50	Square	Plain	SR	39736	18.21			38796	13.89
		10	50	Ball	Plain	SR	39873	20.87			38889	16.55
		13	50	Square	Plain	RR	36586	18.43			36563	14.11
		13	50	0,5	Plain	RR	37480	23.38			37420	19.06

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GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Metric sizes



Metric • Continued

Standard

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price
5	5	16	50	Square	Plain	RR	32224	18.76	32149	18.48	31479	14.44
		16	50	Ball	Plain	RR	39847	22.14			32649	17.82
		19	63	Square	Plain	LL	39806	25.17			30127	19.89
		19	63	Ball	Plain	LL	39882	29.20			38896	23.92
		31	100	Square	Plain	XX	32304	33.74			30135	25.78
		31	100	Ball	Plain	XX	39894	38.64			38897	30.68
6	6	12	54	Square	Plain	SS	36839	18.63			38834	14.31
		12	54	Ball	Plain	SS	37361	21.21			39441	16.89
		13	57	Square	Plain	RR	36587	19.12			36565	14.64
		13	57	0,3	Plain	RR	37481	23.80			37421	19.32
		13	57	0,5	Plain	RR	37482	23.80			37422	19.32
		19	63	Square	Plain	RR	32226	20.36	32150	20.08	31480	15.44
		19	63	Ball	Plain	RR	39848	23.88			32650	18.96
		29	75	Square	Plain	LL	39807	27.14			30049	21.42
		29	75	Ball	Plain	LL	39883	30.37			32335	24.65
		38	100	Square	Plain	XX	32306	34.17			30137	26.73
38	100	Ball	Plain	XX	39895	38.75			38898	31.31		
7	7	16	60	Square	Plain	RR	36588	25.78			36567	20.22
		19	63	Square	Plain	RR	32227	29.00	32151	28.64	31481	23.04
	8	19	63	Ball	Plain	RR	39849	34.00			32651	28.04
8	8	14	58	Square	Plain	SS	36849	26.14			38835	20.58
		14	58	Ball	Plain	SS	37362	32.77			39442	27.21
		19	63	Square	Plain	RR	36589	27.52			36569	21.56
		19	63	0,5	Plain	RR	37483	31.92			37423	25.96
		19	63	1,0	Plain	RR	37484	31.92			37424	25.96
		19	63	1,5	Plain	RR	37485	31.92			37425	25.96
		20	63	Square	Plain	RR	32228	29.69	32152	29.33	31482	23.73
		20	63	Ball	Plain	RR	39850	33.73			32652	27.77
		29	75	Square	Plain	LL	39808	37.96			30052	31.04
		29	75	Ball	Plain	LL	39884	42.52			32338	35.60
		41	100	Square	Plain	XX	32308	45.67			30138	36.71
41	100	Ball	Plain	XX	39896	52.15			38899	43.19		
9	9	19	67	Square	Plain	RR	36590	40.12			36571	27.04
		22	72	Square	Plain	RR	32229	43.32			31483	32.56
	10	22	72	Ball	Plain	RR	39851	48.17			32653	37.41
10	10	16	66	Square	Plain	SS	36848	39.89			38836	29.89
		16	66	Ball	Plain	SS	37364	44.45			39443	34.45
		22	72	Square	Plain	RR	36591	41.76			36573	31.00
		22	72	0,5	Plain	RR	37486	45.88			37426	35.12
		22	72	1,0	Plain	RR	37487	45.88			37427	35.12
		22	72	1,5	Plain	RR	37488	45.88			37428	35.12
		25	72	Square	Plain	RR	32230	44.27	32154	43.63	31484	33.51
		25	72	Ball	Plain	RR	39852	49.26			32654	38.50
		25	100	Square	Plain	RX	31891	60.18			31279	45.82
		25	100	Ball	Plain	RX	37296	68.98			37244	54.62
		40	88	Square	Plain	LL	36838	53.57			30079	40.73
		40	88	Ball	Plain	LL	37366	58.93			39444	46.09
		45	100	Square	Plain	XX	32310	61.36			30055	47.00
45	100	Ball	Plain	XX	39897	67.79			32341	53.43		
11	11	26	83	Square	Plain	RR	36592	50.40			36574	40.40

