UP2DATE

The cool way to machine titanium alloys

MaxiMill – 211-DC with DirectCooling

Faster. Longer. Safer.

... ADDITIONAL PRODUCT HIGHLIGHTS

- **Cermet grade CTEP110-P:** Updated coating technology for cermet inserts.
- Precise **AluLine Micro** milling cutters for precise machining of small, complex aluminum components.

CERATIZIT is a high-technology engineering group specialized in cutting tools and hard material solutions.

Tooling a Sustainable Future

ceratizit.com

CERATIZIT GROUP

Welcome!

Get in touch

Customer Service Team

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techsupport.usa@ceratizit.com

On-site technical support

Your Local Technical Sales Engineer

Your customer number

Precision cooling strategy

with the additively manufactured
MaxiMill – 211-DC milling system

CERATIZIT

The ideal coolant hole location provides added value when machining titanium and other heat-resistant materials

Get operational efficiencies while maximizing process security all while running at high cutting speeds.

You can enjoy all these advantages in a single tool with the 3D-printed MaxiMill – 211-DC indexable milling system developed and manufactured by CERATIZIT. The patented shoulder mill stands out for its added value when machining titanium and other heat-resistant materials, due to an **optimum DirectCooling supply on the indexable insert flanks**. These specific materials require the most effective coolant possible to achieve an excellent machining result.

→ **from page 44**
You can find further information on the product here.

cts.ceratizit.com/us/en/maximill-211-dc

CERATIZIT

The cool way to machine titanium alloys

Optimizing the flank cooling system for machining titanium and super alloys is a top feature for the base body of the MaxiMill – 211-DC, which is why CERATIZIT designers needed to create a concept not possible with conventional machining processes. The aim was to deliver as much coolant as possible straight to the cutting edge. This called for a highly complex design that was feasible thanks to additive manufacturing.

3D-printed tool holder with ideally positioned coolant holes

Advantages/benefits

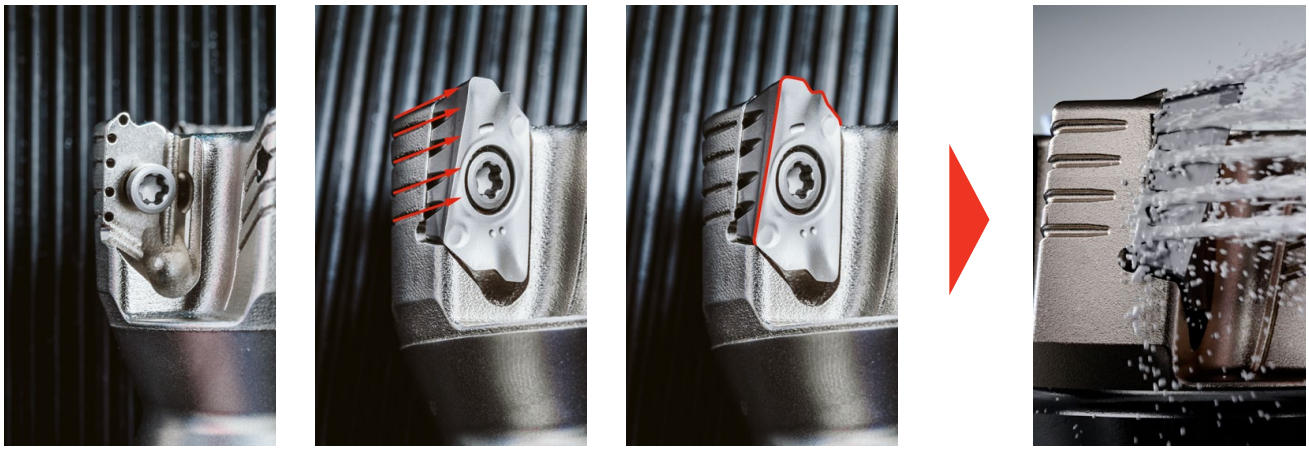
- ▲ Optimum DirectCooling supply on the indexable insert flanks
- ▲ Indexable insert geometry and coolant holes perfectly tailored to DirectCooling

Less insert wear → **Tool cost savings**

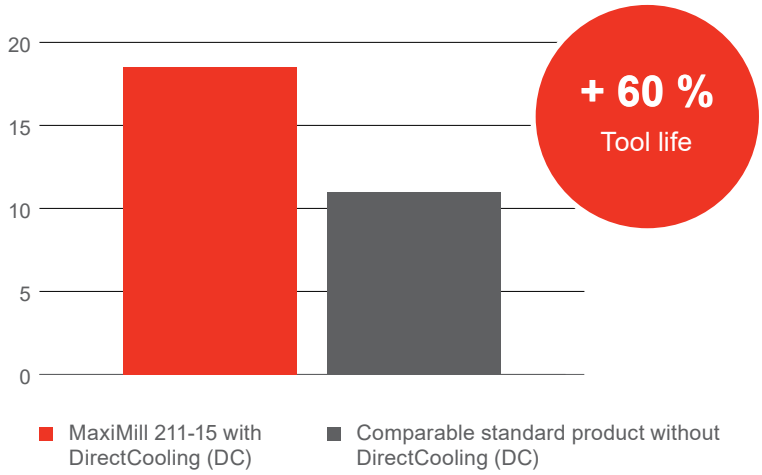
Higher machining parameters possible → **Production time optimization**

The perfect combination: an ideal coolant hole position with matching insert geometry

Produced with additive manufacturing, the base body of the milling cutter on the MaxiMill – 211-DC ensures the design possibilities required for the complexity of flank cooling. This creates the perfect combination of geometric and functional properties – the ideal coolant hole position, paired with an **insert geometry that is precisely tailored** for cooling – guaranteeing full coolant coverage on the insert cutting surface.



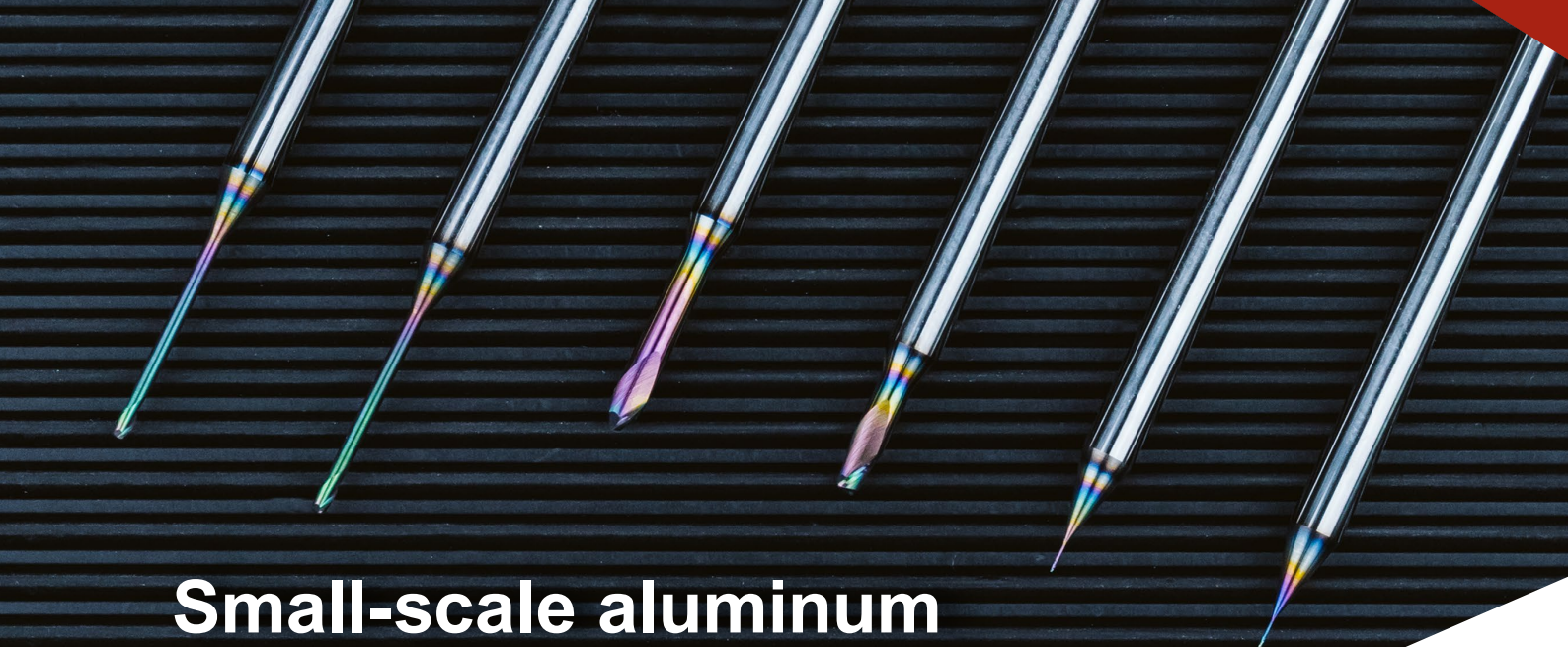
Test report: Tool life [min] compared to standard tools



Machine:	GROB G1050
Workpiece:	TiAl6V4
Tool:	MaxiMill – 211-DC
v_c:	65 m/min.
a_p:	6 mm / a_e 18 mm / f_z 0,13 mm
Coolant pressure:	80 bar

Having an increased tool life helps customers to be more sustainable when machining titanium and super alloys. What's more, they benefit from a reliable process with significantly lower tool usage.

