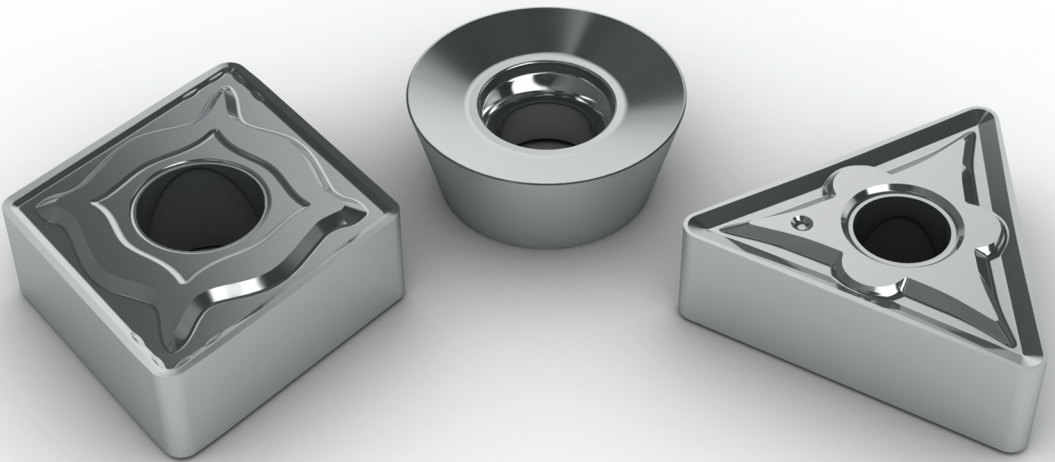




**LAMINA**  
TECHNOLOGIES

# PRODUCT LINE

**TURNING PARTING THREADING MILLING DRILLING SOLID MILL**



**NORTH AMERICA**

**magia**

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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



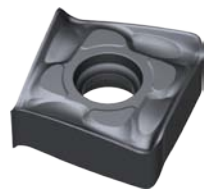
Top Swiss quality

### 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

## Parting like Never Before !



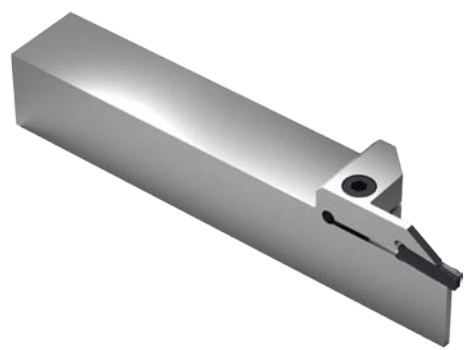
GCTX 2002 NN



GCTX 3003 NN



GCTX 3003 PP

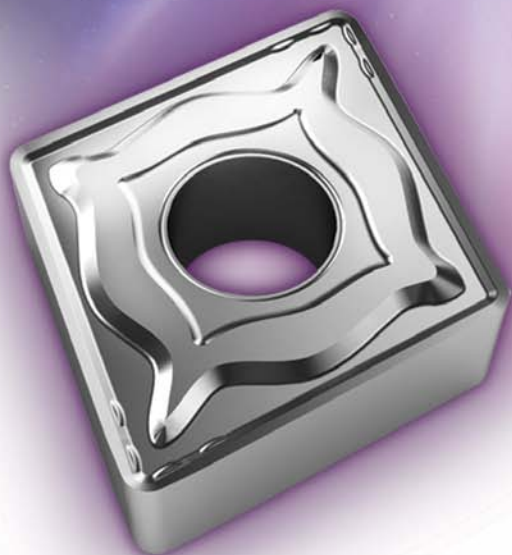


# magia

## Revolution is here

**magia** - LT 1000 grade

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



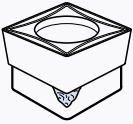
Lamina is now offering an amazing new generation of Multi-Mat™ Turning cutting tools.

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.



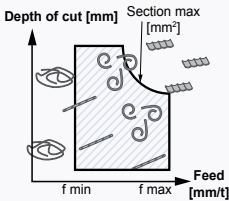
Check the stability of the machine. The tool overhang should be as short as possible.



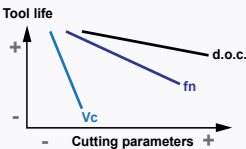
If there are interrupted cut or passes with short lengths of cut, dry operation is recommended to avoid thermal shocks. For heavy interrupted cut, feed rate should be reduced.

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

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  $\text{Amax}$  value.



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

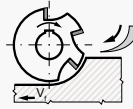
## Milling Tips



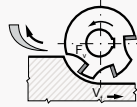
Check the condition of the cutter (Insert seat, screw, etc.) and check if the insert is well seated and clamped.



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

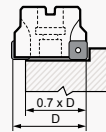


**Climb Milling**  
Usually this is the recommended direction. Tool life about 40% longer than conventional.

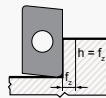


**Conventional Milling**  
Recommended only for:

- Old machines with backlash in the table transmission.
- Flame cut, forged and cast workpieces.
- Thin workpieces (in order to reduce vibration).

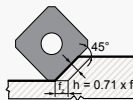


For face milling the width of cut ( $a_e$ ) should be about 70% of the cutter diameter, in order to achieve better chip formation and longer tool life. For limited engagement conditions, it is necessary to increase feed per tooth.



$K = 90^\circ$  Approach angle  
High radial forces / Low axial forces.  
Recommended:

- When  $90^\circ$  wall is needed
- For unstable conditions
- For slender workpieces.



$K = 45^\circ$  Approach angle  
Identical radial and axial forces. High productivity  
 $\rightarrow f_z = 1.41 \times h$   
Recommended:

- When overhang is long (lower vibration tendency).
- For face milling (1<sup>st</sup> choice)

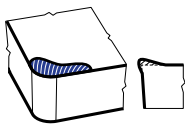


**Round inserts:**  
Roughing and general purposes. Strongest cutting edge.

# Lamina Materials Groups

Material Group	Gr. N°	VDI Group	Material Examples*	Description	Be careful with			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	<p><b>Non-alloyed Steel</b></p> <ul style="list-style-type: none"> <li>• <b>Composition</b> &gt; Fe-C alloy (usually 0.1 to 0.6% of carbon).</li> <li>• <b>Characteristics</b> &gt; Good machinability and high cutting speeds can be ap-plied. When it has less than 0.25% of carbon can be very sticky, requiring positive rake and small land inserts.</li> </ul> <p><b>Alloyed Steel</b></p> <ul style="list-style-type: none"> <li>• <b>Composition</b> &gt; Fe-C alloy (maximum 2.1% of carbon) with additives like Cr, Mo, V, Ni, Mn, Co, W, etc.</li> <li>• <b>Characteristics</b> &gt; 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.</li> </ul> <p><b>High alloyed Steel</b> have more than 5% of alloying elements.</p>	Built-up edge Crater			
		2				42CrMo4, ST50, Ck60, 4140, 4340, 100Cr6	Built-up edge Crater	
		3						
	Low alloyed	6	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19		Crater			
		4,6						
		5,7						
		8						
		10						
	High alloyed	11	304, 316, X5CrNi18-9		<ul style="list-style-type: none"> <li>• <b>Composition</b> &gt; Alloyed Steel with more than 11% of Chrom(Cr).</li> <li>• <b>Characteristics</b> &gt; 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 pro-duces abrasive wears in the cutting edge.</li> </ul>	Built-up edge Notch wear		
		14					X2CrNiN23-4, S31500	Notch wear Crater
		14						
Austenitic	12	410, X6Cr17, 17-4 PH, 430	Crater					
	13							
Duplex	15	GG20, GG40, EN-GJL-250, N630B	<ul style="list-style-type: none"> <li>• <b>Composition</b> &gt; Fe-C alloy with 2.1 to 5% of carbon. It can be alloyed with Si, P, Mn and Ni.</li> <li>• <b>Characteristics</b> &gt; Grey cast iron tends to be brittle, and malleable cast irons usually have a more ductile but less homogeneous microstructure. Reinforced cuting edges will perform the best, and high productivity can be achieved by using high feeds.</li> </ul>	Flank wear Crater Mechanical cracks				
	16							
Ferritic & Martensitic	17,19	GGG40, GGG70, 50005	<ul style="list-style-type: none"> <li>• <b>Composition</b> &gt; Iron (Fe) based, Nickel (Ni) based or Cobalt (Co) based alloys and Titanium alloys.</li> <li>• <b>Characteristics</b> &gt; High Temperature alloys and Titanium provide excellent mechanical strength resistance, as well as corrosion and oxidation resist-ance. Relatively low cutting speed is recommended due to their poor thermal conductivity.</li> </ul>	Notch wear Crater				
	18,20							
Grey	31,32	Incoloy 800	<p><b>Composition</b> &gt; Iron (Fe) based, Nickel (Ni) based or Cobalt (Co) based alloys and Titanium alloys.</p> <p><b>Characteristics</b> &gt; High Temperature alloys and Titanium provide excellent mechanical strength resistance, as well as corrosion and oxidation resist-ance. Relatively low cutting speed is recommended due to their poor thermal conductivity.</p>	Notch wear Crater				
	33							
Fe, Ni & Co based	34	Stellite 21	<p><b>Composition</b> &gt; Iron (Fe) based, Nickel (Ni) based or Cobalt (Co) based alloys and Titanium alloys.</p> <p><b>Characteristics</b> &gt; High Temperature alloys and Titanium provide excellent mechanical strength resistance, as well as corrosion and oxidation resist-ance. Relatively low cutting speed is recommended due to their poor thermal conductivity.</p>	Notch wear Crater				
	36							
Ti based	37	T40	<p><b>Composition</b> &gt; Iron (Fe) based, Nickel (Ni) based or Cobalt (Co) based alloys and Titanium alloys.</p> <p><b>Characteristics</b> &gt; High Temperature alloys and Titanium provide excellent mechanical strength resistance, as well as corrosion and oxidation resist-ance. Relatively low cutting speed is recommended due to their poor thermal conductivity.</p>	Notch wear Crater				
	37							
Hardened Mat.	Steel	38	X100CrMo13, 440C, G-X260NiCr42	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						
	40	Ni-Hard 2						
Chilled Cast Iron	41	G-X300CrMo15						
White Cast Iron	41	G-X300CrMo15						
NF	Al (>8%Si)	12	AlSi12	<p>Non-ferrous and soft materials (less than 130HB of hardness). Most common: Aluminum</p> <p><b>Composition</b> &gt; Al alloys. It can be alloyed with Cu, Zn, Mg, Mn and Si.</p> <p><b>Characteristics</b> &gt; Aluminium is widely used due to its low density and relatively good strength/weight ratio. When machi-ning 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.</p>	Built-up edge			
		13	Si < 4 % 4% < Si < 8 %					
	Cooper Alloys	14	26,27,28 CuZn30					
		29	Fiber Plastics					
	Non-Metallic	15	30			Hard Rubber		
-		Graphite						

# MACHINING OPTIMIZATION TURNING & MILLING



**Built-up edge**  
(Adhesive wear)

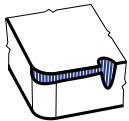


## Description

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)

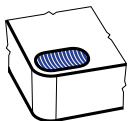


## Description

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)

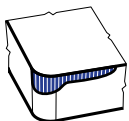


## Description

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)

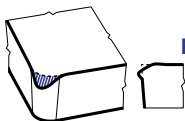


## Description

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)

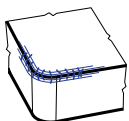


## Description

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)

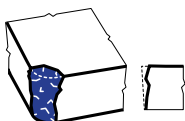


## Description

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 ANSI and ISO norms)

## 1. Insert shape

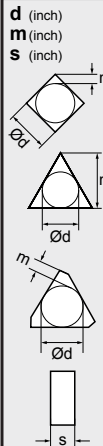
 <b>A</b>	 <b>B</b>	 <b>C</b>	 <b>D</b>
 <b>G</b>	 <b>H</b>	 <b>K</b>	 <b>L</b>
 <b>M</b>	 <b>O</b>	 <b>P</b>	 <b>R</b>
 <b>S</b>	 <b>T</b>	 <b>V</b>	 <b>W</b>

## 2. Clearance angle



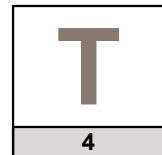
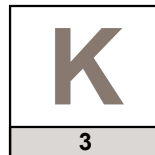
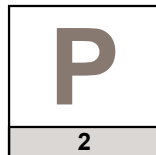
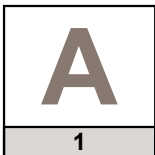
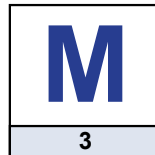
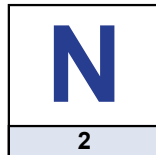
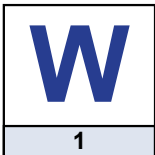
Letter Symbol	$\alpha$
<b>A</b>	3°
<b>B</b>	5°
<b>C</b>	7°
<b>D</b>	15°
<b>E</b>	20°
<b>F</b>	25°
<b>G</b>	30°
<b>N</b>	0°
<b>P</b>	11°
<b>O</b>	Special

## 3. Tolerance Class

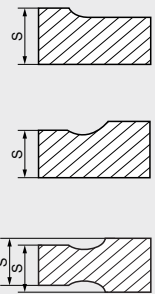


Symbol	D	M	S
<b>A</b>	± 0.0010	± 0.0002	± 0.001
<b>C</b>	± 0.0010	± 0.0005	± 0.001
<b>E</b>	± 0.0010	± 0.0010	± 0.001
<b>F</b>	± 0.0005	± 0.0002	± 0.001
<b>G</b>	± 0.0010	± 0.0010	± 0.005
<b>H</b>	± 0.0005	± 0.0005	± 0.001
<b>J'</b>	± 0.002-0.006	± 0.0002	± 0.001
<b>K'</b>	± 0.002-0.006	± 0.0005	± 0.001
<b>L'</b>	± 0.002-0.006	± 0.0010	± 0.001
<b>M'</b>	± 0.002-0.006	± 0.003-0.008	± 0.005
<b>N'</b>	± 0.002-0.006	± 0.003-0.008	± 0.001
<b>U'</b>	± 0.003-0.010	± 0.005-0.015	± 0.005

\*Depending on the insert size (For exact tolerance see insert page)



## 6. Insert thickness



Symbol	Inch	
	ISO	ANSI
01	1	1/16
T1	1.2	5/64
02	1.5	3/32
03	2	1/8
T3	2.5	5/32
04	3	3/16
05	3.5	7/32
06	4	1/4
07	5	5/16
09	6	3/8

## 7. Insert corner radius

Symbol	Corner radius (in)		1 <sup>st</sup> letter (Milling)
	ISO	ANSI	
01	0	<b>0.004</b>	A = 45°
02	0.5	<b>0.008</b>	D = 60°
04	1	<b>0.016</b>	E = 75°
08	2	<b>0.032</b>	F = 85°
12	3	<b>0.047</b>	P = 90°
16	4	<b>0.063</b>	Z = other
20	5	<b>0.079</b>	
24	6	<b>0.095</b>	2 <sup>nd</sup> letter (Milling)
28	7	<b>0.109</b>	A = 3°
32	8	<b>0.125</b>	B = 5°
00	-	Round insert (in)	C = 7°
M0	-	Round insert (mm)	D = 15°
			E = 20°
			F = 25°
			G = 30°
			N = 0°
			P = 11°
			Z = other

#### 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

I.C.			C	D	R	S	T	V	W
Symbol	Inch	mm							
1.2	.156	1.2	S4	04	03	03	06		
1.5	.187	1.5	04	05	04	04	08	08	S3
1.8	.219	1.8	05	06	05	05	09	09	03
2	.250	2	06	07	06	06	11	11	04
2.5	.313	2.5	08	09	07	07	13	13	05
3	.375	3	09	11	09	09	16	16	06
4	.500	4	12	15	12	12	22	22	08
5	.625	5	16	19	15	15	27	27	10
6	.750	6	19	23	19	19	33	33	13
8	1.000	8	25	31	25	25	44	44	17
08	.315	08			08				
10	.394	10			10				
12	.472	12			12				
16	.630	16			16				

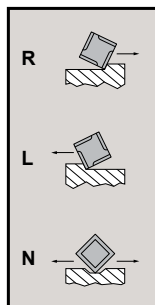
<b>4</b>	<b>3</b>	<b>2</b>			<b>NN</b>
<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>16</b>	<b>04</b>	<b>PD</b>	<b>T</b>	<b>R</b>	
<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>

#### 8. Edge preparation

	F
	E
	T
	S

Optional information

#### 9. Cutting direction



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 Material

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.  
=  
Amax**


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

 **V<sub>c</sub>** ⇒  
**Productivity**

To increase machining productivity, it is recommended to increase speed (Vc) 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.

 **Coolant**

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

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

<b>Cutting speed (ft/min)</b>	$\text{SFM} = \frac{D_m \times \pi \times n}{12}$
<b>Rotation (RPM)</b>	$n = \frac{\text{SFM} \times 12}{D_m \times \pi}$
<b>Chip removal Rate (in<sup>3</sup>/min)</b>	$Q = \text{SFM} \times a_p \times f_n \times 12$
<b>Cutting time (min)</b>	$T_c = \frac{l_m}{f_n \times n}$
<b>Surface roughness (µin)</b>	$R_{\max} = \frac{f_n^2 \times 10^6}{r_\epsilon \times 8}$

## MILLING

<b>Cutting speed (ft/min)</b>	$\text{SFM} = \frac{n \times \pi \times D}{12}$
<b>Rotation (RPM)</b>	$n = \frac{\text{SFM} \times 12}{\pi \times D}$
<b>Table feed (in/min)</b>	$V_f = n \times z_c \times f_z$
<b>Cutting output (in<sup>3</sup>/min)</b>	$Q = a_e \times a_p \times V_f$
<b>Feed per tooth (in/min)</b>	$f_z = \frac{V_f}{n \times z_c}$

Symbol	Designation	Unit
<b>D<sub>m</sub></b>	Machining diameter	inch
<b>f<sub>n</sub></b>	Feed per revolution (ipr)	inch/rev
<b>l<sub>m</sub></b>	Machining length	inch
<b>n</b>	Rotation	RPM
<b>Q</b>	Chip Removal Rate	inch <sup>3</sup> /min
<b>A<sub>max</sub></b>	d.o.c x feed	inch <sup>2</sup>
<b>r<sub>ε</sub></b>	Nose radius	inch
<b>T<sub>c</sub></b>	Cutting time	min
<b>R<sub>max</sub></b>	Surface Roughness	µinch

Symbol	Designation	Unit
<b>SFM</b>	Cutting speed	feet/min
<b>a<sub>p</sub></b>	Depth of cut (d.o.c.)	inch
<b>a<sub>e</sub></b>	Radial depth of cut (width of cut)	inch
<b>D</b>	Cutter diameter	inch
<b>f<sub>z</sub></b>	Feed per tooth (ipt)	inch
<b>Z<sub>c</sub></b>	Effective number of teeth	pcs
<b>V<sub>f</sub></b>	Table Feed (ipm)	inch/min
<b>Z<sub>n</sub></b>	Total number of teeth	pcs

## 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 into 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?**

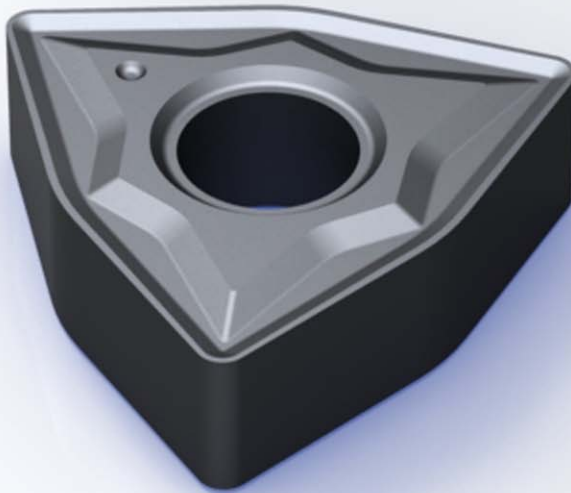
Star line inserts are a good cost for positive turning inserts. Our Star Line inserts offer 3 cutting corners for the VBMT, CCMT, DCMT, and TCMT shapes instead of 2. Moreover, all the inserts can be mounted on the same tool holder.

# Turning

LT 10 Multi-Mat™ Turning

LT 1000 Multi-Mat™ Magia Turning

LT 05 Alu-Turning



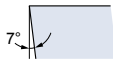
MULTI-MAT™ TURNING LINE



**C C M T**



Shape

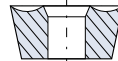


Clearance Angle



Tolerance

s ± 0.005  
For l = 06/09, d ± 0.002 m ± 0.003  
For l = 12, d ± 0.003 m ± 0.005



Fixing  
Chip breaker

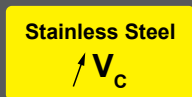
Insert Designation	Grade	l	s	r	Catalog Nr.
CCMT 2(1.5)1 NN	LT 10	0.254	0.094	0.016	T0000055
CCMT 3(2.5)1 NN	LT 10	0.381	0.156	0.016	T0000056
CCMT 3(2.5)2 NN	LT 10	0.381	0.156	0.036	T0000117
CCMT 431 NN	LT 10	0.508	0.187	0.016	T0001456
CCMT 432 NN	LT 10	0.508	0.187	0.036	T0001457
CCMT 433 NN	LT 10	0.508	0.187	0.047	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 2(1.5)1 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
CCMT 3(2.5)1 NN	😊	😐	😞	
CCMT 3(2.5)2 NN	😐	😊	😐	
CCMT 431 NN	😊	😐	😞	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
CCMT 432 NN	😐	😊	😐	
CCMT 433 NN	😞	😐	😊	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended



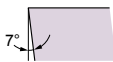
Machine Recommendations Guide. Details on page 10



C C M T



Shape

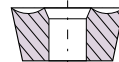


Clearance Angle



Tolerance

s ± 0.005  
For l = 06/09, d ± 0.002 m ± 0.003  
For l = 12, d ± 0.003 m ± 0.005



Fixing  
Chip breaker

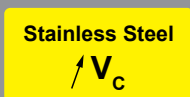
Insert Designation	Grade	l	s	r	Catalog Nr.
CCMT 2(1.5)1 NN	LT 1000	0.254	0.094	0.016	T0001888
CCMT 3(2.5)1 NN	LT 1000	0.381	0.156	0.016	T0001889
CCMT 3(2.5)2 NN	LT 1000	0.381	0.156	0.036	T0001890
CCMT 431 NN	LT 1000	0.508	0.187	0.016	T0001891
CCMT 432 NN	LT 1000	0.508	0.187	0.036	T0001892
CCMT 433 NN	LT 1000	0.508	0.187	0.047	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 2(1.5)1 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
CCMT 3(2.5)1 NN	😊	😐	😞	
CCMT 3(2.5)2 NN	😐	😊	😐	
CCMT 431 NN	😊	😐	😞	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
CCMT 432 NN	😐	😊	😐	
CCMT 433 NN	😞	😐	😊	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended



Machine Recommendations Guide. Details on page 10



## CCMT 2(1.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850
240 HB					680										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450	
				310 HB										450	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780	
				42 HRc										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780
					200 HB										720
250 HB	590														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	TiAl6V4, T40	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190	
-	160														
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290	
				50 HRc										260	
				55 HRc										220	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130	
	NI	Al (>8%Si)	12	AISI12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140

## CCMT 3(2.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	1045, 1060,	190 HB	0.098											0.009	0.0008	910	850	
		3	28Mn6	250 HB	0.098											0.008	0.0007	820	780	
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	230 HB		0.098											0.008	0.0007	820	780	
		5,7	280 HB		0.079											0.007	0.0006	680	650	
		8	350 HB		0.079											0.007	0.0006	590	590	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	280 HB		0.098											0.006	0.0006	490	450	
		11	320 HB		0.079											0.006	0.0005	420	390	
		11	350 HB		0.079											0.006	0.0004	360	360	
	Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850				
X5CrNi18-9			240 HB		0.098	0.007						0.0004	520			720	680			
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		310 HB			0.079						0.006	220			450	450				
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		42 HRC			0.079						0.006	0.0004			390	620	590			
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		EN-GJL-250, No30B		200 HB	0.118						0.008	0.0009			520	750	720			
		250 HB		0.118	0.008						0.0009	490			680	650				
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		200 HB			0.098							0.007			0.0006	750	720			
		250 HB			0.098							0.007			0.0006	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	Inconel 700	250 HB	0.079						0.006	80			160	130				
		34	Stellite 21	350 HB	0.079						0.006	70			140	110				
	TI based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
37	T40	-	0.079	0.006	0.0004						110	190			160					
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.008	0.059	0.002	0.005	0.0003	160	320	0.059	0.004	290					
				440C,	50 HRC						0.055	0.004			0.0003	130	290	0.047	0.004	260
				G-X260NiCr42	55 HRC						0.055	0.004			0.0002	130	260	0.039	0.003	220
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160						
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# CCMT 3(2.5)2 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.157	0.008	0.020	0.0025	590	1080	0.118	0.012	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.008	0.018	0.0017	390	910	0.118	0.011	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.007	0.016	0.0017	220	620	0.098	0.011	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.157	0.008	0.016	0.0017	550	880	0.118	0.012	650	
				240 HB										590	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.007	0.014	0.0011	260	490	0.098	0.010	320	
				310 HB										290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.009	0.016	0.0014	550	820	0.118	0.011	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.006	0.024	0.0028	550	820	0.118	0.012	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.006	0.020	0.0018	390	750	0.118	0.011	520
					200 HB										450
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.094	0.008	0.014	0.0010	80	140	0.079	0.010	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.126	0.008	0.016	0.0011	140	210	0.079	0.012	180
					-										140
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.079	0.004	0.012	0.0008	160	320	0.079	0.009	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.063	0.004	0.010	0.0006	130	190	0.059	0.006	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.047	0.004	0.008	0.0004	90	160	0.039	0.005	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.189	0.008	0.024	0.0025	650	1310	0.118	0.014	910

## CCMT 431 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980						
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850	
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780	
	Low alloyed	2	6	6	42CrMo4, Si50,	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
			4,6	4,6	Ck60, 4140, 4340,	230 HB											0.098	0.008	0.0007	820	780
			5,7	5,7	100Cr6	280 HB											0.079	0.007	0.0006	680	650
			8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	10	X40CrMoV5,	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
			10	10	H13, M42, D3,	280 HB											0.098	0.006	0.0006	490	450
			11	11	S6-5-2, 12Ni19	320 HB											0.079	0.006	0.0005	420	390
			11	11		350 HB											0.079	0.006	0.0004	360	360
	Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
14			14	X5CrNi18-9	240 HB	0.098											0.007	0.0004	520	720	
Duplex		5	14	14	X2CrNiN23-4,	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
			14	14	S31500	310 HB											0.079	0.006		220	450
Ferritic & Martensitic		6	12	12	410, X6Cr17,	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
			13	13	17-4 PH, 430	42 HRC											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780						
		15	15	EN-GJL-250,	200 HB											0.118	0.008	0.0009	520	750	
		16	16	No30B	250 HB											0.118	0.008	0.0009	490	680	
	Malleable & Nodular	8	17,19	17,19	GGG40, GGG70,	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
			17,19	17,19	50005	200 HB											0.098	0.007	0.0006	750	720
			18,20	18,20		250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130						
		33	33	Inconel 700	250 HB											0.079	0.006		80	160	
		34	34	Stellite 21	350 HB											0.079	0.006		70	140	
	Ti based	10	36	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
			37	37	T40	-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	38	X100CrMo13,	45 HRC	0.008	0.059	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38				38	440C,	50 HRC	0.055											0.004	0.0003	130	290
38				38	G-X260NiCr42	55 HRC	0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160						
White Cast Iron		41	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140						

## CCMT 432 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
				230 HB										590	
				280 HB										420	
				350 HB										490	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620
240 HB					550										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320	
				310 HB										290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	590
					200 HB										520
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NI	Al (>8%Si)	12	AISI12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910	

## CCMT 433 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.024	0.0033	590	1080	0.118	0.017	780
		2	1045, 1060,	190 HB	720										
		3	28Mn6	250 HB	650										
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.021	0.0022	390	910	0.118	0.015	650
		4,6	230 HB		590										
		5,7	280 HB		490										
		8	350 HB		420										
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.019	0.0022	220	620	0.098	0.014	450
		10	280 HB		390										
		11	320 HB		320										
		11	350 HB		290										
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.019	0.0022	550	880	0.118	0.014	620	
		14		240 HB										550	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.017	0.0015	260	490	0.098	0.011	320	
		14		310 HB										290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.019	0.0019	550	820	0.118	0.014	620	
		13		42 HRC										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.028	0.0037	550	820	0.118	0.017	650	
		15		200 HB										590	
		16		250 HB										520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.024	0.0028	80	140	0.079	0.012	100	
		17,19		200 HB										90	
		17,19		250 HB										90	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800 Inconel 700 Stellite 21	240 HB	0.020	0.118	0.008	0.017	0.0013	80	140	0.079	0.012	100	
		33		250 HB										90	
		34		350 HB										90	
	Ti based	10	TiAl6V4 T40	-	0.020	0.157	0.008	0.019	0.0015	140	210	0.079	0.014	180	
37		-		140											
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.014	0.0011	160	320	0.079	0.012	260	
		38		50 HRC										220	
		38		55 HRC										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.012	0.0007	130	190	0.059	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.009	0.0006	90	160	0.039	0.007	130	
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.236	0.008	0.028	0.0034	650	1310	0.118	0.019	910



**C**

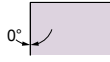
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**M**

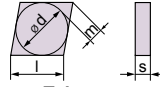
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Shape

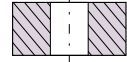


Clearance Angle



Tolerance

d ± 0.003  
m ± 0.005  
s ± 0.005



Fixing

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNMA 432</b>	<b>LT 10</b>	0.508	0.187	0.032	T0002791
<b>CNMA 433</b>	<b>LT 10</b>	0.508	0.187	0.047	T0002792
<b>CNMA 434</b>	<b>LT 10</b>	0.508	0.187	0.063	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	
<b>CNMA 432</b>	☹️	😊	😊	😊 = Good ☹️ = Acceptable 😡 = Not recommended
<b>CNMA 433</b>	😡	😊	😊	
<b>CNMA 434</b>	😡	☹️	😊	

**Finishing:**  
d.o.c. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

**Medium:**  
d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

**Roughing**  
d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

# CNMA 432 LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.031	0.0053	550	820	0.158	0.017	650			
				200 HB						0.236	0.031			0.0047	520	750	590
				250 HB						0.236	0.028			0.0047	490	680	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.026	0.0040	390	750	0.158	0.015	590			
				200 HB							0.236			0.026	0.0034	680	520
				250 HB							0.236			0.026	0.0032	620	450
H Chilled Cast Iron White Cast Iron	11	40 41	Ni-Hard 2	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.009	160				
			G-X300CrMo15										55 HRC	0.029	0.071	0.005	0.010

# CNMA 433 LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.032	0.0053	550	820	0.158	0.018	650			
				200 HB						0.236	0.032			0.0047	520	750	590
				250 HB						0.236	0.029			0.0047	490	680	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.027	0.0040	390	750	0.158	0.016	590			
				200 HB							0.236			0.027	0.0034	680	520
				250 HB							0.236			0.027	0.0032	620	450
H Chilled Cast Iron White Cast Iron	11	40 41	Ni-Hard 2	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.009	160				
			G-X300CrMo15										55 HRC	0.029	0.071	0.005	0.011

# CNMA 434 LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.035	0.0056	550	820	0.158	0.023	650			
				200 HB						0.236	0.035			0.0050	520	750	590
				250 HB						0.236	0.032			0.0050	490	680	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.030	0.0042	390	750	0.158	0.019	590			
				200 HB							0.236			0.030	0.0036	680	520
				250 HB							0.236			0.030	0.0033	620	450
H Chilled Cast Iron White Cast Iron	11	40 41	Ni-Hard 2	0.029	0.094	0.005	0.015	0.0011	130	190	0.079	0.012	160				
			G-X300CrMo15										55 HRC	0.029	0.071	0.005	0.012

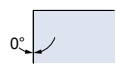




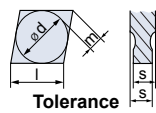
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Shape

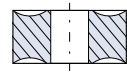


Clearance Angle



Tolerance

d ± 0.003  
m ± 0.005  
s ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNMG 431 NN</b>	<b>LT 10</b>	0.508	0.187	0.016	T0000491
<b>CNMG 432 NN</b>	<b>LT 10</b>	0.508	0.187	0.032	T0000059
<b>CNMG 432 NM</b>	<b>LT 10</b>	0.508	0.187	0.032	T0001966
<b>CNMG 433 NN</b>	<b>LT 10</b>	0.508	0.187	0.047	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	
<b>CNMG 431 NN</b>	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
<b>CNMG 432 NN</b>	😐	😊	😐	
<b>CNMG 432 NM</b>	😐	😊	😐	
<b>CNMG 433 NN</b>	😞	😐	😊	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

**Stainless Steel**  
↑ V<sub>c</sub>

↑ F ⇒  
↑ Productivity

Machine Recommendations Guide  
Details on page 10



C

N

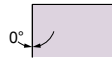
M

G

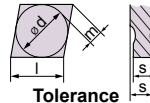
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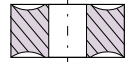
Shape



Clearance Angle



Tolerance  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMG 431 NN	LT 1000	0.508	0.187	0.016	T0001895
CNMG 432 NN	LT 1000	0.508	0.187	0.032	T0001896
CNMG 432 NM	LT 1000	0.508	0.187	0.032	T0001968
CNMG 432 NX	LT 1000	0.508	0.187	0.032	T0002741
CNMG 433 NN	LT 1000	0.508	0.187	0.047	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 431 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
CNMG 432 NN	😐	😊	😊	
CNMG 432 NM	😞	😊	😊	
CNMG 432 NX	😊	😊	😐	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
CNMG 433 NN	😞	😐	😊	
				<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

Stainless Steel  
 $\uparrow V_c$

$\uparrow F \Rightarrow$   
 $\uparrow$  Productivity

Machine Recommendations Guide  
 Details on page 10

# CNMG 431 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850
240 HB					680										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450	
				310 HB										450	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780	
				42 HRc										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780
					200 HB										720
					250 HB										590
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190
					-										160
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290	
				50 HRc										260	
				55 HRc										220	
				400 HB										220	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160	
White Cast Iron	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130		
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140

# CNMG 432 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions																		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>																
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.015	780															
			2		190 HB											0.197	0.018	0.0023	910	0.014	720									
			3		250 HB																	0.020	0.197	0.008	0.018	0.0025	910	0.013	650	
	6	180 HB	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	0.157	0.008	0.016	0.0022	390	0.118	0.013	590																			
	4,6	230 HB										0.157	0.007	0.016	0.0019	680	0.012	490												
	5,7	280 HB																	0.138	0.007	0.016	0.0016	590	0.012	420					
	8	350 HB										X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	0.020	0.157	0.007	0.016	0.0019	220								0.098	0.012	450		
	10	220 HB	0.157	0.016	0.0019	620	0.012	390																						
	10	280 HB							0.118	0.014	0.0012								490	0.011	320									
	11	320 HB																				0.118	0.014	0.0012	420				0.011	320
	11	350 HB																												
Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0014	520	720	0.009	550																	
		14	240 HB	0.157										0.007	0.014	0.0011	260	490	0.098	0.011	320									
Duplex	5	14	X2CrNiN23-4, S31500		290 HB	0.020	0.157	0.007	0.014	0.0011	220	450	0.098									0.011	290							
		14	310 HB	0.020	0.197									0.009	0.016	0.0016	550	820	0.118	0.013	620									
Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430			200 HB	0.020	0.197	0.009	0.016	0.0016	390	620									0.098	0.013	420						
		13	42 HRC	GG20, GG40, EN-GJL-250, No30B	0.020	0.197								0.006	0.024	0.0031	550	820	0.118	0.014	650									
Grey	7	15	150 HB				0.020	0.197	0.006	0.024	0.0028	520	750									0.118	0.014	590						
		16	200 HB																						0.020	0.197	0.022	0.0028	490	680
		16	250 HB	GGG40, GGG70, 50005	0.020	0.197								0.006	0.020	0.0020	390	750	0.118	0.012	520									
Malleable & Nodular	8	17,19	150 HB				0.020	0.197	0.006	0.020	0.0023	820	0.118									0.012	590							
		17,19	200 HB																					0.020	0.197	0.020	0.0019	620	0.118	0.012
		18,20	250 HB	Incoloy 800	0.020	0.118								0.008	0.014	0.0011	80	160	0.079	0.011	100									
Fe, Ni & Co based	9	31,32	240 HB				0.020	0.118	0.008	0.014	0.0011	80	160									0.079	0.011	90						
		33	250 HB																						0.118	0.014	0.0011	70	140	0.079
		34	350 HB	TiAl6V4	0.020	0.138								0.008	0.016	0.0012	140	210	0.079	0.012	140									
Ti based	10	36	-				0.020	0.118	0.008	0.014	0.0011	110	190									0.079	0.012	140						
		37	-																						X100CrMo13, 440C, G-X260NiCr42	0.020	0.079	0.004	0.010	0.0008
Steel	11	38	45 HRC	0.020	0.079	0.004	0.010	0.0008	130	260	0.039	0.007	190																	
		38	50 HRC											0.063	0.008	0.0005	130	190	0.059	0.007	160									
		38	55 HRC																			Ni-Hard 2	0.020	0.079	0.004	0.010	0.0008	130	190	0.059
Chilled Cast Iron	11	40	400 HB	0.020	0.079	0.004	0.010	0.0008	130	190	0.059	0.007	160																	
		40	400 HB											0.020	0.063	0.004	0.008	0.0005	90	160	0.039									
White Cast Iron	11	41	55 HRC	0.020	0.063	0.004	0.008	0.0005	90	160	0.039	0.006	130																	
		41	55 HRC											0.020	0.236	0.008	0.024	0.0031	650	1310	0.118	0.016	910							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0031	650	1310	0.118											0.016	910					

# CNMG 432 NM LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.026	0.0042	590	1080	0.157	0.020	680	
				190 HB										650	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.023	0.0028	390	910	0.157	0.017	520	
				230 HB										490	
				280 HB										450	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.020	0.0028	220	620	0.131	0.015	390	
				280 HB										360	
				320 HB										320	
				350 HB										290	
														290	
Stainless Steel	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.020	0.0025	550	820	0.157	0.015	290	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.031	0.0047	550	820	0.157	0.017	590	
				200 HB										550	
				250 HB										520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.026	0.0035	390	750	0.157	0.015	490	
				200 HB										450	
				250 HB										420	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.079	0.004	0.015	0.0014	160	320	0.105	0.012	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	White Cast Iron	41	Ni-Hard 2, G-X300CrMo15	400 HB	0.020	0.079	0.004	0.013	0.0009	130	260	0.059	0.009	160
					55 HRc										130

## CNMG 432 NX LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780
		2	1045, 1060,	190 HB	720										
		3	28Mn6	250 HB	650										
	Low alloyed	2	6	42CrMo4, S150,	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650
		4,6	Ck60, 4140, 4340,	230 HB	590										
		5,7	100Cr6	280 HB	490										
		8		350 HB	420										
	High alloyed	3	10	X40CrMoV5,	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450
		10	H13, M42, D3,	280 HB	390										
		11	S6-5-2, 12Ni19	320 HB	320										
		11		350 HB	290										
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.010	620
		14	X5CrNi18-9	240 HB	550										
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320
		14	S31500	310 HB	290										
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620
		13	17-4 PH, 430	42 HRc	420										
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650
		15	EN-GJL-250,	200 HB	590										
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	520
		17,19	50005	200 HB	520										
		18,20		250 HB	450										
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100
		33	Inconel 700	250 HB	90										
		34	Stellite 21	350 HB	90										
	Ti based	10	36	TiAl6V4	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180
		37	T40	-	140										
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260
		38	440C,	50 HRc	220										
		38	G-X260NiCr42	55 HRc	190										
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910

# CNMG 433 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.029	0.236	0.010	0.027	0.0047	590	1080	0.158	0.018	780		
				190 HB										720		
				250 HB										650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.236	0.010	0.024	0.0032	390	910	0.158	0.017	650		
				230 HB										590		
				280 HB										490		
				350 HB										420		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.189	0.009	0.021	0.0032	220	620	0.132	0.016	450		
				280 HB										390		
				320 HB										320		
				350 HB										290		
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.236	0.010	0.021	0.0032	550	880	0.158	0.011	620	
240 HB					550											
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.029	0.189	0.009	0.019	0.0021	260	490	0.132	0.013	320		
				310 HB										290		
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.236	0.011	0.021	0.0026	550	820	0.158	0.016	620		
				42 HRc										420		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.032	0.0053	550	820	0.158	0.018	650		
				200 HB										590		
				250 HB										520		
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.027	0.0040	820	590	0.158	0.016	520	
					200 HB										520	
					250 HB										450	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.029	0.142	0.010	0.019	0.0018	80	140	0.106	0.015	100		
				250 HB						80	140					
				350 HB						70	130			90		
	Ti based	10	TiAl6V4, T40	-	0.029	0.189	0.010	0.021	0.0021	140	210	0.106	0.017	180		
-	110	180	140													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.029	0.118	0.005	0.016	0.0016	160	320	0.106	0.013	260		
				50 HRc						130	290			0.079	0.010	220
				55 HRc						130	260			0.053	0.009	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.009	160		
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.029	0.071	0.005	0.011	0.0008	90	160	0.053	0.008	130		
NI	Al (>8%Si)	12	AISI12	130 HB	0.029	0.276	0.010	0.032	0.0048	650	1310	0.158	0.020	910		



C

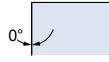
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M

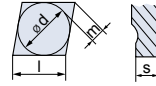
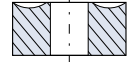
M



Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$ 

**Fixing  
Chip breaker**

CNMM

Insert Designation	Grade	l	s	r	Catalog Nr.
CNMM 432 NR	LT 10	0.508	0.187	0.032	T0000669
CNMM 433 NR	LT 10	0.508	0.187	0.047	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.

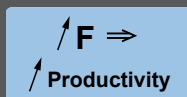
## Application Guide

	Finishing	Medium	Roughing / Interrupted cut
CNMM 432 NR	☹️	😊	☹️
CNMM 433 NR	☹️	☹️	😊

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 ☹️ = Acceptable  
 ☹️ = Not recommended



Machine Recommendations Guide  
 Details on page 10





**C**

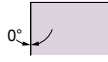
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**M**

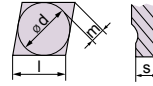
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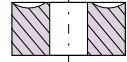
Shape



Clearance Angle



**Tolerance**  
 d ± 0.003  
 m ± 0.005  
 s ± 0.005



**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNMM 432 NR</b>	<b>LT 1000</b>	0.508	0.187	0.032	T0001898
<b>CNMM 433 NR</b>	<b>LT 1000</b>	0.508	0.187	0.047	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.

