# SPEEDS \& FEEDS 

High Feed End Mills

| 팓/ 파C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Material Guide |  | Hardness | SFM | Inches Per Tooth (IPT) |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 1/8 |  | 3/16 |  | 1/4 |  | 3/8 |  | 1/2 |  | 5/8 |  | 3/4 |  |
|  |  | Slot |  | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh |
| CARBON STEEL | 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 |  | $\begin{array}{\|c} \hline<75 \text { HRB } \\ 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \\ \hline \end{array}$ | $\begin{aligned} & 800 \\ & 750 \\ & 700 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0020 \\ & .0013 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0057 \\ & .0037 \\ & .0025 \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0030 \\ & .0020 \end{aligned}$ | $\begin{aligned} & .0085 \\ & .0055 \\ & .0038 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0040 \\ & .0027 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0113 \\ & .0073 \\ & .0050 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0060 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0110 \\ & .0075 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0080 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0187 \\ .0147 \\ .0100 \end{array}$ | $\begin{aligned} & .0134 \\ & .0100 \\ & .0066 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline .0234 \\ .0184 \\ .0125 \\ \hline \end{array}$ | $\begin{aligned} & .0161 \\ & .0120 \\ & .0079 \end{aligned}$ | $\begin{aligned} & \hline .0281 \\ & .0221 \\ & .0150 \\ & \hline \end{aligned}$ |
| $\begin{aligned} & \text { LOW ALLOY } \\ & \text { STEEL } \end{aligned}$ | $\begin{aligned} & \text { 13XX, 41XX, 43XX, 51XX, } \\ & \text { 86XX, 93XX } \end{aligned}$ |  | $\begin{gathered} 75-98 \text { HRB } \\ 21-36 \text { HRC } \\ 36-50 \text { HRC } \\ >50 \text { HRC } \end{gathered}$ | $\begin{aligned} & \hline 600 \\ & 550 \\ & 400 \\ & 350 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0020 \\ & .0013 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0057 \\ & .0047 \\ & .0033 \\ & .0020 \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0030 \\ & .0020 \end{aligned}$ | $\begin{aligned} & \hline .0085 \\ & .0070 \\ & .0050 \\ & .0030 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & .0040 \\ & .0027 \end{aligned}$ | $\begin{aligned} & .0113 \\ & .0093 \\ & .0067 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0060 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0140 \\ & .0100 \\ & .0060 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0080 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0187 \\ & .0133 \\ & .0080 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0134 \\ & .0134 \\ & .0100 \\ & .0066 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0234 \\ & .0234 \\ & .0166 \\ & .0100 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0120 \\ & .0079 \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0281 \\ & .0199 \\ & .0120 \\ & \hline \end{aligned}$ |
| TOOL STEEL | A2, H13, L6, P20, S7 | $\begin{gathered} \hline 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \\ 36-50 \mathrm{HRC} \\ >50 \mathrm{HRC} \\ \hline \end{gathered}$ | $\begin{aligned} & \hline 550 \\ & 500 \\ & 450 \\ & 400 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0020 \\ & .0013 \end{aligned}$ | $\begin{aligned} & .0057 \\ & .0047 \\ & .0033 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0030 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0085 \\ & .0070 \\ & .0050 \\ & .0030 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & .0040 \\ & .0027 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0113 \\ & .0093 \\ & .0067 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0060 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0140 \\ & .0100 \\ & .0060 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0080 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0187 \\ & .0133 \\ & .0080 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \\ & .0100 \\ & .0066 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0234 \\ & .0234 \\ & .0166 \\ & .0100 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0120 \\ & .0079 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0281 \\ & .0199 \\ & .0120 \\ & \hline \end{aligned}$ |
