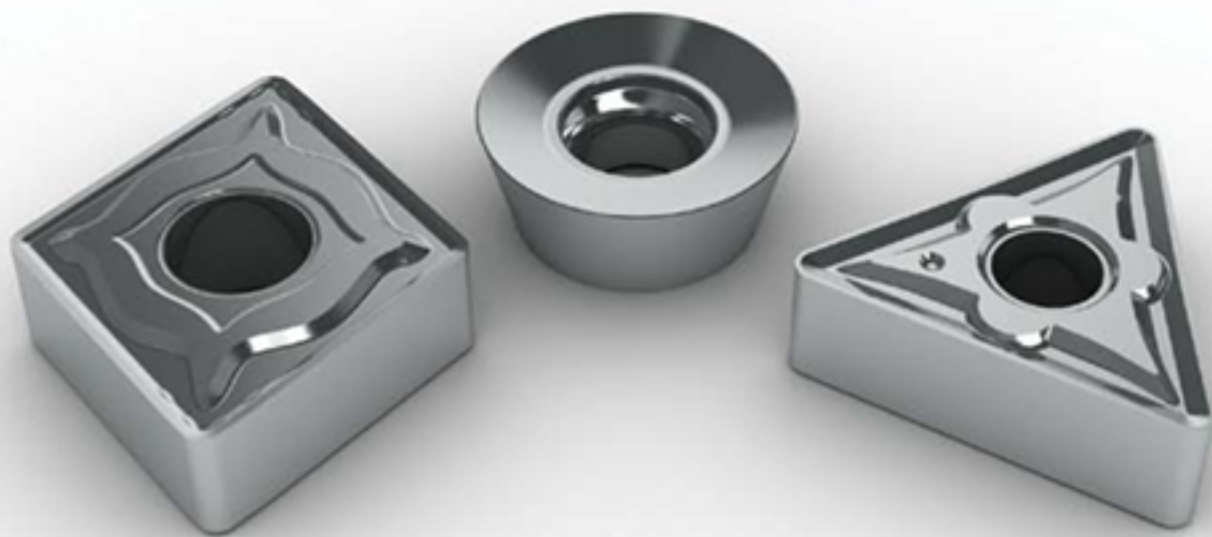




LAMINA
TECHNOLOGIES

PRODUCT LINE

TURNING PARTING THREADING MILLING DRILLING SOLID MILL



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IT IS ABOUT...

Important saving of production costs

Strong reduction of cutting tools stock

Having the right tool at the right time all the time

The Lamina Multi-Mat™ Concept



Cast Iron

*High temp
Alloys*

Stainless Steel

*Aluminium &
Non ferrous Alloys*

Steel

*Hardened
Steel*

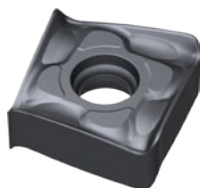
Top Swiss quality

Focused range of Multi Material inserts

Each insert performs on all materials as good as, or better than the dedicated insert of the competition.

New Inserts, More Geometries

45°, 90° and High Feed Milling inserts with 8 cutting edges



Exclusive 8 cutting edges
inserts for High Feed Milling



**OCTO-QUAD
Line**

**PARTING
Line**



GCTX 2002 NN

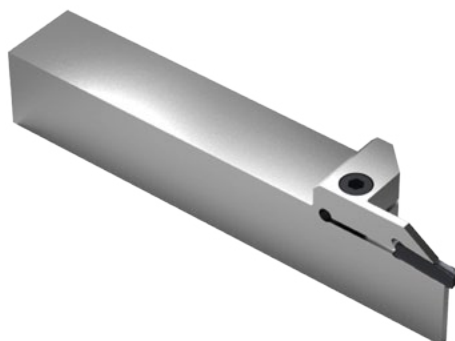


GCTX 3003 NN



GCTX 3003 PP

Parting like Never Before !

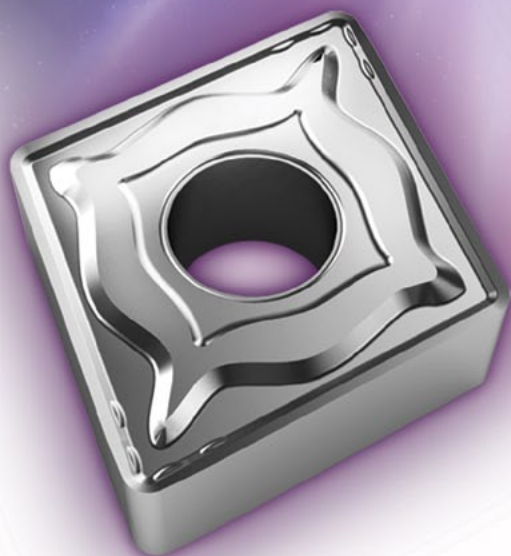


magia

Revolution is here

magia - LT 1000 grade

- ◇ Top level submicron
- ◇ Ultra thick, full adhesion, PVD coating
- ◇ Multi - Mat™ capabilities
- ◇ Extended application range



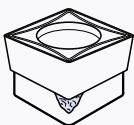
Lamina is now offering an amazing new generation of Multi-Mat™ Turning cutting tools.

We call it magia !

As a new user of the revolutionary Lamina Multi-Mat™ (Multi-Material) inserts, we would like to propose to you the short machining guide below to insure your satisfaction from our products.

The cutting conditions are Lamina Technologies guidelines for optimal machining. However, our inserts can work in a wider range of cutting conditions to meet special machining needs.

Turning Tips



Check the condition of the tool holder (Insert seat, shim, lever, screw) and check if the insert is well seated and clamped.



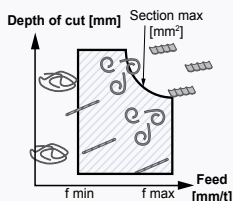
Check the stability of the machine. The tool overhang should be as short as possible.



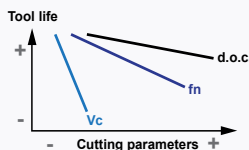
If there are interrupted cut or passes with short lengths of cut, dry operation is recommended to avoid thermal shocks. For heavy interrupted cut, feed rate should be reduced.

$$\text{Feed} \times \text{d.o.c.} = \text{Amax}$$

Respect maximum chip section area for each insert. $\text{Amax} = \text{feed} \times \text{d.o.c.}$



For higher productivity and better chip control in roughing, work close to the recommended Amax value.



Cutting Speed has the greatest influence on tool life. For high productivity and long tool life increase firstly d.o.c. and feed rate.

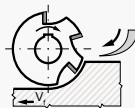
Milling Tips



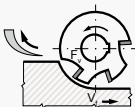
Check the condition of the tool holder (Insert seat, screw, etc.) and check if the insert is well seated and clamped.



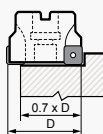
Check the stability of the machine. The tool overhang should be as short as possible.



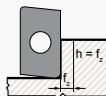
Climb Milling
Usually this is the recommended direction. Tool life about 40% longer than conventional.



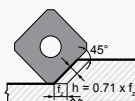
Conventional Milling
Recommended only for:
• Old machines with backlash in the table transmission.
• Flame cut, forged and cast workpieces.
• Thin workpieces (in order to reduce vibration).



For face milling the width of cut (ae) should be about 70% of the cutter diameter, in order to achieve better chip formation and longer tool life. For limited engagement conditions, it is necessary to increase feed per tooth.



K = 90° Approach angle
High radial forces / Low axial forces.
Recommended:
• When 90° wall is needed
• For unstable conditions
• For slender workpieces.



K = 45° Approach angle
Identical radial and axial forces. High productivity
→ $f_z = 1.41 \times h$
Recommended:
• When overhang is long (lower vibration tendency).
• For face milling (1st choice)



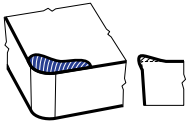
Round inserts:
Roughing and general purposes. Strongest cutting edge.

Lamina Materials Groups

Material Group	Gr. N°	VDI Group	Material Examples*	Description	Be careful with
Steel	Non-alloyed	1	1	Non-alloyed Steel Composition > Fe-C alloy (usually 0.1 to 0.6% of carbon). Characteristics > Good machinability and high cutting speeds can be applied. When it has less than 0.25% of carbon can be very sticky, requiring positive rake and small land inserts. Alloyed Steel Composition > Fe-C alloy (maximum 2.1% of carbon) with additives like Cr, Mo, V, Ni, Mn, Co, W, etc. Characteristics > The variation of the amount of alloying elements and different heat treatments control features such as mechanical resistance and machinability. It's important to follow the cutting speeds recommended according to the hardness of the steel, since it influences a lot the temperature of the cut, chemical and adhesive wears. High alloyed Steel have more than 5% of alloying elements.	Built-up edge Crater
		2	2		
		3	3		
	Low alloyed	2	6		Built-up edge Crater
		4,6	4,6		
		5,7	5,7		
	High alloyed	3	8		Crater
		10	10		
		11	11		
Stainless Steel	Austenitic	4	14	Composition > Alloyed Steel with more than 11% of Chrom(Cr). Characteristics > Stainless steel does not stain, corrode, or rust as easily as ordinary steel. Usually they are difficult to machine, because of it's narrow range of cutting speeds. If the cutting speed is too low, the material sticks in the cutting edge, if it's too high, the high quantity of additives produces abrasive wears in the cutting edge.	Built-up edge Notch wear
		14	14		
	Duplex	5	14		Notch wear Crater
		14	14		
	Ferritic & Martensitic	6	12		Crater
		13	13		
Cast Iron	Grey	7	15	Composition > Fe-C alloy with 2.1 to 5% of carbon. It can be alloyed with Si, P, Mn and Ni. Characteristics > Grey cast iron tends to be brittle, and malleable cast irons usually have a more ductile but less homogeneous microstructure. Reinforced cutting edges will perform the best, and high productivity can be achieved by using high feeds.	Flank wear Crater Mechanical cracks
		15	15		
		16	16		
	Malleable & Nodular	8	17,19		
		17,19	17,19		
		18,20	18,20		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Composition > Iron (Fe) based, Nickel (Ni) based or Cobalt (Co) based alloys and Titanium alloys. Characteristics > High Temperature alloys and Titanium provide excellent mechanical strength resistance, as well as corrosion and oxidation resistance. Relatively low cutting speed is recommended due to their poor thermal conductivity.	Notch wear Crater
		33	33		
		34	34		
	Ti based	10	36		
		37	37		
		37	37		
Hardened Mat.	Steel	11	38	This group includes hardened and tempered steel up to 55 HRC, chilled and white cast iron up to 55 HRC. Machining success depends largely on clamping system rigidity, as cutting forces and power consumption are high. Finishing represents the majority of the operations for this materials group.	Crater
		38	38		
		38	38		
	Chilled Cast Iron	40	40		
	White Cast Iron	41	41		
		41	41		
NF	Al (>8%Si)	12	25	Non-ferrous and soft materials (less than 130HB of hardness). Most common: Aluminum Composition > Al alloys. It can be alloyed with Cu, Zn, Mg, Mn and Si. Characteristics > Aluminium is widely used due to its low density and relatively good strength/weight ratio. When machining it tends to have long chips and built up edge. A highly positive cutting edge together with low friction coating are supposed to control the chips and reduce built up edge.	Built-up edge
		22	22		
	Al (<8%Si)	13	21, 22		
		23, 24	23, 24		
	Cooper Alloys	14	26,27,28		
	Non-Metallic	15	29		
		30	30		
			-		



MACHINING OPTIMIZATION TURNING & MILLING



Built-up edge
(Adhesive wear)



Description

The workpiece material is welded to the cutting edge, normally because of too low temperature.

To solve it

- Increase cutting speed
- Increase feed
- Use more positive geometry



Notch wear
(Adhesive/mechanic wear)

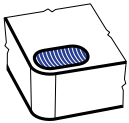


Description

Result of adhesive or mechanical action, it is chipping or localized wear at the depth of cut line.

To solve it

- Use more positive geometry
- Reduce Feed
- Vary depth of cut



Crater
(Chemical wear)

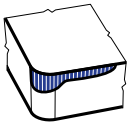


Description

Happens on the rake surface, normally the result of the combination of a diffusion and abrasion wear mechanism.

To solve it

- Decrease cutting speed
- Check coolant direction
- Use more positive geometry



Flank wear
(Abrasive wear)

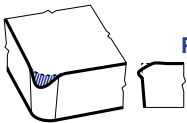


Description

Abrasive wear mechanism that happens on the cutting edge's flank. Not common in Lamina inserts.

To solve it

- Decrease cutting speed
- Check coolant direction.



Plastic deformation
(Thermal wear)

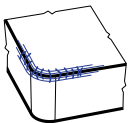


Description

Caused by cutting forces and too high temperature. Not common in Lamina inserts.

To solve it

- Decrease Cutting speed
- Decrease feed rate



Thermal cracks
(Thermal wear)

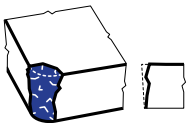


Description

Small cracks normally at 90° to the cutting edge caused by temperature's variation

To solve it

- Stabilize the temperature
- Shut off the coolant



Breakage
(Mechanic wear)



Description

Most of the breakages happen because the wear development is not seen in time.

To solve it

- Check the tool holder
- Check the tool overhang
- Check the Amax
- Decrease feed and Vc
- Apply more robust insert
- Check the run-out

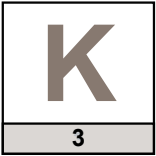
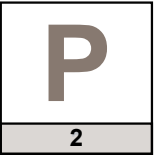
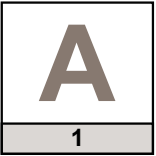
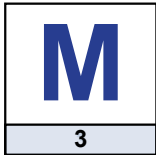
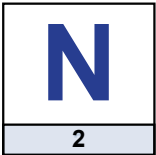
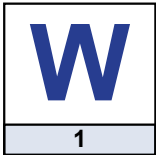
Lamina insert designation (based on ISO norms)

1. Insert shape

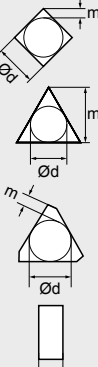
 A	 B	 C	 D
 G	 H	 K	 L
 M	 O	 P	 R
 S	 T	 V	 W

2. Clearance angle

	
Letter Symbol	α
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special



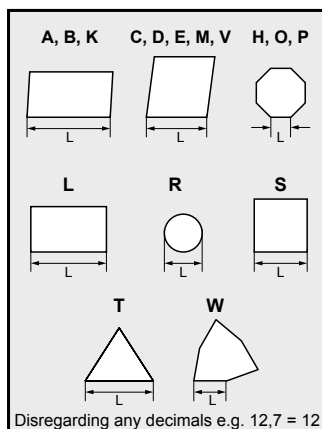
3. Tolerance Class

d (mm) m (mm) s (mm)	Symbol	D	M	S
	A	± 0.025	± 0.005	± 0.025
	C	± 0.025	± 0.013	± 0.025
	E	± 0.025	± 0.025	± 0.025
	F	± 0.013	± 0.005	± 0.025
	G	± 0.025	± 0.025	± 0.130
	H	± 0.013	± 0.013	± 0.025
	J'	± 0.05-0.15	± 0.005	± 0.025
	K'	± 0.05-0.15	± 0.013	± 0.025
	L'	± 0.05-0.15	± 0.025	± 0.025
	M'	± 0.05-0.15	± 0.08-0.20	± 0.130
	N'	± 0.05-0.15	± 0.08-0.20	± 0.025
	U'	± 0.08-0.25	± 0.13-0.38	± 0.130

4. Fixing and chip breaker types

Type	Symbol	Type	Symbol
A		N	
B		P	
F		R	
G		T	
H		W	
M		X	Special design

5. Cutting Edge Length



6. Insert thickness

Symbol	mm
01	= 1.59
T1	= 1.98
02	= 2.38
03	= 3.18
T3	= 3.97
04	= 4.76
05	= 5.56
06	= 6.35
07	= 7.94
09	= 9.52

7. Insert corner radius

1 st letter (Milling)
A = 45°
D = 60°
E = 75°
F = 85°
P = 90°
Z = other
2 nd letter (Milling)
A = 3°
B = 5°
C = 7°
D = 15°
E = 20°
F = 25°
G = 30°
N = 0°
P = 11°
Z = other

08	04	08			NN
5	6	7	8	9	10
16	04	PD	T	R	
5	6	7	8	9	10

8. Edge preparation

	F
	E
	T
	S

Optional information

9. Cutting direction

Turning	Milling
R	R
L	L
N	N

Optional information

Optional information

10. Internal Designation

e.g. Application (Milling)
- 45 = 45° Approach angle
- 90 = 90° Approach angle
- HF = High Feed

Optional information

e.g. Chip breaker (Turning)
NN = General purposes
NM = Roughing operations
NX = General purposes Magia
PP = All purposes grooving
ALU = Non Ferrous Materious

Optional information

MACHINING RECOMMENDATION GUIDE

In order to assist you, our customer and to obtain the best productivity using our cutting tools, we enclosed some relevant comments and tips. Each comment is symbolized by an icon and the relevant icons appear for each insert.

Stainless Steel



In machining Stainless Steel, please verify and respect the cutting speed recommended for the insert, as there is a tendency to machine at speeds that are too low.

Stainless Steel Exotic Material



CNMP - TNMP - WNMP

In machining Stainless Steel or Exotic materials, P geometry inserts (CNMP, TNMP, WNMP), are recommended as first choice.

Exotic Material

Verify



Cutting Conditions

In machining Exotic materials, it is important to verify cutting conditions of the specific insert.

CNMP
TNMP
WNMP



P geometry inserts (CNMP, TNMP, WNMP) are not recommended when machining with interrupted cut.

Feed x d.o.c.
=
A_{max}

It is important to verify and respect A_{max}, which is the maximum chip section. Feed x d.o.c. must be lower than the number noted as A_{max}.

↑ V_c ⇒
↑ Productivity

To increase machining productivity, it is recommended to increase speed (V_c) while respecting chip size calculation.



Appropriate for boring operation.

↑ F ⇒
↑ Productivity

To increase productivity it is recommended to increase feed (f) and respect cutting speed.



1, 2, 3, 4	No
7, 8, 11	No
10, 12	Yes
5, 6, 9	Yes

Coolant

When milling materials from groups 1, 2, 3, 4, 7, 8 and 11, coolant is not recommended. When machining materials from groups 5, 6, 9, 10 and 12, it is recommended to use coolant.

TECHNICAL FORMULAS

TURNING

Cutting speed (m/min)	$V_c = \frac{D_m \times \pi \times n}{1000}$
Rotation (Rev/min)	$n = \frac{V_c \times 1000}{D_m \times \pi}$
Chip removal Rate (cm³/min)	$Q = V_c \times a_p \times f_n$
Cutting time (min)	$T_c = \frac{l_m}{f_n \times n}$
Surface roughness (μm)	$R_{\max} = \frac{f_n^2}{r_\epsilon} \times 125$

MILLING

Cutting speed (m/min)	$V_c = \frac{n \times \pi \times D}{1000}$
Rotation (Rev/min)	$n = \frac{V_c \times 1000}{\pi \times D}$
Table feed (mm/min)	$V_f = n \times z_c \times f_z$
Cutting output (cm³/min)	$Q = \frac{a_e \times a_p \times V_f}{1000}$
Feed per tooth	$f_z = \frac{V_f}{n \times z_c}$

Symbol	Designation	Unit	Symbol	Designation	Unit
D_m	Machining diameter	mm	V_c	Cutting speed	m/min
f_n	Feed per revolution	mm/rev	a_p	Depth of cut (d.o.c.)	mm
l_m	Machining length	mm	a_e	Radial depth of cut (width of cut)	mm
n	Rotation	rev/min	D	Cutter diameter	mm
Q	Chip Removal Rate	cm ³ /min	f_z	Feed per tooth	mm/tooth
A_{max}	d.o.c x feed	mm ²	Z_c	Effective Number of teeth	pcs
r_ε	Nose radius	mm	V_f	Table Feed	mm/min
T_c	Cutting time	min	Z_n	Total Number of teeth	pcs
R_{max}	Surface Roughness	μm			

FAQ

Is it true that Lamina inserts can be used with any type of working material?

Lamina inserts have been tested in countless applications around the world, and are suitable for practically any type of Turning or Milling metal cutting operation.

It is noteworthy that, while Lamina inserts will work in Aluminum production jobs in Aluminum frequently require tailored designed chip-control optimization. Please refer to Lamina Alu-Line.

What speeds and feeds should Lamina inserts be run at?

In this catalog, specific recommendations are provided for each individual insert, indicating the speeds and feeds that are required for most of the material groups. In order to achieve the maximum advantage from Lamina's grade technology it is important to always run the inserts according to the recommended conditions. In general, the best results are normally achieved at the high range of the recommended cutting speeds.

What can we expect regarding the quality and consistency of Lamina inserts?

Due to Lamina's unique production methods and Quality Control procedures, you can expect inserts with much higher accuracy and consistency than you have been accustomed up to now: insert to insert, box to box and batch to batch. This advantage improves the unattended operation of your machines.

What percentage of my tooling requirements can Lamina supply?

In most regular shops Lamina's insert program should cover about 80% of all inserts needed for CNC machines from 20 Hp and down. The insert program covers a full range of standard turning and milling operations from Semi-Roughing to Super-Finishing.

Will the performance of Lamina grades be better than the specialized and dedicated grades available from the market?

Lamina has extensive know-how in sub-micron powder technology as well as in state of the art PVD coating. This know-how combined with unique chip breaker geometry and the in-depth application understanding, enabled Lamina to offer the Multi - Mat Concept; a simple concept of using one insert to work on many materials. The same insert can be used on the next job and the job after and so on, replacing the hundreds of specialized and confusing insert choices that are being used.

In machine shops that run Lamina inserts, what do they find as the biggest benefits?

- Time saving- ability to always have the right insert available for any job. This reduces the number of setups and idle time.
- Cost saving- 80% reduction in insert inventory, ordering and stocking cost.

Are Lamina inserts coated the same as other PVD inserts?

Lamina's state of the art PVD coating has significant differences compared to other suppliers. Our coating process produces thicker and stronger coating – with better adhesion, higher performance and longer tool life.

What about turning tool holders and boring bars?

Lamina's ANSI / ISO standard turning inserts are designed to fit all industrial standard turning tools and boring bars, using the tool holders you have in your stock.

In turning, when should I use the _NMP style inserts rather than the _NMG style inserts?

Most customers find that High-Positive _NMP style inserts (CNMP, TNMP and WNMP) deliver the best results in sticky materials, such as 316 Stainless Steel, Inconel, and Titanium (high heat and corrosion resistant properties). This is achieved by our unique combination of our grades and geometry.

How does the 4 corners Alu-line perform in Low Silicon Aluminum?

Our Alu-line insert's geometry is specially designed for Aluminum with low Silicon content, creating chips that break instead of curl. The inserts are also coated and treated to reduce friction achieving unbeatable performance and tool life.

What is special about your Solid-Mill line?

Our know-how of inserts making was applied to our Solid Mills line. Our mills generate less friction and heat and therefore give better cut and longer tool life.

When should I use Star line?

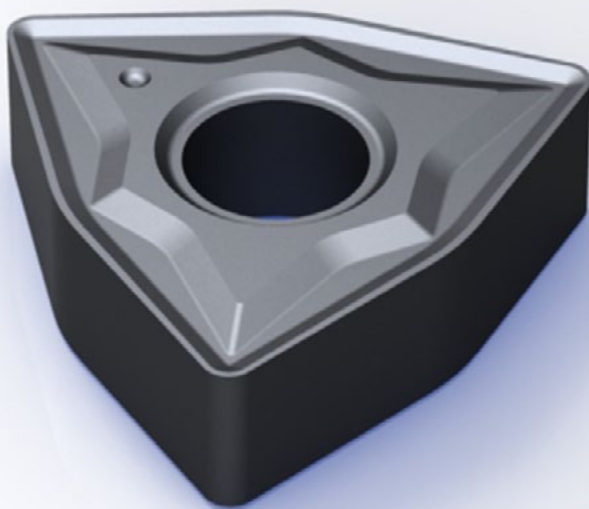
Star line inserts are a good cost for positive turning inserts. Our Star Line inserts offer 3 cutting corners for the VBMT, CCMT, DCMT, and TCMT shapes instead of 2. Moreover, all the inserts can be mounted on the same tool holder.

Turning

LT 10 Multi-Mat™ Turning

LT 1000 Multi-Mat™ Magia Turning

LT 05 Alu-Turning



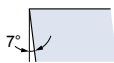
MULTI-MAT™ TURNING LINE



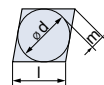
C C M T



Shape

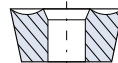


Clearance Angle



Tolerance

$s \pm 0.13$
For $l = 06/09$, $d \pm 0.05$ $m \pm 0.08$
For $l = 12$, $d \pm 0.08$ $m \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CCMT 060204 NN	LT 10	6	2.38	0.4	T0000055
CCMT 09T304 NN	LT 10	9	3.97	0.4	T0000056
CCMT 09T308 NN	LT 10	9	3.97	0.8	T0000117
CCMT 120404 NN	LT 10	12	4.76	0.4	T0001456
CCMT 120408 NN	LT 10	12	4.76	0.8	T0001457
CCMT 120412 NN	LT 10	12	4.76	1.2	T0001776

NN All purpose Chipbreaker 80° Diamond shape inserts, with positive chipbreaker geometry. Very popular and useful for Boring even of small diameters, Facing and external Turning operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
CCMT 060204 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
CCMT 09T304 NN	😊	😐	😞	
CCMT 09T308 NN	😐	😊	😐	
CCMT 120404 NN	😊	😐	😞	
CCMT 120408 NN	😐	😊	😐	
CCMT 120412 NN	😞	😐	😊	

Stainless Steel



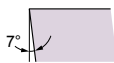
Machine Recommendations
Guide. Details on page 10



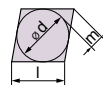
C C M T



Shape

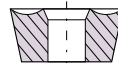


Clearance Angle



Tolerance

$s \pm 0.13$
For $l = 06/09$, $d \pm 0.05$ $m \pm 0.08$
For $l = 12$, $d \pm 0.08$ $m \pm 0.13$



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CCMT 060204 NN	LT 1000	6	2.38	0.4	T0001888
CCMT 09T304 NN	LT 1000	9	3.97	0.4	T0001889
CCMT 09T308 NN	LT 1000	9	3.97	0.8	T0001890
CCMT 120404 NN	LT 1000	12	4.76	0.4	T0001891
CCMT 120408 NN	LT 1000	12	4.76	0.8	T0001892
CCMT 120412 NN	LT 1000	12	4.76	1.2	T0001893

NN All purpose Chipbreaker 80° Diamond shape inserts, with positive chipbreaker geometry. Very popular and useful for Boring even of small diameters, Facing and external Turning operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
CCMT 060204 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
CCMT 09T304 NN	😊	😐	😞	
CCMT 09T308 NN	😐	😊	😐	
CCMT 120404 NN	😊	😐	😞	
CCMT 120408 NN	😐	😊	😐	
CCMT 120412 NN	😞	😐	😊	

Stainless Steel



Machine Recommendations
Guide. Details on page 10

CCMT 060204 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
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	2.1	0.08	0.20	0.37	180	330	1.0	0.18
			2	1045, 1060,	190 HB		1.8		0.19	0.32		280		
			3	28Mn6	250 HB		1.8		0.17	0.30		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		1.8		0.17	0.30		250		
			5,7	100Cr6	280 HB		1.4		0.15	0.25		210		
			8		350 HB		1.4		0.15	0.22		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.12
			10	H13, M42, D3,	280 HB		1.8		0.14	0.25		150		
			11	S6-5-2, 12Ni19	320 HB		1.4		0.12	0.20		130		
			11		350 HB		1.4		0.12	0.16		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.12
			14	X5CrNi18-9	240 HB		1.8		0.15	0.16	160	220		
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.12
			14	S31500	310 HB		1.4		0.12		70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.15
			13	17-4 PH, 430	42 HRC		1.4		0.14	0.16	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.18
			15	EN-GJL-250,	200 HB		2.1		0.17	0.37	160	230		
			16	No30B	250 HB		2.1		0.17	0.37	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	1.8	0.06	0.15	0.30	120	250	1.0	0.15
			17,19	50005	200 HB		1.8		0.15	0.25		230		
			18,20		250 HB		1.8		0.15	0.25		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	1.4	0.08	0.13		25	50	1.0	0.12
			33	Inconel 700	250 HB		1.4		0.13	0.16	25	50		
			34	Stellite 21	350 HB		1.4		0.13		23	45		
	Ti based	10	36	TiAl6V4	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.14
			37	T40	-		1.4		0.12	0.16	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.11
			38	440C,	50 HRC		1.1		0.09	0.11	40	90	0.6	0.09
			38	G-X260NiCr42	55 HRC		1.0		0.08	0.08	40	80	0.5	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20

CCMT 09T304 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		Low alloyed	2 6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
		High alloyed	3 10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Stainless Steel	Austenitic	4 14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
		Duplex	5 14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140 140
		Ferritic & Martensitic	6 12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Cast Iron	Grey	7 15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
		Malleable & Nodular	8 17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	High Temp. Alloys	Fe, Ni & Co based	9 31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
		Ti based	10 36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
	Hardened Mat.	Steel	11 38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

CCMT 09T308 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	1	C35, Ck45, 1020,	125 HB	0.5	4.0	0.21	0.50	1.62	180	330	3.0	0.32	240
			2	1045, 1060,	190 HB		4.0		0.50	1.62		280			220
			3	28Mn6	250 HB		4.0		0.45	1.35		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	4.0	0.21	0.45	1.08	120	280	3.0	0.29	200
			4,6	Ck60, 4140, 4340,	230 HB		3.2		0.45	1.08		250		0.29	180
			5,7	100Cr6	280 HB		3.2		0.40	1.08		210		0.27	150
			8		350 HB		2.8		0.40	0.90		180		0.27	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	3.2	0.18	0.40	1.08	70	190	2.5	0.27	140
			10	H13, M42, D3,	280 HB		3.2		0.40	1.08		150		0.27	120
			11	S6-5-2, 12Ni19	320 HB		2.4		0.35	0.72		130		0.25	100
			11		350 HB		2.4		0.35	0.72		110		0.25	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	4.0	0.20	0.40	1.08	170	270	3.0	0.32	200
			14	X5CrNi18-9	240 HB		4.0		0.40	0.90	160	220		0.29	180
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	3.2	0.18	0.35	0.72	80	150	2.5	0.25	100
			14	S31500	310 HB		3.2		0.35		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	4.0	0.22	0.40	0.90	170	250	3.0	0.29	190
			13	17-4 PH, 430	42 HRC		3.2		0.40		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	4.0	0.15	0.60	1.80	170	250	3.0	0.32	200
			15	EN-GJL-250,	200 HB		4.0		0.60	1.62	160	230			180
			16	No30B	250 HB		4.0		0.55	1.62	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	4.0	0.15	0.50	1.35		250	3.0	0.27	180
			17,19	50005	200 HB		4.0		0.50	1.17	120	230			160
			18,20		250 HB		4.0		0.50	1.08		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.4	0.20	0.35		25	45	2.0	0.25	32
			33	Inconel 700	250 HB		2.4		0.35	0.63	25	45			30
			34	Stellite 21	350 HB		2.4		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	3.2	0.20	0.40	0.72	45	65	2.0	0.30	55
			37	T40	-		2.4		0.35	0.63	35	55		0.27	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.0	0.11	0.30	0.54	50	100	2.0	0.23	80
			38	440C,	50 HRC		1.6		0.25	0.36	40	90	1.5	0.18	70
			38	G-X260NiCr42	55 HRC		1.2		0.20	0.27	40	80	1.0	0.16	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.6	0.11	0.25	0.36	40	60	1.5	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.2	0.11	0.20	0.27	30	50	1.0	0.14	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.8	0.20	0.60	1.60	200	400	3.0	0.36	280

CCMT 120404 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	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	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 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			240
				280 HB		2.0		0.18	0.40		210			200
				350 HB		2.0		0.18	0.36		180			180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 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			140
				320 HB		2.0		0.14	0.32		130			120
				350 HB		2.0		0.14	0.26		110			110
Stainless Steel	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12	260
				240 HB		2.5		0.18	0.26	160	220			210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12	140
				310 HB		2.0		0.14		70	140			140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15	240
				42 HRC		2.0		0.16	0.26	120	190			180
Cast Iron	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18	240
				200 HB		3.0		0.20	0.60	160	230			220
				250 HB		3.0		0.20	0.60	150	210			200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005	150 HB	0.2	2.5	0.08	0.18	0.48	250	250	2.0	0.15	240
				200 HB		2.5		0.18	0.40	120	230			220
				250 HB		2.5		0.18	0.40	190	190			180
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.2	2.0	0.09	0.15		25	50	2.0	0.12	40
			33 Inconel 700	250 HB		2.0		0.15	0.26	25	50			40
			34 Stellite 21	350 HB		2.0		0.15		23	45			35
	Ti based	10	36 TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60
			37 T40	-		2.0		0.14	0.26	35	60			50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	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	0.12	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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

CCMT 120408 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	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2	1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3	28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
			5,7	100Cr6	280 HB		4.0	0.18	0.40	1.20		210		0.30	150
			8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
			11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
			14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14	S31500	310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
			16	No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19	50005	200 HB		5.0		0.50	1.30		230			160
			18,20		250 HB		5.0		0.50	1.20		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35		25	45	2.0	0.28	32
			33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		3.0		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
			37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20	70
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	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
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280

CCMT 120412 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.60	2.16	180	330	3.0	0.42	240
			2 1045, 1060,	190 HB		5.0		0.60	2.16		280			220
			3 28Mn6	250 HB		5.0		0.54	1.80		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.54	1.44	120	280	3.0	0.38	200
			4,6 Ck60, 4140, 4340,	230 HB		4.0		0.54	1.44		250			180
			5,7 100Cr6	280 HB		4.0		0.48	1.44		210			150
			8	350 HB		3.5		0.48	1.20		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.48	1.44	70	190	2.5	0.36	140
			10 H13, M42, D3,	280 HB		4.0		0.48	1.44		150			120
			11 S6-5-2, 12Ni19	320 HB		3.0		0.42	0.96		130			100
				350 HB		3.0		0.42	0.96		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.20	0.48	1.44	170	270	3.0	0.35	190
			14 X5CrNi18-9	240 HB		5.0		0.48	1.20	160	220			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.42	0.96	80	150	2.5	0.28	100
			14 S31500	310 HB		4.0		0.42	0.96	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.48	1.20	170	250	3.0	0.35	190
			13 17-4 PH, 430	42 HRc		4.0		0.48	1.20	120	190			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.72	2.40	170	250	3.0	0.42	200
			16 EN-GJL-250,	200 HB		5.0		0.72	2.16	160	230			180
			16 No30B	250 HB		5.0		0.66	2.16	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.60	1.80	120	250	3.0	0.36	180
			17,19 50005	200 HB		5.0		0.60	1.56		230			160
			18,20	250 HB		5.0		0.60	1.44		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.42		25	45	2.0	0.30	32
			33 Inconel 700	250 HB		3.0		0.42	0.84	25	45			30
			34 Stellite 21	350 HB		3.0		0.42		23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.20	0.48	0.96	45	65	2.0	0.35	55
			37 T40	-		3.0		0.42	0.84	35	55			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.5	0.11	0.36	0.72	50	100	2.0	0.30	80
			38 440C,	50 HRc		2.0		0.30	0.48	40	90	1.5	0.24	70
			38 G-X260NiCr42	55 HRc		1.5		0.24	0.36	40	80	1.0	0.22	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	2.0	0.11	0.30	0.48	40	60	1.5	0.22	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.11	0.24	0.36	30	50	1.0	0.18	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	6.0	0.20	0.72	2.20	200	400	3.0	0.48	280



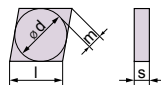
C N M A



Shape

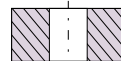


Clearance Angle



Tolerance

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



Fixing

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMA 120408	LT 1000	12	4.76	0.8	T0002791
CNMA 120412	LT 1000	12	4.76	1.2	T0002792
CNMA 120416	LT 1000	12	4.76	1.6	T0001894

Available from Q1-2013

80° Diamond shape flat inserts. Strong edge preparation mainly for Gray Cast Iron machining.
For general purpose Turning, Facing and Boring operations

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
CNMA 120408 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
CNMA 120412 NN	☹	😊	😊	
CNMA 1204016 NN	☹	☹	😊	

CNMA 120408 LT 1000

CNMA

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
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.7	6.0	0.20	0.78	3.40	170	250	4.0	0.44	200
			15 EN-GJL-250, No30B	200 HB		6.0		0.78	3.06	160	230			180
			16	250 HB		6.0		0.72	3.06	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.7	6.0	0.20	0.65	2.55	120	230	4.0	0.38	180
			17,19	200 HB		6.0		0.65	2.21	120	210			160
			18,20	250 HB		6.0		0.65	2.04	120	190			140
H	Chilled Cast Iron	11	40 Ni-Hard 2	400 HB	0.7	2.4	0.14	0.33	0.68	40	60	2.0	0.23	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.26	0.51	30	50	1.3	0.19	40

CNMA 120412 LT 1000

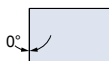
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.7	6.0	0.20	0.81	3.40	170	250	4.0	0.46	200
			15 EN-GJL-250, No30B	200 HB		6.0		0.81	3.06	160	230			180
			16	250 HB		6.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.7	6.0	0.20	0.68	2.55	120	230	4.0	0.40	180
			17,19	200 HB		6.0		0.68	2.21	120	210			160
			18,20	250 HB		6.0		0.68	2.04	120	190			140
H	Chilled Cast Iron	11	40 Ni-Hard 2	400 HB	0.7	2.4	0.14	0.34	0.68	40	60	2.0	0.24	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.27	0.51	30	50	1.3	0.20	40

CNMA 120416 NN LT 1000

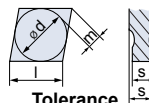
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.7	6.0	0.20	0.90	3.60	170	250	4.0	0.58	200
			15 EN-GJL-250, No30B	200 HB		6.0		0.90	3.24	160	230			180
			16	250 HB		6.0		0.83	3.24	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.7	6.0	0.20	0.75	2.70	120	230	4.0	0.50	180
			17,19	200 HB		6.0		0.75	2.34	120	210			160
			18,20	250 HB		6.0		0.75	2.16	120	190			140
H	Chilled Cast Iron	11	40 Ni-Hard 2	400 HB	0.7	2.4	0.14	0.38	0.72	40	60	2.0	0.30	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.30	0.54	30	50	1.3	0.25	40

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Shape

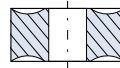


Clearance Angle



Tolerance

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



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMG 120404 NN	LT 10	12	4.76	0.4	T0000491
CNMG 120408 NN	LT 10	12	4.76	0.8	T0000059
CNMG 120408 NM	LT 10	12	4.76	0.8	T0001966
CNMG 120412 NN	LT 10	12	4.76	1.2	T0000061

NN All purpose Chipbreaker

NM Steel and Cast Iron

The most popular general purpose Turning inserts. Use for Turning, Facing and Boring operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
CNMG 120404 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
CNMG 120408 NN				
CNMG 120408 NM				
CNMG 120412 NN				

Stainless Steel



Productivity

Machine Recommendations Guide
Details on page 10



C N M G

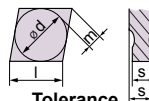
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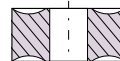
Shape



Clearance Angle



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



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMG 120404 NN	LT 1000	12	4.76	0.4	T0001895
CNMG 120408 NN	LT 1000	12	4.76	0.8	T0001896
CNMG 120408 NM	LT 1000	12	4.76	0.8	T0001968
CNMG 120408 NX	LT 1000	12	4.76	0.8	T0002741
CNMG 120412 NN	LT 1000	12	4.76	1.2	T0001897

NN All purpose Chipbreaker

NX All purpose Chipbreaker

NM Steel and Cast Iron

The most popular Turning inserts. Use for Turning, Facing and Boring operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
CNMG 120404 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
CNMG 120408 NN	😐	😊	😊	
CNMG 120408 NM	😞	😊	😊	
CNMG 120408 NX	😊	😊	😐	
CNMG 120412 NN	😞	😐	😊	

Stainless Steel



Productivity

Machine Recommendations Guide
Details on page 10

CNMG 120404 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
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18
			2	1045, 1060,	190 HB		2.5		0.22	0.52		280		
			3	28Mn6	250 HB		2.5		0.20	0.48		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250		
			5,7	100Cr6	280 HB		2.0		0.18	0.40		210		
			8		350 HB		2.0		0.18	0.36		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12
			10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150		
			11	S6-5-2, 12Ni19	320 HB		2.0		0.14	0.32		130		
			11		350 HB		2.0		0.14	0.26		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12
			14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220		
	Duplex	5	14	X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12
			14	S31500	310 HB		2.0		0.14		70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15
			13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18
			15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230		
			16	No30B	250 HB		3.0		0.20	0.60	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15
			17,19	50005	200 HB		2.5		0.18	0.40		230		
			18,20		250 HB		2.5		0.18	0.40		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15		25	50	2.0	0.12
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50		
			34	Stellite 21	350 HB		2.0		0.15		23	45		
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15
			37	T40	-		2.0		0.14	0.26	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
			38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09
			38	G-X260NiC/42	55 HRC		1.4		0.09	0.13	40	80	1.0	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20

CNMG 120408 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	2.00	180	330	3.0	0.38	240
		2	1045, 1060, 28Mn6	190 HB		5.0		0.50	1.80		280		0.35	220
		3		250 HB		5.0		0.45	1.50		250		0.33	200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.60	120	280	3.0	0.32	200
		4,6	Ck60, 4140, 4340,	230 HB		4.0		0.45	1.40		250		0.32	180
		5,7	100Cr6	280 HB		4.0		0.40	1.20		210		0.30	150
		8		350 HB		3.5		0.40	1.00		180		0.30	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
		10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
		11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
		11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.20	0.40	1.00	170	270	3.0	0.25	190
		14	X5CrNi18-9	240 HB		5.0		0.40	0.90	160	220		0.22	170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.70	80	150	2.5	0.28	100
		14	S31500	310 HB		4.0		0.35	0.70	70	140		0.28	90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
		13	17-4 PH, 430	42 HRc		4.0		0.40	1.00	120	190		0.32	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
		15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230		0.35	180
		16	No30B	250 HB		5.0		0.55	1.80	150	210		0.35	160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
		17,19	50005	200 HB		5.0		0.50	1.30	120	230		0.30	160
		18,20		250 HB		5.0		0.50	1.20	120	190		0.30	140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	50	2.0	0.28	32
		33	Inconel 700	250 HB		3.0		0.35	0.70	25	50		0.28	30
		34	Stellite 21	350 HB		3.0		0.35	0.70	23	45		0.28	28
	Ti based	10	36 TiAl6V4	-	0.5	3.5	0.20	0.40	0.80	45	65	2.0	0.33	55
		37	T40	-		3.0		0.35	0.70	35	60		0.30	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
		38	440C,	50 HRc		2.0		0.25	0.50	40	90	1.5	0.20	70
		38	G-X260NiCr42	55 HRc		1.6		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	2.0	0.11	0.25	0.50	40	60	1.5	0.18	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.6	0.11	0.20	0.30	30	50	1.0	0.15	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	6.0	0.20	0.60	2.00	200	400	3.0	0.40	280

CNMG 120408 NM 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.65	2.7	180	330	4.0	0.50	210
			2 1045, 1060,	190 HB		5.0		0.65	2.7		280			200
			3 28Mn6	250 HB		5.0		0.59	2.3		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.59	1.8	120	280	4.0	0.44	160
			4,6 Ck60, 4140, 4340,	230 HB		4.0		0.59	1.8		250			150
			5,7 100Cr6	280 HB		4.0		0.52	1.8		210			140
			8	350 HB		3.5		0.52	1.6		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.52	1.8	70	190	3.3	0.38	120
			10 H13, M42, D3,	280 HB		4.0		0.52	1.8		150			110
			11 S6-5-2, 12Ni19	320 HB		3.0		0.46	1.2		130			100
				350 HB		3.0		0.46	1.2		110			90
Cast Iron	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.52	1.6	170	250	4.0	0.38	190
			13 17-4 PH, 430	42 HRc		4.0		0.52	1.6		120			130
	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.78	3.0	170	250	4.0	0.44	180
			15 EN-GJL-250,	200 HB		5.0		0.78	2.7		160			170
			16 No30B	250 HB		5.0		0.72	2.7		150			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.65	2.3	120	250	4.0	0.38	150
			17,19 50005	200 HB		5.0		0.65	2.0		230			140
			18,20	250 HB		5.0		0.65	1.8		190			130
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.5	0.11	0.39	0.9	50	100	2.7	0.31	80
			38 440C,	50 HRc		2.0		0.33	0.6		40			70
			38 G-X260NiCr42	55 HRc		1.5		0.26	0.5		40			60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	2.0	0.11	0.33	0.6	40	60	2.0	0.23	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.11	0.26	0.5	30	50	1.5	0.19	40

CNMG 120408 NX LT 1000

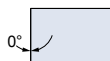
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35
			2	1045, 1060,	190 HB		5.0		0.50	1.80		280		220
			3	28Mn6	250 HB		5.0		0.45	1.50		250		200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32
			4,6	Ck60, 4140, 4340,	230 HB		4.0		0.45	1.20		250		180
			5,7	100Cr6	280 HB		4.0		0.40	1.20		210		150
			8		350 HB		3.5		0.40	1.00		180		130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30
			10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		100
			11		350 HB		3.0		0.35	0.80		110		90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.25
			14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28
			14	S31500	310 HB		4.0		0.35	0.80	70	140		90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32
			13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190		130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35
			15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230		180
			16	No30B	250 HB		5.0		0.55	1.80	150	210		160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30
			17,19	50005	200 HB		5.0		0.50	1.30		230		160
			18,20		250 HB		5.0		0.50	1.20		190		140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28
			33	Inconel 700	250 HB		3.0		0.35	0.70	25	45		30
			34	Stellite 21	350 HB		3.0		0.35	0.70	23	40		28
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33
			37	T40	-		3.0		0.35	0.70	35	55		45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25
			38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.11	0.25	0.40	40	60	1.5	0.18
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.20	0.30	30	50	1.0	0.15
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40

CNMG 120412 NN LT 10 & LT 1000

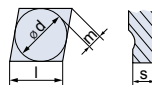
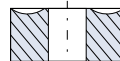
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.7	6.0	0.26	0.68	3.06	180	330	4.0	0.46	240
			2	1045, 1060,	190 HB		6.0		0.68	3.06		280			220
			3	28Mn6	250 HB		6.0		0.61	2.55		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.7	6.0	0.26	0.61	2.04	120	280	4.0	0.42	200
			4,6	Ck60, 4140, 4340,	230 HB		4.8	0.26	0.61	2.04		250		0.42	180
			5,7	100Cr6	280 HB		4.8	0.23	0.54	2.04		210		0.40	150
			8		350 HB		4.2	0.23	0.54	1.70		180		0.40	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.7	4.8	0.23	0.54	2.04	70	190	3.4	0.40	140
			10	H13, M42, D3,	280 HB		4.8		0.54	2.04		150		0.40	120
			11	S6-5-2, 12Ni19	320 HB		3.6		0.47	1.36		130		0.37	100
			11		350 HB		3.6		0.47	1.36		110		0.37	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.7	6.0	0.25	0.54	2.04	170	270	4.0	0.28	190
			14	X5CrNi18-9	240 HB		6.0		0.54	1.70	160	220		0.28	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.7	4.8	0.23	0.47	1.36	80	150	3.4	0.32	100
			14	S31500	310 HB		4.8		0.47		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.7	6.0	0.28	0.54	1.70	170	250	4.0	0.40	190
			13	17-4 PH, 430	42 HRC		4.8		0.54		120	190	3.0	0.35	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.7	6.0	0.20	0.81	3.40	170	250	4.0	0.46	200
			15	EN-GJL-250,	200 HB		6.0		0.81	3.06	160	230			180
			16	No30B	250 HB		6.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.7	6.0	0.20	0.68	2.55		250	4.0	0.40	180
			17,19	50005	200 HB		6.0		0.68	2.21	120	230			160
			18,20		250 HB		6.0		0.68	2.04		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.7	3.6	0.25	0.47		25	45	2.7	0.37	32
			33	Inconel 700	250 HB		3.6		0.47	1.19	25	45			30
			34	Stellite 21	350 HB		3.6		0.47		23	40			28
	Ti based	10	36	TiAl6V4	-	0.7	4.8	0.25	0.54	1.36	45	65	2.7	0.44	55
			37	T40	-		3.6		0.47	1.19	35	55		0.40	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.7	3.0	0.14	0.41	1.02	50	100	2.7	0.33	80
			38	440C,	50 HRC		2.4		0.34	0.68	40	90	2.0	0.26	70
			38	G-X260NiCr42	55 HRC		1.8		0.27	0.51	40	80	1.3	0.24	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.7	2.4	0.14	0.34	0.68	40	60	2.0	0.24	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.27	0.51	30	50	1.3	0.20	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.7	7.0	0.25	0.81	3.10	200	400	4.0	0.50	280

**C****N****M****M**

Shape



Clearance Angle


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

Fixing
Chip breaker
CNMM

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMM 120408 NR	LT 10	12	4.76	0.8	T0000669
CNMM 120412 NR	LT 10	12	4.76	1.2	T0000671

NR Roughing chipbreaker

80° Diamond shape, single sided inserts. Strong cutting edge for Roughing operations which includes Interrupted cut, high feeds and high depth of cut.

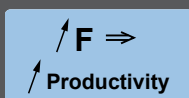
Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNMM 120408 NR			
CNMM 120412 NR			
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			

= Good

= Acceptable

= Not recommended



Machine Recommendations Guide
Details on page 10



C

N

M

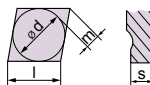
M



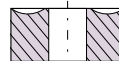
Shape



Clearance Angle



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



**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMM 120408 NR	LT 1000	12	4.76	0.8	T0001898
CNMM 120412 NR	LT 1000	12	4.76	1.2	T0001899

NR Roughing chipbreaker

80° Diamond shape, single sided inserts. Strong cutting edge for Roughing operations which includes Interrupted cut, high feeds and high depth of cut.

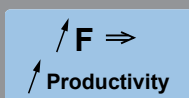
Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNMM 120408 NR			
CNMM 120412 NR			
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			

= Good

= Acceptable

= Not recommended



Machine Recommendations Guide
Details on page 10

CNMM 120408 NR 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	1 C35, Ck45, 1020,	125 HB	0.5	7.0	0.21	0.60	3.20	180	330	5.0	0.46	240
			2 1045, 1060,	190 HB		7.0		0.60	2.88		280		0.42	220
			3 28Mn6	250 HB		7.0		0.54	2.40		250		0.40	200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	7.0	0.21	0.54	2.56	120	280	5.0	0.38	200
			4,6 Ck60, 4140, 4340,	230 HB		5.6		0.54	2.24		250		0.38	180
			5,7 100Cr6	280 HB		5.6		0.48	1.92		210		0.36	150
			8	350 HB		4.9		0.48	1.60		180		0.36	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	5.6	0.18	0.48	1.92	70	190	4.1	0.36	140
			10 H13, M42, D3,	280 HB		5.6		0.48	1.92		150		0.36	120
			11 S6-5-2, 12Ni19	320 HB		4.2		0.42	1.28		130		0.34	100
				350 HB		4.2		0.42	1.28		110		0.34	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	7.0	0.20	0.48	1.92	170	270	5.0	0.32	190
			14 X5CrNi18-9	240 HB		7.0		0.48	1.76		160		0.30	170
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	5.6	0.18	0.42	1.44	80	150	4.1	0.25	100
			14 S31500	310 HB		5.6		0.42	1.44		70		0.25	90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	7.0	0.22	0.48	1.92	170	250	5.0	0.32	190
			13 17-4 PH, 430	42 HRc		5.6		0.48	1.92		120		0.30	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	7.0	0.15	0.72	3.20	170	250	5.0	0.42	200
			15 EN-GJL-250,	200 HB		7.0		0.72	2.88		160		0.42	180
			16 No30B	250 HB		7.0		0.66	2.88		150		0.42	160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	7.0	0.15	0.60	2.40	120	250	5.0	0.36	180
			17,19 50005	200 HB		7.0		0.60	2.08		230		0.36	160
			18,20	250 HB		7.0		0.60	1.92		190		0.36	140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	4.2	0.20	0.42	1.40	25	50	3.3	0.34	32
			33 Inconel 700	250 HB		4.2		0.42	1.40		25		0.34	30
			34 Stellite 21	350 HB		4.2		0.42	1.30		23		0.34	28
	Ti based	10	36 TiAl6V4	-	0.5	4.9	0.20	0.48	1.60	45	65	3.3	0.38	55
			37 T40	-		4.2		0.42	1.30		35		0.34	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	3.5	0.11	0.36	0.96	50	100	3.3	0.30	80
			38 440C,	50 HRc		2.8		0.30	0.80		40		0.24	70
			38 G-X260NiCr42	55 HRc		2.2		0.24	0.48		40		0.22	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	2.8	0.11	0.30	0.80	40	60	2.5	0.22	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	2.2	0.11	0.24	0.48	30	50	1.7	0.18	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	8.4	0.20	0.72	3.20	200	400	5.0	0.48	280

CNMM 120412 NR LT 10 & LT 1000

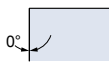
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.21	0.60	3.60	180	330	5.0	0.46	240
			2	1045, 1060, 28Mn6	190 HB		7.0		0.60	3.24		280		0.42	220
			3		250 HB		7.0		0.54	2.70		250		0.40	200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.21	0.54	2.88	120	280	5.0	0.38	200
			4,6		230 HB		5.6	0.21	0.54	2.52		250		0.38	180
			5,7		280 HB		5.6	0.18	0.48	2.16		210		0.36	150
			8		350 HB		4.9	0.18	0.48	1.80		180		0.36	130
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.6	0.18	0.48	2.16	70	190	4.1	0.36	140
			10		280 HB		5.6		0.48	2.16		150		0.36	120
			11		320 HB		4.2		0.42	1.44		130		0.34	100
			11		350 HB		4.2		0.18	0.42		1.44		110	0.34
	Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	7.0	0.20	0.48	2.16	170	270	5.0	0.32
14				X5CrNi18-9	240 HB	7.0		0.48		1.98	160	220	0.30		170
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.6	0.18	0.42	1.62	80	150	4.1	0.25	100
			14		310 HB		5.6	0.18	0.42	70	140	0.25		90	
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.22	0.48	2.16	170	250	5.0	0.32	190
			13		42 HRc		5.6		0.48	2.16	120	190	4.1	0.30	130
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.15	0.72	3.60	170	250	5.0	0.42	200
			15		200 HB		7.0		0.72	3.24	160	230		0.42	180
			16		250 HB		7.0		0.66	3.24	150	210		0.42	160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.60	2.70	120	250	5.0	0.36	180
			17,19		200 HB		7.0		0.60	2.34		230		0.36	160
			18,20		250 HB		7.0		0.60	2.16		190		0.36	140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	4.2	0.20	0.42	1.40	25	50	3.3	0.34	32
			33	Inconel 700	250 HB		4.2		0.42	1.40	25	50		0.34	30
			34	Stellite 21	350 HB		4.2		0.42	1.30	23	45		0.34	28
	Ti based	10	36	TiAl6V4	-	0.5	4.9	0.20	0.48	1.60	45	65	3.3	0.38	55
			37	T40	-		4.2		0.42	1.30	35	60		0.34	45
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	3.5	0.11	0.36	1.08	50	100	3.3	0.30	80
			38	G-X260NiCr42	50 HRc		2.8		0.30	0.90	40	90	2.5	0.24	70
			38		55 HRc		2.2		0.24	0.54	40	80	1.7	0.22	60
	Chilled Cast Iron	11	40	Ni-Hard 2	400 HB	0.5	2.8	0.11	0.30	0.90	40	60	2.5	0.22	50
			41	G-X300CrMo15	55 HRc	0.5	2.2	0.11	0.24	0.54	30	50	1.7	0.18	40
	NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	8.4	0.20	0.72	3.60	200	400	5.0	0.48



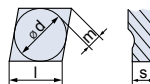
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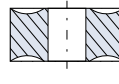
Shape



Clearance Angle



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



**Fixing
Chip breaker**

CNMP

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMP 120408 NN	LT 10	12	4.76	0.8	T0000062
CNMP 120412 NN	LT 10	12	4.76	1.2	T0000063

NN All purpose Chipbreaker

80° Diamond shape, double sided inserts with positive chipbreaker geometry.
 Generates low cutting forces, suitable for High Temperature Alloys.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNMP 120408 NN			
CNMP 120412 NN			
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			

= Good

= Acceptable

= Not recommended

**Stainless Steel
Exotic Material**

CNMP - TNMP - WNMP

**CNMP
TNMP
WNMP** →

Exotic Material
 Verify
Cutting Conditions

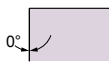
Machine Recommendations
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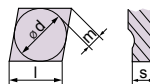
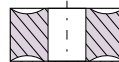
C N M P



Shape



Clearance Angle


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

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMP 120408 NN	LT 1000	12	4.76	0.8	T0001900
CNMP 120412 NN	LT 1000	12	4.76	1.2	T0001901

NN All purpose Chipbreaker

80° Diamond shape, double sided inserts with positive chipbreaker geometry.
Generates low cutting forces, suitable for High Temperature Alloys.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNMP 120408 NN			
CNMP 120412 NN			
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			
	 = Good		
	 = Acceptable		
	 = Not recommended		

**Stainless Steel
Exotic Material**

👍

CNMP - TNMP - WNMP

**CNMP
TNMP
WNMP**

→

Exotic Material

Verify

Cutting Conditions

Machine Recommendations
Guide. Details on page 10

CNMP 120408 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	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
		2	1045, 1060,	190 HB	5.0		0.50		1.80	280		220			
		3	28Mn6	250 HB	5.0		0.45		1.50	250		200			
	Low alloyed	2	6	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
		4,6	230 HB		4.0		0.21	0.45	1.20	250		0.32		180	
		5,7	280 HB		4.0		0.18	0.40	1.20	210		0.30		150	
		8	350 HB		3.5		0.18	0.40	1.00	180		0.30		130	
	High alloyed	3	10	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
		10	280 HB		4.0		0.40		1.20	150		0.30		120	
		11	320 HB		3.0		0.35		0.80	130		0.28		100	
		11	350 HB		3.0		0.35		0.80	110		0.28		90	
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.25	190
		14	X5CrNi18-9	240 HB	5.0		0.40		1.00	160	220	0.22		170	
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
		14	S31500	310 HB	4.0		0.35		70	140	90				
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
		13	17-4 PH, 430	42 HRc	4.0		0.40		120	190	2.5	130			
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
		15	EN-GJL-250,	200 HB	5.0		0.60		1.80	160	230	180			
		16	No30B	250 HB	5.0		0.55		1.80	150	210	160			
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
		17,19	200 HB		5.0		0.50		1.30	120	230	160			
		18,20	250 HB		5.0		0.50		1.20	120	190	140			
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
		33	Inconel 700	250 HB	3.0		0.35		0.70	25	45	30			
		34	Stellite 21	350 HB	3.0		0.35		23	40	28				
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
		37	T40	-	3.0		0.35		0.70	35	55	0.30		45	
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
		38	440C,	50 HRC	2.0		0.25		0.40	40	90	1.5	0.20	70	
		38	G-X260NiCr42	55 HRC	1.5		0.20		0.30	40	80	1.0	0.18	60	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	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

CNMP 120412 NN LT 10 & LT 1000

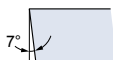
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		A _{max} [mm ²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.7	6.0	0.26	0.68	3.06	180	280	4.0	0.46	240
						6.0		0.68	3.06		250			220
						6.0		0.61	2.55					200
	Low alloyed	2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB 230 HB 280 HB 350 HB	0.7	6.0	0.26	0.61	2.04	120	280	4.0	0.42	200
						4.8	0.26	0.61	2.04		250		0.42	180
						4.8	0.23	0.54	2.04		210		0.40	150
						4.2	0.23	0.54	1.70		180		0.40	130
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB 280 HB 320 HB 350 HB	0.7	4.8	0.23	0.54	2.04	70	190	3.4	0.40	140
						4.8		0.54	2.04		150		0.40	120
						3.6		0.47	1.36		130		0.37	100
						3.6		0.47	1.36		110		0.37	90
Stainless Steel	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.7	6.0	0.25	0.54	2.04	170	270	4.0	0.40	190
						6.0		0.54	1.70	160	220		0.38	170
	Duplex	5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.7	4.8	0.23	0.47	1.36	80	150	3.4	0.32	100
						4.8		0.47		70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.7	6.0	0.28	0.54	1.70	170	250	4.0	0.40	190
						4.8		0.54		120	190	3.0	0.36	130
Cast Iron	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.7	6.0	0.20	0.81	3.40	170	250	4.0	0.46	200
						6.0		0.81	3.06	160	230			180
						6.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.7	6.0	0.20	0.68	2.55	120	230	4.0	0.40	180
						6.0		0.68	2.21		190			160
						6.0		0.68	2.04					140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.7	3.6	0.25	0.47	1.19	25	45	2.7	0.37	32
						3.6		0.47		25	45			30
						3.6		0.47		23	40			28
	Ti based	10	36 TiAl6V4 37 T40	- -	0.7	4.8	0.25	0.54	1.36	45	65	2.7	0.40	55
						3.6		0.47	1.19	35	55		0.37	45
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.7	3.0	0.14	0.41	1.02	50	100	2.7	0.33	80
						2.4		0.34	0.68	40	90	2.0	0.26	70
						1.8		0.27	0.51	40	80	1.3	0.24	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.7	2.4	0.14	0.34	0.68	40	60	2.0	0.24	50
			41 G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.27	0.51	30	50	1.3	0.20	40
	White Cast Iron													
NI	Al (>8%Si)	12	25 AISI12	130 HB	0.7	7.0	0.25	0.81	3.10	200	400	4.0	0.50	280



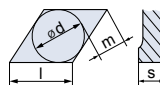
DCMT



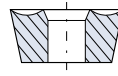
Shape



Clearance Angle



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



**Fixing
Chip breaker**

DCMT

Insert Designation	Grade	l	s	r	Catalog Nr.
DCMT 070204 NN	LT 10	7	2.38	0.4	T0000064
DCMT 11T304 NN	LT 10	11	3.97	0.4	T0000065
DCMT 11T308 NN	LT 10	11	3.97	0.8	T0000721

NN All purpose Chipbreaker

55° Diamond shape inserts, suitable for Internal Turning due to a unique chip removal geometry.
 Generates low cutting forces, most suitable for small work-pieces.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DCMT 070204 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
DCMT 11T304 NN	😊	😐	😞	
DCMT 11T308 NN	😐	😊	😐	

Stainless Steel



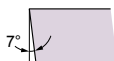
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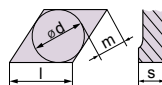
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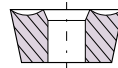
Shape



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.
DCMT 070204 NN	LT 1000	7	2.38	0.4	T0001902
DCMT 11T304 NN	LT 1000	11	3.97	0.4	T0001903
DCMT 11T308 NN	LT 1000	11	3.97	0.8	T0001904

NN All purpose Chipbreaker

55° Diamond shape inserts, suitable for Internal Turning due to a unique chip removal geometry.
 Generates low cutting forces, most suitable for small work-pieces.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DCMT 070204 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
DCMT 11T304 NN				
DCMT 11T308 NN				

Stainless Steel



Machine Recommendations Guide
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DCMT 070204 NN LT 10 & LT 1000

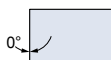
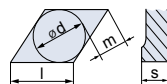
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions				
						min	max	min	max		min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	2.1	0.08	0.20	0.37	180	330	1.0	0.18	300		
			2	1045, 1060,	190 HB		1.8		0.19	0.32		280			260		
			3	28Mn6	250 HB		1.8		0.17	0.30		250			240		
	Low alloyed	2	6	42CrMo4, St50, 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	10	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	14	304, 316,	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.12	260	
14				X5CrNi18-9	240 HB	1.8		0.15		0.16	160	220	210				
Duplex		5	14	X2CrNi23-4,	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.12	140		
			14	S31500	310 HB		1.4		0.12		70	140			140		
Ferritic & Martensitic		6	12	410, X6Cr17,	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.15	240		
			13	17-4 PH, 430	42 HRC		1.4		0.14	0.16	120	190			0.12	180	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.18	240		
			15	EN-GJL-250,	200 HB		2.1		0.17	0.37	160	230			220		
			16	No30B	250 HB		2.1		0.17	0.37	150	210			200		
	Malleable & Nodular	8	17,19	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	31,32	Incoloy 800	240 HB	0.2	1.4	0.08	0.13	0.16	25	50	1.0	0.12	40		
			33	Inconel 700	250 HB		0.13		25		50	40					
			34	Stellite 21	350 HB		0.13		23		45	35					
	Ti based	10	36	TiAl6V4	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.14	60		
			37	T40	-		1.4		0.12	0.16	35	60			0.12	50	
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.11	90		
			38	440C,	50 HRC		1.1		0.09	0.11	40	90			0.6	0.09	80
			38	G-X260NiCr42	55 HRC		1.0		0.08	0.08	40	80			0.5	0.07	70
	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		

DCMT 11T304 NN LT 10 & LT 1000

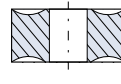
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18
			2	1045, 1060,	190 HB		2.5		0.22	0.52		280		
			3	28Mn6	250 HB		2.5		0.20	0.48		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250		
			5,7	100Cr6	280 HB		2.0		0.18	0.40		210		
			8		350 HB		2.0		0.18	0.36		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12
			10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150		
			11	S6-5-2, 12Ni19	320 HB		2.0		0.14	0.32		130		
			11		350 HB		2.0		0.14	0.26		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12
			14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220		
	Duplex	5	14	X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12
			14	S31500	310 HB		2.0		0.14	0.20	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15
			13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18
			15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230		
			16	No30B	250 HB		3.0		0.20	0.60	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15
			17,19	50005	200 HB		2.5		0.18	0.40		230		
			18,20		250 HB		2.5		0.18	0.40		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50		
			34	Stellite 21	350 HB		2.0		0.15	0.26	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15
			37	T40	-		2.0		0.14	0.26	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
			38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09
			38	G-X260NiC42	55 HRC		1.4		0.09	0.13	40	80	1.0	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20

DCMT 11T308 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	1 C35, Ck45, 1020,	125 HB	0.5	4.0	0.21	0.50	1.62	180	330	3.0	0.32	240
		2	1045, 1060, 28Mn6	190 HB		4.0		0.50	1.62		280			220
		3		250 HB		4.0		0.45	1.35		250			200
	Low alloyed	2	6 42CrMo4, Si50,	180 HB	0.5	4.0	0.21	0.45	1.08	120	280	3.0	0.29	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		3.2	0.21	0.45	1.08		250		0.29	180
		5,7		280 HB		3.2	0.18	0.40	1.08		210		0.27	150
		8		350 HB		2.8	0.18	0.40	0.90		180		0.27	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	3.2	0.18	0.40	1.08	70	190	2.5	0.27	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB		3.2		0.40	1.08		150		0.27	120
		11		320 HB		2.4		0.35	0.72		130		0.25	100
		11		350 HB		2.4		0.35	0.72		110		0.25	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.5	4.0	0.20	0.40	1.08	170	270	3.0	0.32	190
		14		240 HB		4.0		0.40	0.90	160	220		0.29	170
	Duplex	5	14 X2CrNi23-4, S31500	290 HB	0.5	3.2	0.18	0.35	0.72	80	150	2.5	0.25	100
		14		310 HB		3.2		0.35	0.72	70	140		0.25	90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.5	4.0	0.22	0.40	0.90	170	250	3.0	0.29	190
		13		42 HRc		3.2		0.40	0.90	120	190			130
Cast Iron	Grey	7	15 GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	4.0	0.15	0.60	1.80	170	250	3.0	0.32	200
		15		200 HB		4.0		0.60	1.62	160	230			180
		16		250 HB		4.0		0.55	1.62	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.5	4.0	0.15	0.50	1.35	120	250	3.0	0.27	180
		17,19		200 HB		4.0		0.50	1.17	120	230			160
		18,20		250 HB		4.0		0.50	1.08	120	190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.4	0.20	0.35	0.63	25	45	2.0	0.25	32
		33	Inconel 700	250 HB		2.4		0.35	0.63	25	45			30
		34	Stellite 21	350 HB		2.4		0.35	0.63	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	3.2	0.20	0.40	0.72	45	65	2.0	0.30	55
		37	T40	-		2.4		0.35	0.63	35	55		0.27	45
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.0	0.11	0.30	0.54	50	100	2.0	0.23	80
		38		50 HRc		1.6		0.25	0.36	40	90	1.5	0.18	70
		38		55 HRc		1.2		0.20	0.27	40	80	1.0	0.16	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	1.6	0.11	0.25	0.36	40	60	1.5	0.16	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.2	0.11	0.20	0.27	30	50	1.0	0.14	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	4.8	0.20	0.60	1.60	200	400	3.0	0.36	280

**D****N****M****G****Shape****Clearance Angle****Tolerance**

$s \pm 0.13$
 For $l = 11$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 15$, $d \pm 0.08$ $m \pm 0.13$

**Fixing
Chip breaker****NN** All purpose Chipbreaker

Insert Designation	Grade	l	s	r	Catalog Nr.
DNMG 110404 NN	LT 10	11	4.76	0.4	T0000066
DNMG 110408 NN	LT 10	11	4.76	0.8	T0000675
DNMG 150404 NN	LT 10	15	4.76	0.4	T0000476
DNMG 150408 NN	LT 10	15	4.76	0.8	T0000475
DNMG 150412 NN	LT 10	15	4.76	1.2	T0001021
DNMG 150604 NN	LT 10	15	6.35	0.4	T0000583
DNMG 150608 NN	LT 10	15	6.35	0.8	T0000067
DNMG 150612 NN	LT 10	15	6.35	1.2	T0000672

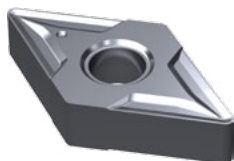
Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DNMG 110404 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
DNMG 110408 NN	😐	😊	😐	
DNMG 150404 NN	😊	😐	😞	
DNMG 150408 NN	😐	😊	😐	
DNMG 150412 NN	😞	😐	😊	
DNMG 150604 NN	😊	😐	😞	
DNMG 150608 NN	😐	😊	😐	
DNMG 150612 NN	😞	😐	😊	

Stainless Steel**V_c ⇒****Productivity**

55° Diamond shape inserts. Suitable for roughing complex shapes operations such as Profiling, Copying and Finishing turning operations.