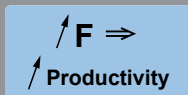
**Application Guide**

	Finishing	Medium	Roughing / Interrupted cut
<b>CNMM 432 NR</b>	☹️	😊	😊
<b>CNMM 433 NR</b>	☹️	☹️	😊

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 ☹️ = Acceptable  
 ☹️ = Not recommended



Machine Recommendations Guide  
 Details on page 10

## CNMM 432 NR LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.276	0.008	0.024	0.0050	590	1080	0.195	0.018	780							
		2	2	1045, 1060,	190 HB									0.0276	0.024	0.0045	910	0.017	720			
		3	3	28Mn6	250 HB									0.276	0.021	0.0037	820	0.016	650			
	Low alloyed	2	6	6	42CrMo4, Si50,	180 HB	0.020	0.276	0.008	0.021	0.0040	390	910	0.195	0.015	650						
			4,6	4,6	Ck60, 4140, 4340,	230 HB									0.220	0.008	0.021	0.0035	820	0.015	590	
			5,7	5,7	100Cr6	280 HB									0.220	0.007	0.019	0.0030	680	0.014	490	
			8	8		350 HB									0.193	0.007	0.019	0.0025	590	0.014	420	
	High alloyed	3	10	10	X40CrMoV5,	220 HB	0.020	0.220	0.007	0.019	0.0030	220	620	0.162	0.014	450						
			10	10	H13, M42, D3,	280 HB									0.220	0.019	0.0030	490	0.014	390		
			11	11	S6-5-2, 12Ni19	320 HB									0.165	0.017	0.0020	420	0.013	320		
			11	11		350 HB									0.165	0.017	0.0020	360	0.013	290		
Stainless Steel	Austenitic	4	14	14	304, 316,	180 HB	0.020	0.276	0.008	0.019	0.0030	550	880	0.195	0.013	620						
			14	14	X5CrNi18-9	240 HB									0.276	0.019	0.0027	520	0.012	550		
	Duplex	5	14	14	X2CrNiN23-4,	290 HB	0.020	0.220	0.007	0.017	0.0022	260	490	0.162	0.010	320						
			14	14	S31500	310 HB									0.220	0.017		220	450	290		
	Ferritic & Martensitic	6	12	12	410, X6Cr17,	200 HB	0.020	0.276	0.009	0.019	0.0030	550	820	0.195	0.013	620						
			13	13	17-4 PH, 430	42 HRC										0.220	0.019		390	620	0.162	0.012
Cast Iron	Grey	7	15	15	GG20, GG40,	150 HB	0.020	0.276	0.006	0.028	0.0050	550	820	0.195	0.017	650						
			15	15	EN-GJL-250,	200 HB										0.276	0.028	0.0045	520	750	590	
			16	16	No30B	250 HB										0.276	0.026	0.0045	490	680	520	
	Malleable & Nodular	8	17,19	17,19	GGG40, GGG70,	150 HB	0.020	0.276	0.006	0.024	0.0037	390	820	0.195	0.014	590						
			17,19	17,19	50005	200 HB										0.276	0.024	0.0032	750	520		
			18,20	18,20		250 HB										0.276	0.024	0.0030	620	450		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	31,32	Incoloy 800	240 HB	0.020	0.165	0.008	0.017	0.0022	80	160	0.130	0.013	100						
			33	33	Inconel 700	250 HB										0.165	0.017	0.0022	80	160	90	
			34	34	Stellite 21	350 HB										0.165	0.017	0.0020	70	140	90	
	Ti based	10	36	36	TiAl6V4	-	0.020	0.193	0.008	0.019	0.0025	140	210	0.130	0.015	180						
37			37	T40	-	0.165									0.017	0.0020	110	190	0.013	140		
Hardened Mat.	Steel	11	38	38	X100CrMo13,	45 HRC	0.020	0.110	0.004	0.014	0.0015	160	320	0.130	0.012	260						
			38	38	440C,	50 HRC									0.110	0.012	0.0012	130	290	0.097	0.009	220
			38	38	G-X260NiCr42	55 HRC									0.088	0.009	0.0007	130	260	0.065	0.009	190
	Chilled Cast Iron	40	40	40	Ni-Hard 2	400 HB	0.020	0.110	0.004	0.012	0.0012	130	190	0.097	0.009	160						
			White Cast Iron	41	41	G-X300CrMo15	55 HRC	0.020	0.088	0.004	0.009	0.0007	90	160	0.065	0.007	130					
NF	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.331	0.008	0.028	0.0050	650	1310	0.195	0.019	910							

# CNMM 433 NR LT 10 & LT 1000

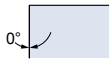
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.008	0.024	0.0056	590	1080	0.195	0.018	780			
		2		190 HB									0.017	720			
		3		250 HB									0.016	650			
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.008	0.021	0.0045	390	910	0.195	0.015	650			
		4,6		230 HB									0.015	590			
		5,7		280 HB									0.014	490			
		8		350 HB									0.014	420			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.220	0.007	0.019	0.0033	220	620	0.162	0.014	450			
		10		280 HB									0.014	390			
		11		320 HB									0.013	320			
		11		350 HB									0.013	290			
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.008	0.019	0.0033	550	880	0.195	0.013	620		
14			240 HB		0.012									550			
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.220	0.007	0.017	0.0025	260	490	0.162	0.010	320			
		14		310 HB									0.010	290			
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.009	0.019	0.0033	550	820	0.195	0.013	620			
		13		42 HRc									0.012	420			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.006	0.028	0.0056	550	820	0.195	0.017	650			
		15		200 HB										750	590		
		16		250 HB										490	680	520	
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.024	0.0042	390	820	0.195	0.014	590			
		17,19		200 HB										750	520		
18,20	250 HB	620	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.165	0.008	0.017	0.0022	80	160	0.130	0.013	100			
		33		250 HB										80	160	90	
		34		350 HB										70	140	90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.193	0.008	0.019	0.0025	140	210	0.130	0.015	180			
37		-		110									190	140			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.138	0.004	0.014	0.0017	160	320	0.130	0.012	260			
		38		50 HRc									130	290	0.097	0.009	220
		38		55 HRc									0.009	0.0008	130	260	0.065
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.110	0.004	0.012	0.0014	130	190	0.097	0.009	160			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.088	0.004	0.009	0.0008	90	160	0.065	0.007	130			
NI	Al (>8%Si)	12	AISI12	130 HB	0.020	0.331	0.008	0.028	0.0056	650	1310	0.195	0.019	910			



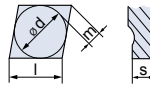
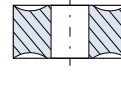
# C N M P



Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$ 

**Fixing  
Chip breaker**

CNMP

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNMP 432 NN</b>	<b>LT 10</b>	0.508	0.187	0.032	T0000062
<b>CNMP 433 NN</b>	<b>LT 10</b>	0.508	0.187	0.047	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 432 NN**



**CNMP 433 NN**



### Finishing:

d.o.c. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

### Medium:

d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

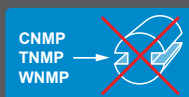
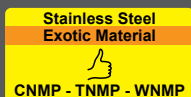
### Roughing

d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

😊 = Good

😐 = Acceptable

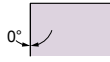
😞 = Not recommended



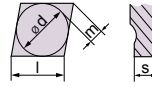
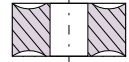
Machine Recommendations  
Guide. Details on page 10

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

Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$ 

**Fixing  
Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNMP 432 NN</b>	<b>LT 1000</b>	0.508	0.187	0.032	T0001900
<b>CNMP 433 NN</b>	<b>LT 1000</b>	0.508	0.187	0.047	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 432 NN****CNMP 433 NN****Finishing:**

d.o.c. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

**Medium:**

d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

**Roughing**

d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

= Good

= Acceptable

= Not recommended

**Stainless Steel  
Exotic Material**



**CNMP - TNMP - WNMP**



**Exotic Material**

Verify

**Cutting Conditions**

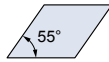
Machine Recommendations  
Guide. Details on page 10

## CNMP 432 NN LT 10 &amp; LT 1000

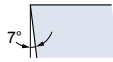
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
		2	2	1045, 1060,	190 HB										720	
		3	3	28Mn6	250 HB										650	
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
			4,6		230 HB										590	
			5,7		280 HB										490	
			8		350 HB										420	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
			10		280 HB										390	
			11		320 HB										320	
			11		350 HB										290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.010	620		
		14		240 HB										550		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320		
		14		310 HB										290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620		
				13										42 HRC	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650		
		15		200 HB										590		
		16		250 HB										520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	820	390	750	0.118	0.012	590	
				17,19											200 HB	520
				18,20											250 HB	450
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100		
		33		250 HB										90		
		34		350 HB										90		
	Ti based	10	TiAl6V4 T40	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180		
37		-		140												
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260		
				50 HRC										220		
				55 HRC										190		
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910	

# CNMP 433 NN LT 10 & LT 1000

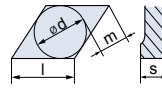
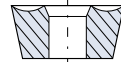
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.029	0.236	0.010	0.027	0.0047	590	1080	0.158	0.018	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.236	0.010	0.024	0.0032	390	910	0.158	0.017	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.189	0.009	0.021	0.0032	220	620	0.132	0.016	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.236	0.010	0.021	0.0032	550	880	0.158	0.016	620
240 HB					550										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.029	0.189	0.009	0.019	0.0021	260	490	0.132	0.013	320	
				310 HB										290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.236	0.011	0.021	0.0026	550	820	0.158	0.016	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.032	0.0053	550	820	0.158	0.018	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.027	0.0040	820	0.158	0.016	590	
					200 HB									520	
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.029	0.142	0.010	0.019	0.0018	80	140	0.106	0.015	100	
				250 HB						80	140				
				350 HB						70	130			90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.029	0.189	0.010	0.021	0.0021	140	210	0.106	0.016	180
-					110						180	140			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.029	0.118	0.005	0.016	0.0016	160	320	0.106	0.013	260	
				50 HRc						220					
				55 HRc						190					
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.010	220	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.029	0.071	0.005	0.011	0.0008	90	160	0.053	0.008	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.029	0.276	0.010	0.032	0.0048	650	1310	0.158	0.020	910

**D****C****M****T**

Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$ 

**Fixing  
Chip breaker**
**DCMT**

Insert Designation	Grade	l	s	r	Catalog Nr.
DCMT 2(1.5)1 NN	LT 10	0.305	0.094	0.016	T0000064
DCMT 3(2.5)1 NN	LT 10	0.458	0.156	0.016	T0000065
DCMT 3(2.5)2 NN	LT 10	0.458	0.156	0.032	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 2(1.5)1 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
DCMT 3(2.5)1 NN	😊	😐	😞	
DCMT 3(2.5)2 NN	😐	😊	😐	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

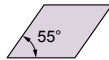
**Stainless Steel**

 Machine Recommendations Guide  
 Details on page 10

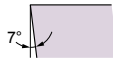




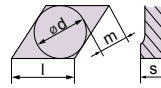
**D C M T**



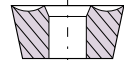
Shape



Clearance Angle



**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



**Fixing**  
**Chip breaker**

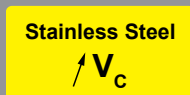
Insert Designation	Grade	l	s	r	Catalog Nr.
<b>DCMT 2(1.5)1 NN</b>	<b>LT 1000</b>	0.305	0.094	0.016	T0001902
<b>DCMT 3(2.5)1 NN</b>	<b>LT 1000</b>	0.458	0.156	0.016	T0001903
<b>DCMT 3(2.5)2 NN</b>	<b>LT 1000</b>	0.458	0.156	0.032	T0001904

**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	
<b>DCMT 2(1.5)1 NN</b>	😊	😐	😞	😊 = Good 😐 = Acceptable 😞 = Not recommended  <b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
<b>DCMT 3(2.5)1 NN</b>	😊	😐	😞	
<b>DCMT 3(2.5)2 NN</b>	😐	😊	😐	



Machine Recommendations Guide  
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## DCMT 2(1.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980							
		2	2	1045, 1060,	190 HB										0.069	0.007	0.0005	910	850			
		3	3	28Mn6	250 HB										0.069	0.007	0.0005	820	780			
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850							
			4,6		230 HB										0.069	0.007	0.0005	820	780			
			5,7		280 HB										0.055	0.006	0.0004	680	650			
			8		350 HB										0.055	0.006	0.0003	590	590			
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590							
			10		280 HB										0.069	0.005	0.0004	490	450			
			11		320 HB										0.055	0.005	0.0003	420	390			
			11		350 HB										0.055	0.005	0.0002	360	360			
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850							
14			240 HB		0.069										0.006	0.0002	520	720	680			
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450								
				14										310 HB	0.055	0.005	0.0002	220	450	450		
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780								
				13										42 HRC	0.055	0.005	0.0002	390	620	0.005	590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780								
				15										200 HB	0.083	0.007	0.0006	520	750	720		
				16										250 HB	0.083	0.007	0.0006	490	680	650		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780								
				17,19										200 HB	0.069	0.006	0.0004	750	720			
				18,20										250 HB	0.069	0.006	0.0004	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130								
				33										250 HB	0.055	0.005	0.0002	80	160	130		
				34										350 HB	0.055	0.005	0.0002	70	140	110		
	Ti based	10	TiAl6V4	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190								
				T40										-	0.055	0.005	0.0002	110	190	0.005	160	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290							
38					50 HRC										0.041	0.003	0.0002	130	290	0.024	0.004	260
38					55 HRC										0.000	0.039	0.003	0.001	130	260	0.020	0.003
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160								
				41										G-X300CrMo15	55 HRC	0.008	0.039	0.001	0.003	0.0001	90	160
NF		Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140						

## DCMT 3(2.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850
240 HB					680										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450	
				310 HB										450	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780	
				42 HRc										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0009	550	820	0.079	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780
					200 HB										720
					250 HB										590
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190
					-										160
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290	
				50 HRc										260	
				55 HRc										220	
				400 HB										220	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160	
White Cast Iron	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130		
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140

## DCMT 3(2.5)2 NN LT 10 &amp; LT 1000

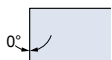
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions							
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>					
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.157	0.008	0.020	0.0025	590	1080	0.118	0.012	780				
		2	1045, 1060,	190 HB	720														
		3	28Mn6	250 HB	650														
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.008	0.018	0.0017	390	910	0.118	0.011	650				
		4,6	230 HB		590														
		5,7	280 HB		490														
		8	350 HB		420														
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.007	0.016	0.0017	220	620	0.098	0.011	450				
		10	280 HB		390														
		11	320 HB		320														
		11	350 HB		290														
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.020	0.157	0.008	0.016	0.0017	550	880	0.118	0.012	620				
		14		X5CrNi18-9	240 HB										520	720	550		
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.007	0.014	0.0011	260	490	0.098	0.010	320				
		14			310 HB										220	450	290		
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.009	0.016	0.0014	550	820	0.118	0.011	620				
		13			42 HRC										390	620	420		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.157	0.006	0.024	0.0028	550	820	0.118	0.012	650				
		15		EN-GJL-250,	200 HB										520	750			
		16		No30B	250 HB										490	680	520		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.006	0.020	0.0021	390	820	0.118	0.011	590				
		17,19			200 HB										750	520			
18,20	250 HB	620	450																
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.020	0.094	0.008	0.014	0.0010	80	140	0.079	0.010	100				
		33	Inconel 700	250 HB	80										140	90			
		34	Stellite 21	350 HB	70										130	90			
	Ti based	10	36	TiAl6V4	-	0.020	0.126	0.008	0.016	0.0011	140	210	0.079	0.012	180				
37		T40	-	0.094	0.014										0.0010	110	180	140	
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.020	0.063	0.004	0.010	0.0008	160	320	0.079	0.009	260				
				440C,	50 HRC										130	290	0.059	0.007	220
				G-X260NiCr42	55 HRC										0.008	0.0004	130	260	0.039
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.063	0.004	0.010	0.0006	130	190	0.059	0.006	160					
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.047	0.004	0.008	0.0004	90	160	0.039	0.005	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.189	0.008	0.024	0.0025	650	1310	0.118	0.014	910				



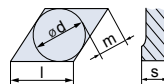
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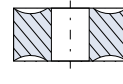
Shape



Clearance Angle



Tolerance

Fixing  
Chip breaker

$s \pm 0.005$   
For  $l = 11$ ,  $d \pm 0.002$   $m \pm 0.003$   
For  $l = 15$ ,  $d \pm 0.003$   $m \pm 0.005$

**NN** All purpose Chipbreaker

Insert Designation	Grade	l	s	r	Catalog Nr.
DNMG 331 NN	LT 10	0.458	0.187	0.016	T0000066
DNMG 332 NN	LT 10	0.458	0.187	0.032	T0000675
DNMG 431 NN	LT 10	0.610	0.187	0.016	T0000476
DNMG 432 NN	LT 10	0.610	0.187	0.032	T0000475
DNMG 433 NN	LT 10	0.610	0.187	0.047	T0001021
DNMG 441 NN	LT 10	0.610	0.250	0.016	T0000583
DNMG 442 NN	LT 10	0.610	0.250	0.032	T0000067
DNMG 443 NN	LT 10	0.610	0.250	0.047	T0000672

## Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DNMG 331 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
DNMG 332 NN	😐	😊	😐	
DNMG 431 NN	😊	😐	😞	
DNMG 432 NN	😐	😊	😐	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
DNMG 433 NN	😞	😐	😊	
DNMG 451 NN	😊	😐	😞	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
DNMG 452 NN	😐	😊	😐	
DNMG 453 NN	😞	😐	😊	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

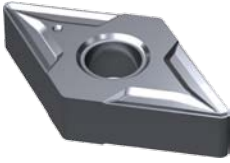
Stainless Steel



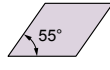
$V_c \Rightarrow$   
 ↑ Productivity

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

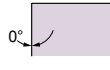
Machine Recommendations Guide. Details on page 10



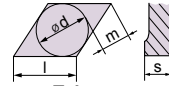
# D N M G



Shape

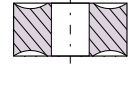


Clearance Angle



Tolerance

$s \pm 0.005$   
For  $l = 11$ ,  $d \pm 0.002$   $m \pm 0.003$   
For  $l = 15$ ,  $d \pm 0.003$   $m \pm 0.005$



Fixing Chip breaker

**NN** All purpose Chipbreaker

**DNMG**

Insert Designation	Grade	l	s	r	Catalog Nr.
DNMG 331 NN	LT 1000	0.458	0.187	0.016	T0001905
DNMG 332 NN	LT 1000	0.458	0.187	0.032	T0001906
DNMG 431 NN	LT 1000	0.610	0.187	0.016	T0001907
DNMG 432 NN	LT 1000	0.610	0.187	0.032	T0001908
DNMG 433 NN	LT 1000	0.610	0.187	0.047	T0001909
DNMG 441 NN	LT 1000	0.610	0.250	0.016	T0001910
DNMG 442 NN	LT 1000	0.610	0.250	0.032	T0001911
DNMG 443 NN	LT 1000	0.610	0.250	0.047	T0001912

## Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
DNMG 331 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
DNMG 332 NN	😐	😊	😐	
DNMG 431 NN	😊	😐	😞	
DNMG 432 NN	😐	😊	😊	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
DNMG 433 NN	😞	😐	😊	
DNMG 451 NN	😊	😐	😞	
DNMG 452 NN	😐	😊	😊	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
DNMG 453 NN	😞	😐	😊	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

**Stainless Steel**

$V_c \Rightarrow$

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 331 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850
240 HB					680										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450	
				310 HB										0	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780	
				42 HRc										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780
					200 HB										720
					250 HB										590
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190
					-										160
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290	
				50 HRc										260	
				55 HRc										220	
				400 HB										160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140

## DNMG 332 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780						
		2	2	1045, 1060,	190 HB										0.197	0.020	0.0028	910	720		
		3	3	28Mn6	250 HB										0.197	0.018	0.0023	820	650		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650						
			4,6		230 HB										0.157	0.008	0.018	0.0019	820	590	
			5,7		280 HB										0.157	0.007	0.016	0.0019	680	490	
			8		350 HB										0.138	0.007	0.016	0.0016	590	420	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450						
			10		280 HB										0.157	0.016	0.0019	490	390		
			11		320 HB										0.118	0.014	0.0012	420	320		
			11		350 HB										0.118	0.014	0.0012	360	290		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.010	620							
				14										240 HB	0.197	0.016	0.0016	520	720	0.009	550
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320							
				14										310 HB	0.157	0.014	0.0000	220	450	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620							
				13										42 HRC	0.157	0.016	0.0000	390	620	0.098	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650							
				200 HB										0.197	0.024	0.0028	520	750	590		
				250 HB										0.197	0.022	0.0028	490	680	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	820	390	750	0.118	0.012	590						
				200 HB											0.020	0.0020	0.0020	390	750	520	
				250 HB											0.197	0.020	0.0019	620	450		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100							
				33										250 HB	0.118	0.014	0.0000	80	140	90	
				34										350 HB	0.118	0.014	0.0000	70	130	90	
	Ti based	10	TiAl6V4	-	0.020	0.138	0.008	0.016	0.0012	140	210	0.079	0.013	180							
				-										0.118	0.014	0.0011	110	180	140		
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260						
50 HRC					0.079										0.010	0.0006	130	290	0.059	0.008	220
55 HRC					0.059										0.008	0.0005	130	260	0.039	0.007	190
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160							
White Cast Iron		41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910						



## DNMG 431 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850	
				240 HB										680	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450	
				310 HB										450	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780	
				42 HRC										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0009	550	820	0.079	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780
					200 HB										720
250 HB	590														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190
-	160														
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290	
				50 HRC										260	
				55 HRC										220	
				400 HB										160	
	Chilled Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	130	190	0.047	0.004	160	
White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130		
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140

## DNMG 432 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780						
		2	2	1045, 1060,	190 HB										0.197	0.020	0.0028	910	720		
		3	3	28Mn6	250 HB										0.197	0.018	0.0023	820	650		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650						
			4,6		230 HB										0.157	0.008	0.018	0.0019	820	590	
			5,7		280 HB										0.157	0.007	0.016	0.0019	680	490	
			8		350 HB										0.138	0.007	0.016	0.0016	590	420	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450						
			10		280 HB										0.157	0.016	0.0019	490	390		
			11		320 HB										0.118	0.014	0.0012	420	320		
			11		350 HB										0.118	0.014	0.0012	360	290		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.010	620							
				14										240 HB	0.197	0.000	0.0016	520	720	0.009	550
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320							
				14										310 HB	0.157	0.000	0.0012	220	450	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620							
				13										42 HRC	0.157	0.000	0.0016	390	620	0.098	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650							
				200 HB										0.197	0.024	0.0028	520	750			
				250 HB										0.197	0.022	0.0028	490	680			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	820	390	0.118	0.012	590							
				200 HB										0.197	0.000	0.0020	750	520			
250 HB	0.197	0.000	0.0019	620	450																
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100							
				33										250 HB	0.118	0.000	0.0011	80	140	90	
				34										350 HB	0.118	0.000	0.0011	70	130	90	
	Ti based	10	TiAl6V4	-	0.020	0.138	0.008	0.016	0.0012	140	210	0.079	0.013	180							
-				0.118										0.014	0.0011	110	180	0.012	140		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260							
				50 HRC										0.079	0.010	0.0006	130	290	0.059	0.008	220
				55 HRC										0.059	0.008	0.0005	130	260	0.039	0.007	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160							
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910						

## DNMG 433 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm²]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.029	0.236	0.010	0.027	0.0047	590	1080	0.158	0.018	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.236	0.010	0.024	0.0032	390	910	0.158	0.017	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.189	0.009	0.021	0.0032	220	620	0.132	0.016	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.236	0.010	0.021	0.0032	550	880	0.158	0.016	620	
				240 HB										550	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.029	0.189	0.009	0.019	0.0021	260	490	0.132	0.013	320	
				310 HB										290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.236	0.011	0.021	0.0026	550	820	0.158	0.016	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.032	0.0053	550	820	0.158	0.018	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.027	0.0040	820	590	0.158	0.016	520
					200 HB										520
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.029	0.142	0.010	0.019	0.0018	80	140	0.106	0.015	100	
				250 HB						80	140				
				350 HB						70	130				
	Ti based	10	36, 37	TiAl6V4, T40	-	0.029	0.189	0.010	0.021	0.0021	140	210	0.106	0.017	180
-	110	180	0.019	0.0018	140						180	0.016			140
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.029	0.118	0.005	0.016	0.0016	160	320	0.106	0.013	260	
				50 HRc						220					
				55 HRc						190					
				400 HB						190					
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.010	220	
White Cast Iron	41	G-X300CrMo15	55 HRc	0.029	0.071	0.005	0.011	0.0008	90	160	0.053	0.008	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.029	0.276	0.010	0.032	0.0048	650	1310	0.158	0.020	910

## DNMG 451 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions											
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>									
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980								
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850			
		3	3	28Mn6	250 HB																0.098	0.008	0.0007
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850								
		4,6	4		230 HB											0.098	0.008	0.0007	820	780			
		5,7	5		280 HB											0.079	0.007	0.0006	680	650			
		8	8		350 HB											0.079	0.007	0.0006	590	590			
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590								
		10	10		280 HB											0.098	0.006	0.0006	490	450			
		11	11		320 HB											0.079	0.006	0.0005	420	390			
		11	11		350 HB											0.079	0.006	0.0004	360	360			
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850								
		14	14		240 HB											0.098	0.007	0.0004	520	720	680		
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450								
		14	14		310 HB											0.079	0.006	0.0003	220	450			
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780								
		13	13		42 HRc											0.079	0.006	0.0004	390	620	590		
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780								
		15	15		200 HB											0.118	0.008	0.0009	520	750	720		
		16	16		250 HB											0.118	0.008	0.0009	490	680	650		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780								
		17,19	17		200 HB											0.098	0.007	0.0006	750	720			
		18,20	18		250 HB											0.098	0.007	0.0006	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130								
		33	33		Inconel 700											250 HB	0.079	0.006	0.0004	80	160		
		34	34		Stellite 21											350 HB	0.079	0.006	0.0004	70	140		
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190								
		37	37		T40											-	0.079	0.006	0.0004	110	190		
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.000	0.002	0.005	0.0003	160	320	0.059	0.004	290							
38			38	50 HRc		0.000											0.004	0.0003	130	290	0.047	0.004	260
38			38	55 HRc		0.000											0.004	0.0002	130	260	0.039	0.003	220
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160								
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130								
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140								

## DNMG 452 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.010	620	
				240 HB										550	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320	
				310 HB										290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	750	0.118	0.012	520
				200 HB	520										
				250 HB				0.020	0.0019	620			450		
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100	
			33 Inconel 700	250 HB										140	
			34 Stellite 21	350 HB										70	130
	Ti based	10	36 TiAl6V4	-	0.020	0.138	0.008	0.016	0.0012	140	210	0.079	0.013	180	
														140	
Hardened Mat.	Steel	11	X100CrMo13, 440C,	45 HRc	0.020	0.079	0.004	0.010	0.0006	160	320	0.079	0.010	260	
			G-X260NiCr42	50 HRc										290	
				55 HRc										260	
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron		41 G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NF	Al (>8%Si)	12	25 AISI12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910	

## DNMG 453 NN LT 10 &amp; LT 1000

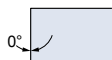
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions											
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>									
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.029	0.236	0.010	0.027	0.0047	590	1080	0.158	0.018	780								
		2	2	1045, 1060,	190 HB										0.236	0.027	0.0047	910	720				
		3	3	28Mn6	250 HB										0.236	0.024	0.0040	820	650				
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.236	0.010	0.024	0.0032	390	910	0.158	0.017	650								
			4,6		230 HB										0.189	0.010	0.024	0.0032	820	0.017	590		
			5,7		280 HB										0.189	0.009	0.021	0.0032	680	0.016	490		
			8		350 HB										0.165	0.009	0.021	0.0026	590	0.016	420		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.189	0.009	0.021	0.0032	220	620	0.132	0.016	450								
			10		280 HB										0.189	0.021	0.0032	490	0.016	390			
			11		320 HB										0.142	0.019	0.0021	420	0.015	320			
			11		350 HB										0.142	0.019	0.0021	360	0.015	290			
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.029	0.236	0.010	0.021	0.0032	550	880	0.158	0.016	620								
		14		240 HB	0.236										0.021	0.0026	520	720	0.015	550			
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.029	0.189	0.009	0.019	0.0021	260	490	0.132	0.013	320								
		14			310 HB										0.189	0.019	0.0021	220	450	290			
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.236	0.011	0.021	0.0026	550	820	0.158	0.016	620								
			13		42 HRC										0.189	0.021	0.0026	390	620	0.118	0.014	420	
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.008	0.032	0.0053	550	820	0.158	0.018	650								
		15		200 HB	0.236										0.032	0.0047	520	750	590				
		16		250 HB	0.236										0.029	0.0047	490	680	520				
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.029	0.236	0.008	0.027	0.0040	820	820	0.158	0.016	590								
			17,19		200 HB										0.236	0.027	0.0034	390	750	520			
			18,20		250 HB										0.236	0.027	0.0032	620	620	450			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.029	0.142	0.010	0.019	0.0018	80	140	0.106	0.015	100								
		33		Inconel 700	250 HB										0.142	0.019	0.0018	80	140	90			
		34		Stellite 21	350 HB										0.142	0.019	0.0018	70	130	90			
	Ti based	10	36	TiAl6V4	-	0.029	0.189	0.010	0.021	0.0021	140	210	0.106	0.017	180								
			37		T40										-	0.142	0.019	0.0018	110	180	0.016	140	
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C,	45 HRC	0.029	0.094	0.005	0.016	0.0016	160	320	0.106	0.013	260							
38					G-X260NiCr42	50 HRC										0.094	0.013	0.0011	130	290	0.079	0.010	220
38						55 HRC										0.071	0.011	0.0008	130	260	0.053	0.009	190
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.029	0.094	0.005	0.013	0.0011	130	190	0.079	0.009	160									
White Cast Iron		41	G-X300CrMo15	55 HRC	0.029	0.071	0.005	0.011	0.0008	90	160	0.053	0.008	130									
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.029	0.276	0.010	0.032	0.0048	650	1310	0.158	0.020	910								



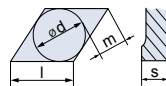
# D N U X



Shape

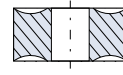


Clearance Angle



Tolerance

d  $\pm$  0.003  
m  $\pm$  0.005  
s  $\pm$  0.005

Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>DNUX 150608 R11</b>	<b>LT 10</b>	0.610	0.250	0.032	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. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

### Medium:

d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

### Roughing

d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

😊 = Good

😐 = Acceptable

☹ = Not recommended

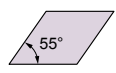
Feed x d.o.c.  
= Amax

$V_c \Rightarrow$   
Productivity

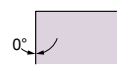
Machine Recommendations  
Guide. Details on page 10



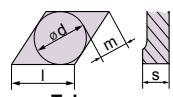
**D N U X**



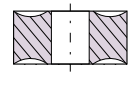
Shape



Clearance Angle



Tolerance  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>DNUX 150608 R11</b>	<b>LT 1000</b>	0.610	0.250	0.032	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**



**Finishing:**

d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**

d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**

d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

- = Good
- = Acceptable
- = Not recommended

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

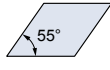
$V_c \Rightarrow$   
**Productivity**

Machine Recommendations Guide. Details on page 10

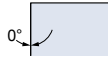


# DNUX 150608 R11 LT 10 & LT 1000

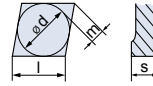
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620
240 HB					550										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320	
				310 HB										290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	590
					200 HB										520
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180
-	140														
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910

**K****N****U****X**

Shape

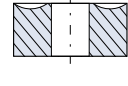


Clearance Angle



Tolerance

d  $\pm$  0.003  
m  $\pm$  0.005  
s  $\pm$  0.005

Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>KNUX 160405 R11</b>	<b>LT 10</b>	0.630	0.187	0.020	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. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

### Medium:

d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

### Roughing

d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

😊 = Good

😐 = Acceptable

😞 = Not recommended

Feed x d.o.c.  
= **A<sub>max</sub>**

$V_c \Rightarrow$   
↑ **Productivity**

Machine Recommendations  
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# KNUX 160405 R11 LT 10

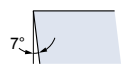
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.196	0.004	0.009	0.0013	590	1080	0.118	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.163	0.004	0.008	0.0011	390	910	0.118	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.163	0.004	0.007	0.0009	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.163	0.004	0.007	0.0009	550	880	0.118	0.006	850	
				240 HB										680	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.131	0.004	0.006	0.0006	260	490	0.079	0.006	450	
				310 HB										450	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.163	0.004	0.007	0.0008	550	820	0.118	0.006	780	
				42 HRC										590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.196	0.003	0.008	0.0012	520	750	0.118	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.163	0.003	0.007	0.0010	390	820	0.098	0.006	780
					200 HB										720
250 HB	590														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.131	0.004	0.006	0.0006	80	160	0.079	0.005	130	
				250 HB										130	
				350 HB										110	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.131	0.004	0.006	0.0007	140	210	0.079	0.006	190
-	160														
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.118	0.002	0.005	0.0004	160	320	0.071	0.004	290	
				50 HRC										260	
				55 HRC										220	
				400 HB										160	
	Chilled Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.091	0.002	0.005	0.0004	130	190	0.071	0.004	160	
White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.091	0.002	0.005	0.0003	90	160	0.047	0.003	130		
NI	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.261	0.004	0.012	0.0015	650	1310	0.118	0.008	1140



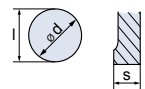
**R C M T**



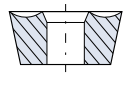
Shape



Clearance Angle



Tolerance



Fixing  
Chip breaker

s ± 0.005  
For l = 06/08/10, d ± 0.002 m ± 0.003  
For l = 12, d ± 0.003 m ± 0.005

Insert Designation	Grade	l	s	r	Catalog Nr.
RCMT 0602 M0	LT 10	0.236	0.094	0.118	T0000090
RCMT 0803 M0	LT 10	0.315	0.125	0.158	T0000091
RCMT 10T3 M0	LT 10	0.394	0.156	0.197	T0000092
RCMT 1204 M0	LT 10	0.472	0.187	0.236	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	☹️	😊	☹️	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
RCMT 0803	☹️	😊	☹️	
RCMT 10T3	☹️	😊	☹️	
RCMT 1204	☹️	😊	☹️	

😊 = Good  
 ☹️ = Acceptable  
 🚫 = Not recommended

**Stainless Steel**

**V<sub>c</sub> ⇒**  
  
**Productivity**

Machine Recommendations Guide  
 Details on page 10



R

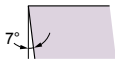
C

M

T



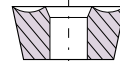
Shape



Clearance Angle



Tolerance

Fixing  
Chip breaker

$s \pm 0.005$   
For  $l = 06/08/10$ ,  $d \pm 0.002$   $m \pm 0.003$   
For  $l = 12$ ,  $d \pm 0.003$   $m \pm 0.005$

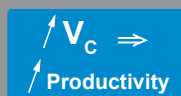
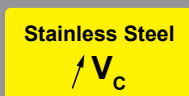
Insert Designation	Grade	l	s	r	Catalog Nr.
RCMT 0602 M0	LT 1000	0.236	0.094	0.118	T0001914
RCMT 0803 M0	LT 1000	0.315	0.125	0.158	T0001915
RCMT 10T3 M0	LT 1000	0.394	0.156	0.197	T0001916
RCMT 1204 M0	LT 1000	0.472	0.187	0.236	T0001917

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	☹️	😊	☹️	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
RCMT 0803	☹️	😊	☹️	
RCMT 10T3	☹️	😊	☹️	
RCMT 1204	☹️	😊	☹️	

😊 = Good  
 ☹️ = Acceptable  
 🚫 = Not recommended



Machine Recommendations Guide  
 Details on page 10

## RCMT 0602 M0 LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.079	0.006	0.016	0.0010	590	1080	0.039	0.014	780							
		2	2	1045, 1060,	190 HB											0.059	0.014	0.0009	820	0.012	650	
		3	3	28Mn6	250 HB																	
	Low alloyed	2	6	6	42CrMo4, St50,	180 HB	0.020	0.079	0.006	0.014	0.0009	390	910	0.039	0.012	650						
			4,6	4,6	Ck60, 4140, 4340,	230 HB											0.079	0.014	0.0007	820	590	
			5,7	5,7	100Cr6	280 HB																0.059
			8	8		350 HB											0.014	0.0006	590	420		
	High alloyed	3	10	10	X40CrMoV5,	220 HB	0.020	0.079	0.005	0.014	0.0007	220	620	0.039	0.012	450						
			10	10	H13, M42, D3,	280 HB											0.079	0.012	0.0006	490	390	
			11	11	S6-5-2, 12Ni19	320 HB																0.059
			11	11		350 HB											0.012	0.0004	360	290		
Stainless Steel	Austenitic	4	14	14	304, 316,	180 HB	0.020	0.079	0.006	0.014	0.0005	550	880	0.039	0.013	720						
			14	14	X5CrNi18-9	240 HB											0.079	0.013	0.0005	520	720	
	Duplex	5	14	14	X2CrNiN23-4,	290 HB	0.020	0.059	0.005	0.012	0.0005	260	490	0.039	0.011	320						
			14	14	S31500	310 HB											0.059	0.012	0.0005	220	450	
	Ferritic & Martensitic	6	12	12	410, X6Cr17,	200 HB	0.020	0.079	0.006	0.014	0.0005	550	820	0.039	0.013	680						
			13	13	17-4 PH, 430	42 HRc											0.079	0.012	0.0005	390	620	
Cast Iron	Grey	7	15	15	GG20, GG40,	150 HB	0.020	0.079	0.004	0.018	0.0011	550	820	0.039	0.014	650						
			15	15	EN-GJL-250,	200 HB											0.079	0.018	0.0009	490	680	
			16	16	No30B	250 HB																
	Malleable & Nodular	8	17,19	17,19	GGG40, GGG70,	150 HB	0.020	0.079	0.004	0.014	0.0009	390	820	0.039	0.012	590						
			17,19	17,19	50005	200 HB											0.079	0.014	0.0008	750	520	
			18,20	18,20		250 HB											0.079	0.014	0.0007	620	450	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	31,32	Incoloy 800	240 HB	0.020	0.059	0.005	0.012	0.0005	80	160	0.039	0.011	100						
			33	33	Inconel 700	250 HB											0.059	0.012	0.0005	80	160	
			34	34	Stellite 21	350 HB																0.012
	Ti based	10	36	36	TiAl6V4	-	0.020	0.059	0.005	0.013	0.0005	140	210	0.039	0.012	180						
			37	37	T40	-											0.059	0.012	0.0005	110	190	
	Hardened Mat.	Steel	11	38	38	X100CrMo13,	45 HRc	0.020	0.047	0.002	0.009	0.0003	160	320	0.035	0.007	260					
38				38	440C,	50 HRc	0.020											0.039	0.007	0.0003	130	290
38				38	G-X260NiCr42	55 HRc																
Chilled Cast Iron		11	40	40	Ni-Hard 2	400 HB	0.020	0.047	0.002	0.009	0.0003	130	190	0.035	0.007	160						
			41	41	G-X300CrMo15	55 HRc											0.012	0.031	0.002	0.006	0.0002	90
White Cast Iron																						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.079	0.006	0.016	0.0011	650	1310	0.039	0.014	910							

## RCMT 0803 M0 LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.094	0.006	0.016	0.0012	590	1080	0.047	0.014	780						
		2	2	1045, 1060,	190 HB											0.071	0.014	0.0010	910	0.014	720
		3	3	28Mn6	250 HB																
	Low alloyed	2	6	42CrMo4, S150,	180 HB	0.020	0.094	0.006	0.014	0.0010	390	910	0.047	0.012	650						
		4,6	4	Ck60, 4140, 4340,	230 HB											0.094	0.014	0.0009	820	0.012	590
		5,7	5	100Cr6	280 HB																
		8	8		350 HB											0.071	0.014	0.0007	590	0.012	420
	High alloyed	3	10	X40CrMoV5,	220 HB	0.020	0.094	0.005	0.014	0.0009	220	620	0.047	0.012	450						
		10	10	H13, M42, D3,	280 HB											0.094	0.012	0.0007	490	0.011	390
		11	11	S6-5-2, 12Ni19	320 HB																
		11	11		350 HB											0.071	0.012	0.0005	360	0.011	290
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.020	0.094	0.006	0.014	0.0006	550	880	0.047	0.013	720						
		14	14	X5CrNi18-9	240 HB											0.071	0.013	0.0006	520	720	
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.020	0.071	0.005	0.012	0.0006	260	490	0.047	0.011	320						
		14	14	S31500	310 HB											0.071	0.012	0.0006	220	450	
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.020	0.094	0.006	0.014	0.0006	550	820	0.047	0.013	680						
		13	13	17-4 PH, 430	42 HRc											0.094	0.012	0.0006	390	620	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.094	0.004	0.018	0.0013	550	820	0.047	0.014	650						
		15	15	EN-GJL-250,	200 HB											0.094	0.018	0.0012	520	750	
	16	16	No30B	250 HB	0.094	0.018	0.0011	490	680												
	Malleable & Nodular	8	17,19	GGG40, GGG70,						150 HB	0.020	0.094	0.004	0.014	0.0011	390	820	0.047	0.012	590	
		17,19	17	50005	200 HB	0.094	0.014	0.0009	750	520											
18,20		18		250 HB	0.094																0.014
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800		240 HB	0.020	0.071	0.005	0.012	0.0006	80	160	0.047	0.011	100					
		33	33	Inconel 700	250 HB	0.071											0.012	0.0006	70	140	
		34	34	Stellite 21	350 HB																0.071
	Ti based	10	36	TiAl6V4	-	0.020	0.071	0.005	0.013	0.0006	140	210	0.047	0.012	180						
		37	37	T40	-											0.071	0.012	0.0006	110	190	
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.020	0.057	0.002	0.009	0.0004	160	320	0.043	0.007	260						
		38	38	440C,	50 HRc											0.020	0.047	0.007	0.0003	130	290
		38	38	G-X260NiCr42	55 HRc																
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.020	0.057	0.002	0.009	0.0003	130	190	0.043	0.007	160						
		41	41	G-X300CrMo15	55 HRc											0.012	0.038	0.002	0.006	0.0002	90
White Cast Iron																					
NI	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.094	0.006	0.016	0.0013	650	1310	0.047	0.014	910						

## RCMT 10T3 M0 LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.110	0.006	0.016	0.0014	590	1080	0.055	0.014	780						
		2	2	1045, 1060,	190 HB											0.083	0.014	0.0012	910	0.014	720
		3	3	28Mn6	250 HB																
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.020	0.110	0.006	0.014	0.0012	390	910	0.055	0.012	650						
		4,6	4	Ck60, 4140, 4340,	230 HB											0.110	0.014	0.0010	820	590	
		5,7	5	100Cr6	280 HB																0.083
		8	8		350 HB											0.012	0.0008	590	420		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.020	0.110	0.005	0.014	0.0010	220	620	0.055	0.012	450						
		10	10	H13, M42, D3,	280 HB											0.110	0.012	0.0009	490	390	
		11	11	S6-5-2, 12Ni19	320 HB																0.083
		11	11		350 HB											0.012	0.0006	360	290		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.020	0.110	0.006	0.014	0.0007	550	880	0.055	0.013	720						
		14	14	X5CrNi18-9	240 HB											0.110	0.013	0.0007	520	720	
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.020	0.083	0.005	0.012	0.0007	260	490	0.055	0.011	320						
		14	14	S31500	310 HB											0.083	0.012	0.0007	220	450	
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.020	0.110	0.006	0.014	0.0007	550	820	0.055	0.013	680						
		13	13	17-4 PH, 430	42 HRc											0.110	0.012	0.0007	390	620	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.110	0.004	0.018	0.0015	550	820	0.055	0.014	650						
		16	16	EN-GJL-250,	200 HB											0.110	0.018	0.0013	490	680	
		16	16	No30B	250 HB																
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.020	0.110	0.004	0.014	0.0013	390	820	0.055	0.012	590						
		17,19	17	50005	200 HB											0.110	0.014	0.0011	750	520	
18,20	18		250 HB	0.110	0.014																0.0010
High Temp. Alloys	Fe, Ni & Co based	9	31,32			Incoloy 800	240 HB	0.020	0.083	0.005	0.012	0.0007	80	160	0.055	0.011	100				
		33	33	Inconel 700	250 HB	0.083	0.012											0.0007	80	160	
		34	34	Stellite 21	350 HB																0.012
	Ti based	10	36	TiAl6V4	-	0.020	0.083	0.005	0.013	0.0007	140	210	0.055	0.012	180						
37		37	T40	-	0.083											0.012	0.0007	110	190		
Hardened Mat.	Steel	11	38	X100CrMo13,		45 HRc	0.020	0.066	0.002	0.009	0.0004	160	320	0.050	0.007					260	
		38	38	440C,	50 HRc	0.020										0.055	0.007	0.0004	130		290
		38	38	G-X260NiCr42	55 HRc																
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.020	0.066	0.002	0.009	0.0004	130	190	0.050	0.007	160						
		41	41	G-X300CrMo15	55 HRc											0.012	0.044	0.002	0.006	0.0002	90
White Cast Iron	41	41			0.012	0.044	0.002	0.006	0.0002	90	160	0.033	0.005	130							
NF	Al (>8%Si)	12	25	AlSi12											130 HB	0.020	0.110	0.006	0.016	0.0015	650



## RCMT 1204 M0 LT 10 &amp; LT 1000

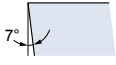
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.126	0.006	0.016	0.0024	590	1080	0.079	0.017	780						
				190 HB										0.126	0.016	0.0024	910	0.017	720	
				250 HB										0.094	0.014	0.0021	820	0.014	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.126	0.006	0.014	0.0021	390	910	0.079	0.014	650						
				230 HB										0.126	0.014	0.0018	820	0.014	590	
				280 HB										0.126	0.014	0.0015	680	0.014	490	
				350 HB										0.094	0.014	0.0013	590	0.014	420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.005	0.014	0.0018	220	620	0.079	0.014	450						
				280 HB										0.126	0.012	0.0015	490	0.013	390	
				320 HB										0.094	0.012	0.0012	420	0.013	320	
				350 HB										0.094	0.012	0.0010	360	0.013	290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.126	0.006	0.014	0.0012	550	880	0.079	0.015	720						
				240 HB						0.126				0.013	0.0012	520	720	620		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.094	0.005	0.012	0.0009	260	490	0.059	0.013	320						
				310 HB						0.094				0.012	0.0009	220	450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.126	0.006	0.014	0.0012	550	820	0.079	0.015	680						
				42 HRC						0.126				0.012	0.0010	390	620	450		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.126	0.004	0.018	0.0026	550	820	0.079	0.017	650						
				200 HB						0.126				0.018	0.0024	520	750	590		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.126	0.004	0.014	0.0022	390	820	0.079	0.014	590						
				200 HB										0.126	0.014	0.0019	750	520		
				250 HB										0.126	0.014	0.0017	620	450		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.094	0.005	0.012	0.0009	80	160	0.059	0.013	100						
				250 HB						0.094				0.012	0.0009	80	160	90		
				350 HB						0.094				0.012	0.0009	70	140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.094	0.005	0.013	0.0009	140	210	0.059	0.014	180						
				-						0.094				0.012	0.0009	110	190	140		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.076	0.002	0.009	0.0007	160	320	0.071	0.009	260						
				50 HRC						0.063				0.007	0.0006	130	290	0.055	0.008	220
				55 HRC						0.050				0.006	0.0004	130	260	0.047	0.006	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.076	0.002	0.009	0.0006	130	190	0.071	0.009	160						
				55 HRC						0.020				0.050	0.002	0.006	0.0004	90	160	0.047
White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.050	0.002	0.006	0.0004	90	160	0.047	0.006	130							
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.126	0.006	0.016	0.0026	650	1310	0.079	0.017	910					



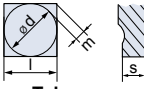
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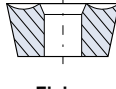
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
SCMT 3(2.5)1 NN	LT 10	0.375	0.156	0.016	T0001459
SCMT 3(2.5)2 NN	LT 10	0.375	0.156	0.032	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 3(2.5)1 NN			
SCMT 3(2.5)2 NN			

<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
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= Good  
 = Acceptable  
 = Not recommended



**S**

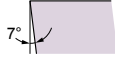
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**M**

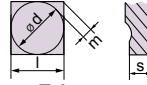
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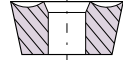
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>SCMT 3(2.5)1 NN</b>	<b>LT 1000</b>	0.375	0.156	0.016	T0001918
<b>SCMT 3(2.5)2 NN</b>	<b>LT 1000</b>	0.375	0.156	0.032	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
<b>SCMT 3(2.5)1 NN</b>	😊	😐	😞
<b>SCMT 3(2.5)2 NN</b>	😐	😊	😐

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

## SCMT 3(2.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.157	0.004	0.010	0.0011	590	1080	0.098	0.007	980					
		2	2	1045, 1060,	190 HB											0.131	0.010	0.0010	910	850
		3	3	28Mn6	250 HB											0.131	0.009	0.0009	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.131	0.004	0.009	0.0009	390	910	0.098	0.006	850					
		4,6	4		230 HB											0.131	0.009	0.0009	820	780
		5,7	5		280 HB											0.105	0.008	0.0007	680	650
		8	8		350 HB											0.105	0.008	0.0007	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.131	0.004	0.008	0.0007	220	620	0.098	0.005	590					
		10	10		280 HB											0.131	0.007	0.0007	490	450
		11	11		320 HB											0.105	0.006	0.0006	420	390
		11	11		350 HB											0.105	0.006	0.0005	360	360
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.131	0.004	0.008	0.0006	550	880	0.098	0.005	850					
		14	14		240 HB											0.131	0.008	0.0005	520	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.105	0.004	0.006	0.0004	260	490	0.079	0.005	450					
		14	14		310 HB											0.105	0.006	0.0004	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.131	0.004	0.008	0.0006	550	820	0.098	0.006	780					
		13	13		42 HRc											0.105	0.007	0.0005	390	620
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.157	0.003	0.009	0.0012	550	820	0.098	0.007	780					
		16	16		200 HB											0.157	0.009	0.0011	520	750
		16	16		250 HB											0.157	0.009	0.0011	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.131	0.003	0.008	0.0009	390	820	0.098	0.006	780					
		17,19	17		200 HB											0.131	0.008	0.0007	750	720
18,20	18	250 HB	0.131	0.008	0.0007	620	590													
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.105	0.004	0.007	0.0005	80	160	0.079	0.005	130					
		33	33		250 HB											0.105	0.007	0.0005	80	160
		34	34		350 HB											0.105	0.007	0.0005	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.105	0.004	0.007	0.0006	140	210	0.079	0.006	190					
		37	37		-											0.105	0.006	0.0005	110	190
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.094	0.002	0.005	0.0004	160	320	0.074	0.004	290					
		38	38		50 HRc											0.079	0.005	0.0003	130	290
		38	38		55 HRc											0.073	0.004	0.0002	130	260
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.008	0.084	0.002	0.005	0.0003	130	190	0.059	0.004	160					
	White Cast Iron	41	41	G-X300CrMo15	55 HRc	0.008	0.073	0.002	0.004	0.0002	90	160	0.049	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.209	0.004	0.014	0.0013	650	1310	0.098	0.008	1140					

# SCMT 3(2.5)2 NN LT 10 & LT 1000

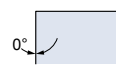
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.157	0.008	0.020	0.0025	590	1080	0.118	0.012	780			
		2		190 HB		0.157		0.020			0.0025			910	720		
		3		250 HB		0.157		0.018			0.0021			820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.008	0.018	0.0017	390	910	0.118	0.011	650			
		4,6		230 HB		0.126		0.008			0.018			0.0017	820	590	
		5,7		280 HB		0.126		0.007			0.016			0.0017	680	490	
		8		350 HB		0.110		0.007			0.016			0.0014	590	420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.007	0.016	0.0017	220	620	0.098	0.011	450			
		10		280 HB		0.126		0.016			0.0017		490	390			
		11		320 HB		0.094		0.014			0.0011		420	320			
		11		350 HB		0.094		0.014			0.0011		360	290			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.157	0.008	0.016	0.0017	550	880	0.118	0.012	650			
		14		240 HB		0.157		0.016		0.0014	520		720	0.011	590		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.007	0.014	0.0011	260	490	0.098	0.010	320			
		14		310 HB		0.126		0.014		0.0011	220			450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.009	0.016	0.0014	550	820	0.118	0.011	620			
		13		42 HRc		0.126		0.016		0.0014	390			620	0.098	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.006	0.024	0.0028	550	820	0.118	0.012	650			
		15		200 HB		0.157		0.024		0.0025	520			750	590		
		16		250 HB		0.157		0.022		0.0025	490			680	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.006	0.020	0.0021	390	820	0.118	0.011	590			
		17,19		200 HB		0.157		0.020			0.0018			750	520		
18,20	250 HB	0.157	0.020	0.0017	620	450											
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.094	0.008	0.014	0.0010	80	140	0.079	0.010	100			
		33		250 HB		0.094		0.014		0.0010	80			140	90		
		34		350 HB		0.094		0.014		0.0010	70			130	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.126	0.008	0.016	0.0011	140	210	0.079	0.012	180			
		37		-		0.094		0.014		0.0010	110		180	0.011	140		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.079	0.004	0.012	0.0008	160	320	0.079	0.009	260			
		38		50 HRc		0.063		0.010		0.0006	130			290	0.059	0.007	220
		38		55 HRc		0.047		0.008		0.0004	130			260	0.039	0.006	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.063	0.004	0.010	0.0006	130	190	0.059	0.006	160			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.047	0.004	0.008	0.0004	90	160	0.039	0.005	130			
NI	Al (>8%Si)	12	AISI12	130 HB	0.020	0.189	0.008	0.024	0.0025	650	1310	0.118	0.014	910			



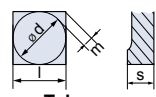
**S N M G**



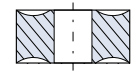
Shape



Clearance Angle



**Tolerance**  
 d ± 0.003  
 m ± 0.005  
 s ± 0.005



**Fixing Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>SNMG 432 NN</b>	<b>LT 10</b>	0.500	0.187	0.032	T0000322
<b>SNMG 433 NN</b>	<b>LT 10</b>	0.500	0.187	0.047	T0000323

**NN** All purpose Chipbreaker

SNMG

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

**Application Guide**

	Finishing	Medium	Roughing / Interrupted cut
<b>SNMG 432 NN</b>	☹️	😊	☹️
<b>SNMG 433 NN</b>	☹️	☹️	😊

<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
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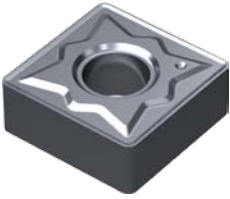
😊 = Good  
 ☹️ = Acceptable  
 ☹️ = Not recommended

**F** ⇒  
 ↑ Productivity

Feed x d.o.c.  
 =  
 Amax

**V<sub>c</sub>** ⇒  
 ↑ Productivity

Machine Recommendations Guide. Details on page 10



**S**

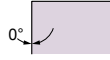
**N**

**M**

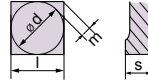
**G**



Shape



Clearance Angle



Tolerance

d ± 0.003  
m ± 0.005  
s ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>SNMG 432 NN</b>	<b>LT 1000</b>	0.500	0.187	0.032	T0001921
<b>SNMG 432 NX*</b>	<b>LT 1000</b>	0.500	0.187	0.032	T0003011
<b>SNMG 433 NN</b>	<b>LT 1000</b>	0.500	0.187	0.047	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	
<b>SNMG 432 NN</b>	☹️	😊	😊	😊 = Good ☹️ = Acceptable 😡 = Not recommended
<b>SNMG 432 NX</b>	😊	😊	☹️	
<b>SNMG 433 NN</b>	😡	☹️	😊	
				<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
				<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
				<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

