

Using These Tables. The Speeds & Feeds listed below are conservative recommendations for initial setup. In actual use, depending on the machining environment and workpiece material, significantly higher speeds and feeds may be achievable. Using the below as a starting point, cutting speed/feed can be gradually adjusted upwards until the optimum settings per application are found. Questions? Contact us by telephone at (800) 776-6170.

## Series # 4105/4106 body (1xD/1.5xD) with # 4111 insert

Material group	Hardness	SFM	Feed Rate - IPR											
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700mm	5/8 in. 15.870mm	3/4 in. 19.050mm	1 in. 25.400mm	1 1/4 in. 31.75mm	1 1/2 in. 38.10mm		
Common structural steels	≤ 100 BHN	425	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	100-260 BHN	360	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Free-cutting steels	≤ 24 HRC	425	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
Unalloyed heat-treatable steels	≤ 16 HRC	425	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	16-24 HRC	410	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	24-30 HRC	360	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Alloyed heat-treatable steels	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	30-38 HRC	295	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Unalloyed case hardened steels	≤ 230 BHN	425	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Alloyed case hardened steels	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	30-38 HRC	230	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
Nitriding steels	24-30 HRC	345	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
	30-38 HRC	230	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
Tool steels	≤ 24 HRC	195	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
	24-30 HRC	180	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
High speed steels	14-30 HRC	180	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012	
Spring steels	≤ 330 BHN	165	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
Stainless steels,	sulphured austenitic martensitic	≤ 24 HRC	180	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
		≤ 24 HRC	130	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
		≤ 24 HRC	115	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
Hardened steels	40-48 HRC	80	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
	48-60 HRC	•	•	•	•	•	•	•	•	•	•	•	•	
Special alloys	≤ 38 HRC	80	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
Cast iron	≤ 240 BHN	330	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	240-300 BHN	295	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
New Cast Materials CGI & ADI	220-300 BHN	260	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
New Cast Materials CGI & ADI	350-410 BHN	260	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Spheroidal graphite iron and malleable cast iron	≤ 240 BHN	395	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Chilled cast iron	240-300 BHN	330	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	≤ 350 BHN	295	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
Ti and Ti-alloys	≤ 24 HRC	130	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012	
	24-38 HRC	115	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
Aluminum and Al-alloys	≤ 120 BHN	655	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Al wrought alloys	≤ 150 BHN	590	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Al cast alloys	≤ 10% Si	490	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
	≤ 24% Si	395	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Magnesium alloys	≤ 150 BHN	590	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Copper,	low-alloyed	≤ 120 BHN	230	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
		≤ 200 BHN	590	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031
Brass,	short-chipping	≤ 200 BHN	395	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
		≤ 200 BHN	395	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Bronze,	short-chipping	≤ 200 BHN	230	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
		200-260 BHN	165	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
Bronze,	long-chipping	≤ 24 HRC	150	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025
		24-30 HRC	115	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020

## Series # 4105/4106 body (1xD/1.5xD) with # 4112 insert

Material group	Hardness	SFM	Feed Rate - IPR											
			1/16 in. 1.590 mm	1/8 in. 3.170 mm	1/4 in. 6.350 mm	3/8 in. 9.520 mm	1/2 in. 12.700mm	5/8 in. 15.870mm	3/4 in. 19.050mm	1 in. 25.400mm	1 1/4 in. 31.75mm	1 1/2 in. 38.10mm		
Common structural steels	≤ 100 BHN	425	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	100-260 BHN	360	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Free-cutting steels	≤ 24 HRC	425	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
Unalloyed heat-treatable steels	≤ 16 HRC	425	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	16-24 HRC	410	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	24-30 HRC	360	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Alloyed heat-treatable steels	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	30-38 HRC	295	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
Unalloyed case hardened steels	≤ 230 BHN	425	•	•	•	•	•	0.012	0.016	0.020	0.025	0.025	0.031	
Alloyed case hardened steels	24-30 HRC	360	•	•	•	•	•	0.010	0.012	0.016	0.020	0.020	0.025	
	30-38 HRC	230	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
Nitriding steels	24-30 HRC	345	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
	30-38 HRC	230	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
Tool steels	≤ 24 HRC	195	•	•	•	•	•	0.008	0.010	0.012	0.016	0.016	0.020	
	24-30 HRC	180	•	•	•	•	•	0.006	0.008	0.010	0.012	0.012	0.016	
High speed steels	14-30 HRC	180	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012	
Spring steels	≤ 330 BHN	165	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
Stainless steels	sulphured austenitic martensitic	≤ 24 HRC	180	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
		≤ 24 HRC	130	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
		≤ 24 HRC	115	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012
Hardened steels	40-48 HRC	80	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
	48-60 HRC	•	•	•	•	•	•	•	•	•	•	•	•	
Special alloys	≤ 38 HRC	80	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	
Ti and Ti-alloys	≤ 24 HRC	130	•	•	•	•	•	0.005	0.006	0.008	0.010	0.010	0.012	
	24-38 HRC	115	•	•	•	•	•	0.004	0.005	0.006	0.008	0.008	0.010	