| SPECIALTY STEEL | 300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350 | $<75$ HRB $75-98$ HRB $21-36$ HRC $36-50$ HRC $>50$ HRC | $\begin{aligned} & 450 \\ & 500 \\ & 450 \\ & 400 \\ & 350 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0027 \\ & .0020 \\ & .0013 \end{aligned}$ | $\begin{aligned} & .0067 \\ & .0060 \\ & .0047 \\ & .0033 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0040 \\ & .0030 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0100 \\ & .0090 \\ & .0070 \\ & .0050 \\ & .0030 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & .0053 \\ & .0040 \\ & .0027 \end{aligned}$ | $\begin{aligned} & .0133 \\ & .0120 \\ & .0093 \\ & .0067 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0080 \\ & .0060 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0140 \\ & .0140 \\ & .0100 \\ & .0060 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0107 \\ & .0080 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0187 \\ & .0187 \\ & .0133 \\ & .0080 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \\ & .0134 \\ & .0100 \\ & .0066 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0234 \\ & .0234 \\ & .0234 \\ & .0166 \\ & .0100 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0161 \\ & .0120 \\ & .0079 \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0281 \\ & .0281 \\ & .0199 \\ & .0120 \\ & \hline \end{aligned}$ |
| AUSTENITIC STAINLESS STEEL | Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347 | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & \hline 500 \\ & 450 \\ & 400 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0022 \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0047 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0033 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0070 \\ & .0060 \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & .0043 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0093 \\ & .0080 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0065 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0140 \\ & .0120 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0087 \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0187 \\ & .0160 \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \\ & .0109 \end{aligned}$ | $\begin{aligned} & .0234 \\ & .0234 \\ & .0200 \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0131 \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0281 \\ & .0240 \end{aligned}$ |
| MARTENSITIC \& FERRITIC STAINLESS STEEL | $\begin{aligned} & 403,410,416,420,440, \\ & 430,446 \end{aligned}$ | $\begin{array}{\|l\|l\|} 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \end{array}$ | $\begin{aligned} & 750 \\ & 650 \end{aligned}$ | $\begin{aligned} & .0025 \\ & .0027 \end{aligned}$ | .0037 .0053 | .0038 .0040 | .0055 .0080 | .0050 .0053 | .0073 .0107 | .0075 .0080 | .0110 .0140 | .0100 .0107 | .0147 .0187 | $\begin{aligned} & .0125 \\ & .0134 \end{aligned}$ | .0184 .0234 | .0150 .0161 | .0221 .0281 |
| PH STAINLESS STEEL | 15-5, 17-4, Carpenter 450, Carpenter 465 | $\begin{array}{\|l\|} 21-36 \mathrm{HRC} \\ 36-50 \mathrm{HRC} \end{array}$ | $\begin{aligned} & 450 \\ & 400 \end{aligned}$ | $\begin{aligned} & .0025 \\ & .0020 \end{aligned}$ | $\begin{aligned} & .0037 \\ & .0033 \end{aligned}$ | $\begin{aligned} & .0038 \\ & .0030 \end{aligned}$ | $0055$ | $\begin{aligned} & .0050 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0073 \\ & .0067 \end{aligned}$ | $\begin{aligned} & .0075 \\ & .0060 \end{aligned}$ | $\begin{aligned} & .0110 \\ & .0100 \end{aligned}$ | .0100 .0080 |  | $\begin{aligned} & .0125 \\ & .0100 \end{aligned}$ | $\begin{aligned} & .0184 \\ & .0166 \end{aligned}$ |  | $\begin{aligned} & .0221 \\ & .0199 \end{aligned}$ |
| GRAY CAST IRON | SAE J431, ASTM A48 | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \end{aligned}$ | $\begin{aligned} & \hline 600 \\ & 550 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \end{aligned}$ | $\begin{aligned} & .0083 \\ & .0063 \end{aligned}$ | $\begin{aligned} & \hline .0040 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0125 \\ & .0095 \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0127 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0140 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0187 \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \end{aligned}$ | $\begin{aligned} & .0234 \\ & .0234 \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0281 \end{aligned}$ |
