Helical *MM*

HEV-5



SPEEDS & FEEDS

5 Flute - Variable Pitch

						HI	EV	/-5	; /	Η	E\	/-	RN	1-!	5 /	′ -	IS	M·	-5											
															Inc	ches p	er Too	oth (IP	'T)											
Mat	erial Guide	Hardness	SFM		1/16			3/32			1/8			3/16			1/4			3/8			1/2			3/4			1	
				Slot	Rgh	Fin																								
CARBON	10XX, 11XX, 12XX,	< 75 HRB	455	.0005	.0008	.0009	.0007	.0011	.0014	.0009	.0015	.0018	.0014	.0021	.0020	.0018	.0029	.0022	.0027	.0043	.0026	.0035	.0056	.0030		.0080	.0036	.0065	.0102	.0044
STEEL	12LXX, ASTM A27, ASTM A36	75 - 98 HRB 21 - 36 HRC	445 400	.0004	.0006 .0004	.0008 .0006	.0005 .0003	.0008 .0005	.0011 .0009	.0007	.0011 .0007	.0015 .0012	.0010 .0007	.0015 .0010	.0017 .0014	.0013	.0021 .0014	.0019 .0015	.0020 .0013	.0031 .0020	.0022 .0018	.0026 .0017	.0041	.0026		.0059 .0038		.0047 .0031	.0075 .0048	.0037 .0030
		75 - 98 HRB	390	.0003	.0005	.0007	.0005	.0007	.0011	.0006	.0009	.0012	.0009	.0013	.0016	.0012	.0018	.0018	.0017	.0027	.0021	.0022	.0035	.0024		.0051	.0029	.0041	.0065	.0035
LOW ALLOY	13XX, 41XX, 43XX,	21 - 36 HRC	340	.0002	.0004	.0006	.0003	.0005	.0009	.0004	.0007	.0012	.0007	.0010	.0013	.0009	.0013	.0015	.0013	.0020	.0018	.0017	.0026	.0021	.0024	.0038	.0025	.0030	.0048	.0030
STEEL	51XX, 86XX, 93XX	36 - 50 HRC	260	.0002	.0003	.0006	.0003	.0005	.0008	.0004	.0006	.0011	.0006	.0009	.0013	.0008	.0012	.0014	.0011		.0017	.0015	.0023	.0019		.0033		.0027	.0042	.0028
		> 50 HRC 75 - 98 HRB	155 340	.0002	.0003 .0005	.0005	.0002	.0004	.0008	.0003	.0005	.0010 .0014	.0005	.0007 .0013	.0011	.0006	.0009 .0018	.0013 .0018	.0009 .0017	.0014 .0027	.0015	.0011	.0018 .0035	.0017 .0024	.0017 .0032	.0026 .0051	.0020	.0021 .0041	.0033	.0025 .0035
		21 - 36 HRC	250	.0003	.0003	.0007	.0003	.0007	.0009	.0005	.0003	.0014	.0003	.0013	.0010	.00012	.0015	.0016	.0017	.0027	.0021	.0022	.0033	.0024		.0040	.0025	.0033	.0051	.0033
TOOL STEEL	A2, H13, L6, P20, S7	36 - 50 HRC	145	.0002	.0003	.0006	.0003	.0005	.0008	.0004	.0006	.0011	.0005	.0008	.0012	.0007	.0011	.0014	.0011	.0017	.0016	.0014	.0022	.0019		.0031	.0023	.0026	.0040	.0027
		> 50 HRC	85	.0002	.0003	.0005	.0002	.0004	.0008	.0003	.0005	.0010	.0005	.0007	.0011	.0006	.0009	.0013	.0009	.0014	.0015	.0011	.0018	.0017		.0026		.0021	.0033	.0025
	300M, Invar 36, Kovar,	< 75 HRB	290	.0004	.0006	.0008	.0006	.0009	.0012	.0008	.0012	.0016	.0011	.0018	.0018	.0015	.0024	.0020	.0023	.0035	.0024	.0029	.0046	.0028		.0066	.0033	.0054	.0085	.0040
SPECIALTY	Maraging 200, Marag-	75 - 98 HRB 21 - 36 HRC	255 175	.0003 .0003	.0004 .0004	.0007 .0007	.0004 .0004	.0006 .0006	.0010 .0010	.0005	.0008 .0008	.0013 .0013	.0008 .0007	.0012 .0011	.0015 .0014	.0010	.0016 .0015	.0017 .0016	.0015 .0014	.0024 .0022	.0019 .0019	.0020 .0018	.0032 .0029	.0023 .0021	.0029 .0026	.0045 .0041	.0027 .0026	.0037 .0033	.0058 .0052	.0033 .0031
STEEL	ing 250, Maraging 300, Maraging 350	36 - 50 HRC	150	.0003	.0004	.0007	.0004	.0005	.0009	.0003	.0007	.0013	.0007	.0010	.0014	.0003	.0013	.0010	.0014	.0022		.0016	.0025	.0021		.0041	.0020	.0030	.0032	.0031
