



5 Flute - Chipbreaker Rougher - Variable Pitch

| HEV-C-5 | | | | | | | | | | | | | | | | | |
|--|--|-------------|-----|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Material Guide | | Hardness | SFM | Inches per Tooth (IPT) | | | | | | | | | | | | | |
| | | | | 1/8 | | 3/16 | | 1/4 | | 3/8 | | 1/2 | | 3/4 | | 1 | |
| | | | | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh | Slot | Rgh |
| CARBON STEEL | 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36 | < 75 HRB | 455 | .0009 | .0015 | .0014 | .0021 | .0018 | .0029 | .0027 | .0043 | .0035 | .0056 | .0051 | .0080 | .0065 | .0102 |
| | | 75 - 98 HRB | 445 | .0007 | .0011 | .0010 | .0015 | .0013 | .0021 | .0020 | .0031 | .0026 | .0041 | .0037 | .0059 | .0047 | .0075 |
| | | 21 - 36 HRC | 400 | .0004 | .0007 | .0007 | .0010 | .0009 | .0014 | .0013 | .0020 | .0017 | .0026 | .0024 | .0038 | .0031 | .0048 |
| LOW ALLOY STEEL | 13XX, 41XX, 43XX, 51XX, 86XX, 93XX | 75 - 98 HRB | 390 | .0006 | .0009 | .0009 | .0013 | .0012 | .0018 | .0017 | .0027 | .0022 | .0035 | .0032 | .0051 | .0041 | .0065 |
| | | 21 - 36 HRC | 340 | .0004 | .0007 | .0007 | .0010 | .0009 | .0013 | .0013 | .0020 | .0017 | .0026 | .0024 | .0038 | .0030 | .0048 |
| | | 36 - 50 HRC | 260 | .0004 | .0006 | .0006 | .0009 | .0008 | .0012 | .0011 | .0017 | .0015 | .0023 | .0021 | .0033 | .0027 | .0042 |
| | | > 50 HRC | 155 | .0003 | .0005 | .0005 | .0007 | .0006 | .0009 | .0009 | .0014 | .0011 | .0018 | .0017 | .0026 | .0021 | .0033 |
| TOOL STEEL | A2, H13, L6, P20, S7 | 75 - 98 HRB | 340 | .0006 | .0009 | .0009 | .0013 | .0012 | .0018 | .0017 | .0027 | .0022 | .0035 | .0032 | .0051 | .0041 | .0065 |
| | | 21 - 36 HRC | 250 | .0005 | .0007 | .0007 | .0011 | .0009 | .0015 | .0014 | .0022 | .0018 | .0028 | .0026 | .0040 | .0033 | .0051 |
| | | 36 - 50 HRC | 145 | .0004 | .0006 | .0005 | .0008 | .0007 | .0011 | .0011 | .0017 | .0014 | .0022 | .0020 | .0031 | .0026 | .0040 |
| | | > 50 HRC | 85 | .0003 | .0005 | .0005 | .0007 | .0006 | .0009 | .0009 | .0014 | .0011 | .0018 | .0016 | .0026 | .0021 | .0033 |
| SPECIALTY STEEL | 300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350 | < 75 HRB | 290 | .0008 | .0012 | .0011 | .0018 | .0015 | .0024 | .0023 | .0035 | .0029 | .0046 | .0042 | .0066 | .0054 | .0085 |
| | | 75 - 98 HRB | 255 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0020 | .0032 | .0029 | .0045 | .0037 | .0058 |
| | | 21 - 36 HRC | 175 | .0005 | .0008 | .0007 | .0011 | .0009 | .0015 | .0014 | .0022 | .0018 | .0029 | .0026 | .0041 | .0033 | .0052 |
| | | 36 - 50 HRC | 150 | .0004 | .0007 | .0006 | .0010 | .0008 | .0013 | .0012 | .0019 | .0016 | .0026 | .0023 | .0037 | .0030 | .0046 |
| | | > 50 HRC | 55 | .0003 | .0004 | .0004 | .0006 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0014 | .0022 | .0018 | .0029 |
| AUSTENITIC STAINLESS STEEL | Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347 | 75 - 98 HRB | 265 | .0006 | .0009 | .0009 | .0013 | .0011 | .0018 | .0017 | .0026 | .0022 | .0034 | .0031 | .0049 | .0040 | .0063 |
| | | 21 - 36 HRC | 225 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0020 | .0031 | .0028 | .0044 | .0036 | .0057 |
| | | 36 - 50 HRC | 180 | .0004 | .0007 | .0006 | .0009 | .0008 | .0013 | .0012 | .0019 | .0016 | .0025 | .0023 | .0036 | .0029 | .0045 |
| MARTENSITIC & FERRITIC STAINLESS STEEL | 403, 410, 416, 420, 440, 430, 446 | 75 - 98 HRB | 300 | .0006 | .0009 | .0009 | .0013 | .0012 | .0018 | .0017 | .0027 | .0023 | .0035 | .0032 | .0051 | .0041 | .0065 |
| | | 21 - 36 HRC | 280 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0020 | .0031 | .0028 | .0044 | .0036 | .0056 |
| PH STAINLESS STEEL | 15-5, 17-4, Carpenter 450, Carpenter 465 | 21 - 36 HRC | 200 | .0004 | .0007 | .0006 | .0010 | .0009 | .0013 | .0013 | .0020 | .0017 | .0026 | .0024 | .0037 | .0030 | .0048 |