| MALLEABLE CAST IRON | ASTM A47, ASTM A220, ASTM A602 | $\begin{array}{\|l\|} \hline 75-98 \text { HRB } \\ 21-36 \text { HRC } \\ \hline \end{array}$ | $\begin{aligned} & 550 \\ & 450 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0056 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0040 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0084 \\ & .0060 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0111 \\ & .0080 \end{aligned}$ | $\begin{array}{r} .0080 \\ .0080 \\ \hline \end{array}$ | $\begin{array}{r} .0140 \\ .0120 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0107 \\ & .0107 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0160 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0134 \\ .0134 \\ \hline \end{array}$ | $\begin{aligned} & .0234 \\ & .0200 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0161 \\ .0161 \\ \hline \end{array}$ | $\begin{aligned} & .0281 \\ & .0240 \\ & \hline \end{aligned}$ |
| NODULAR (DUCTILE) CAST IRON | ASTM A536, ASTM 897 | $\begin{array}{\|l\|} \hline 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \\ 36-50 \mathrm{HRC} \\ \hline \end{array}$ | $\begin{aligned} & \hline 500 \\ & 450 \\ & 400 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0013 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0056 \\ & .0040 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{array}{r} \hline .0084 \\ .0060 \\ .0030 \\ \hline \end{array}$ | $\begin{array}{r} .0053 \\ .0053 \\ .0027 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0111 \\ & .0080 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0120 \\ & .0060 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0187 \\ .0160 \\ .0080 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0134 \\ & .0134 \\ & .0066 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0234 \\ & .0200 \\ & .0100 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0079 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0240 \\ & .0120 \\ & \hline \end{aligned}$ |
| $\begin{aligned} & \text { PURE } \\ & \text { NICKEL } \end{aligned}$ | Nickel 200, Nickel 201 | $\begin{gathered} <75 \mathrm{HRB} \\ 75-98 \mathrm{HRB} \end{gathered}$ | $\begin{aligned} & \hline 600 \\ & 550 \end{aligned}$ | $\begin{aligned} & \hline .0027 \\ & .0027 \end{aligned}$ | $\begin{aligned} & .0047 \\ & .0043 \end{aligned}$ | $\begin{aligned} & \hline .0040 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0070 \\ & .0065 \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \end{aligned}$ | $\begin{aligned} & .0094 \\ & .0087 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \end{aligned}$ | $\begin{aligned} & \hline .0140 \\ & .0130 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0172 \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \end{aligned}$ | $\begin{aligned} & \hline .0234 \\ & .0214 \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0256 \end{aligned}$ |
| NICKEL <br> ALLOY | Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20 | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & 200 \\ & 180 \\ & 150 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0022 \end{aligned}$ | $\begin{aligned} & .0038 \\ & .0033 \\ & .0028 \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0033 \end{aligned}$ | $\begin{aligned} & .0056 \\ & .0049 \\ & .0042 \end{aligned}$ | $\begin{aligned} & .0053 \\ & .0053 \\ & .0043 \end{aligned}$ | $\begin{aligned} & .0075 \\ & .0066 \\ & .0056 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0065 \end{aligned}$ | $\begin{aligned} & .0113 \\ & .0098 \\ & .0084 \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0087 \end{aligned}$ | $\begin{aligned} & .0150 \\ & .0130 \\ & .0112 \end{aligned}$ | $\begin{aligned} & .0134 \\ & .0134 \\ & .0109 \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0162 \\ & .0140 \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0131 \end{aligned}$ | $\begin{aligned} & .0224 \\ & .0194 \\ & .0168 \end{aligned}$ |
