

FRACTIONAL Ice-Carb®

Series 140 8D Fractional	Hardness	Vc (sfm)	DC • in								
			1/8	3/16	1/4	3/8	1/2	5/8	3/4		
P CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175 Bhn or ≤ 7 HRc	405	RPM	12377	8251	6188	4126	3094	2475	2063	
		(324-486)	Fr	0.0036	0.0053	0.0071	0.0107	0.0142	0.0178	0.0213	
			Feed (ipm)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	
	≤ 275 Bhn or ≤ 28 HRc	370	RPM	11307	7538	5654	3769	2827	2261	1885	
		(296-444)	Fr	0.0030	0.0045	0.0060	0.0090	0.0120	0.0150	0.0180	
			Feed (ipm)	34.0	34.0	34.0	34.0	34.0	34.0	34.0	
	≤ 425 Bhn or ≤ 45 HRc	210	RPM	6418	4278	3209	2139	1604	1284	1070	
		(168-252)	Fr	0.0026	0.0039	0.0051	0.0077	0.0103	0.0129	0.0154	
			Feed (ipm)	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
	M ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275 Bhn or ≤ 28 HRc	320	RPM	9779	6519	4890	3260	2445	1956	1630
			(256-384)	Fr	0.0026	0.0038	0.0051	0.0077	0.0102	0.0128	0.0153
				Feed (ipm)	25.0	25.0	25.0	25.0	25.0	25.0	25.0
≤ 375 Bhn or ≤ 40 HRc		190	RPM	5806	3871	2903	1935	1452	1161	968	
		(152-228)	Fr	0.0020	0.0030	0.0040	0.0059	0.0079	0.0099	0.0119	
			Feed (ipm)	11.5	11.5	11.5	11.5	11.5	11.5	11.5	
≤ 450 Bhn or ≤ 48 HRc		135	RPM	4126	2750	2063	1375	1031	825	688	
		(108-162)	Fr	0.0016	0.0024	0.0032	0.0047	0.0063	0.0079	0.0095	
			Feed (ipm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
K STAINLESS STEELS (FREE MACHINING) 303, 416, 420F, 430F, 440F		≤ 185 Bhn or ≤ 9 HRc	290	RPM	8862	5908	4431	2954	2216	1772	1477
			(232-348)	Fr	0.0020	0.0030	0.0039	0.0059	0.0079	0.0099	0.0118
				Feed (ipm)	17.5	17.5	17.5	17.5	17.5	17.5	17.5
	≤ 275 Bhn or ≤ 28 HRc	180	RPM	5501	3667	2750	1834	1375	1100	917	
		(144-216)	Fr	0.0018	0.0027	0.0036	0.0055	0.0073	0.0091	0.0109	
			Feed (ipm)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
	K STAINLESS STEELS (DIFFICULT) 304, 316, 321, 13-8 PH, 15-5PH, 17-4 PH, Custom 450	≤ 275 Bhn or ≤ 28 HRc	130	RPM	3973	2649	1986	1324	993	795	662
			(104-156)	Fr	0.0018	0.0026	0.0035	0.0053	0.0070	0.0088	0.0106
				Feed (ipm)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
		≤ 375 Bhn or ≤ 40 HRc	95	RPM	2903	1935	1452	968	726	581	484
			(76-114)	Fr	0.0016	0.0023	0.0031	0.0047	0.0062	0.0078	0.0093
				Feed (ipm)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
K CAST IRONS Gray, Malleable, Ductile		≤ 220 Bhn or ≤ 19 HRc	350	RPM	10696	7131	5348	3565	2674	2139	1783
			(280-420)	Fr	0.0037	0.0056	0.0075	0.0112	0.0150	0.0187	0.0224
				Feed (ipm)	40.0	40.0	40.0	40.0	40.0	40.0	40.0
		≤ 260 Bhn or ≤ 26 HRc	310	RPM	9474	6316	4737	3158	2368	1895	1579
			(248-372)	Fr	0.0039	0.0059	0.0078	0.0117	0.0156	0.0195	0.0234
				Feed (ipm)	37.0	37.0	37.0	37.0	37.0	37.0	37.0