Manuel Höfferer, Application Manager Aerospace & Defense



Small-scale aluminum machining

with AluLine – Micro

WNT

Micro cutter for complex micro components

AluLine – Micro: with DLC coating and minimal tolerances

Components are getting smaller all the time: from the medical technology sector to the latest generation of smartphones or elegant watch cases. This means that the tools used to make these components are getting smaller as well. That is why we decided to completely redesign the micro cutters in our AluLine – Micro range and adapt them to industry requirements.

→ **from page 34**
You can find further information on the product here.

cts.ceratizit.com/us/en/aluline-micro

Advantages of AluLine – Micro cutters

- Latest geometry
- Polish grinding for uniform cutting edges and optimal chip removal
- Wear-resistant, thin, and ultra-smooth DLC coating
- Outstanding price to performance ratio
- Extensive, continuous range up to overhang lengths of 12xD
- Also suitable for shrinking with a shank diameter of 4 mm
- Lowest tolerances, for maximum contour quality on the component (3 µm for a diameter of 0.2 mm)

Large portfolio of micro tools for machining aluminum

We offer a range of tool variants for AluLine – Micro:

- Radius and torus cutters are available, as well as end mills with a corner chamfer
- Various shank versions and geometries
- Diameters ranging from 0.2 mm to 3.0 mm
- Overhang lengths from 3xD to 12xD

This product range gives small part manufacturers confidence when working with materials such as aluminum alloys, copper, and other non-ferrous metals.

Corner chamfer

Full radius

Torus

Cermet cutting material grades take finish turning to the next level

CERATIZIT

Coating update for cermet CTEP110-P grade

Cermet cutting inserts are a top choice for those looking to lower their costs per part when finishing steel. These cutting inserts are more heat-resistant than their carbide counterparts, allowing higher cutting data and therefore shorter processes. These tools also offer dimensional accuracy with long tool life, especially with our DRAGONSKIN coating with insert wear detection.

→ **from page 14**
You can find further information on the product here.

cts.ceratizit.com/us/en/cermet-inserts

Why choose cermet?

Cermet offers a number of advantages over carbide in specific applications. This allows very high cutting speeds and long tool life to be achieved, with optimally smooth component surfaces.

Efficient production can be achieved with CERATIZIT cermet inserts.

Advantages of the CTEP110-P cermet inserts with a new coating include:

- ▲ Unique multilayer CVD coating
- ▲ Gold-colored indicator layer for insert detection
- ▲ Improved texture and grain of TiCN & Al_2O_3 layers
- ▲ Special post-treatment process
- ▲ Optimized chip breakers
- ▲ Perfect match between chip breakers and grade

→ Best possible utilization of cutting edges

→ Reduced surface roughness

→ High wear resistance

→ Maximum cutting speed

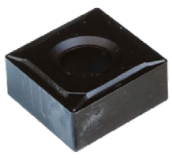
→ Optimal chip control

→ Improved tool life

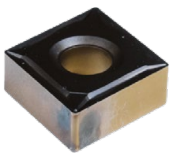
→ Lower costs per part (CPP)

Ability to know when to change a tool before it breaks

The new coating with insert wear detection means a quick glance at the cutting edge can help to identify wear. This enables you to get maximum use of each insert cutting edge as well as help to prevent untimely tool breakages.



Earlier versions of this insert with coating did not have insert wear detection



The CTEP110-P is an updated version that includes both – a coating update as well as the insert wear detection layer

Contents

WNT	**Solid carbide drills**
12+13	WTX Speed VA 8xD
CERATIZIT	**Indexable turning tools**
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CERATIZIT	**Grooving tools**
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Cermet indexable inserts
CTEP110-P

CERATIZIT Indexable milling tools

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CERATIZIT Adapters and accessories

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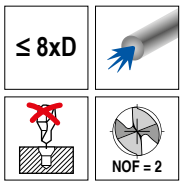
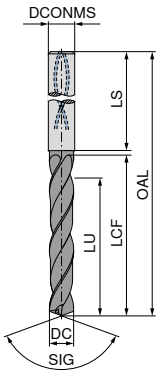
Shoulder milling system
MaxiMill – 211-DC

To the products

WTX – High Speed Drill, DIN 6537

- ▲ For corrosion and acid-resistant steels
- ▲ Developed for high cutting speeds
- ▲ Three guide lands for low friction





NEW

Speed VA

Ti800

SIG 135°

Solid carbide

10 701 ...

DC h7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
3.0	6	72	34	29	36	03000
3.1	6	72	34	29	36	03100
3.2	6	72	34	29	36	03200
3.3	6	72	34	29	36	03300
3.4	6	72	34	29	36	03400
3.5	6	72	34	29	36	03500
3.6	6	72	34	29	36	03600
3.7	6	72	34	29	36	03700
3.8	6	81	43	36	36	03800
3.9	6	81	43	36	36	03900
4.0	6	81	43	36	36	04000
4.1	6	81	43	36	36	04100
4.2	6	81	43	36	36	04200
4.3	6	81	43	36	36	04300
4.4	6	81	43	36	36	04400
4.5	6	81	43	36	36	04500
4.6	6	81	43	36	36	04600
4.8	6	95	57	48	36	04800
5.0	6	95	57	48	36	05000
5.1	6	95	57	48	36	05100
5.2	6	95	57	48	36	05200
5.3	6	95	57	48	36	05300
5.4	6	95	57	48	36	05400
5.5	6	95	57	48	36	05500
5.6	6	95	57	48	36	05600
5.7	6	95	57	48	36	05700
5.8	6	95	57	48	36	05800
5.9	6	95	57	48	36	05900
6.0	6	95	57	48	36	06000
6.1	8	114	76	64	36	06100
6.2	8	114	76	64	36	06200
6.3	8	114	76	64	36	06300
6.4	8	114	76	64	36	06400
6.5	8	114	76	64	36	06500
6.6	8	114	76	64	36	06600
6.8	8	114	76	64	36	06800
6.9	8	114	76	64	36	06900
7.0	8	114	76	64	36	07000
7.5	8	114	76	64	36	07500
7.8	8	114	76	64	36	07800
8.0	8	114	76	64	36	08000
8.1	10	142	95	80	40	08100
8.2	10	142	95	80	40	08200
8.3	10	142	95	80	40	08300
8.5	10	142	95	80	40	08500

10 701 ...

