



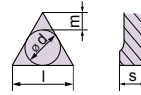
T N M G



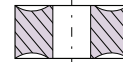
Shape



Clearance Angle



Tolerance
 $s \pm 0.13$
 For $l = 16$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 22$, $d \pm 0.08$ $m \pm 0.13$



Fixing Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNMG 160404 NN	LT 1000	16	4.76	0.4	T0001931
TNMG 160408 NN	LT 1000	16	4.76	0.8	T0001932
TNMG 160408 NX*	LT 1000	16	4.76	0.8	T0003012
TNMG 160412 NN	LT 1000	16	4.76	1.2	T0001933
TNMG 220404 NN	LT 1000	22	4.76	0.4	T0001934
TNMG 220408 NN	LT 1000	22	4.76	0.8	T0001935
TNMG 220408 NX*	LT 1000	22	4.76	1.2	T0003013
TNMG 220412 NN	LT 1000	22	4.76	1.2	T0001936

Application Guide * Available from Q2-2013 **NN** All purpose Chipbreaker

	Finishing	Medium	Roughing / Interrupted cut
TNMG 160404 NN	😊	😐	😞
TNMG 160408 NN	😐	😊	😊
TNMG 160408 NX	😊	😊	😐
TNMG 160412 NN	😞	😐	😊
TNMG 220404 NN	😊	😐	😞
TNMG 220408 NN	😐	😊	😊
TNMG 220408 NX	😊	😊	😐
TNMG 220412 NN	😞	😐	😊

😊 = Good
 😐 = Acceptable
 😞 = Not recommended

Finishing:
 d.o.c. = 0.30 - 1.50 mm
 fn = 0.08 - 0.20 mm/rev

Medium:
 d.o.c. = 0.70 - 4.50 mm
 fn = 0.15 - 0.45 mm/rev

Roughing:
 d.o.c. = 3.00 - 7.00 mm
 fn = 0.35 - 0.70 mm/rev

Stainless Steel
 V_c

Feed x d.o.c.
 =
 Amax

60° Triangle shape inserts. Suitable for general purpose Turning and Copying operations.

Machine Recommendations Guide
 Details on page 10

TNMG 160404 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions				
					min	max	min	max		min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300		
		190 HB		2.5		0.22		0.52			280					
		250 HB		2.5		0.20		0.48			250					
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15	260		
		230 HB		2.5		0.20		0.48			250					
		280 HB		2.0		0.18		0.40			210					
		350 HB		2.0		0.18		0.36			180					
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12	180		
		280 HB		2.5		0.16		0.40			150					
		320 HB		2.0		0.14		0.32			130					
		350 HB		2.0		0.14		0.26			110					
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.2	2.5	0.10	0.18	0.32	170	2.0	0.12	260			
		240 HB		2.5		0.18		0.26		160			220			
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.2	2.0	0.09	0.14	0.20	80	2.0	0.12	140			
		310 HB		2.0		0.14		70		140						
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.2	2.5	0.10	0.18	0.32	170	2.0	0.15	240			
		42 HRc		2.0		0.16		0.26		120			190			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.2	3.0	0.08	0.20	0.64	170	2.0	0.18	240			
		200 HB		3.0		0.20		0.60		160			230			
		250 HB		3.0		0.20		0.60		150			210			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.2	2.5	0.08	0.18	0.48	120	2.0	0.15	240			
		200 HB		2.5		0.18		0.40		230						
250 HB	2.5	0.18	0.40	190												
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.2	2.0	0.09	0.15	0.26	25	2.0	0.12	40			
		250 HB		2.0		0.15		25		50						
		350 HB		2.0		0.15		23		45						
	Ti based	10	TiAl6V4, T40	-	0.2	2.0	0.09	0.16	0.32	45	2.0	0.15	60			
-	2.0	0.14		0.26		35		60		0.12			50			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.2	1.8	0.05	0.12	0.20	50	1.5	0.11	90			
		50 HRc		1.5		0.10		0.17		40			90	1.2	0.09	80
		55 HRc		1.4		0.09		0.13		40			80	1.0	0.07	70
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.2	1.6	0.05	0.17	0.17	40	60	1.2	0.11	50		
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40		
NF	Al (>8%Si)	12	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350		

TNMG 160408 NN/NX LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions				
					min	max	min	max		min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240		
		2		190 HB		5.0		0.50	1.80		280			220		
		3		250 HB		5.0		0.45	1.50		250			200		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200		
				230 HB		4.0	0.21	0.45	1.20		250			180		
				280 HB		4.0	0.18	0.40	1.20		210			150		
				350 HB		3.5	0.18	0.40	1.00		180			130		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140		
				280 HB		4.0		0.40	1.20		150			120		
				320 HB		3.0		0.35	0.80		130			100		
				350 HB		3.0		0.35	0.80		110			90		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190		
				240 HB		5.0		0.40	1.00	160	220			170		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100		
				310 HB		4.0		0.35	0.80	70	140			90		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190		
				42 HRC		4.0		0.40	1.00	120	190			130		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200		
				200 HB		5.0		0.60	1.80	160	230			180		
				250 HB		5.0		0.55	1.80	150	210			160		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180		
				200 HB		5.0		0.50	1.30	120	230			160		
				250 HB		5.0		0.50	1.20	120	190			140		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32		
				250 HB		3.0		0.35	0.70	25	45			30		
				350 HB		3.0		0.35	0.70	23	40			28		
	Ti based	10	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55		
				-		3.0		0.35	0.70	35	55			45		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80		
				50 HRC		2.0		0.25	0.40	40	90			1.5	0.20	70
				55 HRC		1.5		0.20	0.30	40	80			1.0	0.18	60
	Chilled Cast Iron	40	0.5	2.0	0.11	0.25	0.40	40	60	1.5	0.18	50				
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.20	0.30	30	50	1.0	0.15	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280	

