

MILLING RECOMMENDATIONS - GENERAL PURPOSE ENDMILLS



PROFILING

Workpiece Material Group	Hardness	Surface Feet Per Minute (SFM) Radial Depth of Cut (RDOC)					Inches Per Tooth (IPT)					
		SFM based on RDOC					IPT *(BASELINE)					
		Cutting Diameter Engaged					Cutting Diameter					
		5%	10%	20%	30%	50%	5/16	3/8	1/2	5/8	3/4	1
Steels Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 Medium Carbon, High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P ≤ 28 Rc	1050	700	385	375	350						
	P 28-38 Rc	630	420	320	250	210	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090
Tool & Die Steels A2, H13, L6, P20, S7	P 28-44 Rc	525	350	300	275	250	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090
Stainless Steel Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303 304, 304L Incoloy 27-7MO, 316 316L, 321, 347 Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M ≤ 28 Rc	650	600	550	500	450						
	M ≤ 28 Rc	525	400	350	300	250	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090
	M > 28 Rc	525	400	350	300	250						
Super Alloys High Temp, Nimonic, Inconel, Monel, Hastelloy Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	S ≤ 42 Rc	265	200	175	150	100	0.0014	0.0016	0.0023	0.0027	0.0032	0.0045
	S ≤ 42 Rc	230	200	175	150	125						
Hardened Materials	H 45-55 Rc	250	240	230	210	200	0.0018	0.0021	0.0030	0.0036	0.0042	0.0060
	H 55-65 Rc	200	180	160	150	100	0.0013	0.0014	0.0021	0.0024	0.0029	0.0041
Cast-Iron Gray: SAE J431, ASTM A48 Ductile & Malleable: ASTM A536, ASTM 897, ASTM A47, ASTM A220 ASTM A602	K ≤ 240 HB	425	400	375	350	300	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090
	K > 240 HB	320	300	250	225	200						
Non-Ferrous Aluminum, Brass, Bronze, Copper, Plastics, Graphite	N	1000	960	920	880	840	0.0027	0.0032	0.0045	0.0054	0.0063	0.0090

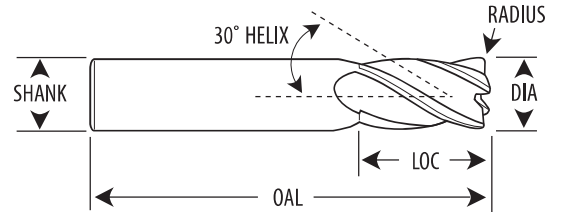
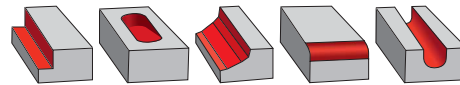
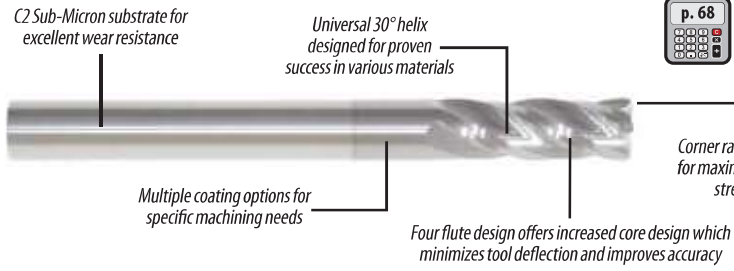
*CHIP THINNING Adjustments	
RDOC	Increase IPT
50%	None
30%	1.1 x
25%	1.2 x
20%	1.3 x
15%	1.4 x
10%	1.8 x
7%	2.0 x
5%	2.3 x
3%	3.0 x
2%	3.5 x
1%	5.0 x



SLOTING

Workpiece Material Group	Hardness	Surface Feet Per Minute (SFM) Radial Depth of Cut (RDOC)			Inches Per Tooth (IPT)					
		SFM			IPT *(BASELINE)					
		Cutting Diameter Engaged			Cutting Diameter					
		25%	50%	100%	5/16	3/8	1/2	5/8	3/4	1
Steels Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 Medium Carbon, High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P ≤ 28 Rc	385	370	350						
	P 28-38 Rc	245	230	2210	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
Tool & Die Steels A2, H13, L6, P20, S7	P 28-44 Rc	210	195	175	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
Stainless Steel Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303 304, 304L Incoloy 27-7MO, 316 316L, 321, 347 Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M ≤ 28 Rc	385	370	350						
	M ≤ 28 Rc	245	210	175	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
	M > 28 Rc	210	195	175						
Super Alloys High Temp, Nimonic, Inconel, Monel, Hastelloy Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	S ≤ 42 Rc	125	105	90	0.0008	0.0010	0.0013	0.0016	0.0017	0.0026
	S ≤ 42 Rc	100	90	80						
Hardened Materials	H 34-45 Rc	245	230	210	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
	H 45-55 Rc	175	160	140	0.0008	0.0010	0.0013	0.0016	0.0020	0.0025
	H 55-65 Rc	150	125	100	0.0004	0.0005	0.0008	0.0008	0.0010	0.0012
Cast-Iron Gray: SAE J431, ASTM A48 Ductile & Malleable: ASTM A536, ASTM 897, ASTM A47, ASTM A220 ASTM A602	K ≤ 240 HB	450	400	350	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050
	K > 240 HB	300	250	225						
Non-Ferrous Aluminum, Brass, Bronze, Copper, Plastics, Graphite	N	750	600	450	0.0016	0.0019	0.0025	0.0031	0.0038	0.0050

4 FLUTE - SINGLE END CORNER RADIUS



DIAMETER TOLERANCE: +0.000 / -0.002" SHANK TOLERANCE: +0.0000 / -0.0005"