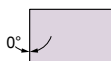
Machine Recommendations
 Guide. Details on page 10



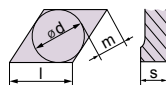
D N M G



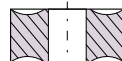
Shape



Clearance Angle



Tolerance
 $s \pm 0.13$
 For $l = 11$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 15$, $d \pm 0.08$ $m \pm 0.13$



Fixing
Chip breaker

NN All purpose Chipbreaker

DNMG

Insert Designation	Grade	l	s	r	Catalog Nr.
DNMG 110404 NN	LT 1000	11	4.76	0.4	T0001905
DNMG 110408 NN	LT 1000	11	4.76	0.8	T0001906
DNMG 150404 NN	LT 1000	15	4.76	0.4	T0001907
DNMG 150408 NN	LT 1000	15	4.76	0.8	T0001908
DNMG 150412 NN	LT 1000	15	4.76	1.2	T0001909
DNMG 150604 NN	LT 1000	15	6.35	0.4	T0001910
DNMG 150608 NN	LT 1000	15	6.35	0.8	T0001911
DNMG 150612 NN	LT 1000	15	6.35	1.2	T0001912

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DNMG 110404 NN	😊	😐	😞	Finishing: d.o.c. = 0.30 - 1.50 mm fn = 0.08 - 0.20 mm/rev
DNMG 110408 NN	😐	😊	😐	
DNMG 150404 NN	😊	😐	😞	
DNMG 150408 NN	😐	😊	😊	Medium: d.o.c. = 0.70 - 4.50 mm fn = 0.15 - 0.45 mm/rev
DNMG 150412 NN	😞	😐	😊	
DNMG 150604 NN	😊	😐	😞	
DNMG 150608 NN	😐	😊	😊	Roughing d.o.c. = 3.00 - 7.00 mm fn = 0.35 - 0.70 mm/rev
DNMG 150612 NN	😞	😐	😊	

Stainless Steel



$V_c \Rightarrow$

Productivity

55° Diamond shape inserts. Suitable for roughing complex shapes operations such as Profiling, Copying and Finishing turning operations.

Machine Recommendations
Guide. Details on page 10

DNMG 110404 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
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18
			2	1045, 1060,	190 HB		2.5		0.22	0.52		280		
			3	28Mn6	250 HB		2.5		0.20	0.48		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250		
			5,7	100Cr6	280 HB		2.0		0.18	0.40		210		
			8		350 HB		2.0		0.18	0.36		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12
			10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150		
			11	S6-5-2, 12Ni19	320 HB		2.0		0.14	0.32		130		
			11		350 HB		2.0		0.14	0.26		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12
			14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220		
	Duplex	5	14	X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12
			14	S31500	310 HB		2.0		0.14	0.20	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15
			13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18
			15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230		
			16	No30B	250 HB		3.0		0.20	0.60	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15
			17,19	50005	200 HB		2.5		0.18	0.40		230		
			18,20		250 HB		2.5		0.18	0.40		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50		
			34	Stellite 21	350 HB		2.0		0.15	0.26	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15
			37	T40	-		2.0		0.14	0.26	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
			38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09
			38	G-X260NiC42	55 HRC		1.4		0.09	0.13	40	80	1.0	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20

DNMG 110408 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2 1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3 28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6 Ck60, 4140, 4340,	230 HB		4.0		0.45	1.20		250			180
			5,7 100Cr6	280 HB		4.0		0.40	1.20		210			150
			8	350 HB		3.5		0.40	1.00		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10 H13, M42, D3,	280 HB		4.0		0.40	1.20		150			120
			11 S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130			100
				350 HB		3.0		0.35	0.80		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.25	190
			14 X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14 S31500	310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13 17-4 PH, 430	42 HRc		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			16 EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
			16 No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19 50005	200 HB		5.0		0.50	1.30		230			160
			18,20	250 HB		5.0		0.50	1.20		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
			33 Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
			34 Stellite 21	350 HB		3.0		0.35	0.70	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	3.5	0.20	0.40	0.80	45	65	2.0	0.33	55
			37 T40	-		3.0		0.35	0.70	35	55			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38 440C,	50 HRc		2.0		0.25	0.40	40	90	1.5	0.20	70
			38 G-X260NiCr42	55 HRc		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	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 AISi12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280

DNMG 150404 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	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300
			2	1045, 1060, 28Mn6	190 HB		2.5		0.22	0.52		280			260
			3		250 HB		2.5		0.20	0.48		250			240
	Low alloyed	2	6	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
			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	10	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	14	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	14	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			140
	Ferritic & Martensitic	6	12	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	15	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	17,19	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	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50			40
			34	Stellite 21	350 HB		2.0		0.15	0.26	23	45			35
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60
			37	T40	-		2.0		0.14	0.26	35	60			50
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
38					50 HRC	1.5		0.10		0.17	40	90	1.2	0.09	80
38				G-X260NiCr42	55 HRC	1.4		0.09		0.13	40	80	1.0	0.07	70
Chilled Cast Iron		11	40	Ni-Hard 2	400 HB	0.2	1.6	0.05	0.12	0.17	40	60	1.2	0.11	50
			41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40
INF	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

DNMG 150408 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
		2	1045, 1060, 28Mn6	190 HB		5.0		0.50	1.80		280			220
		3		250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
		5,7		280 HB		4.0	0.18	0.40	1.20		210		0.30	150
		8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB		4.0		0.40	1.20		150		0.30	120
		11		320 HB		3.0		0.35	0.80		130		0.28	100
		11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.25	190
		14		240 HB		5.0			1.00	160	220		0.22	170
	Duplex	5	14 X2CrNiN23-4, S31500	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
		14		310 HB		4.0				70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
		13		42 HRc		4.0				120	190			130
Cast Iron	Grey	7	15 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
		15		200 HB		5.0		0.60	1.80	160	230			180
		16		250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
		17,19		200 HB		5.0		1.30	1.20	120	230			160
		18,20		250 HB		5.0		1.20		190				140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
		33	Inconel 700	250 HB		3.0				25	45			30
		34	Stellite 21	350 HB		3.0				23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	3.5	0.20	0.40	0.80	45	65	2.0	0.33	55
		37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
		38		50 HRc		2.0		0.25	0.40	40	90	1.5	0.20	70
		38		55 HRc		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	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

DNMG 150412 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	1	C35, Ck45, 1020,	125 HB	0.7	6.0	0.26	0.68	3.06	180	330	4.0	0.46	240
			2	1045, 1060,	190 HB		6.0		0.68	3.06		280			220
			3	28Mn6	250 HB		6.0		0.61	2.55		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.7	6.0	0.26	0.61	2.04	120	280	4.0	0.42	200
			4,6	Ck60, 4140, 4340,	230 HB		4.8	0.26	0.61	2.04		250		0.42	180
			5,7	100Cr6	280 HB		4.8	0.23	0.54	2.04		210		0.40	150
			8		350 HB		4.2	0.23	0.54	1.70		180		0.40	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.7	4.8	0.23	0.54	2.04	70	190	3.4	0.40	140
			10	H13, M42, D3,	280 HB		4.8		0.54	2.04		150		0.40	120
			11	S6-5-2, 12Ni19	320 HB		3.6		0.47	1.36		130		0.37	100
			11		350 HB		3.6		0.47	1.36		110		0.37	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.7	6.0	0.25	0.54	2.04	170	270	4.0	0.40	190
			14	X5CrNi18-9	240 HB		6.0		0.54	1.70	160	220		0.38	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.7	4.8	0.23	0.47	1.36	80	150	3.4	0.32	100
			14	S31500	310 HB		4.8		0.47	1.36	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.7	6.0	0.28	0.54	1.70	170	250	4.0	0.40	190
			13	17-4 PH, 430	42 HRC		4.8		0.54	1.70	120	190	3.0	0.35	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.7	6.0	0.20	0.81	3.40	170	250	4.0	0.46	200
			15	EN-GJL-250,	200 HB		6.0		0.81	3.06	160	230			180
			16	No30B	250 HB		6.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.7	6.0	0.20	0.68	2.55		250	4.0	0.40	180
			17,19	50005	200 HB		6.0		0.68	2.21	120	230			160
			18,20		250 HB		6.0		0.68	2.04		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.7	3.6	0.25	0.47		25	45	2.7	0.37	32
			33	Inconel 700	250 HB		3.6		0.47	1.19	25	45			30
			34	Stellite 21	350 HB		3.6		0.47		23	40			28
	Ti based	10	36	TiAl6V4	-	0.7	4.8	0.25	0.54	1.36	45	65	2.7	0.44	55
			37	T40	-		3.6		0.47	1.19	35	55		0.40	45
	Hardened Mat.														
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.7	3.0	0.14	0.41	1.02	50	100	2.7	0.33	80
			38	440C,	50 HRC		2.4		0.34	0.68	40	90	2.0	0.26	70
			38	G-X260NiCr42	55 HRC		1.8		0.27	0.51	40	80	1.3	0.24	60
	Chilled Cast Iron														
	White Cast Iron		40	Ni-Hard 2	400 HB	0.7	2.4	0.14	0.34	0.68	40	60	2.0	0.24	50
			41	G-X300CrMo15	55 HRC	0.7	1.8	0.14	0.27	0.51	30	50	1.3	0.20	40
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.7	7.0	0.25	0.81	3.10	200	400	4.0	0.50	280

DNMG 150604 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140 140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2		0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 70
	Chilled Cast Iron White Cast Iron		40 Ni-Hard 2 41 G-X300CrMo15	400 HB 55 HRC	0.2	1.6 1.4	0.05	0.12 0.09	0.17 0.13	40 30	60 50	1.2 1.0	0.11 0.07	50 40
	NF	12	25 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

DNMG 150608 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	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2	1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3	28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
			5,7	100Cr6	280 HB		4.0	0.18	0.40	1.20		210		0.30	150
			8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
			11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.25	190
			14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		0.22	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14	S31500	310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
			16	No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19	50005	200 HB		5.0		0.50	1.30		230			160
			18,20		250 HB		5.0		0.50	1.20		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35		25	45	2.0	0.28	32
			33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		3.0		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	3.5	0.20	0.40	0.80	45	65	2.0	0.33	55
			37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20	70
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	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
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280

DNMG 150612 NN LT 10 & LT 1000

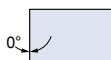
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.7	6.0	0.26	0.68	3.06	180	330	4.0	0.46	240
			2 1045, 1060,	190 HB		6.0		0.68	3.06		280			220
			3 28Mn6	250 HB		6.0		0.61	2.55		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.7	6.0	0.26	0.61	2.04	120	280	4.0	0.42	200
			4,6 Ck60, 4140, 4340,	230 HB		4.8		0.61	2.04		250			180
			5,7 100Cr6	280 HB		4.8	0.23	0.54	2.04		210		0.40	150
			8	350 HB		4.2		0.54	1.70		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.7	4.8	0.23	0.54	2.04	70	190	3.4	0.40	140
			10 H13, M42, D3,	280 HB		4.8		0.54	2.04		150			120
			11 S6-5-2, 12Ni19	320 HB		3.6		0.47	1.36		130		0.37	100
				350 HB		3.6		0.47	1.36		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.7	6.0	0.25	0.54	2.04	170	270	4.0	0.40	190
			14 X5CrNi18-9	240 HB		6.0		0.54	1.70		160		0.38	170
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.7	4.8	0.23	0.47	1.36	80	150	3.4	0.32	100
			14 S31500	310 HB		4.8		0.47	1.36		70			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.7	6.0	0.28	0.54	1.70	170	250	4.0	0.40	190
			13 17-4 PH, 430	42 HRc		4.8		0.54	1.70		120		3.0	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.7	6.0	0.20	0.81	3.40	170	250	4.0	0.46	200
			15 EN-GJL-250,	200 HB		6.0		0.81	3.06		160			180
			16 No30B	250 HB		6.0		0.74	3.06		150			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.7	6.0	0.20	0.68	2.55	120	250	4.0	0.40	180
			17,19 50005	200 HB		6.0		0.68	2.21		230			160
			18,20	250 HB		6.0		0.68	2.04		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.7	3.6	0.25	0.47	1.19	25	45	2.7	0.37	32
			33 Inconel 700	250 HB		3.6		0.47	1.19		25			30
			34 Stellite 21	350 HB		3.6		0.47	1.19		23			28
	Ti based	10	36 TiAl6V4	-	0.7	4.8	0.25	0.54	1.36	45	65	2.7	0.44	55
			37 T40	-		3.6		0.47	1.19		35			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.7	3.0	0.14	0.41	1.02	50	100	2.7	0.33	80
			38 440C,	50 HRc		2.4		0.34	0.68		40			70
			38 G-X260NiCr42	55 HRc		1.8		0.27	0.51		40		1.3	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.7	2.4	0.14	0.34	0.68	40	60	2.0	0.24	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.7	1.8	0.14	0.27	0.51	30	50	1.3	0.20	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.7	7.0	0.25	0.81	3.10	200	400	4.0	0.50	280



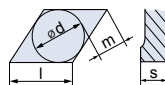
D N U X



Shape

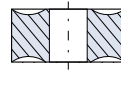


Clearance Angle



Tolerance

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

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
DNUX 150608 R11	LT 10	15	6.35	0.8	T0002157

R11 All purpose Chipbreaker

55° nose angle insert with four cutting edges. Excellent chip control and low cutting forces, suitable for conventional Turning operations and long shafts.

Application Guide

Finishing Medium Roughing / Interrupted cut

DNUX 150608 R11



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

😊 = Good

😐 = Acceptable

😡 = Not recommended

Feed x d.o.c.
=
Amax

$V_c \Rightarrow$
Productivity

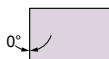
Machine Recommendations
Guide. Details on page 10



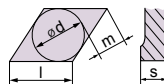
D N U X



Shape

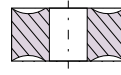


Clearance Angle



Tolerance

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



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
DNUX 150608 R11	LT 1000	15	6.35	0.8	T0002793

DNUX

R11 All purpose Chipbreaker

55° nose angle insert with four cutting edges. Excellent chip control and low cutting forces, suitable for conventional Turning operations and long shafts.

Application Guide

Finishing Medium Roughing / Interrupted cut

DNUX 150608 R11



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

😊 = Good

😐 = Acceptable

☹ = Not recommended

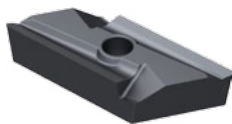
Feed x d.o.c.
=
Amax

$V_c \Rightarrow$
Productivity

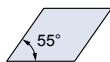
Machine Recommendations
Guide. Details on page 10

DNEX 150608 R11 LT 10 & LT 1000

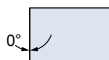
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2	1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3	28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		4.0	0.21	0.45	1.20	120	250		0.32	180
			5,7	100Cr6	280 HB		4.0	0.18	0.40	1.20	120	210		0.30	150
			8		350 HB		3.5	0.18	0.40	1.00	120	180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
			11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
			14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14	S31500	310 HB		4.0		0.35	0.80	70	140		0.28	90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190		0.32	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
			16	No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19	50005	200 HB		5.0		0.50	1.30		230			160
			18,20		250 HB		5.0		0.50	1.20		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
			33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		3.0		0.35	0.70	23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
			37	T40	-		3.0		0.35	0.70	35	55		0.30	45
	Hardened Mat.														
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20	70
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron														
	White Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.11	0.25	0.40	40	60	1.5	0.18	50
			41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.20	0.30	30	50	1.0	0.15	40
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280



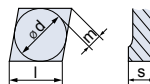
K N U X



Shape

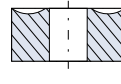


Clearance Angle



Tolerance

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

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
KNUX 160405 R11	LT 10	16	4.76	0.5	T0000951

R11 All purpose Chipbreaker

KNUX

A 55° nose angle insert with two cutting edges. Popular insert with excellent chip control and low cutting forces, suitable for conventional Turning operations

Application Guide

Finishing Medium Roughing / Interrupted cut

KNUX 160405 R11



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

😊 = Good

😐 = Acceptable

😞 = Not recommended

Feed x d.o.c.
=
Amax

$V_c \Rightarrow$
Productivity

Machine Recommendations
Guide. Details on page 10

KNUX 160405 R11 LT 10

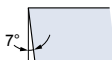
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	5.0	0.11	0.23	0.85	180	330	3.0	0.18
			2	1045, 1060,	190 HB		4.2		0.22	0.73		280		
			3	28Mn6	250 HB		4.2		0.20	0.68		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	4.2	0.10	0.20	0.71	120	280	3.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		4.2		0.20	0.68		250		
			5,7	100Cr6	280 HB		3.3		0.18	0.56		210		
			8		350 HB		3.3		0.18	0.51		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	4.2	0.09	0.18	0.56	70	190	2.0	0.12
			10	H13, M42, D3,	280 HB		4.2		0.16	0.56		150		
			11	S6-5-2, 12Ni19	320 HB		3.3		0.14	0.45		130		
			11		350 HB		3.3		0.14	0.37		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	4.2	0.10	0.18	0.60	170	270	3.0	0.15
			14	X5CrNi18-9	240 HB		4.2		0.18	0.50	160	220		
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.2	3.3	0.09	0.14	0.40	80	150	2.0	0.15
			14	S31500	310 HB		3.3		0.14	0.40	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	4.2	0.10	0.18	0.50	170	250	3.0	0.15
			13	17-4 PH, 430	42 HRC		3.3		0.16	0.45	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	5.0	0.08	0.20	0.85	170	250	3.0	0.18
			15	EN-GJL-250,	200 HB		5.0		0.20	0.75	160	230		
			16	No30B	250 HB		5.0		0.20	0.65	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	4.2	0.08	0.18	0.68	120	250	2.5	0.15
			17,19	50005	200 HB		4.2		0.18	0.60		230		
			18,20		250 HB		4.2		0.18	0.56		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	3.3	0.09	0.15	0.40	25	50	2.0	0.12
			33	Inconel 700	250 HB		3.3		0.15	0.40	25	50		
			34	Stellite 21	350 HB		3.3		0.15	0.40	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	3.3	0.09	0.16	0.45	45	65	2.0	0.15
			37	T40	-		3.3		0.14	0.40	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	3.0	0.05	0.12	0.28	50	100	1.8	0.11
			38	440C,	50 HRC		2.5		0.10	0.24	40	90	1.4	0.09
			38	G-X260NiCr42	55 HRC		2.3		0.09	0.18	40	80	1.2	0.07
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.2	2.7	0.05	0.12	0.24	40	60	1.8	0.11
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	2.3	0.05	0.09	0.18	30	50	1.2	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	6.6	0.10	0.30	0.99	200	400	3.0	0.20



R C M T



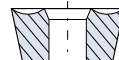
Shape



Clearance Angle



Tolerance

Fixing
Chip breaker

$s \pm 0.13$
For $l = 06/08/10$, $d \pm 0.05$ $m \pm 0.08$
For $l = 12$, $d \pm 0.08$ $m \pm 0.13$

Insert Designation	Grade	l	s	r	Catalog Nr.
RCMT 0602 M0	LT 10	06	2.38	3	T0000090
RCMT 0803 M0	LT 10	08	3.18	4	T0000091
RCMT 10T3 M0	LT 10	10	3.97	5	T0000092
RCMT 1204 M0	LT 10	12	4.76	6	T0000093

RCMT

Round inserts with positive Rake angle and excellent edge resistance. Suitable for Profiling operations of Mill rolls and Aerospace parts.

Application Guide

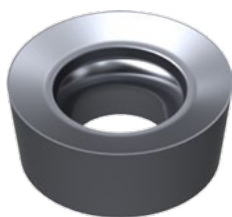
	Finishing	Medium	Roughing / Interrupted cut	
RCMT 0602	☹	😊	☹	😊 = Good ☹ = Acceptable ☹ = Not recommended Finishing: d.o.c. = 0.30 - 1.50 mm fn = 0.08 - 0.20 mm/rev Medium: d.o.c. = 0.70 - 4.50 mm fn = 0.15 - 0.45 mm/rev Roughing d.o.c. = 3.00 - 7.00 mm fn = 0.35 - 0.70 mm/rev
RCMT 0803	☹	😊	☹	
RCMT 10T3	☹	😊	☹	
RCMT 1204	☹	😊	☹	

Stainless Steel


 $V_c \Rightarrow$

Productivity

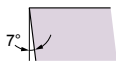
Machine Recommendations Guide
Details on page 10



R C M T



Shape

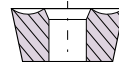


Clearance Angle



Tolerance

$s \pm 0.13$
 For $l = 06/08/10$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 12$, $d \pm 0.08$ $m \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
RCMT 0602 M0	LT 1000	06	2.38	3	T0001914
RCMT 0803 M0	LT 1000	08	3.18	4	T0001915
RCMT 10T3 M0	LT 1000	10	3.97	5	T0001916
RCMT 1204 M0	LT 1000	12	4.76	6	T0001917

Round inserts with positive Rake angle and excellent edge resistance. Suitable for Profiling operations of Mill rolls and Aerospace parts.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
RCMT 0602	☹	😊	☹	😊 = 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
RCMT 0803	☺	😊	☺	
RCMT 10T3	☺	😊	☺	
RCMT 1204	☺	😊	☺	

Stainless Steel



$V_c \Rightarrow$

Productivity

Machine Recommendations Guide
 Details on page 10

RCMT 0602 M0 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	1 C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	2.0	0.15	0.40	0.64	180	330	1.0	0.35	240
		2		190 HB		2.0		0.40	0.64		280		0.35	220
		3		250 HB		1.5		0.35	0.56		250		0.30	200
	Low alloyed	2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB	0.5	2.0	0.15	0.35	0.56	120	280	1.0	0.30	200
				230 HB		2.0		0.35	0.48		250			180
				280 HB		2.0		0.35	0.40		210			150
				350 HB		1.5		0.35	0.36		180			130
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB	0.5	2.0	0.13	0.35	0.48	70	190	1.0	0.30	140
				280 HB		2.0		0.30	0.40		150		0.28	120
				320 HB		1.5		0.30	0.32		130		0.28	100
				350 HB		1.5		0.30	0.26		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB	0.5	2.0	0.14	0.35	0.32	170	270	1.0	0.32	220
				240 HB		2.0		0.32	0.32	160	220			190
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB	0.5	1.5	0.13	0.30	0.30	80	150	1.0	0.28	100
				310 HB		1.5		0.30	0.30	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB	0.5	2.0	0.15	0.35	0.32	170	250	1.0	0.32	210
				42 HRC		2.0		0.30	0.30	120	190		0.28	140
Cast Iron	Grey	7	15 GG20, GG40, 16 EN-GJL-250, 16 No30B	150 HB	0.5	2.0	0.11	0.45	0.70	170	250	1.0	0.35	200
				200 HB		2.0		0.45	0.65	160	230			180
				250 HB		2.0		0.45	0.60	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005	150 HB	0.5	2.0	0.11	0.35	0.60		250	1.0	0.30	180
				200 HB		2.0		0.35	0.50	120	230			160
				250 HB		2.0		0.35	0.45		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	1.5	0.13	0.30	0.30	25	50	1.0	0.28	33
						1.5		0.30	0.30	25	50			30
						1.5		0.30	0.30	23	45			28
	Ti based	10	36 TiAl6V4	-	0.5	1.5	0.13	0.32	0.32	45	65	1.0	0.30	55
				-		1.5		0.30	0.30	35	60		0.28	45
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC	0.5	1.2	0.05	0.22	0.20	50	100	0.9	0.18	80
				50 HRC	0.5	1.0		0.18	0.17	40	90	0.7	0.16	70
				55 HRC	0.3	0.8		0.14	0.12	40	80	0.6	0.12	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	1.2	0.05	0.22	0.17	40	60	0.9	0.18	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.3	0.8	0.05	0.14	0.10	30	50	0.6	0.12	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	2.0	0.15	0.40	0.70	200	400	1.0	0.35	280

RCMT 0803 M0 LT 10 & LT 1000

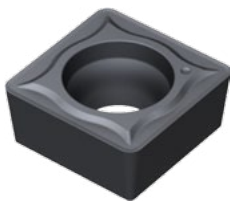
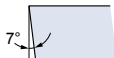
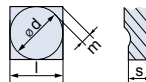
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	2.4	0.15	0.40	0.77	180	330	1.2	0.35	240
			2	1045, 1060,	190 HB		2.4		0.40	0.77		280		0.35	220
			3	28Mn6	250 HB		1.8		0.35	0.67		250		0.30	200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	2.4	0.15	0.35	0.67	120	280	1.2	0.30	200
			4,6	Ck60, 4140, 4340,	230 HB		2.4		0.35	0.58		250			180
			5,7	100Cr6	280 HB		2.4		0.35	0.48		210			150
			8		350 HB		1.8		0.35	0.43		180			130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.4	0.13	0.35	0.58	70	190	1.2	0.30	140
			10	H13, M42, D3,	280 HB		2.4		0.30	0.48		150		0.28	120
			11	S6-5-2, 12Ni19	320 HB		1.8		0.30	0.38		130		0.28	100
			11		350 HB		1.8		0.30	0.31		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	2.4	0.14	0.35	0.38	170	270	1.2	0.32	220
			14	X5CrNi18-9	240 HB		2.4		0.32	0.38	160	220			190
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	1.8	0.13	0.30	0.36	80	150	1.2	0.28	100
			14	S31500	310 HB		1.8		0.30	0.36	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	2.4	0.15	0.35	0.38	170	250	1.2	0.32	210
			13	17-4 PH, 430	42 HRC		2.4		0.30	0.36	120	190		0.28	140
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	2.4	0.11	0.45	0.84	170	250	1.2	0.35	200
			15	EN-GJL-250,	200 HB		2.4		0.45	0.78	160	230			180
			16	No30B	250 HB		2.4		0.45	0.72	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	2.4	0.11	0.35	0.72	120	250	1.2	0.30	180
			17,19	50005	200 HB		2.4		0.35	0.60		230			160
			18,20		250 HB		2.4		0.35	0.54		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	1.8	0.13	0.30	0.36	25	50	1.2	0.28	33
			33	Inconel 700	250 HB		1.8		0.30	0.36	25	50			30
			34	Stellite 21	350 HB		1.8		0.30	0.36	23	45			28
	Ti based	10	36	TiAl6V4	-	0.5	1.8	0.13	0.32	0.38	45	65	1.2	0.30	55
			37	T40	-		1.8		0.30	0.36	35	60		0.28	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	1.4	0.05	0.22	0.24	50	100	1.1	0.18	80
			38	440C,	50 HRC	0.5	1.2		0.18	0.20	40	90	0.8	0.16	70
			38	G-X260NiC42	55 HRC	0.3	1.0		0.14	0.14	40	80	0.7	0.12	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.4	0.05	0.22	0.20	40	60	1.1	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.3	1.0	0.05	0.14	0.12	30	50	0.7	0.12	40
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	2.4	0.15	0.40	0.84	200	400	1.2	0.35	280

RCMT 10T3 M0 LT 10 & LT 1000

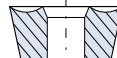
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	2.8	0.15	0.40	0.90	180	330	1.4	0.35	240
		2	1045, 1060, 28Mn6	190 HB		2.8		0.40	0.90		280		0.35	220
		3		250 HB		2.1		0.35	0.78		250		0.30	200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	2.8	0.15	0.35	0.78	120	280	1.4	0.30	200
		4,6	Ck60, 4140, 4340,	230 HB		2.8		0.35	0.67		250			180
		5,7	100Cr6	280 HB		2.8		0.35	0.56		210			150
		8		350 HB		2.1		0.35	0.50		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.8	0.13	0.35	0.67	70	190	1.4	0.30	140
		10	H13, M42, D3,	280 HB		2.8		0.30	0.56		150		0.28	120
		11	S6-5-2, 12Ni19	320 HB		2.1		0.30	0.45		130		0.28	100
		11		350 HB		2.1		0.30	0.36		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	2.8	0.14	0.35	0.45	170	270	1.4	0.32	220
		14	X5CrNi18-9	240 HB		2.8		0.32	0.45	160	220			190
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	2.1	0.13	0.30	0.42	80	150	1.4	0.28	100
		14	S31500	310 HB		2.1		0.30	0.42	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	2.8	0.15	0.35	0.45	170	250	1.4	0.32	210
		13	17-4 PH, 430	42 HRC		2.8		0.30	0.42	120	190		0.28	140
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	2.8	0.11	0.45	0.98	170	250	1.4	0.35	200
		15	EN-GJL-250,	200 HB		2.8		0.45	0.91	160	230			180
		16	No30B	250 HB		2.8		0.45	0.84	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	2.8	0.11	0.35	0.84	250	250	1.4	0.30	180
		17,19	50005	200 HB		2.8		0.35	0.70	120	230			160
		18,20		250 HB		2.8		0.35	0.63	190	190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.1	0.13	0.30	0.42	25	50	1.4	0.28	33
		33	Inconel 700	250 HB		2.1		0.30	0.42	25	50			30
		34	Stellite 21	350 HB		2.1		0.30	0.42	23	45			28
	Ti based	10	36 TiAl6V4	-	0.5	2.1	0.13	0.32	0.45	45	65	1.4	0.30	55
		37	T40	-		2.1		0.30	0.42	35	60		0.28	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	1.7	0.05	0.22	0.28	50	100	1.3	0.18	80
		38	440C,	50 HRC	0.5	1.4		0.18	0.24	40	90	1.0	0.16	70
		38	G-X260NiCr42	55 HRC	0.3	1.1		0.14	0.17	40	80	0.8	0.12	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	1.7	0.05	0.22	0.24	40	60	1.3	0.18	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.3	1.1	0.05	0.14	0.14	30	50	0.8	0.12	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	2.8	0.15	0.40	0.98	200	400	1.4	0.35	280

RCMT 1204 M0 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	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	3.2	0.15	0.40	1.54	180	330	2.0	0.42	240
			2		190 HB		3.2		0.40	1.54		280		0.42	220
			3		250 HB		2.4		0.35	1.34		250		0.36	200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	3.2	0.15	0.35	1.34	120	280	2.0	0.36	200
			4,6		230 HB		3.2		0.35	1.15		250			180
			5,7		280 HB		3.2		0.35	0.96		210			150
			8		350 HB		2.4		0.35	0.86		180			130
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	3.2	0.13	0.35	1.15	70	190	2.0	0.36	140
			10		280 HB		3.2		0.30	0.96		150		0.34	120
			11		320 HB		2.4		0.30	0.77		130		0.34	100
			11		350 HB		2.4		0.30	0.62		110		0.34	90
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	3.2	0.14	0.35	0.77	170	270	2.0	0.38	220
			14		240 HB		3.2		0.32	0.77	160	220			190
	Duplex	5	14	X2CrNi23-4, S31500	290 HB	0.5	2.4	0.13	0.30	0.60	80	150	1.5	0.34	100
			14		310 HB		2.4		0.30	0.60	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	3.2	0.15	0.35	0.77	170	250	2.0	0.38	210
			13		42 HRC		3.2		0.30	0.65	120	190		0.32	140
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	3.2	0.11	0.45	1.68	170	250	2.0	0.42	200
			15		200 HB		3.2		0.45	1.56	160	230			180
			16		250 HB		3.2		0.45	1.44	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	3.2	0.11	0.35	1.44	120	250	2.0	0.36	180
			17,19		200 HB		3.2		0.35	1.20		230			160
			18,20		250 HB		3.2		0.35	1.08		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.4	0.13	0.30	0.60	25	50	1.5	0.34	33
			33	Inconel 700	250 HB		2.4		0.30	0.60	25	50			30
			34	Stellite 21	350 HB		2.4		0.30	0.60	23	45			28
	Ti based	10	36	TiAl6V4	-	0.5	2.4	0.13	0.32	0.60	45	65	1.5	0.36	55
			37	T40	-		2.4		0.30	0.60	35	60		0.34	45
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiC42	45 HRC	0.5	1.9	0.05	0.22	0.48	50	100	1.8	0.22	80
			38		50 HRC		1.6		0.18	0.41	40	90	1.4	0.19	70
			38		55 HRC		1.3		0.14	0.29	40	80	1.2	0.14	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.9	0.05	0.22	0.41	40	60	1.8	0.22	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.3	0.05	0.14	0.24	30	50	1.2	0.14	40
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	3.2	0.15	0.40	1.68	200	400	2.0	0.42	280

**S****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.
SCMT 09T304 NN	LT 10	9	3.97	0.4	T0001459
SCMT 09T308 NN	LT 10	9	3.97	0.8	T0001458

NN All purpose Chipbreaker

SCMT

Square inserts with a positive rake angle with excellent cutting edge resistance. Suitable for Boring.

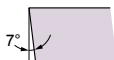
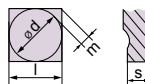
Application Guide

	Finishing	Medium	Roughing / Interrupted cut
SCMT 09T304NN			
SCMT 09T308 NN			
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			

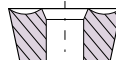
= Good

= Acceptable

= Not recommended

**S****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.
SCMT 09T304 NN	LT 1000	9	3.97	0.4	T0001918
SCMT 09T308 NN	LT 1000	9	3.97	0.8	T0001919

NN All purpose Chipbreaker

Square inserts with a positive rake angle with excellent cutting edge resistance. Suitable for Boring.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
SCMT 09T304NN			
SCMT 09T308 NN			
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			

= Good

= Acceptable

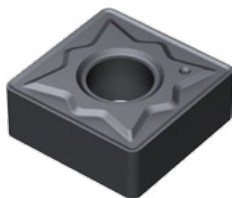
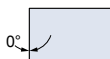
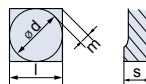
= Not recommended

SCMT 09T304 NN LT 10 & LT 1000

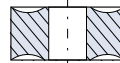
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	4.0 3.3 3.3	0.11	0.26 0.25 0.23	0.72 0.62 0.58	180	330 280 250	2.5	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	3.3 3.3 2.7 2.7	0.10	0.23 0.23 0.21 0.21	0.60 0.58 0.48 0.43	120	280 250 210 180	2.5	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	3.3 3.3 2.7 2.7	0.09	0.21 0.18 0.16 0.16	0.48 0.48 0.38 0.31	70	190 150 130 110	2.5	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	3.3 3.3	0.10	0.21 0.21	0.38 0.31	170 160	270 220	2.5	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.7 2.7	0.09	0.16 0.16	0.24 0.24	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	3.3 2.7	0.10	0.21 0.18	0.38 0.31	170 120	250 190	2.5 2.0	0.15 0.12	240 180
	Cast Iron	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	4.0 4.0 4.0	0.08	0.23 0.23 0.23	0.77 0.72 0.72	170 160 150	250 230 210	2.5	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	3.3 3.3 3.3	0.08	0.21 0.21 0.21	0.58 0.48 0.48	250 120 230 190	250 230 190	2.5	0.15	240 220 180
	High Temp. Alloys	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.7 2.7 2.7	0.09	0.17 0.17 0.17	0.31 0.31 0.31	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.7 2.7	0.09	0.18 0.16	0.38 0.31	45 35	65 60	2.0	0.15 0.12	60 50
	Hardened Mat.	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	2.4 2.0 1.9	0.05	0.14 0.12 0.10	0.24 0.20 0.16	50 40 40	100 90 80	1.9 1.5 1.3	0.11 0.09 0.07	90 80 70
	Chilled Cast Iron White Cast Iron	11	40 Ni-Hard 2 41 G-X300CrMo15	400 HB 55 HRC	0.2	2.1 1.9	0.05	0.14 0.10	0.20 0.16	40 30	60 50	1.5 1.3	0.11 0.07	50 40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.2	5.3	0.10	0.35	0.84	200	400	2.5	0.20	350

SCMT 09T308 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	1	C35, Ck45, 1020,	125 HB	0.5	4.0	0.21	0.50	1.62	180	330	3.0	0.32	240
			2	1045, 1060,	190 HB		4.0		0.50	1.62		280			220
			3	28Mn6	250 HB		4.0		0.45	1.35		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	4.0	0.21	0.45	1.08	120	280	3.0	0.29	200
			4,6	Ck60, 4140, 4340,	230 HB		3.2		0.45	1.08		250			180
			5,7	100Cr6	280 HB		3.2		0.18	0.40		210			150
			8		350 HB		2.8		0.18	0.40		180			130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	3.2	0.18	0.40	1.08	70	190	2.5	0.27	140
			10	H13, M42, D3,	280 HB		3.2		0.40	1.08		150			120
			11	S6-5-2, 12Ni19	320 HB		2.4		0.35	0.72		130			100
			11		350 HB		2.4		0.35	0.72		110			90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	4.0	0.20	0.40	1.08	170	270	3.0	0.32	200
			14	X5CrNi18-9	240 HB		4.0		0.40	0.90	160	220			180
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	3.2	0.18	0.35	0.72	80	150	2.5	0.25	100
			14	S31500	310 HB		3.2		0.35		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	4.0	0.22	0.40	0.90	170	250	3.0	0.29	190
			13	17-4 PH, 430	42 HRC		3.2		0.40		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	4.0	0.15	0.60	1.80	170	250	3.0	0.32	200
			15	EN-GJL-250,	200 HB		4.0		0.60	1.62	160	230			180
			16	No30B	250 HB		4.0		0.55	1.62	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	4.0	0.15	0.50	1.35		250	3.0	0.27	180
			17,19	50005	200 HB		4.0		0.50	1.17	120	230			160
			18,20		250 HB		4.0		0.50	1.08		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.4	0.20	0.35		25	45	2.0	0.25	32
			33	Inconel 700	250 HB		2.4		0.35	0.63	25	45			30
			34	Stellite 21	350 HB		2.4		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	3.2	0.20	0.40	0.72	45	65	2.0	0.30	55
			37	T40	-		2.4		0.35	0.63	35	55			45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.0	0.11	0.30	0.54	50	100	2.0	0.23	80
			38	440C,	50 HRC		1.6		0.25	0.36	40	90			70
			38	G-X260NiCr42	55 HRC		1.2		0.20	0.27	40	80			60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.6	0.11	0.25	0.36	40	60	1.5	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.2	0.11	0.20	0.27	30	50	1.0	0.14	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.8	0.20	0.60	1.60	200	400	3.0	0.36	280

**S****N****M****G****Shape****Clearance Angle****Tolerance**

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

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
SNMG 120408 NN	LT 10	12	4.76	0.8	T0000322
SNMG 120412 NN	LT 10	12	4.76	1.2	T0000323

NN All purpose Chipbreaker

SNMG

Square inserts with strong cutting edge. Suitable for Roughing operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
SNMG 120408 NN	☹	😊	☹
SNMG 120412 NN	☹	☹	😊
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			

😊 = Good

☹ = Acceptable

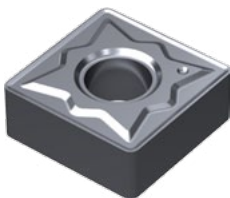
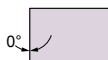
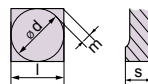
☹ = Not recommended

$\nearrow F \Rightarrow$
 $\nearrow$ **Productivity**

Feed x d.o.c.
 =
Amax

$\nearrow V_c \Rightarrow$
 $\nearrow$ **Productivity**

Machine Recommendations
Guide. Details on page 10

**S****N****M****G****Shape****Clearance Angle**
Tolerance
 $d \pm 0.08$
 $m \pm 0.13$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
SNMG 120408 NN	LT 1000	12	4.76	0.8	T0001921
SNMG 120408 NX*	LT 1000	12	4.76	0.8	T0003011
SNMG 120412 NN	LT 1000	12	4.76	1.2	T0001922

NN All purpose Chipbreaker

*Available from Q2-2013

Square inserts with strong cutting edge. Suitable for Roughing operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
SNMG 120408 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
SNMG 120408 NX				
SNMG 120412 NN				

F $\Rightarrow$
Productivity
Feed x d.o.c.
 =
Amax
V_c $\Rightarrow$
Productivity

 Machine Recommendations
 Guide. Details on page 10

SNMG 120408 NN/NX 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.30	0.70	2.54	180	330	3.0	0.50	240
		2	1045, 1060, 28Mn6	190 HB		5.0		0.70	2.54		280			220
		3		250 HB		5.0		0.63	2.12		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.30	0.63	1.69	120	280	3.0	0.45	200
		4,6	Ck60, 4140, 4340,	230 HB		4.0	0.30	0.63	1.69		250		0.45	180
		5,7	100Cr6	280 HB		4.0	0.25	0.56	1.69		210		0.43	150
		8		350 HB		3.5	0.25	0.56	1.41		180		0.43	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.25	0.56	1.69	70	190	2.5	0.43	140
		10	H13, M42, D3,	280 HB		4.0		0.56	1.69		150		0.43	120
		11	S6-5-2, 12Ni19	320 HB		3.0		0.49	1.13		130		0.40	100
		11		350 HB		3.0		0.49	1.13		110		0.40	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.28	0.56	1.69	170	270	3.0	0.50	190
		14	X5CrNi18-9	240 HB		5.0		0.56	1.41	160	220		0.45	170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.25	0.49	1.13	80	150	2.5	0.40	100
		14	S31500	310 HB		4.0		0.49	1.13	70	140		0.40	90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.31	0.56	1.41	170	250	3.0	0.45	190
		13	17-4 PH, 430	42 HRC		4.0		0.56	1.41	120	190		0.45	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.21	0.84	2.82	170	250	3.0	0.50	200
		15	EN-GJL-250, No30B	200 HB		5.0		0.84	2.54	160	230		0.50	180
		16		250 HB		5.0		0.77	2.54	150	210		0.50	160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.21	0.70	2.12	120	250	3.0	0.43	180
		17,19	50005	200 HB		5.0		0.70	1.83	120	230		0.43	160
		18,20		250 HB		5.0		0.70	1.69	120	190		0.43	140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.28	0.49	0.99	25	45	2.0	0.40	32
		33	Inconel 700	250 HB		3.0		0.49	0.99	25	45		0.40	30
		34	Stellite 21	350 HB		3.0		0.49	0.99	23	40		0.40	28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.28	0.56	1.13	45	65	2.0	0.47	55
		37	T40	-		3.0		0.49	0.99	35	55		0.43	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	2.5	0.16	0.42	0.85	50	100	2.0	0.36	80
		38	440C,	50 HRC		2.0		0.35	0.56	40	90		0.28	70
		38	G-X260NiCr42	55 HRC		1.5		0.28	0.42	40	80		0.26	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	2.0	0.16	0.35	0.56	40	60	1.5	0.26	50
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.5	1.5	0.16	0.28	0.42	30	50	1.0	0.21	40
	NF	12	25 Al (>8%Si)	130 HB	0.5	6.0	0.28	0.80	2.50	200	400	3.0	0.57	280

Values for lead angle (Kr)=45°; For lead angle (Kr)=75°, please limit feed to 75% of the recommended

SNMG 120412 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	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	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.7	6.0	0.37	0.95	3.96	180	280	4.0	0.65	240
						6.0		0.95	3.96		250			220
						6.0		0.86	3.30					200
	Low alloyed	2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.7	6.0	0.37	0.86	2.64	120	280	4.0	0.60	200
						4.8	0.37	0.86	2.64		250		0.60	180
						4.8	0.32	0.76	2.64		210		0.56	150
						4.2	0.32	0.76	2.40		180		0.56	130
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.7	4.8	0.32	0.76	2.64	70	190	3.4	0.56	140
						4.8		0.76	2.64		150		0.56	120
						3.6		0.67	1.76		130		0.52	100
						3.6		0.67	1.76		110		0.52	90
Stainless Steel	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.7	6.0	0.35	0.76	2.64	170	270	4.0	0.58	190
						6.0		0.76	2.20	160	220		0.52	170
	Duplex	5	14 X2CrNiN23-4, 14 S31500	240 HB 310 HB	0.7	4.8	0.32	0.67	1.76	80	150	3.4	0.46	100
						4.8		0.67		70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.7	6.0	0.39	0.76	2.20	170	250	4.0	0.55	190
						4.8		0.76		120	190	3.0	0.50	130
Cast Iron	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.7	6.0	0.30	1.14	4.40	170	250	4.0	0.65	200
						6.0		1.14	3.96	160	230			180
						6.0		1.05	3.96	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.7	6.0	0.30	0.95	3.30	120	250	4.0	0.56	180
						6.0		0.95	2.86		230			160
						6.0		0.95	2.64		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.7	3.6	0.35	0.67	1.54	25	45	2.7	0.52	32
						3.6		0.67		23	40			30
						3.6		0.67						28
	Ti based	10	36 TiAl6V4 37 T40	- -	0.7	4.8	0.35	0.76	1.76	45	65	2.7	0.58	55
						3.6		0.67	1.54	35	55		0.52	45
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.7	3.0	0.19	0.57	1.32	50	100	2.7	0.47	80
						2.4		0.48	0.88	40	90	2.0	0.37	70
						1.8		0.38	0.66	40	80	1.3	0.33	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.7	2.4	0.19	0.48	0.88	40	60	2.0	0.33	50
			41 G-X300CrMo15	55 HRC	0.7	1.8	0.19	0.38	0.66	30	50	1.3	0.28	40
	White Cast Iron													
WF	Al (>8%Si)	12	25 AISI12	130 HB	0.7	7.0	0.35	1.14	4.30	200	400	4.0	0.80	280

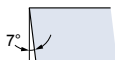
Values for lead angle (Kr)=45°; For lead angle (Kr)=75°, please limit feed to 75% of the recommended



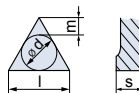
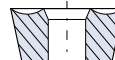
TCMT



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 10	11	2.38	0.4	T0000477
TCMT 110208 NN	LT 10	11	2.38	0.8	T0000478
TCMT 16T304 NN	LT 10	16	3.97	0.4	T0000479
TCMT 16T308 NN	LT 10	16	3.97	0.8	T0000068
TCMT 16T312 NN	LT 10	16	3.97	1.2	T0001774

NN All purpose Chipbreaker

TCMT

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

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
TCMT 110204 NN	😊	😐	😞	Legend: 😊 = 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	😞	😐	😊	

Stainless Steel

 Machine Recommendations Guide
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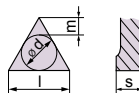
T C M T



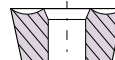
Shape



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	😞	😐	😊	

Stainless Steel



Machine Recommendations Guide
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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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	2.1 1.8 1.8	0.08	0.20 0.19 0.17	0.37 0.32 0.30	180	330 280 250	1.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.08	0.17 0.17 0.15 0.15	0.31 0.30 0.25 0.22	120	280 250 210 180	1.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.07	0.15 0.14 0.12 0.12	0.25 0.25 0.20 0.16	70	190 150 130 110	1.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	1.8 1.8	0.08	0.15 0.15	0.20 0.16	170 160	270 220	1.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	1.4 1.4	0.07	0.12 0.12	0.12 0.12	80 70	150 140	1.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	1.8 1.4	0.08	0.15 0.14	0.20 0.16	170 120	250 190	1.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	2.1 2.1 2.1	0.06	0.17 0.17 0.17	0.40 0.37 0.37	170 160 150	250 230 210	1.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	1.8 1.8 1.8	0.06	0.15 0.15 0.15	0.30 0.25 0.25	250 120 190	250 230 190	1.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	1.4 1.4 1.4	0.08	0.13 0.13 0.13	0.16 0.16 0.16	25 25 23	50 50 45	1.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	1.4 1.4	0.08	0.14 0.12	0.20 0.16	45 35	65 60	1.0	0.14 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.3 1.1 1.0	0.04	0.10 0.09 0.08	0.12 0.11 0.08	50 40 40	100 90 80	0.8 0.6 0.5	0.11 0.09 0.07	90 80 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 AISi12	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 [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	2.1	0.08	0.20	0.37	180	330	1.0	0.25
			2	1045, 1060,	190 HB		1.8		0.19	0.32		280		
			3	28Mn6	250 HB		1.8		0.17	0.30		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.21
			4,6	Ck60, 4140, 4340,	230 HB		1.8		0.17	0.30		250		
			5,7	100Cr6	280 HB		1.4		0.15	0.25		210		
			8		350 HB		1.4		0.15	0.22		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.17
			10	H13, M42, D3,	280 HB		1.8		0.14	0.25		150		
			11	S6-5-2, 12Ni19	320 HB		1.4		0.12	0.20		130		
			11		350 HB		1.4		0.12	0.16		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.17
			14	X5CrNi18-9	240 HB		1.8		0.15	0.16	160	220		
	Duplex	5	14	X2CrNi23-4,	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.17
			14	S31500	310 HB		1.4		0.12		70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.21
			13	17-4 PH, 430	42 HRC		1.4		0.14	0.16	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.25
			15	EN-GJL-250,	200 HB		2.1		0.17	0.37	160	230		
			16	No30B	250 HB		2.1		0.17	0.37	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	1.8	0.06	0.15	0.30		250	1.0	0.21
			17,19	50005	200 HB		1.8		0.15	0.25	120	230		
			18,20		250 HB		1.8		0.15	0.25		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	1.4	0.08	0.13		25	50	1.0	0.17
			33	Inconel 700	250 HB		1.4		0.13	0.16	25	50		
			34	Stellite 21	350 HB		1.4		0.13		23	45		
	Ti based	10	36	TiAl6V4	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.20
			37	T40	-		1.4		0.12	0.16	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.15
			38	440C,	50 HRC		1.1		0.09	0.11	40	90	0.6	0.13
			38	G-X260NiCr42	55 HRC		1.0		0.08	0.08	40	80	0.5	0.10
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.10
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.28

TCMT 16T304 NN LT 10 & LT 1000

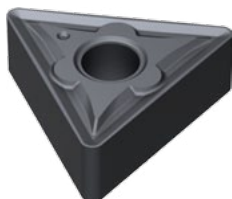
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 70
	Chilled Cast Iron White 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
	G-X300CrMo15	41		55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40
	NF	12	25 AISi12	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

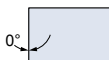
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.43	1.62	180	330	3.0	0.30	240
			2	1045, 1060,	190 HB		5.0		0.43	1.62		280			220
			3	28Mn6	250 HB		5.0		0.38	1.35		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.38	1.08	120	280	3.0	0.27	200
			4,6	Ck60, 4140, 4340,	230 HB		4.0		0.38	1.08		250		0.27	180
			5,7	100Cr6	280 HB		4.0		0.18	0.34		210		0.26	150
			8		350 HB		3.5		0.18	0.34		180		0.26	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.34	1.08	70	190	2.5	0.26	140
			10	H13, M42, D3,	280 HB		4.0		0.34	1.08		150		0.26	120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.30	0.72		130		0.24	100
			11		350 HB		3.0		0.30	0.72		110		0.24	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.34	1.08	170	270	3.0	0.30	200
			14	X5CrNi18-9	240 HB		5.0		0.34	0.90	160	220		0.27	180
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.30	0.72	80	150	2.5	0.24	100
			14	S31500	310 HB		4.0		0.30		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.34	0.90	170	250	3.0	0.27	190
			13	17-4 PH, 430	42 HRC		4.0		0.34		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.51	1.80	170	250	3.0	0.30	200
			15	EN-GJL-250,	200 HB		5.0		0.51	1.62	160	230			180
			16	No30B	250 HB		5.0		0.47	1.62	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.43	1.35		250	3.0	0.26	180
			17,19	50005	200 HB		5.0		0.43	1.17	120	230			160
			18,20		250 HB		5.0		0.43	1.08		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.30		25	45	2.0	0.24	32
			33	Inconel 700	250 HB		3.0		0.30	0.63	25	45			30
			34	Stellite 21	350 HB		3.0		0.30		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.34	0.72	45	65	2.0	0.28	55
			37	T40	-		3.0		0.30	0.63	35	55		0.26	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.26	0.54	50	100	2.0	0.21	80
			38	440C,	50 HRC		2.0		0.21	0.36	40	90	1.5	0.17	70
			38	G-X260NiCr42	55 HRC		1.5		0.17	0.27	40	80	1.0	0.15	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.11	0.21	0.36	40	60	1.5	0.15	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.17	0.27	30	50	1.0	0.13	40
	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

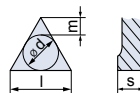
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.48	1.94	180	330	3.0	0.38	240
		2	1045, 1060, 28Mn6	190 HB		5.0		0.48	1.94		280			220
		3		250 HB		5.0		0.43	1.62		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.43	1.30	120	280	3.0	0.35	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		4.0	0.21	0.43	1.30		250		0.35	180
		5,7		280 HB		4.0	0.18	0.38	1.30		210		0.32	150
		8		350 HB		3.5	0.18	0.38	1.08		180		0.32	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.38	1.30	70	190	2.5	0.32	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB		4.0		0.38	1.30		150		0.32	120
		11		320 HB		3.0		0.33	0.86		130		0.30	100
		11		350 HB		3.0		0.33	0.86		110		0.30	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.38	1.30	170	270	3.0	0.38	200
		14		240 HB		5.0		0.38	1.08	160	220		0.35	180
	Duplex	5	14 X2CrNi23-4, S31500	290 HB	0.5	4.0	0.18	0.33	0.86	80	150	2.5	0.30	100
		14		310 HB		4.0		0.33	0.86	70	140		0.30	90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.38	1.08	170	250	3.0	0.35	190
		13		42 HRc		4.0		0.38	1.08	120	190			130
Cast Iron	Grey	7	15 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
		15		200 HB		5.0		0.57	1.94	160	230			180
		16		250 HB		5.0		0.52	1.94	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.48	1.62	120	250	3.0	0.32	180
		17,19		200 HB		5.0		0.48	1.40		230			160
		18,20		250 HB		5.0		0.48	1.30		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.33	0.76	25	45	2.0	0.30	32
		33	Inconel 700	250 HB		3.0		0.33	0.76	25	45			30
		34	Stellite 21	350 HB		3.0		0.33	0.76	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.20	0.38	0.86	45	65	2.0	0.36	55
		37	T40	-		3.0		0.33	0.76	35	55		0.32	45
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.11	0.29	0.65	50	100	2.0	0.27	80
		38		50 HRc		2.0		0.24	0.43	40	90	1.5	0.22	70
		38		55 HRc		1.5		0.19	0.32	40	80	1.0	0.19	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	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

**T****N****M****G**

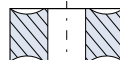
Shape



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 10	16	4.76	0.4	T0000457
TNMG 160408 NN	LT 10	16	4.76	0.8	T0000069
TNMG 160412 NN	LT 10	16	4.76	1.2	T0001734
TNMG 220404 NN	LT 10	22	4.76	0.4	T0001873
TNMG 220408 NN	LT 10	22	4.76	0.8	T0000113
TNMG 220412 NN	LT 10	22	4.76	1.2	T0001735

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

Application Guide

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

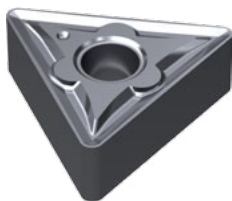
Stainless Steel



Feed x d.o.c.