DC h7 mm	DCONMS h6 mm	OAL mm	LCF mm	LU mm	LS mm	
8.8	10	142	95	80	40	08800
9.0	10	142	95	80	40	09000
9.3	10	142	95	80	40	09300
9.5	10	142	95	80	40	09500
9.8	10	142	95	80	40	09800
10.0	10	142	95	80	40	10000
10.2	12	162	114	96	45	10200
10.5	12	162	114	96	45	10500
10.8	12	162	114	96	45	10800
11.0	12	162	114	96	45	11000
11.5	12	162	114	96	45	11500
11.8	12	162	114	96	45	11800
12.0	12	162	114	96	45	12000
12.2	14	178	133	112	45	12200
12.5	14	178	133	112	45	12500
12.8	14	178	133	112	45	12800
13.0	14	178	133	112	45	13000
13.5	14	178	133	112	45	13500
13.8	14	178	133	112	45	13800
14.0	14	178	133	112	45	14000
14.5	16	203	152	128	48	14500
15.0	16	203	152	128	48	15000
15.5	16	203	152	128	48	15500
16.0	16	203	152	128	48	16000
16.5	18	222	171	144	48	16500
17.0	18	222	171	144	48	17000
17.5	18	222	171	144	48	17500
18.0	18	222	171	144	48	18000

P	○
M	○
K	○
N	○
S	●
H	
O	

→ v_c Page 13

Cutting data standard values – WTX – Speed VA

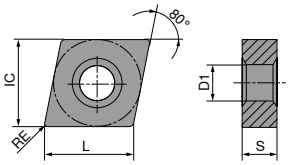
	Material sub-group	Index	Tensile strength lbf/in²* / HB / HRC	10 701 ...					
				With through coolant	8xD				
					Ø 3–5	Ø 5–8	Ø 8–12	Ø 12–16	Ø 16–20
				v_c (m/min)	f (mm/rev)				
P	Unalloyed steel	P.1.1	60900 lbf/in² / 125 HB	165	0,12	0,17	0,23	0,28	0,31
		P.1.2	92800 lbf/in² / 190 HB	160	0,11	0,16	0,22	0,26	0,30
		P.1.3	121800 lbf/in² / 250 HB	150	0,11	0,15	0,20	0,25	0,28
		P.1.4	132000 lbf/in² / 270 HB	145	0,10	0,15	0,19	0,24	0,27
		P.1.5	146500 lbf/in² / 300 HB	135	0,10	0,14	0,18	0,23	0,26
	Low-alloy steel	P.2.1	88500 lbf/in² / 180 HB	165	0,14	0,20	0,27	0,33	0,37
		P.2.2	134900 lbf/in² / 275 HB	150	0,13	0,18	0,24	0,30	0,34
		P.2.3	146500 lbf/in² / 300 HB	135	0,11	0,16	0,22	0,27	0,30
		P.2.4	174000 lbf/in² / 375 HB	105	0,11	0,15	0,19	0,24	0,27
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in² / 200 HB	115	0,11	0,16	0,22	0,27	0,30
		P.3.2	159500 lbf/in² / 300 HB	90	0,10	0,13	0,18	0,22	0,25
		P.3.3	188500 lbf/in² / 400 HB	90	0,08	0,11	0,14	0,17	0,19
	Stainless steel	P.4.1	98600 lbf/in² / 200 HB	70	0,08	0,11	0,14	0,18	0,20
		P.4.2	117500 lbf/in² / 250 HB	70	0,08	0,11	0,14	0,18	0,20
M	Stainless steel	M.1.1	88500 lbf/in² / 200 HB	80	0,09	0,13	0,18	0,22	0,25
		M.2.1	300 HB	75	0,08	0,11	0,15	0,19	0,21
		M.3.1	113100 lbf/in² / 230 HB	75	0,08	0,11	0,15	0,19	0,21
K	Grey cast iron	K.1.1	88500 lbf/in² / 180 HB	150	0,15	0,24	0,33	0,41	0,47
		K.1.2	127600 lbf/in² / 260 HB	125	0,14	0,20	0,27	0,33	0,37
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in² / 160 HB	200	0,15	0,22	0,31	0,38	0,43
		K.2.2	122600 lbf/in² / 250 HB	125	0,14	0,20	0,27	0,33	0,37
	Malleable iron	K.3.1	63800 lbf/in² / 130 HB	115	0,15	0,21	0,29	0,35	0,40
		K.3.2	113100 lbf/in² / 230 HB	100	0,12	0,17	0,23	0,28	0,32
N	Aluminum wrought alloy	N.1.1	60 HB						
		N.1.2	49300 lbf/in² / 100 HB						
	Cast aluminum alloy	N.2.1	36300 lbf/in² / 75 HB						
		N.2.2	43500 lbf/in² / 90 HB						
		N.2.3	63800 lbf/in² / 130 HB						
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in² / 110 HB						
		N.3.2	43500 lbf/in² / 90 HB	145	0,14	0,20	0,27	0,33	0,37
		N.3.3	49300 lbf/in² / 100 HB						
	Magnesium alloys	N.4.1	70 HB						
S	Heat-resistant alloys	S.1.1	98600 lbf/in² / 200 HB	35	0,07	0,10	0,14	0,17	0,19
		S.1.2	137800 lbf/in² / 280 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.1	121800 lbf/in² / 250 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.2	171100 lbf/in² / 350 HB	20	0,06	0,09	0,12	0,15	0,17
		S.2.3	156600 lbf/in² / 320 HB	20	0,05	0,07	0,10	0,12	0,14
	Titanium alloys	S.3.1	5800 lbf/in²						
		S.3.2	152300 lbf/in²	35	0,08	0,11	0,15	0,18	0,20
		S.3.3	203100 lbf/in² / 410 HB	30	0,06	0,09	0,12	0,15	0,17
H	Hardened steel	H.1.1	46-55 HRC						
		H.1.2	56-60 HRC						
		H.1.3	61-65 HRC						
		H.1.4	66-70 HRC						
	Chilled iron	H.2.1	400 HB						
	Hardened cast iron	H.3.1	55 HRC						
O	Non-metal materials	O.1.1	≤ 21800 lbf/in²						
		O.1.2	≤ 14500 lbf/in²						
		O.2.1	≤ 145000 lbf/in²						
		O.2.2	≤ 145000 lbf/in²						
		O.3.1							

* Tensile Strength at Rupture (Rm)

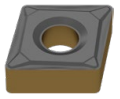
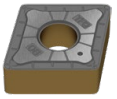
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that must be corrected according to the usage conditions.

CNMG

Designation	L	S	D1	IC
	mm	mm	mm	mm
CNMG 1204..	12.9	4.76	5.16	12.7

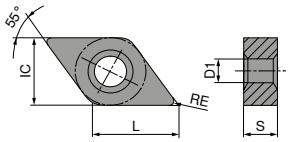


CNMG

		NEW	NEW
		-CF20	**-TFQ**
		CTEP110-P	CTEP110-P
		DRAGONSKIN	DRAGONSKIN
			
		F	**F**
		CERMET CNMG	**CERMET** CNMG
		76 101 ...	**76 110 ...**
ISO	RE mm		
120404EN	0.4	**02801**	**02801**
120408EN	0.8	**03001**	**03001**
120412EN	1.2		**03201**
P		●	●
M		○	○
K		○	○
N			
S			
H			
O			

DNMG

Designation	L	S	D1	IC
	mm	mm	mm	mm
DNMG 1104..	11.6	4.76	3.81	9.52
DNMG 1506..	15.5	6.35	5.16	12.70

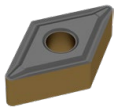


DNMG

NEW

-CF20
CTEP110-P

DRAGONSKIN



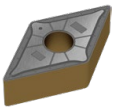
F
CERMET
DNMG

76 102 ...

NEW

-TFQ
CTEP110-P

DRAGONSKIN



F
CERMET
DNMG

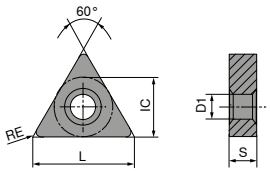
76 153 ...

ISO	RE		
	mm		
110404EN	0.4	**00401**	
110408EN	0.8	**00601**	
150604EN	0.4	**02801**	**02801**
150608EN	0.8	**03001**	**03001**
150612EN	1.2	**03201**	

P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

TNMG

Designation	L	S	D1	IC
	mm	mm	mm	mm
TNMG 1604..	16.5	4.76	3.81	9.52



TNMG

NEW

-CF20
CTEP110-P

DRAGONSKIN

F
CERMET
TNMG

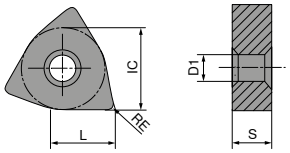
76 149 ...

