

Material			Material group	Hardness Brinell (HB)	Tensile Strength R _m [N/mm ²]	Example Ma- terial SAE, DIN	
P	Carbon steel	~ 0.2 % C	P1.1	125	430	1015 , CK15	
		~ 0.4% C annealed	P1.2	190	610	A515 , 19Mn6	
		~ 0.4% C quenched	P1.3	210	640	1335 , 36Mn5	
		~ 0.6% C annealed	P1.4	190	610	1055 , C55	
		~ 0.6% C quenched	P1.5	300	1000	1060 , CK60	
		Free cutting steel	P1.6	220	750	1213 , 9SMn28	
	Alloyed steel (<5%)	annealed	P2.1	180	590	52100 , 100Cr6	
		quenched	P2.2	280	960	3415 , 14NiCr10	
		quenched	P2.3	350	1250	4135 , 34CrMo4	
		quenched	P2.4	430	1450	5155 , 55Cr3	
	High alloyed steel (>5%)	annealed	P3.1	200	680	442 , X10CrAl18	
		hardened	P3.2	350	1200	D3 , X210Cr2	
	Cast steel	unalloyed	P4.1	180	590	A27 , GE200	
		alloyed	P4.2	220	750	10295 , GX40CrSi28	
	Sintered steel	soft	P5.1	220	570	P3082 , Sint-D39	
M	Stainless steel	martensitic ferritic	M1.1	200	680	410 , X16Cr13	
		austenitic	M1.2	300	1000	316Ti , X6CrNi- MoTi17-12-2	
		austenitic ferritic	M1.3	230	780	316LN , X2CrNi- Mo-N17-13-3	

Cutting Data



		MG12				Coating Grade					
		395-55		=		Cutting speed Vc (SFM) - Suggested range					
		120-16				Cutting speed Vc (m/min) - Suggested range					
	K10 MG12	TN3_	TI2_	TH3_ TF4_ AS4_ AS6_	ES1_ AC2_	EG3_ EG5_ HP6_	IG3_ IG6_	DD2_	SG3_	H20 H54 IG6T	Coating Grades
Carbon Steel		655-425 200-130	855-525 260-160	920-590 280-180	920-590 280-180	920-590 280-180	1115-720 340 - 220			1310-985 400 - 300	
		525-230 160-70	755-395 230 - 120	820-460 250 -140	820-460 250 -140	820-460 250 -140	1050-655 320 - 200			1310-985 400 - 300	
		525-230 160-70	755-395 230 - 120	820-460 250 -140	820-460 250 -140	820-460 250 -140	1050-655 320 - 200			1310-985 400 - 300	
		525-230 160-70	755-395 230 - 120	820-460 250 -140	820-460 250 -140	820-460 250 -140	1050-655 320 - 200			1310-985 400 - 300	
		490-195 150-60	625-230 190 - 70	690-295 210 - 90	690-295 210 - 90	690-295 210 - 90	920-490 280 - 150			1310-985 400 - 300	
		525-230 160-70	755-395 230 - 120	820-460 250 - 140	820-460 250 - 140	820-460 250 - 140	1050-655 320 - 200			1150-820 350 - 250	
Alloyed steel <5%		490-260 150-80	655-260 200 - 80	720-330 220 - 100	720-330 220 - 100	720-330 220 - 100	985-590 300 - 180			1310-985 400 - 300	
		460-230 140-70	625-230 190 - 70	690-295 210 - 90	690-295 210 - 90	690-295 210 - 90	920-490 280 - 150			1310-985 400 - 300	
		425-165 130-50	560-195 170 - 60	625-260 190 - 80	625-260 190 - 80	625-260 190 - 80	820-460 250 - 140			1150-820 350 - 250	
		425-165 130-50	560-195 170 - 60	625-260 190 - 80	625-260 190 - 80	625-260 190 - 80	755-395 230 - 120			1150-820 350 - 250	
High alloyed steel >5%		460-195 140-60	590-195 180 - 60	655-260 200 - 80	655-260 200 - 80	655-260 200 - 80	855-460 260 - 140			820-655 250 -200	
		425-165 130-50	560-195 170 - 60	625-260 190 - 80	625-260 190 - 80	625-260 190 - 80	820-395 250 - 120			820-655 250 -200	
Cast steel		460-330 140-100	590-395 180 - 120	655-460 200 - 140	655-460 200 - 140	655-460 200 - 140	820-655 250 - 200			820-655 250 - 200	
		360-230 110-70	460-260 140 - 80	525-330 160 - 100	525-330 160 - 100	525-330 160 - 100	720-525 220 - 160			720-525 220 - 160	
Sintered steel											
Stainless steel					395-260 120 - 80	395-260 120 - 80	490-295 150-90		490-295 150-90	820-655 250 - 200	
					330-195 100 - 60	330-195 100 - 60	360-260 110-80		360-260 110-80	655-490 200 - 150	
							395-295 120-90		395-295 120-90	655-490 200 - 150	