**=
Amax**

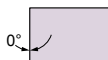
Machine Recommendations Guide
 Details on page 10



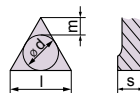
T N M G



Shape

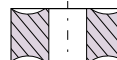


Clearance Angle



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	0.8	T0003013
TNMG 220412 NN	LT 1000	22	4.76	1.2	T0001936

TNMG

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



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 [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	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
			2		190 HB		2.5		0.22	0.52		280		
			3		250 HB		2.5		0.20	0.48		250		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15
			4,6		230 HB		2.5		0.20	0.48		250		
			5,7		280 HB		2.0		0.18	0.40		210		
			8		350 HB		2.0		0.18	0.36		180		
	High alloyed	3	10	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
			10		280 HB		2.5		0.16	0.40		150		
			11		320 HB		2.0		0.14	0.32		130		
			11		350 HB		2.0		0.14	0.26		110		
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12
			14		240 HB		2.5		0.18	0.26	160	220		
	Duplex	5	14	X2CrNi23-4, S31500	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12
			14		310 HB		2.0		0.14		70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15
			13		42 HRC		2.0		0.16	0.26	120	190		
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18
			15		200 HB		3.0		0.20	0.60	160	230		
			16		250 HB		3.0		0.20	0.60	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15
			17,19		200 HB		2.5		0.18	0.40		230		
			18,20		250 HB		2.5		0.18	0.40		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15		25	50	2.0	0.12
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50		
			34	Stellite 21	350 HB		2.0		0.15		23	45		
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15
			37	T40	-		2.0		0.14	0.26	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiC42	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
			38		50 HRC		1.5		0.10	0.17	40	90	1.2	0.09
			38		55 HRC		1.4		0.09	0.13	40	80	1.0	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20

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 [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
		2	1045, 1060,	190 HB		5.0		0.50	1.80		280			220
		3	28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, Si50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
		4,6	Ck60, 4140, 4340,	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
		5,7	100Cr6	280 HB		4.0	0.18	0.40	1.20		210		0.30	150
		8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
		10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
		11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
		11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
		14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
		14	S31500	310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
		13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
		15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
		16	No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
		17,19	50005	200 HB		5.0		0.50	1.30	120	230			160
		18,20		250 HB		5.0		0.50	1.20	120	190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
		33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
		34	Stellite 21	350 HB		3.0		0.35	0.70	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
		37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
		38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20	70
		38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	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 AISi12	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 [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.7	5.0	0.26	0.68	3.06	180	330	4.0	0.46	240
			2 1045, 1060,	190 HB		5.0		0.68	3.06		280			220
			3 28Mn6	250 HB		5.0		0.61	2.55		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.7	5.0	0.26	0.61	2.04	120	280	4.0	0.42	200
			4,6 Ck60, 4140, 4340,	230 HB		4.0		0.61	2.04		250			180
			5,7 100Cr6	280 HB		4.0		0.23	0.54		210			150
			8	350 HB		3.5		0.23	0.54		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.7	4.0	0.23	0.54	2.04	70	190	3.4	0.40	140
			10 H13, M42, D3,	280 HB		4.0		0.54	2.04		150			120
			11 S6-5-2, 12Ni19	320 HB		3.0		0.47	1.36		130			100
				350 HB		3.0		0.47	1.36		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.7	5.0	0.25	0.54	2.04	170	270	4.0	0.40	190
			14 X5CrNi18-9	240 HB		5.0		0.54	1.70	160	220			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.7	4.0	0.23	0.47	1.36	80	150	3.4	0.32	100
			14 S31500	310 HB		4.0		0.47	1.36	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.7	5.0	0.28	0.54	1.70	170	250	4.0	0.40	190
			13 17-4 PH, 430	42 HRC		4.0		0.54	1.70	120	190			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.7	5.0	0.20	0.81	3.40	170	250	4.0	0.46	200
			15 EN-GJL-250,	200 HB		5.0		0.81	3.06	160	230			180
			16 No30B	250 HB		5.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.7	5.0	0.20	0.68	2.55	120	250	4.0	0.40	180
			17,19 50005	200 HB		5.0		0.68	2.21		230			160
			18,20	250 HB		5.0		0.68	2.04		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.7	3.0	0.25	0.47	1.19	25	45	2.7	0.37	32
			33 Inconel 700	250 HB		3.0		0.47	1.19	25	45			30
			34 Stellite 21	350 HB		3.0		0.47	1.19	23	40			28
	Ti based	10	36 TiAl6V4	-	0.7	4.0	0.25	0.54	1.36	45	65	2.7	0.40	55
			37 T40	-		3.0		0.47	1.19	35	55			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.7	2.5	0.14	0.41	1.02	50	100	2.2	0.33	80
			38 440C,	50 HRC		2.0		0.34	0.68	40	90			70
			38 G-X260NiCr42	55 HRC		1.5		0.27	0.51	40	80			60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.7	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
	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

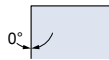
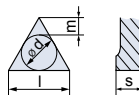
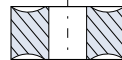
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300
		2		190 HB		2.5		0.22	0.52		280			260
		3		250 HB		2.5		0.20	0.48		250			240
	Low alloyed	2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 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			240
				280 HB		2.0		0.18	0.40		210			200
				350 HB		2.0		0.18	0.36		180			180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 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			140
				320 HB		2.0		0.14	0.32		130			120
				350 HB		2.0		0.14	0.26		110			110
Stainless Steel	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12	260
				240 HB		2.5		0.18	0.26	160	220			210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12	140
				310 HB		2.0		0.14	0.20	70	140			
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15	240
				42 HRC		2.0		0.16	0.26	120	190			180
Cast Iron	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18	240
				200 HB		3.0		0.20	0.60	160	230			220
				250 HB		3.0		0.20	0.60	150	210			200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005	150 HB	0.2	2.5	0.08	0.18	0.48	250	250	2.0	0.15	240
				200 HB		2.5		0.18	0.40	120	230			220
				250 HB		2.5		0.18	0.40	190	190			180
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40
			33 Inconel 700	250 HB		2.0		0.15	0.26	25	50			40
			34 Stellite 21	350 HB		2.0		0.15	0.26	23	45			35
	Ti based	10	36 TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60
			37 T40	-		2.0		0.14	0.26	35	60			50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	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	0.12	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 AISi12	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 [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2	1045, 1060,	190 HB		7.0		0.50	1.80		280			220
			3	28Mn6	250 HB		7.0		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	7.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		5.6	0.21	0.45	1.20		250		0.32	180
			5,7	100Cr6	280 HB		5.6	0.18	0.40	1.20		210		0.30	150
			8		350 HB		4.9	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	5.6	0.18	0.40	1.20	70	190	2.5	0.30	140
			10	H13, M42, D3,	280 HB		5.6		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		4.2		0.35	0.80		130		0.28	100
			11		350 HB		4.2		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	7.0	0.20	0.40	1.20	170	270	3.0	0.35	190
			14	X5CrNi18-9	240 HB		7.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	5.6	0.18	0.35	0.80	80	150	2.5	0.28	100
			14	S31500	310 HB		5.6		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	7.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13	17-4 PH, 430	42 HRC		5.6		0.40	1.00	120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15	EN-GJL-250,	200 HB		7.0		0.60	1.80	160	230			180
			16	No30B	250 HB		7.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	7.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19	50005	200 HB		7.0		0.50	1.30		230			160
			18,20		250 HB		7.0		0.50	1.20		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	4.2	0.20	0.35		25	45	2.0	0.28	32
			33	Inconel 700	250 HB		4.2		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		4.2		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	5.6	0.20	0.40	0.80	45	65	2.0	0.33	55
			37	T40	-		4.2		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	3.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38	440C,	50 HRC		2.8		0.25	0.40	40	90	1.5	0.20	70
			38	G-X260NiCr42	55 HRC		2.1		0.20	0.30	40	80	1.0	0.18	60
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	2.1	0.11	0.20	0.30	30	50	1.0	0.15	40
	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

TNMG 220412 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	Vc [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	Vc
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB		7.0		0.68	3.06		330			240
		2	1045, 1060, 28Mn6	190 HB	0.7	7.0	0.26	0.68	3.06	180	280	4.0	0.46	220
		3		250 HB		7.0		0.61	2.55		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB		7.0	0.26	0.61	2.04		280		0.42	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB	0.7	5.6	0.26	0.61	2.04	120	250	4.0	0.42	180
		5,7		280 HB		5.6	0.23	0.54	2.04		210		0.40	150
		8		350 HB		4.9	0.23	0.54	1.70		180		0.40	130
	High alloyed	3	10 X40CrMoV5,	220 HB		5.6		0.54	2.04		190		0.40	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB	0.7	5.6	0.23	0.54	2.04	70	150	3.4	0.40	120
		11		320 HB		4.2		0.47	1.36		130		0.37	100
		11		350 HB		4.2		0.47	1.36		110		0.37	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.7	7.0	0.25	0.54	2.04	170	270	4.0	0.40	190
		14		240 HB		7.0		0.54	1.70	160	220		0.36	170
	Duplex	5	14 X2CrNi23-4, S31500	290 HB	0.7	5.6	0.23	0.47	1.36	80	150	3.4	0.32	100
		14		310 HB		5.6		0.47	1.36	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.7	7.0	0.28	0.54	1.70	170	250	4.0	0.40	190
		13		42 HRc		5.6		0.54		120	190	3.0	0.35	130
Cast Iron	Grey	7	15 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
		15		200 HB		7.0		0.81	3.06	160	230			180
		16		250 HB		7.0		0.74	3.06	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.7	7.0	0.20	0.68	2.55	120	250	4.0	0.40	180
		17,19		200 HB		7.0		0.68	2.21		230			160
		18,20		250 HB		7.0		0.68	2.04		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.7	4.2	0.25	0.47	1.19	25	45	2.7	0.37	32
		33	Inconel 700	250 HB		4.2		0.47		25	45			30
		34	Stellite 21	350 HB		4.2		0.47		23	40			28
	Ti based	10	36 TiAl6V4	-	0.7	5.6	0.25	0.54	1.36	45	65	2.7	0.40	55
		37	T40	-		4.2		0.47	1.19	35	55		0.37	45
	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.7	3.5	0.14	0.41	1.02	50	100	2.2	0.33	80
Hardened Mat.	Chilled Cast Iron	38		50 HRc		2.8		0.34	0.68	40	90	2.0	0.26	70
		38		55 HRc		2.1		0.27	0.51	40	80	1.3	0.24	60
		40	Ni-Hard 2	400 HB	0.7	2.8	0.14	0.34	0.68	40	60	2.0	0.24	50
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.7	7.0	0.25	0.27	0.51	30	50	1.3	0.20	40
								0.81	3.10	200	400	4.0	0.50	280

**T****N****M****P****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.
TNMP 160408 NN	LT 10	16	4.76	0.8	T0000492

NN All purpose Chipbreaker

60° Triangle shape inserts, with positive chip breaker geometry. Generates considerably low cutting forces. Suitable for General purpose, Copying, High Temperature Alloys and Stainless Steel Turning operations.

Application Guide

Finishing Medium Roughing / Interrupted cut

TNMP 160408 NN

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

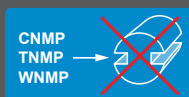
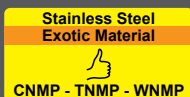
Roughing

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

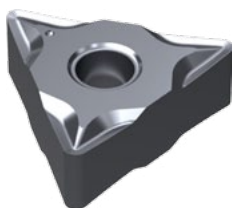
= Good

= Acceptable

= Not recommended



Machine Recommendations
 Guide. Details on page 10



T

N

M

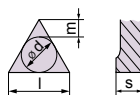
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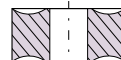
Shape



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.
TNMP 160408 NN	LT 1000	16	4.76	0.8	T0001937

NN All purpose Chipbreaker

60° Triangle shape inserts, with positive chip breaker geometry. Generates considerably low cutting forces. Suitable for General purpose, Copying, High Temperature Alloys and Stainless Steel Turning operations.

TNMP

Application Guide

Finishing Medium Roughing / Interrupted cut

TNMP 160408 NN



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

😊 = Good

😐 = Acceptable

😞 = Not recommended

Stainless Steel
Exotic Material

CNMP - TNMP - WNMP

CNMP
TNMP
WNMP

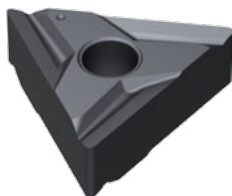
Exotic Material

Verify
Cutting Conditions

Machine Recommendations
Guide. Details on page 10

TNMP 160408 NN LT 10 & LT 1000

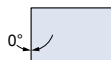
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2	1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3	28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
			5,7	100Cr6	280 HB		4.0	0.18	0.40	1.20		210		0.30	150
			8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10	H13, M42, D3,	280 HB		4.0		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130		0.28	100
			11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
			14	X5CrNi18-9	240 HB		5.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14	S31500	310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13	17-4 PH, 430	42 HRC		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15	EN-GJL-250,	200 HB		5.0		0.60	1.80	160	230			180
			16	No30B	250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19	50005	200 HB		5.0		0.50	1.30		230			160
			18,20		250 HB		5.0		0.50	1.20		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	3.0	0.20	0.35		25	45	2.0	0.28	32
			33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		3.0		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
			37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38	440C,	50 HRC		2.0		0.25	0.40	40	90	1.5	0.20	70
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	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
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280



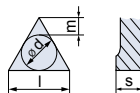
T N U X



Shape



Clearance Angle



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



**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TNUX 160404 R	LT 10	16	4.76	0.4	T0001125
TNUX 160404 L	LT 10	16	4.76	0.4	T0001877
TNUX 160408 R	LT 10	16	4.76	0.8	T0001137
TNUX 160408 L	LT 10	16	4.76	0.8	T0001878

60° Triangle shape inserts. Suitable for general Turning and longitudinal operations, where there is a concern for work piece vibrations.

Application Guide

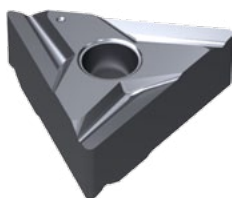
TNUX

	Finishing	Medium	Roughing / Interrupted cut	
TNUX 160404 R				= 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
TNUX 160404 L				
TNUX 160408 R				
TNUX 160408 L				

Feed x d.o.c.
= Amax

$V_c \Rightarrow$
Productivity

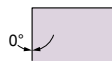
Machine Recommendations
Guide. Details on page 10



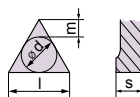
T N U X



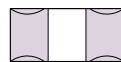
Shape



Clearance Angle



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



**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TNUX 160404 R	LT 1000	16	4.76	0.4	T0001938
TNUX 160404 L	LT 1000	16	4.76	0.4	T0002794
TNUX 160408 R	LT 1000	16	4.76	0.8	T0001939
TNUX 160408 L	LT 1000	16	4.76	0.8	T0002795

60° Triangle shape inserts. Suitable for general Turning and longitudinal operations, where there is a concern for work piece vibrations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
TNUX 160404 R	😊	😐	😞	😊 = 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
TNUX 160404 L	😊	😐	😞	
TNUX 160408 R	😐	😊	😐	
TNUX 160408 L	😐	😊	😐	

Feed x d.o.c.
= Amax

$V_c \Rightarrow$
Productivity

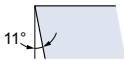
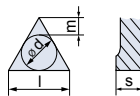
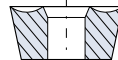
Machine Recommendations
Guide. Details on page 10

TNUX 160404 R&L 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

TNUX 160408 R&L 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	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
			2 1045, 1060,	190 HB		5.0		0.50	1.80		280			220
			3 28Mn6	250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
			4,6 Ck60, 4140, 4340,	230 HB		4.0		0.45	1.20		250			180
			5,7 100Cr6	280 HB		4.0		0.40	1.20		210			150
			8	350 HB		3.5		0.18	1.00		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
			10 H13, M42, D3,	280 HB		4.0		0.40	1.20		150			120
			11 S6-5-2, 12Ni19	320 HB		3.0		0.35	0.80		130			100
				350 HB		3.0		0.35	0.80		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
			14 X5CrNi18-9	240 HB		5.0		0.40	1.00		220			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
			14 S31500	310 HB		4.0		0.35	0.80		70			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
			13 17-4 PH, 430	42 HRC		4.0		0.40	1.00		120			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	5.0	0.15	0.60	2.00	170	250	3.0	0.35	200
			15 EN-GJL-250,	200 HB		5.0		0.60	1.80		160			180
			16 No30B	250 HB		5.0		0.55	1.80		150			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
			17,19 50005	200 HB		5.0		0.50	1.30		230			160
			18,20	250 HB		5.0		0.50	1.20		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
			33 Inconel 700	250 HB		3.0		0.35	0.70		25			30
			34 Stellite 21	350 HB		3.0		0.35	0.70		23			28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
			37 T40	-		3.0		0.35	0.70		35			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
			38 440C,	50 HRC		2.0		0.25	0.40		40			70
			38 G-X260NiCr42	55 HRC		1.5		0.20	0.30		40			60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	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
	Al (>8%Si)	12	25 AISI12	130 HB	0.5	6.0	0.20	0.60	1.80	200	400	3.0	0.40	280

**T****P****M****R****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.
TPMR 160304 NN	LT 10	16	3.76	0.4	T0001638
TPMR 160308 NN	LT 10	16	3.76	0.8	T0001535

NN All purpose Chipbreaker

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

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
TPMR 160304 NN			
TPMR 160308 NN			
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			

= Good
 = Acceptable
 = Not recommended

Stainless Steel

 $V_c \Rightarrow$
Productivity

Machine Recommendations Guide
Details on page 10

TPMR 160304 NN LT 10

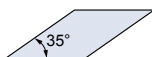
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18
			2	1045, 1060,	190 HB		2.5		0.22	0.52		280		
			3	28Mn6	250 HB		2.5		0.20	0.48		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250		
			5,7	100Cr6	280 HB		2.0		0.18	0.40		210		
			8		350 HB		2.0		0.18	0.36		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12
			10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150		
			11	S6-5-2, 12Ni19	320 HB		2.0		0.14	0.32		130		
			11		350 HB		2.0		0.14	0.26		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12
			14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220		
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12
			14	S31500	310 HB		2.0		0.14	0.20	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15
			13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18
			15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230		
			16	No30B	250 HB		3.0		0.20	0.60	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15
			17,19	50005	200 HB		2.5		0.18	0.40		230		
			18,20		250 HB		2.5		0.18	0.40		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50		
			34	Stellite 21	350 HB		2.0		0.15	0.26	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15
			37	T40	-		2.0		0.14	0.26	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11
			38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09
			38	G-X260NiCr42	55 HRC		1.4		0.09	0.13	40	80	1.0	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20

TPMR 160308 NN LT 10

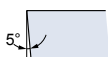
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	5.0	0.21	0.50	1.80	180	330	3.0	0.35	240
		2	1045, 1060, 28Mn6	190 HB		5.0		0.50	1.80		280			220
		3		250 HB		5.0		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	5.0	0.21	0.45	1.20	120	280	3.0	0.32	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		4.0	0.21	0.45	1.20		250		0.32	180
		5,7		280 HB		4.0	0.18	0.40	1.20		210		0.30	150
		8		350 HB		3.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	4.0	0.18	0.40	1.20	70	190	2.5	0.30	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB		4.0		0.40	1.20		150		0.30	120
		11		320 HB		3.0		0.35	0.80		130		0.28	100
		11		350 HB		3.0		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.5	5.0	0.20	0.40	1.20	170	270	3.0	0.35	190
		14		240 HB		5.0		0.40	1.00	160	220		0.32	170
	Duplex	5	14 X2CrNi23-4, S31500	290 HB	0.5	4.0	0.18	0.35	0.80	80	150	2.5	0.28	100
		14		310 HB		4.0		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.5	5.0	0.22	0.40	1.00	170	250	3.0	0.32	190
		13		42 HRc		4.0		0.40	1.00	120	190			130
Cast Iron	Grey	7	15 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
		15		200 HB		5.0		0.60	1.80	160	230			180
		16		250 HB		5.0		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.5	5.0	0.15	0.50	1.50	120	250	3.0	0.30	180
		17,19		200 HB		5.0		0.50	1.30	120	230			160
		18,20		250 HB		5.0		0.50	1.20	120	190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.0	0.20	0.35	0.70	25	45	2.0	0.28	32
		33	Inconel 700	250 HB		3.0		0.35	0.70	25	45			30
		34	Stellite 21	350 HB		3.0		0.35	0.70	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	4.0	0.20	0.40	0.80	45	65	2.0	0.33	55
		37	T40	-		3.0		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.11	0.30	0.60	50	100	2.0	0.25	80
		38		50 HRc		2.0		0.25	0.40	40	90	1.5	0.20	70
		38		55 HRc		1.5		0.20	0.30	40	80	1.0	0.18	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	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



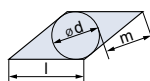
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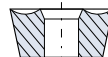
Shape



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.
VBMT 110304 NN	LT 10	11	3.76	0.4	T0001460
VBMT 160404 NN	LT 10	16	4.76	0.4	T0000070
VBMT 160408 NN	LT 10	16	4.76	0.8	T0000071

NN All purpose Chipbreaker

35° shape inserts with positive rake angle. Suitable for Internal and External Copying operations of complex geometries.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
VBMT 110304 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
VBMT 160404 NN	😊	😐	😞	
VBMT 160408 NN	😐	😊	😐	

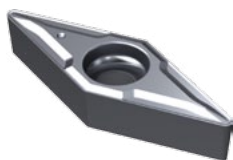
Stainless Steel



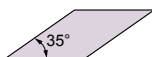
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Productivity

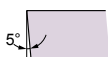
Machine Recommendations Guide
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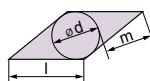
V B M T



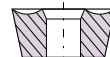
Shape



Clearance Angle



Tolerance
d ± 0.05
m ± 0.08
s ± 0.13



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
VBMT 110304 NN	LT 1000	11	3.76	0.4	T0001942
VBMT 160404 NN	LT 1000	16	4.76	0.4	T0001943
VBMT 160408 NN	LT 1000	16	4.76	0.8	T0001944

NN All purpose Chipbreaker

35° shape inserts with positive rake angle. Suitable for Internal and External Copying operations of complex geometries.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
VBMT 110304 NN				VBMT 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
VBMT 160404 NN				
VBMT 160408 NN				

= Good
 = Acceptable
 = Not recommended

Stainless Steel



V_c ⇒

Productivity

Machine Recommendations Guide
Details on page 10

VBMT 110304 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
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	2.1	0.08	0.20	0.37	180	330	1.0	0.18
			2	1045, 1060,	190 HB		1.8		0.19	0.32		280		
			3	28Mn6	250 HB		1.8		0.17	0.30		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		1.8		0.17	0.30		250		
			5,7	100Cr6	280 HB		1.4		0.15	0.25		210		
			8		350 HB		1.4		0.15	0.22		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.12
			10	H13, M42, D3,	280 HB		1.8		0.14	0.25		150		
			11	S6-5-2, 12Ni19	320 HB		1.4		0.12	0.20		130		
			11		350 HB		1.4		0.12	0.16		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.12
			14	X5CrNi18-9	240 HB		1.8		0.15	0.16	160	220		
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.12
			14	S31500	310 HB		1.4		0.12	0.12	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.15
			13	17-4 PH, 430	42 HRC		1.4		0.14	0.16	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.18
			15	EN-GJL-250,	200 HB		2.1		0.17	0.37	160	230		
			16	No30B	250 HB		2.1		0.17	0.37	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	1.8	0.06	0.15	0.30	120	250	1.0	0.15
			17,19	50005	200 HB		1.8		0.15	0.25		230		
			18,20		250 HB		1.8		0.15	0.25		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	1.4	0.08	0.13	0.16	25	50	1.0	0.12
			33	Inconel 700	250 HB		1.4		0.13	0.16	25	50		
			34	Stellite 21	350 HB		1.4		0.13	0.16	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.14
			37	T40	-		1.4		0.12	0.16	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.11
			38	440C,	50 HRC		1.1		0.09	0.11	40	90	0.6	0.09
			38	G-X260NiCr42	55 HRC		1.0		0.08	0.08	40	80	0.5	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20

VBMT 160404 NN LT 10 & LT 1000

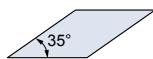
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 70
	Chilled Cast Iron White 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
	G-X300CrMo15	41		55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40
	NF	12	25 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

VBMT 160408 NN LT 10 & LT 1000

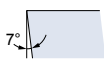
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	3.5	0.19	0.40	1.26	180	330	2.5	0.30	240
			2	1045, 1060,	190 HB		3.5		0.40	1.26		280			220
			3	28Mn6	250 HB		3.5		0.36	1.05		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	3.5	0.19	0.36	0.84	120	280	2.5	0.27	200
			4,6	Ck60, 4140, 4340,	230 HB		2.8		0.36	0.84		250		0.27	180
			5,7	100Cr6	280 HB		2.8		0.32	0.84		210		0.26	150
			8		350 HB		2.5		0.32	0.70		180		0.26	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.8	0.16	0.32	0.84	70	190	2.1	0.26	140
			10	H13, M42, D3,	280 HB		2.8		0.32	0.84		150		0.26	120
			11	S6-5-2, 12Ni19	320 HB		2.1		0.28	0.56		130		0.24	100
			11		350 HB		2.1		0.28	0.56		110		0.24	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	3.5	0.18	0.32	0.84	170	270	2.5	0.30	190
			14	X5CrNi18-9	240 HB		3.5		0.32	0.70	160	220		0.27	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	2.8	0.16	0.28	0.56	80	150	2.1	0.24	100
			14	S31500	310 HB		2.8		0.28	0.56	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	3.5	0.20	0.32	0.70	170	250	2.5	0.27	190
			13	17-4 PH, 430	42 HRC		2.8		0.32		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.5	0.14	0.48	1.40	170	250	2.5	0.30	200
			15	EN-GJL-250,	200 HB		3.5		0.48	1.26	160	230			180
			16	No30B	250 HB		3.5		0.44	1.26	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	3.5	0.14	0.40	1.05		250	2.5	0.26	180
			17,19	50005	200 HB		3.5		0.40	0.91	120	230			160
			18,20		250 HB		3.5		0.40	0.84		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.1	0.18	0.28		25	45	2.0	0.24	32
			33	Inconel 700	250 HB		2.1		0.28	0.49	25	45			30
			34	Stellite 21	350 HB		2.1		0.28		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	2.8	0.18	0.32	0.56	45	65	2.0	0.28	55
			37	T40	-		2.1		0.28	0.49	35	55		0.26	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	1.8	0.10	0.24	0.42	50	100	1.6	0.21	80
			38	440C,	50 HRC		1.4		0.20	0.28	40	90	1.2	0.17	70
			38	G-X260NiCr42	55 HRC		1.1		0.16	0.21	40	80	1.0	0.15	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.4	0.10	0.20	0.28	40	60	1.2	0.15	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.1	0.10	0.16	0.21	30	50	1.0	0.13	40
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.2	0.18	0.48	1.40	200	400	2.5	0.34	280



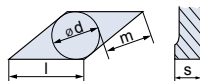
V C M T



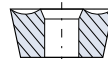
Shape



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.
VCMT 160404 NN	LT 10	16	4.76	0.4	T0001102
VCMT 160408 NN	LT 10	16	4.76	0.8	T0001103

NN All purpose Chipbreaker

35° shape inserts with positive rake angle. Suitable for Internal and External Copying operations of complex geometries.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
VCMT 160404 NN			
VCMT 160408 NN			
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			

= Good
 = Acceptable
 = Not recommended

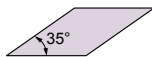
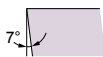
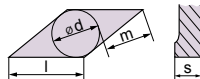
VCMT

Stainless Steel

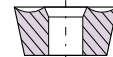


V_c ⇒
Productivity

Machine Recommendations
 Guide. Details on page 10

**V****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.
VCMT 160404 NN	LT 1000	16	4.76	0.4	T0001945
VCMT 160408 NN	LT 1000	16	3.76	0.8	T0001946

NN All purpose Chipbreaker

35° shape inserts with positive rake angle. Suitable for Internal and External Copying operations of complex geometries.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
VCMT 160404 NN			
VCMT 160408 NN			
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			

= Good

= Acceptable

= Not recommended

Stainless Steel



V_c ⇒

Productivity

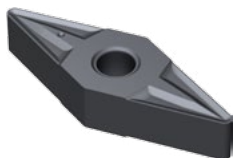
Machine Recommendations
Guide. Details on page 10

VCMT 160404 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	1 C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18		300
		2	1045, 1060, 28Mn6	190 HB		2.5		0.22	0.52		280				260
		3		250 HB		2.5		0.20	0.48		250				240
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15		260
		4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250				240
		5,7	100Cr6	280 HB		2.0		0.18	0.40		210				200
		8		350 HB		2.0		0.18	0.36		180				180
	High alloyed	3	10 X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12		180
		10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150				140
		11	S6-5-2, 12Ni19	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	14 304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12		260
		14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220				210
	Duplex	5	14 X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12		140
		14	S31500	310 HB		2.0		0.14	0.20	70	140				
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15		240
		13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190				180
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18		240
		15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230				220
		16	No30B	250 HB		3.0		0.20	0.60	150	210				200
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15		240
		17,19	50005	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	31,32 Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12		40
		33	Inconel 700	250 HB		2.0		0.15	0.26	25	50				40
		34	Stellite 21	350 HB		2.0		0.15	0.26	23	45				35
	Ti based	10	36 TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15		60
		37	T40	-		2.0		0.14	0.26	35	60				50
	Hardened Mat.	11	38 X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11		90
Hardened Mat.	Steel	38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09		80
		38	G-X260NiCr42	55 HRC		1.4		0.09	0.13	40	80	1.0	0.07		70
	Chilled Cast Iron														
	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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20		350

VCMT 160408 NN LT 10 & LT 1000

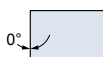
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	3.5	0.19	0.40	1.26	180	330	2.5	0.30	240
			2	1045, 1060,	190 HB		3.5		0.40	1.26		280			220
			3	28Mn6	250 HB		3.5		0.36	1.05		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	3.5	0.19	0.36	0.84	120	280	2.5	0.27	200
			4,6	Ck60, 4140, 4340,	230 HB		2.8		0.36	0.84		250		0.27	180
			5,7	100Cr6	280 HB		2.8		0.32	0.84		210		0.26	150
			8		350 HB		2.5		0.32	0.70		180		0.26	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.8	0.16	0.32	0.84	70	190	2.1	0.26	140
			10	H13, M42, D3,	280 HB		2.8		0.32	0.84		150		0.26	120
			11	S6-5-2, 12Ni19	320 HB		2.1		0.28	0.56		130		0.24	100
			11		350 HB		2.1		0.28	0.56		110		0.24	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	3.5	0.18	0.32	0.84	170	270	2.5	0.30	190
			14	X5CrNi18-9	240 HB		3.5		0.32	0.70	160	220		0.27	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	2.8	0.16	0.28	0.56	80	150	2.1	0.24	100
			14	S31500	310 HB		2.8		0.28		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	3.5	0.20	0.32	0.70	170	250	2.5	0.27	190
			13	17-4 PH, 430	42 HRC		2.8		0.32		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.5	0.14	0.48	1.40	170	250	2.5	0.30	200
			15	EN-GJL-250,	200 HB		3.5		0.48	1.26	160	230			180
			16	No30B	250 HB		3.5		0.44	1.26	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	3.5	0.14	0.40	1.05		250	2.5	0.26	180
			17,19	50005	200 HB		3.5		0.40	0.91	120	230			160
			18,20		250 HB		3.5		0.40	0.84		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.1	0.18	0.28		25	45	2.0	0.24	32
			33	Inconel 700	250 HB		2.1		0.28	0.49	25	45			30
			34	Stellite 21	350 HB		2.1		0.28		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	2.8	0.18	0.32	0.56	45	65	2.0	0.28	55
			37	T40	-		2.1		0.28	0.49	35	55		0.26	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	1.8	0.10	0.24	0.42	50	100	1.6	0.21	80
			38	440C,	50 HRC		1.4		0.20	0.28	40	90	1.2	0.17	70
			38	G-X260NiCr42	55 HRC		1.1		0.16	0.21	40	80	1.0	0.15	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.4	0.10	0.20	0.28	40	60	1.2	0.15	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.1	0.10	0.16	0.21	30	50	1.0	0.13	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.2	0.18	0.48	1.40	200	400	2.5	0.34	280



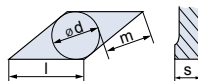
V N M G



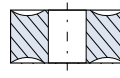
Shape



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.
VNMG 160404 NN	LT 10	16	4.76	0.4	T0000072
VNMG 160408 NN	LT 10	16	4.76	0.8	T0000073

NN All purpose Chipbreaker

35° shape inserts. Suitable for Semi-roughing External Copying operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
VNMG 160404 NN	😊	😐	😞
VNMG 160408 NN	😐	😊	😐
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	

😊 = Good
 😐 = Acceptable
 😞 = Not recommended

VNMG

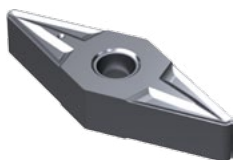
Stainless Steel



$V_c \Rightarrow$
Productivity

**Feed x d.o.c.
= Amax**

Machine Recommendations
 Guide. Details on page 10



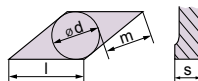
V N M G



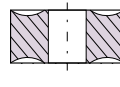
Shape



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.
VNMG 160404 NN	LT 1000	16	4.76	0.4	T0001947
VNMG 160408 NN	LT 1000	16	4.76	0.8	T0001948

NN All purpose Chipbreaker

35° shape inserts. Suitable for Semi-roughing External Copying operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
VNMG 160404 NN			
VNMG 160408 NN			
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			
	 = Good		
	 = Acceptable		
	 = Not recommended		

Stainless Steel



$V_c \Rightarrow$
Productivity

**Feed x d.o.c.
= Amax**

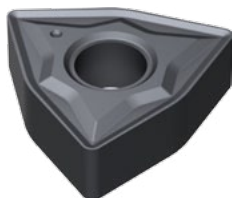
Machine Recommendations
Guide. Details on page 10

VNMG 160404 NN LT 10 & LT 1000

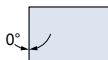
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300
		2	1045, 1060, 28Mn6	190 HB		2.5		0.22	0.52		280			260
		3		250 HB		2.5		0.20	0.48		250			240
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15	260
		4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250			240
		5,7	100Cr6	280 HB		2.0		0.18	0.40		210			200
		8		350 HB		2.0		0.18	0.36		180			180
	High alloyed	3	10 X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12	180
		10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150			140
		11	S6-5-2, 12Ni19	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	14 304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12	260
		14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220			210
	Duplex	5	14 X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12	140
		14	S31500	310 HB		2.0		0.14	0.20	70	140			
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15	240
		13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190			180
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18	240
		15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230			220
		16	No30B	250 HB		3.0		0.20	0.60	150	210			200
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	120	250	2.0	0.15	240
		17,19	50005	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	31,32 Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40
		33	Inconel 700	250 HB		2.0		0.15	0.26	25	50			40
		34	Stellite 21	350 HB		2.0		0.15	0.26	23	45			35
	Ti based	10	36 TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60
		37	T40	-		2.0		0.14	0.26	35	60			50
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11	90
		38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09	80
		38	G-X260NiCr42	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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

VNMG 160408 NN LT 10 & LT 1000

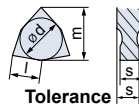
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	4.0	0.19	0.40	1.44	180	330	2.7	0.32	240
			2	1045, 1060,	190 HB		4.0		0.40	1.44		280			220
			3	28Mn6	250 HB		4.0		0.36	1.20		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	4.0	0.19	0.36	0.96	120	280	2.7	0.29	200
			4,6	Ck60, 4140, 4340,	230 HB		3.2		0.36	0.96		250		0.29	180
			5,7	100Cr6	280 HB		3.2		0.32	0.96		210		0.27	150
			8		350 HB		2.8		0.32	0.80		180		0.27	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	3.2	0.16	0.32	0.96	70	190	2.3	0.27	140
			10	H13, M42, D3,	280 HB		3.2		0.32	0.96		150		0.27	120
			11	S6-5-2, 12Ni19	320 HB		2.4		0.28	0.64		130		0.25	100
			11		350 HB		2.4		0.28	0.64		110		0.25	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	4.0	0.18	0.32	0.96	170	270	2.7	0.32	190
			14	X5CrNi18-9	240 HB		4.0		0.32	0.80	160	220		0.29	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	3.2	0.16	0.28	0.64	80	150	2.3	0.25	100
			14	S31500	310 HB		3.2		0.28	0.64	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	4.0	0.20	0.32	0.80	170	250	2.7	0.29	190
			13	17-4 PH, 430	42 HRC		3.2		0.32	0.80	120	190		2.5	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	4.0	0.14	0.48	1.60	170	250	2.7	0.32	200
			15	EN-GJL-250,	200 HB		4.0		0.48	1.44	160	230			180
			16	No30B	250 HB		4.0		0.44	1.44	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	4.0	0.14	0.40	1.20		250	2.7	0.27	180
			17,19	50005	200 HB		4.0		0.40	1.04	120	230			160
			18,20		250 HB		4.0		0.40	0.96		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.4	0.18	0.28	0.56	25	45	2.0	0.25	32
			33	Inconel 700	250 HB		2.4		0.28	0.56	25	45			30
			34	Stellite 21	350 HB		2.4		0.28	0.56	23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	3.2	0.18	0.32	0.64	45	65	2.0	0.30	55
			37	T40	-		2.4		0.28	0.56	35	55		0.27	45
	Hardened Mat.														
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	2.0	0.10	0.24	0.48	50	100	1.8	0.23	80
			38	440C,	50 HRC		1.6		0.20	0.32	40	90	1.4	0.18	70
			38	G-X260NiCr42	55 HRC		1.2		0.16	0.24	40	80	1.0	0.16	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.6	0.10	0.20	0.32	40	60	1.4	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.2	0.10	0.16	0.24	30	50	1.0	0.14	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.8	0.18	0.48	1.40	200	400	2.7	0.36	280

**W****N****M****G**

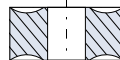
Shape



Clearance Angle



$s \pm 0.13$
 For $l = 06$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 08$, $d \pm 0.08$ $m \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMG 060404 NN	LT 10	6	4.76	0.4	T0000133
WNMG 060408 NN	LT 10	6	4.76	0.8	T0000137
WNMG 080404 NN	LT 10	8	4.76	0.4	T0000584
WNMG 080408 NN	LT 10	8	4.76	0.8	T0000075
WNMG 080408 NM	LT 10	8	4.76	0.8	T0001967
WNMG 080412 NN	LT 10	8	4.76	1.2	T0000077

NN All purpose Chipbreaker**NM** Steel and Cast Iron

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
WNMG 060404 NN	😊	😐	😞
WNMG 060408 NN	😐	😊	😐
WNMG 080404 NN	😊	😐	😞
WNMG 080408 NN	😐	😊	😐
WNMG 080408 NM	😞	😊	😊
WNMG 080412 NN	😞	😐	😊

😊 = Good
 😐 = Acceptable
 😞 = Not recommended

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

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

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

WNMG

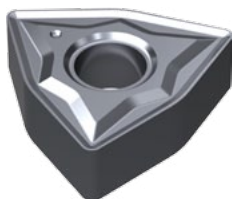
Stainless Steel

 $V_c \Rightarrow$

Productivity

80° Trigon shape inserts, with 6 cutting edges. Suitable for all-purpose Turning, Facing and Boring operations.

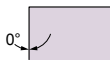
Machine Recommendations
 Guide. Details on page 10



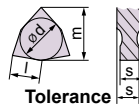
W N M G



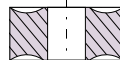
Shape



Clearance Angle



$s \pm 0.13$
For $l = 06$, $d \pm 0.05$ $m \pm 0.08$
For $l = 08$, $d \pm 0.08$ $m \pm 0.13$

Fixing
Chip breaker

* Available from Q2-2013

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMG 060404 NN	LT 1000	6	4.76	0.4	T0001949
WNMG 060408 NN	LT 1000	6	4.76	0.8	T0001950
WNMG 060408 NX*	LT 1000	6	4.76	0.8	T0003014
WNMG 080404 NN	LT 1000	8	4.76	0.4	T0001951
WNMG 080408 NN	LT 1000	8	4.76	0.8	T0001952
WNMG 080408 NM	LT 1000	8	4.76	0.8	T0001969
WNMG 080408 NX	LT 1000	8	4.76	0.8	T0002742
WNMG 080412 NN	LT 1000	8	4.76	1.2	T0001953

Application Guide **NN** All purpose Chipbreaker **NX** All purpose Chipbreaker **NM** Steel and Cast Iron

	Finishing	Medium	Roughing / Interrupted cut
WNMG 060404 NN	😊	😐	😞
WNMG 060408 NN	😐	😊	😐
WNMG 060408 NX	😊	😊	😐
WNMG 080404 NN	😊	😐	😞
WNMG 080408 NN	😐	😊	😊
WNMG 080408 NM	😞	😊	😊
WNMG 080408 NX	😐	😊	😊
WNMG 080412 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



$V_c \Rightarrow$

Productivity

80° Trigon shape inserts, with 6 cutting edges. Suitable for all-purpose Turning, Facing and Boring operations.

Machine Recommendations
Guide. Details on page 10

WNMG 060404 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	1 C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300
		2	1045, 1060, 28Mn6	190 HB		2.5		0.22	0.52		280			260
		3		250 HB		2.5		0.20	0.48		250			240
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.2	2.5	0.10	0.20	0.50	120	280	2.0	0.15	260
		4,6	Ck60, 4140, 4340,	230 HB		2.5		0.20	0.48		250			240
		5,7	100Cr6	280 HB		2.0		0.18	0.40		210			200
		8		350 HB		2.0		0.18	0.36		180			180
	High alloyed	3	10 X40CrMoV5,	220 HB	0.2	2.5	0.09	0.18	0.40	70	190	2.0	0.12	180
		10	H13, M42, D3,	280 HB		2.5		0.16	0.40		150			140
		11	S6-5-2, 12Ni19	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	14 304, 316,	180 HB	0.2	2.5	0.10	0.18	0.32	170	270	2.0	0.12	260
		14	X5CrNi18-9	240 HB		2.5		0.18	0.26	160	220			210
	Duplex	5	14 X2CrNi23-4,	290 HB	0.2	2.0	0.09	0.14	0.20	80	150	2.0	0.12	140
		14	S31500	310 HB		2.0		0.14	0.20	70	140			
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.2	2.5	0.10	0.18	0.32	170	250	2.0	0.15	240
		13	17-4 PH, 430	42 HRC		2.0		0.16	0.26	120	190			180
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.2	3.0	0.08	0.20	0.64	170	250	2.0	0.18	240
		15	EN-GJL-250,	200 HB		3.0		0.20	0.60	160	230			220
		16	No30B	250 HB		3.0		0.20	0.60	150	210			200
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.2	2.5	0.08	0.18	0.48	250	250	2.0	0.15	240
		17,19	50005	200 HB		2.5		0.18	0.40	120	230			220
		18,20		250 HB		2.5		0.18	0.40	190	190			180
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40
		33	Inconel 700	250 HB		2.0		0.15	0.26	25	50			40
		34	Stellite 21	350 HB		2.0		0.15	0.26	23	45			35
	Ti based	10	36 TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60
		37	T40	-		2.0		0.14	0.26	35	60			50
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.2	1.8	0.05	0.12	0.20	50	100	1.5	0.11	90
		38	440C,	50 HRC		1.5		0.10	0.17	40	90	1.2	0.09	80
		38	G-X260NiCr42	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

WNMG 060408 NN/NX 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	1 C35, Ck45, 1020,	125 HB	0.5	2.5	0.21	0.50	1.17	180	330	2.2	0.35	240
			2 1045, 1060,	190 HB		2.5		0.50	1.17		280			220
			3 28Mn6	250 HB		2.5		0.45	0.98		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	2.5	0.21	0.45	0.78	120	280	2.2	0.32	200
			4,6 Ck60, 4140, 4340,	230 HB		2.0		0.45	0.78		250			180
			5,7 100Cr6	280 HB		2.0		0.40	0.78		210			150
			8	350 HB		1.8		0.40	0.65		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.0	0.18	0.40	0.78	70	190	1.8	0.30	140
			10 H13, M42, D3,	280 HB		2.0		0.40	0.78		150			120
			11 S6-5-2, 12Ni19	320 HB		1.5		0.35	0.52		130			100
				350 HB		1.5		0.35	0.52		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	2.5	0.20	0.40	0.78	170	270	2.2	0.25	190
			14 X5CrNi18-9	240 HB		2.5		0.40	0.65	160	220			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	2.0	0.18	0.35	0.52	80	150	1.8	0.28	100
			14 S31500	310 HB		2.0		0.35		70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	2.5	0.22	0.40	0.65	170	250	2.2	0.32	190
			13 17-4 PH, 430	42 HRC		2.0		0.40		120	190			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	2.5	0.15	0.60	1.30	170	250	2.2	0.35	200
			15 EN-GJL-250,	200 HB		2.5		0.60	1.17	160	230			180
			16 No30B	250 HB		2.5		0.55	1.17	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	2.5	0.15	0.50	0.98		250	2.2	0.30	180
			17,19 50005	200 HB		2.5		0.50	0.85	120	230			160
			18,20	250 HB		2.5		0.50	0.78		190			140
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	1.5	0.20	0.35		25	45	1.5	0.28	32
			33 Inconel 700	250 HB		1.5		0.35	0.46	25	45			30
			34 Stellite 21	350 HB		1.5		0.35		23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	2.0	0.20	0.40	0.52	45	65	1.5	0.33	55
			37 T40	-		1.5		0.35	0.46	35	55			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	1.6	0.11	0.30	0.39	50	100	1.5	0.25	80
			38 440C,	50 HRC		1.3		0.25	0.26	40	90			70
			38 G-X260NiCr42	55 HRC		1.3		0.20	0.20	40	80			60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	1.3	0.11	0.25	0.26	40	60	1.0	0.18	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.5	1.3	0.11	0.20	0.20	30	50	1.0	0.15	40
	Al (>8%Si)	12	25 AISI12	130 HB	0.5	3.0	0.20	0.60	1.80	200	400	2.2	0.40	280

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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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 70
	Chilled Cast Iron White 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
	G-X300CrMo15	41		55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40
	NF	12	25 AlSi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

WNMG 080408 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	1	C35, Ck45, 1020,	125 HB	0.5	3.5	0.21	0.50	1.80	180	330	2.4	0.35	240
			2	1045, 1060,	190 HB		3.5		0.50	1.80		280			220
			3	28Mn6	250 HB		3.5		0.45	1.50		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	3.5	0.21	0.45	1.20	120	280	2.4	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		2.8	0.21	0.45	1.20		250		0.32	180
			5,7	100Cr6	280 HB		2.8	0.18	0.40	1.20		210		0.30	150
			8		350 HB		2.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.8	0.18	0.40	1.20	70	190	2.0	0.30	140
			10	H13, M42, D3,	280 HB		2.8		0.40	1.20		150		0.30	120
			11	S6-5-2, 12Ni19	320 HB		2.1		0.35	0.80		130		0.28	100
			11		350 HB		2.1		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	3.5	0.20	0.40	1.20	170	270	2.4	0.25	190
			14	X5CrNi18-9	240 HB		3.5		0.40	1.00	160	220		0.22	170
	Duplex	5	14	X2CrNi23-4,	290 HB	0.5	2.8	0.18	0.35	0.80	80	150	2.0	0.28	100
			14	S31500	310 HB		2.8		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	3.5	0.22	0.40	1.00	170	250	2.4	0.32	190
			13	17-4 PH, 430	42 HRC		2.8		0.40	1.00	120	190		2.0	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.5	0.15	0.60	2.00	170	250	2.4	0.35	200
			15	EN-GJL-250,	200 HB		3.5		0.60	1.80	160	230			180
			16	No30B	250 HB		3.5		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	3.5	0.15	0.50	1.50	120	250	2.4	0.30	180
			17,19	50005	200 HB		3.5		0.50	1.30	120	230			160
			18,20		250 HB		3.5		0.50	1.20		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.1	0.20	0.35		25	45	1.6	0.28	32
			33	Inconel 700	250 HB		2.1		0.35	0.70	25	45			30
			34	Stellite 21	350 HB		2.1		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	2.8	0.20	0.40	0.80	45	65	1.6	0.33	55
			37	T40	-		2.1		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	1.8	0.11	0.30	0.60	50	100	1.6	0.25	80
			38	440C,	50 HRC		1.5		0.25	0.40	40	90	1.2	0.20	70
			38	G-X260NiCr42	55 HRC		1.5		0.20	0.30	40	80	0.8	0.18	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.5	0.11	0.25	0.40	40	60	1.2	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.5	0.11	0.20	0.30	30	50	0.8	0.15	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	4.2	0.20	0.60	1.80	200	400	2.4	0.40	280

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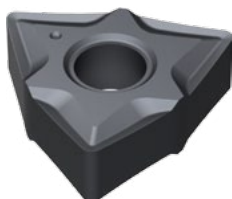
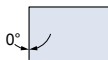
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	3.5	0.25	0.65	2.16	180	330	3.0	0.44	240
		2	1045, 1060,	190 HB		3.5		0.65	2.16		280			220
		3	28Mn6	250 HB		3.5		0.59	1.80		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.5	0.25	0.59	1.44	120	280	3.0	0.40	200
		4,6	Ck60, 4140, 4340,	230 HB		2.8	0.25	0.59	1.44		250		0.40	180
		5,7	100Cr6	280 HB		2.8	0.22	0.52	1.44		210		0.38	150
		8		350 HB		2.5	0.22	0.52	1.20		180		0.38	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.8	0.22	0.52	1.44	70	190	2.5	0.38	140
		10	H13, M42, D3,	280 HB		2.8		0.52	1.44		150		0.38	120
		11	S6-5-2, 12Ni19	320 HB		2.1		0.46	0.96		130		0.35	100
		11		350 HB		2.1		0.46	0.96		110		0.35	90
Cast Iron	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	3.5	0.26	0.52	1.20	170	250	3.0	0.40	190
		13	17-4 PH, 430	42 HRC		2.8		0.52		120	190	2.5		130
	Grey	7	15 GG20, GG40,	150 HB	0.5	3.5	0.18	0.78	2.40	170	250	3.0	0.44	200
		15	EN-GJL-250,	200 HB		3.5		0.78	2.16	160	230			180
		16	No30B	250 HB		3.5		0.72	2.16	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	3.5	0.18	0.65	1.80	120	250	3.0	0.38	180
		17,19	50005	200 HB		3.5		0.65	1.56		230			160
		18,20		250 HB		3.5		0.65	1.44		190			140
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	1.8	0.13	0.39	0.72	50	100	2.0	0.31	80
		38	440C,	50 HRC		1.5		0.33	0.48	40	90	1.5	0.25	70
		38	G-X260NiCr42	55 HRC		1.5		0.26	0.36	40	80	1.0	0.23	60
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	1.5	0.13	0.33	0.48	40	60	1.5	0.23	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.5	1.5	0.13	0.26	0.36	30	50	1.0	0.19	40

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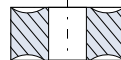
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	3.5	0.21	0.50	1.80	180	330	2.4	0.35	240
		2	1045, 1060, 28Mn6	190 HB		3.5		0.50	1.80		280			220
		3		250 HB		3.5		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.5	0.21	0.45	1.20	120	280	2.4	0.32	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		2.8		0.45	1.20		250			180
		5,7		280 HB		2.8		0.40	1.20		210			150
		8		350 HB		2.5		0.40	1.00		180			130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.8	0.18	0.40	1.20	70	190	2.0	0.30	140
		10	H13, M42, D3,	280 HB		2.8		0.40	1.20		150			120
		11	S6-5-2, 12Ni19	320 HB		2.1		0.35	0.80		130			100
		11		350 HB		2.1		0.35	0.80		110			90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	3.5	0.20	0.40	1.20	170	270	2.4	0.25	190
		14	X5CrNi18-9	240 HB		3.5		0.40	1.00		160			170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	2.8	0.18	0.35	0.80	80	150	2.0	0.28	100
		14	S31500	310 HB		2.8		0.35	0.80		70			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	3.5	0.22	0.40	1.00	170	250	2.4	0.32	190
		13	17-4 PH, 430	42 HRc		2.8		0.40	1.00		120			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	3.5	0.15	0.60	2.00	170	250	2.4	0.35	200
		15	EN-GJL-250, No30B	200 HB		3.5		0.60	1.80		160			180
		16		250 HB		3.5		0.55	1.80		150			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	3.5	0.15	0.50	1.50	120	250	2.4	0.30	180
		17,19	50005	200 HB		3.5		0.50	1.30		230			160
		18,20		250 HB		3.5		0.50	1.20		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.1	0.20	0.35	0.70	25	45	1.6	0.28	32
		33	Inconel 700	250 HB		2.1		0.35	0.70		25			30
		34	Stellite 21	350 HB		2.1		0.35	0.70		23			28
	Ti based	10	36 TiAl6V4	-	0.5	2.8	0.20	0.40	0.80	45	65	1.6	0.33	55
		37	T40	-		2.1		0.35	0.70		35			45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	1.8	0.11	0.30	0.60	50	100	1.6	0.25	80
		38	440C,	50 HRc		1.5		0.25	0.40		40			70
		38	G-X260NiCr42	55 HRc		1.5		0.20	0.30		40			60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	1.5	0.11	0.25	0.40	40	60	1.2	0.18	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.5	0.11	0.20	0.30	30	50	0.8	0.15	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	4.2	0.20	0.60	1.80	200	400	2.4	0.40	280

WNMG 080412 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	1 C35, Ck45, 1020,	125 HB	0.7	3.5	0.25	0.65	2.16	180	330	3.0	0.44	240
		2	1045, 1060, 28Mn6	190 HB		3.5		0.65	2.16		280			220
		3		250 HB		3.5		0.59	1.80		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.7	3.5	0.25	0.59	1.44	120	280	3.0	0.40	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		2.8	0.25	0.59	1.44		250		0.40	180
		5,7		280 HB		2.8	0.22	0.52	1.44		210		0.38	150
		8		350 HB		2.5	0.22	0.52	1.20		180		0.38	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.7	2.8	0.22	0.52	1.44	70	190	2.5	0.38	140
		10	H13, M42, D3, S6-5-2, 12Ni19	280 HB		2.8		0.52	1.44		150		0.38	120
		11		320 HB		2.1		0.46	0.96		130		0.35	100
		11		350 HB		2.1		0.46	0.96		110		0.35	90
Stainless Steel	Austenitic	4	14 304, 316, X5CrNi18-9	180 HB	0.7	3.5	0.24	0.52	1.44	170	270	3.0	0.40	190
		14		240 HB		3.5		0.52	1.20	160	220		0.36	170
	Duplex	5	14 X2CrNi23-4, S31500	290 HB	0.7	2.8	0.22	0.46	0.96	80	150	2.5	0.32	100
		14		310 HB		2.8		0.46	0.96	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17, 17-4 PH, 430	200 HB	0.7	3.5	0.26	0.52	1.20	170	250	3.0	0.40	190
		13		42 HRc		2.8		0.52	1.20	120	190	2.5	0.36	130
Cast Iron	Grey	7	15 GG20, GG40, EN-GJL-250, No30B	150 HB	0.7	3.5	0.18	0.78	2.40	170	250	3.0	0.44	200
		16		200 HB		3.5		0.78	2.16	160	230			180
		16		250 HB		3.5		0.72	2.16	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.7	3.5	0.18	0.65	1.80	120	250	3.0	0.38	180
		17,19		200 HB		3.5		0.65	1.56	120	230			160
		18,20		250 HB		3.5		0.65	1.44	120	190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.7	2.1	0.24	0.46	0.84	25	45	2.0	0.35	32
		33	Inconel 700	250 HB		2.1		0.46	0.84	25	45			30
		34	Stellite 21	350 HB		2.1		0.46	0.84	23	40			28
	Ti based	10	36 TiAl6V4	-	0.7	2.8	0.24	0.52	0.96	45	65	2.0	0.40	55
		37	T40	-		2.1		0.46	0.84	35	55		0.36	45
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.7	1.8	0.13	0.39	0.72	50	100	2.0	0.31	80
		38		50 HRc		1.5		0.33	0.48	40	90	1.5	0.25	70
		38		55 HRc		1.5		0.26	0.36	40	80	1.0	0.23	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.7	1.5	0.13	0.33	0.48	40	60	1.5	0.23	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.7	1.5	0.13	0.26	0.36	30	50	1.0	0.19	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.7	4.2	0.24	0.78	2.20	200	400	3.0	0.50	280

**W****N****M****P****Shape****Clearance Angle****Tolerance**

$s \pm 0.13$
 For $l = 06$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 08$, $d \pm 0.08$ $m \pm 0.13$

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMP 060404 NN	LT 10	6	4.76	0.4	T0000306
WNMP 060408 NN	LT 10	6	4.76	0.8	T0000307
WNMP 080408 NN	LT 10	8	4.76	0.8	T0000308

NN All purpose Chipbreaker

80° Trigon shape inserts with positive chipbreaker geometry. Generates lower cutting forces, suitable for High Temperature Alloys and Stainless Steel operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
WNMP 060404 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
WNMP 060408 NN				
WNMP 080408 NN				

Exotic Material

Verify
 Cutting Conditions

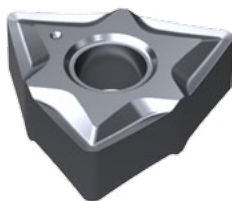
**Stainless Steel
 Exotic Material**

CNMP - TNMP - WNMP

**CNMP
 TNMP
 WNMP**



Machine Recommendations
 Guide. Details on page 10



W

N

M

P



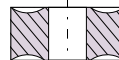
Shape



Clearance Angle



Tolerance
 $s \pm 0.13$
 For $l = 06$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 08$, $d \pm 0.08$ $m \pm 0.13$



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMP 060404 NN	LT 1000	6	4.76	0.4	T0001954
WNMP 060408 NN	LT 1000	6	4.76	0.8	T0001955
WNMP 080408 NN	LT 1000	8	4.76	0.8	T0001956

NN All purpose Chipbreaker

80° Trigon shape inserts with positive chipbreaker geometry. Generates lower cutting forces, suitable for High Temperature Alloys and Stainless Steel operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
WNMP 060404 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
WNMP 060408 NN				
WNMP 080408 NN				

WNMP

Exotic Material

Verify
Cutting Conditions

Stainless Steel
Exotic Material

CNMP - TNMP - WNMP

CNMP
TNMP
WNMP



Machine Recommendations
Guide. Details on page 10

WNMP 060404 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	3.0 2.5 2.5	0.11	0.23 0.22 0.20	0.60 0.52 0.48	180	330 280 250	2.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.10	0.20 0.20 0.18 0.18	0.50 0.48 0.40 0.36	120	280 250 210 180	2.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	2.5 2.5 2.0 2.0	0.09	0.18 0.16 0.14 0.14	0.40 0.40 0.32 0.26	70	190 150 130 110	2.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	2.5 2.5	0.10	0.18 0.18	0.32 0.26	170 160	270 220	2.0	0.12	260 210
	Duplex	5	14 X2CrNi23-4, 14 S31500	290 HB 310 HB	0.2	2.0 2.0	0.09	0.14 0.14	0.20 0.20	80 70	150 140	2.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	2.5 2.0	0.10	0.18 0.16	0.32 0.26	170 120	250 190	2.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	3.0 3.0 3.0	0.08	0.20 0.20 0.20	0.64 0.60 0.60	170 160 150	250 230 210	2.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	2.5 2.5 2.5	0.08	0.18 0.18 0.18	0.48 0.40 0.40	250 120 190	250 230 190	2.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	2.0 2.0 2.0	0.09	0.15 0.15 0.15	0.26 0.26 0.26	25 25 23	50 50 45	2.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	2.0 2.0	0.09	0.16 0.14	0.32 0.26	45 35	65 60	2.0	0.15 0.12	60 50
	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.8 1.5 1.4	0.05	0.12 0.10 0.09	0.20 0.17 0.13	50 40 40	100 90 80	1.5 1.2 1.0	0.11 0.09 0.07	90 80 70
Hardened Mat.	Chilled Cast Iron	11	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	11	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 AISi12	130 HB	0.2	4.0	0.10	0.30	0.70	200	400	2.0	0.20	350

WNMP 060408 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	1	C35, Ck45, 1020,	125 HB	0.5	2.5	0.21	0.50	1.17	180	330	2.2	0.35	240
			2	1045, 1060,	190 HB		2.5		0.50	1.17		280			220
			3	28Mn6	250 HB		2.5		0.45	0.98		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	2.5	0.21	0.45	0.78	120	280	2.2	0.32	200
			4,6	Ck60, 4140, 4340,	230 HB		2.0	0.21	0.45	0.78		250	1.8	0.32	180
			5,7	100Cr6	280 HB		2.0	0.18	0.40	0.78		210	1.8	0.30	150
			8		350 HB		1.8	0.18	0.40	0.65		180	1.6	0.30	130
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.0	0.18	0.40	0.78	70	190	1.8	0.30	140
			10	H13, M42, D3,	280 HB		2.0		0.40	0.78		150	1.8	0.30	120
			11	S6-5-2, 12Ni19	320 HB		1.5		0.35	0.52		130	1.5	0.28	100
			11		350 HB		1.5		0.35	0.52		110	1.5	0.28	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	2.5	0.20	0.40	0.78	170	270	2.2	0.35	190
			14	X5CrNi18-9	240 HB		2.5		0.40	0.65	160	220		0.32	170
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	2.0	0.18	0.35	0.52	80	150	1.8	0.28	100
			14	S31500	310 HB		2.0		0.35		70	140			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	2.5	0.22	0.40	0.65	170	250	2.2	0.32	190
			13	17-4 PH, 430	42 HRC		2.0		0.40		120	190			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	2.5	0.15	0.60	1.30	170	250	2.2	0.35	200
			15	EN-GJL-250,	200 HB		2.5		0.60	1.17	160	230			180
			16	No30B	250 HB		2.5		0.55	1.17	150	210			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	2.5	0.15	0.50	0.98		250	2.2	0.30	180
			17,19	50005	200 HB		2.5		0.50	0.85	120	230			160
			18,20		250 HB		2.5		0.50	0.78		190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	1.5	0.20	0.35		25	45	1.5	0.28	32
			33	Inconel 700	250 HB		1.5		0.35	0.46	25	45			30
			34	Stellite 21	350 HB		1.5		0.35		23	40			28
	Ti based	10	36	TiAl6V4	-	0.5	2.0	0.20	0.40	0.52	45	65	1.5	0.33	55
			37	T40	-		1.5		0.35	0.46	35	55			45
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.5	1.6	0.11	0.30	0.39	50	100	1.5	0.25	80
			38	440C,	50 HRC		1.3		0.25	0.26	40	90	1.0	0.20	70
			38	G-X260NiCr42	55 HRC		1.3		0.20	0.20	40	80	1.0	0.18	60
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.3	0.11	0.25	0.26	40	60	1.0	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.5	1.3	0.11	0.20	0.20	30	50	1.0	0.15	40
	Al (>8%Si)	12	25	AISI12	130 HB	0.5	3.0	0.20	0.60	1.80	200	400	2.2	0.40	280

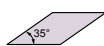
WNMP 080408 NN LT 10 & LT 1000

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	1 C35, Ck45, 1020,	125 HB	0.5	3.5	0.21	0.50	1.80	180	330	2.4	0.35	240
		2	1045, 1060, 28Mn6	190 HB		3.5		0.50	1.80		280			220
		3		250 HB		3.5		0.45	1.50		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.5	0.21	0.45	1.20	120	280	2.4	0.32	200
		4,6	Ck60, 4140, 4340, 100Cr6	230 HB		2.8	0.21	0.45	1.20		250		0.32	180
		5,7		280 HB		2.8	0.18	0.40	1.20		210		0.30	150
		8		350 HB		2.5	0.18	0.40	1.00		180		0.30	130
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.8	0.18	0.40	1.20	70	190	2.0	0.30	140
		10	H13, M42, D3,	280 HB		2.8		0.40	1.20		150		0.30	120
		11	S6-5-2, 12Ni19	320 HB		2.1		0.35	0.80		130		0.28	100
		11		350 HB		2.1		0.35	0.80		110		0.28	90
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	3.5	0.20	0.40	1.20	170	270	2.4	0.25	190
		14	X5CrNi18-9	240 HB		3.5		0.40	1.00	160	220		0.22	170
	Duplex	5	14 X2CrNi23-4,	290 HB	0.5	2.8	0.18	0.35	0.80	80	150	2.0	0.28	100
		14	S31500	310 HB		2.8		0.35	0.80	70	140			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	3.5	0.22	0.40	1.00	170	250	2.4	0.32	190
		13	17-4 PH, 430	42 HRc		2.8		0.40	1.00	120	190		2.0	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	3.5	0.15	0.60	2.00	170	250	2.4	0.35	200
		15	EN-GJL-250, No30B	200 HB		3.5		0.60	1.80	160	230			180
		16		250 HB		3.5		0.55	1.80	150	210			160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.5	3.5	0.15	0.50	1.50	250	250	2.4	0.30	180
		17,19		200 HB		3.5		0.50	1.30	120	230			160
		18,20		250 HB		3.5		0.50	1.20	190	190			140
High Temp Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.1	0.20	0.35	0.70	25	45	1.6	0.28	32
		33	Inconel 700	250 HB		2.1		0.35	0.70	25	45			30
		34	Stellite 21	350 HB		2.1		0.35	0.70	23	40			28
	Ti based	10	36 TiAl6V4	-	0.5	2.8	0.20	0.40	0.80	45	65	1.6	0.33	55
		37	T40	-		2.1		0.35	0.70	35	55		0.30	45
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	1.8	0.11	0.30	0.60	50	100	1.6	0.25	80
		38	440C,	50 HRc		1.5		0.25	0.40	40	90	1.2	0.20	70
		38	G-X260NiCr42	55 HRc		1.5		0.20	0.30	40	80	0.8	0.18	60
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	1.5	0.11	0.25	0.40	40	60	1.2	0.18	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.5	0.11	0.20	0.30	30	50	0.8	0.15	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	4.2	0.20	0.60	1.80	200	400	2.4	0.40	280



STAR

V_{35°} D_{55°} T_{60°} C_{80°} B M T



35°
Diamond



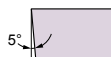
55°
Diamond



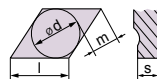
60°
Triangle



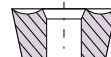
80°
Diamond



Clearance
Angle



Tolerance
d ± 0.05
m ± 0.08
s ± 0.13



Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
ST-CBMT 060408L NN LT 1000		6	4.76	0.8	T0002784
ST-DBMT 060404L NN LT 1000		6	4.76	0.4	T0002781
ST-TBMT 060404L NN LT 1000		6	4.76	0.4	T0002783
ST-VBMT 060404L NN LT 1000		6	4.76	0.4	T0002782

NN All purpose Chipbreaker

Exclusive and unique design inserts with positive chipbreaker geometry. Suitable for Roughing, Semi-finishing and Finishing operations due to the ability to use the same Tool holder and for 35° - 80° angle operations. Limited in Plunging angle.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
ST-CBMT 060408L NN	😊	😐	😞
ST-DBMT 060404L NN	😊	😞	😞
ST-TBMT 060404L NN	😊	😞	😞
ST-VBMT 060404L 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



Feed x d.o.c.