TNMG 160412 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions							
					min	max	min	max		min	max	D.O.C.	Feed	V _c					
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.7	5.0	0.26	0.68	3.06	180	330	4.0	0.46	240					
		190 HB		5.0		0.68		3.06			280			220					
		250 HB		5.0		0.61		2.55			250			200					
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.7	5.0	0.26	0.61	2.04	120	280	4.0	0.42	200					
				230 HB		4.0		0.26			0.61				2.04	250	180		
				280 HB		4.0		0.23			0.54				2.04	210	150		
				350 HB		3.5		0.23			0.54				1.70	180	130		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.7	4.0	0.23	0.54	2.04	70	190	3.4	0.40	140					
				280 HB		4.0		0.23			0.54				2.04	150	120		
				320 HB		3.0		0.23			0.47				1.36	130	100		
				350 HB		3.0		0.23			0.47				1.36	110	90		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.7	5.0	0.25	0.54	2.04	170	4.0	0.40	190						
				240 HB		5.0		0.25		0.54				1.70	160	220	170		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.7	4.0	0.23	0.47	1.36	80	3.4	0.32	100						
				310 HB		4.0		0.23		0.47				1.36	70	140	90		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.7	5.0	0.28	0.54	1.70	170	4.0	0.40	190						
				42 HRc		4.0		0.28		0.54				1.70	120	190	3.0	0.35	130
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.7	5.0	0.20	0.81	3.40	170	4.0	0.46	180						
				200 HB		5.0		0.20		0.81				3.06	160	230			
				250 HB		5.0		0.20		0.74				3.06	150	210	160		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.7	5.0	0.20	0.68	2.55	250	4.0	0.40	160						
				200 HB		5.0		0.20		0.68				2.21	120	230	160		
250 HB	5.0	0.20	0.68	2.04	190	140	140												
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.7	3.0	0.25	0.47	1.19	25	2.7	0.37	32						
				250 HB		3.0		0.25		0.47				1.19	25	45			
				350 HB		3.0		0.25		0.47				1.19	23	40	28		
	Ti based	10	TiAl6V4, T40	-	0.7	4.0	0.25	0.54	1.36	45	2.7	0.40	55						
				-		3.0		0.25		0.47				1.19	35	55	37	45	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.7	2.5	0.14	0.41	1.02	50	2.2	0.33	80						
				50 HRc		2.0		0.14		0.34				0.68	40	90	2.0	0.26	70
				55 HRc		1.5		0.14		0.27				0.51	40	80	1.3	0.24	60
	Chilled Cast Iron	40	2.0	0.14	0.34	0.68	40	60	2.0	0.24	50								
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.7	1.5	0.14	0.27	0.51	30	50	1.3	0.20	40					
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.7	6.0	0.25	0.81	3.10	200	400	4.0	0.50	280				

TNMG 220404 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V _c			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300			
		2		190 HB		2.5		0.22	0.52		280			260			
		3		250 HB		2.5		0.20	0.48		250			240			
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15	260			
		4,6		230 HB		2.5		0.20	0.48		250			240			
		5,7		280 HB		2.0		0.18	0.40		210			200			
		8		350 HB		2.0		0.18	0.36		180			180			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12	180			
		10		280 HB		2.5		0.16	0.40		150			140			
		11		320 HB		2.0		0.14	0.32		130			120			
		11		350 HB		2.0		0.14	0.26		110			110			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12	260			
		14		240 HB		2.5		0.18	0.26		160			220	210		
	Duplex	5	X2CrNi23-4, S31500	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12	140			
		14		310 HB		2.0		0.14	0.20		70			140			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15	240			
		13		42 HRc		2.0		0.16	0.26		120			190	180		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18	240			
		15		200 HB		3.0		0.20	0.60		160			230	220		
		16		250 HB		3.0		0.20	0.60		150			210	200		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15	240			
		17,19		200 HB		2.5		0.18	0.40		230			220			
		18,20		250 HB		2.5		0.18	0.40		190			180			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40			
		33		250 HB		2.0		0.15	0.26		25			50	40		
		34		350 HB		2.0		0.15	0.26		23			45	35		
	Ti based	10	TiAl6V4, T40	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60			
		37		-		2.0		0.14	0.26		35			60	50		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11	90			
		38		50 HRc		1.5		0.10	0.17		40			90	1.2	0.09	80
		38		55 HRc		1.4		0.09	0.13		40			80	1.0	0.07	70
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.2	1.6	0.05	0.12	0.17	40	60	1.2	0.11	50			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350		

