

Cutting Speed

(Vc) SFM

Cutting Speed (v _c) SFM							
ISO	Materials	Rm and Hardness	CVD Coated				
			NL200	NL250	NL300	NL400	NL920
			min. - max.	min. - max.	min. - max.	min. - max.	min. - max.
P	Unalloyed Steel	<600 N/mm ² <180 HBN	548 - 1362	533 - 1332	518 - 1250	444 - 1184	385 - 740
		<950 N/mm ² <280 HBN	355 - 883	346 - 864	336 - 800	288 - 768	250 - 480
	Alloyed Steel	700-950 N/mm ² 200-280 HBN	326 - 810	317 - 792	308 - 750	264 - 704	229 - 440
		950-1200 N/mm ² 280-355 HBN	296 - 736	288 - 720	280 - 660	240 - 640	208 - 400
		1200-1400 N/mm ² 355-415 HBN	202 - 503	197 - 492	191 - 440	164 - 437	142 - 273
M	Stainless Steel	Austenitic + Ferritic 300 series		360 - 900	355 - 835	300 - 800	260 - 500
		Martensitic 400 series		346 - 864	340 - 800	288 - 768	250 - 480
	PH Stainless	Refractory P.H.		192 - 480	190 - 445	160 - 427	139 - 267
K	Cast Iron	Grey GG-Ft	543 - 1349	528 - 1225	513 - 1100		381 - 733
		Spheroidal-Ductile GGG-FGS	469 - 1165	456 - 1058	443 - 950		329 - 633
		Malleable GTS - MN/MP	316 - 785	307 - 713	299 - 640		222 - 427
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB					
		Aluminium + Silicon > 16% 92 HB					
S	High Temperature Alloys	Iron Based		77 - 92		64 - 171	55 - 107
		Cobalt Based		62 - 156		52 - 139	45 - 87
		Nickel Based		67 - 168		56 - 149	49 - 93
		Titanium Based		106 - 264		88 - 235	76 - 147
H	Hard Materials	Hard Steel >1400 N/mm ² >415 HBN	150 - 410				
		Chilled Cast Iron >1400 N/mm ² >400 HBN	165 - 390				

Material Guide – Key to Recommended Inserts

Material Designation

◆ P Unalloyed Steels
 ◆ P Alloyed Steels
 ◆ M Stainless Steels
 ◆ M PH Stainless
 ◆ K Cast Irons
 ◆ N Aluminum & Alloys
 ◆ S High Temp. Alloys
 ◆ H Hard Materials

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ISO	Materials	Rm and Hardness	PVD				Uncoated	Ceramic
			SP0819	SP4019	SP4030 (Grooving)	SP4066 (Threading)	GH1 Micrograin	SA6609
			min. - max.	min. - max.	min. - max.	min. - max.	min. - max.	min. - max.
P	Unalloyed Steel	<600 N/mm ² <180 HBN	696 - 1480	681 - 1450	444 - 888	750 - 1595		
		<950 N/mm ² <280 HBN	451 - 960	442 - 941	288 - 576	492 - 1035		
	Alloyed Steel	700-950 N/mm ² 200-280 HBN	414 - 880	405 - 862	264 - 528	445 - 950		
		950-1200 N/mm ² 280-355 HBN	376 - 800	368 - 784	240 - 480	405 - 860		
		1200-1400 N/mm ² 355-415 HBN	257 - 547	251 - 536	164 - 328	275 - 590		
M	Stainless Steel	Austenitic + Ferritic 300 series	470 - 1000	460 - 980	350 - 750	505 - 1079	260 - 500	
		Martensitic 400 series	489 - 1040	442 - 941	336 - 720	525 - 1122	270 - 520	
	PH Stainless	Refractory P.H.	251 - 533	245 - 523	187 - 400	270 - 574	140 - 265	
K	Cast Iron	Grey GG-Ft		675 - 1437	440 - 880	740 - 1581	381 - 733	
		Spheroidal-Ductile GGG-FGS		583 - 1241	380 - 760	640 - 1364	329 - 633	
		Malleable GTS - MN/MP		393 - 836	256 - 512	430 - 920	222 - 427	
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB	1300 - 3200	1200 - 3200	1200 - 3000		1100 - 2700	
		Aluminium + Silicon > 16% 92 HB	900 - 2200		800 - 2000		600 - 1800	
S	High Temperature Alloys	Iron Based	100 - 213	98 - 209	64 - 128	110 - 230	55 - 150	590 - 1475
		Cobalt Based	81 - 173	80 - 170	52 - 104	90 - 187	45 - 90	590 - 1310
		Nickel Based	88 - 187	86 - 183	56 - 112	95 - 200	50 - 95	590 - 1180
		Titanium Based	138 - 293	135 - 287	88 - 176	150 - 315	75 - 150	
H	Hard Materials	Hard Steel >1400 N/mm ² >415 HBN	230 - 460	202 - 431				
		Chilled Cast Iron >1400 N/mm ² >400 HBN	215 - 440	196 - 418				