| | | 36 - 50 HRC | 145 | .0004 | .0006 | .0006 | .0009 | .0007 | .0012 | .0011 | .0017 | .0014 | .0023 | .0021 | .0032 | .0026 | .0041 |
| GRAY CAST IRON | SAE J431, ASTM A48 | 75 - 98 HRB | 410 | .0010 | .0015 | .0014 | .0022 | .0019 | .0029 | .0028 | .0044 | .0036 | .0057 | .0052 | .0082 | .0066 | .0104 |
| | | 21 - 36 HRC | 370 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0020 | .0031 | .0028 | .0045 | .0036 | .0057 |
| MALLEABLE CAST IRON | ASTM A47, ASTM A220, ASTM A602 | 75 - 98 HRB | 345 | .0006 | .0010 | .0009 | .0014 | .0012 | .0019 | .0018 | .0028 | .0023 | .0036 | .0033 | .0052 | .0042 | .0066 |
| | | 21 - 36 HRC | 335 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0020 | .0031 | .0029 | .0045 | .0036 | .0057 |
| NODULAR (DUCTILE) CAST IRON | ASTM A536, ASTM 897 | 75 - 98 HRB | 310 | .0006 | .0010 | .0009 | .0014 | .0012 | .0020 | .0018 | .0029 | .0024 | .0038 | .0034 | .0054 | .0044 | .0069 |
| | | 21 - 36 HRC | 260 | .0004 | .0007 | .0006 | .0010 | .0008 | .0013 | .0012 | .0019 | .0016 | .0025 | .0023 | .0036 | .0029 | .0046 |
| | | 36 - 50 HRC | 135 | .0003 | .0004 | .0004 | .0006 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0014 | .0023 | .0018 | .0029 |
| PURE NICKEL | Nickel 200, Nickel 201 | < 75 HRB | 285 | .0008 | .0013 | .0012 | .0018 | .0016 | .0025 | .0024 | .0037 | .0031 | .0049 | .0044 | .0070 | .0056 | .0089 |
| | | 75 - 98 HRB | 250 | .0007 | .0011 | .0010 | .0015 | .0013 | .0021 | .0020 | .0031 | .0026 | .0041 | .0037 | .0058 | .0047 | .0074 |
| NICKEL ALLOY | Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20 | 75 - 98 HRB | 80 | .0004 | .0006 | .0006 | .0009 | .0008 | .0013 | .0012 | .0019 | .0016 | .0025 | .0023 | .0035 | .0029 | .0045 |
| | | 21 - 36 HRC | 75 | .0004 | .0006 | .0006 | .0009 | .0008 | .0012 | .0012 | .0018 | .0015 | .0024 | .0022 | .0034 | .0028 | .0043 |
| | | 36 - 50 HRC | 70 | .0003 | .0005 | .0005 | .0008 | .0007 | .0010 | .0010 | .0015 | .0013 | .0020 | .0019 | .0029 | .0023 | .0037 |
| PURE TITANIUM | Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12 | < 75 HRB | 300 | .0011 | .0017 | .0017 | .0025 | .0022 | .0035 | .0033 | .0051 | .0043 | .0067 | .0061 | .0096 | .0078 | .0122 |
| | | 75 - 98 HRB | 275 | .0009 | .0015 | .0014 | .0021 | .0018 | .0029 | .0027 | .0043 | .0036 | .0056 | .0051 | .0081 | .0065 | .0103 |
| | | 21 - 36 HRC | 250 | .0007 | .0011 | .0010 | .0016 | .0014 | .0022 | .0021 | .0032 | .0027 | .0042 | .0038 | .0060 | .0049 | .0077 |
| TITANIUM ALLOY | Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al | 21 - 36 HRC | 180 | .0006 | .0009 | .0008 | .0013 | .0011 | .0017 | .0016 | .0025 | .0021 | .0033 | .0030 | .0048 | .0039 | .0061 |
| | | 36 - 50 HRC | 160 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0023 | .0019 | .0030 | .0028 | .0043 | .0035 | .0055 |
| COBALT ALLOY | ASTM F562, ASTM F90, ASTM F75, ASTM F799 | 75 - 98 HRB | 210 | .0005 | .0007 | .0007 | .0011 | .0009 | .0015 | .0014 | .0021 | .0018 | .0028 | .0026 | .0040 | .0032 | .0051 |
| | | 21 - 36 HRC | 170 | .0005 | .0007 | .0007 | .0010 | .0009 | .0014 | .0013 | .0021 | .0017 | .0027 | .0025 | .0039 | .0031 | .0050 |
| | | 36 - 50 HRC | 65 | .0003 | .0005 | .0005 | .0007 | .0006 | .0010 | .0009 | .0014 | .0012 | .0018 | .0017 | .0026 | .0021 | .0034 |

| Milling Process | Hardness | ADOC | RDOC |
|----------------------------|----------|------------------|------------------|
| Slot (Full Slotting) | < 35 HRC | 30%-75% Diameter | 100% Diameter |
| | ≥ 35 HRC | 25%-50% Diameter | 100% Diameter |
| Rgh (Traditional Roughing) | < 35 HRC | Up to Max LOC | 10%-30% Diameter |
| | ≥ 35 HRC | Up to Max LOC | 10%-30% Diameter |

NOTES:

Hardness Scales: HRB = Rockwell B
HRC = Rockwell C

IPT values shown are for 2.5xD 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.