ISO	RE	
	mm	
160404EN	0.4	**01601**
160408EN	0.8	**01801**
160412EN	1.2	**02001**

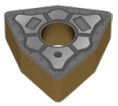
P	●
M	○
K	○
N	
S	
H	
O	

WNMG

Designation	L	S	D1	IC
	mm	mm	mm	mm
WNMG 0604..	6.5	4.76	3.81	9.52
WNMG 0804..	8.6	4.76	5.16	12.70

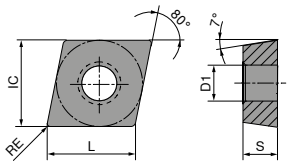


WNMG

		NEW	NEW
		-CF20	-TFQ
		CTEP110-P	CTEP110-P
		DRAGONSKIN	DRAGONSKIN
			
		F	F
		CERMET	CERMET
		WNMG	WNMG
		76 171 ...	76 177 ...
ISO	RE mm		
060404EN	0.4	00401	
060408EN	0.8	00601	00601
080404EN	0.4		01601
080408EN	0.8	01801	01801
P		●	●
M		○	○
K		○	○
N			
S			
H			
O			

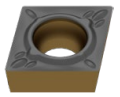
CCGT / CCMT

Designation	L	S	D1	IC
	mm	mm	mm	mm
CC.T 0602..	6.4	2.38	2.8	6.35
CC.T 09T3..	9.7	3.97	4.4	9.52
CC.T 1204..	12.9	4.76	5.5	12.70



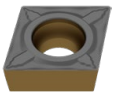
CCGT / CCMT

NEW
-CF05
CTEP110-P
DRAGONSKIN



F
CERMET
CCGT
76 247 ...

NEW
-CF55
CTEP110-P
DRAGONSKIN

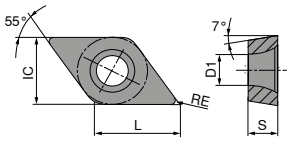


F
CERMET
CCMT
76 248 ...

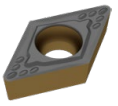
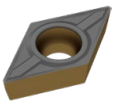
ISO	RE		
	mm		
060202EN	0.2	00201	
060204EN	0.4	00401	00401
09T302EN	0.2	01401	
09T304EN	0.4	01601	01601
09T308EN	0.8	01801	01801
120404EN	0.4	02001	02801
P		●	●
M		○	○
K		○	○
N			
S			
H			
O			

DCGT / DCMT

Designation	L	S	D1	IC
	mm	mm	mm	mm
DC.T 0702..	7.75	2.38	2.8	6.35
DC.T 11T3..	11.60	3.97	4.4	9.52

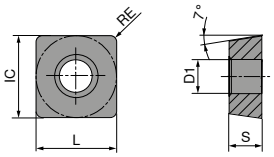


DCGT / DCMT

			NEW	NEW
			-CF05 CTEP110-P	-CF55 CTEP110-P
			DRAGONSKIN	DRAGONSKIN
				
			F	F
			CERMET DCGT	CERMET DCMT
			76 245 ...	76 246 ...
ISO	RE			
	mm			
070201EN	0.1		00101	
070202EN	0.2		00201	00201
070204EN	0.4		00401	00401
11T302EN	0.2		01401	
11T304EN	0.4		01601	01601
11T308EN	0.8		01801	01801
P			●	●
M			○	○
K			○	○
N				
S				
H				
O				

SCGT / SCMT

Designation	L	S	D1	IC
	mm	mm	mm	mm
SC.T 09T3..	9.52	3.97	4.4	9.52

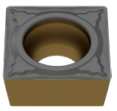


SCGT / SCMT

NEW
-CF05
CTEP110-P
DRAGONSKIN

F
CERMET
SCGT
76 261 ...

NEW
-CF55
CTEP110-P
DRAGONSKIN



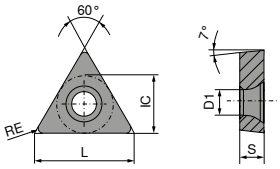
F
CERMET
SCMT
76 260 ...

ISO	RE		
	mm		
09T304EN	0.4	00401	00401
09T308EN	0.8	00601	00601

P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

TCGT / TCMT

Designation	L	S	D1	IC
	mm	mm	mm	mm
TC.T 1102..	11.0	2.38	2.8	6.35
TC.T 16T3..	16.5	3.97	4.4	9.52



TCGT / TCMT

NEW
-CF05
CTEP110-P
DRAGONSKIN

F
CERMET
TCGT
76 272 ...

NEW
-CF55
CTEP110-P
DRAGONSKIN

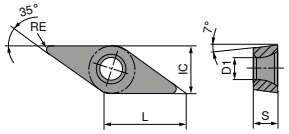
F
CERMET
TCMT
76 266 ...

ISO	RE		
	mm		
110202EN	0.2	01401	
110204EN	0.4	01601	01601
110208EN	0.8	01801	
16T304EN	0.4	02801	
16T308EN	0.8		03001

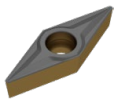
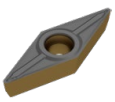
P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

VCGT / VCMT

Designation	L	S	D1	IC
	mm	mm	mm	mm
VC.T 1103..	11.1	3.18	2.9	6.35
VC.T 1604..	16.6	4.76	4.4	9.52

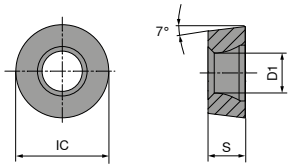


VCGT / VCMT

			NEW	NEW
			-CF05 CTEP110-P	-CF55 CTEP110-P
			DRAGONSKIN	DRAGONSKIN
				
			F	F
			CERMET VCGT	CERMET VCMT
			76 276 ...	76 292 ...
ISO	RE			
	mm			
110301EN	0.1		01201	
110302EN	0.2		01401	
110304EN	0.4		01601	01601
160404EN	0.4		02801	02801
160408EN	0.8		03001	03001
P			●	●
M			○	○
K			○	○
N				
S				
H				
O				

RCMT

Designation	S mm	D1 mm	IC mm
RCMT 0803..	3.18	3.4	8



RCMT

NEW

-M23
CTCP115-P

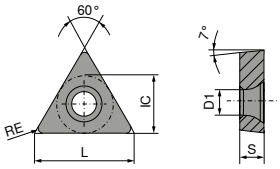
DRAGONSKIN

M
RCMT
74 121 ...

ISO	RE mm	21300
0803M0SN	4	
P		●
M		
K		○
N		
S		
H		
O		

TCGT

Designation	L	S	D1	IC
	mm	mm	mm	mm
TCGT 16T3..	16.5	3.97	4.4	9.52



TCGT

-27
CTPX715

DRAGONSKIN

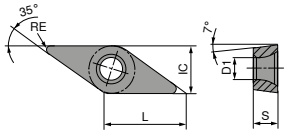
M
TCGT

70 276 ...

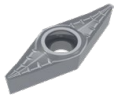
ISO	RE	
	mm	
16T302FN	0.2	72600
P		●
M		●
K		○
N		●
S		●
H		
O		○

VCGT

Designation	L	S	D1	IC
	mm	mm	mm	mm
VCGT 1604..	16.6	4.76	4.4	9.52



VCGT

	-25P CTPX710	-27 CTPX715
	DRAGONSKIN	DRAGONSKIN
		
	M VCGT	M VCGT
	70 282 ...	70 280 ...
ISO / RE mm		
160402FN 0.2	72600	72600
160412FN 1.2		73200
P	●	●
M	●	●
K		○
N	●	●
S	●	●
H		
O		○

