



**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			
<b>Steels</b> Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 Medium/High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P ≤ 28 Rc	400											
	P 28-38 Rc	300	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100		
<b>Tool &amp; Die Steels</b> A2, H13, L6, P20, S7	P 28-44 Rc	200											
<b>Stainless Steel</b> 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	400											
	M ≤ 28 Rc	200	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100		
	M > 28 Rc	150											
<b>Super Alloys</b> High Temp, Nimonic, Inconel, Monel, Hastelloy Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	S ≤ 42 Rc	70	0.00004	0.00008	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00080		
	S ≤ 42 Rc	150											
<b>Hardened Materials</b>	H 45-55 Rc	100	0.00010	0.00030	0.00050	0.00140	0.00180	0.00210	0.00300	0.00360	0.00420		
<b>Cast-Iron</b> Gray: SAE J431, ASTM A48 Ductile & Malleable, ASTM A536, ASTM 897, ASTM A47, ASTM A220, ASTM A602	K 160-200 HB	400											
	K 200-250 HB	250	0.00007	0.00015	0.00023	0.00027	0.00034	0.00040	0.00054	0.00081	0.00100		
<b>Non-Ferrous</b> 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		

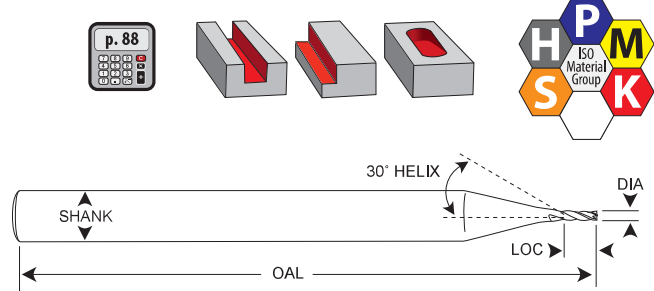
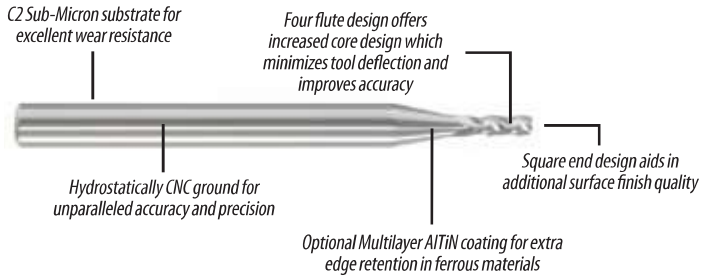
**SLOTTING** 

*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			
<b>Steels</b> Free Machining & Low Carbon: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 Medium/High Carbon Steels, Alloy Steels & Easy to Machine Tool: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	P ≤ 28 Rc	400											
	P 28-38 Rc	300	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005	0.0007	0.0010		
<b>Tool &amp; Die Steels</b> A2, H13, L6, P20, S7	P 28-44 Rc	200											
<b>Stainless Steel</b> 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	400											
	M ≤ 28 Rc	200	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0007	0.0009		
	M > 28 Rc	150											
<b>Super Alloys</b> High Temp, Nimonic, Inconel, Monel, Hastelloy Titanium: Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	S ≤ 42 Rc	70	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004	0.0005		
	S ≤ 42 Rc	150											
<b>Hardened Materials</b>	H 35-45 Rc	100	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0003	0.0004		
<b>Cast-Iron</b> Gray: SAE J431, ASTM A48 Ductile & Malleable, ASTM A536, ASTM 897, ASTM A47, ASTM A220, ASTM A602	K 160-200 HB	400											
	K 200-250 HB	250	0.0001	0.0001	0.0002	0.0002	0.0003	0.0003	0.0004	0.0007	0.0009		
<b>Non-Ferrous</b> 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		

