## 4 Flute - Corner Radius - Coolant Through - Variable Pitch

| HEVC-4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Material Guide |  | Hardness | SFM | Inches per Tooth (IPT) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 1/8 |  | 3/16 |  |  | 1/4 |  |  | 3/8 |  |  | 1/2 |  |  | 3/4 |  |  | 1 |  |  |
|  |  | Slot |  | Rgh | Fin | Slot | Rgh | Fin | Slot | Rgh | Fin | Slot | Rgh | Fin | Slot | Rgh | Fin | Slot | Rgh | Fin | Slot | Rgh | Fin |
| Carbon Steel | 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 |  | $\begin{array}{\|r\|} \hline<75 \mathrm{HRB} \\ 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \end{array}$ | $\begin{aligned} & 455 \\ & 445 \\ & 400 \end{aligned}$ | $\begin{aligned} & .0007 \\ & .0005 \\ & .0003 \end{aligned}$ | $\begin{array}{\|l} \hline .0013 \\ .0009 \\ .0006 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0017 \\ .0014 \\ .0012 \end{array}$ | $\begin{array}{\|l} \hline .0011 \\ .0008 \\ .0005 \end{array}$ | $\begin{aligned} & \hline .0019 \\ & .0014 \\ & .0009 \end{aligned}$ | $\begin{array}{\|l\|} \hline .0019 \\ .0016 \\ .0013 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0014 \\ & .0010 \\ & .0007 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0025 \\ .0018 \\ .0012 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0022 \\ .0018 \\ .0015 \end{array}$ | $\begin{aligned} & \hline .0021 \\ & .0016 \\ & .0010 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0037 \\ .0027 \\ .0018 \end{array}$ | $\begin{aligned} & \hline .0025 \\ & .0021 \\ & .0017 \end{aligned}$ | $\begin{array}{\|l} \hline .0028 \\ .0020 \\ .0013 \\ \hline \end{array}$ | $\begin{aligned} & .0049 \\ & .0036 \\ & .0023 \end{aligned}$ | $\begin{aligned} & \hline .0029 \\ & .0025 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0040 \\ .0029 \\ .0019 \end{array}$ | $\begin{array}{\|l} \hline .0070 \\ .0051 \\ .0033 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0034 \\ .0029 \\ .0024 \\ \hline \end{array}$ | $\begin{aligned} & .0050 \\ & .0037 \\ & .0024 \end{aligned}$ | $\begin{array}{\|l} \hline .0089 \\ .0065 \\ .0042 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0042 \\ .0036 \\ .0029 \end{array}$ |
| Low Alloy Steel | $\begin{aligned} & \text { 13XX, 41XX, 43XX, } \\ & \text { 51XX, 86XX, 93XX } \end{aligned}$ |  | $\begin{array}{r} \hline 75-98 \text { HRB } \\ 21-36 \text { HRC } \\ 36-50 \text { HRC } \\ >50 \text { HRC } \end{array}$ | $\begin{aligned} & \hline 390 \\ & 340 \\ & 260 \\ & 155 \end{aligned}$ | $\begin{aligned} & .0005 \\ & .0003 \\ & .0003 \\ & .0002 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0008 \\ .0006 \\ .0005 \\ .0004 \end{array}$ | $\begin{array}{\|l\|} \hline .0014 \\ .0012 \\ .0011 \\ .0010 \\ \hline \end{array}$ | $\begin{aligned} & .0007 \\ & .0005 \\ & .0005 \\ & .0004 \end{aligned}$ | $\begin{aligned} & \hline .0012 \\ & .0009 \\ & .0008 \\ & .0006 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0015 \\ .0013 \\ .0012 \\ .0011 \end{array}$ | $\begin{aligned} & .0009 \\ & .0007 \\ & .0006 \\ & .0005 \end{aligned}$ | .0016 <br> .0012 <br> .0010 <br> .0008 | $\begin{array}{\|l\|} \hline .0017 \\ .0015 \\ .0014 \\ .0012 \end{array}$ | $\begin{aligned} & .0013 \\ & .0010 \\ & .0009 \\ & .0007 \end{aligned}$ | . 0024 <br> . 0018 <br> .0015 <br> .0012 | $\begin{array}{\|l\|} \hline .0020 \\ .0017 \\ .0016 \\ .0014 \\ \hline \end{array}$ | .0017 <br> .0013 <br> .0011 <br> .0009 | $\begin{aligned} & \hline .0031 \\ & .0023 \\ & .0020 \\ & .0016 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0023 \\ & .0020 \\ & .0019 \\ & .0017 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0025 \\ .0019 \\ .0016 \\ .0013 \\ \hline \end{array}$ | $\begin{aligned} & .0044 \\ & .0033 \\ & .0029 \\ & .0023 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0024 \\ & .0022 \\ & .0020 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0032 \\ & .0024 \\ & .0021 \\ & .0016 \end{aligned}$ | $\begin{array}{\|l\|} \hline .0056 \\ .0042 \\ .0036 \\ .0029 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0033 \\ .0029 \\ .0027 \\ .0024 \\ \hline \end{array}$ |