Cutting data standard values

	Material sub-group	Index	Tensile strength lbf/in²* / HB / HRC	CTEP110-P DRAGONSKIN v_c (m/min)		CTCP115-P	CTPX710 -25P	CTPX715 -27 DRAGONSKIN v_c (m/min)
P	Unalloyed steel	P.1.1	60900 lbf/in² / 125 HB	500	P.1.1	370	340	275
		P.1.2	92800 lbf/in² / 190 HB	440	P.1.2	315	300	235
		P.1.3	121800 lbf/in² / 250 HB	380	P.1.3	270	260	200
		P.1.4	132000 lbf/in² / 270 HB	360	P.1.4	250	250	190
		P.1.5	146500 lbf/in² / 300 HB	330	P.1.5	230	235	170
	Low-alloy steel	P.2.1	88500 lbf/in² / 180 HB	450	P.2.1	325	300	240
		P.2.2	134900 lbf/in² / 275 HB	360	P.2.2	250	250	185
		P.2.3	146500 lbf/in² / 300 HB	330	P.2.3	230	235	170
		P.2.4	174000 lbf/in² / 375 HB	250	P.2.4	170	190	125
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in² / 200 HB	380	P.3.1	200	150	140
		P.3.2	159500 lbf/in² / 300 HB	310	P.3.2	140	95	80
		P.3.3	188500 lbf/in² / 400 HB	230	P.3.3	85	35	25
	Stainless steel	P.4.1	98600 lbf/in² / 200 HB	380	P.4.1	200	155	140
		P.4.2	117500 lbf/in² / 250 HB	340	P.4.2	170	130	110
M	Stainless steel	M.1.1	88500 lbf/in² / 200 HB	380	M.1.1		150	140
		M.2.1	300 HB		M.2.1		90	80
		M.3.1	113100 lbf/in² / 230 HB		M.3.1		130	120
K	Grey cast iron	K.1.1	88500 lbf/in² / 180 HB	450	K.1.1	255		200
		K.1.2	127600 lbf/in² / 260 HB	340	K.1.2	235		160
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in² / 160 HB	480	K.2.1	270		190
		K.2.2	122600 lbf/in² / 250 HB	380	K.2.2	205		150
	Malleable iron	K.3.1	63800 lbf/in² / 130 HB	460	K.3.1	250		210
		K.3.2	113100 lbf/in² / 230 HB	280	K.3.2	210		180
N	Aluminum wrought alloy	N.1.1	60 HB		N.1.1		1840	1750
		N.1.2	49300 lbf/in² / 100 HB		N.1.2		1600	1500
	Cast aluminum alloy	N.2.1	36300 lbf/in² / 75 HB		N.2.1		1250	1200
		N.2.2	43500 lbf/in² / 90 HB		N.2.2		1250	1200
		N.2.3	63800 lbf/in² / 130 HB		N.2.3		750	700
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in² / 110 HB		N.3.1		650	625
		N.3.2	43500 lbf/in² / 90 HB		N.3.2		630	600
		N.3.3	49300 lbf/in² / 100 HB		N.3.3		500	475
	Magnesium alloys	N.4.1	70 HB		N.4.1		340	325
S	Heat-resistant alloys	S.1.1	98600 lbf/in² / 200 HB		S.1.1		110	40
		S.1.2	137800 lbf/in² / 280 HB		S.1.2		85	30
		S.2.1	121800 lbf/in² / 250 HB		S.2.1		75	30
		S.2.2	171100 lbf/in² / 350 HB		S.2.2		45	25
		S.2.3	156600 lbf/in² / 320 HB		S.2.3		45	20
	Titanium alloys	S.3.1	5800 lbf/in²		S.3.1		100	110
		S.3.2	152300 lbf/in²		S.3.2		60	70
		S.3.3	203100 lbf/in² / 410 HB		S.3.3		45	50
H	Hardened steel	H.1.1	46-55 HRC		H.1.1			
		H.1.2	56-60 HRC		H.1.2			
		H.1.3	61-65 HRC		H.1.3			
		H.1.4	66-70 HRC		H.1.4			
	Chilled iron	H.2.1	400 HB		H.2.1			
	Hardened cast iron	H.3.1	55 HRC		H.3.1			
O	Non-metal materials	O.1.1	≤ 21800 lbf/in²		O.1.1			140
		O.1.2	≤ 14500 lbf/in²		O.1.2			
		O.2.1	≤ 145000 lbf/in²		O.2.1			150
		O.2.2	≤ 145000 lbf/in²		O.2.2			
		O.3.1			O.3.1			

* Tensile Strength at Rupture (Rm)

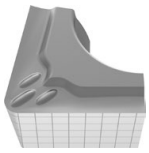
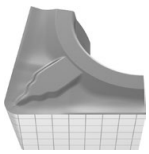
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approximately **±20%** according to the usage conditions.

Standard chip breakers / application tips

Negative

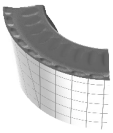
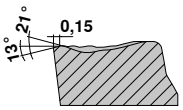
Main application steel and cast iron, secondary application stainless steels	Model	Smooth cut	Interrupted cut	Interrupted cut	Cut a_p mm	Cut f mm	Geometry
-CF / -CF20 ▲ Finest finishing ▲ Sharp cutting edge for low cutting forces ▲ Good chip control even at small depths of cut	 F	**CTEP110-P / TCM10**			0,30–1,50	0,07–0,25	CN.. DN.. TN.. WN..
		CTEP110-P / TCM10					
		CTEP110-P / TCM10					
-TFQ ▲ Wiper geometry ▲ Finishing to medium machining ▲ Very high feeds ▲ High surface quality	 F	**CTEP110-P / CTCP115-P**	**CTCP115-P / CTCP125-P**		0,50–5,00	0,10–0,60	CN.. DN.. WN..
		CTEP110-P					
		CTEP110-P / CTCP115-P	CTCP115-P / CTCP125-P				

Positive

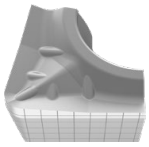
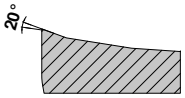
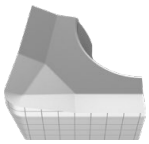
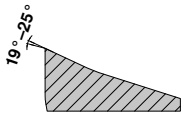
Main application steel and cast iron, secondary application stainless steels and super alloys	Model	Smooth cut	Interrupted cut	Interrupted cut	Cut a_p mm	Cut f mm	Geometry
-CF05 ▲ Fine finishing ▲ For all common steel materials, stainless steels, and nodular iron ▲ Good chip control ▲ High surface quality	 F	**CTEP110-P / TCM407**	TCM10 / TCM407		0,20–1,30	0,06–0,25	CC.. DC.. SC.. TC.. VC..
		CTEP110-P					
		CTEP110-P	TCM10 / TCM407				
-CF55 ▲ Finishing to medium machining ▲ Suitable for general and stainless steels ▲ Low cutting force ▲ Good chip control ▲ High surface quality	 F M	**CTEP110-P**	**TCM10** / CTEP110-P		0,20–1,30	0,06–0,25	CC.. DC.. SC.. TC.. VC..
		CTEP110-P	CTEP110-P				
		CTEP110-P	CTEP110-P				

Standard chip breakers / application tips

Positive

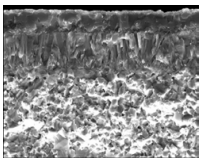
Model	Smooth cut	Interrupted cut	Interrupted cut	Cut a_p mm	Cut f mm	Geometry
Main application steel and cast iron, secondary application stainless steels and super alloys						
-M23 ▲ Soft cutting geometry with outstanding chip breaking abilities at low cutting depths in finish machining						
F	**CTCP115-P / CTCP125-P**	**CTCP125-P**	**CTCP125-P**			RC..
M	CTCP115-P / CTCP125-P	CTCP125-P	CTCP125-P			
				0,30–4,0	1,0–0,45	

Positive

Model				Cut a_p mm	Cut f mm	Geometry
Main application non-ferrous metals, secondary application stainless steels, steels, super alloys, cast iron						
-25P ▲ Sharp cutting edge ▲ Good chip control with softer aluminum alloys ▲ Low adhesion						
F	**CTPX710**	CTPX710				CC.. DC.. SC.. VC..
	CTPX710	CTPX710				
	CTPX710 / H216T	**CTPX710 / H216T**	**CTPX710 / H216T**			
	CTPX710	CTPX710				
	CTPX710	CTPX710		0,50–4,50	0,05–0,60	
-27 ▲ The universal aluminum geometry ▲ Sharp cutting edge ▲ Extremely positive rake angle ▲ Low adhesion ▲ High feeds						
M	**CTPX715**	CTPX715				CC.. DC.. RC.. SC.. TC.. VC..
R	**CTPX715**	CTPX715				
	CTPX715 / H216T	CTPX715 / H216T				
	CTPX715 / H216T	**CTPX715 / H216T**	**CTPX715 / H216T**			
	CTPX715 / H216T	CTPX715 / H216T	CTPX715 / H216T	1,00–10,00	0,10–0,75	

Grade description

CTEP110-P

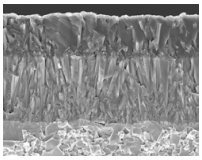


ISO | **P10** | M10 | K05

Specification:
Composition: Co/Ni 12.2%; additives 26.4%; Ti(C,N) balance | Grain size: 0.8-1.0 µm | Hardness: HV_{30} 1650 | Layer system: CVD TiCN-Al_2O_3 + TiN cover layer

Usage recommendation:
The coated cermet grade with reserves of toughness for finish machining at high cutting speeds.