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ISO	Materials	Rm and Hardness	CVD Coated				
			NL200	NL250	NL300	NL400	NL920
			min. - max.	min. - max.	min. - max.	min. - max.	min. - max.
P	Unalloyed Steel	<600 N/mm ² <180 HBN	167 - 415	162 - 406	158 - 381	135 - 361	117 - 226
		<950 N/mm ² <280 HBN	108 - 269	105 - 263	102 - 244	88 - 234	76 - 146
	Alloyed Steel	700-950 N/mm ² 200-280 HBN	99 - 247	97 - 241	94 - 229	80 - 215	70 - 134
		950-1200 N/mm ² 280-355 HBN	90 - 224	88 - 220	85 - 201	73 - 195	63 - 122
		1200-1400 N/mm ² 355-415 HBN	62 - 153	60 - 150	58 - 134	50 - 133	43 - 83
M	Stainless Steel	Austenitic + Ferritic 300 series		110 - 274	110 - 255	91 - 244	79 - 152
		Martensitic 400 series		105 - 263	105 - 245	88 - 234	76 - 146
	PH Stainless	Refractory P.H.		59 - 146	60 - 135	49 - 130	42 - 81
K	Cast Iron	Grey GG-Ft	165 - 411	161 - 373	157 - 335		116 - 224
		Spheroidal-Ductile GGG-FGS	143 - 355	139 - 322	135 - 290		100 - 193
		Malleable GTS - MN/MP	96 - 239	94 - 217	91 - 195		68 - 130
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB					
		Aluminium + Silicon > 16% 92 HB					
S	High Temperature Alloys	Iron Based		23 - 59		20 - 52	17 - 33
		Cobalt Based		19 - 48		16 - 42	14 - 26
		Nickel Based		20 - 51		17 - 46	15 - 28
		Titanium Based		32 - 80		27 - 72	23 - 45
H	Hard Materials	Hard Steel >1400 N/mm ² >415 HBN	45 - 125				
		Chilled Cast Iron >1400 N/mm ² >400 HBN	50 - 120				

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			SP0819	SP4019	SP4030 (Grooving)	SP4066 (Threading)	GH1 Micrograin	SA6609
			min. - max.	min. - max.	min. - max.	min. - max.	min. - max.	min. - max.
P	Unalloyed Steel	<600 N/mm ² <180 HBN	212 - 451	208 - 442	135 - 271	230 - 485		
		<950 N/mm ² <280 HBN	138 - 293	135 - 287	88 - 176	150 - 315		
	Alloyed Steel	700-950 N/mm ² 200-280 HBN	126 - 268	123 - 263	80 - 161	135 - 290		
		950-1200 N/mm ² 280-355 HBN	115 - 244	112 - 239	73 - 146	125 - 265		
		1200-1400 N/mm ² 355-415 HBN	78 - 167	77 - 163	50 - 100	85 - 180		
M	Stainless Steel	Austenitic + Ferritic 300 series	143 - 305	140 - 299	107 - 229	154 - 329	80 - 150	
		Martensitic 400 series	149 - 317	135 - 287	102 - 220	160 - 342	80 - 160	
	PH Stainless	Refractory P.H.	76 - 163	75 - 159	57 - 122	82 - 175	40 - 80	
K	Cast Iron	Grey GG-Ft		206 - 438	134 - 268	226 - 482	116 - 224	
		Spheroidal-Ductile GGG-FGS		178 - 378	116 - 232	195 - 416	100 - 193	
		Malleable GTS - MN/MP		120 - 255	78 - 156	132 - 280	60 - 130	
N	Aluminium & Alloys	Aluminium & Alloys < 16% 116 HB	396 - 976	365 - 975	366 - 915		335 - 823	
		Aluminium + Silicon > 16% 92 HB	274 - 671		244 - 610		183 - 549	
S	High Temperature Alloys	Iron Based	31 - 65	30 - 64	20 - 39	33 - 70	15 - 35	180 - 450
		Cobalt Based	25 - 53	24 - 52	16 - 32	27 - 57	15 - 25	180 - 400
		Nickel Based	27 - 57	26 - 56	17 - 34	29 - 61	15 - 30	180 - 360
		Titanium Based	42 - 89	41 - 88	27 - 54	45 - 96	25 - 45	
H	Hard Materials	Hard Steel >1400 N/mm ² >415 HBN	70 - 140	62 - 131				
		Chilled Cast Iron >1400 N/mm ² >400 HBN	65 - 135	60 - 127				

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