| Tool Steel | $\begin{aligned} & \text { A2, H13, L6, } \\ & \text { P20, S7 } \end{aligned}$ | $\begin{aligned} & \hline 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \\ & >50 \text { HRC } \end{aligned}$ | $\begin{aligned} & \hline 340 \\ & 250 \\ & 145 \\ & 85 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0005 \\ & .0004 \\ & .0003 \\ & .0002 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0008 \\ .0006 \\ .0005 \\ .0004 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0014 \\ .0012 \\ .0011 \\ .0010 \\ \hline \end{array}$ | $\begin{aligned} & .0007 \\ & .0005 \\ & .0004 \\ & .0003 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0012 \\ & .0009 \\ & .0007 \\ & .0006 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0015 \\ & .0013 \\ & .0012 \\ & .0011 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0009 \\ & .0007 \\ & .0006 \\ & .0005 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0016 \\ .0013 \\ .0010 \\ .0008 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0017 \\ .0015 \\ .0014 \\ .0012 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0013 \\ .0011 \\ .0008 \\ .0007 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0024 \\ .0019 \\ .0015 \\ .0012 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0020 \\ .0017 \\ .0015 \\ .0014 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0017 \\ & .0014 \\ & .0011 \\ & .0009 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0031 \\ & .0025 \\ & .0019 \\ & .0016 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0023 \\ .0020 \\ .0018 \\ .0016 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0025 \\ .0020 \\ .0016 \\ .0013 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0044 \\ .0035 \\ .0028 \\ .0022 \\ \hline \end{array}$ | $\begin{aligned} & .0027 \\ & .0024 \\ & .0022 \\ & .0019 \end{aligned}$ | $\begin{aligned} & \hline .0032 \\ & .0025 \\ & .0020 \\ & .0016 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0056 \\ .0045 \\ .0035 \\ .0029 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0033 \\ & .0029 \\ & .0026 \\ & .0023 \\ & \hline \end{aligned}$ |
| Specialty Steel | 300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350 | $\begin{array}{r} \hline<75 \mathrm{HRB} \\ 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \\ 36-50 \mathrm{HRC} \\ >50 \mathrm{HRC} \\ \hline \end{array}$ | $\begin{aligned} & \hline 290 \\ & 255 \\ & 175 \\ & 150 \\ & 55 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0006 \\ & .0004 \\ & .0004 \\ & .0003 \\ & .0002 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0011 \\ .0007 \\ .0007 \\ .0006 \\ .0004 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0015 \\ .0013 \\ .0012 \\ .0011 \\ .0009 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0009 \\ .0006 \\ .0006 \\ .0005 \\ .0003 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0015 \\ & .0011 \\ & .0010 \\ & .0009 \\ & .0005 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0017 \\ .0014 \\ .0013 \\ .0013 \\ .0010 \\ \hline \end{array}$ | $\begin{aligned} & .0012 \\ & .0008 \\ & .0007 \\ & .0007 \\ & .0004 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0021 \\ .0014 \\ .0013 \\ .0012 \\ .0007 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0020 \\ .0016 \\ .0015 \\ .0015 \\ .0011 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0018 \\ & .0012 \\ & .0011 \\ & .0010 \\ & .0006 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0031 \\ .0021 \\ .0019 \\ .0017 \\ .0010 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0023 \\ .0019 \\ .0018 \\ .0017 \\ .0013 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0023 \\ & .0016 \\ & .0014 \\ & .0013 \\ & .0008 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0040 \\ & .0028 \\ & .0025 \\ & .0022 \\ & .0014 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0026 \\ .0022 \\ .0021 \\ .0019 \\ .0015 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0033 \\ .0023 \\ .0020 \\ .0018 \\ .0011 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0058 \\ .0040 \\ .0036 \\ .0032 \\ .0020 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0032 \\ .0026 \\ .0025 \\ .0023 \\ .0018 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0042 \\ .0029 \\ .0026 \\ .0023 \\ .0014 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0074 \\ & .0051 \\ & .0046 \\ & .0041 \\ & .0025 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0038 \\ .0031 \\ .0030 \\ .0028 \\ .0022 \\ \hline \end{array}$ |
| Austenitic Stainless Steel | Nitronic 50, Nitronic <br> 60, 301, 303, 304, <br> 304L, Incoloy 27- <br> 7MO, 316, <br> 316L, 321, 347 | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & 265 \\ & 225 \\ & 180 \end{aligned}$ | $\begin{aligned} & .0004 \\ & .0004 \\ & .0003 \end{aligned}$ | $\begin{aligned} & .0008 \\ & .0007 \\ & .0006 \end{aligned}$ | .0013 <br> . 0013 <br> .0011 | $\begin{aligned} & .0007 \\ & .0006 \\ & .0005 \end{aligned}$ | $\begin{aligned} & .0012 \\ & .0010 \\ & .0008 \end{aligned}$ | $\begin{aligned} & .0015 \\ & .0014 \\ & .0012 \end{aligned}$ | $\begin{aligned} & .0009 \\ & .0008 \\ & .0006 \end{aligned}$ | .0016 <br> . 0014 <br> .0011 | $\begin{aligned} & .0017 \\ & .0016 \\ & .0014 \end{aligned}$ | $\begin{aligned} & .0013 \\ & .0012 \\ & .0009 \end{aligned}$ | $\begin{array}{\|l} .0023 \\ .0021 \\ .0017 \end{array}$ | .0019 <br> . 0018 <br> .0017 | $\begin{aligned} & .0017 \\ & .0015 \\ & .0012 \end{aligned}$ | $\begin{aligned} & .0030 \\ & .0027 \\ & .0022 \end{aligned}$ | $\begin{aligned} & .0023 \\ & .0021 \\ & .0019 \end{aligned}$ |  | $\begin{aligned} & .0043 \\ & .0039 \\ & .0031 \end{aligned}$ | $\begin{aligned} & .0027 \\ & .0026 \\ & .0023 \end{aligned}$ | $\begin{aligned} & .0031 \\ & .0028 \\ & .0023 \end{aligned}$ | $\begin{aligned} & .0055 \\ & .0049 \\ & .0040 \end{aligned}$ | $\begin{aligned} & .0033 \\ & .0031 \\ & .0028 \end{aligned}$ |
| Martensitic \& Ferritic Stainless Steel | $\begin{aligned} & 403,410,416,420, \\ & 440,430,446 \end{aligned}$ | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \end{aligned}$ | $\begin{aligned} & 300 \\ & 280 \end{aligned}$ | $\begin{aligned} & .0005 \\ & .0004 \end{aligned}$ | $0008$ | $\begin{array}{\|l\|} \hline .0013 \\ .0013 \end{array}$ | $\begin{aligned} & .0007 \\ & .0006 \end{aligned}$ | $\begin{array}{\|} .0012 \\ .0010 \end{array}$ | $\begin{aligned} & .0015 \\ & .0014 \end{aligned}$ | $\begin{aligned} & .0009 \\ & .0008 \end{aligned}$ | $\begin{aligned} & .0016 \\ & .0014 \end{aligned}$ | $\begin{aligned} & .0017 \\ & .0016 \end{aligned}$ | $\begin{aligned} & .0013 \\ & .0012 \end{aligned}$ | $\begin{array}{\|l\|} \hline .0024 \\ .0021 \end{array}$ | $\begin{aligned} & .0020 \\ & .0018 \end{aligned}$ | $\begin{aligned} & .0018 \\ & .0015 \end{aligned}$ | $\begin{aligned} & .0031 \\ & .0027 \end{aligned}$ | $\begin{array}{\|l} .0023 \\ .0021 \end{array}$ | $0025.0022 .$ | $\begin{aligned} & .0044 \\ & .0039 \end{aligned}$ | $0027$ | $\begin{aligned} & .0032 \\ & .0028 \end{aligned}$ | $\begin{aligned} & .0057 \\ & .0049 \end{aligned}$ | $0033 .$ |
| PH Stainless Steel | 15-5, 17-4, Carpenter 450, Carpenter 465 | $\begin{aligned} & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ |  |  | $\text { 0006 } 0 .$ |  |  |  |  |  | . 0012 | $\text { . } 0015 .$ |  | . 0017 | . 0017 | . 0013 | . 0023 | . 0020 | . 0018 | . 0033 | . 0023 |  | . 0041 |  |