CTCP115-P

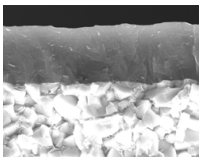


ISO | **P15** | K25

Specification:
Composition: Co 5.5%; mixed carbides 6.4%; WC balance | Grain size: 1 µm | Hardness: HV_{30}1530 | Layer system: CVD TiCN-Al_2O_3

Usage recommendation:
The wear-resistant high-performance grade for steel machining with stable conditions and a continuous cut.

CTPX710

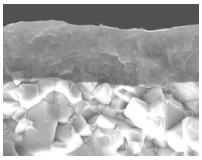


ISO | **P10 | M10** | K10 | **N10 | S15**

Specification:
Composition: Co 6.0%; WC balance | Grain size: 0.8 µm | Hardness: HV_{30}1820 | Layer system: PVD AlTiN

Usage recommendation:
The universal carbide grade for the most demanding machining requirements for multiple materials.

CTPX715



ISO | **P15 | M15** | K15 | **N15 | S20** | O10

Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30}1650 | Layer system: PVD AlTiN

Usage recommendation:
The universal carbide grade for the most demanding machining requirements for multiple materials.

C T C P 1 2 5 -P (Example)

CT
CERATIZIT

-P
Performance

Degree of hardness

05	ISO 05
10	ISO 10
15	ISO 15
20	ISO 20
25	ISO 25
30	ISO 30
35	ISO 35
40	ISO 40

Process

1	Turning
2	Milling
3	Grooving
4	Drilling
5	Thread turning
6	Other
7	Several processes

Main application - material

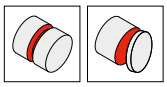
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metals
S	Heat-resistant
H	Hardened steel
O	Non-metal materials
X	Universal application

Coating

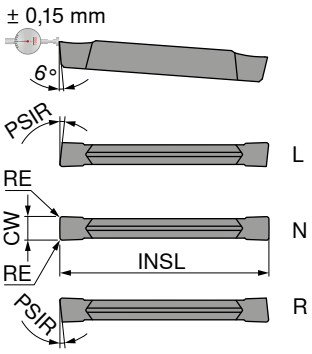
W	Carbide, uncoated
C	CVD-coated carbide
P	PVD-coated carbide
T	Cermet, uncoated
E	Cermet, coated
N	Silicon nitride, uncoated
M	Silicon nitride, coated
S	Mixed ceramic
K	Whisker ceramic
I	SiAlON
D	PCD
B	PcBN
H	HSS sintered

Grooving insert GX 35

▲ For parting and parting off



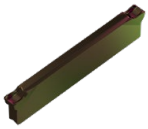
F	M	R



NEW

-M1
CTCP325

DRAGONSKIN



NEW

-M1
CTP1340

DRAGONSKIN

Designation	IH	INSL mm	CW +/-0,15 mm	RE +/-0,15 mm	PSIR °	For tool holder	70 390 ...	70 390 ...
GX 35-E3.00 L 6	L	35	3	0.2	6	-GX35	**92300**	**62300**
GX 35-E3.00 N 0.20	N	35	3	0.2		-GX35	**93300**	**63300**
GX 35-E3.00 R 6	R	35	3	0.2	6	-GX35	**94300**	**64300**
P							●	●
M							○	●
K							●	●
N								○
S							○	●
H								
O								○

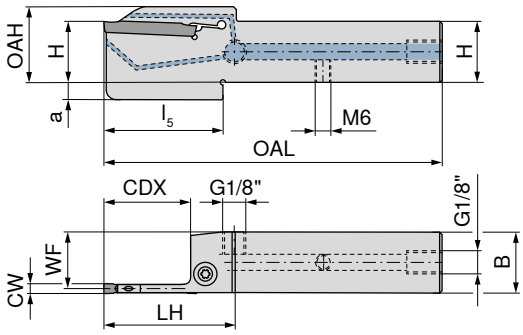
→ v_c Page 33

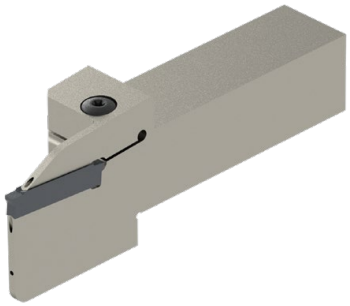
Note: Reduce feed rate value by 20-50% for R/L version.
→ **Page 33**

MonoClamp – Radial Monoholder GX-DC 35

Scope of supply:
Monoholder includes key and clamping screw

Direct Cooling





Illustrations show right-hand versions

												NEW Left	NEW Right
												70 869 ...	**70 869 ...**
Designation	H mm	B mm	CW mm	WF mm	OAH mm	OAL mm	LH mm	l_5 mm	CDX mm	a mm	For grooving inserts		
E20 R/L 0034S3-2020X-S-DC-GX35	20	20	3	18.75	31	117	55	48	34	10	GX 35-E3.00	**32001**	**32000**
E25 R/L 0034S3-2525X-S-DC-GX35	25	25	3	23.75	36	132	55	48	34	10	GX 35-E3.00	**32501**	**32500**

Screwdriver

Clamping screw

		80 950 ...		**70 950 ...**
Spare parts				
For grooving inserts				
GX 35-E3.00	T20 - IP	**129**	M6x22 - 20IP	**92200**

→ **Chapter 16 Adapters and accessories**
Here you will find suitable base adapters.

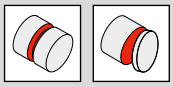
Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength lbf/in²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C	Annealed	60900 lbf/in² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C	Annealed	92800 lbf/in² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3		Tempered	121800 lbf/in² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C	Annealed	132000 lbf/in² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5		Tempered	146500 lbf/in² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1		Annealed	88500 lbf/in² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2		Tempered	134900 lbf/in² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3		Tempered	146500 lbf/in² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4		Tempered	174000 lbf/in² / 375 HB	1.7225	4142	17223	4140
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	98600 lbf/in² / 200 HB	1.4021	420	1.2379	D2
		P.3.2		Hardened and tempered	159500 lbf/in² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3		Hardened and tempered	188500 lbf/in² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	98600 lbf/in² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic	Tempered	117500 lbf/in² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	88500 lbf/in² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic	Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)		113100 lbf/in² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic		88500 lbf/in² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)		127600 lbf/in² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic		78300 lbf/in² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic		122600 lbf/in² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic		63800 lbf/in² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic		113100 lbf/in² / 230 HB	0.8170	70003		
N	Aluminum wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable		49300 lbf/in² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminum alloy	N.2.1	≤ 12 % Si, non-hardenable		36300 lbf/in² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable		43500 lbf/in² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable		63800 lbf/in² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		54400 lbf/in² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn		43500 lbf/in² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper		49300 lbf/in² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn		
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	98600 lbf/in² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2			137800 lbf/in² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis	Annealed	121800 lbf/in² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2			171100 lbf/in² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in² / 320 HB	2.4674	Nimocast PK24	2.4670	Nimocast 713
	Titanium alloys	S.3.1	Pure titanium		5800 lbf/in²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys		152300 lbf/in²	3.7165	TiAl6V4		
		S.3.3	Beta alloys		203100 lbf/in² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr		
H	Hardened steel	H.1.1		Hardened and tempered	46-55 HRC				
		H.1.2		Hardened and tempered	56-60 HRC				
		H.1.3		Hardened and tempered	61-65 HRC				
		H.1.4		Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 21800 lbf/in²				
		O.1.2	Plastics, thermoplastic		≤ 14500 lbf/in²				
		O.2.1	Aramid fibre-reinforced		≤ 145000 lbf/in²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 145000 lbf/in²				
		O.3.1	Graphite						

