

# UP2DATE

## The Revolution in Turning

High Dynamic Turning with FreeTurn



**FREETURN**  
The revolution in turning

**ALULINE**  
With optimised coating and geometry  
for the effective machining of aluminium  
and non-ferrous metals

**MONSTERMILL TCR**  
Titanium machining done to perfection

**PCD MILLING TOOLS**  
Hard cutting material = long tool life

**MAXIMILL 271**  
New system size for more economy

TEAM CUTTING TOOLS



KOMET



KLENK

CERATIZIT is a high-tech engineering group  
specialised in tooling and hard material  
technologies.

**Tooling the Future**

[www.ceratizit.com](http://www.ceratizit.com)

# Welcome!



It couldn't be easier  
**Ordering via the  
Online Shop**

<http://cuttingtools.ceratizit.com>



On-site technical support  
**Your Local Technical  
Sales Engineer**

Your customer number

# FreeTurn

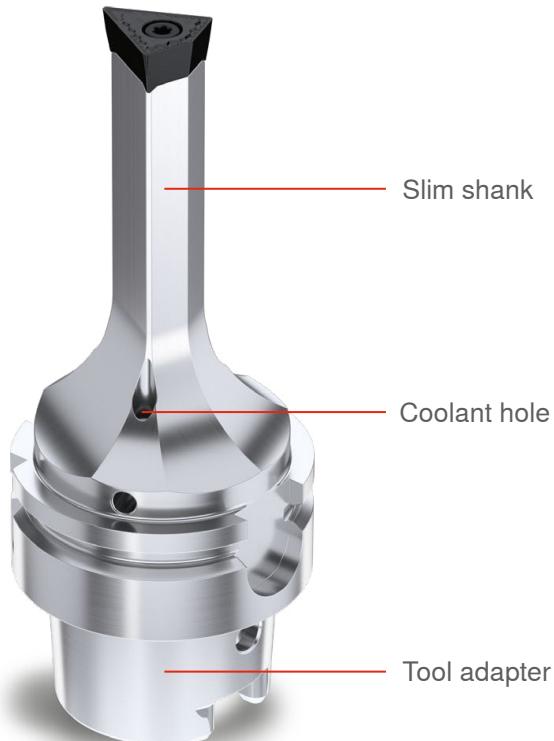
Be part of the  
FreeTurn generation!

Multi-award-winning:



## High Dynamic Turning (HDT)

With High Dynamic Turning, HDT for short, and the dynamic FreeTurn turning tools, CERATIZIT is turning the conventional method of turning completely on its head. All familiar turning operations such as roughing, finishing, contour turning, facing and longitudinal turning can now be completed using just one tool.



Conventional application:

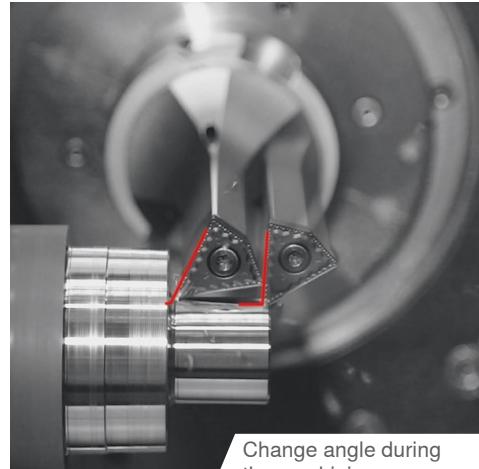
**5 tools**

Application with FreeTurn:

**1 tool**

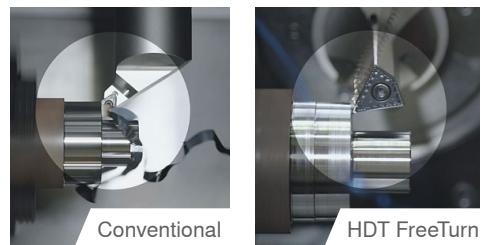
## Variable approach angle

- ▲ Can be changed during machining
- ▲ Adjustable feed rates
- ▲ Perfect chip control
- ▲ Dynamic turning in all directions
- ▲ Pull and push cut



Change angle during  
the machining process

Comparison

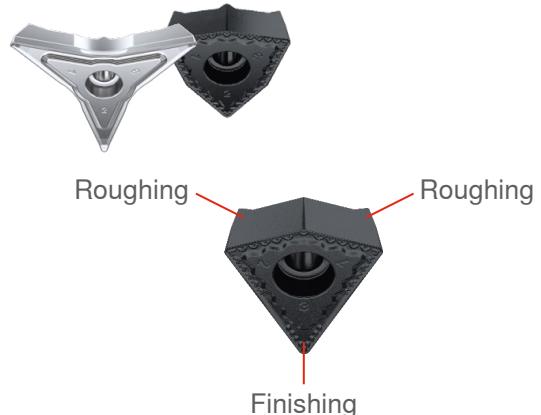


Conventional

HDT FreeTurn

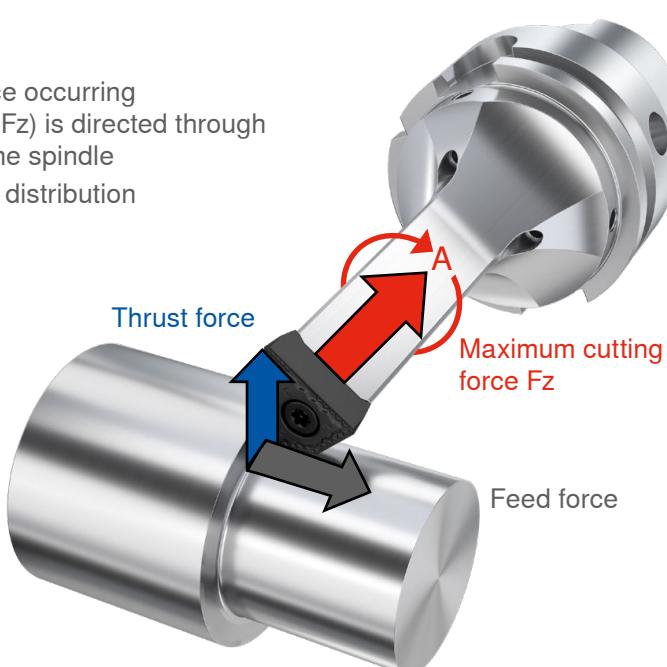
## Flexibility

- ▲ Turning with just one tool
- ▲ Huge savings on tool types
- ▲ No tool changes = huge time savings
- ▲ Indexable inserts with up to three ISO geometries can be used on one holder
- ▲ An indexable insert with multiple cutters can consist of different point angles, flanging radii, chip breakers, coatings and cutting materials and can be customised for use.



## Stability

- ▲ The main force occurring (cutting force  $F_z$ ) is directed through the tool into the spindle
- ▲ Optimal force distribution

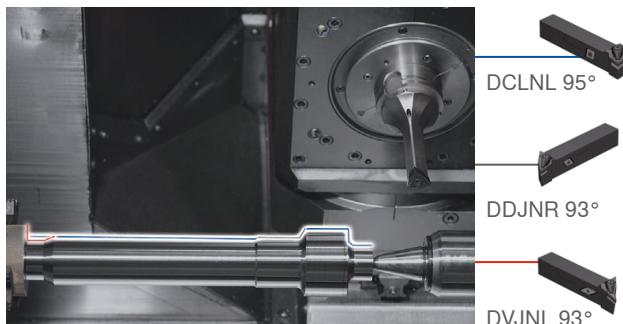


## Time comparison

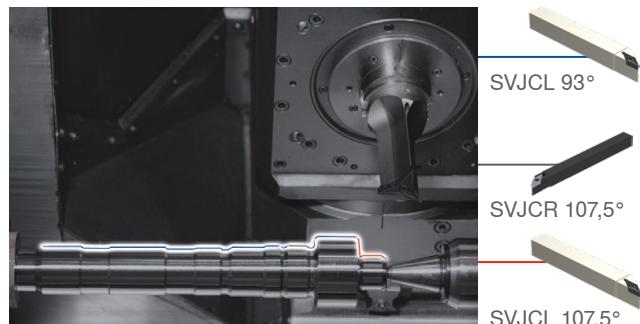
Material 42CrMo4

Dynamic cutting parameters in the process based on catalogue cutting data

### Roughing



### Finishing



### Conventional production

Conventional production time for a single part with six different tools

= 03:32 minutes

### Production with FreeTurn

Production time for a single part with the HDT

= 2:50 minutes

**25 %**  
Time savings

### Productivity

- ▲ Almost all workpiece contours can be machined
- ▲ 40% higher feed rate value
- ▲ Up to 90 % fewer empty runs
- ▲ Adjustable feed rates during the process
- ▲ Improved surface quality thanks to ideal adjustment of the approach angle
- ▲ The versatility of the FreeTurn means fewer tool changes
- ▲ Fewer tool spaces required in the machine

Follow our video: A time comparison between conventional machining and the HDT. You'll be amazed!



Further information on the product can be found on page 18–29

# AluLine

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With optimised coating and geometry for the effective machining of aluminium and non-ferrous metals



Solid carbide milling tools from CERATIZIT ensure you always do a good job: We have added milling tools for machining aluminium and non-ferrous metals to our product portfolio. This means you will now be able to find the ideal product for any application.

This AluLine milling cutter allows you to master even the toughest demands when working with aluminium and non-ferrous metals. This is all made possible thanks to the special geometry and the specifically tailored coating.



Our AluLine milling cutter impresses with its outstanding coating. It achieves first-rate results even in dry machining.

Product Manager CERATIZIT, Michael Wucher

## Advantages/ benefits

- ▲ **Economical and process-secure machining of aluminium and non-ferrous metals.**  
Optimal performance thanks to the perfectly coordinated combination of geometry, substrate and coating.
- ▲ **Optimal/versatile tool selection for almost all applications in the machining of non-ferrous metals**  
The product portfolio has increased in size following the program extension and now offers access to around 2500 items.
- ▲ **Extremely long tool service life possible**  
Thanks to the wear-resistant DLC coating.



Further information on the product can be found on page 30–65



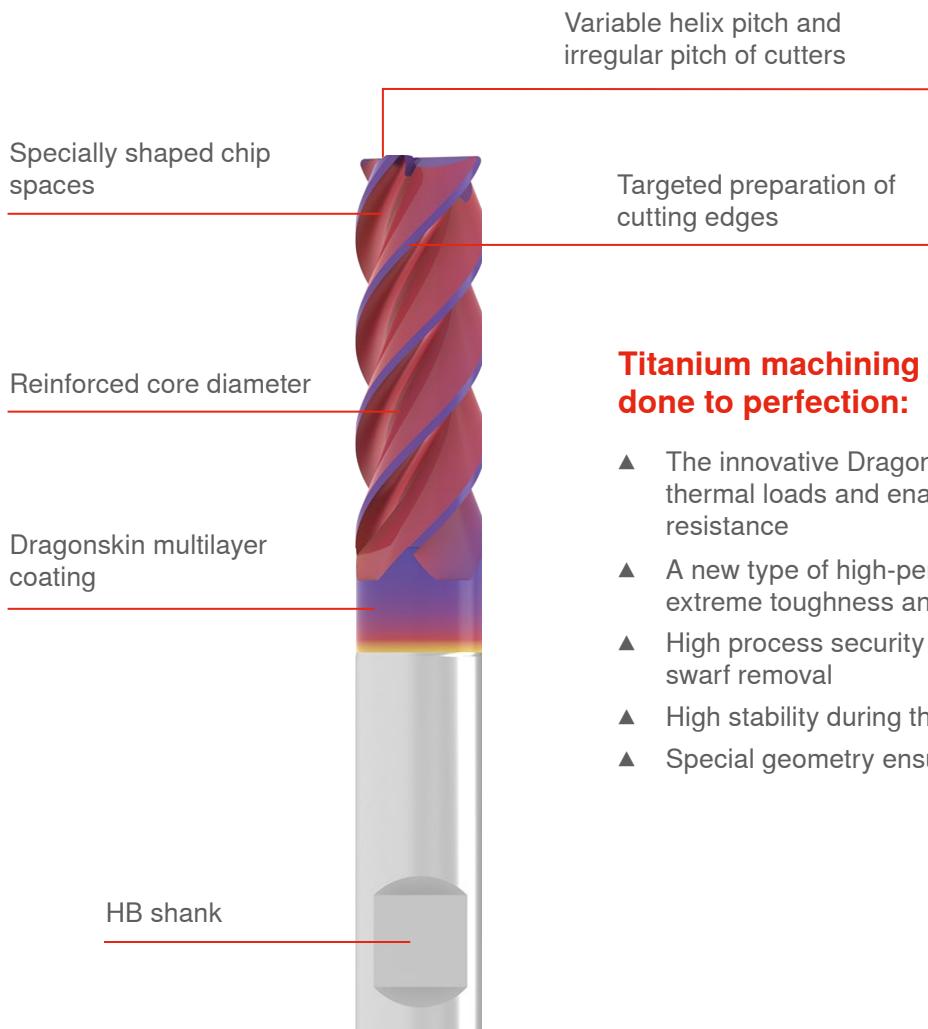
# MonsterMill TCR

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Titanium machining done  
to perfection



Developed for machining titanium parts – predestined for use in the area of medical technology and for the aerospace industry: The MonsterMill TCR milling cutter is setting new standards in titanium machining and impresses thanks to its process security and long tool life.



### Titanium machining done to perfection:

- ▲ The innovative Dragonskin coating reduces thermal loads and enables high levels of wear resistance
- ▲ A new type of high-performance substrate for extreme toughness and torsional strength
- ▲ High process security thanks to safe and targeted swarf removal
- ▲ High stability during the process
- ▲ Special geometry ensures strong performance

### Test Report

Material	3.7164 TiAl6V4
Ø Milling cutter diameter (mm)	12
Number of flutes	5
Speed $v_c$ (m/min)	90
Rotation n (rpm)	2,388
Feed per tooth $f_z$ (mm)	0,120
Table feed $v_f$ (mm/min)	1,433
Cutting depth $a_p$ (mm)	18
Cutting width $a_e$ (mm)	0,75
Coolant type	Emulsion

Tool life  $T_{\text{Total}}$  min.

**450**  
Minutes

CERATIZIT

Tool life  $T_{\text{Total}}$  min.

**360**  
Minutes

Competitor



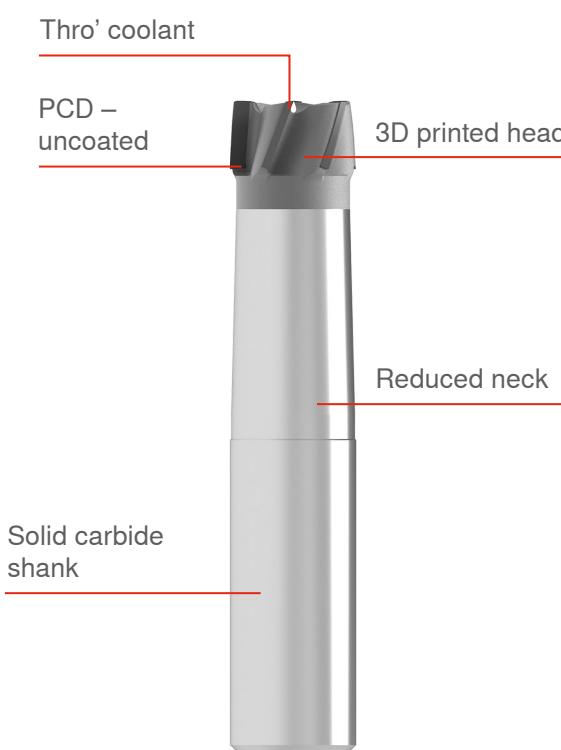
Further information on the product can be found on page 66–79

# PCD milling tools

Hard cutting material  
= long tool life

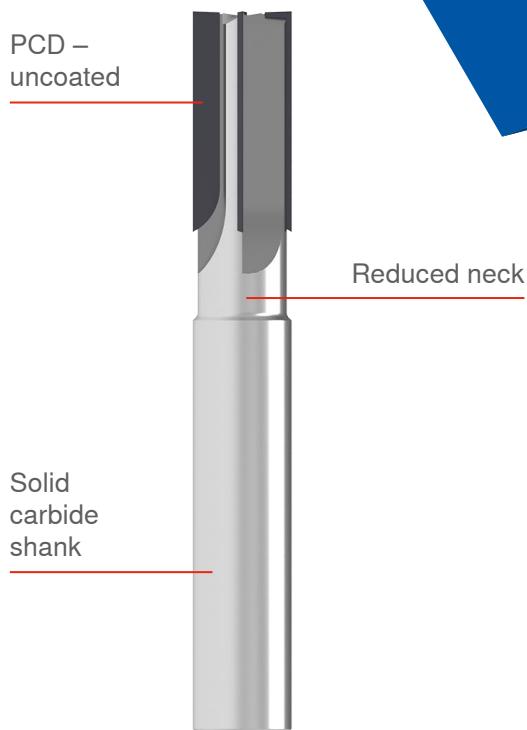
## PCD – polycrystalline diamond

The polycrystalline diamond is a synthetically produced diamond material which comes very close to the hardness of monocrystalline diamond (natural diamond). Its high level of hardness makes it possible to machine and withstand particularly abrasive materials. Tools with PCD cutting materials are therefore extremely well suited for machining lightweight construction materials like aluminium, magnesium and fibre-reinforced plastics. When circular milling with PCD-equipped tools, fewer radius corrections are required before the end of the tool life in comparison to solid carbide tools. This significantly increases the process security.



## Additively manufactured PCD tools

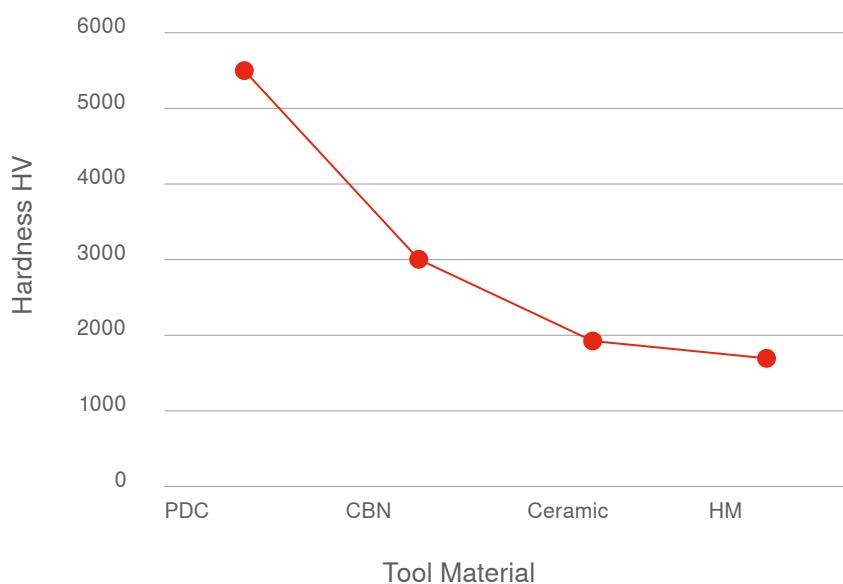
- ▲ Diameter range 10–32 mm
- ▲ More cutting edges than conventionally produced PCD face mills
- ▲ High blade angle for silent running
- ▲ As a screw-in cutter for variable tool length
- ▲ In projection lengths  $2.5 \times DC$  in hybrid design with solid carbide base body



### PCD end mill

- ▲ With up to 4 cutting edges
- ▲ High resistance to wear
- ▲ Extremely high cutting speeds
- ▲ Specialist for aluminium and graphite

### Hardness comparison of ultra-hard cutting materials



Further information on the product can be found on page 80–91

# MaxiMill 271

New system size for more economy

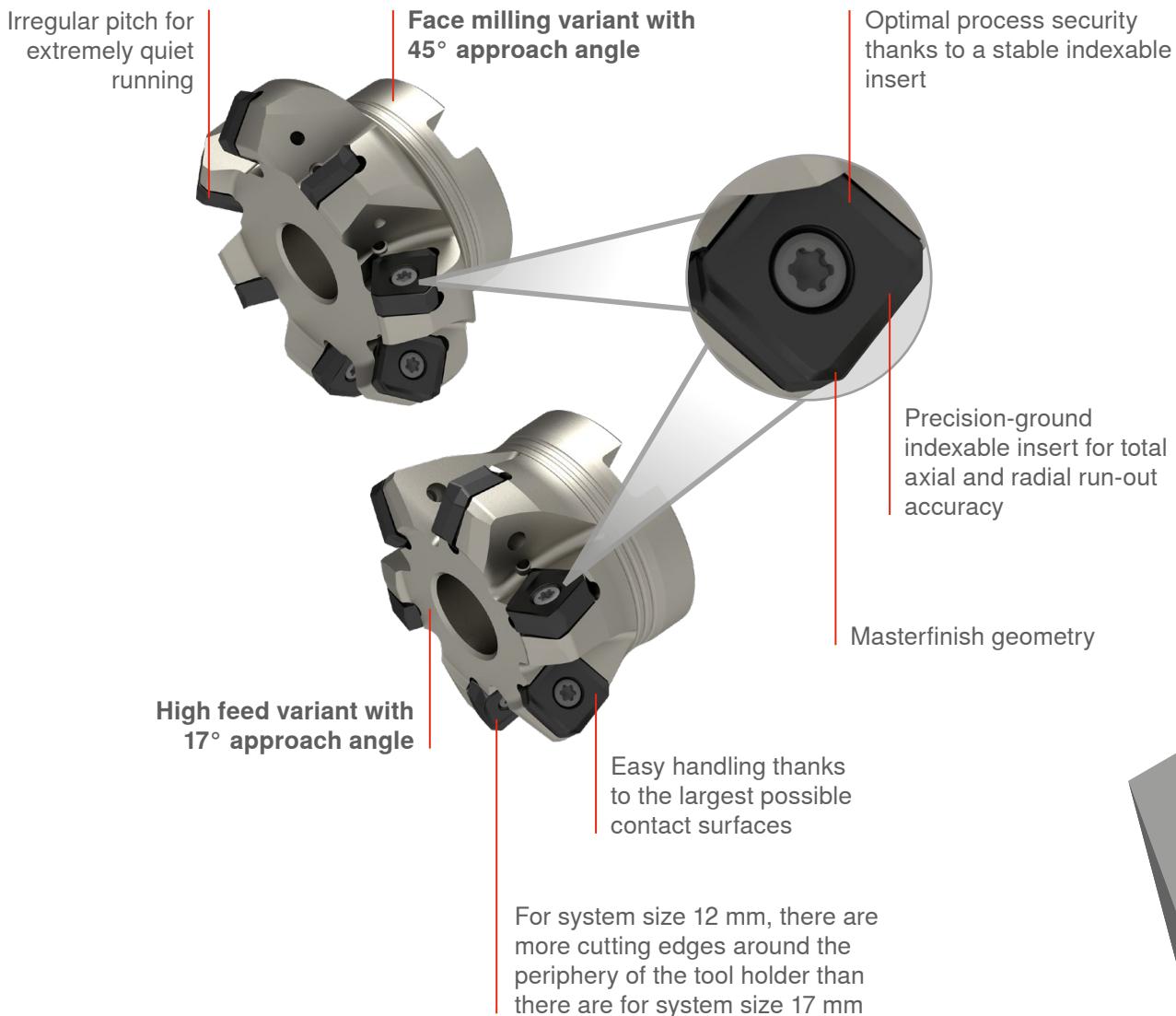


Further information on the product can be found on page 92–99

## Advantages/ benefits

- ▲ **Optimal surface quality**  
Produced with the Masterfinish geometry
- ▲ **Flexible usage / wide range of applications**  
Product portfolio with fine and standard pitch holders
- ▲ **High chip volume and cutting data and outstanding process security**  
Thanks to stable and highly streamlined indexable inserts
- ▲ **Excellent efficiency**  
8 usable cutting edges
- ▲ **Perfect face and radial run-out properties**  
Thanks to the tool holder's close tolerances in combination with the indexable inserts' precision peripherally ground cutting edges

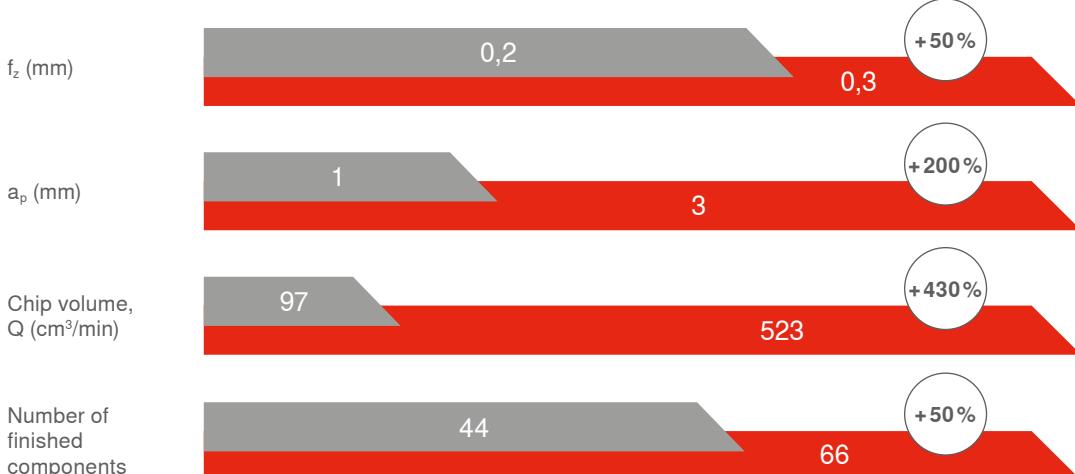
Efficiency, process security and flexibility. That's what MaxiMill 271 stands for. The extremely soft-cutting tool system can be used in a wide range of applications thanks to the fine and standard pitch holders, while the wiper insert also helps achieve first-class finishes. Furthermore, the system stands out thanks to the cutter's excellent wear behaviour and also impresses with optimal chip formation and removal.



## Test Report

Ø Milling cutter diameter (mm)	125
Material	S355
Speed $v_c$ (m/min)	200
Cutting width $a_e$ (mm)	100

■ CERATIZIT  
■ Competitor



# FreeTurn

Be part of the  
FreeTurn generation!

Turning Tools

FreeTurn

18–29



## Solid Carbide milling cutters

AluLine

30–65

MonsterMill TCR

66–79

CircularLine CCR-Ti

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## Tools made from ultra-hard cutting materials

PCD milling cutters

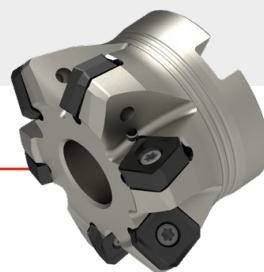
80–91



## Milling tools with indexable inserts

MaxiMill 271-12

92–99



## Vices

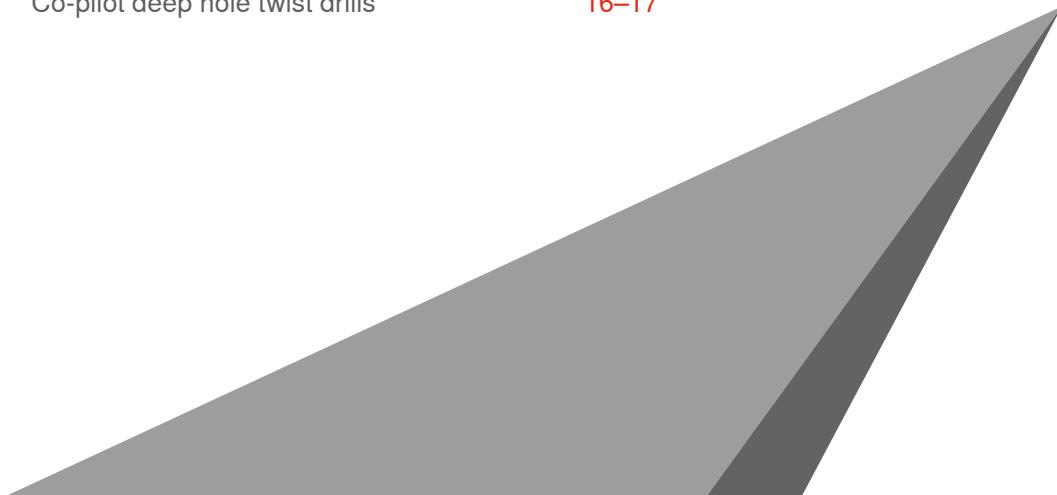
Magnet – workpiece support, set

100

## Solid Carbide Drilling

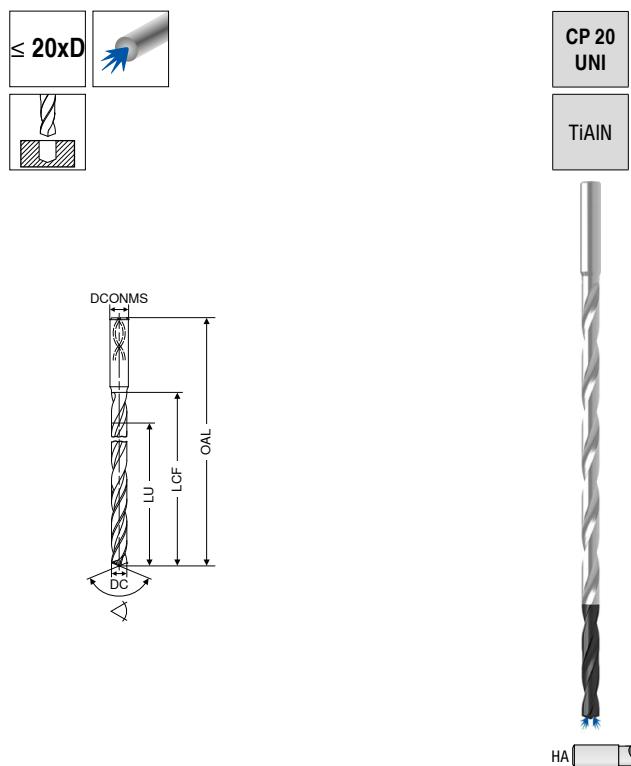
Co-pilot deep hole twist drills

16–17



## WTX – Co-pilot deep hole twist drills

- ▲ Cutting tolerance j6 optimally coordinated as an intermediate tolerance between the pilot drill and deep hole twist drill
- ▲ Pilot hole necessary
- ▲ up to 20xD without peck drilling
- ▲ Excellent alignment precision
- ▲ Reliable chip removal



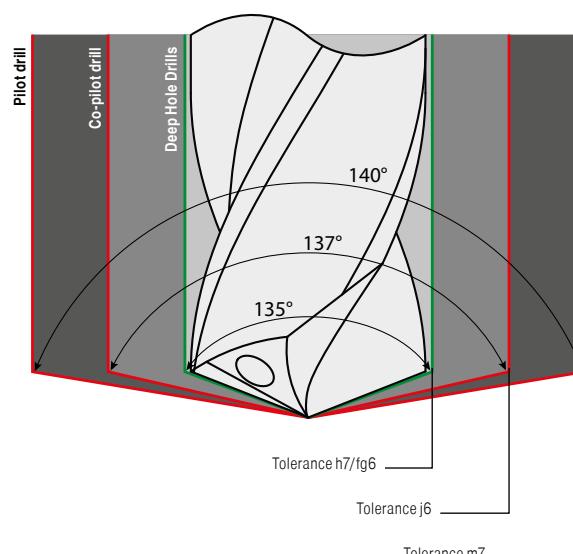
DC <sub>j6</sub>	DCONMS <sub>h5</sub>	OAL	LCF	LU	
mm	mm	mm	mm	mm	
3,0	6	120	80	60	03000
4,0	6	130	90	80	04000
4,2	6	160	110	84	04200
4,5	6	160	110	90	04500
4,8	6	160	120	96	04800
5,0	6	160	120	100	05000
5,5	6	185	140	110	05500
5,8	6	185	140	116	05800
6,0	6	185	140	120	06000
6,5	8	210	160	130	06500
6,8	8	210	160	136	06800
7,0	8	210	160	140	07000
7,5	8	230	180	150	07500
7,8	8	230	180	156	07800
8,0	8	230	180	160	08000
8,5	10	260	195	170	08500
8,8	10	290	230	176	08800
9,0	10	290	230	180	09000

Steel	●
Stainless steel	●
Cast iron	●
Non ferrous metals	
Heat resistant alloys	

## Technical Information

- ▲ Ensures an even safer deep hole drilling process
- ▲ Reduction in material cutting time for the deep hole twist drill
- ▲ For optimal guidance of the deep hole twist drill for hole depths > 30xD

### Tolerance and angle



### Tolerance table

ISO tolerances for shafts and holes

Tolerance designation	of Ø	3	6	10	18
up to and including	6	10	18	30	
p6	20	24	29	35	
	12	15	18	22	
h7	0	0	0	0	Deep hole twist drill 16xD to 30xD
	-12	-15	-18	-21	
j6	6	7	8	9	Co-pilot drill
	-2	-2	-3	-4	
fg6	-6	-8			Deep hole twist drill > 30xD
	-14	-17			
m6	12	15	18	21	
	4	6	7	8	
m7	16	21	25	29	WTX UNI / WPC
	4	6	7	8	

**i** Please observe the strategy for producing deep holes in the main catalogue for 2019 on → **page 134**

# Cutting data standard values – WTX – co-pilot deep hole twist drills

Index	Material	Strength N/mm <sup>2</sup> / HB / HRC	v <sub>c</sub> m/min	Ø > 3–5	Ø > 5–8	Ø > 8–12
				f mm/rev.	f mm/rev.	f mm/rev.
P	1.1 General construction steel	< 800 N/mm <sup>2</sup>	95	0,10	0,15	0,20
	1.2 Free cutting steel	< 800 N/mm <sup>2</sup>	95	0,10	0,15	0,20
	1.3 Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	100	0,14	0,20	0,275
	1.4 Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	90	0,10	0,15	0,20
	1.5 Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	90	0,14	0,20	0,275
	1.6 Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	90	0,10	0,15	0,20
	1.7 Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	90	0,14	0,20	0,275
	1.8 Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	70	0,10	0,15	0,20
	1.9 Steel castings	< 850 N/mm <sup>2</sup>	70	0,10	0,15	0,20
	1.10 Nitriding steel	< 1000 N/mm <sup>2</sup>	90	0,10	0,15	0,20
	1.11 Nitriding steel	< 1200 N/mm <sup>2</sup>	90	0,10	0,15	0,20
	1.12 Roller bearing steel	< 1200 N/mm <sup>2</sup>	70	0,10	0,15	0,20
	1.13 Spring steel	< 1200 N/mm <sup>2</sup>				
	1.14 High-speed steel	< 1300 N/mm <sup>2</sup>				
	1.15 Cold working tool steel	< 1300 N/mm <sup>2</sup>				
	1.16 Hot working tool steel	< 1300 N/mm <sup>2</sup>	70	0,10	0,15	0,20
M	2.1 Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	70	0,08	0,12	0,15
	2.2 Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	70	0,08	0,12	0,15
	2.3 Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	45	0,08	0,12	0,15
	2.4 Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	45	0,08	0,12	0,15
	2.5 Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>	50	0,08	0,12	0,15
	2.6 Stainless steel, austenitic	< 750 N/mm <sup>2</sup>	50	0,08	0,12	0,15
	2.7 Heat resistant steel	< 1100 N/mm <sup>2</sup>				
K	3.1 Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	100	0,23	0,335	0,425
	3.2 Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	95	0,23	0,335	0,425
	3.3 Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	100	0,20	0,25	0,35
	3.4 Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	95	0,20	0,25	0,35
	3.5 White malleable cast iron	270–450 N/mm <sup>2</sup>	100	0,20	0,25	0,35
	3.6 White malleable cast iron	500–650 N/mm <sup>2</sup>	95	0,20	0,25	0,35
	3.7 Black malleable cast iron	300–450 N/mm <sup>2</sup>	100	0,20	0,25	0,35
	3.8 Black malleable cast iron	500–800 N/mm <sup>2</sup>	95	0,20	0,25	0,35
N	4.1 Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>				
	4.2 Aluminium alloys < 0,5 % Si	< 500 N/mm <sup>2</sup>				
	4.3 Aluminium alloy 0,5–10 % Si	< 400 N/mm <sup>2</sup>				
	4.4 Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>				
	4.5 Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>				
	4.6 Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>				
	4.7 Copper wrought alloys	< 700 N/mm <sup>2</sup>				
	4.8 Special copper alloys	< 200 HB				
	4.9 Special copper alloys	< 300 HB				
	4.10 Special copper alloys	> 300 HB				
	4.11 Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>				
	4.12 Long-chipping brass	< 600 N/mm <sup>2</sup>				
S	4.13 Thermoplastics					
	4.14 Duroplastics					
	4.15 Fibre-reinforced plastics					
	4.16 Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>				
	4.17 Graphite					
	4.18 Tungsten and tungsten alloys					
	4.19 Molybdenum and molybdenum alloys					
	5.1 Pure nickel					
	5.2 Nickel alloys					
	5.3 Nickel alloys	< 850 N/mm <sup>2</sup>				
H	5.4 Nickel molybdenum alloys					
	5.5 Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>				
	5.6 Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>				
	5.7 Heat resistant alloys	< 1300 N/mm <sup>2</sup>				
	5.8 Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>				
	5.9 Pure titanium	< 900 N/mm <sup>2</sup>				
H	5.10 Titanium alloys	< 700 N/mm <sup>2</sup>				
	5.11 Titanium alloys	< 1200 N/mm <sup>2</sup>				
	6.1	< 45 HRC				
	6.2	46–55 HRC				
	6.3 Tempered steel	56–60 HRC				
	6.4	61–65 HRC				
	6.5	65–70 HRC				

**i** The cutting data depends extremely on the external conditions, the material and machine type. The indicated values are possible values which have to be increased or reduced according to the application conditions.

