

SPEEDS & FEEDS

HSVR-C-4

4 Flute - Chipbreaker Rougher - Variable Pitch

HSVR-C-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
TOOL STEEL	A2, H13, L6, P20, S7	> 50 HRC	155	.0003	.0004	.0004	.0006	.0005	.0008	.0007	.0012	.0010	.0016	.0014	.0023	.0017	.0029
		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
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	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
		75 - 98 HRB	290	.0006	.0011	.0010	.0015	.0013	.0021	.0019	.0031	.0025	.0040	.0035	.0058	.0045	.0073
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	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
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	> 50 HRC	55	.0002	.0004	.0003	.0005	.0004	.0007	.0006	.0010	.0008	.0014	.0012	.0019	.0015	.0025
		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
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	36 - 50 HRC	180	.0003	.0006	.0005	.0008	.0007	.0011	.0010	.0016	.0013	.0022	.0019	.0031	.0024	.0039
		21 - 36 HRC	200	.0004	.0006	.0005	.0009	.0007	.0012	.0011	.0017	.0014	.0023	.0020	.0032	.0025	.0041
		75 - 98 HRB	300	.0005	.0008	.0007	.0012	.0010	.0016	.0014	.0024	.0019	.0031	.0027	.0044	.0034	.0056
GRAY CAST IRON	SAE J431, ASTM A48	21 - 36 HRC	280	.0004	.0007	.0006	.0010	.0008	.0014	.0012	.0020	.0016	.0027	.0023	.0038	.0030	.0049
		75 - 98 HRB	410	.0008	.0013	.0012	.0019	.0016	.0026	.0023	.0038	.0030	.0050	.0044	.0071	.0055	.0091
		36 - 50 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	36 - 50 HRC	145	.0003	.0005	.0005	.0008	.0006	.0010	.0009	.0015	.0012	.0020	.0017	.0028	.0022	.0036
		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	36 - 50 HRC	135	.0002	.0004	.0003	.0005	.0004	.0007	.0007	.0011	.0009	.0014	.0012	.0020	.0015	.0025
		21 - 36 HRC	260	.0004	.0006	.0005	.0008	.0007	.0011	.0010	.0017	.0013	.0022	.0019	.0031	.0024	.0040
		75 - 98 HRB	310	.0005	.0009	.0008	.0013	.0010	.0017	.0015	.0025	.0020	.0033	.0029	.0047	.0037	.0060
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
		21 - 36 HRC	200	.0004	.0006	.0005	.0009	.0007	.0012	.0011	.0017	.0014	.0023	.0020	.0032	.0025	.0041
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	36 - 50 HRC	70	.0003	.0005	.0004	.0007	.0006	.0009	.0008	.0014	.0011	.0018	.0015	.0025	.0020	.0032
		21 - 36 HRC	75	.0003	.0005	.0005	.0008	.0006	.0011	.0010	.0016	.0013	.0021	.0018	.0030	.0023	.0037
		75 - 98 HRB	80	.0003	.0006	.0005	.0008	.0007	.0011	.0010	.0016	.0013	.0022	.0019	.0031	.0024	.0039
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	36 - 50 HRC	160	.0004	.0007	.0006	.0010	.0008	.0014	.0012	.0020	.0016	.0026	.0023	.0038	.0029	.0048
		21 - 36 HRC	180	.0005	.0008	.0007	.0011	.0009	.0015	.0014	.0022	.0018	.0029	.0025	.0041	.0032	.0053
		75 - 98 HRB	210	.0004	.0006	.0006	.0009	.0008	.0013	.0011	.0019	.0015	.0024	.0021	.0035	.0027	.0045
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	36 - 50 HRC	65	.0003	.0004	.0004	.0006	.0005	.0008	.0007	.0012	.0010	.0016	.0014	.0023	.0018	.0029
		21 - 36 HRC	170	.0004	.0006	.0006	.0009	.0008	.0012	.0011	.0018	.0014	.0024	.0021	.0034	.0026	.0043
		75 - 98 HRB	210	.0004	.0006	.0006	.0009	.0008	.0013	.0011	.0019	.0015	.0024	.0021	.0035	.0027	.0045

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. For more accurate running parameters, please refer to Machining Advisor Pro.