



MILLING RECOMMENDATIONS - GP MINIATURE ENDMILLS

PROFILING 

Surface Feet Per Minute (SFM)
Radial Depth of Cut (RDOC)

Inches Per Tooth (IPT)

Workpiece Material Group	Hardness	SFM	Inches Per Tooth (IPT)										
			0.015	0.031	0.047	Cutting Diameter		0.125	0.187	0.250			
Steels	Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	P ≤ 28 Rc	400										
	Medium/High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P 28-38 Rc	300	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100	
Tool & Die Steels	A2, H13, L6, P20, S7	P 28-44 Rc	200										
Stainless Steel	Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F	M ≤ 28 Rc	400										
	Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303, 304, 304L Incoloy 27-7MO, 316, 316L, 321, 347	M ≤ 28 Rc	200	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100	
	Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M > 28 Rc	150										
Super Alloys	High Temp, Nimonic, Inconel, Monel, Hastelloy	S ≤ 42 Rc	70	0.00004	0.00008	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00080	
	Titanium: Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	S ≤ 42 Rc	150										
Hardened Materials		H 45-55 Rc	100	0.00010	0.00030	0.00050	0.00140	0.00180	0.00210	0.00300	0.00360	0.00420	
Cast-Iron	Gray: SAE J431, ASTM A48	K 160-200 HB	400										
	Ductile & Malleable, ASTM A536, ASTM 897, ASTM A47, ASTM A220, ASTM A602	K 200-250 HB	250	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100	
Non-Ferrous	Aluminum, Brass, Bronze, Copper, Plastics, Graphite	N	100	0.00004	0.00008	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00080	

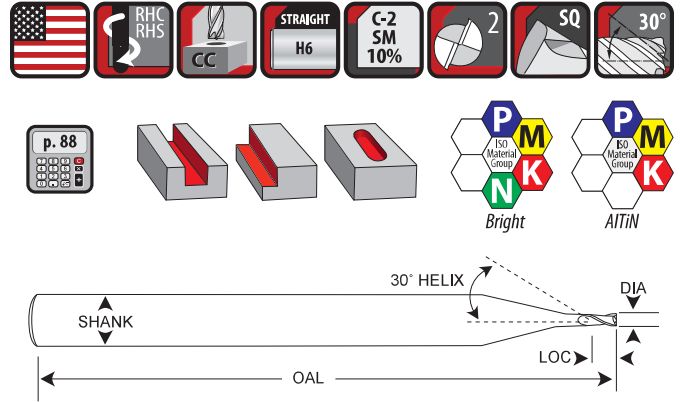
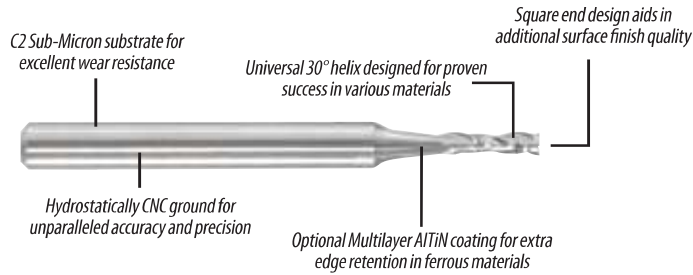
SLOTTING 

Surface Feet Per Minute (SFM)
Radial Depth of Cut (RDOC)

Inches Per Tooth (IPT)

Workpiece Material Group	Hardness	SFM	Inches Per Tooth (IPT)										
			0.015	0.031	0.047	Cutting Diameter		0.125	0.187	0.250			
Steels	Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	P ≤ 28 Rc	400					0.0003	0.0004	0.0005	0.0007	0.0010	
	Medium/High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P 28-38 Rc	300	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0007	0.0009	
Tool & Die Steels	A2, H13, L6, P20, S7	P 28-44 Rc	200					0.0002	0.0003	0.0004	0.0006	0.0008	
Stainless Steel	Easy to Machine, 430F, 301, 303, 410, 416 Annealed, 420F, 430, 430F	M ≤ 28 Rc	400			0.0002	0.0002	0.0003	0.0004	0.0005	0.0007	0.0010	
	Moderately Difficult to Machine, Nitronic 50, Nitronic 60, 301, 303, 304, 304L Incoloy 27-7MO, 316, 316L, 321, 347	M ≤ 28 Rc	200	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0007	0.0009	
	Difficult to Machine, 302B, 304B, 309, 310, 316, 316B, 316L, 316Ti, 317, 317L, 321, PH13-8Mo, Nitronics	M > 28 Rc	150			0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005	
Super Alloys	High Temp, Nimonic, Inconel, Monel, Hastelloy	S ≤ 42 Rc	70	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005	
	Titanium: Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	S ≤ 42 Rc	150										
Hardened Materials		H 35-45 Rc	100	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	
Cast-Iron	Gray: SAE J431, ASTM A48	K 160-200 HB	400						0.0004	0.0005	0.0007	0.0010	
	Ductile & Malleable, ASTM A536, ASTM 897, ASTM A47, ASTM A220, ASTM A602	K 200-250 HB	250	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0007	0.0009	
Non-Ferrous	Aluminum, Brass, Bronze, Copper, Plastics, Graphite	N	750	0.0002	0.0003	0.0005	0.0006	0.0007	0.0008	0.0011	0.0017	0.0022	