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## CERATIZIT \ Performance

Premium quality tools for high performance.

The premium quality tools from the **CERATIZIT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

## Symbol explanation

**-28P** Polished chip breaker  
**H216T** Carbide Grade

**F** Fine Machining  
**M** Medium Machining  
**R** Rough Machining

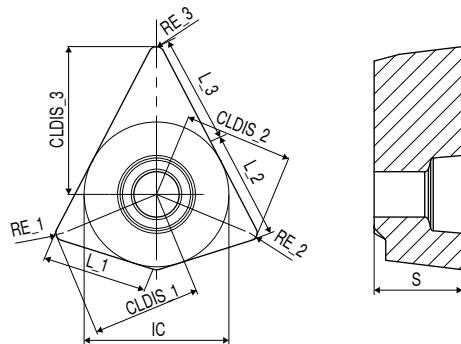
   Smooth cut  
 Irregular cutting depth  
 Interrupted cut

## Overview – FreeTurn

	Inserts	Type			Tool holder				
		Designation	Chip groove	CTCP125	CTPM125	H216T	HSK-T 63 / LPR = 100	HSK-T 63 / LPR = 125	PSC 63 / LPR = 100
	FT15 M 808055R08-MMF			19	19				
	FT15 M 808055R080804-MMF			19			22	22	23
	FT15 M 808055R121208-MMF			19					23
	FT15 G 353535R04-28P	-28P				20			
	FT15 G 353535R08-28P	-28P				20	22	22	23
	FT15 M 555555R04-FFF			21			22	22	23
	FT15 M 555555R04-FFF			21	21				23
	FT17 M 808080R04-MMM			24					
	FT17 M 808080R08-MMM			24	24		25	25	26
	FT17 M 808080R12-MMM			24					26

 You will find a detailed explanation of the designation system on → **page 29**

## FT15 . 808055...



Designation	IC	CLDIS_1	L_1	CLDIS_2	L_2	CLDIS_3	L_3	S
	mm	mm	mm	mm	mm	mm	mm	mm
FT15 M 808055R080804-MMF	15	11,22	10,8	11,22	11,4	15,78	11,4	9,14
FT15 M 808055R08-MMF	15	11,22	10,8	11,22	11,2	15,31	11,2	9,14
FT15 M 808055R121208-MMF	15	11,00	10,7	11,00	11,2	15,31	11,2	9,14

CTCP125

CTPM125

DRAGOSKIN



M M F

NEW Article no.  
74 003 ...

DRAGOSKIN



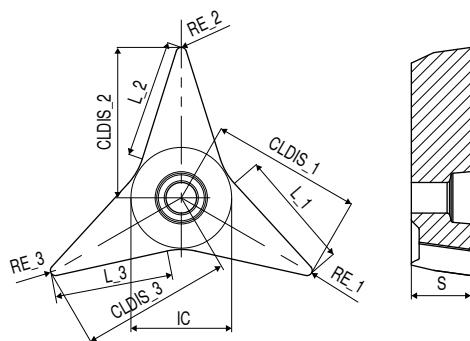
M M F

NEW Article no.  
74 003 ...

ISO	RE_1	RE_2	RE_3	Article no. 74 003 ...	Article no. 74 003 ...
	mm	mm	mm		
FT15 M 808055R080804-MMF	0,8	0,8	0,4	00400	
FT15 M 808055R08-MMF	0,8	0,8	0,8	00200	10200
FT15 M 808055R121208-MMF	1,2	1,2	0,8	00600	

Steel	●	○
Stainless steel	○	●
Cast iron	○	
Non ferrous metals		
Heat resistant alloys		

## FT15 . 353535...



Designation	IC	CLDIS_1	L_1	CLDIS_2	L_2	CLDIS_3	L_3	S
	mm	mm	mm	mm	mm	mm	mm	mm
FT15 G 353535R04-28P	15	24,01	16,1	24,01	16,1	24,01	16,1	9,14
FT15 G 353535R08-28P	15	23,08	15,2	23,08	15,2	23,08	15,2	9,14

-28P  
H216T

DRAGONSKIN



F F F

NEW

Article no.  
74 001 ...

ISO	RE_1	RE_2	RE_3		
	mm	mm	mm		
FT15 G 353535R04-28P	0,4	0,4	0,4		20200
FT15 G 353535R08-28P	0,8	0,8	0,8		20400

Steel

Stainless steel

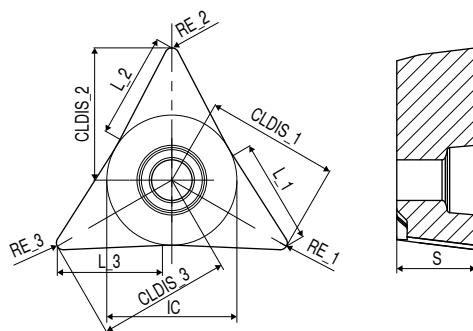
Cast iron

Non ferrous metals

Heat resistant alloys



## FT15 . 555555...



Designation	IC	CLDIS_1	L_1	CLDIS_2	L_2	CLDIS_3	L_3	S
	mm	mm	mm	mm	mm	mm	mm	mm
FT15 M 555555R04-FFF	15	15,78	12,6	15,78	12,6	15,78	12,6	9,14
FT15 M 555555R08-FFF	15	15,31	12,3	15,31	12,3	15,31	12,3	9,14

CTCP125

CTPM125

DRAGOSKIN



DRAGOSKIN



F F F

NEW Article no.  
74 002 ...

F F F

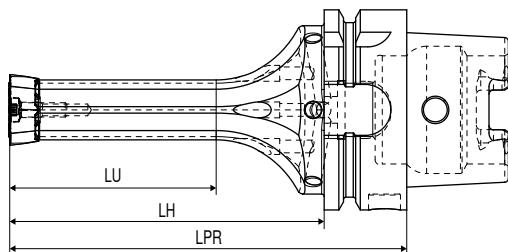
NEW Article no.  
74 002 ...

ISO	RE_1	RE_2	RE_3	00200	00400	10400
	mm	mm	mm			
FT15 M 555555R04-FFF	0,4	0,4	0,4			
FT15 M 555555R08-FFF	0,8	0,8	0,8			

Steel	●	○
Stainless steel	○	●
Cast iron	○	○
Non ferrous metals		
Heat resistant alloys		

## FreeTurn – HSK-T tool holder FT15

- ▲ Tool holder for FreeTurn indexable insert
- ▲ DirectCooling coolant supply



Figures show version FT15 . 808055...

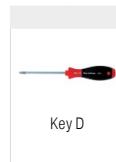


DirectCooling

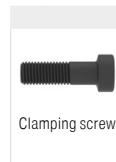
**NEW**

Article no.  
**74 700 ...**

ISO designation	Adapter	LPR	LH	LU	Insert	Article no.
		mm	mm	mm		
HSK-T63-100-FT15 353535	HSK-T 63	100	74	40	FT15 . 353535...	00137
HSK-T63-100-FT15 555555	HSK-T 63	100	74	40	FT15 . 555555...	00337
HSK-T63-100-FT15 808055	HSK-T 63	100	74	40	FT15 . 808055...	00537
HSK-T63-125-FT15 353535	HSK-T 63	125	99	65	FT15 . 353535...	00237
HSK-T63-125-FT15 555555	HSK-T 63	125	99	65	FT15 . 555555...	00437
HSK-T63-125-FT15 808055	HSK-T 63	125	99	65	FT15 . 808055...	00637



Key D



Clamping screw

### Spare parts

Article no.  
**80 950 ...**

Article no.  
**70 950 ...**

### Adapter

HSK-T 63

T20 - IP

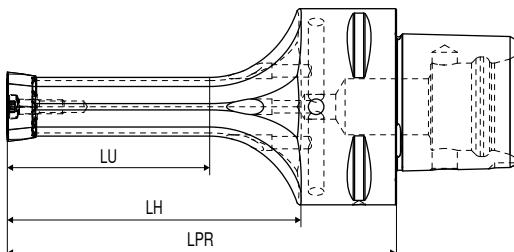
121

M4,5x18 - IP

25900

## FreeTurn – PSC tool holder FT15

- ▲ Tool holder for FreeTurn indexable insert
- ▲ DirectCooling coolant supply



Figures show version FT15 . 808055...

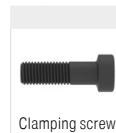


DirectCooling

**NEW**

Article no.  
**74 700 ...**

ISO designation	Adapter	LPR mm	LH mm	LU mm	Insert	
PSC-63-100-FT15 353535	PSC 63	100	69,4	40	FT15 . 353535...	00193
PSC-63-100-FT15 555555	PSC 63	100	69,6	40	FT15 . 555555...	00393
PSC-63-100-FT15 808055	PSC 63	100	69,3	40	FT15 . 808055...	00593
PSC-63-125-FT15 353535	PSC 63	125	94,4	65	FT15 . 353535...	00293
PSC-63-125-FT15 555555	PSC 63	125	94,6	65	FT15 . 555555...	00493
PSC-63-125-FT15 808055	PSC 63	125	94,3	65	FT15 . 808055...	00693



Key D

Clamping screw

Article no.  
**80 950 ...**

Article no.  
**70 950 ...**

### Spare parts

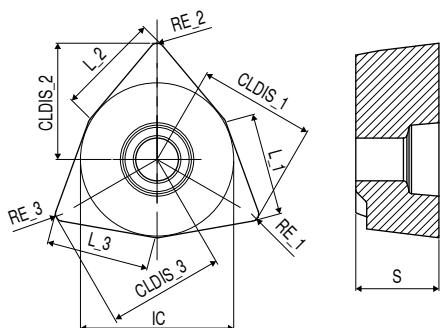
#### Adapter

PSC 63

121

25900

## FT17 . 808080...



Designation	IC	CLDIS_1	L_1	CLDIS_2	L_2	CLDIS_3	L_3	S
	mm	mm	mm	mm	mm	mm	mm	mm
FT17 M 808080R012-MMM	17	12,56	11,2	12,56	11,2	12,56	11,2	9,14
FT17 M 808080R04-MMM	17	13,00	11,3	13,00	11,3	13,00	11,3	9,14
FT17 M 808080R08-MMM	17	12,78	11,3	12,78	11,3	12,78	11,3	9,14

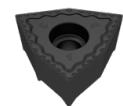
CTCP125

CTPM125

DRAGONSkin



DRAGONSkin



M M M

NEW Article no.  
74 000 ...

M M M

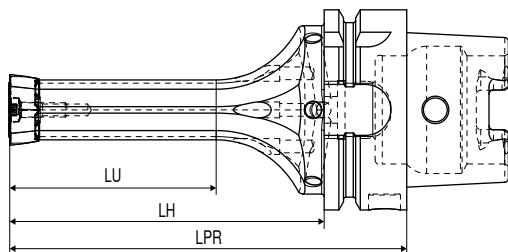
NEW Article no.  
74 000 ...

ISO	RE_1	RE_2	RE_3		
	mm	mm	mm		
FT17 M 808080R012-MMM	1,2	1,2	1,2		00600
FT17 M 808080R04-MMM	0,4	0,4	0,4		00200
FT17 M 808080R08-MMM	0,8	0,8	0,8		00400
					10400

Steel	●	○
Stainless steel	○	●
Cast iron	○	
Non ferrous metals		
Heat resistant alloys		

## FreeTurn – HSK-T tool holder FT17

- ▲ Tool holder for FreeTurn indexable insert
- ▲ DirectCooling coolant supply



DirectCooling

**NEW**

Article no.  
**74 701 ...**

ISO designation	Adapter	LPR mm	LH mm	LU mm	Insert	
HSK-T63-100-FT17 808080	HSK-T 63	100	74	40	FT17 . 808080...	00737
HSK-T63-125-FT17 808080	HSK-T 63	125	99	65	FT17 . 808080...	00837



Key D



Clamping screw

### Spare parts

Article no.  
**80 950 ...**

Article no.  
**70 950 ...**

### Adapter

HSK-T 63

T20 - IP

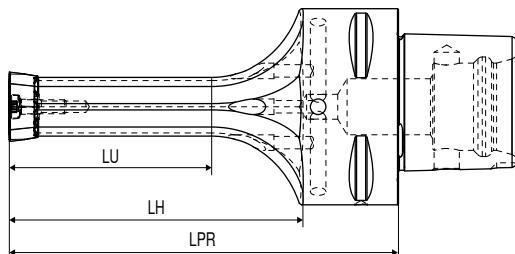
121

M4,5x18 - IP

25900

## FreeTurn – PSC tool holder FT17

- ▲ Tool holder for FreeTurn indexable insert
- ▲ DirectCooling coolant supply



DirectCooling

**NEW**

Article no.

**74 701 ...**

ISO designation	Adapter	LPR mm	LH mm	LU mm	Insert	
PSC-63-100-FT17 808080	PSC 63	100	69,3	40	FT17 . 808080...	00793
PSC-63-125-FT17 808080	PSC 63	125	94,3	65	FT17 . 808080...	00893



Key D



Clamping screw

### Spare parts

Article no.  
**80 950 ...**Article no.  
**70 950 ...**

### Adapter

PSC 63

T20 - IP

121

M4,5x18 - IP

25900

## Cutting data approximate values

			F		M		-28P	
			DRAGONSkin	DRAGONSkin	DRAGONSkin	DRAGONSkin		
			CTCP125	CTPM125	CTCP125	CTPM125	H216T	
			v <sub>c</sub> in m/min		v <sub>c</sub> in m/min		v <sub>c</sub> in m/min	
			v <sub>c</sub> in m/min	v <sub>c</sub> in m/min	v <sub>c</sub> in m/min	v <sub>c</sub> in m/min	v <sub>c</sub> in m/min	v <sub>c</sub> in m/min
P	1.1	General construction steel	< 800 N/mm <sup>2</sup>	200–270	120–260	200–260	120–250	
	1.2	Free cutting steel	< 800 N/mm <sup>2</sup>	230–280	130–220	230–280	120–220	
	1.3	Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	240–290	130–250	240–290	120–250	
	1.4	Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	200–270	130–220	200–250	130–200	
	1.5	Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	220–260	100–180	210–250	100–170	
	1.6	Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	210–250	100–180	190–240	100–170	
	1.7	Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	210–280	60–180	200–270	50–160	
	1.8	Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	190–240	60–180	180–230	50–160	
	1.9	Steel castings	< 850 N/mm <sup>2</sup>	170–240	80–180	160–220	60–160	
	1.10	Nitriding steel	< 1000 N/mm <sup>2</sup>	180–240	100–180	170–240	100–180	
	1.11	Nitriding steel	< 1200 N/mm <sup>2</sup>	170–240	100–180	190–260	70–170	
	1.12	Roller bearing steel	< 1200 N/mm <sup>2</sup>	200–270	80–180	170–230	60–170	
	1.13	Spring steel	< 1200 N/mm <sup>2</sup>	170–240	60–180	170–210	70–160	
	1.14	High-speed steel	< 1300 N/mm <sup>2</sup>	180–230	80–180	130–220	60–120	
	1.15	Cold working tool steel	< 1300 N/mm <sup>2</sup>	150–230	80–150	130–220	60–120	
	1.16	Hot working tool steel	< 1300 N/mm <sup>2</sup>	140–220	80–150	40–100		
M	2.1	Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	200–280	200–280	200–280	120–280	
	2.2	Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	200–280	200–280	200–280	120–280	
	2.3	Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	190–260	190–260	190–260	120–260	
	2.4	Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	190–240	190–240	190–240	120–240	
	2.5	Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>		100–220		100–220	
	2.6	Stainless steel, austenitic	< 750 N/mm <sup>2</sup>		100–220		100–220	
	2.7	Heat resistant steel	< 1100 N/mm <sup>2</sup>		40–100		40–100	
K	3.1	Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	200–260		120–210		
	3.2	Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	190–250		160–200		
	3.3	Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	170–240		150–200		
	3.4	Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	140–190		130–190		
	3.5	White malleable cast iron	270–450 N/mm <sup>2</sup>	240–290		160–230		
	3.6	White malleable cast iron	500–650 N/mm <sup>2</sup>	170–290		150–210		
	3.7	Black malleable cast iron	300–450 N/mm <sup>2</sup>	240–290		160–230		
	3.8	Black malleable cast iron	500–800 N/mm <sup>2</sup>	170–290		150–210		
N	4.1	Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>				300–2500	
	4.2	Aluminium alloys < 0.5 % Si	< 500 N/mm <sup>2</sup>				200–2000	
	4.3	Aluminium alloy 0.5–10 % Si	< 400 N/mm <sup>2</sup>				400–1500	
	4.4	Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>				400–1500	
	4.5	Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>				200–800	
	4.6	Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>				150–300	
	4.7	Copper wrought alloys	< 700 N/mm <sup>2</sup>				150–400	
	4.8	Special copper alloys	< 200 HB				150–400	
	4.9	Special copper alloys	< 300 HB				150–400	
	4.10	Special copper alloys	> 300 HB				150–400	
	4.11	Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>				200–600	
	4.12	Long-chipping brass	< 600 N/mm <sup>2</sup>				150–400	
S	4.13	Thermoplastics					100–200	
	4.14	Duroplastics					80–180	
	4.15	Fibre-reinforced plastics					60–150	
	4.16	Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>				100–140	
	4.17	Graphite						
	4.18	Tungsten and tungsten alloys						
	4.19	Molybdenum and molybdenum alloys						
	5.1	Pure nickel						
	5.2	Nickel alloys						
	5.3	Nickel alloys	< 850 N/mm <sup>2</sup>					
H	5.4	Nickel molybdenum alloys						
	5.5	Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>					
	5.6	Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>					
	5.7	Heat resistant alloys	< 1300 N/mm <sup>2</sup>					
	5.8	Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>					
	5.9	Pure titanium	< 900 N/mm <sup>2</sup>					
	5.10	Titanium alloys	< 700 N/mm <sup>2</sup>					
	5.11	Titanium alloys	< 1200 N/mm <sup>2</sup>					
	6.1		< 45 HRC					
	6.2		46–55 HRC					
H	6.3	Tempered steel	56–60 HRC					
	6.4		61–65 HRC					
	6.5		65–70 HRC					

**i** The cutting data depends extremely on the external conditions, e.g. stability of the tool and tool clamping, material and machine type.  
The indicated values are possible cutting data which have to be increased or reduced according to the application conditions.

## Cutting data appoximate values

	-F					
RE	f			a <sub>p</sub>		
	min.	Recom-mended	max.	min.	Recom-mended	max.
mm	mm/rev.			mm		
0,4	0,07	<b>0,15</b>	0,22	0,2	<b>1</b>	2
0,8	0,1	<b>0,2</b>	0,3	0,4	<b>1,4</b>	2,6
1,2						

	-M					
RE	f			a <sub>p</sub>		
	min.	Recom-mended	max.	min.	Recom-mended	max.
mm	mm/rev.			mm		
0,4	0,1	<b>0,17</b>	0,25	0,3	<b>1,3</b>	2,5
0,8	0,15	<b>0,25</b>	0,4	0,5	<b>2</b>	3,2
1,2	0,17	<b>0,3</b>	0,5	0,5	<b>2,5</b>	3,5

	-F					
RE	f			a <sub>p</sub>		
	min.	Recom-mended	max.	min.	Recom-mended	max.
mm	mm/rev.			mm		
0,4	0,07	<b>0,12</b>	0,2	0,2	<b>1</b>	2
0,8	0,1	<b>0,17</b>	0,27	0,4	<b>1,4</b>	2,6
1,2						

	-M					
RE	f			a <sub>p</sub>		
	min.	Recom-mended	max.	min.	Recom-mended	max.
mm	mm/rev.			mm		
0,4	0,1	<b>0,15</b>	0,22	0,3	<b>1,3</b>	2,5
0,8	0,15	<b>0,22</b>	0,35	0,5	<b>2</b>	3,2
1,2	0,17	<b>0,25</b>	0,4	0,5	<b>2,5</b>	3,5

	-28P					
RE	f			a <sub>p</sub>		
	min.	Recom-mended	max.	min.	Recom-mended	max.
mm	mm/rev.			mm		
0,4	0,07	<b>0,15</b>	0,25	0,3	<b>1,5</b>	3,5
0,8	0,15	<b>0,25</b>	0,4	0,5	<b>2</b>	3,5
1,2						

## Correction Factor

Feedrate f [mm/U] should be multiplied by correction factor f<sub>k</sub>

Approach angle	Correction Factor
∠	f <sub>k</sub>
95° – 120°	0,90
85° – 95°	1,00
85° – 65°	1,10
65° – 30°	1,20

## ISO Designation System

FreeTurn – indexable insert designation



**FT15 M/G 808055R080804 Q MMF CTCP125**

[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

- |  |  |
|--|--|
| [1] FreeTurn                                   | [7] Corner radius 1 in mm                |
| [2] Nominal diameter in mm                     | [8] Corner radius 2 in mm                |
| [3] ISO tolerance (M = sintered, G = polished) | [9] Corner radius 3 in mm                |
| [4] Cutter angle 1 in degrees                  | [10] Masterfinish – wiper geometry       |
| [5] Cutter angle 2 in degrees                  | [11] Chip breaker (M = medium, F = fine) |
| [6] Cutter angle 3 in degrees                  | [12] Carbide Grade                       |

FreeTurn – holder designation



**HSK - T63 - 100 - FT15 808055**

[1] [2] [3] [4] [5] [6] [7] [8]

- |                     |                               |
|---------------------|-------------------------------|
| [1] System          | [5] Nominal diameter in mm    |
| [2] Size            | [6] Cutter angle 1 in degrees |
| [3] Overhang length | [7] Cutter angle 2 in degrees |
| [4] FreeTurn        | [8] Cutter angle 3 in degrees |

## Grade description

### CTCP125

- ▲ Carbide, TiCN-Al<sub>2</sub>O<sub>3</sub>-coated
- ▲ ISO | P25 | M20 | K30
- ▲ The first choice for universal machining of steels

### H216T

- ▲ Carbide, uncoated
- ▲ ISO | K15 | N15
- ▲ The uncoated carbide grade for machining aluminium and other non-ferrous metals
- ▲ Also highly suitable for HSC machining

### CTPM125

- ▲ ISO | P35 | M25 | S25
- ▲ The universal carbide grade with maximum toughness, without affecting the necessary hot hardness and wear resistance for stainless machining

## Table of contents

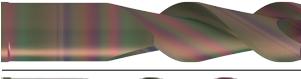
Overview High Performance Milling Cutters	30
Product programme	31-60
Technical Information	
Cutting Data	61-65

## WNT \ Performance

Premium quality tools for high performance.

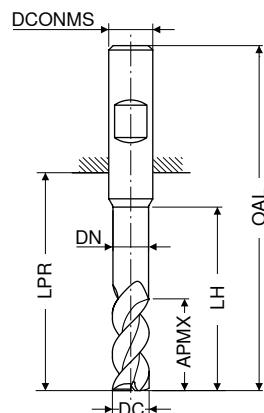
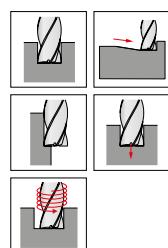
The premium quality tools from the **WNT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

## Overview High Performance Milling Cutters

Tool type 	Number of flutes	Diameter in mm Ø DC	Material					Length	Tool design	Pages	
			Steel	Stainless steel	Cast iron	Non ferrous metals	Heat resistant alloys				
<b>AluLine</b>											
	W	2	2-20	HA	HB	●		 	 	 	31-34
	W	2	2-20	HA	HB	●				 	35+36
	W	3	2-20	HA	HB	●		 	 	 	37-42
	W	3	3-20	HA	HB	●				  	43
	W	3	3-20	HA	HB	●				 	44-49
	W	4	2-20	HA	HB	●		 	 	 	50-53
	WF	3	3-20	HA	HB	●				 	54
	WR	4	3-25	HA	HB	●				  	55+56
	W	6	6-20	HA	HB	●				  	57
	W	2	3-20	HA	HB	●				 	58-60

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP	NEW Article no. 53 623 ...	NEW Article no. 53 625 ...	NEW Article no. 53 624 ...	NEW Article no. 53 626 ...
5,0	10,5	4,8	15	22	58	6	2	05100	05100	05100	05100
5,5	13,0	5,3	18	22	58	6	2	05600	05600	05600	05600
6,0	13,0	5,8	18	22	58	6	2	06100	06100	06100	06100
6,5	17,0	6,2	24	28	64	8	2	06600	06600	06600	06600
7,0	17,0	6,7	24	28	64	8	2	07100	07100	07100	07100
7,5	17,0	7,2	24	28	64	8	2	07600	07600	07600	07600
8,0	17,0	7,7	24	28	64	8	2	08100	08100	08100	08100
8,5	21,0	8,2	30	34	74	10	2	08600	08600	08600	08600
9,0	21,0	8,7	30	34	74	10	2	09100	09100	09100	09100
9,5	21,0	9,2	30	34	74	10	2	09600	09600	09600	09600
10,0	21,0	9,7	30	34	74	10	2	10100	10100	10100	10100
10,5	25,0	10,1	36	40	85	12	2	10600	10600	10600	10600
11,0	25,0	10,6	36	40	85	12	2	11100	11100	11100	11100
11,5	25,0	11,1	36	40	85	12	2	11600	11600	11600	11600
12,0	25,0	11,6	36	40	85	12	2	12100	12100	12100	12100
12,5	29,0	12,1	42	46	91	14	2			12600	12600
13,0	29,0	12,6	42	46	91	14	2			13100	13100
13,5	29,0	13,1	42	46	91	14	2			13600	13600
14,0	29,0	13,6	42	46	91	14	2			14100	14100
14,5	33,0	14,0	48	52	100	16	2			14600	14600
15,0	33,0	14,5	48	52	100	16	2			15100	15100
15,5	33,0	15,0	48	52	100	16	2			15600	15600
16,0	33,0	15,5	48	52	100	16	2			16100	16100
16,5	38,0	16,0	54	58	106	18	2			16600	16600
17,0	38,0	16,5	54	58	106	18	2			17100	17100
17,5	38,0	17,0	54	58	106	18	2			17600	17600
18,0	38,0	17,5	54	58	106	18	2			18100	18100
18,5	42,0	18,0	60	64	114	20	2			18600	18600
19,0	42,0	18,5	60	64	114	20	2			19100	19100
19,5	42,0	19,0	60	64	114	20	2			19600	19600
20,0	42,0	19,5	60	64	114	20	2			20100	20100

Steel

Stainless steel

Cast iron

Non ferrous metals

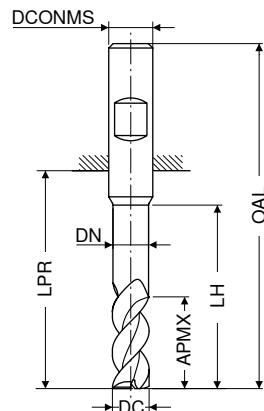
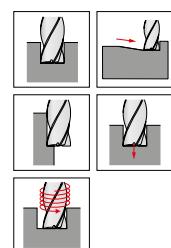
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



Factory standard      Factory standard      Factory standard      Factory standard

HA      HA      HB      HB

NEW Article no.	NEW Article no.	NEW Article no.	NEW Article no.
53 633 ...	53 635 ...	53 634 ...	53 636 ...
02300	02300	02300	02300
02800	02800	02800	02800
03300	03300	03300	03300
03800	03800	03800	03800
04300	04300	04300	04300
04800	04800	04800	04800
05300	05300	05300	05300
05800	05800	05800	05800
06300	06300	06300	06300
06800	06800	06800	06800
07300	07300	07300	07300
07800	07800	07800	07800
08300	08300	08300	08300
08800	08800	08800	08800
09300	09300	09300	09300
09800	09800	09800	09800
10300	10300	10300	10300
10800	10800	10800	10800
11300	11300	11300	11300
11800	11800	11800	11800
12300	12300	12300	12300
		12800	12800
		13300	13300
		13800	13800
		14300	14300
		14800	14800
		15300	15300
		15800	15800
		16300	16300
		16800	16800
		17300	17300
		17800	17800
		18300	18300
		18800	18800
		19300	19300
		19800	19800
		20300	20300