**F** ⇒  
 ↑ Productivity

Feed x d.o.c.  
 =  
 Amax

**V<sub>c</sub>** ⇒  
 ↑ Productivity

Machine Recommendations Guide. Details on page 10

# SNMG 432 NN/NX LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.012	0.028	0.0039	590	1080	0.118	0.020	780							
		2	2	1045, 1060,	190 HB											0.197	0.028	0.0039	910	720		
		3	3	28Mn6	250 HB											0.197	0.025	0.0033	820	650		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.012	0.025	0.0026	390	910	0.118	0.018	0.018	650						
			4,6		230 HB											0.157	0.012	0.025	0.0026	820	590	
			5,7		280 HB											0.157	0.010	0.022	0.0026	680	490	
			8		350 HB											0.138	0.010	0.022	0.0022	590	420	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.010	0.022	0.0026	220	620	0.098	0.017	0.017	450						
			10		280 HB											0.157	0.022	0.0026	490	390		
			11		320 HB											0.118	0.019	0.0017	420	320		
			11		350 HB											0.118	0.019	0.0017	360	290		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.020	0.197	0.011	0.022	0.0026	550	880	0.118	0.020	620							
				X5CrNi18-9	240 HB										0.197	0.022	0.0022	520	720	550		
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.010	0.019	0.0017	260	490	0.098	0.016	320							
					310 HB										0.157	0.019	0.0017	220	450	290		
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.012	0.022	0.0022	550	820	0.118	0.018	620							
					42 HRC										0.157	0.022	0.0022	390	620	420		
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.020	0.197	0.008	0.033	0.0044	550	820	0.118	0.020	650							
				15	EN-GJL-250,										200 HB	0.197	0.033	0.0039	520	750	590	
				16	No30B										250 HB	0.197	0.030	0.0039	490	680	520	
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.008	0.028	0.0033	390	820	0.118	0.017	590							
					200 HB										0.197	0.028	0.0028	750	520			
250 HB	0.197	0.028	0.0026	620	450																	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.020	0.118	0.011	0.019	0.0015	80	140	0.079	0.016	100							
				33	Inconel 700										250 HB	0.118	0.019	0.0015	80	140	90	
				34	Stellite 21										350 HB	0.118	0.019	0.0015	70	130	90	
	Ti based	10	36	TiAl6V4	-	0.020	0.157	0.011	0.022	0.0017	140	210	0.079	0.018	180							
-					0.118										0.019	0.0015	110	180	140			
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.020	0.079	0.006	0.017	0.0013	160	320	0.079	0.014	260							
				440C,	50 HRC										0.079	0.014	0.0009	130	290	0.059	0.011	220
				G-X260NiCr42	55 HRC										0.059	0.011	0.0007	130	260	0.039	0.010	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.006	0.014	0.0009	130	190	0.059	0.010	160								
					55 HRC	0.020	0.059	0.006	0.011	0.0007	90	160	0.039	0.008	130							
White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.006	0.011	0.0007	90	160	0.039	0.008	130									
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.011	0.031	0.0039	650	1310	0.118	0.022	910							

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



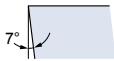
# SNMG 433 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.029	0.236	0.015	0.037	0.0061	590	1080	0.158	0.026	780			
		2		190 HB		0.236		0.037			0.0061			910	720		
		3		250 HB		0.236		0.034			0.0051			820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.236	0.015	0.034	0.0041	390	910	0.158	0.023	650			
		4,6		230 HB		0.189		0.015			0.034			0.0041	820	590	
		5,7		280 HB		0.189		0.012			0.030			0.0041	680	490	
		8		350 HB		0.165		0.012			0.030			0.0037	590	420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.189	0.012	0.030	0.0041	220	620	0.132	0.022	450			
		10		280 HB		0.189		0.030			0.0041			490	390		
		11		320 HB		0.142		0.026			0.0027			420	320		
		11		350 HB		0.142		0.026			0.0027			360	290		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.236	0.014	0.030	0.0041	550	880	0.158	0.023	620			
		14		240 HB		0.236		0.030		0.0034	520			720	550		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.029	0.189	0.012	0.026	0.0027	260	490	0.132	0.018	320			
		14		310 HB		0.189		0.026		0.0027	220			450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.236	0.015	0.030	0.0034	550	820	0.158	0.022	620			
		13		42 HRc		0.189		0.030		0.0034	390			620	420		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.236	0.012	0.045	0.0068	550	820	0.158	0.026	650			
		15		200 HB		0.236		0.045		0.0061	520			750	590		
		16		250 HB		0.236		0.041		0.0061	490			680	520		
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.029	0.236	0.012	0.037	0.0051	390	820	0.158	0.022	590			
		17,19		200 HB		0.236		0.037			0.0044			750	520		
18,20	250 HB	0.236	0.037	0.0041	620	450											
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.029	0.142	0.014	0.026	0.0024	80	140	0.106	0.021	100			
		33		250 HB		0.142		0.026		0.0024	80			140	90		
		34		350 HB		0.142		0.026		0.0024	70			130	90		
	Ti based	10	TiAl6V4, T40	-	0.029	0.189	0.014	0.030	0.0027	140	210	0.106	0.023	180			
37		-		0.142		0.026		0.0024		110	180			140			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.029	0.118	0.008	0.022	0.0020	160	320	0.106	0.018	260			
				50 HRc		0.094		0.019		0.0014	130			290	0.079	0.015	220
				55 HRc		0.071		0.015		0.0010	130			260	0.053	0.013	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.094	0.008	0.019	0.0014	130	190	0.079	0.013	160			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.029	0.071	0.008	0.015	0.0010	90	160	0.053	0.011	130			
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.029	0.276	0.014	0.045	0.0067	650	1310	0.158	0.031	910		

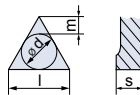
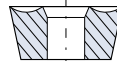
Values for lead angle (Kr)=45°; For lead angle (Kr)=75°, please limit feed to 75% of the recommended

**T****C****M****T**

Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TCMT 2(1.5)1 NN	LT 10	0.433	0.094	0.016	T0000477
TCMT 2(1.5)2 NN	LT 10	0.433	0.094	0.032	T0000478
TCMT 3(2.5)1 NN	LT 10	0.650	0.156	0.016	T0000479
TCMT 3(2.5)2 NN	LT 10	0.650	0.156	0.032	T0000068
TCMT 3(2.5)3 NN	LT 10	0.650	0.156	0.047	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 2(1.5)1 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
TCMT 2(1.5)2 NN	😐	😊	😐	
TCMT 3(2.5)1 NN	😊	😐	😞	
TCMT 3(2.5)2 NN	😐	😊	😐	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
TCMT 3(2.5)3 NN	😞	😐	😊	
				<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

**Stainless Steel**

 Machine Recommendations Guide  
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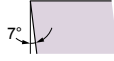
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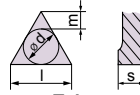
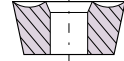
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Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TCMT 2(1.5)1 NN	LT 1000	0.433	0.094	0.016	T0001924
TCMT 2(1.5)2 NN	LT 1000	0.433	0.094	0.032	T0001925
TCMT 3(2.5)1 NN	LT 1000	0.650	0.156	0.016	T0001927
TCMT 3(2.5)2 NN	LT 1000	0.650	0.156	0.032	T0001928
TCMT 3(2.5)3 NN	LT 1000	0.650	0.156	0.047	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 2(1.5)1 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
TCMT 2(1.5)2 NN	😐	😊	😐	
TCMT 3(2.5)1 NN	😊	😐	😞	
TCMT 3(2.5)2 NN	😐	😊	😊	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
TCMT 3(2.5)3 NN	😞	😐	😊	
				<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

Stainless Steel



Machine Recommendations Guide  
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## TCMT 2(1.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980						
		2	2	1045, 1060,	190 HB											0.069	0.007	0.0005	910	850	
		3	3	28Mn6	250 HB											0.069	0.007	0.0005	820	780	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850						
		4,6	4		230 HB											0.069	0.007	0.0005	820	780	
		5,7	5		280 HB											0.055	0.006	0.0004	680	650	
		8	8		350 HB											0.055	0.006	0.0003	590	590	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590						
		10	10		280 HB											0.069	0.005	0.0004	490	450	
		11	11		320 HB											0.055	0.005	0.0003	420	390	
		11	11		350 HB											0.055	0.005	0.0002	360	360	
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850						
		14	14		240 HB											0.069	0.006	0.0002	520	680	
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450						
		14	14		310 HB											0.055	0.005	0.0002	220	450	
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780						
		13	13		42 HRc											0.055	0.005	0.0002	390	620	590
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780						
		15	15		200 HB											0.083	0.007	0.0006	520	750	
		16	16		250 HB											0.083	0.007	0.0006	490	680	
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780						
		17,19	17		200 HB											0.069	0.006	0.0004	750	720	
		18,20		250 HB		0.069		0.006	0.0004	620				590							
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130						
		33	33		Inconel 700											250 HB	0.055	0.005	0.0002	80	160
		34	34		Stellite 21											350 HB	0.055	0.005	0.0002	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190						
		37	37		T40											-	0.055	0.005	0.0002	110	190
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290						
		38	38		50 HRc											0.041	0.003	0.0002	130	290	
		38	38		55 HRc											0.039	0.003	0.0001	130	260	
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160						
	White Cast Iron	41	41	G-X300CrMo15	55 HRc	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140						

## TCMT 2(1.5)2 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions											
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>									
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.010	980								
		2	2	1045, 1060,	190 HB											0.069	0.007	0.0005	820	850			
		3	3	28Mn6	250 HB											0.069	0.007	0.0005					
	Low alloyed	2	6	42CrMo4, S150,	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.008	850								
			4,6	4	Ck60, 4140, 4340,											230 HB	0.069	0.007	0.0005	680	780		
			5,7	5	100Cr6											280 HB	0.055	0.006	0.0004				
			8	8												350 HB	0.055	0.006	0.0003	590	590		
	High alloyed	3	10	X40CrMoV5,	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.007	590								
			10	10	H13, M42, D3,											280 HB	0.069	0.005	0.0004	490	450		
			11	11	S6-5-2, 12Ni19											320 HB	0.055	0.005	0.0003			420	390
			11	11												350 HB	0.055	0.005	0.0002	360	360		
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.007	850								
		14	14	X5CrNi18-9	240 HB											0.069	0.006	0.0002	520	720	680		
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.007	450								
			14	14	S31500											310 HB	0.055	0.005	0.0002	220	450		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.008	780								
			13	13	17-4 PH, 430											42 HRC	0.055	0.005	0.0002	390	620	590	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.010	780								
		15	15	EN-GJL-250,	200 HB											0.083	0.007	0.0006	520	750	720		
		16	16	No30B	250 HB											0.083	0.007	0.0006	490	680	650		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.008	780								
			17,19	17	50005											200 HB	0.069	0.006	0.0004	750	720		
		18,20		250 HB		0.069		0.006	0.0004	620				590									
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.007	130								
			33	Inconel 700	250 HB											0.055	0.005	0.0002	80	160	130		
			34	Stellite 21	350 HB											0.055	0.005	0.0002	70	140	110		
	Ti based	10	36	TiAl6V4	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.008	190								
			37	T40	-											0.055	0.005	0.0002	110	190	160		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.006	290								
			38	440C,	50 HRC											0.041	0.003	0.0002	130	290	0.024	0.005	260
			38	G-X260NiCr42	55 HRC											0.039	0.003	0.0001	130	260	0.020	0.004	220
	Chilled Cast Iron	11	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.006	160								
			41	G-X300CrMo15	55 HRC	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.004	130								
White Cast Iron																							
NI	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.011	1140								

## TCMT 3(2.5)1 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4		230 HB											0.098	0.008	0.0007	820	780
		5,7	5		280 HB											0.079	0.007	0.0006	680	650
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10		280 HB											0.098	0.006	0.0006	490	450
		11	11		320 HB											0.079	0.006	0.0005	420	390
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14	14		240 HB											0.098	0.007	0.0004	520	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14	14		310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13	13		42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15	15		200 HB											0.118	0.008	0.0009	520	750
		16	16		250 HB											0.118	0.008	0.0009	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19	17		200 HB											0.098	0.007	0.0006	750	720
		18,20	18		250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	33		250 HB											0.079	0.006	0.0004	80	160
		34	34		350 HB											0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37	37		-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			38	50 HRc		0.059											0.004	0.0003	130	290
38			38	55 HRc		0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160					
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# TCMT 3(2.5)2 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					7	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.017	0.0025	590	1080	0.118	0.012	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.015	0.0017	390	910	0.118	0.011	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.013	0.0017	220	620	0.098	0.010	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.013	0.0017	550	880	0.118	0.012	650	
				240 HB										590	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.012	0.0011	260	490	0.098	0.009	320	
				310 HB										290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.013	0.0014	550	820	0.118	0.011	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.020	0.0028	550	820	0.118	0.012	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.017	0.0021	390	750	0.118	0.010	520
					200 HB										450
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.012	0.0010	80	140	0.079	0.009	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.157	0.008	0.013	0.0011	140	210	0.079	0.011	180
					-										140
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.098	0.004	0.010	0.0008	160	320	0.079	0.008	260	
				50 HRc										220	
				55 HRc										190	
				400 HB										160	
	Chilled Cast Iron	41	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.008	0.0006	130	190	0.059	0.006	160	
White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.007	0.0004	90	160	0.039	0.005	130		
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.236	0.008	0.020	0.0025	650	1310	0.118	0.013	910

## TCMT 3(2.5)3 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.019	0.0030	590	1080	0.118	0.015	780							
		2		190 HB										0.197	0.019	0.0030	910	720			
		3		250 HB										0.197	0.017	0.0025	820	650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.017	0.0020	390	910	0.118	0.014	650							
		4,6		230 HB										0.157	0.008	0.017	0.0020	820	590		
		5,7		280 HB										0.157	0.007	0.015	0.0020	680	490		
		8		350 HB										0.138	0.007	0.015	0.0017	590	420		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.015	0.0020	220	620	0.098	0.013	450							
		10		280 HB										0.157	0.015	0.0020	490	390			
		11		320 HB										0.118	0.013	0.0013	420	320			
		11		350 HB										0.118	0.013	0.0013	360	290			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.015	0.0020	550	880	0.118	0.015	650							
		14		240 HB										0.197	0.015	0.0017	520	720	590		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.013	0.0013	260	490	0.098	0.012	320							
		14		310 HB										0.157	0.013	0.0013	220	450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.015	0.0017	550	820	0.118	0.014	620							
		13		42 HRC										0.157	0.015	0.0017	390	620	420		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.022	0.0033	550	820	0.118	0.015	650							
		15		200 HB										0.197	0.022	0.0030	520	750	590		
		16		250 HB										0.197	0.021	0.0030	490	680	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.019	0.0025	390	820	0.118	0.013	590							
		17,19		200 HB										0.197	0.019	0.0022	750	520			
		18,20		250 HB										0.197	0.019	0.0020	620	450			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.013	0.0012	80	140	0.079	0.012	100							
		33		250 HB										0.118	0.013	0.0012	80	140	90		
		34		350 HB										0.118	0.013	0.0012	70	130	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.157	0.008	0.015	0.0013	140	210	0.079	0.014	180							
		37		-										0.118	0.013	0.0012	110	180	140		
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.011	0.0010	160	320	0.079	0.011	260						
38			50 HRC		0.079										0.009	0.0007	130	290	0.059	0.009	220
38			55 HRC		0.059										0.007	0.0005	130	260	0.039	0.008	190
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.009	0.0007	130	190	0.059	0.008	160							
White Cast Iron		41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.007	0.0005	90	160	0.039	0.006	130							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.022	0.0029	650	1310	0.118	0.017	910						

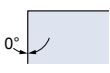




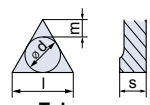
**T N M G**



Shape

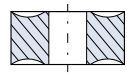


Clearance Angle



Tolerance

s ± 0.005  
For l = 16, d ± 0.002 m ± 0.003  
For l = 22, d ± 0.003 m ± 0.005



Fixing Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNMG 331 NN	LT 10	0.650	0.187	0.016	T0000457
TNMG 332 NN	LT 10	0.650	0.187	0.032	T0000069
TNMG 333 NN	LT 10	0.650	0.187	0.047	T0001734
TNMG 431 NN	LT 10	0.866	0.187	0.016	T0001873
TNMG 432 NN	LT 10	0.866	0.187	0.032	T0000113
TNMG 433 NN	LT 10	0.866	0.187	0.047	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 331 NN	😊	😞	😡	😊 = Good 😞 = Acceptable 😡 = Not recommended  <b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
TNMG 332 NN	😞	😊	😞	
TNMG 333 NN	😡	😞	😊	
TNMG 431 NN	😊	😞	😡	
TNMG 432 NN	😞	😊	😞	
TNMG 433 NN	😡	😞	😊	

**Stainless Steel**  
↗  $V_c$

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

Machine Recommendations Guide  
Details on page 10

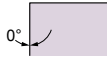




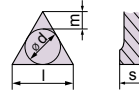
**T N M G**



Shape

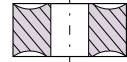


Clearance Angle



Tolerance

s ± 0.005  
For l = 16, d ± 0.002 m ± 0.003  
For l = 22, d ± 0.003 m ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNMG 331 NN	LT 1000	0.650	0.187	0.016	T0001931
TNMG 332 NN	LT 1000	0.650	0.187	0.032	T0001932
TNMG 332 NX	LT 1000	0.650	0.187	0.032	T0003012
TNMG 333 NN	LT 1000	0.650	0.187	0.047	T0001933
TNMG 431 NN	LT 1000	0.866	0.187	0.016	T0001934
TNMG 432 NN	LT 1000	0.866	0.187	0.032	T0001935
TNMG 432 NX	LT 1000	0.866	0.187	0.032	T0003013
TNMG 433 NN	LT 1000	0.866	0.187	0.047	T0001936

TNMG

**Application Guide**

\* Available from Q2-2013

**NN** All purpose Chipbreaker

	Finishing	Medium	Roughing / Interrupted cut	
TNMG 331 NN	😊	😐	😞	<p>😊 = Good 😐 = Acceptable 😞 = Not recommended</p> <p><b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev</p> <p><b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev</p> <p><b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev</p>
TNMG 332 NN	😐	😊	😊	
TNMG 332 NX	😊	😊	😐	
TNMG 333 NN	😞	😐	😊	
TNMG 431 NN	😊	😐	😞	
TNMG 432 NN	😐	😊	😊	
TNMG 432 NX	😊	😊	😐	
TNMG 433 NN	😞	😐	😊	

**Stainless Steel**  
↗ V<sub>c</sub>

**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 331 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980	
				190 HB										850	
				250 HB										780	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850	
				230 HB										780	
				280 HB										650	
				350 HB										590	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590	
				280 HB										450	
				320 HB										390	
				350 HB										360	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850	
				240 HB										680	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450	
				310 HB										220	450
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780	
				42 HRC										390	620
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0009	550	820	0.079	0.007	780	
				200 HB										720	
				250 HB										650	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780
					200 HB										720
250 HB	590														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130	
				250 HB										80	160
				350 HB										70	140
	Ti based	10	36, 37	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190
-	110	190	0.005	160											
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290	
				50 HRC										260	
				55 HRC										220	
				40 HB										130	260
	Chilled Cast Iron	38	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160	
White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130		
NI	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140

## TNMG 332 NN/NX LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780							
		2	2	1045, 1060,	190 HB										0.197	0.020	0.0028	910	720			
		3	3	28Mn6	250 HB										0.197	0.018	0.0023	820	650			
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650							
			4,6		230 HB										0.157	0.008	0.018	0.0019	820	590		
			5,7		280 HB										0.157	0.007	0.016	0.0019	680	490		
			8		350 HB										0.138	0.007	0.016	0.0016	590	420		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450							
			10		280 HB										0.157	0.016	0.0019	490	390			
			11		320 HB										0.118	0.014	0.0012	420	320			
			11		350 HB										0.118	0.014	0.0012	360	290			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620								
				14										240 HB	0.197	0.016	0.0016	520	720	550		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320								
				14										310 HB	0.157	0.014	0.0012	220	450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620								
				13										42 HRC	0.157	0.016	0.0016	390	620	0.098	0.000	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650								
				200 HB										0.197	0.024	0.0028	520	750	590			
				250 HB										0.197	0.022	0.0028	490	680	520			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	820	390	750	0.118	0.012	590							
				200 HB											0.020	0.020	0.0020	620	520			
				250 HB											0.197	0.020	0.0019	620	450			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100								
			33	Inconel 700										0.118	0.014	0.0011	80	140	90			
			34	Stellite 21										0.118	0.014	0.0011	70	130	90			
	Ti based	10	36	TiAl6V4	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180							
37			T40	-	0.118										0.014	0.0011	110	180	140			
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.020	0.079	0.004	0.012	0.0009	160	320	0.079	0.010	260							
			38	440C,	50 HRC										0.079	0.010	0.0006	130	290	0.059	0.008	220
			38	G-X260NiCr42	55 HRC										0.059	0.008	0.0005	130	260	0.039	0.007	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160								
				55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130								
White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130									
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910							

# TNMG 333 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.029	0.197	0.010	0.027	0.0047	590	1080	0.158	0.018	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.197	0.010	0.024	0.0032	390	910	0.158	0.017	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.157	0.009	0.021	0.0032	220	620	0.132	0.016	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.197	0.010	0.021	0.0032	550	880	0.158	0.016	620
240 HB					550										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.029	0.157	0.009	0.019	0.0021	260	490	0.132	0.013	320	
				310 HB										290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.197	0.011	0.021	0.0026	550	820	0.158	0.016	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.197	0.008	0.032	0.0053	550	820	0.158	0.018	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.029	0.197	0.008	0.027	0.0040	820	750	0.158	0.016	520
					200 HB										450
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.029	0.118	0.010	0.019	0.0018	80	140	0.106	0.015	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.029	0.157	0.010	0.021	0.0021	140	210	0.106	0.016	180
					-										140
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.029	0.098	0.005	0.016	0.0016	160	320	0.087	0.013	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.079	0.005	0.013	0.0011	130	190	0.079	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.029	0.059	0.005	0.011	0.0008	90	160	0.053	0.008	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.029	0.236	0.010	0.032	0.0048	650	1310	0.158	0.020	910

## TNMG 431 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4		230 HB											0.098	0.008	0.0007	820	780
		5,7	5		280 HB											0.079	0.007	0.0006	680	650
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10		280 HB											0.098	0.006	0.0006	490	450
		11	11		320 HB											0.079	0.006	0.0005	420	390
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14	14		240 HB											0.098	0.007	0.0004	520	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14	14		310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13	13		42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15	15		200 HB											0.118	0.008	0.0009	520	750
		16	16		250 HB											0.118	0.008	0.0009	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19	17		200 HB											0.098	0.007	0.0006	750	720
		18,20	18		250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	33		250 HB											0.079	0.006	0.0004	80	160
		34	34		350 HB											0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37	37		-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			38	50 HRc		0.059											0.004	0.0003	130	290
38			38	55 HRc		0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160					
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# TNMG 432 NN/NX LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.008	0.020	0.0028	590	1080	0.118	0.014	780							
		2		190 HB										0.276	0.020	0.0028	910	720			
		3		250 HB										0.276	0.018	0.0023	820	650			
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.008	0.018	0.0019	390	910	0.118	0.013	650							
		4,6		230 HB										0.220	0.008	0.018	0.0019	820	590		
		5,7		280 HB										0.220	0.007	0.016	0.0019	680	490		
		8		350 HB										0.193	0.007	0.016	0.0016	590	420		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.220	0.007	0.016	0.0019	220	620	0.098	0.012	450							
		10		280 HB										0.220	0.016	0.0019	490	390			
		11		320 HB										0.165	0.014	0.0012	420	320			
		14		350 HB										0.165	0.014	0.0012	360	290			
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.008	0.016	0.0019	550	880	0.118	0.014	620						
14			240 HB		0.276										0.016	0.0016	520	720	550		
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.220	0.007	0.014	0.0012	260	490	0.098	0.011	320							
		14		310 HB										0.220	0.014	0.0012	220	450	290		
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.009	0.016	0.0016	550	820	0.118	0.013	620							
		13		42 HRc										0.220	0.016	0.0016	390	620	420		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.006	0.024	0.0031	550	820	0.118	0.014	650							
		15		200 HB										0.276	0.024	0.0028	520	750	590		
		16		250 HB										0.276	0.022	0.0028	490	680	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.020	0.0023	390	820	0.118	0.012	590							
		17,19		200 HB										0.276	0.020	0.0020	750	520			
18,20	250 HB	0.276	0.020	0.0019	620	450															
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.165	0.008	0.014	0.0011	80	140	0.079	0.011	100							
		33		250 HB										0.165	0.014	0.0011	80	140	90		
		34		350 HB										0.165	0.014	0.0011	70	130	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.220	0.008	0.016	0.0012	140	210	0.079	0.013	180							
37	-	0.165	0.014	0.0011										110	180	140					
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.138	0.004	0.012	0.0009	160	320	0.079	0.010	260							
		38		50 HRc										0.110	0.010	0.0006	130	290	0.059	0.008	220
		38		55 HRc										0.083	0.008	0.0005	130	260	0.039	0.007	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.110	0.004	0.010	0.0006	130	190	0.059	0.007	160							
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.083	0.004	0.008	0.0005	90	160	0.039	0.006	130							
NI	Al (>8%Si)	12	AISI12	130 HB	0.020	0.331	0.008	0.024	0.0028	650	1310	0.118	0.016	910							

## TNMG 433 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.029	0.276	0.010	0.027	0.0047	590	1080	0.158	0.018	780							
		2	2	1045, 1060,	190 HB										0.276	0.027	0.0047	910	720			
		3	3	28Mn6	250 HB										0.276	0.024	0.0040	820	650			
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.276	0.010	0.024	0.0032	390	910	0.158	0.017	650							
			4,6		230 HB										0.220	0.010	0.024	0.0032	820	590		
			5,7		280 HB										0.220	0.009	0.021	0.0032	680	490		
			8		350 HB										0.193	0.009	0.021	0.0026	590	420		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.220	0.009	0.021	0.0032	220	620	0.132	0.016	450							
			10		280 HB										0.220	0.021	0.0032	490	390			
			11		320 HB										0.165	0.019	0.0021	420	320			
			11		350 HB										0.165	0.019	0.0021	360	290			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.276	0.010	0.021	0.0032	550	880	0.158	0.016	620								
		14		240 HB										0.276	0.021	0.0026	520	720	550			
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.029	0.220	0.009	0.019	0.0021	260	490	0.132	0.013	320							
					14										310 HB	0.220	0.019	0.0021	220	450	290	
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.276	0.011	0.021	0.0026	550	820	0.158	0.016	620							
					13										42 HRC	0.220	0.021	0.0026	390	620	0.118	0.014
Cast Iron	Grey	7	15	GG20, GG40,	0.029	0.276	0.008	0.032	0.0053	550	820	0.158	0.018	650								
				EN-GJL-250, No30B										200 HB	0.276	0.032	0.0047	520	750	590		
				250 HB										0.276	0.029	0.0047	490	680	520			
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.029	0.276	0.008	0.027	0.0040	390	820	0.158	0.016	590							
					200 HB										0.276	0.027	0.0034	750	520			
					250 HB										0.276	0.027	0.0032	620	450			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.029	0.165	0.010	0.019	0.0018	80	140	0.106	0.015	100								
				33										Inconel 700	0.165	0.019	0.0018	80	140	90		
				34										Stellite 21	0.165	0.019	0.0018	70	130	90		
	Ti based	10	36	TiAl6V4	0.029	0.220	0.010	0.021	0.0021	140	210	0.106	0.016	180								
37				T40										0.165	0.019	0.0018	110	180	140			
Hardened Mat.	Steel	11	38	X100CrMo13,	0.029	0.110	0.005	0.013	0.0016	160	320	0.087	0.013	260								
				440C,										50 HRC	0.110	0.013	0.0011	130	290	0.079	0.010	220
				G-X260NiCr42										55 HRC	0.083	0.011	0.0008	130	260	0.053	0.009	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.110	0.005	0.013	0.0011	130	190	0.079	0.009	160								
				White Cast Iron										41	G-X300CrMo15	55 HRC	0.029	0.083	0.005	0.011	0.0008	90
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.029	0.276	0.010	0.032	0.0048	650	1310	0.158	0.020	910							

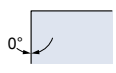




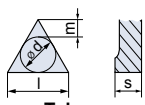
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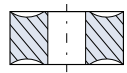
Shape



Clearance Angle



**Tolerance**  
 d ± 0.002  
 m ± 0.003  
 s ± 0.005



**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>TNMP 332 NN</b>	<b>LT 10</b>	0.650	0.187	0.032	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 332 NN**



**Finishing:**  
 d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**  
 d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**  
 d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

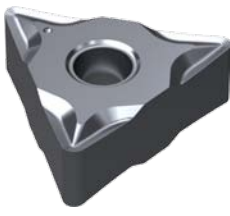
- = Good
- = Acceptable
- = Not recommended

**Stainless Steel Exotic Material**  
  
**CNMP - TNMP - WNMP**

**CNMP**  
**TNMP** →   
**WNMP**

**Exotic Material**  
 Verify   
**Cutting Conditions**

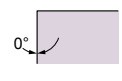
Machine Recommendations Guide. Details on page 10



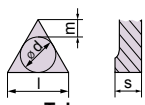
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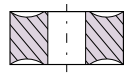
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNMP 332 NN	LT 1000	0.650	0.187	0.032	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 332 NN

**Finishing:**  
 d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**  
 d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**  
 d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/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 332 NN LT 10 & LT 1000

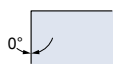
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
		2		190 HB										720	
		3		250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
				4,6										230 HB	590
				5,7										280 HB	490
				8										350 HB	420
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
				10										280 HB	390
				11										320 HB	320
				14										350 HB	290
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620
14					240 HB										550
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320	
				14										310 HB	290
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620	
				13										42 HRc	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650	
				15										200 HB	590
				16										250 HB	520
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	590
					17,19										200 HB
18,20	250 HB	450													
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100	
				33										250 HB	90
				34										350 HB	90
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180
-					110										180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260	
				38										50 HRc	220
				38										55 HRc	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910



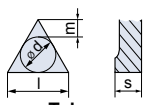
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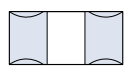
Shape



Clearance Angle



**Tolerance**  
 d ± 0.003  
 m ± 0.005  
 s ± 0.005



**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TNUX 331 R	LT 10	0.650	0.187	0.016	T0001125
TNUX 331 L	LT 10	0.650	0.187	0.016	T0001877
TNUX 332 R	LT 10	0.650	0.187	0.032	T0001137
TNUX 332 L	LT 10	0.650	0.187	0.032	T0001878

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

**Application Guide**

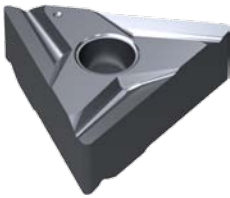
TNUX

	Finishing	Medium	Roughing / Interrupted cut	
TNUX 331 R	😊	😐	😞	😊 = Good 😐 = Acceptable 😞 = Not recommended  <b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
TNUX 331 L	😊	😐	😞	
TNUX 332 R	😐	😊	😐	
TNUX 332 L	😐	😊	😐	

Feed x d.o.c.  
 =  
 Amax

V<sub>C</sub> ⇒  
 ↑ Productivity

Machine Recommendations Guide. Details on page 10



T

N

U

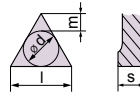
X



Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.005$   
 $s \pm 0.005$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
TNUX 331 R	LT 1000	0.650	0.187	0.016	T0001938
TNUX 331 L	LT 1000	0.650	0.187	0.016	T0002794
TNUX 332 R	LT 1000	0.650	0.187	0.032	T0001939
TNUX 332 L	LT 1000	0.650	0.187	0.032	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 331 R	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
TNUX 331 L	😊	😐	😞	
TNUX 332 R	😐	😊	😐	
TNUX 332 L	😐	😊	😐	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

Feed x d.o.c.  
= Amax

$V_c \Rightarrow$   
Productivity

Machine Recommendations  
Guide. Details on page 10

# TNUX 331 R&L LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.008	0.0008	910	850
		3	3	28Mn6	250 HB															
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4	Ck60, 4140, 4340,	230 HB											0.098	0.008	0.0007	820	780
		5,7	5	100Cr6	280 HB															
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5,	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10	H13, M42, D3,	280 HB											0.098	0.006	0.0006	490	450
		11	11	S6-5-2, 12Ni19	320 HB															
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14	14	X5CrNi18-9	240 HB											0.098	0.007	0.0004	520	680
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14	14	S31500	310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13	13	17-4 PH, 430	42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15	15	EN-GJL-250,	200 HB											0.118	0.008	0.0009	520	750
		16	16	No30B	250 HB															
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19	17	50005	200 HB											0.098	0.007	0.0006	750	720
		18,20	18		250 HB															
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	33	Inconel 700	250 HB											0.079	0.006	0.0004	80	160
		34	34	Stellite 21	350 HB															
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37	37	T40	-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			38	440C,	50 HRc	0.059											0.004	0.0003	130	290
38			38	G-X260NiCr42	55 HRc															
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160					
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# TNUX 332 R&L LT 10 & LT 1000

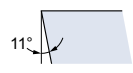
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780	
				190 HB										720	
				250 HB										650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650	
				230 HB										590	
				280 HB										490	
				350 HB										420	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450	
				280 HB										390	
				320 HB										320	
				350 HB										290	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620
240 HB					550										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320	
				310 HB										290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620	
				42 HRc										420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650	
				200 HB										590	
				250 HB										520	
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	590
					200 HB										520
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100	
				250 HB										90	
				350 HB										90	
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180
-	140														
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.098	0.004	0.012	0.0009	160	320	0.079	0.010	260	
				50 HRc										220	
				55 HRc										190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NI	Al (>8%Si)	12	25	AISI12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910



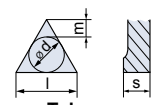
**T P M R**



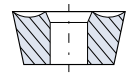
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TPMR 321 NN	LT 10	0.650	0.125	0.016	T0001638
TPMR 322 NN	LT 10	0.650	0.125	0.032	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 321 NN	😊	😐	😞
TPMR 322 NN	😐	😊	😐

TPMR

**Finishing:**  
 d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**  
 d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**  
 d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

**Stainless Steel**  
 $V_c$

$V_c \Rightarrow$   
**Productivity**

Machine Recommendations Guide  
 Details on page 10



## TPMR 321 NN LT 10

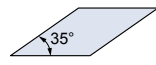
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions											
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>									
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	1080	0.079	0.007	980									
		2	2	1045, 1060,	190 HB										0.098	0.008	590	910	850				
		3	3	28Mn6	250 HB										0.098	0.008	0.0007	820	780				
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850								
			4,6		230 HB											0.098	0.008	0.0007	820	780			
			5,7		280 HB											0.079	0.007	0.0006	680	650			
			8		350 HB											0.079	0.007	0.0006	590	590			
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590								
			10		280 HB											0.098	0.006	0.0006	490	450			
			11		320 HB											0.079	0.006	0.0005	420	390			
			11		350 HB											0.079	0.006	0.0004	360	360			
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850								
14			240 HB		0.098											0.007	0.0004	520	720	680			
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450									
		14		310 HB											0.079	0.006	0.0003	220	450				
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780									
				13											42 HRc	0.079	0.006	0.0004	390	620	590		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780									
		15		200 HB											0.118	0.008	0.0009	520	750	720			
		16		250 HB											0.118	0.008	0.0009	490	680	650			
	Malleable & Nodular	8	GGG40, GGG70, 50005	17,19	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780								
				17,19	200 HB											0.098	0.007	0.0006	750	720			
				18,20	250 HB											0.098	0.007	0.0006	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	31,32	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130								
				33	Inconel 700											250 HB	0.079	0.006	0.0004	80	160		
				34	Stellite 21											350 HB	0.079	0.006	0.0004	70	140	110	
	Ti based	10	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190									
				37											T40	-	0.079	0.006	0.0004	110	190	160	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	38	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290							
38					50 HRc	0.059											0.004	0.0003	130	290	0.047	0.004	260
38					55 HRc	0.055											0.004	0.0002	130	260	0.039	0.003	220
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160									
White Cast Iron		41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130									
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140								

## TPMR 322 NN LT 10

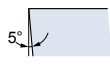
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.197	0.008	0.020	0.0028	590	1080	0.118	0.014	780
		2	1045, 1060,	190 HB	720										
		3	28Mn6	250 HB	650										
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.197	0.008	0.018	0.0019	390	910	0.118	0.013	650
		4,6	230 HB		590										
		5,7	280 HB		490										
		8	350 HB		420										
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.157	0.007	0.016	0.0019	220	620	0.098	0.012	450
		10	280 HB		390										
		11	320 HB		320										
		11	350 HB		290										
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.020	0.197	0.008	0.016	0.0019	550	880	0.118	0.014	620
		14		240 HB	550										
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.020	0.157	0.007	0.014	0.0012	260	490	0.098	0.011	320
		14	310 HB		290										
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.197	0.009	0.016	0.0016	550	820	0.118	0.013	620
		13	42 HRC		420										
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.197	0.006	0.024	0.0031	550	820	0.118	0.014	650
		15		200 HB	590										
		16		250 HB	520										
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.020	0.197	0.006	0.020	0.0023	390	820	0.118	0.012	590
		17,19	200 HB		520										
		18,20	250 HB		450										
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.020	0.118	0.008	0.014	0.0011	80	140	0.079	0.011	100
		33	Inconel 700	250 HB	90										
		34	Stellite 21	350 HB	90										
	Ti based	10	36	TiAl6V4	-	0.020	0.157	0.008	0.016	0.0012	140	210	0.079	0.013	180
37		T40	-	140											
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.020	0.079	0.004	0.012	0.0009	160	320	0.079	0.010	260
				440C,	50 HRC										220
				G-X260NiCr42	55 HRC										190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	0.0006	130	190	0.059	0.007	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	0.0005	90	160	0.039	0.006	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.236	0.008	0.024	0.0028	650	1310	0.118	0.016	910



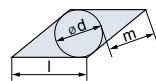
**V B M T**



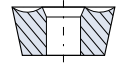
Shape



Clearance Angle



**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>VBMT 221 NN</b>	<b>LT 10</b>	0.433	0.125	0.016	T0001460
<b>VBMT 331 NN</b>	<b>LT 10</b>	0.654	0.187	0.016	T0000070
<b>VBMT 332 NN</b>	<b>LT 10</b>	0.654	0.187	0.032	T0000071

**NN** All purpose Chipbreaker

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

**Application Guide**

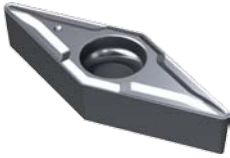
	Finishing	Medium	Roughing / Interrupted cut	
<b>VBMT 221 NN</b>	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
<b>VBMT 331 NN</b>	😊	😐	😞	
<b>VBMT 332 NN</b>	😐	😊	😐	

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

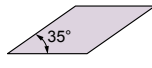
**Stainless Steel**  
 $V_c$

$V_c \Rightarrow$   
**Productivity**

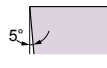
Machine Recommendations Guide  
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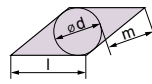
**V B M T**



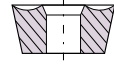
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>VBMT 221 NN</b>	<b>LT 1000</b>	0.433	0.125	0.016	T0001942
<b>VBMT 331 NN</b>	<b>LT 1000</b>	0.654	0.187	0.016	T0001943
<b>VBMT 332 NN</b>	<b>LT 1000</b>	0.654	0.187	0.032	T0001944

**NN** All purpose Chipbreaker

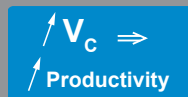
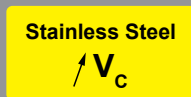
35° shape inserts with positive rake angle. Suitable for Internal and External Copying operations of complex geometries.

**Application Guide**

	Finishing	Medium	Roughing / Interrupted cut	
<b>VBMT 221 NN</b>	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
<b>VBMT 331 NN</b>	😊	😐	😞	
<b>VBMT 332 NN</b>	😐	😊	😐	

**VBMT**

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended



Machine Recommendations Guide  
 Details on page 10

# VBMT 221 NN LT 10 & LT 1000

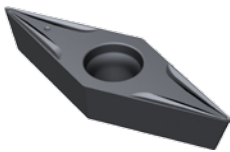
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980		
		2		190 HB		0.069		0.007	0.0005		910			850		
		3		250 HB		0.069		0.007	0.0005		820			780		
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850		
		4,6		230 HB		0.069		0.007	0.0005		820			780		
		5,7		280 HB		0.055		0.006	0.0004		680			650		
		8		350 HB		0.055		0.006	0.0003		590			590		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590		
		10		280 HB		0.069		0.005	0.0004		490			450		
		11		320 HB		0.055		0.005	0.0003		420			390		
		11		350 HB		0.055		0.005	0.0002		360			360		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850		
		14		240 HB		0.069		0.006	0.0002	520	720			680		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450		
		14		310 HB		0.055		0.005	0.0002	220	450					
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780		
		13		42 HRC		0.055		0.005	0.0002	390	620			590		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780		
		15		200 HB		0.083		0.007	0.0006	520	750			720		
		16		250 HB		0.083		0.007	0.0006	490	680			650		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780		
		17,19		200 HB		0.069		0.006	0.0004		750			720		
18,20	250 HB	0.069	0.006	0.0004	620	590										
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130		
		33		250 HB		0.055		0.005	0.0002	80	160			130		
		34		350 HB		0.055		0.005	0.0002	70	140			110		
	Ti based	10	TiAl6V4, T40	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190		
37		-		0.055		0.005		0.0002	110	190	160					
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290		
				50 HRC		0.041		0.003	0.0002	130	290			0.024	0.004	260
				55 HRC		0.039		0.003	0.0001	130	260			0.020	0.003	220
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160		
		41		55 HRC		0.039		0.001	0.003	0.0001	90			160	0.020	0.003
White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130			
	41		55 HRC		0.039		0.001	0.003	0.0001	90			160	0.020	0.003	130
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140	

## VBMT 331 NN LT 10 &amp; LT 1000

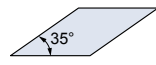
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions											
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>									
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980								
		2	2	1045, 1060,	190 HB											0.098	0.008	0.0008	910	850			
		3	3	28Mn6	250 HB																0.098	0.008	0.0007
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850								
		4,6	4		230 HB											0.098	0.008	0.0007	820	780			
		5,7	5		280 HB											0.079	0.007	0.0006	680	650			
		8	8		350 HB											0.079	0.007	0.0006	590	590			
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590								
		10	10		280 HB											0.098	0.006	0.0006	490	450			
		11	11		320 HB											0.079	0.006	0.0005	420	390			
		11	11		350 HB											0.079	0.006	0.0004	360	360			
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850								
		14	14		240 HB											0.098	0.007	0.0004	520	720	680		
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450								
		14	14		310 HB											0.079	0.006	0.0003	220	450			
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780								
		13	13		42 HRc											0.079	0.006	0.0004	390	620	590		
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780								
		15	15		200 HB											0.118	0.008	0.0009	520	750	720		
		16	16		250 HB											0.118	0.008	0.0009	490	680	650		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780								
		17,19	17		200 HB											0.098	0.007	0.0006	750	720			
		18,20	18		250 HB											0.098	0.007	0.0006	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130								
		33	33		Inconel 700											250 HB	0.079	0.006	0.0004	80	160		
		34	34		Stellite 21											350 HB	0.079	0.006	0.0004	70	140		
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190								
		37	37		T40											-	0.079	0.006	0.0004	110	190		
Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290								
		38	38		50 HRc											0.059	0.004	0.0003	130	290	0.047	0.004	260
		38	38		55 HRc											0.055	0.004	0.0002	130	260	0.039	0.003	220
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160								
	White Cast Iron	41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130								
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140								

# VBMT 332 NN LT 10 & LT 1000

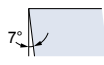
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.007	0.016	0.0020	590	1080	0.097	0.012	780	
		2		190 HB										720	
		3		250 HB										650	
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.007	0.014	0.0013	390	910	0.097	0.011	650	
				4,6										230 HB	590
				5,7										280 HB	490
				8										350 HB	420
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.006	0.013	0.0013	220	620	0.081	0.010	450	
				10										280 HB	390
				11										320 HB	320
				14										350 HB	290
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.007	0.013	0.0013	550	880	0.097	0.012	620	
				14										240 HB	550
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.110	0.006	0.011	0.0009	260	490	0.081	0.009	320	
				14										310 HB	290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.008	0.013	0.0011	550	820	0.097	0.011	620	
				13										42 HRc	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.005	0.019	0.0022	550	820	0.097	0.012	650	
				15										200 HB	590
				16										250 HB	520
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.005	0.016	0.0016	390	820	0.097	0.010	590
				200 HB	520										
250 HB	450														
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.083	0.007	0.011	0.0008	80	140	0.079	0.009	100	
				33										250 HB	90
				34										350 HB	90
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.110	0.007	0.013	0.0009	140	210	0.079	0.011	180
-				0.083	110										180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.004	0.009	0.0007	160	320	0.065	0.008	260	
				50 HRc										220	
				55 HRc										190	
				400 HB										160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.055	0.004	0.008	0.0004	130	190	0.048	0.006	160	
White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.041	0.004	0.006	0.0003	90	160	0.039	0.005	130		
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.165	0.007	0.019	0.0022	650	1310	0.097	0.013	910



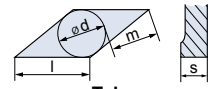
**V C M T**



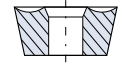
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
VCMT 331 NN	LT 10	0.654	0.187	0.016	T0001102
VCMT 332 NN	LT 10	0.654	0.187	0.032	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 331 NN	😊	😐	😞
VCMT 332 NN	😐	😊	😐

VCMT

**Finishing:**

d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

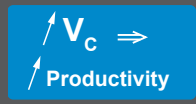
**Medium:**

d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**

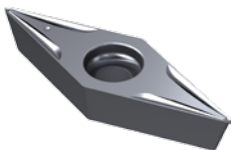
d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

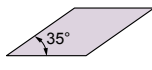


Machine Recommendations Guide. Details on page 10

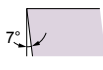




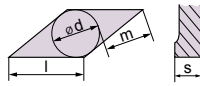
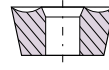
# V C M T



Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>VCMT 331 NN</b>	<b>LT 1000</b>	0.654	0.187	0.016	T0001945
<b>VCMT 332 NN</b>	<b>LT 1000</b>	0.654	0.187	0.032	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
<b>VCMT 331 NN</b>	😊	😐	😞
<b>VCMT 332 NN</b>	😐	😊	😐

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

**Stainless Steel**

$V_c$

$V_c \Rightarrow$   
**Productivity**

Machine Recommendations  
 Guide. Details on page 10

## VCMT 331 NN LT 10 &amp; LT 1000

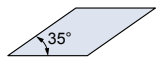
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980						
		2	1045, 1060,	190 HB	0.098										0.009	0.0008	910	850			
		3	28Mn6	250 HB	0.098										0.008	0.0007	820	780			
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850						
		4,6	230 HB		0.098										0.008	0.0007	820	780			
		5,7	280 HB		0.079										0.007	0.0006	680	650			
		8	350 HB		0.079										0.007	0.0006	590	590			
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590						
		10	280 HB		0.098										0.006	0.0006	490	450			
		11	320 HB		0.079										0.006	0.0005	420	390			
		11	350 HB		0.079										0.006	0.0004	360	360			
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850						
		14	240 HB		0.098										0.007	0.0004	520	720	680		
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450						
		14	310 HB		0.079										0.006	0.0003	220	450			
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780						
		13	42 HRc		0.079										0.006	0.0004	390	620	590		
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780						
		15	200 HB		0.118										0.008	0.0009	520	750	720		
		16	250 HB		0.118										0.008	0.0009	490	680	650		
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780						
		17,19	200 HB		0.098										0.007	0.0006	750	720			
		18,20	250 HB		0.098										0.007	0.0006	620	590			
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130						
		33	Inconel 700		250 HB										0.079	0.006	0.0004	80	160	130	
		34	Stellite 21		350 HB										0.079	0.006	0.0004	70	140	110	
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190						
		37	T40		-										0.079	0.006	0.0004	110	190	160	
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290					
38			50 HRc	0.059		0.004										0.0003	130	290	0.047	0.004	260
38			55 HRc	0.055		0.004										0.0002	130	260	0.039	0.003	220
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.000	0.000	0.000	0.000	0.0000	0	0	0.000	0.000	0							
White Cast Iron		41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140						

# VCMT 332 NN LT 10 & LT 1000

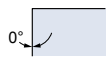
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.007	0.016	0.0020	590	1080	0.097	0.012	780
		2		190 HB										720
		3		250 HB										650
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.007	0.014	0.0013	390	910	0.097	0.011	650
		4,6		230 HB										590
		5,7		280 HB										490
		8		350 HB										420
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.006	0.013	0.0013	220	620	0.081	0.010	450
		10		280 HB										390
		11		320 HB										320
		14		350 HB										290
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.007	0.013	0.0013	550	880	0.097	0.012	620
		14		240 HB										550
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.110	0.006	0.011	0.0009	260	490	0.081	0.009	320
		14		310 HB										290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.008	0.013	0.0011	550	820	0.097	0.011	620
		13		42 HRc										420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.005	0.019	0.0022	550	820	0.097	0.012	650
		15		200 HB										590
		16		250 HB										520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.005	0.016	0.0016	390	820	0.097	0.010	590
		17,19		200 HB										520
18,20	250 HB	450												
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.083	0.007	0.011	0.0008	80	140	0.079	0.009	100
		33		250 HB										90
		34		350 HB										90
	Ti based	10	TiAl6V4, T40	-	0.020	0.110	0.007	0.013	0.0009	140	210	0.079	0.011	180
37	-	180												
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.004	0.009	0.0007	160	320	0.065	0.008	260
				50 HRc										220
				55 HRc										190
				400 HB										160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.055	0.004	0.008	0.0004	130	190	0.048	0.006	160
White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.041	0.004	0.006	0.0003	90	160	0.039	0.005	130	
NF	Al (>8%Si)	12	AISi12	130 HB	0.020	0.165	0.007	0.019	0.0022	650	1310	0.097	0.013	910