continued on next page

Series 140 8D Fractional	Hardness	Vc (sfm)	DC • in								
			1/8	3/16	1/4	3/8	1/2	5/8	3/4		
N ALUMINUM ALLOYS 2017, 2024, 356, 6061, 7075	≤ 80 Bhn or ≤ 47 HRb	730	RPM	22309	14873	11154	7436	5577	4462	3718	
		(584-876)	Fr	0.0045	0.0067	0.0090	0.0134	0.0179	0.0224	0.0269	
			Feed (ipm)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
	≤ 150 Bhn or ≤ 7 HRc	635	RPM	19406	12937	9703	6469	4851	3881	3234	
		(508-762)	Fr	0.0046	0.0070	0.0093	0.0139	0.0186	0.0232	0.0278	
			Feed (ipm)	90.0	90.0	90.0	90.0	90.0	90.0	90.0	
	COPPER ALLOYS Alum Bronze, C110, Muntz Brass	≤ 140 Bhn or ≤ 3 HRc	255	RPM	7793	5195	3896	2598	1948	1559	1299
			(204-306)	Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0090	0.0108
				Feed (ipm)	14.0	14.0	14.0	14.0	14.0	14.0	14.0
		≤ 200 Bhn or ≤ 23 HRc	235	RPM	7182	4788	3591	2394	1795	1436	1197
			(188-282)	Fr	0.0018	0.0027	0.0036	0.0054	0.0072	0.0091	0.0109
				Feed (ipm)	13.0	13.0	13.0	13.0	13.0	13.0	13.0
S SUPER ALLOYS (NICKEL, COBALT, IRON BASE) Inconel 601, 617, 625, Incoloy, Monel 400, Rene, Waspaloy	≤ 300 Bhn or ≤ 32 HRc	65	RPM	1986	1324	993	662	497	397	331	
		(52-78)	Fr	0.0009	0.0013	0.0017	0.0026	0.0034	0.0043	0.0051	
			Feed (ipm)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
	≤ 400 Bhn or ≤ 43 HRc	35	RPM	1070	713	535	357	267	214	178	
		(28-42)	Fr	0.0006	0.0008	0.0011	0.0017	0.0022	0.0028	0.0034	
			Feed (ipm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	TITANIUM ALLOYS Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti-6Al4V	≤ 275 Bhn or ≤ 28 HRc	185	RPM	5654	3769	2827	1885	1413	1131	942
			(148-222)	Fr	0.0016	0.0024	0.0032	0.0048	0.0064	0.0080	0.0096
				Feed (ipm)	9.0	9.0	9.0	9.0	9.0	9.0	9.0
		≤ 350 Bhn or ≤ 38 HRc	140	RPM	4278	2852	2139	1426	1070	856	713
			(112-168)	Fr	0.0012	0.0018	0.0023	0.0035	0.0047	0.0058	0.0070
				Feed (ipm)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
≤ 440 Bhn or ≤ 47 HRc	75	RPM	2292	1528	1146	764	573	458	382		
	(60-90)	Fr	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060		
		Feed (ipm)	2.3	2.3	2.3	2.3	2.3	2.3	2.3		
H TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 200 Bhn or ≤ 13 HRc	140	RPM	4278	2852	2139	1426	1070	856	713	
		(112-168)	Fr	0.0020	0.0030	0.0040	0.0060	0.0079	0.0099	0.0119	
			Feed (ipm)	8.5	8.5	8.5	8.5	8.5	8.5	8.5	
	≤ 375 Bhn or ≤ 40 HRc	90	RPM	2750	1834	1375	917	688	550	458	
		(72-108)	Fr	0.0011	0.0016	0.0022	0.0033	0.0044	0.0055	0.0065	
			Feed (ipm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	≤ 475 Bhn or ≤ 50 HRc	80	RPM	2445	1630	1222	815	611	489	407	
		(64-96)	Fr	0.0006	0.0009	0.0012	0.0018	0.0025	0.0031	0.0037	
			Feed (ipm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	

Bhn (Brinell) HRc (Rockwell C) HRb (Rockwell B)
 $rpm = Vc \times 3.82 / DC$
 $ipm = Fr \times rpm$
 reduce speed and feed for materials harder than listed
 refer to the SGS Tool Wizard® for complete technical information (www.kyocera-sgstool.com)