



General Purpose End Mills - Carbide

| Material Guide | | HRc | SFM | | | | Suggested Chip Load Per Tooth | | | | |
|---------------------------------|-------------------------------------------------------------------|---------------------|---------------------|------------------------|------------------------|------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | | | 2 Flute | | 3 & 4 Flute | | 1/32" - 1/8" | 1/8" - 1/4" | 1/4" - 1/2" | 1/2" - 1" | 1" - 1 1/4" |
| | | | 30° Helix Stub, Std | 30° Helix Long, X-Long | 30° Helix Stub, Std | 30° Helix Long, X-Long | | | | | |
| COBALT BASE ALLOYS | Stellite, HS-21, Haynes 25/188, X-40, L-605 | under 32 over 32 | | | 175 - 225 125 - 175 | 140 - 180 100 - 140 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| NICKEL BASE ALLOYS | Inconel-625/718, Waspalloy, Rene, Hastelloy | under 32 over 32 | | | 125 - 175 70 - 115 | 100 - 140 55 - 95 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| IRON BASE ALLOYS | Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpeneter 22-b3 | under 32 over 32 | | | 175 - 225 125 - 175 | 140 - 180 100 - 140 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| MONEL | Monel-65% Nickel | | 175 - 300 | 125 - 175 | 175 - 300 | 140 - 240 | .0007 - .0015 | .0010 - .0025 | .0015 - .0040 | .0030 - .0050 | .0040 - .0060 |
| TITANIUM ALLOYS | Commercially Pure, 6AL-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si | | 200 - 300 | 125 - 250 | 200 - 300 | 160 - 240 | .0007 - .0015 | .0010 - .0025 | .0015 - .0040 | .0030 - .0050 | .0040 - .0060 |
| STAINLESS STEEL (PRECIPITATION) | 13/8, 15/5, 17-4 | under 32 over 32 | | | 150 - 250 125 - 175 | 120 - 200 100 - 140 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| STAINLESS STEEL (AUSTENITIC) | 200 Series, 302, 303, 304, 304L, 316, 316L | under 32 over 32 | | | 200 - 250 150 - 200 | 160 - 200 120 - 160 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| STAINLESS STEEL (MARTENSITIC) | 403, 410, 416, 440 | under 32 over 32 | | | 150 - 250 125 - 175 | 120 - 200 100 - 140 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| HIGH STRENGTH TOOL STEELS | 4140, 4340, 6150, 5210, A2, D2 P20, H11, H13, S2, 01 | under 32 over 32 | | | 150 - 225 60 - 125 | 120 - 180 50 - 100 | .0005 - .0010 .0003 - .0005 | .0008 - .0020 .0005 - .0015 | .0010 - .0030 .0010 - .0020 | .0020 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 |
| MEDIUM ALLOY STEELS | 200, 250, 300 | under 32 over 32 | | | 200 - 250 125 - 175 | 160 - 200 100 - 140 | .0007 - .0015 .0005 - .0010 | .0010 - .0025 .0008 - .0020 | .0015 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 | .0040 - .0060 .0030 - .0050 |
| CARBON STEELS | 1000's, 1100's, 1300's | under 32 over 32 | | | 200 - 250 125 - 175 | 160 - 200 100 - 140 | .0007 - .0015 .0005 - .0010 | .0010 - .0025 .0008 - .0020 | .0015 - .0040 .0010 - .0030 | .0030 - .0050 .0020 - .0040 | .0040 - .0060 .0030 - .0050 |
| DUCTILE | Ductile Cast Irons | | 200 - 300 | 125 - 200 | 200 - 300 | 160 - 240 | .0010 - .0020 | .0015 - .0040 | .0020 - .0060 | .0030 - .0100 | .0030 - .0080 |
| CAST IRONS | Gray Cast Irons | | 225 - 325 | 175 - 250 | 250 - 350 | 200 - 280 | .0010 - .0020 | .0015 - .0040 | .0020 - .0060 | .0030 - .0100 | .0050 - .0100 |
| ALUMINUM | 2014, 2024, 6061-(T1-T6), 7075, Die Cast, Extruded | | 300 - 500 | 300 - 500 | 300 - 500 | 240 - 400 | .0010 - .0020 | .0015 - .0040 | .0020 - .0060 | .0030 - .0100 | .0030 - .0150 |
| MAGNESIUM | | | 300 - 500 | 300 - 500 | 300 - 500 | 240 - 400 | .0010 - .0020 | .0015 - .0040 | .0020 - .0060 | .0030 - .0100 | .0050 - .0100 |
| COPPER, COPPER ALLOYS | | | 400 - 500 | 250 - 350 | 300 - 400 | 240 - 320 | .0007 - .0015 | .0010 - .0025 | .0015 - .0035 | .0020 - .0080 | .0040 - .0100 |
| BRASS, BRONZE | Brass, Alum/Bronze, Low Silicon Bronze | | 300 - 400 | 200 - 300 | 250 - 350 | 200 - 280 | .0007 - .0015 | .0010 - .0025 | .0015 - .0035 | .0020 - .0080 | .0040 - .0100 |
| COMPOSITES | G-10 Fiberglass, Graphite, Graphite/Epoxy, Plastics | | 250 - 1000 | 250 - 1000 | 250 - 1000 | 200 - 800 | .0010 - .0020 | .0015 - .0040 | .0020 - .0060 | .0030 - .0100 | .0050 - .0100 |