TNMG 220408 NN/NX LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	7.0	0.21	0.50	1.80	180	280	3.0	0.35	240	
		190 HB		7.0		0.50		1.80						220	
		250 HB		7.0		0.45		1.50						200	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.21	0.45	1.20	120	280	3.0	0.32	200	
		230 HB		5.6		0.45		1.20						180	
		280 HB		5.6		0.18		0.40						1.20	150
		350 HB		4.9		0.18		0.40						1.00	130
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.6	0.18	0.40	1.20	70	190	2.5	0.30	140	
		280 HB		5.6		0.40		1.20						120	
		320 HB		4.2		0.35		0.80						130	
		350 HB		4.2		0.35		0.80						110	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.20	0.40	1.20	170	270	3.0	0.35	190	
		240 HB		7.0		0.40		1.00		160				220	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.5	5.6	0.18	0.35	0.80	80	150	2.5	0.28	100	
		310 HB		5.6		0.35		0.80		70				140	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.22	0.40	1.00	170	250	3.0	0.32	190	
		42 HRc		5.6		0.40		1.00		120				190	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.15	0.60	2.00	170	250	3.0	0.35	180	
		200 HB		7.0		0.60		1.80		160				230	
		250 HB		7.0		0.55		1.80		150				210	
Cast Iron	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.50	1.50	120	230	3.0	0.30	160	
		200 HB		7.0		0.50		1.30		190					
		250 HB		7.0		0.50		1.20		190					
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.5	4.2	0.20	0.35	0.70	25	45	2.0	0.28	32	
		250 HB		4.2		0.35		0.70		25				45	
		350 HB		4.2		0.35		0.70		23				40	
	Ti based	10	TiAl6V4, T40	-	0.5	5.6	0.20	0.40	0.80	45	65	2.0	0.33	55	
		-		4.2		0.35		0.70		35				55	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	3.5	0.11	0.30	0.60	50	100	2.0	0.25	80	
		50 HRc		2.8		0.25		0.40		40				90	
		55 HRc		2.1		0.20		0.30		40				80	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	2.8	0.11	0.25	0.40	40	60	1.5	0.18	50	
		41	G-X300CrMo15	55 HRc	0.5	2.1	0.11	0.20	0.30	30	50	1.0	0.15	40	
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.5	8.4	0.20	0.60	1.80	200	400	3.0	0.40	280

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Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.7	7.0	0.26	0.68	3.06	180	330	4.0	0.46	240	
		2		190 HB		7.0		0.68	3.06		280			220	
		3		250 HB		7.0		0.61	2.55		250			200	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.7	7.0	0.26	0.61	2.04	120	280	4.0	0.42	200	
				230 HB		5.6		0.61	2.04		250			180	
				280 HB		5.6		0.23	0.54		2.04			210	150
				350 HB		4.9		0.23	0.54		1.70			180	130
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.7	5.6	0.23	0.54	2.04	70	190	3.4	0.40	140	
				280 HB		5.6		0.54	2.04		150			120	
				320 HB		4.2		0.47	1.36		130			100	
				350 HB		4.2		0.47	1.36		110			90	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.7	7.0	0.25	0.54	2.04	170	270	4.0	0.40	190	
				240 HB		7.0		0.54	1.70	160	220			170	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.7	5.6	0.23	0.47	1.36	80	150	3.4	0.32	100	
				310 HB		5.6		0.47	1.36	70	140			90	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.7	7.0	0.28	0.54	1.70	170	250	4.0	0.40	190	
				42 HRc		5.6		0.54	1.70	120	190			130	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.7	7.0	0.20	0.81	3.40	170	250	4.0	0.46	200	
				200 HB		7.0		0.81	3.06	160	230			180	
				250 HB		7.0		0.74	3.06	150	210			160	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.7	7.0	0.20	0.68	2.55	250	4.0	0.40	180		
				200 HB		7.0		0.68	2.21	120			230	160	
250 HB	7.0	0.68	2.04	190	140	140									
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.7	4.2	0.25	0.47	1.19	25	45	2.7	0.37	32	
				250 HB		4.2		0.47	1.19	25	45			30	
				350 HB		4.2		0.47	1.19	23	40			28	
	Ti based	10	TiAl6V4	-	0.7	5.6	0.25	0.54	1.36	45	65	2.7	0.40	55	
				-		4.2		0.47	1.19	35	55			45	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.7	3.5	0.14	0.41	1.02	50	100	2.2	0.33	80	
				50 HRc		2.8		0.34	0.68	40	90			70	
				55 HRc		2.1		0.27	0.51	40	80			60	
	Chilled Cast Iron	40	0.7	2.8	0.14	0.34	0.68	40	60	2.0	0.24	50			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.7	2.1	0.14	0.27	0.51	30	50	1.3	0.20	40	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.7	7.0	0.25	0.81	3.10	200	400	4.0	0.50	280