=
Amax

Machine Recommendations
Guide. Details on page 10

STAR

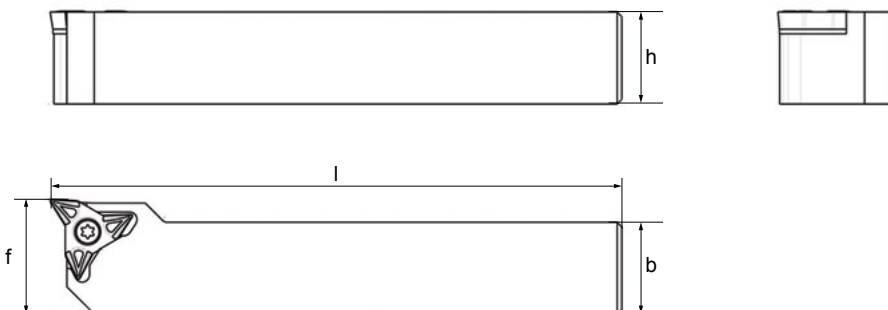
STAR C / D / T / VBMT tool-holders

External

Description	h	b	l	f	Catalog Nr.
ST-SXJBL 2020 K06	20	20	125	25	T2001028
ST-SXJBL 2525 K06	25	25	150	32	T2001029

Screw: M2001146

Key: M2000602

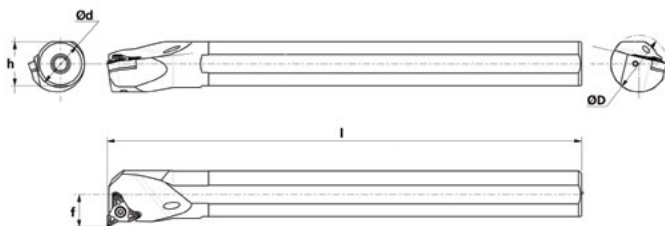


Internal

Description	Ød	h	l	f	ØDmin	Catalog Nr.
ST-A25S-SXJBR 06	25	23	250	17	30	T2001031

Screw: M2001146

Key: M2000602



ST-CBMT 060408L NN 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	1	C35, Ck45, 1020,	125 HB	0.2	3.0	0.11	0.23	0.60	180	330	2.0	0.18	300	
			2	1045, 1060,	190 HB		2.5		0.22	0.52		280			260	
			3	28Mn6	250 HB		2.5		0.20	0.48		250			240	
	Low alloyed	2	6	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	
			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	10	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	14	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	14	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	12	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	15	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	17,19	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	31,32	Incoloy 800	240 HB	0.2	2.0	0.09	0.15	0.26	25	50	2.0	0.12	40	
			33	Inconel 700	250 HB		2.0		0.15	0.26	25	50			40	
			34	Stellite 21	350 HB		2.0		0.15	0.26	23	45			35	
	Ti based	10	36	TiAl6V4	-	0.2	2.0	0.09	0.16	0.32	45	65	2.0	0.15	60	
			37	T40	-		2.0		0.14	0.26	35	60			50	
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	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				G-X260NiCr42	55 HRC	1.4		0.09		0.13	40	80	1.0			0.07
Chilled Cast Iron		11	40	Ni-Hard 2	400 HB	0.2	1.6	0.05	0.12	0.17	40	60	1.2	0.11	50	
			41	G-X300CrMo15	55 HRC	0.2	1.4	0.05	0.09	0.13	30	50	1.0	0.07	40	
NP	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	

ST-DBMT 060404L NN 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	2.1 1.8 1.8	0.08	0.20 0.19 0.17	0.37 0.32 0.30	180	330 280 250	1.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.08	0.17 0.17 0.15 0.15	0.31 0.30 0.25 0.22	120	280 250 210 180	1.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.07	0.15 0.14 0.12 0.12	0.25 0.25 0.20 0.16	70	190 150 130 110	1.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	1.8 1.8	0.08	0.15 0.15	0.20 0.16	170 160	270 220	1.0	0.12	260 210
	Duplex	5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.2	1.4 1.4	0.07	0.12 0.12	0.12 0.12	80 70	150 140	1.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	1.8 1.4	0.08	0.15 0.14	0.20 0.16	170 120	250 190	1.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	2.1 2.1 2.1	0.06	0.17 0.17 0.17	0.40 0.37 0.37	170 160 150	250 230 210	1.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	1.8 1.8 1.8	0.06	0.15 0.15 0.15	0.30 0.25 0.25	250 120 230	250 230 190	1.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	1.4 1.4 1.4	0.08	0.13 0.13 0.13	0.16 0.16 0.16	25 25 23	50 50 45	1.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	1.4 1.4	0.08	0.14 0.12	0.20 0.16	45 35	65 60	1.0	0.14 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.3 1.1 1.0	0.04	0.10 0.09 0.08	0.12 0.11 0.08	50 40 40	100 90 80	0.8 0.6 0.5	0.11 0.09 0.07	90 80 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 AISi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20	350

ST-TBMT 060404L NN LT 1000

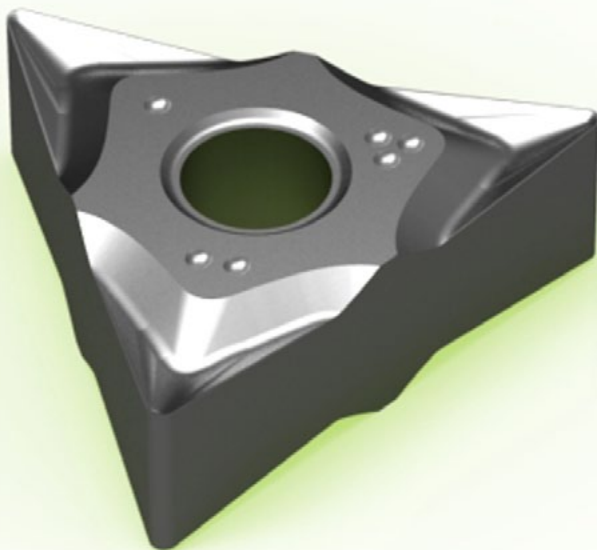
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions	
						min	max	min	max		min	max	D.O.C.	Feed
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.2	2.1	0.08	0.20	0.37	180	330	1.0	0.18
			2	1045, 1060,	190 HB		1.8		0.19	0.32		280		
			3	28Mn6	250 HB		1.8		0.17	0.30		250		
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.2	1.8	0.08	0.17	0.31	120	280	1.0	0.15
			4,6	Ck60, 4140, 4340,	230 HB		1.8		0.17	0.30		250		
			5,7	100Cr6	280 HB		1.4		0.15	0.25		210		
			8		350 HB		1.4		0.15	0.22		180		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.2	1.8	0.07	0.15	0.25	70	190	1.0	0.12
			10	H13, M42, D3,	280 HB		1.8		0.14	0.25		150		
			11	S6-5-2, 12Ni19	320 HB		1.4		0.12	0.20		130		
			11		350 HB		1.4		0.12	0.16		110		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.2	1.8	0.08	0.15	0.20	170	270	1.0	0.12
			14	X5CrNi18-9	240 HB		1.8		0.15	0.16	160	220		
	Duplex	5	14	X2CrNi23-4,	290 HB	0.2	1.4	0.07	0.12	0.12	80	150	1.0	0.12
			14	S31500	310 HB		1.4		0.12	0.12	70	140		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.2	1.8	0.08	0.15	0.20	170	250	1.0	0.15
			13	17-4 PH, 430	42 HRC		1.4		0.14	0.16	120	190		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.2	2.1	0.06	0.17	0.40	170	250	1.0	0.18
			15	EN-GJL-250,	200 HB		2.1		0.17	0.37	160	230		
			16	No30B	250 HB		2.1		0.17	0.37	150	210		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.2	1.8	0.06	0.15	0.30	120	250	1.0	0.15
			17,19	50005	200 HB		1.8		0.15	0.25		230		
			18,20		250 HB		1.8		0.15	0.25		190		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.2	1.4	0.08	0.13	0.16	25	50	1.0	0.12
			33	Inconel 700	250 HB		1.4		0.13	0.16	25	50		
			34	Stellite 21	350 HB		1.4		0.13	0.16	23	45		
	Ti based	10	36	TiAl6V4	-	0.2	1.4	0.08	0.14	0.20	45	65	1.0	0.14
			37	T40	-		1.4		0.12	0.16	35	60		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.2	1.3	0.04	0.10	0.12	50	100	0.8	0.11
			38	440C,	50 HRC		1.1		0.09	0.11	40	90	0.6	0.09
			38	G-X260NiCr42	55 HRC		1.0		0.08	0.08	40	80	0.5	0.07
	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
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.2	1.0	0.04	0.08	0.08	30	50	0.5	0.07
NP	Al (>8%Si)	12	25	AlSi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20

ST-VBMT 060404L NN 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	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.2	2.1 1.8 1.8	0.08	0.20 0.19 0.17	0.37 0.32 0.30	180	330 280 250	1.0	0.18	300 260 240
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6 8	180 HB 230 HB 280 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.08	0.17 0.17 0.15 0.15	0.31 0.30 0.25 0.22	120	280 250 210 180	1.0	0.15	260 240 200 180
	High alloyed	3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19 11	220 HB 280 HB 320 HB 350 HB	0.2	1.8 1.8 1.4 1.4	0.07	0.15 0.14 0.12 0.12	0.25 0.25 0.20 0.16	70	190 150 130 110	1.0	0.12	180 140 120 110
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.2	1.8 1.8	0.08	0.15 0.15	0.20 0.16	170 160	270 220	1.0	0.12	260 210
	Duplex	5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.2	1.4 1.4	0.07	0.12 0.12	0.12 0.12	80 70	150 140	1.0	0.12	140
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRC	0.2	1.8 1.4	0.08	0.15 0.14	0.20 0.16	170 120	250 190	1.0	0.15 0.12	240 180
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.2	2.1 2.1 2.1	0.06	0.17 0.17 0.17	0.40 0.37 0.37	170 160 150	250 230 210	1.0	0.18	240 220 200
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.2	1.8 1.8 1.8	0.06	0.15 0.15 0.15	0.30 0.25 0.25	250 120 190	250 230 190	1.0	0.15	240 220 180
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.2	1.4 1.4 1.4	0.08	0.13 0.13 0.13	0.16 0.16 0.16	25 25 23	50 50 45	1.0	0.12	40 40 35
	Ti based	10	36 TiAl6V4 37 T40	- -	0.2	1.4 1.4	0.08	0.14 0.12	0.20 0.16	45 35	65 60	1.0	0.14 0.12	60 50
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRC 50 HRC 55 HRC	0.2	1.3 1.1 1.0	0.04	0.10 0.09 0.08	0.12 0.11 0.08	50 40 40	100 90 80	0.8 0.6 0.5	0.11 0.09 0.07	90 80 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 AISi12	130 HB	0.2	2.8	0.08	0.26	0.43	200	400	1.0	0.20	350

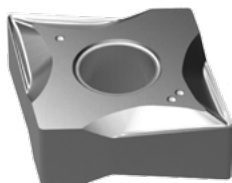
Alu-Turning

LT 05 Alu-Turning



ALU-TURNING LINE

ALU-
Turning



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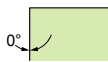
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G

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Shape



Clearance Angle


Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CNGG 120404 ALU	LT 05	12	4.76	0.4	T0001025
CNGG 120408 ALU	LT 05	12	4.76	0.8	T0001019

ALU All purpose Chipbreaker

ISO standard with extreme and unique positive chipbreaker geometry for Aluminium Turning operations. Suitable mostly for External operations but good also for Internal operations, Roughing and Finishing operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNGG 120404 ALU	😊	😐	😞
CNGG 120408 ALU	😐	😊	😐
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			

😊 = Good

😐 = Acceptable

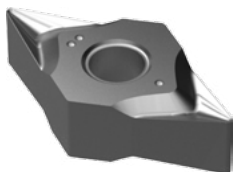
😞 = Not recommended

CNGG 120404 ALU LT 05

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
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	5.0	0.12	0.35	1.50	400	1200	2.5	0.23	400
			23, 24	4% < Si < 8 %	100 HB		5.0	0.10	0.30	1.20	250	600			300
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	5.0	0.10	0.30	1.20	150	800	2.5	0.23	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	5.0	0.10	0.20	1.20	70	500	2.0	0.15	150
			30	Hard Rubber	-		5.0		0.20		80	300			
			-	Graphite	-		5.0		0.20		100	200			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	2.0	0.09	0.16	0.28	35	60	1.5	0.13	45
			37	TiAl 6 V4	-		2.0	0.12	0.20	0.24	28	40		0.12	35

CNGG 120408 ALU LT 05

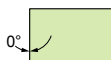
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm ²]	V _c [m/min]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C	Feed	V _c
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	5.0	0.18	0.60	1.50	400	1200	3.0	0.32	400
			23, 24	4% < Si < 8 %	100 HB		5.0		0.50	1.20	250	600			300
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	5.0	0.15	0.40	1.20	150	800	3.0	0.25	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	5.0	0.15	0.40	1.20	70	500	3.0	0.25	150
			30	Hard Rubber	-		5.0		0.40		80	300			
			-	Graphite	-		5.0		0.40		100	200			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	4.0	0.15	0.28	0.28	35	60	2.5	0.20	45
			37	TiAl 6 V4	-		4.0		0.26	0.24	28	40	2.5	0.18	35



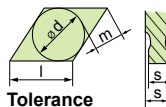
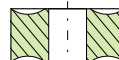
D N G G



Shape



Clearance Angle


Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.13$

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
DNGG 110404 ALU	LT 05	12	4.76	0.4	T0001026
DNGG 110408 ALU	LT 05	11	4.76	0.8	T0001010

ALU All purpose Chipbreaker

ISO standard with extreme and unique positive chipbreaker geometry for Aluminium Turning operations. Suitable mostly for External operations but good also for Internal operations, Roughing and Finishing operations.

Application Guide

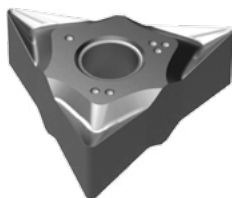
	Finishing	Medium	Roughing / Interrupted cut
DNGG 110404 ALU	😊	😐	😞
DNGG 110408 ALU	😐	😊	😐
Finishing: d.o.c. = 0.30 - 1.50 mm fn = 0.08 - 0.20 mm/rev	Medium: d.o.c. = 0.70 - 4.50 mm fn = 0.15 - 0.45 mm/rev	Roughing d.o.c. = 3.00 - 7.00 mm fn = 0.35 - 0.70 mm/rev	
😊 = Good 😐 = Acceptable 😞 = Not recommended			

DNGG 110404 ALU LT 05

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
NF	Al (<8%Si)	13	21, 22 23, 24	Si < 4 % 4% < Si < 8 %	60 HB 100 HB	0.3	4.0	0.12	0.35	1.50	400 1200	2.5	0.23	400 300
							4.0	0.10	0.30	1.20	250 600			
	Cooper Alloys	14	26, 27, 28	CuZn30	100 HB	0.3	4.0	0.10	0.30	1.20	150 800	2.5	0.23	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	4.0	0.10	0.20	1.20	70 500	2.0	0.15	150
			30	Hard Rubber	-		4.0		0.20		80 300			
			-	Graphite	-		4.0		0.20		100 200			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	2.0	0.09	0.16	0.28	35 60	1.5	0.13	45
			37	TiAl 6 V4	-		2.0	0.12	0.20	0.24	28 40		0.12	35

DNGG 110408 ALU LT 05

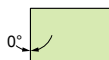
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/rev]		Amax [mm²]	V _c [m/min]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C	Feed	V _c
NF	Al (<8%Si)	13	21, 22 23, 24	Si < 4 % 4% < Si < 8 %	60 HB 100 HB	0.3	4.0	0.18	0.60	1.50	400 1200	2.0	0.25	400 300
							4.0		0.50	1.20	250 600			
	Cooper Alloys	14	26, 27, 28	CuZn30	100 HB	0.3	4.0	0.15	0.40	1.20	150 800	2.0	0.25	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	4.0	0.15	0.40	1.20	70 500	2.0	0.25	150
			30	Hard Rubber	-		4.0		0.40		80 300			
			-	Graphite	-		4.0		0.40		100 200			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	3.0	0.15	0.28	0.28	35 60	2.0	0.20	45
			37	TiAl 6 V4	-		3.0		0.26	0.24	28 40		0.18	35



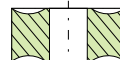
T N G G



Shape



Clearance Angle


Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNGG 160404 ALU	LT 05	16	4.76	0.4	T0001105

ALU All purpose Chipbreaker

ISO standard with extreme and unique positive chipbreaker geometry for Aluminium Turning operations. Suitable mostly for External operations but good also for Internal operations, Roughing and Finishing operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
TNGG 160404 ALU			

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

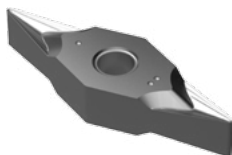
= Good

= Acceptable

= Not recommended

TNGG 160404 ALU LT 05

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
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	4.0	0.12	0.35	1.50	400	1200	2.5	0.23	400
			23, 24	4% < Si < 8 %	100 HB		4.0	0.10	0.30	1.20	250	600			300
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	4.0	0.10	0.30	1.20	150	800	2.5	0.23	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	4.0	0.10	0.20	1.20	70	500	2.0	0.15	150
			30	Hard Rubber	-		4.0		0.20	1.20	80	300			
			-	Graphite	-		4.0		0.20	1.20	100	200			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	2.0	0.09	0.16	0.28	35	60	1.5	0.13	45
			37	TiAl 6 V4	-		2.0	0.12	0.20	0.24	28	40		0.12	35

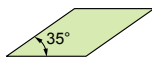


V

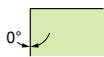
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G

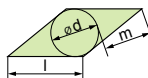
G



Shape



Clearance Angle


Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $r \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
VNGG 160404 ALU	LT 05	16	4.76	0.4	T0001006
VNGG 160408 ALU	LT 05	16	4.76	0.8	T0001032

ALU All purpose Chipbreaker

ISO standard with extreme and unique positive chipbreaker geometry for Aluminium Turning operations. Suitable mostly for External operations but good also for Internal operations, Roughing and Finishing operations.

Application Guide

	Finishing	Medium	Roughing / Interrupted cut
VNGG 160404 ALU	😊	😐	😞
VNGG 160408 ALU	😐	😊	😐
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	

😊 = Good

😐 = Acceptable

😞 = Not recommended

VNGG 160404 ALU LT 05

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
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	4.0	0.12	0.30	1.50	400	1200	2.5	0.23	400
			23, 24	4% < Si < 8 %	100 HB		4.0	0.10	0.25	1.20	250	600			300
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	4.0	0.10	0.25	1.20	150	800	2.5	0.23	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	4.0	0.10	0.20	1.20	70	500	2.0	0.15	150
			30	Hard Rubber	-		4.0		0.20		80	300			
-			Graphite	-	4.0		0.20		100		200				
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	2.0	0.09	0.16	0.28	35	60	1.5	0.13	45
		37	TiAl 6 V4	-	2.0		0.12	0.20	0.24	28	40	0.12		35	

VNGG 160408 ALU LT 05

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
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	6.0	0.18	0.60	1.50	400	1200	3.0	0.25	400
			23, 24	4% < Si < 8 %	100 HB		6.0		0.50	1.20	250	600			300
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	6.0	0.15	0.40	1.20	150	800	3.0	0.25	250
	Non-Metallic	15	29	Fiber Plastics	-	0.3	6.0	0.15	0.40	1.20	70	500	3.0	0.25	150
			30	Hard Rubber	-		6.0		0.40	1.20	80	300			150
-			Graphite	-	6.0		0.40		1.20	100	200	150			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	3.0	0.15	0.28	0.28	35	60	2.0	0.20	45
		37	TiAl 6 V4	-	3.0		0.26		0.24	28	40	0.18		35	

MULTI-MAT™

The Lamina Multi-Mat™ LT 1000 Grade for Parting
can machine most materials with
ONLY ONE GRADE



Steel



Stainless Steel



Cast Iron



High Temp. Alloys



Hardened Steel



Aluminium & Non ferrous Alloys

True Multi-Mat™ inserts for real productivity

Parting

LT 1000 Multi-Mat™ Magia Parting



MULTI-MAT™ PARTING LINE

PARTING


G
C
T
X
Shape
"Dog bone"

Clearance Angle
N = 0° No rake
C = 7° Rake angle

Tolerance
d ± 0.05
m ± 0.16
s ± 0.13

Insert Type
Special

Insert Designation	Grade	W	r	Catalog Nr.
GCTX 2002 NN	LT 1000	2.0	0.18	T0002825
GCTX 3003 NN	LT 1000	3.0	0.25	T0002826
GCTX 3003 PP	LT 1000	3.0	0.25	T0002828

PP All purpose Chipbreaker
NN

Application Guide

Parting Grooving Side Turning

NN			
PP			

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

= Good
 = Acceptable
 = Not recommended

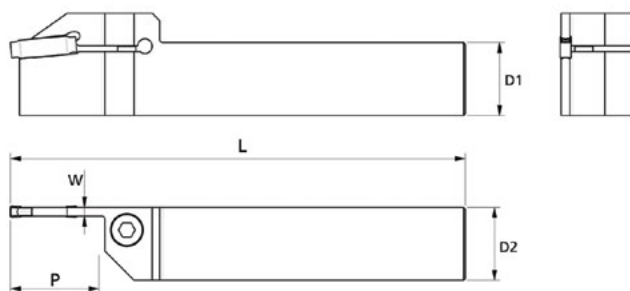
Parting Tool holders

Designation	D1	D2	L	W	P _{max}	Hand	Catalog Nr.
LT PNG-L 12-2.0*	12	12	120	1.6	15	Left	T2001164
LT PNG-R 12-2.0*	12	12	120	1.6	15	Right	T2001165
LT PNG-L 16-2.0*	16	16	120	1.6	15	Left	T2001166
LT PNG-R 16-2.0*	16	16	120	1.6	15	Right	T2001167
LT PNG-L 20-2.0*	20	20	120	1.6	15	Left	T2001484
LT PNG-L 20-2.0*	20	20	120	1.6	15	Right	T2001485
LT PNG-L 25-2.0*	25	25	120	1.6	15	Left	T2001482
LT PNG-L 25-2.0*	25	25	120	1.6	15	Right	T2001483
Designation	D1	D2	L	W	P _{max}	Hand	Catalog Nr.
LT PNG-L 16-3.0*	16	16	120	2.4	15	Left	T2001168
LT PNG-R 16-3.0*	16	16	120	2.4	15	Right	T2001169
LT PNG-L 20-3.0*	20	20	125	2.4	15	Left	T2001170
LT PNG-R 20-3.0*	20	20	125	2.4	15	Right	T2001171
LT PNG-L 25-3.0*	25	25	125	2.4	15	Left	T2001197
LT PNG-R 25-3.0*	25	25	125	2.4	15	Right	T2001198

* Current line of 20mm overhang shall be replaced by 15mm overhang

Screw: M2001797

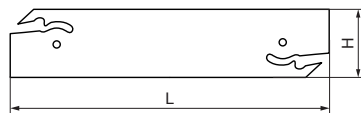
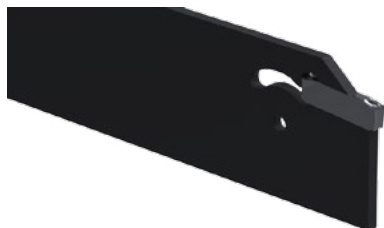
Key: M2000609



Blades

Designation	L	H	Catalog Nr.
LT BNG-32-3	145	32	T2002751

Key: T2002761

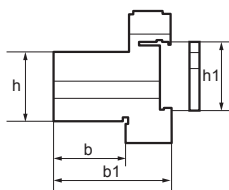
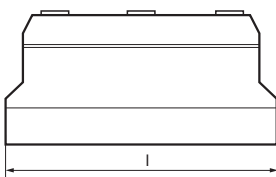


Blocks

Designation	h	b	h1	l	b1	Catalog Nr.
LT PNB-N 2020-32	20	20	32	110	50	T2002762
LT PNB-N 2525-32	25	25	32	110	50	T2002763

Screw: T2002785

Key: T2002786



GCTX 2002 NN LT 1000

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.05	0.17	130	220	0.11	175
			2	1045, 1060,	190 HB		0.17		220	0.09	110
			3	28Mn6	250 HB		0.17		200	0.09	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.05	0.15	90	200	0.10	145
			4,6		230 HB		0.15		200	0.08	100
			5,7		280 HB		0.15		170	0.08	85
			8		350 HB		0.15		150	0.08	75
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.05	0.14	60	170	0.10	115
			10		280 HB		0.14		150	0.07	75
			11		320 HB		0.13		130	0.07	65
			11		350 HB		0.12		100	0.06	50
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.05	0.10	90	150	0.07	120
			14		240 HB		0.10	70	140	0.05	105
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.05	0.09	60	100	0.07	80
			14		310 HB		0.09		100	0.04	50
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.05	0.09	60	130	0.07	95
			13		42 HRc		0.08	50	90	0.04	70
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.05	0.16	130	190	0.11	160
			15		200 HB		0.16		190	0.08	95
			16		250 HB		0.16		190	0.08	95
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.05	0.14	90	150	0.10	120
			17,19		200 HB		0.14		150	0.07	75
			18,20		250 HB		0.14		150	0.07	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.05	0.08	25	35	0.07	30
			33	Inconel 700	250 HB		0.08	25	35	0.04	30
			34	Stellite 21	350 HB		0.08	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.05	0.08	35	60	0.07	45
			37	T40	-		0.08	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.05	0.11	50	90	0.08	70
			38		50 HRc		0.10	40	70	0.05	55
			38		55 HRc		0.09	30	60	0.05	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.05	0.08	40	60	0.07	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.05	0.08	30	50	0.07	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.05	0.10	100	300	0.08	200

GCTX 3003 NN LT 1000

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.07	0.20	130	220	0.14	175
			2	1045, 1060, 28Mn6	190 HB		0.20		220	0.10	110
			3		250 HB		0.20		200	0.10	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.07	0.18	90	200	0.13	145
			4,6		230 HB		0.18		200	0.09	100
			5,7		280 HB		0.18		170	0.09	85
			8		350 HB		0.18		150	0.09	75
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.07	0.17	60	170	0.12	115
			10		280 HB		0.17		150	0.08	75
			11		320 HB		0.16		130	0.08	65
			11		350 HB		0.14		100	0.07	50
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.07	0.12	90	150	0.09	120
			14		240 HB		0.12		70	0.06	105
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.07	0.11	60	100	0.09	80
			14		310 HB		0.11		100	0.05	50
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.07	0.11	60	130	0.09	95
			13		42 HRc		0.10		90	0.05	70
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.07	0.19	130	190	0.13	160
			15		200 HB		0.19		190	0.10	95
			16		250 HB		0.19		190	0.10	95
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.07	0.17	90	150	0.12	120
			17,19		200 HB		0.17		150	0.08	75
			18,20		250 HB		0.17		150	0.08	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.07	0.10	25	35	0.08	30
			33	Inconel 700	250 HB		0.10		35	0.05	30
			34	Stellite 21	350 HB		0.10		35	0.05	29
	Ti based	10	36	TiAl6V4	-	0.07	0.10	35	60	0.08	45
			37	T40	-		0.10		28	0.05	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.07	0.13	50	90	0.10	70
			38		50 HRc		0.12		40	0.06	55
			38		55 HRc		0.11		30	0.05	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.07	0.10	40	60	0.08	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.07	0.10	30	50	0.08	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.07	0.12	100	300	0.10	200

GCTX 3003 PP LT 1000

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.05	0.17	130	220	0.11	175
			2	1045, 1060,	190 HB		0.17		220	0.09	110
			3	28Mn6	250 HB		0.17		200	0.09	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.05	0.15	90	200	0.10	145
			4,6		230 HB		0.15		200	0.08	100
			5,7		280 HB		0.15		170	0.08	85
			8		350 HB		0.15		150	0.08	75
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.05	0.14	60	170	0.10	115
			10		280 HB		0.14		150	0.07	75
			11		320 HB		0.13		130	0.07	65
			11		350 HB		0.12		100	0.06	50
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.05	0.10	90	150	0.07	120
			14		240 HB		0.10	70	140	0.05	105
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.05	0.09	60	100	0.07	80
			14		310 HB		0.09		100	0.04	50
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.05	0.09	60	130	0.07	95
			13		42 HRc		0.08	50	90	0.04	70
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.05	0.16	130	190	0.11	160
			15		200 HB		0.16		190	0.08	95
			16		250 HB		0.16		190	0.08	95
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.05	0.14	90	150	0.10	120
			17,19		200 HB		0.14		150	0.07	75
			18,20		250 HB		0.14		150	0.07	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.05	0.08	25	35	0.07	30
			33	Inconel 700	250 HB		0.08		35	0.04	17.5
			34	Stellite 21	350 HB		0.08		35	0.04	17.5
	Ti based	10	36	TiAl6V4	-	0.05	0.08	35	60	0.07	45
			37	T40	-		0.08	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.05	0.11	50	90	0.08	70
			38		50 HRc		0.10	40	70	0.05	55
			38		55 HRc		0.09	30	60	0.05	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.05	0.08	40	60	0.07	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.05	0.08	30	50	0.07	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.05	0.10	100	300	0.08	200

The Lamina Multi-Mat™ Concept is also about
Reducing environmental impacts !



- By machining more materials without coolant
- By using less machine energy consumption
- By reducing unused insert stock

Lamina Multi-Mat™ Concept
The only alternative for Today and TOMORROW

Thread Turning

Multi-Mat™ Thread Turning



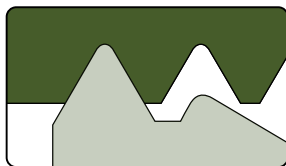
MULTI-MAT™ THREADING LINE

Inserts Ordering Code

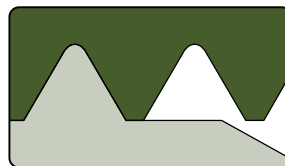
Lamina NEW Threading line, provides high range of standard Threading inserts, focusing on profitability and high quality according to the customers updated demands

ISO	1.5		ER	16	V	Grade
Profile	Pitch	Multitooth	Type of insert	Insert size	Vertical	LT 10
Partial Profile 60° 55°	Partial Profile mm tpi A 0.5-1.5 48-16 G 1.75-3.0 14-8 AG 0.5-3.0 48-8 N 3.5-5.0 7-5 Q 5.5-6.0 4.5-4	2M 3M	HER External right handed HEL External left handed HIR Internal right handed HIL Internal left handed	L I.C. 06 4.00 08 5.00 11 6.35 16 9.525 22 12.70 27 15.875		
Full Profile ISO METRIC UN WHITWORTH BSPT MJ NPT NPTF TRAPEZ ACME STUB ACME AM. BUTTRESS ROUND (DIN 405) DIN 20400 PG SAGENGWINDE UNJ API API ROUND BUT. CASING EXTREME LINE	Full Profile mm tpi 0.35-6.0 72-4					

Partial and Full Profiles



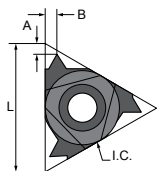
Partial profile, most economical solution, used for wide range of pitches. It is partial because the ext. major, or int. minor diameter, is not machined.



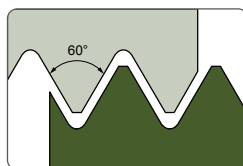
Full profile, cuts all thread shapes, according to the requirements. Wide range of inserts needed in order to fit each standard and range of pitches.

Partial Profile 60°

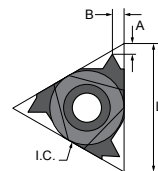
Designation		Pitch Range			Dimensions			Catalog Nr.
EX / IN	Grade	mm	TPI	L mm	I.C.	A	B	
A60 IR11	LT 10	0.5 - 1.5	48 - 16	11	6.35	0.8	0.9	TH000001
A60 ER16	LT 10	0.5 - 1.5	48 - 16	16	9.525	0.8	0.9	TH000004
A60 IR16	LT 10	0.5 - 1.5	48 - 16	16	9.525	0.8	0.9	TH000007
G60 ER16	LT 10	1.75 - 3.0	14 - 8	16	9.525	1.2	1.7	TH000010
G60 IR16	LT 10	1.75 - 3.0	14 - 8	16	9.525	1.2	1.7	TH000013
AG60 ER16	LT 10	0.5 - 3.0	48 - 8	16	9.525	1.2	1.7	TH000016
AG60 IR16	LT 10	0.5 - 3.0	48 - 8	16	9.525	1.2	1.7	TH000019



External Right



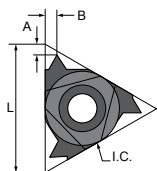
Partial Profile 60°



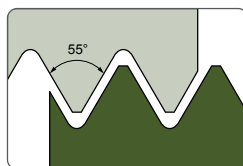
Internal Right

Partial Profile 55°

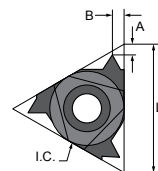
Designation		Pitch Range			Dimensions			Catalog Nr.
EX / IN	Grade	mm	TPI	L mm	I.C.	A	B	
AG55 ER16	LT 10	0.5 - 3.0	48 - 8	16	9.525	1.2	1.7	TH000022
AG55 IR16	LT 10	0.5 - 3.0	48 - 8	16	9.525	1.2	1.7	TH000025



External Right



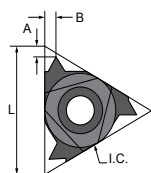
Partial Profile 55°



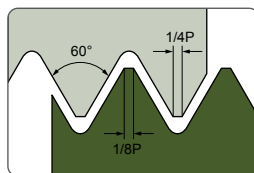
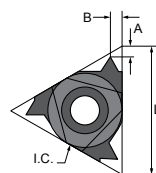
Internal Right

ISO METRIC

Designation		Pitch		Dimensions			Catalog Nr.
EX / IN	Grade	mm	L mm	I.C.	A	B	
ISO 1.0 IR11	LT10	1.00	11	6.350	0.7	0.7	TH000028
ISO 1.5 IR11	LT10	1.50	11	6.350	0.8	1.0	TH000031
ISO 2.0 IR11	LT10	2.00	11	6.350	0.8	0.9	TH000034
ISO 1.0 ER16	LT10	1.00	16	9.525	0.7	0.7	TH000037
ISO 1.0 IR16	LT10	1.00	16	9.525	0.7	0.7	TH000040
ISO 1.25 ER16	LT10	1.25	16	9.525	0.8	0.9	TH000043
ISO 1.25 IR16	LT10	1.25	16	9.525	0.8	0.9	TH000046
ISO 1.5 ER16	LT10	1.50	16	9.525	0.8	1.0	TH000049
ISO 1.5 IR16	LT10	1.50	16	9.525	0.8	1.0	TH000052
ISO 1.75 ER16	LT10	1.75	16	9.525	0.9	1.2	TH000055
ISO 1.75 IR16	LT10	1.75	16	9.525	0.9	1.2	TH000056
ISO 2.0 ER16	LT10	2.00	16	9.525	1.0	1.3	TH000058
ISO 2.0 IR16	LT10	2.00	16	9.525	1.0	1.3	TH000061
ISO 2.5 ER16	LT10	2.50	16	9.525	1.1	1.5	TH000064
ISO 2.5 IR16	LT10	2.50	16	9.525	1.1	1.5	TH000067
ISO 3.0 ER16	LT10	3.00	16	9.525	1.2	1.5	TH000070
ISO 3.0 IR16	LT10	3.00	16	9.525	1.2	1.5	TH000073



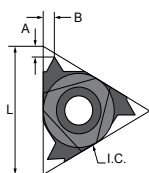
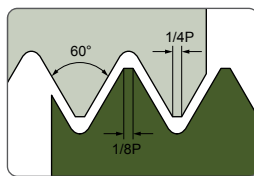
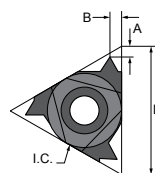
External Right

ISO Metric ISO 965-1:1999-11
DIN 13: 2005-08

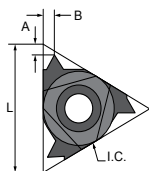
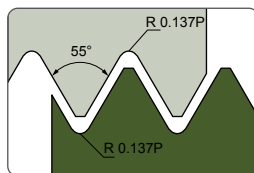
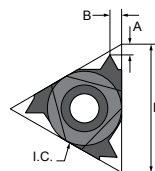
Internal Right

UN

Designation	Grade	Pitch		Dimensions			Catalog Nr.
		TPI	L mm	I.C.	A	B	
UN 20 ER16	LT10	20	16	9.525	0.8	0.9	TH000076
UN 20 IR16	LT10	20	16	9.525	0.8	0.9	TH000079
UN 16 ER16	LT10	16	16	9.525	0.9	1.1	TH000082
UN 16 IR16	LT10	16	16	9.525	0.9	1.1	TH000085
UN 12 ER16	LT10	12	16	9.525	1.1	1.4	TH000088
UN 12 IR16	LT10	12	16	9.525	1.1	1.4	TH000091

**External Right****UNC, UNF, UNEF**
ANSI B1.1-1982**Internal Right****WHITWORTH**

Designation	Grade	Pitch		Dimensions			Catalog Nr.
		TPI	L mm	I.C.	A	B	
W 14 ER16	LT10	14	16	9.525	1.0	1.2	TH000094
W 14 IR16	LT10	14	16	9.525	1.0	1.2	TH000097
W 11 ER16	LT10	11	16	9.525	1.1	1.5	TH000100
W 11 IR16	LT10	11	16	9.525	1.1	1.5	TH000103

**External Right****BSW, BSF, BSP** **B.S.84: 1956**
ISO 228-1: 1994**Internal Right**

Toolholders Ordering code

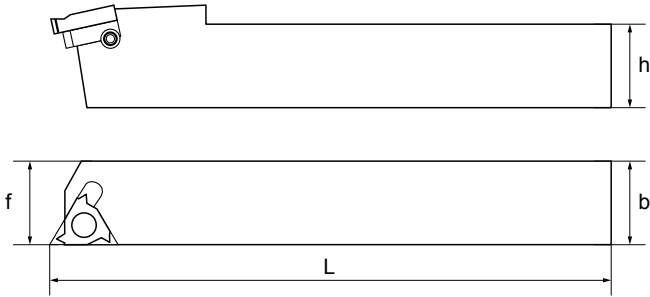
HER	2020		16	
Holder type	Shank	Tool length	Insert size	V-Vertical
HER External right handed	External Toolholders Square Shank			
HEL External left handed	8	H - 100	L I.C.	
	10	K - 125	06 4.00	
	12	L - 140	08 5.00	
HIR Internal right handed	16	M - 150	11 6.35	
	20	P - 170	16 9.525	
	25	R - 200	22 12.70	
HIL Internal left handed	32	S - 250	27 15.875	
	Internal Toolholders round shank	T - 300		
	10			
	12			
	16			
	20			
	25			
	32			
	40			



External Toolholders

Designation	Insert Type	h	b	f	l	Catalog Nr.
LT-HER 1616 H16	ER16	16	16	16	100	TH200001
LT-HER 2020 K16	ER16	20	20	20	125	TH200004
LT-HER 2525 M16	ER16	25	25	25	150	TH200007

Accessories: on request



The holders are made for 1.5 helix angle, in case higher helix is required, it should be replaced by other shim

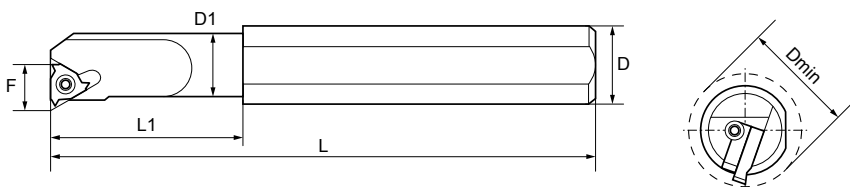
Internal Toolholders

Designation	Insert Type	D	D1	Dmin	L	L1	F	Catalog Nr.
LT-HIR 0010 H11	IR11	10	10	12.5	100	-	7.3	TH200010
LT-HIR 0010 K11	IR11	16	10	12.5	125	25	7.3	TH200013

Accessories: on request

Designation	Insert Type	D	D1	Dmin	L	L1	F	Catalog Nr.
LT-HIR 0013 M16	IR16	16	13	16.5	150	32	10.4	TH200016
LT-HIR 0016 P16	IR16	20	16	19.5	170	40	11.6	TH200019
LT-HIR 0020 P16	IR16	20	20	23.5	170	-	13.6	TH200022
LT-HIR 0025 R16	IR16	25	25	28.5	200	-	16.3	TH200025

Accessories: on request



The holders are made for 1.5 helix angle, in case higher helix is required, it should be replaced by other anvil

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Vc [m/min]	
						min	max
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	120	200
			2	1045, 1060, 28Mn6	190 HB	110	180
			3		250 HB	100	170
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	100	170
			4,6		230 HB	100	170
			5,7		280 HB	70	120
			8		350 HB	60	90
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	100	170
			10		280 HB	100	170
			11		320 HB	70	120
			11		350 HB	60	90
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	70	140
			14	X5CrNi18-9	240 HB	80	120
	Duplex	5	14	X2CrNiN23-4,	290 HB	50	110
			14	S31500	310 HB	50	110
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	70	140
			13	17-4 PH, 430	42 HRc	50	110
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	70	150
			15	EN-GJL-250,	200 HB	100	140
			16	No30B	250 HB	70	120
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	70	150
			17,19		200 HB	100	140
			18,20		250 HB	70	120
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	40	60
			33	Inconel 700	250 HB	30	50
			34	Stellite 21	350 HB	20	35
	Ti based	10	36	TiAl6V4	-	50	70
			37	T40	-	40	60
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	25	50
			38	440C,	50 HRc	25	50
			38	G-X260NiCr42	55 HRc	25	35
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	25	35
	White Cast Iron		41	G-X300CrMo15	55 HRc	25	35
NF	Al (>8%Si)	12	25	AlSi12	130 HB	100	400

Pitch		Passes	
mm	TPI	min	max
0.5	48	4	6
1.0	24	4	9
1.5	16	5	11
2.0	12	7	12
2.5	10	8	15
3.0	8	12	22

MULTI-MAT™

The Lamina **Multi-Mat™ LT 30 Grade** for Milling
can machine most materials with
ONLY ONE GRADE



Steel



Stainless Steel



Cast Iron



High Temp. Alloys



Hardened Steel



Aluminium & Non ferrous Alloys

True Multi-Mat™ inserts for real productivity

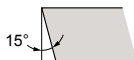
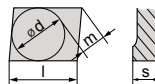
Milling

LT 30 Multi-Mat™ Milling

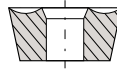
LT 05 Alu-Milling



MULTI-MAT™ MILLING LINE

**A****D****K****T****Shape****Clearance Angle****Tolerance**

d ± 0.05
m ± 0.013
s ± 0.025

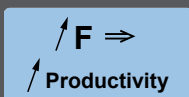
**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ADKT 1505 PDTR	LT 30	15.75	5.63	0.96	Right	M0001573

Surfacing Insert Lead angle 90°

Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

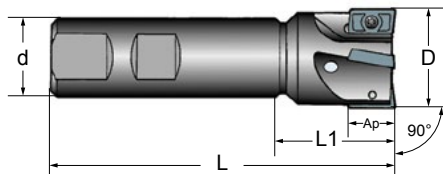
End Mill for ADKT 1505 PDTR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 790 W-W-D025/2*	25	25	44	100	15	2	5	M2001613
LT 790 W-W-D032/3*	32	32	50	110	15	3	3	M2001503
LT 790 W-W-D040/4*	40	32	45	115	15	4	2.5	M2001614

* On request

Screw: M2000597

Key: M2000602



Shell Mill for ADKT 1505 PDTR

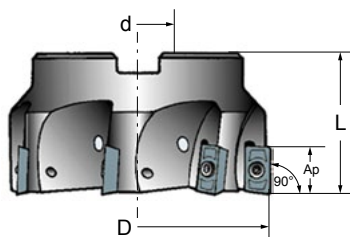
Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 790 M-W-D040/4*	40	16	40	15	4	2.5	M2001615
LT 790 M-W-D050/5*	50	22	40	15	5	2.2	M2001504
LT 790 M-W-D063/6*	63	22	40	15	6	1.8	M2001616
LT 790 M-W-D080/7*	80	27	50	15	7	1.4	M2001617
LT 790 M-W-D100/8*	100	32	50	15	8	1.1	M2001618
LT 790 M-W-D125/9*	125	40	63	15	9	0.8	M2001619

W= With coolant

* On request

Screw: M2000597

Key: M2000602



ADKT 1505 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	14.0	0.18	0.32	190	330	4.0	0.23	250
		2	1045, 1060,	190 HB		14.0		0.32		300			220
		3	28Mn6	250 HB		14.0		0.32		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	14.0	0.15	0.25	150	240	4.0	0.20	200
		4,6	1045, 1060,	230 HB		14.0		0.25	150	210		0.20	180
		5,7	Ck60, 4140, 4340,	280 HB		14.0		0.22	130	190		0.18	150
		8	100Cr6	350 HB		14.0		0.22	130	170		0.18	140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	10.0	0.12	0.22	90	150	3.0	0.18	130
		10	H13, M42, D3,	280 HB		10.0		0.22	90	130		0.18	120
		11	S6-5-2, 12Ni19	320 HB		10.0		0.18	60	110		0.16	100
		11		350 HB		10.0		0.18	60	90		0.16	80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	14.0	0.15	0.25	190	250	4.0	0.20	220
		14	X5CrNi18-9	240 HB		14.0	0.12	0.22	160	210		0.20	190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	10.0	0.12	0.18	70	130	3.0	0.16	100
		14	S31500	310 HB		10.0		0.18		120		0.16	90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	14.0	0.15	0.25	150	210	4.0	0.20	190
		13	17-4 PH, 430	42 HRc		10.0		0.20	90	150		0.16	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	14.0	0.18	0.32	150	240	4.0	0.23	200
		15	EN-GJL-250,	200 HB		14.0		0.32		220			180
		16	No30B	250 HB		14.0		0.32		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	14.0	0.15	0.28	100	200	4.0	0.20	180
		17,19	50005	200 HB		14.0		0.28		180			150
		18,20		250 HB		14.0		0.28		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	10.0	0.12	0.18	25	45	3.0	0.16	32
		33	Inconel 700	250 HB		10.0		0.18		45			30
		34	Stellite 21	350 HB		10.0		0.18		45			30
	Ti based	10	36 TiAl6V4	-	0.5	10.0	0.12	0.20	40	65	3.0	0.18	55
		37	T40	-		10.0		0.18	30	55		0.16	40
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	5.0	0.10	0.18	40	80	2.0	0.14	60
		38	440C,	50 HRc		3.0		0.16		70	1.5	0.13	55
		38	G-X260NiCr42	55 HRc		1.5		0.14		60	1.0	0.12	50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	4.0	0.10	0.18	40	80	1.5	0.14	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.14	30	60	1.0	0.12	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	14.0	0.18	0.32	200	400	4.0	0.25	280

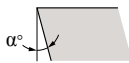
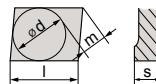
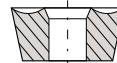


A O M T

AOMT



Shape

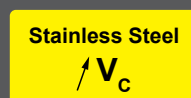
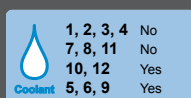
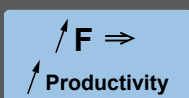
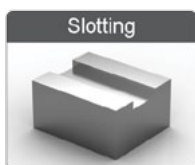

Clearance Angle
 $\alpha = \text{Special}$

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

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
AOMT 123608 PETR	LT 30	11.93	3.62	0.70	Right	M0001640

Surfacing Insert Lead angle 90°

Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Ramping down Milling operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

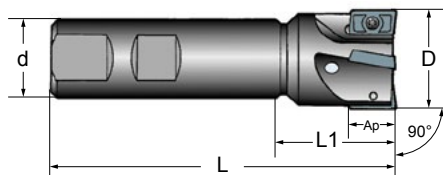
End Mill for AOMT 123608 PETR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 720 W-W-D016/2*	16	16	22	85	10	2	12	M2001781
LT 720 W-W-D020/3*	20	20	25	90	10	3	7	M2001782
LT 720 W-W-D025/3*	25	25	25	95	10	3	5	M2001783
LT 720 W-W-D025/4*	25	25	25	95	10	4	5	M2001819
LT 720 W-W-D032/5*	32	32	25	95	10	5	3	M2001784

* On request

Screw: M2002181

Key set: M2000601



Shell Mill for AOMT 123608 PETR

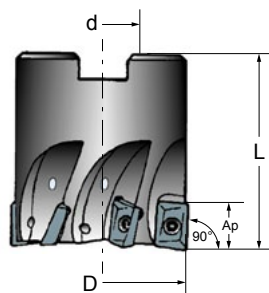
Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 720 M-W-D040/6*	40	22	40	10	6	2.5	M2001785
LT 720 M-W-D050/7*	50	22	40	10	7	2.2	M2001821

W= With coolant

* On request

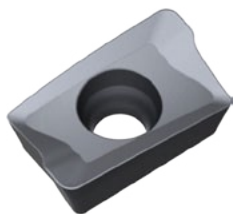
Screw: M2002181

Key set: M2000601



AOMT 123608 PETR LT 30

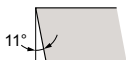
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions			
						min	max	min	max	min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	11.0	0.13	0.22	190	330	2.0	0.15	250	
			2	1045, 1060, 28Mn6	190 HB		0.22		300		220				
			3		250 HB		0.22		250		200				
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	11.0	0.11	0.18	150	240	2.0	0.13	200	
			4,6		230 HB		0.18		150	210	0.13			180	
			5,7		280 HB		0.15		130	190	0.12			150	
			8		350 HB		0.15		130	170	0.12			140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	7.9	0.08	0.15	90	150	1.5	0.12	130	
			10		280 HB		7.9		0.15	90	130			0.12	120
			11		320 HB		7.9		0.13	60	110			0.10	100
			11		350 HB		7.9		0.13	60	90			0.10	80
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	11.0	0.11	0.18	190	250	2.0	0.13	220
14				240 HB	0.15	160		210		190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	7.9	0.08	0.13	70	130	1.5	0.10	100	
			14	310 HB	7.9		0.13		120		90				
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	11.0	0.11	0.18	150	210	2.0	0.13	190	
			13	42 HRc	7.9		0.14		90	150	1.5	0.10	130		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	11.0	0.13	0.22	150	240	2.0	0.15	200	
			15	EN-GJL-250, No30B	200 HB		0.22		220		180				
			16	250 HB	0.22		190		160						
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	11.0	0.11	0.20	100	200	2.0	0.13	180	
			17,19	200 HB	11.0		0.20		180		150			150	
			18,20	250 HB	11.0		0.20		150		130				
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	7.9	0.08	0.13	25	45	1.5	0.10	32	
			33	Inconel 700	250 HB		7.9		0.13		45			30	
			34	Stellite 21	350 HB		7.9		0.13		45			30	
	Ti based	10	36	TiAl6V4	-	0.5	7.9	0.08	0.14	40	65	1.5	0.12	55	
37	T40	-	7.9	0.13	30		55		0.10	40					
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	3.9	0.07	0.13	40	80	1.0	0.09	60	
			38	G-X260NiCr42	50 HRc		2.4		0.11		70	0.8	0.08	55	
			38		55 HRc		1.2		0.10		60	0.5	0.08	50	
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	3.1	0.07	0.13	40	80	0.8	0.09	50	
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.2	0.07	0.10	30	60	0.5	0.08	40	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	11.0	0.13	0.22	200	400	2.0	0.16	280	



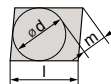
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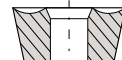
Shape



Clearance Angle



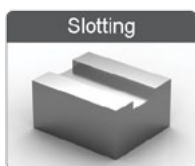
Tolerance
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 $m \pm 0.013$
 $s \pm 0.025$



Fixing
Chip breaker

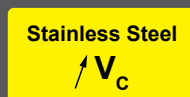
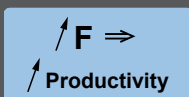
	Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
From Q1-2013	APKT 100304 PDTR	LT 30	10.39	3.53	0.4	Right	M0002920
	APKT 1003 PDTR	LT 30	10.39	3.53	0.8	Right	M0002918
From Q1-2013	APKT 100312 PDTR	LT 30	10.39	3.53	1.2	Right	M0002921
	APKT 100332 PDTR¹	LT 30	10.39	3.53	3.2	Right	M0002922
	APKT 100340 PDTR¹	LT 30	10.39	3.53	4.0	Right	M0002923
¹ Replacing APLX 100332 and APLX 100340 respectively; no change in cutter bodies							
	APLX 1003 PDTR*	LT 30	10.39	3.53	0.54	Right	M0000454
	APLX 100308 PDTR*	LT 30	10.39	3.53	0.8	Right	M0001151
* These two items are available until mid 2013 including their cutter bodies (LT 740 serie) and will be phased out after.							

