

Turning

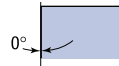


T



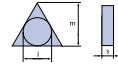
Shape
Triangle 60°

N



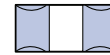
Clearance Angle
0° No rake

M



Tolerance
d ± 0.05 m ± 0.08
s ± 0.13

G



Insert Type
Pin / Top clamp
Double sided

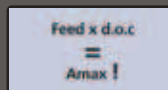
Insert designation	Grade	l	s	r	Catalog Nr.	Page
TNMG 160404 NN	LT 10	16	4,76	0,4	T0000457	69
TNMG 160408 NN	LT 10	16	4,76	0,8	T0000069	70
TNMG 160412 NN	LT 10	16	4,76	1,2	T0001734	71
TNMG 220404 NN	LT 10	22	4,76	0,4	T0001873	72
TNMG 220408 NN	LT 10	22	4,76	0,8	T0000113	73
TNMG 220412 NN	LT 10	22	4,76	1,2	T0001735	74

NN All Purpose Chipbreaker

Application Guide	Super Finishing	Finishing	Semi Finishing	Roughing	Interrupted Cut
TNMG 160404 NN					
TNMG 160408 NN					
TNMG 160412 NN					
TNMG 220404 NN					
TNMG 220408 NN					
TNMG 220412 NN					

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

- 1** Not Recommended
- 2** Acceptable
- 3** Recommended
- 4** Excellent



Machining Recommendation Guide - Please see Pg. 8



Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions		
				min	max	min	max		min	max	d.o.c	feed	
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.20	3.0	0.11	0.23	0.60	180	350	2.0	0.18	
			180		2.5		0.20			0.48			280
			210		2.5		0.18			0.48			250
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.20	2.5	0.11	0.20	0.48	120	280	2.0	0.15	
			230		2.5		0.20			0.40			250
			280		2.0	0.09	0.18	0.40		210			
			320		2.0		0.16	0.32		180			
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.20	2.5	0.09	0.18	0.40	70	190	2.0	0.12	
			280		2.5		0.16			0.40			150
			320		2.0		0.14			0.28			130
			350		2.0		0.14			0.24			100
			400	0.20	1.8	0.05	0.12	0.20		50	90	1.7	0.11
			480		1.5		0.10	0.17		40	80	1.4	0.09
550	1.4	0.08	0.13	30	70	1.2	0.07						
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.20	2.5	0.10	0.18	0.32	170	270	2.0	0.15	
	5	X2 CrNiMo 17 2 2 316	230 to 270		2.0	0.09	0.16	0.24	160	210	2.0	0.12	
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		2.0	0.09	0.14	0.20	70	150	2.0	0.12	
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.20	2.0	0.11	0.18	0.28	170	250	2.0	0.15	
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.20	2.0	0.11	0.18	0.28	170 120	250 190	2.0	0.12	
Grey Cast Iron	9	GG 20	140 to 230	0.20	3.0	0.08	0.20	0.64	170	250	2.0	0.18	
		GG 25						0.60		230			
		GG 30						0.60		210			
Nodular Cast Iron	10	GGG 40	210	0.20	2.5	0.08	0.18	0.48	120	230	2.0	0.15	
		GGG 50	260					0.40		190			
		GGG 70	310					0.40		150			
		G-X260NiCr42	450					0.05		0.10			0.17
Nickel Based Alloys	11	Inconel 625	-----	0.20	2.0	0.10	0.16	0.24	25	35	2.0	0.12	
		Inconel 718	-----					0.24	28	40			
		Hastelloy C	-----					0.28	40	65			
Titanium Based Alloys	12	TiAl 6 V4	-----	0.20	2.0	0.09	0.16	0.28	35	60	2.0	0.14	
		T40	-----				0.14	0.24	28	40	2.0	0.12	

TNMG

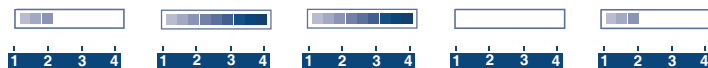
Insert designation Super Finishing Finishing Semi Finishing Roughing Interrupted Cut



Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.50	5.0	0.21	0.45	1.8	180	350	3.0	0.35
			180		5.0		0.45			300		
			210		4.0		0.40			250		
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.50	5.0	0.21	0.40	1.2	120	280	3.0	0.30
			230		4.0		0.40			250		
			280		4.0	0.35	210					
			320		3.5	0.35	180					
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.50	4.0	0.18	0.40	1.2	70	190	2.5	0.28
			280		4.0		0.40			150		
			320		3.0		0.35			130		
			350		3.0		0.35			100		
			400	2.5	0.30	90	2.0	0.25				
			480	2.0	0.25	80	1.7	0.20				
550	1.7	0.20	70	1.0	0.18							
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.50	5.0	0.20	0.40	1.0	170	270	3.0	0.35
	5	X2 CrNiMo 17 2 2 316	230 to 270		4.0	0.18	0.35	0.8	160	210	3.0	0.32
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		4.0	0.18	0.35	0.6	70	150	2.5	0.28
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.50	4.0	0.22	0.35	0.9	170	250	3.0	0.32
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.50	4.0	0.22	0.35	0.9	170 120	250 190	3.0	0.32
Grey Cast Iron	9	GG 20	140 to 230	0.50	5.0	0.15	0.60	2.0	170	250	3.0	0.35
		GG 25						1.8		230		
		GG 30						1.8		210		
Nodular Cast Iron	10	GGG 40	210	0.50	5.0	0.15	0.50	1.5	120	230	3.0	0.30
		GGG 50	260					1.3		190		
		GGG 70	310					1.2		150		
		G-X260NiCr42	450					0.4		30		
Nickel Based Alloys	11	Inconel 625	-----	0.50	3.0	0.20	0.35	0.7	25	35	2.0	0.28
		Inconel 718	-----					0.7	28	40		
		Hastelloy C	-----					0.8	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	3.0	0.18	0.35	35	60	2.0	0.30	
		T40	-----				0.30	28	40	2.0	0.28	

Insert designation Super Finishing Finishing Semi Finishing Roughing Interrupted Cut

TNMG 160408 NN

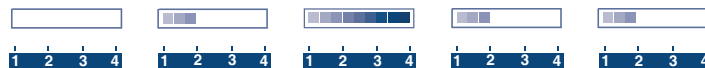


Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.50	5.0	0.27	0.68	3.1	180	330	4.0	0.50
			180		5.0		0.68	3.1		280		
			210		5.0		0.60	2.6		250		
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.50	5.0	0.27	0.60	2.6	120	280	4.0	0.45
			230		5.0		0.60	2.0		250		
			280		4.0	0.23	0.53	2.0		210		
			320			0.53	1.7	180				
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.50	5.0	0.23	0.60	2.0	70	190	4.0	0.40
			280		5.0		0.60	2.0		150		
			320		4.0		0.53	1.6		130		
			350		4.0		0.53	1.6		100		
			400	0.50	3.5	0.14	0.45	1.2	50	90	3.4	0.36
			480		3.0		0.35	0.9	40	80	2.9	0.30
			550		2.5		0.28	0.6	30	70	2.5	0.25
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.50	5.0	0.26	0.52	1.7	170	270	4.0	0.40
	5	X2 CrNiMo 17 2 2 316	230 to 270		5.0	0.23	0.46	1.4	160	210	4.0	0.36
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		5.0	0.23	0.46	1.0	70	150	4.0	0.32
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	4.0	0.35
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.50	5.0	0.29	0.46	1.5	170 120	250 190	4.0	0.35
Grey Cast Iron	9	GG 20	140 to 230	0.50	5.0	0.20	0.90	3.0	170	250	4.0	0.60
		GG 25						2.7		230		
		GG 30						2.7		210		
Nodular Cast Iron	10	GGG 40	210	0.50	5.0	0.20	0.70	2.3	120	230	4.0	0.50
		GGG 50	260					2.0		190		
		GGG 70	310					1.8		150		
		G-X260NiCr42	450					0.50		1.8		
Nickel Based Alloys	11	Inconel 625	-----	0.50	5.0	0.26	0.46	1.4	25	35	3.0	0.38
		Inconel 718						1.4	28	40		
		Hastelloy C						1.6	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	5.0	0.23	0.46	1.6	35	60	3.0	0.38
		T40					0.39	1.2	28	40	3.0	0.32