| Gray Cast Iron | SAE J431, ASTM A48 | $\begin{aligned} & \hline 75-98 \mathrm{HRB} \\ & 21-36 \mathrm{HRC} \\ & \hline \end{aligned}$ | $\begin{aligned} & 410 \\ & 370 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0007 \\ & .0004 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0013 \\ .0007 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0017 \\ .0013 \\ \hline \end{array}$ | $\begin{array}{\|l} .0011 \\ .0006 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0019 \\ & .0010 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0019 \\ .0014 \\ \hline \end{array}$ | $\begin{aligned} & .0015 \\ & .0008 \end{aligned}$ | $\begin{array}{\|l} \hline .0026 \\ .0014 \\ \hline \end{array}$ | $\begin{aligned} & .0022 \\ & .0016 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0022 \\ & .0012 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0038 \\ & .0021 \end{aligned}$ | $\begin{array}{\|l} \hline .0025 \\ .0018 \\ \hline \end{array}$ |  | $\begin{aligned} & .0050 \\ & .0027 \end{aligned}$ | $\begin{array}{\|l} \hline .0029 \\ .0022 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0041 \\ .0022 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0072 \\ .0039 \\ \hline \end{array}$ | . 0035 | $\begin{aligned} & \hline .0052 \\ & .0028 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0091 \\ .0050 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0043 \\ .0031 \\ \hline \end{array}$ |
| $\begin{aligned} & \text { Malleable Cast } \\ & \text { Iron } \end{aligned}$ | ASTM A47, ASTM A220, ASTM A602 | $\begin{array}{\|l\|} \hline 75-98 \mathrm{HRB} \\ 21-36 \text { HRC } \\ \hline \end{array}$ | $\begin{aligned} & 345 \\ & 335 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0005 \\ & .0004 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0008 \\ .0007 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0014 \\ .0013 \\ \hline \end{array}$ | $\begin{array}{\|l} .0007 \\ .0006 \\ \hline \end{array}$ |  |  |  | $\begin{array}{\|l\|} \hline .0016 \\ .0014 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0017 \\ .0016 \\ \hline \end{array}$ |  | . 0024 |  | $\begin{array}{\|l} .0018 \\ .0016 \\ \hline \end{array}$ |  | $\begin{array}{\|l} \hline .0023 \\ .0022 \\ \hline \end{array}$ | . 00262 | $\begin{array}{\|l} \hline .0045 \\ .0039 \\ \hline \end{array}$ | . 0028 | $\begin{aligned} & .0033 \\ & .0028 \\ & \hline \end{aligned}$ | . 0058 | $\begin{array}{\|l} \hline .0034 \\ .0031 \\ \hline \end{array}$ |
| Nodular (Ductile) Cast Iron | ASTM A536, ASTM 897 | $\begin{aligned} & \hline 75-98 \mathrm{HRB} \\ & 21-36 \mathrm{HRC} \\ & 36-50 \mathrm{HRC} \\ & \hline \end{aligned}$ | $\begin{aligned} & 310 \\ & 260 \\ & 135 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0005 \\ & .0003 \\ & .0002 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0009 \\ .0006 \\ .0004 \\ \hline \end{array}$ | $\begin{array}{\|l} .0014 \\ .0011 \\ .0009 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0007 \\ .0005 \\ .0003 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0013 \\ .0008 \\ .0005 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0015 \\ .0013 \\ .0010 \\ \hline \end{array}$ | $\begin{aligned} & .0010 \\ & .0006 \\ & .0004 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0017 \\ .0011 \\ .0007 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0018 \\ .0014 \\ .0011 \\ \hline \end{array}$ | $\begin{aligned} & .0014 \\ & .0010 \\ & .0006 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0025 \\ .0017 \\ .0011 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0020 \\ & .0017 \\ & .0013 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} .0019 \\ .0012 \\ .0008 \\ \hline \end{array}$ | $\begin{aligned} & .0033 \\ & .0022 \\ & .0014 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0024 \\ .0019 \\ .0015 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0027 \\ .0018 \\ .0011 \\ \hline \end{array}$ | $\begin{array}{\|l} .0047 \\ .0031 \\ .0020 \\ \hline \end{array}$ | $\begin{array}{\|l} .0028 \\ .0023 \\ .0018 \\ \hline \end{array}$ | $\begin{aligned} & .0034 \\ & .0023 \\ & .0014 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0060 \\ & .0040 \\ & .0025 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0034 \\ .0028 \\ .0022 \\ \hline \end{array}$ |