Steel

Stainless steel

Cast iron

Non ferrous metals

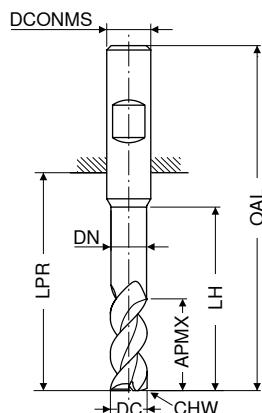
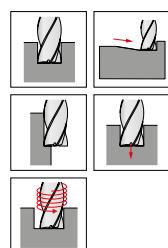
Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	CHW mm	ZEFP	NEW Article no. 53 619 ...	NEW Article no. 53 621 ...	NEW Article no. 53 620 ...	NEW Article no. 53 622 ...
5,0	10,5	4,8	15	22	58	6	0,1	2	05100	05100	05100	05100
5,5	13,0	5,3	18	22	58	6	0,1	2	05600	05600	05600	05600
6,0	13,0	5,8	18	22	58	6	0,1	2	06100	06100	06100	06100
6,5	17,0	6,2	24	28	64	8	0,1	2	06600	06600	06600	06600
7,0	17,0	6,7	24	28	64	8	0,1	2	07100	07100	07100	07100
7,5	17,0	7,2	24	28	64	8	0,1	2	07600	07600	07600	07600
8,0	17,0	7,7	24	28	64	8	0,1	2	08100	08100	08100	08100
8,5	21,0	8,2	30	34	74	10	0,1	2	08600	08600	08600	08600
9,0	21,0	8,7	30	34	74	10	0,1	2	09100	09100	09100	09100
9,5	21,0	9,2	30	34	74	10	0,1	2	09600	09600	09600	09600
10,0	21,0	9,7	30	34	74	10	0,1	2	10100	10100	10100	10100
10,5	25,0	10,1	36	40	85	12	0,1	2	10600	10600	10600	10600
11,0	25,0	10,6	36	40	85	12	0,1	2	11100	11100	11100	11100
11,5	25,0	11,1	36	40	85	12	0,1	2	11600	11600	11600	11600
12,0	25,0	11,6	36	40	85	12	0,1	2	12100	12100	12100	12100
12,5	29,0	12,1	42	46	91	14	0,1	2			12600	12600
13,0	29,0	12,6	42	46	91	14	0,1	2			13100	13100
13,5	29,0	13,1	42	46	91	14	0,1	2			13600	13600
14,0	29,0	13,6	42	46	91	14	0,1	2			14100	14100
14,5	33,0	14,0	48	52	100	16	0,1	2			14600	14600
15,0	33,0	14,5	48	52	100	16	0,1	2			15100	15100
15,5	33,0	15,0	48	52	100	16	0,1	2			15600	15600
16,0	33,0	15,5	48	52	100	16	0,1	2			16100	16100
16,5	38,0	16,0	54	58	106	18	0,1	2			16600	16600
17,0	38,0	16,5	54	58	106	18	0,1	2			17100	17100
17,5	38,0	17,0	54	58	106	18	0,1	2			17600	17600
18,0	38,0	17,5	54	58	106	18	0,1	2			18100	18100
18,5	42,0	18,0	60	64	114	20	0,1	2			18600	18600
19,0	42,0	18,5	60	64	114	20	0,1	2			19100	19100
19,5	42,0	19,0	60	64	114	20	0,1	2			19600	19600
20,0	42,0	19,5	60	64	114	20	0,1	2			20100	20100

Steel

Stainless steel

Cast iron

Non ferrous metals

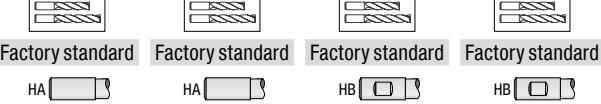
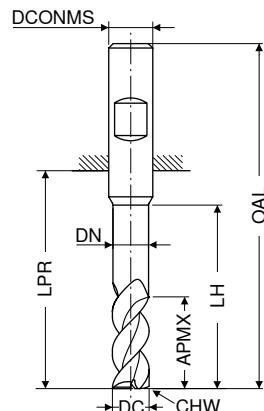
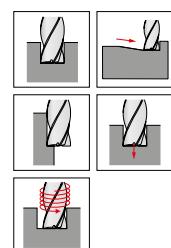
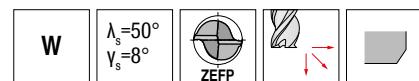
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	CHW mm	ZEFP	NEW Article no. 53 629 ...	NEW Article no. 53 631 ...	NEW Article no. 53 630 ...	NEW Article no. 53 632 ...
2,0	5,5	1,8	10,0	19	55	6	0,05	2	02300	02300	02300	02300
2,5	6,5	2,3	12,5	22	58	6	0,05	2	02800	02800	02800	02800
3,0	8,0	2,8	15,0	22	58	6	0,10	2	03300	03300	03300	03300
3,5	10,5	3,3	20,0	26	62	6	0,10	2	03800	03800	03800	03800
4,0	10,5	3,8	20,0	26	62	6	0,10	2	04300	04300	04300	04300
4,5	13,0	4,3	25,0	34	70	6	0,10	2	04800	04800	04800	04800
5,0	13,0	4,8	25,0	34	70	6	0,10	2	05300	05300	05300	05300
5,5	16,0	5,3	30,0	34	70	6	0,10	2	05800	05800	05800	05800
6,0	16,0	5,8	30,0	34	70	6	0,10	2	06300	06300	06300	06300
6,5	21,0	6,2	40,0	44	80	8	0,10	2	06800	06800	06800	06800
7,0	21,0	6,7	40,0	44	80	8	0,10	2	07300	07300	07300	07300
7,5	21,0	7,2	40,0	44	80	8	0,10	2	07800	07800	07800	07800
8,0	21,0	7,7	40,0	44	80	8	0,10	2	08300	08300	08300	08300
8,5	26,0	8,2	50,0	54	94	10	0,10	2	08800	08800	08800	08800
9,0	26,0	8,7	50,0	54	94	10	0,10	2	09300	09300	09300	09300
9,5	26,0	9,2	50,0	54	94	10	0,10	2	09800	09800	09800	09800
10,0	26,0	9,7	50,0	54	94	10	0,10	2	10300	10300	10300	10300
10,5	31,0	10,1	60,0	64	109	12	0,10	2	10800	10800	10800	10800
11,0	31,0	10,6	60,0	64	109	12	0,10	2	11300	11300	11300	11300
11,5	31,0	11,1	60,0	64	109	12	0,10	2	11800	11800	11800	11800
12,0	31,0	11,6	60,0	64	109	12	0,10	2	12300	12300	12300	12300
12,5	36,0	12,1	70,0	74	119	14	0,10	2			12800	12800
13,0	36,0	12,6	70,0	74	119	14	0,10	2			13300	13300
13,5	36,0	13,1	70,0	74	119	14	0,10	2			13800	13800
14,0	36,0	13,6	70,0	74	119	14	0,10	2			14300	14300
14,5	41,0	14,0	80,0	84	132	16	0,10	2			14800	14800
15,0	41,0	14,5	80,0	84	132	16	0,10	2			15300	15300
15,5	41,0	15,0	80,0	84	132	16	0,10	2			15800	15800
16,0	41,0	15,5	80,0	84	132	16	0,10	2			16300	16300
16,5	47,0	16,0	90,0	94	142	18	0,10	2			16800	16800
17,0	47,0	16,5	90,0	94	142	18	0,10	2			17300	17300
17,5	47,0	17,0	90,0	94	142	18	0,10	2			17800	17800
18,0	47,0	17,5	90,0	94	142	18	0,10	2			18300	18300
18,5	52,0	18,0	100,0	104	154	20	0,10	2			18800	18800
19,0	52,0	18,5	100,0	104	154	20	0,10	2			19300	19300
19,5	52,0	19,0	100,0	104	154	20	0,10	2			19800	19800
20,0	52,0	19,5	100,0	104	154	20	0,10	2			20300	20300

Steel

Stainless steel

Cast iron

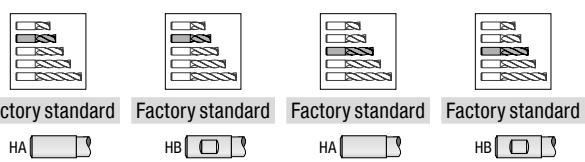
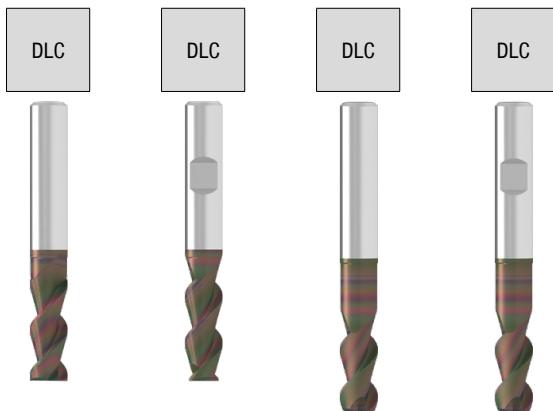
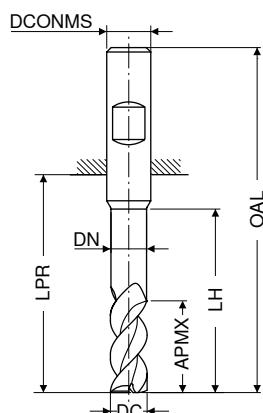
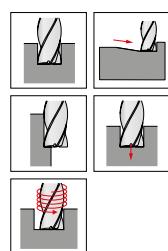
Non ferrous metals

Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 62+63

## AluLine – End milling cutter



DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP
mm	mm	mm	mm	mm	mm	mm	
2,0	5,5	1,8	10,0	19	55	6	2
2,5	6,5	2,3	12,5	22	58	6	2
3,0	8,0	2,8	15,0	22	58	6	2
3,5	10,5	3,3	20,0	26	62	6	2
4,0	10,5	3,8	20,0	26	62	6	2
4,5	13,0	4,3	25,0	34	70	6	2
5,0	10,5	4,8	15,0	22	58	6	2
5,0	13,0	4,8	25,0	34	70	6	2
5,5	13,0	5,3	18,0	22	58	6	2
5,5	16,0	5,3	30,0	34	70	6	2
6,0	13,0	5,8	18,0	22	58	6	2
6,0	16,0	5,8	30,0	34	70	6	2
6,5	17,0	6,2	24,0	28	64	8	2
6,5	21,0	6,2	40,0	44	80	8	2
7,0	17,0	6,7	24,0	28	64	8	2
7,0	21,0	6,7	40,0	44	80	8	2
7,5	17,0	7,2	24,0	28	64	8	2
7,5	17,0	7,2	24,0	49	85	8	2
7,5	21,0	7,2	40,0	44	80	8	2
8,0	17,0	7,7	24,0	28	64	8	2
8,0	17,0	7,7	24,0	49	85	8	2
8,0	21,0	7,7	40,0	44	80	8	2
8,5	21,0	8,2	30,0	34	74	10	2
8,5	26,0	8,2	50,0	54	94	10	2
9,0	21,0	8,7	30,0	34	74	10	2
9,0	26,0	8,7	50,0	54	94	10	2
9,5	21,0	9,2	30,0	34	74	10	2
9,5	26,0	9,2	50,0	54	94	10	2
10,0	21,0	9,7	30,0	34	74	10	2
10,0	26,0	9,7	50,0	54	94	10	2
10,5	25,0	10,1	36,0	40	85	12	2
10,5	31,0	10,1	60,0	64	109	12	2
11,0	25,0	10,6	36,0	40	85	12	2
11,0	31,0	10,6	60,0	64	109	12	2
11,5	25,0	11,1	36,0	40	85	12	2
11,5	31,0	11,1	60,0	64	109	12	2
12,0	25,0	11,6	36,0	40	85	12	2
12,0	31,0	11,6	60,0	64	109	12	2
12,5	29,0	12,1	42,0	46	91	14	2
12,5	36,0	12,1	70,0	74	119	14	2
13,0	29,0	12,6	42,0	46	91	14	2
13,0	36,0	12,6	70,0	74	119	14	2

Steel

Stainless steel

Cast iron

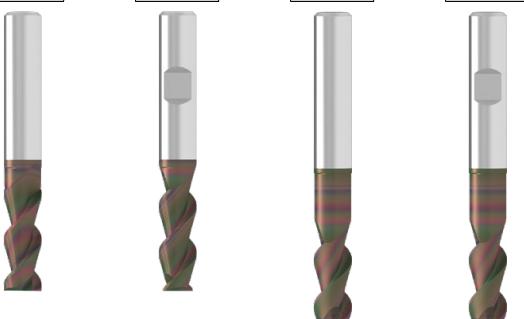
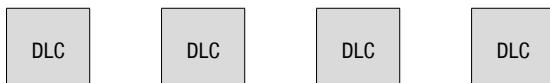
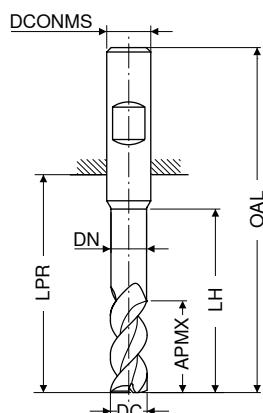
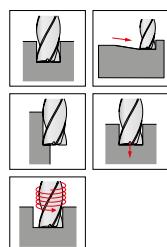
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter



**NEW Article no. 53 627 ...**    **NEW Article no. 53 628 ...**    **NEW Article no. 53 637 ...**    **NEW Article no. 53 638 ...**

DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	HA	HB	HA	HB
mm	mm	mm	mm	mm	mm	mm					
13,5	29,0	13,1	42,0	46	91	14	2			13600	
13,5	36,0	13,1	70,0	74	119	14	2				13800
14,0	29,0	13,6	42,0	46	91	14	2			14100	
14,0	36,0	13,6	70,0	74	119	14	2			14600	
14,5	33,0	14,0	48,0	52	100	16	2			15100	
14,5	41,0	14,0	80,0	84	132	16	2			15600	
15,0	33,0	14,5	48,0	52	100	16	2			16100	
15,0	41,0	14,5	80,0	84	132	16	2			16600	
15,5	33,0	15,0	48,0	52	100	16	2			17100	
15,5	41,0	15,0	80,0	84	132	16	2			17600	
16,0	33,0	15,5	48,0	52	100	16	2			18100	
16,0	41,0	15,5	80,0	84	132	16	2			18600	
16,5	38,0	16,0	54,0	58	106	18	2			19100	
16,5	47,0	16,0	90,0	94	142	18	2			19600	
17,0	38,0	16,5	54,0	58	106	18	2			20100	
17,0	47,0	16,5	90,0	94	142	18	2			20300	
17,5	38,0	17,0	54,0	58	106	18	2				
17,5	47,0	17,0	90,0	94	142	18	2				
18,0	38,0	17,5	54,0	58	106	18	2				
18,0	47,0	17,5	90,0	94	142	18	2				
18,5	42,0	18,0	60,0	64	114	20	2				
18,5	52,0	18,0	100,0	104	154	20	2				
19,0	42,0	18,5	60,0	64	114	20	2				
19,0	52,0	18,5	100,0	104	154	20	2				
19,5	42,0	19,0	60,0	64	114	20	2				
19,5	52,0	19,0	100,0	104	154	20	2				
20,0	42,0	19,5	60,0	64	114	20	2				
20,0	52,0	19,5	100,0	104	154	20	2				

Steel

Stainless steel

Cast iron

Non ferrous metals

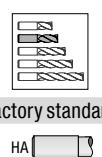
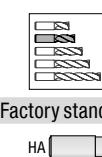
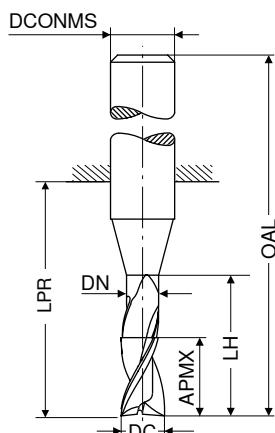
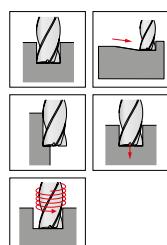
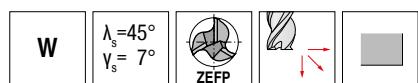
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>x</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	NEW Article no.	NEW Article no.	NEW Article no.	NEW Article no.
mm	mm	mm	mm	mm	mm	mm		53 615 ...	53 617 ...	53 616 ...	53 618 ...
2,0	4,5	1,8	6,0	14	50	6	3	02100	02100	02100	02100
2,5	5,5	2,3	7,5	19	55	6	3	02600	02600	02600	02600
3,0	6,5	2,8	9,0	19	55	6	3	03100	03100	03100	03100
3,5	8,5	3,3	12,0	19	55	6	3	03600	03600	03600	03600
4,0	8,5	3,8	12,0	19	55	6	3	04100	04100	04100	04100
4,5	10,5	4,3	15,0	22	58	6	3	04600	04600	04600	04600
5,0	10,5	4,8	15,0	22	58	6	3	05100	05100	05100	05100
5,5	13,0	5,3	18,0	22	58	6	3	05600	05600	05600	05600
6,0	13,0	5,8	18,0	22	58	6	3	06100	06100	06100	06100
6,5	17,0	6,2	24,0	28	64	8	3	06600	06600	06600	06600
7,0	17,0	6,7	24,0	28	64	8	3	07100	07100	07100	07100
7,5	17,0	7,2	24,0	28	64	8	3	07600	07600	07600	07600
8,0	17,0	7,7	24,0	28	64	8	3	08100	08100	08100	08100
8,5	21,0	8,2	30,0	34	74	10	3	08600	08600	08600	08600
9,0	21,0	8,7	30,0	34	74	10	3	09100	09100	09100	09100
9,5	21,0	9,2	30,0	34	74	10	3	09600	09600	09600	09600
10,0	21,0	9,7	30,0	34	74	10	3	10100	10100	10100	10100
10,5	25,0	10,1	36,0	40	85	12	3	10600	10600	10600	10600
11,0	25,0	10,6	36,0	40	85	12	3	11100	11100	11100	11100
11,5	25,0	11,1	36,0	40	85	12	3	11600	11600	11600	11600
12,0	25,0	11,6	36,0	40	85	12	3	12100	12100	12100	12100
12,5	29,0	12,1	42,0	46	91	14	3			12600	12600
13,0	29,0	12,6	42,0	46	91	14	3			13100	13100
13,5	29,0	13,1	42,0	46	91	14	3			13600	13600
14,0	29,0	13,6	42,0	46	91	14	3			14100	14100
14,5	33,0	14,0	48,0	52	100	16	3			14600	14600
15,0	33,0	14,5	48,0	52	100	16	3			15100	15100
15,5	33,0	15,0	48,0	52	100	16	3			15600	15600
16,0	33,0	15,5	48,0	52	100	16	3			16100	16100
16,5	38,0	16,0	54,0	58	106	18	3			16600	16600
17,0	38,0	16,5	54,0	58	106	18	3			17100	17100
17,5	38,0	17,0	54,0	58	106	18	3			17600	17600
18,0	38,0	17,5	54,0	58	106	18	3			18100	18100
18,5	42,0	18,0	60,0	64	114	20	3			18600	18600
19,0	42,0	18,5	60,0	64	114	20	3			19100	19100
19,5	42,0	19,0	60,0	64	114	20	3			19600	19600
20,0	42,0	19,5	60,0	64	114	20	3			20100	20100

Steel

Stainless steel

Cast iron

Non ferrous metals

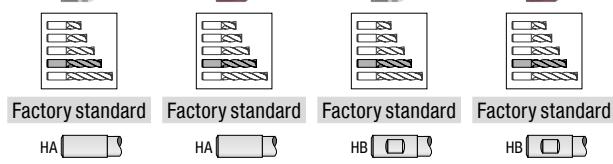
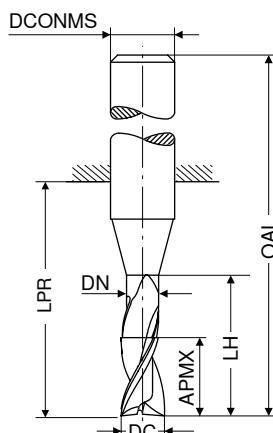
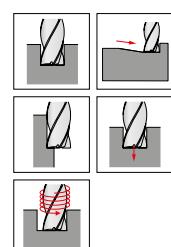
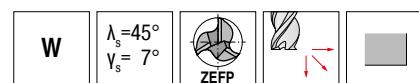
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP
mm	mm	mm	mm	mm	mm	mm	
2,0	5,5	1,8	10,0	19	55	6	3
2,5	6,5	2,3	12,5	22	58	6	3
3,0	8,0	2,8	15,0	22	58	6	3
3,5	10,5	3,3	20,0	26	62	6	3
4,0	10,5	3,8	20,0	26	62	6	3
4,5	13,0	4,3	25,0	34	70	6	3
5,0	13,0	4,8	25,0	34	70	6	3
5,5	16,0	5,3	30,0	34	70	6	3
6,0	16,0	5,8	30,0	34	70	6	3
6,5	21,0	6,2	40,0	44	80	8	3
7,0	21,0	6,7	40,0	44	80	8	3
7,5	21,0	7,2	40,0	44	80	8	3
8,0	21,0	7,7	40,0	44	80	8	3
8,5	26,0	8,2	50,0	54	94	10	3
9,0	26,0	8,7	50,0	54	94	10	3
9,5	26,0	9,2	50,0	54	94	10	3
10,0	26,0	9,7	50,0	54	94	10	3
10,5	31,0	10,1	60,0	64	109	12	3
11,0	31,0	10,6	60,0	64	109	12	3
11,5	31,0	11,1	60,0	64	109	12	3
12,0	31,0	11,6	60,0	64	109	12	3
12,5	36,0	12,1	70,0	74	119	14	3
13,0	36,0	12,6	70,0	74	119	14	3
13,5	36,0	13,1	70,0	74	119	14	3
14,0	36,0	13,6	70,0	74	119	14	3
14,5	41,0	14,0	80,0	84	132	16	3
15,0	41,0	14,5	80,0	84	132	16	3
15,5	41,0	15,0	80,0	84	132	16	3
16,0	41,0	15,5	80,0	84	132	16	3
16,5	47,0	16,0	90,0	94	142	18	3
17,0	47,0	16,5	90,0	94	142	18	3
17,5	47,0	17,0	90,0	94	142	18	3
18,0	47,0	17,5	90,0	94	142	18	3
18,5	52,0	18,0	100,0	104	154	20	3
19,0	52,0	18,5	100,0	104	154	20	3
19,5	52,0	19,0	100,0	104	154	20	3
20,0	52,0	19,5	100,0	104	154	20	3

Steel

Stainless steel

Cast iron

Non ferrous metals

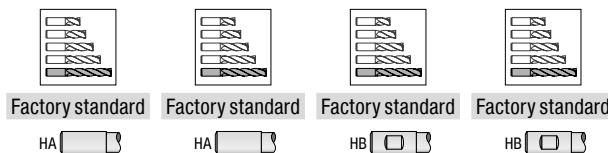
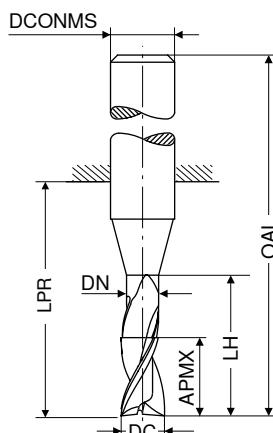
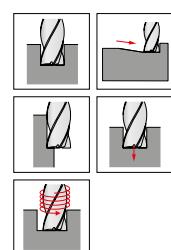
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



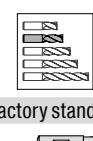
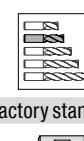
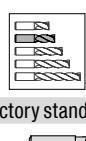
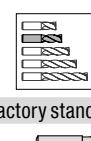
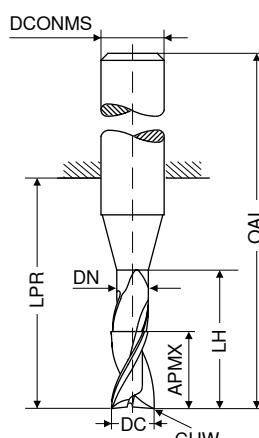
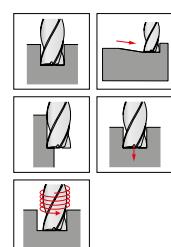
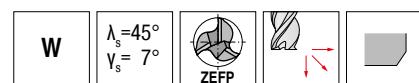
DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	NEW Article no.	NEW Article no.	NEW Article no.	NEW Article no.
mm	mm	mm	mm	mm	mm	mm		53 615 ...	53 617 ...	53 616 ...	53 618 ...
2,0	8,5	1,8	16	26	62	6	3	02400	02400	02400	02400
2,5	10,5	2,3	20	31	67	6	3	02900	02900	02900	02900
3,0	12,5	2,8	24	31	67	6	3	03400	03400	03400	03400
3,5	16,5	3,3	32	38	74	6	3	03900	03900	03900	03900
4,0	16,5	3,8	32	38	74	6	3	04400	04400	04400	04400
4,5	20,5	4,3	40	52	88	6	3	04900	04900	04900	04900
5,0	20,5	4,8	40	52	88	6	3	05400	05400	05400	05400
5,5	25,0	5,3	48	52	88	6	3	05900	05900	05900	05900
6,0	25,0	5,8	48	52	88	6	3	06400	06400	06400	06400
6,5	33,0	6,2	64	68	104	8	3	06900	06900	06900	06900
7,0	33,0	6,7	64	68	104	8	3	07400	07400	07400	07400
7,5	33,0	7,2	64	68	104	8	3	07900	07900	07900	07900
8,0	33,0	7,7	64	68	104	8	3	08400	08400	08400	08400
8,5	41,0	8,2	80	84	124	10	3	08900	08900	08900	08900
9,0	41,0	8,7	80	84	124	10	3	09400	09400	09400	09400
9,5	41,0	9,2	80	84	124	10	3	09900	09900	09900	09900
10,0	41,0	9,7	80	84	124	10	3	10400	10400	10400	10400
10,5	49,0	10,1	96	100	145	12	3	10900	10900	10900	10900
11,0	49,0	10,6	96	100	145	12	3	11400	11400	11400	11400
11,5	49,0	11,1	96	100	145	12	3	11900	11900	11900	11900
12,0	49,0	11,6	96	100	145	12	3	12400	12400	12400	12400
12,5	57,0	12,1	112	116	161	14	3			12900	12900
13,0	57,0	12,6	112	116	161	14	3			13400	13400
13,5	57,0	13,1	112	116	161	14	3			13900	13900
14,0	57,0	13,6	112	116	161	14	3			14400	14400
14,5	65,0	14,0	128	132	180	16	3			14900	14900
15,0	65,0	14,5	128	132	180	16	3			15400	15400
15,5	65,0	15,0	128	132	180	16	3			15900	15900
16,0	65,0	15,5	128	132	180	16	3			16400	16400
16,5	74,0	16,0	144	148	196	18	3			16900	16900
17,0	74,0	16,5	144	148	196	18	3			17400	17400
17,5	74,0	17,0	144	148	196	18	3			17900	17900
18,0	74,0	17,5	144	148	196	18	3			18400	18400
18,5	82,0	18,0	160	164	214	20	3			18900	18900
19,0	82,0	18,5	160	164	214	20	3			19400	19400
19,5	82,0	19,0	160	164	214	20	3			19900	19900
20,0	82,0	19,5	160	164	214	20	3			20400	20400

Steel  
Stainless steel  
Cast iron  
Non ferrous metals  
Heat resistant alloys  
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	CHW mm	ZEFP
2,0	4,5	1,8	6,0	14	50	6	0,05	3
2,5	5,5	2,3	7,5	19	55	6	0,05	3
3,0	6,5	2,8	9,0	19	55	6	0,10	3
3,5	8,5	3,3	12,0	19	55	6	0,10	3
4,0	8,5	3,8	12,0	19	55	6	0,10	3
4,5	10,5	4,3	15,0	22	58	6	0,10	3
5,0	10,5	4,8	15,0	22	58	6	0,10	3
5,5	13,0	5,3	18,0	22	58	6	0,10	3
6,0	13,0	5,8	18,0	22	58	6	0,20	3
6,5	17,0	6,2	24,0	28	64	8	0,20	3
7,0	17,0	6,7	24,0	28	64	8	0,20	3
7,5	17,0	7,2	24,0	28	64	8	0,20	3
8,0	17,0	7,7	24,0	28	64	8	0,20	3
8,5	21,0	8,2	30,0	34	74	10	0,20	3
9,0	21,0	8,7	30,0	34	74	10	0,20	3
9,5	21,0	9,2	30,0	34	74	10	0,20	3
10,0	21,0	9,7	30,0	34	74	10	0,20	3
10,5	25,0	10,1	36,0	40	85	12	0,20	3
11,0	25,0	10,6	36,0	40	85	12	0,20	3
11,5	25,0	11,1	36,0	40	85	12	0,20	3
12,0	25,0	11,6	36,0	40	85	12	0,20	3
12,5	29,0	12,1	42,0	46	91	14	0,20	3
13,0	29,0	12,6	42,0	46	91	14	0,20	3
13,5	29,0	13,1	42,0	46	91	14	0,20	3
14,0	29,0	13,6	42,0	46	91	14	0,20	3
14,5	33,0	14,0	48,0	52	100	16	0,20	3
15,0	33,0	14,5	48,0	52	100	16	0,20	3
15,5	33,0	15,0	48,0	52	100	16	0,20	3
16,0	33,0	15,5	48,0	52	100	16	0,20	3
16,5	38,0	16,0	54,0	58	106	18	0,20	3
17,0	38,0	16,5	54,0	58	106	18	0,20	3
17,5	38,0	17,0	54,0	58	106	18	0,20	3
18,0	38,0	17,5	54,0	58	106	18	0,20	3
18,5	42,0	18,0	60,0	64	114	20	0,20	3
19,0	42,0	18,5	60,0	64	114	20	0,20	3
19,5	42,0	19,0	60,0	64	114	20	0,20	3
20,0	42,0	19,5	60,0	64	114	20	0,20	3

<b>NEW</b> Article no. <b>53 611 ...</b>	<b>NEW</b> Article no. <b>53 613 ...</b>	<b>NEW</b> Article no. <b>53 612 ...</b>	<b>NEW</b> Article no. <b>53 614 ...</b>
02100	02100	02100	02100
02600	02600	02600	02600
03100	03100	03100	03100
03600	03600	03600	03600
04100	04100	04100	04100
04600	04600	04600	04600
05100	05100	05100	05100
05600	05600	05600	05600
06100	06100	06100	06100
06600	06600	06600	06600
07100	07100	07100	07100
07600	07600	07600	07600
08100	08100	08100	08100
08600	08600	08600	08600
09100	09100	09100	09100
09600	09600	09600	09600
10100	10100	10100	10100
10600	10600	10600	10600
11100	11100	11100	11100
11600	11600	11600	11600
12100	12100	12100	12100
12600	12600	12600	12600
13100	13100	13100	13100
13600	13600	13600	13600
14100	14100	14100	14100
14600	14600	14600	14600
15100	15100	15100	15100
15600	15600	15600	15600
16100	16100	16100	16100
16600	16600	16600	16600
17100	17100	17100	17100
17600	17600	17600	17600
18100	18100	18100	18100
18600	18600	18600	18600
19100	19100	19100	19100
19600	19600	19600	19600
20100	20100	20100	20100

Steel

Stainless steel

Cast iron

Non ferrous metals

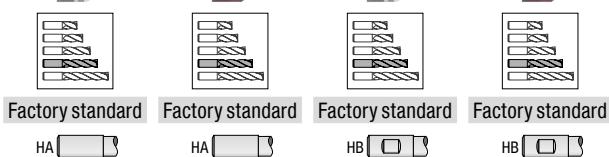
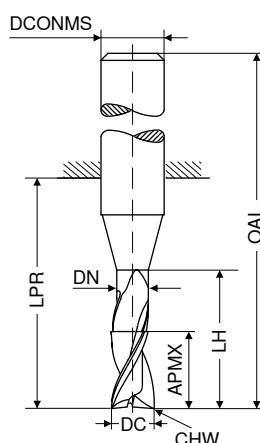
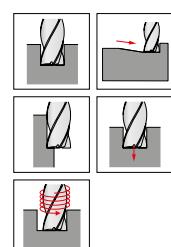
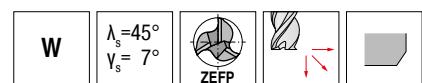
Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



Factory standard Factory standard Factory standard Factory standard

HA HB HA HB

**NEW** Article no. 53 611 ... **NEW** Article no. 53 613 ... **NEW** Article no. 53 612 ... **NEW** Article no. 53 614 ...

DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	CHW	ZEFP				
mm	mm	mm	mm	mm	mm	mm	mm		02200	02200	02200	02200
2,0	5,5	1,8	10,0	19	55	6	0,05	3	02200	02200	02200	02200
2,5	6,5	2,3	12,5	22	58	6	0,05	3	02700	02700	02700	02700
3,0	8,0	2,8	15,0	22	58	6	0,10	3	03200	03200	03200	03200
3,5	10,5	3,3	20,0	26	62	6	0,10	3	03700	03700	03700	03700
4,0	10,5	3,8	20,0	26	62	6	0,10	3	04200	04200	04200	04200
4,5	13,0	4,3	25,0	34	70	6	0,10	3	04700	04700	04700	04700
5,0	13,0	4,8	25,0	34	70	6	0,10	3	05200	05200	05200	05200
5,5	16,0	5,3	30,0	34	70	6	0,10	3	05700	05700	05700	05700
6,0	16,0	5,8	30,0	34	70	6	0,20	3	06200	06200	06200	06200
6,5	21,0	6,2	40,0	44	80	8	0,20	3	06700	06700	06700	06700
7,0	21,0	6,7	40,0	44	80	8	0,20	3	07200	07200	07200	07200
7,5	21,0	7,2	40,0	44	80	8	0,20	3	07700	07700	07700	07700
8,0	21,0	7,7	40,0	44	80	8	0,20	3	08200	08200	08200	08200
8,5	26,0	8,2	50,0	54	94	10	0,20	3	08700	08700	08700	08700
9,0	26,0	8,7	50,0	54	94	10	0,20	3	09200	09200	09200	09200
9,5	26,0	9,2	50,0	54	94	10	0,20	3	09700	09700	09700	09700
10,0	26,0	9,7	50,0	54	94	10	0,20	3	10200	10200	10200	10200
10,5	31,0	10,1	60,0	64	109	12	0,20	3	10700	10700	10700	10700
11,0	31,0	10,6	60,0	64	109	12	0,20	3	11200	11200	11200	11200
11,5	31,0	11,1	60,0	64	109	12	0,20	3	11700	11700	11700	11700
12,0	31,0	11,6	60,0	64	109	12	0,20	3	12200	12200	12200	12200
12,5	36,0	12,1	70,0	74	119	14	0,20	3			12700	12700
13,0	36,0	12,6	70,0	74	119	14	0,20	3			13200	13200
13,5	36,0	13,1	70,0	74	119	14	0,20	3			13700	13700
14,0	36,0	13,6	70,0	74	119	14	0,20	3			14200	14200
14,5	41,0	14,0	80,0	84	132	16	0,20	3			14700	14700
15,0	41,0	14,5	80,0	84	132	16	0,20	3			15200	15200
15,5	41,0	15,0	80,0	84	132	16	0,20	3			15700	15700
16,0	41,0	15,5	80,0	84	132	16	0,20	3			16200	16200
16,5	47,0	16,0	90,0	94	142	18	0,20	3			16700	16700
17,0	47,0	16,5	90,0	94	142	18	0,20	3			17200	17200
17,5	47,0	17,0	90,0	94	142	18	0,20	3			17700	17700
18,0	47,0	17,5	90,0	94	142	18	0,20	3			18200	18200
18,5	52,0	18,0	100,0	104	154	20	0,20	3			18700	18700
19,0	52,0	18,5	100,0	104	154	20	0,20	3			19200	19200
19,5	52,0	19,0	100,0	104	154	20	0,20	3			19700	19700
20,0	52,0	19,5	100,0	104	154	20	0,20	3			20200	20200

Steel

Stainless steel

Cast iron

Non ferrous metals

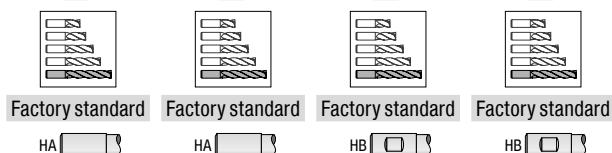
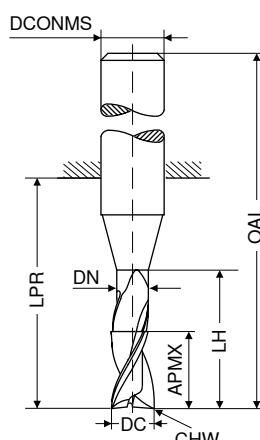
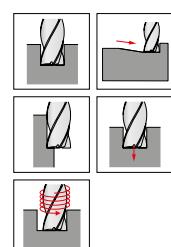
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



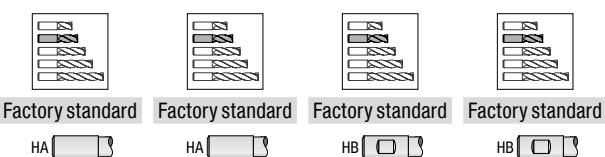
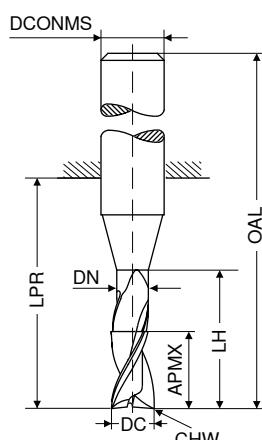
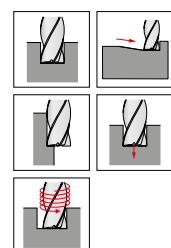
DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	CHW mm	ZEFP	NEW Article no.							
									02400	02900	03400	03900	04400	04900	05400	05900
2,0	8,5	1,8	16	26	62	6	0,05	3	02400	02900	03400	03900	04400	04900	05400	05900
2,5	10,5	2,3	20	31	67	6	0,05	3	02400	02900	03400	03900	04400	04900	05400	05900
3,0	12,5	2,8	24	31	67	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
3,5	16,5	3,3	32	38	74	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
4,0	16,5	3,8	32	38	74	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
4,5	20,5	4,3	40	52	88	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
5,0	20,5	4,8	40	52	88	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
5,5	25,0	5,3	48	52	88	6	0,10	3	02400	02900	03400	03900	04400	04900	05400	05900
6,0	25,0	5,8	48	52	88	6	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
6,5	33,0	6,2	64	68	104	8	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
7,0	33,0	6,7	64	68	104	8	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
7,5	33,0	7,2	64	68	104	8	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
8,0	33,0	7,7	64	68	104	8	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
8,5	41,0	8,2	80	84	124	10	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
9,0	41,0	8,7	80	84	124	10	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
9,5	41,0	9,2	80	84	124	10	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
10,0	41,0	9,7	80	84	124	10	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
10,5	49,0	10,1	96	100	145	12	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
11,0	49,0	10,6	96	100	145	12	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
11,5	49,0	11,1	96	100	145	12	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
12,0	49,0	11,6	96	100	145	12	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
12,5	57,0	12,1	112	116	161	14	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
13,0	57,0	12,6	112	116	161	14	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
13,5	57,0	13,1	112	116	161	14	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
14,0	57,0	13,6	112	116	161	14	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
14,5	65,0	14,0	128	132	180	16	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
15,0	65,0	14,5	128	132	180	16	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
15,5	65,0	15,0	128	132	180	16	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
16,0	65,0	15,5	128	132	180	16	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
16,5	74,0	16,0	144	148	196	18	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
17,0	74,0	16,5	144	148	196	18	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
17,5	74,0	17,0	144	148	196	18	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
18,0	74,0	17,5	144	148	196	18	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
18,5	82,0	18,0	160	164	214	20	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
19,0	82,0	18,5	160	164	214	20	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
19,5	82,0	19,0	160	164	214	20	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900
20,0	82,0	19,5	160	164	214	20	0,20	3	02400	02900	03400	03900	04400	04900	05400	05900

Steel  
Stainless steel  
Cast iron  
Non ferrous metals  
Heat resistant alloys  
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With graduated flute depth



DC <sub>r8</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	CHW	ZEFP	NEW Article no. 53 584 ...	NEW Article no. 53 598 ...	NEW Article no. 53 597 ...	NEW Article no. 53 599 ...
mm	mm	mm	mm	mm	mm	mm	mm		03000	03000	03000	03000
3,0	8	2,7	12	21	57	6	0,1	3	03000	03000	03000	03000
3,5	8	3,2	12	21	57	6	0,1	3	03600	03600	03600	03600
4,0	11	3,7	18	21	57	6	0,1	3	04000	04000	04000	04000
4,5	11	4,2	18	21	57	6	0,1	3	04600	04600	04600	04600
5,0	13	4,7	18	21	57	6	0,1	3	05000	05000	05000	05000
5,5	13	5,2	18	21	57	6	0,1	3	05600	05600	05600	05600
6,0	13	5,7	18	21	57	6	0,2	3	06000	06000	06000	06000
6,5	21	6,1	25	27	63	8	0,2	3	06600	06600	06600	06600
7,0	21	6,6	25	27	63	8	0,2	3	07000	07000	07000	07000
7,5	21	7,1	25	27	63	8	0,2	3	07600	07600	07600	07600
8,0	21	7,4	25	27	63	8	0,2	3	08000	08000	08000	08000
8,5	22	7,9	30	33	73	10	0,2	3	08600	08600	08600	08600
9,0	22	8,4	30	33	73	10	0,2	3	09000	09000	09000	09000
9,5	22	8,9	30	33	73	10	0,2	3	09600	09600	09600	09600
10,0	22	9,2	30	33	73	10	0,2	3	10000	10000	10000	10000
10,5	26	9,7	36	38	83	12	0,2	3	10600	10600	10600	10600
11,0	26	10,0	36	38	83	12	0,2	3	11000	11000	11000	11000
11,5	26	10,5	36	38	83	12	0,2	3	11600	11600	11600	11600
12,0	26	11,0	36	38	83	12	0,2	3	12000	12000	12000	12000
12,5	26	11,5	36	38	83	14	0,2	3			12600	12600
13,0	26	12,0	36	38	83	14	0,2	3			13000	13000
13,5	26	12,5	36	38	83	14	0,2	3			13600	13600
14,0	26	13,0	36	38	83	14	0,2	3			14000	14000
14,5	36	13,5	42	44	92	16	0,2	3			14600	14600
15,0	36	14,0	42	44	92	16	0,2	3			15000	15000
15,5	36	14,5	42	44	92	16	0,2	3			15600	15600
16,0	36	15,0	42	44	92	16	0,2	3			16000	16000
16,5	36	15,5	42	44	92	18	0,2	3			16600	16600
17,0	36	16,0	42	44	92	18	0,2	3			17000	17000
17,5	36	16,5	42	44	92	18	0,2	3			17600	17600
18,0	36	17,0	42	44	92	18	0,2	3			18000	18000
18,5	41	17,5	52	54	104	20	0,2	3			18600	18600
19,0	41	18,0	52	54	104	20	0,2	3			19000	19000
19,5	41	18,5	52	54	104	20	0,2	3			19600	19600
20,0	41	19,0	52	54	104	20	0,2	3			20000	20000

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

→ V<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter with corner radius

▲ With polished chip flutes

DLC

DLC

Factory standard

Factory standard

Factory standard

Factory standard

**NEW**

**Article no.**  
**53 708 ...**

**NEW**

**Article no.**  
**53 710 ...**

**NEW**

**Article no.**  
**53 709 ...**

**NEW**

**Article no.**  
**53 711 ...**

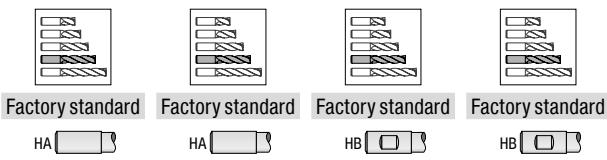
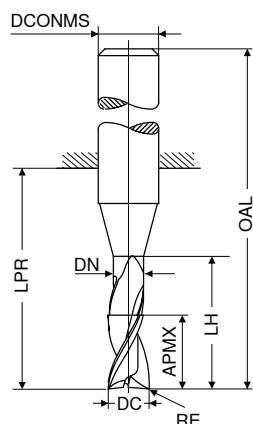
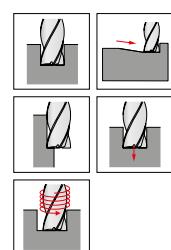
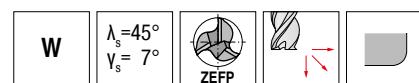
DC <sub>h6</sub>	RE <sub>±0,05</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP				
mm	mm	mm	mm	mm	mm	mm	mm					
2	0,3	4,5	1,8	6	14	50	6	3	02103	02103	02103	02103
2	0,5	4,5	1,8	6	14	50	6	3	02105	02105	02105	02105
3	0,3	6,5	2,7	9	19	55	6	3	03103	03103	03103	03103
3	0,5	6,5	2,7	9	19	55	6	3	03105	03105	03105	03105
3	1,0	6,5	2,7	9	19	55	6	3	03110	03110	03110	03110
4	0,3	8,5	3,7	12	19	55	6	3	04103	04103	04103	04103
4	0,5	8,5	3,7	12	19	55	6	3	04105	04105	04105	04105
4	1,0	8,5	3,7	12	19	55	6	3	04110	04110	04110	04110
5	0,3	10,5	4,7	15	22	58	6	3	05103	05103	05103	05103
5	0,5	10,5	4,7	15	22	58	6	3	05105	05105	05105	05105
5	1,0	10,5	4,7	15	22	58	6	3	05110	05110	05110	05110
6	0,3	13,0	5,7	18	22	58	6	3	06103	06103	06103	06103
6	0,5	13,0	5,7	18	22	58	6	3	06105	06105	06105	06105
6	1,0	13,0	5,7	18	22	58	6	3	06110	06110	06110	06110
6	1,5	13,0	5,7	18	22	58	6	3	06115	06115	06115	06115
8	0,3	17,0	7,4	24	28	64	8	3	08103	08103	08103	08103
8	0,5	17,0	7,4	24	28	64	8	3	08105	08105	08105	08105
8	1,0	17,0	7,4	24	28	64	8	3	08110	08110	08110	08110
8	1,5	17,0	7,4	24	28	64	8	3	08115	08115	08115	08115
8	2,0	17,0	7,4	24	28	64	8	3	08120	08120	08120	08120
10	0,3	21,0	9,2	30	34	74	10	3	10103	10103	10103	10103
10	0,5	21,0	9,2	30	34	74	10	3	10105	10105	10105	10105
10	1,0	21,0	9,2	30	34	74	10	3	10110	10110	10110	10110
10	1,5	21,0	9,2	30	34	74	10	3	10115	10115	10115	10115
10	2,0	21,0	9,2	30	34	74	10	3	10120	10120	10120	10120
10	3,0	21,0	9,2	30	34	74	10	3	10130	10130	10130	10130
12	0,3	25,0	11,0	36	40	85	12	3	12103	12103	12103	12103
12	0,5	25,0	11,0	36	40	85	12	3	12105	12105	12105	12105
12	1,0	25,0	11,0	36	40	85	12	3	12110	12110	12110	12110
12	1,5	25,0	11,0	36	40	85	12	3	12115	12115	12115	12115
12	2,0	25,0	11,0	36	40	85	12	3	12120	12120	12120	12120
12	3,0	25,0	11,0	36	40	85	12	3	12130	12130	12130	12130
12	4,0	25,0	11,0	36	40	85	12	3	12140	12140	12140	12140
16	0,3	33,0	15,0	48	52	100	16	3			16103	16103
16	0,5	33,0	15,0	48	52	100	16	3			16105	16105
16	1,0	33,0	15,0	48	52	100	16	3			16110	16110
16	1,5	33,0	15,0	48	52	100	16	3			16115	16115
16	2,0	33,0	15,0	48	52	100	16	3			16120	16120
16	3,0	33,0	15,0	48	52	100	16	3			16130	16130
16	4,0	33,0	15,0	48	52	100	16	3			16140	16140
20	0,5	42,0	19,0	60	64	114	20	3			20105	20105
20	1,0	42,0	19,0	60	64	114	20	3			20110	20110
20	1,5	42,0	19,0	60	64	114	20	3			20115	20115
20	2,0	42,0	19,0	60	64	114	20	3			20120	20120
20	3,0	42,0	19,0	60	64	114	20	3			20130	20130
20	4,0	42,0	19,0	60	64	114	20	3			20140	20140

Steel
Stainless steel
Cast iron
Non ferrous metals
Heat resistant alloys
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter with corner radius

▲ With polished chip flutes



DC $\text{h}_6$	RE $\pm 0,05$	APMX	DN	LH	LPR	OAL	DCONMS $\text{h}_6$	ZEFP	NEW Article no. 53 708 ...		NEW Article no. 53 710 ...		NEW Article no. 53 709 ...		NEW Article no. 53 711 ...	
									HA	HB	HA	HB	HA	HB	HA	HB
2	0,3	5,5	1,8	10	19	55	6	3	02203		02203		02203		02203	
2	0,5	5,5	1,8	10	19	55	6	3	02205		02205		02205		02205	
3	0,3	8,0	2,7	15	22	58	6	3	03203		03203		03203		03203	
3	0,5	8,0	2,7	15	22	58	6	3	03205		03205		03205		03205	
3	1,0	8,0	2,7	15	22	58	6	3	03210		03210		03210		03210	
4	0,3	10,5	3,7	20	26	62	6	3	04203		04203		04203		04203	
4	0,5	10,5	3,7	20	26	62	6	3	04205		04205		04205		04205	
4	1,0	10,5	3,7	20	26	62	6	3	04210		04210		04210		04210	
5	0,3	13,0	4,7	25	34	70	6	3	05203		05203		05203		05203	
5	0,5	13,0	4,7	25	34	70	6	3	05205		05205		05205		05205	
5	1,0	13,0	4,7	25	34	70	6	3	05210		05210		05210		05210	
6	0,3	16,0	5,7	30	34	70	6	3	06203		06203		06203		06203	
6	0,5	16,0	5,7	30	34	70	6	3	06205		06205		06205		06205	
6	1,0	16,0	5,7	30	34	70	6	3	06210		06210		06210		06210	
6	1,5	16,0	5,7	30	34	70	6	3	06215		06215		06215		06215	
8	0,3	21,0	7,4	40	44	80	8	3	08203		08203		08203		08203	
8	0,5	21,0	7,4	40	44	80	8	3	08205		08205		08205		08205	
8	1,0	21,0	7,4	40	44	80	8	3	08210		08210		08210		08210	
8	1,5	21,0	7,4	40	44	80	8	3	08215		08215		08215		08215	
8	2,0	21,0	7,4	40	44	80	8	3	08220		08220		08220		08220	
10	0,3	26,0	9,2	50	54	94	10	3	10203		10203		10203		10203	
10	0,5	26,0	9,2	50	54	94	10	3	10205		10205		10205		10205	
10	1,0	26,0	9,2	50	54	94	10	3	10210		10210		10210		10210	
10	1,5	26,0	9,2	50	54	94	10	3	10215		10215		10215		10215	
10	2,0	26,0	9,2	50	54	94	10	3	10220		10220		10220		10220	
10	3,0	26,0	9,2	50	54	94	10	3	10230		10230		10230		10230	
12	0,3	31,0	11,0	60	64	109	12	3	12203		12203		12203		12203	
12	0,5	31,0	11,0	60	64	109	12	3	12205		12205		12205		12205	
12	1,0	31,0	11,0	60	64	109	12	3	12210		12210		12210		12210	
12	1,5	31,0	11,0	60	64	109	12	3	12215		12215		12215		12215	
12	2,0	31,0	11,0	60	64	109	12	3	12220		12220		12220		12220	
12	3,0	31,0	11,0	60	64	109	12	3	12230		12230		12230		12230	
12	4,0	31,0	11,0	60	64	109	12	3	12240		12240		12240		12240	
16	0,3	41,0	15,0	80	84	132	16	3					16203		16203	
16	0,5	41,0	15,0	80	84	132	16	3					16205		16205	
16	1,0	41,0	15,0	80	84	132	16	3					16210		16210	
16	1,5	41,0	15,0	80	84	132	16	3					16215		16215	
16	2,0	41,0	15,0	80	84	132	16	3					16220		16220	
16	3,0	41,0	15,0	80	84	132	16	3					16230		16230	
16	4,0	41,0	15,0	80	84	132	16	3					16240		16240	
20	0,3	52,0	19,0	100	104	154	20	3					20205		20205	
20	1,0	52,0	19,0	100	104	154	20	3					20210		20210	
20	1,5	52,0	19,0	100	104	154	20	3					20215		20215	
20	2,0	52,0	19,0	100	104	154	20	3					20220		20220	
20	3,0	52,0	19,0	100	104	154	20	3					20230		20230	
20	4,0	52,0	19,0	100	104	154	20	3					20240		20240	

Steel

Stainless steel

Cast iron

Non ferrous metals

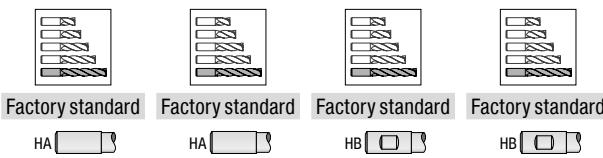
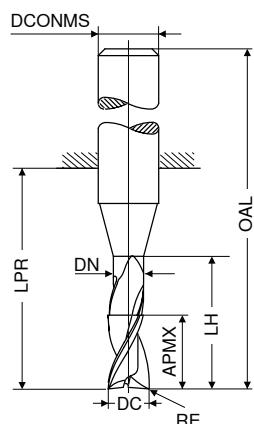
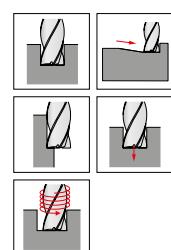
Heat resistant alloys

Hardened materials

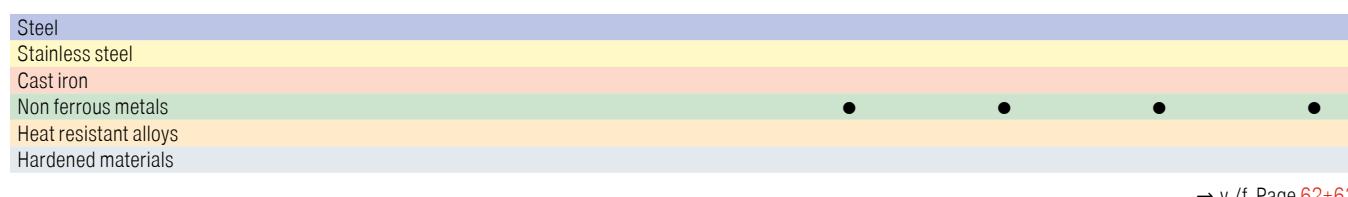
→  $v_c/f_z$  Page 62+63

## AluLine – End milling cutter with corner radius

▲ With polished chip flutes



DC $\text{h}_6$	RE $\pm 0,05$	APMX	DN	LH	LPR	OAL	DCONMS $\text{h}_6$	ZEFP	NEW Article no.							
									mm	mm	mm	mm	mm	mm	mm	mm
2	0,3	8,5	1,8	16	26	62	6	3	02403	02403	02403	02403	02403	02403	02403	02403
2	0,5	8,5	1,8	16	26	62	6	3	02405	02405	02405	02405	02405	02405	02405	02405
3	0,3	12,5	2,7	24	31	67	6	3	03403	03403	03403	03403	03403	03403	03403	03403
3	0,5	12,5	2,7	24	31	67	6	3	03405	03405	03405	03405	03405	03405	03405	03405
3	1,0	12,5	2,7	24	31	67	6	3	03410	03410	03410	03410	03410	03410	03410	03410
4	0,3	16,5	3,7	32	38	74	6	3	04403	04403	04403	04403	04403	04403	04403	04403
4	0,5	16,5	3,7	32	38	74	6	3	04405	04405	04405	04405	04405	04405	04405	04405
4	1,0	16,5	3,7	32	38	74	6	3	04410	04410	04410	04410	04410	04410	04410	04410
5	0,3	20,5	4,7	40	52	88	6	3	05403	05403	05403	05403	05403	05403	05403	05403
5	0,5	20,5	4,7	40	52	88	6	3	05405	05405	05405	05405	05405	05405	05405	05405
5	1,0	20,5	4,7	40	52	88	6	3	05410	05410	05410	05410	05410	05410	05410	05410
6	0,3	25,0	5,7	48	52	88	6	3	06403	06403	06403	06403	06403	06403	06403	06403
6	0,5	25,0	5,7	48	52	88	6	3	06405	06405	06405	06405	06405	06405	06405	06405
6	1,0	25,0	5,7	48	52	88	6	3	06410	06410	06410	06410	06410	06410	06410	06410
6	1,5	25,0	5,7	48	52	88	6	3	06415	06415	06415	06415	06415	06415	06415	06415
8	0,3	33,0	7,4	64	68	104	8	3	08403	08403	08403	08403	08403	08403	08403	08403
8	0,5	33,0	7,4	64	68	104	8	3	08405	08405	08405	08405	08405	08405	08405	08405
8	1,0	33,0	7,4	64	68	104	8	3	08410	08410	08410	08410	08410	08410	08410	08410
8	1,5	33,0	7,4	64	68	104	8	3	08415	08415	08415	08415	08415	08415	08415	08415
8	2,0	33,0	7,4	64	68	104	8	3	08420	08420	08420	08420	08420	08420	08420	08420
10	0,3	41,0	9,2	80	84	124	10	3	10403	10403	10403	10403	10403	10403	10403	10403
10	0,5	41,0	9,2	80	84	124	10	3	10405	10405	10405	10405	10405	10405	10405	10405
10	1,0	41,0	9,2	80	84	124	10	3	10410	10410	10410	10410	10410	10410	10410	10410
10	1,5	41,0	9,2	80	84	124	10	3	10415	10415	10415	10415	10415	10415	10415	10415
10	2,0	41,0	9,2	80	84	124	10	3	10420	10420	10420	10420	10420	10420	10420	10420
10	3,0	41,0	9,2	80	84	124	10	3	10430	10430	10430	10430	10430	10430	10430	10430
12	0,3	49,0	11,0	96	100	145	12	3	12403	12403	12403	12403	12403	12403	12403	12403
12	0,5	49,0	11,0	96	100	145	12	3	12405	12405	12405	12405	12405	12405	12405	12405
12	1,0	49,0	11,0	96	100	145	12	3	12410	12410	12410	12410	12410	12410	12410	12410
12	1,5	49,0	11,0	96	100	145	12	3	12415	12415	12415	12415	12415	12415	12415	12415
12	2,0	49,0	11,0	96	100	145	12	3	12420	12420	12420	12420	12420	12420	12420	12420
12	3,0	49,0	11,0	96	100	145	12	3	12430	12430	12430	12430	12430	12430	12430	12430
12	4,0	49,0	11,0	96	100	145	12	3	12440	12440	12440	12440	12440	12440	12440	12440
16	0,3	65,0	15,0	128	132	180	16	3	16403	16403	16403	16403	16403	16403	16403	16403
16	0,5	65,0	15,0	128	132	180	16	3	16405	16405	16405	16405	16405	16405	16405	16405
16	1,0	65,0	15,0	128	132	180	16	3	16410	16410	16410	16410	16410	16410	16410	16410
16	1,5	65,0	15,0	128	132	180	16	3	16415	16415	16415	16415	16415	16415	16415	16415
16	2,0	65,0	15,0	128	132	180	16	3	16420	16420	16420	16420	16420	16420	16420	16420
16	3,0	65,0	15,0	128	132	180	16	3	16430	16430	16430	16430	16430	16430	16430	16430
16	4,0	65,0	15,0	128	132	180	16	3	16440	16440	16440	16440	16440	16440	16440	16440
20	0,5	82,0	19,0	160	164	214	20	3	20405	20405	20405	20405	20405	20405	20405	20405
20	1,0	82,0	19,0	160	164	214	20	3	20410	20410	20410	20410	20410	20410	20410	20410
20	1,5	82,0	19,0	160	164	214	20	3	20415	20415	20415	20415	20415	20415	20415	20415
20	2,0	82,0	19,0	160	164	214	20	3	20420	20420	20420	20420	20420	20420	20420	20420
20	3,0	82,0	19,0	160	164	214	20	3	20430	20430	20430	20430	20430	20430	20430	20430
20	4,0	82,0	19,0	160	164	214	20	3	20440	20440	20440	20440	20440	20440	20440	20440



## AluLine – End milling cutter with corner radius

▲ With polished chip flutes

<b>W</b>	$\lambda_s = 45^\circ$	$\gamma_s = 7^\circ$	ZEFP					
			<img					

## AluLine – End milling cutter with corner radius

▲ With polished chip flutes

DC <sub>h6</sub> mm	RE <sub>±0,01</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h5</sub> mm	ZEFP	NEW Article no. 53 712 ...	NEW Article no. 53 714 ...	NEW Article no. 53 713 ...	NEW Article no. 53 715 ...
6	0,3	16	5,7	30	34	70	6	3	06203	06203	06203	06203
6	0,5	16	5,7	30	34	70	6	3	06205	06205	06205	06205
6	1,0	16	5,7	30	34	70	6	3	06210	06210	06210	06210
6	1,5	16	5,7	30	34	70	6	3	06215	06215	06215	06215
8	0,3	21	7,4	40	44	80	8	3	08203	08203	08203	08203
8	0,5	21	7,4	40	44	80	8	3	08205	08205	08205	08205
8	1,0	21	7,4	40	44	80	8	3	08210	08210	08210	08210
8	1,5	21	7,4	40	44	80	8	3	08215	08215	08215	08215
8	2,0	21	7,4	40	44	80	8	3	08220	08220	08220	08220
10	0,3	26	9,2	50	54	94	10	3	10203	10203	10203	10203
10	0,5	26	9,2	50	54	94	10	3	10205	10205	10205	10205
10	1,0	26	9,2	50	54	94	10	3	10210	10210	10210	10210
10	1,5	26	9,2	50	54	94	10	3	10215	10215	10215	10215
10	2,0	26	9,2	50	54	94	10	3	10220	10220	10220	10220
10	3,0	26	9,2	50	54	94	10	3	10230	10230	10230	10230
12	0,3	31	11,0	60	64	109	12	3	12203	12203	12203	12203
12	0,5	31	11,0	60	64	109	12	3	12205	12205	12205	12205
12	1,0	31	11,0	60	64	109	12	3	12210	12210	12210	12210
12	1,5	31	11,0	60	64	109	12	3	12215	12215	12215	12215
12	2,0	31	11,0	60	64	109	12	3	12220	12220	12220	12220
12	3,0	31	11,0	60	64	109	12	3	12230	12230	12230	12230
12	4,0	31	11,0	60	64	109	12	3	12240	12240	12240	12240
16	0,3	41	15,0	80	84	132	16	3			16203	16203
16	0,5	41	15,0	80	84	132	16	3			16205	16205
16	1,0	41	15,0	80	84	132	16	3			16210	16210
16	1,5	41	15,0	80	84	132	16	3			16215	16215
16	2,0	41	15,0	80	84	132	16	3			16220	16220
16	3,0	41	15,0	80	84	132	16	3			16230	16230
16	4,0	41	15,0	80	84	132	16	3			16240	16240
20	0,5	52	19,0	100	104	154	20	3			20205	20205
20	1,0	52	19,0	100	104	154	20	3			20210	20210
20	1,5	52	19,0	100	104	154	20	3			20215	20215
20	2,0	52	19,0	100	104	154	20	3			20220	20220
20	3,0	52	19,0	100	104	154	20	3			20230	20230
20	4,0	52	19,0	100	104	154	20	3			20240	20240

Steel  
Stainless steel  
Cast iron  
Non ferrous metals  
Heat resistant alloys  
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

# AluLine – End milling cutter with corner radius

▲ With polished chip flutes

DLC

DLC

Factory standard

Factory standard

Factory standard

Factory standard

HA

HA

HB

HB

**NEW**  
Article no.  
**53 712 ...**

**NEW**  
Article no.  
**53 714 ...**

**NEW**  
Article no.  
**53 713 ...**

**NEW**  
Article no.  
**53 715 ...**

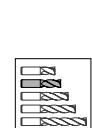
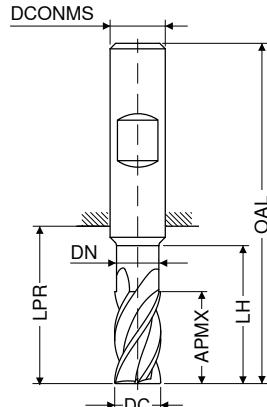
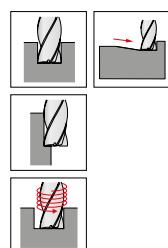
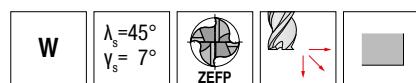
DC <sub>h6</sub>	RE <sub>±0,01</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP				
mm	mm	mm	mm	mm	mm	mm	mm					
6	0,3	25	5,7	48	52	88	6	3	06403	06403	06403	06403
6	0,5	25	5,7	48	52	88	6	3	06405	06405	06405	06405
6	1,0	25	5,7	48	52	88	6	3	06410	06410	06410	06410
6	1,5	25	5,7	48	52	88	6	3	06415	06415	06415	06415
8	0,3	33	7,4	64	68	104	8	3	08403	08403	08403	08403
8	0,5	33	7,4	64	68	104	8	3	08405	08405	08405	08405
8	1,0	33	7,4	64	68	104	8	3	08410	08410	08410	08410
8	1,5	33	7,4	64	68	104	8	3	08415	08415	08415	08415
8	2,0	33	7,4	64	68	104	8	3	08420	08420	08420	08420
10	0,3	41	9,2	80	84	124	10	3	10403	10403	10403	10403
10	0,5	41	9,2	80	84	124	10	3	10405	10405	10405	10405
10	1,0	41	9,2	80	84	124	10	3	10410	10410	10410	10410
10	1,5	41	9,2	80	84	124	10	3	10415	10415	10415	10415
10	2,0	41	9,2	80	84	124	10	3	10420	10420	10420	10420
10	3,0	41	9,2	80	84	124	10	3	10430	10430	10430	10430
12	0,3	49	11,0	96	100	145	12	3	12403	12403	12403	12403
12	0,5	49	11,0	96	100	145	12	3	12405	12405	12405	12405
12	1,0	49	11,0	96	100	145	12	3	12410	12410	12410	12410
12	1,5	49	11,0	96	100	145	12	3	12415	12415	12415	12415
12	2,0	49	11,0	96	100	145	12	3	12420	12420	12420	12420
12	3,0	49	11,0	96	100	145	12	3	12430	12430	12430	12430
12	4,0	49	11,0	96	100	145	12	3	12440	12440	12440	12440
16	0,3	65	15,0	128	132	180	16	3			16403	16403
16	0,5	65	15,0	128	132	180	16	3			16405	16405
16	1,0	65	15,0	128	132	180	16	3			16410	16410
16	1,5	65	15,0	128	132	180	16	3			16415	16415
16	2,0	65	15,0	128	132	180	16	3			16420	16420
16	3,0	65	15,0	128	132	180	16	3			16430	16430
16	4,0	65	15,0	128	132	180	16	3			16440	16440
20	0,5	82	19,0	160	164	214	20	3			20405	20405
20	1,0	82	19,0	160	164	214	20	3			20410	20410
20	1,5	82	19,0	160	164	214	20	3			20415	20415
20	2,0	82	19,0	160	164	214	20	3			20420	20420
20	3,0	82	19,0	160	164	214	20	3			20430	20430
20	4,0	82	19,0	160	164	214	20	3			20440	20440