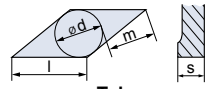
**V N M G**



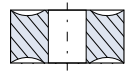
Shape



Clearance Angle



**Tolerance**  
 d ± 0.002  
 m ± 0.003  
 s ± 0.005



**Fixing Chip breaker**

Insert Designation	Grade	l	s	r	Catalog Nr.
VNMG 331 NN	LT 10	0.654	0.187	0.016	T0000072
VNMG 332 NN	LT 10	0.654	0.187	0.032	T0000073

**NN** All purpose Chipbreaker

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

**Application Guide**

	Finishing	Medium	Roughing / Interrupted cut
VNMG 331 NN	😊	😐	😞
VNMG 332 NN	😐	😊	😐

<p><b>Finishing:</b>                  d.o.c. = 0.012 - 0.059 inch                  fn = 0.003 - 0.008 inch/rev</p>	<p><b>Medium:</b>                  d.o.c. = 0.028 - 0.177 inch                  fn = 0.006 - 0.018 inch/rev</p>	<p><b>Roughing</b>                  d.o.c. = 0.118 - 0.276 inch                  fn = 0.014 - 0.028 inch/rev</p>
--	---	--

VNMG

😊 = Good  
 😐 = Acceptable  
 😞 = Not recommended

**Stainless Steel**

$V_c \Rightarrow$   
**Productivity**

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

Machine Recommendations Guide. Details on page 10

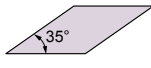


**V**

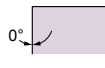
**N**

**M**

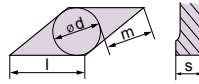
**G**



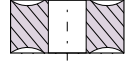
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
VNMG 331 NN	LT 1000	0.654	0.187	0.016	T0001947
VNMG 332 NN	LT 1000	0.654	0.187	0.032	T0001948

**NN** All purpose Chipbreaker

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

**Application Guide**

	Finishing	Medium	Roughing / Interrupted cut
VNMG 331 NN			
VNMG 332 NN			

<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/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 331 NN LT 10 & LT 1000

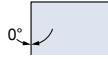
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [Inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4		230 HB											0.098	0.008	0.0007	820	780
		5,7	5		280 HB											0.079	0.007	0.0006	680	650
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10		280 HB											0.098	0.006	0.0006	490	450
		11	11		320 HB											0.079	0.006	0.0005	420	390
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14	14		240 HB											0.098	0.007	0.0004	520	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14	14		310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13	13		42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15	15		200 HB											0.118	0.008	0.0009	520	750
		16	16		250 HB											0.118	0.008	0.0009	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19	17		200 HB											0.098	0.007	0.0006	750	720
		18,20	18		250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	33		250 HB											0.079	0.006	0.0004	80	160
		34	34		350 HB											0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37	37		-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			38	50 HRc		0.059											0.004	0.0003	130	290
38			38	55 HRc		0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160					
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# VNMG 332 NN LT 10 & LT 1000

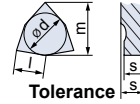
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.157	0.007	0.016	0.0022	590	1080	0.106	0.012	780
		2		190 HB										720
		3		250 HB										650
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.007	0.014	0.0015	390	910	0.106	0.011	650
		4,6		230 HB										590
		5,7		280 HB										490
		8		350 HB										420
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.006	0.013	0.0015	220	620	0.089	0.011	450
		10		280 HB										390
		11		320 HB										320
		14		350 HB										290
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.157	0.007	0.013	0.0015	550	880	0.106	0.012	620
		14		240 HB										550
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.006	0.011	0.0010	260	490	0.089	0.010	320
		14		310 HB										290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.008	0.013	0.0012	550	820	0.106	0.011	620
		13		42 HRc										420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.005	0.019	0.0025	550	820	0.106	0.012	650
		15		200 HB										590
		16		250 HB										520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.005	0.016	0.0019	390	820	0.106	0.011	590
		17,19		200 HB										520
18,20	250 HB	450												
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.094	0.007	0.011	0.0009	80	140	0.079	0.010	100
		33		250 HB										90
		34		350 HB										90
	Ti based	10	TiAl6V4, T40	-	0.020	0.126	0.007	0.013	0.0010	140	210	0.079	0.012	180
37		-		140										
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.079	0.004	0.009	0.0007	160	320	0.071	0.009	260
		38		50 HRc										220
		38		55 HRc										190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.063	0.004	0.008	0.0005	130	190	0.053	0.006	160
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.047	0.004	0.006	0.0004	90	160	0.039	0.005	130
NF	Al (>8%Si)	12	AISi12	130 HB	0.020	0.189	0.007	0.019	0.0022	650	1310	0.106	0.014	910

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

Shape

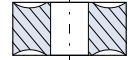


Clearance Angle



Tolerance

s ± 0.005  
For l = 06, d ± 0.002 m ± 0.003  
For l = 08, d ± 0.003 m ± 0.005

Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMG 331 NN	LT 10	0.256	0.187	0.016	T0000133
WNMG 332 NN	LT 10	0.256	0.187	0.032	T0000137
WNMG 431 NN	LT 10	0.343	0.187	0.016	T0000584
WNMG 432 NN	LT 10	0.343	0.187	0.032	T0000075
WNMG 432 NM	LT 10	0.343	0.187	0.032	T0001967
WNMG 433 NN	LT 10	0.343	0.187	0.047	T0000077

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

## Application Guide

	Finishing	Medium	Roughing / Interrupted cut	
WNMG 331 NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
WNMG 332 NN	😐	😊	😐	
WNMG 431 NN	😊	😐	😞	
WNMG 432 NN	😐	😊	😐	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
WNMG 432 NM	😞	😊	😊	
WNMG 433 NN	😞	😐	😊	
				<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

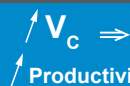
😊 = Good

😐 = Acceptable

😞 = Not recommended

WNMG

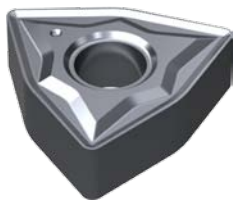
Stainless Steel



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

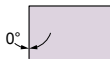
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M

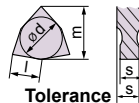
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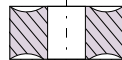
Shape



Clearance Angle



Tolerance

Fixing  
Chip breaker

s ± 0.005  
For l = 06, d ± 0.002 m ± 0.003  
For l = 08, d ± 0.003 m ± 0.005

\* Available from Q2-2013

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMG 331 NN	LT 1000	0.256	0.187	0.016	T0001949
WNMG 332 NN	LT 1000	0.256	0.187	0.032	T0001950
WNMG 332 NX*	LT 1000	0.256	0.187	0.032	T0003014
WNMG 431 NN	LT 1000	0.343	0.187	0.016	T0001951
WNMG 432 NN	LT 1000	0.343	0.187	0.032	T0001952
WNMG 432 NM	LT 1000	0.343	0.187	0.032	T0001969
WNMG 432 NX	LT 1000	0.343	0.187	0.032	T0002742
WNMG 433 NN	LT 1000	0.343	0.187	0.047	T0001953

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

	Finishing	Medium	Roughing / Interrupted cut	
WNMG 331 NN	😊	😞	😡	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev
WNMG 332 NN	😞	😊	😞	
WNMG 332 NX	😊	😊	😞	
WNMG 431 NN	😊	😞	😡	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev
WNMG 432 NN	😞	😊	😊	
WNMG 432 NM	😡	😊	😊	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
WNMG 432 NX	😞	😊	😊	
WNMG 433 NN	😡	😞	😊	

😊 = Good  
 😞 = Acceptable  
 😡 = Not recommended

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 331 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4		230 HB											0.098	0.008	0.0007	820	780
		5,7	5		280 HB											0.079	0.007	0.0006	680	650
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10		280 HB											0.098	0.006	0.0006	490	450
		11	11		320 HB											0.079	0.006	0.0005	420	390
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14	14		240 HB											0.098	0.007	0.0004	520	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14	14		310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13	13		42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15	15		200 HB											0.118	0.008	0.0009	520	750
		16	16		250 HB											0.118	0.008	0.0009	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19	17		200 HB											0.098	0.007	0.0006	750	720
		18,20	18		250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33	33		250 HB											0.079	0.006	0.0004	80	160
		34	34		350 HB											0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37	37		-											0.079	0.006	0.0004	110	190
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			38	50 HRc		0.059											0.004	0.0003	130	290
38			38	55 HRc		0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160					
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

# WNMG 332 NN/NX LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.098	0.008	0.020	0.0018	590	1080	0.086	0.014	780			
				190 HB							910			720			
				250 HB							820			650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.098	0.008	0.018	0.0012	390	910	0.086	0.013	650			
				230 HB							820			590			
				280 HB							680			490			
				350 HB							590			420			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.079	0.007	0.016	0.0012	220	620	0.072	0.012	450			
				280 HB							490			390			
				320 HB							420			320			
				350 HB							360			290			
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.098	0.008	0.016	0.0012	550	880	0.086	0.010	620		
240 HB					520						720						
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.079	0.007	0.014	0.0008	260	490	0.072	0.011	320			
				310 HB						220				450			
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.098	0.009	0.016	0.0010	550	820	0.086	0.013	620			
				42 HRc						390				620			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.098	0.006	0.024	0.0020	550	820	0.086	0.014	650			
				200 HB						520				750			
				250 HB						490				680			
	Malleable & Nodular	8	17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.098	0.006	0.020	0.0015	820	750	0.086	0.012	590		
					200 HB						390				520		
250 HB	620	450															
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.059	0.008	0.014	0.0007	80	140	0.057	0.011	100			
				250 HB						80				140			
				350 HB						70				130			
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.079	0.008	0.016	0.0008	140	210	0.057	0.013	180		
-	110	180	0.012	140													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.063	0.004	0.012	0.0006	160	320	0.057	0.010	260			
				50 HRc						130				290	0.039	0.008	220
				55 HRc						130				260	0.039	0.007	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.051	0.004	0.010	0.0004	130	190	0.039	0.007	160			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.051	0.004	0.008	0.0003	90	160	0.039	0.006	130			
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.118	0.008	0.024	0.0028	650	1310	0.086	0.016	910		

## WNMG 431 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980					
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850
		3	3	28Mn6	250 HB											0.098	0.008	0.0007	820	780
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850					
		4,6	4		230 HB											0.098	0.008	0.0007	820	780
		5,7	5		280 HB											0.079	0.007	0.0006	680	650
		8	8		350 HB											0.079	0.007	0.0006	590	590
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590					
		10	10		280 HB											0.098	0.006	0.0006	490	450
		11	11		320 HB											0.079	0.006	0.0005	420	390
		11	11		350 HB											0.079	0.006	0.0004	360	360
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850					
		14		X5CrNi18-9	240 HB											0.098	0.007	0.0004	520	720
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450					
		14			310 HB											0.079	0.006	0.0003	220	450
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780					
		13			42 HRc											0.079	0.006	0.0004	390	620
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780					
		15		EN-GJL-250,	200 HB											0.118	0.008	0.0009	520	750
		16		No30B	250 HB											0.118	0.008	0.0009	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780					
		17,19			200 HB											0.098	0.007	0.0006	750	720
		18,20			250 HB											0.098	0.007	0.0006	620	590
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130					
		33		Inconel 700	250 HB											0.079	0.006	0.0004	80	160
		34		Stellite 21	350 HB											0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190					
		37			T40											-	0.079	0.006	0.0004	110
	Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290				
38			440C,		50 HRc	0.059											0.004	0.0003	130	290
38			G-X260NiCr42		55 HRc	0.055											0.004	0.0002	130	260
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160						
White Cast Iron		41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140					

## WNUMG 432 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.008	0.020	0.0028	590	1080	0.094	0.014	785
		2		190 HB										720
		3		250 HB										655
	Low alloyed	2	42CrMo4, S150, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.008	0.018	0.0019	390	910	0.094	0.013	655
		4,6		230 HB										590
		5,7		280 HB										490
		8		350 HB										425
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.007	0.016	0.0019	220	620	0.079	0.012	455
		10		280 HB										390
		11		320 HB										325
		11		350 HB										295
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.008	0.016	0.0019	550	880	0.094	0.010	620
		14		240 HB										555
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.110	0.007	0.014	0.0012	260	490	0.079	0.011	325
		14		310 HB										295
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.009	0.016	0.0016	550	820	0.094	0.013	620
		13		42 HRc										425
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.006	0.024	0.0031	550	820	0.094	0.014	655
		15		200 HB										590
		16		250 HB										520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.006	0.020	0.0023	390	820	0.094	0.012	590
		17,19		200 HB										520
18,20	250 HB	455												
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.083	0.008	0.014	0.0011	80	140	0.063	0.011	100
		33		250 HB										95
		34		350 HB										90
	Ti based	10	TiAl6V4, T40	-	0.020	0.110	0.008	0.016	0.0012	140	210	0.063	0.013	180
37	-	180	145											
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.004	0.012	0.0009	160	320	0.063	0.010	260
		38		50 HRc										225
		38		55 HRc										195
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.059	0.004	0.010	0.0006	130	190	0.047	0.007	160
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.031	0.006	130
NF	Al (>8%Si)	12	AISi12	130 HB	0.020	0.165	0.008	0.024	0.0028	650	1310	0.094	0.016	915

## WNMG 432 NM LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.138	0.010	0.026	0.0033	590	1080	0.118	0.017	780
		2	2	1045, 1060,	190 HB										720
		3	3	28Mn6	250 HB										650
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.010	0.023	0.0022	390	910	0.118	0.016	650
			4,6		230 HB										590
			5,7		280 HB										490
			8		350 HB										420
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.009	0.020	0.0022	220	620	0.098	0.015	450
			10		280 HB										390
			11		320 HB										320
			11		350 HB										290
Cast Iron	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.010	0.020	0.0019	550	820	0.118	0.016	620	
		13		42 HRc										420	
	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.007	0.031	0.0037	550	820	0.098	0.000	420
			15		200 HB										590
			16		250 HB										520
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.007	0.026	0.0028	390	820	0.118	0.015	590
			17,19		200 HB										520
			18,20		250 HB										450
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.005	0.015	0.0011	160	320	0.079	0.012	260
					50 HRc										220
55 HRc					190										
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.020	0.059	0.005	0.013	0.0007	130	190	0.059	0.009	160	
White Cast Iron		41	G-X300CrMo15	55 HRc	0.020	0.059	0.005	0.010	0.0006	90	160	0.039	0.007	130	

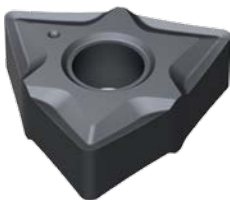
## WNMG 432 NX LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.008	0.020	0.0028	590	1080	0.094	0.014	785							
		2		190 HB										0.138	0.020	0.0028	910	720			
		3		250 HB										0.138	0.018	0.0023	820	655			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.008	0.018	0.0019	390	910	0.094	0.013	655							
				4,6										230 HB	0.110	0.008	0.018	0.0019	820	590	
				5,7										280 HB	0.110	0.007	0.016	0.0019	680	490	
				8										350 HB	0.096	0.007	0.016	0.0016	590	425	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.007	0.016	0.0019	220	620	0.079	0.012	455							
				10										280 HB	0.110	0.016	0.0019	490	390		
				11										320 HB	0.083	0.014	0.0012	420	325		
				14										350 HB	0.083	0.014	0.0012	360	295		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.008	0.016	0.0019	550	880	0.094	0.010	620							
				14										240 HB	0.138	0.016	0.0016	520	720	555	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.110	0.007	0.014	0.0012	260	490	0.079	0.011	325							
				14										310 HB	0.110	0.014	0.0012	220	450	295	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.009	0.016	0.0016	550	820	0.094	0.013	620							
				13										42 HRc	0.110	0.016	0.0016	390	620	425	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.006	0.024	0.0031	550	820	0.094	0.014	655							
				15										200 HB	0.138	0.024	0.0028	520	750	590	
				16										250 HB	0.138	0.022	0.0028	490	680	520	
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.006	0.020	0.0023	390	820	0.094	0.012	590						
					200 HB										0.138	0.020	0.0020	0	750	520	
250 HB	0.138	0.020	0.0019	0	620	455															
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.083	0.008	0.014	0.0011	80	140	0.063	0.011	100							
				33										250 HB	0.083	0.014	0.0011	80	140	95	
				34										350 HB	0.083	0.014	0.0011	70	130	90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.110	0.008	0.016	0.0012	140	210	0.063	0.013	180							
37	-	-	0.083	0.014	0.0011	110	180	0.063	0.012	145											
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.004	0.012	0.0009	160	320	0.063	0.010	260							
				50 HRc										0.059	0.010	0.0006	130	290	0.047	0.008	225
				55 HRc										0.059	0.008	0.0005	130	260	0.031	0.007	195
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.059	0.004	0.010	0.0006	130	190	0.047	0.007	160							
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.031	0.006	130							
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.165	0.008	0.024	0.0028	650	1310	0.094	0.016	915						

## WNMG 432 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.029	0.138	0.010	0.026	0.0033	590	1080	0.118	0.017	780						
		2	2	1045, 1060,	190 HB										0.138	0.026	0.0033	910	720		
		3	3	28Mn6	250 HB										0.138	0.023	0.0028	820	650		
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.029	0.138	0.010	0.023	0.0022	390	910	0.118	0.016	650						
			4,6		230 HB										0.110	0.010	0.023	0.0022	820	590	
			5,7		280 HB										0.110	0.009	0.020	0.0022	680	490	
			8		350 HB										0.096	0.009	0.020	0.0019	590	420	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.029	0.110	0.009	0.020	0.0022	220	620	0.098	0.015	450						
			10		280 HB										0.110	0.020	0.0022	490	390		
			11		320 HB										0.083	0.018	0.0015	420	320		
			11		350 HB										0.083	0.018	0.0015	360	290		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.029	0.138	0.009	0.020	0.0022	550	880	0.118	0.016	620							
		14		240 HB										0.138	0.020	0.0019	520	720	550		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.029	0.110	0.009	0.018	0.0015	260	490	0.098	0.013	320							
		14		310 HB										0.110	0.018	0.0000	220	450	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.029	0.138	0.010	0.020	0.0019	550	820	0.118	0.016	0.014	620						
				13											42 HRC	0.110	0.020	0.0019	390	620	0.098
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.029	0.138	0.007	0.031	0.0037	550	820	0.118	0.017	0.017	650						
		15		200 HB											0.138	0.031	0.0033	520	750	590	
		16		250 HB											0.138	0.028	0.0033	490	680	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.029	0.138	0.007	0.026	0.0028	820	390	750	0.118	0.015	590						
				17,19											200 HB	0.138	0.026	0.0024	620	520	
				18,20											250 HB	0.138	0.026	0.0022	620	450	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.029	0.083	0.009	0.018	0.0013	80	140	0.079	0.014	100							
		33		250 HB										0.083	0.018	0.0013	80	140	90		
		34		350 HB										0.083	0.018	0.0013	70	130	90		
	Ti based	10	TiAl6V4 T40	-	0.029	0.110	0.009	0.020	0.0015	140	210	0.079	0.016	180							
37		-		0.083										0.018	0.0013	110	180	140			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.029	0.069	0.005	0.015	0.0011	160	320	0.079	0.012	260							
				50 HRC										0.059	0.013	0.0007	130	290	0.059	0.010	220
				55 HRC										0.059	0.010	0.0006	130	260	0.039	0.009	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.029	0.059	0.005	0.013	0.0007	130	190	0.059	0.009	160							
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.029	0.059	0.005	0.010	0.0006	90	160	0.039	0.007	130							
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.029	0.165	0.009	0.031	0.0034	650	1310	0.118	0.020	910						

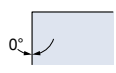




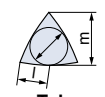
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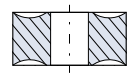
Shape



Clearance Angle



Tolerance



Fixing Chip breaker

s ± 0.005  
For l = 06, d ± 0.002 m ± 0.003  
For l = 08, d ± 0.003 m ± 0.005

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMP 331 NN	LT 10	0.256	0.187	0.016	T0000306
WNMP 332 NN	LT 10	0.256	0.187	0.032	T0000307
WNMP 432 NN	LT 10	0.343	0.187	0.032	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**

😊 = Good  
 😊 = Acceptable  
 😞 = Not recommended

WNMP 331 NN	😊	😊	😞
WNMP 332 NN	😊	😊	😞
WNMP 432 NN	😊	😊	😞

**Finishing:**  
 d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**  
 d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

**Roughing**  
 d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

**Exotic Material**  
 Verify Cutting Conditions

**Stainless Steel Exotic Material**  
  
 CNMP - TNMP - WNMP

**CNMP TNMP WNMP**

Machine Recommendations Guide. Details on page 10



W

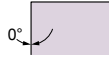
N

M

P



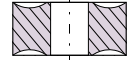
Shape



Clearance Angle



Tolerance



Fixing Chip breaker

s ± 0.005  
For l = 06, d ± 0.002 m ± 0.003  
For l = 08, d ± 0.003 m ± 0.005

Insert Designation	Grade	l	s	r	Catalog Nr.
WNMP 331 NN	LT 1000	0.256	0.187	0.016	T0001954
WNMP 332 NN	LT 1000	0.256	0.187	0.032	T0001955
WNMP 432 NN	LT 1000	0.343	0.187	0.032	T0001956

**NN** All purpose Chipbreaker

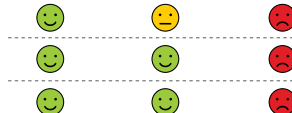
80° Trigon shape inserts with positive chipbreaker geometry. Generates lower cutting forces, suitable for High Temperature Alloys and Stainless Steel operations.

### Application Guide

Finishing Medium Roughing / Interrupted cut

😊 = Good  
😊 = Acceptable  
😞 = Not recommended

WNMP 331 NN  
WNMP 332 NN  
WNMP 432 NN



**Finishing:**  
d.o.c. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

**Medium:**  
d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

**Roughing**  
d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

WNMP

**Exotic Material**  
Verify Cutting Conditions

**Stainless Steel Exotic Material**  
 CNMP - TNMP - WNMP

CNMP  
TNMP  
WNMP

Machine Recommendations Guide. Details on page 10

# WNMP 331 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980							
		2		190 HB										0.098	0.009	0.0008	850				
		3		250 HB										0.098	0.008	0.0007	780				
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850							
		4,6		230 HB										0.098	0.008	0.0007	780				
		5,7		280 HB										0.079	0.007	0.0006	650				
		8		350 HB										0.079	0.007	0.0006	590				
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590							
		10		280 HB										0.098	0.006	0.0006	450				
		11		320 HB										0.079	0.006	0.0005	390				
		11		350 HB										0.079	0.006	0.0004	360				
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850							
		14		240 HB										0.098	0.007	0.0004	720	680			
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450							
		14		310 HB										0.079	0.006	0.0003	220	450			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780							
		13		42 HRC										0.079	0.006	0.0004	390	620	0.005	590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780							
		15		200 HB										0.118	0.008	0.0009	520	750	720		
		16		250 HB										0.118	0.008	0.0009	490	680	650		
	Malleable & Nodular	8	17,19 GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780							
		17,19		200 HB										0.098	0.007	0.0006	750	720			
18,20	250 HB	0.098	0.007	0.0006	620	590															
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130							
		33		250 HB										0.079	0.006	0.0004	80	160			
		34		350 HB										0.079	0.006	0.0004	70	140	110		
	Ti based	10	TiAl6V4, T40	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190							
		37		-										0.079	0.006	0.0004	110	190	0.005	160	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290							
		38		50 HRC										0.059	0.004	0.0003	130	290	0.047	0.004	260
		38		55 HRC										0.055	0.004	0.0002	130	260	0.039	0.003	220
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160							
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130							
NE	Al (>8%Si)	12	25	AISI12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140						

## WNMP 332 NN LT 10 &amp; LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.098	0.008	0.020	0.0018	590	1080	0.086	0.014	780							
		2	2	1045, 1060,	190 HB										0.098	0.020	0.0018	910	720			
		3	3	28Mn6	250 HB										0.098	0.018	0.0015	820	650			
	Low alloyed	2	6	42CrMo4, Si50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.098	0.008	0.018	0.0012	390	910	0.086	0.013	650							
			4,6		230 HB										0.079	0.008	0.018	0.0012	820	0.071	0.013	590
			5,7		280 HB										0.079	0.007	0.016	0.0012	680	0.071	0.012	490
			8		350 HB										0.069	0.007	0.016	0.0010	590	0.063	0.012	420
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.079	0.007	0.016	0.0012	220	620	0.072	0.012	450							
			10		280 HB										0.079	0.016	0.0012	490	0.072	0.012	390	
			11		320 HB										0.059	0.014	0.0008	420	0.059	0.011	320	
			11		350 HB										0.059	0.014	0.0008	360	0.059	0.011	290	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.098	0.008	0.016	0.0012	550	880	0.086	0.014	620								
		14		240 HB										0.098	0.016	0.0010	520	720	0.086	0.013	550	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.079	0.007	0.014	0.0008	260	490	0.072	0.011	320								
		14		310 HB										0.079	0.014	0.0008	220	450	0.072	0.011	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.098	0.009	0.016	0.0010	550	820	0.086	0.013	620								
				13										42 HRC	0.079	0.016	0.0010	390	620	0.079	0.013	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.098	0.006	0.024	0.0020	550	820	0.086	0.014	650								
		15		200 HB										0.098	0.024	0.0018	520	750	0.086	0.014	590	
		16		250 HB										0.098	0.022	0.0018	490	680	0.086	0.014	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.098	0.006	0.020	0.0015	820	750	0.086	0.012	590								
		17,19		200 HB										0.098	0.020	0.0013	390	750	0.086	0.012	520	
		18,20		250 HB										0.098	0.020	0.0012	620	450	0.086	0.012	450	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.059	0.008	0.014	0.0007	80	140	0.057	0.011	100								
		33		250 HB										0.059	0.014	0.0007	80	140	0.057	0.011	90	
		34		350 HB										0.059	0.014	0.0007	70	130	0.057	0.011	90	
	Ti based	10	TiAl6V4 T40	-	0.020	0.079	0.008	0.016	0.0008	140	210	0.057	0.013	180								
37		-		0.059										0.014	0.0007	110	180	0.057	0.012	140		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.063	0.004	0.012	0.0006	160	320	0.057	0.010	260								
				50 HRC										0.051	0.010	0.0004	130	290	0.039	0.008	220	
				55 HRC										0.051	0.008	0.0003	130	260	0.039	0.007	190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.051	0.004	0.010	0.0004	130	190	0.039	0.007	160								
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.051	0.004	0.008	0.0003	90	160	0.039	0.006	130								
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.118	0.008	0.024	0.0028	650	1310	0.086	0.016	910							

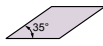
# WNMP 432 NN LT 10 & LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.008	0.020	0.0028	590	1080	0.094	0.014	785								
		2		190 HB										0.138	0.020	0.0028	910	720				
		3		250 HB										0.138	0.018	0.0023	820	655				
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.008	0.018	0.0019	390	910	0.094	0.013	655								
				4,6										230 HB	0.110	0.008	0.018	0.0019	820	590		
				5,7										280 HB	0.110	0.007	0.016	0.0019	680	490		
				8										350 HB	0.096	0.007	0.016	0.0016	590	425		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.110	0.007	0.016	0.0019	220	620	0.079	0.012	455								
				10										280 HB	0.110	0.016	0.0019	490	390			
				11										320 HB	0.083	0.014	0.0012	420	325			
				11										350 HB	0.083	0.014	0.0012	360	295			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.008	0.016	0.0019	550	880	0.094	0.010	620								
				14										240 HB	0.138	0.016	0.0016	520	720	555		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.110	0.007	0.014	0.0012	260	490	0.079	0.011	325								
				14										310 HB	0.110	0.014	0.0012	220	450	295		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.009	0.016	0.0016	550	820	0.094	0.013	620								
				13										42 HRc	0.110	0.016	0.0016	390	620	425		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.006	0.024	0.0031	550	820	0.094	0.014	655								
				15										200 HB	0.138	0.024	0.0028	520	750	590		
				16										250 HB	0.138	0.022	0.0028	490	680	520		
	Malleable & Nodular	8	17,19, 17,19, 18,20	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.006	0.020	0.0023	390	820	0.094	0.012	590							
					200 HB										0.138	0.020	0.0020	0	750	520		
250 HB	0.138	0.020	0.0019	0	620	455																
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.083	0.008	0.014	0.0011	80	140	0.063	0.011	100								
				33										250 HB	0.083	0.014	0.0011	80	140	95		
				34										350 HB	0.083	0.014	0.0011	70	130	90		
	Ti based	10	36, 37	TiAl6V4, T40	-	0.020	0.110	0.008	0.016	0.0012	140	210	0.063	0.013	180							
37	-	0.083	0.014	0.0011	110										180	145						
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.069	0.004	0.012	0.0009	160	320	0.063	0.010	260								
				38										50 HRc	0.059	0.010	0.0006	130	290	0.047	0.008	225
				38										55 HRc	0.059	0.008	0.0005	130	260	0.031	0.007	195
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.059	0.004	0.010	0.0006	130	190	0.047	0.007	160								
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.059	0.004	0.008	0.0005	90	160	0.031	0.006	130								
NF	Al (>8%Si)	12	25	AISi12	130 HB	0.020	0.165	0.008	0.024	0.0028	650	1310	0.094	0.016	915							



STAR

V<sub>35°</sub> D<sub>55°</sub> T<sub>60°</sub> C<sub>80°</sub> B M T



35°  
Diamond



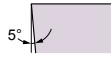
55°  
Diamond



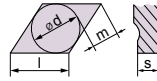
60°  
Triangle



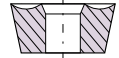
80°  
Diamond



5°  
Clearance  
Angle



Tolerance  
d ± 0.002  
m ± 0.003  
s ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
ST-CBMT 232-L NN	LT 1000	0.256	0.187	0.032	T0002784
ST-DBMT 231-L NN	LT 1000	0.256	0.187	0.016	T0002781
ST-TBMT 231-L NN	LT 1000	0.256	0.187	0.016	T0002783
ST-VBMT 231-L NN	LT 1000	0.256	0.187	0.016	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 232-L NN	😊	😐	😞	<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev  <b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev  <b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
ST-DBMT 231-L NN	😊	😞	😞	
ST-TBMT 231-L NN	😊	😞	😞	
ST-VBMT 231-L NN	😊	😞	😞	

- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

Stainless Steel  
↑ V<sub>C</sub>

Feed x d.o.c.  
= Amax

Machine Recommendations  
Guide. Details on page 10

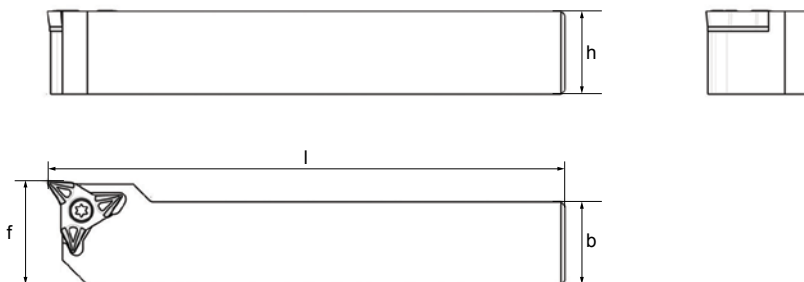
STAR

# STAR C / D / T / VBMT tool-holders

## External

Description	h	b	l	f	Catalog Nr.
<b>ST-SXJBL 0.75-0.75 K06</b>	0.750	0.750	5.00	1.000	T2001348
<b>ST-SXJBL 1.00-1.00 K06</b>	1.000	1.000	6.00	1.250	T2001349
<b>ST-SXJBL 1.25-1.25 K06</b>	1.250	1.250	7.00	1.500	T2001402

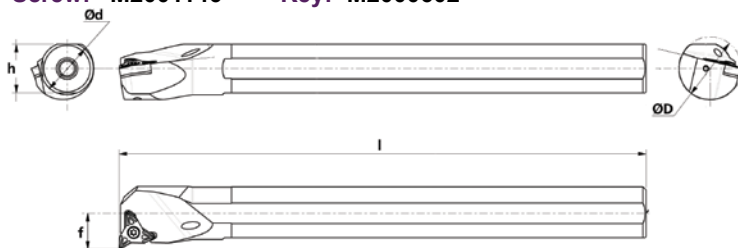
**Screw:** M2001146     **Key:** M2000602



## Internal

Description	$\varnothing d$	h	l	f	$\varnothing D_{min}$	Catalog Nr.
<b>ST-A1.00S-SXJBR 06</b>	1.000	0.921	9.843	0.669	1.180	T2001351

**Screw:** M2001146     **Key:** M2000602



## ST-CBMT 232-L NN LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions									
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>							
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.118	0.004	0.009	0.0009	590	1080	0.079	0.007	980						
		2	2	1045, 1060,	190 HB											0.098	0.009	0.0008	910	850	
		3	3	28Mn6	250 HB																0.098
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.098	0.004	0.008	0.0008	390	910	0.079	0.006	850						
		4,6	4		230 HB											0.098	0.008	0.0007	820	780	
		5,7	5		280 HB											0.079	0.007	0.0006	680	650	
		8	8		350 HB											0.079	0.007	0.0006	590	590	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.098	0.004	0.007	0.0006	220	620	0.079	0.005	590						
		10	10		280 HB											0.098	0.006	0.0006	490	450	
		11	11		320 HB											0.079	0.006	0.0005	420	390	
		11	11		350 HB											0.079	0.006	0.0004	360	360	
Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.008	0.098	0.004	0.007	0.0005	550	880	0.079	0.005	850						
		14	14		240 HB											0.098	0.007	0.0004	520	720	680
	Duplex	5	14	X2CrNiN23-4, S31500	290 HB	0.008	0.079	0.004	0.006	0.0003	260	490	0.079	0.005	450						
		14	14		310 HB											0.079	0.006	0.0003	220	450	
	Ferritic & Martensitic	6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.098	0.004	0.007	0.0005	550	820	0.079	0.006	780						
		13	13		42 HRc											0.079	0.006	0.0004	390	620	590
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.118	0.003	0.008	0.0010	550	820	0.079	0.007	780						
		15	15		200 HB											0.118	0.008	0.0009	520	750	720
		16	16		250 HB											0.118	0.008	0.0009	490	680	650
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.008	0.098	0.003	0.007	0.0007	390	820	0.079	0.006	780						
		17,19	17		200 HB											0.098	0.007	0.0006	750	720	
		18,20	18		250 HB											0.098	0.007	0.0006	620	590	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.079	0.004	0.006	0.0004	80	160	0.079	0.005	130						
		33	33		Inconel 700											250 HB	0.079	0.006	0.0004	80	160
		34	34		Stellite 21											350 HB	0.079	0.006	0.0004	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.079	0.004	0.006	0.0005	140	210	0.079	0.006	190						
		37	37		-											0.079	0.006	0.0004	110	190	160
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.071	0.002	0.005	0.0003	160	320	0.059	0.004	290					
38			38	50 HRc		0.059											0.004	0.0003	130	290	260
38			38	55 HRc		0.055											0.004	0.0002	130	260	220
Chilled Cast Iron		40	40	Ni-Hard 2	400 HB	0.008	0.063	0.002	0.005	0.0003	130	190	0.047	0.004	160						
White Cast Iron		41	41	G-X300CrMo15	55 HRc	0.008	0.055	0.002	0.004	0.0002	90	160	0.039	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.157	0.004	0.012	0.0011	650	1310	0.079	0.008	1140						



## ST-DBMT 231-L NN LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions										
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>								
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980							
		2	2	1045, 1060,	190 HB										0.069	0.007	0.0005	850				
		3	3	28Mn6	250 HB										0.069	0.007	0.0005	780				
	Low alloyed	2	6	42CrMo4, St50,	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850							
			4,6	4	Ck60, 4140, 4340,										230 HB	0.069	0.007	0.0005	780			
			5,7	5	100Cr6										280 HB	0.055	0.006	0.0004	650			
			8	8											350 HB	0.055	0.006	0.0003	590			
	High alloyed	3	10	X40CrMoV5,	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590							
			10	10	H13, M42, D3,										280 HB	0.069	0.005	0.0004	450			
			11	11	S6-5-2, 12Ni19										320 HB	0.055	0.005	0.0003	390			
			11	11											350 HB	0.055	0.005	0.0002	360			
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850							
		14	14	X5CrNi18-9	240 HB										0.069	0.006	0.0002	520	720			
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450							
			14	14	S31500										310 HB	0.055	0.005	0.0002	220	450		
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780							
			13	13	17-4 PH, 430										42 HRC	0.055	0.005	0.0002	390	620	590	
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780							
		15	15	EN-GJL-250,	200 HB										0.083	0.007	0.0006	520	750			
		16	16	No30B	250 HB										0.083	0.007	0.0006	490	680	650		
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780							
			17,19	17,19	50005										200 HB	0.069	0.006	0.0004	750	720		
		18,20		250 HB		0.069		0.006	0.0004	620				590								
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130							
			33	Inconel 700	250 HB										0.055	0.005	0.0002	80	160			
			34	Stellite 21	350 HB										0.055	0.005	0.0002	70	140	110		
	Ti based	10	36	TiAl6V4	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190							
			37	T40	-										0.055	0.005	0.0002	110	190	160		
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290							
			38	440C,	50 HRC										0.041	0.003	0.0002	130	290	0.024	0.004	260
			38	G-X260NiCr42	55 HRC										0.039	0.003	0.0001	130	260	0.020	0.003	220
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160								
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130								
NI	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140							

## ST-TBMT 231-L NN LT 1000

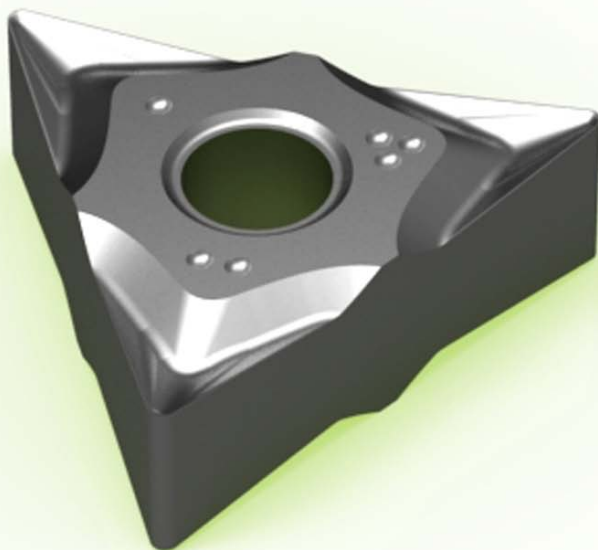
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980						
		190 HB		0.069										0.007	0.0005	850				
		250 HB		0.069										0.007	0.0005	780				
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850						
		230 HB		0.069										0.007	0.0005	780				
		280 HB		0.055										0.006	0.0004	650				
		350 HB		0.055										0.006	0.0003	590				
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590						
		280 HB		0.069										0.005	0.0004	450				
		320 HB		0.055										0.005	0.0003	390				
		350 HB		0.055										0.005	0.0002	360				
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850						
		240 HB		0.069										0.006	0.0002	680				
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450						
		310 HB		0.055										0.005	0.0002	220	450			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780						
		42 HRc		0.055										0.005	0.0002	390	620	0.005	590	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780						
		200 HB		0.083										0.007	0.0006	520	750	650		
		250 HB		0.083										0.007	0.0006	490	680			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780						
		200 HB		0.069										0.006	0.0004	750	720			
250 HB	0.069	0.006	0.0004	620	590															
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130						
		250 HB		0.055										0.005	0.0002	80	160	130		
		350 HB		0.055										0.005	0.0002	70	140	110		
	Ti based	10	TiAl6V4, T40	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190						
		-		0.055										0.005	0.0002	110	190	0.005	160	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290					
50 HRc			0.041		0.003										0.0002	130	290	0.024	0.004	260
55 HRc			0.039		0.003										0.0001	130	260	0.020	0.003	220
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160						
White Cast Iron		41	G-X300CrMo15	55 HRc	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130						
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140					

## ST-VBMT 231-L NN LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions							
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>					
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.008	0.083	0.003	0.008	0.0006	590	1080	0.039	0.007	980				
		2	2	1045, 1060,	190 HB										0.069	0.007	0.0005	850	
		3	3	28Mn6	250 HB										0.069	0.007	0.0005	780	
	Low alloyed	2	6	42CrMo4, S150,	180 HB	0.008	0.069	0.003	0.007	0.0005	390	910	0.039	0.006	850				
			4,6	4	Ck60, 4140, 4340,										230 HB	0.069	0.007	0.0005	780
			5,7	5	100Cr6										280 HB	0.055	0.006	0.0004	650
			8	8											350 HB	0.055	0.006	0.0003	590
	High alloyed	3	10	X40CrMoV5,	220 HB	0.008	0.069	0.003	0.006	0.0004	220	620	0.039	0.005	590				
			10	10	H13, M42, D3,										280 HB	0.069	0.005	0.0004	450
			11	11	S6-5-2, 12Ni19										320 HB	0.055	0.005	0.0003	390
			11	11											350 HB	0.055	0.005	0.0002	360
Stainless Steel	Austenitic	4	14	304, 316,	180 HB	0.008	0.069	0.003	0.006	0.0003	550	880	0.039	0.005	850				
		14	14	X5CrNi18-9	240 HB										0.069	0.006	0.0002	520	720
	Duplex	5	14	X2CrNiN23-4,	290 HB	0.008	0.055	0.003	0.005	0.0002	260	490	0.039	0.005	450				
			14	14	S31500										310 HB	0.055	0.005	0.0002	220
	Ferritic & Martensitic	6	12	410, X6Cr17,	200 HB	0.008	0.069	0.003	0.006	0.0003	550	820	0.039	0.006	780				
			13	13	17-4 PH, 430										42 HRC	0.055	0.005	0.0002	390
Cast Iron	Grey	7	15	GG20, GG40,	150 HB	0.008	0.083	0.002	0.007	0.0006	550	820	0.039	0.007	780				
		15	15	EN-GJL-250,	200 HB										0.083	0.007	0.0006	520	750
		16	16	No30B	250 HB										0.083	0.007	0.0006	490	680
	Malleable & Nodular	8	17,19	GGG40, GGG70,	150 HB	0.008	0.069	0.002	0.006	0.0005	390	820	0.039	0.006	780				
			17,19	17,19	50005										200 HB	0.069	0.006	0.0004	750
		18,20		250 HB		0.069		0.006	0.0004	620					590				
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.008	0.055	0.003	0.005	0.0002	80	160	0.039	0.005	130				
			33	Inconel 700	250 HB										0.055	0.005	0.0002	80	160
			34	Stellite 21	350 HB										0.055	0.005	0.0002	70	140
	Ti based	10	36	TiAl6V4	-	0.008	0.055	0.003	0.005	0.0003	140	210	0.039	0.006	190				
37	T40		-	0.055	0.005										0.0002	110	190	160	
Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRC	0.008	0.050	0.001	0.004	0.0002	160	320	0.030	0.004	290				
			38	440C,	50 HRC										0.041	0.003	0.0002	130	290
			38	G-X260NiCr42	55 HRC										0.039	0.003	0.0001	130	260
	Chilled Cast Iron	11	40	Ni-Hard 2	400 HB	0.008	0.044	0.001	0.004	0.0002	130	190	0.024	0.004	160				
	White Cast Iron		41	G-X300CrMo15	55 HRC	0.008	0.039	0.001	0.003	0.0001	90	160	0.020	0.003	130				
NE	Al (>8%Si)	12	25	AlSi12	130 HB	0.008	0.110	0.003	0.010	0.0007	650	1310	0.039	0.008	1140				

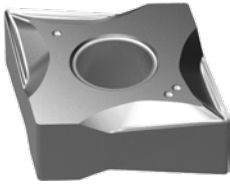
# Alu-Turning

LT 05 Alu-Turning



ALU-TURNING LINE

ALU-  
Turning



C

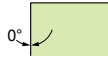
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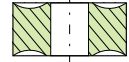
Shape



Clearance Angle



Tolerance  
 $d \pm 0.001$   
 $m \pm 0.001$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>CNGG 431 ALU</b>	<b>LT 05</b>	0.508	0.187	0.016	T0001025
<b>CNGG 432 ALU</b>	<b>LT 05</b>	0.508	0.187	0.032	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
<b>CNGG 431 ALU</b>	😊	😐	😞
<b>CNGG 432 ALU</b>	😐	😊	😐

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

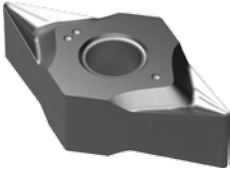
- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

# CNGG 431 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22	Si < 4 %	60 HB	0.010	0.197	0.005	0.014	0.0023	1320	3960	0.098	0.009	1320
		23, 24	4% < Si < 8 %	100 HB										0.197
	14	26,27,28	CuZn30	100 HB	0.010	0.197	0.004	0.012	0.0019	495	2640	0.098	0.009	825
		29	Fiber Plastics	-										0.197
15	30	Hard Rubber	-	0.010	0.197	0.004	0.008	0.0019	264	990	0.079	0.006	495	
	-	Graphite	-											0.197
H.T.A.	10	36	Ti 1	-	0.010	0.079	0.004	0.006	0.0004	115.5	198	0.059	0.005	148.5
		37	TiAl 6 V4	-										0.079

# CNGG 432 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22	Si < 4 %	60 HB	0.010	0.197	0.007	0.024	0.0023	1320	3960	0.118	0.013	1320
		23, 24	4% < Si < 8 %	100 HB										0.197
	14	26,27,28	CuZn30	100 HB	0.010	0.197	0.006	0.016	0.0019	495	2640	0.118	0.010	825
		29	Fiber Plastics	-										0.197
15	30	Hard Rubber	-	0.010	0.197	0.006	0.016	0.0019	264	990	0.118	0.010	495	
	-	Graphite	-											0.197
H.T.A.	10	36	Ti 1	-	0.010	0.157	0.006	0.011	0.0004	115.5	198	0.098	0.008	148.5
		37	TiAl 6 V4	-										0.157

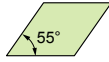


**D**

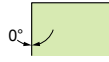
**N**

**G**

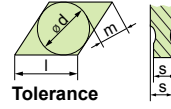
**G**



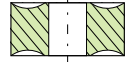
Shape



Clearance Angle



Tolerance  
 $d \pm 0.001$   
 $m \pm 0.001$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
<b>DNGG 331 ALU</b>	<b>LT 05</b>	0.457	0.187	0.016	T0001026
<b>DNGG 332 ALU</b>	<b>LT 05</b>	0.457	0.187	0.032	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
<b>DNGG 331 ALU</b>	😊	😐	😞
<b>DNGG 332 ALU</b>	😐	😊	😐

<b>Finishing:</b> d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	<b>Medium:</b> d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	<b>Roughing</b> d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev
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- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

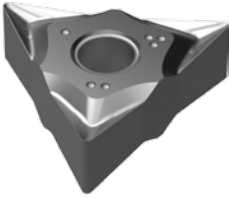
# DNGG 331 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22 23, 24	Si < 4 %	60 HB	0.010	0.157	0.005	0.014	0.0023	1320	3960	0.098	0.009	1320
			4% < Si < 8 %	100 HB		0.157	0.004	0.012	0.0019	825	1980			990
	14	26, 27, 28	CuZn30	100 HB	0.010	0.157	0.004	0.012	0.0019	495	2640	0.098	0.009	825
	15	29	30	Fiber Plastics	-	0.010	0.157	0.008	0.0019	231	1650	0.079	0.006	495
				Hard Rubber	-		0.157	0.004		0.008	264			990
Graphite				-	0.157		0.008	330		660	495			
H.T.A.	10	36 37	Ti 1	-	0.010	0.079	0.004	0.006	0.0004	115.5	198	0.059	0.005	148.5
			TiAl 6 V4	-		0.079	0.005	0.008	0.0004	92.4	132			115.5

# DNGG 332 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22 23, 24	Si < 4 %	60 HB	0.010	0.157	0.007	0.024	0.0023	1320	3960	0.079	0.010	1320
			4% < Si < 8 %	100 HB		0.157		0.020	0.0019	825	1980			990
	14	26, 27, 28	CuZn30	100 HB	0.010	0.157	0.006	0.016	0.0019	495	2640	0.079	0.010	825
	15	29	30	Fiber Plastics	-	0.010	0.157	0.016	0.0019	231	1650	0.079	0.010	495
				Hard Rubber	-		0.157	0.006		0.016	264			990
Graphite				-	0.157		0.016	330		660	495			
H.T.A.	10	36 37	Ti 1	-	0.010	0.118	0.006	0.011	0.0004	115.5	198	0.079	0.008	148.5
			TiAl 6 V4	-		0.118		0.010	92.4	132	115.5			





