

Uncoated Carbide Grade Machining Recommendations for Turning

Type of Material	Hardness		Maximum Surface Speeds (ft/min)								
	Rc	BHN	G-60 G-53	G-70	G-50	G-10 G-02	G-23	G-20M	G-01M	G-40	G-74
Non-Alloy Carbon Steel:											
<i>C < 0.25 %</i>		110	612	663	391	N/A	N/A	N/A	N/A	N/A	663
<i>C < 0.80 %</i>	6	150	468	510	298	N/A	N/A	N/A	N/A	N/A	510
<i>C < 1.40 %</i>	33	310	374	408	238	N/A	N/A	N/A	N/A	N/A	408
Low-Alloy Steels:											
<i>Annealed, Medium - High Carbon</i>	12	180	391	425	247	N/A	N/A	N/A	N/A	N/A	425
<i>Hardened</i>	36	330	255	272	162	N/A	N/A	N/A	N/A	N/A	272
High-Alloy Steels:											
<i>Annealed</i>	16	200	238	255	153	N/A	N/A	N/A	N/A	N/A	255
<i>Hardened</i>	41	380	170	187	111	N/A	N/A	N/A	N/A	N/A	187
High-Alloy Tool Steel:											
<i>Hardened</i>	36	330	247	264	153	N/A	N/A	N/A	N/A	N/A	264
Cast Steel:											
<i>Non-Alloy</i>	6	150	468	510	298	N/A	N/A	N/A	N/A	N/A	510
<i>Low-Alloy</i>	16	200	374	408	238	N/A	N/A	N/A	N/A	N/A	408
<i>High-Alloy</i>	16	200	332	357	213	N/A	N/A	N/A	N/A	N/A	357
Stainless Steels:											
<i>Ferritic, 400 Series</i>	16	200	374	408	238	N/A	N/A	N/A	N/A	N/A	408
<i>Austenitic, 300 Series</i>	16	200	N/A	N/A	N/A	264	340	298	N/A	N/A	N/A
Gray, Pearlitic Cast Irons:											
<i>Low Tensile</i>	12	180	N/A	N/A	N/A	383	510	425	300	700	N/A
<i>High Tensile</i>	26	260	N/A	N/A	N/A	170	213	196	150	350	N/A
Nodular / Malleable Irons:											
<i>Short Chipping</i>	6	150	578	629	374	N/A	N/A	N/A	N/A	N/A	629
<i>Long Chipping</i>	21	230	340	374	213	N/A	N/A	N/A	N/A	N/A	374
Aluminum Alloys:											
			N/A	N/A	N/A	1190	1530	1275	1000	1900	N/A
Brass, Copper, Bronze:											
			N/A	N/A	N/A	425	510	468	350	700	N/A
Hardened Steels (> 50 Rc):											
			N/A	43	N/A	N/A	N/A	N/A	N/A	50	43
Chilled, Hardened Irons (> 50 Rc):											
			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Titanium, Refractory Metals:											
			N/A	N/A	N/A	85	128	111	70	N/A	N/A
Nickel & Iron Based Superalloys:											
<i>Inconels</i>			N/A	N/A	N/A	68	N/A	85	60	N/A	N/A
<i>Hastelloys</i>			N/A	N/A	N/A	102	N/A	119	90	N/A	N/A
<i>Wasploys</i>			N/A	N/A	N/A	68	N/A	85	60	N/A	N/A
<i>Renes</i>			N/A	N/A	N/A	51	N/A	68	40	N/A	N/A
<i>Monels</i>			N/A	N/A	N/A	51	N/A	68	40	N/A	N/A
Cobalt Based Superalloys:											
<i>Stellites</i>			N/A	N/A	N/A	43	N/A	51	40	N/A	N/A
<i>Haynes Alloys</i>			N/A	N/A	N/A	43	N/A	51	40	N/A	N/A

Finishing: 0.003 to 0.015 in/rev
 General Purpose: 0.008 to 0.020 in/rev
 Medium Roughing: 0.015 to 0.030 in/rev
 Heavy Roughing: > 0.030 in/rev

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