Steel
Stainless steel
Cast iron
Non ferrous metals
Heat resistant alloys
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



Factory standard	Factory standard	Factory standard	Factory standard
HA	HA	HB	HB
<b>NEW</b> Article no. <b>53 704 ...</b>	<b>NEW</b> Article no. <b>53 706 ...</b>	<b>NEW</b> Article no. <b>53 705 ...</b>	<b>NEW</b> Article no. <b>53 707 ...</b>
05100	05100	05100	05100
06100	06100	06100	06100
08100	08100	08100	08100
10100	10100	10100	10100
12100	12100	12100	12100
		14100	14100
		16100	16100
		18100	18100
		20100	20100

DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP
mm	mm	mm	mm	mm	mm	mm	
5	10,5	4,8	15	22	58	6	4
6	13,0	5,8	18	22	58	6	4
8	17,0	7,7	24	28	64	8	4
10	21,0	9,7	30	34	74	10	4
12	25,0	11,6	36	40	85	12	4
14	29,0	13,6	42	46	91	14	4
16	33,0	15,5	48	52	100	16	4
18	38,0	17,5	54	58	106	18	4
20	42,0	19,5	60	64	114	20	4

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

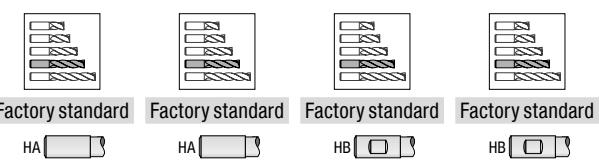
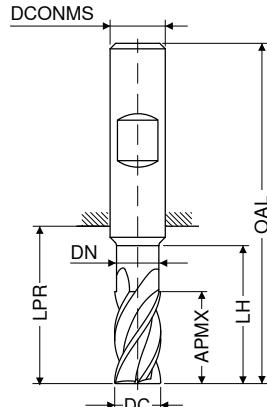
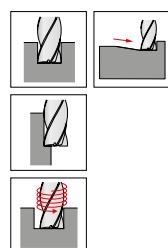
Hardened materials

•      •      •      •

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP	NEW Article no. 53 704 ...	NEW Article no. 53 706 ...	NEW Article no. 53 705 ...	NEW Article no. 53 707 ...
2	5,5	1,8	10	19	55	6	4	02200	02200	02200	02200
3	8,0	2,8	15	22	58	6	4	03200	03200	03200	03200
4	10,5	3,8	20	26	62	6	4	04200	04200	04200	04200
5	13,0	4,8	25	34	70	6	4	05200	05200	05200	05200
6	16,0	5,8	30	34	70	6	4	06200	06200	06200	06200
8	21,0	7,7	40	44	80	8	4	08200	08200	08200	08200
10	26,0	9,7	50	54	94	10	4	10200	10200	10200	10200
12	31,0	11,6	60	64	109	12	4	12200	12200	12200	12200
14	36,0	13,6	70	74	119	14	4			14200	14200
16	41,0	15,5	80	84	132	16	4			16200	16200
18	47,0	17,5	90	94	142	18	4			18200	18200
20	52,0	19,5	100	104	154	20	4			20200	20200

Steel

Stainless steel

Cast iron

Non ferrous metals

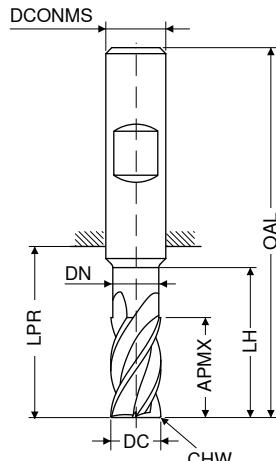
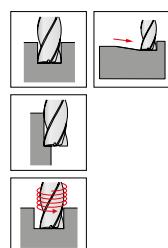
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



Factory standard  
HA



Factory standard  
HA



Factory standard  
HB



Factory standard  
HB

DC <sub>h6</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	CHW	ZEFP	NEW Article no.	NEW Article no.	NEW Article no.	NEW Article no.
mm	mm	mm	mm	mm	mm	mm	mm		53 700 ...	53 702 ...	53 701 ...	53 703 ...
5	10,5	4,8	15	22	58	6	0,1	4	05100	05100	05100	05100
6	13,0	5,8	18	22	58	6	0,2	4	06100	06100	06100	06100
8	17,0	7,7	24	28	64	8	0,2	4	08100	08100	08100	08100
10	21,0	9,7	30	34	74	10	0,2	4	10100	10100	10100	10100
12	25,0	11,6	36	40	85	12	0,2	4	12100	12100	12100	12100
14	29,0	13,6	42	46	91	14	0,2	4			14100	14100
16	33,0	15,5	48	52	100	16	0,2	4			16100	16100
18	38,0	17,5	54	58	106	18	0,2	4			18100	18100
20	42,0	19,5	60	64	114	20	0,2	4			20100	20100

Steel

Stainless steel

Cast iron

Non ferrous metals

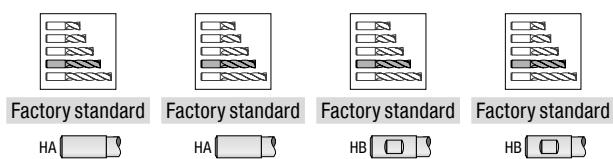
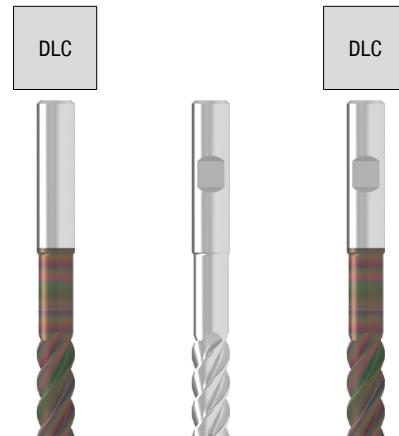
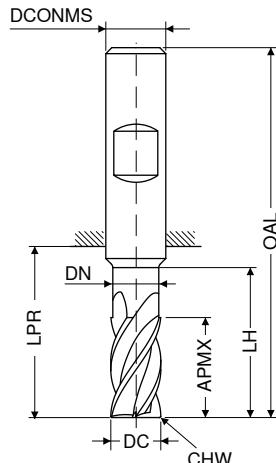
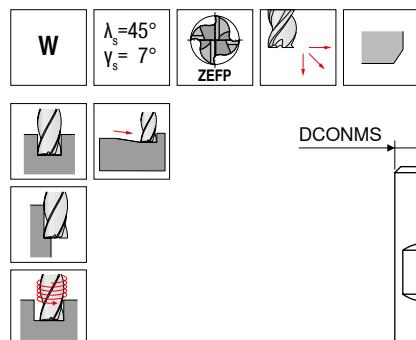
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – End milling cutter

▲ With polished chip flutes



DC <sub>h6</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	CHW mm	ZEFP	NEW Article no. 53 700 ...	NEW Article no. 53 702 ...	NEW Article no. 53 701 ...	NEW Article no. 53 703 ...
2	5,5	1,8	10	19	55	6	0,05	4	02200	02200	02200	02200
3	8,0	2,8	15	22	58	6	0,10	4	03200	03200	03200	03200
4	10,5	3,8	20	26	62	6	0,10	4	04200	04200	04200	04200
5	13,0	4,8	25	34	70	6	0,10	4	05200	05200	05200	05200
6	16,0	5,8	30	34	70	6	0,20	4	06200	06200	06200	06200
8	21,0	7,7	40	44	80	8	0,20	4	08200	08200	08200	08200
10	26,0	9,7	50	54	94	10	0,20	4	10200	10200	10200	10200
12	31,0	11,6	60	64	109	12	0,20	4	12200	12200	12200	12200
14	36,0	13,6	70	74	119	14	0,20	4			14200	14200
16	41,0	15,5	80	84	132	16	0,20	4			16200	16200
18	47,0	17,5	90	94	142	18	0,20	4			18200	18200
20	52,0	19,5	100	104	154	20	0,20	4			20200	20200

Steel

Stainless steel

Cast iron

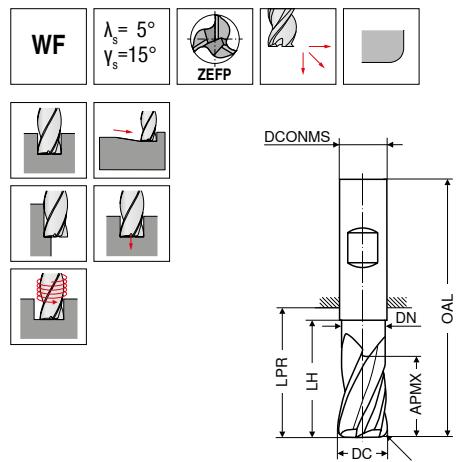
Non ferrous metals

Heat resistant alloys

Hardened materials

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## AluLine – Roughing-Finishing Cutter



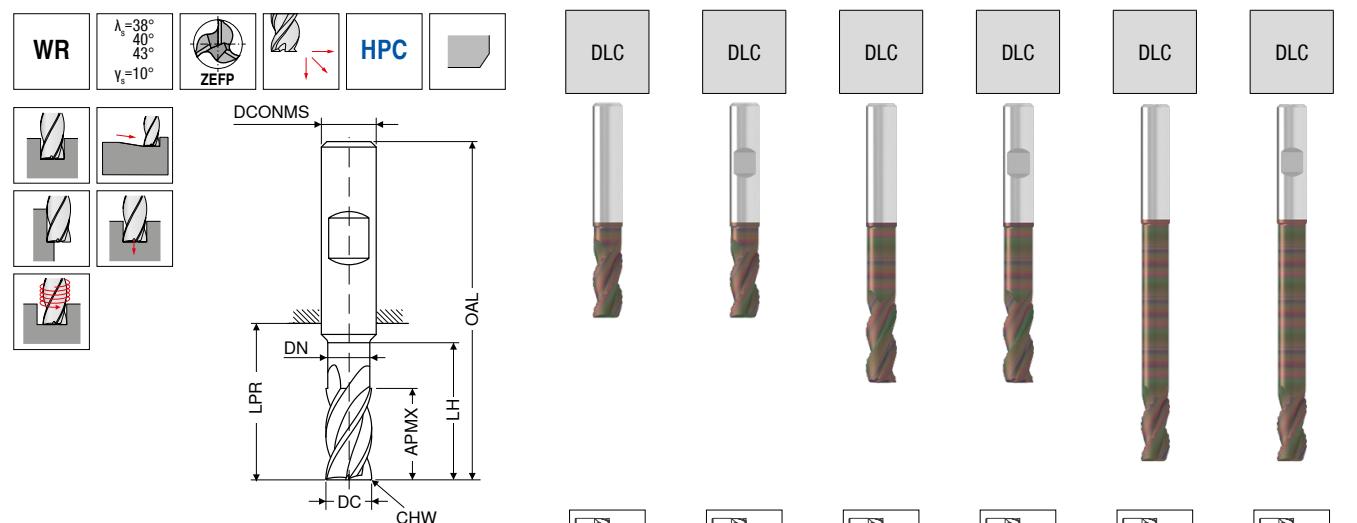
DC <sub>e8</sub>	RE <sub>±0,05</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	NEW Article no. 53 582 ...	NEW Article no. 53 583 ...	NEW Article no. 53 582 ...	NEW Article no. 53 583 ...	NEW Article no. 53 582 ...	NEW Article no. 53 583 ...
mm	mm	mm	mm	mm	mm	mm	mm		HA	HB	HA	HB	HA	HB
3	0,10	5	2,7	18	44	80	6	3			03301	03301		
4	0,10	7	3,7	24	44	80	6	3			04301	04301		
5	0,15	8	4,7	16	18	54	6	3	05101	05101				
5	0,15	8	4,7	30	44	80	6	3			05301	05301		
5	0,15	13	4,7	18	21	57	6	3					05201	05201
6	0,20	10	5,7	17	18	54	6	3	06102	06102				
6	0,20	10	5,7	42	44	80	6	3			06302	06302		
6	0,20	13	5,7	18	21	57	6	3					06202	06202
8	0,25	13	7,4	20	22	58	8	3	08103	08103				
8	0,25	13	7,4	62	64	100	8	3			08303	08303		
8	0,25	21	7,4	25	27	63	8	3					08203	08203
10	0,30	16	9,2	24	26	66	10	3	10103	10103				
10	0,30	16	9,2	58	60	100	10	3			10303	10303		
10	0,30	22	9,2	30	32	72	10	3					10203	10203
12	0,35	19	11,0	26	28	73	12	3	12104	12104				
12	0,35	19	11,0	73	75	120	12	3			12304	12304		
12	0,35	26	11,0	36	38	83	12	3					12204	12204
16	0,50	25	15,0	32	34	82	16	3			16105			
16	0,50	25	15,0	100	102	150	16	3					16305	
16	0,50	36	15,0	42	44	92	16	3						16205
20	0,60	32	19,0	40	42	92	20	3	20106				20306	
20	0,60	32	19,0	100	100	150	20	3						20206
20	0,60	41	19,0	52	54	104	20	3						

Steel  
Stainless steel  
Cast iron  
Non ferrous metals  
Heat resistant alloys  
Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 62+63

## AluLine – Rough milling cutter

▲ With polished chip flutes



DC <sub>d11</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	CHW	ZEFP	NEW Article no.						
mm	mm	mm	mm	mm	mm	mm	mm		53 578 ...	53 579 ...	53 578 ...	53 579 ...	53 578 ...	53 579 ...	
6	13	5,8	18	22	58	6	0,4	3	06100	06100					
6	13	5,8	48	52	88	6	0,4	3					06400	06400	
6	16	5,8	30	34	70	6	0,4	3		06200	06200				
8	17	7,7	24	28	64	8	0,4	3	08100	08100					
8	17	7,7	65	68	104	8	0,4	3			08200	08200			
8	21	7,7	40	44	80	8	0,4	3				08400	08400		
10	21	9,7	30	34	74	10	0,4	3	10100	10100					
10	21	9,7	80	84	124	10	0,4	3			10200	10200			
10	26	9,7	50	54	94	10	0,4	3					10400	10400	
12	25	11,6	36	40	85	12	0,4	3	12100	12100					
12	25	11,6	96	100	145	12	0,4	3			12200	12200			
12	31	11,6	60	64	109	12	0,4	3				12400	12400		
16	33	15,5	48	52	100	16	0,4	3		16100					
16	33	15,5	128	132	180	16	0,4	3				16200			
16	41	15,5	80	84	132	16	0,4	3							
20	42	19,5	60	64	114	20	0,4	3	20100						
20	42	19,5	160	164	214	20	0,4	3			20200				
20	52	19,5	100	104	154	20	0,4	3						20400	

Steel  
Stainless steel  
Cast iron  
Non ferrous metals  
Heat resistant alloys  
Hardened materials

→  $v_c/f_z$  Page 62+63

## AluLine – Rough milling cutter

▲ With polished chip flutes

**WR**  $\lambda_s=38^\circ$   $40^\circ$   $43^\circ$   $\nu_s=10^\circ$  **ZEFP**

**HPC**

**DLC**

**DLC**

**DLC**

**DLC**

**DLC**

**DLC**

**DCONMS**

**OAL**

**LH**

**APMX**

**DN**

**LPR**

**CHW**

**DC**

**ZEFP**

**Factory standard**

**HA**

**HB**

**NEW Article no. 53 580 ...**

**NEW Article no. 53 581 ...**

**NEW Article no. 53 580 ...**

**NEW Article no. 53 581 ...**

**NEW Article no. 53 580 ...**

**NEW Article no. 53 581 ...**

DC <sub>d11</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	CHW	ZEFP	HA	HB	HA	HB	HA	HB
mm	mm	mm	mm	mm	mm	mm	mm							
6	13	5,8	18	22	58	6	0,4	3	06100	06100				
6	13	5,8	48	52	88	6	0,4	3					06400	06400
6	16	5,8	30	34	70	6	0,4	3			06200	06200		
8	17	7,7	24	28	64	8	0,4	3	08100	08100				
8	17	7,7	64	68	104	8	0,4	3					08400	08400
8	21	7,7	40	44	80	8	0,4	3			08200	08200		
10	21	9,7	30	34	74	10	0,4	3	10100	10100				
10	21	9,7	80	84	124	10	0,4	3					10400	10400
10	26	9,7	50	54	94	10	0,4	3			10200	10200		
12	25	11,6	36	40	85	12	0,4	3	12100	12100				
12	25	11,6	96	100	145	12	0,4	3					12400	12400
12	31	11,6	60	64	109	12	0,4	3			12200	12200		
16	33	15,5	48	52	100	16	0,4	3		16100				
16	33	15,5	128	132	180	16	0,4	3						16400
16	41	15,5	80	84	132	16	0,4	3			16200			
20	42	19,5	60	64	114	20	0,4	3	20100					
20	42	19,5	160	164	214	20	0,4	3						20400
20	52	19,5	100	104	154	20	0,4	3			20200			

Steel

Stainless steel

Cast iron

Non ferrous metals

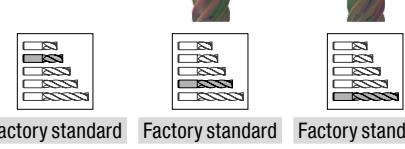
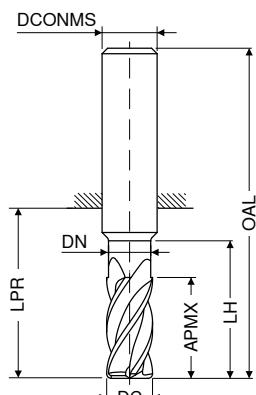
Heat resistant alloys

Hardened materials

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## AluLine – High Accuracy Finish Milling Cutter

- ▲ max. taper of 0.003 mm for high precision and parallelism of vertical walls
- ▲ Tool with cutting edge correction



Factory standard      Factory standard      Factory standard

HA      HA      HA

**NEW** Article no. 53 639 ...      **NEW** Article no. 53 639 ...      **NEW** Article no. 53 639 ...

DC <sub>r8</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP
mm	mm	mm	mm	mm	mm	mm	
6	16	5,7	20	22	58	6	6
6	16	5,7	42	44	80	6	6
8	19	7,4	26	28	64	8	6
8	19	7,4	62	64	100	8	6
10	25	9,2	32	34	74	10	6
10	25	9,2	58	60	100	10	6
12	30	11,0	37	39	84	12	6
12	30	11,0	73	75	120	12	6
12	45			75	120	12	6
16	40	15,0	44	45	93	16	6
16	40	15,0	100	102	150	16	6
16	65			102	150	16	6
20	50	19,0	53	54	104	20	6
20	50	19,0	98	100	150	20	6
20	75			100	150	20	6

Steel

Stainless steel

Cast iron

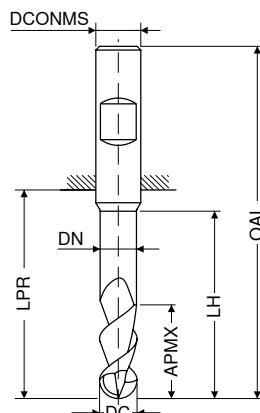
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 64+65

## AluLine – Ball Nosed Cutter



DC <sub>f8</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	NEW Article no. 53 607 ...	NEW Article no. 53 608 ...	NEW Article no. 53 609 ...	NEW Article no. 53 610 ...
mm	mm	mm	mm	mm	mm	mm		03100	03100	06100	06100
3	6	2,7	16	22	50	3	2				
4	7	3,7	17	26	54	4	2	04100	04100		
5	8	4,6	18	26	54	5	2	05100	05100		
6	10	5,5	21	26	62	6	2	06100	06100	06100	06100
8	12	7,5	27	31	67	8	2	08100	08100	08100	08100
10	13	9,4	32	34	74	10	2	10100	10100	10100	10100
12	16	11,4	38	48	93	12	2	12100	12100	12100	12100
14	16	13,2	38	55	100	14	2	14100	14100	14100	14100
16	20	15,0	44	52	100	16	2	16100	16100	16100	16100
20	25	19,0	50	54	104	20	2	20100	20100	20100	20100

Steel

Stainless steel

Cast iron

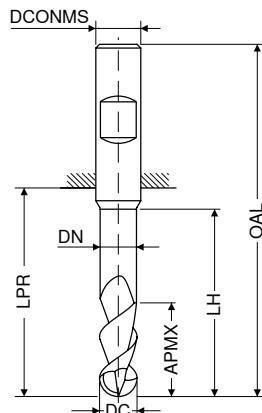
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 64+65

## AluLine - Ball Nosed Cutter



Factory standard

HA

Factory standard

HA

Factory standard

HB

Factory standard

HB

**NEW**Article no.  
**53 607 ...****NEW**Article no.  
**53 608 ...****NEW**Article no.  
**53 609 ...****NEW**Article no.  
**53 610 ...**

DC <sub>r8</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP mm
3	10	2,7	32	47	75	3	2
4	13	3,7	36	47	75	4	2
5	15	4,6	40	47	75	5	2
6	16	5,5	44	64	100	6	2
8	22	7,5	54	64	100	8	2
10	25	9,4	60	61	101	10	2
12	26	11,4	60	63	108	12	2
14	26	13,2	60	65	110	14	2
16	30	15,0	92	102	150	16	2
20	40	19,0	92	100	150	20	2

Steel

Stainless steel

Cast iron

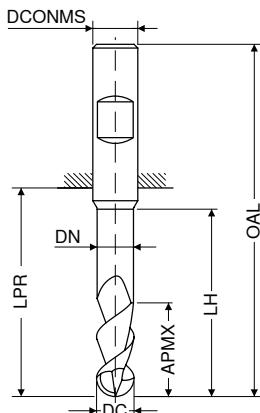
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 64+65

## AluLine – Ball Nosed Cutter



Factory standard

Factory standard



NEW

NEW



NEW

NEW



NEW

NEW



Article no.

Article no.

Article no.

Article no.

53 607 ...

53 608 ...

53 609 ...

53 610 ...

DC $r_8$	APMX	DN	LH	LPR	OAL	DCONMS $h_6$	ZEFP
mm	mm	mm	mm	mm	mm		
3	10	2,7	82	97	125	3	2
4	13	3,7	86	97	125	4	2
6	16	5,5	94	114	150	6	2
8	22	7,5	104	114	150	8	2
10	25	9,4	110	111	151	10	2
12	26	11,4	105	106	151	12	2
16	30	15,0	192	202	250	16	2

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 64+65

## Material examples referring to the cutting data tables

Index	Material	Strength N/mm <sup>2</sup> / HB / HRC	Material number	Material designation	Material number	Material designation	Material number	Material designation
P	1.1 General construction steel	< 800 N/mm <sup>2</sup>	1.0402	EN3B				
	1.2 Free cutting steel	< 800 N/mm <sup>2</sup>	1.0711	EN1A				
	1.3 Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	1.0401	EN32C				
	1.4 Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	1.7325	25 CD4				
	1.5 Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	1.5752	EN36	1.0535	EN9		
	1.6 Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	1.6582	EN24				
	1.7 Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	1.7225	EN19				
	1.8 Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	1.8515	EN40B				
	1.9 Steel castings	< 850 N/mm <sup>2</sup>	0.9650	G-X 260 Cr 27	1.6750	GS-20 NiCrMo 3.7	1.6582	GS-34 CrNiMo 6
	1.10 Nitriding steel	< 1000 N/mm <sup>2</sup>	1.8509	EN41B				
	1.11 Nitriding steel	< 1200 N/mm <sup>2</sup>	1.1186	EN8	1.1160	EN14A		
	1.12 Roller bearing steel	< 1200 N/mm <sup>2</sup>	1.3505	534A99				
	1.13 Spring steel	< 1200 N/mm <sup>2</sup>		EN45		EN47		EN43
	1.14 High-speed steel	< 1300 N/mm <sup>2</sup>	1.3343	M2	1.3249	M34		
	1.15 Cold working tool steel	< 1300 N/mm <sup>2</sup>	1.2379	D2	1.2311	P20		
	1.16 Hot working tool steel	< 1300 N/mm <sup>2</sup>	1.2344	H13				
M	2.1 Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	1.4581	318				
	2.2 Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	1.4000	403				
	2.3 Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	1.4057	EN57				
	2.4 Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	1.4028	EN56B				
	2.5 Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>	1.4542	17-4PH				
	2.6 Stainless steel, austenitic	< 750 N/mm <sup>2</sup>	1.4305	303	1.4401	316	1.4301	304
	2.7 Heat resistant steel	< 1100 N/mm <sup>2</sup>	1.4876	Incoloy 800				
K	3.1 Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	0.6015	Grade 150	0.6020	Grade 220	0.6025	Grade 260
	3.2 Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	0.6030	Grade 300	0.6035	Grade 350	0.6040	Grade 400
	3.3 Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	0.7040	SG 400-12	0.7043	SG 370-17	0.7050	SG 500-7
	3.4 Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	0.7060	SG 600-3	0.7070	SG 700-2	0.7080	SG 800-2
	3.5 White malleable cast iron	270–450 N/mm <sup>2</sup>	0.8035	GTW-35	0.8045	GTW-45		
	3.6 White malleable cast iron	500–650 N/mm <sup>2</sup>	0.8055	GTW-55	0.8065	GTW-65		
	3.7 Black malleable cast iron	300–450 N/mm <sup>2</sup>	0.8135	GTS-35	0.8145	GTS-45		
	3.8 Black malleable cast iron	500–800 N/mm <sup>2</sup>	0.8155	GTS-55	0.8170	GTS-70		
N	4.1 Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	3.0255	1050 A	3.0275	1070 A	3.0285	1080 A (A8)
	4.2 Aluminium alloys < 0.5 % Si	< 500 N/mm <sup>2</sup>	3.1325	2017 A (AU4G)	3.4335	7005 (AZ5G)	3.4365	7075 (AZ5GU)
	4.3 Aluminium alloy 0.5–10 % Si	< 400 N/mm <sup>2</sup>	3.2315	A-G 51	3.2373	A-S9 G	3.2151	A-S 6 U4
	4.4 Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>	3.2581	A-S12	3.2583	A-S12 U		
	4.5 Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>		A-S18	A-S17 U4			
	4.6 Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	2.0040	Cu-c1	2.0060	Cu-a1	2.0090	Cu-b1
	4.7 Copper wrought alloys	< 700 N/mm <sup>2</sup>	2.1247	Cub2 (Beryllium Copper)	2.0855	CuN2S (Nickel Copper)	2.1310	CU-Fe2P
	4.8 Special copper alloys	< 200 HB	2.0916	Cu-A5	2.1525	Cu-S3 M		Ampco 8 (Cu-A6Fe2)
	4.9 Special copper alloys	< 300 HB	2.0978	Cu-Al11 Fe5 Ni5		Ampco 18 (Cu-A10 Fe3)		
	4.10 Special copper alloys	> 300 HB	2.1247	Cu Be2		Ampco M4		
	4.11 Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>	2.0331	Cu Zn36 Pb1,5	2.0380	Cu Zn39 Pb2 (Ms 56)	2.0410	Cu Zn44 Pb2
S	4.12 Long-chipping brass	< 600 N/mm <sup>2</sup>	2.0335	Cu Zn 36 (Ms63)	2.1293	Cu Cr1 Zr		
	4.13 Thermoplastics		PE	PVC	PS	Polystyrene		Plexiglas
	4.14 Duroplastics		PF	Bakelite		Pertinax		
	4.15 Fibre-reinforced plastics			Carbon Fibre		Fibreglass		Aramid Fibre (Kevlar)
	4.16 Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>	3.5812	Mg A7 Z1	3.5662	Mg A9	3.5105	Mg Tr 22 Zn 1
	4.17 Graphite			R8500X		R8650		Technograph 15
	4.18 Tungsten and tungsten alloys			W-Ni Fe (Densimet)		W-Ni Cu (Inermet)		Denal
	4.19 Molybdenum and molybdenum alloys			TZM		MHQ		Mo W
	5.1 Pure nickel		2.4066	Ni99 (Nickel 200)	2.4068	Lc Ni99 (Nickel 201)		
	5.2 Nickel alloys		1.3912	Fe-Ni36 (Invar)	1.3917	Fe-Ni42 (N42)	1.3922	Fe-Ni48 (N48)
H	5.3 Nickel alloys	< 850 N/mm <sup>2</sup>	2.4375	Ni Cu30 Al (Monel K500)	2.4360	Ni Cu30Fe (Monel 400)	2.4668	
	5.4 Nickel-molybdenum alloys		2.4600	Ni Mo30Cr2 (Hastelloy B4)	2.4617	Ni Mo28 (Hastelloy B2)	2.4819	Ni Mo16Cr16 Hastell. C276
	5.5 Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>	2.4951	Ni Cr20TiAl (Nimonic 80A)	2.4858	Ni Cr21Mo (Inconel 825)	2.4856	Ni Cr22Mo9Nb Inconel 625
	5.6 Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>	2.4964	Co Cr20 W15 Ni10		Co Cr20 Ni16 Mo7		Co Cr28 Mo 6
	5.7 Heat resistant alloys	< 1300 N/mm <sup>2</sup>	1.4718	Z45 C S 9-3	1.4747	Z80 CSN 20-02	1.4845	Z12 CN 25-20
	5.8 Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>	2.4851	Ni Cr23Fe (Inconel 601)	2.4668	Ni Cr19NbMo (Inconel 718)	2.4602	Ni Cr21Mo14 Hastelloy C22
	5.9 Pure titanium	< 900 N/mm <sup>2</sup>	3.7025	T35 (Titanium Grade 1)	3.7034	T40 (Titanium Grade 2)	3.7064	T60 (Titanium Grade 4)
	5.10 Titanium alloys	< 700 N/mm <sup>2</sup>	T-A6-Nb7 (367)		T-A5-Sn2-Mo4-Cr4 (Ti17)		T-A3-V2,5 (Gr18)	
	5.11 Titanium alloys	< 1200 N/mm <sup>2</sup>	3.7165	T-A6-V4 (Ta6V)		T-A4-3V-Mo2-Fe2 (SP700)		T-A5-Sn1-Zr1-V1-Mo (Gr32)
	6.1	< 45 HRC						
	6.2	46–55 HRC						
	6.3	Tempered steel	56–60 HRC					
	6.4		61–65 HRC					
	6.5		65–70 HRC					

