

SPEEDS & FEEDS

3 Flute - Variable Pitch

HSV-3

HSV-3																	
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	.0007	.0012	.0010	.0018	.0013	.0023	.0020	.0035	.0026	.0045	.0037	.0066	.0047	.0084
		75 - 98 HRB	445	.0005	.0009	.0007	.0013	.0010	.0017	.0014	.0026	.0019	.0033	.0027	.0048	.0034	.0062
		21 - 36 HRC	400	.0003	.0006	.0005	.0008	.0006	.0011	.0009	.0017	.0012	.0021	.0017	.0031	.0022	.0040
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	390	.0004	.0008	.0006	.0011	.0008	.0015	.0012	.0022	.0016	.0029	.0023	.0042	.0030	.0053
		21 - 36 HRC	340	.0003	.0006	.0005	.0009	.0006	.0011	.0009	.0017	.0012	.0021	.0017	.0031	.0022	.0040
		36 - 50 HRC	260	.0003	.0005	.0004	.0007	.0005	.0010	.0008	.0014	.0011	.0019	.0015	.0027	.0019	.0035
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	340	.0004	.0008	.0006	.0011	.0008	.0015	.0012	.0022	.0016	.0029	.0023	.0042	.0030	.0053
		21 - 36 HRC	250	.0003	.0006	.0005	.0009	.0007	.0012	.0010	.0018	.0013	.0023	.0019	.0033	.0023	.0042
		36 - 50 HRC	145	.0003	.0005	.0004	.0007	.0005	.0010	.0009	.0014	.0010	.0018	.0014	.0026	.0018	.0033
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	290	.0006	.0010	.0008	.0015	.0011	.0019	.0016	.0029	.0021	.0038	.0031	.0055	.0039	.0070
		75 - 98 HRB	255	.0004	.0007	.0006	.0010	.0008	.0013	.0011	.0020	.0015	.0026	.0021	.0038	.0027	.0048
		21 - 36 HRC	175	.0003	.0006	.0005	.0009	.0007	.0012	.0010	.0018	.0013	.0023	.0019	.0034	.0024	.0043
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	265	.0004	.0007	.0006	.0011	.0008	.0014	.0012	.0022	.0016	.0028	.0023	.0041	.0029	.0052
		21 - 36 HRC	225	.0004	.0007	.0006	.0010	.0007	.0013	.0011	.0020	.0014	.0025	.0020	.0037	.0026	.0047
		36 - 50 HRC	180	.0003	.0005	.0004	.0008	.0006	.0011	.0009	.0016	.0011	.0020	.0016	.0030	.0021	.0038
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	300	.0004	.0008	.0006	.0011	.0008	.0015	.0013	.0022	.0016	.0029	.0023	.0042	.0030	.0054
		21 - 36 HRC	280	.0004	.0007	.0006	.0010	.0007	.0013	.0011	.0020	.0014	.0025	.0020	.0036	.0026	.0047
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	200	.0003	.0006	.0005	.0008	.0006	.0011	.0009	.0016	.0012	.0021	.0017	.0031	.0022	.0039
		36 - 50 HRC	145	.0003	.0005	.0004	.0007	.0005	.0010	.0008	.0014	.0010	.0018	.0015	.0027	.0019	.0034
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	410	.0007	.0012	.0010	.0018	.0013	.0024	.0020	.0036	.0026	.0047	.0038	.0068	.0048	.0087
		21 - 36 HRC	370	.0004	.0007	.0006	.0010	.0007	.0013	.0011	.0020	.0014	.0025	.0021	.0037	.0026	.0047
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	345	.0004	.0008	.0007	.0012	.0009	.0015	.0013	.0023	.0017	.0030	.0024	.0043	.0030	.0055
		21 - 36 HRC	335	.0004	.0007	.0006	.0010	.0007	.0013	.0011	.0020	.0014	.0025	.0021	.0037	.0026	.0047
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	310	.0005	.0008	.0007	.0012	.0009	.0016	.0013	.0024	.0017	.0031	.0025	.0045	.0032	.0057
		21 - 36 HRC	260	.0003	.0005	.0005	.0008	.0006	.0011	.0009	.0016	.0012	.0020	.0016	.0030	.0021	.0038
		36 - 50 HRC	135	.0002	.0003	.0003	.0005	.0004	.0007	.0006	.0010	.0007	.0013	.0010	.0019	.0013	.0024
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	285	.0006	.0010	.0009	.0016	.0012	.0020	.0017	.0031	.0022	.0039	.0032	.0057	.0041	.0073
		75 - 98 HRB	250	.0005	.0009	.0007	.0013	.0010	.0017	.0014	.0026	.0019	.0033	.0027	.0048	.0034	.0061
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	80	.0003	.0005	.0004	.0008	.0006	.0010	.0009	.0016	.0011	.0020	.0016	.0029	.0021	.0037
		21 - 36 HRC	75	.0003	.0005	.0004	.0008	.0006	.0010	.0008	.0015	.0011	.0019	.0016	.0028	.0020	.0036
		36 - 50 HRC	70	.0003	.0004	.0004	.0007	.0005	.0008	.0007	.0013	.0009	.0016	.0013	.0024	.0017	.0031
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	300	.0008	.0014	.0012	.0022	.0016	.0028	.0024	.0042	.0031	.0055	.0044	.0079	.0056	.0101
		75 - 98 HRB	275	.0007	.0012	.0010	.0018	.0013	.0024	.0020	.0035	.0026	.0046	.0037	.0066	.0047	.0085
		21 - 36 HRC	250	.0005	.0009	.0008	.0014	.0010	.0018	.0015	.0027	.0019	.0034	.0028	.0050	.0035	.0064
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	180	.0004	.0007	.0006	.0011	.0008	.0014	.0012	.0021	.0015	.0027	.0022	.0039	.0028	.0050
		36 - 50 HRC	160	.0004	.0006	.0005	.0010	.0007	.0013	.0011	.0019	.0014	.0025	.0020	.0036	.0025	.0046
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	210	.0003	.0006	.0005	.0009	.0007	.0012	.0010	.0018	.0013	.0023	.0019	.0033	.0024	.0042
		21 - 36 HRC	170	.0003	.0006	.0005	.0009	.0006	.0011	.0010	.0017	.0012	.0022	.0018	.0032	.0023	.0041
		36 - 50 HRC	65	.0002	.0004	.0003	.0006	.0004	.0008	.0007	.0012	.0008	.0015	.0012	.0022	.0015	.0028

Milling Process	Hardness	ADOC	RDOC
Slot (Full Slotting)	< 35 HRC	100%-150% Diameter	100% Diameter
	≥ 35 HRC	100%-125% Diameter	100% Diameter
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	Up to 50% Diameter
	≥ 35 HRC	Up to Max LOC	Up to 50% 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.