Application Guide



Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Surfacing Insert Lead angle 90°



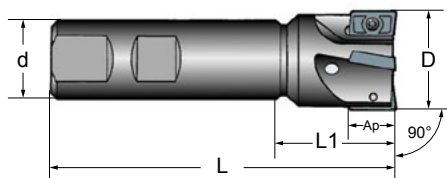
Machine Recommendations
 Guide. Details on page 10

End Mill for APKT 1003 PDTR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 741 C-W-D010/1	10	10	24	80	9	1	5	M2002802
LT 741 CL-W-D010/1	10	16	32	150	9	1	5	M2002815
LT 741 C-W-D012/1	12	12	24	80	9	1	5	M2002803
LT 741 CL-W-D012/1	12	16	32	150	9	1	5	M2002816
LT 741 C-W-D014/1	14	16	24	80	9	1	5	M2002804
LT 741 C-W-D016/2	16	16	25	85	9	2	12	M2002806
LT 741 CL-W-D016/2	16	16	40	150	9	2	12	M2002817
LT 741 C-W-D018/2	18	20	30	85	9	2	12	M2002807
LT 741 C-W-D020/3	20	20	25	90	9	3	7	M2002808
LT 741 CL-W-D020/3	20	20	40	150	9	3	7	M2002818
LT 741 C-W-D022/3	22	20	25	95	9	3	7	M2002809
LT 741 C-W-D025/3	25	25	32	120	9	3	5	M2002810
LT 741 C-W-D025/4	25	25	32	120	9	4	5	M2002811
LT 741 CL-W-D025/4	25	25	40	200	9	4	5	M2002819
LT 741 C-W-D028/4	28	25	32	120	9	4	2	M2002812
LT 741 C-W-D030/4	30	25	32	95	9	4	2	M2002813
LT 741 W-W-D032/5	32	25	32	95	9	5	3	M2002814
LT 741 WL-W-D032/4	32	32	32	200	9	4	3	M2002820

Screw: M2002181

Key set: M2000601



Shell Mill for APKT 1003 PDTR

Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 741 M-W-D040/6	40	16	40	9	6	2.5	M2002798
LT 741 M-W-D050/7	50	22	40	9	7	2.2	M2002799
LT 741 M-W-D063/8	63	22	40	9	8	1.8	M2002800
LT 741 M-W-D080/11*	80	27	50	9	10	1.4	M2002801
LT 745 M-W-D040/6* ¹	40	22	40	9	6	-	M2001580

* On request

¹ For APKT 100332/40

Screw coupling for APKT 1003 PDTR

Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 741 S-W-D016/2*	16	M8	25	9	2	12	M2002962
LT 741 S-W-D020/3*	20	M10	30	9	3	7	M2002963
LT 741 S-W-D025/4*	25	M22	35	9	4	5	M2002964

* On request

Screw: M2002181

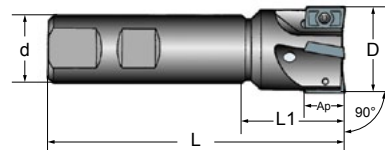
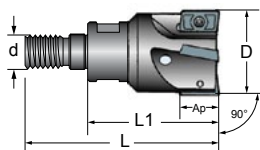
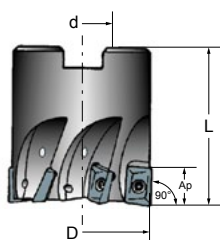
Key: M2000601

End Mill for APLX 100332/40 PDTR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 745 W-W-D016/2	16	16	25	85	9	2	-	M2001587
LT 745 WL-W-D016/2	16	16	24	150	9	2	12	M2001849
LT 745 W-W-D020/3	20	20	25	90	9	3	-	M2001589
LT 745 WL-W-D020/3	20	20	25	150	9	3	7	M2001850
LT 745 W-W-D025/3	25	25	25	95	9	3	-	M2001591
LT 745 WL-W-D025/3	25	20	25	150	9	3	5	M2001851
LT 745 WL-W-D032/4	32	25	26	150	9	4	3	M2001852
LT 745 W-W-D032/5	32	25	26	95	9	5	-	M2001848

Screw: M2002181

Key: M2000601



APKT 1003 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	9.0	0.13	0.26	330	190	2.0	0.17	250
		2	1045, 1060,	190 HB		9.0		0.26	300				220
		3	28Mn6	250 HB		9.0		0.26	250				200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	9.0	0.11	0.21	150	240	2.0	0.15	200
		4,6	Ck60, 4140, 4340,	230 HB		9.0		0.21	150	210			180
		5,7	100Cr6	280 HB		9.0		0.18	130	190			150
		8		350 HB		9.0		0.18	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	6.4	0.08	0.18	90	150	1.5	0.13	130
		10	H13, M42, D3,	280 HB		6.4		0.18	90	130			120
		11	S6-5-2, 12Ni19	320 HB		6.4		0.15	60	110			100
		11		350 HB		6.4		0.15	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	9.0	0.11	0.21	190	250	2.0	0.15	220
		14	X5CrNi18-9	240 HB		9.0	0.08	0.18	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	6.4	0.08	0.15	70	130	1.5	0.12	100
		14	S31500	310 HB		6.4		0.15	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	9.0	0.11	0.21	150	210	2.0	0.15	190
		13	17-4 PH, 430	42 HRc		6.4		0.16	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	9.0	0.13	0.26	240	240	2.0	0.17	200
		15	EN-GJL-250,	200 HB		9.0		0.26	150	220			180
		16	No30B	250 HB		9.0		0.26	190	190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	9.0	0.11	0.23	200	200	2.0	0.15	180
		17,19	50005	200 HB		9.0		0.23	100	180			150
		18,20		250 HB		9.0		0.23	150	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	6.4	0.08	0.15	45	45	1.5	0.12	32
		33	Inconel 700	250 HB		6.4		0.15	25	45			30
		34	Stellite 21	350 HB		6.4		0.15	45	45			30
	Ti based	10	36 TiAl6V4	-	0.5	6.4	0.08	0.16	40	65	1.5	0.13	55
Hardened Mat.	Steel	38	X100CrMo13,	45 HRc		3.2		0.15	80	80	1.0	0.10	60
		38	440C,	50 HRc	0.5	1.9	0.07	0.13	40	70			55
		38	G-X260NiCr42	55 HRc		1.0		0.11	60	60			50
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	2.6	0.07	0.15	40	80	0.8	0.10	50
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.0	0.07	0.11	30	60	0.5	0.09	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	9.0	0.13	0.26	200	400	2.0	0.18	280

APKT 100304 PDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	9.0	0.11	0.20	190	330	2.0	0.14	250		
			2	1045, 1060, 28Mn6	190 HB		9.0		0.20					300	220	
			3		250 HB		9.0		0.20					250	200	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	9.0	0.09	0.16	150	240	2.0		0.12	200	
			4,6		230 HB		9.0		0.16	150	210			0.12	180	
			5,7		280 HB		9.0		0.14	130	190			0.11	150	
			8		350 HB		9.0		0.14	130	170			0.11	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	6.4	0.07	0.14	90	150	1.5		0.11	130	
			10		280 HB		6.4		0.14	90	130			0.11	120	
			11		320 HB		6.4		0.11	60	110			0.10	100	
			11		350 HB		6.4		0.11	60	90			0.10	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	9.0	0.09	0.16	190	250	2.0	0.12	220	
14				240 HB	9.0	0.07		0.14	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	6.4	0.07	0.11	70	130	1.5	0.10	100		
			14	310 HB	6.4		0.11		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	9.0	0.09	0.16	150	210	2.0	0.12	190		
			13	42 HRc	6.4		0.12		90	150	1.5			0.10	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	9.0	0.11	0.20	150	240	2.0	0.14	200		
			15	EN-GJL-250, No30B	200 HB		9.0		0.20		220			180		
			16	250 HB	9.0		0.20		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	9.0	0.09	0.17	100	200	2.0	0.12	180		
			17,19	200 HB	9.0		0.17		180		150					
			18,20	250 HB	9.0		0.17		150		130					
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	6.4	0.07	0.11	25	45	1.5	0.10	32		
			33	Inconel 700	250 HB		6.4		0.11		45			30		
			34	Stellite 21	350 HB		6.4		0.11		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	6.4	0.07	0.12	40	65	1.5	0.11	55		
37	T40	-	6.4	0.11	30		55		0.10	40						
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	3.2	0.06	0.11	40	80	1.0	0.09	60		
			38	G-X260NiCr42	50 HRc		1.9		0.10		70			0.8	0.08	55
			38		55 HRc		1.0		0.09		60			0.5	0.07	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.6	0.06	0.11	40	80	0.8	0.09	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.0	0.06	0.09	30	60	0.5	0.07	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	9.0	0.11	0.20	200	400	2.0	0.16	280		

APKT 100312 PDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	9.0	0.13	0.28	190	330	2.0	0.20	250		
			2	1045, 1060, 28Mn6	190 HB		9.0		0.28		300			220		
			3		250 HB		9.0		0.28		250			200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	9.0	0.11	0.22	150	240	2.0		0.18	200	
			4,6		230 HB		9.0		0.22	150	210			0.18	180	
			5,7		280 HB		9.0		0.19	130	190			0.16	150	
			8		350 HB		9.0		0.19	130	170			0.16	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	6.4	0.08	0.19	90	150	1.5		0.16	130	
			10		280 HB		6.4		0.19	90	130			0.16	120	
			11		320 HB		6.4		0.16	60	110			0.14	100	
			11		350 HB		6.4		0.16	60	90			0.14	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	9.0	0.11	0.22	190	250	2.0	0.18	220	
14				240 HB	9.0	0.08		0.19	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	6.4	0.08	0.16	70	130	1.5	0.14	100		
			14	310 HB	6.4		0.16		120		90					
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	9.0	0.11	0.22	150	210	2.0	0.18	190		
			13	42 HRc	6.4		0.18		90	150	1.5			0.14	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	9.0	0.13	0.28	150	240	2.0	0.20	200		
			15	EN-GJL-250, No30B	200 HB		9.0		0.28		220			180		
			16	250 HB	9.0		0.28		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	9.0	0.11	0.25	100	200	2.0	0.18	180		
			17,19		200 HB		9.0		0.25		180			150		
			18,20		250 HB		9.0		0.25		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	6.4	0.08	0.16	25	45	1.5	0.14	32		
			33	Inconel 700	250 HB		6.4		0.16		45			30		
			34	Stellite 21	350 HB		6.4		0.16		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	6.4	0.08	0.18	40	65	1.5	0.16	55		
37	T40	-	6.4	0.16	30		55		0.14	40						
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	3.2	0.07	0.16	40	80	1.0	0.12	60		
			38	G-X260NiCr42	50 HRc		1.9		0.14		70			0.8	0.11	55
			38		55 HRc		1.0		0.12		60			0.5	0.11	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.6	0.07	0.16	40	80	0.8	0.12	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.0	0.07	0.12	30	60	0.5	0.11	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	9.0	0.13	0.28	200	400	2.0	0.22	280		

APKT 100332 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	0.13	9.0	0.28	330	1.0	0.29	250
		2	2	1045, 1060,	190 HB			9.0	0.28	190			220
		3	3	28Mn6	250 HB			9.0	0.28	250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	0.11	9.0	0.22	150	1.0	0.25	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB			9.0	0.22	150			180
		5,7	5,7	100Cr6	280 HB			9.0	0.19	130			150
		8	8		350 HB			9.0	0.19	130			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	0.08	6.4	0.19	90	1.0	0.22	130
		10	10	H13, M42, D3,	280 HB			6.4	0.19	90			120
		11	11	S6-5-2, 12Ni19	320 HB			6.4	0.16	60			100
		11	11		350 HB			6.4	0.16	60			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	0.11	9.0	0.22	190	1.0	0.25	220
		14	14	X5CrNi18-9	240 HB			9.0	0.08	190			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	0.08	6.4	0.16	70	1.0	0.20	100
		14	14	S31500	310 HB			6.4	0.16	120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	0.11	9.0	0.22	150	1.0	0.25	190
		13	13	17-4 PH, 430	42 HRc			6.4	0.18	90			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	0.13	9.0	0.28	240	1.0	0.29	200
		15	15	EN-GJL-250,	200 HB			9.0	0.28	150			180
		16	16	No30B	250 HB			9.0	0.28	190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	0.11	9.0	0.25	200	1.0	0.25	180
		17,19	17,19	50005	200 HB			9.0	0.25	100			150
		18,20	18,20		250 HB			9.0	0.25	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	0.08	6.4	0.16	45	1.0	0.20	32
		33	33	Inconel 700	250 HB			6.4	0.16	25			30
		34	34	Stellite 21	350 HB			6.4	0.16	45			30
	Ti based	10	36	TiAl6V4	-	0.5	0.08	6.4	0.18	40	1.0	0.22	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc			3.2	0.16	80			60
		38	38	440C,	50 HRc	0.4	0.07	1.9	0.14	40	0.7	0.16	55
		38	38	G-X260NiCr42	55 HRc			1.0	0.12	60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.4	2.6	0.07	0.16	40	0.7	0.17	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.4	1.0	0.07	0.12	30	0.7	0.15	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	9.0	0.13	0.28	200	1.0	0.31	280

APKT 100340 PDTR LT 30

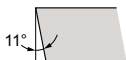
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	9.0	0.13	0.46	190	330	1.0	0.35	250
		2	1045, 1060,	190 HB		9.0		0.46		300			220
		3	28Mn6	250 HB		9.0		0.46		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	9.0	0.11	0.36	150	240	1.0	0.30	200
		4,6	Ck60, 4140, 4340,	230 HB		9.0		0.36	150	210			180
		5,7	100Cr6	280 HB		9.0		0.32	130	190			150
		8		350 HB		9.0		0.32	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	6.4	0.08	0.32	90	150	1.0	0.27	130
		10	H13, M42, D3,	280 HB		6.4		0.32	90	130			120
		11	S6-5-2, 12Ni19	320 HB		6.4		0.26	60	110			100
		11		350 HB		6.4		0.26	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	9.0	0.11	0.36	190	250	1.0	0.30	220
		14	X5CrNi18-9	240 HB		9.0	0.08	0.32	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	6.4	0.08	0.26	70	130	1.0	0.24	100
		14	S31500	310 HB		6.4		0.26	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	9.0	0.11	0.36	150	210	1.0	0.30	190
		13	17-4 PH, 430	42 HRc		6.4		0.29	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	9.0	0.13	0.46	150	240	1.0	0.35	200
		15	EN-GJL-250,	200 HB		9.0		0.46		220			180
		16	No30B	250 HB		9.0		0.46		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	9.0	0.11	0.41	100	200	1.0	0.30	180
		17,19	50005	200 HB		9.0		0.41		180			150
		18,20		250 HB		9.0		0.41		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	6.4	0.08	0.26	25	45	1.0	0.24	32
		33	Inconel 700	250 HB		6.4		0.26		45			30
		34	Stellite 21	350 HB		6.4		0.26		45			30
	Ti based	10	36 TiAl6V4	-	0.5	6.4	0.08	0.29	40	65	1.0	0.27	55
		37	T40	-		6.4		0.26	30	55			40
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.4	3.2	0.07	0.26	40	80	0.7	0.21	60
		38	440C,	50 HRc		1.9		0.23		70			55
		38	G-X260NiCr42	55 HRc		1.0		0.20		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	2.6	0.07	0.26	40	80	0.7	0.21	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	1.0	0.07	0.20	30	60	0.7	0.18	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	9.0	0.13	0.46	200	400	1.0	0.38	280



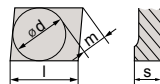
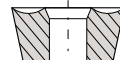
A P K T



Shape



Clearance Angle


Tolerance
 $d \pm 0.05$
 $m \pm 0.013$
 $s \pm 0.025$

Fixing
Chip breaker

From Q1-2013



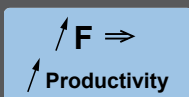
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APKT 1604 PDTR	LT 30	15.3	4.76	0.8	Right	M0000022
APKT 1604 PDTR*	LT 30	15.3	4.76	0.95	Right	M0000021
APKT 160424 ER	LT 30	15.3	4.76	2.4	Right	M0000300
APKT 1705 PETR	LT 30	15.8	5.12	0.8	Right	M0001810

* This item is available until mid 2013 including its cutter bodies (LT 730 serie) and will be phased out after.

Surfacing Insert Lead angle 90°

Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

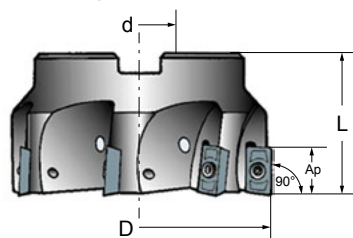
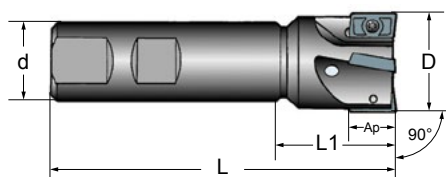
Application Guide



Machine Recommendations
Guide. Details on page 10

End Mill for APKT 1604 PDTR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 731 WL-W-D025/2	25	25	90	220	15	2	5	M2002965
LT 731 W-W-D025/2	25	25	44	100	15	2	5	M2002966
LT 731 WL-W-D032/3	32	32	90	220	15	3	3	M2002967
LT 731 W-W-D032/3	32	32	50	110	15	3	3	M2002968
LT 731 WL-W-D040/4	40	32	90	220	15	4	2.5	M2002969
LT 731 W-W-D040/4	40	32	50	115	15	4	2.5	M2002970

Screw: **M2000597**Key: **M2000602**

Shell Mill for APKT 1604 PDTR

Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 731 M-W-D040/4	40	16	40	15	4	2.5	M2002971
LT 731 M-W-D050/5	50	22	40	15	5	2.2	M2002972
LT 731 M-W-D063/6	63	22	40	15	6	1.8	M2002973
LT 731 M-W-D080/7	80	27	50	15	7	1.4	M2002974
LT 731 M-W-D100/8	100	32	50	15	8	1.1	M2002975
LT 731 M-W-D125/9	125	40	63	15	9	0.8	M2002976
LT 731 M-W-D160/10*	160	40	63	15	10	-	M2002977

* On request

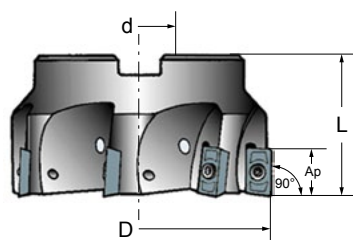
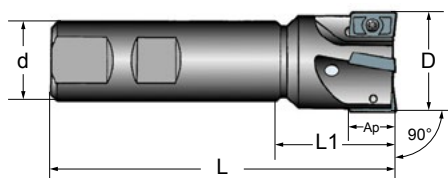
Screw: **M2000597**Key: **M2000602**

End Mill for APKT 1705 PETR

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 737 W-W-D025/2	25	25	20	32	100	14	2	5	M2001833
LT 737 WL-W-D025/2	25	25	25	40	210	14	2	5	M2001836
LT 737 W-W-D032/3	32	32	32	40	110	14	3	3	M2001834
LT 737 WL-W-D032/3	32	32	32	65	200	14	3	3	M2001837
LT 737 W-W-D040/4	40	40	32	45	115	14	4	2.5	M2001835
LT 737 WL-W-D040/4	40	40	32	45	115	14	4	2.5	M2001982

Screw: M2000597

Key: M2000602



Shell Mill for APKT 1705 PETR

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 737 M-W-D040/4	40	40	16	40	14	4	2.5	M2001838
LT 737 M-W-D050/5	50	50	22	40	14	5	2.2	M2001839
LT 737 M-W-D063/6	63	63	22	40	14	6	1.8	M2001841
LT 737 M-W-D080/7	80	80	27	50	14	7	1.4	M2001842
LT 737 M-W-D100/7	100	100	32	50	14	7	1.1	M2001843
LT 737 M-W-D125/9	125	125	40	63	14	9	0.8	M2001844
LT 737 M-W-D160/10	160	160	40	63	14	10	-	M2001845

Screw: M2000597

Key: M2000602

APKT 1604 PDTR LT 30

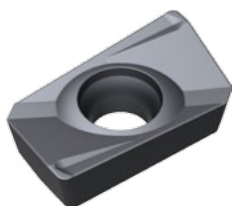
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.5	15.0	0.18	0.32	190	330	4.0	0.23	250 220 200
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB 230 HB 280 HB 350 HB	0.5	15.0	0.15	0.25 0.25 0.22 0.22	150 150 130 130	240 210 190 170	4.0	0.20 0.20 0.18 0.18	200 180 150 140
		3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB 280 HB 320 HB 350 HB	0.5	10.7	0.12	0.22 0.22 0.18 0.18	90 90 60 60	150 130 110 90	3.0	0.18 0.18 0.16 0.16	130 120 100 80
	Austenitic	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.5	15.0	0.15	0.25 0.22	190 160	250 210	4.0	0.20	220 190
		5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.5	10.7	0.12	0.18 0.18	70 70	130 120	3.0	0.16	100 90
	Ferritic & Martensitic	6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRc	0.5	15.0	0.15	0.25 0.20	150 90	210 150	4.0 3.0	0.20 0.16	190 130
	Grey	7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.5	15.0	0.18	0.32 0.32 0.32	150	240 220 190	4.0	0.23	200 180 160
	Malleable & Nodular	8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.5	15.0	0.15	0.28 0.28 0.28	100	200 180 150	4.0	0.20	180 150 130
	Fe, Ni & Co based	9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.5	10.7	0.12	0.18 0.18 0.18	25	45 45 45	3.0	0.16	32 30 30
	Ti based	10	36 TiAl6V4 37 T40	- -	0.5	10.7	0.12	0.20 0.18	40 30	65 55	3.0	0.18 0.16	55 40
Hardened Mat.	Steel	11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRc 50 HRc 55 HRc	0.5	5.4 3.2 1.6	0.10	0.18 0.16 0.14	40	80 70 60	2.0 1.5 1.0	0.14 0.13 0.12	60 55 50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	4.3	0.10	0.18	40	80	1.5	0.14	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.6	0.10	0.14	30	60	1.0	0.12	40
	Al (>8%Si)	12	25 AISi12	130 HB	0.5	15.0	0.18	0.32	200	400	4.0	0.25	280

APKT 160424 ER LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V _c [sfm]		Optimal cutting conditions			
						min	max	min	max	min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.590	0.007	0.013	620	1080	0.197	0.009	820	
			2	1045, 1060, 28Mn6	190 HB		0.590		0.013					980	720
			3		250 HB		0.590		0.013					820	650
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.590	0.006	0.010	490	780	0.197	0.008	650	
			4,6		230 HB		0.590		0.010	490	680		0.008	590	
			5,7		280 HB		0.590		0.009	420	620		0.007	490	
			8		350 HB		0.590		0.009	420	550		0.007	450	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.422	0.005	0.009	290	490	0.148	0.007	420	
			10		280 HB		0.422		0.009	290	420		0.007	390	
			11		320 HB		0.422		0.007	190	360		0.006	320	
			11		350 HB		0.422		0.007	190	290		0.006	260	
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.020	0.590	0.006	0.010	620	820	0.197	0.008	720	
			14	240 HB	0.590		0.005	0.009	520	680	620				
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.020	0.422	0.005	0.007	220	420	0.148	0.006	320	
			14	310 HB	0.422		0.007		390	290					
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.590	0.006	0.010	490	680	0.197	0.008	620	
			13	42 HRc	0.422		0.008		290	490	0.148	0.006	420		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.590	0.007	0.013	490	780	0.197	0.009	650	
			15	EN-GJL-250, No30B	200 HB		0.590		0.013		720			590	
			16	250 HB	0.590		0.013		620		520				
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.020	0.590	0.006	0.011	320	650	0.197	0.008	590	
			17,19	200 HB	0.590		0.011		590	490					
			18,20	250 HB	0.590		0.011		490	420					
High Temp Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.020	0.422	0.005	0.007	80	140	0.148	0.006	100	
			33	Inconel 700	250 HB		0.422		0.007	140	90				
			34	Stellite 21	350 HB		0.422		0.007	140	90				
	Ti based	10	36	TiAl6V4	-	0.020	0.422	0.005	0.008	130	210	0.148	0.007	180	
37	T40	-	0.422	0.007	90		180		0.006	130					
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.020	0.211	0.004	0.007	130	260	0.098	0.006	190	
			38	G-X260NiCr42	50 HRc		0.126		0.006	220	0.074	0.005	180		
			38		55 HRc		0.063		0.006	190	0.049	0.005	160		
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.020	0.169	0.004	0.007	130	260	0.074	0.006	160	
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.020	0.063	0.004	0.006	90	190	0.049	0.005	130	
NF	AI (>8%Si)	12	25	AlSi12	130 HB	0.020	0.590	0.007	0.013	650	1310	0.197	0.010	910	

APKT 1705 PETR LT 30

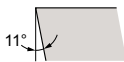
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions			
						min	max	min	max	min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	15.0	0.18	0.40	190	4.0	0.28	250		
			2	1045, 1060,	190 HB		0.40		300				220		
			3	28Mn6	250 HB		0.40		250				200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	15.0	0.15	0.31	150	240	4.0	0.24	200	
			4,6		230 HB		0.31		150	210	0.24		180		
			5,7		280 HB		0.27		130	190	0.22		150		
			8		350 HB		0.27		130	170	0.22		140		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	10.7	0.12	0.27	90	150	3.0	0.22	130	
			10		280 HB		0.27		90	130	0.22		120		
			11		320 HB		0.22		60	110	0.19		100		
			11		350 HB		0.22		60	90	0.19		80		
	Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	15.0	0.15	0.31	190	250	4.0	0.24	220
14				X5CrNi18-9	240 HB	0.12		0.27	160	210	190				
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	10.7	0.12	0.22	130	3.0	0.19	100		
			14	310 HB	10.7		0.22		70	120			90		
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	15.0	0.15	0.31	150	210	4.0	0.24	190	
			13	42 HRc	10.7		0.25		90	150	3.0	0.19	130		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	15.0	0.18	0.40	150	4.0	0.28	200		
			15	EN-GJL-250, No30B	200 HB		0.40		220				180		
			16	250 HB	0.40		190		160						
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	15.0	0.15	0.35	200	4.0	0.24	180		
			17,19		200 HB		15.0		0.35	100			180	150	150
			18,20		250 HB		15.0		0.35	150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	10.7	0.12	0.22	45	3.0	0.19	32		
			33	Inconel 700	250 HB		0.22		25	45			30		
			34	Stellite 21	350 HB		0.22		45	30					
	Ti based	10	36	TiAl6V4	-	0.5	10.7	0.12	0.25	40	65	3.0	0.22	55	
37	T40	-	10.7	0.22	30		55		0.19	40					
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	5.4	0.10	0.22	80	2.0	0.17	60		
			38	G-X260NiCr42	50 HRc		3.2		0.20	70	1.5	0.16	55		
			38	55 HRc	1.6		0.17		60	1.0	0.14	50			
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	4.3	0.10	0.22	40	80	1.5	0.17	50	
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.6	0.10	0.17	30	60	1.0	0.14	40	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	15.0	0.18	0.40	200	400	4.0	0.30	280	



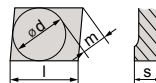
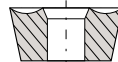
A P M T



Shape



Clearance Angle

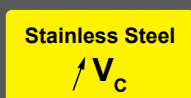
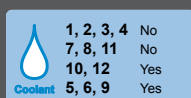
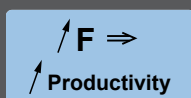
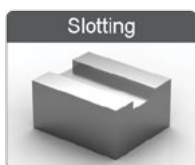

Tolerance
 $d \pm 0.05$
 $m \pm 0.08$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
APMT 0903 PDTR	LT 30	9.94	3.38	0.40	Right	M0000663
APMT 1135 PDTR	LT 30	11.45	3.52	0.70	Right	M0001133
APMT 1604 PDTR	LT 30	17.01	4.82	0.66	Right	M0001134

Surfacing Insert Lead angle 90°

Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

End Mill for APMT 1135 PDTR

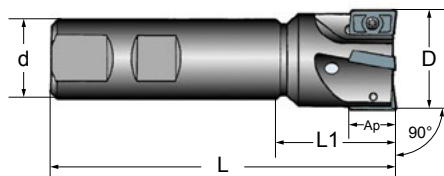
Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 755 W-W-D010/1*	10	16	25	100	9	1	5	M2001652
LT 755 W-W-D012/1*	12	16	25	100	9	1	5	M2001653
LT 755 W-W-D016/2*	16	16	30	120	9	2	12	M2001654
LT 755 W-W-D020/3*	20	20	35	120	9	3	7	M2001655
LT 755 WL-W-D016/2*	16	16	30	150	9	2	12	M2001658
LT 755 WL-W-D020/2*	20	20	35	150	9	2	7	M2001659
LT 755 W-W-D025/4*	25	25	40	150	9	4	5	M2001656
LT 755 WL-W-D025/4*	25	25	40	200	9	4	5	M2001660
LT 755 W-W-D032/5*	32	25	40	150	9	5	3	M2001657
LT 755 WL-W-D032/5*	32	25	40	200	9	5	3	M2001661

APMT

* On request

Screw: M2002778

Key: M2002912



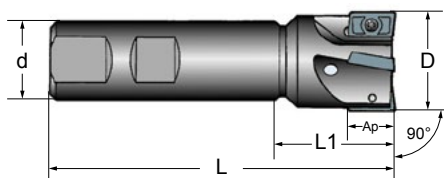
End Mill for APMT 1604 PDTR

Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 760 W-W-D025/2*	25	25	50	150	15	2	5	M2001662
LT 760 WL-W-D025/2*	25	25	70	200	15	2	5	M2001665
LT 760 W-W-D032/3*	32	32	100	200	15	3	3	M2001663
LT 760 WL-W-D032/3*	32	32	100	250	15	3	3	M2001666
LT 760 W-W-D040/4*	35	32	100	200	15	4	2.5	M2001664
LT 760 WL-W-D040/4*	35	32	100	250	15	4	2.5	M2001667

* On request

Screw: M2000597

Key: M2000602



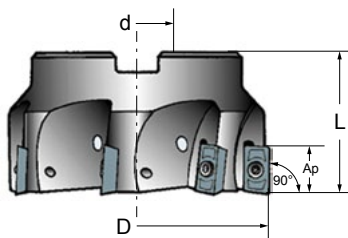
Shell Mill for APMT 1604 PDTR

Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 760 M-W-D050/5*	50	22	40	15	5	2.2	M2001668
LT 760 M-W-D063/6*	63	22	40	15	6	1.8	M2001669
LT 760 M-W-D080/7*	80	27	50	15	7	1.4	M2001670
LT 760 M-W-D100/8*	100	32	50	15	8	1.1	M2001671
LT 760 M-W-D125/9*	125	40	63	15	9	0.8	M2001672

* On request

Screw: M2000597

Key: M2000602



APMT 0903 PDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions			
						min	max	min	max	min	max	D.O.C.	Feed	V _c	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	8.0	0.11	0.20	190	330	2.0	0.14	250	
			2	1045, 1060, 28Mn6	190 HB		8.0		0.20		300			220	
			3		250 HB		8.0		0.20		250			200	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	8.0	0.09	0.16	150	240	2.0	0.12	200	
			4,6		230 HB		8.0		0.16	150	210		0.12	180	
			5,7		280 HB		8.0		0.14	130	190		0.11	150	
			8		350 HB		8.0		0.14	130	170		0.11	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.7	0.07	0.14	90	150	1.5	0.11	130	
			10		280 HB		5.7		0.14	90	130		0.11	120	
			11		320 HB		5.7		0.11	60	110		0.10	100	
			11		350 HB		5.7		0.11	60	90		0.10	80	
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	8.0	0.09	0.16	190	250	2.0	0.12	220	
			14	240 HB	8.0		0.07	0.14	160	210	190				
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.7	0.07	0.11	70	130	1.5	0.10	100	
			14	310 HB	5.7		0.11		120	90					
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	8.0	0.09	0.16	150	210	2.0	0.12	190	
			13	42 HRc	5.7		0.12		90	150	1.5			0.10	130
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	8.0	0.11	0.20	150	240	2.0	0.14	200	
			15	200 HB	8.0		0.20		220		180				
			16	250 HB	8.0		0.20		190		160				
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	8.0	0.09	0.17	100	200	2.0	0.12	180	
			17,19		200 HB		8.0		0.17		180			150	
			18,20		250 HB		8.0		0.17		150			130	
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.7	0.07	0.11	25	45	1.5	0.10	32	
			33	Inconel 700	250 HB		5.7		0.11		45			30	
			34	Stellite 21	350 HB		5.7		0.11		45			30	
	Ti based	10	36	TiAl6V4	-	0.5	5.7	0.07	0.12	40	65	1.5	0.11	55	
37	T40	-	5.7	0.11	30		55		0.10	40					
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.9	0.06	0.11	40	80	1.0	0.09	60	
			38	50 HRc	1.7		0.10		70		0.8			0.08	55
			38	55 HRc	1.2		0.09		60		0.5			0.07	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.3	0.06	0.11	40	80	0.8	0.09	50	
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.2	0.06	0.09	30	60	0.5	0.07	40	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	8.0	0.11	0.20	200	400	2.0	0.16	280	

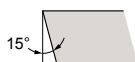
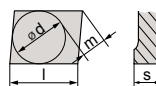
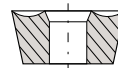
APMT 1135 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	10.0	0.13	0.22	330	2.0	0.15	250
		2	2	1045, 1060,	190 HB					300			220
		3	3	28Mn6	250 HB					250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	10.0	0.11	0.18	150 240	2.0	0.13	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB					150 210			180
		5,7	5,7	100Cr6	280 HB					130 190			150
		8	8		350 HB					130 170			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	7.2	0.08	0.15	90 150	1.5	0.12	130
		10	10	H13, M42, D3,	280 HB					90 130			120
		11	11	S6-5-2, 12Ni19	320 HB					60 110			100
		11	11		350 HB					60 90			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	10.0	0.11	0.18	190 250	2.0	0.13	220
		14	14	X5CrNi18-9	240 HB					160 210			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	7.2	0.08	0.13	70 130	1.5	0.10	100
		14	14	S31500	310 HB					120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	10.0	0.11	0.18	150 210	2.0	0.13	190
		13	13	17-4 PH, 430	42 HRc					90 150			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	10.0	0.13	0.22	240	2.0	0.15	200
		15	15	EN-GJL-250,	200 HB					220			180
		16	16	No30B	250 HB					190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	10.0	0.11	0.20	200	2.0	0.13	180
		17,19	17,19	50005	200 HB					180			150
		18,20	18,20		250 HB					150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	7.2	0.08	0.13	45	1.5	0.10	32
		33	33	Inconel 700	250 HB					45			30
		34	34	Stellite 21	350 HB					45			30
	Ti based	10	36	TiAl6V4	-	0.5	7.2	0.08	0.14	40 65	1.5	0.12	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc					80			60
		38	38	440C,	50 HRc	0.5	2.1	0.07	0.11	40	0.8	0.08	55
		38	38	G-X260NiCr42	55 HRc					60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.9	0.07	0.13	40	0.8	0.09	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.1	0.07	0.10	30	0.5	0.08	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	10.0	0.13	0.22	200 400	2.0	0.16	280

APMT 1604 PDTR & APMT 160408 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	15.0	0.16	0.30	330	4.0	0.21	250
		2	2	1045, 1060,	190 HB		15.0		0.30	190			220
		3	3	28Mn6	250 HB		15.0		0.30	250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	15.0	0.14	0.23	150	4.0	0.18	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB		15.0		0.23	150			180
		5,7	5,7	100Cr6	280 HB		15.0		0.20	130			150
		8	8		350 HB		15.0		0.20	130			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	10.7	0.11	0.20	90	3.0	0.16	130
		10	10	H13, M42, D3,	280 HB		10.7		0.20	90			120
		11	11	S6-5-2, 12Ni19	320 HB		10.7		0.17	60			100
		11	11		350 HB		10.7		0.17	60			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	15.0	0.14	0.23	190	4.0	0.18	220
		14	14	X5CrNi18-9	240 HB		15.0	0.11	0.20	160			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	10.7	0.11	0.17	70	3.0	0.14	100
		14	14	S31500	310 HB		10.7		0.17	120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	15.0	0.14	0.23	150	4.0	0.18	190
		13	13	17-4 PH, 430	42 HRc		10.7		0.19	90			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	15.0	0.16	0.30	240	4.0	0.21	200
		15	15	EN-GJL-250,	200 HB		15.0		0.30	150			180
		16	16	No30B	250 HB		15.0		0.30	190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	15.0	0.14	0.26	200	4.0	0.18	180
		17,19	17,19	50005	200 HB		15.0		0.26	100			150
		18,20	18,20		250 HB		15.0		0.26	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	10.7	0.11	0.17	45	3.0	0.14	32
		33	33	Inconel 700	250 HB		10.7		0.17	25			30
		34	34	Stellite 21	350 HB		10.7		0.17	45			30
	Ti based	10	36	TiAl6V4	-	0.5	10.7	0.11	0.19	40	3.0	0.16	55
Hardened Mat.			37	T40	-		10.7		0.17	30			40
	Steel	11	38	X100CrMo13,	45 HRc	0.5	5.4	0.09	0.17	80	2.0	0.13	60
			38	440C,	50 HRc		3.2		0.15	40			55
			38	G-X260NiCr42	55 HRc		1.6		0.13	60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	4.3	0.09	0.17	40	1.5	0.13	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.6	0.09	0.13	30	1.0	0.11	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	15.0	0.16	0.30	200	4.0	0.23	280


L
D
M
T

Shape

Clearance Angle

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

**Fixing
Chip breaker**

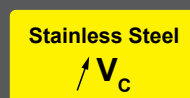
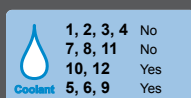
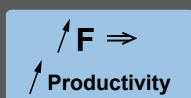
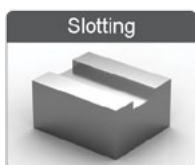
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
LDMT 1504 PDTR	LT 30	15.71	4.79	0.74	Right	M0001772

* Availability is subject to special agreement

Surfacing Insert Lead angle 90°

Multi purpose 90° Milling insert. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



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Guide. Details on page 10

End Mill for LDMT 1504 PDTR

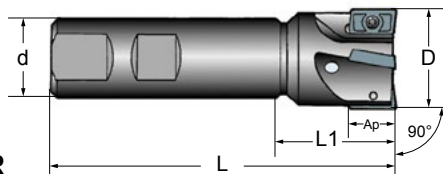
Cutter Designation	D	d	L1	L	Ap	z	α	Catalog Nr.
LT 770 W-W-D025/2*	25	25	44	100	15	2	5	M2001822
LT 770 W-W-D032/3*	32	35	50	110	15	3	3	M2001823
LT 770 W-W-D040/4*	40	32	45	115	15	4	2.5	M2001824
LT 770 WL-W-D25/2*	25	25	44	150	15	2	5	M2001825
LT 770 WL-W-D32/3*	32	25	50	150	15	3	3	M2001826

LDMT

* On request

Screw: M2001418

Key: M2000602



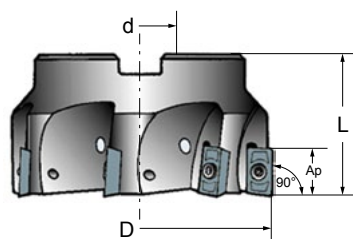
Shell Mill for LDMT 1504 PDTR

Cutter Designation	D	d	L	Ap	z	α	Catalog Nr.
LT 770 M-W-D040/4	40	16	40	15	4	2.5	M2001827
LT 770 M-W-D050/5	50	22	40	15	5	2.2	M2001828
LT 770 M-W-D063/6	63	22	40	15	6	1.8	M2001829
LT 770 M-W-D080/7	80	27	50	15	7	1.4	M2001846
LT 770 M-W-D100/8	100	32	50	15	8	1.1	M2001830
LT 770 M-W-D125/9	125	40	63	15	9	0.8	M2001831
LT 770 M-W-D160/9	160	40	63	15	9	-	M2001832

* On request

Screw: M2001418

Key: M2000602



LDMT 1504 PDTR LT 30

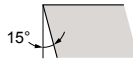
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	14.0	0.18	0.32	190	330	4.0	0.23	250
		2	1045, 1060,	190 HB		14.0		0.32		300			220
		3	28Mn6	250 HB		14.0		0.32		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	14.0	0.15	0.25	150	240	4.0	0.20	200
		4,6	Ck60, 4140, 4340,	230 HB		14.0		0.25		210			180
		5,7	100Cr6	280 HB		14.0		0.22		190			150
		8		350 HB		14.0		0.22		170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	10.0	0.12	0.22	90	150	3.0	0.18	130
		10	H13, M42, D3,	280 HB		10.0		0.22		130			120
		11	S6-5-2, 12Ni19	320 HB		10.0		0.18		110			100
		11		350 HB		10.0		0.18		90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	14.0	0.15	0.25	190	250	4.0	0.20	220
		14	X5CrNi18-9	240 HB		14.0		0.22		210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	10.0	0.12	0.18	70	130	3.0	0.16	100
		14	S31500	310 HB		10.0		0.18		120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	14.0	0.15	0.25	150	210	4.0	0.20	190
		13	17-4 PH, 430	42 HRc		10.0		0.20		150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	14.0	0.18	0.32	150	240	4.0	0.23	200
		15	EN-GJL-250,	200 HB		14.0		0.32		220			180
		16	No30B	250 HB		14.0		0.32		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	14.0	0.15	0.28	100	200	4.0	0.20	180
		17,19	50005	200 HB		14.0		0.28		180			150
		18,20		250 HB		14.0		0.28		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	10.0	0.12	0.18	25	45	3.0	0.16	32
		33	Inconel 700	250 HB		10.0		0.18		45			30
		34	Stellite 21	350 HB		10.0		0.18		45			30
	Ti based	10	36 TiAl6V4	-	0.5	10.0	0.12	0.20	40	65	3.0	0.18	55
Hardened Mat.			37 T40	-		10.0		0.18		55			40
	Steel	11	38 X100CrMo13,	45 HRc	0.5	5.0	0.10	0.18	40	80	2.0	0.14	60
		38	440C,	50 HRc		3.0		0.16		70			55
		38	G-X260NiCr42	55 HRc		1.5		0.14		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	4.0	0.10	0.18	40	80	1.5	0.14	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.14	30	60	1.0	0.12	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	14.0	0.18	0.32	200	400	4.0	0.25	280



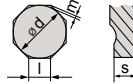
ODMT



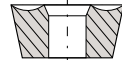
Shape



Clearance Angle



Tolerance
 $s \pm 0.13$
 For $l = 05$, $d \pm 0.08$ $m \pm 0.13$
 For $l = 06$, $d \pm 0.10$ $m \pm 0.15$

Fixing
Chip breaker

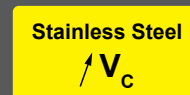
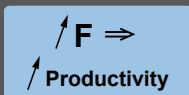
ODMT

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ODMT 0504 ZZTR	LT 30	12.70	4.76	0.80	Right	M0000664
ODMT 060508 TN	LT 30	15.88	5.56	0.70	Right	M0001104

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert with 8 cutting edges. Suitable for Roughing to Finishing-Face Milling, Plunging and Ramping down operations.

Application Guide



Machine Recommendations
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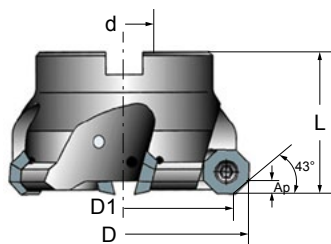
Shell Mill for ODMT 060508 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 820 M-D-D080/5*	90	80	27	50	3.5	5	M2000711
LT 820 M-D-D100/6*	110	100	32	50	3.5	6	M2000712
LT 820 M-D-D125/7*	135	125	40	63	3.5	7	M2000713
LT 820 M-D-D160/9*	170	160	40	63	3.5	9	M2000714

* On request

Screw: M2002733

Key: M2000603



ODMT 0504 ZZTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	3.5	0.22	0.51	190	2.5	0.37	250
		2	2	1045, 1060,	190 HB								220
		3	3	28Mn6	250 HB								200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	3.5	0.18	0.40	150	2.5	0.32	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB								180
		5,7	5,7	100Cr6	280 HB								150
		8	8		350 HB								140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.5	0.14	0.35	90	1.9	0.29	130
		10	10	H13, M42, D3,	280 HB								120
		11	11	S6-5-2, 12Ni19	320 HB								100
		11	11		350 HB								80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	3.5	0.18	0.35	190	2.5	0.29	220
		14	14	X5CrNi18-9	240 HB								190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	2.5	0.14	0.29	70	1.9	0.26	100
		14	14	S31500	310 HB								90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	3.5	0.18	0.35	150	2.5	0.29	190
		13	13	17-4 PH, 430	42 HRc								130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.5	0.22	0.51	150	2.5	0.37	200
		15	15	EN-GJL-250,	200 HB								180
		16	16	No30B	250 HB								160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	3.5	0.18	0.45	100	2.5	0.32	180
		17,19	17,19	50005	200 HB								150
		18,20	18,20		250 HB								130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.5	0.14	0.29	25	1.9	0.26	32
		33	33	Inconel 700	250 HB								30
		34	34	Stellite 21	350 HB								30
	Ti based	10	36	TiAl6V4	-	0.5	2.5	0.14	0.32	40	1.9	0.29	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc								60
		38	38	440C,	50 HRc	0.4	0.8	0.12	0.26	40	0.9	0.21	55
		38	38	G-X260NiCr42	55 HRc								50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.4	1.0	0.12	0.29	40	0.9	0.22	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.4	0.4	0.12	0.22	30	0.6	0.19	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	3.5	0.22	0.51	200	2.5	0.40	280

ODMT 060508 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	4.0	0.22	0.54	190	330	2.5	0.39	250
		2	1045, 1060,	190 HB		4.0		0.54		300			220
		3	28Mn6	250 HB		4.0		0.54		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	4.0	0.18	0.43	150	240	2.5	0.34	200
		4,6	Ck60, 4140, 4340,	230 HB		4.0		0.43		210			180
		5,7	100Cr6	280 HB		4.0		0.37		190			150
		8		350 HB		4.0		0.37		170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.9	0.14	0.37	90	150	1.9	0.31	130
		10	H13, M42, D3,	280 HB		2.9		0.37		130			120
		11	S6-5-2, 12Ni19	320 HB		2.9		0.31		110			100
		11		350 HB		2.9		0.31		90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	4.0	0.18	0.37	190	250	2.5	0.31	220
		14	X5CrNi18-9	240 HB		4.0		0.34		210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	2.9	0.14	0.31	70	130	1.9	0.27	100
		14	S31500	310 HB		2.9		0.31		120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	4.0	0.18	0.37	150	210	2.5	0.31	190
		13	17-4 PH, 430	42 HRc		2.9		0.34		150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	4.0	0.22	0.54	150	240	2.5	0.39	200
		15	EN-GJL-250,	200 HB		4.0		0.54		220			180
		16	No30B	250 HB		4.0		0.54		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	4.0	0.18	0.48	100	200	2.5	0.34	180
		17,19	50005	200 HB		4.0		0.48		180			150
		18,20		250 HB		4.0		0.48		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.9	0.14	0.31	25	45	1.9	0.27	32
		33	Inconel 700	250 HB		2.9		0.31		45			30
		34	Stellite 21	350 HB		2.9		0.31		45			30
	Ti based	10	36 TiAl6V4	-	0.5	2.9	0.14	0.34	40	65	1.9	0.31	55
Hardened Mat.			37 T40	-		2.9		0.31		55			40
	Steel	11	38 X100CrMo13,	45 HRc	0.4	1.4	0.12	0.31	40	80	1.3	0.24	60
		38	440C,	50 HRc		0.9		0.27		70			55
		38	G-X260NiCr42	55 HRc		0.4		0.24		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	1.1	0.12	0.31	40	80	0.9	0.24	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	0.4	0.12	0.24	30	60	0.6	0.20	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	4.0	0.22	0.54	200	400	2.5	0.43	280



O

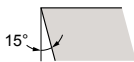
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M

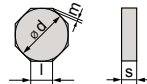
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Shape

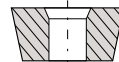


Clearance Angle



Tolerance

d $\pm$ 0.10
m $\pm$ 0.15
s $\pm$ 0.13

Fixing
Chip breaker

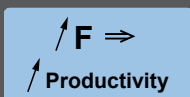
ODMW

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ODMW 060508 TN	LT 30	15.88	5.56	0.80	Right	M0000451

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert with 8 cutting edges and flat rake surface. Designed for materials that generate short chips. Suitable for Roughing to Finishing - Face Milling, Plunging and Ramping down operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

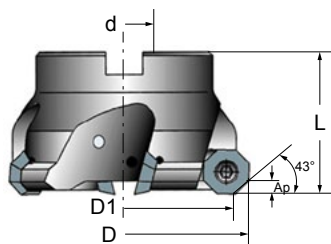
Shell Mill for ODMW 060508 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 820 M-D-D080/5*	90	80	27	50	3.5	5	M2000711
LT 820 M-D-D100/6*	110	100	32	50	3.5	6	M2000712
LT 820 M-D-D125/7*	135	125	40	63	3.5	7	M2000713
LT 820 M-D-D160/9*	170	160	40	63	3.5	9	M2000714

* On request

Screw: M2002733

Key: M2000603



ODMW 060508 TN LT 30

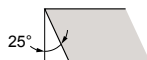
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	4.0	0.22	0.58	330	190	3.0	0.41	250
			2		190 HB		4.0		0.58	300				220
			3		250 HB		4.0		0.58	250				200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	4.0	0.18	0.45	150	240	3.0	0.36	200
			4,6		230 HB		4.0		0.45	150	210			180
			5,7		280 HB		4.0		0.40	130	190			150
			8		350 HB		4.0		0.40	130	170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	2.9	0.14	0.40	90	150	2.3	0.32	130
			10		280 HB		2.9		0.40	90	130			120
			11		320 HB		2.9		0.32	60	110			100
			11		350 HB		2.9		0.32	60	90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	4.0	0.22	0.58	240	150	3.0	0.41	200
			15		200 HB		4.0		0.58	220				180
			16		250 HB		4.0		0.58	190				160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	4.0	0.18	0.50	200	100	3.0	0.36	180
			17,19		200 HB		4.0		0.50	180				150
			18,20		250 HB		4.0		0.50	150				130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.4	1.4	0.12	0.32	80	40	1.5	0.25	60
			38		50 HRc		0.9		0.29	70	40	1.1	0.23	55
			38		55 HRc		0.4		0.25	60	40	0.8	0.22	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.4	1.1	0.12	0.32	40	80	1.1	0.25	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.4	0.4	0.12	0.25	30	60	0.8	0.22	40



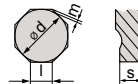
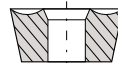
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Shape



Clearance Angle

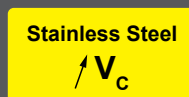
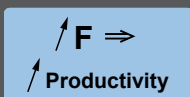

Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.025$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
OFER 070405 TN	LT 30	17.93	4.76	0.80	Right	M0000033

Surfacing Insert Lead angle 43°

Multi purpose 45° Milling insert with 8 cutting edges and flat rake surface. Suitable for Roughing to Finishing-Face Milling, Plunging and Ramping down operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

Shell Mill for OFER 070405 TN

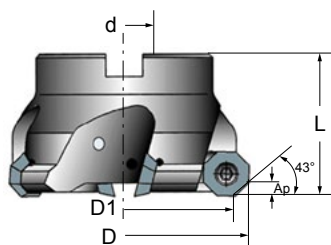
Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 880 M-W-D063/4*	73	63	22	40	5	4	M2000508
LT 880 M-W-D080/5*	90	80	27	50	5	5	M2000510
LT 880 M-W-D100/6*	110	100	32	50	5	6	M2000511
LT 880 M-W-D125/8*	135	125	40	63	5	8	M2000512
LT 880 M-W-D160/10*	170	160	40	63	5	10	M2000513

* On request

Screw: M2000606

Key: M2000609

OFER



OFER 070405 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	4.5	0.22	0.51	190	330	3.0	0.37	250
		2	1045, 1060,	190 HB		4.5		0.51		300			220
		3	28Mn6	250 HB		4.5		0.51		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	4.5	0.18	0.40	150	240	3.0	0.32	200
		4,6	Ck60, 4140, 4340,	230 HB		4.5		0.40	150	210			180
		5,7	100Cr6	280 HB		4.5		0.35	130	190			150
		8		350 HB		4.5		0.35	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	3.2	0.14	0.35	90	150	2.2	0.29	130
		10	H13, M42, D3,	280 HB		3.2		0.35	90	130			120
		11	S6-5-2, 12Ni19	320 HB		3.2		0.29	60	110			100
		11		350 HB		3.2		0.29	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	4.5	0.18	0.35	190	250	3.0	0.29	220
		14	X5CrNi18-9	240 HB		4.5	0.14	0.32	160	210		0.29	190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	3.2	0.14	0.29	70	130	2.2	0.26	100
		14	S31500	310 HB		3.2		0.29		120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	4.5	0.18	0.35	150	210	3.0	0.29	190
		13	17-4 PH, 430	42 HRc		3.2		0.32	90	150	2.2	0.26	130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	4.5	0.22	0.51	150	240	3.0	0.37	200
		15	EN-GJL-250,	200 HB		4.5		0.51		220			180
		16	No30B	250 HB		4.5		0.51		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	4.5	0.18	0.45	100	200	3.0	0.32	180
		17,19	50005	200 HB		4.5		0.45		180			150
		18,20		250 HB		4.5		0.45		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.2	0.14	0.29	25	45	2.2	0.26	32
		33	Inconel 700	250 HB		3.2		0.29		45			30
		34	Stellite 21	350 HB		3.2		0.29		45			30
	Ti based	10	36 TiAl6V4	-	0.5	3.2	0.14	0.32	40	65	2.2	0.29	55
Hardened Mat.			37 T40	-		3.2		0.29	30	55		0.26	40
	Steel	11	38 X100CrMo13,	45 HRc	0.4	1.6	0.12	0.29	40	80	1.5	0.22	60
		38	440C,	50 HRc		1.0		0.26		70	1.1	0.21	55
		38	G-X260NiCr42	55 HRc		0.5		0.22		60	0.7	0.19	50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	1.3	0.12	0.29	40	80	1.1	0.22	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	0.5	0.12	0.22	30	60	0.7	0.19	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	4.5	0.22	0.51	200	400	3.0	0.40	280



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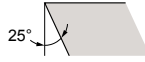
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M

T



Shape

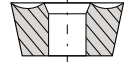


Clearance Angle



Tolerance

$s \pm 0.13$
For $l = 05$, $d \pm 0.08$ $m \pm 0.13$
For $l = 07$, $d \pm 0.10$ $m \pm 0.15$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
OFMT 05T305 TN	LT 30	12.70	4.00	0.80	Right	M0000591
OFMT 050405 TR	LT 30	13.30	4.76	-	Right	M0000034
OFMT 070405 TN	LT 30	17.97	4.76	0.50	Right	M0000592

OFMT

Surfacing Insert Lead angle 43°

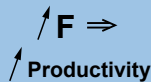
Multi purpose 45° Milling insert with 8 cutting edges and flat rake surface. Suitable for Roughing to Finishing-Face Milling, Plunging and Ramping down operations.

Application Guide

Chamfering



Surfacing



Productivity



1, 2, 3, 4 No
7, 8, 11 No
10, 12 Yes
5, 6, 9 Yes

Stainless Steel



Machine Recommendations
Guide. Details on page 10

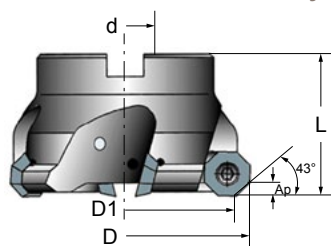
Shell Mill for OFMT 05T305 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 800 M-W-D032/3	39	32	16	40	3	3	M2000501
LT 800 M-W-D040/3	47	40	16	40	3	3	M2000502
LT 800 M-W-D050/4	57	50	22	40	3	4	M2000503
LT 800 M-W-D063/5	70	63	22	40	3	5	M2000504
LT 800 M-W-D080/6	87	80	27	50	3	6	M2000505
LT 800 M-W-D100/7	107	100	32	50	3	7	M2000506
LT 800 M-W-D125/8	132	125	40	63	3	8	M2000507

Screw: M2000597**Key: M2000602****Shell Mill for OFMT 050405 TR**

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 805 M-W-D032/3*	39	32	16	40	3	3	M2001602
LT 805 M-W-D040/3*	47	40	16	40	3	3	M2001603
LT 805 M-W-D050/4*	57	50	22	40	3	4	M2001604
LT 805 M-W-D063/5*	70	63	22	40	3	5	M2001605
LT 805 M-W-D080/6*	87	80	27	50	3	6	M2001607
LT 805 M-W-D100/7*	107	100	32	50	3	7	M2001608
LT 805 M-W-D125/8*	132	125	40	63	3	8	M2001609

* On request

Screw: M2000597**Key: M2000602**

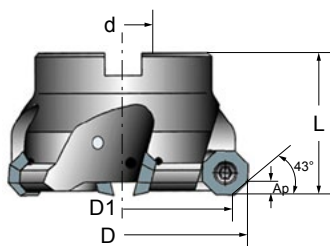
Shell Mill for OFMT 070405 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 810 M-D-D080/6*	92	80	27	50	4.5	6	M2000707
LT 810 M-D-D100/7*	112	100	32	50	4.5	7	M2000708
LT 810 M-D-D125/8*	137	125	40	63	4.5	8	M2000709

* On request

Screw: M2002733

Key: M2000603



OFMT 05T305 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	3.5	0.22	0.51	190	330	2.5	0.37	250
		2	1045, 1060,	190 HB		3.5		0.51		300			220
		3	28Mn6	250 HB		3.5		0.51		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.5	0.18	0.40	150	240	2.5	0.32	200
		4,6	Ck60, 4140, 4340,	230 HB		3.5		0.40	150	210			180
		5,7	100Cr6	280 HB		3.5		0.35	130	190			150
		8		350 HB		3.5		0.35	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.5	0.14	0.35	90	150	1.9	0.29	130
		10	H13, M42, D3,	280 HB		2.5		0.35	90	130			120
		11	S6-5-2, 12Ni19	320 HB		2.5		0.29	60	110			100
		11		350 HB		2.5		0.29	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	3.5	0.18	0.35	190	250	2.5	0.29	220
		14	X5CrNi18-9	240 HB		3.5	0.14	0.32	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	2.5	0.14	0.29	70	130	1.9	0.26	100
		14	S31500	310 HB		2.5		0.29	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	3.5	0.18	0.35	150	210	2.5	0.29	190
		13	17-4 PH, 430	42 HRc		2.5		0.32	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	3.5	0.22	0.51	150	240	2.5	0.37	200
		15	EN-GJL-250,	200 HB		3.5		0.51		220			180
		16	No30B	250 HB		3.5		0.51		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	3.5	0.18	0.45	100	200	2.5	0.32	180
		17,19	50005	200 HB		3.5		0.45		180			150
		18,20		250 HB		3.5		0.45		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.5	0.14	0.29	25	45	1.9	0.26	32
		33	Inconel 700	250 HB		2.5		0.29		45			30
		34	Stellite 21	350 HB		2.5		0.29		45			30
	Ti based	10	36 TiAl6V4	-	0.5	2.5	0.14	0.32	40	65	1.9	0.29	55
Hardened Mat.			37 T40	-		2.5		0.29	30	55		0.26	40
	Steel	11	38 X100CrMo13,	45 HRc	0.4	1.3	0.12	0.29	40	80	1.3	0.22	60
		38	440C,	50 HRc		0.8		0.26		70	0.9	0.21	55
		38	G-X260NiCr42	55 HRc		0.4		0.22		60	0.6	0.19	50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	1.0	0.12	0.29	40	80	0.9	0.22	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	0.4	0.12	0.22	30	60	0.6	0.19	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	3.5	0.22	0.51	200	400	2.5	0.40	280

OFMT 050405 TR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	3.5	0.22	0.51	190	330	2.5	0.37	250
			2	1045, 1060, 28Mn6	190 HB		3.5		0.51		300			220
			3		250 HB		3.5		0.51		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	3.5	0.18	0.40	150	240	2.5	0.32	200
			4,6		230 HB		3.5		0.40	150	210		0.32	180
			5,7		280 HB		3.5		0.35	130	190		0.29	150
			8		350 HB		3.5		0.35	130	170		0.29	140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	2.5	0.14	0.35	90	150	1.9	0.29	130
			10		280 HB		2.5		0.35	90	130		0.29	120
			11		320 HB		2.5		0.29	60	110		0.26	100
			11		350 HB		2.5		0.29	60	90		0.26	80
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	3.5	0.18	0.35	190	250	2.5	0.29
14				240 HB	3.5	0.14		0.32	160	210	190			
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	2.5	0.14	0.29	70	130	1.9	0.26	100
			14	310 HB	2.5		0.29		120	90				
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	3.5	0.18	0.35	150	210	2.5	0.29	190
			13	42 HRc	2.5		0.32		90	150	1.9		0.26	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.5	0.22	0.51	150	240	2.5	0.37	200
			15	EN-GJL-250, No30B	200 HB		3.5		0.51		220			180
			16	250 HB	3.5		0.51		190		160			
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	3.5	0.18	0.45	200	2.5	0.32	180	
			17,19		200 HB		3.5		0.45	100			180	150
			18,20		250 HB		3.5		0.45	150			130	
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.5	0.14	0.29	45	1.9	0.26	32	
			33	Inconel 700	250 HB		2.5		0.29	25			45	30
			34	Stellite 21	350 HB		2.5		0.29	45			30	
	Ti based	10	36	TiAl6V4	-	0.5	2.5	0.14	0.32	40	65	1.9	0.29	55
			37	T40	-		2.5		0.29	30	55		0.26	40
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.4	1.3	0.12	0.29	80	1.3	0.22	60	
			38	G-X260NiCr42	50 HRc		0.8		0.26	70		0.9	0.21	55
			38		55 HRc		0.4		0.22	60		0.6	0.19	50
	Chilled Cast Iron White Cast Iron		40	Ni-Hard 2	400 HB	0.4	1.0	0.12	0.29	40	80	0.9	0.22	50
			41	G-X300CrMo15	55 HRc	0.4	0.4	0.12	0.22	30	60	0.6	0.19	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	3.5	0.22	0.51	200	400	2.5	0.40	280

OFMT 070405 TN LT 30

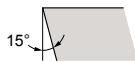
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	4.5	0.22	0.51	190	330	3.0	0.37	250
		2	1045, 1060,	190 HB		4.5		0.51		300			220
		3	28Mn6	250 HB		4.5		0.51		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	4.5	0.18	0.40	150	240	3.0	0.32	200
		4,6	Ck60, 4140, 4340,	230 HB		4.5		0.40	150	210			180
		5,7	100Cr6	280 HB		4.5		0.35	130	190			150
		8		350 HB		4.5		0.35	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	3.2	0.14	0.35	90	150	2.2	0.29	130
		10	H13, M42, D3,	280 HB		3.2		0.35	90	130			120
		11	S6-5-2, 12Ni19	320 HB		3.2		0.29	60	110			100
		11		350 HB		3.2		0.29	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	4.5	0.18	0.35	190	250	3.0	0.29	220
		14	X5CrNi18-9	240 HB		4.5	0.14	0.32	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	3.2	0.14	0.29	70	130	2.2	0.26	100
		14	S31500	310 HB		3.2		0.29	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	4.5	0.18	0.35	150	210	3.0	0.29	190
		13	17-4 PH, 430	42 HRc		3.2		0.32	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	4.5	0.22	0.51	150	240	3.0	0.37	200
		15	EN-GJL-250,	200 HB		4.5		0.51		220			180
		16	No30B	250 HB		4.5		0.51		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	4.5	0.18	0.45	100	200	3.0	0.32	180
		17,19	50005	200 HB		4.5		0.45		180			150
		18,20		250 HB		4.5		0.45		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.2	0.14	0.29	25	45	2.2	0.26	32
		33	Inconel 700	250 HB		3.2		0.29		45			30
		34	Stellite 21	350 HB		3.2		0.29		45			30
	Ti based	10	36 TiAl6V4	-	0.5	3.2	0.14	0.32	40	65	2.2	0.29	55
Hardened Mat.		37	T40	-		3.2		0.29	30	55			40
	Steel	11	38 X100CrMo13,	45 HRc	0.4	1.6	0.12	0.29	40	80	1.5	0.22	60
		38	440C,	50 HRc		1.0		0.26		70			55
		38	G-X260NiCr42	55 HRc		0.5		0.22		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	1.3	0.12	0.29	40	80	1.1	0.22	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	0.5	0.12	0.22	30	60	0.7	0.19	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	4.5	0.22	0.51	200	400	3.0	0.40	280



R D M T



Shape

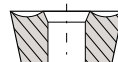


Clearance Angle



Tolerance

$s \pm 0.13$
For $l = 06/08/10$, $d \pm 0.05$
For $l = 12$, $d \pm 0.08$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
RDMT 0602 M0	LT 30	6	2.38	-	Neutral	M0000035
RDMT 0702 M0	LT 30	7	2.38	-	Neutral	M0001882
RDMT 0803 M0	LT 30	8	3.18	-	Neutral	M0000037
RDMT 1003 M0	LT 30	10	3.18	-	Neutral	M0001875
RDMT 10T3 M0	LT 30	10	3.97	-	Neutral	M0000038
RDMT 12T3 M0	LT 30	12	3.97	-	Neutral	M0001876
RDMT 1204 M0	LT 30	12	4.76	-	Neutral	M0000039
RDMT 1604 M0	LT 30	16	4.76	-	Neutral	M0001881

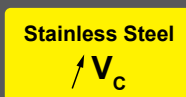
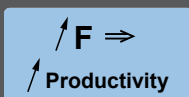
RDMT

Application Guide

Surfacing Insert Lead angle 90°



Multi purpose Round insert. Suitable for Roughing to Semi-Finishing Copying of 3D surfaces and Face Milling operations.



