



Feeds & Speeds for Carbide

Recommendations For Surface Feet Per Minute & Feed Per Tooth*

"UNDER" 32 HRc Hard Grade Materials

MATERIAL	SFM	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
NON-FERROUS MATERIALS									
Aluminum Alloys: 2024-T4/T6, 2014, 6061-T6/T651, 7075-T6	800-2000	0.001	0.002	0.003	0.004	0.005	0.006	0.008	0.010
Magnesium: Die-Cast, Extruded	800-1500	0.001	0.0015	0.002	0.003	0.004	0.006	0.008	0.009
Copper: Yellow Brass, High Lead Brass, Red Brass	800-1000	0.001	0.0012	0.002	0.0025	0.003	0.004	0.004	0.005
Copper Alloys: Aluminum/Bronze, Low Silicon Bronze	800-1000	0.001	0.0012	0.002	0.0025	0.003	0.004	0.004	0.005
Plastics: Acrylics, Phenolics, Polysulfone, G10, G11	200-500	0.001	0.002	0.003	0.004	0.006	0.008	0.010	0.012
Carbon, Graphites: Carbon, Graphites	200-500	0.002	0.003	0.004	0.006	0.008	0.009	0.010	0.012
STAINLESS STEELS									
Precipitation: 13/8, 15/5, AM-350/355	80-250	0.0003	0.0005	0.001	0.001	0.002	0.003	0.004	0.005
Austenitic: 200 Series, 302, 303, 304L, 316L	100-350	0.0002	0.0003	0.0005	0.001	0.002	0.0025	0.0035	0.0045
Martensitic: 403, 410, 416	80-250	0.0002	0.0003	0.0005	0.001	0.0015	0.0025	0.003	0.004
HIGH TEMP. ALLOYS									
Cobalt Base: Stellite, HS-21, Haynes 25/188, X-40, L-605	50-90	0.0003	0.0004	0.0006	0.0008	0.0012	0.0015	0.002	0.0025
Nickel Base: Inconel 600/625, Nichel 200-270, Invar, Monel 400-405, K-Monel, PermaNechel 300, Incoly 600-800, Mar-M-246/247	50-95	0.0004	0.0005	0.0008	0.001	0.002	0.0025	0.003	0.004
Iron Base: N-155, Timken 16-26-6, Incoloy 800-802, Multimet	70-125	0.0004	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.004
STEELS									
High Strength Steels: 4140, 4340, 6150, 52100, H11, H13	100-160	0.0004	0.0006	0.001	0.0015	0.002	0.0025	0.003	0.004
High Alloy Steels-Mold & Die: A-2/6/10, p20, 01, 02, 06	100-160	0.0004	0.0006	0.001	0.0015	0.0015	0.0025	0.003	0.004
Medium Alloy Steels: 200, 250, 300	100-350	0.0005	0.0005	0.001	0.002	0.0025	0.0035	0.004	0.005
Low Alloy Steels-Maraging: 10XX, 11XX, 13XX	100-350	0.0005	0.0007	0.0012	0.002	0.003	0.004	0.005	0.006
CAST IRONS									
Ductile Iron: Ductile Cast Iron	120-350	0.0005	0.008	0.0015	0.002	0.0022	0.003	0.004	0.006
Cast Iron: Gray Cast Iron	120-300	0.0005	0.001	0.002	0.003	0.004	0.005	0.006	0.008
TITANIUM									
Titanium Alloys: Commercially Pure, 6AL-4V, ASTM 1/2/3, 6AL-25N-4Zr-2Mo-Si	100-250	0.0003	0.0004	0.0005	0.001	0.0015	0.0025	0.003	0.004

* These are base-line recommendations. Adjust feed and speeds according to individual circumstances.

$$\text{RPM} = \text{SFM} \times 3.82 / \text{Tool Diameter} \quad \text{Feed (in IPM's)} = \text{RPM} \times \text{FPT} \times \# \text{ of Flutes}$$

Recommendations For Surface Feet Per Minute & Feed Per Tooth*

"OVER" 32 HRC Hard Grade Materials

MATERIAL	SFM	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
NON-FERROUS MATERIALS									
Aluminum Alloys: 440, 356, 380, C6130	500-1000	0.001	0.0015	0.002	0.003	0.004	0.005	0.006	0.008
Copper: Naval Brass, High Silicon Bronze, A17, C-17200	800-1000	0.001	0.0015	0.002	0.0025	0.003	0.004	0.0045	0.005
Copper Alloys: Nickel, Silver, Beryllium Copper, Oxygen-Free Copper	800-1000	0.001	0.0015	0.002	0.0025	0.003	0.004	0.004	0.005
Plastics: Polycarbonate	200-500	0.001	0.002	0.003	0.004	0.006	0.008	0.010	0.012
STAINLESS STEELS									
Precipitation: 17/4, 17/7, AF-17, Custom 450/635, 15/7Mo	90-125	0.0003	0.0005	0.001	0.001	0.002	0.003	0.004	0.005
Austenitic: 304, 310, 314, 316, 321, 330, 347, 348	90-150	0.0002	0.0003	0.0005	0.001	0.002	0.0025	0.0035	0.004
Martensitic: 420, 430F, 440C, 446	90-170	0.0002	0.0003	0.0005	0.001	0.0015	0.0025	0.0025	0.004
HIGH TEMP. ALLOYS									
Cobalt Base: Air-Resist 13/213/215, Haynes 21/36, Howmet 3, Hs 6/51, Nasa Co-W-Re, Mar-M-302, MP-159	50-80	0.0003	0.0004	0.0006	0.0008	0.0012	0.0015	0.002	0.0025
Nickel Base: Hastelloy-C/B/G/X, Inconel 718, Waspaloy, M252, Rene 41-95, Nimonic 75-80, Astroloy, Udimet 500-700	50-80	0.0004	0.0005	0.0008	0.001	0.002	0.0025	0.003	0.004
Iron Base: A286, Haynes 556, Discoloy, V-57	70-110	0.0004	0.0005	0.001	0.0015	0.002	0.0025	0.003	0.004
STEELS									
High Strength Steels: 4140, 4340M, EDT-150, HP9-430, 11-10, 300M, D6Ac, H11, H13, Armor Plate	80-140	0.0004	0.0006	0.001	0.0015	0.0015	0.0025	0.003	0.004
High Alloy Steels-Mold & Die: Hy-Tugg, Stressproof, Armor Plate	80-140	0.0004	0.0006	0.001	0.0015	0.0015	0.0025	0.003	0.004
Medium Alloy Steels: 200, 250, 300	80-140	0.0005	0.0005	0.001	0.002	0.0025	0.0035	0.004	0.005
Low Alloy Steels-Maraging: 23XX, 31XX	100-120	0.0005	0.0007	0.0012	0.002	0.003	0.004	0.005	0.006
CAST IRONS									
Ductile Iron: Ductile Cast Iron	80-140	0.0005	0.008	0.0015	0.002	0.0022	0.003	0.004	0.006
Cast Iron: Malleable, Chilled	80-140	0.0005	0.001	0.002	0.003	0.004	0.005	0.006	0.008
TITANIUM									
Titanium Alloys: 5Al-2.5-Sn-Eli 8AlMo-1V	80-180	0.0003	0.0004	0.0005	0.001	0.0015	0.0025	0.003	0.004

* These are base-line recommendations. Adjust feed and speeds according to individual circumstances.

$$\text{RPM} = \text{SFM} \times 3.82 / \text{Tool Diameter} \quad \text{Feed (in IPM's)} = \text{RPM} \times \text{FPT} \times \# \text{ of Flutes}$$