



# Speed & Feed Recommendations

Z1, Z1B, Z16CR Fractional	HARDNESS	CUT	SPEED		FEED (inch/flute)				
	BRINELL	Type	sfm	1/8	1/4	3/8	1/2	3/4	1
CARBON STEEL 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536	≤ 175	Slot	505	0.00038	0.0010	0.0019	0.0025	0.0030	0.0035
		Profile	630	0.00038	0.0010	0.0019	0.0025	0.0030	0.0035
		Light	1040	0.00086	0.0023	0.0043	0.0057	0.0069	0.0080
	> 175 ≤ 275	Slot	440	0.00038	0.0010	0.0019	0.0025	0.0030	0.0035
		Profile	550	0.00038	0.0010	0.0019	0.0025	0.0030	0.0035
		Light	910	0.00086	0.0023	0.0043	0.0057	0.0069	0.0080
ALLOY STEEL 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100	≤ 275	Slot	370	0.00028	0.0008	0.0014	0.0019	0.0023	0.0026
		Profile	465	0.00028	0.0008	0.0014	0.0019	0.0023	0.0026
		Light	765	0.00065	0.0017	0.0032	0.0043	0.0052	0.0060
	> 275 ≤ 375	Slot	250	0.00028	0.0008	0.0014	0.0019	0.0023	0.0026
		Profile	315	0.00028	0.0008	0.0014	0.0019	0.0023	0.0026
		Light	520	0.00065	0.0017	0.0032	0.0043	0.0052	0.0060
TOOL STEEL A2, D2, H13, L2, M2, P20, S7, T15, W2	≤ 250	Slot	240	0.00025	0.0007	0.0012	0.0017	0.0020	0.0023
		Profile	300	0.00025	0.0007	0.0012	0.0017	0.0020	0.0023
		Light	495	0.00057	0.0015	0.0028	0.0038	0.0045	0.0053
	> 250 ≤ 375	Slot	145	0.00020	0.0005	0.0010	0.0013	0.0016	0.0018
		Profile	185	0.00020	0.0005	0.0010	0.0013	0.0016	0.0018
		Light	305	0.00045	0.0012	0.0023	0.0030	0.0036	0.0042
CAST IRON Gray, Malleable, Ductile	≤ 220	Slot	355	0.00035	0.0009	0.0018	0.0024	0.0028	0.0033
		Profile	445	0.00035	0.0009	0.0018	0.0024	0.0028	0.0033
		Light	730	0.00081	0.0022	0.0041	0.0054	0.0065	0.0076
	> 220 ≤ 260	Slot	265	0.00035	0.0009	0.0018	0.0024	0.0028	0.0033
		Profile	330	0.00035	0.0009	0.0018	0.0024	0.0028	0.0033
		Light	545	0.00081	0.0022	0.0041	0.0054	0.0065	0.0076
STAINLESS (free machining) 303, 416, 420F, 430F, 440F	≤ 275	Slot	455	0.00027	0.0007	0.0014	0.0018	0.0022	0.0025
		Profile	570	0.00027	0.0007	0.0014	0.0018	0.0022	0.0025
		Light	935	0.00062	0.0017	0.0031	0.0041	0.0050	0.0058
STAINLESS (difficult) 304, 304L, 316, 316L	≤ 275	Slot	315	0.00022	0.0006	0.0011	0.0014	0.0017	0.0020
		Profile	395	0.00022	0.0006	0.0011	0.0014	0.0017	0.0020
		Light	650	0.00050	0.0013	0.0025	0.0033	0.0040	0.0046
STAINLESS (PH) 17-4PH, 15-5PH, Custom 450, 16-6PH, PH13-8Mo	≤ 325	Slot	290	0.00022	0.0006	0.0011	0.0014	0.0017	0.0020
		Profile	360	0.00022	0.0006	0.0011	0.0014	0.0017	0.0020
		Light	595	0.00050	0.0013	0.0025	0.0033	0.0040	0.0046
TITANIUM Ti5Al-5V-5Mo, Ti6Al4V, Ti-7Al4Mo	≤ 350	Slot	170	0.00020	0.0005	0.0010	0.0013	0.0016	0.0018
		Profile	215	0.00020	0.0005	0.0010	0.0013	0.0016	0.0018
		Light	355	0.00045	0.0012	0.0023	0.0030	0.0036	0.0042
HIGH TEMPERATURE ALLOY A-286, Hastelloy, Incoloy, Inconel, Rene, Waspalloy	≤ 300	Slot	65	0.00015	0.0004	0.0008	0.0010	0.0012	0.0014
		Profile	80	0.00015	0.0004	0.0008	0.0010	0.0012	0.0014
		Light	130	0.00034	0.0009	0.0017	0.0023	0.0028	0.0032

CUT TYPE			rpm = sfm x 3.82 / D <sub>1</sub> ipm = (inch/flute) x 4 x rpm
SLOT	PROFILE	LIGHT*	
Short, Regular Rw = D <sub>1</sub> Ad = D <sub>1</sub>	Short Rw = .5 x D <sub>1</sub> Ad = L <sub>2</sub>	Regular Rw = .5 x D <sub>1</sub> Ad = 1.5 x D <sub>1</sub>	Short, Regular Rw = .05 x D <sub>1</sub> Ad = L <sub>2</sub>
			<ul style="list-style-type: none"> <li>• maximum recommended depths shown</li> <li>• reduce speed and feed for materials harder than listed</li> <li>* finish cuts typically require reduced feed and cutting depths of .02 x D<sub>1</sub> maximum</li> <li>• refer to the SGS Tool Wizard for more complete technical information (available at )</li> </ul>