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K	Grey cast iron	low tensile strength	K1.1	180	250	A48 Class 35B , GG-25	
		high tensile strength	K1.2	250	350	A48 Class 60 , GG-40	
	Spheroidal graphite cast iron	ferritic	K2.1	160	400	A536 60-40-18 , GGG-40	
		perlitic	K2.1	260	700	A536 80-60-03 , GGG-60	
	Malleable cast iron	ferritic	K3.1	200	400	A47 Grade 35018 , GTW-45	
		perlitic	K3.2	260	700	A47 Grade 55004 , GTS-55-04	
	Ausferritic spheroidal cast iron / ADI	quenched	K4.1	260	800		
		quenched	K4.2	350	1050		
		quenched	K4.3	450	1400		
N	Al-alloys	not heat treatable	N1.1	30		5005 , AlMg1	
		heat treatable	N1.2	100	340	6082 , AlMgSi1	
	Al-cast-alloy	< 6% Si	N2.1	80	300	AA 441 , AlMgSi6	
		6-10% Si	N2.2	100	320	AA 356 , AlSi7Mg	
		10-15 % Si	N2.3	130	450	AA 413 , AlSi12	
	Copper-alloys	pure copper	N3.1	100	340	C11000 , Cu	
		brass	N3.2	90	310	C38500 , CuZn40Pb	
		lead-free brass	N3.3	110	430	C28000 , CuZn40	
		high strength	N3.4	300	1000	C67800 , CuZn25Al5-Mn4Fe3	

Cutting Data



				MG12			Coating Grade					
				395-55	=	Cutting speed Vc (SFM) - Suggested range						
				120-16	Cutting speed Vc (m/min) - Suggested range							
	K10 MG12	TN3_ 	TI2_ 	TH3_ TF4_ AS4_ AS6_ 	ES1_ AC2_ 	EG3_ EG5_ HP6_ 	IG3_ IG6_ 	DD2_ 	SG3_ 	H20 H54 IG6T	Coating Grades	
Grey cast iron	295-195	460-295		655-395	655-395	655-395	820-460		820-460			
	90- 60	140-90		200 - 120	200 - 120	200 - 120	250 -140		250 -140			
	295-195	360-295		525-395	525-395	525-395	720-490		720-490			
	90 -60	110-90		160 - 120	160 - 120	160 - 120	220 - 150		220 - 150			
Spheroidal graphite cast iron		360-260		590-425	590-425	590-425	785-525		785-525			
		110-80		180 - 130	180 - 130	180 - 130	240 - 160		240 - 160			
		360-260		525-395	525-395	525-395	655-525		655-525			
		110-80		160 - 120	160 - 120	160 - 120	200 - 160		200 - 160			
Malleable cast iron		490-295		720-395	720-395	720-395	920-590		920-590			
		150-90		220 - 120	220 - 120	220 - 120	280 - 180		280 - 180			
		425-195		625-330	625-330	625-330	820-525		820-525			
		130-60		190 - 100	190 - 100	190 - 100	250 - 160		250 - 160			
Ausferritic spheroidal cast iron / ADI		360-195		590-295	590-295	590-295						
		110-60		180 - 90	180 - 90	180 - 90						
		360-195		525-260	525-260	525-260						
		110-60		160 - 80	160 - 80	160 - 80						
Al-alloys		260-165		395-195	395-195	395-195						
		80-50		120 - 60	120 - 60	120 - 60						
	1970-1310							3280-1970		1640-1150		
	600-400							1000 - 600		500 - 350		
Al-cast- alloy	1310-655							1970-985		1150-985		
	400-200							600-300		350 - 300		
	1970-985							3280-1970		1640-1150		
	600 - 300							1000 -600		500 - 350		
Copper- alloys								1310-720				
	655-395							400 - 220				
	200 - 120							985-590				
	490-295							300 - 180				
	150 - 90							820-395				
	490-295							250 - 120				
	150 -90							655-260				
								200 - 80				

V

Material			Material group	Hardness Brinell (HB)	Tensile Strength R_m [N/mm ²]	Example Ma- terial SAE, DIN	
S	Heat resistant alloy	annealed	S1.1	200	670		
		hardened	S1.2	275	930		
	Heat resistant alloy (Ni, Co)	annealed	S2.1	250	840	Inconel 600	
		hardened	S2.2	350	1200	Inconel 713	
	Titanium	Titanium alloy α	S3.1	120	240	Grade 1-2 Ti, Ti99,7	
		Titanium alloy α - β	S3.2	360	1200	Grade 5 Ti, Ti6Al4V	
		Titanium alloy β	S3.3	410	1400	Ti-10-2-3, Ti-10V-2Fe-3Al	
H	Hardened steels	50-55 HRC	H1.1	-	-		
		55-60 HRC	H1.2	-	-		
		60-63 HRC	H1.3	-	-		
		> 63HRC	H1.4	-	-		
O	Thermoplastics		O1.1				
	Duro plaste		O1.2				
	Plastics - glass fiber reinforced	GFC	O1.3				
	Plastics - carbon fiber reinforced	CFC	O1.4				

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	K10 MG12	TN3_	TI2_	TH3_ TF4_ AS4_ AS6_	ES1_ AC2_	EG3_ EG5_ HP6_	IG3_ IG6_	DD2_	SG3_	H20 H54 IG6T	
Heat resistant alloy	165-100 50-30						260-195 80 - 60		295-230 90-70		
	165-100 50-30						165-100 50 - 30		195-130 60-40		
Heat resistant alloy	165-100 50-30						230-165 70 - 50		260-195 80-60		
	165-100 50-30						195-130 60 - 40		230-165 70-50		
Titanium	165-100 50-30						490-360 150 - 110		525-395 160-120		
	165-100 50-30						260-195 80 - 60		295-230 90-70		
	165-100 50-30						165-150 50 - 45		195-165 60-50		
Hardened steels							195-130 60 - 40		230-165 70-50		
							165-100 50 -30		195-130 60-40		
Thermo-plastics	490-165 150 - 50										
Duro plaste	490-330 150 - 100										
Plastics - glass fiber reinforced	490-330 150 - 100										
Plastics - carbon fiber reinforced	985-490 300 - 150										

V