Style Code Reference
 LL—Long LOC, Long OAL
 RR—Regular LOC, Regular OAL
 RX—Regular LOC, X-Long OAL
 SR—Short LOC, Regular OAL
 SS—Short LOC, Short OAL
 XX—X-Long LOC, X-Long OAL

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GENERAL PURPOSE E14 END MILLS

For general milling applications

E14

Metric sizes



Metric E14 end mills with DIN 6535 HB (Weldon®) flats are available by request. See page 160 for modification charges.

Metric • Continued

Standard

d_1 Cutter Dia	d_2 Shank Dia	l_2 Length of Cut	l_1 Overall Length	R Corner Radius	Shank Style	Style Code	AlTiN EDP Number	List Price	TiCN EDP Number	List Price	MG EDP Number	List Price
12	12	19	73	Square	Plain	SS	36847	51.64			38837	41.64
		25	76	Square	Plain	RR	32231	55.03	32155	54.43	31485	44.71
		25	76	Ball	Plain	RR	39853	61.70			32655	51.38
		26	83	Square	Plain	RR	36593	53.94			36575	42.78
		26	83	0,5	Plain	RR	37489	57.52			37429	46.36
		26	83	1,0	Plain	RR	37490	57.52			37430	46.36
		26	83	1,5	Plain	RR	37491	57.52			37431	46.36
		26	83	Ball	Plain	RR	37344	60.63			39446	49.47
		50	100	Square	Plain	LL	39810	73.01			30058	59.89
		50	100	Ball	Plain	LL	39886	80.30			32344	67.18
		75	150	Square	Plain	XX	32312	105.29			30061	86.33
		75	150	Ball	Plain	XX	39898	122.58			32347	103.62
14	14	26	83	Square	Plain	RR	36594	88.41			36577	75.33
		32	83	Square	Plain	RR	32232	92.21			34445	79.13
		32	83	Ball	Plain	RR	39854	102.46			34567	89.38
		57	125	Square	Plain	LL	39811	119.61			30129	100.89
		75	150	Square	Plain	XX	32314	138.97			30064	116.89
16	16	25	82	Square	Plain	SS	39751	96.08			38802	83.00
		32	89	Square	Plain	RR	32234	102.77			31487	88.73
		32	89	Ball	Plain	RR	39865	115.93			32657	101.89
		32	92	Square	Plain	RR	36595	101.28			36579	86.84
		32	92	0,5	Plain	RR	37492	104.86			37432	90.42
		32	92	1,0	Plain	RR	37493	104.86			37433	90.42
		32	92	1,5	Plain	RR	37494	104.86			37434	90.42
		32	92	2,0	Plain	RR	37495	104.86			37435	90.42
		57	125	Square	Plain	LL	39812	145.54			30131	126.62
		57	125	Ball	Plain	LL	39888	170.89			39087	151.97
75	150	Square	Plain	XX	32318	156.43			30067	134.11		
18	18	32	92	Square	Plain	RR	36596	133.96			36580	120.04
		38	100	Square	Plain	RR	32235	147.00			31488	132.04
		38	100	Ball	Plain	RR	39857	165.17			32658	150.21
		57	125	Square	Plain	LL	39813	179.78			30132	161.62
		75	150	Square	Plain	XX	32322	206.44			30070	185.04
20	20	38	100	Square	Plain	RR	32237	178.27			31489	156.71
		38	104	Square	Plain	RR	36597	171.59			36581	149.27
		38	104	0,5	Plain	RR	37496	174.89			37436	152.57
		38	104	1,0	Plain	RR	37497	174.89			37437	152.57
		38	104	1,5	Plain	RR	37498	174.89			37438	152.57
		38	104	2,0	Plain	RR	37499	174.89			37439	152.57
		38	104	Ball	Plain	RR	32672	213.73			32671	192.17
		57	125	Square	Plain	LL	39814	207.82			30133	181.62
		57	125	Ball	Plain	LL	39890	244.13			39090	217.93
		75	150	Square	Plain	XX	32324	248.53			30073	217.69
22	22	38	100	Square	Plain	RR	30255	215.78			31402	195.70
25	25	38	100	Square	Plain	SS	32238	220.58			31490	200.50
		45	120	Square	Plain	RR	36899	284.21			36582	260.73
		45	120	Ball	Plain	RR	37252	265.06			39448	241.58
		57	125	Square	Plain	LL	39815	349.23			30134	324.87
		75	150	Square	Plain	XX	32325	355.62			30076	327.02