T

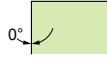
N

G

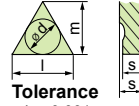
G



Shape



Clearance Angle



Tolerance  
 $d \pm 0.001$   
 $m \pm 0.001$   
 $s \pm 0.005$



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
TNGG 331 ALU	LT 05	0.457	0.187	0.032	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 331 ALU



**Finishing:**

d.o.c. = 0.012 - 0.059 inch  
 fn = 0.003 - 0.008 inch/rev

**Medium:**

d.o.c. = 0.028 - 0.177 inch  
 fn = 0.006 - 0.018 inch/rev

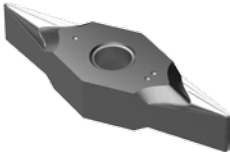
**Roughing**

d.o.c. = 0.118 - 0.276 inch  
 fn = 0.014 - 0.028 inch/rev

- = Good
- = Acceptable
- = Not recommended

# TNGG 331 ALU LT 05

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
						min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.010	0.157	0.005	0.014	0.0023	1320	3960	0.098	0.009	1320
			23, 24	4% < Si < 8 %	100 HB		0.157	0.004	0.012	0.0019	825	1980			990
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.010	0.157	0.004	0.012	0.0019	495	2640	0.098	0.009	825
			29	Fiber Plastics	-		0.010	0.157	0.004	0.008	0.0019	231			1650
Non-Metallic	15	30	Hard Rubber	-	0.010	0.157		0.004	0.008	0.0019	264	990	0.079	0.006	495
		-	Graphite	-		0.157	0.008	0.0019	330	660					
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.010	0.079	0.004	0.006	0.0004	115.5	198	0.059	0.005	148.5
			37	TiAl 6 V4	-		0.079	0.005	0.008	0.0004	92.4	132			115.5

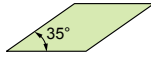


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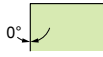
N

G

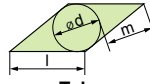
G



Shape



Clearance Angle



Tolerance  
 $d \pm 0.001$   
 $m \pm 0.001$   
 $r \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Catalog Nr.
VNGG 331 ALU	LT 05	0.654	0.187	0.016	T0001006
VNGG 332 ALU	LT 05	0.654	0.187	0.032	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 331 ALU	😊	😐	😞
VNGG 332 ALU	😐	😊	😐

Finishing:	Medium:	Roughing
d.o.c. = 0.012 - 0.059 inch fn = 0.003 - 0.008 inch/rev	d.o.c. = 0.028 - 0.177 inch fn = 0.006 - 0.018 inch/rev	d.o.c. = 0.118 - 0.276 inch fn = 0.014 - 0.028 inch/rev

- 😊 = Good
- 😐 = Acceptable
- 😞 = Not recommended

# VNKG 331 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [Inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22 23, 24	Si < 4 %	60 HB	0.010	0.157	0.005	0.012	0.0023	1320	3960	0.098	0.009	1320
			4% < Si < 8 %	100 HB		0.157	0.004	0.010	0.0019	825	1980			990
	14	26,27,28	CuZn30	100 HB	0.010	0.157	0.004	0.010	0.0019	495	2640	0.098	0.009	825
			29	Fiber Plastics		-	0.157	0.004	0.008	0.0019	231			1650
15	30	Hard Rubber	-	0.010	0.157	0.004	0.008	0.0019	264	990	0.079	0.006	495	
		-	Graphite		-	0.157	0.004	0.008	0.0019	330				660
H.T.A.	10	36 37	Ti 1	-	0.010	0.079	0.004	0.006	0.0004	115.5	198	0.059	0.005	148.5
			TiAl 6 V4	-		0.079	0.005	0.008	0.0004	92.4	132			115.5

# VNKG 332 ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [Inch]		Feed [Inch/rev]		Amax [mm <sup>2</sup> ]	V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max		min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22 23, 24	Si < 4 %	60 HB	0.010	0.236	0.007	0.024	0.0023	1320	3960	0.118	0.010	1320
			4% < Si < 8 %	100 HB		0.236		0.020	0.0019	825	1980			990
	14	26,27,28	CuZn30	100 HB	0.010	0.236	0.006	0.016	0.0019	495	2640	0.118	0.010	825
			29	Fiber Plastics		-	0.236	0.006	0.016	0.0019	231			1650
15	30	Hard Rubber	-	0.010	0.236	0.006	0.016	0.0019	264	990	0.118	0.010	495	
		-	Graphite		-	0.236	0.006	0.016	0.0019	330				660
H.T.A.	10	36 37	Ti 1	-	0.010	0.118	0.006	0.011	0.0004	115.5	198	0.079	0.008	148.5
			TiAl 6 V4	-		0.118		0.010	0.0004	92.4	132			115.5

# 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 ± 0.002  
m ± 0.006  
s ± 0.005

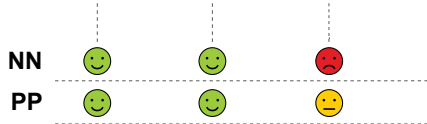
**Insert Type**  
Special

Insert Designation	Grade	W	r	Catalog Nr.
<b>GCTX 2002 NN</b>	<b>LT 1000</b>	0.079	0.007	T0002825
<b>GCTX 3003 NN</b>	<b>LT 1000</b>	0.118	0.010	T0002826
<b>GCTX 3003 PP</b>	<b>LT 1000</b>	0.118	0.010	T0002828

**PP** All purpose Chipbreaker  
**NN**

**Application Guide**

**Parting Grooving Side Turning**



**Finishing:**  
d.o.c. = 0.012 - 0.059 inch  
fn = 0.003 - 0.008 inch/rev

**Medium:**  
d.o.c. = 0.028 - 0.177 inch  
fn = 0.006 - 0.018 inch/rev

**Roughing**  
d.o.c. = 0.118 - 0.276 inch  
fn = 0.014 - 0.028 inch/rev

😊 = Good  
😐 = Acceptable  
😞 = Not recommended

## Parting Tool holders

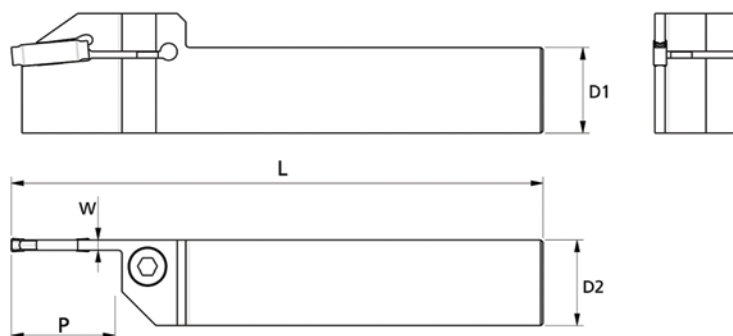
Designation	D1	D2	L	W	P <sub>max</sub>	Hand	Catalog Nr.
RILT PNG-L 0.500-2.0*	0.500	0.500	4.750	0.063	0.590	Left	T2001305
RILT PNG-R 0.500-2.0*	0.500	0.500	4.750	0.063	0.590	Right	T2001306
RILT PNG-L 0.625-2.0*	0.620	0.620	4.750	0.063	0.590	Left	T2001307
RILT PNG-R 0.625-2.0*	0.620	0.620	4.750	0.063	0.590	Right	T2001308

Designation	D1	D2	L	W	P <sub>max</sub>	Hand	Catalog Nr.
RILT PNG-L 0.625-3.0*	0.620	0.620	4.750	0.094	0.590	Left	T2001310
RILT PNG-R 0.625-3.0*	0.620	0.620	4.750	0.094	0.590	Right	T2001309
RILT PNG-L 0.750-3.0*	0.750	0.750	5.000	0.094	0.590	Left	T2001311
RILT PNG-R 0.750-3.0*	0.750	0.750	5.000	0.094	0.590	Right	T2001312
RILT PNG-L 1.000-3.0*	1.000	1.000	5.000	0.094	0.590	Left	T2001403
RILT PNG-R 1.000-3.0*	1.000	1.000	5.000	0.094	0.590	Right	T2001404

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

**Screw:** M2001797

**Key:** M2000609

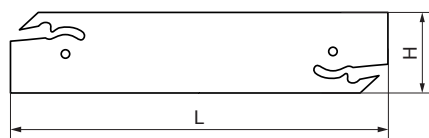




## Blades

Designation	L	H	Catalog Nr.
LT BNG-32-3	5.71	1.26	T2002751

Key: T2002761



## GCTX 2002 NN LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.002	0.007	420	720	0.004	570			
		2	2	1045, 1060,	190 HB						360			
		3	3	28Mn6	250 HB						320			
	Low alloyed	2	6	6	42CrMo4, St50,	180 HB	0.002	0.006	290	650	0.004	470		
			4,6	4,6	Ck60, 4140, 4340,	230 HB						320		
			5,7	5,7	100Cr6	280 HB						270		
			8	8		350 HB						240		
	High alloyed	3	10	10	X40CrMoV5,	220 HB	0.002	0.006	190	550	0.004	370		
			10	10	H13, M42, D3,	280 HB						240		
			11	11	S6-5-2, 12Ni19	320 HB						210		
			11	11		350 HB						160		
	Stainless Steel	Austenitic	4	14	14	304, 316,	0.002	0.004	290	490	0.003	390		
14				14	X5CrNi18-9	240 HB						340		
Duplex		5	14	14	X2CrNiN23-4,	290 HB	0.002	0.003	190	320	0.003	260		
			14	14	S31500	310 HB						320		
Ferritic & Martensitic		6	12	12	410, X6Cr17,	200 HB	0.002	0.003	190	420	0.003	310		
			13	13	17-4 PH, 430	42 HRc						290	220	
Cast Iron	Grey	7	15	15	GG20, GG40,	0.002	0.006	420	620	0.004	520			
			15	15	EN-GJL-250,						200 HB	620	310	
			16	16	No30B						250 HB	620	310	
	Malleable & Nodular	8	17,19	17,19	GGG40, GGG70,	150 HB	0.002	0.006	290	490	0.004	390		
			17,19	17,19	50005	200 HB						490	240	
			18,20	18,20		250 HB						490	240	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	31,32	Incoloy 800	0.002	0.003	80	110	0.003	90			
			33	33	Inconel 700						250 HB	110	90	
			34	34	Stellite 21						350 HB	110	90	
	Ti based	10	36	36	TiAl6V4	0.002	0.003	110	190	0.003	140			
			37	37	T40						-	90	130	110
Hardened Mat.	Steel	11	38	38	X100CrMo13,	0.002	0.004	160	290	0.003	220			
			38	38	440C,						50 HRc	130	220	180
			38	38	G-X260NiCr42						55 HRc	90	190	140
	Chilled Cast Iron	40	40	Ni-Hard 2	400 HB	0.002	0.003	130	190	0.003	160			
	White Cast Iron	41	41	G-X300CrMo15	55 HRc	0.002	0.003	90	160	0.003	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.002	0.004	320	980	0.003	650			

## GCTX 3003 NN LT 1000

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions	
						min	max	min	max	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.003	0.008	420	720	0.005	570
			2		190 HB		0.008		720		360
			3		250 HB		0.008		650		320
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.003	0.007	290	650	0.005	470
			4,6		230 HB		0.007		650		320
			5,7		280 HB		0.007		550		270
			8		350 HB		0.007		490		240
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.007	190	550	0.005	370
			10		280 HB		0.007		490	0.003	240
			11		320 HB		0.006		420	0.003	210
			11		350 HB		0.006		320	0.003	160
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.003	0.005	290	490	0.004	390
240 HB					0.005		220	450	340		
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.003	0.004	190	320	0.003	260	
				310 HB		0.004		320		160	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.004	190	420	0.003	310	
				42 HRc		0.004	160	290		220	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.003	0.008	420	620	0.005	520	
				200 HB		0.008		620			
				250 HB		0.008		620			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.003	0.007	290	490	0.005	390	
				200 HB		0.007		490			
				250 HB		0.007		490			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.003	0.004	80	110	0.003	90	
				250 HB		0.004	80	110			
				350 HB		0.004	70	110			
	Ti based	10	TiAl6V4	-	0.003	0.004	110	190	0.003	140	
				-		0.004	90	130		110	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.003	0.005	160	290	0.004	220	
				50 HRc		0.005	130	220		180	
				55 HRc		0.004	90	190		140	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.003	0.004	130	190	0.003	160	
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.003	0.004	90	160	0.003	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.003	0.005	320	980	0.004	650

## GCTX 3003 PP LT 1000

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.002	0.007	420	720	0.004	570	
		2	2	1045, 1060,	190 HB						360	
		3	3	28Mn6	250 HB						320	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.006	290	650	0.004	470	
			4,6		230 HB						320	
			5,7		280 HB						270	
			8		350 HB						240	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.002	0.006	190	550	0.004	370	
			10		280 HB						240	
			11		320 HB						210	
			11		350 HB						160	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	0.002	0.004	290	490	0.003	390
14			240 HB		340							
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.002	0.003	190	320	0.003	260	
		14			310 HB							320
Ferritic & Martensitic		6	12	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.002	0.003	190	420	0.003	310
			13		42 HRc	290						220
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	0.002	0.006	420	620	0.004	520	
		15		200 HB								
		16		250 HB								
	Malleable & Nodular	8	17,19	8	GGG40, GGG70, 50005	150 HB	0.002	0.006	290	490	0.004	390
			17,19			200 HB						
			18,20			250 HB						
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	0.002	0.003	80	110	0.003	90	
		33		Inconel 700	250 HB							
		34		Stellite 21	350 HB							
	Ti based	10	36	10	TiAl6V4	-	0.002	0.003	110	190	0.003	140
			37		T40	-						90
	Hardened Mat.	Steel	11	38	X100CrMo13,	45 HRc	0.002	0.004	160	290	0.003	220
38					440C,	50 HRc						180
38					G-X260NiCr42	55 HRc						140
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.002	0.003	130	190	0.003	160		
White Cast Iron		41	G-X300CrMo15	55 HRc	0.002	0.003	90	160	0.003	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.002	0.004	320	980	0.003	650	

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



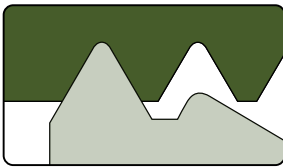
MULTI-MAT™ THREADING LINE

## Inserts Ordering Code

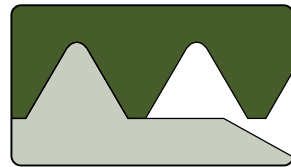
Lamina NEW Threading line, provides high range of standard Threading inserts, focusing on profitability and high quality according to the customers updated demands

ISO	1.5	Multitooth	ER	16	V	Grade																																						
<b>Profile</b>  <b>Partial Profile</b> 60° 55°  <b>Full Profile</b> 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	<b>Pitch</b>  <b>Partial Profile</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td><b>A</b></td> <td>0.5-1.5</td> <td>48-16</td> </tr> <tr> <td><b>G</b></td> <td>1.75-3.0</td> <td>14-8</td> </tr> <tr> <td><b>AG</b></td> <td>0.5-3.0</td> <td>48-8</td> </tr> <tr> <td><b>N</b></td> <td>3.5-5.0</td> <td>7-5</td> </tr> <tr> <td><b>Q</b></td> <td>5.5-6.0</td> <td>4.5-4</td> </tr> </tbody> </table> <b>Full Profile</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>mm</th> <th>tpi</th> </tr> </thead> <tbody> <tr> <td></td> <td>0.35-6.0</td> <td>72-4</td> </tr> </tbody> </table>		mm	tpi	<b>A</b>	0.5-1.5	48-16	<b>G</b>	1.75-3.0	14-8	<b>AG</b>	0.5-3.0	48-8	<b>N</b>	3.5-5.0	7-5	<b>Q</b>	5.5-6.0	4.5-4		mm	tpi		0.35-6.0	72-4	2M  3M	<b>Type of insert</b>  <b>HER</b> External right handed  <b>HEL</b> External left handed  <b>HIR</b> Internal right handed  <b>HIL</b> Internal left handed	<b>Insert size</b>  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>L</th> <th>I.C.</th> </tr> </thead> <tbody> <tr> <td>06</td> <td>0.158</td> </tr> <tr> <td>08</td> <td>0.197</td> </tr> <tr> <td>11</td> <td>0.250</td> </tr> <tr> <td>16</td> <td>0.375</td> </tr> <tr> <td>22</td> <td>0.500</td> </tr> <tr> <td>27</td> <td>0.625</td> </tr> </tbody> </table>	L	I.C.	06	0.158	08	0.197	11	0.250	16	0.375	22	0.500	27	0.625	Vertical	<b>LT 10</b>
	mm	tpi																																										
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### Partial and Full Profiles



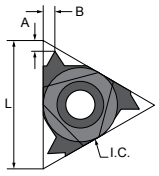
**Partial profile**, most economical solution, used for wide range of pitches. It is partial because the ext. major, or int. minor diameter, is not machined.



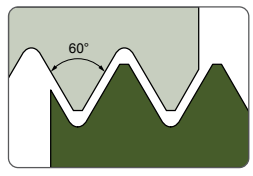
**Full profile**, cuts all thread shapes, according to the requirements. Wide range of inserts needed in order to fit each standard and range of pitches.

### Partial Profile 60°

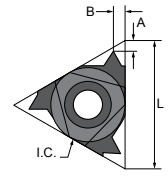
Designation		Pitch Range			Dimensions			Catalog Nr.
EX / IN	Grade	mm	TPI	L (mm)	I.C.	A	B	
<b>A60 IR11</b>	<b>LT 10</b>	0.5 - 1.5	48 - 16	11	0.250	0.030	0.040	TH000001
<b>A60 ER16</b>	<b>LT 10</b>	0.5 - 1.5	48 - 16	16	0.375	0.030	0.040	TH000004
<b>A60 IR16</b>	<b>LT 10</b>	0.5 - 1.5	48 - 16	16	0.375	0.030	0.040	TH000007
<b>G60 ER16</b>	<b>LT 10</b>	1.75 - 3.0	14 - 8	16	0.375	0.050	0.070	TH000010
<b>G60 IR16</b>	<b>LT 10</b>	1.75 - 3.0	14 - 8	16	0.375	0.050	0.070	TH000013
<b>AG60 ER16</b>	<b>LT 10</b>	0.5 - 3.0	48 - 8	16	0.375	0.050	0.070	TH000016
<b>AG60 IR16</b>	<b>LT 10</b>	0.5 - 3.0	48 - 8	16	0.375	0.050	0.070	TH000019



**External Right**



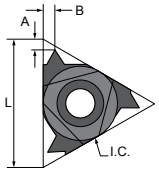
**Partial Profile 60°**



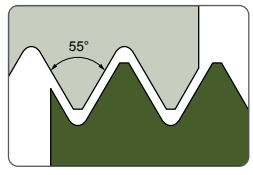
**Internal Right**

### Partial Profile 55°

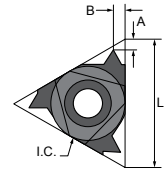
Designation		Pitch Range			Dimensions			Catalog Nr.
EX / IN	Grade	mm	TPI	L (mm)	I.C.	A	B	
<b>AG55 ER16</b>	<b>LT 10</b>	0.5 - 3.0	48 - 8	16	0.375	0.050	0.070	TH000022
<b>AG55 IR16</b>	<b>LT 10</b>	0.5 - 3.0	48 - 8	16	0.375	0.050	0.070	TH000025



**External Right**



**Partial Profile 55°**

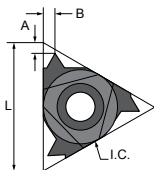


**Internal Right**

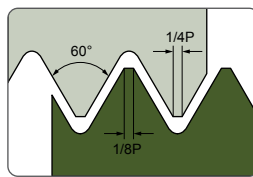
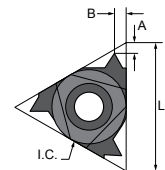


## ISO METRIC

Designation	Pitch	Dimensions			Catalog Nr.		
		Grade	mm	L (mm)		I.C.	A
ISO 1.0 IR11	LT10	1.00	11	0.250	0.030	0.030	TH000028
ISO 1.5 IR11	LT10	1.50	11	0.250	0.030	0.040	TH000031
ISO 2.0 IR11	LT10	2.00	11	0.250	0.030	0.040	TH000034
ISO 1.0 ER16	LT10	1.00	16	0.375	0.030	0.030	TH000037
ISO 1.0 IR16	LT10	1.00	16	0.375	0.030	0.030	TH000040
ISO 1.25 ER16	LT10	1.25	16	0.375	0.030	0.040	TH000043
ISO 1.25 IR16	LT10	1.25	16	0.375	0.030	0.040	TH000046
ISO 1.5 ER16	LT10	1.50	16	0.375	0.030	0.040	TH000049
ISO 1.5 IR16	LT10	1.50	16	0.375	0.030	0.040	TH000052
ISO 1.75 ER16	LT10	1.75	16	0.375	0.040	0.050	TH000055
ISO 1.75 IR16	LT10	1.75	16	0.375	0.040	0.050	TH000056
ISO 2.0 ER16	LT10	2.00	16	0.375	0.040	0.050	TH000058
ISO 2.0 IR16	LT10	2.00	16	0.375	0.040	0.050	TH000061
ISO 2.5 ER16	LT10	2.50	16	0.375	0.040	0.060	TH000064
ISO 2.5 IR16	LT10	2.50	16	0.375	0.040	0.060	TH000067
ISO 3.0 ER16	LT10	3.00	16	0.375	0.050	0.060	TH000070
ISO 3.0 IR16	LT10	3.00	16	0.375	0.050	0.060	TH000073



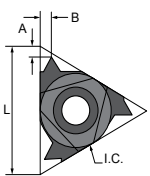
External Right

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

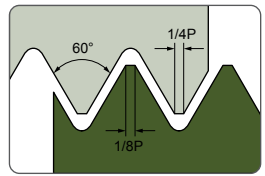
Internal Right

## UN

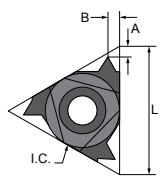
Designation	Pitch		Dimensions			Catalog Nr.	
EX / IN	Grade	TPI	L (mm)	I.C.	A	B	
UN 20 ER16	LT 10	20	16	0.375	0.030	0.040	TH000076
UN 20 IR16	LT 10	20	16	0.375	0.030	0.040	TH000079
UN 16 ER16	LT 10	16	16	0.375	0.040	0.040	TH000082
UN 16 IR16	LT 10	16	16	0.375	0.040	0.040	TH000085
UN 12 ER16	LT 10	12	16	0.375	0.040	0.060	TH000088
UN 12 IR16	LT 10	12	16	0.375	0.040	0.060	TH000091



External Right



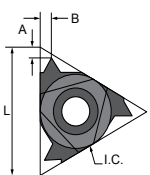
UNC, UNF, UNEF  
ANSI B1.1-1982



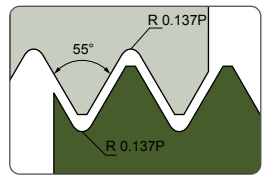
Internal Right

## WHITWORTH

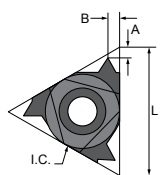
Designation	Pitch		Dimensions			Catalog Nr.	
EX / IN	Grade	TPI	L (mm)	I.C.	A	B	
W 14 ER16	LT10	14	16	0.375	0.040	0.050	TH000094
W 14 IR16	LT10	14	16	0.375	0.040	0.050	TH000097
W 11 ER16	LT10	11	16	0.375	0.040	0.060	TH000100
W 11 IR16	LT10	11	16	0.375	0.040	0.060	TH000103



External Right



BSW, BSF, BSP  
B.S.84: 1956  
ISO 228-1: 1994



Internal Right

## Toolholders Ordering code

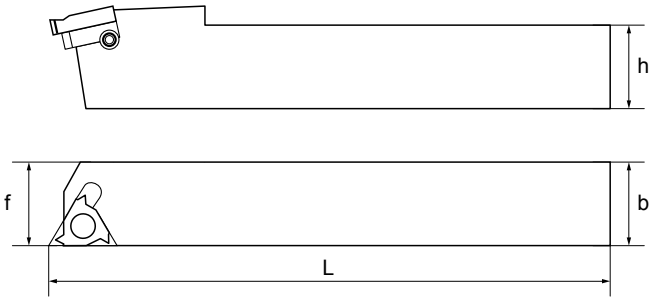
HER	0.750	Tool length	16	V-Vertical														
<b>Holder type</b>  <b>HER</b> External right handed  <b>HEL</b> External left handed  <b>HIR</b> Internal right handed  <b>HIL</b> Internal left handed	<b>Shank</b>  External Toolholders Square Shank  0.375 0.500 0.625 0.750 1.000 1.250  Internal Toolholders round shank  0.375 0.500 0.625 0.750 1.000 1.250 1.500	H - 4.000 K - 5.000 L - 5.500 M - 6.000 P - 7.000 R - 8.000 S - 10.000 T - 12.000	<b>Insert size</b>  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="border-right: 1px dashed black;">L</th> <th>I.C.</th> </tr> </thead> <tbody> <tr> <td style="border-right: 1px dashed black;">06</td> <td>0.158</td> </tr> <tr> <td style="border-right: 1px dashed black;">08</td> <td>0.197</td> </tr> <tr> <td style="border-right: 1px dashed black;">11</td> <td>0.250</td> </tr> <tr> <td style="border-right: 1px dashed black;">16</td> <td>0.375</td> </tr> <tr> <td style="border-right: 1px dashed black;">22</td> <td>0.500</td> </tr> <tr> <td style="border-right: 1px dashed black;">27</td> <td>0.625</td> </tr> </tbody> </table>	L	I.C.	06	0.158	08	0.197	11	0.250	16	0.375	22	0.500	27	0.625	
L	I.C.																	
06	0.158																	
08	0.197																	
11	0.250																	
16	0.375																	
22	0.500																	
27	0.625																	



## External Toolholders

Designation	Insert Type	h	b	f	l	Catalog Nr.
LT-HER 0625 H16	ER16	0.625	0.625	0.625	4	TH200001
LT- HER 0750 K16	ER16	0.750	0.750	0.750	5	TH200004
LT-HER 1000 M16	ER16	1.000	1.000	1.000	6	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

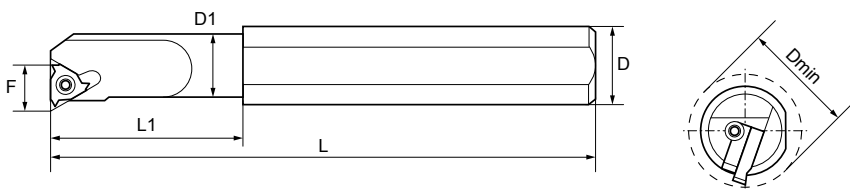
## Internal Toolholders

Designation	Insert Type	D	D1	Dmin	L	L1	F	Catalog Nr.
LT-HIR 0375 H11	IR11	0.375	0.375	0.490	4	-	0.290	TH200010
LT-HIR 375 K11	IR11	0.625	0.375	0.490	5	0.980	0.290	TH200013

**Accessories:** on request

Designation	Insert Type	D	D1	Dmin	L	L1	F	Catalog Nr.
LT-HIR 0500 M16	IR16	0.625	0.500	0.650	6	1.260	0.400	TH200016
LT-HIR 0625 P16	IR16	0.750	0.625	0.770	7	1.560	0.440	TH200019
LT-HIR 0750 P16	IR16	0.750	0.750	0.890	7	-	0.520	TH200022
LT-HIR 1000 R16	IR16	1.000	1.000	1.120	8	-	0.640	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 shim

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Vc [sfm]		
						min	max	
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	400	650	
			2		190 HB	360	600	
			3		250 HB	330	650	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	330	650	
			4,6		230 HB	330	650	
			5,7		280 HB	230	400	
			8		350 HB	200	300	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	330	650	
			10		280 HB	330	650	
			11		320 HB	230	400	
			11		350 HB	200	300	
	Stainless Steel	Austenitic	4	14	304, 316, X5CrNi18-9	180 HB	230	450
14				240 HB		260	400	
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	165	350	
			14		310 HB	165	350	
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	230	460	
			13		42 HRc	165	360	
Cast Iron	Grey	7	15	GG20, GG40, EN-GJL-250, No30B	150 HB	230	500	
			15		200 HB	330	460	
			16		250 HB	230	400	
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	230	500	
			17,19		200 HB	330	460	
			18,20		250 HB	230	400	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	240 HB	130	200	
			33		Inconel 700	250 HB	100	160
			34		Stellite 21	350 HB	65	115
	Ti based	10	36	TiAl6V4	-	160	230	
			37	T40	-	130	200	
	Hardened Mat.	Steel	11	38	X100CrMo13, 440C, G-X260NiCr42	45 HRc	80	160
38				50 HRc		80	160	
38				55 HRc		80	115	
Chilled Cast Iron		40	Ni-Hard 2	400 HB	80	115		
White Cast Iron		41	G-X300CrMo15	55 HRc	80	115		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	330	1300	

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

ADKT  
AOMT  
APKT  
APMT  
LDMT  
ODMT  
ODMW  
OFER  
OFMT  
RDMT  
RDMW  
RDMX  
SDKT  
SEKN  
SEKR  
SEKT  
SNKX  
SPKN  
SPKR  
SPMT  
SPUN  
TPKN  
TPKR  
TPUN

ALU-Milling

DRILLING

THREAD  
Milling

SOLID  
MILL





**A**

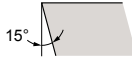
**D**

**K**

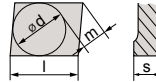
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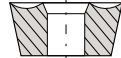
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.005$   
 $s \pm 0.001$



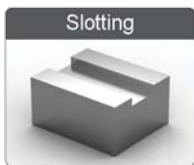
Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ADKT 1505 PDTR	LT 30	0.512	0.222	0.038	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**



↑ **F** ⇒  
 ↑ **Productivity**

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

**Coolant**

**Stainless Steel**

↑ **V<sub>C</sub>**

Machine Recommendations  
 Guide. Details on page 10

## ADKT 1505 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.551	0.007	0.013	620	1080	0.157	0.009	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.551	0.006	0.010	490	780	0.157	0.008	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.394	0.005	0.009	290	490	0.118	0.007	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.551	0.006	0.010	620	820	0.157	0.008	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.394	0.005	0.007	220	420	0.118	0.006	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.551	0.006	0.010	490	680	0.157	0.008	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.551	0.007	0.013	490	780	0.157	0.009	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.551	0.006	0.011	320	650	0.157	0.008	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.394	0.005	0.007	80	140	0.118	0.006	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.394	0.005	0.008	130	210	0.118	0.007	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.197	0.004	0.007	130	260	0.079	0.006	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.157	0.004	0.007	130	260	0.059	0.006	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.006	90	190	0.039	0.005	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.551	0.007	0.013	650	1310	0.157	0.010	910

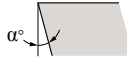




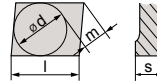
**A O M T**



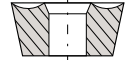
Shape



Clearance Angle  
 $\alpha$  = Special



Tolerance  
d  $\pm$  0.002  
m  $\pm$  0.003  
s  $\pm$  0.005



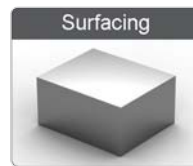
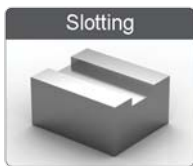
Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
AOMT 123608 PETR	LT 30	0.409	0.143	0.032	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**



**F**  $\Rightarrow$   
Productivity

**Coolant**

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

**Stainless Steel**

**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## AOMT 123608 PETR LT 30

AOMT

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.433	0.005	0.009	620	1080	0.079	0.006	820
		190 HB		720									
		250 HB		650									
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.433	0.004	0.007	490	780	0.079	0.005	650
		230 HB		590									
		280 HB		490									
		350 HB		450									
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.309	0.003	0.006	290	490	0.059	0.005	420
		280 HB		390									
		320 HB		320									
		350 HB		260									
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.433	0.004	0.007	620	820	0.079	0.005
240 HB			620										
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.309	0.003	0.005	220	420	0.059	0.004	320
		310 HB		290									
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.433	0.004	0.007	490	680	0.079	0.005	620
		42 HRC		420									
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.433	0.005	0.009	490	780	0.079	0.006	650
		200 HB		590									
		250 HB		520									
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.433	0.004	0.008	320	650	0.079	0.005	590
		200 HB		490									
		250 HB		420									
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.309	0.003	0.005	80	140	0.059	0.004	100
		250 HB		90									
		350 HB		90									
	Ti based	10	TiAl6V4, T40	-	0.020	0.309	0.003	0.006	130	210	0.059	0.005	180
-	130												
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.155	0.003	0.005	130	260	0.039	0.004	190
		50 HRC		180									
		55 HRC		160									
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.124	0.003	0.005	130	260	0.030	0.004	160
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.046	0.003	0.004	90	190	0.020	0.003	130
NF	Al (>8%Si)	12	AlSi12	130 HB	0.020	0.433	0.005	0.009	650	1310	0.079	0.006	910



A

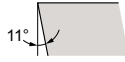
P

K

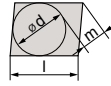
T



Shape

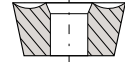


Clearance Angle



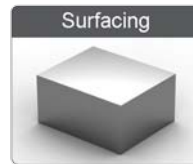
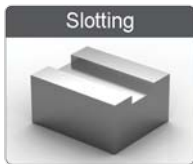
Tolerance

$d \pm 0.002$   
 $m \pm 0.005$   
 $s \pm 0.001$

Fixing  
Chip breaker

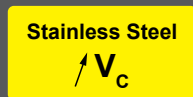
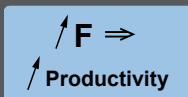
	Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
From Q1-2013	<b>APKT 100304 PDTR</b>	<b>LT 30</b>	0.409	0.138	0.016	Right	M0002920
	<b>APKT 1003 PDTR</b>	<b>LT 30</b>	0.409	0.138	0.032	Right	M0002918
From Q1-2013	<b>APKT 100312 PDTR</b>	<b>LT 30</b>	0.409	0.138	0.047	Right	M0002921
	<b>APKT 100332 PDTR<sup>1</sup></b>	<b>LT 30</b>	0.409	0.138	0.126	Right	M0002922
	<b>APKT 100340 PDTR<sup>1</sup></b>	<b>LT 30</b>	0.409	0.138	0.157	Right	M0002923
	<sup>1</sup> Replacing APLX 100332 and APLX 100340 respectively; no change in cutter bodies						
	<b>APLX 1003 PDTR*</b>	<b>LT 30</b>	0.409	0.138	0.022	Right	M0000454
	<b>APLX 100308 PDTR*</b>	<b>LT 30</b>	0.409	0.138	0.032	Right	M0001151
	* These two items are available until mid 2013 including their cutter bodies (LT 740 series) 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

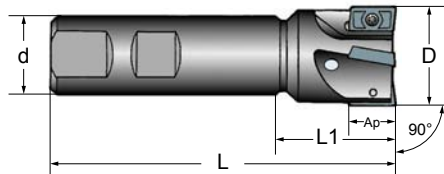
## End Mill for APKT 1003 PDTR

Cutter Designation	D	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 741 W-W-D0500/1*	0.500	0.500	1.000	3.250	0.354	1	5	M2002932
RILT 741 W-W-D0625/2*	0.625	0.625	1.000	3.250	0.354	2	10	M2002933
RILT 741 W-W-D0750/3*	0.750	0.750	1.250	3.500	0.354	3	7	M2002934
RILT 741 W-W-D1000/3*	1.000	1.000	1.250	3.500	0.354	3	5	M2002935
RILT 741 W-W-D1000/4*	1.000	1.000	1.250	3.500	0.354	4	5	M2002936
RILT 741 W-W-D1250/5*	1.250	1.250	1.250	3.750	0.354	5	3	M2002937
RILT 741 WL-W-D0625/2*	0.625	0.625	1.000	6.000	0.354	2	10	M2002938
RILT 741 WL-W-D0750/3*	0.750	0.750	1.250	8.000	0.354	3	7	M2002939
RILT 741 WL-W-D1000/4*	1.000	1.000	1.250	8.000	0.354	4	5	M2002940
RILT 741 WL-W-D1250/5*	1.250	1.250	1.250	10.00	0.354	5	3	M2002941
RILT 741 M-W-D2000/7*	2000	0.750	-	1.750	0.354	7	2.2	M2002942

\* On request

Screw: **M2002181**Key: **M2000601**

APKT



## APKT 1003 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.005	0.010	620	1080	0.079	0.007	820			
		2		190 HB		0.353		0.010		980			720			
		3		250 HB		0.353		0.010		820			650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.004	0.008	490	780	0.079	0.006	0.006	650		
				4,6		230 HB		0.353		0.008				490	680	590
				5,7		280 HB		0.353		0.007				420	620	490
				8		350 HB		0.353		0.007				420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.003	0.007	290	490	0.059	0.005	0.005	420		
				10		280 HB		0.252		0.007				290	420	390
				11		320 HB		0.252		0.006				190	360	320
11				350 HB		0.252		0.006		190				290	260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.004	0.008	620	820	0.079	0.006	720			
				14		240 HB		0.353		0.003			0.007	520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.003	0.006	220	420	0.059	0.005	320			
				14		310 HB		0.252		0.006			390	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.004	0.008	490	680	0.079	0.006	0.006	620		
				13		42 HRC		0.252		0.006				290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.005	0.010	490	780	0.079	0.007	650			
				15		200 HB		0.353		0.010			720	590		
				16		250 HB		0.353		0.010			620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.004	0.009	320	650	0.079	0.006	0.006	590		
				17,19		200 HB		0.353		0.009				590	490	
				18,20		250 HB		0.353		0.009				490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.252	0.003	0.006	80	140	0.059	0.005	100			
				33		250 HB		0.252		0.006			140	90		
				34		350 HB		0.252		0.006			140	90		
	Ti based	10	TiAl6V4	-	0.020	0.252	0.003	0.006	130	210	0.059	0.005	180			
				37		-		0.252		0.006			90	180	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.126	0.003	0.006	130	260	0.039	0.004	190			
				38		50 HRC		0.076		0.005			220	0.030	0.004	180
				38		55 HRC		0.038		0.005			190	0.020	0.003	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.101	0.003	0.006	130	260	0.030	0.004	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.038	0.003	0.005	90	190	0.020	0.003	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.005	0.010	650	1310	0.079	0.007	910		

# APKT 100304 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.004	0.008	620	1080	0.079	0.006	820			
		2		190 HB									0.008	980	720	
		3		250 HB									0.008	820	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.004	0.006	490	780	0.079	0.005	650			
		4,6		230 HB									0.006	490	680	590
		5,7		280 HB									0.005	420	620	490
		8		350 HB									0.005	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.003	0.005	290	490	0.059	0.004	420			
		10		280 HB									0.005	290	420	390
11		320 HB		0.004									190	360	320	
11		350 HB		0.004									190	290	260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.004	0.006	620	820	0.079	0.005	720			
		14		240 HB									0.003	0.005	520	680
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.003	0.004	220	420	0.059	0.004	320			
		14		310 HB									0.004	390	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.004	0.006	490	680	0.079	0.005	620			
		13		42 HRC									0.005	290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.004	0.008	490	780	0.079	0.006	650			
		15		200 HB									0.008	720	590	
		16		250 HB									0.008	620	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.004	0.007	320	650	0.079	0.005	590			
		17,19		200 HB									0.007	590	490	
		18,20		250 HB									0.007	490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.252	0.003	0.004	80	140	0.059	0.004	100			
		33		250 HB									0.004	140	90	
		34		350 HB									0.004	140	90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.252	0.003	0.005	130	210	0.059	0.004	180			
37		-		0.004									90	180	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.126	0.002	0.004	130	260	0.039	0.003	190			
		38		50 HRC									0.004	220	180	
		38		55 HRC									0.003	190	160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.101	0.002	0.004	130	260	0.030	0.003	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.038	0.002	0.003	90	190	0.020	0.003	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.004	0.008	650	1310	0.079	0.006	910		





## APKT 100312 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.005	0.011	620	1080	0.079	0.008	820			
		2		190 HB		0.353		0.011		980			720			
		3		250 HB		0.353		0.011		820			650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.004	0.009	490	780	0.079	0.007	0.007	650		
		4,6		230 HB		0.353		0.009		490				680	590	
		5,7		280 HB		0.353		0.008		420				620	490	
		8		350 HB		0.353		0.008		420				550	450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.003	0.008	290	490	0.059	0.006	0.006	420		
		10		280 HB		0.252		0.008		290				420	390	
		11		320 HB		0.252		0.006		190				360	320	
11		350 HB		0.252		0.006		190		290				260		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.004	0.009	620	820	0.079	0.007	720			
		14		240 HB		0.353		0.003		0.008			520	680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.003	0.006	220	420	0.059	0.006	320			
		14		310 HB		0.252		0.006		390			290			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.004	0.009	490	680	0.079	0.007	0.007	620		
		13		42 HRC		0.252		0.007		290				490	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.005	0.011	490	780	0.079	0.008	650			
		15		200 HB		0.353		0.011		720			590			
		16		250 HB		0.353		0.011		620			520			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.004	0.010	320	650	0.079	0.007	0.007	590		
		17,19		200 HB		0.353		0.010		590				490		
		18,20		250 HB		0.353		0.010		490				420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.252	0.003	0.006	80	140	0.059	0.006	100			
		33		250 HB		0.252		0.006		140			90			
		34		350 HB		0.252		0.006		140			90			
	Ti based	10	TiAl6V4, T40	-	0.020	0.252	0.003	0.007	130	210	0.059	0.006	180			
		37		-		0.252		0.006		90			180	130		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.126	0.003	0.006	130	260	0.039	0.005	0.005	190		
		38		50 HRC		0.076		0.006		220				0.030	0.005	180
		38		55 HRC		0.038		0.005		190				0.020	0.004	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.101	0.003	0.006	130	260	0.030	0.005	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.038	0.003	0.005	90	190	0.020	0.004	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.005	0.011	650	1310	0.079	0.009	910		

# APKT 100332 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.005	0.011	620	1080	0.039	0.011	820		
		2		190 HB				0.011					980	720	
		3		250 HB				0.011					820	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.004	0.009	490	780	0.039	0.010	650		
				230 HB				0.009					680	590	
				280 HB				0.008					420	620	490
				350 HB				0.008					420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.003	0.008	290	490	0.039	0.009	420		
				280 HB				0.008					420	390	
				320 HB				0.006					190	360	320
				350 HB				0.006					190	290	260
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.004	0.009	620	820	0.039	0.010	720		
				240 HB				0.008					520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.003	0.006	220	420	0.039	0.008	320		
				310 HB				0.006					390	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.004	0.009	490	680	0.039	0.010	620		
				42 HRC				0.007					290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.005	0.011	490	780	0.039	0.011	650		
				200 HB				0.011					720	590	
				250 HB				0.011					620	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.004	0.010	320	650	0.039	0.010	590		
				200 HB				0.010					590	490	
				250 HB				0.010					490	420	
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.020	0.252	0.003	0.006	80	140	0.039	0.008	100			
			33 Inconel 700				0.006					140	90		
			34 Stellite 21				0.006					140	90		
	Ti based	10	TiAl6V4	-	0.020	0.252	0.003	0.007	130	210	0.039	0.009	180		
T40	-	0.006	90	180				0.008					130		
Hardened Mat.	Steel	11	X100CrMo13, 440C,	45 HRC	0.016	0.076	0.003	0.006	130	260	0.028	0.006	190		
			G-X260NiCr42	50 HRC				0.006					220	180	
				55 HRC				0.005					190	160	
	Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.016	0.101	0.003	0.006	130	260	0.028	0.007	160		
	White Cast Iron		41 G-X300CrMo15	55 HRC	0.016	0.038	0.003	0.005	90	190	0.028	0.006	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.005	0.011	650	1310	0.039	0.012	910	



# APKT 100340 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.005	0.018	620	1080	0.039	0.014	820		
		2		190 HB		0.353		0.018		980			720		
		3		250 HB		0.353		0.018		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.004	0.014	490	780	0.039	0.012	0.011	650	
		4,6		230 HB		0.353		0.014		490				680	590
		5,7		280 HB		0.353		0.013		420				620	490
		8		350 HB		0.353		0.013		420				550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.003	0.013	290	490	0.039	0.011	0.009	420	
		10		280 HB		0.252		0.013		290				420	390
		11		320 HB		0.252		0.010		190				360	320
		11		350 HB		0.252		0.010		190				290	260
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.004	0.014	620	820	0.039	0.012	720		
		14		240 HB		0.353		0.003		0.013			520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.003	0.010	220	420	0.039	0.009	320		
		14		310 HB		0.252		0.010		390			290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.004	0.014	490	680	0.039	0.012	0.009	620	
		13		42 HRC		0.252		0.011		290				490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.005	0.018	490	780	0.039	0.014	650		
		15		200 HB		0.353		0.018		720			590		
		16		250 HB		0.353		0.018		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.004	0.016	320	650	0.039	0.012	0.009	590	
		17,19		200 HB		0.353		0.016		590				490	
		18,20		250 HB		0.353		0.016		490				420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.252	0.003	0.010	80	140	0.039	0.009	100		
		33		250 HB		0.252		0.010		140			90		
		34		350 HB		0.252		0.010		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.252	0.003	0.011	130	210	0.039	0.011	180		
		37		-		0.252		0.010		90			180	130	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.126	0.003	0.010	130	260	0.028	0.008	190	
38			50 HRC		0.076		0.009		220		180				
38			55 HRC		0.038		0.008		190		160				
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.016	0.101	0.003	0.010	130	260	0.028	0.008	160		
White Cast Iron		41	G-X300CrMo15	55 HRC	0.016	0.038	0.003	0.008	90	190	0.028	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.005	0.018	650	1310	0.039	0.015	910	



A

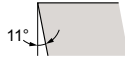
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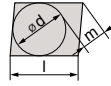
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Shape

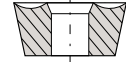



Clearance Angle



Tolerance

d ± 0.002  
m ± 0.005  
s ± 0.001

Fixing  
Chip breakerFrom Q1-2013 

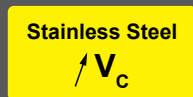
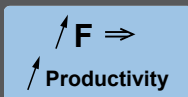
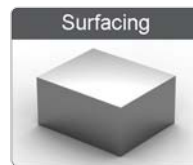
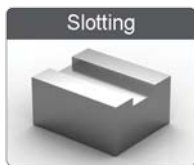
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>APKT 1604 PDTR</b>	<b>LT 30</b>	0.606	0.187	0.032	Right	M000022
<b>APKT 1604 PDTR*</b>	<b>LT 30</b>	0.606	0.187	0.037	Right	M000021
<b>APKT 160424 ER</b>	<b>LT 30</b>	0.606	0.187	0.094	Right	M0000300
<b>APKT 1705 PETR</b>	<b>LT 30</b>	0.646	0.205	0.032	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

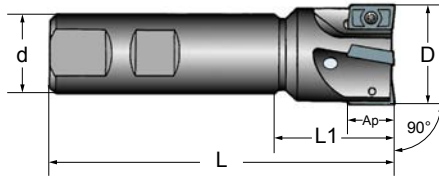
## End Mill for APKT 1604 PDTR

Cutter Designation	D	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 731 W-W-D1000/2*	1.000	1.000	1.250	3.500	0.590	2	5	M2002924
RILT 731 W-W-D1250/3*	1.250	1.250	1.250	3.750	0.590	3	3	M2002925
RILT 731 W-W-D1500/4*	1.500	1.500	1.250	4.000	0.590	4	2.5	M2002926

\* On request

Screw: **M2000597**

Key: **M2000602**



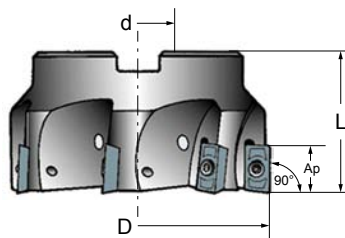
## Shell Mill for APKT 1604 PDTR

Cutter Designation	D	d	L	Ap	z	$\alpha$	Catalog Nr.																							
RILT 731 M-W-D2000/4*	2.000	0.750	1.750	0.590	4	2.2	M2002927																							
RILT 731 M-W-D2500/5*	2.500	1.000	2.000	0.590	5	M2002928	RILT 731 M-W-D3000/6*	3.000	1.000	2.000	0.590	6	1.4	M2002929	RILT 731 M-W-D4000/7*	4.000	1.250	2.000	0.590	7	1.1	M2002930	RILT 731 M-W-D5000/8*	5.000	1.500	2.000	0.590	8	0.8	M2002931
RILT 731 M-W-D3000/6*	3.000	1.000	2.000	0.590	6	1.4	M2002929																							
RILT 731 M-W-D4000/7*	4.000	1.250	2.000	0.590	7	1.1	M2002930																							
RILT 731 M-W-D5000/8*	5.000	1.500	2.000	0.590	8	0.8	M2002931																							

