



## MATERIAL AND COATING PERFORMANCE RECOMMENDATIONS

Material	Material Hardness	HIGH SPEED STEEL			SUPER COBALT		
		BHN	M4			T15	
			TiN	TiCN	TiAlN	Ultra-TiN	Life-Coat
Free Machining Steel 1117, 1215, 12L14, etc.	100 - 150	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	151 - 200	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	201 - 250	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
Low Carbon Steel 1010, 1020, 1144, etc.	85 - 125	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	126 - 175	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	176 - 225	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	226 - 275	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
Medium Carbon Steel 1040, 1050, 1140, etc.	125 - 175	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	176 - 225	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	226 - 275	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	276 - 325				☆☆☆☆☆	☆☆☆☆☆	
Alloy Steel 4140, 5140, 8620, etc.	125 - 175	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	176 - 225	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	226 - 275	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	276 - 325				☆☆☆☆☆	☆☆☆☆☆	
	326 - 375				☆☆☆☆☆	☆☆☆☆☆	
High Strength Alloy 4340, 4330V, 300M, etc.	225 - 300				☆☆☆☆☆	☆☆☆☆☆	
	301 - 350				☆☆☆☆☆	☆☆☆☆☆	
	351 - 400						
Structural Steel A36, A285, A526, etc.	100 - 150	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	151 - 250	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	251 - 350				☆☆☆☆☆	☆☆☆☆☆	
High Temperature Alloy Hastelloy B, Inconel 600, etc.	140 - 220				☆☆☆☆☆	☆☆☆☆☆	
	221 - 310						
Stainless Steel 303, 416, 420, 17-4PH, etc.	135 - 185	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	186 - 275	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
Tool Steel H13, H21, A4, etc.	150 - 200				☆☆☆☆☆	☆☆☆☆☆	
	201 - 250				☆☆☆☆☆	☆☆☆☆☆	
Aluminum	30	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆		
	180	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆		
Cast Iron Gray, Ductile, Nodular	120 - 150	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	151 - 200	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	201 - 220	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	
	221 - 260				☆☆☆☆☆	☆☆☆☆☆	
	261 - 320				☆☆☆☆☆	☆☆☆☆☆	

• These materials and coating performance recommendations are offered as guidelines. Equipment, horsepower, rigidity, fixturing, coolant volume and pressure, and material conditions will affect results.



## MATERIAL AND COATING PERFORMANCE RECOMMENDATIONS

Material	Material Hardness BHN	PREMIUM COBALT		CARBIDE	
		M48		K20	
		Life-Coat	Life-Coat	Ultra-TiN	Life-Coat
Free Machining Steel 1117, 1215, 12L14, etc.	100 - 150			★★★★☆	★★★★★
	151 - 200			★★★★☆	★★★★★
	201 - 250			★★★★☆	★★★★★
Low Carbon Steel 1010, 1020, 1144, etc.	85 - 125			★★★★☆	★★★★★
	126 - 175			★★★★☆	★★★★★
	176 - 225			★★★★☆	★★★★★
	226 - 275			★★★★☆	★★★★★
Medium Carbon Steel 1040, 1050, 1140, etc.	125 - 175			★★★★☆	★★★★★
	176 - 225			★★★★☆	★★★★★
	226 - 275			★★★★☆	★★★★★
	276 - 325	★★★★☆	★★★★★	★★★★☆	★★★★★
Alloy Steel 4140, 5140, 8620, etc.	125 - 175			★★★★☆	★★★★★
	176 - 225			★★★★☆	★★★★★
	226 - 275			★★★★☆	★★★★★
	276 - 325	★★★★☆	★★★★★	★★★★☆	★★★★★
	326 - 375	★★★★☆	★★★★★	★★★★☆	★★★★★
High Strength Alloy 4340, 4330V, 300M, etc.	225 - 300	★★★★☆	★★★★★	★★★★☆	★★★★★
	301 - 350	★★★★☆	★★★★★	★★★★☆	★★★★★
	351 - 400	★★★★☆	★★★★★	★★★★☆	★★★★★
Structural Steel A36, A285, A526, etc.	100 - 150			★★★★☆	★★★★★
	151 - 250			★★★★☆	★★★★★
	251 - 350	★★★★☆	★★★★★	★★★★☆	★★★★★
High Temperature Alloy Hastelloy B, Inconel 600, etc.	140 - 220	★★★★☆	★★★★★	★★★★☆	★★★★★
	221 - 310	★★★★☆	★★★★★	★★★★☆	★★★★★
Stainless Steel 303, 416, 420, 17-4PH, etc.	135 - 185			★★★★★	★★★★★
	186 - 275			★★★★★	★★★★★
Tool Steel H13, H21, A4, etc.	150 - 200			★★★★☆	★★★★★
	201 - 250	★★★★☆	★★★★★	★★★★☆	★★★★★
Aluminum	30			★★★★★	
	180			★★★★★	
Cast Iron Gray, Ductile, Nodular	120 - 150			★★★★☆	★★★★★
	151 - 200			★★★★☆	★★★★★
	201 - 220			★★★★☆	★★★★★
	221 - 260	★★★★☆	★★★★★	★★★★☆	★★★★★
	261 - 320	★★★★☆	★★★★★	★★★★☆	★★★★★

SPADE BLADES & HOLDERS

M4	T15	M48	K20	TiN	TiCN	TiAlN	Ultra-TiN	Life-Coat	★★★★☆ Good
General Purpose HSS	Heavy cuts in difficult materials	Temp. resistant for high feeds & speeds	Wear resistant w / cutting edge strength	Effective Abrasion Wear and good lubricity	Outstanding wear resistance	High temp. and outstanding wear resistance	High lubricity, high temperature and outstanding wear resistance	Phenomenal lubricity, high temperature, and outstanding wear resistance	★★★★★ Very Good
									★★★★☆ Better
									★★★★☆ Exceptional
									★★★★★ Best