| $\begin{gathered} \text { PURE } \\ \text { TITANIUM } \end{gathered}$ | Ti Grade 1, Ti Grade 2, <br> Ti Grade 3, Ti Grade 4, <br> Ti Grade 7, Ti Grade 12 | < 75 HRB $75-98$ HRB $21-36$ HRC | $\begin{aligned} & \hline 350 \\ & 400 \\ & 325 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0027 \\ & .0027 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0047 \\ & .0042 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0040 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0070 \\ & .0063 \\ & .0060 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0053 \\ & .0053 \\ & .0053 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0094 \\ & .0084 \\ & .0080 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0080 \\ & .0080 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0140 \\ & .0127 \\ & .0120 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0107 \\ & .0107 \\ & .0107 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0187 \\ & .0168 \\ & .0158 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0134 \\ .0134 \\ .0134 \\ \hline \end{array}$ | $\begin{aligned} & .0234 \\ & .0209 \\ & .0196 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0161 \\ & .0161 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0281 \\ & .0250 \\ & .0234 \\ & \hline \end{aligned}$ |
| $\underset{\substack{\text { TITANIUM } \\ \text { ALLOY }}}{ }$ | $\begin{aligned} & \text { Ti 3AI-2.5V, Ti 6AI-4V, } \\ & \text { Ti 10V-2Fe-3AI } \end{aligned}$ | $\begin{array}{\|l\|} \hline 21-36 \text { HRC } \\ 36-50 \text { HRC } \\ \hline \end{array}$ | $\begin{aligned} & 300 \\ & 250 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0025 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0033 \\ .0023 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0040 \\ & .0038 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0049 \\ .0035 \\ \hline \end{array}$ | $\begin{aligned} & .0053 \\ & .0050 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0066 \\ & .0047 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0075 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0098 \\ & .0070 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0107 \\ .0100 \\ \hline \end{array}$ | $\begin{array}{r} .0130 \\ .0093 \\ \hline \end{array}$ | $\begin{array}{r} .0134 \\ .0125 \\ \hline \end{array}$ | $\begin{aligned} & .0162 \\ & .0116 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0161 \\ & .0150 \\ & \hline \end{aligned}$ | $\begin{array}{r} .0194 \\ .0139 \\ \hline \end{array}$ |
| COBALT ALLOY | ASTM F562, ASTM F90, ASTM F75, ASTM F799 | $\begin{aligned} & \hline 75-98 \mathrm{HRB} \\ & 21-36 \mathrm{HRC} \\ & 36-50 \mathrm{HRC} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 225 \\ & 150 \\ & 90 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0020 \\ & .0027 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0023 \\ & .0035 \\ & .0023 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0030 \\ & .0040 \\ & .0030 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0035 \\ & .0053 \\ & .0035 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0040 \\ & .0053 \\ & .0040 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0047 \\ & .0070 \\ & .0047 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0060 \\ & .0080 \\ & .0060 \end{aligned}$ | $\begin{aligned} & .0070 \\ & .0105 \\ & .0070 \end{aligned}$ | $\begin{aligned} & .0080 \\ & .0107 \\ & .0080 \\ & \hline \end{aligned}$ | .0093 .0140 .0093 | $\begin{aligned} & .0100 \\ & .0134 \\ & .0100 \end{aligned}$ | $\begin{aligned} & .0116 \\ & .0175 \\ & .0116 \end{aligned}$ | $\begin{aligned} & .0120 \\ & .0161 \\ & .0120 \end{aligned}$ | $\begin{aligned} & .0139 \\ & .0210 \\ & .0139 \\ & \hline \end{aligned}$ |


| Milling Process | Hardness | ADOC | RDOC |
| ---: | :---: | :---: | :---: |
| Slot (Full Slotting) | $<35$ HRC | $3.00 \%-5.00 \%$ Diameter | $100 \%$ Diameter |
|  | $\geq 35$ HRC | $2.50 \%-4.00 \%$ Diameter | $100 \%$ Diameter |
| Rgh (Traditional | $<35$ HRC | $3.00 \%-5.00 \%$ Diameter | Up to 65\% Diameter |
| Roughing) | $\geq 35$ HRC | $2.75 \%-4.25 \%$ Diameter | Up to 65\% Diameter |

## NOTES:

IPT values shown are for $3 \times D$ reach tools, and should be adjusted for longer or shorter reaches. For tools with reaches greater than 3xD, IPT should be reduced.


Roughing


ADOC
RDOC

Please note for slotting applications, axial engagement will increase while axial stepdown (ADOC) remains the same.