Cutting data standard values – AluLine – End mills – ZEFP = 2

Cutting data standard values – AluLine – End mills – ZEFP = 3-4

\* = only suitable for DLC coated cutters

\* = only suitable for DLC coated cutters

## Cutting data – AluLine – Ball Nosed End Mills

Index	Type short/ medium length	Type long/ extra long	Ø DC = 3 mm			Ø DC = 4 mm			Ø DC = 5 mm			Ø DC = 6 mm			Ø DC = 8 mm			Ø DC = 10 mm			
			$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	
			$a_{p_{max}}$ $x$ DC	$f_z$ mm	$f_z$ mm	$f_z$ mm	$a_{p_{max}}$ $x$ DC	$f_z$ mm	$f_z$ mm												
4.1	750	450	0,03	0,054	0,042	0,030	0,072	0,055	0,040	0,090	0,067	0,045	0,100	0,075	0,050	0,120	0,089	0,060	0,140	0,104	0,070
4.2	750	450	0,03	0,054	0,042	0,030	0,072	0,055	0,040	0,090	0,067	0,045	0,100	0,075	0,050	0,120	0,089	0,060	0,140	0,104	0,070
4.3	600	360	0,03	0,041	0,032	0,023	0,054	0,042	0,030	0,070	0,052	0,035	0,080	0,060	0,040	0,100	0,075	0,050	0,120	0,089	0,060
4.4	400	240	0,03	0,041	0,032	0,023	0,054	0,042	0,030	0,070	0,052	0,035	0,080	0,060	0,040	0,100	0,075	0,050	0,120	0,089	0,060
4.5	400	240	0,03	0,041	0,032	0,023	0,054	0,042	0,030	0,070	0,052	0,035	0,080	0,060	0,040	0,100	0,075	0,050	0,120	0,089	0,060
4.6	230	170	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.7	190	145	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.8	80	55	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.9	80	55	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.10	80	55	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.11	145	85	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.12	135	105	0,03	0,027	0,021	0,015	0,036	0,028	0,020	0,050	0,037	0,025	0,060	0,045	0,030	0,080	0,060	0,040	0,100	0,075	0,050
4.13	240	145	0,03				0,135	0,104	0,075	0,200	0,149	0,100	0,240	0,179	0,120	0,300	0,224	0,150	0,400	0,298	0,200
4.14	65	40	0,03				0,135	0,104	0,075	0,200	0,149	0,100	0,240	0,179	0,120	0,300	0,224	0,150	0,400	0,298	0,200
4.15																					
4.16	350	210	0,03	0,041	0,032	0,023	0,054	0,042	0,030	0,070	0,052	0,035	0,080	0,060	0,040	0,100	0,075	0,050	0,120	0,089	0,060
4.17																					
4.18																					
4.19																					

**i** Feedrate guides for radius and torus cutters can be found in our main catalogue in the solid carbide milling cutters section on → [page 356](#)

## Cutting data – AluLine – High Accuracy Finishing Cutters

Index	Type short/ medium length	Type long/ extra long	Ø DC = 6 mm			Ø DC = 8 mm			Ø DC = 10 mm			Ø DC = 12 mm			Ø DC = 16 mm						
			$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	
			$a_{p_{max}}$ $x$ DC	$f_z$ mm	$f_z$ mm	$f_z$ mm	$a_{p_{max}}$ $x$ DC	$f_z$ mm	$f_z$ mm												
4.1	500	360	2,0	0,030	0,018		0,040	0,024		0,045	0,027		0,050	0,030		0,060	0,036				
4.2	500	360	2,0	0,030	0,018		0,040	0,024		0,045	0,027		0,050	0,030		0,060	0,036				
4.3	300	220	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.4	210	150	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.5	210	150	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.6	150	110	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.7	140	100	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.8	60	40	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.9	60	40	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.10	60	40	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.11	140	100	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.12	150	110	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.13																					
4.14																					
4.15																					
4.16	200	140	2,0	0,018	0,011		0,020	0,012		0,025	0,015		0,030	0,018		0,050	0,030				
4.17																					
4.18																					
4.19																					

Index	Ø DC = 12 mm			Ø DC = 14 mm			Ø DC = 16 mm			Ø DC = 20 mm			●	○	
	1st choice			suitable									Emulsion	Compressed air	MMS
	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC			
<b>4.1</b>	0,160	0,119	0,080	0,201	0,156	0,110	0,254	0,194	0,150	0,316	0,258	0,200	●	○	
<b>4.2</b>	0,160	0,119	0,080	0,201	0,156	0,110	0,254	0,194	0,150	0,316	0,258	0,200	●	○	
<b>4.3</b>	0,140	0,104	0,070	0,164	0,127	0,090	0,203	0,155	0,120	0,269	0,219	0,170	●	○	
<b>4.4</b>	0,140	0,104	0,070	0,164	0,127	0,090	0,203	0,155	0,120	0,269	0,219	0,170	●	○	
<b>4.5</b>	0,140	0,104	0,070	0,164	0,127	0,090	0,203	0,155	0,120	0,269	0,219	0,170	●	○	
<b>4.6</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.7</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.8</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.9</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.10</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.11</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.12</b>	0,120	0,089	0,060	0,128	0,099	0,070	0,135	0,103	0,080	0,190	0,155	0,120	●	○	
<b>4.13</b>	0,500	0,373	0,250	0,548	0,424	0,300	0,592	0,452	0,350	0,712	0,581	0,450	●	○	
<b>4.14</b>	0,500	0,373	0,250	0,548	0,424	0,300	0,592	0,452	0,350	0,712	0,581	0,450	●	○	
<b>4.15</b>															
<b>4.16</b>	0,140	0,104	0,070	0,164	0,127	0,090	0,203	0,155	0,120	0,269	0,219	0,170	●	○	
<b>4.17</b>															
<b>4.18</b>															
<b>4.19</b>															

Index	Ø DC = 20 mm			●	○	
	1st choice			1st choice	suitable	
	$a_e$ 0,1-0,2 x DC	$a_e$ 0,3-0,4 x DC	$a_e$ 0,6-1,0 x DC	Emulsion	Compressed air	MMS
<b>4.1</b>	0,070	0,042		●	○	
<b>4.2</b>	0,070	0,042		●	○	
<b>4.3</b>	0,060	0,036		●	○	
<b>4.4</b>	0,060	0,036		●	○	
<b>4.5</b>	0,060	0,036		●	○	
<b>4.6</b>	0,060	0,036		●	○	
<b>4.7</b>	0,060	0,036		●	○	
<b>4.8</b>	0,060	0,036		●	○	
<b>4.9</b>	0,060	0,036		●	○	
<b>4.10</b>	0,060	0,036		●	○	
<b>4.11</b>	0,060	0,036		●	○	
<b>4.12</b>	0,060	0,036		●	○	
<b>4.13</b>						
<b>4.14</b>						
<b>4.15</b>						
<b>4.16</b>	0,060	0,036		●	○	
<b>4.17</b>						
<b>4.18</b>						
<b>4.19</b>						

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## WNT \ Performance

Premium quality tools for high performance.

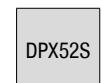
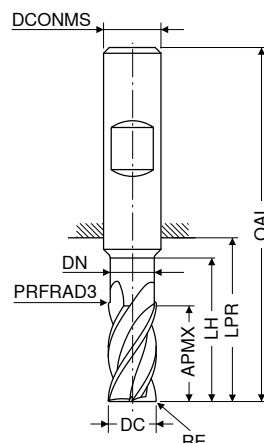
The premium quality tools from the **WNT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

## Overview High Performance Milling Cutters

Tool type	Number of flutes	Diameter in mm Ø DC						Length	Tool design	Pages	
			Steel	Stainless steel	Cast iron	Non ferrous metals	Heat resistant alloys				
				Sharp	Chamfer	Radius	Full Radius				
<b>MonsterMill</b>											
	TCR	4-5	4-20						HPC		67-69
	TCR	4	2-16						HPC		71
	TCR	2-5	2-16						HPC		72
<b>CircularLine</b>											
	CCR Ti	5	6-20						HPC		70

## MonsterMill – End milling cutter with corner radius

▲ PRFRAD3 = 1 mm



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Factory standard



Factory standard



Factory standard



Factory standard

HB

HB

HB

DC <sub>es</sub>	RE	APMX	DN	LH	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP	NEW Article no. 52 503 ...	NEW Article no. 52 504 ...	NEW Article no. 52 505 ...	NEW Article no. 52 506 ...
mm	mm	mm	mm	mm	mm	mm			04000	04000	04000 <sup>1)</sup>	04000 <sup>1)</sup>
4	0,1	11		14	21	57	6	4	04000	04000	04000 <sup>1)</sup>	04000 <sup>1)</sup>
4	0,1	11	3,8	17	21	57	6	5			04000 <sup>1)</sup>	04000 <sup>1)</sup>
5	0,1	13		16	21	57	6	4	05000	05000	05000 <sup>1)</sup>	05000 <sup>1)</sup>
5	0,1	13	4,8	19	21	57	6	5			05000 <sup>1)</sup>	05000 <sup>1)</sup>
6	0,1	13			21	57	6	4	06000	06000	06000 <sup>1)</sup>	06000 <sup>1)</sup>
6	0,1	13	5,8	19	21	57	6	5			06000 <sup>1)</sup>	06000 <sup>1)</sup>
8	0,2	21			27	63	8	4	08000	08000	08000 <sup>1)</sup>	08000 <sup>1)</sup>
8	0,2	21	7,7	25	27	63	8	5			08000 <sup>1)</sup>	08000 <sup>1)</sup>
10	0,2	22			32	72	10	4	10000	10000	10000 <sup>1)</sup>	10000 <sup>1)</sup>
10	0,2	22	9,7	30	32	72	10	5			10000 <sup>1)</sup>	10000 <sup>1)</sup>
12	0,2	26			38	83	12	4	12000	12000	12000 <sup>1)</sup>	12000 <sup>1)</sup>
12	0,2	26	11,6	36	38	83	12	5			12000 <sup>1)</sup>	12000 <sup>1)</sup>
16	0,3	36			44	92	16	4	16000	16000	16000 <sup>1)</sup>	16000 <sup>1)</sup>
16	0,3	36	15,5	42	44	92	16	5			16000 <sup>1)</sup>	16000 <sup>1)</sup>
20	0,3	41			54	104	20	4	20000	20000	20000 <sup>1)</sup>	20000 <sup>1)</sup>
20	0,3	41	19,5	52	54	104	20	5			20000 <sup>1)</sup>	20000 <sup>1)</sup>

Steel

○ ○ ○ ○

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

● ● ● ●

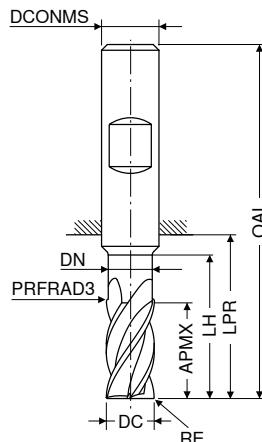
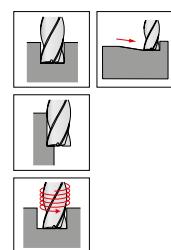
Hardened materials

1) Cutter not suitable for full slot milling, use for finishing and trochoidal milling when slotting only!

→ v<sub>c</sub>/f<sub>x</sub> Page 74+75

## MonsterMill – End milling cutter with corner radius

▲ PRFRAD3 = 1 mm



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Factory standard   Factory standard   Factory standard   Factory standard

HB

HB

HB

HB

NEW Article no. 52 507 ...	NEW Article no. 52 508 ...	NEW Article no. 52 507 ...	NEW Article no. 52 508 ...
----------------------------	----------------------------	----------------------------	----------------------------

DC <sub>ø8</sub>	RE	APMX	DN	LH	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP				
mm	mm	mm	mm	mm	mm	mm	mm					
4	0,4	8,5	3,8	20	26	62	6	4				
4	0,5	8,5	3,8	20	26	62	6	4				
4	0,8	8,5	3,8	20	26	62	6	4				
4	0,2	11,0		14	21	57	6	4	04002	04002		
4	0,4	11,0		14	21	57	6	4	04004	04004		
4	0,5	11,0		14	21	57	6	4	04005	04005		
5	0,5	10,5	4,8	25	34	70	6	4				05105
5	0,8	10,5	4,8	25	34	70	6	4				05108
5	0,5	13,0		16	21	57	6	4	05005	05005		
5	1,0	13,0		16	21	57	6	4	05010	05010		
6	0,4	13,0			21	57	6	4	06004	06004		
6	0,5	13,0			21	57	6	4	06005	06005		
6	0,6	13,0			21	57	6	4	06006	06006		
6	0,6	13,0	5,8	30	34	70	6	4			06106	06106
6	0,8	13,0			21	57	6	4	06008	06008		
6	0,8	13,0	5,8	30	34	70	6	4			06108	06108
6	1,0	13,0	5,8	30	34	70	6	4			06110	06110
6	1,0	13,0			21	57	6	4	06010	06010		
6	1,5	13,0			21	57	6	4	06015	06015		
8	0,8	17,0	7,7	40	44	80	8	4			08108	08108
8	1,0	17,0	7,7	40	44	80	8	4			08110	08110
8	1,5	17,0	7,7	40	44	80	8	4			08115	08115
8	2,0	17,0	7,7	40	44	80	8	4			08120	08120
8	0,5	21,0			27	63	8	4	08005	08005		
8	0,8	21,0			27	63	8	4	08008	08008		
8	1,0	21,0			27	63	8	4	08010	08010		
8	1,2	21,0			27	63	8	4	08012	08012		
8	1,5	21,0			27	63	8	4	08015	08015		
8	2,0	21,0			27	63	8	4	08020	08020		
10	0,5	21,0	9,7	50	54	94	10	4			10105	10105
10	1,0	21,0	9,7	50	54	94	10	4			10110	10110
10	1,5	21,0	9,7	50	54	94	10	4			10115	10115
10	2,0	21,0	9,7	50	54	94	10	4			10120	10120
10	0,5	22,0			32	72	10	4	10005	10005		
10	1,0	22,0			32	72	10	4	10010	10010		
10	1,2	22,0			32	72	10	4	10012	10012		
10	1,5	22,0			32	72	10	4	10015	10015		
10	1,6	22,0			32	72	10	4	10016	10016		
10	2,0	22,0			32	72	10	4	10020	10020		
12	0,5	25,0	11,6	60	65	110	12	4			12105	12105
12	1,0	25,0	11,6	60	65	110	12	4			12110	12110
12	1,5	25,0	11,6	60	65	110	12	4			12115	12115
12	2,0	25,0	11,6	60	65	110	12	4			12120	12120

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

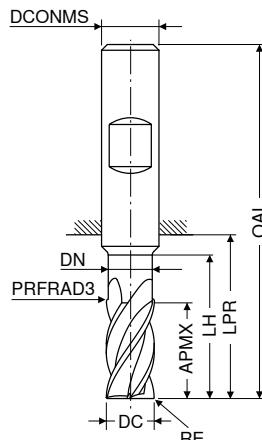
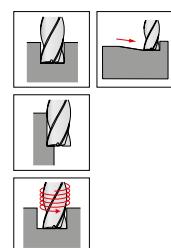
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→ v<sub>c</sub>/f<sub>x</sub> Page 74+75

## MonsterMill – End milling cutter with corner radius

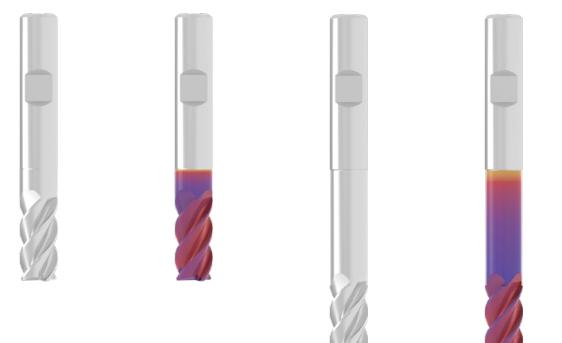
▲ PRFRAD3 = 1 mm



DRAGONSKIN



DRAGONSKIN



Factory standard



HB



Factory standard



HB



Factory standard



HB



Factory standard



HB

DC <sub>e8</sub>	RE	APMX	DN	LH	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP	NEW Article no.			
									52 507 ...	52 508 ...	52 507 ...	52 508 ...
12	3,0	25,0	11,6	60	65	110	12	4				
12	4,0	25,0	11,6	60	65	110	12	4	12005	12005	12130	12130
12	0,5	26,0			38	83	12	4			12140	12140
12	1,0	26,0			38	83	12	4	12010	12010		
12	1,2	26,0			38	83	12	4	12012	12012		
12	1,5	26,0			38	83	12	4	12015	12015		
12	1,6	26,0			38	83	12	4	12016	12016		
12	2,0	26,0			38	83	12	4	12020	12020		
12	2,5	26,0			38	83	12	4	12025	12025		
12	3,0	26,0			38	83	12	4	12030	12030		
14	1,0	29,0	13,6	70	75	120	14	4			14110	14110
14	2,0	29,0	13,6	70	75	120	14	4			14120	14120
14	3,0	29,0	13,6	70	75	120	14	4			14130	14130
14	4,0	29,0	13,6	70	75	120	14	4			14140	14140
16	1,0	33,0	15,5	80	84	132	16	4			16110	16110
16	2,0	33,0	15,5	80	84	132	16	4			16120	16120
16	3,0	33,0	15,5	80	84	132	16	4			16130	16130
16	4,0	33,0	15,5	80	84	132	16	4			16140	16140
16	1,0	36,0			44	92	16	4	16010	16010		
16	1,6	36,0			44	92	16	4	16016	16016		
16	2,0	36,0			44	92	16	4	16020	16020		
16	2,5	36,0			44	92	16	4	16025	16025		
16	3,0	36,0			44	92	16	4	16030	16030		
16	3,2	36,0			44	92	16	4	16032	16032		
16	4,0	36,0			44	92	16	4	16040	16040		
18	1,0	38,0	17,5	90	94	142	18	4			18110	18110
18	2,0	38,0	17,5	90	94	142	18	4			18120	18120
18	3,0	38,0	17,5	90	94	142	18	4			18130	18130
18	4,0	38,0	17,5	90	94	142	18	4			18140	18140
20	2,0	41,0			54	104	20	4	20020	20020		
20	3,0	41,0			54	104	20	4	20030	20030		
20	4,0	41,0			54	104	20	4	20040	20040		
20	5,0	41,0			54	104	20	4	20050	20050		
20	6,3	41,0			54	104	20	4	20063	20063		
20	1,0	42,0	19,5	100	104	154	20	4			20110	20110
20	2,0	42,0	19,5	100	104	154	20	4			20120	20120
20	3,0	42,0	19,5	100	104	154	20	4			20130	20130
20	4,0	42,0	19,5	100	104	154	20	4			20140	20140

Steel

Stainless steel

Cast iron

Non ferrous metals

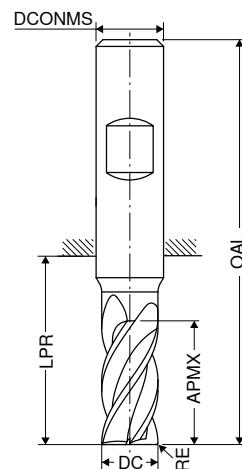
Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>x</sub> Page 74+75

**CircularLine – End milling cutter with corner radius**

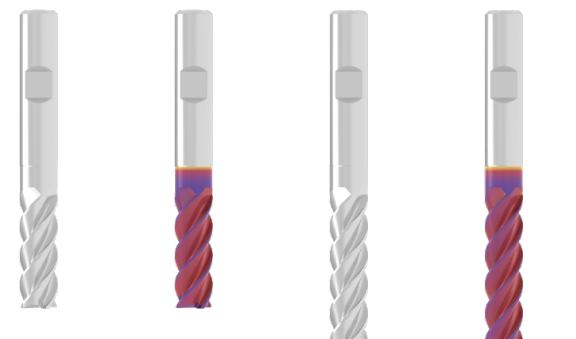
▲ Chip breaker 0.9 x DC



DRAGONSKIN



DRAGONSKIN



Factory standard



Factory standard



Factory standard



Factory standard

HB

HB

HB

HB

DC <sub>e8</sub>	RE <sub>±0,01</sub>	APMX	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP	NEW Article no.	NEW Article no.	NEW Article no.	NEW Article no.
6	0,1	18	29	65	6	5	06000	06000		
6	0,1	24	31	67	6	5			06100	06100
8	0,2	24	34	70	8	5	08000	08000		
8	0,2	32	44	80	8	5			08100	08100
10	0,2	30	40	80	10	5	10000	10000		
10	0,2	40	50	90	10	5			10100	10100
12	0,2	36	50	95	12	5	12000	12000		
12	0,2	48	55	100	12	5			12100	12100
16	0,2	48	62	110	16	5	16000	16000		
16	0,3	64	72	120	16	5			16100	16100
20	0,3	60	75	125	20	5	20000	20000		
20	0,3	80	90	140	20	5			20100	20100

Steel

Stainless steel

○ ○ ○ ○

Cast iron

Non ferrous metals

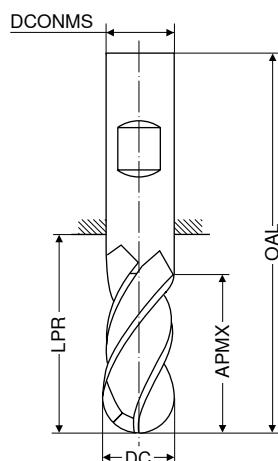
Heat resistant alloys

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Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 76+77

## MonsterMill – Ball Nosed Cutter



DRAGONSkin

DRAGONSkin



Factory standard

Factory standard

Factory standard

Factory standard



NEW Article no. 52 513 ...

NEW Article no. 52 514 ...

NEW Article no. 52 513 ...

NEW Article no. 52 514 ...

DC <sub>e8</sub>	APMX	LPR	OAL	DCONMS <sub>h5</sub>	ZEFP
mm	mm	mm	mm	mm	
2	4	18	54	6	4
2	4	44	80	6	4
3	5	44	80	6	4
3	5	18	54	6	4
4	8	44	80	6	4
4	8	18	54	6	4
5	9	44	80	6	4
5	9	18	54	6	4
6	10	44	80	6	4
6	10	18	54	6	4
8	12	64	100	8	4
8	12	22	58	8	4
10	14	60	100	10	4
10	14	26	66	10	4
12	16	55	100	12	4
12	16	28	73	12	4
16	20	52	100	16	4
16	20	34	82	16	4

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

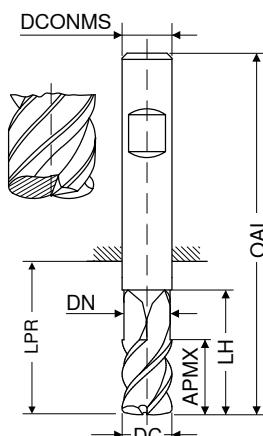
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→ v<sub>c</sub>/f<sub>z</sub> Page 78+79

# MonsterMill – Torus Face Milling Cutter

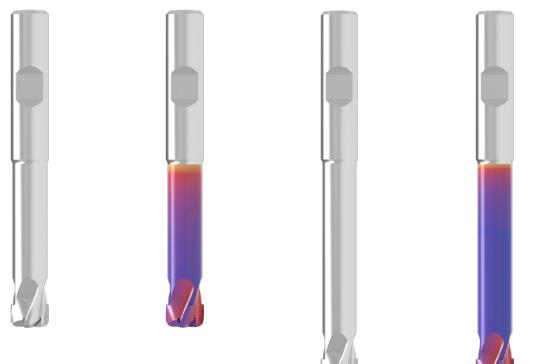
- ▲  $r_{3D}$  = programmed corner radius
- ▲ APMX does not correspond to the maximum cutting depth



DRAGOSKIN



DRAGOSKIN



DIN 6527

HB



DIN 6527

HB



DIN 6527

HB



DIN 6527

HB

DC <sub>68</sub> mm	r <sub>3D</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>H5</sub> mm	ZEFP mm	Article no.			
									DIN 6527	DIN 6527	DIN 6527	DIN 6527
2	0,3	1,5	1,7	13	18	54	6	2	02000	02000		
2	0,3	1,5	1,7	18	39	75	6	2			02100	02100
3	0,3	1,5	2,7	15	18	54	6	2	03000	03000		
3	0,3	1,5	2,7	20	39	75	6	2			03100	03100
4	0,5	2,5	3,6	16	22	58	6	2	04000	04000		
4	0,5	2,5	3,6	24	49	85	6	2			04100	04100
5	0,5	3,5	4,6	18	29	65	6	4	05000	05000		
5	0,5	3,5	4,6	28	64	100	6	4			05100	05100
6	1,0	3,5	5,2	20	29	65	6	4	06000	06000		
6	1,0	3,5	5,2	28	64	100	6	4			06100	06100
8	1,5	4,8	7,0	24	34	70	8	5	08000	08000		
8	1,5	4,8	7,0	40	64	100	8	5			08100	08100
10	2,0	5,8	9,0	26	45	85	10	5	10000	10000		
10	2,0	5,8	9,0	48	60	100	10	5			10100	10100
12	2,0	6,8	11,0	30	48	93	12	5	12000	12000		
12	2,0	6,8	11,0	56	75	120	12	5			12100	12100
16	2,5	8,8	14,5	35	52	100	16	5	16000	16000		
16	2,5	8,8	14,5	65	102	150	16	5			16100	16100

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

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→ v<sub>c</sub>/f<sub>z</sub> Page 78+79

## Material examples referring to the cutting data tables

Index	Material	Strength N/mm <sup>2</sup> / HB / HRC	Material number	Material designation	Material number	Material designation	Material number	Material designation
P	1.1 General construction steel	< 800 N/mm <sup>2</sup>	1.0402	EN3B				
	1.2 Free cutting steel	< 800 N/mm <sup>2</sup>	1.0711	EN1A				
	1.3 Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	1.0401	EN32C				
	1.4 Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	1.7325	25 CD4				
	1.5 Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	1.5752	EN36	1.0535	EN9		
	1.6 Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	1.6582	EN24				
	1.7 Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	1.7225	EN19				
	1.8 Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	1.8515	EN40B				
	1.9 Steel castings	< 850 N/mm <sup>2</sup>	0.9650	G-X 260 Cr 27	1.6750	GS-20 NiCrMo 3.7	1.6582	GS-34 CrNiMo 6
	1.10 Nitriding steel	< 1000 N/mm <sup>2</sup>	1.8509	EN41B				
	1.11 Nitriding steel	< 1200 N/mm <sup>2</sup>	1.1186	EN8	1.1160	EN14A		
	1.12 Roller bearing steel	< 1200 N/mm <sup>2</sup>	1.3505	534A99				
	1.13 Spring steel	< 1200 N/mm <sup>2</sup>		EN45		EN47		EN43
	1.14 High-speed steel	< 1300 N/mm <sup>2</sup>	1.3343	M2	1.3249	M34		
	1.15 Cold working tool steel	< 1300 N/mm <sup>2</sup>	1.2379	D2	1.2311	P20		
	1.16 Hot working tool steel	< 1300 N/mm <sup>2</sup>	1.2344	H13				
M	2.1 Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	1.4581	318				
	2.2 Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	1.4000	403				
	2.3 Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	1.4057	EN57				
	2.4 Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	1.4028	EN56B				
	2.5 Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>	1.4542	17-4PH				
	2.6 Stainless steel, austenitic	< 750 N/mm <sup>2</sup>	1.4305	303	1.4401	316	1.4301	304
	2.7 Heat resistant steel	< 1100 N/mm <sup>2</sup>	1.4876	Incoloy 800				
K	3.1 Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	0.6015	Grade 150	0.6020	Grade 220	0.6025	Grade 260
	3.2 Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	0.6030	Grade 300	0.6035	Grade 350	0.6040	Grade 400
	3.3 Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	0.7040	SG 400-12	0.7043	SG 370-17	0.7050	SG 500-7
	3.4 Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	0.7060	SG 600-3	0.7070	SG 700-2	0.7080	SG 800-2
	3.5 White malleable cast iron	270–450 N/mm <sup>2</sup>	0.8035	GTW-35	0.8045	GTW-45		
	3.6 White malleable cast iron	500–650 N/mm <sup>2</sup>	0.8055	GTW-55	0.8065	GTW-65		
	3.7 Black malleable cast iron	300–450 N/mm <sup>2</sup>	0.8135	GTS-35	0.8145	GTS-45		
	3.8 Black malleable cast iron	500–800 N/mm <sup>2</sup>	0.8155	GTS-55	0.8170	GTS-70		
N	4.1 Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	3.0255	1050 A	3.0275	1070 A	3.0285	1080 A (A8)
	4.2 Aluminium alloys < 0.5 % Si	< 500 N/mm <sup>2</sup>	3.1325	2017 A (AU4G)	3.4335	7005 (AZ5G)	3.4365	7075 (AZ5GU)
	4.3 Aluminium alloy 0.5–10 % Si	< 400 N/mm <sup>2</sup>	3.2315	A-G 51	3.2373	A-S9 G	3.2151	A-S 6 U4
	4.4 Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>	3.2581	A-S12	3.2583	A-S12 U		
	4.5 Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>		A-S18	A-S17 U4			
	4.6 Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	2.0040	Cu-c1	2.0060	Cu-a1	2.0090	Cu-b1
	4.7 Copper wrought alloys	< 700 N/mm <sup>2</sup>	2.1247	Cub2 (Beryllium Copper)	2.0855	CuN2S (Nickel Copper)	2.1310	CU-Fe2P
	4.8 Special copper alloys	< 200 HB	2.0916	Cu-A5	2.1525	Cu-S3 M		Ampco 8 (Cu-A6Fe2)
	4.9 Special copper alloys	< 300 HB	2.0978	Cu-Al11 Fe5 Ni5		Ampco 18 (Cu-A10 Fe3)		
	4.10 Special copper alloys	> 300 HB	2.1247	Cu Be2		Ampco M4		
	4.11 Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>	2.0331	Cu Zn36 Pb1,5	2.0380	Cu Zn39 Pb2 (Ms 56)	2.0410	Cu Zn44 Pb2
S	4.12 Long-chipping brass	< 600 N/mm <sup>2</sup>	2.0335	Cu Zn 36 (Ms63)	2.1293	Cu Cr1 Zr		
	4.13 Thermoplastics		PE	PVC	PS	Polystyrene		Plexiglas
	4.14 Duroplastics		PF	Bakelite		Pertinax		
	4.15 Fibre-reinforced plastics			Carbon Fibre		Fibreglass		Aramid Fibre (Kevlar)
	4.16 Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>	3.5812	Mg A7 Z1	3.5662	Mg A9	3.5105	Mg Tr 22 Zn 1
	4.17 Graphite			R8500X		R8650		Technograph 15
	4.18 Tungsten and tungsten alloys			W-Ni Fe (Densimet)		W-Ni Cu (Inermet)		Denal
	4.19 Molybdenum and molybdenum alloys			TZM		MHQ		Mo W
	5.1 Pure nickel		2.4066	Ni99 (Nickel 200)	2.4068	Lc Ni99 (Nickel 201)		
	5.2 Nickel alloys		1.3912	Fe-Ni36 (Invar)	1.3917	Fe-Ni42 (N42)	1.3922	Fe-Ni48 (N48)
H	5.3 Nickel alloys	< 850 N/mm <sup>2</sup>	2.4375	Ni Cu30 Al (Monel K500)	2.4360	Ni Cu30Fe (Monel 400)	2.4668	
	5.4 Nickel-molybdenum alloys		2.4600	Ni Mo30Cr2 (Hastelloy B4)	2.4617	Ni Mo28 (Hastelloy B2)	2.4819	Ni Mo16Cr16 Hastell. C276
	5.5 Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>	2.4951	Ni Cr20TiAl (Nimonic 80A)	2.4858	Ni Cr21Mo (Inconel 825)	2.4856	Ni Cr22Mo9Nb Inconel 625
	5.6 Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>	2.4964	Co Cr20 W15 Ni10		Co Cr20 Ni16 Mo7		Co Cr28 Mo 6
	5.7 Heat resistant alloys	< 1300 N/mm <sup>2</sup>	1.4718	Z45 C S 9-3	1.4747	Z80 CSN 20-02	1.4845	Z12 CN 25-20
	5.8 Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>	2.4851	Ni Cr23Fe (Inconel 601)	2.4668	Ni Cr19NbMo (Inconel 718)	2.4602	Ni Cr21Mo14 Hastelloy C22
	5.9 Pure titanium	< 900 N/mm <sup>2</sup>	3.7025	T35 (Titanium Grade 1)	3.7034	T40 (Titanium Grade 2)	3.7064	T60 (Titanium Grade 4)
	5.10 Titanium alloys	< 700 N/mm <sup>2</sup>		T-A6-Nb7 (367)		T-A5-Sn2-Mo4-Cr4 (Ti17)		T-A3-V2,5 (Gr18)
	5.11 Titanium alloys	< 1200 N/mm <sup>2</sup>	3.7165	T-A6-V4 (Ta6V)		T-A4-3V-Mo2-Fe2 (SP700)		T-A5-Sn1-Zr1-V1-Mo (Gr32)
	6.1	< 45 HRC						
	6.2	46–55 HRC						
	6.3	Tempered steel	56–60 HRC					
	6.4		61–65 HRC					
	6.5		65–70 HRC					

## Cutting data standard values – MonsterMill – TCR, end mills 52 503 ... / 52 504 ... /

	long	extra long	long	extra long	Ø DC = 4 mm			Ø DC = 5 mm			Ø DC = 6 mm			Ø DC = 8 mm		
					$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC
Index	$v_c$ m/min	$v_c$ m/min	$a_{p,max}$ x DC	$a_{p,max}$ x DC	$f_z$ mm											
<b>2.1</b>	110	88	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.2</b>	100	80	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.3</b>	80	64	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.4</b>	80	64	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.5</b>	100	80	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.6</b>	100	80	1,0	0,5	0,022	0,017	0,012	0,032	0,024	0,016	0,042	0,031	0,021	0,050	0,037	0,025
<b>2.7</b>	55	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.1</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.2</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.3</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.4</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.5</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.6</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.7</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.8</b>	<b>55</b>	44	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.9</b>	<b>120</b>	96	1,0	0,5	0,045	0,035	0,025	0,060	0,045	0,030	0,070	0,052	0,035	0,100	0,075	0,050
<b>5.10</b>	<b>100</b>	80	1,0	0,5	0,036	0,028	0,020	0,054	0,040	0,027	0,070	0,052	0,035	0,080	0,060	0,040
<b>5.11</b>	<b>80</b>	64	1,0	0,5	0,027	0,021	0,015	0,040	0,030	0,020	0,050	0,037	0,025	0,060	0,045	0,030

