

# SPEEDS & FEEDS

## 7 Flute - Variable Pitch



# HEV-7

HEV-7 / HEV-RN-7																	
Material Guide		Hardness	SFM	1/8		3/16		1/4		3/8		1/2		3/4		1	
				Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin	Rgh	Fin
				CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB 75 - 98 HRB 21 - 36 HRC	455 445 400	.0016 .0011 .0007	.0017 .0015 .0012	.0024 .0017 .0011	.0019 .0016 .0013	.0031 .0023 .0015	.0022 .0019 .0015	.0047 .0034 .0022	.0025 .0044 .0017	.0060 .0022 .0028	.0029 .0044 .0020
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC > 50 HRC	390 340 260 155	.0010 .0007 .0006 .0005	.0014 .0012 .0011 .0010	.0015 .0011 .0010 .0008	.0015 .0013 .0012 .0011	.0020 .0015 .0013 .0010	.0018 .0015 .0014 .0013	.0030 .0022 .0019 .0015	.0020 .0017 .0016 .0014	.0038 .0028 .0025 .0020	.0023 .0020 .0019 .0017	.0055 .0041 .0036 .0028	.0028 .0024 .0023 .0020	.0070 .0052 .0046 .0036	.0034 .0029 .0027 .0024
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC > 50 HRC	340 250 145 85	.0010 .0008 .0006 .0005	.0014 .0012 .0011 .0010	.0015 .0012 .0009 .0008	.0015 .0013 .0012 .0011	.0020 .0016 .0012 .0010	.0018 .0016 .0014 .0012	.0030 .0023 .0018 .0015	.0020 .0018 .0016 .0014	.0038 .0030 .0024 .0019	.0023 .0021 .0019 .0016	.0055 .0044 .0034 .0028	.0028 .0025 .0022 .0020	.0070 .0056 .0044 .0036	.0034 .0030 .0027 .0024
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	290 255 175 150 55	.0013 .0009 .0008 .0007 .0004	.0016 .0013 .0012 .0011 .0009	.0020 .0014 .0012 .0011 .0007	.0018 .0014 .0014 .0013 .0010	.0026 .0018 .0016 .0015 .0009	.0020 .0017 .0016 .0015 .0012	.0039 .0027 .0024 .0021 .0017	.0023 .0019 .0018 .0017 .0013	.0050 .0034 .0031 .0027 .0017	.0027 .0022 .0021 .0020 .0016	.0072 .0050 .0045 .0040 .0025	.0032 .0027 .0025 .0024 .0018	.0092 .0063 .0057 .0051 .0031	.0039 .0032 .0030 .0029 .0022
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	265 225 180	.0010 .0009 .0007	.0013 .0013 .0012	.0015 .0013 .0011	.0015 .0015 .0013	.0019 .0017 .0015	.0017 .0016 .0015	.0029 .0026 .0021	.0020 .0019 .0017	.0037 .0033 .0027	.0023 .0022 .0020	.0054 .0048 .0039	.0028 .0026 .0023	.0069 .0062 .0049	.0034 .0032 .0028
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB 21 - 36 HRC	300 280	.0010 .0009	.0014 .0013	.0015 .0013	.0015 .0014	.0020 .0017	.0018 .0016	.0030 .0026	.0020 .0019	.0038 .0033	.0023 .0022	.0055 .0048	.0028 .0026	.0071 .0061	.0034 .0032
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC 36 - 50 HRC	200 145	.0007 .0006	.0012 .0011	.0011 .0010	.0013 .0012	.0015 .0013	.0015 .0014	.0022 .0019	.0017 .0016	.0028 .0024	.0020 .0019	.0041 .0035	.0024 .0022	.0052 .0045	.0029 .0027
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB 21 - 36 HRC	410 370	.0016 .0009	.0017 .0013	.0024 .0013	.0020 .0014	.0032 .0017	.0022 .0016	.0048 .0026	.0026 .0019	.0062 .0033	.0030 .0022	.0090 .0049	.0036 .0026	.0114 .0062	.0043 .0032
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB 21 - 36 HRC	345 335	.0010 .0009	.0014 .0013	.0015 .0013	.0015 .0014	.0020 .0017	.0018 .0016	.0030 .0026	.0020 .0019	.0039 .0034	.0024 .0022	.0057 .0049	.0028 .0026	.0072 .0062	.0034 .0032
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	310 260 135	.0011 .0007 .0005	.0014 .0011 .0009	.0016 .0011 .0007	.0016 .0013 .0010	.0021 .0014 .0009	.0018 .0015 .0012	.0032 .0021 .0013	.0021 .0017 .0014	.0041 .0027 .0017	.0024 .0020 .0016	.0059 .0039 .0025	.0029 .0023 .0019	.0075 .0050 .0032	.0035 .0028 .0023
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB 75 - 98 HRB	285 250	.0014 .0011	.0016 .0015	.0021 .0017	.0018 .0016	.0027 .0023	.0020 .0019	.0041 .0034	.0023 .0021	.0052 .0044	.0027 .0025	.0076 .0064	.0033 .0030	.0097 .0081	.0040 .0036
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	80 75 70	.0007 .0007 .0006	.0011 .0011 .0010	.0011 .0010 .0008	.0013 .0012 .0011	.0014 .0013 .0011	.0015 .0014 .0013	.0021 .0020 .0017	.0017 .0016 .0015	.0027 .0025 .0022	.0020 .0019 .0018	.0039 .0037 .0032	.0023 .0023 .0021	.0049 .0047 .0040	.0028 .0028 .0026
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB 75 - 98 HRB 21 - 36 HRC	300 275 250	.0019 .0016 .0012	.0019 .0017 .0015	.0028 .0024 .0018	.0021 .0019 .0017	.0037 .0031 .0023	.0024 .0022 .0019	.0056 .0047 .0035	.0028 .0025 .0022	.0072 .0060 .0045	.0032 .0030 .0026	.0105 .0088 .0066	.0039 .0035 .0031	.0134 .0112 .0084	.0047 .0043 .0037
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC 36 - 50 HRC	180 160	.0009 .0009	.0013 .0013	.0014 .0013	.0015 .0014	.0018 .0017	.0017 .0016	.0028 .0025	.0020 .0019	.0036 .0033	.0023 .0022	.0052 .0047	.0027 .0026	.0066 .0060	.0033 .0031
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	210 170 65	.0008 .0008 .0005	.0012 .0012 .0010	.0012 .0013 .0008	.0014 .0013 .0011	.0016 .0015 .0010	.0016 .0015 .0013	.0023 .0023 .0015	.0018 .0017 .0014	.0030 .0029 .0020	.0021 .0020 .0017	.0044 .0042 .0029	.0025 .0024 .0020	.0056 .0054 .0037	.0030 .0030 .0024

Milling Process	Hardness	ADOC	RDOC
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	10%-15% Diameter
	≥ 35 HRC	Up to Max LOC	10%-15% Diameter
Fin (Finishing)	N/A	Up to Max LOC	4%-6% 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.