TNMG

Insert designation Super Finishing Finishing Semi Finishing Roughing Interrupted Cut

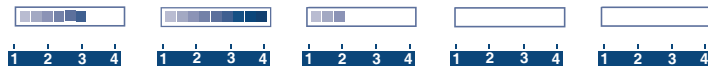
TNMG 160412 NN



Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.50	4.0	0.15	0.40	1.3	180	330	3.0	0.25
			180		4.0		0.40			280		
			210		4.0		0.30			250		
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.50	4.0	0.15	0.30	1.1	120	280	2.5	0.25
			230				0.30			250		
			280		4.0	0.15	0.28			210		
			320				0.28			180		
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.50	4.0	0.13	0.30	1.1	70	190	2.0	0.20
			280				0.30			150		
			320				3.0			0.28		
			350		3.0	0.28	100					
			400		2.5	0.08	0.24			90		
			480				0.20			80		
550	1.5	0.15	0.2	30	70	1.2	0.14					
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.50	4.0	0.15	0.30	1.0	170	270	2.0	0.18
	5	X2 CrNiMo 17 2 2 316	230 to 270		3.0	0.15	0.25	1.0	160	210	2.0	0.15
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		3.0	0.15	0.25	1.0	70	150	2.0	0.12
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.50	4.0	0.16	0.25	1.0	170	250	2.0	0.15
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.50	4.0	0.16	0.25	0.9	170 120	250 190	2.0	0.15
Grey Cast Iron	9	GG 20	140 to 230	0.50	4.0	0.12	0.40	1.7	170	250	3.0	0.18
		GG 25						1.5		230		
		GG 30						1.3		210		
Nodular Cast Iron	10	GGG 40	210	0.50	4.0	0.12	0.35	1.6	120	230	2.0	0.15
		GGG 50	260					1.3		190		
		GGG 70	310					1.1		150		
		G-X260NiCr42	450					0.50		1.5		
Nickel Based Alloys	11	Inconel 625	-----	0.50	3.0	0.12	0.25	0.5	25	35	1.0	0.13
		Inconel 718	-----					0.5	28	40		
		Hastelloy C	-----					0.3	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	3.0	0.11	0.25	35	60	1.0	0.15	
		T40	-----				0.23	0.3	28	40	1.0	0.12

Insert designation Super Finishing Finishing Semi Finishing Roughing Interrupted Cut

TNMG 220404 NN

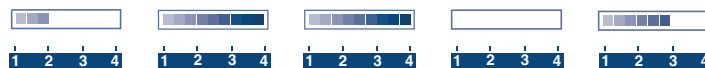


Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.50	7.0	0.21	0.45	1.8	180	350	3.0	0.35
			180		7.0		0.45	1.8		300		
			210		5.0		0.40	1.5		250		
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.50	7.0	0.21	0.40	1.2	120	280	3.0	0.30
			230		7.0		0.40	1.2		250		
			280		5.0	0.18	0.35	1.2		210		
			320		4.0		0.35	1.0		180		
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.50	5.0	0.18	0.40	1.2	70	190	2.5	0.28
			280		5.0		0.40	1.2		150		
			320		4.0		0.35	0.8		130		
			350		4.0		0.35	0.8		100		
			400	2.5	0.11	0.30	0.6	50	90	2.0	0.25	
			480	2.0		0.25	0.4	40	80	1.7	0.20	
550	1.7	0.20	0.3	30	70	1.0	0.18					
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.50	5.0	0.20	0.40	1.0	170	270	3.0	0.35
	5	X2 CrNiMo 17 2 2 316	230 to 270		4.0	0.18	0.35	0.8	160	210	3.0	0.32
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		4.0	0.18	0.35	0.6	70	150	2.5	0.28
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.50	4.0	0.22	0.35	0.9	170	250	3.0	0.32
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.50	4.0	0.22	0.35	0.9	170 120	250 190	3.0	0.32
Grey Cast Iron	9	GG 20	140 to 230	0.50	7.0	0.15	0.60	2.0	170	250	3.0	0.35
		GG 25						1.8		230		
		GG 30						1.8		210		
Nodular Cast Iron	10	GGG 40	210	0.50	7.0	0.15	0.50	1.5	120	230	3.0	0.30
		GGG 50	260					1.3		190		
		GGG 70	310					1.2		150		
		G-X260NiCr42	450					0.50		1.7		
Nickel Based Alloys	11	Inconel 625	-----	0.50	5.0	0.20	0.35	0.7	25	35	2.0	0.28
		Inconel 718	-----					0.7	28	40		
		Hastelloy C	-----					0.8	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	5.0	0.18	0.35	35	60	2.0	0.30	
		T40	-----				0.30	0.6	28	40	2.0	0.28

