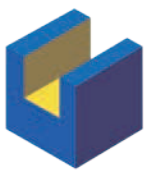
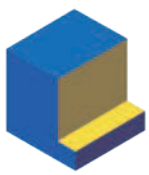
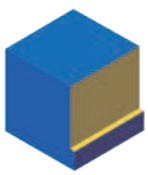
Speed & Feed Recommendations

CARB Five Flute End Mills

55M Metric	HARDNESS BRINELL	CUT Type	SPEED m/min	FEED (mm/flute) 6	8	10	12	16	20
CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175	Slot	107	0.0192	0.032	0.040	0.048	0.064	0.064
		Profile	133	0.0192	0.032	0.040	0.048	0.064	0.064
		Light	219	0.0432	0.073	0.091	0.110	0.147	0.147
	> 175 ≤ 275	Slot	93	0.0192	0.032	0.040	0.048	0.064	0.064
		Profile	116	0.0192	0.032	0.040	0.048	0.064	0.064
		Light	192	0.0432	0.073	0.091	0.110	0.147	0.147
ALLOY STEEL 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275	Slot	78	0.0144	0.023	0.029	0.036	0.048	0.048
		Profile	98	0.0144	0.023	0.029	0.036	0.048	0.048
		Light	162	0.0336	0.055	0.069	0.082	0.109	0.109
	> 275 ≤ 375	Slot	53	0.0144	0.023	0.029	0.036	0.048	0.048
		Profile	67	0.0144	0.023	0.029	0.036	0.048	0.048
		Light	110	0.0336	0.055	0.069	0.082	0.109	0.109
TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	Slot	70	0.0144	0.023	0.029	0.034	0.045	0.045
		Profile	87	0.0144	0.023	0.029	0.034	0.045	0.045
		Light	143	0.0312	0.051	0.064	0.077	0.102	0.104
	> 250 ≤ 375	Slot	43	0.0096	0.017	0.021	0.026	0.035	0.035
		Profile	53	0.0096	0.017	0.021	0.026	0.035	0.035
		Light	88	0.0240	0.041	0.051	0.060	0.080	0.080
CAST IRON Gray, Malleable, Ductile	≤ 220	Slot	104	0.0192	0.032	0.040	0.048	0.064	0.064
		Profile	131	0.0192	0.032	0.040	0.048	0.064	0.064
		Light	215	0.0432	0.073	0.091	0.110	0.147	0.147
	> 220 ≤ 260	Slot	78	0.0192	0.032	0.040	0.048	0.064	0.064
		Profile	98	0.0192	0.032	0.040	0.048	0.064	0.064
		Light	160	0.0432	0.073	0.091	0.110	0.147	0.147
STAINLESS (free machining) 303, 416, 420F, 430F, 440F	≤ 275	Slot	82	0.0144	0.023	0.029	0.036	0.048	0.048
		Profile	104	0.0144	0.023	0.029	0.036	0.048	0.048
		Light	171	0.0336	0.055	0.069	0.082	0.109	0.109
STAINLESS (difficult) 304, 304L, 316, 316L	≤ 275	Slot	56	0.0120	0.019	0.024	0.029	0.038	0.037
		Profile	72	0.0120	0.019	0.024	0.029	0.038	0.037
		Light	117	0.0026	0.045	0.056	0.067	0.090	0.088
STAINLESS (PH) 17-4PH, 15-5PH, Custom 450, 16-6PH, PH13-8Mo	≤ 325	Slot	52	0.0120	0.019	0.024	0.029	0.038	0.037
		Profile	66	0.0120	0.019	0.024	0.029	0.038	0.037
		Light	108	0.0026	0.045	0.056	0.067	0.090	0.088
TITANIUM Ti5Al-5V-5Mo, Ti6Al4V, Ti-7Al4Mo	≤ 350	Slot	58	0.0144	0.023	0.029	0.034	0.045	0.045
		Profile	72	0.0144	0.023	0.029	0.034	0.045	0.045
		Light	119	0.0312	0.051	0.064	0.077	0.102	0.104
HIGH TEMPERATURE ALLOY A-286, Hastelloy, Incoloy, Inconel, Rene, Waspalloy	≤ 300	Slot	16	0.0120	0.019	0.024	0.029	0.038	0.037
		Profile	20	0.0120	0.019	0.024	0.029	0.038	0.037
		Light	33	0.0026	0.045	0.056	0.067	0.090	0.088

CUT TYPE					
SLOT		PROFILE		LIGHT*	
Short Rw = D_1 Ad = .6 x D_1	Regular Rw = D_1 Ad = .5 x D_1	Short Rw = .5 x D_1 Ad = L_2	Regular Rw = .3 x D_1 Ad = 1.5 x D_1	Short, Regular Rw = .05 x D_1 Ad = L_2	Long Rw = .02 x D_1 Ad = 3 x D_1
					

rpm = (1000 x m/min) / (3.14 x D_1)
mm/min = (mm/flute) x 5 x rpm

- maximum recommended depths shown
- reduce speed and feed for materials harder than listed
- long flute tools not recommended for Slot or Profile

* finish cuts typically require reduced feed and cutting depths of .02 x D1 maximum

- refer to the SGS Tool Wizard for more complete technical information (available at)