Machine Recommendations
Guide. Details on page 10

End Mill for RDMT 0602 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 060 WL-W-D016/2	16	10	16	25	150	3	2	6	M2000676
LT 060 WL-W-D020/3	20	14	20	60	180	3	3	4.5	M2000677
LT 060 WL-W-D025/3	25	19	25	80	180	3	3	4	M2000678

Screw: M2001416

Key: M2002912

End Mill for RDMT 0803 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 080 WL-W-D020/2	20	12	20	42	180	5	2	6	M2000679
LT 080 WL-W-D025/3	25	17	25	60	180	5	3	4.5	M2000680
LT 080 WL-W-D032/3	32	24	32	80	180	5	3	4	M2000681

Screw: M2002181

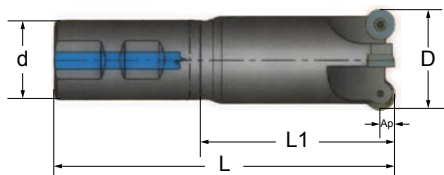
Key: M2000601

End Mill for RDMT 10T3 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 100 WL-W-D020/2	20	10	20	80	180	5	2	12	M2000683
LT 100 WL-W-D025/3	25	15	25	60	180	5	3	8	M2000684
LT 100 WL-W-D032/3	32	22	32	80	180	5	3	5	M2000685

Screw: M2000597

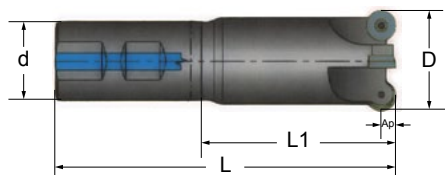
Key: M2000602



End Mill for RDMT 1204 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 120 WL-W-D040/4	40	28	32	110	170	6	4	7	M2000687

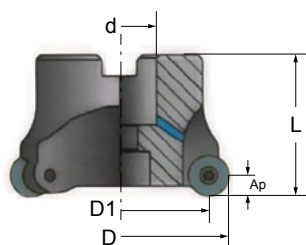
Screw: M2000597 Key: M2000602



Shell Mill for RDMT 1204 MO

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 120 M-W-D040/4	40	28	16	40	6	4	7	M2000691
LT 120 M-W-D050/4	50	38	22	50	6	4	5	M2001780
LT 120 M-W-D063/5	63	51	27	50	6	5	3.5	M2000689
LT 120 M-W-D080/6	80	68	27	50	6	6	2.5	M2000690
LT 120 M-W-D100/7	100	88	40	50	6	7	2	M2000688

Screw: M2000597 Key: M2000602



RDMT 0602 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.5	1.5 1.5 1.5	0.18	0.48 0.48 0.48	190	330 300 250	0.8	0.29	250 220 200
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB 230 HB 280 HB 350 HB	0.5	1.5 1.5 1.5 1.5	0.15	0.38 0.38 0.33 0.33	150 150 130 130	240 210 190 170	0.8	0.25 0.25 0.23 0.23	200 180 150 140
		3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB 280 HB 320 HB 350 HB	0.5	1.1 1.1 1.1 1.1	0.12	0.33 0.33 0.27 0.27	90 90 60 60	150 130 110 90	0.6	0.23 0.23 0.20 0.20	130 120 100 80
	Stainless Steel	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.5	1.5 1.5	0.15 0.12	0.38 0.33	190 160	250 210	0.8	0.25	220 190
		5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.5	1.2 1.2	0.12	0.27 0.27	70	130 120	0.6	0.20	100 90
		6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRc	0.5	1.5 1.2	0.15	0.38 0.30	150 90	210 150	0.8 0.6	0.25 0.20	190 130
		7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.5	1.5 1.5 1.5	0.18	0.48 0.48 0.48	150	240 220 190	0.8	0.29	200 180 160
		8	17,19 GGG40, GGG70, 17,19 50005 18,20	150 HB 200 HB 250 HB	0.5	1.5 1.5 1.5	0.15	0.42 0.42 0.42	100	200 180 150	0.8	0.25	180 150 130
		9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.5	1.2 1.2 1.2	0.12	0.27 0.27 0.27	25	45 45 45	0.6	0.20	32 30 30
	High Temp. Alloys	10	36 TiAl6V4 37 T40	- -	0.5	1.2 1.2	0.12	0.30 0.27	40 30	65 55	0.6	0.23 0.20	55 40
		11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRc 50 HRc 55 HRc	0.3	0.6 0.4 0.4	0.10	0.27 0.24 0.21	40	80 70 60	0.4 0.3 0.3	0.18 0.16 0.15	60 55 50
	Hardened Mat.		40 Ni-Hard 2	400 HB	0.3	0.4	0.10	0.27	40	80	0.3	0.18	50
	Chilled Cast Iron		41 G-X300CrMo15	55 HRc	0.3	0.4	0.10	0.21	30	60	0.3	0.15	40
	White Cast Iron												
NF	AI (>8%Si)	12	25 AISi12	130 HB	0.5	1.5	0.18	0.48	200	400	0.8	0.31	280

RDMT 0702 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	1.8	0.18	0.54	330	190	0.8	0.32	250
		2	1045, 1060,	190 HB		1.8		0.54	300				220
		3	28Mn6	250 HB		1.8		0.54	250				200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	1.8	0.15	0.43	150	240	0.8	0.28	200
		4,6	Ck60, 4140, 4340,	230 HB		1.8		0.43	150	210			180
		5,7	100Cr6	280 HB		1.8		0.37	130	190			150
		8		350 HB		1.8		0.37	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	1.3	0.12	0.37	90	150	0.6	0.25	130
		10	H13, M42, D3,	280 HB		1.3		0.37	90	130			120
		11	S6-5-2, 12Ni19	320 HB		1.3		0.31	60	110			100
		11		350 HB		1.3		0.31	60	90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	1.8	0.15	0.43	190	250	0.8	0.28	220
		14	X5CrNi18-9	240 HB		1.8	0.12	0.37	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	1.4	0.12	0.31	70	130	0.6	0.22	100
		14	S31500	310 HB		1.4		0.31	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	1.8	0.15	0.43	150	210	0.8	0.28	190
		13	17-4 PH, 430	42 HRc		1.4		0.34	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	1.8	0.18	0.54	240	240	0.8	0.32	200
		15	EN-GJL-250,	200 HB		1.8		0.54	150	220			180
		16	No30B	250 HB		1.8		0.54	190	190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	1.8	0.15	0.48	200	200	0.8	0.28	180
		17,19	50005	200 HB		1.8		0.48	100	180			150
		18,20		250 HB		1.8		0.48	150	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	1.4	0.12	0.31	45	45	0.6	0.22	32
		33	Inconel 700	250 HB		1.4		0.31	25	45			30
		34	Stellite 21	350 HB		1.4		0.31	45	45			30
	Ti based	10	36 TiAl6V4	-	0.5	1.4	0.12	0.34	40	65	0.6	0.25	55
		37	T40	-		1.4		0.31	30	55			40
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.3	0.7	0.10	0.31	80	80	0.4	0.20	60
		38	440C,	50 HRc		0.5		0.27	40	70			55
		38	G-X260NiCr42	55 HRc		0.5		0.24	60	60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.3	0.5	0.10	0.31	40	80	0.3	0.20	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.3	0.5	0.10	0.24	30	60	0.3	0.17	40
NF	Al (>8%Si)	12	25 AISi12	130 HB	0.5	1.8	0.18	0.54	200	400	0.8	0.35	280

RDMT 0803 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	0.18	2.0	0.58	330	0.8	0.35	250
		2	2	1045, 1060,	190 HB			2.0	0.58	300			220
		3	3	28Mn6	250 HB			2.0	0.58	250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	0.15	2.0	0.45	150	0.8	0.30	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB			2.0	0.45	150			180
		5,7	5,7	100Cr6	280 HB			2.0	0.40	130			150
		8	8		350 HB			2.0	0.40	130			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	0.12	1.4	0.40	90	0.6	0.27	130
		10	10	H13, M42, D3,	280 HB			1.4	0.40	90			120
		11	11	S6-5-2, 12Ni19	320 HB			1.4	0.32	60			100
		11	11		350 HB			1.4	0.32	60			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	0.15	2.0	0.45	190	0.8	0.30	220
		14	14	X5CrNi18-9	240 HB			2.0	0.40	160			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	0.12	1.5	0.32	70	0.6	0.24	100
		14	14	S31500	310 HB			1.5	0.32	120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	0.15	2.0	0.45	150	0.8	0.30	190
		13	13	17-4 PH, 430	42 HRc			1.5	0.36	90			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	0.18	2.0	0.58	240	0.8	0.35	200
		15	15	EN-GJL-250,	200 HB			2.0	0.58	150			180
		16	16	No30B	250 HB			2.0	0.58	190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	0.15	2.0	0.50	200	0.8	0.30	180
		17,19	17,19	50005	200 HB			2.0	0.50	100			150
		18,20	18,20		250 HB			2.0	0.50	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	0.12	1.5	0.32	45	0.6	0.24	32
		33	33	Inconel 700	250 HB			1.5	0.32	25			30
		34	34	Stellite 21	350 HB			1.5	0.32	45			30
	Ti based	10	36	TiAl6V4	-	0.5	0.12	1.5	0.36	40	0.6	0.27	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc			0.7	0.32	80			60
		38	38	440C,	50 HRc	0.3	0.10	0.6	0.29	40	0.3	0.20	55
		38	38	G-X260NiCr42	55 HRc			0.5	0.25	60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.6	0.10	0.32	40	0.3	0.21	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.5	0.10	0.25	30	0.3	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	2.0	0.18	0.58	200	0.8	0.38	280

RDMT 1003 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	2.5	0.18	0.64	190	1.0	0.35	250
		2	2	1045, 1060,	190 HB								220
		3	3	28Mn6	250 HB								200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	2.5	0.15	0.50	150	1.0	0.30	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB								180
		5,7	5,7	100Cr6	280 HB								150
		8	8		350 HB								140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	1.8	0.12	0.44	90	0.8	0.27	130
		10	10	H13, M42, D3,	280 HB								120
		11	11	S6-5-2, 12Ni19	320 HB								100
		11	11		350 HB								80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	2.5	0.15	0.50	190	1.0	0.30	220
		14	14	X5CrNi18-9	240 HB								190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	2.0	0.12	0.36	70	0.8	0.24	100
		14	14	S31500	310 HB								90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	2.5	0.15	0.50	150	1.0	0.30	190
		13	13	17-4 PH, 430	42 HRc								130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	2.5	0.18	0.64	150	1.0	0.35	200
		15	15	EN-GJL-250,	200 HB								180
		16	16	No30B	250 HB								160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	2.5	0.15	0.56	100	1.0	0.30	180
		17,19	17,19	50005	200 HB								150
		18,20	18,20		250 HB								130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.0	0.12	0.36	25	0.8	0.24	32
		33	33	Inconel 700	250 HB								30
		34	34	Stellite 21	350 HB								30
	Ti based	10	36	TiAl6V4	-	0.5	2.0	0.12	0.40	40	0.8	0.27	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc								60
		38	38	440C,	50 HRc	0.3	0.7	0.10	0.32	40	0.4	0.20	55
		38	38	G-X260NiCr42	55 HRc								50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.7	0.10	0.36	40	0.4	0.21	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.6	0.10	0.28	30	0.3	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	2.5	0.18	0.64	200	1.0	0.38	280

RDMT 10T3 M0 LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	2.5	0.18	0.64	190	330	1.0	0.35	250		
			2	1045, 1060, 28Mn6	190 HB		2.5		0.64		300			220		
			3		250 HB		2.5		0.64		250			200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	2.5	0.15	0.50	150	240	1.0	0.30	200		
			4,6		230 HB		2.5		0.50	150	210			0.30	180	
			5,7		280 HB		2.5		0.44	130	190			0.27	150	
			8		350 HB		2.5		0.44	130	170			0.27	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	1.8	0.12	0.44	90	150	0.8	0.27	130		
			10		280 HB		1.8		0.44	90	130			0.27	120	
			11		320 HB		1.8		0.36	60	110			0.24	100	
			11		350 HB		1.8		0.36	60	90			0.24	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	2.5	0.15	0.50	190	250	1.0	0.30	220	
14				240 HB	2.5	0.12		0.44	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	2.0	0.12	0.36	70	130	0.8	0.24	100		
			14	310 HB	2.0		0.36		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	2.5	0.15	0.50	150	210	1.0	0.30	190		
			13	42 HRc	2.0		0.40		90	150	0.8			0.24	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	2.5	0.18	0.64	150	240	1.0	0.35	200		
			15	EN-GJL-250, No30B	200 HB		2.5		0.64		220			180		
			16	250 HB	2.5		0.64		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	2.5	0.15	0.56	100	200	1.0	0.30	180		
			17,19	200 HB	2.5		0.56		180		150					
			18,20	250 HB	2.5		0.56		150		130					
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.0	0.12	0.36	25	45	0.8	0.24	32		
			33	Inconel 700	250 HB		2.0		0.36		45			30		
			34	Stellite 21	350 HB		2.0		0.36		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	2.0	0.12	0.40	40	65	0.8	0.27	55		
			37	T40	-		2.0		0.36	30	55			0.24	40	
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.3	0.9	0.10	0.36	40	80	0.5	0.21	60		
			38	G-X260NiCr42	50 HRc		0.7		0.32		70			0.4	0.20	55
			38		55 HRc		0.6		0.28		60			0.3	0.18	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.7	0.10	0.36	40	80	0.4	0.21	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.6	0.10	0.28	30	60	0.3	0.18	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	2.5	0.18	0.64	200	400	1.0	0.38	280		

RDMT 12T3 M0 LT 30

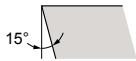
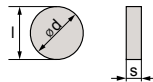
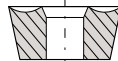
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	3.0	0.25	0.74	190	330	1.3	0.35	250
		2	1045, 1060,	190 HB		3.0		0.74		300			220
		3	28Mn6	250 HB		3.0		0.74		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.0	0.21	0.58	150	240	1.3	0.30	200
		4,6	Ck60, 4140, 4340,	230 HB		3.0		0.58		210			180
		5,7	100Cr6	280 HB		3.0		0.51		190			150
		8		350 HB		3.0		0.51		170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.2	0.17	0.51	90	150	1.0	0.27	130
		10	H13, M42, D3,	280 HB		2.2		0.51		130			120
		11	S6-5-2, 12Ni19	320 HB		2.2		0.41		110			100
		11		350 HB		2.2		0.41		90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	3.0	0.21	0.58	190	250	1.3	0.30	220
		14	X5CrNi18-9	240 HB		3.0		0.51		210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	2.4	0.17	0.41	70	130	1.0	0.24	100
		14	S31500	310 HB		2.4		0.41		120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	3.0	0.21	0.58	150	210	1.3	0.30	190
		13	17-4 PH, 430	42 HRc		2.4		0.46		150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	3.0	0.25	0.74	150	240	1.3	0.35	200
		15	EN-GJL-250,	200 HB		3.0		0.74		220			180
		16	No30B	250 HB		3.0		0.74		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	3.0	0.21	0.64	100	200	1.3	0.30	180
		17,19	50005	200 HB		3.0		0.64		180			150
		18,20		250 HB		3.0		0.64		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	2.4	0.17	0.41	25	45	1.0	0.24	32
		33	Inconel 700	250 HB		2.4		0.41		45			30
		34	Stellite 21	350 HB		2.4		0.41		45			30
	Ti based	10	36 TiAl6V4	-	0.5	2.4	0.17	0.46	40	65	1.0	0.27	55
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc		1.1		0.41		80			60
		38	440C,	50 HRc	0.3	0.9	0.14	0.37	40	70	0.5	0.20	55
		38	G-X260NiCr42	55 HRc		0.8		0.32		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.3	0.9	0.14	0.41	40	80	0.5	0.21	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.3	0.8	0.14	0.32	30	60	0.3	0.18	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	3.0	0.25	0.74	200	400	1.3	0.38	280

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Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020, 2 1045, 1060, 3 28Mn6	125 HB 190 HB 250 HB	0.5	3.0 3.0 3.0	0.25	0.74 0.74 0.74	190	330 300 250	1.3	0.35	250 220 200
		2	6 42CrMo4, St50, 4,6 Ck60, 4140, 4340, 5,7 100Cr6	180 HB 230 HB 280 HB 350 HB	0.5	3.0 3.0 3.0 3.0	0.21	0.58 0.58 0.51 0.51	150 150 130 130	240 210 190 170	1.3	0.30 0.30 0.27 0.27	200 180 150 140
		3	10 X40CrMoV5, 10 H13, M42, D3, 11 S6-5-2, 12Ni19	220 HB 280 HB 320 HB 350 HB	0.5	2.2 2.2 2.2 2.2	0.17	0.51 0.51 0.41 0.41	90 90 60 60	150 130 110 90	1.0	0.27 0.27 0.24 0.24	130 120 100 80
	Stainless Steel	4	14 304, 316, 14 X5CrNi18-9	180 HB 240 HB	0.5	3.0 3.0	0.21 0.17	0.58 0.51	190 160	250 210	1.3	0.30	220 190
		5	14 X2CrNiN23-4, 14 S31500	290 HB 310 HB	0.5	2.4 2.4	0.17	0.41 0.41	70	130 120	1.0	0.24	100 90
		6	12 410, X6Cr17, 13 17-4 PH, 430	200 HB 42 HRc	0.5	3.0 2.4	0.21	0.58 0.46	150 90	210 150	1.3 1.0	0.30 0.24	190 130
		7	15 GG20, GG40, 15 EN-GJL-250, 16 No30B	150 HB 200 HB 250 HB	0.5	3.0 3.0 3.0	0.25	0.74 0.74 0.74	150	240 220 190	1.3	0.35	200 180 160
		8	17,19 GGG40, GGG70, 17,19 50005	150 HB 200 HB 250 HB	0.5	3.0 3.0 3.0	0.21	0.64 0.64 0.64	100	200 180 150	1.3	0.30	180 150 130
		9	31,32 Incoloy 800 33 Inconel 700 34 Stellite 21	240 HB 250 HB 350 HB	0.5	2.4 2.4 2.4	0.17	0.41 0.41 0.41	25	45 45 45	1.0	0.24	32 30 30
	High Temp. Alloys	10	36 TiAl6V4 37 T40	- -	0.5	2.4 2.4	0.17	0.46 0.41	40 30	65 55	1.0	0.27 0.24	55 40
		11	38 X100CrMo13, 38 440C, 38 G-X260NiCr42	45 HRc 50 HRc 55 HRc	0.3	1.1 0.9 0.8	0.14	0.41 0.37 0.32	40	80 70 60	0.7 0.5 0.3	0.21 0.20 0.18	60 55 50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.3	0.9	0.14	0.41	40	80	0.5	0.21	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.3	0.8	0.14	0.32	30	60	0.3	0.18	40
NF	AI (>8%Si)	12	25 AISi12	130 HB	0.5	3.0	0.25	0.74	200	400	1.3	0.38	280

RDMT 1604 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	4.0	0.25	1.00	190	330	2.0	0.35	250
		2	1045, 1060,	190 HB		4.0		1.00		300			220
		3	28Mn6	250 HB		4.0		1.00		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	4.0	0.21	0.78	150	240	2.0	0.30	200
		4,6	Ck60, 4140, 4340,	230 HB		4.0		0.78	150	210		0.30	180
		5,7	100Cr6	280 HB		4.0		0.69	130	190		0.27	150
		8		350 HB		4.0		0.69	130	170		0.27	140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.9	0.17	0.69	90	150	1.5	0.27	130
		10	H13, M42, D3,	280 HB		2.9		0.69	90	130		0.27	120
		11	S6-5-2, 12Ni19	320 HB		2.9		0.56	60	110		0.24	100
		11		350 HB		2.9		0.56	60	90		0.24	80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	4.0	0.21	0.78	190	250	2.0	0.30	220
		14	X5CrNi18-9	240 HB		4.0	0.17	0.69	160	210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	3.1	0.17	0.56	70	130	1.5	0.24	100
		14	S31500	310 HB		3.1		0.56	70	120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	4.0	0.21	0.78	150	210	2.0	0.30	190
		13	17-4 PH, 430	42 HRc		3.1		0.63	90	150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	4.0	0.25	1.00	150	240	2.0	0.35	200
		15	EN-GJL-250,	200 HB		4.0		1.00		220			180
		16	No30B	250 HB		4.0		1.00		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	4.0	0.21	0.88	100	200	2.0	0.30	180
		17,19	50005	200 HB		4.0		0.88		180			150
		18,20		250 HB		4.0		0.88		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	3.1	0.17	0.56	25	45	1.5	0.24	32
		33	Inconel 700	250 HB		3.1		0.56		45			30
		34	Stellite 21	350 HB		3.1		0.56		45			30
	Ti based	10	36 TiAl6V4	-	0.5	3.1	0.17	0.63	40	65	1.5	0.27	55
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc		1.4	0.14	0.56	40	80	1.0	0.21	60
		38	440C,	50 HRc	0.4	1.1		0.50		70	0.8	0.20	55
		38	G-X260NiCr42	55 HRc		1.0		0.44		60	0.5	0.18	50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.4	1.1	0.14	0.56	40	80	0.8	0.21	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.4	1.0	0.14	0.44	30	60	0.5	0.18	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	4.0	0.25	1.00	200	400	2.0	0.38	280

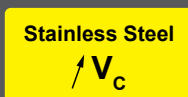
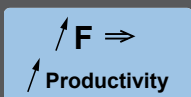
**R****D****M****W****Shape****Clearance Angle****Tolerance**
d $\pm$ 0.05
s $\pm$ 0.13**Fixing**
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
RDMW 10T3 M0	LT 30	10	3.97	-	Neutral	M0001550
RDMW 1204 M0	LT 30	12	4.76	-	Neutral	M0001551

Surfacing Insert Lead angle 90°

Multi purpose Round insert with flat rake surface, designed for Hard materials. Suitable for Roughing to Semi-Finishing Copying of 3D surfaces and Face Milling operations.

Application Guide

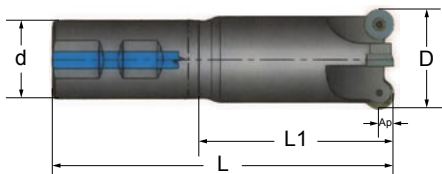
Machine Recommendations
Guide. Details on page 10

End Mill for RDMW 10T3 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 100 WL-W-D020/2	20	10	20	42	180	5	2	12	M2000683
LT 100 WL-W-D025/3	25	15	25	60	180	5	3	8	M2000684
LT 100 WL-W-D032/3	32	22	32	80	180	5	3	5	M2000685

Screw: M2000597

Key: M2000602



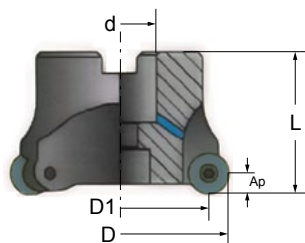
Shell Mill for RDMW 1204 MO

RDMW

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 120 M-W-D040/4	40	28	16	40	6	4	7	M2000691
LT 120 M-W-D050/4	50	38	22	50	6	4	5	M2001780
LT 120 M-W-D063/5	63	51	27	50	6	5	3.5	M2000689
LT 120 M-W-D080/6	80	68	32	50	6	6	2.5	M2000690
LT 120 M-W-D100/7	100	88	40	50	6	7	2	M2000688

Screw: M2000597

Key: M2000602



RDMW 10T3 M0 LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	2.5	0.18	0.70	190	330	1.0	0.39	250
			2		190 HB		2.5		0.70		300			220
			3		250 HB		2.5		0.70		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	2.5	0.15	0.55	150	240	1.0	0.34	200
			4,6		230 HB		2.5		0.55		210			180
			5,7		280 HB		2.5		0.48		190			150
			8		350 HB		2.5		0.48		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	1.8	0.12	0.48	90	150	0.8	0.31	130
			10		280 HB		1.8		0.48		130			120
			11		320 HB		1.8		0.40		110			100
			11		350 HB		1.8		0.40		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	2.5	0.18	0.70	150	240	1.0	0.39	200
			15		200 HB		2.5		0.70		220			180
			16		250 HB		2.5		0.70		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	2.5	0.15	0.62	100	200	1.0	0.34	180
			17,19		200 HB		2.5		0.62		180			150
			18,20		250 HB		2.5		0.62		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.3	0.9	0.10	0.40	40	80	0.5	0.24	60
			38		50 HRc		0.7		0.35		70			55
			38		55 HRc		0.6		0.31		60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.7	0.10	0.40	40	80	0.4	0.24	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.6	0.10	0.31	30	60	0.3	0.20	40

RDMW 1204 M0 LT 30

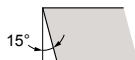
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	3.0	0.18	0.74	190	330	1.3	0.39	250
			2		190 HB		3.0		0.74		300			220
			3		250 HB		3.0		0.74		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	3.0	0.15	0.58	150	240	1.3	0.34	200
			4,6		230 HB		3.0		0.58		210			180
			5,7		280 HB		3.0		0.51		190			150
			8		350 HB		3.0		0.51		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	2.2	0.12	0.51	90	150	1.0	0.31	130
			10		280 HB		2.2		0.51		130			120
			11		320 HB		2.2		0.41		110			100
			11		350 HB		2.2		0.41		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	3.0	0.18	0.74	150	240	1.3	0.39	200
			15		200 HB		3.0		0.74		220			180
			16		250 HB		3.0		0.74		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	3.0	0.15	0.64	100	200	1.3	0.34	180
			17,19		200 HB		3.0		0.64		180			150
			18,20		250 HB		3.0		0.64		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.3	1.1	0.10	0.41	40	80	0.7	0.24	60
			38		50 HRc		0.9		0.37		70	0.5	0.22	55
			38		55 HRc		0.8		0.32		60	0.3	0.20	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.9	0.10	0.41	40	80	0.5	0.24	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.8	0.10	0.32	30	60	0.3	0.20	40



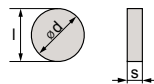
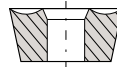
R D M X



Shape



Clearance Angle

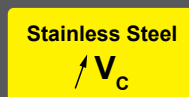
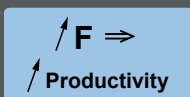

Tolerance
 $d \pm 0.05$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
RDMX 10T3 M0	LT 30	10	3.97	-	Neutral	M0001552
RDMX 1204 M0	LT 30	12	4.76	-	Neutral	M0001553

Surfacing Insert Lead angle 90°

Multi purpose Round insert. Suitable for Roughing to Semi-Finishing Copying of 3D surfaces and Face Milling operations.

Application Guide



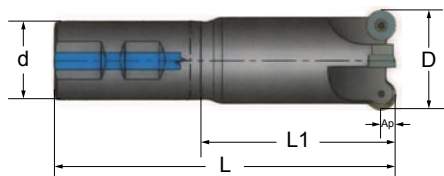
Machine Recommendations
Guide. Details on page 10

End Mill for RDMX 10T3 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 100 WL-W-D020/2	20	10	20	42	180	5	2	12	M2000683
LT 100 WL-W-D025/3	25	15	25	60	180	5	3	8	M2000684
LT 100 WL-W-D032/3	32	22	32	80	180	5	3	5	M2000685

Screw: M2000597

Key: M2000602



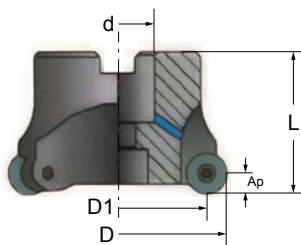
Shell Mill for RDMX 1204 MO

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 120 M-W-D040/4	40	28	16	40	6	4	7	M2000691
LT 120 M-W-D050/4	50	38	22	50	6	4	5	M2001780
LT 120 M-W-D063/5	63	51	27	50	6	5	3.5	M2000689
LT 120 M-W-D080/6	80	68	32	50	6	6	2.5	M2000690
LT 120 M-W-D100/7	100	88	40	50	6	7	2	M2000688

RDMX

Screw: M2000597

Key: M2000602



RDMX 10T3 M0 LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	2.5	0.18	0.64	190	330	1.0	0.35	250		
			2	1045, 1060,	190 HB		0.64		300		220					
			3	28Mn6	250 HB		0.64		250		200					
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	2.5	0.15	0.50	150	240	1.0	0.30	200		
			4,6		230 HB		0.50		150	210	0.30			180		
			5,7		280 HB		0.44		130	190	0.27			150		
			8		350 HB		0.44		130	170	0.27			140		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	1.8	0.12	0.44	90	150	0.8	0.27	130		
			10		280 HB		0.44		90	130	0.27			120		
			11		320 HB		0.36		60	110	0.24			100		
			11		350 HB		0.36		60	90	0.24			80		
	Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	2.5	0.15	0.50	190	250	1.0	0.30	220	
14				X5CrNi18-9	240 HB	0.12		0.44	160	210	190					
Duplex		5	14	X2CrNiN23-4,	290 HB	0.5	2.0	0.12	0.36	70	130	0.8	0.24	100		
			14	S31500	310 HB		0.36		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17,	200 HB	0.5	2.5	0.15	0.50	150	210	1.0	0.30	190		
			13	17-4 PH, 430	42 HRc		0.40		90	150	0.8			0.24	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	2.5	0.18	0.64	240	150	1.0	0.35	200		
			15	EN-GJL-250,	200 HB		0.64		220	180						
			16	No30B	250 HB		0.64		190	160						
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	2.5	0.15	0.56	200	100	1.0	0.30	180		
			17,19		200 HB		0.56		180	150				130		
			18,20		250 HB		0.56		150							
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.0	0.12	0.36	45	25	0.8	0.24	32		
			33	Inconel 700	250 HB		0.36		45	30						
			34	Stellite 21	350 HB		0.36		45	30						
	Ti based	10	36	TiAl6V4	-	0.5	2.0	0.12	0.40	40	65	0.8	0.27	55		
			37	T40	-		2.0		0.36	30	55			0.24	40	
	Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.3	0.9	0.10	0.36	80	40	0.5	0.21	60	
38				440C,	50 HRc	0.7		0.32		70	0.4				0.20	55
38				G-X260NiCr42	55 HRc	0.6		0.28		60	0.3				0.18	50
Chilled Cast Iron			40	Ni-Hard 2	400 HB	0.3	0.7	0.10	0.36	40	80	0.4	0.21	50		
White Cast Iron			41	G-X300CrMo15	55 HRc	0.3	0.6	0.10	0.28	30	60	0.3	0.18	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	2.5	0.18	0.64	200	400	1.0	0.38	280		

RDMX 1204 M0 LT 30

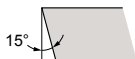
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	3.0	0.25	0.74	330	1.3	0.35	250
		2	2	1045, 1060,	190 HB					300			220
		3	3	28Mn6	250 HB					250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	3.0	0.21	0.58	150 240	1.3	0.30	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB					150 210			180
		5,7	5,7	100Cr6	280 HB					130 190			150
		8	8		350 HB					130 170			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	2.2	0.17	0.51	90 150	1.0	0.27	130
		10	10	H13, M42, D3,	280 HB					90 130			120
		11	11	S6-5-2, 12Ni19	320 HB					60 110			100
		11	11		350 HB					60 90			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	3.0	0.21	0.58	190 250	1.3	0.30	220
		14	14	X5CrNi18-9	240 HB		3.0	0.17	0.51	160 210			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	2.4	0.17	0.41	70 130	1.0	0.24	100
		14	14	S31500	310 HB		2.4		0.41	70 120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	3.0	0.21	0.58	150 210	1.3	0.30	190
		13	13	17-4 PH, 430	42 HRc		2.4		0.46	90 150	1.0	0.24	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	3.0	0.25	0.74	240	1.3	0.35	200
		15	15	EN-GJL-250,	200 HB		3.0		0.74	150 220			180
		16	16	No30B	250 HB		3.0		0.74	190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	3.0	0.21	0.64	200	1.3	0.30	180
		17,19	17,19	50005	200 HB		3.0		0.64	100 180			150
		18,20	18,20		250 HB		3.0		0.64	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	2.4	0.17	0.41	45	1.0	0.24	32
		33	33	Inconel 700	250 HB		2.4		0.41	25 45			30
		34	34	Stellite 21	350 HB		2.4		0.41	45			30
	Ti based	10	36	TiAl6V4	-	0.5	2.4	0.17	0.46	40 65	1.0	0.27	55
		37	37	T40	-		2.4		0.41	30 55		0.24	40
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.3	1.1	0.14	0.41	80	0.7	0.21	60
		38	38	440C,	50 HRc		0.9		0.37	40 70	0.5	0.20	55
		38	38	G-X260NiCr42	55 HRc		0.8		0.32	60	0.3	0.18	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.3	0.9	0.14	0.41	40 80	0.5	0.21	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.3	0.8	0.14	0.32	30 60	0.3	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	3.0	0.25	0.74	200 400	1.3	0.38	280



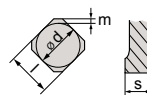
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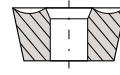
Shape



Clearance Angle



Tolerance
d ± 0.08
m ± 0.013
s ± 0.025



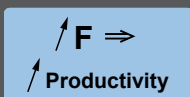
**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SDKT 1204 AETN	LT 30	12.70	4.76	-	Neutral	M0000171

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert, designed for high depths of cut. Suitable for Roughing to Finishing-Face Milling, Plunging and Ramping down Milling operations.

Application Guide



Machine Recommendations
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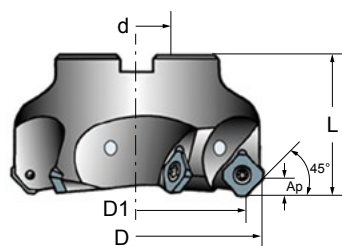
Shell Mill for SDKT 1204 AETN

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 670 M-W-D050/4*	63	50	22	48	6	4	12	M2000553
LT 670 M-W-D063/5*	76	63	22	48	6	5	8	M2000555
LT 670 M-W-D080/6*	93	80	27	50	6	6	5	M2000556
LT 670 M-W-D100/6*	113	100	32	50	6	6	5	M2000557
LT 670 M-W-D125/7*	138	125	40	63	6	7	5	M2000558
LT 670 M-W-D160/8*	173	160	40	63	6	8	5	M2000559

* On request

Screw: M2000598

Key: M2000603



SDKT

SDKT 1204 AETN LT 30

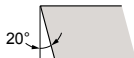
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.53	190	330	3.0	0.39	250
			1045, 1060,	190 HB		7.0		0.53		300			220
			28Mn6	250 HB		7.0		0.53		250			200
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.41	150	240	3.0	0.34	200
				230 HB		7.0		0.41	150	210			180
				280 HB		7.0		0.36	130	190			150
				350 HB		7.0		0.36	130	170			140
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.36	90	150	2.3	0.31	130
				280 HB		5.0		0.36	90	130			120
				320 HB		5.0		0.30	60	110			100
				350 HB		5.0		0.30	60	90			80
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.15	0.36	190	250	3.0	0.31	220
				240 HB		7.0		0.33	160	210			190
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.5	5.0	0.12	0.30	70	130	2.3	0.27	100
				310 HB		5.0		0.30	70	120			90
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.15	0.36	150	210	3.0	0.31	190
				42 HRc		5.0		0.30	90	150			130
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.18	0.53	150	240	3.0	0.39	200
				200 HB		7.0		0.53		220			180
				250 HB		7.0		0.53		190			160
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.46	100	200	3.0	0.34	180
				200 HB		7.0		0.46		180			150
				250 HB		7.0		0.46		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	5.0	0.12	0.30	25	45	2.3	0.27	32
			33 Inconel 700	250 HB		5.0		0.30		45			30
			34 Stellite 21	350 HB		5.0		0.30		45			30
	Ti based	10	36 TiAl6V4 37 T40	- -	0.5	5.0	0.12	0.33	40	65	2.3	0.31	55
Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc 50 HRc 55 HRc		2.5 1.8 1.5	0.10	0.30 0.26 0.23	40	80 70 60	1.5 1.1 0.8	0.24 0.22 0.20	60 55 50
			40 Ni-Hard 2	400 HB	0.5	2.0	0.10	0.30	40	80	1.1	0.24	50
			41 G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.23	30	60	0.8	0.20	40
	Chilled Cast Iron												
	White Cast Iron												
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	7.0	0.18	0.53	200	400	3.0	0.43	280



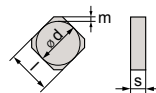
SEKN



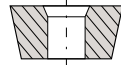
Shape



Clearance Angle



Tolerance
 $m \pm 0.013$
 $s \pm 0.025$
 For $l = 12$, $d \pm 0.08$
 For $l = 15$, $d \pm 0.10$

Fixing
Chip breaker

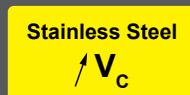
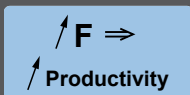
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKN 1203 AFTN	LT 30	12.70	3.18	-	Neutral	M0000041
SEKN 1204 AFTN	LT 30	12.70	4.76	-	Neutral	M0000042
SEKN 1504 AFTN	LT 30	15.88	4.76	-	Neutral	M0000450

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert, designed for high depths of cut. Suitable for Roughing to Finishing- Face Milling, Plunging and Ramping down Milling operations.

SEKN

Application Guide



Machine Recommendations
Guide. Details on page 10

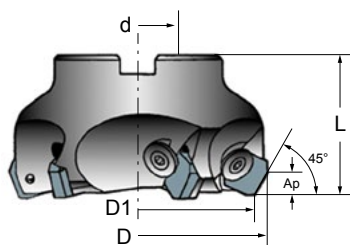
Shell Mill for SEKN 1203 AFTN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 550 M-D-D050/4*	63	50	22	48	6	4	M2000563
LT 550 M-D-D063/5*	76	63	22	48	6	5	M2000564
LT 550 M-D-D080/6*	93	80	27	50	6	6	M2000565
LT 550 M-D-D100/6*	113	100	32	50	6	6	M2000566
LT 550 M-D-D125/7*	138	125	40	63	6	7	M2000567
LT 550 M-D-D160/7*	173	160	40	63	6	7	M2000568
LT 550 M-D-D200/10*	213	200	60	63	6	10	M2000569
LT 550 M-D-D250/13*	263	250	60	63	6	13	M2000570

* On request

Screw: M2000608

Key: M2000609



SEKN 1203 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.46	190	3.0	0.34	250
		2	2	1045, 1060,	190 HB								220
		3	3	28Mn6	250 HB								200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	7.0	0.15	0.36	150	3.0	0.30	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB								180
		5,7	5,7	100Cr6	280 HB								150
		8	8		350 HB								140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	5.0	0.12	0.32	90	2.3	0.27	130
		10	10	H13, M42, D3,	280 HB								120
		11	11	S6-5-2, 12Ni19	320 HB								100
		11	11		350 HB								80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	7.0	0.15	0.32	190	3.0	0.27	220
		14	14	X5CrNi18-9	240 HB								190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	5.0	0.12	0.26	70	2.3	0.24	100
		14	14	S31500	310 HB								90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	7.0	0.15	0.32	150	3.0	0.27	190
		13	13	17-4 PH, 430	42 HRc								130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.46	150	3.0	0.34	200
		15	15	EN-GJL-250,	200 HB								180
		16	16	No30B	250 HB								160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	7.0	0.15	0.41	100	3.0	0.30	180
		17,19	17,19	50005	200 HB								150
		18,20	18,20		250 HB								130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.26	25	2.3	0.24	32
		33	33	Inconel 700	250 HB								30
		34	34	Stellite 21	350 HB								30
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.29	40	2.3	0.27	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc								60
		38	38	440C,	50 HRc	0.5	1.8	0.10	0.23	40	1.1	0.19	55
		38	38	G-X260NiCr42	55 HRc								50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.26	40	8.0	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.20	30	0.8	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.46	200	3.0	0.37	280

SEKN 1204 AFTN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.46	190	330	3.0	0.34	250		
			2	1045, 1060, 28Mn6	190 HB		7.0		0.46		300			220		
			3		250 HB		7.0		0.46		250			200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.36	150	240	3.0		0.30	200	
			4,6		230 HB		7.0		0.36	150	210			0.30	180	
			5,7		280 HB		7.0		0.32	130	190			0.27	150	
			8		350 HB		7.0		0.32	130	170			0.27	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.32	90	150	2.3		0.27	130	
			10		280 HB		5.0		0.32	90	130			0.27	120	
			11		320 HB		5.0		0.26	60	110			0.24	100	
			11		350 HB		5.0		0.26	60	90			0.24	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.15	0.32	190	250	3.0	0.27	220	
14				240 HB	7.0	0.12		0.29	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.0	0.12	0.26	70	130	2.3	0.24	100		
			14	310 HB	5.0		0.26		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.15	0.32	150	210	3.0	0.27	190		
			13	42 HRc	5.0		0.26		90	150	2.3			0.24	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.46	150	240	3.0	0.34	200		
			15	EN-GJL-250, No30B	200 HB		7.0		0.46		220			180		
			16	250 HB	7.0		0.46		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.41	100	200	3.0	0.30	180		
			17,19		200 HB		7.0		0.41		180			150		
			18,20		250 HB		7.0		0.41		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.26	25	45	2.3	0.24	32		
			33	Inconel 700	250 HB		5.0		0.26		45			30		
			34	Stellite 21	350 HB		5.0		0.26		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.29	40	65	2.3	0.27	55		
37	T40	-	5.0	0.26	30		55		0.24	40						
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	2.5	0.10	0.26	40	80	1.5	0.21	60		
			38	G-X260NiCr42	50 HRc		1.8		0.23		70			1.1	0.19	55
			38		55 HRc		1.5		0.20		60			0.8	0.18	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.26	40	80	1.1	0.21	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.20	30	60	0.8	0.18	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.46	200	400	3.0	0.37	280		

SEKN 1504 AFTN LT 30

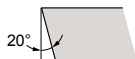
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	0.18	9.0	190	330	4.0	0.37	250
		2	2	1045, 1060,	190 HB			9.0		300			220
		3	3	28Mn6	250 HB			9.0		250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	0.15	9.0	150	240	4.0	0.32	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB			9.0		210			180
		5,7	5,7	100Cr6	280 HB			9.0		190			150
		8	8		350 HB			9.0		170			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	0.12	6.4	90	150	3.0	0.29	130
		10	10	H13, M42, D3,	280 HB			6.4		130			120
		11	11	S6-5-2, 12Ni19	320 HB			6.4		110			100
		11	11		350 HB			6.4		90			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	0.15	9.0	150	250	4.0	0.29	220
		14	14	X5CrNi18-9	240 HB			9.0		210			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	0.12	6.4	70	130	3.0	0.26	100
		14	14	S31500	310 HB			6.4		120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	0.15	9.0	150	210	4.0	0.29	190
		13	13	17-4 PH, 430	42 HRc			6.4		150			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	0.18	9.0	150	240	4.0	0.37	200
		15	15	EN-GJL-250,	200 HB			9.0		220			180
		16	16	No30B	250 HB			9.0		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	0.15	9.0	100	200	4.0	0.32	180
		17,19	17,19	50005	200 HB			9.0		180			150
		18,20	18,20		250 HB			9.0		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	0.12	6.4	25	45	3.0	0.26	32
		33	33	Inconel 700	250 HB			6.4		45			30
		34	34	Stellite 21	350 HB			6.4		45			30
	Ti based	10	36	TiAl6V4	-	0.5	0.12	6.4	40	65	3.0	0.29	55
		37	37	T40	-			6.4		55			40
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.5	0.10	3.2	40	80	2.0	0.22	60
		38	38	440C,	50 HRc			1.9		70			55
		38	38	G-X260NiCr42	55 HRc			1.6		60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.6	0.10	0.28	40	1.5	0.22	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.6	0.10	0.22	30	1.0	0.19	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	9.0	0.18	0.50	200	4.0	0.40	280



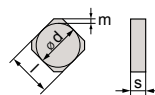
SEKR



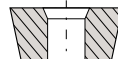
Shape



Clearance Angle



Tolerance
 $d \pm 0.08$
 $m \pm 0.013$
 $s \pm 0.025$



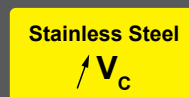
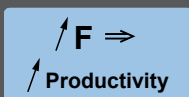
Insert Type
Clamping
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKR 1203 AFTN	LT 30	12.70	3.18	-	Neutral	M0000043
SEKR 1204 AFTN	LT 30	12.70	4.76	-	Neutral	M0000044

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert, designed for high depths of cut and materials that generate long chips.
Suitable for Roughing to Finishing-Face, Plunging and Ramping down Milling operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

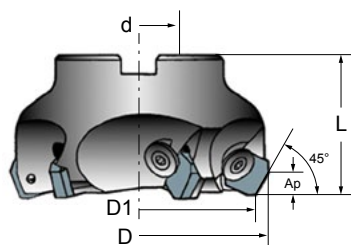
Shell Mill for SEKR 1203 AFTN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 550 M-D-D050/4*	63	50	22	48	6	4	M2000563
LT 550 M-D-D063/5*	76	63	22	48	6	5	M2000564
LT 550 M-D-D080/6*	93	80	27	50	6	6	M2000565
LT 550 M-D-D100/6*	113	100	32	50	6	6	M2000566
LT 550 M-D-D125/7*	138	125	40	63	6	7	M2000567
LT 550 M-D-D160/7*	173	160	40	63	6	7	M2000568
LT 550 M-D-D200/10*	213	200	60	63	6	10	M2000569
LT 550 M-D-D250/13*	263	250	60	63	6	13	M2000570

* On request

Screw: **M2000608**

Key: **M2000609**



SEKR

SEKR 1203 AFTN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.46	190	330	3.0	0.34	250		
			2	1045, 1060, 28Mn6	190 HB		7.0		0.46		300			220		
			3		250 HB		7.0		0.46		250			200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.36	150	240	3.0	0.30	200		
			4.6		230 HB		7.0		0.36	150	210			180		
			5,7		280 HB		7.0		0.32	130	190			150		
			8		350 HB		7.0		0.32	130	170			140		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.32	90	150	2.3	0.27	130		
			10		280 HB		5.0		0.32	90	130			120		
			11		320 HB		5.0		0.26	60	110			100		
			11		350 HB		5.0		0.26	60	90			80		
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.15	0.32	190	250	3.0	0.27	220	
14					240 HB	7.0		0.12	0.29	160	210	190				
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.0	0.12	0.26	70	130	2.3	0.24	100		
			14		310 HB		5.0		0.26	70	120			90		
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.15	0.32	150	210	3.0	0.27	190		
			13		42 HRc		5.0		0.26	90	150			2.3	0.24	130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.46	150	240	3.0	0.34	200		
			15	EN-GJL-250, No30B	200 HB		7.0		0.46		220			180		
			16		250 HB		7.0		0.46		190			160		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.41	100	200	3.0	0.30	180		
			17,19		200 HB		7.0		0.41		180			150		
			18,20		250 HB		7.0		0.41		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.26	25	45	2.3	0.24	32		
			33	Inconel 700	250 HB		5.0		0.26		45			30		
			34	Stellite 21	350 HB		5.0		0.26		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.29	40	65	2.3	0.27	55		
37			T40	-	5.0		0.26		30	55	0.24			40		
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	2.5	0.10	0.26	40	80	1.5	0.21	60		
			38	G-X260NiCr42	50 HRc		1.8		0.23		70			1.1	0.19	55
			38		55 HRc		1.5		0.20		60			0.8	0.18	50
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.26	40	80	1.1	0.21	50			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.20	30	60	0.8	0.18	40			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.46	200	400	3.0	0.37	280		

SEKR 1204 AFTN LT 30

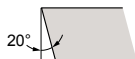
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.46	190	330	3.0	0.34	250
		2	1045, 1060,	190 HB		7.0		0.46		300			220
		3	28Mn6	250 HB		7.0		0.46		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	7.0	0.15	0.36	150	240	3.0	0.30	200
		4,6	Ck60, 4140, 4340,	230 HB		7.0		0.36		210			180
		5,7	100Cr6	280 HB		7.0		0.32		190			150
		8		350 HB		7.0		0.32		170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	5.0	0.12	0.32	90	150	2.3	0.27	130
		10	H13, M42, D3,	280 HB		5.0		0.32		130			120
		11	S6-5-2, 12Ni19	320 HB		5.0		0.26		110			100
		11		350 HB		5.0		0.26		90			80
Stainless Steel	Austenitic	4	14 304, 316,	180 HB	0.5	7.0	0.15	0.32	190	250	3.0	0.27	220
		14	X5CrNi18-9	240 HB		7.0		0.29		210			190
	Duplex	5	14 X2CrNiN23-4,	290 HB	0.5	5.0	0.12	0.26	70	130	2.3	0.24	100
		14	S31500	310 HB		5.0		0.26		120			90
	Ferritic & Martensitic	6	12 410, X6Cr17,	200 HB	0.5	7.0	0.15	0.32	150	210	3.0	0.27	190
		13	17-4 PH, 430	42 HRc		5.0		0.26		150			130
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	7.0	0.18	0.46	150	240	3.0	0.34	200
		15	EN-GJL-250,	200 HB		7.0		0.46		220			180
		16	No30B	250 HB		7.0		0.46		190			160
	Malleable & Nodular	8	17,19 GGG40, GGG70,	150 HB	0.5	7.0	0.15	0.41	100	200	3.0	0.30	180
		17,19	50005	200 HB		7.0		0.41		180			150
		18,20		250 HB		7.0		0.41		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.5	5.0	0.12	0.26	25	45	2.3	0.24	32
		33	Inconel 700	250 HB		5.0		0.26		45			30
		34	Stellite 21	350 HB		5.0		0.26		45			30
	Ti based	10	36 TiAl6V4	-	0.5	5.0	0.12	0.29	40	65	2.3	0.27	55
Hardened Mat.			37 T40	-		5.0		0.26		55			40
	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.5	0.10	0.26	40	80	1.5	0.21	60
		38	440C,	50 HRc		1.8		0.23		70			55
		38	G-X260NiCr42	55 HRc		1.5		0.20		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	2.0	0.10	0.26	40	80	1.1	0.21	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.20	30	60	0.8	0.18	40
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.5	7.0	0.18	0.46	200	400	3.0	0.37	280



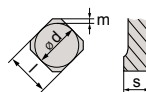
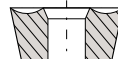
SEKT



Shape



Clearance Angle

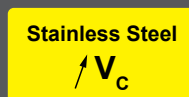
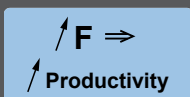

Tolerance
 $d \pm 0.08$
 $m \pm 0.013$
 $s \pm 0.025$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKT 12T3 AGSN	LT 30	13.40	3.97	-	Neutral	M0000455
SEKT 1204 AFTN	LT 30	12.70	4.76	-	Neutral	M0000045

Surfacing Insert Lead angle 45°

Multi purpose 45° Milling insert, designed for high depths of cut. Suitable for Roughing to Finishing-Face, Plunging and Ramping down Milling operations.

Application Guide



Machine Recommendations
Guide. Details on page 10

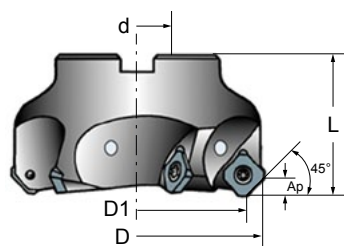
Shell Mill for SEKT 1204 AFTN

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 600 M-W-D040/3	53	40	16	40	6	3	10	M2000546
LT 600 M-W-D050/4	63	50	22	48	6	4	8	M2000547
LT 600 M-W-D063/5	76	63	22	48	6	5	6	M2000548
LT 600 M-W-D080/6	93	80	27	50	6	6	4.5	M2000549
LT 600 M-W-D100/6	113	100	32	50	6	6	3.5	M2000550
LT 600 M-W-D125/7	138	125	40	63	6	7	3	M2000551
LT 600 M-W-D160/8	173	160	40	63	6	8	2.2	M2000552

Screw: M2000599**Key: M2000603****Shell Mill for SEKT 12T3 AFTN**

Cutter Designation	D	D1	d	L	Ap	z	α	Catalog Nr.
LT 610 M-W-D040/3	53	40	16	40	6	3	10	M2001431
LT 610 M-W-D050/4	63	50	22	48	6	4	8	M2001382
LT 610 M-W-D063/5	76	63	22	48	6	5	6	M2001383
LT 610 M-W-D080/6	93	80	27	50	6	6	4.5	M2001384
LT 610 M-W-D100/6	113	100	32	50	6	6	3.5	M2001432
LT 610 M-W-D125/7	138	125	40	63	6	7	3	M2001433
LT 610 M-W-D160/8	173	160	40	63	6	8	2.2	M2001434

SEKT

Key: M2000602**Screw: M2001418**

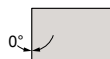
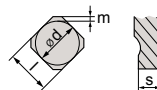
SEKT 12T3 AGSN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		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,	125 HB	0.5	7.0	0.18	0.46	190	330	3.0	0.34	250
			1045, 1060,	190 HB		7.0		0.46		300			220
			28Mn6	250 HB		7.0		0.46		250			200
	Low alloyed	2	6	180 HB	0.5	7.0	0.15	0.36	150	240	3.0	0.30	200
			4,6	230 HB		7.0		0.36	150	210			180
			5,7	280 HB		7.0		0.32	130	190			150
			8	350 HB		7.0		0.32	130	170			140
	High alloyed	3	10	220 HB	0.5	5.0	0.12	0.32	90	150	2.3	0.27	130
			10	280 HB		5.0		0.32	90	130			120
			11	320 HB		5.0		0.26	60	110			100
			11	350 HB		5.0		0.26	60	90			80
Stainless Steel	Austenitic	4	14	180 HB	0.5	7.0	0.15	0.32	190	250	3.0	0.27	220
			14	240 HB		7.0	0.12	0.29	160	210			190
	Duplex	5	14	290 HB	0.5	5.0	0.12	0.26	70	130	2.3	0.24	100
			14	310 HB		5.0		0.26	70	120			90
	Ferritic & Martensitic	6	12	200 HB	0.5	7.0	0.15	0.32	150	210	3.0	0.27	190
			13	42 HRc		5.0		0.26	90	150			130
Cast Iron	Grey	7	15	150 HB	0.5	7.0	0.18	0.46	150	240	3.0	0.34	200
			15	200 HB		7.0		0.46		220			180
			16	250 HB		7.0		0.46		190			160
	Malleable & Nodular	8	17,19	150 HB	0.5	7.0	0.15	0.41	100	200	3.0	0.30	180
			17,19	200 HB		7.0		0.41		180			150
			18,20	250 HB		7.0		0.41		150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.5	5.0	0.12	0.26	25	45	2.3	0.24	32
			33	Inconel 700		5.0		0.26		45			30
			34	Stellite 21		5.0		0.26		45			30
	Ti based	10	36	TiAl6V4	0.5	5.0	0.12	0.29	40	65	2.3	0.27	55
Hardened Mat.	Steel	11	38	X100CrMo13,		2.5		0.26	40	80	1.5	0.21	60
			38	440C,	0.5	1.8	0.10	0.23		70			55
			38	G-X260NiCr42		1.5		0.20		60			50
	Chilled Cast Iron		40	Ni-Hard 2	0.5	2.0	0.10	0.26	40	80	1.1	0.21	50
	White Cast Iron		41	G-X300CrMo15	0.5	1.5	0.10	0.20	30	60	0.8	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	0.5	7.0	0.18	0.46	200	400	3.0	0.37	280

SEKT 1204 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.46	330	3.0	0.34	250
		2	2	1045, 1060,	190 HB					300			220
		3	3	28Mn6	250 HB					250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	7.0	0.15	0.36	150 240	3.0	0.30	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB					150 210			180
		5,7	5,7	100Cr6	280 HB					130 190			150
		8	8		350 HB					130 170			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	5.0	0.12	0.32	90 150	2.3	0.27	130
		10	10	H13, M42, D3,	280 HB					90 130			120
		11	11	S6-5-2, 12Ni19	320 HB					60 110			100
		11	11		350 HB					60 90			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	7.0	0.15	0.32	190 250	3.0	0.27	220
		14	14	X5CrNi18-9	240 HB					160 210			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	5.0	0.12	0.26	70 130	2.3	0.24	100
		14	14	S31500	310 HB					120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	7.0	0.15	0.32	150 210	3.0	0.27	190
		13	13	17-4 PH, 430	42 HRc					90 150			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.46	240	3.0	0.34	200
		15	15	EN-GJL-250,	200 HB					220			180
		16	16	No30B	250 HB					190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	7.0	0.15	0.41	200	3.0	0.30	180
		17,19	17,19	50005	200 HB					180			150
		18,20	18,20		250 HB					150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.26	45	2.3	0.24	32
		33	33	Inconel 700	250 HB					25 45			30
		34	34	Stellite 21	350 HB					45			30
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.29	40 65	2.3	0.27	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc					80			60
		38	38	440C,	50 HRc	0.5	1.8	0.10	0.23	40 70	1.1	0.19	55
		38	38	G-X260NiCr42	55 HRc					60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.26	40 80	1.1	0.21	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.20	30 60	0.8	0.18	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.46	200 400	3.0	0.37	280


S
N
K
X

Shape

Clearance Angle

Tolerance
 $d \pm 0.05$
 $m \pm 0.013$
 $s \pm 0.025$

**Fixing
Chip breaker**

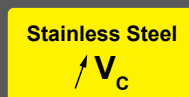
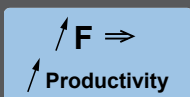
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-45°	LT 30	9.53	3.71	-	Right	M0001984
SNKX 1607-45°	LT 30	16.70	7.7	-	Neutral	M0002205

Octo-Quad Line

Surfacing Insert Lead angle 45°

Exclusive and unique design insert with 8 cutting edges for 45°. Suitable for general purpose milling.