\* On request

Screw: **M2000597**

Key: **M2000602**



## APKT 1604 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.590	0.007	0.013	620	1080	0.157	0.009	820			
		190 HB		720												
		250 HB		650												
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.590	0.006	0.010	490	780	0.157	0.008	650			
				230 HB									590			
				280 HB									0.009	420	620	490
				350 HB									0.009	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.422	0.005	0.009	290	490	0.118	0.007	420			
				280 HB									0.009	290	420	390
				320 HB									0.007	190	360	320
				350 HB									0.007	190	290	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.590	0.006	0.010	620	820	0.157	0.008	720		
240 HB					0.009									520	680	620
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.422	0.005	0.007	220	420	0.118	0.006	320			
				310 HB									0.007	390	290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.590	0.006	0.010	490	680	0.157	0.008	620			
				42 HRC									0.008	290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.590	0.007	0.013	490	780	0.157	0.009	650			
				200 HB									0.013	720	590	
				250 HB									0.013	620	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.590	0.006	0.011	320	650	0.157	0.008	590			
				200 HB									0.011	590	490	
				250 HB									0.011	490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.422	0.005	0.007	80	140	0.118	0.006	100			
				250 HB									0.007	140	90	
				350 HB									0.007	140	90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.422	0.005	0.008	130	210	0.118	0.007	180			
-	0.007	90	180	130												
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.126	0.004	0.006	130	220	0.079	0.006	190			
				50 HRC									0.006	190	180	
				55 HRC									0.006	190	160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.169	0.004	0.007	130	260	0.059	0.006	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.063	0.004	0.006	90	190	0.039	0.005	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.590	0.007	0.013	650	1310	0.157	0.010	910		



## APKT 160424 ER LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions								
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>						
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.590	0.007	0.013	620	1080	0.197	0.009	820						
		2		190 HB									0.590	0.013	980	720			
		3		250 HB									0.590	0.013	820	650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.590	0.006	0.010	490	780	0.197	0.008	0.007	650					
				4,6										230 HB	0.590	0.010	490	680	590
				5,7										280 HB	0.590	0.009	420	620	490
				8										350 HB	0.590	0.009	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.422	0.005	0.009	290	490	0.148	0.007	0.006	420					
				10										280 HB	0.422	0.009	290	420	390
				11										320 HB	0.422	0.007	190	360	320
11				350 HB										0.422	0.007	190	290	260	
Stainless Steel	Austenitic	4	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	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	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.590	0.006	0.010	490	680	0.197	0.008	0.006	620					
				13										42 HRC	0.422	0.008	290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.590	0.007	0.013	490	780	0.197	0.009	650						
				15									200 HB	0.590	0.013	720	590		
				16									250 HB	0.590	0.013	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.590	0.006	0.011	320	650	0.197	0.008	0.006	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	0.020	0.422	0.005	0.007	140	140	0.148	0.006	100						
			33										250 HB	0.422	0.007	80	140	90	
			34										350 HB	0.422	0.007	140	90		
	Ti based	10	TiAl6V4	-	0.020	0.422	0.005	0.008	130	210	0.148	0.007	180						
				37									T40	0.422	0.007	90	180	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.211	0.004	0.007	130	260	0.098	0.006	190						
				38									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	Al (>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. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.590	0.007	0.016	620	1080	0.157	0.011	820		
		2		190 HB									0.016	980	720
		3		250 HB									0.016	820	650
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.590	0.006	0.012	490	780	0.157	0.009	650		
				230 HB									0.012	490	680
				280 HB									0.011	420	620
				350 HB									0.011	420	550
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.422	0.005	0.011	290	490	0.118	0.009	420		
				280 HB									0.011	290	420
				320 HB									0.009	190	360
				350 HB									0.009	190	290
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.590	0.006	0.012	620	820	0.157	0.009	720		
				240 HB									0.011	520	680
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.422	0.005	0.009	220	420	0.118	0.008	320		
				310 HB									0.009	390	290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.590	0.006	0.012	490	680	0.157	0.009	620		
				42 HRC									0.010	290	490
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.590	0.007	0.016	490	780	0.157	0.011	650		
				200 HB									0.016	720	590
				250 HB									0.016	620	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.590	0.006	0.014	320	650	0.157	0.009	590		
				200 HB									0.014	590	490
				250 HB									0.014	490	420
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.422	0.005	0.009	80	140	0.118	0.008	100		
				250 HB									0.009	140	90
				350 HB									0.009	140	90
	Ti based	10	TiAl6V4, T40	-	0.020	0.422	0.005	0.010	130	210	0.118	0.009	180		
-				0.009									90	180	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.211	0.004	0.009	130	260	0.079	0.007	190		
				50 HRC									0.008	220	180
				55 HRC									0.007	190	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.169	0.004	0.009	130	260	0.059	0.007	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.063	0.004	0.007	90	190	0.039	0.006	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.590	0.007	0.016	650	1310	0.157	0.012	910	







**A**

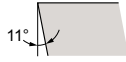
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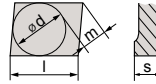
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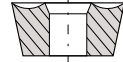
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



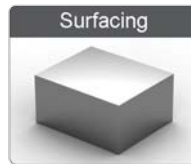
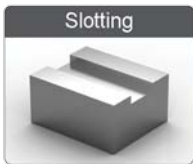
Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
APMT 0903 PDTR	LT 30	0.375	0.125	0.016	Right	M0000663
APMT 1135 PDTR	LT 30	0.374	0.139	0.028	Right	M0001133
APMT 1604 PDTR	LT 30	0.625	0.187	0.026	Right	M0001134
APMT 160408 PDTR	LT 30	0.625	0.187	0.031	Right	M0001733

**Surfacing Insert Lead angle 90°**

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

**Application Guide**



**F** ⇒  
Productivity

**Coolant**

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

**Stainless Steel**

**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## APMT 0903 PDTR LT 30

APMT

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.314	0.004	0.008	620	1080	0.079	0.006	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.314	0.004	0.006	490	780	0.079	0.005	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.224	0.003	0.005	290	490	0.059	0.004	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.314	0.004	0.006	620	820	0.079	0.005	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.224	0.003	0.004	220	420	0.059	0.004	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.314	0.004	0.006	490	680	0.079	0.005	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.314	0.004	0.008	490	780	0.079	0.006	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.314	0.004	0.007	320	650	0.079	0.005	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.224	0.003	0.004	80	140	0.059	0.004	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.224	0.003	0.005	130	210	0.059	0.004	180	
				-									130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.112	0.002	0.004	130	260	0.039	0.003	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.090	0.002	0.004	130	260	0.030	0.003	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.047	0.002	0.003	90	190	0.020	0.003	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.314	0.004	0.008	650	1310	0.079	0.006	910

# APMT 1135 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.394	0.005	0.009	620	1080	0.079	0.006	820		
		2		190 HB		0.394		0.009		980			720		
		3		250 HB		0.394		0.009		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.394	0.004	0.007	490	780	0.079	0.005	650		
		4,6		230 HB		0.394		0.007		490			680	590	
		5,7		280 HB		0.394		0.006		420			620	490	
		8		350 HB		0.394		0.006		420			550	450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.281	0.003	0.006	290	490	0.059	0.005	420		
		10		280 HB		0.281		0.006		290			420	390	
		11		320 HB		0.281		0.005		190			360	320	
11		350 HB		0.281		0.005		190		290			260		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.394	0.004	0.007	620	820	0.079	0.005	720		
		14		240 HB		0.394		0.003		0.006			520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.281	0.003	0.005	220	420	0.059	0.004	320		
		14		310 HB		0.281		0.005		390			290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.394	0.004	0.007	490	680	0.079	0.005	620		
		13		42 HRC		0.281		0.006		290			490	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.394	0.005	0.009	490	780	0.079	0.006	650		
		15		200 HB		0.394		0.009		720			590		
		16		250 HB		0.394		0.009		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.394	0.004	0.008	320	650	0.079	0.005	590		
		17,19		200 HB		0.394		0.008		590			490		
		18,20		250 HB		0.394		0.008		490			420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.281	0.003	0.005	80	140	0.059	0.004	100		
		33		250 HB		0.281		0.005		140			90		
		34		350 HB		0.281		0.005		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.281	0.003	0.006	130	210	0.059	0.005	180		
		37		-		0.281		0.005		90			180	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.141	0.003	0.005	130	260	0.039	0.004	190		
		38		50 HRC		0.084		0.004		220			0.030	0.003	180
		38		55 HRC		0.042		0.004		190			0.020	0.003	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.113	0.003	0.005	130	260	0.030	0.004	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.042	0.003	0.004	90	190	0.020	0.003	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.394	0.005	0.009	650	1310	0.079	0.006	910	

# APMT 1604 PDTR & APMT 160408 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions							
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>					
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.590	0.006	0.012	620	1080	0.157	0.008	820					
		2		190 HB									720					
		3		250 HB									650					
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.590	0.005	0.009	490	780	0.157	0.007	0.007	650				
				230 HB										590				
				280 HB										0.590	0.008	420	620	490
				350 HB										0.590	0.008	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.422	0.004	0.008	290	490	0.118	0.006	0.006	420				
				280 HB										0.422	0.007	190	360	390
320 HB				0.422										0.007	190	290	320	
350 HB				0.422										0.007	190	290	260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.590	0.005	0.009	620	820	0.157	0.007	720					
				240 HB									0.590	0.008	520	680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.422	0.004	0.007	220	420	0.118	0.006	320					
				310 HB									0.422	0.007	390	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.590	0.005	0.009	490	680	0.157	0.007	0.007	620				
				42 HRC										0.422	0.007	290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.590	0.006	0.012	490	780	0.157	0.008	650					
				200 HB									0.590	0.012	720	590		
				250 HB									0.590	0.012	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.590	0.005	0.010	320	650	0.157	0.007	0.007	590				
				200 HB										0.590	0.010	590	490	
				250 HB										0.590	0.010	490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.422	0.004	0.007	80	140	0.118	0.006	100					
				250 HB									0.422	0.007	140	90		
				350 HB									0.422	0.007	140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.422	0.004	0.007	130	210	0.118	0.006	180					
-				0.422									0.007	90	180	130		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.211	0.004	0.007	130	260	0.079	0.005	190					
				50 HRC									0.126	0.006	220	180		
				55 HRC									0.063	0.005	190	160		
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.169	0.004	0.007	130	260	0.059	0.005	160					
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.063	0.004	0.005	90	190	0.039	0.004	130					
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.590	0.006	0.012	650	1310	0.157	0.009	910				





**L**

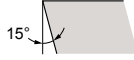
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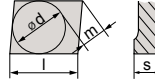
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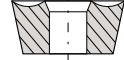
Shape



Clearance Angle



Tolerance  
 d ± 0.002  
 m ± 0.003  
 s ± 0.005



Fixing  
 Chip breaker

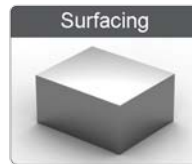
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LDMT 1504 PDTR	LT 30	0.575	0.187	0.029	Right	M0001772

\* Availability is subjected 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**



**F** ⇒  
 ↑  
**Productivity**

**Coolant**

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

**Stainless Steel**

↑  
**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## LDMT 1504 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.551	0.007	0.013	620	1080	0.157	0.009	820	
		190 HB		720										
		250 HB		650										
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.551	0.006	0.010	490	780	0.157	0.008	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.394	0.005	0.009	290	490	0.118	0.007	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.551	0.006	0.010	620	820	0.157	0.008	720
240 HB					620									
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.394	0.005	0.007	220	420	0.118	0.006	320	
				310 HB									290	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.551	0.006	0.010	490	680	0.157	0.008	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.551	0.007	0.013	490	780	0.157	0.009	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.551	0.006	0.011	320	650	0.157	0.008	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.394	0.005	0.007	80	140	0.118	0.006	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.394	0.005	0.008	130	210	0.118	0.007	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.197	0.004	0.007	130	260	0.079	0.006	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.157	0.004	0.007	130	260	0.059	0.006	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.006	90	190	0.039	0.005	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.551	0.007	0.013	650	1310	0.157	0.010	910

LDMT





O

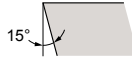
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M

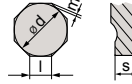
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Shape

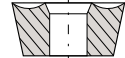


Clearance Angle



Tolerance

s ± 0.005  
For l = 05, d ± 0.003 m ± 0.005  
For l = 06, d ± 0.004 m ± 0.006



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ODMT 0504 ZZTR	LT 30	0.207	0.187	0.032	Right	M0000664
ODMT 060508 TN	LT 30	0.259	0.219	0.032	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**



**F** ⇒  
↑  
Productivity

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

**Stainless Steel**  
↑  
V<sub>C</sub>

Machine Recommendations  
Guide. Details on page 10

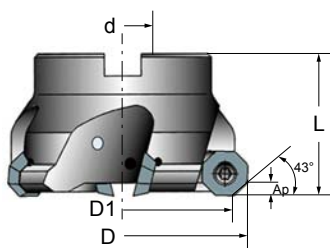
## Shell Mill for ODMT 060508 TN\*

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 820 M-D3000/5*	3.394	3.000	1.000	2.000	0.157	5	M2001247
RILT 820 M-D4000/6*	4.394	4.000	1.250	2.000	0.157	6	M2001248
RILT 820 M-D5000/8*	5.394	5.000	1.500	2.000	0.157	8	M2001249

\* On request

Screw: **M2002733** Key: **M2000603**

ODMT





## ODMT 0504 ZZTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.009	0.020	620	1080	0.099	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.007	0.016	490	780	0.099	0.013	650	
				4,6									230 HB	590
				5,7									280 HB	490
				8									350 HB	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.098	0.006	0.014	290	490	0.074	0.011	420	
				10									280 HB	390
				11									320 HB	360
11				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.007	0.014	620	820	0.099	0.011	720	
				14									240 HB	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.000	0.098	0.006	0.011	220	420	0.074	0.010	320	
				14									310 HB	290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.007	0.014	490	680	0.099	0.011	620	
				13									42 HRC	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.009	0.020	490	780	0.099	0.014	650	
				15									200 HB	590
				16									250 HB	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.007	0.018	320	650	0.099	0.013	590	
				17,19									200 HB	490
				18,20									250 HB	420
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.098	0.006	0.011	80	140	0.074	0.010	100	
				33									250 HB	90
				34									350 HB	90
	Ti based	10	TiAl6V4, T40	-	0.020	0.098	0.006	0.013	130	210	0.074	0.011	180	
				37									-	180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.030	0.005	0.010	130	220	0.037	0.008	190	
				38									50 HRC	180
				38									55 HRC	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.039	0.005	0.011	130	260	0.037	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.015	0.005	0.009	90	190	0.025	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.138	0.009	0.020	650	1310	0.099	0.016	910

## ODMT 060508 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.020	0.157	0.009	0.021	620	1080	0.099	0.015	820
		2	2	1045, 1060,	190 HB									720
		3	3	28Mn6	250 HB									650
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.007	0.017	490	780	0.099	0.013	650
			4,6		230 HB					490	680			590
			5,7		280 HB					420	620			490
			8		350 HB					420	550			450
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.112	0.006	0.015	290	490	0.074	0.012	420
			10		280 HB					290	420			390
			11		320 HB					190	360			320
			11		350 HB					190	290			260
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.157	0.007	0.015	620	820	0.099	0.012	720	
				240 HB					520	680			620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.112	0.006	0.012	220	420	0.074	0.011	320	
				310 HB					390	290				
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.007	0.015	490	680	0.099	0.012	620	
				42 HRC					290	490			420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.009	0.021	490	780	0.099	0.015	650	
				200 HB					720	590				
				250 HB					620	520				
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.007	0.019	320	650	0.099	0.013	590	
				200 HB					590	490				
				250 HB					490	420				
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	0.020	0.112	0.006	0.012	80	140	0.074	0.011	100	
				250 HB					140	90				
				350 HB					140	90				
	Ti based	10	TiAl6V4	-	0.020	0.112	0.006	0.013	130	210	0.074	0.012	180	
-				90					180	130				
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.056	0.005	0.011	130	260	0.050	0.009	190	
				50 HRC					220	0.037			0.009	180
				55 HRC					190	0.025			0.008	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.045	0.005	0.012	130	260	0.037	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.017	0.005	0.009	90	190	0.025	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.157	0.009	0.021	650	1310	0.099	0.017	910



O

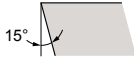
D

M

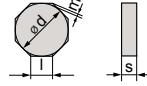
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Shape

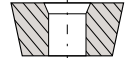


Clearance Angle



Tolerance

d ± 0.004  
m ± 0.006  
s ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
ODMW 060508 TN	LT 30	0.259	0.219	0.032	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



**F** ⇒  
**Productivity**

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

**Stainless Steel**  
**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

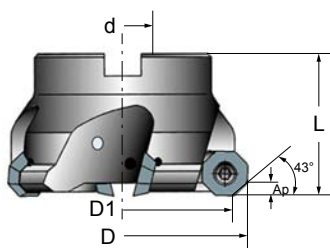
## Shell Mill for ODMW 060508 TN

Cutter Designation	D	D1	d	L	Ap	z	
RILT 820 M-D3000/5*	3.394	3.000	1.000	2.000	0.157	5	M2001247
RILT 820 M-D4000/6*	4.394	4.000	1.250	2.000	0.157	6	M2001248
RILT 820 M-D5000/8*	5.394	5.000	1.500	2.000	0.157	8	M2001249

\* On request

**Screw: M2002733    Key: M2000603**

ODMW



## ODMW 060508 TN LT 30

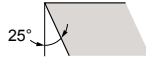
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.157	0.009	0.023	620	1080	0.118	0.016	820		
		2		0.157				0.023		980			720		
		3		0.157				0.023		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.007	0.018	490	780	0.118	0.014	0.013	650	
				230 HB				0.018	490	680				590	
				280 HB				0.016	420	620				490	
				350 HB				0.016	420	550				450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.112	0.006	0.016	290	490	0.089	0.013	0.011	420	
				280 HB				0.016	290	420				390	
				320 HB				0.013	190	360				320	
				350 HB				0.013	190	290				260	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.009	0.023	490	780	0.118	0.016	650		
				200 HB				0.023		720			590		
				250 HB				0.023		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.007	0.020	320	650	0.118	0.014	0.010	590	
				200 HB				0.020		590				490	
				250 HB				0.020		490				420	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.016	0.034	0.005	0.013	130	260	0.059	0.010	190		
				50 HRc				0.011		220			0.044	0.009	180
				55 HRc				0.010		190			0.030	0.009	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.045	0.005	0.013	130	260	0.044	0.010	160		
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.016	0.017	0.005	0.010	90	190	0.030	0.009	130		



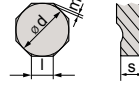
# O F E R



Shape

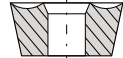


Clearance Angle



Tolerance

d  $\pm$  0.001  
m  $\pm$  0.001  
s  $\pm$  0.001

Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>OFER 070405 TN</b>	<b>LT 30</b>	0.268	0.187	0.032	Right	M0000033

OFER

**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



**F**  $\Rightarrow$   
Productivity

**Coolant**

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

**Stainless Steel**

**V<sub>C</sub>**

Machine Recommendations  
Guide. Details on page 10

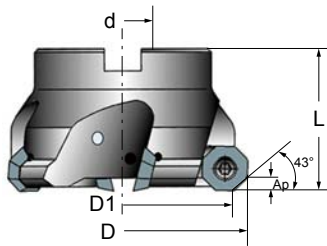
## Shell Mill for OFER 070405 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 880 M-W-D3000/5*	3.394	3.000	1.000	2.000	0.196	5	M2001250
RILT 880 M-W-D4000/6*	4.394	4.000	1.250	2.000	0.196	6	M2001251
RILT 880 M-W-D5000/8*	5.394	5.000	1.500	2.000	0.196	8	M2001252

W= With coolant

Screw: **M2000606** Key: **M2000609**

\* On request



## OFER 070405 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.176	0.009	0.020	620	1080	0.117	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.176	0.007	0.016	490	780	0.117	0.013	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.006	0.014	290	490	0.087	0.011	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.176	0.007	0.014	620	820	0.117	0.011	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.006	0.011	220	420	0.087	0.010	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.176	0.007	0.014	490	680	0.117	0.011	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.176	0.009	0.020	490	780	0.117	0.014	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.176	0.007	0.018	320	650	0.117	0.013	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.126	0.006	0.011	80	140	0.087	0.010	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.126	0.006	0.013	130	210	0.087	0.011	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.038	0.005	0.010	130	220	0.058	0.008	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.050	0.005	0.011	130	260	0.044	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.019	0.005	0.009	90	190	0.029	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.176	0.009	0.020	650	1310	0.117	0.016	910







O

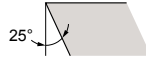
F

M

T



Shape

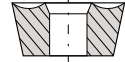


Clearance Angle



Tolerance

s ± 0.005  
For l = 05, d ± 0.003 m ± 0.005  
For l = 07, d ± 0.004 m ± 0.006



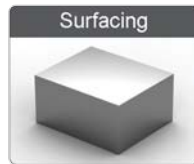
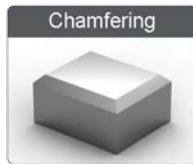
Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
OFMT 05T305 TN	LT 30	0.207	0.156	0.032	Right	M0000591
OFMT 050405 TR	LT 30	0.217	0.187	0.021	Right	M0000034
OFMT 070405 TN	LT 30	0.268	0.187	0.020	Right	M0000592

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



**F** ⇒  
Productivity

**Coolant**

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

**Stainless Steel**

**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## Shell Mill for OFMT 05T305 TN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 800 M-W-D2000/4*	2.276	2.000	0.750	1.750	0.137	4	M2001253
RILT 800 M-W-D3000/6*	3.276	3.000	1.000	2.000	0.137	6	M2001254
RILT 800 M-W-D4000/7*	4.276	4.000	1.250	2.000	0.137	7	M2001255
RILT 800 M-W-D5000/8*	5.276	5.000	1.500	2.000	0.137	8	M2001256

W= With coolant

Screw: **M2000597**

Key: **M2000602**

\* On request

OFMT

## Shell Mill for OFMT 070405 TN

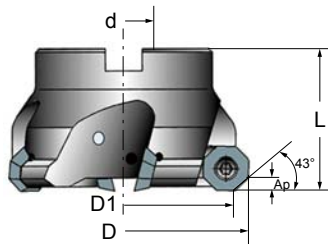
Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 810 M-D3000/6*	3.473	3.000	1.000	2.000	0.196	6	M2001257
RILT 810 M-D4000/7*	4.473	4.000	1.250	2.000	0.196	7	M2001258
RILT 810 M-D5000/8*	5.473	5.000	1.500	2.000	0.196	8	M2001259

W= With coolant

Screw: **M2002733**

Key: **M2000603**

\* On request



## OFMT 05T305 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.009	0.020	620	1080	0.099	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.007	0.016	490	780	0.099	0.013	650	
		4,6		230 HB									590	
		5,7		280 HB									490	
		8		350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.098	0.006	0.014	290	490	0.074	0.011	420	
		10		280 HB									390	
		11		320 HB									320	
11		350 HB		260										
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.007	0.014	620	820	0.099	0.011	720	
		14		240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.098	0.006	0.011	220	420	0.074	0.010	320	
		14		310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.007	0.014	490	680	0.099	0.011	620	
		13		42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.009	0.020	490	780	0.099	0.014	650	
		15		200 HB									590	
		16		250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.007	0.018	320	650	0.099	0.013	590	
		17,19		200 HB									490	
		18,20		250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.098	0.006	0.011	80	140	0.074	0.010	100	
		33		250 HB									90	
		34		350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.098	0.006	0.013	130	210	0.074	0.011	180	
		37		-									180	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.030	0.005	0.010	130	220	0.037	0.008	190	
		38		50 HRC									180	
		38		55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.039	0.005	0.011	130	260	0.037	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.015	0.005	0.009	90	190	0.025	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.138	0.009	0.020	650	1310	0.099	0.016	910

## OFMT 050405 TR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.138	0.009	0.020	620	1080	0.099	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.138	0.007	0.016	490	780	0.099	0.013	650	
				4,6									230 HB	590
				5,7									280 HB	490
				8									350 HB	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.098	0.006	0.014	290	490	0.074	0.011	420	
				10									280 HB	390
				11									320 HB	320
11				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.138	0.007	0.014	620	820	0.099	0.011	720	
				14									240 HB	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.098	0.006	0.011	220	420	0.074	0.010	320	
				14									310 HB	290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.138	0.007	0.014	490	680	0.099	0.011	620	
				13									42 HRC	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.138	0.009	0.020	490	780	0.099	0.014	650	
				15									200 HB	590
				16									250 HB	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.138	0.007	0.018	320	650	0.099	0.013	590	
				17,19									200 HB	490
				18,20									250 HB	420
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.098	0.006	0.011	80	140	0.074	0.010	100	
				33									250 HB	90
				34									350 HB	90
	Ti based	10	TiAl6V4, T40	-	0.020	0.098	0.006	0.013	130	210	0.074	0.011	180	
				37									-	180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.030	0.005	0.010	130	220	0.037	0.008	190	
				38									50 HRC	180
				38									55 HRC	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.039	0.005	0.011	130	260	0.037	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.015	0.005	0.009	90	190	0.025	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.138	0.009	0.020	650	1310	0.099	0.016	910



## OFMT 070405 TN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.176	0.009	0.020	620	1080	0.117	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.176	0.007	0.016	490	780	0.117	0.013	650	
		4,6		230 HB									590	
		5,7		280 HB									490	
		8		350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.126	0.006	0.014	290	490	0.087	0.011	420	
		10		280 HB									390	
		11		320 HB									320	
11		350 HB		260										
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.176	0.007	0.014	620	820	0.117	0.011	720	
		14		240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.126	0.006	0.011	220	420	0.087	0.010	320	
		14		310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.176	0.007	0.014	490	680	0.117	0.011	620	
		13		42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.176	0.009	0.020	490	780	0.117	0.014	650	
		15		200 HB									590	
		16		250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.176	0.007	0.018	320	650	0.117	0.013	590	
		17,19		200 HB									490	
		18,20		250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.126	0.006	0.011	80	140	0.087	0.010	100	
		33		250 HB									90	
		34		350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.126	0.006	0.013	130	210	0.087	0.011	180	
		37		-									130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.063	0.005	0.011	130	260	0.058	0.009	190	
		38		50 HRC									180	
		38		55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.050	0.005	0.011	130	260	0.044	0.009	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.019	0.005	0.009	90	190	0.029	0.008	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.176	0.009	0.020	650	1310	0.117	0.016	910



R

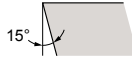
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M

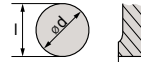
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Shape

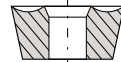


Clearance Angle



Tolerance

s ± 0.005  
For l = 06/08/10, d ± 0.002  
For l = 12, d ± 0.003

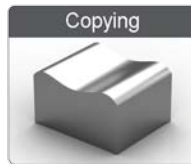
Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>RDMT 0602 M0</b>	<b>LT 30</b>	0.236	0.094	-	Neutral	M0000035
<b>RDMT 0702 M0</b>	<b>LT 30</b>	0.276	0.094	-	Neutral	M0001882
<b>RDMT 0803 M0</b>	<b>LT 30</b>	0.315	0.125	-	Neutral	M0000037
<b>RDMT 1003 M0</b>	<b>LT 30</b>	0.394	0.125	-	Neutral	M0001875
<b>RDMT 10T3 M0</b>	<b>LT 30</b>	0.394	0.156	-	Neutral	M0000038
<b>RDMT 12T3 M0</b>	<b>LT 30</b>	0.472	0.156	-	Neutral	M0001876
<b>RDMT 1204 M0</b>	<b>LT 30</b>	0.472	0.187	-	Neutral	M0000039
<b>RDMT 1604 M0</b>	<b>LT 30</b>	0.630	0.187	-	Neutral	M0001881

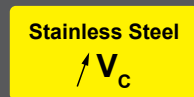
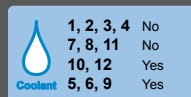
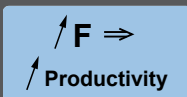
RDMT

## 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	$\alpha$	Catalog Nr.
<b>RILT 060 W-D-D0750/3*</b>	0.750	0.514	0.750	1.250	3.500	0.118	3	4.5	M2001260
<b>RILT 060 W-D-D1000/3*</b>	1.000	0.764	1.000	1.250	3.500	0.118	3	4	M2001261

**Screw: M2001416    Key: M2002912**

\* On request

## End Mill for RDMT 0803 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
<b>RILT 080 W-D-D1000/3*</b>	1.000	0.685	1.000	1.250	3.500	0.157	3	8	M2001262
<b>RILT 080 W-D-D1250/3*</b>	1.250	0.935	1.250	1.250	3.750	0.157	3	5	M2001263

**Screw: M2002181    Key: M2000601**

\* On request

## End Mill for RDMT 10T3 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
<b>RILT 100 W-D-D1000/3*</b>	1.000	0.606	1.000	1.250	3.500	0.196	3	8	M2001264
<b>RILT 100 W-D-D1250/3*</b>	1.250	0.856	1.250	1.250	3.750	0.196	3	5	M2001265

**Screw: M2000597    Key: M2000602**

\* On request



## Shell Mill for RDMT 1204 MO

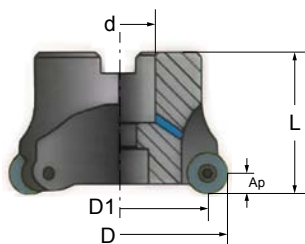
Cutter Designation	D	D1	d	L	Ap	z	$\alpha$	Catalog Nr.																										
RILT 120 M-W-D1500/3*	1.500	1.028	0.500	1.750	0.236	3	7	M2001266																										
RILT 120 M-W-D2000/4*	2.000	1.528	0.750	1.750	0.236	4	M2001267	RILT 120 M-W-D2500/5*	2.500	2.028	1.000	2.000	0.236	5	3.5	M2001268	RILT 120 M-W-D3000/6*	3.000	2.528	1.000	2.000	0.236	6	2.5	M2001269	RILT 120 M-W-D4000/7*	4.000	3.528	1.250	2.000	0.236	7	2	M2001270
RILT 120 M-W-D2500/5*	2.500	2.028	1.000	2.000	0.236	5	3.5	M2001268																										
RILT 120 M-W-D3000/6*	3.000	2.528	1.000	2.000	0.236	6	2.5	M2001269																										
RILT 120 M-W-D4000/7*	4.000	3.528	1.250	2.000	0.236	7	2	M2001270																										

W= With coolant

Screw: M2000597

Key: M2000602

\* On request





## RDMT 0602 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.061	0.007	0.019	620	1080	0.031	0.011	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.061	0.006	0.015	490	780	0.031	0.010	650	
		4,6		230 HB									590	
		5,7		280 HB									490	
		8		350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.043	0.005	0.013	290	490	0.024	0.009	420	
		10		280 HB									390	
		11		320 HB									320	
11		350 HB		260										
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.061	0.006	0.015	620	820	0.031	0.010	720	
		14		240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.048	0.005	0.011	220	420	0.024	0.008	320	
		14		310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.061	0.006	0.015	490	680	0.031	0.010	620	
		13		42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.061	0.007	0.019	490	780	0.031	0.011	650	
		15		200 HB									590	
		16		250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.061	0.006	0.017	320	650	0.031	0.010	590	
		17,19		200 HB									490	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.048	0.005	0.011	80	140	0.024	0.008	100	
		33		250 HB									90	
		34		350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.048	0.005	0.012	130	210	0.024	0.009	180	
		37		-									130	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.022	0.004	0.011	130	260	0.016	0.007	190
38			50 HRC		180									
38			55 HRC		160									
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.012	0.017	0.004	0.011	130	260	0.012	0.007	160	
White Cast Iron		41	G-X300CrMo15	55 HRC	0.012	0.015	0.004	0.008	90	190	0.010	0.006	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.061	0.007	0.019	650	1310	0.031	0.012	910

## RDMT 0702 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.072	0.007	0.021	620	1080	0.031	0.013	820	
		190 HB		720										
		250 HB		650										
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.072	0.006	0.017	490	780	0.031	0.011	650	
		230 HB		590										
		280 HB		490										
		350 HB		450										
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.051	0.005	0.015	290	490	0.024	0.010	420	
		280 HB		390										
		320 HB		320										
		350 HB		260										
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.072	0.006	0.017	620	820	0.031	0.011	720
240 HB			620											
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.056	0.005	0.012	220	420	0.024	0.009	320	
		310 HB		290										
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.072	0.006	0.017	490	680	0.031	0.011	620	
		42 HRC		420										
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.072	0.007	0.021	490	780	0.031	0.013	650	
		200 HB		590										
		250 HB		520										
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.072	0.006	0.019	320	650	0.031	0.011	590	
		200 HB		490										
		250 HB		420										
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.056	0.005	0.012	80	140	0.024	0.009	100	
		250 HB		90										
		350 HB		90										
	Ti based	10	TiAl6V4, T40	-	0.020	0.056	0.005	0.013	130	210	0.024	0.010	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.020	0.004	0.011	130	260	0.016	0.008	190	
		50 HRC		180										
		55 HRC		160										
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.020	0.004	0.012	130	260	0.012	0.008	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.018	0.004	0.009	90	190	0.010	0.007	130	
NF	AI (>8%Si)	12	25	AlSi12	130 HB	0.020	0.072	0.007	0.021	650	1310	0.031	0.014	910



## RDMT 0803 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.077	0.007	0.023	620	1080	0.031	0.014	820		
		2		190 HB				0.023					980	720	
		3		250 HB				0.023					820	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.077	0.006	0.018	490	780	0.031	0.012	0.011	650	
		4,6		230 HB				0.018	490	680				590	
		5,7		280 HB				0.016	420	620				490	
		8		350 HB				0.016	420	550				450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.055	0.005	0.016	290	490	0.024	0.011	0.009	420	
		10		280 HB				0.016	290	420				390	
		11		320 HB				0.013	190	360				320	
11		350 HB		0.013				190	290	260					
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.077	0.006	0.018	620	820	0.031	0.012	720		
		14		240 HB				0.005	0.016	520			680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.061	0.005	0.013	220	420	0.024	0.009	320		
		14		310 HB				0.013		390			290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.077	0.006	0.018	490	680	0.031	0.012	0.009	620	
		13		42 HRC				0.014	290	490				420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.077	0.007	0.023	490	780	0.031	0.014	650		
		15		200 HB				0.023		720			590		
		16		250 HB				0.023		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.077	0.006	0.020	320	650	0.031	0.012	0.009	590	
		17,19		200 HB				0.020		590				490	
		18,20		250 HB				0.020		490				420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.061	0.005	0.013	80	140	0.024	0.009	100		
		33		250 HB				0.013		140			90		
		34		350 HB				0.013		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.061	0.005	0.014	130	210	0.024	0.011	180		
		37		-				0.013	90	180			0.009	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.028	0.004	0.013	130	260	0.016	0.008	190		
		38		50 HRC				0.011		220			0.012	0.008	180
		38		55 HRC				0.010		190			0.010	0.007	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.022	0.004	0.013	130	260	0.012	0.008	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.019	0.004	0.010	90	190	0.010	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.077	0.007	0.023	650	1310	0.031	0.015	910	

## RDMT 1003 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.099	0.007	0.025	620	1080	0.039	0.014	820	
		190 HB		0.025				720						
		250 HB		0.025				650						
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.099	0.006	0.020	490	780	0.039	0.012	650	
				230 HB				0.020	490	680				
				280 HB				0.017	420	620				
				350 HB				0.017	420	550				
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.071	0.005	0.017	290	490	0.030	0.011	420	
				280 HB				0.017	290	420				
				320 HB				0.014	190	360				
				350 HB				0.014	190	290				
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.099	0.006	0.020	620	820	0.039	0.012	720
240 HB					0.017				520	680				
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.078	0.005	0.014	220	420	0.030	0.009	320	
				310 HB				0.014	390	290				
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.099	0.006	0.020	490	680	0.039	0.012	620	
				42 HRC				0.016	290	490				
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.099	0.007	0.025	490	780	0.039	0.014	650	
				200 HB				0.025	720	590				
				250 HB				0.025	620	520				
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.099	0.006	0.022	320	650	0.039	0.012	590	
				200 HB				0.022	590	490				
				250 HB				0.022	490	420				
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.020	0.078	0.005	0.014	80	140	0.030	0.009	100		
			33 Inconel 700				0.014	140	90					
			34 Stellite 21				0.014	140	90					
	Ti based	10	TiAl6V4	-	0.020	0.078	0.005	0.016	130	210	0.030	0.011	180	
Hardened Mat.	Steel	11	X100CrMo13, 440C,	45 HRC	0.012	0.028	0.004	0.013	130	260	0.020	0.008	190	
			G-X260NiCr42	50 HRC				0.011	190	0.010	0.007	160		
				55 HRC										
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.028	0.004	0.014	130	260	0.015	0.008	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.025	0.004	0.011	90	190	0.010	0.007	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.099	0.007	0.025	650	1310	0.039	0.015	910



## RDMT 1204 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.119	0.010	0.029	620	1080	0.052	0.014	820		
		2		190 HB				0.029		980			720		
		3		250 HB				0.029		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.119	0.008	0.023	490	780	0.052	0.012	0.011	650	
		4,6		230 HB				0.023	490	680				590	
		5,7		280 HB				0.020	420	620				490	
		8		350 HB				0.020	420	550				450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.085	0.007	0.020	290	490	0.039	0.011	0.009	420	
		10		280 HB				0.020	290	420				390	
		11		320 HB				0.016	190	360				320	
11		350 HB		0.016				190	290	260					
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.119	0.008	0.023	620	820	0.052	0.012	720		
		14		240 HB				0.007	0.020	520			680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.093	0.007	0.016	220	420	0.039	0.009	320		
		14		310 HB				0.016	390	290					
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.119	0.008	0.023	490	680	0.052	0.012	0.009	620	
		13		42 HRC				0.093	0.018	290				490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.119	0.010	0.029	490	780	0.052	0.014	650		
		15		200 HB				0.029		720			590		
		16		250 HB				0.029		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.119	0.008	0.025	320	650	0.052	0.012	590		
		17,19		200 HB				0.025		590			490		
		18,20		250 HB				0.025		490			420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.093	0.007	0.016	80	140	0.039	0.009	100		
		33		250 HB				0.016		140			90		
		34		350 HB				0.016		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.093	0.007	0.018	130	210	0.039	0.011	180		
		37		-				0.016	90	180			0.009	130	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.042	0.006	0.016	130	260	0.026	0.008	190	
38			50 HRC		0.014				220		0.019			0.008	180
38			55 HRC		0.013				190		0.013			0.007	160
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.012	0.034	0.006	0.016	130	260	0.019	0.008	160		
White Cast Iron		41	G-X300CrMo15	55 HRC	0.012	0.030	0.006	0.013	90	190	0.013	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.119	0.010	0.029	650	1310	0.052	0.015	910	

## RDMT 10T3 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.099	0.007	0.025	620	1080	0.039	0.014	820				
		2		190 HB									0.025	980	720		
		3		250 HB									0.025	820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.099	0.006	0.020	490	780	0.039	0.012	0.012	650			
				230 HB										0.020	680	590	
				280 HB										0.017	420	620	490
				350 HB										0.017	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.071	0.005	0.017	290	490	0.030	0.011	0.011	420			
				280 HB										0.017	420	390	
				320 HB										0.014	190	360	320
				350 HB										0.014	190	290	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.099	0.006	0.020	620	820	0.039	0.012	720			
240 HB					0.017									520	680	620	
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.078	0.005	0.014	220	420	0.030	0.009	320				
				310 HB									0.014	390	290		
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.099	0.006	0.020	490	680	0.039	0.012	0.012	620			
				42 HRC										0.016	290	490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.099	0.007	0.025	490	780	0.039	0.014	650				
				200 HB									0.025	720	590		
				250 HB									0.025	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.099	0.006	0.022	320	650	0.039	0.012	0.012	590			
				200 HB										0.022	590	490	
				250 HB										0.022	490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.078	0.005	0.014	80	140	0.030	0.009	100				
				250 HB									0.014	140	90		
				350 HB									0.014	140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.078	0.005	0.016	130	210	0.030	0.011	180				
-				0.014									90	180	130		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.035	0.004	0.014	130	260	0.020	0.008	190				
				50 HRC									0.028	220	180		
				55 HRC									0.025	190	160		
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.028	0.004	0.014	130	260	0.015	0.008	160				
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.025	0.004	0.011	90	190	0.010	0.007	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.099	0.007	0.025	650	1310	0.039	0.015	910			

## RDMT 12T3 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.119	0.010	0.029	620	1080	0.052	0.014	820			
		2		190 HB				0.029		980			720			
		3		250 HB				0.029		820			650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.119	0.008	0.023	490	780	0.052	0.012	0.011	650		
		4,6		230 HB				0.023	490	680				590		
		5,7		280 HB				0.020	420	620				490		
		8		350 HB				0.020	420	550				450		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.085	0.007	0.020	290	490	0.039	0.011	0.009	420		
		10		280 HB				0.020	290	420				390		
		11		320 HB				0.016	190	360				320		
11		350 HB		0.016				190	290	260						
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.119	0.008	0.023	620	820	0.052	0.012	720			
		14		240 HB					0.007	0.020			520	680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.093	0.007	0.016	220	420	0.039	0.009	320			
		14		310 HB						0.093			0.016	390	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.119	0.008	0.023	490	680	0.052	0.012	620			
		13		42 HRC					0.093	0.018			290	490	0.039	0.009
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.119	0.010	0.029	490	780	0.052	0.014	650			
		15		200 HB						0.029			720	590		
		16		250 HB						0.029			620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.119	0.008	0.025	320	650	0.052	0.012	590			
		17,19		200 HB						0.025			490	420		
		18,20		250 HB						0.025			490	420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.093	0.007	0.016	80	140	0.039	0.009	100			
		33		250 HB						0.016			140	90		
		34		350 HB						0.016			140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.093	0.007	0.018	130	210	0.039	0.011	180			
		37		-					0.093	0.016			90	180	0.009	130
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.034	0.006	0.014	130	260	0.026	0.008	190		
38			50 HRC		0.014						220			0.019	0.008	180
38			55 HRC		0.013						190			0.013	0.007	160
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.012	0.034	0.006	0.016	130	260	0.019	0.008	160			
White Cast Iron		41	G-X300CrMo15	55 HRC	0.012	0.030	0.006	0.013	90	190	0.013	0.007	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.119	0.010	0.029	650	1310	0.052	0.015	910		

## RDMT 1604 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.157	0.010	0.039	620	1080	0.079	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.157	0.008	0.031	490	780	0.079	0.012	650	
				4,6									230 HB	590
				5,7									280 HB	490
				8									350 HB	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.112	0.007	0.027	290	490	0.059	0.011	420	
				10									280 HB	390
				11									320 HB	320
				11									350 HB	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.157	0.008	0.031	620	820	0.079	0.012	720
14					240 HB									620
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.123	0.007	0.022	220	420	0.059	0.009	320	
				14									310 HB	290
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.157	0.008	0.031	490	680	0.079	0.012	620	
				13									42 HRC	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.157	0.010	0.039	490	780	0.079	0.014	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.157	0.008	0.035	320	650	0.079	0.012	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800 Inconel 700 Stellite 21	240 HB	0.020	0.123	0.007	0.022	80	140	0.059	0.009	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4 T40	- -	0.020	0.123	0.007	0.025	130	210	0.059	0.011	180	
37	-	-	0.123	0.022									90	180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.045	0.006	0.020	130	260	0.039	0.008	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.045	0.006	0.022	130	260	0.030	0.008	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.039	0.006	0.017	90	190	0.020	0.007	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.157	0.010	0.039	650	1310	0.079	0.015	910







**R**

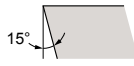
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**M**

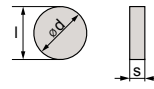
**W**



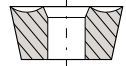
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $s \pm 0.005$



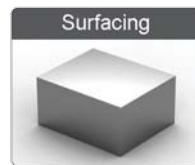
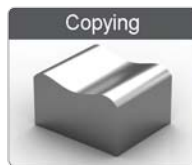
Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
RDMW 10T3 M0	LT 30	-	0.156	-	Neutral	M0001550
RDMW 1204 M0	LT 30	-	0.187	-	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



**F** ⇒  
 ↑ Productivity

**Coolant**

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

**Stainless Steel**

↑ **V<sub>C</sub>**

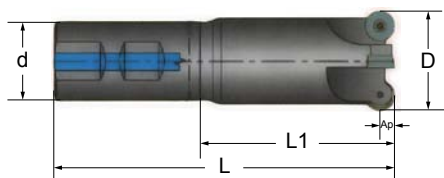
Machine Recommendations Guide. Details on page 10

## End Mill for RDMW 10T3 MO

Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 100 W-D-D1000/3*	1.000	0.606	1.000	1.250	3.500	0.196	3	8	M2001264
RILT 100 W-D-D1250/3*	1.250	0.856	1.250	1.250	3.750	0.196	3	5	M2001265

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

\* On request



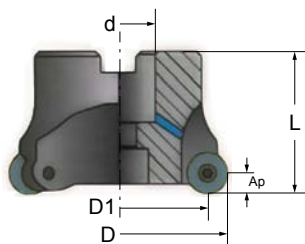
## Shell Mill for RDMW 1204 MO

RDMW

Cutter Designation	D	D1	d	L	Ap	z	$\alpha$	Catalog Nr.
RILT 120 M-W-D1500/3*	1.500	1.028	0.500	1.750	0.236	3	7	M2001266
RILT 120 M-W-D2000/4*	2.000	1.528	0.750	1.750	0.236	4	5	M2001267
RILT 120 M-W-D2500/5*	2.500	2.028	1.000	2.000	0.236	5	3.5	M2001268
RILT 120 M-W-D3000/6*	3.000	2.528	1.000	2.000	0.236	6	2.5	M2001269
RILT 120 M-W-D4000/7*	4.000	3.528	1.250	2.000	0.236	7	2	M2001270

W= With coolant Screw: **M2000597** Key: **M2000602**

\* On request



## RDMW 10T3 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.099	0.007	0.028	620	1080	0.039	0.015	820	
				190 HB									720	
				250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.099	0.006	0.022	490	780	0.039	0.013	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.071	0.005	0.019	290	490	0.030	0.012	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.099	0.007	0.028	490	780	0.039	0.015	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.099	0.006	0.024	320	650	0.039	0.013	590	
				200 HB									490	
				250 HB									420	
	Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.012	0.035	0.004	0.016	130	260	0.020	0.009	190
					50 HRc									180
					55 HRc									160
Chilled Cast Iron		White Cast Iron	41	Ni-Hard 2 G-X300CrMo15	400 HB	0.012	0.028	0.004	0.016	130	260	0.015	0.009	160
					55 HRc									130

## RDMW 1204 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.119	0.007	0.029	620	1080	0.052	0.015	820
		2		190 HB		0.119		0.029		980			720
		3		250 HB		0.119		0.029		820			650
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.119	0.006	0.023	490	780	0.052	0.013	650
				230 HB		0.119		0.023		490			680
				280 HB		0.119		0.020		420			620
				350 HB		0.119		0.020		420			550
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.085	0.005	0.020	290	490	0.039	0.012	420
				280 HB		0.085		0.020		290			420
				320 HB		0.085		0.016		190			360
				350 HB		0.085		0.016		190			290
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.119	0.007	0.029	490	780	0.052	0.015	650
				200 HB		0.119		0.029		720			590
				250 HB		0.119		0.029		620			520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.119	0.006	0.025	320	650	0.052	0.013	590
				200 HB		0.119		0.025		590			490
				250 HB		0.119		0.025		490			420
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 Hrc	0.012	0.042	0.004	0.016	130	260	0.026	0.009	190
				50 Hrc		0.034		0.014		220			180
				55 Hrc		0.030		0.013		190			160
	Chilled Cast Iron White Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.034	0.004	0.016	130	260	0.019	0.009	160
				41		G-X300CrMo15		55 Hrc		0.012			0.030



**R**

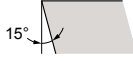
**D**

**M**

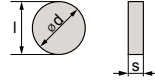
**X**



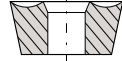
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $s \pm 0.005$



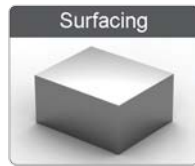
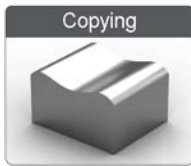
Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>RDMX 10T3 M0</b>	<b>LT 30</b>	0.394	0.156	-	Neutral	M0001552
<b>RDMX 1204 M0</b>	<b>LT 30</b>	0.472	0.187	-	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**



**F** ⇒  
 ↑ Productivity

**Coolant**

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

**Stainless Steel**

↑ **V<sub>C</sub>**

## End Mill for RDMX 10T3 MO

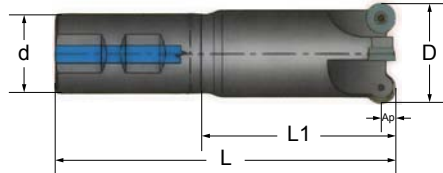
Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 100 W-D-D1000/3*	1.000	0.606	1.000	1.250	3.500	0.196	3	8	M2001264
RILT 100 W-D-D1250/3*	1.250	0.856	1.250	1.250	3.750	0.196	3	5	M2001265

W= With coolant

\* On request

Screw: M2000597

Key: M2000602



## Shell Mill for RDMX 1204 MO

Cutter Designation	D	D1	d	L	Ap	z	$\alpha$	Catalog Nr.
RILT 120 M-W-D1500/3*	1.500	1.028	0.500	1.750	0.236	3	7	M2001266
RILT 120 M-W-D2000/4*	2.000	1.528	0.750	1.750	0.236	4	5	M2001267
RILT 120 M-W-D2500/5*	2.500	2.028	1.000	2.000	0.236	5	3.5	M2001268
RILT 120 M-W-D3000/6*	3.000	2.528	1.000	2.000	0.236	6	2.5	M2001269
RILT 120 M-W-D4000/7*	4.000	3.528	1.250	2.000	0.236	7	2	M2001270