Style Code Reference
 LL—Long LOC, Long OAL
 RR—Regular LOC, Regular OAL
 SS—Short LOC, Short OAL
 XX—X-Long LOC, X-Long OAL

GENERAL PURPOSE 4-FLUTE END MILLS

For general milling applications

Application Guide • Speed & Feed

Work Material	Type of Cut	Axial DOC	Radial DOC	Speed (SFM)			Feed (Inches per Tooth)							Speed (m/min)			Feed (mm per Tooth)						
				MG	TiCN	AlTiN	1/8	1/4	3/8	1/2	5/8	3/4	1	MG	TiCN	AlTiN	3,0	6,0	9,0	12,0	16,0	19,0	25,0
Composites, Plastics	Slot	.5 x D	1 x D	300	350	350	.0008	.0015	.0022	.0030	.0037	.0047	.0060	91	107	107	.0203	.0381	.0559	.0762	.0940	.1194	.1524
	Rough	1 x D	.5 x D	375	450	450	.0009	.0018	.0027	.0035	.0045	.0055	.0070	114	137	137	.0229	.0457	.0686	.0889	.1143	.1397	.1778
	Finish	1.5 x D	.01 x D	450	650	650	.0009	.0018	.0027	.0035	.0045	.0055	.0070	137	198	198	.0229	.0457	.0686	.0889	.1143	.1397	.1778
Graphite	Slot	.5 x D	1 x D	350	400	450	.0008	.0015	.0023	.0030	.0037	.0045	.0060	107	122	137	.0203	.0381	.0584	.0762	.0940	.1143	.1524
	Rough	1 x D	.5 x D	425	475	525	.0009	.0017	.0026	.0035	.0043	.0053	.0070	130	145	160	.0229	.0432	.0660	.0889	.1092	.1346	.1778
	Finish	1.5 x D	.01 x D	500	550	600	.0010	.0019	.0028	.0038	.0047	.0057	.0076	152	168	183	.0254	.0483	.0711	.0965	.1194	.1448	.1930
Cast Iron - Gray	Slot	.5 x D	1 x D	200	350	350	.0004	.0007	.0011	.0015	.0019	.0023	.0030	61	107	107	.0102	.0178	.0279	.0381	.0483	.0584	.0762
	Rough	1 x D	.5 x D	250	400	400	.0005	.0010	.0015	.0020	.0025	.0030	.0040	76	122	122	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Finish	1.5 x D	.01 x D	300	450	450	.0007	.0015	.0022	.0030	.0038	.0045	.0060	91	137	137	.0178	.0381	.0559	.0762	.0965	.1143	.1524
Cast Iron - Ductile	Slot	.5 x D	1 x D	200	250	250	.0004	.0007	.0011	.0015	.0018	.0023	.0030	61	76	76	.0102	.0178	.0279	.0381	.0457	.0584	.0762
	Rough	1 x D	.5 x D	250	275	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040	76	84	84	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Finish	1.5 x D	.01 x D	275	325	325	.0006	.0012	.0018	.0023	.0028	.0034	.0046	84	99	99	.0152	.0305	.0457	.0584	.0711	.0864	.1168
Low Carbon Steel ≤ 38 HRC 1018, 12L14, 8620	Slot	.5 x D	1 x D	250	275	300	.0005	.0010	.0015	.0020	.0025	.0030	.0040	76	84	91	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Rough	1 x D	.5 x D	275	300	325	.0006	.0012	.0018	.0025	.0031	.0037	.0050	84	91	99	.0152	.0305	.0457	.0635	.0787	.0940	.1270