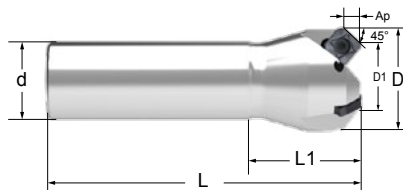
Application Guide



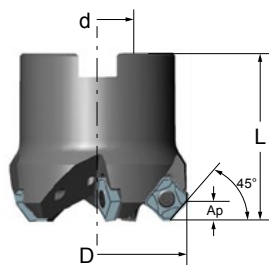
Machine Recommendations
Guide. Details on page 10

End Mill for SNKX 09T3-45°

Cutter Designation	D	D1	d	L1	L	Ap	z	Catalog Nr.
LT 945 W-D-D025/3	34.3	25	25	-	100	3	3	M2002075
LT 945 W-D-D032/4	41.3	32	32	40	110	3	4	M2002076

Screw: M2002101**Key: M2002911****Shell Mill for SNKX 09T3-45°**

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 945 M-W-D040/5	49.3	40	16	40	3	5	M2001988
LT 945 M-W-D050/6	59.3	50	22	45	3	6	M2002077
LT 945 M-W-D063/8	72.3	63	22	45	3	8	M2002078

Screw: M2002101**Key: M2002911****Shell Mill for SNKX 1607-45°**

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.	SNKX
LT 947 M-W-D050/4	69	50	22	50	7	4	M2002200	
LT 947 M-W-D063/5	82	63	22	50	7	5	M2002201	
LT 947 M-W-D080/6	99	80	27	50	7	6	M2002202	
LT 947 M-W-D100/7	119	100	32	63	7	7	M2002203	
LT 947 M-W-D125/8	144	125	40	63	7	8	M2002204	

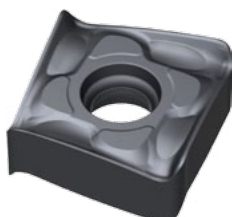
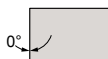
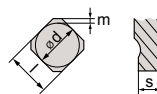
Screw: M2002733**Key: M2000603**

SNKX 09T3-45° LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	2.0	0.11	0.48	190	330	1.0	0.28	250
			2		190 HB		2.0		0.48		300			220
			3		250 HB		2.0		0.48		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	2.0	0.11	0.44	150	240	1.0	0.24	200
			4,6		230 HB		2.0		0.44	150	210		0.24	180
			5,7		280 HB		2.0		0.40	130	190		0.20	150
			8		350 HB		2.0		0.40	130	170		0.20	140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	2.0	0.11	0.38	90	150	1.0	0.20	130
			10		280 HB		2.0		0.38	90	130		0.20	120
			11		320 HB		2.0		0.36	60	110		0.16	100
			11		350 HB		2.0		0.36	60	90		0.16	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	2.0	0.11	0.48	150	240	1.0	0.28	200
			15		200 HB		2.0		0.48		220		0.28	180
			16		250 HB		2.0		0.48		190		0.24	160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	2.0	0.11	0.44	100	200	1.0	0.24	180
			17,19		200 HB		2.0		0.44		180		0.22	150
			18,20		250 HB		2.0		0.44		150		0.20	130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	1.5	0.11	0.30	40	80	0.8	0.16	60
			38		50 HRc		1.5		0.28		70	0.7		55
			38		55 HRc		1.0		0.26		60	0.6		50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	1.5	0.11	0.30	40	80	0.8	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.0	0.11	0.26	30	60	0.6	0.16	40

SNKX 1607-45° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	0.16	6.5	0.58	330	4.0	0.46	250
		2	2	1045, 1060,	190 HB			6.5	0.58	190			220
		3	3	28Mn6	250 HB			6.5	0.58	250			200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	0.14	6.5	0.50	150	4.0	0.40	200
		4,6	4,6	Ck60, 4140, 4340,	230 HB			6.5	0.50	150			180
		5,7	5,7	100Cr6	280 HB			6.5	0.44	130			150
		8	8		350 HB			6.5	0.44	130			140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	0.11	6.5	0.44	90	3.0	0.36	130
		10	10	H13, M42, D3,	280 HB			6.5	0.44	90			120
		11	11	S6-5-2, 12Ni19	320 HB			6.5	0.36	60			100
		11	11		350 HB			6.5	0.36	60			80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	0.14	6.5	0.44	190	4.0	0.34	220
		14	14	X5CrNi18-9	240 HB			6.5	0.44	160			190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	0.11	5.0	0.36	70	3.0	0.30	100
		14	14	S31500	310 HB			5.0	0.36	120			90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	0.14	6.5	0.44	150	4.0	0.34	190
		13	13	17-4 PH, 430	42 HRc			5.0	0.40	90			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	0.17	6.5	0.58	240	4.0	0.46	200
		15	15	EN-GJL-250,	200 HB			6.5	0.58	150			180
		16	16	No30B	250 HB			6.5	0.58	190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	0.14	6.5	0.52	200	4.0	0.40	180
		17,19	17,19	50005	200 HB			6.5	0.52	100			150
		18,20	18,20		250 HB			6.5	0.52	150			130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	0.11	5.0	0.36	45	3.0	0.30	32
		33	33	Inconel 700	250 HB			5.0	0.36	25			30
		34	34	Stellite 21	350 HB			5.0	0.36	45			30
	Ti based	10	36	TiAl6V4	-	0.5	0.11	5.0	0.40	40	3.0	0.34	55
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc			3.0	0.36	80			60
		38	38	440C,	50 HRc	0.4	0.10	3.0	0.32	40	1.5	0.26	55
		38	38	G-X260NiCr42	55 HRc			1.5	0.28	60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.4	0.10	3.0	0.36	40	1.5	0.28	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.4	0.10	1.5	0.28	30	1.0	0.24	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	0.17	6.5	0.60	200	4.0	0.50	280

**S****N****K****X****Shape****Clearance Angle**
Tolerance
 $d \pm 0.05$
 $m \pm 0.013$
 $s \pm 0.025$

Fixing
Chip breaker

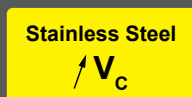
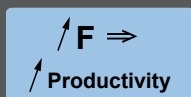
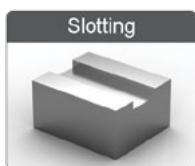
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-90°	LT 30	9.53	3.71	0.40	Right	M0001986
SNKX 1204-90°	LT 30	12.06	4.73	0.90	Right	M0002208

Octo-Quad Line

Surfacing Insert Lead angle 90°

Exclusive and unique design insert with 8 cutting edges for true 90°. Suitable for general purpose milling including Slotting, Square shoulder and Facing operations.

Application Guide



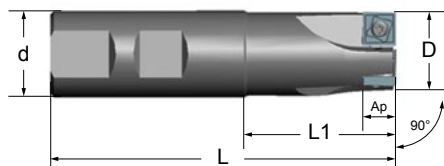
Machine Recommendations
Guide. Details on page 10

End Mill for SNKX 09T3-90°

Cutter Designation	D	d	L1	L	Ap	z	Catalog Nr.
LT 990 W-D-D025/3	25	25	44	100	8	3	M2001987
LT 990 W-D-D032/4	32	25	50	110	8	4	M2002070

Screw: M2002101

Key: M2002911

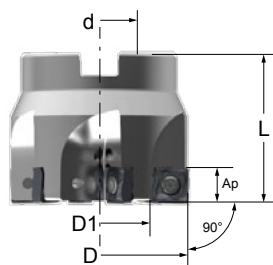


Shell Mill for SNKX 09T3-90°

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 990 M-W-D040/5	40	16	40	8	5	M2002072
LT 990 M-W-D050/6	50	22	40	8	6	M2002073
LT 990 M-W-D063/8	63	22	40	8	8	M2002074

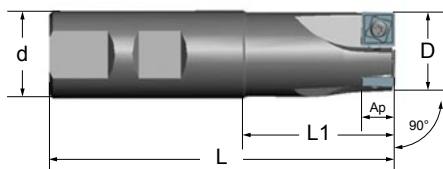
Screw: M2002101

Key: M2002911

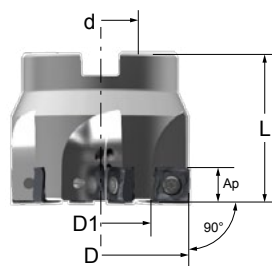


End Mill for SNKX 1204-90°

Cutter Designation	D	d	L1	L	Ap	z	Catalog Nr.
LT 991 W-W-D032/2	32	32	40	110	10	2	M2002191
LT 991 W-W-D040/3	40	32	45	110	10	3	M2002193
LT 991 WL-W-D032/2	32	32	65	170	10	2	M2002192
LT 991 WL-W-D040/3	40	32	65	170	10	3	M2002194

Screw: M2002101**Key: M2002911****Shell Mill for SNKX 1204-90°**

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 991 M-W-D063/5	63	22	40	10	5	M2002196
LT 991 M-W-D080/6	80	27	50	10	6	M2002197
LT 991 M-W-D100/7	100	32	50	10	7	M2002198
LT 991 M-W-D125/8	125	40	63	10	8	M2002199

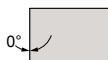
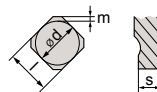
Screw: M2002101**Key: M2002911**

SNKX 1204-90° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	3.0	0.08	0.25	190	330	2.0	0.14	250
			2 1045, 1060,	190 HB		3.0		0.25		300			220
			3 28Mn6	250 HB		3.0		0.25		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	3.0	0.08	0.22	150	240	2.0	0.12	200
			4,6 Ck60, 4140, 4340,	230 HB		3.0		0.22	150	210			180
			5,7 100Cr6	280 HB		3.0		0.18	130	190			150
			8	350 HB		3.0		0.18	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	3.0	0.08	0.18	90	150	2.0	0.10	130
			10 H13, M42, D3,	280 HB		3.0		0.18	90	130			120
			11 S6-5-2, 12Ni19	320 HB		3.0		0.16	60	110			100
			11	350 HB		3.0		0.16	60	90			80
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	3.0	0.08	0.28	150	240	2.0	0.14	200
			15 EN-GJL-250,	200 HB		3.0		0.28		220			180
			16 No30B	250 HB		3.0		0.25		190			160
	Malleable & Nodular	8	17,19 GG40, GG670,	150 HB	0.5	3.0	0.08	0.25	100	200	2.0	0.12	180
			17,19 50005	200 HB		3.0		0.25		180			150
			18,20	250 HB		3.0		0.25		150			130
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRc	0.5	2.3	0.08	0.15	40	80	1.6	0.08	60
			38 440C,	50 HRc		2.3		0.14		70	1.4		55
			38 G-X260NiCr42	55 HRc		1.5		0.13		60	1.2		50
	Chilled Cast Iron		40 NI-Hard 2	400 HB	0.5	2.3	0.08	0.15	40	80	1.6	0.08	50
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.5	1.5	0.08	0.13	30	60	1.2	0.08	40

SNKX 09T3-90° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1 C35, Ck45, 1020,	125 HB	0.5	2.0	0.08	0.25	190	330	1.0	0.14	250
			2 1045, 1060,	190 HB		2.0		0.25		300			220
			3 28Mn6	250 HB		2.0		0.25		250			200
	Low alloyed	2	6 42CrMo4, St50,	180 HB	0.5	2.0	0.08	0.22	150	240	1.0	0.12	200
			4,6 Ck60, 4140, 4340,	230 HB		2.0		0.22	150	210			180
			5,7 100Cr6	280 HB		2.0		0.18	130	190			150
			8	350 HB		2.0		0.18	130	170			140
	High alloyed	3	10 X40CrMoV5,	220 HB	0.5	2.0	0.08	0.18	90	150	1.0	0.10	130
			10 H13, M42, D3,	280 HB		2.0		0.18	90	130			120
			11 S6-5-2, 12Ni19	320 HB		2.0		0.16	60	110			100
				350 HB		2.0		0.16	60	90			80
Cast Iron	Grey	7	15 GG20, GG40,	150 HB	0.5	2.0	0.08	0.28	150	240	1.0	0.14	200
			15 EN-GJL-250,	200 HB		2.0		0.28		220			180
			16 No30B	250 HB		2.0		0.25		190			160
	Malleable & Nodular	8	17,19 GG640, GG670,	150 HB	0.5	2.0	0.08	0.25	100	200	1.0	0.12	180
			17,19 50005	200 HB		2.0		0.25		180			150
			18,20	250 HB		2.0		0.25		150			130
Hardened Mat.	Steel	11	38 X100CrMo13,	45 HRC	0.5	1.5	0.08	0.15	40	80	0.8	0.08	60
			38 440C,	50 HRC		1.5		0.14		70			55
			38 G-X260NiCr42	55 HRC		1.0		0.13		60			50
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.5	1.5	0.08	0.15	40	80	0.8	0.08	50
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.5	1.0	0.08	0.13	30	60	0.6	0.08	40

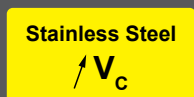
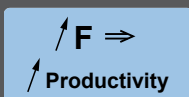
**S****N****K****X****Shape****Clearance Angle**
Tolerance
 $d \pm 0.05$
 $m \pm 0.013$
 $s \pm 0.025$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-HF	LT 30	9.67	3.71	-	Right	M0002115

Exclusive and unique design insert with 8 cutting edges for High Feed. Suitable for Roughing to Semi-Finishing Copying of 3D surfaces and Face Milling operations.

Application Guide



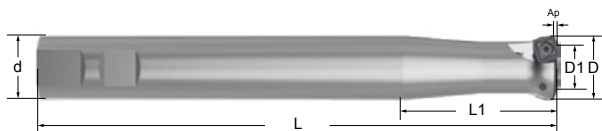
Machine Recommendations
Guide. Details on page 10

End Mill for SNKX 09T3-HF

Cutter Designation	D	D1	d	L1	L	Ap	z	α	Catalog Nr.
LT 900 W-W-D025/3	25	13.5	25	60	120	1	3	3.5	M2002118
LT 900 WL-W-D025/2	32	20.5	32	60	120	1	2	2	M2002117
LT 900 W-W-D032/4	25	13.5	25	60	200	1	4	3.5	M2002119
LT 900 WL-W-D032/3	32	20.5	32	60	200	1	3	2	M2002120

Screw: M2002101

Key: M2002911

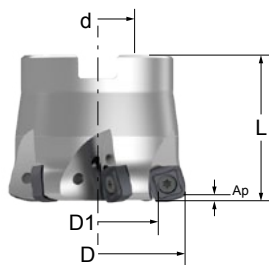


Shell Mill for SNKX 09T3-HF

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 900 M-W-D040/5	40	28.5	16	40	1	5	M2002121
LT 900 M-W-D042/5	42	30.5	16	5	1	5	M2002122
LT 900 M-W-D050/6	50	38.5	22	6	1	6	M2002123
LT 900 M-W-D052/6	52	40.5	22	6	1	6	M2002124
LT 900 M-W-D063/6	63	51.5	22	6	1	6	M2002125
LT 900 M-W-D066/6	66	54.5	22	6	1	6	M2002127

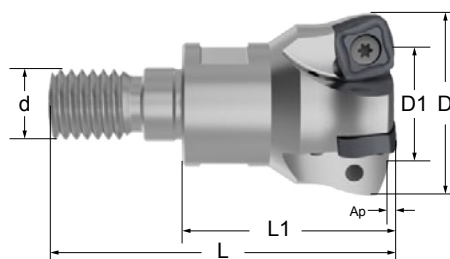
Screw: M2002101

Key: M2002911



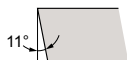
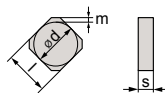
Screw Coupling End Mill for SNKX 09T3-HF

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 900 S-W-D025/3	25	13.5	M12	35	1	3	M2002128
LT 900 S-W-D032/4	32	20.5	M16	35	1	4	M2002129
LT 900 S-W-D035/4	35	23.5	M16	35	1	4	M2002130
Screw: M2002101		Key: M2002911					

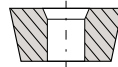


SNKX 09T3-HF LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.1	1.0	0.27	2.10	190	330	0.6	1.10	250
			2		190 HB		1.0		1.95		300			220
			3		250 HB		1.0		1.50		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.1	1.0	0.25	1.95	150	240	0.5	1.00	200
			4,6		230 HB		1.0		1.70		210			180
			5,7		280 HB		1.0		1.60		190			150
			8		350 HB		1.0		1.50		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.1	1.0	0.20	1.70	90	150	0.5	0.90	130
			10		280 HB		1.0		1.60		130			120
			11		320 HB		0.8		1.50		110			100
			11		350 HB		0.8		1.40		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.1	1.0	0.20	2.40	150	240	0.6	1.10	200
			15		200 HB		1.0		2.40		220			180
			16		250 HB		1.0		2.40		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.1	1.0	0.20	1.80	100	200	0.5	1.00	180
			17,19		200 HB		1.0		1.80		180			150
			18,20		250 HB		1.0		1.80		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.1	0.6	0.16	1.10	40	80	0.4	0.70	60
			38		50 HRc		0.5		1.00		70			55
			38		55 HRc		0.4		0.90		60			50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.1	0.6	0.16	1.10	40	80	0.4	0.70	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.1	0.4	0.16	0.90	30	60	0.3	0.60	40

**S****P****K****N****Shape****Clearance Angle****Tolerance**

$m \pm 0.013$ $s \pm 0.025$
For $l = 12$, $d \pm 0.08$
For $l = 15$, $d \pm 0.10$

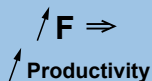
**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPKN 1203 EDTR	LT 30	12.70	3.21	1.20	Right	M0000046
SPKN 1204 EDTR	LT 30	12.70	4.76	1.20	Right	M0000047
SPKN 1504 EDTR	LT 30	15.88	4.76	1.60	Right	M0001673

Surfacing Insert Lead angle 75°

Square inserts with 75° lead angle, designed for High depths of cut. Suitable for Roughing to Finishing-Face Milling operations.

Application Guide

**SPKN**

Machine Recommendations Guide
Details on page 10

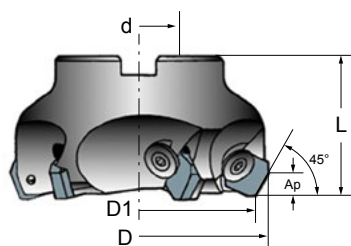
Shell Mill for SPKN 1203 EDTR

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 750 M-D-D063/4*	69	63	22	40	9	4	M2000571
LT 750 M-D-D080/5*	86	80	27	50	9	5	M2000572
LT 750 M-D-D100/7*	106	100	32	50	9	7	M2000574
LT 750 M-D-D125/8*	131	125	40	63	9	8	M2000575
LT 750 M-D-D160/10*	166	160	40	63	9	10	M2000576
LT 750 M-D-D200/12*	206	200	60	63	9	12	M2000577
LT 750 M-D-D250/14*	256	250	60	63	9	14	M2000578

* On request

Screw: M2000606

Key: M2000609



SPKN 1203 EDTR LT 30

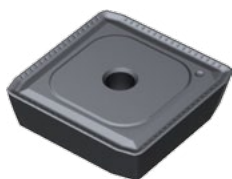
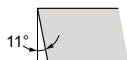
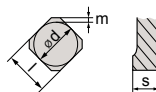
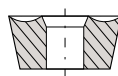
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	7.0	0.18	0.43	190	330	3.0	0.30	250
			2		190 HB		7.0		0.43		300			220
			3		250 HB		7.0		0.43		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.34	150	240	3.0	0.26	200
			4,6		230 HB		7.0		0.34		210			180
			5,7		280 HB		7.0		0.30		190			150
			8		350 HB		7.0		0.30		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.30	90	150	2.3	0.23	130
			10		280 HB		5.0		0.30		130			120
			11		320 HB		5.0		0.24		110			100
			11		350 HB		5.0		0.24		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.18	0.43	150	240	3.0	0.30	200
			15		200 HB		7.0		0.43		220			180
			16		250 HB		7.0		0.43		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.38	100	200	3.0	0.26	180
			17,19		200 HB		7.0		0.38		180			150
			18,20		250 HB		7.0		0.38		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.10	0.24	40	80	1.5	0.18	60
			38		50 HRc		1.8		0.22		70	1.1	0.17	55
			38		55 HRc		1.5		0.19		60	0.8	0.16	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.24	40	80	1.1	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.19	30	60	0.8	0.16	40

SPKN 1204 EDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	7.0	0.18	0.43	190	330	3.0	0.30	250
			2		190 HB		7.0		0.43		300			220
			3		250 HB		7.0		0.43		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.34	150	240	3.0	0.26	200
			4,6		230 HB		7.0		0.34		210			180
			5,7		280 HB		7.0		0.30		190			150
			8		350 HB		7.0		0.30		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.30	90	150	2.3	0.23	130
			10		280 HB		5.0		0.30		130			120
			11		320 HB		5.0		0.24		110			100
			11		350 HB		5.0		0.24		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.18	0.43	150	240	3.0	0.30	200
			15		200 HB		7.0		0.43		220			180
			16		250 HB		7.0		0.43		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.38	100	200	3.0	0.26	180
			17,19		200 HB		7.0		0.38		180			150
			18,20		250 HB		7.0		0.38		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.10	0.24	40	80	1.5	0.18	60
			38		50 HRc		1.8		0.22		70	1.1	0.17	55
			38		55 HRc		1.5		0.19		60	0.8	0.16	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.24	40	80	1.1	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.19	30	60	0.8	0.16	40

SPKN 1504 EDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	9.0	0.18	0.43	190	330	4.0	0.30	250
			2		190 HB		9.0		0.43		300			220
			3		250 HB		9.0		0.43		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	9.0	0.15	0.34	150	240	4.0	0.26	200
			4,6		230 HB		9.0		0.34		210			180
			5,7		280 HB		9.0		0.30		190			150
			8		350 HB		9.0		0.30		170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	6.5	0.12	0.30	90	150	3.0	0.23	130
			10		280 HB		6.5		0.30		130			120
			11		320 HB		6.5		0.24		110			100
			11		350 HB		6.5		0.24		90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	9.0	0.18	0.43	150	240	4.0	0.30	200
			15		200 HB		9.0		0.43		220			180
			16		250 HB		9.0		0.43		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	9.0	0.15	0.38	100	200	4.0	0.26	180
			17,19		200 HB		9.0		0.38		180			150
			18,20		250 HB		9.0		0.38		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	3.2	0.10	0.24	40	80	2.0	0.18	60
			38		50 HRc		2.3		0.22		70	1.5	0.17	55
			38		55 HRc		1.9		0.19		60	1.0	0.16	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.6	0.10	0.24	40	80	1.5	0.18	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.9	0.10	0.19	30	60	1.0	0.16	40

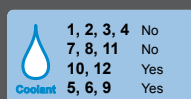
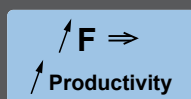
**S****P****K****R****Shape****Clearance Angle**
Tolerance
 $d \pm 0.08$
 $m \pm 0.013$
 $s \pm 0.025$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPKR 1203 EDTR	LT 30	12.70	3.21	-	Right	M0000048
SPKR 1204 EDTR	LT 30	12.70	4.76	-	Right	M0000049

Surfacing Insert Lead angle 75°

Square inserts, with 75° lead angle designed for high depths of cut and materials that generate long chips. Suitable for Roughing to Finishing-Face Milling operations.

Application Guide



Machine Recommendations Guide
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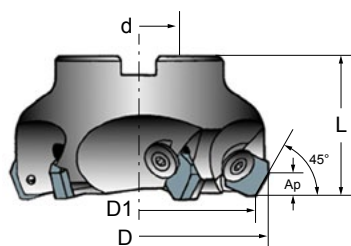
Shell Mill for SPKR 1203 EDTR

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 750 M-D-D063/4*	69	63	22	40	9	4	M2000571
LT 750 M-D-D080/5*	86	80	27	50	9	5	M2000572
LT 750 M-D-D100/7*	106	100	32	50	9	7	M2000574
LT 750 M-D-D125/8*	131	125	40	63	9	8	M2000575
LT 750 M-D-D160/10*	166	160	40	63	9	10	M2000576
LT 750 M-D-D200/12*	206	200	60	63	9	12	M2000577
LT 750 M-D-D250/14*	256	250	60	63	9	14	M2000578

* On request

Screw: M2000606

Key: M2000609



SPKR

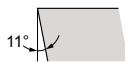
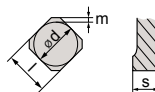
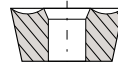
SPKR 1203 EDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.38	190	330	3.0	0.26	250		
			2	1045, 1060, 28Mn6	190 HB		7.0		0.38		300			220		
			3		250 HB		7.0		0.38		250			200		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.30	150	240	3.0	0.23	200		
			4,6		230 HB		7.0		0.30	150	210			0.23	180	
			5,7		280 HB		7.0		0.26	130	190			0.21	150	
			8		350 HB		7.0		0.26	130	170			0.21	140	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.26	90	150	2.3	0.21	130		
			10		280 HB		5.0		0.26	90	130			0.21	120	
			11		320 HB		5.0		0.22	60	110			0.18	100	
			11		350 HB		5.0		0.22	60	90			0.18	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.15	0.26	190	250	3.0	0.21	220	
14				240 HB	7.0	0.12		0.24	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.0	0.12	0.22	70	130	2.3	0.18	100		
			14	310 HB	5.0		0.22		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.15	0.26	150	210	3.0	0.21	190		
			13	42 HRc	5.0		0.22		90	150	2.3			0.18	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.38	150	240	3.0	0.26	200		
			15	EN-GJL-250, No30B	200 HB		7.0		0.38		220			180		
			16	250 HB	7.0		0.38		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.34	100	200	3.0	0.23	180		
			17,19		200 HB		7.0		0.34		180			150		
			18,20		250 HB		7.0		0.34		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.22	25	45	2.3	0.18	32		
			33	Inconel 700	250 HB		5.0		0.22		45			30		
			34	Stellite 21	350 HB		5.0		0.22		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.24	40	65	2.3	0.21	55		
			37	T40	-		5.0		0.22	30	55			0.18	40	
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	2.5	0.10	0.22	40	80	1.5	0.16	60		
			38	G-X260NiCr42	50 HRc		1.8		0.19		70			1.1	0.15	55
			38		55 HRc		1.5		0.17		60			0.8	0.14	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.22	40	80	1.1	0.16	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.17	30	60	0.8	0.14	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.38	200	400	3.0	0.29	280		

SPKR 1204 EDTR LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	7.0	0.18	0.38	190	330	3.0	0.26	250
			2	1045, 1060,	190 HB		0.38		300		220			
			3	28Mn6	250 HB		0.38		250		200			
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.30	150	240	3.0	0.23	200
			4,6		230 HB		0.30		150	210	0.23			180
			5,7		280 HB		0.26		130	190	0.21			150
			8		350 HB		0.26		130	170	0.21			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.26	90	150	2.3	0.21	130
			10		280 HB		0.26		90	130	0.21			120
			11		320 HB		0.22		60	110	0.18			100
			11		350 HB		0.22		60	90	0.18			80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	7.0	0.15	0.26	190	250	3.0	0.21	220
			14	240 HB	0.12		0.24	160	210	190				
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.5	5.0	0.12	0.22	70	130	2.3	0.18	100
			14	310 HB	5.0		0.22		120	90				
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	7.0	0.15	0.26	150	210	3.0	0.21	190
			13	42 HRc	0.22		90		150	2.3	0.18			130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	7.0	0.18	0.38	150	240	3.0	0.26	200
			15	EN-GJL-250, No30B	200 HB		0.38		220		180			
			16	250 HB	0.38		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.34	200	3.0	0.23	180	
			17,19		200 HB		0.34		180	150				
			18,20		250 HB		0.34		150	130				
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	5.0	0.12	0.22	45	2.3	0.18	32	
			33	Inconel 700	250 HB		0.22		25	45			30	
			34	Stellite 21	350 HB		0.22		45	30				
	Ti based	10	36	TiAl6V4	-	0.5	5.0	0.12	0.24	40	65	2.3	0.21	55
37	T40	-	5.0	0.22	30		55		0.18	40				
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	2.5	0.10	0.22	80	1.5	0.16	60	
			38	G-X260NiCr42	50 HRc		1.8		0.19	70	1.1	0.15	55	
			38	55 HRc	1.5		0.17		60	0.8	0.14	50		
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.22	40	80	1.1	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.17	30	60	0.8	0.14	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	7.0	0.18	0.38	200	400	3.0	0.29	280


S
P
M
T

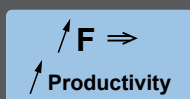
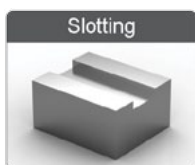
Shape

Clearance Angle

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

**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPMT 12T308	LT 30	13.29	3.97	0.80	Right	M0001226

Surfacing Insert Lead angle 45°

Multi purpose 90° Milling insert with 4 cutting edges. Suitable for Roughing to Finishing-Slotting, shoulder and Face Milling operations.

Application Guide

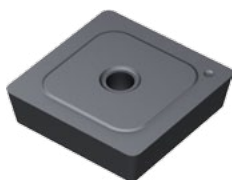


Machine Recommendations Guide
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SPMT 12T308 LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	9.0	0.13	0.29	190	330	3.0	0.18	250		
			2	1045, 1060, 28Mn6	190 HB		9.0		0.29					300	220	
			3		250 HB		9.0		0.29					250	200	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	9.0	0.11	0.23	150	240	3.0	0.16	200		
			4,6		230 HB		9.0		0.23	150	210			180		
			5,7		280 HB		9.0		0.20	130	190			150		
			8		350 HB		9.0		0.20	130	170			140		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	6.5	0.08	0.20	90	150	2.3	0.14	130		
			10		280 HB		6.5		0.20	90	130			120		
			11		320 HB		6.5		0.16	60	110			100		
			11		350 HB		6.5		0.16	60	90			80		
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	9.0	0.11	0.23	190	250	3.0	0.16	220	
14				240 HB	9.0	0.08		0.20	160	210	190					
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	6.5	0.08	0.16	70	130	2.3	0.13	100		
			14	310 HB	6.5		0.16		120					90		
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	9.0	0.11	0.23	150	210	3.0	0.16	190		
			13	42 HRc	6.5		0.18		90	150	2.3			0.13	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	9.0	0.13	0.29	150	240	3.0	0.18	200		
			15	EN-GJL-250, No30B	200 HB		9.0		0.29		220			180		
			16	250 HB	9.0		0.29		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	9.0	0.11	0.25	100	200	3.0	0.16	180		
			17,19		200 HB		9.0		0.25		180			150		
			18,20		250 HB		9.0		0.25		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	6.5	0.08	0.16	25	45	2.3	0.13	32		
			33	Inconel 700	250 HB		6.5		0.16		45			30		
			34	Stellite 21	350 HB		6.5		0.16		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	6.5	0.08	0.18	40	65	2.3	0.14	55		
37	T40	-	6.5	0.16	30		55		0.13	40						
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	3.2	0.07	0.16	40	80	1.5	0.11	60		
			38	G-X260NiCr42	50 HRc		1.9		0.14		70			1.1	0.10	55
			38		55 HRc		1.0		0.13		60			0.8	0.10	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.6	0.07	0.16	40	80	1.1	0.11	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.0	0.07	0.13	30	60	0.8	0.10	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	9.0	0.13	0.29	200	400	3.0	0.20	280		

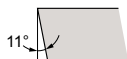
SPMT



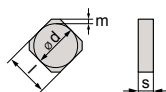
S P U N



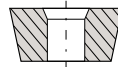
Shape



Clearance Angle



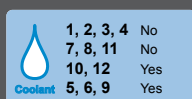
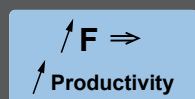
Tolerance

d $\pm$ 0.13m $\pm$ 0.20s $\pm$ 0.13Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPUN 120308	LT 30	12.70	3.18	0.80	Neutral	M0000050

Multi purpose Square insert with corner radius and a flat rake surface. Use for Face Milling. Roughing to Finishing

Application Guide



Machine Recommendations Guide
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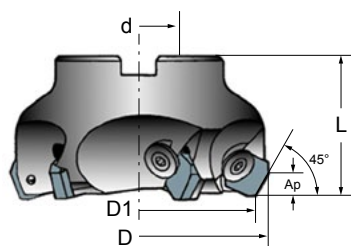
Shell Mill for SPUN 120308

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
LT 750 M-D-D063/4*	69	63	22	40	9	4	M2000571
LT 750 M-D-D080/5*	86	80	27	50	9	5	M2000572
LT 750 M-D-D100/7*	106	100	32	50	9	7	M2000574
LT 750 M-D-D125/8*	131	125	40	63	9	8	M2000575
LT 750 M-D-D160/10*	166	160	40	63	9	10	M2000576
LT 750 M-D-D200/12*	206	200	60	63	9	12	M2000577
LT 750 M-D-D250/14*	256	250	60	63	9	14	M2000578

* On request

Screw: M2000606

Key: M2000609



SPUN

SPUN 120308 LT 30

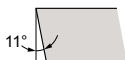
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	7.0	0.18	0.37	330		3.0	0.26	250
			2		190 HB		7.0		0.37	190	300			220
			3		250 HB		7.0		0.37	250				200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	7.0	0.15	0.29	150	240	3.0	0.23	200
			4,6		230 HB		7.0		0.29	150	210			180
			5,7		280 HB		7.0		0.25	130	190			150
			8		350 HB		7.0		0.25	130	170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	5.0	0.12	0.25	90	150	2.3	0.21	130
			10		280 HB		5.0		0.25	90	130			120
			11		320 HB		5.0		0.21	60	110			100
			11		350 HB		5.0		0.21	60	90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	7.0	0.18	0.37	240		3.0	0.26	200
			15		200 HB		7.0		0.37	150	220			180
			16		250 HB		7.0		0.37	190				160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	7.0	0.15	0.32	200		3.0	0.23	180
			17,19		200 HB		7.0		0.32	100	180			150
			18,20		250 HB		7.0		0.32	150				130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	2.5	0.10	0.21	80		1.5	0.16	60
			38		50 HRc		1.8		0.18	40	70	1.1	0.15	55
			38		55 HRc		1.5		0.16	60		0.8	0.14	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	2.0	0.10	0.21	40	80	1.1	0.16	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	1.5	0.10	0.16	30	60	0.8	0.14	40



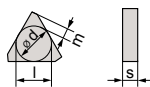
T P K N



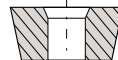
Shape



Clearance Angle



Tolerance
 $m \pm 0.013$ $s \pm 0.025$
 For $l = 16$, $d \pm 0.05$
 For $l = 22$, $d \pm 0.08$

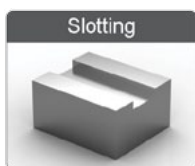


**Fixing
Chip breaker**

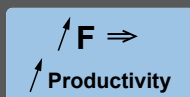
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPKN 1603 PDTR	LT 30	14.52	3.18	-	Right	M0000051
TPKN 2204 PDTR	LT 30	19.92	4.76	-	Right	M0000052

Multi purpose 90° Milling insert with 3 cutting edges. Use for Slotting, Shoulder Milling and Face Milling. Roughing to Finishing.

Application Guide



TPKN



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Shell Mill for TPKN 1603 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 310 M-D063/4*	63	22	50	16	4	M2000699
LT 310 M-D080/5*	80	27	50	16	5	M2000700
LT 310 M-D100/6*	100	32	50	16	6	M2000701
LT 310 M-D125/6*	125	40	63	16	6	M2000702

* On request

Screw: On request

Key: M2000609

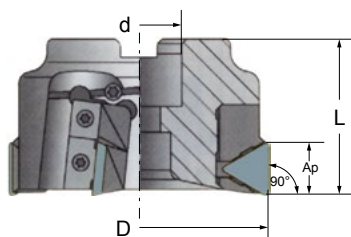
Shell Mill for TPKN 2204 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 320 M-D080/4*	80	27	50	20	4	M2000703
LT 320 M-D100/5*	100	32	50	20	5	M2000704
LT 320 M-D125/6*	125	40	63	20	6	M2000705
LT 320 M-D160/7*	160	40	63	20	7	M2000706

* On request

Screw: On request

Key: M2000609

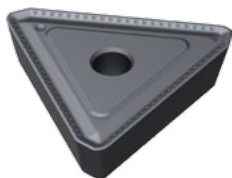


TPKN 1603 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		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	12.0	0.14	0.27	190	330	3.0	0.20	250
		2		190 HB		12.0		0.27	300				220
		3		250 HB		12.0		0.27	250				200
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	12.0	0.12	0.21	150	240	3.0	0.17	200
		4,6		230 HB		12.0		0.21	150	210			180
		5,7		280 HB		12.0		0.19	130	190			150
		8		350 HB		12.0		0.19	130	170			140
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	8.6	0.10	0.19	90	150	2.3	0.15	130
		10		280 HB		8.6		0.19	90	130			120
		11		320 HB		8.6		0.15	60	110			100
		11		350 HB		8.6		0.15	60	90			80
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	12.0	0.14	0.27	150	240	3.0	0.20	200
		15		200 HB		12.0		0.27	220				180
		16		250 HB		12.0		0.27	190				160
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.5	12.0	0.12	0.24	100	200	3.0	0.17	180
		17,19		200 HB		12.0		0.24	180				150
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc		4.3	0.08	0.15	40	80	1.5	0.12	60
		38		50 HRc		3.0		0.14	70		1.1	0.11	55
		38		55 HRc		2.6		0.12	60		0.8	0.10	50
	Chilled Cast Iron		Ni-Hard 2	400 HB	0.5	3.4	0.08	0.15	40	80	1.1	0.12	50
	White Cast Iron		G-X300CrMo15	55 HRc	0.5	2.6	0.08	0.12	30	60	0.8	0.10	40

TPKN 2204 PDTR LT 30

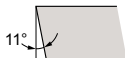
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	18.0	0.16	0.27	330	190	4.0	0.19	250
			2		190 HB		18.0		0.27	300				220
			3		250 HB		18.0		0.27	250				200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	18.0	0.14	0.21	150	240	4.0	0.17	200
			4,6		230 HB		18.0		0.21	150	210			180
			5,7		280 HB		18.0		0.19	130	190			150
			8		350 HB		18.0		0.19	130	170			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	12.9	0.11	0.19	90	150	3.0	0.15	130
			10		280 HB		12.9		0.19	90	130			120
			11		320 HB		12.9		0.15	60	110			100
			11		350 HB		12.9		0.15	60	90			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	18.0	0.16	0.27	240	150	4.0	0.19	200
			15		200 HB		18.0		0.27	220				180
			16		250 HB		18.0		0.27	190				160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	18.0	0.14	0.24	200	100	4.0	0.17	180
			17,19		200 HB		18.0		0.24	180				150
			18,20		250 HB		18.0		0.24	150				130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	6.4	0.09	0.15	80	40	2.0	0.12	60
			38		50 HRc		4.5		0.14	70	40	1.5	0.11	55
			38		55 HRc		3.9		0.12	60	40	1.0	0.10	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	5.1	0.09	0.15	40	80	1.5	0.12	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	3.9	0.09	0.12	30	60	1.0	0.10	40



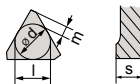
T P K R



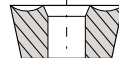
Shape



Clearance Angle



Tolerance
 $m \pm 0.013$ $s \pm 0.025$
 For $l = 16$, $d \pm 0.05$
 For $l = 22$, $d \pm 0.08$

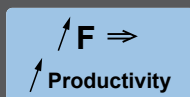


**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPKR 1603 PDTR	LT 30	14.52	3.18	1.20	Right	M0000053
TPKR 2204 PDTR	LT 30	19.92	4.76	1.20	Right	M0000983

Multi purpose 90° Milling insert with 3 cutting edges, designed for materials that generate long chips.
 Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

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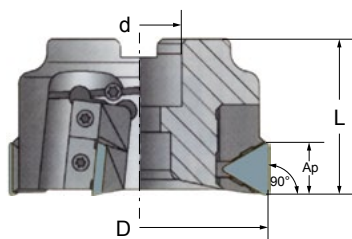
TPKR

Shell Mill for TPKR 1603 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 310 M-D063/4*	63	22	50	16	4	M2000699
LT 310 M-D080/5*	80	27	50	16	5	M2000700
LT 310 M-D100/6*	100	32	50	16	6	M2000701
LT 310 M-D125/6*	125	40	63	16	6	M2000702
* On request	Screw: On request			Key: M2000609		

Shell Mill for TPKR 2204 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 320 M-D080/4*	80	27	50	20	4	M2000703
LT 320 M-D100/5*	100	32	50	20	5	M2000704
LT 320 M-D125/6*	125	40	63	20	6	M2000705
LT 320 M-D160/7*	160	40	63	20	7	M2000706
* On request	Screw: On request			Key: M2000609		

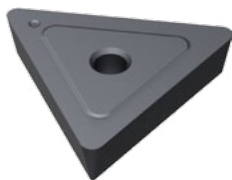


TPKR 1603 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	12.0	0.16	0.22	190	3.0	0.17	250
		2	2	1045, 1060,	190 HB								220
		3	3	28Mn6	250 HB								200
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.5	12.0	0.14	0.18	150	3.0	0.15	200
		4,6	4	Ck60, 4140, 4340,	230 HB								180
		5,7	5	100Cr6	280 HB								150
		8	8		350 HB								140
	High alloyed	3	10	X40CrMoV5,	220 HB	0.5	8.6	0.11	0.15	90	2.3	0.13	130
		10	10	H13, M42, D3,	280 HB								120
		11	11	S6-5-2, 12Ni19	320 HB								100
		11	11		350 HB								80
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.5	12.0	0.14	0.15	190	3.0	0.13	220
		14	14	X5CrNi18-9	240 HB								190
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.5	8.6	0.11	0.13	70	2.3	0.12	100
		14	14	S31500	310 HB								90
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.5	12.0	0.14	0.15	150	3.0	0.13	190
		13	13	17-4 PH, 430	42 HRc								130
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	12.0	0.16	0.22	150	3.0	0.17	200
		15	15	EN-GJL-250,	200 HB								180
		16	16	No30B	250 HB								160
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.5	12.0	0.14	0.20	100	3.0	0.15	180
		17,19	17,19	50005	200 HB								150
		18,20	18,20		250 HB								130
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	8.6	0.11	0.13	25	2.3	0.12	32
		33	33	Inconel 700	250 HB								30
		34	34	Stellite 21	350 HB								30
	Ti based	10	36	TiAl6V4	-	0.5	8.6	0.11	0.14	40	2.3	0.13	55
Hardened Mat.			37	T40	-								40
	Steel	11	38	X100CrMo13,	45 HRc	0.5	4.3	0.09	0.13	40	1.5	0.10	60
			38	440C,	50 HRc								55
			38	G-X260NiCr42	55 HRc								50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	3.4	0.09	0.13	40	1.1	0.10	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	2.6	0.09	0.10	30	0.8	0.09	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	12.0	0.16	0.22	200	3.0	0.18	280

TPKR 2204 PDTR LT 30

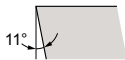
Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions				
						min	max	min	max	min	max	D.O.C.	Feed	V _c		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.5	18.0	0.16	0.22	190	330	4.0	0.17	250		
			2	1045, 1060, 28Mn6	190 HB		0.22		300		220					
			3		250 HB		0.22		250		200					
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	18.0	0.14	0.18	150	240	4.0		0.15	200	
			4,6		230 HB		0.18		150	210	0.15			180		
			5,7		280 HB		0.15		130	190	0.13			150		
			8		350 HB		0.15		130	170	0.13			140		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	12.9	0.11	0.15	90	150	3.0		0.13	130	
			10		280 HB		12.9		0.15	90	130			0.13	120	
			11		320 HB		12.9		0.13	60	110			0.12	100	
			11		350 HB		12.9		0.13	60	90			0.12	80	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.5	18.0	0.14	0.15	190	250	4.0	0.13	220	
14				240 HB	0.11	0.14		160	210	190						
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.5	12.9	0.11	0.13	70	130	3.0	0.12	100		
			14	310 HB	12.9		0.13		120	90						
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.5	18.0	0.14	0.15	150	210	4.0	0.13	190		
			13	42 HRc	12.9		0.13		90	150	3.0			0.12	130	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.5	18.0	0.16	0.22	150	240	4.0	0.17	200		
			15	EN-GJL-250, No30B	200 HB		0.22		220		180					
			16	250 HB	18.0		0.22		190		160					
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	18.0	0.14	0.20	100	200	4.0	0.15	180		
			17,19		200 HB		18.0		0.20		180			150		
			18,20		250 HB		18.0		0.20		150			130		
High Temp.Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.5	12.9	0.11	0.13	25	45	3.0	0.12	32		
			33	Inconel 700	250 HB		12.9		0.13		45			30		
			34	Stellite 21	350 HB		12.9		0.13		45			30		
	Ti based	10	36	TiAl6V4	-	0.5	12.9	0.11	0.14	40	65	3.0	0.13	55		
			37	T40	-		12.9		0.13	30	55			0.12	40	
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	0.5	6.4	0.09	0.13	40	80	2.0	0.10	60		
			38	G-X260NiCr42	50 HRc		4.5		0.11		70			1.5	0.09	55
				55 HRc	3.9		0.10		60		1.0			0.09	50	
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	5.1	0.09	0.13	40	80	1.5	0.10	50		
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	3.9	0.09	0.10	30	60	1.0	0.09	40		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.5	18.0	0.16	0.22	200	400	4.0	0.18	280		



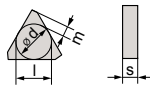
T P U N



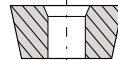
Shape



Clearance Angle



Tolerance

d $\pm$ 0.08m $\pm$ 0.13s $\pm$ 0.13Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPUN 160308	LT 30	13.49	3.18	0.80	Right	M0000054

Multi purpose 90° Milling insert with 3 cutting edges and corner radius. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



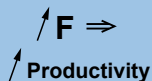
Slotting



Shoulder Milling



Surfacing



Productivity



1, 2, 3, 4	No
7, 8, 11	No
10, 12	Yes
5, 6, 9	Yes

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TPUN

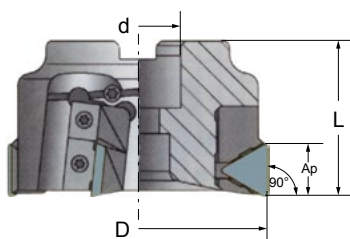
Shell Mill for TPUN 160308

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
LT 310 M-D063/4*	63	22	50	16	4	M2000699
LT 310 M-D080/5*	80	27	50	16	5	M2000700
LT 310 M-D100/6*	100	32	50	16	6	M2000701
LT 310 M-D125/6*	125	40	63	16	6	M2000702

* On request

Screw: On request

Key: M2000609



TPUN 160308 LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. (mm)		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C.	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.5	12.0	0.14	0.27	190	330	3.0	0.20	250
			2		190 HB		12.0		0.27		300			220
			3		250 HB		12.0		0.27		250			200
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.5	12.0	0.12	0.21	150	240	3.0	0.17	200
			4,6		230 HB		12.0		0.21		210			180
			5,7		280 HB		12.0		0.19		130			150
			8		350 HB		12.0		0.19		130			140
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.5	8.6	0.10	0.19	90	150	2.3	0.15	130
			10		280 HB		8.6		0.19		130			120
			11		320 HB		8.6		0.15		60			100
			11		350 HB		8.6		0.15		60			80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.5	12.0	0.14	0.27	150	240	3.0	0.20	200
			15		200 HB		12.0		0.27		220			180
			16		250 HB		12.0		0.27		190			160
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.5	12.0	0.12	0.24	100	200	3.0	0.17	180
			17,19		200 HB		12.0		0.24		180			150
			18,20		250 HB		12.0		0.24		150			130
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.5	4.3	0.08	0.15	40	80	1.5	0.12	60
			38		50 HRc		3.0		0.14		70	1.1	0.11	55
			38		55 HRc		2.6		0.12		60	0.8	0.10	50
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.5	3.4	0.08	0.15	40	80	1.1	0.12	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.5	2.6	0.08	0.12	30	60	0.8	0.10	40

The Lamina Multi-Mat™ Concept is also about
Reducing environmental impacts !

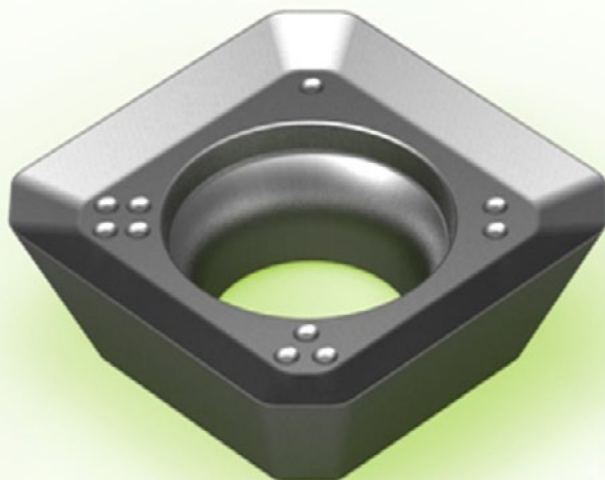


- By machining more materials without coolant
- By using less machine energy consumption
- By reducing unused insert stock

Lamina Multi-Mat™ Concept
The only alternative for Today and TOMORROW

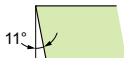
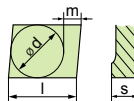
Alu-Milling

LT 05 Alu-Milling



ALU-MILLING LINE

ALU-
Milling

**A****P****G****T****Shape****Clearance Angle**
Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.13$

Fixing
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
APGT 1003 PDER ALU	LT 05	11.24	3.47	0.56	Right	M0001007
APGT 1604 PDER ALU	LT 05	17.03	4.76	0.95	Right	M0000963

Surfacing Insert Lead angle 90°

Highly positive inserts with a unique coating and 90° lead angle for Aluminium. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



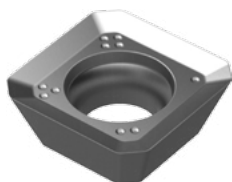
For APTG 10 Milling bodies, see APTG 10 cutters p.167
 For APTG 16 Milling bodies, see APTG 16 cutters p.175

APGT 1003 PDER ALU LT 05

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C	Feed	V _c
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.3	9.0	0.12	0.20	400	1200	3.0	0.14	500
			23, 24	4% < Si < 8 %	100 HB		9.0	0.10	0.18	250	600			400
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.3	9.0	0.10	0.18	100	800	3.0	0.14	300
	Non-Metallic	15	29	Fiber Plastics	-	0.3	9.0	0.12	0.20	80	500	3.0	0.12	200
			30	Hard Rubber	-		9.0		0.20	80	300			150
			-	Graphite	-		9.0		0.20	100	200			150
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.3	5.0	0.08	0.20	35	60	2.0	0.12	45
		37	TiAl 6 V4	-	5.0		0.15		28	45	35			

APGT 1604 PDER ALU LT 05

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
						min	max	min	max	min	max	D.O.C	Feed	V _c
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.5	15.0	0.15	0.32	400	1200	4.0	0.16	500
			23, 24	4% < Si < 8 %	100 HB		15.0	0.13	0.29	250	600			400
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.5	15.0	0.13	0.29	100	800	4.0	0.16	300
	Non-Metallic	15	29	Fiber Plastics	-	0.5	15.0	0.15	0.32	80	500	4.0	0.14	200
			30	Hard Rubber	-		15.0		0.32	80	300			150
			-	Graphite	-		15.0		0.32	100	200			150
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.5	15.0	0.10	0.32	35	60	4.0	0.14	45
		37	TiAl 6 V4	-	15.0		0.24		28	45	35			



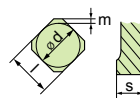
SEGT



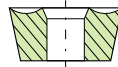
Shape



Clearance Angle



Tolerance
 $d \pm 0.025$
 $m \pm 0.025$
 $s \pm 0.13$



**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEGT 1204 AFEN ALU	LT 05	12.70	4.76	0.84	Neutral	M0001008

Surfacing Insert Lead angle 45°

Highly positive inserts with a unique coating and 90° lead angle for Aluminium. Suitable for Roughing to Finishing-Slotting, Shoulder and Face Milling operations.

Application Guide



For SEGT 1204 Milling bodies, see SEKT cutters p. 237

SEGT 1204 AFEN ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [mm]		Feed [mm/tooth]		V _c [m/min]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V _c
NF	Al (<8%Si)	13	21, 22 23, 24	Si < 4 % 4% < Si < 8 %	0.3	9.0	0.12	0.35	400	1200	3.0	0.25	500
						9.0	0.10	0.35	250	600			400
	Cooper Alloys	14	26, 27, 28	CuZn30	0.3	9.0	0.10	0.35	100	800	3.0	0.25	300
	Non-Metallic	15	29	Fiber Plastics	0.3	9.0	0.12	0.35	80	500	3.0	0.20	200
			30	Hard Rubber		9.0		0.35	80	300			150
			-	Graphite		9.0		0.35	100	200			150
H.T.A.	Ti based Alloys	10	36	Ti 1	0.3	5.0	0.08	0.35	35	60	2.0	0.20	45
			37	TiAl 6 V4		5.0		0.28	28	45			35

MULTI-MAT™

The Lamina Multi-Mat™ LT 30 Grade for Drilling
can machine most materials with
ONLY ONE GRADE



Steel



Stainless Steel



Cast Iron



High Temp. Alloys



Hardened Steel

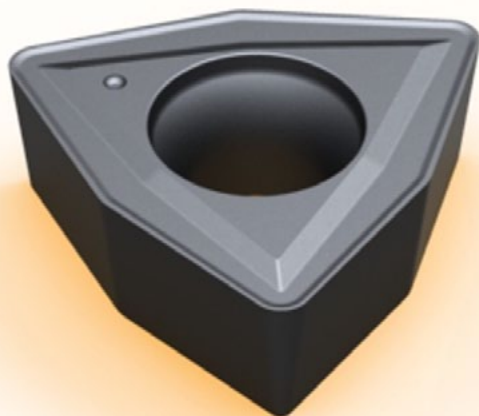


Aluminium & Non ferrous Alloys

True Multi-Mat™ inserts for real productivity

Drilling

LT 30 Multi-Mat™ Drilling

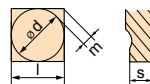
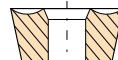


MULTI-MAT™ DRILLING LINE

DRILLING


S
P
M
G

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	Direction	Catalog Nr.
SPMG 060204 NN*	LT 30	6.00	2.38	0.40	Right	M3002913
SPMG 07T308 NN*	LT 30	7.94	3.97	0.80	Right	M3002914
SPMG 090408 NN*	LT 30	9.80	4.30	0.80	Right	M3002915

*Available from Q1 2013

Square inserts for Drilling. Strong cutting edges for High feeds.

SPMG 060204 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.04	0.09	180	270	0.07	225
			2	1045, 1060,	190 HB		0.09		230	0.05	115
			3	28Mn6	250 HB		0.09		200	0.05	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.04	0.09	120	230	0.07	175
			4,6		230 HB		0.09	120	190	0.05	155
			5,7		280 HB		0.09	100	170	0.04	135
			8		350 HB		0.09	100	150	0.04	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.05	0.09	70	170	0.07	120
			10		280 HB		0.09	70	150	0.05	110
			11		320 HB		0.08	60	130	0.04	95
			11		350 HB		0.08	60	100	0.04	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.04	0.09	170	230	0.06	200
			14		240 HB	0.05	0.09	120	210	0.07	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.05	0.08	70	120	0.07	95
			14		310 HB				120	0.04	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.05	0.08	100	150	0.07	125
			13		42 HRc	0.04	0.07	60	100	0.05	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.07	0.10	150	230	0.09	190
			15		200 HB				210	0.05	105
			16		250 HB				170	0.05	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.07	0.10	120	200	0.09	160
			17,19		200 HB				170	0.05	85
			18,20		250 HB				150	0.05	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.04	0.07	25	35	0.05	30
			33	Inconel 700	250 HB		0.07	25	35	0.04	30
			34	Stellite 21	350 HB		0.07	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.04	0.07	35	60	0.05	45
			37	T40	-		0.07	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.04	0.07	50	90	0.05	70
			38		50 HRc		0.07	40	70	0.04	55
			38		55 HRc		0.07	30	60	0.04	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.04	0.07	40	60	0.05	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.04	0.07	30	50	0.05	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.04	0.09	200	400	0.07	300

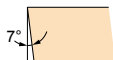
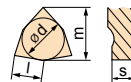
SPMG 07T308 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.05	0.10	180	270	0.08	225
			2	1045, 1060,	190 HB		0.10		230	0.05	115
			3	28Mn6	250 HB		0.10		200	0.05	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.05	0.10	120	230	0.08	175
			4,6		230 HB		0.10	120	190	0.05	155
			5,7		280 HB		0.10	100	170	0.05	135
			8		350 HB		0.10	100	150	0.05	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.07	0.10	70	170	0.09	120
			10		280 HB		0.10	70	150	0.05	110
			11		320 HB		0.09	60	130	0.04	95
			11		350 HB		0.09	60	100	0.04	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.05	0.10	170	230	0.07	200
			14		240 HB	0.07	0.10	120	210	0.08	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.07	0.09	70	120	0.08	95
			14		310 HB		0.09		120	0.04	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.07	0.09	100	150	0.08	125
			13		42 HRC	0.05	0.08	60	100	0.07	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.10	0.11	150	230	0.11	190
			15		200 HB		0.11		210	0.06	105
			16		250 HB		0.11		170	0.06	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.10	0.11	120	200	0.11	160
			17,19		200 HB		0.11		170	0.06	85
			18,20		250 HB		0.11		150	0.06	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.05	0.08	25	35	0.07	30
			33	Inconel 700	250 HB		0.08	25	35	0.04	30
			34	Stellite 21	350 HB		0.08	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.05	0.08	35	60	0.07	45
			37	T40	-		0.08	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.05	0.08	50	90	0.07	70
			38		50 HRC		0.08	40	70	0.04	55
			38		55 HRC		0.08	30	60	0.04	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.05	0.08	40	60	0.07	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.05	0.08	30	50	0.07	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.05	0.10	200	400	0.08	300

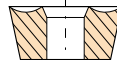
SPMG 090408 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.06	0.11	180	270	0.09	225
			2	1045, 1060,	190 HB		0.11		230	0.06	115
			3	28Mn6	250 HB		0.11		200	0.06	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.06	0.11	120	230	0.09	175
			4,6		230 HB		0.11	120	190	0.06	155
			5,7		280 HB		0.11	100	170	0.05	135
			8		350 HB		0.11	100	150	0.05	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.09	0.11	70	170	0.10	120
			10		280 HB		0.11	70	150	0.06	110
			11		320 HB		0.10	60	130	0.05	95
			11		350 HB		0.10	60	100	0.05	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.06	0.11	170	230	0.08	200
			14		240 HB	0.09	0.11	120	210	0.10	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.09	0.10	70	120	0.09	95
			14		310 HB		0.10		120	0.05	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.09	0.10	100	150	0.09	125
			13		42 HRc	0.06	0.09	60	100	0.08	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.13	0.12	150	230	0.12	190
			15		200 HB		0.12		210	0.06	105
			16		250 HB		0.12		170	0.06	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.13	0.12	120	200	0.12	160
			17,19		200 HB		0.12		170	0.06	85
			18,20		250 HB		0.12		150	0.06	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.06	0.09	25	35	0.08	30
			33	Inconel 700	250 HB		0.09	25	35	0.04	30
			34	Stellite 21	350 HB		0.09	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.06	0.09	35	60	0.08	45
			37	T40	-		0.09	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.06	0.09	50	90	0.08	70
			38		50 HRc		0.09	40	70	0.04	55
			38		55 HRc		0.09	30	60	0.04	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.06	0.09	40	60	0.08	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.06	0.09	30	50	0.08	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.06	0.11	200	400	0.09	300


W
C
M
X

Shape

Clearance Angle

Tolerance

$s \pm 0.13$
 For $l = 04/05/06$, $d \pm 0.05$ $m \pm 0.08$
 For $l = 08$, $d \pm 0.08$ $m \pm 0.13$


**Fixing
Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
WCMX 040208 NN	LT 30	4.0	2.38	0.80	Neutral	M3001122
WCMX 050308 NN	LT 30	5.0	3.18	0.80	Neutral	M3001121
WCMX 06T308 NN	LT 30	6.0	3.97	0.80	Neutral	M3000953
WCMX 080412 NN	LT 30	7.0	4.76	1.20	Neutral	M3000954

Trigon inserts for Drilling. Strong cutting edges for High feeds.