| Pure Nickel | Nickel 200, Nickel 201 | $\begin{array}{r} \hline<75 \mathrm{HRB} \\ 75.98 \mathrm{HRB} \\ \hline \end{array}$ | $\begin{aligned} & 285 \\ & 250 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0006 \\ & .0005 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} .0011 \\ .0009 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0016 \\ .0014 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0009 \\ .0008 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0016 \\ .0014 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0018 \\ .0016 \\ \hline \end{array}$ | $\begin{aligned} & .0012 \\ & .0010 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0022 \\ .0018 \\ \hline \end{array}$ | $\begin{aligned} & .0020 \\ & .0018 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0018 \\ & .0015 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} .0032 \\ .0027 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0023 \\ .0021 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0024 \\ .0020 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0042 \\ & .0036 \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline .0027 \\ & .0025 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0035 \\ .0029 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0061 \\ .0051 \\ \hline \end{array}$ | $\begin{aligned} & .0032 \\ & .0029 \end{aligned}$ | $\begin{aligned} & \hline .0044 \\ & .0037 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0077 \\ .0065 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0039 \\ .0036 \\ \hline \end{array}$ |
| Nickel Alloy | Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20 | $\begin{aligned} & 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & 80 \\ & 75 \\ & 70 \end{aligned}$ | $\begin{aligned} & .0003 \\ & .0003 \\ & .0003 \end{aligned}$ | $\text { . } 0005$ | .0011 <br> . 0011 <br> .0010 | $\begin{aligned} & .0005 \\ & .0005 \\ & .0004 \end{aligned}$ | $\begin{aligned} & .0008 \\ & .0008 \\ & .0007 \end{aligned}$ | $\begin{aligned} & .0013 \\ & .0012 \\ & .0011 \end{aligned}$ | $\begin{aligned} & .0006 \\ & .0006 \\ & .0005 \end{aligned}$ | .0011 <br> . 0011 <br> .0009 | $\text { . } 0014 .$ | $\begin{aligned} & .0009 \\ & .0009 \\ & .0008 \end{aligned}$ | .0017 .0016 .0014 | .0017 .0016 .0015 | .0012 .0012 .0010 | $\begin{aligned} & .0022 \\ & .0021 \\ & .0018 \end{aligned}$ | .0019 .0019 .0017 | .0018 .0017 .0014 | .0031 .0030 .0025 | .0023 .0023 .0021 | $\begin{aligned} & .0022 \\ & .0021 \\ & .0018 \end{aligned}$ | .0039 .0038 .0032 | .0028 .0027 .0025 |
| Pure Titanium | Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12 | $\begin{array}{\|r\|} \hline<75 \mathrm{HRB} \\ 75-98 \mathrm{HRB} \\ 21-36 \mathrm{HRC} \\ \hline \end{array}$ | $\begin{aligned} & \hline 300 \\ & 275 \\ & 250 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0009 \\ .0007 \\ .0006 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0015 \\ .0013 \\ .0010 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0019 \\ .0017 \\ .0015 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0013 \\ .0011 \\ .0008 \\ \hline \end{array}$ | $\begin{aligned} & .0022 \\ & .0019 \\ & .0014 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0021 \\ .0019 \\ .0017 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0017 \\ & .0014 \\ & .0011 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0030 \\ .0025 \\ .0019 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0024 \\ .0022 \\ .0019 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0025 \\ & .0021 \\ & .0016 \\ & \hline \end{aligned}$ | .0045 .0038 .0028 | $\begin{array}{\|l\|} \hline .0027 \\ .0025 \\ .0022 \\ \hline \end{array}$ | .0033 .0028 .0021 | .0059 .0049 .0037 | .0032 .0029 .0025 | .0048 .0040 .0030 | .0084 .0070 .0053 | . 