	Finish	1.5 x D	.01 x D	300	325	350	.0007	.0015	.0022	.0030	.0038	.0045	.0060	91	99	107	.0178	.0381	.0559	.0762	.0965	.1143	.1524
Medium Carbon Steels ≤ 38 HRC 4140, 4340	Slot	.5 x D	1 x D	225	250	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040	69	76	84	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Rough	1 x D	.5 x D	250	275	300	.0006	.0012	.0018	.0025	.0031	.0037	.0050	76	84	91	.0152	.0305	.0457	.0635	.0787	.0940	.1270
	Finish	1.5 x D	.01 x D	275	300	325	.0007	.0015	.0022	.0030	.0038	.0045	.0060	84	91	99	.0178	.0381	.0559	.0762	.0965	.1143	.1524
Tool & Die Steels ≤ 38 HRC A2, D2, H13, P20	Slot	.5 x D	1 x D	225	250	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040	69	76	84	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Rough	1 x D	.5 x D	250	275	300	.0006	.0012	.0018	.0025	.0031	.0037	.0050	76	84	91	.0152	.0305	.0457	.0635	.0787	.0940	.1270
	Finish	1.5 x D	.01 x D	275	300	325	.0007	.0015	.0022	.0030	.0038	.0045	.0060	84	91	99	.0178	.0381	.0559	.0762	.0965	.1143	.1524
Tool & Die Steels 39 - 48 HRC A2, D2, H13, P20	Slot	.25 x D	1 x D	175	200	225	.0002	.0005	.0007	.0010	.0012	.0015	.0020	53	61	69	.0051	.0127	.0178	.0254	.0305	.0381	.0508
	Rough	1 x D	.25 x D	200	225	250	.0003	.0007	.0011	.0015	.0019	.0022	.0030	61	69	76	.0076	.0178	.0279	.0381	.0483	.0559	.0762
	Finish	1.5 x D	.01 x D	225	250	275	.0004	.0009	.0014	.0018	.0023	.0027	.0036	69	76	84	.0102	.0229	.0356	.0457	.0584	.0686	.0914
Easy to Machine Stainless Steel 416, 410, 302, 303	Slot	.5 x D	1 x D	200	250	250	.0003	.0007	.0011	.0015	.0019	.0023	.0030	61	76	76	.0076	.0178	.0279	.0381	.0483	.0584	.0762
	Rough	1 x D	.5 x D	250	275	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040	76	84	84	.0127	.0254	.0381	.0508	.0635	.0762	.1016
	Finish	1.5 x D	.01 x D	300	325	325	.0006	.0012	.0018	.0025	.0031	.0038	.0050	91	99	99	.0152	.0305	.0457	.0635	.0787	.0965	.1270
Moderate Machining Stainless Steels 304, 316, Invar, Kovar	Slot	.5 x D	1 x D	200	225	250	.0003	.0005	.0008	.0010	.0012	.0015	.0020	61	69	76	.0064	.0127	.0191	.0254	.0305	.0381	.0508
	Rough	1 x D	.5 x D	250	275	300	.0003	.0007	.0011	.0015	.0019	.0022	.0030	76	84	91	.0076	.0178	.0279	.0381	.0483	.0559	.0762
	Finish	1.5 x D	.01 x D	300	325	350	.0004	.0009	.0014	.0018	.0023	.0027	.0036	91	99	107	.0102	.0229	.0356	.0457	.0584	.0686	.0914

D = tool diameter Reduce feed rates by 20% when using long length tools Starting parameters shown