TNMG

Insert designation Super Finishing Finishing Semi Finishing Roughing Interrupted Cut

TNMG 220408 NN



Material Group	Group No	Material Examples*	Brinell hardness	d.o.c [mm]		feed [mm/rev]		A max [mm ²]	V _c [m/min]		Optimal cutting conditions	
				min	max	min	max		min	max	d.o.c	feed
Low Carbon Steel	1	Ck15, Ck45 1020, 1045	150	0.50	6.0	0.27	0.68	3.1	180	330	4.0	0.50
			180		5.0		0.68			280		
			210		5.0		0.60			250		
Alloy Steel	2	42 CrMo 4 St 50-2 Ck60 1060 4140	180	0.50	6.0	0.27	0.60	2.6	120	280	4.0	0.45
			230		6.0		0.60			250		
			280		5.0	0.53	210					
			320		5.0	0.53	180					
High Alloy Steel	3	X40 CrMoV 5 1 H 13 40 NiCrMo 6 4340 S 2-10-1-8 HSS M42	220	0.50	6.0	0.23	0.60	2.0	70	190	4.0	0.40
			280		5.0		0.60			150		
			320		5.0		0.53			130		
			350		4.0		0.53			100		
			400	0.50	3.5	0.14	0.45	1.2	50	90	3.4	0.36
			480		3.0		0.35	0.9	40	80	2.9	0.30
550	2.5	0.28	0.6	30	70	2.5	0.25					
Austenitic Stainless Steel	4	X5 CrNi 18 9 304	210 to 250	0.50	5.0	0.26	0.52	1.7	170	270	4.0	0.40
	5	X2 CrNiMo 17 2 2 316	230 to 270		5.0	0.23	0.46	1.4	160	210	4.0	0.36
	6	X6 CrNiMoTi 17 12 2 316 Ti Duplex / Nitronic	-----		5.0	0.23	0.46	1.0	70	150	4.0	0.32
Ferritic Stainless Steel	7	X8 Cr 7 430	Annealed	0.50	5.0	0.29	0.46	1.5	170	250	4.0	0.35
Martensitic Stainless Steel	8	X15 Cr 13 410	Annealed Treated	0.50	5.0	0.29	0.46	1.5	170 120	250 190	4.0	0.35
Grey Cast Iron	9	GG 20	140 to 230	0.50	6.0	0.20	0.90	3.0	170	250	4.0	0.60
		GG 25						2.7		230		
		GG 30						2.7		210		
Nodular Cast Iron	10	GGG 40	210	0.50	6.0	0.20	0.70	2.3	120	230	4.0	0.50
		GGG 50	260					2.0		190		
		GGG 70	310					1.8		150		
		G-X260NiCr42	450					0.50		1.8		
Nickel Based Alloys	11	Inconel 625	-----	0.50	5.0	0.26	0.46	1.4	25	35	3.0	0.38
		Inconel 718	-----					1.4	28	40		
		Hastelloy C	-----					1.6	40	65		
Titanium Based Alloys	12	TiAl 6 V4	-----	0.50	5.0	0.23	0.46	35	60	3.0	0.38	
		T40	-----				0.39	1.2	28	40	3.0	0.32