## Cutting data standard values – MonsterMill – TCR, end mills 52 505 ... / 52 506 ...

	long	long	Ø DC = 4 mm			Ø DC = 5 mm			Ø DC = 6 mm			Ø DC = 8 mm			Ø DC = 10 mm			Ø DC = 12 mm			Ø DC = 16 mm		
			$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC			
Index	$v_c$ m/min	$a_{p,max}$ x DC	$f_z$ mm																				
<b>2.1</b>	110	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.2</b>	100	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.3</b>	80	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.4</b>	80	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.5</b>	100	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.6</b>	100	1,0	0,017	0,012	0,024	0,016	0,031	0,021	0,037	0,025	0,048	0,032	0,060	0,040	0,065	0,050							
<b>2.7</b>	55	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.1</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.2</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.3</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.4</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.5</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.6</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.7</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.8</b>	<b>55</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,075	0,050	0,077	0,060							
<b>5.9</b>	<b>120</b>	1,0	0,035	0,025	0,045	0,030	0,052	0,035	0,075	0,050	0,089	0,060	0,104	0,070	0,077	0,060							
<b>5.10</b>	<b>100</b>	1,0	0,028	0,020	0,040	0,027	0,052	0,035	0,060	0,040	0,075	0,050	0,089	0,060	0,077	0,060							
<b>5.11</b>	<b>80</b>	1,0	0,021	0,015	0,030	0,020	0,037	0,025	0,045	0,030	0,060	0,040	0,075	0,050	0,077	0,060							

## 52 507 ... / 52 508 ...

	$\varnothing DC = 10\text{ mm}$			$\varnothing DC = 12\text{ mm}$			$\varnothing DC = 16\text{ mm}$			$\varnothing DC = 20\text{ mm}$			● 1st choice	○ suitable	
	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC	$a_e$ 0,6–1,0 x DC			
	Index	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	Emulsion	Compressed air	MMS
<b>2.1</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.2</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.3</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.4</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.5</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.6</b>	0,064	0,048	0,032	0,080	0,060	0,040	0,085	0,065	0,050	0,111	0,090	0,070	●		
<b>2.7</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.1</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.2</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.3</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.4</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.5</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.6</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.7</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.8</b>	0,100	0,075	0,050	0,100	0,075	0,050	0,101	0,077	0,060	0,111	0,090	0,070	●		
<b>5.9</b>	0,120	0,089	0,060	0,140	0,104	0,070	0,101	0,077	0,060	0,190	0,155	0,120	●		
<b>5.10</b>	0,100	0,075	0,050	0,120	0,089	0,060	0,101	0,077	0,060	0,158	0,129	0,100	●		
<b>5.11</b>	0,080	0,060	0,040	0,100	0,075	0,050	0,101	0,077	0,060	0,126	0,103	0,080	●		

	$\varnothing DC = 20\text{ mm}$		● 1st choice	○ suitable		
	$a_e$ 0,1–0,2 x DC	$a_e$ 0,3–0,4 x DC				
	Index	$f_z$ mm	$f_z$ mm	Emulsion	Compressed air	MMS
<b>2.1</b>	0,090	0,070	●			
<b>2.2</b>	0,090	0,070	●			
<b>2.3</b>	0,090	0,070	●			
<b>2.4</b>	0,090	0,070	●			
<b>2.5</b>	0,090	0,070	●			
<b>2.6</b>	0,090	0,070	●			
<b>2.7</b>	0,090	0,070	●			
<b>5.1</b>	0,090	0,070	●			
<b>5.2</b>	0,090	0,070	●			
<b>5.3</b>	0,090	0,070	●			
<b>5.4</b>	0,090	0,070	●			
<b>5.5</b>	0,090	0,070	●			
<b>5.6</b>	0,090	0,070	●			
<b>5.7</b>	0,090	0,070	●			
<b>5.8</b>	0,090	0,070	●			
<b>5.9</b>	0,155	0,120	●			
<b>5.10</b>	0,129	0,100	●			
<b>5.11</b>	0,103	0,080	●			

## Cutting data standard values – CircularLine – CCR-Ti, long

Index	v <sub>c</sub> m/min	long	max. angle of engagement	Ø DC = 6 mm				Ø DC = 8 mm				Ø DC = 10 mm			
				a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>	a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>	a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>
				f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm		f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm		f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm	
2.1	200	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.2	180	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.3	160	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.4	160	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.5	140	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.6	140	45°	0,080	0,057	0,046	0,018	0,098	0,070	0,057	0,022	0,125	0,089	0,072	0,028	
2.7															
5.1	120	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.2	80	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.3	80	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.4	60	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.5	60	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.6	60	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.7	60	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.8	60	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	
5.9	140	40°	0,060	0,042	0,034	0,013	0,070	0,049	0,040	0,016	0,089	0,063	0,052	0,020	
5.10	120	40°	0,060	0,042	0,034	0,013	0,070	0,049	0,040	0,016	0,089	0,063	0,052	0,020	
5.11	100	40°	0,045	0,032	0,026	0,010	0,052	0,037	0,030	0,012	0,067	0,047	0,039	0,015	

## Cutting data standard values – CircularLine – CCR-Ti, extra-long

Index	v <sub>c</sub> m/min	extra long	max. angle of engagement	Ø DC = 6 mm				Ø DC = 8 mm				Ø DC = 10 mm				Ø DC = 12 mm			
				a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>	a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>	a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>	a <sub>e</sub> 0,05 x DC	a <sub>e</sub> 0,10 x DC	a <sub>e</sub> 0,15 x DC	h <sub>m</sub>
				f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm		f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm		f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm		f <sub>z</sub> mm	f <sub>z</sub> mm	f <sub>z</sub> mm	
2.1	170	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.2	150	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.3	130	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.4	130	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.5	110	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.6	110	45°	0,080	0,057	0,018	0,098	0,070	0,022	0,125	0,089	0,028	0,125	0,089	0,028					
2.7																			
5.1	100	40°	0,022	0,016	0,005	0,027	0,019	0,006	0,036	0,025	0,008	0,045	0,032	0,010					
5.2	70	40°	0,022	0,016	0,005	0,027	0,019	0,006	0,036	0,025	0,008	0,045	0,032	0,010					
5.3	70	40°	0,022	0,016	0,005	0,027	0,019	0,006	0,036	0,025	0,008	0,045	0,032	0,010					
5.4																			
5.5																			
5.6																			
5.7																			
5.8																			
5.9	120	40°	0,031	0,022	0,007	0,036	0,025	0,008	0,045	0,032	0,010	0,054	0,038	0,012					
5.10	100	40°	0,031	0,022	0,007	0,036	0,025	0,008	0,045	0,032	0,010	0,054	0,038	0,012					
5.11	90	40°	0,022	0,016	0,005	0,027	0,019	0,006	0,036	0,025	0,008	0,045	0,032	0,010					

 Depth of cut corresponds to the flute length

	$\emptyset$ DC = 12 mm						$\emptyset$ DC = 16 mm						$\emptyset$ DC = 20 mm						● 1st choice		○ suitable	
	$a_e$			$h_m$	$a_e$			$h_m$	$a_e$			$h_m$	$a_e$			$h_m$	Emulsion		Compressed air			
	0,05 x DC	0,10 x DC	0,15 x DC		0,05 x DC	0,10 x DC	0,15 x DC		0,05 x DC	0,10 x DC	0,15 x DC		0,05 x DC	0,10 x DC	0,15 x DC		MMS					
<b>2.1</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.2</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.3</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.4</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.5</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.6</b>	0,161	0,114	0,093	0,036	0,188	0,133	0,108	0,042	0,268	0,190	0,155	0,06	●									
<b>2.7</b>																						
<b>5.1</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.2</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.3</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.4</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.5</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.6</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.7</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.8</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									
<b>5.9</b>	0,113	0,080	0,065	0,025	0,157	0,111	0,090	0,035	0,217	0,153	0,125	0,049	●									
<b>5.10</b>	0,113	0,080	0,065	0,025	0,157	0,111	0,090	0,035	0,217	0,153	0,125	0,049	●									
<b>5.11</b>	0,085	0,060	0,049	0,019	0,117	0,083	0,068	0,026	0,163	0,115	0,094	0,036	●									

	$\emptyset$ DC = 16 mm						$\emptyset$ DC = 20 mm						● 1st choice		○ suitable								
	$a_e$			$h_m$	$a_e$			$h_m$	$a_e$			$h_m$	$a_e$			$h_m$	Emulsion	Compressed air	MMS				
	0,05 x DC	0,10 x DC			0,05 x DC	0,10 x DC			0,05 x DC	0,10 x DC	0,15 x DC		0,05 x DC	0,10 x DC	0,15 x DC		MMS						
<b>2.1</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.2</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.3</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.4</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.5</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.6</b>	0,161	0,114	0,036	0,188	0,133	0,108	0,042	●															
<b>2.7</b>																							
<b>5.1</b>	0,058	0,041	0,013	0,080	0,057	0,018	●																
<b>5.2</b>	0,058	0,041	0,013	0,080	0,057	0,018	●																
<b>5.3</b>	0,058	0,041	0,013	0,080	0,057	0,018	●																
<b>5.4</b>																							
<b>5.5</b>																							
<b>5.6</b>																							
<b>5.7</b>																							
<b>5.8</b>																							
<b>5.9</b>	0,076	0,054	0,017	0,107	0,076	0,024	●																
<b>5.10</b>	0,076	0,054	0,017	0,107	0,076	0,024	●																
<b>5.11</b>	0,058	0,041	0,013	0,080	0,057	0,018	●																

## Cutting data standard values – MonsterMill – TCR, ball-nosed end mills 52 513 ... /

	long	extra long	Ø DC = 2 mm		Ø DC = 3 mm		Ø DC = 4 mm		Ø DC = 5 mm		Ø DC = 6 mm		Ø DC = 8 mm		
			$a_e$ 0,1–0,2 x DC	$f_z$ mm											
Index	$v_c$ m/min	$v_c$ m/min	$a_{p,max} \times DC$	$f_z$ mm	$f_z$ mm	$f_z$ mm									
2.1	60	55	0,1–0,2	0,009	0,007	0,011	0,008	0,012	0,009	0,012	0,009	0,018	0,014	0,029	0,023
2.2	55	50	0,1–0,2	0,009	0,007	0,011	0,008	0,012	0,009	0,012	0,009	0,018	0,014	0,029	0,023
2.3	45	40	0,1–0,2	0,009	0,007	0,011	0,008	0,012	0,009	0,012	0,009	0,018	0,014	0,029	0,023
2.4	45	40	0,1–0,2	0,009	0,007	0,011	0,008	0,012	0,009	0,012	0,009	0,018	0,014	0,029	0,023
2.5	55	50	0,1–0,2	0,009	0,007	0,011	0,008	0,012	0,009	0,012	0,009	0,018	0,014	0,029	0,023
2.6	55	50	0,1–0,2	0,009	0,007	0,010	0,008	0,012	0,010	0,012	0,010	0,020	0,015	0,025	0,020
2.7	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.1	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.2	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.3	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.4	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.5	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.6	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.7	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.8	33	28	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030
5.9	65	60	0,1–0,2	0,017	0,013	0,020	0,014	0,022	0,017	0,022	0,017	0,034	0,025	0,053	0,042
5.10	55	50	0,1–0,2	0,014	0,011	0,017	0,012	0,019	0,014	0,019	0,014	0,029	0,022	0,046	0,036
5.11	45	40	0,1–0,2	0,012	0,009	0,014	0,010	0,016	0,012	0,016	0,012	0,024	0,018	0,038	0,030

## Cutting data standard values – MonsterMill – TCR, torus cutters 52 511 ... / 52 512 ...

	long	extra long	Ø DC = 2 mm		Ø DC = 3 mm		Ø DC = 4 mm		Ø DC = 5 mm		Ø DC = 6 mm		Ø DC = 10 mm		Ø DC = 12 mm		Ø DC = 16 mm		● 1st choice	○ suitable		
			$a_e$ 0,1–1,0 x DC	$f_z$ mm	Emulsion	Compressed air	MMS															
Index	$v_c$ m/min	$v_c$ m/min	$a_{p,max} \times DC$	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm													
2.1	120	110	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.2	110	100	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.3	90	80	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.4	90	80	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.5	110	100	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.6	110	100	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
2.7																						
5.1	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.2	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.3	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.4	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.5	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.6	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.7	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.8	65	55	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									
5.9	130	120	0,06	0,040	0,060	0,070	0,090	0,120	0,150	0,180	0,210	0,300	●									
5.10	110	100	0,06	0,030	0,040	0,060	0,080	0,100	0,120	0,150	0,180	0,240	●									
5.11	90	80	0,06	0,015	0,040	0,055	0,065	0,075	0,100	0,120	0,150	0,180	●									

## 52 514 ...

	$\emptyset DC = 10\text{ mm}$		$\emptyset DC = 12\text{ mm}$		$\emptyset DC = 16\text{ mm}$		● 1st choice	○ suitable	
	$a_e$ 0,1–0,2 $\times DC$	$a_e$ 0,3–0,4 $\times DC$	$a_e$ 0,1–0,2 $\times DC$	$a_e$ 0,3–0,4 $\times DC$	$a_e$ 0,1–0,2 $\times DC$	$a_e$ 0,3–0,4 $\times DC$			
Index	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	$f_z$ mm	Emulsion	Compressed air	MMS
<b>2.1</b>	0,032	0,025	0,035	0,030	0,039	0,034	●		
<b>2.2</b>	0,032	0,025	0,035	0,030	0,039	0,034	●		
<b>2.3</b>	0,032	0,025	0,035	0,030	0,039	0,034	●		
<b>2.4</b>	0,032	0,025	0,035	0,030	0,039	0,034	●		
<b>2.5</b>	0,032	0,025	0,035	0,030	0,039	0,034	●		
<b>2.6</b>	0,030	0,025	0,035	0,030	0,040	0,035	●		
<b>2.7</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.1</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.2</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.3</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.4</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.5</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.6</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.7</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.8</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		
<b>5.9</b>	0,059	0,046	0,066	0,056	0,073	0,063	●		
<b>5.10</b>	0,050	0,040	0,056	0,048	0,062	0,054	●		
<b>5.11</b>	0,042	0,033	0,047	0,040	0,052	0,045	●		

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## CERATIZIT \ Performance

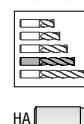
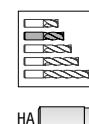
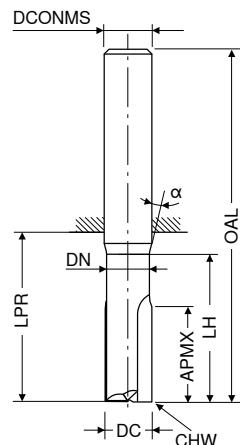
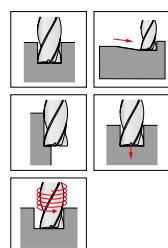
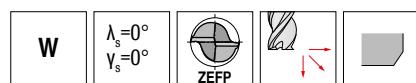
Premium quality tools for high performance.

The premium quality tools from the **CERATIZIT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

## Overview of PCD milling cutters

Tool type	Number of flutes	∅ DC	Diameter in mm						Length	Tool design	Pages					
				Steel	Stainless steel	Cast iron	Non ferrous metals	Heat resistant alloys	hardened materials	Sharp	Chamfer	Radius	Full Radius	Length	Tool design	Pages
Endmill																
	W	2	3-10	HA			•									81
	W	1-2	2-12	HA			•									82
	W	4	6-20	HA			•									83
	W	4-10	10-32	HA			•									84
Ball nose end milling cutters																
	W	1-2	2-20	HA			•									85
Torus end milling cutters																
	W	1-2	2-20	HA			•									86+87
Screw in Cutter																
	W	4-10	10-32				•									88

## PCD end mill

▲ Transition angle  $\alpha = 45^\circ$ 

NEW Article no. 50 010 ...		NEW Article no. 50 010 ...								
DC $_{h7}$	APMX	DN	LH	LPR	OAL	DCONMS $_{h6}$	CHW	ZEFP		
mm	mm	mm	mm	mm	mm	mm	mm			
3	6	2,8	11	21	57	6	0,1	2		03100
3	6	2,8	22	64	100	6	0,1	2		03300
4	8	3,5	13	21	57	6	0,1	2		04100
4	8	3,5	26	64	100	6	0,1	2		04300
5	10	4,4	15	21	57	6	0,1	2		05100
5	10	4,4	30	64	100	6	0,1	2		05300
6	12	5,4	19	21	57	6	0,1	2		06100
6	12	5,4	38	64	100	6	0,1	2		06300
8	16	7,2	26	28	64	8	0,1	2		08100
8	16	7,2	52	64	100	8	0,1	2		08300
10	20	9,0	31	34	74	10	0,1	2		10100
10	20	9,0	60	60	100	10	0,1	2		10300

Steel

Stainless steel

Cast iron

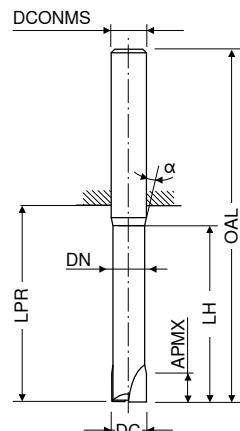
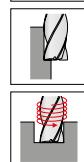
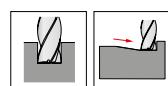
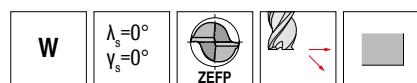
Non ferrous metals

Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 90+91

## PCD end mill

▲ Transition angle  $\alpha = 15^\circ$ 

NEW

Article no.  
50 011 ...

DC $_{h7}$ mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS $_{h6}$ mm	ZEFP	
2	2,0	1,7	6	39	75	6	1	02100
2	2,0	1,7	10	39	75	6	1	02300
2	2,0	1,7	14	39	75	6	1	02200
3	2,5	2,5	9	39	75	6	2	03100
3	2,5	2,5	15	39	75	6	2	03300
3	2,5	2,5	21	39	75	6	2	03200
4	2,5	3,5	12	39	75	6	2	04100
4	2,5	3,5	20	39	75	6	2	04300
4	2,5	3,5	28	39	75	6	2	04200
5	3,0	4,4	15	39	75	6	2	05100
5	3,0	4,4	25	39	75	6	2	05300
5	3,0	4,4	35	39	75	6	2	05200
6	6,0	5,4	18	64	100	6	2	06100
6	6,0	5,4	30	64	100	6	2	06300
6	6,0	5,4	42	64	100	6	2	06200
8	7,0	7,2	24	64	100	8	2	08100
8	7,0	7,2	40	64	100	8	2	08300
10	8,0	9,0	30	60	100	10	2	10100
10	8,0	9,0	50	60	100	10	2	10300
12	9,0	11,0	36	60	105	12	2	12100
12	9,0	11,0	58	60	105	12	2	12300

Steel

Stainless steel

Cast iron

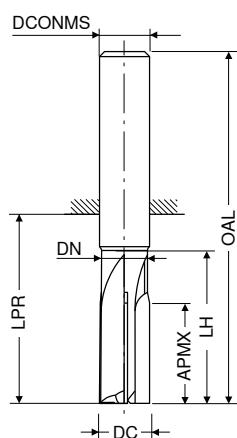
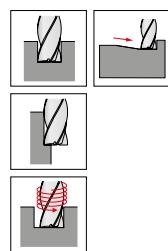
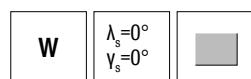
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 90+91

## PCD end mill



DC <sub>h7</sub>	APMX	DN	LH	LPR	OAL	DCONMS <sub>h6</sub>	ZEFP	NEW Article no. 50 013 ...	NEW Article no. 50 013 ...
mm	mm	mm	mm	mm	mm	mm			
6	12	5,4	19,0	21	57	6	4	06100	
6	12	5,4	38,0	64	100	6	4		06200
8	16	7,2	26,0	28	64	8	4	08100	
8	16	7,2	52,0	64	100	8	4		08200
10	20	9,0	31,0	34	74	10	4	10100	
10	20	9,0	62,0	60	100	10	4		10200
12	24	11,0	36,5	39	84	12	4	12100	
12	24	11,0	73,0	70	115	12	4		12200
16	32	15,0	44,0	45	93	16	4	16100	
16	32	15,0	88,0	82	130	16	4		16200
20	38	19,0	52,5	54	104	20	4	20100	
20	38	19,0	105,0	110	160	20	4		20200

Steel

Stainless steel

Cast iron

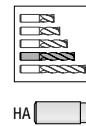
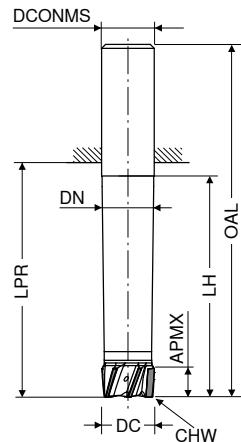
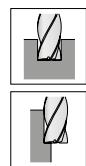
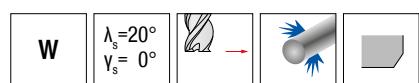
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 90+91

## PCD end mill

**NEW**Article no.  
**50 015 ...**

DC	APMX	DN	LH	LPR	OAL	DCONMS	CHW	ZEFP	
mm	mm	mm	mm	mm	mm	mm	mm		
10	5	9,6	25,0	27	67	10	0,2	4	10200
12	5	11,6	30,0	33	78	12	0,2	4	12200
16	10	15,6	40,0	43	91	16	0,2	5	16200
20	10	19,6	50,0	54	104	20	0,2	6	20200
25	10	24,6	62,5	68	124	25	0,2	8	25200
32	10	31,6	80,0	87	147	32	0,2	10	32200

Steel

Stainless steel

Cast iron

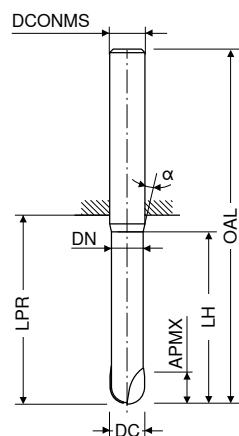
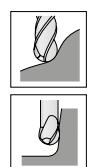
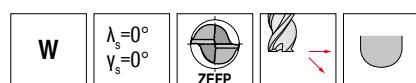
Non ferrous metals

Heat resistant alloys

Hardened materials

→  $v_c/f_z$  Page 90+91

## PCD radius cutter

▲ Transition angle  $\alpha = 15^\circ$ 

NEW

Article no.  
50 014 ...

DC <sub>h7</sub> mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP	Article no. 50 014 ...
2	2,0	1,7	6	39	75	6	1	02100
2	2,0	1,7	10	39	75	6	1	02200
2	2,0	1,7	14	39	75	6	1	02300
2	2,0	1,7	35	39	75	6	1	02400
3	2,5	2,5	9	39	75	6	2	03100
3	2,5	2,5	15	39	75	6	2	03200
3	2,5	2,5	21	39	75	6	2	03300
3	2,5	2,5	35	39	75	6	2	03400
4	2,5	3,5	12	39	75	6	2	04100
4	2,5	3,5	20	39	75	6	2	04200
4	2,5	3,5	28	39	75	6	2	04300
4	2,5	3,5	35	39	75	6	2	04400
5	3,0	4,4	15	39	75	6	2	05100
5	3,0	4,4	25	39	75	6	2	05200
5	3,0	4,4	35	39	75	6	2	05400
6	6,0	5,4	18	64	100	6	2	06100
6	6,0	5,4	30	64	100	6	2	06200
6	6,0	5,4	40	64	100	8	2	06300
6	6,0	5,4	42	64	100	6	2	06400
8	7,0	7,2	24	64	100	8	2	08100
8	7,0	7,2	40	64	100	8	2	08300
8	7,0	7,2	40	60	100	10	2	08900
10	8,0	9,0	30	60	100	10	2	10100
10	8,0	9,0	40	55	100	12	2	10200
10	8,0	9,0	50	60	100	10	2	10300
12	9,0	11,0	36	60	105	12	2	12100
12	9,0	11,0	40	55	100	16	2	12200
12	9,0	11,0	58	60	105	12	2	12400
16	11,0	15,0	45	82	130	16	2	16200
16	11,0	15,0	50	82	130	16	2	16300
20	13,0	19,0	60	110	160	20	2	20400

Steel

Stainless steel

Cast iron

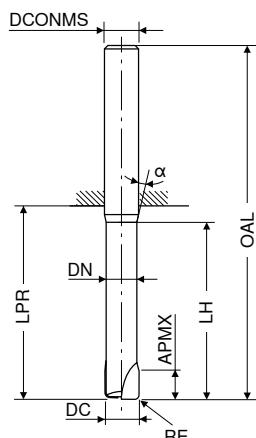
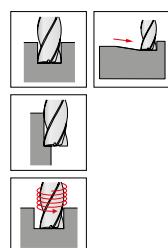
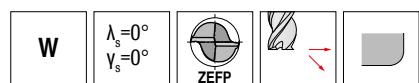
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 90+91

## PCD torus cutter

▲ Transition angle  $\alpha = 15^\circ$ 

NEW

Article no.  
50 012 ...

DC <sub>h7</sub> mm	RE mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP	Article no. 50 012 ...
2	0,3	2,0	1,7	6	39	75	6	1	02103
2	0,3	2,0	1,7	10	39	75	6	1	02203
2	0,3	2,0	1,7	14	39	75	6	1	02303
2	0,3	2,0	1,7	35	39	75	6	1	02403
3	0,3	2,5	2,5	9	39	75	6	2	03103
3	0,3	2,5	2,5	15	39	75	6	2	03203
3	0,3	2,5	2,5	21	39	75	6	2	03303
3	0,3	2,5	2,5	35	39	75	6	2	03403
4	0,3	2,5	3,5	12	39	75	6	2	04103
4	0,3	2,5	3,5	20	39	75	6	2	04203
4	0,3	2,5	3,5	28	39	75	6	2	04303
4	0,3	2,5	3,5	35	39	75	6	2	04403
5	0,3	3,0	4,4	15	39	75	6	2	05103
5	0,3	3,0	4,4	25	39	75	6	2	05203
5	0,3	3,0	4,4	35	39	75	6	2	05303
6	0,3	6,0	5,4	18	64	100	6	2	06103
6	0,3	6,0	5,4	30	64	100	6	2	06203
6	0,3	6,0	5,4	42	64	100	6	2	06403
6	0,5	6,0	5,4	18	64	100	6	2	06105
6	0,5	6,0	5,4	30	64	100	6	2	06205
6	0,5	6,0	5,4	42	64	100	6	2	06405
6	1,0	6,0	5,4	18	64	100	6	2	06110
6	1,0	6,0	5,4	40	64	100	8	2	06310
6	1,0	6,0	5,4	42	64	100	6	2	06410
8	0,3	7,0	7,2	24	64	100	8	2	08103
8	0,3	7,0	7,2	40	64	100	8	2	08203
8	0,5	7,0	7,2	24	64	100	8	2	08105
8	0,5	7,0	7,2	40	64	100	8	2	08205
8	1,0	7,0	7,2	24	64	100	8	2	08110
8	1,0	7,0	7,2	40	64	100	8	2	08210
8	2,0	7,0	7,2	24	64	100	8	2	08120
8	2,0	7,0	7,2	40	60	100	10	2	08920
8	2,0	7,0	7,2	40	64	100	8	2	08220
10	0,5	8,0	9,0	30	60	100	10	2	10105
10	0,5	8,0	9,0	50	60	100	10	2	10305
10	1,0	8,0	9,0	30	60	100	10	2	10110
10	1,0	8,0	9,0	50	60	100	10	2	10310
10	1,5	8,0	9,0	30	60	100	10	2	10115
10	1,5	8,0	9,0	50	60	100	10	2	10315
10	2,0	8,0	9,0	30	60	100	10	2	10120
10	2,0	8,0	9,0	50	60	100	10	2	10320

Steel

Stainless steel

Cast iron

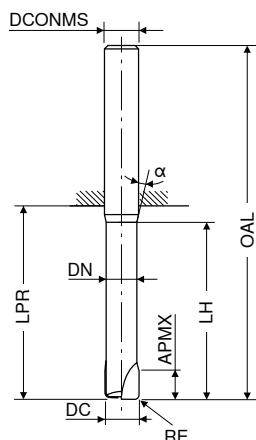
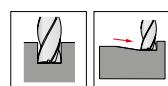
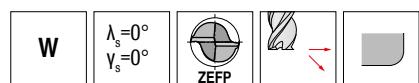
Non ferrous metals

Heat resistant alloys

Hardened materials

→ v<sub>c</sub>/f<sub>z</sub> Page 90+91

## PCD torus cutter

▲ Transition angle  $\alpha = 15^\circ$ 

NEW

Article no.  
50 012 ...

