

SPEEDS & FEEDS

HSVR-C-4

4 Flute - Chipbreaker Rougher - Variable Pitch

| HSVR-C-4 / HSVR-C-RN-4 | | | | | | | | | | | | | | | | | |
|--|--|-------------|-------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 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 | .0008 | .0013 | .0012 | .0019 | .0015 | .0025 | .0023 | .0037 | .0030 | .0048 | .0042 | .0069 | .0054 | .0088 |
| | | 75 - 98 HRB | 445 | .0006 | .0009 | .0008 | .0014 | .0011 | .0018 | .0017 | .0027 | .0022 | .0035 | .0031 | .0051 | .0040 | .0065 |
| | | 21 - 36 HRC | 400 | .0004 | .0006 | .0005 | .0009 | .0007 | .0012 | .0011 | .0017 | .0014 | .0023 | .0020 | .0033 | .0026 | .0042 |
| LOW ALLOY STEEL | 13XX, 41XX, 43XX, 51XX, 86XX, 93XX | 75 - 98 HRB | 390 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0023 | .0019 | .0031 | .0027 | .0044 | .0034 | .0056 |
| | | 21 - 36 HRC | 340 | .0004 | .0006 | .0005 | .0009 | .0007 | .0012 | .0011 | .0017 | .0014 | .0023 | .0020 | .0033 | .0025 | .0042 |
| | | 36 - 50 HRC | 260 | .0003 | .0005 | .0005 | .0008 | .0006 | .0010 | .0009 | .0015 | .0012 | .0020 | .0018 | .0029 | .0022 | .0036 |
| | | > 50 HRC | 155 | .0003 | .0004 | .0004 | .0006 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0023 | .0017 | .0029 |
| TOOL STEEL | A2, H13, L6, P20, S7 | 75 - 98 HRB | 340 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0023 | .0019 | .0031 | .0027 | .0044 | .0034 | .0056 |
| | | 21 - 36 HRC | 250 | .0004 | .0006 | .0006 | .0009 | .0008 | .0013 | .0011 | .0019 | .0015 | .0024 | .0021 | .0035 | .0027 | .0045 |
| | | 36 - 50 HRC | 145 | .0003 | .0005 | .0005 | .0007 | .0006 | .0010 | .0009 | .0015 | .0012 | .0019 | .0017 | .0027 | .0021 | .0035 |
| | | > 50 HRC | 85 | .0003 | .0004 | .0004 | .0006 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0022 | .0017 | .0028 |
| SPECIALTY STEEL | 300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350 | < 75 HRB | 290 | .0006 | .0011 | .0010 | .0015 | .0013 | .0021 | .0019 | .0031 | .0025 | .0040 | .0035 | .0058 | .0045 | .0073 |
| | | 75 - 98 HRB | 255 | .0005 | .0007 | .0007 | .0011 | .0009 | .0014 | .0013 | .0021 | .0017 | .0028 | .0024 | .0040 | .0031 | .0050 |
| | | 21 - 36 HRC | 175 | .0004 | .0007 | .0006 | .0010 | .0008 | .0013 | .0012 | .0019 | .0015 | .0025 | .0022 | .0035 | .0028 | .0045 |
| | | 36 - 50 HRC | 150 | .0004 | .0006 | .0005 | .0009 | .0007 | .0011 | .0010 | .0017 | .0014 | .0022 | .0019 | .0032 | .0025 | .0040 |
| > 50 HRC | 55 | .0002 | .0004 | .0003 | .0005 | .0004 | .0007 | .0006 | .0010 | .0008 | .0014 | .0012 | .0019 | .0015 | .0025 | | |
| AUSTENITIC STAINLESS STEEL | Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347 | 75 - 98 HRB | 265 | .0005 | .0008 | .0007 | .0011 | .0009 | .0015 | .0014 | .0023 | .0018 | .0030 | .0026 | .0043 | .0033 | .0054 |
| | | 21 - 36 HRC | 225 | .0004 | .0007 | .0006 | .0010 | .0008 | .0014 | .0013 | .0021 | .0016 | .0027 | .0024 | .0039 | .0030 | .0049 |
| | | 36 - 50 HRC | 180 | .0003 | .0006 | .0005 | .0008 | .0007 | .0011 | .0010 | .0016 | .0013 | .0022 | .0019 | .0031 | .0024 | .0039 |
| MARTENSITIC & FERRITIC STAINLESS STEEL | 403, 410, 416, 420, 440, 430, 446 | 75 - 98 HRB | 300 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0024 | .0019 | .0031 | .0027 | .0044 | .0034 | .0056 |
| | | 21 - 36 HRC | 280 | .0004 | .0007 | .0006 | .0010 | .0008 | .0014 | .0012 | .0020 | .0016 | .0027 | .0023 | .0038 | .0030 | .0049 |
| PH STAINLESS STEEL | 15-5, 17-4, Carpenter 450, Carpenter 465 | 21 - 36 HRC | 200 | .0004 | .0006 | .0005 | .0009 | .0007 | .0012 | .0011 | .0017 | .0014 | .0023 | .0020 | .0032 | .0025 | .0041 |
| | | 36 - 50 HRC | 145 | .0003 | .0005 | .0005 | .0008 | .0006 | .0010 | .0009 | .0015 | .0012 | .0020 | .0017 | .0028 | .0022 | .0036 |