2 FLUTE SQUARE



ALL SHANK DIAMETERS = 0.125" ALL OAL = 1.500"
 DIA TOLERANCE: ±0.0005" LOC TOLERANCE: +0.0000 / +0.0120" SHANK TOLERANCE: +0.0000/-0.0003"

DIA	LOC	Length	Bright	AlTiN
0.005	0.008	Stub	250-300100	—
	0.015	Regular	250-100010	—
0.006	0.009	Stub	250-300110	—
	0.018	Regular	250-200110	—
0.007	0.011	Stub	250-300120	—
	0.021	Regular	250-200120	—
0.008	0.012	Stub	250-300130	—
	0.024	Regular	250-200130	—
0.009	0.014	Stub	250-300140	—
	0.027	Regular	250-200140	—
0.010	0.015	Stub	250-300150	250-300150B
	0.030	Regular	250-100030	250-100030B
0.011	0.017	Stub	250-300160	250-300160B
	0.033	Regular	250-200160	250-200160B
0.012	0.018	Stub	250-300170	250-300170B
	0.036	Regular	250-200170	250-200170B
0.013	0.020	Stub	250-300180	250-300180B
	0.039	Regular	250-200180	250-200180B
0.014	0.021	Stub	250-300190	250-300190B
	0.042	Regular	250-200190	250-200190B
0.015	0.023	Stub	250-300200	250-300200B
	0.045	Regular	250-100050	250-100050B
0.016	0.024	Stub	250-300210	250-300210B
	0.048	Regular	250-200210	250-200210B
0.017	0.026	Stub	250-300220	250-300220B
	0.051	Regular	250-200220	250-200220B
0.018	0.027	Stub	250-300230	250-300230B
	0.054	Regular	250-200230	250-200230B
0.019	0.029	Stub	250-300240	250-300240B
	0.057	Regular	250-200240	250-200240B
0.020	0.030	Stub	250-300250	250-300250B
	0.060	Regular	250-100070	250-100070B
0.021	0.032	Stub	250-300260	250-300260B
	0.063	Regular	250-200260	250-200260B
0.022	0.033	Stub	250-300270	250-300270B
	0.066	Regular	250-200270	250-200270B
0.023	0.035	Stub	250-300280	250-300280B
	0.069	Regular	250-200280	250-200280B
0.024	0.036	Stub	250-300290	250-300290B
	0.072	Regular	250-200290	250-200290B

2 FLUTE - SQUARE CONTINUED

ALL SHANK DIAMETERS = 0.125"

ALL OAL = 1.500"