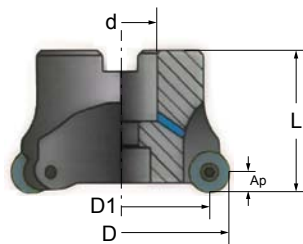
RDMX

W= With coolant

\* On request

Screw: M2000597

Key: M2000602



## RDMX 10T3 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.099	0.007	0.025	620	1080	0.039	0.014	820		
		2		190 HB		0.099		0.025		980			720		
		3		250 HB		0.099		0.025		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.099	0.006	0.020	490	780	0.039	0.012	0.011	650	
		4,6		230 HB		0.099		0.020		490				680	590
		5,7		280 HB		0.099		0.017		420				620	490
		8		350 HB		0.099		0.017		420				550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.071	0.005	0.017	290	490	0.030	0.011	0.009	420	
		10		280 HB		0.071		0.017		290				420	390
		11		320 HB		0.071		0.014		190				360	320
11		350 HB		0.071		0.014		190		290				260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.099	0.006	0.020	620	820	0.039	0.012	720		
		14		240 HB		0.099		0.005		0.017			520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.078	0.005	0.014	220	420	0.030	0.009	320		
		14		310 HB		0.078		0.014		390			290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.099	0.006	0.020	490	680	0.039	0.012	0.009	620	
		13		42 HRC		0.078		0.016		290				490	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.099	0.007	0.025	490	780	0.039	0.014	650		
		15		200 HB		0.099		0.025		720			590		
		16		250 HB		0.099		0.025		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.099	0.006	0.022	320	650	0.039	0.012	0.009	590	
		17,19		200 HB		0.099		0.022		590				490	
		18,20		250 HB		0.099		0.022		490				420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.078	0.005	0.014	80	140	0.030	0.009	100		
		33		250 HB		0.078		0.014		140			90		
		34		350 HB		0.078		0.014		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.078	0.005	0.016	130	210	0.030	0.011	180		
		37		-		0.078		0.014		90			180	0.009	130
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.035	0.004	0.014	130	260	0.020	0.008	190		
		38		50 HRC		0.028		0.013		220			0.015	0.008	180
		38		55 HRC		0.025		0.011		190			0.010	0.007	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.028	0.004	0.014	130	260	0.015	0.008	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.025	0.004	0.011	90	190	0.010	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.099	0.007	0.025	650	1310	0.039	0.015	910	

## RDMX 1204 M0 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.119	0.010	0.029	620	1080	0.052	0.014	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.119	0.008	0.023	490	780	0.052	0.012	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.085	0.007	0.020	290	490	0.039	0.011	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.119	0.008	0.023	620	820	0.052	0.012	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.093	0.007	0.016	220	420	0.039	0.009	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.119	0.008	0.023	490	680	0.052	0.012	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.119	0.010	0.029	490	780	0.052	0.014	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.119	0.008	0.025	320	650	0.052	0.012	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.093	0.007	0.016	80	140	0.039	0.009	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.093	0.007	0.018	130	210	0.039	0.011	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.012	0.034	0.006	0.016	130	260	0.026	0.008	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.012	0.034	0.006	0.016	130	260	0.019	0.008	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.012	0.030	0.006	0.013	90	190	0.013	0.007	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.119	0.010	0.029	650	1310	0.052	0.015	910







**S**

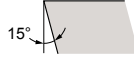
**D**

**K**

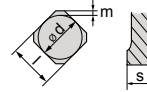
**T**



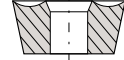
Shape



Clearance Angle



**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.0005$   
 $s \pm 0.0001$



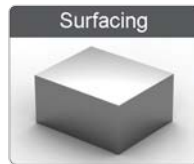
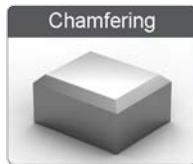
**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>SDKT 1204 AETN</b>	<b>LT 30</b>	0.500	0.187	-	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**



**F** ⇒  
**Productivity**

**Coolant**

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

**Stainless Steel**

**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## Shell Mill for SDKT 1204 AETN

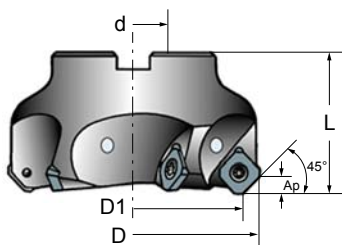
Cutter Designation	D	D1	d	L	Ap	z	$\alpha$	Catalog Nr.
RILT 670 M-W-D2000/4*	2.511	2.000	0.750	1.750	0.236	4	8	M2001271
RILT 670 M-W-D3000/5*	3.511	3.000	1.000	2.000	0.236	5	4.5	M2001272
RILT 670 M-W-D4000/6*	4.511	4.000	1.250	2.000	0.236	6	3.5	M2001273
RILT 670 M-W-D5000/7*	5.511	5.000	1.500	2.000	0.236	7	-	M2001274

W= With coolant

Screw: M2000598

Key: M2000603

\* On request



SDKT

# SDKT 1204 AETN LT 30

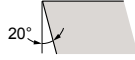
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.021	620	1080	0.118	0.015	820			
		2		190 HB				0.021					720			
		3		250 HB				0.021					820			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.016	490	780	0.118	0.013	650			
		4,6		230 HB				0.016	490	680			0.013	590		
		5,7		280 HB				0.014	420	620			0.012	490		
		8		350 HB				0.014	420	550			0.012	450		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.014	290	490	0.089	0.012	420			
		10		280 HB				0.014	290	420			0.012	390		
		11		320 HB				0.012	190	360			0.011	320		
11		350 HB		0.012				190	290	0.011			260			
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.014	620	820	0.118	0.012	720			
		14		240 HB					0.005	0.013			520	680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.012	220	420	0.089	0.011	320			
		14		310 HB						0.012			390	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.014	490	680	0.118	0.012	620			
		13		42 HRC					0.012	290			490	0.089	0.011	420
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.021	490	780	0.118	0.015	650			
		15		200 HB						0.021			720			
		16		250 HB						0.021			620			
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.018	320	650	0.118	0.013	590			
		17,19		200 HB						0.018			490			
		18,20		250 HB						0.018			490			
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.012	80	140	0.089	0.011	100			
		33		250 HB						0.012			140	90		
		34		350 HB						0.012			140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.013	130	210	0.089	0.012	180			
		37		-					0.012	90			180	0.011	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	260	0.059	0.009	190			
		38		50 HRC						0.010			220	0.044	0.009	180
		38		55 HRC						0.009			190	0.030	0.008	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.012	130	260	0.044	0.009	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.009	90	190	0.030	0.008	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.021	650	1310	0.118	0.017	910		



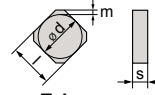
# SEKN



Shape

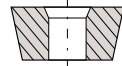


Clearance Angle



Tolerance

$m \pm 0.0005$   
 $s \pm 0.001$   
 For  $l = 12$ ,  $d \pm 0.003$   
 For  $l = 15$ ,  $d \pm 0.004$

Fixing  
Chip breaker

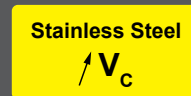
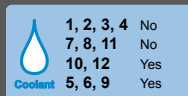
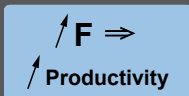
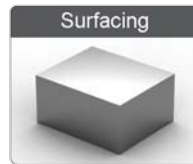
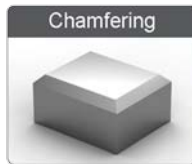
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKN 1203 AFTN	LT 30	0.500	0.125	-	Neutral	M0000041
SEKN 1204 AFTN	LT 30	0.500	0.187	-	Neutral	M0000042
SEKN 1504 AFTN	LT 30	0.625	0.187	-	Neutral	M0000450

**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

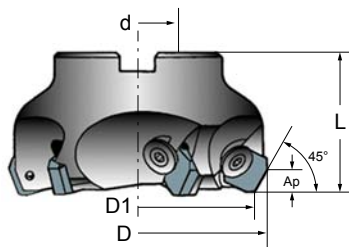
## Shell Mill for SEKN 1203 AFTN

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 550 M-D-D2000/4*	2.511	2.000	0.750	1.750	0.236	4	M2001275
RILT 550 M-D-D3000/6*	3.511	3.000	1.000	2.000	0.236	6	M2001276
RILT 550 M-D-D4000/6*	4.511	4.000	1.250	2.000	0.236	6	M2001277
RILT 550 M-D-D5000/7*	5.511	5.000	1.500	2.000	0.236	7	M2001278
RILT 550 M-D-D6000/8*	6.511	6.000	1.500	2.000	0.236	8	M2001279

W= With coolant

Screw: **M2000608** Key: **M2000609**

\* On request



## SEKN 1203 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820				
		2		190 HB									0.018	980	720		
		3		250 HB									0.018	820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	650				
				230 HB									0.014	490	680		
				280 HB									0.013	420	620		
				350 HB									0.013	420	550		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	420				
				280 HB									0.013	290	420		
				320 HB									0.010	190	360		
				350 HB									0.010	190	290		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720				
				240 HB									0.011	520	680	620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320				
				310 HB									0.010	390	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	620				
				42 HRC									0.010	290	490	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650				
				200 HB									0.018	720	590		
				250 HB									0.018	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	590				
				200 HB									0.016	590	490		
				250 HB									0.016	490	420		
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.020	0.197	0.005	0.010	80	140	0.089	0.009	100					
			33 Inconel 700									0.010	140	90			
			34 Stellite 21									0.010	140	90			
	Ti based	10	36 TiAl6V4	0.020	0.197	0.005	0.011	130	210	0.089	0.010	180					
37 T40			0.010									90	180	0.009	130		
Hardened Mat.	Steel	11	38 X100CrMo13, 440C,	0.020	0.098	0.004	0.010	130	260	0.059	0.008	190					
			38 G-X260NiCr42									0.069	0.009	220	0.044	0.008	180
			38									0.059	0.008	190	0.030	0.007	160
	Chilled Cast Iron	40 Ni-Hard 2	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160						
	White Cast Iron	41 G-X300CrMo15	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130						
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910				



## SEKN 1204 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820		
		2		190 HB				0.018					720		
		3		250 HB				0.018					820		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	0.010	650	
		4,6		230 HB				0.014						680	
		5,7		280 HB				0.013						620	
		8		350 HB				0.013						550	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	0.009	420	
		10		280 HB				0.013						420	
		11		320 HB				0.010						360	
11		350 HB		0.010				290							
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720		
		14		240 HB									0.005	680	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320		
		14		310 HB									0.010	390	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	0.009	620	
		13		42 HRC										0.010	490
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650		
		15		200 HB									0.018	720	
		16		250 HB									0.018	620	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	0.009	590	
		17,19		200 HB										0.016	590
		18,20		250 HB										0.016	490
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.010	80	140	0.089	0.009	100		
		33		250 HB									0.010	140	
		34		350 HB									0.010	140	
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.011	130	210	0.089	0.010	180		
		37		-									0.010	90	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	220	0.059	0.008	0.007	190	
		38		50 HRC										0.009	190
		38		55 HRC										0.008	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910	

## SEKN 1504 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.353	0.007	0.020	620	1080	0.157	0.014	820				
		190 HB		0.020									980	720			
		250 HB		0.020									820	650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.353	0.006	0.015	490	780	0.157	0.013	650				
				230 HB									0.015	680	590		
				280 HB									0.013	420	620	490	
				350 HB									0.013	420	550	450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.252	0.005	0.013	290	490	0.118	0.011	420				
				280 HB									0.013	290	420	390	
				320 HB									0.011	190	360	320	
				350 HB									0.011	190	290	260	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.353	0.006	0.013	620	820	0.157	0.011	720			
240 HB					0.012									520	680	620	
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.252	0.005	0.011	220	420	0.118	0.010	320				
				310 HB									0.011	390	290		
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.353	0.006	0.013	490	680	0.157	0.011	620				
				42 HRC									0.011	290	490	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.353	0.007	0.020	490	780	0.157	0.014	650				
				200 HB									0.020	620	590		
				250 HB									0.020	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.353	0.006	0.017	320	650	0.157	0.013	590				
				200 HB									0.017	590	490		
				250 HB									0.017	490	420		
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.020	0.252	0.005	0.011	80	140	0.118	0.010	100					
			33 Inconel 700									0.011	140	90			
			34 Stellite 21									0.011	140	90			
	Ti based	10	36 TiAl6V4	0.020	0.252	0.005	0.012	130	210	0.118	0.011	180					
37 T40			0.011									90	180	130			
Hardened Mat.	Steel	11	38 X100CrMo13, 440C,	0.020	0.126	0.004	0.010	130	260	0.079	0.009	190					
			38 G-X260NiCr42									0.076	0.010	220	0.059	0.008	180
			38									0.063	0.009	190	0.039	0.008	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.101	0.004	0.011	130	260	0.059	0.009	160				
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.063	0.004	0.009	90	190	0.039	0.008	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.353	0.007	0.020	650	1310	0.157	0.016	910			



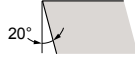




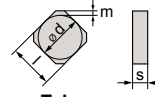
**S E K R**



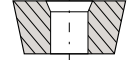
Shape



Clearance Angle



**Tolerance**  
 $d \pm 0.003$   
 $m \pm 0.0005$   
 $s \pm 0.0001$



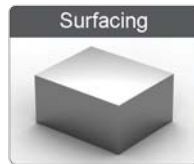
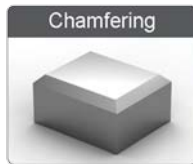
**Insert Type**  
 Clamping  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKR 1203 AFTN	LT 30	0.500	0.125	-	Neutral	M0000043
SEKR 1204 AFTN	LT 30	0.500	0.187	-	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**



**F** ⇒  
 ↑  
**Productivity**

**Coolant**

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

**Stainless Steel**

↑  
**V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## Shell Mill for SEKR 1203 AFTN

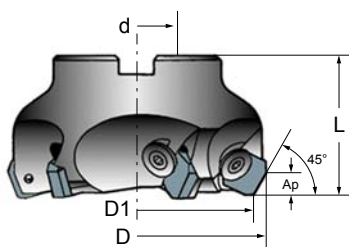
Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 550 M-D-D2000/4*	2.511	2.000	0.750	1.750	0.236	4	M2001275
RILT 550 M-D-D3000/6*	3.511	3.000	1.000	2.000	0.236	6	M2001276
RILT 550 M-D-D4000/6*	4.511	4.000	1.250	2.000	0.236	6	M2001277
RILT 550 M-D-D5000/7*	5.511	5.000	1.500	2.000	0.236	7	M2001278
RILT 550 M-D-D6000/8*	6.511	6.000	1.500	2.000	0.236	8	M2001279

W= With coolant

Screw: M2000608

Key: M2000609

\* On request



SEKR

## SEKR 1203 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820		
		2		190 HB				0.018		980			720		
		3		250 HB				0.018		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	0.010	650	
		4,6		230 HB				0.014		490				680	590
		5,7		280 HB				0.013		420				620	490
		8		350 HB				0.013		420				550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	0.009	420	
		10		280 HB				0.013		290				420	390
		11		320 HB				0.010		190				360	320
11		350 HB		0.010				190		290				260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720		
		14		240 HB									0.005	0.011	520
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320		
		14		310 HB									0.010	390	290
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	0.009	620	
		13		42 HRC										0.010	290
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650		
		15		200 HB									0.018	720	590
		16		250 HB									0.018	620	520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	590		
		17,19		200 HB									0.016	590	490
		18,20		250 HB									0.016	490	420
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.010	80	140	0.089	0.009	100		
		33		250 HB									0.010	140	90
		34		350 HB									0.010	140	90
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.011	130	210	0.089	0.010	180		
		37		-									0.010	90	180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	220	0.059	0.008	190		
		38		50 HRC									0.009	190	160
		38		55 HRC									0.008	190	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910	

## SEKR 1204 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820			
		2		190 HB									0.018	980	720	
		3		250 HB									0.018	820	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	0.010	650		
				230 HB										0.014	490	680
				280 HB										0.013	420	620
				350 HB										0.013	420	550
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	0.009	420		
				280 HB										0.010	190	360
				320 HB										0.010	190	290
				350 HB										0.010	190	290
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720			
				240 HB									0.011	520	680	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320			
				310 HB									0.010	390	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	0.009	620		
				42 HRC										0.010	290	490
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650			
				200 HB									0.018	720	590	
				250 HB									0.018	620	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	0.009	590		
				200 HB										0.016	590	490
				250 HB										0.016	490	420
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.020	0.197	0.005	0.010	80	140	0.089	0.009	0.008	100			
			33 Inconel 700										0.010	140	90	
			34 Stellite 21										0.010	140	90	
	Ti based	10	TiAl6V4	-	0.020	0.197	0.005	0.011	130	210	0.089	0.010	0.009	180		
T40				0.010										90	180	
Hardened Mat.	Steel	11	X100CrMo13, 440C,	0.020	0.098	0.004	0.010	130	260	0.059	0.008	0.007	190			
			50 HRC										0.009	220	180	
			G-X260NiCr42										0.008	190	160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910		

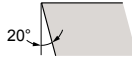




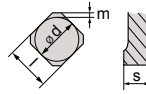
# SEKT



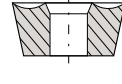
Shape



Clearance Angle



Tolerance  
 d ± 0.003  
 m ± 0.0005  
 s ± 0.0001



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEKT 12T3 AGSN	LT 30	0.528	0.156	-	Neutral	M0000455
SEKT 1204 AFTN	LT 30	0.500	0.187	-	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



**F** ⇒  
 ↑ Productivity

**Coolant**

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

**Stainless Steel**

↑ **V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## Shell Mill for SEKT 1204 AFTN

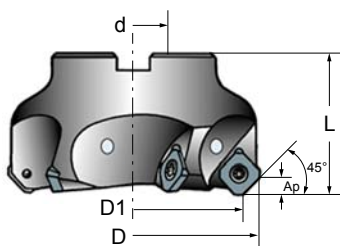
Cutter Designation	D	D1	d	L	Ap	z	$\alpha$	Catalog Nr.
RILT 600 M-D-D2000/4*	2.511	2.000	0.750	1.750	0.236	4	8	M2001280
RILT 600 M-D-D2500/5*	3.011	2.500	1.000	2.000	0.236	5	6	M2001281
RILT 600 M-D-D3000/6*	3.511	3.000	1.250	2.000	0.236	6	4.5	M2001282
RILT 600 M-D-D4000/6*	4.511	4.000	1.250	2.000	0.236	6	3.5	M2001283
RILT 600 M-D-D5000/7*	5.511	5.000	1.500	2.000	0.236	7	-	M2001284

W= With coolant

Screw: M2000599

Key: M2000603

\* On request



SEKT

## SEKT 12T3 AGSN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820		
		2		190 HB				0.018					720		
		3		250 HB				0.018					820		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	0.010	650	
		4,6		230 HB				0.014						680	
		5,7		280 HB				0.013						620	
		8		350 HB				0.013						550	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	0.009	420	
		10		280 HB				0.013						420	
		11		320 HB				0.010						360	
11		350 HB		0.010				290							
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720		
		14		240 HB									0.005	520	680
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320		
		14		310 HB									0.010	390	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	0.009	620	
		13		42 HRC										0.010	290
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650		
		15		200 HB									0.018	720	
		16		250 HB									0.018	620	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	0.009	590	
		17,19		200 HB										0.016	590
		18,20		250 HB										0.016	490
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.010	80	140	0.089	0.009	100		
		33		250 HB									0.010	140	
		34		350 HB									0.010	140	
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.011	130	210	0.089	0.010	180		
		37		-									0.010	90	180
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	220	0.059	0.008	0.007	190	
		38		50 HRC										0.009	190
		38		55 HRC										0.008	190
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910	

## SEKT 1204 AFTN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.018	620	1080	0.118	0.013	820	
		190 HB		720										
		250 HB		650										
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.014	490	780	0.118	0.012	650	
		230 HB		590										
		280 HB		490										
		350 HB		450										
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.013	290	490	0.089	0.010	420	
		280 HB		390										
		320 HB		320										
		350 HB		260										
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.013	620	820	0.118	0.010	720
240 HB			620											
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.010	220	420	0.089	0.009	320	
		310 HB		290										
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.013	490	680	0.118	0.010	620	
		42 HRC		420										
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.018	490	780	0.118	0.013	650	
		200 HB		590										
		250 HB		520										
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.016	320	650	0.118	0.012	590	
		200 HB		490										
		250 HB		420										
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.010	80	140	0.089	0.009	100	
		250 HB		90										
		350 HB		90										
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.011	130	210	0.089	0.010	180	
-	130													
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	260	0.059	0.008	190	
		50 HRC		180										
		55 HRC		160										
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.008	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.008	90	190	0.030	0.007	130	
NF	AI (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.018	650	1310	0.118	0.015	910







S

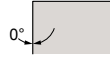
N

K

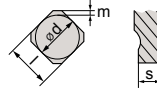
X



Shape



Clearance Angle



Tolerance  
 $d \pm 0.0002$   
 $m \pm 0.0005$   
 $s \pm 0.0001$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-45°	LT 30	0.375	0.146	-	Right	M0001984
SNKX 1607-45°	LT 30	0.658	0.269	-	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



**F** ⇒  
 ↑ Productivity

**Coolant**

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

**Stainless Steel**

↑ **V<sub>C</sub>**

Machine Recommendations  
 Guide. Details on page 10

## SNKX 09T3-45° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.079	0.004	0.019	620	1080	0.039	0.011	820		
		2		190 HB									0.019	980	720
		3		250 HB									0.019	820	650
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.079	0.004	0.017	490	780	0.039	0.009	650		
				230 HB					0.017	490			680	590	
				280 HB					0.016	420			620	490	
				350 HB					0.016	420			550	450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.079	0.004	0.015	290	490	0.039	0.008	420		
				280 HB					0.015	290			420	390	
				320 HB					0.014	190			360	320	
				350 HB					0.014	190			290	260	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.079	0.004	0.019	780	0.039	0.011	650			
				200 HB					0.019			490	720	590	
				250 HB					0.019			620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.079	0.004	0.017	650	0.039	0.009	590			
				200 HB					0.017			320	590	490	
				250 HB					0.017			490	420		
Hardened Mat.	Steel	11	X100CrMo13, 440C,	45 HRc	0.020	0.059	0.004	0.012	260	0.031	0.006	190			
				50 HRc					0.011			130	220	180	
			G-X260NiCr42	55 HRc					0.010			190	0.024	160	
				400 HB					0.012			130	260	0.031	0.006
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.039	0.004	0.010	90	190	0.024	0.006	130		

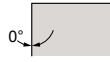
SNKX

# SNKX 1607-45° LT 30

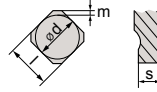
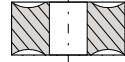
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.256	0.006	0.023	620	1080	0.157	0.018	820				
		2		190 HB				0.023					980	720			
		3		250 HB				0.023					820	650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.256	0.006	0.020	490	780	0.157	0.016	0.014	650			
		4,6		230 HB				0.020	490	680				590			
		5,7		280 HB				0.017	420	620				490			
		8		350 HB				0.017	420	550				450			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.256	0.004	0.017	290	490	0.118	0.014	0.013	420			
		10		280 HB				0.017	290	420				390			
		11		320 HB				0.014	190	360				320			
11		350 HB		0.014				190	290	260							
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.256	0.006	0.017	620	820	0.157	0.013	720				
		14		240 HB					0.004	0.016			520	680	620		
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.004	0.014	220	420	0.118	0.012	320				
		14		310 HB						0.014			390	290			
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.256	0.006	0.017	490	680	0.157	0.013	620				
		13		42 HRC					0.198	0.016			290	490	420		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.256	0.007	0.023	490	780	0.157	0.018	650				
		15		200 HB									0.023	720	590		
		16		250 HB									0.023	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.256	0.006	0.020	320	650	0.157	0.016	590				
		17,19		200 HB									0.020	490	420		
		18,20		250 HB									0.256	0.020	490	420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.004	0.014	80	140	0.118	0.012	100				
		33		250 HB									0.014	140	90		
		34		350 HB									0.197	0.014	140	90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.004	0.016	130	210	0.118	0.013	180				
		37		-					0.197	0.014			90	180	0.012	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.016	0.119	0.004	0.014	130	260	0.079	0.011	190				
		38		50 HRC									0.013	220	0.059	0.010	180
		38		55 HRC									0.011	190	0.039	0.009	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.016	0.119	0.004	0.014	130	260	0.059	0.011	160				
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.016	0.059	0.004	0.011	90	190	0.039	0.009	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.256	0.007	0.024	650	1310	0.157	0.020	910			

**S****N****K****X**

Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.0002$   
 $m \pm 0.0005$   
 $s \pm 0.0001$ 

**Fixing**  
**Chip breaker**

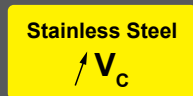
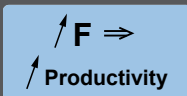
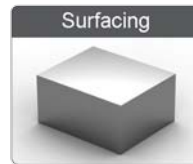
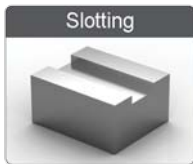
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-90°	LT 30	0.375	0.146	0.016	Right	M0001986
SNKX 1204-90°	LT 30	0.475	0.230	0.032	Right	M0002208

## 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

# SNKX 09T3-90° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.079	0.003	0.010	620	1080	0.039	0.006	820		
		2		190 HB									720		
		3		250 HB									650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.079	0.003	0.009	490	780	0.039	0.005	0.004	650	
				4,6										230 HB	590
				5,7										280 HB	490
				8										350 HB	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.079	0.003	0.007	290	490	0.039	0.004	0.003	420	
				10										280 HB	390
				11										320 HB	320
				11										350 HB	260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.079	0.003	0.011	490	780	0.039	0.006	650		
				15									200 HB	590	
				16									250 HB	520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.079	0.003	0.010	320	650	0.039	0.005	0.004	590	
				17,19										200 HB	490
				17,19										250 HB	490
				18,20										250 HB	420
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.059	0.003	0.006	130	260	0.031	0.003	190		
				38									50 HRc	180	
				38									55 HRc	160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.059	0.003	0.006	130	260	0.031	0.003	160		
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.020	0.039	0.003	0.005	90	190	0.024	0.003	130		

# SNKX 1204-90° LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.118	0.003	0.010	620	1080	0.079	0.006	820	
		2		190 HB		0.118		0.010		980			720	
		3		250 HB		0.118		0.010		820			650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.118	0.003	0.009	490	780	0.079	0.005	650	
				230 HB		0.118		0.009		490			680	590
				280 HB		0.118		0.007		420			620	490
				350 HB		0.118		0.007		420			550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.118	0.003	0.007	290	490	0.079	0.004	420	
				280 HB		0.118		0.007		290			420	390
				320 HB		0.118		0.006		190			360	320
				350 HB		0.118		0.006		190			290	260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.118	0.003	0.011	490	780	0.079	0.006	650	
				200 HB		0.118		0.011		720			590	
				250 HB		0.118		0.010		620			520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.118	0.003	0.010	320	650	0.079	0.004	590	
				200 HB		0.118		0.010		590			490	
				250 HB		0.118		0.010		490			420	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.089	0.003	0.006	130	260	0.063	0.003	190	
				50 HRC		0.089		0.006		220			180	
				55 HRC		0.059		0.005		190			160	
	Chilled Cast Iron White Cast Iron	40 41	Ni-Hard 2 G-X300CrMo15	400 HB	0.020	0.089	0.003	0.006	130	260	0.063	0.003	160	
				55 HRC		0.059		0.005		90			190	130



**S**

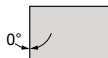
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**K**

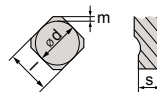
**X**



Shape



Clearance Angle



Tolerance  
 $d \pm 0.0002$   
 $m \pm 0.0005$   
 $s \pm 0.0001$

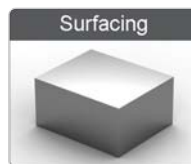
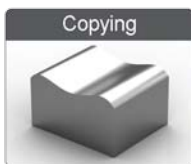


Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SNKX 09T3-HF	LT 30	0.381	0.146	-	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**



**F** ⇒  
 ↑ Productivity

**Coolant**

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

**Stainless Steel**

↑ **V<sub>C</sub>**

Machine Recommendations Guide. Details on page 10

## End Mill for SNKX 09T3-HF

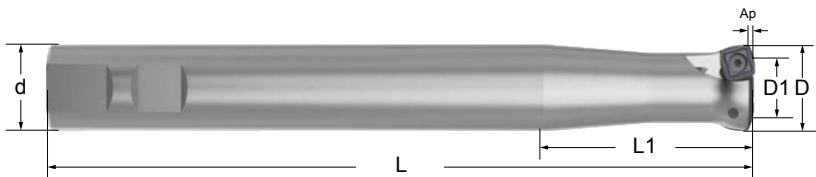
Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 900 W-W-D1000/3*	1.000	0.548	1.000	1.250	3.500	0.039	3	3.5	M2002943
RILT 900 W-W-D1250/4*	1.250	0.798	1.250	1.250	3.750	0.039	4	2	M2002944

W= With coolant

Screw: M2002101

Key: M2002911

\* On request



## Shell Mill for SNKX 09T3-HF

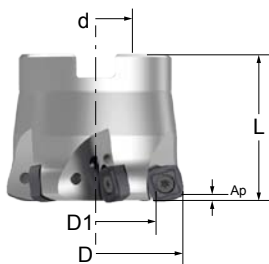
Cutter Designation	D	D1	d	L1	L	Ap	z	$\alpha$	Catalog Nr.
RILT 900 M-W-D2000/5*	2.000	1.548	0.750	-	1.750	0.039	5	-	M2002945
RILT 900 M-W-D2500/6*	2.500	2.048	1.000	-	2.000	0.039	6	-	M2002946

W= With coolant

Screw: M2002101

Key: M2002911

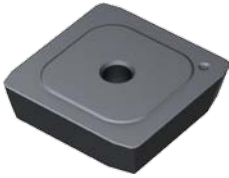
\* On request



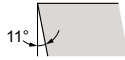


## SNKX 09T3-HF LT 30

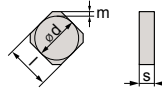
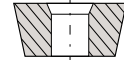
Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.004	0.039	0.011	0.083	620	1080	0.022	0.043	820	
				190 HB				0.077		980			720	
				250 HB				0.059		820			650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.004	0.039	0.010	0.077	490	780	0.020	0.039	0.035	650
				230 HB				0.067		680				590
				280 HB				0.063		620				490
				350 HB				0.059		550				450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.004	0.039	0.008	0.067	290	490	0.020	0.035	0.031	420
				280 HB				0.059		360				390
				320 HB				0.055		290				260
				350 HB				0.055		290				260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.004	0.039	0.008	0.094	490	780	0.024	0.043	650	
				200 HB				0.094		720			590	
				250 HB				0.094		620			520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.004	0.039	0.008	0.071	320	650	0.020	0.039	0.031	590
				200 HB				0.071		590				490
				250 HB				0.071		490				420
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.004	0.024	0.006	0.043	130	260	0.016	0.028	190	
				50 HRC				0.039		220			180	
				55 HRC				0.035		190			160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.004	0.024	0.006	0.043	130	260	0.016	0.028	160	
				White Cast Iron	41	G-X300CrMo15	55 HRC	0.004	0.016	0.006	0.035	90	190	0.012

**S****P****K****N**

Shape



Clearance Angle

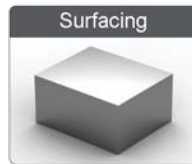

**Tolerance**  
 $m \pm 0.0005$   $s \pm 0.001$   
 For  $l = 12$ ,  $d \pm 0.003$   
 For  $l = 15$ ,  $d \pm 0.004$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPKN 1203 EDTR	LT 30	0.500	0.125	-	Right	M0000046
SPKN 1204 EDTR	LT 30	0.500	0.187	-	Right	M0000047
SPKN 1504 EDTR	LT 30	0.625	0.187	-	Right	M0001673

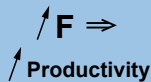
**Surfacing Insert Lead angle 75°**

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

## Application Guide



SPKN


**Productivity**


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

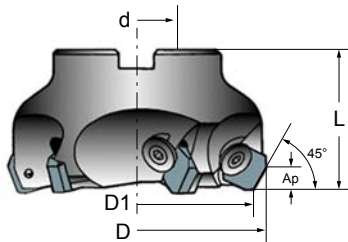
Machine Recommendations Guide  
 Details on page 10

## Shell Mill for SPKN 1203 EDTR

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 750 M-D-D3000/5*	3.236	3.000	1.000	2.000	0.354	5	M2001285
RILT 750 M-D-D4000/6*	4.236	4.000	1.250	2.000	0.354	6	M2001286
RILT 750 M-D-D5000/6*	5.236	5.000	1.500	2.000	0.354	6	M2001287
RILT 750 M-D-D6000/7*	6.236	6.000	1.500	2.000	0.354	7	M2001288

\* On request

Screw: **M2000606** Key: **M2000609**



## SPKN 1203 EDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.017	620	1080	0.118	0.012	820				
		190 HB		0.017									980	720			
		250 HB		0.017									820	650			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.013	490	780	0.118	0.010	0.010	650			
				230 HB										0.013	490	680	
				280 HB										0.012	420	620	490
				350 HB										0.012	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.012	290	490	0.089	0.009	0.009	420			
				280 HB										0.012	290	420	390
				320 HB										0.010	190	360	320
				350 HB										0.010	190	290	260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.017	490	780	0.118	0.012	650				
				200 HB									0.017	720	590		
				250 HB									0.017	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.015	320	650	0.118	0.010	590				
				200 HB									0.015	590	490		
				250 HB									0.015	490	420		
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	260	0.059	0.007	190				
				50 HRC									0.009	220	180		
				55 HRC									0.007	190	160		
	Chilled Cast Iron White Cast Iron	40 41	Ni-Hard 2 G-X300CrMo15	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.007	160				
				55 HRC									0.007	90	190	130	

## SPKN 1204 EDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.017	620	1080	0.118	0.012	820			
		2		190 HB									0.017	720		
		3		250 HB									0.017	820		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.013	490	780	0.118	0.010	0.010	650		
				4,6										230 HB	0.013	680
				5,7										280 HB	0.012	620
				8										350 HB	0.012	550
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.012	290	490	0.089	0.009	0.008	420		
				10										280 HB	0.012	420
				11										320 HB	0.010	360
				11										350 HB	0.010	290
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.017	490	780	0.118	0.012	650			
				200 HB									0.017	720		
				250 HB									0.017	620		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.015	320	650	0.118	0.010	0.008	590		
				17,19										200 HB	0.015	590
				17,19										250 HB	0.015	490
				18,20										250 HB	0.015	490
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.010	130	260	0.059	0.007	190			
				50 HRC									0.069	0.009	220	
				55 HRC									0.059	0.007	190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.010	130	260	0.044	0.007	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.007	90	190	0.030	0.006	130			

## SPKN 1504 EDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.356	0.007	0.017	620	1080	0.157	0.012	820				
		2		190 HB									0.017	980	720		
		3		250 HB									0.017	820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.356	0.006	0.013	490	780	0.157	0.010	0.010	650			
				230 HB										0.013	490	680	590
				280 HB										0.012	420	620	490
				350 HB										0.012	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.254	0.005	0.012	290	490	0.118	0.009	0.009	420			
				280 HB										0.012	290	420	390
				320 HB										0.010	190	360	320
				350 HB										0.010	190	290	260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.356	0.007	0.017	490	780	0.157	0.012	650				
				200 HB									0.017	720	590		
				250 HB									0.017	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.356	0.006	0.015	320	650	0.157	0.010	0.010	590			
				200 HB										0.015	590	490	
				250 HB										0.015	490	420	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.127	0.004	0.010	130	260	0.079	0.007	190				
				50 HRC									0.009	220	180		
				55 HRC									0.007	190	160		
	Chilled Cast Iron White Cast Iron	40 41	Ni-Hard 2 G-X300CrMo15	400 HB	0.020	0.102	0.004	0.010	130	260	0.059	0.007	160				
				55 HRC									0.007	90	130		





**S**

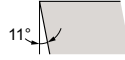
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**K**

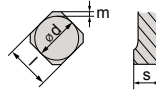
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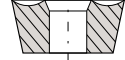
Shape



Clearance Angle



**Tolerance**  
 d ± 0.003  
 m ± 0.0005  
 s ± 0.001



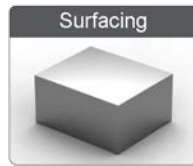
**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPKR 1203 EDTR	LT 30	0.500	0.125	-	Right	M0000048
SPKR 1204 EDTR	LT 30	0.500	0.187	-	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**



**F** ⇒  
 ↑ **Productivity**

**Coolant**

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

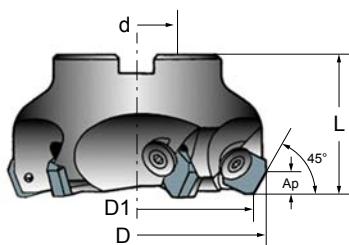
Machine Recommendations Guide  
 Details on page 10

## Shell Mill for SPKR 1203 EDTR

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 750 M-D-D3000/5*	3.236	3.000	1.000	2.000	0.354	5	M2001285
RILT 750 M-D-D4000/6*	4.236	4.000	1.250	2.000	0.354	6	M2001286
RILT 750 M-D-D5000/6*	5.236	5.000	1.500	2.000	0.354	6	M2001287
RILT 750 M-D-D6000/7*	6.236	6.000	1.500	2.000	0.354	7	M2001288

\* On request

**Screw: M2000606 Key: M2000609**



SPKR



## SPKR 1203 EDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions						
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.015	620	1080	0.118	0.010	820				
		2		190 HB				0.015		980			720				
		3		250 HB				0.015		820			650				
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.012	490	780	0.118	0.009	0.008	650			
		4,6		230 HB				0.012		490				680			
		5,7		280 HB				0.010		420				620			
		8		350 HB				0.010		420				550			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.010	290	490	0.089	0.008	0.007	420			
		10		280 HB				0.010		290				420			
		11		320 HB				0.009		190				360			
11		350 HB		0.009				190		290							
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.010	620	820	0.118	0.008	720				
		14		240 HB									0.005	0.009	520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.009	220	420	0.089	0.007	320				
		14		310 HB									0.009	390	290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.010	490	680	0.118	0.008	0.007	620			
		13		42 HRC										0.009	290	490	0.089
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.015	490	780	0.118	0.010	650				
		15		200 HB									0.015	720	590		
		16		250 HB									0.015	620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.013	320	650	0.118	0.009	590				
		17,19		200 HB									0.013	590	490		
		18,20		250 HB									0.013	490	420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.009	140	140	0.089	0.007	100				
		33		250 HB									0.009	80	140	90	
		34		350 HB									0.009	140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.009	130	210	0.089	0.008	180				
		37		-									0.009	90	180	0.007	130
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.009	130	220	0.059	0.006	190				
		38		50 HRC									0.008	190	0.044	0.006	180
		38		55 HRC									0.007	190	0.030	0.005	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.009	130	260	0.044	0.006	160				
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.007	90	190	0.030	0.005	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.276	0.007	0.015	650	1310	0.118	0.011	910			

## SPKR 1204 EDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.015	620	1080	0.118	0.010	820			
		190 HB		0.015									980	720		
		250 HB		0.015									820	650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.012	490	780	0.118	0.009	0.009	650		
		230 HB		0.012										490	590	
		280 HB		0.010										420	620	490
		350 HB		0.010										420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.010	290	490	0.089	0.008	0.008	420		
		280 HB		0.010										290	420	390
		320 HB		0.009										190	360	320
		350 HB		0.009										190	290	260
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.276	0.006	0.010	620	820	0.118	0.008	720			
		240 HB		0.005									0.009	520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.197	0.005	0.009	220	420	0.089	0.007	320			
		310 HB		0.009									0.009	390	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.276	0.006	0.010	490	680	0.118	0.008	0.008	620		
		42 HRC		0.009										0.009	290	490
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.015	490	780	0.118	0.010	650			
		200 HB		0.015									720	590		
		250 HB		0.015									620	520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.013	320	650	0.118	0.009	590			
		200 HB		0.013									590	490		
		250 HB		0.013									490	420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.197	0.005	0.009	80	140	0.089	0.007	100			
		250 HB		0.009									140	90		
		350 HB		0.009									140	90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.197	0.005	0.009	130	210	0.089	0.008	180			
-	0.009	90		180									130			
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.009	130	260	0.059	0.006	190			
		50 HRC		0.008									220	180		
		55 HRC		0.007									190	160		
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.009	130	260	0.044	0.006	160			
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.007	90	190	0.030	0.005	130			
NF	Al (>8%Si)	12	AlSi12	130 HB	0.020	0.276	0.007	0.015	650	1310	0.118	0.011	910			



S

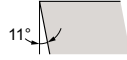
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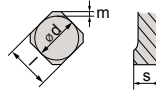
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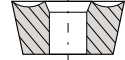
Shape



Clearance Angle



Tolerance  
 d ± 0.003  
 m ± 0.005  
 s ± 0.005



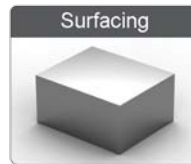
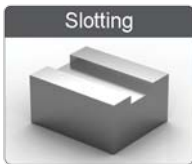
Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SPMT12T308	LT 30	0.523	0.156	0.032	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



**Productivity**

**Coolant**

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

Machine Recommendations Guide  
 Details on page 10

## SPMT 12T308 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.356	0.005	0.011	620	1080	0.118	0.007	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.356	0.004	0.009	490	780	0.118	0.006	650	
				230 HB									590	
				280 HB									490	
				350 HB									620	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.254	0.003	0.008	290	490	0.089	0.006	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.356	0.004	0.009	620	820	0.118	0.006	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.254	0.003	0.006	220	420	0.089	0.005	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.356	0.004	0.009	490	680	0.118	0.006	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.356	0.005	0.011	490	780	0.118	0.007	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.356	0.004	0.010	320	650	0.118	0.006	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.254	0.003	0.006	80	140	0.089	0.005	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.254	0.003	0.007	130	210	0.089	0.006	180	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.076	0.003	0.006	130	260	0.059	0.004	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.102	0.003	0.006	130	260	0.044	0.004	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.038	0.003	0.005	90	190	0.030	0.004	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.356	0.005	0.011	650	1310	0.118	0.008	910

SPMT



S

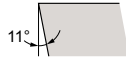
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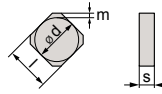
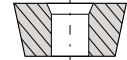
N



Shape



Clearance Angle


**Tolerance**  
 $d \pm 0.005$   
 $m \pm 0.008$   
 $s \pm 0.005$ 

**Fixing**  
**Chip breaker**

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>SPUN 120308</b>	<b>LT 30</b>	0.500	0.125	0.032	Neutral	M0000050

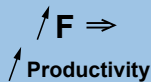
Multi purpose Square insert with corner radius and a flat rake surface. Use for Face Milling. Roughing to Finishing

## Application Guide

Chamfering



Surfacing



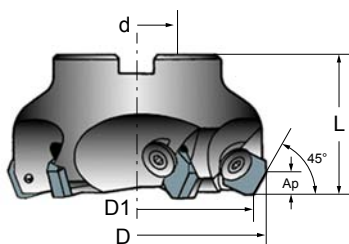
Machine Recommendations Guide  
 Details on page 10

## Shell Mill for SPUN 120308

Cutter Designation	D	D1	d	L	Ap	z	Catalog Nr.
RILT 750 M-D-D3000/5*	3.236	3.000	1.000	2.000	0.354	5	M2001285
RILT 750 M-D-D4000/6*	4.236	4.000	1.250	2.000	0.354	6	M2001286
RILT 750 M-D-D5000/6*	5.236	5.000	1.500	2.000	0.354	6	M2001287
RILT 750 M-D-D6000/7*	6.236	6.000	1.500	2.000	0.354	7	M2001288

\* On request

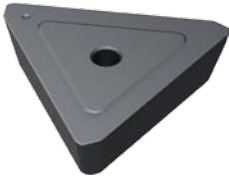
Screw: **M2000606** Key: **M2000609**



SPUN

## SPUN 120308 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.276	0.007	0.014	620	1080	0.118	0.010	820	
		2		190 HB				0.014					720	
		3		250 HB				0.014					820	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.276	0.006	0.011	490	780	0.118	0.009	0.008	650
				230 HB				0.011	490	680				
				280 HB				0.010	420	620				
				350 HB				0.010	420	550				
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.197	0.005	0.010	290	490	0.089	0.008	0.007	420
				280 HB				0.010	290	420				
				320 HB				0.008	190	360				
				350 HB				0.008	190	290				
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.276	0.007	0.014	490	780	0.118	0.010	650	
				200 HB				0.014					720	
				250 HB				0.014					620	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.276	0.006	0.013	320	650	0.118	0.009	0.008	590
				200 HB				0.013						590
				250 HB				0.013						490
				17,19										
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.098	0.004	0.008	130	260	0.059	0.006	190	
				50 HRC				0.007					220	
				55 HRC				0.006					190	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.079	0.004	0.008	130	260	0.044	0.006	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.059	0.004	0.006	90	190	0.030	0.005	130	



T

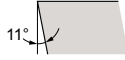
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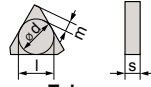
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Shape

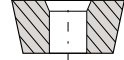


Clearance Angle



Tolerance

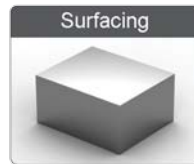
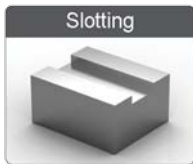
$m \pm 0.013$   $s \pm 0.0005$   
For  $l = 16$ ,  $d \pm 0.002$   
For  $l = 22$ ,  $d \pm 0.003$

Fixing  
Chip breaker

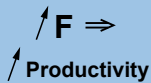
Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPKN 1603 PDTR	LT 30	0.650	0.125	-	Right	M0000051
TPKN 2204 PDTR	LT 30	0.866	0.187	-	Right	M0000052

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

## Application Guide



TPKN



Machine Recommendations Guide  
Details on page 10



### Shell Mill for TPKN 1603 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
RILT 310 M-D-D3000/5*	3.000	1.000	2.000	0.551	5	M2001289
RILT 310 M-D-D4000/6*	4.000	1.250	2.000	0.551	6	M2001290
RILT 310 M-D-D5000/7*	5.000	1.500	2.000	0.551	7	M2001291

\* On request

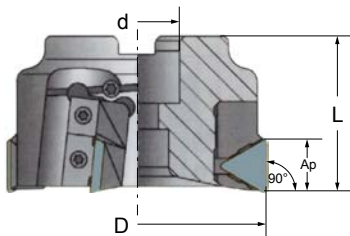
Screw: On request Key: M2000609

### Shell Mill for TPKN 2204 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
RILT 320 M-D-D4000/5*	4.000	1.250	2.000	0.787	5	M2001292
RILT 320 M-D-D5000/6*	5.000	1.500	2.000	0.787	6	M2001293
RILT 320 M-D-D6000/7*	6.000	1.500	2.000	0.787	7	M2001294

\* On request

Screw: On request Key: T2002786



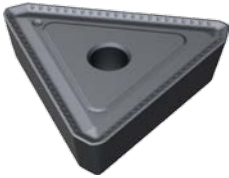
# TPKN 1603 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.474	0.006	0.011	620	1080	0.118	0.008	820			
		190 HB		0.011									980			
		250 HB		0.011									820			
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.474	0.005	0.008	490	780	0.118	0.007	650			
				230 HB					0.008	490			680			
				280 HB					0.007	420			620			
				350 HB					0.007	420			550			
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.339	0.004	0.007	290	490	0.089	0.006	420			
				280 HB					0.007	290			420			
				320 HB					0.006	190			360			
				350 HB					0.006	190			290			
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.474	0.006	0.011	780	0.118	0.008	650				
				200 HB					0.011			490	720			
				250 HB					0.011			620				
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.474	0.005	0.009	650	0.118	0.007	590				
				200 HB					0.009			320	590			
				250 HB					0.009			490				
				420												
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 Hrc	0.020	0.119	0.003	0.006	260	0.059	0.005	190				
				50 Hrc					0.005			130	220	0.044	0.004	180
				55 Hrc					0.005			190	0.030	0.004	160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.135	0.003	0.006	130	260	0.044	0.005	160			
	White Cast Iron	41	G-X300CrMo15	55 Hrc	0.020	0.102	0.003	0.005	90	190	0.030	0.004	130			



# TPKN 2204 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.708	0.006	0.011	620	1080	0.157	0.008	820
				190 HB	0.000	0.708	0.000	0.011	0	980			720
				250 HB	0.000	0.708	0.000	0.011	0	820			650
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.708	0.005	0.008	490	780	0.157	0.007	650
				230 HB	0.000	0.708	0.000	0.008	490	680			590
				280 HB	0.000	0.708	0.000	0.007	420	620			490
				350 HB	0.000	0.708	0.000	0.007	420	550			450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.506	0.004	0.007	290	490	0.118	0.006	420
				280 HB	0.000	0.506	0.000	0.007	290	420			390
				320 HB	0.000	0.506	0.000	0.006	190	360			320
				350 HB	0.000	0.506	0.000	0.006	190	290			260
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.708	0.006	0.011	490	780	0.157	0.008	650
				200 HB	0.000	0.708	0.000	0.011	0	720			590
				250 HB	0.000	0.708	0.000	0.011	0	620			520
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.708	0.005	0.009	320	650	0.157	0.007	590
				200 HB	0.000	0.708	0.000	0.009	0	590			490
				250 HB	0.000	0.708	0.000	0.009	0	490			420
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.253	0.004	0.006	130	260	0.079	0.005	190
				50 HRC	0.000	0.177	0.000	0.005	0	220	0.059	0.004	180
				55 HRC	0.000	0.152	0.000	0.005	0	190	0.039	0.004	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.202	0.004	0.006	130	260	0.059	0.005	160
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.152	0.004	0.005	90	190	0.039	0.004	130



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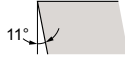
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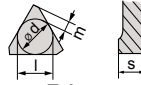
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Shape

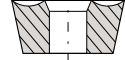


Clearance Angle



Tolerance

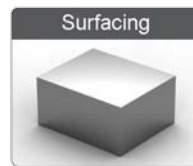
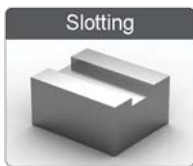
$m \pm 0.0005$   $s \pm 0.001$   
 For  $l = 16$ ,  $d \pm 0.002$   
 For  $l = 22$ ,  $d \pm 0.003$

Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPKR 1603 PDTR	LT 30	0.650	0.125	-	Right	M0000053
TPKR 2204 PDTR	LT 30	0.866	0.187	-	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.