DC <sub>h7</sub> mm	RE mm	APMX mm	DN mm	LH mm	LPR mm	OAL mm	DCONMS <sub>h6</sub> mm	ZEFP
10	3,0	8,0	9,0	30	60	100	10	2
10	3,0	8,0	9,0	40	55	100	12	2
10	3,0	8,0	9,0	50	60	100	10	2
12	0,5	9,0	11,0	36	60	105	12	2
12	0,5	9,0	11,0	58	60	105	12	2
12	1,0	9,0	11,0	36	60	105	12	2
12	1,0	9,0	11,0	58	60	105	12	2
12	1,5	9,0	11,0	36	60	105	12	2
12	1,5	9,0	11,0	58	60	105	12	2
12	4,0	9,0	11,0	40	52	100	16	2
16	3,0	11,0	15,0	45	82	130	16	2
16	5,0	11,0	15,0	50	82	130	16	2
20	6,0	13,0	19,0	60	140	160	20	2

Steel

Stainless steel

Cast iron

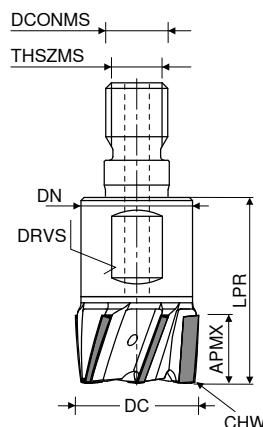
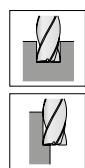
Non ferrous metals

Heat resistant alloys

Hardened materials

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## PCD screw-in cutter



DC mm	APMX mm	DN mm	OAL mm	DCONMS mm	CHW mm	DRVS mm	ZEFP	THSZMS	NEW	
									Article no.	50 015 ...
10	5	9,6	22	5,5	0,2	8	4	M5		10100
12	5	11,5	22	6,5	0,2	8	4	M6		12100
16	10	13,8	28	8,5	0,2	13	5	M8		16100
20	10	18,0	30	10,5	0,2	16	6	M10		20100
25	10	21,0	35	12,5	0,2	18	8	M12		25100
32	10	29,0	35	17,0	0,2	27	10	M16		32100

Steel

Stainless steel

Cast iron

Non ferrous metals

Heat resistant alloys

Hardened materials

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## Material examples referring to the cutting data tables

Index	Material	Strength N/mm <sup>2</sup> / HB / HRC	Material number	Material designation	Material number	Material designation	Material number	Material designation
P	1.1 General construction steel	< 800 N/mm <sup>2</sup>	1.0402	EN3B				
	1.2 Free cutting steel	< 800 N/mm <sup>2</sup>	1.0711	EN1A				
	1.3 Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	1.0401	EN32C				
	1.4 Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	1.7325	25 CD4				
	1.5 Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	1.5752	EN36	1.0535	EN9		
	1.6 Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	1.6582	EN24				
	1.7 Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	1.7225	EN19				
	1.8 Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	1.8515	EN40B				
	1.9 Steel castings	< 850 N/mm <sup>2</sup>	0.9650	G-X 260 Cr 27	1.6750	GS-20 NiCrMo 3.7	1.6582	GS-34 CrNiMo 6
	1.10 Nitriding steel	< 1000 N/mm <sup>2</sup>	1.8509	EN41B				
	1.11 Nitriding steel	< 1200 N/mm <sup>2</sup>	1.1186	EN8	1.1160	EN14A		
	1.12 Roller bearing steel	< 1200 N/mm <sup>2</sup>	1.3505	534A99				
	1.13 Spring steel	< 1200 N/mm <sup>2</sup>		EN45		EN47		EN43
	1.14 High-speed steel	< 1300 N/mm <sup>2</sup>	1.3343	M2	1.3249	M34		
	1.15 Cold working tool steel	< 1300 N/mm <sup>2</sup>	1.2379	D2	1.2311	P20		
	1.16 Hot working tool steel	< 1300 N/mm <sup>2</sup>	1.2344	H13				
M	2.1 Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	1.4581	318				
	2.2 Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	1.4000	403				
	2.3 Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	1.4057	EN57				
	2.4 Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	1.4028	EN56B				
	2.5 Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>	1.4542	17-4PH				
	2.6 Stainless steel, austenitic	< 750 N/mm <sup>2</sup>	1.4305	303	1.4401	316	1.4301	304
	2.7 Heat resistant steel	< 1100 N/mm <sup>2</sup>	1.4876	Incoloy 800				
K	3.1 Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	0.6015	Grade 150	0.6020	Grade 220	0.6025	Grade 260
	3.2 Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	0.6030	Grade 300	0.6035	Grade 350	0.6040	Grade 400
	3.3 Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	0.7040	SG 400-12	0.7043	SG 370-17	0.7050	SG 500-7
	3.4 Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	0.7060	SG 600-3	0.7070	SG 700-2	0.7080	SG 800-2
	3.5 White malleable cast iron	270–450 N/mm <sup>2</sup>	0.8035	GTW-35	0.8045	GTW-45		
	3.6 White malleable cast iron	500–650 N/mm <sup>2</sup>	0.8055	GTW-55	0.8065	GTW-65		
	3.7 Black malleable cast iron	300–450 N/mm <sup>2</sup>	0.8135	GTS-35	0.8145	GTS-45		
	3.8 Black malleable cast iron	500–800 N/mm <sup>2</sup>	0.8155	GTS-55	0.8170	GTS-70		
N	4.1 Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	3.0255	1050 A	3.0275	1070 A	3.0285	1080 A (A8)
	4.2 Aluminium alloys < 0.5 % Si	< 500 N/mm <sup>2</sup>	3.1325	2017 A (AU4G)	3.4335	7005 (AZ5G)	3.4365	7075 (AZ5GU)
	4.3 Aluminium alloy 0.5–10 % Si	< 400 N/mm <sup>2</sup>	3.2315	A-G 51	3.2373	A-S9 G	3.2151	A-S 6 U4
	4.4 Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>	3.2581	A-S12	3.2583	A-S12 U		
	4.5 Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>		A-S18	A-S17 U4			
	4.6 Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	2.0040	Cu-c1	2.0060	Cu-a1	2.0090	Cu-b1
	4.7 Copper wrought alloys	< 700 N/mm <sup>2</sup>	2.1247	Cub2 (Beryllium Copper)	2.0855	CuN2S (Nickel Copper)	2.1310	CU-Fe2P
	4.8 Special copper alloys	< 200 HB	2.0916	Cu-A5	2.1525	Cu-S3 M		Ampco 8 (Cu-A6Fe2)
	4.9 Special copper alloys	< 300 HB	2.0978	Cu-Al11 Fe5 Ni5		Ampco 18 (Cu-A10 Fe3)		
	4.10 Special copper alloys	> 300 HB	2.1247	Cu Be2		Ampco M4		
	4.11 Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>	2.0331	Cu Zn36 Pb1,5	2.0380	Cu Zn39 Pb2 (Ms 56)	2.0410	Cu Zn44 Pb2
S	4.12 Long-chipping brass	< 600 N/mm <sup>2</sup>	2.0335	Cu Zn 36 (Ms63)	2.1293	Cu Cr1 Zr		
	4.13 Thermoplastics		PE	PVC	PS	Polystyrene		Plexiglas
	4.14 Duroplastics		PF	Bakelite		Pertinax		
	4.15 Fibre-reinforced plastics			Carbon Fibre		Fibreglass		Aramid Fibre (Kevlar)
	4.16 Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>	3.5812	Mg A7 Z1	3.5662	Mg A9	3.5105	Mg Tr 22 Zn 1
	4.17 Graphite			R8500X		R8650		Technograph 15
	4.18 Tungsten and tungsten alloys			W-Ni Fe (Densimet)		W-Ni Cu (Inermet)		Denal
	4.19 Molybdenum and molybdenum alloys			TZM		MHQ		Mo W
	5.1 Pure nickel		2.4066	Ni99 (Nickel 200)	2.4068	Lc Ni99 (Nickel 201)		
	5.2 Nickel alloys		1.3912	Fe-Ni36 (Invar)	1.3917	Fe-Ni42 (N42)	1.3922	Fe-Ni48 (N48)
H	5.3 Nickel alloys	< 850 N/mm <sup>2</sup>	2.4375	Ni Cu30 Al (Monel K500)	2.4360	Ni Cu30Fe (Monel 400)	2.4668	
	5.4 Nickel-molybdenum alloys		2.4600	Ni Mo30Cr2 (Hastelloy B4)	2.4617	Ni Mo28 (Hastelloy B2)	2.4819	Ni Mo16Cr16 Hastell. C276
	5.5 Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>	2.4951	Ni Cr20TiAl (Nimonic 80A)	2.4858	Ni Cr21Mo (Inconel 825)	2.4856	Ni Cr22Mo9Nb Inconel 625
	5.6 Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>	2.4964	Co Cr20 W15 Ni10		Co Cr20 Ni16 Mo7		Co Cr28 Mo 6
	5.7 Heat resistant alloys	< 1300 N/mm <sup>2</sup>	1.4718	Z45 C S 9-3	1.4747	Z80 CSN 20-02	1.4845	Z12 CN 25-20
	5.8 Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>	2.4851	Ni Cr23Fe (Inconel 601)	2.4668	Ni Cr19NbMo (Inconel 718)	2.4602	Ni Cr21Mo14 Hastelloy C22
	5.9 Pure titanium	< 900 N/mm <sup>2</sup>	3.7025	T35 (Titanium Grade 1)	3.7034	T40 (Titanium Grade 2)	3.7064	T60 (Titanium Grade 4)
	5.10 Titanium alloys	< 700 N/mm <sup>2</sup>		T-A6-Nb7 (367)		T-A5-Sn2-Mo4-Cr4 (Ti17)		T-A3-V2,5 (Gr18)
	5.11 Titanium alloys	< 1200 N/mm <sup>2</sup>	3.7165	T-A6-V4 (Ta6V)		T-A4-3V-Mo2-Fe2 (SP700)		T-A5-Sn1-Zr1-V1-Mo (Gr32)
	6.1	< 45 HRC						
	6.2	46–55 HRC						
	6.3	Tempered steel	56–60 HRC					
	6.4		61–65 HRC					
	6.5		65–70 HRC					

## Cutting data standard values – PCD milling cutter

Index	V <sub>c</sub> m/min	50 011 / 50 012		50 010 / 50 013		50 014		50 015			
		a <sub>p</sub> max. mm	a <sub>e</sub>								
<b>4.1</b>	<b>700</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.2</b>	<b>600</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.3</b>	<b>450</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.4</b>	<b>350</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.5</b>	<b>250</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.6</b>	<b>400</b>	0,15xDC	1xDC	1xDC	0,1xDC	0,15xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.7</b>											
<b>4.8</b>											
<b>4.9</b>											
<b>4.10</b>											
<b>4.11</b>	<b>300–800</b>							0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.12</b>											
<b>4.13</b>	<b>100–350</b>	0,2xDC	1xDC	1xDC	0,1xDC	0,2xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.14</b>	<b>80–150</b>	0,2xDC	1xDC	1xDC	0,1xDC	0,2xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.15</b>	<b>100–150</b>	0,2xDC	1xDC	1xDC	0,1xDC	0,2xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.16</b>	<b>700</b>							0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.17</b>	<b>500–800</b>	0,2xDC	1xDC	1xDC	0,1xDC	0,2xDC	0,1xDC	0,9xAPMX	0,3xDC	0,1xDC	1xDC
<b>4.18</b>											
<b>4.19</b>											



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Chip Breakers Overview	99

## Symbol explanation



lateral internal coolant

ZNF = Number of flutes

- = Main Application
- = Extended application

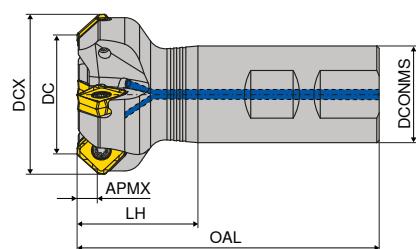
## Overview – carrier tools

	$a_p$ max. mm	$\varnothing$ -range mm	Pages
MaxiMill – end mill C 271-12	6,8	$\varnothing$ 32–40	93
MaxiMill – face mill A 271-12	6,8	$\varnothing$ 40–250	94
MaxiMill – face mill A 271-12 HFC	2,6	$\varnothing$ 40–250	94

## Overview – Milling Inserts

Inserts	Cutting edges per insert	Steel Stainless steel Cast iron Non ferrous metals Heat resistant alloys hardened materials	Pages
SOHU 1204..	8		95
XOHU 1204..	2		96

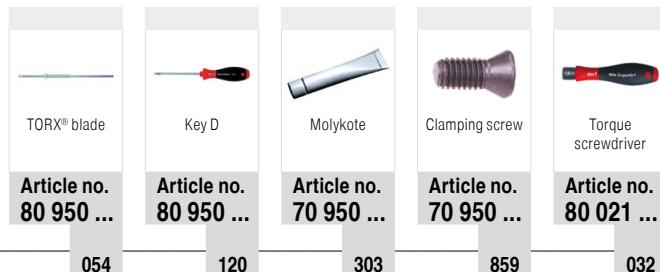
## MaxiMill – End milling cutter C 271-12



B

**NEW**Article no.  
**50 786 ...**

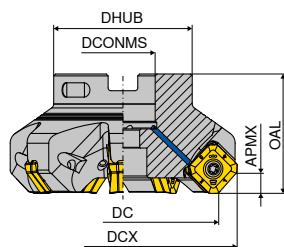
Designation	DC	DCX	ZNF	APMX	OAL	LH	DCONMS <sub>h6</sub>	RPMX	Insert	torque moment	Nm
	mm	mm		mm	mm	mm	mm	1/min.			
C271.32.R.03-12-B-40	32	45	3	6,8	100	40	32	18400	SOHU 1204.. / XOHU 1204..	3,2	03203
C271.40.R.04-12-B32-40	40	53	4	6,8	100	40	32	16800	SOHU 1204.. / XOHU 1204..	3,2	04004

Spare parts  
DC

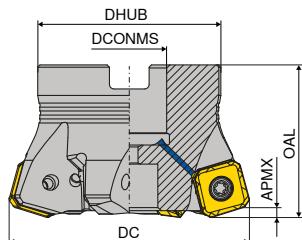
32-40

**MaxiMill - A 271-12 Face mill**

▲ 8 cutting edges per insert



Designation	DC	DCX	ZNF	APMX	OAL	DHUB	DCONMS <sub>H6</sub>	RPMX	torque moment 1/min.	Insert	<b>NEW</b>	<b>NEW</b>
										Article no. 50 787 ...	Article no. 50 787 ...	
A271.40.R.04-12	40	53	4	6,8	40	38	16	17900	3,2	SOHU 1204.. / XOHU 1204..		04004
A271.50.R.05-12	50	63	5	6,8	40	43	22	15200	3,2	SOHU 1204.. / XOHU 1204..		05005
A271.63.R.07-12	63	76	7	6,8	40	48	22	13100	3,2	SOHU 1204.. / XOHU 1204..		06307
A271.80.R.06-12	80	93	6	6,8	50	58	27	11300	3,2	SOHU 1204.. / XOHU 1204..	08006	
A271.80.R.08-12	80	93	8	6,8	50	58	27	11300	3,2	SOHU 1204.. / XOHU 1204..		08008
A271.100.R.07-12	100	113	7	6,8	63	78	32	9900	3,2	SOHU 1204.. / XOHU 1204..	10007	
A271.100.R.10-12	100	113	10	6,8	63	78	32	9900	3,2	SOHU 1204.. / XOHU 1204..		10010
A271.125.R.08-12	125	138	8	6,8	63	88	40	8700	3,2	SOHU 1204.. / XOHU 1204..	12508	
A271.125.R.12-12	125	138	12	6,8	63	88	40	8700	3,2	SOHU 1204.. / XOHU 1204..		12512
A271.160.R.09-12	160	173	9	6,8	63	98	40	7600	3,2	SOHU 1204.. / XOHU 1204..	16009	
A271.160.R.14-12	160	173	14	6,8	63	98	40	7600	3,2	SOHU 1204.. / XOHU 1204..		16014
A271.200.R.11-12	200	213	11	6,8	63	132	60	6700	3,2	SOHU 1204.. / XOHU 1204..	20011	
A271.200.R.17-12	200	213	17	6,8	63	132	60	6700	3,2	SOHU 1204.. / XOHU 1204..		20017
A271.250.R.13-12	250	263	13	6,8	63	132	60	6000	3,2	SOHU 1204.. / XOHU 1204..	25013	
A271.250.R.21-12	250	263	21	6,8	63	132	60	6000	3,2	SOHU 1204.. / XOHU 1204..		25021

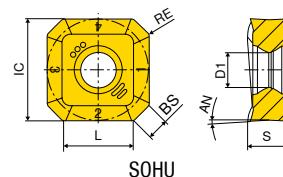
**MaxiMill - A 271-12 HFC Face mill**

Designation	DC	ZNF	APMX	OAL	DHUB	DCONMS <sub>H6</sub>	RPMX	torque moment Nm	Insert	<b>NEW</b>	<b>NEW</b>
										Article no. 50 788 ...	Article no. 50 788 ...
A271.50.R.04-12-HFC	50	4	2,6	40	43	22	14600	3,2	SOHU 1204..		05004
A271.63.R.06-12-HFC	63	6	2,6	40	48	22	12500	3,2	SOHU 1204..		06306
A271.80.R.07-12-HFC	80	7	2,6	50	58	27	10800	3,2	SOHU 1204..		08007

Spare parts	Article no. 80 950 ...	TORX® blade	Clamping key - T	Key D	Power Screw	Molykote	Clamping screw	Torque screwdriver
		Article no. 80 397 ...	Article no. 80 950 ...	Article no. 70 950 ...	Article no. 80 021 ...			
40 (5078704004)	054	040	120	151	303	859	859	032
50-250	054	050	120	154	303	859	859	032
50 (5078805004)	054	050	120	154	303	859	859	032

**SOHU**

Designation	IC	D1	L	BS	S	AN
	mm	mm	mm	mm	mm	°
SOHU 1204..	13,36	4,4	8,8	1,7	5,00	7,4

**SOHU****-M50**  
**CTCP230****-M50**  
**CTPP235****-M50**  
**CTCM235****-M50**  
**CTPM240****DRAGONSkin****DRAGONSkin****DRAGONSkin****DRAGONSkin**

SOHU

SOHU

SOHU

SOHU

**NEW****NEW****NEW****NEW**Article no.  
51 138 ...Article no.  
51 138 ...Article no.  
51 138 ...Article no.  
51 138 ...

ISO	RE	02000	12000	32000	42000
	mm				
1204ABSR	0,8				
Steel		●	●	○	○
Stainless steel		○	○	●	●
Cast iron					
Non ferrous metals					
Heat resistant alloys					
Hardened materials					

**i** The indexable inserts with chip breaker -M50 are available from October 2019.

**SOHU****-F50**  
**CTPM245****-R50**  
**CTCK215****-R50**  
**CTPK220****-F50**  
**CTC5240****DRAGONSkin****DRAGONSkin****DRAGONSkin****DRAGONSkin**

SOHU

SOHU

SOHU

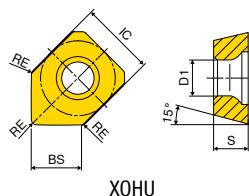
SOHU

**NEW****NEW****NEW****NEW**Article no.  
51 140 ...Article no.  
51 139 ...Article no.  
51 139 ...Article no.  
51 140 ...

ISO	RE	47000	52000	62000	17000
	mm				
1204ABSR	0,8				
Steel		●	○	○	
Stainless steel		●			
Cast iron			●	●	
Non ferrous metals					
Heat resistant alloys					●
Hardened materials					

## XOHU

Designation	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XOHU 1204..	13,36	4,4	8,8	7,3	5,00



## XOHU

-M50  
CTPP235

DRAGOSKIN



XOHU

NEW  
Article no.  
51 141 ...

ISO	RE	12000
	mm	
1204ABSR	0,8	
Steel		●
Stainless steel		○
Cast iron		
Non ferrous metals		
Heat resistant alloys		
Hardened materials		

## Material examples referring to the cutting data tables

Index	Material	Strength N/mm <sup>2</sup> / HB / HRC	Material number	Material designation	Material number	Material designation	Material number	Material designation
P	1.1 General construction steel	< 800 N/mm <sup>2</sup>	1.0402	EN3B				
	1.2 Free cutting steel	< 800 N/mm <sup>2</sup>	1.0711	EN1A				
	1.3 Hardened steel, non alloyed	< 800 N/mm <sup>2</sup>	1.0401	EN32C				
	1.4 Alloyed hardened steel	< 1000 N/mm <sup>2</sup>	1.7325	25 CD4				
	1.5 Tempering steel, unalloyed	< 850 N/mm <sup>2</sup>	1.5752	EN36	1.0535	EN9		
	1.6 Tempering steel, unalloyed	< 1000 N/mm <sup>2</sup>	1.6582	EN24				
	1.7 Tempering steel, alloyed	< 800 N/mm <sup>2</sup>	1.7225	EN19				
	1.8 Tempering steel, alloyed	< 1300 N/mm <sup>2</sup>	1.8515	EN40B				
	1.9 Steel castings	< 850 N/mm <sup>2</sup>	0.9650	G-X 260 Cr 27	1.6750	GS-20 NiCrMo 3.7	1.6582	GS-34 CrNiMo 6
	1.10 Nitriding steel	< 1000 N/mm <sup>2</sup>	1.8509	EN41B				
	1.11 Nitriding steel	< 1200 N/mm <sup>2</sup>	1.1186	EN8	1.1160	EN14A		
	1.12 Roller bearing steel	< 1200 N/mm <sup>2</sup>	1.3505	534A99				
	1.13 Spring steel	< 1200 N/mm <sup>2</sup>		EN45		EN47		EN43
	1.14 High-speed steel	< 1300 N/mm <sup>2</sup>	1.3343	M2	1.3249	M34		
	1.15 Cold working tool steel	< 1300 N/mm <sup>2</sup>	1.2379	D2	1.2311	P20		
	1.16 Hot working tool steel	< 1300 N/mm <sup>2</sup>	1.2344	H13				
M	2.1 Cast steel and sulphured stainless steel	< 850 N/mm <sup>2</sup>	1.4581	318				
	2.2 Stainless steel, ferritic	< 750 N/mm <sup>2</sup>	1.4000	403				
	2.3 Stainless steel, martensitic	< 900 N/mm <sup>2</sup>	1.4057	EN57				
	2.4 Stainless steel, ferritic / martensitic	< 1100 N/mm <sup>2</sup>	1.4028	EN56B				
	2.5 Stainless steel, austenitic / ferritic	< 850 N/mm <sup>2</sup>	1.4542	17-4PH				
	2.6 Stainless steel, austenitic	< 750 N/mm <sup>2</sup>	1.4305	303	1.4401	316	1.4301	304
	2.7 Heat resistant steel	< 1100 N/mm <sup>2</sup>	1.4876	Incoloy 800				
K	3.1 Grey cast iron with lamellar graphite	100–350 N/mm <sup>2</sup>	0.6015	Grade 150	0.6020	Grade 220	0.6025	Grade 260
	3.2 Grey cast iron with lamellar graphite	300–500 N/mm <sup>2</sup>	0.6030	Grade 300	0.6035	Grade 350	0.6040	Grade 400
	3.3 Gray cast iron with spheroidal graphite	300–500 N/mm <sup>2</sup>	0.7040	SG 400-12	0.7043	SG 370-17	0.7050	SG 500-7
	3.4 Gray cast iron with spheroidal graphite	500–900 N/mm <sup>2</sup>	0.7060	SG 600-3	0.7070	SG 700-2	0.7080	SG 800-2
	3.5 White malleable cast iron	270–450 N/mm <sup>2</sup>	0.8035	GTW-35	0.8045	GTW-45		
	3.6 White malleable cast iron	500–650 N/mm <sup>2</sup>	0.8055	GTW-55	0.8065	GTW-65		
	3.7 Black malleable cast iron	300–450 N/mm <sup>2</sup>	0.8135	GTS-35	0.8145	GTS-45		
	3.8 Black malleable cast iron	500–800 N/mm <sup>2</sup>	0.8155	GTS-55	0.8170	GTS-70		
N	4.1 Aluminium (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	3.0255	1050 A	3.0275	1070 A	3.0285	1080 A (A8)
	4.2 Aluminium alloys < 0.5 % Si	< 500 N/mm <sup>2</sup>	3.1325	2017 A (AU4G)	3.4335	7005 (AZ5G)	3.4365	7075 (AZ5GU)
	4.3 Aluminium alloy 0.5–10 % Si	< 400 N/mm <sup>2</sup>	3.2315	A-G 51	3.2373	A-S9 G	3.2151	A-S 6 U4
	4.4 Aluminium alloys 10–15 % Si	< 400 N/mm <sup>2</sup>	3.2581	A-S12	3.2583	A-S12 U		
	4.5 Aluminum alloys > 15 % Si	< 400 N/mm <sup>2</sup>		A-S18	A-S17 U4			
	4.6 Copper (non alloyed, low alloyed)	< 350 N/mm <sup>2</sup>	2.0040	Cu-c1	2.0060	Cu-a1	2.0090	Cu-b1
	4.7 Copper wrought alloys	< 700 N/mm <sup>2</sup>	2.1247	Cub2 (Beryllium Copper)	2.0855	CuN2S (Nickel Copper)	2.1310	CU-Fe2P
	4.8 Special copper alloys	< 200 HB	2.0916	Cu-A5	2.1525	Cu-S3 M		Ampco 8 (Cu-A6Fe2)
	4.9 Special copper alloys	< 300 HB	2.0978	Cu-Al11 Fe5 Ni5		Ampco 18 (Cu-A10 Fe3)		
	4.10 Special copper alloys	> 300 HB	2.1247	Cu Be2		Ampco M4		
	4.11 Short-chipping brass, bronze, red bronze	< 600 N/mm <sup>2</sup>	2.0331	Cu Zn36 Pb1,5	2.0380	Cu Zn39 Pb2 (Ms 56)	2.0410	Cu Zn44 Pb2
S	4.12 Long-chipping brass	< 600 N/mm <sup>2</sup>	2.0335	Cu Zn 36 (Ms63)	2.1293	Cu Cr1 Zr		
	4.13 Thermoplastics		PE	PVC	PS	Polystyrene		Plexiglas
	4.14 Duroplastics		PF	Bakelite		Pertinax		
	4.15 Fibre-reinforced plastics			Carbon Fibre		Fibreglass		Aramid Fibre (Kevlar)
	4.16 Magnesium and magnesium alloys	< 850 N/mm <sup>2</sup>	3.5812	Mg A7 Z1	3.5662	Mg A9	3.5105	Mg Tr 22 Zn 1
	4.17 Graphite			R8500X		R8650		Technograph 15
	4.18 Tungsten and tungsten alloys			W-Ni Fe (Densimet)		W-Ni Cu (Inermet)		Denal
	4.19 Molybdenum and molybdenum alloys			TZM		MHQ		Mo W
	5.1 Pure nickel		2.4066	Ni99 (Nickel 200)	2.4068	Lc Ni99 (Nickel 201)		
	5.2 Nickel alloys		1.3912	Fe-Ni36 (Invar)	1.3917	Fe-Ni42 (N42)	1.3922	Fe-Ni48 (N48)
H	5.3 Nickel alloys	< 850 N/mm <sup>2</sup>	2.4375	Ni Cu30 Al (Monel K500)	2.4360	Ni Cu30Fe (Monel 400)	2.4668	
	5.4 Nickel-molybdenum alloys		2.4600	Ni Mo30Cr2 (Hastelloy B4)	2.4617	Ni Mo28 (Hastelloy B2)	2.4819	Ni Mo16Cr16 Hastell. C276
	5.5 Nickel-chromium alloys	< 1300 N/mm <sup>2</sup>	2.4951	Ni Cr20TiAl (Nimonic 80A)	2.4858	Ni Cr21Mo (Inconel 825)	2.4856	Ni Cr22Mo9Nb Inconel 625
	5.6 Cobalt Chrome Alloys	< 1300 N/mm <sup>2</sup>	2.4964	Co Cr20 W15 Ni10		Co Cr20 Ni16 Mo7		Co Cr28 Mo 6
	5.7 Heat resistant alloys	< 1300 N/mm <sup>2</sup>	1.4718	Z45 C S 9-3	1.4747	Z80 CSN 20-02	1.4845	Z12 CN 25-20
	5.8 Nickel-cobalt-chromium alloys	< 1400 N/mm <sup>2</sup>	2.4851	Ni Cr23Fe (Inconel 601)	2.4668	Ni Cr19NbMo (Inconel 718)	2.4602	Ni Cr21Mo14 Hastelloy C22
	5.9 Pure titanium	< 900 N/mm <sup>2</sup>	3.7025	T35 (Titanium Grade 1)	3.7034	T40 (Titanium Grade 2)	3.7064	T60 (Titanium Grade 4)
	5.10 Titanium alloys	< 700 N/mm <sup>2</sup>		T-A6-Nb7 (367)		T-A5-Sn2-Mo4-Cr4 (Ti17)		T-A3-V2,5 (Gr18)
	5.11 Titanium alloys	< 1200 N/mm <sup>2</sup>	3.7165	T-A6-V4 (Ta6V)		T-A4-3V-Mo2-Fe2 (SP700)		T-A5-Sn1-Zr1-V1-Mo (Gr32)
	6.1	< 45 HRC						
	6.2	46–55 HRC						
	6.3	Tempered steel	56–60 HRC					
	6.4		61–65 HRC					
	6.5		65–70 HRC					

## Cutting data approximate values

Cutting Material hard ( $v_c \uparrow$ ) → tough ( $v_c \downarrow$ )																
	DRAGONSkin		DRAGONSkin		DRAGONSkin		DRAGONSkin		DRAGONSkin		DRAGONSkin		DRAGONSkin			
Index	CTCP230		CTPP235		CTCM235		CTPM240		CTPM245		CTCK215		CTPK220		CTC5240	
1.1	280	170	240	140	240	140	220	130			350	210	300	180		
1.2	230	140	190	110	190	110	170	100			300	180	250	150		
1.3	280	170	240	140	240	140	220	130			350	210	300	180		
1.4	250	150	220	130	210	130	200	120	250							
1.5	250	150	210	130	210	130	190	110			320	190	270	160		
1.6	250	150	210	130	210	130	190	110			320	190	270	160		
1.7	250	150	220	130	210	130	200	120	220							
1.8	190	110	160	100	150	90	140	80	180							
1.9	230	140	200	120	200	120	180	100	250		300	180	260	160		
1.10	250	150	220	130	210	130	200	120	220							
1.11	140	90	120	70	100	60	100	60	180							
1.12	250	150	220	130	210	130	200	120	250							
1.13	250	150	210	130	210	130	190	110	250		320	190	270	160		
1.14	100	60	90	50	120	70	90	50	120							
1.15	130	80	110	70	150	90	120	70	220							
1.16	130	80	110	70	150	90	120	70	160							
2.1	90	60	80	50	110	70	80	50	240							
2.2	130	80	110	70	150	90	120	70	240							
2.3	90	60	80	50	110	70	80	50	260							
2.4	130	80	110	70	150	90	120	70	280							
2.5			190	110	250	140	190	110	180	160						
2.6			190	110	260	150	210	120	200	180						
2.7			190	110	260	150	210	120	150	130						
3.1											360	160	320	160		
3.2											360	160	320	160		
3.3											230	140	210	130		
3.4											160	100	140	80		
3.5											250	150	200	120		
3.6											250	150	200	120		
3.7											210	130	170	100		
3.8											210	130	170	100		
4.1																
4.2																
4.3																
4.4																
4.5																
4.6																
4.7																
4.8																
4.9																
4.10																
4.11																
4.12																
4.13																
4.14																
4.15																
4.16																
4.17																
4.18																
4.19																
5.1															50	
5.2															50	
5.3															50	
5.4															40	
5.5															40	
5.6															40	
5.7															40	
5.8															40	
5.9															90	
5.10															60	
5.11															60	
6.1																
6.2																
6.3																
6.4																
6.5																

# MaxiMill 271-12 system

## Cutting data appoximate values

for standard inserts

Material	F			M			R		
	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm
Steel				150-250	0,20-0,40	0,3-6,0	150-250	0,20-0,40	0,3-6,0
Stainless steel				150-200	0,15-0,30	0,3-6,0	150-200	0,15-0,30	0,3-6,0
Cast iron				250-350	0,15-0,35	0,3-6,0	250-350	0,15-0,35	0,3-6,0
Non ferrous metals									
Heat resistant alloys	25-80	0,10-0,25	0,3-6,0	25-80	0,10-0,35	0,3-6,0			
hardened materials									

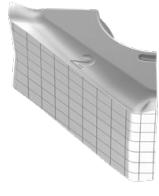
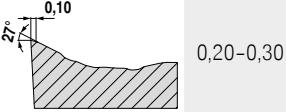
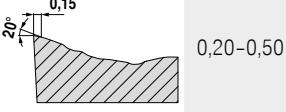
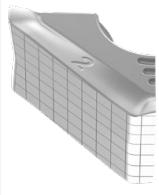
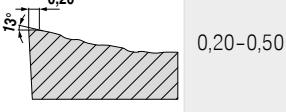
for wiper inserts

Material	F			M			R		
	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm
Steel	150-250	0,20-0,40	0,3-4,0						
Stainless steel	150-200	0,15-0,30	0,3-4,0						
Cast iron	250-350	0,15-0,35	0,3-4,0						
Non ferrous metals									
Heat resistant alloys	25-80	0,10-0,35	0,3-4,0						
hardened materials									

for HFC tools

Material	F			M			R		
	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm	v <sub>c</sub> m/min	f <sub>z</sub> mm	a <sub>p</sub> mm
Steel				150-250	0,20-1,20	0,3-2,6	150-250	0,20-1,20	0,3-2,6
Stainless steel				150-200	0,20-0,80	0,3-2,6	150-200	0,20-0,80	0,3-2,6
Cast iron				250-350	0,20-1,00	0,3-2,6	250-350	0,20-1,00	0,3-2,6
Non ferrous metals									
Heat resistant alloys				25-80	0,20-0,80	0,3-2,6	25-80	0,20-0,80	0,3-2,6
hardened materials									

## Chip Breakers Overview

	Model	fine	Machining Medium	rough	Sectional illustration	f <sub>z</sub> in mm
-F50			CTPM245 CTPM245 CTC5240	CTPM245 CTPM245 CTC5240		0,20-0,30
-M50			CTCP230/CTPP235 CTCM235/CTPM240	CTCP230/CTPP235 CTCM235/CTPM240		0,20-0,50
-R50			CTCK215/CTPK220 CTCK215/CTPK220			0,20-0,50

## Magnet – workpiece support, set

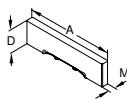


- ▲ With clearance on the underside
- ▲ Flexible and rational clamping
- ▲ Height accuracy +/- 0.01 mm
- ▲ Quick and easy to install thanks to magnetic adhesion

## Workpiece supports overview

Description	A	D	M	price	Article no.	Type association
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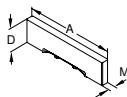
### Magnet – workpiece support, set



- ▲ Stainless spring steel
- ▲ Pressed magnets
- ▲ Delivered in set: 5 pairs of 2 pieces
- ▲ Price per set

80	5 / 10 / 15 / 20 / 22	2,5	80 878 79800	NCG	HSG / S / Z	ESG 4	ESG mini	HDG 2	ZSG 4	ZSG 3	ZSG 2	DSG 4	MSG 2	HSG
125	8 / 12 / 20 / 25 / 27	2,5	80 878 79900	●	●	●	●	●	●	●	●	●	●	●

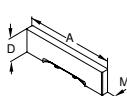
### Magnet – workpiece support, set



- ▲ Stainless spring steel
- ▲ Pressed magnets
- ▲ Delivered in set: 5 pairs of 2 pieces
- ▲ Price per set

100	12 / 20 / 25 / 30 / 32	2,5	80 892 79700	NCG	HSG / S / Z	ESG 4	ESG mini	HDG 2	ZSG 4	ZSG 3	ZSG 2	DSG 4	MSG 2	HSG
125	12 / 25 / 30 / 35 / 37	2,5	80 892 79800	●	●	●	●	●	●	●	●	●	●	●
160	15 / 30 / 40 / 45 / 47	2,5	80 892 79900	●	●	●	●	●	●	●	●	●	●	●

### Magnet – workpiece support, set



- ▲ Stainless spring steel
- ▲ Pressed magnets
- ▲ Delivered in set: 5 pairs of 2 pieces
- ▲ Price per set

125	9 / 22 / 27 / 32 / 34	2,5	80 901 79900	NCG	HSG / S / Z	ESG 4	ESG mini	HDG 2	ZSG 4	ZSG 3	ZSG 2	DSG 4	MSG 2	HSG
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## Workpiece support, magnetic

### Scope of supply:

Including stop pin 50 mm/100 mm

Length		<b>NEW</b> Article no. <b>80 892 ...</b>	Size mm 68x30
60		23800	
115		23900	

## Extension for workpiece support, magnetic

	<b>NEW</b> Article no. <b>80 892 ...</b>
	25400

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