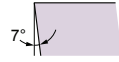


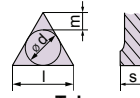
T C M T



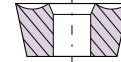
Shape



Clearance Angle



Tolerance
 $d \pm 0.05$
 $m \pm 0.08$
 $s \pm 0.13$



Fixing
Chip breaker

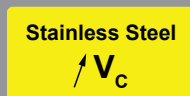
Insert Designation	Grade	l	s	r	Catalog Nr.
TCMT 110204 NN	LT 1000	11	2.38	0.4	T0001924
TCMT 110208 NN	LT 1000	11	2.38	0.8	T0001925
TCMT 16T304 NN	LT 1000	16	3.97	0.4	T0001927
TCMT 16T308 NN	LT 1000	16	3.97	0.8	T0001928
TCMT 16T312 NN	LT 1000	16	3.97	0.8	T0001929

NN All purpose Chipbreaker

60° Triangle shape inserts, with positive rake angle. Suitable for Boring and Internal Turning.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
TCMT 110204 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
TCMT 110208 NN	😐	😊	😐	
TCMT 16T304 NN	😊	😐	😞	
TCMT 16T308 NN	😐	😊	😊	
TCMT 16T312 NN	😞	😐	😊	



Machine Recommendations Guide
 Details on page 10

TCMT 110204 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	2.1	0.08	0.20	0.37	180	330	1.0	0.18	300			
		2		190 HB		1.8		0.19	0.32		280			260			
		3		250 HB		1.8		0.17	0.30		250			240			
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.15	260			
		4,6		230 HB		1.8		0.17	0.30		250			240			
		5,7		280 HB		1.4		0.15	0.25		210			200			
		8		350 HB		1.4		0.15	0.22		180			180			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.12	180			
		10		280 HB		1.8		0.14	0.25		150			140			
		11		320 HB		1.4		0.12	0.20		130			120			
		11		350 HB		1.4		0.12	0.16		110			110			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.12	260			
		14		240 HB		1.8		0.15	0.16		160			220	210		
	Duplex	5	X2CrNi23-4, S31500	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.12	140			
		14		310 HB		1.4		0.12	0.12		70			140			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.15	240			
		13		42 HRC		1.4		0.14	0.16		120			190	180		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.18	240			
		15		200 HB		2.1		0.17	0.37		160			230	220		
		16		250 HB		2.1		0.17	0.37		150			210	200		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.2	1.8	0.06	0.15	0.30	120	250	1.0	0.15	240			
		17,19		200 HB		1.8		0.15	0.25		230			220			
18,20	250 HB	1.8	0.15	0.25	190	180											
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.2	1.4	0.08	0.13	0.16	25	50	1.0	0.12	40			
		33		250 HB		1.4		0.13	0.16		25			50	40		
		34		350 HB		1.4		0.13	0.16		23			45	35		
	Ti based	10	TiAl6V4, T40	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.14	60			
		37		-		1.4		0.12	0.16		35			60	50		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.11	90			
		38		50 HRC		1.1		0.09	0.11		40			90	0.6	0.09	80
		38		55 HRC		1.0		0.08	0.08		40			80	0.5	0.07	70
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.2	1.1	0.04	0.10	0.11	40	60	0.6	0.11	50			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.07	40			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20	350		

TCMT 110208 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	2.1	0.08	0.20	0.37	180	330	1.0	0.25	300			
		2		190 HB		1.8		0.19	0.32		280			260			
		3		250 HB		1.8		0.17	0.30		250			240			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.21	260			
		4,6		230 HB		1.8		0.17	0.30		250			240			
		5,7		280 HB		1.4		0.15	0.25		210			200			
		8		350 HB		1.4		0.15	0.22		180			180			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.17	180			
		10		280 HB		1.8		0.14	0.25		150			140			
		11		320 HB		1.4		0.12	0.20		130			120			
		11		350 HB		1.4		0.12	0.16		110			110			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.17	260			
		14		240 HB		1.8		0.15	0.16		160			220	210		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.17	140			
		14		310 HB		1.4		0.12	0.12		70			140			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.21	240			
		13		42 HRc		1.4		0.14	0.16		120			190	180		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.25	240			
		15		200 HB		2.1		0.17	0.37		160			230	220		
		16		250 HB		2.1		0.17	0.37		150			210	200		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.2	1.8	0.06	0.15	0.30	120	250	1.0	0.21	240			
		17,19		200 HB		1.8		0.15	0.25		120			230	220		
18,20	250 HB	1.8	0.15	0.25	190	180											
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.2	1.4	0.08	0.13	0.16	25	50	1.0	0.17	40			
		33		250 HB		1.4		0.13	0.16		25			50	40		
		34		350 HB		1.4		0.13	0.13		23			45	35		
	Ti based	10	TiAl6V4, T40	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.20	60			
37	-	1.4		0.12		0.16		35	60		50						
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.15	90			
		38		50 HRc		1.1		0.09	0.11		40			90	0.6	0.13	80
		38		55 HRc		1.0		0.08	0.08		40			80	0.5	0.10	70
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.2	1.1	0.04	0.10	0.11	40	60	0.6	0.15	50			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.10	40			
NF	Al (>8%Si)	12	25	AISI12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.28	350		