0038 .0035 .0030 | $\begin{array}{\|l} \hline .0061 \\ .0051 \\ .0038 \\ \hline \end{array}$ | .0107 .0090 .0067 | .0046 <br> .0042 <br> .0036 |
| Titanium Alloy | Ti 3Al-2.5V, Ti 6AI4V, Ti 10V-2Fe-3AI | $\begin{aligned} & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & 180 \\ & 160 \end{aligned}$ | $\begin{aligned} & \hline .0004 \\ & .0004 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0008 \\ .0007 \end{array}$ | . 0013 | $\begin{array}{\|l} \hline .0006 \\ .0006 \end{array}$ | $\begin{aligned} & \hline .0011 \\ & .0010 \end{aligned}$ | $\begin{array}{\|l\|} \hline .0015 \\ .0014 \end{array}$ | . 0009 | $\begin{array}{\|l\|} \hline .0015 \\ .0014 \end{array}$ | $\begin{aligned} & .0017 \\ & .0016 \end{aligned}$ | . 0013 | . 0022 | . 0019 | . 0016 | $\begin{aligned} & .0029 \\ & .0026 \end{aligned}$ | . 0022 | . 0024 <br> .0022 | . 0042 | . 0027 | . 0030 | .0053 <br> .0048 | $\begin{aligned} & \hline .0032 \\ & .0031 \end{aligned}$ |
| Cobalt Alloy | ASTM F562, ASTM F90, ASTM F75, ASTM F799 | $\begin{aligned} & \hline 75-98 \text { HRB } \\ & 21-36 \text { HRC } \\ & 36-50 \text { HRC } \end{aligned}$ | $\begin{aligned} & 210 \\ & 170 \\ & 65 \\ & \hline \end{aligned}$ | $\begin{aligned} & .0004 \\ & .0004 \\ & .0002 \end{aligned}$ | $\begin{array}{\|l} \hline .0006 \\ .0006 \\ .0004 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0012 \\ & .0012 \\ & .0010 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} .0006 \\ .0005 \\ .0004 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0009 \\ & .0009 \\ & .0006 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0014 \\ .0013 \\ .0011 \\ \hline \end{array}$ | $\begin{aligned} & .0007 \\ & .0007 \\ & .0005 \end{aligned}$ | $\begin{array}{\|l\|} \hline .0013 \\ .0012 \\ .0008 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0015 \\ .0015 \\ .0012 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0011 \\ & .0010 \\ & .0007 \\ & \hline \end{aligned}$ | $\begin{array}{\|l} \hline .0019 \\ .0018 \\ .0012 \\ \hline \end{array}$ | $\begin{aligned} & \hline .0018 \\ & .0017 \\ & .0014 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0014 \\ .0013 \\ .0009 \\ \hline \end{array}$ | $\begin{aligned} & .0025 \\ & .0024 \\ & .0016 \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline .0021 \\ .0020 \\ .0017 \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline .0020 \\ .0019 \\ .0013 \\ \hline \end{array}$ | $\begin{array}{\|l} \hline .0035 \\ .0034 \\ .0023 \\ \hline \end{array}$ | .0024 .0024 .0020 | $\begin{aligned} & \hline .0025 \\ & .0025 \\ & .0017 \\ & \hline \end{aligned}$ | .0045 .0043 .0029 | $\begin{array}{\|l} \hline .0030 \\ .0029 \\ .0024 \\ \hline \end{array}$ |


| Milling Process | Hardness | ADOC | RDOC |
| :---: | :---: | :---: | :---: |
| Slot (Full Slotting) | $<35$ HRC | $75 \%-125 \%$ Diameter | $100 \%$ Diameter |
|  | $\geq 35$ HRC | $60 \%-100 \%$ Diameter | $100 \%$ Diameter |
| Rgh (Traditional Roughing) | $<35$ HRC | Up to Max LOC | $30 \%-40 \%$ Diameter |
|  | $\geq 35$ HRC | Up to Max LOC | $25 \%-35 \%$ Diameter |
| Fin (Finishing) | N/A | Up to Max LOC | $4 \%-6 \%$ Diameter |

## NOTES:

IPT values shown are for $2.5 \times \mathrm{D}$ length of cut tools, and should be adjusted for longer or shorter lengths of cut. For more accurate running parameters, please refer to Machining Advisor Pro.

