# MVH - VARIABLE HELIX END MILLS
## Speed and Feed Data

| Material | SFM | Chip Load per Tooth | | | |
|---|---|---|---|---|---|
| | | 1/8" | 1/4" | 1/2" | 1" |
| Aluminum Alloys | 1200 | .0010 | .0020 | .0040 | .0080 |
| Carbon Steel | 300-600 | .0010 | .0015 | .0030 | .0060 |
| Cast Iron | 350-550 | .0010 | .0015 | .0030 | .0060 |
| Copper Alloys | 500-900 | .0010 | .0020 | .0030 | .0060 |
| Steel - Annealed | 350-500 | .0010 | .0020 | .0030 | .0050 |
| Steel - Rc 18-24 | 150-500 | .0004 | .0008 | .0015 | .0045 |
| Steel - Rc 25-37 | 125-200 | .0003 | .0005 | .0010 | .0030 |
| Stainless Steel - Free Machining | 250-400 | .0005 | .0010 | .0020 | .0030 |
| Stainless Steel - Other | 150-300 | .0005 | .0010 | .0020 | .0030 |
| Inconel/Monel | 60-100 | .0005 | .0010 | .0015 | .0030 |
| Titanium | 175-300 | .0005 | .0008 | .0015 | .0030 |

All speeds and feeds are suggested starting points. They may be increased or decreased depending on machine condition, depth of cut, finish required, coolant, etc.

# ROUGHING END MILLS
## Speed and Feed Data

| Material | SFM | Chip Load per Tooth | | | |
|---|---|---|---|---|---|
| | | 1/8" | 1/4" | 1/2" | 1" |
| Aluminum Alloys | 125-250 | .0010 | .0020 | .0025 | .0030 |
| Magnesium | 125-250 | .0010 | .0020 | .0025 | .0030 |
| Copper | 75-100 | .0008 | .0015 | .0030 | .0060 |
| Brass | 85-110 | .0008 | .0015 | .0030 | .0060 |
| Bronze | 75-100 | .0008 | .0015 | .0030 | .0060 |
| Cast Iron | 100-125 | .0008 | .0015 | .0025 | .0050 |
| Cast Steel | 75-100 | .0008 | .0015 | .0025 | .0050 |
| Malleable Iron | 80-120 | .0008 | .0015 | .0025 | .0050 |
| Stainless Steel | | | | | |
|   Free Machining | 75-90 | .0005 | .0007 | .0012 | .0020 |
|   Other | 50-75 | .0005 | .0007 | .0012 | .0020 |
| Steel | | | | | |
|   Annealed | 100-125 | .0010 | .0020 | .0040 | .0060 |
|   Rc 18-24 | 75-100 | .0070 | .0012 | .0030 | .0050 |
|   Rc 25-37 | 40-75 | .0005 | .0010 | .0020 | .0040 |
| Titanium | | | | | |
|   Up to Rc 30 | 40-75 | .0005 | .0012 | .0025 | .0050 |
|   Rc 30+ | 20-25 | .0005 | .0010 | .0020 | .0035 |
| High Temp Alloys | | | | | |
|   Austenitic | 12-20 | * | .0007 | .0015 | .0030 |
|   Ferritic | 50-75 | .0004 | .0007 | .0020 | .0050 |
|   Nickel Base | 20-25 | .0004 | .0007 | .0015 | .0030 |
|   Cobalt Base | 8-15 | * | .0007 | .0015 | .0030 |

### LIST OF SYMBOLS

F = NUMBER OF FLUTES
D = DIAMETER OF CUTTER
R.P.M. = REVOLUTIONS PER MINUTE
S.F.M. = SURFACE FEET PER MINUTE
I.P.M. = FEED RATE: INCHES PER MINUTE
I.P.R. = FEED RATE: INCHES PER REVOLUTION

### MACHINING FORMULAS

$$S.F.M. = 0.262 \times D \times R.P.M.$$

$$R.P.M. = \frac{3.82 \times S.F.M.}{D}$$

$$I.P.R. = \frac{I.P.M.}{R.P.M.} \quad \text{or} \quad CHIP\ LOAD \times F$$

$$I.P.M. = R.P.M. \times I.P.R.$$

$$CHIP\ LOAD = \frac{I.P.M.}{R.P.M. \times F} \quad \text{or} \quad \frac{I.P.R.}{F}$$