TCMT 16T304 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		

TCMT 16T308 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	0.5	5.0	0.21	0.43	1.62	180	330	3.0	0.30	240			
		190 HB		5.0		0.43		280			220						
		250 HB		5.0		0.38		1.35			250			200			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	5.0	0.21	0.38	1.08	120	280	3.0	0.27	200			
				230 HB		4.0		0.38			1.08			250	180		
				280 HB		4.0		0.18			0.34			1.08	210	150	
				350 HB		3.5		0.18			0.34			0.90	180	130	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	4.0	0.18	0.34	1.08	70	190	2.5	0.26	140			
				280 HB		4.0		0.34			1.08			150	120		
				320 HB		3.0		0.30			0.72			130	100		
				350 HB		3.0		0.30			0.72			110	90		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.34	1.08	170	3.0	0.30	200				
				240 HB		5.0		0.34		0.90			160	220	180		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.5	4.0	0.18	0.30	0.72	80	2.5	0.24	100				
				310 HB		4.0		0.30		0.72			70	140	90		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.34	0.90	170	3.0	0.27	190				
				42 HRc		4.0		0.34		0.90			120	190	130		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	5.0	0.15	0.51	1.80	170	3.0	0.30	200				
				200 HB		5.0		0.51		1.62			160	230	180		
				250 HB		5.0		0.47		1.62			150	210	160		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.43	1.35	250	3.0	0.26	180				
				200 HB		5.0		0.43		1.17			120	230	160		
250 HB	5.0	0.43	1.08	190	140	140											
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.5	3.0	0.20	0.30	0.63	25	2.0	0.24	32				
				250 HB		3.0		0.30		0.63			25	45	30		
				350 HB		3.0		0.30		0.63			23	40	28		
	Ti based	10	TiAl6V4, T40	-	0.5	4.0	0.20	0.34	0.72	45	2.0	0.28	55				
-	3.0			0.30		0.63		35		55			45				
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.11	0.26	0.54	50	2.0	0.21	80				
				50 HRc		2.0		0.21		0.36			40	90	1.5	0.17	70
				55 HRc		1.5		0.17		0.27			40	80	1.0	0.15	60
	Chilled Cast Iron	40	0.5	2.0	0.11	0.21	0.36	40	60	1.5	0.15	50					
	White Cast Iron	41	0.5	1.5	0.11	0.17	0.27	30	50	1.0	0.13	40					
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.5	6.0	0.20	0.51	1.60	200	400	3.0	0.34	280		

TCMT 16T312 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	0.5	5.0	0.21	0.48	1.94	180	330	3.0	0.38	240	
		2		190 HB		5.0		0.48	1.94		280			220	
		3		250 HB		5.0		0.43	1.62		250			200	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	5.0	0.21	0.43	1.30	120	280	3.0	0.35	200	
				230 HB		4.0	0.21	0.43	1.30		250		0.35	180	
				280 HB		4.0	0.18	0.38	1.30		210		0.32	150	
				350 HB		3.5	0.18	0.38	1.08		180		0.32	130	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	4.0	0.18	0.38	1.30	70	190	2.5	0.32	140	
				280 HB		4.0		0.38	1.30		150		0.32	120	
				320 HB		3.0		0.33	0.86		130		0.30	100	
				350 HB		3.0		0.33	0.86		110		0.30	90	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.38	1.30	170	270	3.0	0.38	200	
				240 HB		5.0		0.38	1.08	160	220		0.35	180	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.5	4.0	0.18	0.33	0.86	80	150	2.5	0.30	100	
				310 HB		4.0		0.33	0.86	70	140			90	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.38	1.08	170	250	3.0	0.35	190	
				42 HRC		4.0		0.38	1.08	120	190			130	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	5.0	0.15	0.57	2.16	170	250	3.0	0.38	200	
				200 HB		5.0		0.57	1.94	160	230			180	
				250 HB		5.0		0.52	1.94	150	210			160	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.48	1.62	250	250	3.0	0.32	180	
				200 HB		5.0		0.48	1.40	120	230			160	
				250 HB		5.0		0.48	1.30	190	140			140	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.5	3.0	0.20	0.33	0.76	25	45	2.0	0.30	32	
				250 HB		3.0		0.33	0.76	25	45			30	
				350 HB		3.0		0.33	0.76	23	40			28	
	Ti based	10	TiAl6V4	-	0.5	4.0	0.20	0.38	0.86	45	65	2.0	0.36	55	
				-		3.0		0.33	0.76	35	55		0.32	45	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.5	2.5	0.11	0.29	0.65	50	100	2.0	0.27	80	
				50 HRC		2.0		0.24	0.43	40	90		1.5	0.22	70
				55 HRC		1.5		0.19	0.32	40	80		1.0	0.19	60
	Chilled Cast Iron	40	0.5	2.0	0.11	0.24	0.43	40	60	1.5	0.19	50			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.19	0.32	30	50	1.0	0.16	40	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	6.0	0.20	0.57	1.90	200	400	3.0	0.43	280