# 4 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	250-305100	—
	0.015	Regular	250-100410	—
0.006	0.009	Stub	250-305110	—
	0.018	Regular	250-205110	—
0.007	0.011	Stub	250-305120	—
	0.021	Regular	250-205120	—
0.008	0.012	Stub	250-305130	—
	0.024	Regular	250-205130	—
0.009	0.014	Stub	250-305140	—
	0.027	Regular	250-205140	—
0.010	0.015	Stub	250-305150	250-305150B
	0.030	Regular	250-100430	250-100430B
0.011	0.017	Stub	250-305160	250-305160B
	0.033	Regular	250-205160	250-205160B
0.012	0.018	Stub	250-305170	250-305170B
	0.036	Regular	250-205170	250-205170B
0.013	0.020	Stub	250-305180	250-305180B
	0.039	Regular	250-205180	250-205180B
0.014	0.021	Stub	250-305190	250-305190B
	0.042	Regular	250-205190	250-205190B
0.015	0.023	Stub	250-305200	250-305200B
	0.045	Regular	250-100450	250-100450B
0.016	0.024	Stub	250-305210	250-305210B
	0.048	Regular	250-205210	250-205210B
0.017	0.026	Stub	250-305220	250-305220B
	0.051	Regular	250-205220	250-205220B
0.018	0.027	Stub	250-305230	250-305230B
	0.054	Regular	250-205230	250-205230B
0.019	0.029	Stub	250-305240	250-305240B
	0.057	Regular	250-205240	250-205240B
0.020	0.030	Stub	250-305250	250-305250B
	0.060	Regular	250-100470	250-100470B
0.021	0.032	Stub	250-305260	250-305260B
	0.063	Regular	250-205260	250-205260B
0.022	0.033	Stub	250-305270	250-305270B
	0.066	Regular	250-205270	250-205270B
0.023	0.035	Stub	250-305280	250-305280B
	0.069	Regular	250-205280	250-205280B

## 4 FLUTE - SQUARE CONTINUED

ALL SHANK DIAMETERS = 0.125"

ALL OAL = 1.500"

DIA	LOC	Length	Bright	AlTiN
0.024	0.036	Stub	250-305290	250-305290B
	0.072	Regular	250-205290	250-205290B
0.025	0.038	Stub	250-305300	250-305300B
	0.075	Regular	250-100490	250-100490B
0.026	0.039	Stub	250-305310	250-305310B
	0.078	Regular	250-205310	250-205310B
0.027	0.041	Stub	250-305320	250-305320B
	0.081	Regular	250-205320	250-205320B
0.028	0.042	Stub	250-305330	250-305330B
	0.084	Regular	250-205330	250-205330B
0.029	0.044	Stub	250-305340	250-305340B
	0.087	Regular	250-205340	250-205340B
0.030	0.045	Stub	250-305350	250-305350B
	0.090	Regular	250-100510	250-100510B
0.031	0.047	Stub	250-305360	250-305360B
	0.093	Regular	250-205360	250-205360B
0.032	0.048	Stub	250-305370	250-305370B
	0.096	Regular	250-205370	250-205370B
0.033	0.050	Stub	250-305380	250-305380B
	0.099	Regular	250-205380	250-205380B
0.034	0.051	Stub	250-305390	250-305390B
	0.102	Regular	250-205390	250-205390B
0.035	0.053	Stub	250-305400	250-305400B
	0.105	Regular	250-100530	250-100530B
0.036	0.054	Stub	250-305410	250-305410B
	0.108	Regular	250-205410	250-205410B
0.037	0.056	Stub	250-305420	250-305420B
	0.111	Regular	250-205420	250-205420B
0.038	0.057	Stub	250-305430	250-305430B
	0.114	Regular	250-205430	250-205430B
0.039	0.059	Stub	250-305440	250-305440B
	0.117	Regular	250-205440	250-205440B
0.040	0.060	Stub	250-305450	250-305450B
	0.120	Regular	250-100550	250-100550B
0.041	0.062	Stub	250-305460	250-305460B
	0.123	Regular	250-205460	250-205460B
0.042	0.063	Stub	250-305470	250-305470B
	0.126	Regular	250-205470	250-205470B
0.043	0.065	Stub	250-305480	250-305480B
	0.129	Regular	250-205480	250-205480B
0.044	0.066	Stub	250-305490	250-305490B
	0.132	Regular	250-205490	250-205490B
0.045	0.068	Stub	250-305500	250-305500B
	0.135	Regular	250-100570	250-100570B
0.046	0.069	Stub	250-305510	250-305510B
	0.138	Regular	250-205510	250-205510B
0.047	0.071	Stub	250-305520	250-305520B
	0.141	Regular	250-205520	250-205520B
0.048	0.072	Stub	250-305530	250-305530B
	0.144	Regular	250-205530	250-205530B