	waraging 550	> 50 HRC	55	.0002	.0002	.0005	.0002	.0003	.0007	.0003	.0004	.0009	.0004	.0006	.0010	.0005	.0008	.0012	.0008	.0012	.0014	.0010	.0016	.0016		.0022	.0019	.0018	.0029	.0023
AUSTENITIC	Nitronic 50, Nitronic 60,	75 - 98 HRB	265	.0003	.0005	.0007	.0005	.0007	.0011	.0006	.0009	.0014	.0009	.0013	.0016	.0011	.0018	.0018	.0017	.0026	.0020	.0022	.0034	.0024	.0031	.0049	.0028	.0040	.0063	.0034
STAINLESS	301, 303, 304, 304L, Incoloy 27-7MO, 316,	21 - 36 HRC	225	.0003	.0004	.0007	.0004	.0006	.0010	.0005	.0008	.0013	.0008	.0012	.0015	.0010	.0016	.0017	.0015	.0024	.0019	.0020	.0031	.0023	.0028	.0044	.0027	.0036	.0057	.0033
STEEL	316L, 321, 347	36 - 50 HRC	180	.0002	.0004	.0006	.0003	.0005	.0009	.0004	.0007	.0012	.0006	.0009	.0013	.0008	.0013	.0015	.0012	.0019	.0017	.0016	.0025	.0020	.0023	.0036	.0024	.0029	.0045	.0029
MARTENSITIC	402 410 416 420	75 - 98 HRB	300	.0003	.0005	.0007	.0005	.0007	.0011	.0006	.0009	.0014	.0009	.0013	.0016	.0012	.0018	.0018	.0017	.0027	.0021	.0023	.0035	.0024	.0032	.0051	.0029	.0041	.0065	.0035
& FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	21 - 36 HRC	280	.0003	.0004	.0007	.0004	.0006	.0010	.0005	.0008	.0013	.0008	.0012	.0015	.0010	.0016	.0017	.0015	.0024	.0019	.0020	.0031	.0022	.0028	.0044	.0027	.0036	.0056	.0033
PH STAINLESS	15-5, 17-4, Carpenter	21 - 36 HRC	200	.0002	.0004	.0006	.0003	.0005	.0009	.0004	.0007	.0012	.0006	.0010	.0013	.0009	.0013	.0015	.0013	.0020	.0018	.0017	.0026	.0021	.0024	.0037	.0025	.0030	.0048	.0030
STEEL	450, Carpenter 465	36 - 50 HRC	145	.0002	.0003	.0006	.0003	.0005	.0008	.0004	.0006	.0011	.0006	.0009	.0013	.0007	.0012	.0014	.0011	.0017	.0016	.0014	.0023	.0019	.0021	.0032	.0023	.0026	.0041	.0028
GRAY CAST	SAE J431, ASTM A48	75 - 98 HRB	410	.0005	.0008	.0009	.0008	.0011	.0014	.0010	.0015	.0018	.0014	.0022	.0020	.0019	.0029	.0023	.0028	.0044	.0026	.0036	.0057	.0030		.0082	.0037	.0066	.0104	.0044
IRON		21 - 36 HRC	370	.0003	.0004	.0007	.0004	.0006 .0008	.0010	.0005	.0008	.0013	.0008 .0009	.0012	.0015 .0016	.0010	.0016 .0019	.0017	.0015	.0024	.0019	.0020	.0031	.0022		.0045	.0027	.0036 .0042	.0057	.0033
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB 21 - 36 HRC	345 335	.0003 .0003	.0005	.0007	.0005	.0008	.0010	.0005	.0010	.0014 .0013	.0009	.0014 .0012	.0016	.0012	.0019	.0018 .0017	.0018 .0015	.0028 .0024	.0021 .0019	.0023 .0020	.0036 .0031	.0024		.0052 .0045	.0029	.0042	.0066 .0057	.0035 .0033
NODULAR		75 - 98 HRB	310	.0003	.0005	.0008	.0005	.0008	.0011	.0006	.0010	.0015	.0009	.0014	.0016	.0012	.0020	.0018	.0018	.0029	.0021	.0024	.0038	.0025	.0034	.0054	.0029	.0044	.0069	.0036
(DUCTILE)	ASTM A536, ASTM 897	21 - 36 HRC	260	.0002	.0004	.0006	.0003	.0005	.0009	.0004	.0007	.0012	.0006	.0010	.0013	.0008	.0013	.0015	.0012	.0019	.0017	.0016	.0025	.0020		.0036		.0029	.0046	.0029
CAST IRON		36 - 50 HRC	135	.0002	.0002	.0005	.0002	.0003	.0007	.0003	.0004	.0009	.0004	.0006	.0010	.0005	.0008	.0012	.0008		.0014	.0010	.0016	.0016		.0023	.0019	.0018	.0029	.0023