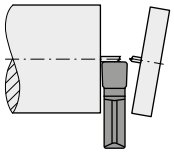
*** Tensile Strength at Rupture (Rm)**

Cutting data standard values for grooving inserts

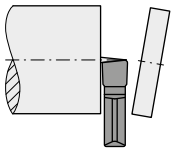
Index	GX	
	CTCP325	CTP1340
	DRAGONSKIN	
	v_c (m/min)	
P.1.1	220	180
P.1.2	195	150
P.1.3	170	125
P.1.4	165	115
P.1.5	150	100
P.2.1	200	155
P.2.2	160	110
P.2.3	150	100
P.2.4	120	70
P.3.1	150	110
P.3.2	95	75
P.3.3	45	40
P.4.1	150	110
P.4.2	125	95
M.1.1	150	110
M.2.1	95	80
M.3.1	135	100
K.1.1	170	150
K.1.2	150	125
K.2.1	160	140
K.2.2	145	120
K.3.1	210	170
K.3.2	140	120
N.1.1		300
N.1.2		200
N.2.1		300
N.2.2		200
N.2.3		150
N.3.1		300
N.3.2		300
N.3.3		200
N.4.1		200
S.1.1	35	35
S.1.2	30	30
S.2.1	20	20
S.2.2	15	15
S.2.3	15	15
S.3.1		85
S.3.2		40
S.3.3		30
H.1.1		
H.1.2		
H.1.3		
H.1.4		
H.2.1		
H.3.1		
O.1.1		130
O.1.2		
O.2.1		105
O.2.2		
O.3.1		

Groove width CW (mm)	GX-M1  Grooving/Parting off
	Feed f (mm/U)
3	0,10–0,20

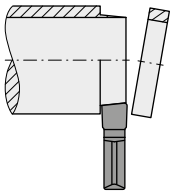
References for parting off



From Ø 5 mm on, reduce feed "f" by approximately 50 %. Do not cut across the center (risk of breakage).

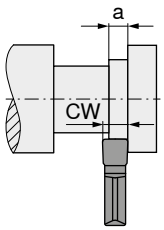


For "pip-free" parting off, use R or L inserts. To minimize lateral deflection forces, reduce the feed rate by approximately 20-50 %.

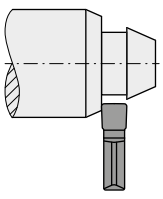


To prevent ring formation,
use R or L inserts.
Reduce feed "f" by approximately
20-50 %
because of lateral deflection.

References for grooving



When grooving with an axial displacement, the "a" width should equal at least 70 % of the "CW" groove width.



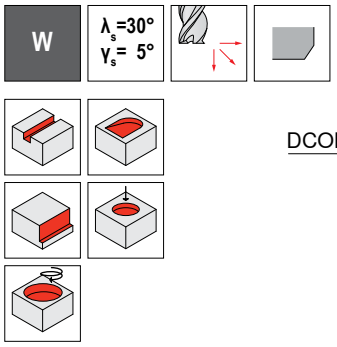
When grooving oblique surfaces, the feed must be reduced by approx.
20–50 % until fully engaged.

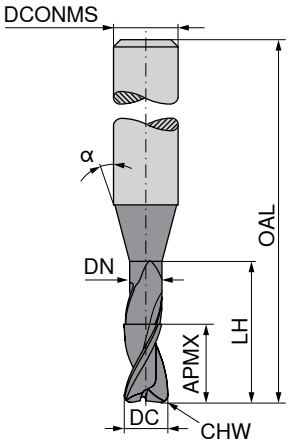
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine.
The specified values represent guideline cutting data that can be adjusted by approximately **±20 %** according to the usage conditions.

AluLine – Micro end mills

The specialist for machining non-ferrous metals

▲ T_x = maximum depth of cut





Factory standard | Factory standard | Factory standard

											53 900 ...	53 900 ...	53 900 ...
DC $_{-0,01}$	APMX	DN	LH	OAL	LPR	α°	DCONMS $_{h5}$	T_X	CHW	ZEFP			
mm	mm	mm	mm	mm	mm		mm		mm				
0.2	0.2	0.18	0.6	45	17	15	4	3 x DC	0.02	2	**02101**		
0.2	0.2	0.18	1.0	45	17	15	4	5 x DC	0.02	2	**02201**		
0.2	0.2	0.18	1.6	45	17	15	4	8 x DC	0.02	2		**02301**	
0.2	0.2	0.18	2.0	50	22	15	4	10 x DC	0.02	2		**02401**	
0.3	0.3	0.28	0.9	45	17	15	4	3 x DC	0.03	2	**03101**		
0.3	0.3	0.28	1.5	45	17	15	4	5 x DC	0.03	2	**03201**		
0.3	0.3	0.28	2.4	50	22	15	4	8 x DC	0.03	2		**03301**	
0.3	0.3	0.28	3.0	50	22	15	4	10 x DC	0.03	2		**03401**	
0.4	0.4	0.37	1.2	45	17	15	4	3 x DC	0.04	2	**04101**		
0.4	0.4	0.37	2.0	45	17	15	4	5 x DC	0.04	2	**04201**		
0.4	0.4	0.37	3.2	50	22	15	4	8 x DC	0.04	2		**04301**	
0.4	0.4	0.37	4.0	50	22	15	4	10 x DC	0.04	2		**04401**	
0.5	0.5	0.45	1.5	45	17	15	4	3 x DC	0.05	2	**05101**		
0.5	0.5	0.45	1.5	45	17	15	3	3 x DC	0.05	2	**05100**		
0.5	0.5	0.45	2.5	45	17	15	4	5 x DC	0.05	2	**05201**		
0.5	0.5	0.45	2.5	45	17	15	3	5 x DC	0.05	2	**05200**		
0.5	0.5	0.45	4.0	45	17	15	3	8 x DC	0.05	2		**05300**	
0.5	0.5	0.45	4.0	50	22	15	4	8 x DC	0.05	2		**05301**	
0.5	0.5	0.45	5.0	50	22	15	3	10 x DC	0.05	2		**05400**	
0.5	0.5	0.45	5.0	50	22	15	4	10 x DC	0.05	2		**05401**	
0.6	0.6	0.58	2.0	45	17	15	4	3,3 x DC	0.06	2	**06101**		
0.6	0.6	0.58	3.0	50	22	15	4	5 x DC	0.06	2	**06201**		
0.6	0.6	0.58	5.0	50	22	15	4	8,3 x DC	0.06	2		**06301**	
0.6	0.6	0.58	6.0	50	22	15	4	10 x DC	0.06	2		**06401**	
0.8	0.8	0.77	2.5	45	17	15	4	3,1 x DC	0.08	2	**08101**		
0.8	0.8	0.77	4.0	50	22	15	4	5 x DC	0.08	2	**08201**		
0.8	0.8	0.77	6.5	50	22	15	4	8,1 x DC	0.08	2		**08301**	
0.8	0.8	0.77	8.0	50	22	15	4	10 x DC	0.08	2		**08401**	
1.0	1.0	0.95	3.0	45	17	15	4	3 x DC	0.10	2	**10101**		
1.0	1.0	0.95	3.0	45	17	15	3	3 x DC	0.10	2	**10100**		
1.0	1.0	0.95	5.0	45	17	15	3	5 x DC	0.10	2	**10200**		
1.0	1.0	0.95	5.0	50	22	15	4	5 x DC	0.10	2	**10201**		
1.0	1.0	0.95	8.0	50	22	15	3	8 x DC	0.10	2		**10300**	
1.0	1.0	0.95	8.0	50	22	15	4	8 x DC	0.10	2		**10301**	
1.0	1.0	0.95	10.0	50	22	15	3	10 x DC	0.10	2		**10400**	
1.0	1.0	0.95	10.0	55	27	15	4	10 x DC	0.10	2		**10401**	
1.0	1.0	0.95	12.0	55	27	15	3	12 x DC	0.10	2			**10500**
1.0	1.0	0.95	12.0	55	27	15	4	12 x DC	0.10	2			**10501**
1.2	1.2	1.15	3.0	45	17	15	4	2,5 x DC	0.10	2	**12101**		
1.2	1.2	1.15	6.0	50	22	15	4	5 x DC	0.10	2	**12201**		
1.2	1.2	1.15	10.0	55	27	15	4	8,3 x DC	0.10	2		**12301**	
1.2	1.2	1.15	12.0	55	27	15	4	10 x DC	0.10	2		**12401**	

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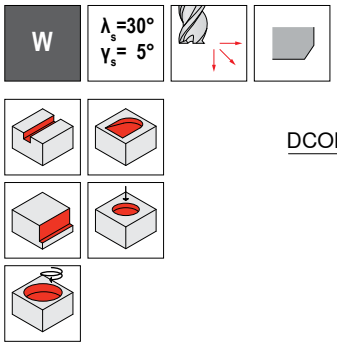
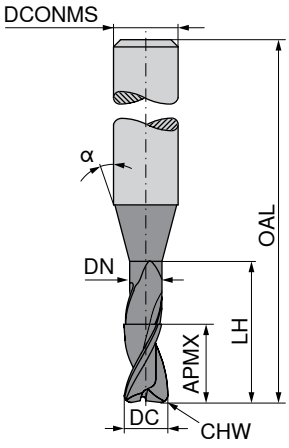
AluLine – Micro end mills