| GRAY CAST IRON | SAE J431, ASTM A48 | 75 - 98 HRB | 410 | .0008 | .0013 | .0012 | .0019 | .0016 | .0026 | .0023 | .0038 | .0030 | .0050 | .0044 | .0071 | .0055 | .0091 |
| | | 21 - 36 HRC | 370 | .0004 | .0007 | .0006 | .0010 | .0009 | .0014 | .0013 | .0021 | .0017 | .0027 | .0024 | .0039 | .0030 | .0049 |
| MALLEABLE CAST IRON | ASTM A47, ASTM A220, ASTM A602 | 75 - 98 HRB | 345 | .0005 | .0008 | .0008 | .0012 | .0010 | .0016 | .0015 | .0024 | .0019 | .0032 | .0028 | .0045 | .0035 | .0058 |
| | | 21 - 36 HRC | 335 | .0004 | .0007 | .0007 | .0010 | .0009 | .0014 | .0013 | .0021 | .0017 | .0027 | .0024 | .0039 | .0030 | .0049 |
| NODULAR (DUCTILE) CAST IRON | ASTM A536, ASTM 897 | 75 - 98 HRB | 310 | .0005 | .0009 | .0008 | .0013 | .0010 | .0017 | .0015 | .0025 | .0020 | .0033 | .0029 | .0047 | .0037 | .0060 |
| | | 21 - 36 HRC | 260 | .0004 | .0006 | .0005 | .0008 | .0007 | .0011 | .0010 | .0017 | .0013 | .0022 | .0019 | .0031 | .0024 | .0040 |
| | | 36 - 50 HRC | 135 | .0002 | .0004 | .0003 | .0005 | .0004 | .0007 | .0007 | .0011 | .0009 | .0014 | .0012 | .0020 | .0015 | .0025 |
| PURE NICKEL | Nickel 200, Nickel 201 | < 75 HRB | 285 | .0007 | .0011 | .0010 | .0016 | .0013 | .0022 | .0020 | .0032 | .0026 | .0042 | .0037 | .0060 | .0047 | .0077 |
| | | 75 - 98 HRB | 250 | .0006 | .0009 | .0008 | .0014 | .0011 | .0018 | .0017 | .0027 | .0022 | .0035 | .0031 | .0051 | .0039 | .0064 |
| NICKEL ALLOY | Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20 | 75 - 98 HRB | 80 | .0003 | .0006 | .0005 | .0008 | .0007 | .0011 | .0010 | .0016 | .0013 | .0022 | .0019 | .0031 | .0024 | .0039 |
| | | 21 - 36 HRC | 75 | .0003 | .0005 | .0005 | .0008 | .0006 | .0011 | .0010 | .0016 | .0013 | .0021 | .0018 | .0030 | .0023 | .0037 |
| | | 36 - 50 HRC | 70 | .0003 | .0005 | .0004 | .0007 | .0006 | .0009 | .0008 | .0014 | .0011 | .0018 | .0015 | .0025 | .0020 | .0032 |
| PURE TITANIUM | Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12 | < 75 HRB | 300 | .0009 | .0015 | .0014 | .0022 | .0018 | .0030 | .0027 | .0044 | .0036 | .0058 | .0051 | .0083 | .0065 | .0106 |
| | | 75 - 98 HRB | 275 | .0008 | .0013 | .0012 | .0019 | .0015 | .0025 | .0023 | .0037 | .0030 | .0049 | .0043 | .0070 | .0054 | .0089 |
| | | 21 - 36 HRC | 250 | .0006 | .0010 | .0009 | .0014 | .0012 | .0019 | .0017 | .0028 | .0022 | .0037 | .0032 | .0052 | .0041 | .0067 |
| TITANIUM ALLOY | Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al | 21 - 36 HRC | 180 | .0005 | .0008 | .0007 | .0011 | .0009 | .0015 | .0014 | .0022 | .0018 | .0029 | .0025 | .0041 | .0032 | .0053 |
| | | 36 - 50 HRC | 160 | .0004 | .0007 | .0006 | .0010 | .0008 | .0014 | .0012 | .0020 | .0016 | .0026 | .0023 | .0038 | .0029 | .0048 |
| COBALT ALLOY | ASTM F562, ASTM F90, ASTM F75, ASTM F799 | 75 - 98 HRB | 210 | .0004 | .0006 | .0006 | .0009 | .0008 | .0013 | .0011 | .0019 | .0015 | .0024 | .0021 | .0035 | .0027 | .0045 |
| | | 21 - 36 HRC | 170 | .0004 | .0006 | .0006 | .0009 | .0008 | .0012 | .0011 | .0018 | .0014 | .0024 | .0021 | .0034 | .0026 | .0043 |
| | | 36 - 50 HRC | 65 | .0003 | .0004 | .0004 | .0006 | .0005 | .0008 | .0007 | .0012 | .0010 | .0016 | .0014 | .0023 | .0018 | .0029 |

| Milling Process | Hardness | ADOC | RDOC |
|----------------------------|----------|-------------------|------------------|
| Slot (Full Slotting) | < 35 HRC | 75%-125% Diameter | 100% Diameter |
| | ≥ 35 HRC | 60%-75% Diameter | 100% Diameter |
| Rgh (Traditional Roughing) | < 35 HRC | Up to Max LOC | 30%-40% Diameter |
| | ≥ 35 HRC | Up to Max LOC | 20%-40% 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. Values shown are for non-reached tools. For tools with reaches greater than 3xD, IPT should be reduced. For more accurate running parameters, please refer to Machining Advisor Pro.