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB 75 - 98 HRB	285 250	.0004 .0004	.0007 .0006	.0009 .0008	.0006 .0005	.0010 .0008	.0013 .0011	.0008 .0007	.0013 .0011	.0017 .0015	.0012 .0010	.0018 .0015	.0019 .0017	.0016 .0013	.0025 .0021	.0021 .0019	.0024 .0020	.0037 .0031	.0024 .0022	.0031 .0026	.0049 .0041	.0028 .0026		.0070 .0058	.0034 .0031	.0056 .0047	.0089 .0074	.0041 .0037
	Hastelloy C-22, Inconel	75 - 98 HRB	80	.0002	.0003	.0006	.0003	.0005	.0009	.0004	.0006	.0012	.0006	.0009	.0013	.0008	.0013	.0015	.0012		.0017	.0016	.0025	.0020	i i	.0035	1	.0029	.0045	.0029
NICKEL	625, Waspaloy, René	21 - 36 HRC	75	.0002	.0003	.0006	.0003	.0005	.0003	.0004	.0006	.0012	.0000	.0009	.0013	.0008	.0012	.0015	.0012	.0018	.0017	.0015	.0023	.0020		.0034	.0024	.0023	.0043	.0023
ALLOY	41, Inconel 718, Incoloy 20	36 - 50 HRC	70	.0002	.0003	.0005	.0002	.0004	.0008	.0003	.0005	.0010	.0005	.0008	.0012	.0007	.0010	.0014	.0010			.0013	.0020	.0018		.0029		.0023	.0037	.0026
	Ti Grade 1, Ti Grade 2,	< 75 HRB	300	.0006	.0009	.0010	.0008	.0013	.0014	.0011	.0017	.0019	.0017	.0025	.0022	.0022	.0035	.0025	.0033	.0051	.0028	.0043	.0067	.0033	.0061	.0096	.0039	.0078	.0122	.0048
PURE TITANIUM	Ti Grade 3, Ti Grade 4,	75 - 98 HRB	275	.0005	.0008	.0009	.0007	.0011	.0014	.0009	.0015	.0018	.0014	.0021	.0020	.0018	.0029	.0023	.0027	.0043	.0026	.0036	.0056	.0030		.0081	.0036	.0065	.0103	.0044
	Ti Grade 7, Ti Grade 12	21 - 36 HRC	250	.0004	.0006	.0008	.0005	.0008	.0011	.0007	.0011	.0015	.0010	.0016	.0017	.0014	.0022	.0020	.0021	.0032	.0022	.0027	.0042	.0026		.0060	.0031	.0049	.0077	.0038
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC 36 - 50 HRC	180 160	.0003 .0003	.0005 .0004	.0007 .0007	.0005 .0004	.0007 .0006	.0011 .0010	.0006	.0009 .0008	.0014 .0013	.0008 .0008	.0013 .0012	.0015 .0015	.0011 .0010	.0017 .0016	.0017 .0017	.0016 .0015	.0025 .0023	.0020 .0019	.0021 .0019	.0033 .0030	.0023 .0022		.0048 .0043	.0028 .0027	.0039 .0035	.0061 .0055	.0034 .0032
	ASTM F562, ASTM	75 - 98 HRB	210	.0003	.0004	.0007	.0004	.0005	.0010	.0005	.0008	.0013	.0008	.0012	.0013	.0010	.0010	.0017	.0013	.0023	.0019	.0019	.0030	.0022	.0026	.0043	.0027	.0035	.0055	.0032
COBALT ALLOY		21 - 36 HRC	170	.0003	.0004	.0006	.0004	.0005	.0009	.0005	.0007	.0012	.0007	.0010	.0014	.0009	.0014	.0016	.0013	.0021	.0018	.0017	.0027	.0021	.0025	.0039	.0025	.0031	.0050	.0030
	F133		65	.0002	.0003	.0005	.0002	.0004	.0008	.0003	.0005	.0010	.0005	.0007	.0011	.0006	.0010	.0013	.0009	.0014	.0015	.0012	.0018	.0017	.0017	.0026	.0021	.0021	.0034	.0025

Milling Process	Hardness	ADOC	RDOC				
Slot (Full Slotting)	< 35 HRC	30%-75% Diameter	100% Diameter				
Slot (Full Slotting)	≥ 35 HRC	25%-50% Diameter	100% Diameter				
Deb (Traditional Daughing)	< 35 HRC	Up to Max LOC	15%-30% Diameter				
Rgh (Traditional Roughing)	≥ 35 HRC	Up to Max LOC	10%-20% 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.