WCMX 040208 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.05	0.10	180	270	0.08	225
			2	1045, 1060, 28Mn6	190 HB		0.10		230	0.05	115
			3		250 HB		0.10		200	0.05	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.05	0.10	120	230	0.08	175
			4,6		230 HB		0.10	120	190	0.05	155
			5,7		280 HB		0.10	100	170	0.05	135
			8		350 HB		0.10	100	150	0.05	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.07	0.10	70	170	0.09	120
			10		280 HB		0.10	70	150	0.05	110
			11		320 HB		0.09	60	130	0.04	95
			11		350 HB		0.09	60	100	0.04	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.05	0.10	170	230	0.07	200
			14		240 HB	0.07	0.10	120	210	0.08	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.07	0.09	70	120	0.08	95
			14		310 HB		0.09		120	0.04	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.07	0.09	100	150	0.08	125
			13		42 HRc	0.05	0.08	60	100	0.07	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.10	0.11	150	230	0.11	190
			15		200 HB		0.11		210	0.06	105
			16		250 HB		0.11		170	0.06	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.10	0.11	120	200	0.11	160
			17,19		200 HB		0.11		170	0.06	85
			18,20		250 HB		0.11		150	0.06	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.05	0.08	25	35	0.07	30
			33	Inconel 700	250 HB		0.08	25	35	0.04	30
			34	Stellite 21	350 HB		0.08	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.05	0.08	35	60	0.07	45
			37	T40	-		0.08	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.05	0.08	50	90	0.07	70
			38		50 HRc		0.08	40	70	0.04	55
			38		55 HRc		0.08	30	60	0.04	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.05	0.08	40	60	0.07	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.05	0.08	30	50	0.07	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.05	0.10	200	400	0.08	300

WCMX 050308 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.06	0.11	180	270	0.09	225
			2	1045, 1060,	190 HB		0.11		230	0.06	115
			3	28Mn6	250 HB		0.11		200	0.06	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.06	0.11	120	230	0.09	175
			4,6		230 HB		0.11	120	190	0.06	155
			5,7		280 HB		0.11	100	170	0.05	135
			8		350 HB		0.11	100	150	0.05	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.09	0.11	70	170	0.10	120
			10		280 HB		0.11	70	150	0.06	110
			11		320 HB		0.10	60	130	0.05	95
			11		350 HB		0.10	60	100	0.05	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.06	0.11	170	230	0.08	200
			14		240 HB	0.09	0.11	120	210	0.10	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.09	0.10	70	120	0.09	95
			14		310 HB		0.10		120	0.05	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.09	0.10	100	150	0.09	125
			13		42 HRC	0.06	0.09	60	100	0.08	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.13	0.12	150	230	0.12	190
			15		200 HB		0.12		210	0.06	105
			16		250 HB		0.12		170	0.06	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.13	0.12	120	200	0.12	160
			17,19		200 HB		0.12		170	0.06	85
			18,20		250 HB		0.12		150	0.06	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.06	0.09	25	35	0.08	30
			33	Inconel 700	250 HB		0.09	25	35	0.04	30
			34	Stellite 21	350 HB		0.09	23	35	0.04	29
	Ti based	10	36	TiAl6V4	-	0.06	0.09	35	60	0.08	45
			37	T40	-		0.09	28	40	0.04	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.06	0.09	50	90	0.08	70
			38		50 HRC		0.09	40	70	0.04	55
			38		55 HRC		0.09	30	60	0.04	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.06	0.09	40	60	0.08	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.06	0.09	30	50	0.08	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.06	0.11	200	400	0.09	300

WCMX 06T308 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.06	0.12	180	270	0.09	225
			2	1045, 1060, 28Mn6	190 HB		0.12		230	0.06	115
			3		250 HB		0.12		200	0.06	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.06	0.12	120	230	0.09	175
			4,6		230 HB		0.12	120	190	0.06	155
			5,7		280 HB		0.12	100	170	0.06	135
			8		350 HB		0.12	100	150	0.06	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.08	0.12	70	170	0.10	120
			10		280 HB		0.12	70	150	0.06	110
			11		320 HB		0.11	60	130	0.05	95
			11		350 HB		0.11	60	100	0.05	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.06	0.12	170	230	0.09	200
			14		240 HB	0.08	0.12	120	210	0.10	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.08	0.11	70	120	0.09	95
			14		310 HB		0.11		120	0.05	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.08	0.11	100	150	0.09	125
			13		42 HRc	0.06	0.10	60	100	0.08	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.12	0.13	150	230	0.13	190
			15		200 HB		0.13		210	0.07	105
			16		250 HB		0.13		170	0.07	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.12	0.13	120	200	0.13	160
			17,19		200 HB		0.13		170	0.07	85
			18,20		250 HB		0.13		150	0.07	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.06	0.10	25	35	0.08	30
			33	Inconel 700	250 HB		0.10	25	35	0.05	30
			34	Stellite 21	350 HB		0.10	23	35	0.05	29
	Ti based	10	36	TiAl6V4	-	0.06	0.10	35	60	0.08	45
			37	T40	-		0.10	28	40	0.05	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.06	0.10	50	90	0.08	70
			38		50 HRc		0.10	40	70	0.05	55
			38		55 HRc		0.10	30	60	0.05	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.06	0.10	40	60	0.08	50
	White Cast Iron		41	G-X300CrMo15	55 HRc	0.06	0.10	30	50	0.08	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.10	0.12	200	400	0.11	300

WCMX 080412 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [mm/rev]		V _c [m/min]		Optimal cutting conditions	
						min	max	min	max	Feed	V _c
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.06	0.16	180	270	0.11	225
			2	1045, 1060,	190 HB		0.16		230	0.08	115
			3	28Mn6	250 HB		0.16		200	0.08	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.06	0.16	120	230	0.11	175
			4,6		230 HB		0.16	120	190	0.08	155
			5,7		280 HB		0.15	100	170	0.08	135
			8		350 HB		0.15	100	150	0.08	125
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.09	0.16	70	170	0.13	120
			10		280 HB		0.16	70	150	0.08	110
			11		320 HB		0.14	60	130	0.07	95
			11		350 HB		0.14	60	100	0.07	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.06	0.15	170	230	0.11	200
			14		240 HB	0.09	0.15	120	210	0.12	165
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.09	0.14	70	120	0.11	95
			14		310 HB		0.14		120	0.07	60
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.09	0.14	100	150	0.11	125
			13		42 HRC	0.06	0.13	60	100	0.09	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.10	0.18	150	230	0.14	190
			15		200 HB		0.18		210	0.09	105
			16		250 HB		0.18		170	0.09	85
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.10	0.18	120	200	0.14	160
			17,19		200 HB		0.18		170	0.09	85
			18,20		250 HB		0.18		150	0.09	75
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.06	0.13	25	35	0.09	30
			33	Inconel 700	250 HB		0.13	25	35	0.06	30
			34	Stellite 21	350 HB		0.13	23	35	0.06	29
	Ti based	10	36	TiAl6V4	-	0.06	0.13	35	60	0.09	45
			37	T40	-		0.13	28	40	0.06	34
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.06	0.13	50	90	0.09	70
			38		50 HRC		0.13	40	70	0.06	55
			38		55 HRC		0.13	30	60	0.06	45
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.06	0.13	40	60	0.09	50
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.06	0.13	30	50	0.09	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.10	0.16	200	400	0.13	300

Thread Milling

Multi-Mat™ Thread Milling



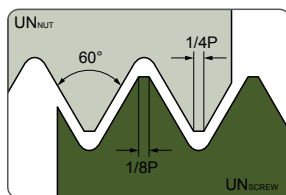
MULTI-MAT™ THREADING LINE

ISO METRIC Internal miniature tools

Designation	Thread Size	Pitch mm	L	L1	D1	D2	N° of Flutes	Catalog Nr.
TMC03012L5 0.35 ISO	M1.6x0.35	0.35	39	5.1	3	1.20	3	TH400001
TMC06015L6 0.4 ISO	M2.0x0.4	0.40	39	6.1	3	1.54	3	TH400019
TMC06019L7 0.45 ISO	M2.5x0.45	0.45	39	7.6	4	1.96	3	TH400016
TMC06024L9 0.5 ISO	M3.0x0.5	0.50	51	9.3	4	2.40	3	TH400013
TMC06031L12 0.7 ISO	M4.0x0.7	0.70	51	12.4	6	3.15	3	TH400004
TMC06040L15 0.8 ISO	M5.0x0.8	0.80	57	15.6	6	4.00	3	TH400010
TMC06047L19 1.0 ISO	M6.0x1.0	1.00	57	19.0	6	4.75	3	TH400007
TMC06059L24 1.25 ISO	M8.0x1.25	1.25	57	24.3	6	5.95	3	TH400022
TMC08079L31 1.5 ISO	M10x1.5	1.50	63	31.0	8	7.90	3	TH400025

Thread Length - Up to 3D

D = Nominal Thread size



ISO Metric ISO 965-1:1999-11
DIN 13: 2005-08

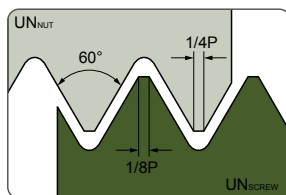


UN Internal miniature tools

Designation	Coarse UNC	Fine UNF	Pitch TPI	L	L1	D1	D2	N° of Flutes	Catalog Nr.
TMC03011L3 80UN	-	0-80UNF	80	39	3.9	3	1.18	3	TH400052
TMC03014L5 72UN	-	1-72UNF	72	39	5.8	3	1.44	3	TH400040
TMC03016L6 56UN	2-56UNC	3-56UNF	56	39	6.8	3	1.66	3	TH400034
TMC06021L8 40UN	4-40UNC	-	40	51	8.1	6	2.12	3	TH400028
TMC06024L9 40UN	5-40UNC	6-40UNF	40	51	9.8	6	2.46	3	TH400055
TMC06025L10 32UN	6-32UNC	-	32	51	10.7	6	2.57	3	TH400031
TMC06032L12 32UN	8-32UNC	10-32UNF	32	57	12.7	6	3.22	3	TH400037
TMC06052L19 28 UN	-	1/4-28UNF	28	57	19.3	6	5.20	3	TH400043
TMC08066L24 24 UN	-	5/16-24UNF	24	63	24.2	8	6.65	3	TH400049
TMC06048L19 20UN	1/4-20UNC	7/16-20UNF	20	57	19.4	6	4.85	3	TH400046

Thread Length - Up to 3D

D = Nominal Thread size



ANSI B1.1-1982



Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Vc [m/min]	
						min	max
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	80	130
			2	1045, 1060,	190 HB	70	110
			3	28Mn6	250 HB	60	100
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	70	110
			4,6		230 HB	70	110
			5,7		280 HB	60	100
			8		350 HB	50	80
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	70	110
			10		280 HB	60	100
			11		320 HB	50	80
			11		350 HB	50	80
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	70	110
			14		240 HB	60	90
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	60	80
			14		310 HB	60	80
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	70	90
			13		42 HRC	60	80
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	60	110
			15		200 HB	70	110
			16		250 HB	60	90
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	60	110
			17,19		200 HB	60	90
			18,20		250 HB	60	90
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	40	60
			33	Inconel 700	250 HB	30	50
			34	Stellite 21	350 HB	20	40
	Ti based	10	36	TiAl6V4	-	40	70
			37	T40	-	25	50
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRC	30	50
			38		50 HRC	25	50
			38		55 HRC	25	40
	Chilled Cast Iron		40	Ni-Hard 2	400 HB	25	40
	White Cast Iron		41	G-X300CrMo15	55 HRC	25	40
NF	Al (>8%Si)	12	25	AlSi12	130 HB	80	300

FEED (mm/Tooth) per Cutting Dia.				
1.5-3	3.0-5	5.0-7.0	7.0-9.0	9.0-11
0.030	0.040	0.060	0.070	0.090
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.060
0.020	0.030	0.050	0.060	0.060
0.020	0.030	0.050	0.060	0.050
0.020	0.020	0.030	0.040	0.050
0.020	0.020	0.020	0.030	0.040
0.015	0.020	0.020	0.030	0.040
0.020	0.030	0.060	0.070	0.080
0.020	0.030	0.050	0.060	0.070
0.020	0.030	0.050	0.060	0.070
0.020	0.020	0.020	0.030	0.040
0.015	0.015	0.015	0.020	0.020
0.010	0.010	0.010	0.015	0.015
0.020	0.020	0.020	0.020	0.025
0.020	0.020	0.020	0.020	0.020
0.010	0.010	0.020	0.020	0.020
0.010	0.010	0.020	0.020	0.020
0.010	0.010	0.020	0.020	0.020
0.010	0.010	0.020	0.020	0.020
0.010	0.010	0.020	0.020	0.020
0.030	0.030	0.040	0.080	0.120

Solid Mill

LT 40 Multi-Mat™ Solid Mill



One grade for all materials



The advantages of LT- Solid Mill line

- Developed grade LT-40 is made from fine grain powder and coated with specially developed PVD coating, to provide high hardness and at the same time high toughness.
- Special production processes allow for improved wear resistance and smoother machining.
- One grade for all materials.

What does our LT - Solid Mill line offer ?

- Excellent performance at dry cutting conditions.
- Excellent performance on hardened steel (HRC 65).
- Optimized geometry for machining tough materials.
- Top performance on a large range of materials.
- Extended tool life at regular and extreme conditions.
- Superior surface finish.
- Fast chip ejection.

Index	Group
2 flute short 30°	SC410C
2 flute long 30°	SC415C
2 flute long 30° ball nose	SC420C
3 flute short 30°	SC425C
4 flute short 30°	SC430C
4 flute long 30°	SC435C
4 flute long 30° ball nose	SC440C
6,8 flute long 45°	SC445C
6 flute extra long 45°	SC450C
6,8 flute long 45° positive rake	SC455C
Multi flute rougher 20°	SC460C
Multi flute rougher 45°	SC465C

MULTI-MAT™ SOLID CARBIDE LINE

2 Flute - Short Length - 30° Helix / SC410C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
2 flute 2mm short 30° cyl.	2.0	-14 -28	4.0	0 -6	6.0	40.0	M4000723
2 flute 3mm short 30° cyl.	3.0	-14 -28	6.0	0 -6	8.0	45.0	M4000724
2 flute 4mm short 30° cyl.	4.0	-20 -38	6.0	0 -8	11.0	45.0	M4000725
2 flute 5mm short 30° cyl.	5.0	-20 -38	6.0	0 -8	13.0	50.0	M4000726
2 flute 6mm short 30° cyl.	6.0	-20 -38	6.0	0 -8	13.0	50.0	M4000727
2 flute 8mm short 30° cyl.	8.0	-25 -47	8.0	0 -9	19.0	60.0	M4000728
2 flute 10mm short 30° cyl.	10.0	-25 -47	10.0	0 -9	22.0	70.0	M4000729
2 flute 12mm short 30° cyl.	12.0	-32 -59	12.0	0 -11	26.0	75.0	M4000730
2 flute 16mm short 30° cyl.	16.0	-32 -59	16.0	0 -11	32.0	100.0	M4000731
2 flute 20mm short 30° cyl.	20.0	-40 -73	20.0	0 -13	38.0	105.0	M4000732

2 Flute - Long Length - 30° Helix / SC415C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
2 flute 6mm long 30° cyl.	6.0	-20 -38	6.0	0 -8	20.0	60.0	M4000743
2 flute 8mm long 30° cyl.	8.0	-25 -47	8.0	0 -9	25.0	70.0	M4000744
2 flute 10mm long 30° cyl.	10.0	-25 -47	10.0	0 -9	30.0	90.0	M4000745
2 flute 12mm long 30° cyl.	12.0	-32 -59	12.0	0 -11	30.0	90.0	M4000746
2 flute 16mm long 30° cyl.	16.0	-32 -59	16.0	0 -11	50.0	110.0	M4000747
2 flute 20mm long 30° cyl.	20.0	-40 -73	20.0	0 -13	55.0	110.0	M4000748



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

Application Guide



For full machining recommendations
See pages 308 - 310

2 Flute - Long Length - 30° Helix / SC420C Cylindrical Ball nose

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
2 flute 2mm long 30° B.N. cyl.	2.0	-14 -28	6.0	0 -6	5.0	50.0	M4000755
2 flute 3mm long 30° B.N. cyl.	3.0	-14 -28	6.0	0 -6	8.0	60.0	M4000756
2 flute 4mm long 30° B.N. cyl.	4.0	-20 -38	6.0	0 -8	8.0	70.0	M4000757
2 flute 5mm long 30° B.N. cyl.	5.0	-20 -38	6.0	0 -8	10.0	80.0	M4000758
2 flute 6mm long 30° B.N. cyl.	6.0	-20 -38	6.0	0 -8	12.0	90.0	M4000759
2 flute 8mm long 30° B.N. cyl.	8.0	-25 -47	8.0	0 -9	14.0	100.0	M4000760
2 flute 10mm long 30° B.N. cyl.	10.0	-25 -47	10.0	0 -9	18.0	100.0	M4000761
2 flute 12mm long 30° B.N. cyl.	12.0	-32 -59	12.0	0 -11	22.0	110.0	M4000762



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

Application Guide

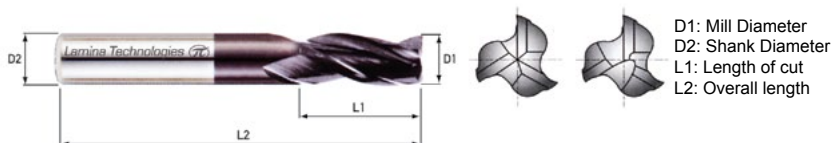


For full machining recommendations
See pages 308 - 310

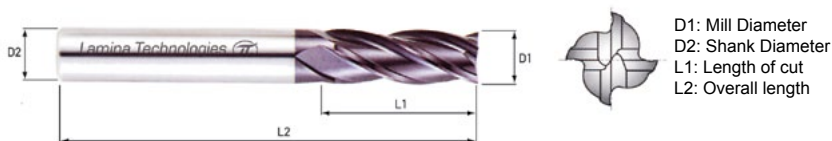
3 Flute - Short Length - 30° Helix / SC425C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
3 flute 3mm short 30° cyl.	3.0	-14 -28	6.0	0 -6	10.0	50.0	M4000775
3 flute 4mm short 30° cyl.	4.0	-20 -38	6.0	0 -8	12.0	50.0	M4000776
3 flute 5mm short 30° cyl.	5.0	-20 -38	6.0	0 -8	14.0	57.0	M4000777
3 flute 6mm short 30° cyl.	6.0	-20 -38	6.0	0 -8	16.0	57.0	M4000778
3 flute 8mm short 30° cyl.	8.0	-25 -47	8.0	0 -9	20.0	63.0	M4000779
3 flute 10mm short 30° cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000780
3 flute 12mm short 30° cyl.	12.0	-32 -59	12.0	0 -11	25.0	83.0	M4000781
3 flute 16mm short 30° cyl.	16.0	-32 -59	16.0	0 -11	32.0	92.0	M4000782
3 flute 20mm short 30° cyl.	20.0	-40 -73	20.0	0 -13	38.0	105.0	M4000783

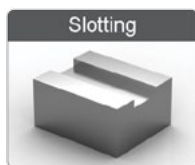
Cylindrical SC425C



Cylindrical SC430C, SC435C



Application Guide



For full machining recommendations
See pages 308 - 310

4 Flute - Short Length - 30° Helix / SC430C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
4 flute 2mm short 30° cyl.	2.0	-14 -28	6.0	0 -6	6.0	40.0	M4000793
4 flute 3mm short 30° cyl.	3.0	-14 -28	6.0	0 -6	8.0	45.0	M4000794
4 flute 4mm short 30° cyl.	4.0	-20 -38	6.0	0 -8	11.0	45.0	M4000795
4 flute 5mm short 30° cyl.	5.0	-20 -38	6.0	0 -8	13.0	50.0	M4000796
4 flute 6mm short 30° cyl.	6.0	-20 -38	6.0	0 -8	13.0	50.0	M4000797
4 flute 8mm short 30° cyl.	8.0	-25 -47	8.0	0 -9	19.0	60.0	M4000798
4 flute 10mm short 30° cyl.	10.0	-25 -47	10.0	0 -9	22.0	70.0	M4000799
4 flute 12mm short 30° cyl.	12.0	-32 -59	12.0	0 -11	26.0	75.0	M4000800
4 flute 16mm short 30° cyl.	16.0	-32 -59	16.0	0 -11	32.0	100.0	M4000801
4 flute 20mm short 30° cyl.	20.0	-40 -73	20.0	0 -13	38.0	105.0	M4000802

4 Flute - Long Length - 30° Helix / SC435C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
4 flute 2mm long 30° cyl.	2.0	-14 -28	6.0	0 -6	8.0	40.0	M4000921
4 flute 3mm long 30° cyl.	3.0	-20 -38	6.0	0 -8	12.0	50.0	M4000922
4 flute 4mm long 30° cyl.	4.0	-20 -38	6.0	0 -8	15.0	50.0	M4000923
4 flute 5mm long 30° cyl.	5.0	-20 -38	6.0	0 -8	20.0	60.0	M4000924
4 flute 6mm long 30° cyl.	6.0	-20 -38	6.0	0 -8	20.0	60.0	M4000813
4 flute 8mm long 30° cyl.	8.0	-25 -47	8.0	0 -9	25.0	70.0	M4000814
4 flute 10mm long 30° cyl.	10.0	-25 -47	10.0	0 -9	30.0	90.0	M4000815
4 flute 12mm long 30° cyl.	12.0	-32 -59	12.0	0 -11	30.0	90.0	M4000816
4 flute 16mm long 30° cyl.	16.0	-32 -59	16.0	0 -11	50.0	110.0	M4000817

Application Guide



For full machining recommendations
See pages 308 - 310

4 Flute - Long Length - 30° Helix / Cylindrical Ball nose SC440C

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
4 flute 2mm long 30° B.N. cyl.	2.0	-14 -28	6.0	0 -6	5.0	50.0	M4000825
4 flute 3mm long 30° B.N. cyl.	3.0	-14 -28	6.0	0 -6	8.0	60.0	M4000826
4 flute 4mm long 30° B.N. cyl.	4.0	-20 -38	6.0	0 -8	8.0	70.0	M4000827
4 flute 5mm long 30° B.N. cyl.	5.0	-20 -38	6.0	0 -8	10.0	80.0	M4000828
4 flute 6mm long 30° B.N. cyl.	6.0	-20 -38	6.0	0 -8	12.0	90.0	M4000829
4 flute 8mm long 30° B.N. cyl.	8.0	-25 -47	8.0	0 -9	14.0	100.0	M4000830
4 flute 10mm long 30° B.N. cyl.	10.0	-25 -47	10.0	0 -9	18.0	100.0	M4000831
4 flute 12mm long 30° B.N. cyl.	12.0	-32 -59	12.0	0 -11	22.0	110.0	M4000832



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

Application Guide



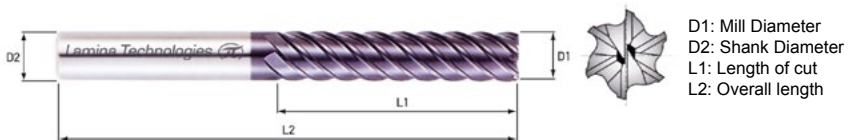
For full machining recommendations
See pages 308 - 310

6,8 Flute - Long Length - 45° Helix / SC445C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
6 flute 6mm long 45° cyl.	6.0	-20 -38	6.0	0 -8	13.0	57.0	M4000845
6 flute 8mm long 45° cyl.	8.0	-25 -47	8.0	0 -9	19.0	63.0	M4000846
6 flute 10mm long 45° cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000847
6 flute 12mm long 45° cyl.	12.0	-32 -59	12.0	0 -11	26.0	83.0	M4000848
6 flute 16mm long 45° cyl.	16.0	-32 -59	16.0	0 -11	32.0	92.0	M4000849
8 flute 20mm long 45° cyl.	20.0	-40 -73	20.0	0 -13	38.0	104.0	M4000850

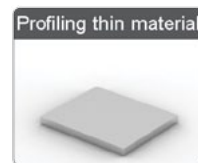
6 Flute - Extra Long Length - 45° Helix / SC450C Cylindrical

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
6 flute 6mm X-long 45° cyl.	6.0	-20 -38	6.0	0 -8	26.0	70.0	M4000857
6 flute 8mm X-long 45° cyl.	8.0	-25 -47	8.0	0 -9	36.0	90.0	M4000858
6 flute 10mm X-long 45° cyl.	10.0	-25 -47	10.0	0 -9	46.0	100.0	M4000859
6 flute 12mm X-long 45° cyl.	12.0	-32 -59	12.0	0 -11	56.0	110.0	M4000860
6 flute 16mm X-long 45° cyl.	16.0	-32 -59	16.0	0 -11	66.0	130.0	M4000861
6 flute 20mm X-long 45° cyl.	20.0	-40 -73	20.0	0 -13	76.0	140.0	M4000862



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

Application Guide



For full machining recommendations
See pages 308 - 310

6,8 Flute - Long Length - 45° Helix / SC455C Cylindrical PR

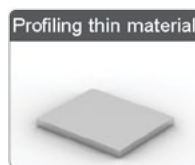
Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
6 flute 6mm long 45° cyl.	6.0	-20 -38	6.0	0 -8	13.0	57.0	M4000869
6 flute 8mm long 45° cyl.	8.0	-25 -47	8.0	0 -9	19.0	63.0	M4000870
6 flute 10mm long 45° cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000871
6 flute 12mm long 45° cyl.	12.0	-32 -59	12.0	0 -11	26.0	83.0	M4000872
6 flute 16mm long 45° cyl.	16.0	-32 -59	16.0	0 -11	32.0	92.0	M4000873
8 flute 20mm long 45° cyl.	20.0	-40 -73	20.0	0 -13	38.0	104.0	M4000874

Positive rake angle



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

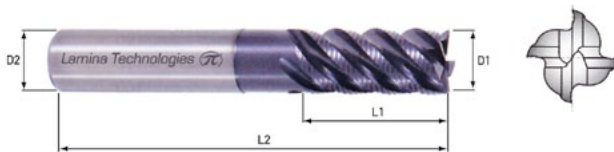
Application Guide



For full machining recommendations
See pages 308 - 310

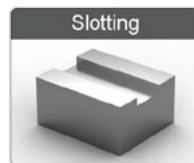
Multi-Flute - Roughing - Long Reach - 45° Helix / SC465C Cyl.

Product Designation	D1	Tolerance e8 μm	D2	Tolerance h6 μm	L1	L2	Catalog Nr.
3 flute 6mm rougher 45° L.R. Cyl.	6.0	-20 -38	6.0	0 -8	16.0	57.0	M4000893
3 flute 8mm rougher 45° L.R. Cyl.	8.0	-25 -47	8.0	0 -9	16.0	63.0	M4000894
4 flute 10mm rougher 45° L.R. Cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000895
4 flute 12mm rougher 45° L.R. Cyl.	12.0	-32 -59	12.0	0 -11	26.0	83.0	M4000896
5 flute 16mm rougher 45° L.R. Cyl.	16.0	-32 -59	16.0	0 -11	32.0	92.0	M4000897
6 flute 20mm rougher 45° L.R. Cyl.	20.0	-40 -73	20.0	0 -13	38.0	104.0	M4000898



D1: Mill Diameter
D2: Shank Diameter
L1: Length of cut
L2: Overall length

Application Guide



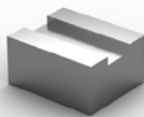
For full machining recommendations
See pages 308 - 310

MACHINING RECOMMENDATIONS

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	V _c [m/min]	
						min	max
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	250	300
			2	1045, 1060,	190 HB	200	270
			3	28Mn6	250 HB	160	250
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	160	250
			4,6		230 HB	140	180
			5,7		280 HB	140	180
			8		350 HB	120	170
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	140	180
			10		280 HB	120	140
			11		320 HB	100	140
			11		350 HB	90	120
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	80	100
			14		240 HB	80	100
	Duplex	5	14	X2CrNi23-4, S31500	290 HB	70	90
			14		310 HB	70	90
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	100	140
			13		42 HRc	80	100
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	200	250
			15		200 HB	160	200
			16		250 HB	150	210
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	160	200
			17,19		200 HB	140	160
			18,20		250 HB	120	140
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	40	60
			33	Inconel 700	250 HB	40	60
			34	Stellite 21	350 HB	40	60
	Ti based	10	36	TiAl6V4	-	50	100
			37	T40	-	40	80
Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRc	50	90
			38		50 HRc	40	80
			38	G-X260NiCr42	55 HRc	40	80
	Chilled Cast Iron	11	40	Ni-Hard 2	400 HB	40	60
	White Cast Iron		41	G-X300CrMo15	55 HRc	30	50
NF	Al (>8%Si)	12	25	AlSi12	130 HB	160	200
	Al (<8%Si)	13	21, 22	4% < Si < 8 %	60 HB	200	250
			23, 24		100 HB	400	500
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	200	500



Shoulder Milling



Slotting



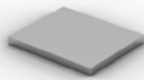
Plunging



Copying



Pocket Milling



Profiling thin material

PROFILING

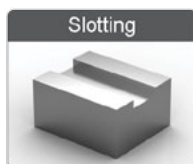
As a simple starting point, it is recommended to use the following cutting conditions

Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.006	0.025	0.25	2.00
3	0.012	0.040	0.38	3.00
4	0.160	0.048	0.50	4.00
5	0.020	0.050	0.63	5.00
6	0.025	0.080	0.75	6.00
8	0.030	0.075	1.00	8.00
10	0.032	0.080	1.25	10.00
12	0.040	0.100	1.50	12.00
16	0.048	0.120	2.00	16.00
20	0.050	0.150	2.50	20.00

Semi Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.025	0.040	0.50	2.00
3	0.040	0.050	0.75	3.00
4	0.040	0.050	1.00	4.00
5	0.050	0.070	1.25	5.00
6	0.050	0.090	1.50	6.00
8	0.065	0.120	2.00	8.00
10	0.065	0.120	2.50	10.00
12	0.065	0.130	3.00	12.00
16	0.075	0.140	4.00	16.00
20	0.090	0.170	5.00	20.00

Roughing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.012	0.025	1.00	2.00
3	0.025	0.040	1.50	3.00
4	0.025	0.040	2.00	4.00
5	0.040	0.065	2.50	5.00
6	0.040	0.075	3.00	6.00
8	0.050	0.100	4.00	8.00
10	0.050	0.100	5.00	10.00
12	0.065	0.120	6.00	12.00
16	0.080	0.130	8.00	16.00
20	0.090	0.160	10.00	20.00

SLOTING



Semi Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.012	0.020	2.00	2.00
3	0.016	0.030	3.00	3.00
4	0.020	0.032	4.00	4.00
5	0.020	0.040	5.00	5.00
6	0.024	0.048	6.00	6.00
8	0.032	0.050	8.00	8.00
10	0.035	0.055	10.00	10.00
12	0.040	0.060	12.00	12.00
16	0.045	0.075	16.00	16.00
20	0.048	0.080	20.00	20.00

Roughing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.016	0.040	2.00	2.00
3	0.024	0.048	3.00	3.00
4	0.032	0.050	4.00	4.00
5	0.040	0.070	5.00	5.00
6	0.048	0.085	6.00	6.00
8	0.050	0.100	8.00	8.00
10	0.060	0.110	10.00	10.00
12	0.065	0.120	12.00	12.00
16	0.080	0.130	16.00	16.00
20	0.090	0.160	20.00	20.00

CONTOURING

Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.032	0.045	0.25	2.00
3	0.036	0.050	0.38	3.00
4	0.040	0.055	0.50	4.00
5	0.045	0.065	0.63	5.00
6	0.050	0.070	0.75	6.00
8	0.060	0.080	1.00	8.00
10	0.070	0.100	1.25	10.00
12	0.080	0.120	1.50	12.00
16	0.100	0.150	2.00	16.00
20	0.120	0.200	2.50	20.00

Semi Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut	Depth of Cut
	min	max	mm	mm
2	0.032	0.045	0.50	2.00
3	0.036	0.050	0.75	3.00
4	0.040	0.055	1.00	4.00
5	0.045	0.065	1.25	5.00
6	0.050	0.070	1.50	6.00
8	0.060	0.080	2.00	8.00
10	0.070	0.100	2.50	10.00
12	0.080	0.120	3.00	12.00
16	0.100	0.150	4.00	16.00
20	0.120	0.200	5.00	20.00



Formulas

$$\text{rpm} = \text{sfm} \times 3.82 / \text{tool diameter}$$

$$\text{rpm} = (\text{m/min} \times 1000) / (3.14 \times \text{tool diameter})$$

$$\text{feed per min} = \text{feed per tooth} \times \text{number of teeth} \times \text{rpm}$$

Selection recommendation according to application

- **Profiling - Finishing cut:** use 4 or 6 flute mills
- **Slotting - Semi-roughing cut and High feed rates:**
 - use 3 flute mill for regular chips removal
 - use a 2 flute mill for long chips (soft material)
 - use Roughing mill for maximum chip removal
- **Plunge - Slot cut:** use 3 flute mill for higher feed rate and 2 flute mill for soft material
- **Profiling - Roughing cut:** use Roughing mill for rapid material removal and higher feed rates
- **Contour - Finishing cut:** use 2 or 4 ball nose mill
- **Slot - Contouring cut:** use 2 flute ball nose for maximum chip removal, use 4 flute ball nose for Finishing
- **For profiling of thin materials:** use 6 flute mill
- **For Aluminum machining - Finishing cut:** use 6 or 8 positive rake flute mill, for Slotting cut - use 2 flute short mill.

Machining Tips

- Climb milling is preferred with CNC machines
- Use ramping down operation to avoid vibrations
- When opening a pocket, helical interpolation operation is preferred

Steel

Stainless Steel

Lamina Materials Reference list

Cast Iron

High Temperature Alloys

Non Ferrous

Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI / SAE
Non-Alloyed Steel						
1.0030	US137-3	-	-	FE 37B/FU	-	-
1.0401	C15	CC12	080M15	C15 / C16	S15C	1015
1.0402	C22	CC20	050A20	C20 / C21	S20C / S22C	1020
1.0501	-	-	-	-	-	-
1.0503	C45	CC45	080M46	C45	S45C / S45CM	1045
1.0715	9 SMn 28	S250	230M07	CF 9 SMn 28	SUM22	1213
1.0718	9 SMnPb 28	S250Pb	-	CF 9 SMnPb 28	SUM22L / SUM23L	12L3
1.0722	10 SPb 20	-	-	-	-	-
1.0725	15 SMn 13	-	-	-	-	-
1.0726	35 S 20	-	-	-	-	-
1.0755	35 SPb 20	-	-	-	-	-
1.0760	38 SMn 28	-	-	-	-	-
1.0762	44 SMn 28	-	-	-	-	-
1.0763	44 SMnPb 28	-	-	-	-	-
1.0764	36 SMn 14	-	-	-	-	-
1.0765	36 SMnPb 14	-	-	-	-	-
1.1121	Ck 10	XC10	040 A10	2 C 10	S9 CK / S 10 C	1010
1.1131	20 Mn 5	20 M5	120 M19	20 Mn 7	SMnC 420	1022 / 1518
1.1141	Ck 15	XC 12	080 M15	C16	S15/S15CK	1015
1.1157	40 Mn 4	40 M5	150 M36	-	-	1035 / 1041
1.1158	C25E (CK 25)	XC 25	070M25	C25	S25 / S28C	1025
1.1166	35 Mn 5	-	-	-	SMn 433H	1536
1.1170	28 Mn 6	20 M5	(150 M8)	C 28 Mn	SCMn 1	1330
1.1173	30 Mn 5	35 M5	(150 M28)	-	SMn 433H / SCMn 2	1300 / 1330
1.1181	C35E (CK 35)	XC 32	080 A35	C35	S 35C	1035 / 1038
1.1183	Cf 35	XC 38TS	080 A35	C36 / C38	S35C / S35CM	1035
1.1191	C45E (CK 45)	XC 45	080 M46 / 060 A47	C45	S45C/S48C/S45CM/S45CM	1045
Low Alloyed Steel						
1.0050	St 50-2	-	-	FE 50	SS50 / SS490	-
1.0060	St 60-2	-	-	FE 60-2	SM570 / SM58	-
1.0070	St 70-2	-	-	FE 70-2	FE70-2	-
1.0535	C55	-	070M55	C55	S55C / S55CM	1055
1.0601	C60	CC55	080A62	C60	S58C	1060
1.1203	C55E (CK 55)	XC 55	060 A57 / 070 M55	C50	S55C / S55CM	1055
1.1213	Cf 53	XC 48TS	060A52	C53	S50C / S50CM	1050
1.1221	C60E (CK 60)	XC 60	060A62	C60	S58C / S60CM	1060 / 1064
1.1525	C 60 W1	C 90 E2U	-	C 60 KU	-	W108
1.1545	C 105 W1	C 105 E2U	-	C 100 KU	SK3 / SUP4	W110
1.1563	C 125 W	C 120 E3U	-	C 120 KU	SK2	W112
1.1573	C 135 W	C 140 E3U	-	C 140 KU	-	-
1.1625	C 60 W2	-	BW 1B	-	SK5 / SK6	W1
1.1750	C 75 W	-	BW 1A	-	-	W1
1.2330	35 CrMo 4	34 CD 4	708 A37 / (BP20)	35 CrMo 4	-	4135 / P20
1.2332	47 CrMo 4	-	-	40 CrMo 4	-	4142
1.5415	15 Mo 3	15 D 3	1501 - 240	16 Mo3 kW	STBA12 / STFA12	ASTM A204 GrA
1.5423	16 Mo 5	-	1501 - 245 - 420	16 Mo5	SB 450M / SB 480M	4520
1.5622	14 Ni 6	16 N 6	-	14 Ni 6	SL9N590	ASTM A350LF5
1.5711	40 NiCr 6	38 NC 6	-	-	3140	-
1.5713	13 NiCr 6	10 NC 6	-	-	3115	-
1.5732	14 NiCr 10	14 NC 11	-	16 NiCr 11	SNC 415(H)	3415
1.5752	-	-	-	-	-	-
1.5919	15 CrNi 6	-	-	-	-	3115
1.7003	-	-	-	-	-	-
1.7005	46 Cr 2	42 C 2	-	45 Cr 2	-	5045 / 5046
1.7015	15 Cr 3	15 C 2	523 M15	-	SCR 415 (H)	5015 / 5115
1.7033	34 Cr 4	32 C 4	530 A32	34 CR 4 (KB)	SCR 430 (H)	5132

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Low Alloyed Steel						
1.7035	41 Cr 4	42 C 4	530 M40	-	SCr 440 (H)(M)	5140
1.7045	41 Cr 4	41 C 4	530 A40	41 Cr 4	SCr 440	5140
1.7147	20 MnCr 5	20 MC 5	-	20 MnCr 5	SMnC 420H	5120
1.7178	55 Cr 3	55 C 3	527 A60	55 Cr 3	SUP9 (A)	5155 / 5190
1.7218	25 CrMo 4	25 CD 4	708 A25	25 CrMo 4 (KB)	SCM 420 / SCM 430	4130
1.7220	34 CrMo 4	35 CD 4	708 A37	35 CrMo 4	SCCr M3 / SCM 435H	4137 / 4135
1.7223	41 CrMo 4	42 CD 4TS	708 M40	41 CrMo 4	SCM 440	4140 / 4142
1.7225	42 CrMo 4	42 CD 4	708 M40	42 CrMo 4	SCM 440(H) / SNB 7	4140 / 4142
1.7227	42 CrMoS 4	-	-	-	-	-
1.7228	50 CrMo 4	50 CD 4	708 A47	-	SCM 445 (H)	4150
1.7242	16 CrMo 4	-	-	18 CrMo 4	SCM 418 (H)	-
1.7262	15 CrMo 5	12 CD 4	-	-	SCM 415 (H)	-
1.7264	20 CrMo 5	18 CD 4	-	-	SCM 421 / SCM 420H	-
1.7335	13 CrMo 4 4	15 CD 3.5 / 4.5	1502 620 540	14 CrMo 3	SFVAF12	A192 A367 Gr. 12
1.7337	16 CrMo 4 4	15 CD 4 5	-	18 CrMo 4 5 KW	-	A 387 Gr. 12 C12
1.7361	32 CrMo 12	30 CD 12	722 M24	32 CrMo 12	-	-
1.2067	102 Cr 6	Y 100 C 6	(BL3)	-	SUJ 2	L1 / L3
1.2080	X210 Cr 12	Z200 C 12	BD3	X205 Cr 12KU	SKD 1	D3
1.2210	115 CrV 3	100 C 3	-	107 CrV3 KU	-	L2
1.2241	51 CrV 4	-	-	-	-	-
High Alloyed Steel						
1.2311	40 CrNiMo 7	-	-	35 CrMo 8 KU	-	-
1.2343	X38 CrMoV 5 1	Z38 CDV 5	BH11	X37 CrMoV51 KU	SKD 5	H 11
1.2344	X40 CrMoV 5 1	Z40 CDV 5	BH13	X40 CrMoV511 KU	SKD 51	H 13
1.2363	X100 CrMoV 5 1	Z100 CDV 5	BA2	X100 CrMoV 5 1 KU	SKD 12	A2
1.2365	X32 CrMoV 3 3	32 DCV 12 28	BH10	30 CrMoV 12 27 KU	-	H10
1.2379	X155 CrVMo 12 1	Z160 CDV 12	BD2	X155 CrVMo121 KU	SKD 11	D2
1.2419	105 WCr 6	105 WC 13	-	107 WCr 5 KU	SKS 31 / SKS 2 / SKS 3	-
1.2438	X210 CrW 12	Z210 CW 12 1	-	X215 CrW 12 1 KU	SKD 2	-
1.2510	100 MnCrV 4	90 MWCV 5	BO1	95 MnWCr 5KU	BO 1	O1
1.2542	45 WCrV 7	45 WCV 20	BS1	45 WCrV 8 KU	-	S1
1.2550	60 WCrV 7	55 WC 20	BS1	58 WCr 9 KU	-	S1
1.2567	30 WCrV 17 2	Z32 WCV 5	-	X30 WCrV 5 3 KU	SKD 4	-
1.2581	X30 WCrV 9 3	Z30 WCV 9	BH21	X30 WCrV 9 3 KU	SKD 5	H 21
1.2601	X165 CrMo V 12	-	-	X165 CrMoV 12 KU	-	-
1.2605	X37 CrMoW 5 1	Z35 CWDV 5	BH12	X35 CrMoW 05 KU	SKD 52	H 12
1.2713	55 NiCrMoV 6	55 NCDV 7	BH 244/5	-	SKT 4	L6
1.2721	50 NiCr 13	-	-	-	-	-
1.2762	75 CrMoNiW 6 7	-	-	-	-	-
1.2842	90 MnCrV 8	90 MV 8	BO2	88 MnV 8 KU	-	O2
1.2885	X32 CrMoCoV 3 3 3	-	BH 10A	-	-	(H10A)
1.3202	S 12-1-4-5	-	BT15	HS12-1-5-5	-	T15
1.3207	S 10-4-3-10	Z130 WVKCDV 10 10 4 4 3	BT42	HS10-4-3-10	SKH 57	-
1.3243	S 6-5-2-5	Z90 KCV 6 5 5 4 2	334	HS 6-5-2-5	SKH 55	-
1.3245	S 7-4-2-5	Z110 WVKCDV 7 5 4 4 2	-	HS 7-4-2-5	-	M 41
1.3247	S 2-10-1-8	Z110 DKCVV 9 8 4 2 1	BM42	HS 2-9-1-8	SKH 50	M 42
1.3249	S 2-9-8	-	(BM34)	-	-	M33 / M34
1.3343	S 6-5-2	Z85 WDCV 6 5 4 2	BM2	HS 6-5-2-5	SKH 51	M2
1.3344	S 6-5-3	Z130 WDCV 6 5 4 4	-	-	SKH 52 / SKH 53	M2 Class 2
1.3346	S 2-9-1	Z85 DCWV 8 4 2 1	BM1	-	-	H41 / M1
1.3401	G-X120 Mn 12	Z120 M 12	BW10	-	-	A128 75
1.3501	100 Cr 2	100 C 2	-	-	-	E 50100
1.3505	100 Cr 6	100 C 6	534 A99	100 Cr 6	SUJ2 / SUJ 4	52100
1.4085	G-X120 Cr 29	-	452 C11	-	-	-
1.4125	X105 CrMo 17	Z100 CD 17	-	-	SUS 440C	440C
1.4871	X53CrMnNiN 21 9	Z53 CMN 21 9 Az	349 S54	X53 CrMnNiN 21 9	SUH 35 / SUH 36	Ev8

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High Alloyed Steel						
1.4922	X20 CrMoV 12 1	-	-	X20 CrMoV 12 1	-	-
1.5662	X8 Ni 9	-	1502-502-650	X10 Ni 9	SL 9N53 / 60	A363
1.5680	X12 Ni 5	Z18 N5	-	-	SL 5N 590	2515 2517
1.5710	36 NiCr 6	35 NC 6	640 A35	-	SNC 236	3135
1.5736	36 NiCr 10	30 NC 11	-	-	SNC 631 (H)	3435
1.5755	31 NiCr 14	18 NC 13	653 M31	-	SNC 836	-
1.5864	35 NiCr 18	-	-	-	-	-
1.6511	36 CrNiMo 4	40 NCD 3	817 M37	38 NCrMo 4(KB)	-	9840 4340
1.6523	21 NiCrMo 2	20 NCD 2	805 M29	20 NCrMo 2	SNM 220(H)	8620
1.6545	40 NiCrMo 22	-	311-Type 7	40 NCrMo 2(KB)	SNM 240	8740
1.6562	40 NiCrMo 8 4	-	817 M40	40 NCrMo 7(KB)	-	E 4340
1.6565	40 NiCrMo 6	-	817 A37 / 818 M40	-	SNM 439	4340 / 9850
1.6580	30 CrNiMo 8	30 CND 8	823 M30	30 NCrMo 8	SNM 431	-
1.6582	34 CrNiMo 6	35 NCD 6	817 M40	34 CrNiMo 6	SNM 447	4340 / 4337
1.6587	17 CrNiMo 6	18 NCD 6	820 A16	-	-	-
1.6657	14 NiCrMo 34	16 NCD 13	832 M13	15 NCrMo 13	-	9310
1.6746	32 NiCrMo 14 5	35 NCD 14	-	-	-	-
1.6747	30 NiCrMo 16 6	35 NCD 16	835 M30	-	-	-
1.6773	36 NiCrMo 16	-	-	-	-	-
1.7102	54 SiCr 6	54 SC 6	-	-	-	401
1.7108	60 SiCr 7	60 SC 7	-	60 SiCr 8	-	9282
1.7131	16 MnCr 5	16 MC 5	527 M17 / 590 H17	16 MnCr 5	-	5115
1.7238	49 CrMo 4	-	-	-	-	-
1.7362	12 CrMo 19 5	Z 10 CD 5 5	3606-625	16 CrMo 20 5	SFVAF5A / SFVAF5B	-
1.7380	10 CrMo 9 10	10 CD 9 10	3606-622	12 CrMo 9 10	SFVAF22A-B / SCM4V	A 182 F11 / A 387 Gr.22
1.7561	42 CrV 6	-	-	-	-	-
1.7701	51 CrMoV 4	51 CDV 4	-	51 CrMoV 4	-	-
1.7715	14 MoV 6 3	-	1503-660-440	-	-	-
1.7733	24 CrMoV 5 5	20 CDV 6	-	21 CrMoV 5 11	-	-
1.7755	GS-45 CrMoV 10 4	-	-	-	-	-
1.8070	21 CrMoV 5 11	-	-	35 NCr 9	-	-
1.8159	50 CrV 4	51 CV 4	735 A51	50 CrV 4	SUP 10	6145 / 6150
1.8507	34 CrAlMo 5	30 CAD 6.12	-	34 CrAlMo 7	-	A 355 Cl.D
1.8509	41 CrAlMo 7	40 CAD 6.12	905 M39	41 CrAlMo 7	SACM 645 / SACM 1	A 355 Cl.A / E71400
1.8515	31 CrMo 12	30 DC 12	722 M24	30 CrMo 12	-	-
1.8519	31 CrMoV 9	-	-	-	-	-
1.8523	39 CrMoV 13 9	-	897 M39	36 CrMoV 12	-	-
1.8550	34 CrAlNi 7	30 CAD 6.12	905 M31	-	-	-
Austenitic Stainless Steel						
1.4005	X12 CrS 13	Z11 CF 13	416 S21	X12 CrS 13	SUS 416	415
1.4104	X14 CrMoS 17	Z13 CF 17	441 S29	X10 CrS 17	SUS 430F	430F
1.4113	X6 CrMoS 17 1	Z8 CD 17 01	434 S17	X8 CrMo 17	SUS 434	434
1.4301	X5 CrNi 18 9	Z6 CN 18 9	304 S15 / LW21 / LWCF	X5 CrNi 18 10	SUS 304	304 / 304H
1.4303	X4 or Ni 18 12	Z5 CN 18 11FF	305 S17 / 305 S19	X7 CrNi 18 10	SUS 305 / SUS 305J1	305 / 308
1.4305	X8 CrNiS 18 9	Z8 CNF 18 9	303 S22 / 303 S31	X10 CrNiS 18 9	SUS 303	303
1.4306	X2 CrNi 18 9	Z2 CN 18 9	304 S11 / LW20 / LWCF	X3 CrNi 18 11	SUS 304L / SCS16	304L
1.4308	G-X5 CrNi 19 10	Z6 CN 18 10M	304 C15 / LT196)	-	SCS 13	CF8
1.4310	X10 CrNi 18 8	Z12 CN 17 8	301 S21 / 301 S22	X12 CrNi 18 07	SUS 301	301
1.4311	X2 CrNiN 18 10	Z2 CN 18 7 Az	304 S61	X2 CrNiN 18 10	SUS 304LN	304LN
1.4312	G-X10 CrNi 18 8	Z10 CN 18 9M	302 C25 / ANC3A	-	SCS 12 / SCS 13A	-
1.4567	X3 CrNiCu 18.9.4	-	304 Cu	X3 CrNiCu 18.9.4	XM7	304Cu
1.4568	X7 CrNiAl 17 7	Z CNA 17 7	301 S81	-	-	-
1.4570	X8 CrNiCuS 18.9.2	-	303 Cu	X8 CrNiCuS 18.9.2	SUS 303 Cu	303Cu
1.4401	X2 CrNiMo 17 12 2	Z6 CND 17 11 2	316 S13 / 316 S31	X5 CrNiMo 17 12	SUS 316	316
1.4404	X2 CrNiMo 17 12 2	Z2 CND 17 12 2	316 S11 / 316 S13	X2 CrNiMo 17 12	SUS 316L	316L
1.4405	X2 CrNiMoN 17 11 2	Z3 CND 17 11 Az	316 S61 / 316 S63	X2 CrNiMoN 17 12	SUS 316LN	316LN

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Austenitic Stainless Steel							
Lamina group Nr. 4	1.4408	G-X5 CrNiMo 19 11 2	-	316 C16 / (LT190) / A	-	SCS14	CF-8M
	1.4429	X2 CrNiMo 17 13 3	Z2 CND 17 12 Az	316 S63	X2 CrNiMoN 17 13	(SUS 316LN)	316LN
	1.4435	X2 CrNiMo 18 14 3	Z2 CND 17 12 3	316 S11 / 316 S31	X2 CrNiMo 17 13	SUS 316L	316L
	1.4436	X3 CrNiMo 17 13 3	Z6 CND 18 12 3	316 S19 / 316 S33 / LW	X5 CrNiMo 17 13	SUS 316	316
	1.4438	X2 CrNiMo 18 15 4	Z2 CND 19 15 4	317 S12	X2 CrNiMo 18 16	SUS 317L	317L
	1.4449	X3 CrNiMo 18 12 3	-	317 S16	X5 CrNiMo 18 15	SUS 317	317
Duplex Stainless Steel							
Lamina group Nr. 5	1.4057	X17 CrNi 16 2	Z15 CN 16 2	431 S29	X16 CrNi 16	SUS 431	431
	1.4313	X3 CrNiMo 13 4	Z4 CND 13 4	425 C11	-	SCS 5	-
	1.4319	X3 CrNiN 17 8	-	301 S26 / 302 S26	-	SUS 302	302
	1.4340	G-X40 CrNi 27 4	-	-	-	-	-
	1.4362	X2 CrNiN 23 4	Z2 CN 23 04 Az	-	-	-	S32304
	1.4410	X2 CrNiMoN 25 7 4	-	-	-	-	-
	1.4417	X2 CrNiMoSi 19 5	-	-	-	-	S31500
	1.4460	X8 CrNiMoN 27 5 2	Z5 CND 27 5 Az	-	-	SUS 329J1	329
	1.4462	X2 CrNiMoN 22 5 3	Z23 CND 22 5 3 Az	318 S13	-	SUS 329J3L	-
	1.4500	G-X 7 NiCrMoCuNb 25 20	Z3 NCDU 25 20M	-	-	-	-
	1.4510	X3 CrTi 17	Z4 CT 17	-	X5 CrTi 17	SUS 430LX	430 Ti / 439
	1.4511	X3 CrNb 17	Z4 CNb 17	-	X5 CrNb 17	SUS 430LX	-
	1.4521	X2 CrMoTi 18 2	-	-	-	SUS 444	443 / 444
	1.4539	X1 NiCrMoCuN 25 20 3	Z2 NCDU 25 20	-	-	-	904L / UNS N08904
	1.4541	X10 CrNiMoTi 18 10	Z6 CNT 18 10	321 S12 / 321 S51	X5 CrNiTi 18 11	SUS 321	321
	1.4542	X5 CrNiCuNb 16 4	Z7 CNU 17 4	-	-	SUS 630 / SCS 24	630
	1.4546	X5 CrNiNb 18 10	-	347 SD31	X5 CrNiNb 18 11	-	348
	1.4550	X6 CrNiNb 18 10	Z6 CNNb 18 10	347 S20 / 347 S31	X5 CrNiNb 18 11	SUS 347	347 / 348
	1.4552	G-X5 CrNiNb 19 11	Z4 CNNb 18 10M	347 C17	-	SCS 21	-
	1.4558	X2 NiCrAlTi 32 20	-	NA15	-	-	N 08800
	1.4562	X1 NiCrMoCu 32 28 7	-	-	-	-	N 08031
	1.4563	X1 NiCrMoCuN 31 27 4	Z1 NCDU 31 27	-	-	-	N 08028
	1.4571	X6 CrNiMoTi 17 12 2	Z6 CNDT 17 12	320 S18 / 320 S31	X5 CrNiMoTi 17 12	SUS 316Ti	316Ti
	1.4580	X6 CrNiMoNb 17 12 2	Z6 CNDNb 17 12	318 S17	X5 CrNiMoNb 17 12	-	(316 Cb)
	1.4581	G-X5 CrNiMoNb 19 11 2	Z4 CNDNb 18 12M	318 C17 / ANC4C	G-X6 CrNiMoNb 20 11	-	-
	1.4583	X10 CrNiMoNb 18 12	-	-	X5 CrNiMoNb 17 13	-	318
	1.4585	G-X7 CrNiMoCuNb 18 18	-	-	X5 CrNiMoSi 17 12	-	-
	1.4747	X80 CrNiSi 20	Z80 CNS 20 2	443 S65	X80 CrNiSi 20	SUH 4	HNV6
	1.4821	X20 CrNiSi 25 4	Z80 CNS 25 04	-	-	-	-
	1.4823	G-X40 CrNiSi 27 4	-	-	-	-	-
	1.4828	X15 CrNiSi 20 12	Z17 CNS 20 12	309 S24	X16 CrNi 23 14	SUH 309	309
	1.4833	X12 CrNi 22 13	Z15 CN 24 13	309 S13	X5 CrNi 23 14	-	309S
	1.4837	G-X40 CrNiSi 25 12	-	309 C30	G-X40 CrNiSi 25 12	SCH 17 / SCH 13A	-
	1.4841	X15 CrNiSi 25 20	Z15 CNS 25 20	314 S25	X15 CrNiSi 25 20	SUH 310	310 / 314
	1.4845	X12 CrNi 25 21	Z12 CN 25 20	310 S24	X5 CrNi 25 20	SUS 310	310
	1.4848	G-X40 CrNiSi 25 20	-	310 C40 / 310 C45	G-X40 CrNiSi 26 20	SCH 21 / SCH 22	HK
	1.4864	X12 NiCrSi 35 16	Z12 NCS 33 16	NA17	-	SUH 330	330
	1.4865	G-X40 NiCrSi 38 18	-	330 C11 / 330 C40	G-X50 NiCrSi 39 19	SCH 15 / SCH 16	-
	1.4873	X45 CrNiW 18 9	Z45 CNW 18 9	-	X45 CrNiW 18 9	SUH 31	-
	1.4876	X10 NiCrAlTi 32 20	Z10 NC 32 21	NA15(H)	-	NCF 800(TP)	B163
	1.4878	X12 CrNiTi 18 9	Z6 CNT 18 10	321 S51	(X6 CrNiTi 18 11)	SUS 321	321
	1.4882	X50 CrMnNiNbN 219	Z50 CMNNb 21 9	-	-	-	-
	1.4958	X5 NiCrAlTi 31 20	-	-	-	-	-
	1.4977	X40 CoCrNi 20 20	Z42 CNKDOWNb	-	-	-	-

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Ferritic & Martensitic Stainless Steel						
1.4000	X6 Cr 13	Z6 C 13	403 S17	X6 Cr 13	SUS 403 / SUS 410S	403 / 410S / 429
1.4001	X7 Cr 14	Z8 C 13FF	403 S17	X6 Cr 13	SUS 403 / SUS 401S	403 / 410S / 429
1.4002	X6 CrAl 13	Z8 CA 12	405 S17	X8 CrAl 13	SUS 405	405
1.4008	G-X 7 CrNiMo 12 1	Z12 CN 13M	410 C21	GX12 Cr 13	-	-
1.4016	X8 Cr 17	Z8 C 17	403 S17 / 430 S18	X8 Cr 17	SUS 430	430
1.4742	X10 CrAl 18	Z12 CAS 18	403 S15	X8 Cr 17	SUH 21	-
1.4762	X10 CrAl 24	Z10 CAS 24	-	X16 Cr 26	(SUH 446)	446
1.2083	X42 Cr 13	Z40 C 14	-	-	SUS 420J2	420
1.4006	X12 Cr 13	Z10 C 13	410 S21 / 410 C21	X12 Cr 13	SUS 410	410
1.4011	G-X 12 Cr 12	-	ANC1A	-	-	CA-15
1.4021	X20 Cr 13	Z20 C 13	420 S37	X20 Cr 13	SUS 420J1	420
1.4024	X15 Cr 13	Z15 C 13	420 S29	-	SUS 410J1	410
1.4027	G-X20 Cr 14	Z20 C 13M	420 C24 / 420 C29	-	SCS 2	-
1.4028	X30 Cr 13	Z30 C 13	420 S45	(G) X30 Cr 13	SUS 420J2	420F
1.4031	X39 Cr 13	Z40 C 14	-	X40 Cr 13	SUS 420J2	-
1.4034	X46 Cr 13	Z44 C 14	(420 S45)	X40 Cr 14	-	-
1.4531	X40 CrSiMo 10 2	Z40 CSD 10	-	-	SUH 3	-
1.4718	X45 CrSi 9 3	Z45 CS 9	401 S45	X45 CrSi 8	SUH 1	HNv3
1.4720	X20 CrMo 13	-	-	-	-	-
1.4724	X10 CrAl 13	Z10 C 13	-	X10 CrAl 12	SUH 405	405
Cast Iron Grey						
0.6010	EN-GJL 150 / GG 10	Fl 10D	-	G 10	FC 100	CLASS 20
0.6015	EN-GJL 150 / GG 15	Fl 15D	GRADE 150	G 15	FC 150	CLASS 25
0.6020	EN-GJL 200 / GG 20	Fl 20D	GRADE 220	G 20	FC 200	CLASS 30
0.6025	EN-GJL 250 / GG 25	Fl 25D	GRADE 260	G 25	FC 250	CLASS 35
0.6030	EN-GJL 300 / GG 30	Fl 30D	GRADE 300	G 30	FC 300	CLASS 45
0.6035	EN-GJL 350 / GG 35	Fl 35D	GRADE 350	G 35	FC 350	CLASS 50
0.6040	EN-GJL 400 / GG 40	Fl 40D	GRADE 400	-	-	CLASS 55
Cast Iron Malleable & Nodular						
0.7033	EN-GJS 350 / GGG 35.3	-	-	-	-	-
0.7040	EN-GJS 400 / GGG 40	FCS 400-12	SN6420/12	GGG 40	FCD 400	60-40-18
0.7043	EN-GJS 400-15 / GGG 40.3	FCS 370-17	SN6370/17	-	-	-
0.7050	EN-GJS 500 / GGG 50	FCS 500-7	SN6500/7	GGG 50	FCD 500	80-55-06
0.7060	EN-GJS 6007 / GGG 60	FCS 600-3	SN6600/3	GGG 60	FCD 600	-
0.7070	EN-GJS 700 / GGG 70	FCS 700-2	SN6700/2	GGG 70	FCD 700	1000-70-03
0.8035	GTW-35	MB35-7	W340/3	-	-	-
0.8040	GTW-40	MB40-10	W410/4	GMB40	-	-
0.8045	GTW-45	-	-	GMB45	-	-
0.8055	GTW-55	-	-	-	-	-
0.8065	GTW-65	-	-	-	-	-
0.8135	GTS-35	MN35-10	B340/12	-	FCMW 330	32510
0.8145	GTS-45	-	P440/7	-	FCMW 470	40010
0.8155	GTS-55	MP50-5	P510/4	-	FCMP 390	50005
0.8165	GTS-65	MP60-3	P570/3	-	FCMP 540	70003
0.8170	GTS-70	M870-2	P690/2	-	-	90001
Fe, Ni & Co based High Temperature Alloys						
2.4360	NiCu 30 Fe	NU 30	NA13	-	Monel 400	Monel 400
2.4375	NiCu 30 Al	ND 30 AT	NA18	-	Monel K-500	Monel K-500
2.4610	NiMo 16Cr 16Ti	-	-	-	Hastelloy C-4	Hastelloy C-4
2.4630	NiCr 20 Ti	NC 20 T	HR 5, 203-4	-	Nimonic 75	Nimonic 75
2.4642	NiCr 29 Fe	NC 30 Fe	-	-	Inconel 690	Inconel 690
2.4608	NiCr 19 FeNbMo	NC 19 Fe Nb	-	-	Inconel 718	Inconel 718
2.4669	NiCr 15 Fe7TiAl	NC 15 TNb A	-	-	Inconel X-750	Inconel X-750
2.4685	G-NiMo 28	-	-	-	Hastelloy B	Hastelloy B
2.4694	NiCr 15 Fe7TiAl	-	-	-	Inconel 751	Inconel 751
2.4810	G-NiMo 30	-	-	-	Hastelloy C	Hastelloy C
2.4858	NiCr 22Mo 9Nb	NC 22 FeNb	NA21	-	Inconel 625	Inconel 625
2.4858	NiCr 21 Mo	NC 21 FeDU	NA16	-	Incoloy 825	Incoloy 825
-	Stellite 6	Stellite 6	-	-	-	VF2
-	Stellite 7	Stellite 7	-	-	-	-
-	Stellite 12	Stellite 12	-	-	-	VF7
-	Stellite F	Stellite F	-	-	-	-

Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI / SAE
Ti based High Temperature Alloys						
Lamina group Nr. 10	3.7025 Ti 1	-	2TA1	-	-	R 50250 / Titan Grade 2
	3.7115 TiAl 5 Sn 2	-	-	-	-	-
	3.7124 TiCu 2	-	2TA21-24	-	-	-
	3.7145 TiAl 16 Sn 2 Zr 4 Mo 2 S	-	-	-	-	R 54620
	3.7165 TiAl 6 V 4	TA 8 V	TA 10-13; TA28	-	-	R 56400 / Titan Grade 5
	3.7175 TiAl 6 V 6 Sn 2	-	-	-	-	-
	3.7185 TiAl 4 Mo 4 Sn 2	-	TA 45-51; TA 57	-	-	-
	3.7195 TiAl 3 V 2.5	-	-	-	-	-
	3.7225 Ti-35A 0.2PD	-	TP1	-	-	R 52250 / Titan Grade 1
	3.7235 Ti-50A 0.2PD	-	-	-	-	Titan Grade 7
Al (>8%Si) Non-Ferrous						
Gr. Nr. 12	3.2573 G-AISI9	-	-	-	-	-
	3.2581 G-AISI12	-	-	-	-	-
	3.2583 G-AISI12 Cu	-	-	-	-	-
Al (<8%Si) Non-Ferrous						
Lamina group Nr. 13	3.1255 AlCuSiMn	A-U4SG	-	-	-	-
	3.1325 AlCuMg 1	A-U4G	-	-	-	-
	3.1645 AlCuMgPb	A-U4Pb	-	-	-	-
	3.2153 G-AISI7 Cu3	-	-	-	-	-
	3.2315 AlMgSi 1	A-SGMo,7	-	-	-	-
	3.3355 AlMg 5	-	-	-	-	-
	3.3535 AlMg 3	A-C3M	-	-	-	-
Cooper Alloys Non-Ferrous						
Group Nr. 14	2.0968 CuAl10 Ni5 Fe4	CuAl9 Ni5 Fe3 M1	CA 104	-	-	CDA / C63000
	2.1052 CuSn 12 Ni	-	1400 PB2	-	-	CDA / C91700
	2.1080 CuSn7 ZNPb	U-E7 Z5 Pb4	BS 1400	-	-	CDA / C93200
	2.1176 CuPb10 SN	U PB8	1400 LB2	-	-	CDA / C94400

Notes

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Notes

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Notes

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