## Application Guide



$F \Rightarrow$   
 ↑ Productivity

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

Machine Recommendations Guide  
 Details on page 10

TPKR

### Shell Mill for TPKR 1603 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
RILT 310 M-D-D3000/5*	3.000	1.000	2.000	0.551	5	M2001289
RILT 310 M-D-D4000/6*	4.000	1.250	2.000	0.551	6	M2001290
RILT 310 M-D-D5000/7*	5.000	1.500	2.000	0.551	7	M2001291

\* On request

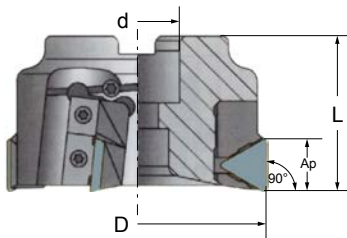
**Screw:** On request    **Key:** M2000609

### Shell Mill for TPKR 2204 PDTR

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
RILT 320 M-D-D4000/5*	4.000	1.250	2.000	0.787	5	M2001292
RILT 320 M-D-D5000/6*	5.000	1.500	2.000	0.787	6	M2001293
RILT 320 M-D-D6000/7*	6.000	1.500	2.000	0.787	7	M2001294

\* On request

**Screw:** On request    **Key:** T2002786



## TPKR 1603 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.474	0.006	0.009	620	1080	0.118	0.007	820	
		2		190 HB									720	
		3		250 HB									650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.474	0.005	0.007	490	780	0.118	0.006	650	
				230 HB									590	
				280 HB									490	
				350 HB									450	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.339	0.004	0.006	290	490	0.089	0.005	420	
				280 HB									390	
				320 HB									320	
				350 HB									260	
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.474	0.005	0.006	620	820	0.118	0.005	720	
				240 HB									620	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.339	0.004	0.005	220	420	0.089	0.005	320	
				310 HB									290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.474	0.005	0.006	490	680	0.118	0.005	620	
				42 HRC									420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.474	0.006	0.009	490	780	0.118	0.007	650	
				200 HB									590	
				250 HB									520	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.474	0.005	0.008	320	650	0.118	0.006	590	
				200 HB									490	
				250 HB									420	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.339	0.004	0.005	80	140	0.089	0.005	100	
				250 HB									90	
				350 HB									90	
	Ti based	10	TiAl6V4, T40	-	0.020	0.339	0.004	0.006	130	210	0.089	0.005	180	
				-									130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.169	0.004	0.004	130	260	0.059	0.004	190	
				50 HRC									180	
				55 HRC									160	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.135	0.004	0.005	130	260	0.044	0.004	160	
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.102	0.004	0.004	90	190	0.030	0.003	130	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.474	0.006	0.009	650	1310	0.118	0.007	910



# TPKR 2204 PDTR LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.708	0.006	0.009	620	1080	0.157	0.007	820		
		2		190 HB		0.708		0.009		980			720		
		3		250 HB		0.708		0.009		820			650		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.708	0.005	0.007	490	780	0.157	0.006	650		
		4,6		230 HB		0.708		0.007		490			680	0.006	590
		5,7		280 HB		0.708		0.006		420			620	0.005	490
		8		350 HB		0.708		0.006		420			550	0.005	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.506	0.004	0.006	290	490	0.118	0.005	420		
		10		280 HB		0.506		0.006		290			420	390	
		11		320 HB		0.506		0.005		190			360	320	
11		350 HB		0.506		0.005		190		290			260		
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.020	0.708	0.005	0.006	620	820	0.157	0.005	720		
		14		240 HB		0.708		0.004		0.006			520	680	620
	Duplex	5	X2CrNiN23-4, S31500	290 HB	0.020	0.506	0.004	0.005	220	420	0.118	0.005	320		
		14		310 HB		0.506		0.005		390			290		
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	0.020	0.708	0.005	0.006	490	680	0.157	0.005	620		
		13		42 HRC		0.506		0.005		290			490	420	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.708	0.006	0.009	490	780	0.157	0.007	650		
		15		200 HB		0.708		0.009		720			590		
		16		250 HB		0.708		0.009		620			520		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.020	0.708	0.005	0.008	320	650	0.157	0.006	590		
		17,19		200 HB		0.708		0.008		590			490		
		18,20		250 HB		0.708		0.008		490			420		
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	0.020	0.506	0.004	0.005	80	140	0.118	0.005	100		
		33		250 HB		0.506		0.005		140			90		
		34		350 HB		0.506		0.005		140			90		
	Ti based	10	TiAl6V4, T40	-	0.020	0.506	0.004	0.006	130	210	0.118	0.005	180		
		37		-		0.506		0.005		90			180	130	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	0.020	0.253	0.004	0.005	130	260	0.079	0.004	190		
		38		50 HRC		0.177		0.004		220			0.059	0.004	180
		38		55 HRC		0.152		0.004		190			0.039	0.003	160
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.020	0.202	0.004	0.005	130	260	0.059	0.004	160		
	White Cast Iron	41	G-X300CrMo15	55 HRC	0.020	0.152	0.004	0.004	90	190	0.039	0.003	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.020	0.708	0.006	0.009	650	1310	0.157	0.007	910	



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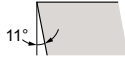
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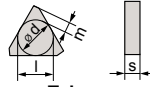
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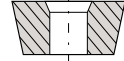
Shape



Clearance Angle



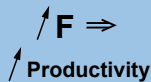
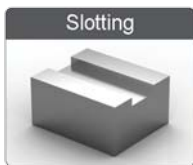
Tolerance

d  $\pm$  0.003m  $\pm$  0.005s  $\pm$  0.005Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
TPUN 160308	LT 30	0.650	0.125	0.032	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



Machine Recommendations Guide  
Details on page 10

TPUN

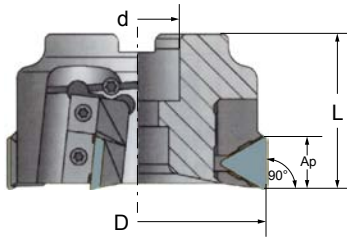


## Shell Mill for TPUN 160308

Cutter Designation	D	d	L	Ap	z	Catalog Nr.
RILT 310 M-D-D3000/5*	3.000	1.000	2.000	0.551	5	M2001289
RILT 310 M-D-D4000/6*	4.000	1.250	2.000	0.551	6	M2001290
RILT 310 M-D-D5000/7*	5.000	1.500	2.000	0.551	7	M2001291

\* On request

Screw: On request Key: M2000609



## TPUN 160308 LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.020	0.474	0.006	0.011	620	1080	0.118	0.008	820			
		2		190 HB									0.011	980	720	
		3		250 HB									0.011	820	650	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.020	0.474	0.005	0.008	490	780	0.118	0.007	650			
				230 HB									0.008	490	680	590
				280 HB									0.007	420	620	490
				350 HB									0.007	420	550	450
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.020	0.339	0.004	0.007	290	490	0.089	0.006	420			
				280 HB									0.007	290	420	390
				320 HB									0.006	190	360	320
				350 HB									0.006	190	290	260
	Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.020	0.474	0.006	0.011	490	720	0.118	0.008	650		
200 HB					0.011									720	590	
250 HB					0.011									620	520	
Malleable & Nodular		8	GGG40, GGG70, 50005	150 HB	0.020	0.474	0.005	0.009	320	650	0.118	0.007	590			
				200 HB									0.009	590	490	
				250 HB									0.009	490	420	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.020	0.119	0.003	0.005	130	220	0.044	0.004	180			
				50 HRc									0.005	190	160	
				55 HRc									0.005	190	160	
	Chilled Cast Iron	White Cast Iron	41	Ni-Hard 2, G-X300CrMo15	400 HB	0.020	0.135	0.003	0.006	130	260	0.044	0.005	160		
					55 HRc									0.005	90	190

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

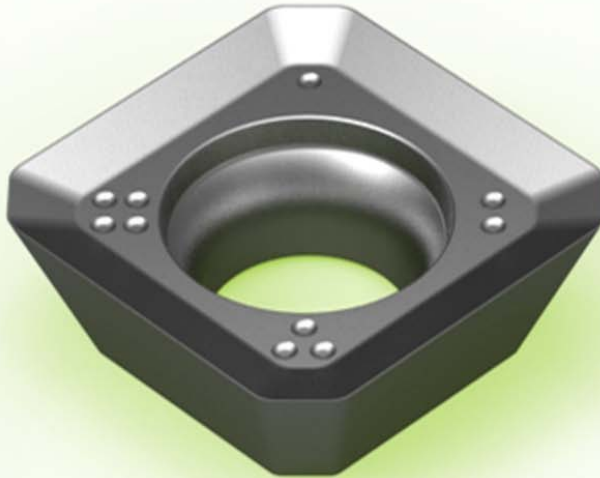


- By machining more materials without coolant
- By using less machine energy consumption
- By reducing unused insert stock

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

# Alu-Milling

LT 05 Alu-Milling



ALU-MILLING LINE

ALU-  
Milling



**A**

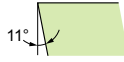
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**G**

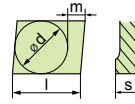
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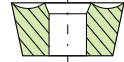
Shape



Clearance Angle



Tolerance  
 $d \pm 0.001$   
 $m \pm 0.001$   
 $s \pm 0.005$



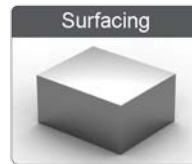
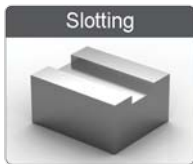
Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>APGT 1003 PDER ALU</b>	<b>LT 05</b>	0.409	0.136	0.022	Right	M0001007
<b>APGT 1604 PDER ALU</b>	<b>LT 05</b>	0.606	0.187	0.037	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



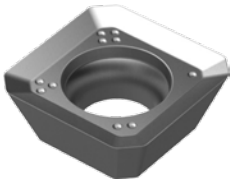
**For APTG 10 Milling bodies, see APTK 10 cutters p.165**  
**For APTG 16 Milling bodies, see APTK 16 cutters p.172**

# APGT 1003 PDER ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.012	0.354	0.005	0.008	1320	3960	0.118	0.006	1650
			23, 24	4% < Si < 8 %	100 HB		0.354	0.004	0.007	825	1980			1320
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.012	0.354	0.004	0.007	330	2640	0.118	0.006	990
	Non-Metallic	15	29	Fiber Plastics	-	0.012	0.354	0.005	0.008	264	1650	0.118	0.005	660
			30	Hard Rubber	-		0.354		0.008	264	990			495
-			Graphite	-	0.354		0.008		330	660	495			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.012	0.197	0.003	0.008	115.5	198	0.079	0.005	148.5
37	TiAl 6 V4	-	0.197	0.006	92.4		148.5		115.5					

# APGT 1604 PDER ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>	
NF	Al (<8%Si)	13	21, 22	Si < 4 %	60 HB	0.020	0.591	0.006	0.013	1320	3960	0.157	0.006	1650
			23, 24	4% < Si < 8 %	100 HB		0.591	0.005	0.011	825	1980			1320
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	0.020	0.591	0.005	0.011	330	2640	0.157	0.006	990
	Non-Metallic	15	29	Fiber Plastics	-	0.020	0.591	0.006	0.013	264	1650	0.157	0.005	660
			30	Hard Rubber	-		0.591		0.013	264	990			495
-			Graphite	-	0.591		0.013		330	660	495			
H.T.A.	Ti based Alloys	10	36	Ti 1	-	0.020	0.591	0.004	0.013	115.5	198	0.157	0.005	148.5
37	TiAl 6 V4	-	0.591	0.009	92.4		148.5		115.5					



**S**

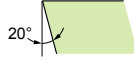
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**G**

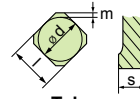
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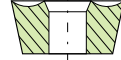
Shape



Clearance Angle



Tolerance  
d ± 0.001  
m ± 0.001  
s ± 0.005



Fixing  
Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
SEGT 1204 AFEN ALU	LT 05	0.500	0.187	-	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. 229

# SEGT 1204 AFEN ALU LT 05

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	D.O.C. [inch]		Feed [inch/tooth]		V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max	min	max	D.O.C.	Feed	V <sub>c</sub>
NF	13	21, 22 23, 24	Si < 4 %	60 HB	0.012	0.354	0.005	0.014	1320	3960	0.118	0.010	1650
			4% < Si < 8 %	100 HB		0.354	0.004	0.014	825	1980			1320
	14	26,27,28	CuZn30	100 HB	0.012	0.354	0.004	0.014	330	2640	0.118	0.010	990
	15	29 30 -	Fiber Plastics Hard Rubber Graphite	-	0.012	0.354	0.005	0.014	264	1650	0.118	0.008	660
						0.354		0.014	264	990			495
0.354						0.014		330	660	495			
H.T.A.	10	36 37	Ti 1	-	0.012	0.197	0.003	0.014	115.5	198	0.079	0.008	148.5
			TiAl 6 V4	-		0.197		0.011	92.4	148.5			115.5



# 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

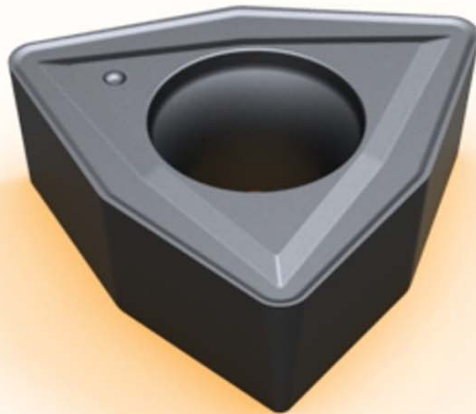


Aluminium & Non ferrous Alloys

**True Multi-Mat™ inserts for real productivity**

# Drilling

LT 30 Multi-Mat™ Drilling



MULTI-MAT™ DRILLING LINE

DRILLING



**S**

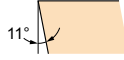
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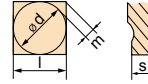
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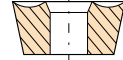
Shape



Clearance Angle



Tolerance  
 $d \pm 0.002$   
 $m \pm 0.003$   
 $s \pm 0.005$



Fixing  
 Chip breaker

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>SPMG 060204 NN*</b>	<b>LT 30</b>	0.236	0.094	0.016	Right	M3002913
<b>SPMG 07T308 NN*</b>	<b>LT 30</b>	0.313	0.156	0.032	Right	M3002914
<b>SPMG 090408 NN*</b>	<b>LT 30</b>	0.386	0.187	0.032	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 [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.001	0.004	590	880	0.003	730		
				190 HB		0.004		750		370		
				250 HB		0.004		650		320		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.001	0.004	390	750	0.003	570		
				230 HB		0.004	390	620	0.002	500		
				280 HB		0.003	320	550	0.002	440		
				350 HB		0.003	320	490	0.002	410		
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.002	0.004	220	550	0.003	390		
				280 HB		0.004	220	490		360		
				320 HB		0.003	190	420		310		
				350 HB		0.003	190	320		260		
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.001	0.003	550	750	0.002	650	
240 HB					0.002	0.003	390	680	0.003	540		
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.002	0.003	220	390	0.003	310		
				310 HB				0.003			390	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.002	0.003	320	490	0.003	410		
				42 HRc	0.001	0.003	190	320	0.002	260		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.003	0.004	490	750	0.003	620		
				200 HB				0.004		680	340	
				250 HB				0.004		550	270	
	Malleable & Nodular	8	GGG40, GGG70, 50005	17,19	0.003	0.004	390	650	0.003	520		
				17,19				0.004		550	270	
				18,20				0.004		490	240	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	0.001	0.003	80	110	0.002	90			
			33				Inconel 700			250 HB	80	110
			34				Stellite 21			350 HB	70	110
	Ti based	10	36	TiAl6V4	-	0.001	0.003	110	190	0.002	140	
			37	T40	-	0.003	90	130	110			
Hardened Mat.	Steel	11	38	X100CrMo13,	0.001	0.003	160	290	0.002	220		
			38	440C,				50 HRc		130	220	180
			38	G-X260NiCr42				55 HRc		90	190	140
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.001	0.003	130	190	0.002	160		
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.001	0.003	90	160	0.002	130		
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.001	0.004	650	1310	0.003	980	

# SPMG 07T308 NN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions					
					min	max	min	max	Feed	V <sub>c</sub>				
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.002	0.004	590	880	0.003	730			
		2	2	1045, 1060,	190 HB						0.004	750	370	
		3	3	28Mn6	250 HB						0.004	650	320	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.004	390	750	0.003	570			
			4,6		230 HB						0.004	390	620	500
			5,7		280 HB						0.004	320	550	440
			8		350 HB						0.004	320	490	410
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.004	220	550	0.003	390			
			10		280 HB						0.004	220	490	360
			11		320 HB						0.003	190	420	310
			11		350 HB						0.003	190	320	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.004	550	750	0.003	650			
240 HB					0.003						0.004	390	680	540
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.003	0.003	220	390	0.003	310			
					310 HB							0.003	0.003	390
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.003	320	490	0.003	410			
					42 HRc						0.002	0.003	190	320
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.004	0.004	490	750	0.004	620				
				200 HB						0.004	680	340		
				250 HB						0.004	550	270		
	Malleable & Nodular	8	17,19 17,19 18,20	GGG40, GGG70, 50005	150 HB	0.004	0.004	390	650	0.004	520			
					200 HB						0.004	550	270	
					250 HB						0.004	490	240	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.002	0.003	80	110	0.003	90				
			33	Inconel 700							250 HB			
			34	Stellite 21							350 HB			
	Ti based	10	36	TiAl6V4	-	0.002	0.003	110	190	0.003	140			
37			T40	-	0.003						90	130	110	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.002	0.003	160	290	0.003	220				
				50 HRc						0.003	130	220	180	
				55 HRc						0.003	90	190	140	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.002	0.003	130	190	0.003	160				
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.002	0.003	90	160	0.003	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.002	0.004	650	1310	0.003	980			

## SPMG 090408 NN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.002	0.005	590	880	0.003	730		
		2	1045, 1060,	190 HB	0.005		750		370				
		3	28Mn6	250 HB	0.005		650		320				
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.005	390	750	0.003	570		
			4,6		230 HB		0.005	390	620		500		
			5,7		280 HB		0.004	320	550		440		
			8		350 HB		0.004	320	490		410		
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.005	220	550	0.004	390		
			10		280 HB		0.005	220	490		360		
			11		320 HB		0.004	190	420		310		
			11		350 HB		0.004	190	320		260		
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.004	550	750	0.003	650		
14			240 HB		0.003	0.004	390	680	0.004	540			
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.003	0.004	220	390	0.004	310			
		14		310 HB				390					
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.004	320	490	0.004	410		
			13		42 HRc	0.002	0.003	190	320	0.003	260		
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.005	0.005	490	750	0.005	620			
		15		200 HB				680		340			
		16		250 HB				550		270			
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.005	0.005	390	650	0.005	520		
			17,19		200 HB				550		270		
			18,20		250 HB				490		240		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.002	0.003	80	110	0.003	90			
		33	Inconel 700	250 HB									
		34	Stellite 21	350 HB									
	Ti based	10	36	TiAl6V4	-	0.002	0.003	110	190	0.003	140		
			37	T40	-						90	130	110
	Hardened Mat.	Steel	11	38	X100CrMo13,	0.002	0.003	160	290	0.003	220		
38				440C,	50 HRc						130	220	180
38				G-X260NiCr42	55 HRc						90	190	140
Chilled Cast Iron		40	Ni-Hard 2	400 HB	0.002	0.003	130	190	0.003	160			
White Cast Iron		41	G-X300CrMo15	55 HRc	0.002	0.003	90	160	0.003	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.002	0.005	650	1310	0.003	980		





**W**

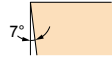
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**M**

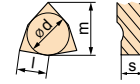
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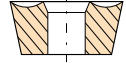
Shape



Clearance Angle



Tolerance



Fixing  
Chip breaker

s ± 0.005  
For l = 04/05/06, d ± 0.002 m ± 0.003  
For l = 08, d ± 0.003 m ± 0.005

Insert Designation	Grade	l	s	r	Direction	Catalog Nr.
<b>WCMX 040208 NN</b>	<b>LT 30</b>	0.169	0.094	0.032	Neutral	M3001122
<b>WCMX 050308 NN</b>	<b>LT 30</b>	0.199	0.125	0.032	Neutral	M3001121
<b>WCMX 06T308 NN</b>	<b>LT 30</b>	0.256	0.156	0.032	Neutral	M3000953
<b>WCMX 080412 NN</b>	<b>LT 30</b>	0.343	0.187	0.047	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 [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions			
					min	max	min	max	Feed	V <sub>c</sub>		
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.002	0.004	590	880	0.003	730		
		2		190 HB		0.004		750		370		
		3		250 HB		0.004		650		320		
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.004	390	750	0.003	570		
				230 HB		0.004		620		500		
				280 HB		0.004		320		550	440	
				350 HB		0.004		320		490	410	
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.004	220	550	0.003	390		
				280 HB		0.004		490		360		
				320 HB		0.003		190		420	310	
				350 HB		0.003		190		320	260	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.004	550	750	0.003	650	
240 HB					0.003						390	680
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.003	0.003	220	390	0.003	310		
				310 HB							0.003	390
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.003	320	490	0.003	410		
				42 HRc						0.002	190	320
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.004	0.004	490	750	0.004	620		
				200 HB						0.004	680	340
				250 HB						0.004	550	270
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.004	0.004	390	650	0.004	520		
				200 HB						0.004	550	270
				250 HB						0.004	490	240
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.002	0.003	80	110	0.003	90			
			33 Inconel 700							0.003	80	110
			34 Stellite 21							0.003	70	110
	Ti based	10	36 TiAl6V4	0.002	0.003	110	190	0.003	140			
			37 T40						0.003	90	130	110
	Hardened Mat.	Steel	11	38 X100CrMo13, 440C,	0.002	0.003	160	290	0.003	220		
38 G-X260NiCr42				0.003						130	220	180
38				0.003						90	190	140
Chilled Cast Iron		40 Ni-Hard 2	0.002	0.003	130	190	0.003	160				
White Cast Iron		41 G-X300CrMo15	0.002	0.003	90	160	0.003	130				
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.002	0.004	650	1310	0.003	980		





## WCMX 050308 NN LT 30

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
						min	max	min	max	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.002	0.005	590	880	0.003	730			
			2		190 HB						0.005	750	370	
			3		250 HB						0.005	650	320	
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.005	390	750	0.003	570			
			4,6		230 HB						0.005	390	620	500
			5,7		280 HB						0.004	320	550	440
			8		350 HB						0.004	320	490	410
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.005	220	550	0.004	390			
			10		280 HB						0.005	220	490	360
			11		320 HB						0.004	190	420	310
			11		350 HB						0.004	190	320	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.004	550	750	0.003	650			
240 HB					0.003						0.004	390	680	0.004
Duplex		5	14	X2CrNiN23-4, S31500	290 HB	0.003	0.004	220	390	0.004	310			
					310 HB							0.004	390	
Ferritic & Martensitic		6	12	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.004	320	490	0.004	410			
			13		42 HRc						0.002	0.003	190	320
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.005	0.005	490	750	0.005	620				
				200 HB						680	340			
				250 HB						550	270			
	Malleable & Nodular	8	17,19	GGG40, GGG70, 50005	150 HB	0.005	0.005	390	650	0.005	520			
			17,19		200 HB						550	270		
			18,20		250 HB						0.005	490	240	
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.002	0.003	80	110	0.003	90				
			33	Inconel 700							250 HB			
			34	Stellite 21							350 HB			
	Ti based	10	36	TiAl6V4	-	0.002	0.003	110	190	0.003	140			
			37	T40	-						0.003	90	130	110
Hardened Mat.	Steel	11	38	X100CrMo13,	0.002	0.003	160	290	0.003	220				
			38	440C,						50 HRc	0.003	130	220	180
			38	G-X260NiCr42						55 HRc	0.003	90	190	140
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.002	0.003	130	190	0.003	160				
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.002	0.003	90	160	0.003	130				
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.002	0.005	650	1310	0.003	980			

## WCMX 06T308 NN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions		
					min	max	min	max	Feed	V <sub>c</sub>	
Steel	Non-alloyed	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	0.002	0.005	590	880	0.004	730	
		2		190 HB		0.005		750		370	
		3		250 HB		0.005		650		320	
	Low alloyed	2	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.005	390	750	0.004	570	
				230 HB		0.005		620		500	
				280 HB		0.005		320		550	440
				350 HB		0.005		320		490	410
	High alloyed	3	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.005	220	550	0.004	390	
				280 HB		0.005		490		360	
				320 HB		0.004		190		420	310
				350 HB		0.004		190		320	260
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.005	550	750	0.003	650
240 HB					0.003	0.005	390	680	0.004	540	
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.003	0.004	220	390	0.004	310	
				310 HB				0.004			390
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.004	320	490	0.004	410	
				42 HRc	0.002	0.004	190	320	0.003	260	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.005	0.005	490	750	0.005	620	
				200 HB				680		340	
				250 HB				550		270	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.005	0.005	390	650	0.005	520	
				200 HB				550		270	
				250 HB				490		240	
High Temp. Alloys	Fe, Ni & Co based	9	31,32 Incoloy 800	0.002	0.004	80	110	0.003	90		
			33 Inconel 700				80			110	
			34 Stellite 21				70			110	
	Ti based	10	36 TiAl6V4	0.002	0.004	110	190	0.003	140		
			37 T40				90		130	110	
	Hardened Mat.	Steel	11	38 X100CrMo13, 440C, G-X260NiCr42	45 HRc	0.002	0.004	160	290	0.003	220
50 HRc				130	220			180			
55 HRc				90	190			140			
Chilled Cast Iron		40 Ni-Hard 2	400 HB	0.002	0.004	130	190	0.003	160		
White Cast Iron		41 G-X300CrMo15	55 HRc	0.002	0.004	90	160	0.003	130		
NF	Al (>8%Si)	12	25 AlSi12	130 HB	0.004	0.005	650	1310	0.004	980	



## WCMX 080412 NN LT 30

Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Feed [inch/rev]		V <sub>c</sub> [sfm]		Optimal cutting conditions				
					min	max	min	max	Feed	V <sub>c</sub>			
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	0.002	0.006	590	880	0.004	730		
		2	2	1045, 1060,	190 HB						370		
		3	3	28Mn6	250 HB						320		
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	0.002	0.006	390	750	0.004	570		
			4,6		230 HB						620	500	
			5,7		280 HB						550	440	
			8		350 HB						490	410	
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	0.003	0.006	220	550	0.005	390		
			10		280 HB						490	360	
			11		320 HB						420	310	
			11		350 HB						320	260	
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	0.002	0.006	550	750	0.004	650		
240 HB					0.003						0.006	390	680
Duplex		5	X2CrNiN23-4, S31500	290 HB	0.003	0.005	220	390	0.004	310			
				310 HB							0.005	390	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	0.003	0.005	320	490	0.004	410			
				42 HRc						0.002	0.005	190	320
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	0.004	0.007	490	750	0.005	620			
				200 HB						680	340		
				250 HB						550	270		
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	0.004	0.007	390	650	0.005	520			
				200 HB						550	270		
				250 HB						490	240		
High Temp. Alloys	Fe, Ni & Co based	9	31,32	Incoloy 800	0.002	0.005	80	110	0.004	90			
			33	Inconel 700							250 HB		
			34	Stellite 21							350 HB		
	Ti based	10	36	TiAl6V4	-	0.002	0.005	110	190	0.004	140		
37			T40	-	90						130	110	
Hardened Mat.	Steel	11	38	X100CrMo13,	0.002	0.005	160	290	0.004	220			
			38	440C,						50 HRc	130	220	180
			38	G-X260NiCr42						55 HRc	90	190	140
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	0.002	0.005	130	190	0.004	160			
	White Cast Iron	41	G-X300CrMo15	55 HRc	0.002	0.005	90	160	0.004	130			
NF	Al (>8%Si)	12	25	AlSi12	130 HB	0.004	0.006	650	1310	0.005	980		

# Thread Milling

Multi-Mat™ Thread Milling



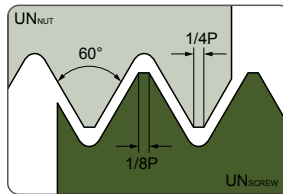
MULTI-MAT™ THREADING LINE

## 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 2D

D = Nominal Thread size



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



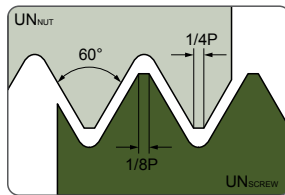
## UN Internal miniature tools

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
TMC04021L8 40UN	4-40UNC	-	40	51	8.1	4	2.12	3	TH400028
TMC04024L9 40UN	5-40UNC	6-40UNC	40	51	9.8	4	2.46	3	TH400055
TMC04025L10 32UN	6-32UNC	-	32	51	10.7	4	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

Values in mm

D = Nominal Thread size



ANSI B1.1-1982



Material Group	Gr. N°	VDI Group	Material Examples*	Hardness	Vc [SFM]		FEED (inch/Tooth) per Cutting Dia.					
					min	max	1.5-3	3.0-5	5.0-7.0	7.0-9.0	9.0-11	
Steel	Non-alloyed	1	1	C35, Ck45, 1020,	125 HB	265	430	0.0012	0.0016	0.0024	0.0028	0.0035
		2	2	1045, 1060,	190 HB	230	360	0.0008	0.0012	0.0020	0.0024	0.0028
		3	3	28Mn6	250 HB	200	330	0.0008	0.0012	0.0020	0.0024	0.0028
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	230	360	0.0008	0.0012	0.0020	0.0024	0.0028
			4,6		230 HB	230	360	0.0008	0.0012	0.0020	0.0024	0.0028
			5,7		280 HB	200	330	0.0008	0.0012	0.0020	0.0024	0.0028
			8		350 HB	165	265	0.0008	0.0012	0.0020	0.0020	0.0020
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	230	365	0.0008	0.0012	0.0020	0.0024	0.0028
			10		280 HB	200	330	0.0008	0.0012	0.0020	0.0024	0.0024
			11		320 HB	165	265	0.0008	0.0012	0.0020	0.0024	0.0024
			11		350 HB	165	230	0.0008	0.0012	0.0020	0.0020	0.0020
	Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	230	360	0.0008	0.0008	0.0012	0.0016	0.0020
240 HB					200	300	0.0008	0.0008	0.0008	0.0012	0.0016	
Duplex		5	X2CrNiN23-4, S31500	290 HB	200	265	0.0008	0.0008	0.0008	0.0012	0.0016	
				310 HB	200	265	0.0006	0.0008	0.0008	0.0012	0.0016	
Ferritic & Martensitic		6	410, X6Cr17, 17-4 PH, 430	200 HB	230	300	0.0008	0.0008	0.0008	0.0012	0.0016	
				42 HRC	200	265	0.0006	0.0008	0.0008	0.0012	0.0012	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	200	360	0.0008	0.0012	0.0024	0.0028	0.0031	
				200 HB	230	360	0.0008	0.0012	0.0020	0.0024	0.0028	
				250 HB	200	300	0.0008	0.0012	0.0020	0.0024	0.0028	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	200	360	0.0008	0.0012	0.0024	0.0028	0.0031	
				200 HB	200	300	0.0008	0.0012	0.0020	0.0024	0.0028	
				250 HB	200	300	0.0008	0.0012	0.0020	0.0024	0.0028	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800	240 HB	130	200	0.0008	0.0008	0.0008	0.0012	0.0016	
				250 HB	100	165	0.0006	0.0006	0.0006	0.0008	0.0008	
				350 HB	65	130	0.0004	0.0004	0.0004	0.0006	0.0006	
	Ti based	10	TiAl6V4	-	130	230	0.0008	0.0008	0.0008	0.0008	0.0010	
				-	80	165	0.0008	0.0008	0.0008	0.0008	0.0008	
				-	80	165	0.0008	0.0008	0.0008	0.0008	0.0008	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRC	100	165	0.0004	0.0004	0.0008	0.0008	0.0008	
				50 HRC	80	165	0.0004	0.0004	0.0008	0.0008	0.0008	
				55 HRC	80	130	0.0004	0.0004	0.0008	0.0008	0.0008	
	Chilled Cast Iron	40	Ni-Hard 2	400 HB	80	130	0.0004	0.0004	0.0008	0.0008	0.0008	
	White Cast Iron	41	G-X300CrMo15	55 HRC	80	130	0.0004	0.0004	0.0008	0.0008	0.0008	
NF	Al (>8%Si)	12	25	AlSi12	130 HB	260	1000	0.0012	0.0012	0.0016	0.0031	0.0047

# 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.

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

## MULTI-MAT™ SOLID CARBIDE LINE



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

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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

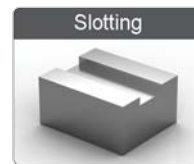
## 2 Flute - Long Length - 30° Helix / SC415C Cylindrical

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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 page 286

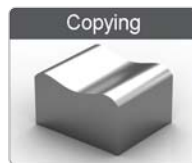
## 2 Flute - Long Length - 30° Helix / SC420C Cylindrical Ball nose

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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

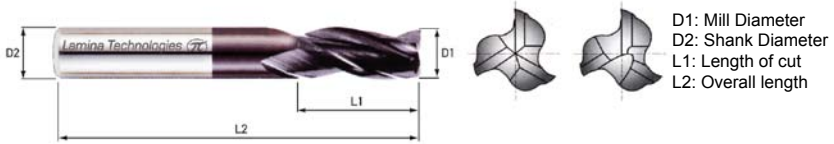


For full machining recommendations  
See page 286

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

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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

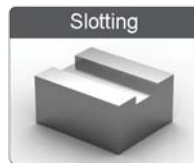
#### Cylindrical SC425C



#### Cylindrical SC430C, SC435C



#### Application Guide



For full machining recommendations  
See page 286

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

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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 page 286

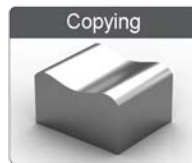
## 4 Flute - Long Length - 30° Helix / Cylindrical Ball nose SC440C

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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



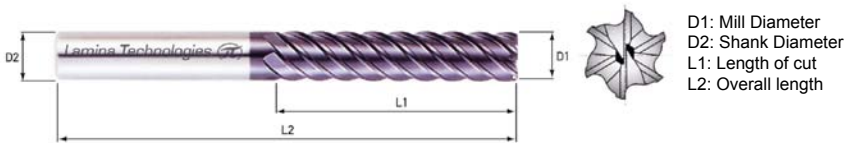
For full machining recommendations  
 See page 286

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

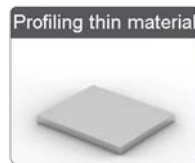
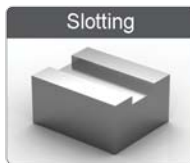
Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	L1	L2	Catalog Nr.
6 flute 6mm long 45° cyl.	6.0	-20 -38	6.0	0 -8	13.0	57.0	M4000845
6 flute 8mm long 45° cyl.	8.0	-25 -47	8.0	0 -9	19.0	63.0	M4000846
6 flute 10mm long 45° cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000847
6 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 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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



## Application Guide



For full machining recommendations  
See page 286

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

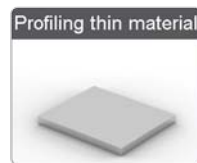
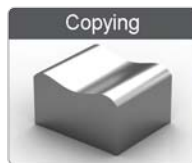
Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	L1	L2	Catalog Nr.
6 flute 6mm long 45° cyl.	6.0	-20 -38	6.0	0 -8	13.0	57.0	M4000869
6 flute 8mm long 45° cyl.	8.0	-25 -47	8.0	0 -9	19.0	63.0	M4000870
6 flute 10mm long 45° cyl.	10.0	-25 -47	10.0	0 -9	22.0	72.0	M4000871
6 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

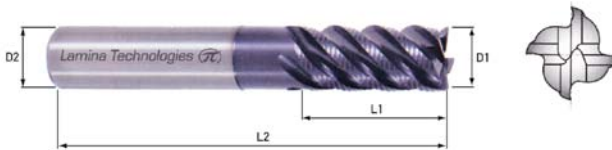
### Application Guide



For full machining recommendations  
See page 286

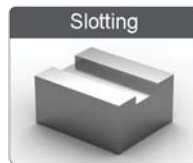
## Multi-Flute - Roughing - Long Reach - 45° Helix / SC465C Cyl.

Product Designation	D1	Tolerance e8 $\mu\text{m}$	D2	Tolerance h6 $\mu\text{m}$	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 page 286

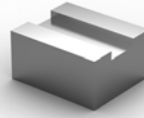


## MACHINING RECOMMENDATIONS

Material Group		Gr. N°	VDI Group	Material Examples*	Hardness	V <sub>c</sub> [sfm]	
						min	max
Steel	Non-alloyed	1	1	C35, Ck45, 1020, 1045, 1060, 28Mn6	125 HB	820	980
			2		190 HB	650	880
			3		250 HB	520	820
	Low alloyed	2	6	42CrMo4, St50, Ck60, 4140, 4340, 100Cr6	180 HB	520	820
			4,6		230 HB	450	590
			5,7		280 HB	450	590
			8		350 HB	390	550
	High alloyed	3	10	X40CrMoV5, H13, M42, D3, S6-5-2, 12Ni19	220 HB	450	590
			10		280 HB	390	450
			11		320 HB	320	450
			11		350 HB	290	390
Stainless Steel	Austenitic	4	304, 316, X5CrNi18-9	180 HB	260	320	
				240 HB	260	320	
	Duplex	5	X2CrNiN23-4, S31500	290 HB	220	290	
				310 HB	220	290	
	Ferritic & Martensitic	6	410, X6Cr17, 17-4 PH, 430	200 HB	320	450	
				42 HRc	260	320	
Cast Iron	Grey	7	GG20, GG40, EN-GJL-250, No30B	150 HB	650	820	
				200 HB	520	650	
				250 HB	490	680	
	Malleable & Nodular	8	GGG40, GGG70, 50005	150 HB	520	650	
				200 HB	450	520	
				250 HB	390	450	
High Temp. Alloys	Fe, Ni & Co based	9	Incoloy 800, Inconel 700, Stellite 21	240 HB	130	190	
				250 HB	130	190	
				350 HB	130	190	
	Ti based	10	TiAl6V4, T40	-	160	320	
				-	130	260	
Hardened Mat.	Steel	11	X100CrMo13, 440C, G-X260NiCr42	45 HRc	160	290	
				50 HRc	130	260	
				55 HRc	130	260	
	Chilled Cast Iron White Cast Iron	11	40, 41	Ni-Hard 2, G-X300CrMo15	400 HB	130	190
					55 HRc	90	160
NF	Al (>8%Si)	12	25	AISI12	130 HB	520	650
	Al (<8%Si)	13	21, 22, 23, 24	Si < 4 % 4% < Si < 8 %	60 HB	650	820
					100 HB	1310	1640
	Cooper Alloys	14	26,27,28	CuZn30	100 HB	650	1640



Shoulder Milling



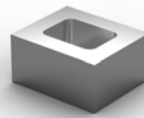
Slotting



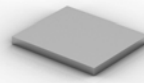
Plunging



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 (mm)	Depth of Cut (mm)
	min	max		
2	0.006	0.025	0.25	2.00
3	0.012	0.040	0.38	3.00
4	0.0160	0.048	0.50	4.00
5	0.020	0.050	0.63	5.00
6	0.025	0.060	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 (mm)	Depth of Cut (mm)
	min	max		
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 (mm)	Depth of Cut (mm)
	min	max		
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

**SLOTTING**

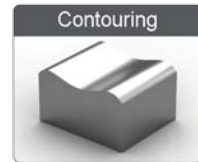
Semi Finishing				
Tool diameter (mm)	Feed per tooth		Width of Cut (mm)	Depth of Cut (mm)
	min	max		
2	0.012	0.020	2.00	2.00
3	0.016	0.030	3.00	3.00
4	0.020	0.032	4.00	4.00
5	0.020	0.040	5.00	5.00
6	0.024	0.048	6.00	6.00
8	0.032	0.050	8.00	8.00
10	0.035	0.055	10.00	10.00
12	0.040	0.060	12.00	12.00
16	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 (mm)	Depth of Cut (mm)
	min	max		
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 (mm)	Depth of Cut (mm)
	min	max		
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 (mm)	Depth of Cut (mm)
	min	max		
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
<b>Non-Alloyed Steel</b>						
1.0036	US137-3	-	-	FE 37BFU	-	-
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	-	-	-	-	-
1.0756	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
1.1133	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	1306 / 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/S45CM045CM	1045
<b>Low Alloyed Steel</b>						
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 80 W1	C 90 E2U	-	C 80 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 80 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	-	1503 - 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	-	-	-	-	-	-
1.7006	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




Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI / SAE	
<b>Low Alloyed Steel</b>							
Lamina group Nr. 2	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	SMnCr 420H	5120
	1.7176	55 Cr 3	55 C 3	527 A60	55 Cr 3	SUP9 (A)	5155 / 5160
	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	A182 A387 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	-	-	-	-	-	
<b>High Alloyed Steel</b>							
Lamina group Nr. 3	1.2311	40 CrMnMo 7	-	-	35 CrMo 8 KU	-	-
	1.2343	X38 CrMoV 5 1	Z38 CDV 5	BH11	X37 CrMoV51 KU	SKD 6	H 11
	1.2344	X40 CrMoV 5 1	Z40 CDV 5	BH13	X40 CrMoV511 KU	SKD 61	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	-
	1.2436	X210 CrW 12	Z210 CW 12 1	-	X215 CrW 12 1 KU	SKD 2	-
	1.2510	100 MnCrW 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	-	-
	1.2606	X37 CrMoW 5 1	Z35 CWDV 5	BH12	X35 CrMoW 05 KU	SKD 62	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 WKCDV 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	-
	1.3246	S 7-4-2-5	Z110 WKCDV 7 5 4 4 2	-	HS 7-4-2-5	-	M 41
	1.3247	S 2-10-1-8	Z110 DKCWV 9 8 4 2 1	BM42	HS 2-9-1-8	SKH 59	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
1.4086	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	

Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI / SAE
<b>High Alloyed Steel</b>						
1.4922	X20 CrMoV 12 1	-	-	X20 CrMoV 12 1	-	-
1.5662	X8 Ni 9	-	1502-502-650	X10 Ni 9	SL 9N53 / 60	A353
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 NiCrMo 4(KB)	-	9840 4340
1.6523	21 NiCrMo 2	20 NCD 2	805 M20	20 NiCrMo 2	SNCM 220(H)	8620
1.6546	40 NiCrMo 22	-	311-Type 7	40 NiCrMo 2(KB)	SNCM 240	8740
1.6562	40 NiCrMo 8 4	-	817 M40	40 NiCrMo 7(KB)	-	E 4340
1.6565	40 NiCrMo 8	-	817 A37 / 818 M40	-	SNCM 439	4340 / 9850
1.6580	30 CrNiMo 8	30 CND 8	823 M30	30 NiCrMo 8	SNCM 431	-
1.6582	34 CrNiMo 6	35 NCD 6	817 M40	34 CrNiMo 6	SNCM 447	4340 / 4337
1.6587	17 CrNiMo 6	18 NCD 6	820 A16	-	-	-
1.6657	14 NiCrMo 34	16 NCD 13	832 M13	15 NiCrMo 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	9262
1.7131	16 MnCr 5	16 MC 5	527 M17 / 590 H17	16 MnCr 5	-	5115
1.7238	49 CrMo 4	-	-	-	-	-
1.7262	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 / SCMV4	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 NiCr 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 ClD
1.8509	41 CrAlMo 7	40 CAD 6.12	905 M39	41 CrAlMo 7	SACM 645 / SACM 1	A 355 ClA / 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	-	-	-
<b>Austenitic Stainless Steel</b>						
1.4005	X12 CrS 13	Z11 CF 13	416 S21	X12 CrS 13	SUS 416	416
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 Cr 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 / SCS19	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
1.4406	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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<b>Austenitic Stainless Steel</b>							
Lamina group Nr. 4	1.4408	G-X5 CrNiMo 19 11 2	-	316 C16 / (LT196) / 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
<b>Duplex Stainless Steel</b>							
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	-	X6 CrTi 17	SUS 430LX	430 Ti / 439
	1.4511	X3 CrNb 17	Z4 CNb 17	-	X6 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	X6 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	X6 CrNiNb 18 11	-	348
	1.4550	X6 CrNiNb 18 10	Z6 CNb 18 10	347 S20 / 347 S31	X6 CrNiNb 18 11	SUS 347	347 / 348
	1.4552	G-X5 CrNiNb 19 11	Z4 CNb 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	X6 CrNiMoTi 17 12	SUS 316Ti	316Ti
	1.4580	X6 CrNiMoNb 17 12 2	Z6 CNDNb 17 12	318 S17	X6 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	-	-	X6 CrNiMoNb 17 13	-	318
	1.4585	G-X7 CrNiMoCuNb 18 18	-	-	X6 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	X6 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	X6 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 CNKDWnb	-	-	-	-	



Material number	 DIN	 AFNOR	 BS	 UNI	 JIS	 AISI / SAE	
<b>Ferritic &amp; Martensitic Stainless Steel</b>							
Lamina group Nr. 6	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	X6 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	HNW3
1.4720	X20 CrMo 13	-	-	-	-	-	
1.4724	X10 CrAl 13	Z10 C 13	-	X10 CrAl 12	SUH 405	405	
<b>Cast Iron Grey</b>							
Lamina group Nr. 7	0.6010	EN-GJL 100 / GG 10	F1 10D	-	G 10	FC 100	CLASS 20
	0.6015	EN-GJL 150 / GG 15	F1 15D	GRADE 150	G 15	FC 150	CLASS 25
	0.6020	EN-GJL 200 / GG 20	F1 20D	GRADE 220	G 20	FC 200	CLASS 30
	0.6025	EN-GJL 250 / GG 25	F1 25D	GRADE 260	G 25	FC 250	CLASS 35
	0.6030	EN-GJL 300 / GG 30	F1 30D	GRADE 300	G 30	FC 300	CLASS 45
	0.6035	EN-GJL 350 / GG 35	F1 35D	GRADE 350	G 35	FC 350	CLASS 50
	0.6040	EN-GJL 400 / GG 40	F1 40D	GRADE 400	-	-	CLASS 55
	<b>Cast Iron Malleable &amp; Nodular</b>						
Lamina group Nr. 8	0.7033	EN-GJS 350 / GGG 35.3	-	-	-	-	-
	0.7040	EN-GJS 400 / GGG 40	FCS 400-12	SNG420/12	GGG 40	FCD 400	60-40-18
	0.7043	EN-GJS 400-15 / GGG 40.3	FCS 370-17	SNG370/17	-	-	-
	0.7050	EN-GJS 500 / GGG 50	FCS 500-7	SNG500/7	GGG 50	FCD 500	80-55-06
	0.7060	EN-GJS 6007 / GGG 60	FCS 600-3	SNG600/3	GGG 60	FCD 600	-
	0.7070	EN-GJS 700 / GGG 70	FCS 700-2	SNG700/2	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 370	40010
	0.8155	GTS-55	MP50-5	P510/4	-	FCMP 490	50005
	0.8165	GTS-65	MP60-3	P570/3	-	FCMP 540	70003
0.8170	GTS-70	M870-2	P690/2	-	-	90001	
<b>Fe, Ni &amp; Co based High Temperature Alloys</b>							
Lamina group Nr. 9	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
	2.4668	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 16 Fe7TiAl	-	-	-	Inconel 751	Inconel 751
	2.4810	G-NiMo 30	-	-	-	Hastelloy C	Hastelloy C
	2.4856	NiCr 22Mo 9Nb	NC 22 FeDNb	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
<b>Ti based High Temperature Alloys</b>						
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 6 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	
<b>Al (&gt;8%Si) Non-Ferrous</b>						
Gr. Nr. 12	3.2573	G-AISI9	-	-	-	-
	3.2581	G-AISI12	-	-	-	-
	3.2583	G-AISI12 Cu	-	-	-	-
<b>Al (&lt;8%Si) Non-Ferrous</b>						
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-G3M	-	-	-
<b>Cooper Alloys Non-Ferrous</b>						
Group Nr. 14	2.0966	CuAl10 Ni5 Fe4	CuAl9 Ni5 Fe3 M1	CA 104	-	CDA / C63000
	2.1052	CuSn 12 Ni	-	1400 PB2	-	CDA / C91700
	2.1090	CuSn7 ZNPb	U-E7 Z5 Pb4	BS 1400	-	CDA / C93200
	2.1176	CuPb10 SN	U PB8	1400 LB2	-	CDA / C94400

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## Notes

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**LAMINA**  
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# THE MULTI-MAT™ TECHNOLOGY

**Productivity is everything, innovation is beyond**

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