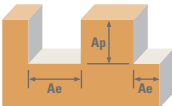


Coarse Cut Carbon Composite

Series 31 Fractional		 Ae x DC Ap x DC		Vc (sfm)	DC • in					
					1/4	5/16	3/8	1/2		
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)	 Slot	1	≤ 1	400	RPM	6112	4890	4075	3056
					(320-480)	Fr	0.0029	0.0065	0.0088	0.0147
						Feed (ipm)	18	32	36	45
		 Profile	≤ 0.5	≤ 1.5	500	RPM	7640	6112	5093	3820
					(400-600)	Fr	0.0029	0.0065	0.0088	0.0147
						Feed (ipm)	23	40	45	56
		 HSM	≤ 0.05	≤ 2	825	RPM	12606	10085	8404	6303
					(660-990)	Fr	0.0069	0.0151	0.0206	0.0344
						Feed (ipm)	87	152	173	217
	GFRP (FIBERGLASS)	 Slot	1	≤ 1	320	RPM	4890	3912	3260	2445
					(256-384)	Fr	0.0031	0.0066	0.0089	0.0147
						Feed (ipm)	15	26	29	36
		 Profile	≤ 0.5	≤ 1.5	400	RPM	6112	4890	4075	3056
					(320-480)	Fr	0.0031	0.0066	0.0089	0.0147
						Feed (ipm)	19	33	36	45
		 HSM	≤ 0.05	≤ 2	660	RPM	10085	8068	6723	5042
					(528-792)	Fr	0.0069	0.0150	0.0205	0.0343
						Feed (ipm)	70	121	138	173
	CARBON, GRAPHITE	 Slot	1	≤ 1	480	RPM	7334	5868	4890	3667
					(384-576)	Fr	0.0040	0.0087	0.0119	0.0199
						Feed (ipm)	29	51	58	73
		 Profile	≤ 0.5	≤ 1.5	600	RPM	9168	7334	6112	4584
					(480-720)	Fr	0.0040	0.0087	0.0119	0.0199
						Feed (ipm)	36	64	73	91
		 HSM	≤ 0.05	≤ 2	990	RPM	15127	12102	10085	7564
					(792-1188)	Fr	0.0092	0.0201	0.0275	0.0459
						Feed (ipm)	139	243	277	347
	PLASTICS	 Slot	1	≤ 1	800	RPM	12224	9779	8149	6112
					(640-690)	Fr	0.0040	0.0087	0.0119	0.0200
						Feed (ipm)	49	85	97	122
		 Profile	≤ 0.5	≤ 1.5	1000	RPM	15280	12224	10187	7640
					(800-1200)	Fr	0.0040	0.0087	0.0119	0.0200
						Feed (ipm)	61	106	121	153
		 HSM	≤ 0.05	≤ 2	1650	RPM	25212	20170	16808	12606
					(1320-1980)	Fr	0.0092	0.0201	0.0275	0.0459
						Feed (ipm)	232	405	462	578

HSM (high speed machining)

rpm = Vc x 3.82 / DC

ipm = Fr x rpm

adjust parameters based on resin type and fiber structure

reduce speed when overheating causes melting or damage to resin

reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths

rates shown are for use without coolant; rates may be increased with coolant

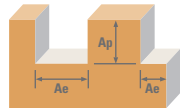
dust collection is vital when machining dry

diamond coating will increase tool life in graphite and composite materials

refer to the SGS Tool Wizard® for complete technical information

(www.kyocera-sgtool.com)

Coarse Cut Carbon Composite



Series 31M Metric			Vc (m/min)	DC • mm						
	Ae x DC	Ap x DC		6	8	10	12			
N	CFRP, AFRP (CARBON FIBER, ARAMID FIBER)		1	≤ 1	120	RPM	6361	4771	3817	3181
					(96-164)	Fr	0.071	0.170	0.244	0.366
						Feed (mm/min)	450	810	930	1165
			≤ 0.5	≤ 1.5	150	RPM	7951	5963	4771	3976
					(120-180)	Fr	0.071	0.170	0.244	0.366
						Feed (mm/min)	563	1013	1163	1456
			≤ 0.05	≤ 2	250	RPM	13252	9939	7951	6626
					(200-300)	Fr	0.162	0.388	0.555	0.832
						Feed (mm/min)	2150	3860	4415	5515
	GFRP (FIBERGLASS)		1	≤ 1	100	RPM	5301	3976	3181	2650
					(80-120)	Fr	0.069	0.165	0.237	0.357
						Feed (mm/min)	365	655	755	945
			≤ 0.5	≤ 1.5	120	RPM	6361	4771	3817	3181
					(96-164)	Fr	0.069	0.165	0.237	0.357
						Feed (mm/min)	438	786	906	1134
			≤ 0.05	≤ 2	200	RPM	10602	7951	6361	5301
					(160-240)	Fr	0.163	0.390	0.557	0.834
						Feed (mm/min)	1725	3100	3540	4420
CARBON, GRAPHITE		1	≤ 1	145	RPM	7686	5765	4612	3843	
				(116-174)	Fr	0.095	0.226	0.321	0.483	
					Feed (mm/min)	728	1300	1480	1855	
		≤ 0.5	≤ 1.5	185	RPM	9807	7355	5884	4903	
				(148-222)	Fr	0.095	0.226	0.321	0.483	
					Feed (mm/min)	929	1659	1888	2367	
		≤ 0.05	≤ 2	300	RPM	15903	11927	9542	7951	
				(240-360)	Fr	0.217	0.517	0.739	1.111	
					Feed (mm/min)	3450	6170	7050	8830	
PLASTICS		1	≤ 1	245	RPM	12987	9740	7792	6494	
				(196-294)	Fr	0.094	0.223	0.318	0.477	
					Feed (mm/min)	1215	2175	2475	3100	
		≤ 0.5	≤ 1.5	305	RPM	16168	12126	9701	8084	
				(244-366)	Fr	0.094	0.223	0.318	0.477	
					Feed (mm/min)	1513	2708	3081	3859	
		≤ 0.05	≤ 2	505	RPM	26769	20077	16062	13385	
				(404-606)	Fr	0.215	0.512	0.731	1.098	
					Feed (mm/min)	5760	10280	11745	14700	

HSM (high speed machining)
 $\text{rpm} = (\text{Vc} \times 1000) / (\text{DC} \times 3.14)$
 $\text{mm/min} = \text{Fr} \times \text{rpm}$
 adjust parameters based on resin type and fiber structure
 reduce speed when overheating causes melting or damage to resin
 reduce feed if delamination or fraying occur

finish cuts typically required reduced feed and cutting depths
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