DIA	LOC	Length	Bright	AlTiN
0.025	0.038	Stub	250-300300	250-300300B
	0.075	Regular	250-100090	250-100090B
0.026	0.039	Stub	250-300310	250-300310B
	0.078	Regular	250-200310	250-200310B
0.027	0.041	Stub	250-300320	250-300320B
	0.081	Regular	250-200320	250-200320B
0.028	0.042	Stub	250-300330	250-300330B
	0.084	Regular	250-200330	250-200330B
0.029	0.044	Stub	250-300340	250-300340B
	0.087	Regular	250-200340	250-200340B
0.030	0.045	Stub	250-300350	250-300350B
	0.090	Regular	250-100110	250-100110B
0.031	0.047	Stub	250-300360	250-300360B
	0.093	Regular	250-200360	250-200360B
0.032	0.048	Stub	250-300370	250-300370B
	0.096	Regular	250-200370	250-200370B
0.033	0.050	Stub	250-300380	250-300380B
	0.099	Regular	250-200380	250-200380B
0.034	0.051	Stub	250-300390	250-300390B
	0.102	Regular	250-200390	250-200390B
0.035	0.053	Stub	250-300400	250-300400B
	0.105	Regular	250-100130	250-100130B
0.036	0.054	Stub	250-300410	250-300410B
	0.108	Regular	250-200410	250-200410B
0.037	0.056	Stub	250-300420	250-300420B
	0.111	Regular	250-200420	250-200420B
0.038	0.057	Stub	250-300430	250-300430B
	0.114	Regular	250-200430	250-200430B
0.039	0.059	Stub	250-300440	250-300440B
	0.117	Regular	250-200440	250-200440B
0.040	0.060	Stub	250-300450	250-300450B
	0.120	Regular	250-100150	250-100150B
0.041	0.062	Stub	250-300460	250-300460B
	0.123	Regular	250-200460	250-200460B
0.042	0.063	Stub	250-300470	250-300470B
	0.126	Regular	250-200470	250-200470B
0.043	0.065	Stub	250-300480	250-300480B
	0.129	Regular	250-200480	250-200480B
0.044	0.066	Stub	250-300490	250-300490B
	0.132	Regular	250-200490	250-200490B
0.045	0.068	Stub	250-300500	250-300500B
	0.135	Regular	250-100170	250-100170B
0.046	0.069	Stub	250-300510	250-300510B
	0.138	Regular	250-200510	250-200510B
0.047	0.071	Stub	250-300520	250-300520B
	0.141	Regular	250-200520	250-200520B
0.048	0.072	Stub	250-300530	250-300530B
	0.144	Regular	250-200530	250-200530B
0.049	0.074	Stub	250-300540	250-300540B
	0.147	Regular	250-200540	250-200540B
0.050	0.075	Stub	250-300550	250-300550B
	0.150	Regular	250-100190	250-100190B

2 FLUTE - SQUARE CONTINUED

ALL SHANK DIAMETERS = 0.125"

ALL OAL = 1.500"

DIA	LOC	Length	Bright	AlTiN
0.051	0.077	Stub	250-300560	250-300560B
	0.153	Regular	250-200560	250-200560B
0.052	0.078	Stub	250-300570	250-300570B
	0.156	Regular	250-200570	250-200570B
0.053	0.080	Stub	250-300580	250-300580B
	0.159	Regular	250-200580	250-200580B
0.054	0.081	Stub	250-300590	250-300590B
	0.162	Regular	250-200590	250-200590B
0.055	0.083	Stub	250-300600	250-300600B
	0.165	Regular	250-100210	250-100210B
0.056	0.084	Stub	250-300610	250-300610B
	0.168	Regular	250-200610	250-200610B
0.057	0.086	Stub	250-300620	250-300620B
	0.171	Regular	250-200620	250-200620B
0.058	0.087	Stub	250-300630	250-300630B
	0.174	Regular	250-200630	250-200630B
0.059	0.089	Stub	250-300640	250-300640B
	0.177	Regular	250-200640	250-200640B
0.060	0.090	Stub	250-300650	250-300650B
	0.180	Regular	250-100230	250-100230B
0.061	0.092	Stub	250-300660	250-300660B
	0.183	Regular	250-200660	250-200660B
0.062	0.093	Stub	250-300670	250-300670B
	0.186	Regular	250-200670	250-200670B
0.063	0.095	Stub	250-300680	250-300680B
	0.189	Regular	250-200680	250-200680B
0.064	0.096	Stub	250-300690	250-300690B
	0.192	Regular	250-200690	250-200690B
0.065	0.098	Stub	250-300700	250-300700B
	0.195	Regular	250-100250	250-100250B
0.070	0.105	Stub	250-300750	250-300750B
	0.210	Regular	250-100270	250-100270B
0.075	0.113	Stub	250-300800	250-300800B
	0.225	Regular	250-100290	250-100290B
0.080	0.120	Stub	250-300850	250-300850B
	0.240	Regular	250-100310	250-100310B
0.085	0.128	Stub	250-300900	250-300900B
	0.255	Regular	250-100330	250-100330B
0.090	0.135	Stub	250-300950	250-300950B
	0.270	Regular	250-100350	250-100350B
0.095	0.143	Stub	250-301000	250-301000B
	0.285	Regular	250-100370	250-100370B
0.100	0.150	Stub	250-301050	250-301050B
	0.300	Regular	250-100390	250-100390B
0.105	0.158	Stub	250-301100	250-301100B
	0.315	Regular	250-100401	250-100401B
0.110	0.165	Stub	250-301150	250-301150B
	0.330	Regular	250-100403	250-100403B
0.115	0.173	Stub	250-301200	250-301200B
	0.345	Regular	250-100406	250-100406B
0.120	0.180	Stub	250-301250	250-301250B
	0.360	Regular	250-100408	250-100408B