4 FLUTE - SQUARE CONTINUED

ALL SHANK DIAMETERS = 0.125"

ALL OAL = 1.500"

DIA	LOC	Length	Bright	AlTiN
0.049	0.074	Stub	250-305540	250-305540B
	0.147	Regular	250-205540	250-205540B
0.050	0.075	Stub	250-305550	250-305550B
	0.150	Regular	250-100590	250-100590B
0.051	0.077	Stub	250-305560	250-305560B
	0.153	Regular	250-205560	250-205560B
0.052	0.078	Stub	250-305570	250-305570B
	0.156	Regular	250-205570	250-205570B
0.053	0.080	Stub	250-305580	250-305580B
	0.159	Regular	250-205580	250-205580B
0.054	0.081	Stub	250-305590	250-305590B
	0.162	Regular	250-205590	250-205590B
0.055	0.083	Stub	250-305600	250-305600B
	0.165	Regular	250-100610	250-100610B
0.056	0.084	Stub	250-305610	250-305610B
	0.168	Regular	250-205610	250-205610B
0.057	0.086	Stub	250-305620	250-305620B
	0.171	Regular	250-205620	250-205620B
0.058	0.087	Stub	250-305630	250-305630B
	0.174	Regular	250-205630	250-205630B
0.059	0.089	Stub	250-305640	250-305640B
	0.177	Regular	250-205640	250-205640B
0.060	0.090	Stub	250-305650	250-305650B
	0.180	Regular	250-100630	250-100630B
0.061	0.092	Stub	250-305660	250-305660B
	0.183	Regular	250-205660	250-205660B
0.062	0.093	Stub	250-305670	250-305670B
	0.186	Regular	250-205670	250-205670B
0.063	0.095	Stub	250-305680	250-305680B
	0.189	Regular	250-205680	250-205680B
0.064	0.096	Stub	250-305690	250-305690B
	0.192	Regular	250-205690	250-205690B
0.065	0.098	Stub	250-305700	250-305700B
	0.195	Regular	250-100650	250-100650B
0.070	0.105	Stub	250-305750	250-305750B
	0.210	Regular	250-100670	250-100670B
0.075	0.113	Stub	250-305800	250-305800B
	0.225	Regular	250-100690	250-100690B
0.080	0.120	Stub	250-305850	250-305850B
	0.240	Regular	250-100710	250-100710B
0.085	0.128	Stub	250-305900	250-305900B
	0.255	Regular	250-100730	250-100730B
0.090	0.135	Stub	250-305950	250-305950B
	0.270	Regular	250-100750	250-100750B
0.095	0.143	Stub	250-306000	250-306000B
	0.285	Regular	250-100770	250-100770B

**MICRO DECIMAL ENDMILLS**

**4 FLUTE - SQUARE** CONTINUED

ALL SHANK DIAMETERS = 0.125"

ALL OAL = 1.500"

<b>DIA</b>	<b>LOC</b>	<b>Length</b>	<b>Bright</b>	<b>AlTiN</b>
0.100	0.150	Stub	250-306050	250-306050B
	0.300	Regular	250-100790	250-100790B
0.105	0.158	Stub	250-306100	250-306100B
	0.315	Regular	250-100801	250-100801B
0.110	0.165	Stub	250-306150	250-306150B
	0.330	Regular	250-100803	250-100803B
0.115	0.173	Stub	250-306200	250-306200B
	0.345	Regular	250-100805	250-100805B
0.120	0.180	Stub	250-306250	250-306250B
	0.360	Regular	250-100807	250-100807B