DIA	Dec In	LOC	Shank	OAL	Length	Radius	Bright	TiN	TiCN	AlTiN
1/8	0.1250	1/2	1/8	1-1/2	Regular	0.005	206-602297	—	—	206-602298
						0.010	206-602300	206-602301	206-602302	206-602303
						0.015	206-602306	206-602307	206-602308	206-602309
						0.020	206-602312	206-602313	206-602314	206-602315
						0.030	206-602318	206-602319	206-602320	206-602321
3/16	0.1875	5/8	3/16	2	Regular	0.010	206-602424	206-602425	206-602426	206-602427
						0.015	206-602430	206-602431	206-602432	206-602433
						0.020	206-602436	206-602437	206-602438	206-602439
						0.030	206-602442	206-602443	206-602444	206-602445
						0.045	206-602448	206-602449	206-602450	206-602451
						0.050	206-602452	—	—	206-602455
						0.060	206-602453	—	—	206-602456
1/4	0.2500	3/4	1/4	2-1/2	Regular	0.010	206-602548	—	—	206-602549
						0.015	206-602551	206-602552	206-602553	206-602554
						0.020	206-602557	206-602558	206-602559	206-602560
						0.025	206-602563	206-602564	206-602565	206-602566
						0.030	206-602569	206-602570	206-602571	206-602572
						0.045	206-602575	206-602576	206-602577	206-602578
						0.060	206-602581	206-602582	206-602583	206-602584
5/16	0.3125	13/16	5/16	2-1/2	Regular	0.090	206-602595	—	—	206-602598
						0.015	206-602684	206-602685	206-602686	206-602687
						0.020	206-602690	206-602691	206-602692	206-602693
						0.025	206-602696	206-602697	206-602698	206-602699
						0.030	206-602702	206-602703	206-602704	206-602705
						0.045	206-602708	206-602709	206-602710	206-602711
						0.060	206-602714	206-602715	206-602716	206-602717
						0.090	206-602719	—	—	206-602722
3/8	0.3750	1	3/8	2-1/2	Regular	0.125	206-602723	—	—	206-602726
						0.015	206-602820	206-602821	206-602822	206-602823
						0.020	206-602826	206-602827	206-602828	206-602829
						0.025	206-602832	206-602833	206-602834	206-602835
						0.030	206-602838	206-602839	206-602840	206-602841
						0.045	206-602844	206-602845	206-602846	206-602847
						0.060	206-602850	206-602851	206-602852	206-602853
						0.090	206-602856	206-602857	206-602858	206-602859
						0.125	206-602860	—	—	206-602863

4 FLUTE - SINGLE END - RADIUS CONTINUED

DIA	Dec In	LOC	Shank	OAL	Length	Radius	Bright	TiN	TiCN	AlTiN
7/16	0.4375	1	7/16	2-3/4	Regular	0.015	206-602961	206-602962	206-602963	206-602964
						0.020	206-602967	206-602968	206-602969	206-602970
						0.025	206-602974	206-602975	206-602976	206-602977
						0.030	206-602980	206-602981	206-602982	206-602983
						0.045	206-602986	206-602987	206-602988	206-602989
						0.060	206-602992	206-602993	206-602994	206-602995
						0.090	206-602998	206-602999	206-603000	206-603001
1/2	0.5000	1	1/2	3	Regular	0.015	206-603003	206-603004	206-603005	206-603006
						0.020	206-603009	206-603010	206-603011	206-603012
						0.025	206-603015	206-603016	206-603017	206-603018
						0.030	206-603021	206-603022	206-603023	206-603024
						0.045	206-603027	206-603028	206-603029	206-603030
						0.060	206-603033	206-603034	206-603035	206-603036
						0.090	206-603039	206-603040	206-603041	206-603042
5/8	0.6250	1-1/4	5/8	3-1/2	Regular	0.015	206-603150	206-603151	206-603152	206-603153
						0.020	206-603156	206-603157	206-603158	206-603159
						0.025	206-603162	206-603163	206-603164	206-603165
						0.030	206-603168	206-603169	206-603170	206-603171
						0.045	206-603174	206-603175	206-603176	206-603177
						0.060	206-603180	206-603181	206-603182	206-603183
						0.090	206-603186	206-603187	206-603188	206-603189
3/4	0.7500	1-1/2	3/4	4	Regular	0.015	206-603297	206-603298	206-603299	206-603300
						0.020	206-603303	206-603304	206-603305	206-603306
						0.025	206-603309	206-603310	206-603311	206-603312
						0.030	206-603315	206-603316	206-603317	206-603318
						0.045	206-603321	206-603322	206-603323	206-603324
						0.060	206-603327	206-603328	206-603329	206-603330
						0.090	206-603333	206-603334	206-603335	206-603336
1	1.0000	1-1/2	1	4	Regular	0.125	206-603339	206-603340	206-603341	206-603342
						0.190	206-603345	206-603346	206-603347	206-603348
						0.250	206-603350	—	—	206-603353
						0.015	206-603450	206-603451	206-603452	206-603453
						0.020	206-603456	206-603457	206-603458	206-603459
						0.025	206-603462	206-603463	206-603464	206-603465
						0.030	206-603468	206-603469	206-603470	206-603471
						0.045	206-603474	206-603475	206-603476	206-603477
						0.060	206-603480	206-603481	206-603482	206-603483
						0.090	206-603486	206-603487	206-603488	206-603489
0.125	206-603492	206-603493	206-603494	206-603495						
0.190	206-603498	206-603499	206-603500	206-603501						
0.250	206-603504	206-603505	206-603506	206-603507						