The specialist for machining non-ferrous metals

▲ T_x = maximum depth of cut





Factory standard | Factory standard | Factory standard

DC -0,01	APMX	DN	LH	OAL	LPR	α°	DCONMS h5	T_X	CHW	ZEFP	53 900 ...	53 900 ...	53 900 ...
mm	mm	mm	mm	mm	mm		mm		mm				
1.3	1.3	1.25	4.0	45	17	15	4	3,1 x DC	0.10	2	13101		
1.3	1.3	1.25	7.0	50	22	15	4	5,4 x DC	0.10	2		13201	
1.3	1.3	1.25	11.0	55	27	15	4	8,5 x DC	0.10	2		13301	
1.3	1.3	1.25	13.0	55	27	15	4	10 x DC	0.10	2		13401	
1.5	1.5	1.44	5.0	50	22	15	4	3,3 x DC	0.10	2	15101		
1.5	1.5	1.44	5.0	45	17	15	3	3,3 x DC	0.10	2	15100		
1.5	1.5	1.44	7.5	50	22	15	3	5 x DC	0.10	2	15200		
1.5	1.5	1.44	7.5	50	22	15	4	5 x DC	0.10	2	15201		
1.5	1.5	1.44	12.0	55	27	15	3	8 x DC	0.10	2		15300	
1.5	1.5	1.44	12.0	55	27	15	4	8 x DC	0.10	2		15301	
1.5	1.5	1.44	15.0	55	27	15	3	10 x DC	0.10	2		15400	
1.5	1.5	1.44	15.0	60	32	15	4	10 x DC	0.10	2		15401	
1.6	1.6	1.52	5.0	50	22	15	4	3,1 x DC	0.10	2	16101		
1.6	1.6	1.52	8.0	50	22	15	4	5 x DC	0.10	2	16201		
1.6	1.6	1.52	13.0	55	27	15	4	8,1 x DC	0.10	2		16301	
1.6	1.6	1.52	16.0	60	32	15	4	10 x DC	0.10	2		16401	
1.8	1.8	1.72	5.5	50	22	15	4	3,1 x DC	0.10	2	18101		
1.8	1.8	1.72	9.0	50	22	15	4	5 x DC	0.10	2	18201		
1.8	1.8	1.72	14.5	55	27	15	4	8,1 x DC	0.10	2		18301	
1.8	1.8	1.72	18.0	60	32	15	4	10 x DC	0.10	2		18401	
2.0	2.0	1.92	6.0	50	22	15	4	3 x DC	0.10	2	20101		
2.0	2.0	1.92	6.0	45	17	15	3	3 x DC	0.10	2	20100		
2.0	2.0	1.92	10.0	50	22	15	4	5 x DC	0.10	2	20201		
2.0	2.0	1.92	10.0	50	22	15	3	5 x DC	0.10	2	20200		
2.0	2.0	1.92	14.0	55	27	15	3	7 x DC	0.10	2		20300	
2.0	2.0	1.92	14.0	55	27	15	4	7 x DC	0.10	2		20301	
2.0	2.0	1.92	16.0	55	27	15	3	8 x DC	0.10	2		20400	
2.0	2.0	1.92	16.0	60	32	15	4	8 x DC	0.10	2		20401	
2.0	2.0	1.92	20.0	60	32	15	3	10 x DC	0.10	2		20500	
2.0	2.0	1.92	20.0	60	32	15	4	10 x DC	0.10	2		20501	
2.3	2.3	2.22	7.0	50	22	15	4	3 x DC	0.10	2	23101		
2.3	2.3	2.22	11.5	55	27	15	4	5 x DC	0.10	2	23201		
2.3	2.3	2.22	18.5	60	32	15	4	8 x DC	0.10	2		23301	
2.3	2.3	2.22	20.0	60	32	15	4	8,7 x DC	0.10	2		23401	
2.3	2.3	2.22	23.0	65	37	15	4	10 x DC	0.10	2		23501	
3.0	3.0	2.90	9.0	50	22	15	4	3 x DC	0.10	2	30101		
3.0	3.0	2.90	15.0	55	27	15	4	5 x DC	0.10	2	30201		
3.0	3.0	2.90	24.0	65	37	15	4	8 x DC	0.10	2		30301	
3.0	3.0	2.90	30.0	70	42	15	4	10 x DC	0.10	2		30401	
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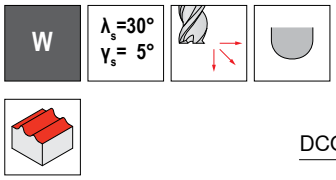
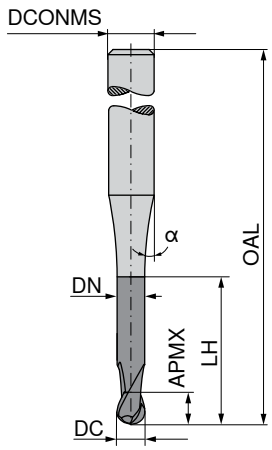
AluLine – Micro radius cutters

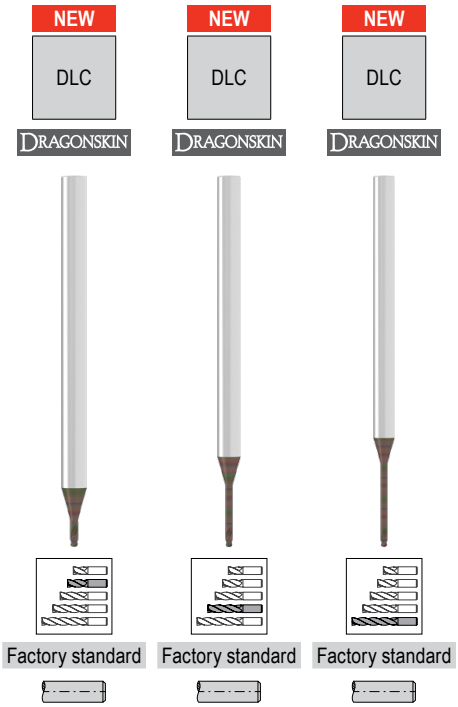
The specialist for machining non-ferrous metals

▲ Radius accuracy: ± 0,01 mm

▲ T_x = maximum engagement depth







DC -0,01 mm	APMX mm	DN mm	LH mm	OAL mm	LPR mm	α°	DCONMS h5 mm	T_x	ZEFP	Factory standard 53 903 ...	Factory standard 53 903 ...	Factory standard 53 903 ...
0.2	0.2	0.18	0.6	45	17	15	4	3 x DC	2	**02101**		
0.2	0.2	0.18	1.0	45	17	15	4	5 x DC	2	**02201**		
0.2	0.2	0.18	1.6	45	17	15	4	8 x DC	2		**02301**	
0.2	0.2	0.18	2.0	50	22	15	4	10 x DC	2		**02401**	
0.3	0.3	0.28	0.9	45	17	15	4	3 x DC	2	**03101**		
0.3	0.3	0.28	1.5	45	17	15	4	5 x DC	2	**03201**		
0.3	0.3	0.28	2.4	50	22	15	4	8 x DC	2		**03301**	
0.3	0.3	0.28	3.0	50	22	15	4	10 x DC	2		**03401**	
0.4	0.4	0.37	1.2	45	17	15	4	3 x DC	2	**04101**		
0.4	0.4	0.37	2.0	45	17	15	4	5 x DC	2	**04201**		
0.4	0.4	0.37	3.2	50	22	15	4	8 x DC	2		**04301**	
0.4	0.4	0.37	4.0	50	22	15	4	10 x DC	2		**04401**	
0.5	0.5	0.45	1.5	45	17	15	4	3 x DC	2	**05101**		
0.5	0.5	0.45	1.5	45	17	15	3	3 x DC	2	**05100**		
0.5	0.5	0.45	2.5	45	17	15	4	5 x DC	2	**05201**		
0.5	0.5	0.45	2.5	45	17	15	3	5 x DC	2	**05200**		
0.5	0.5	0.45	4.0	45	17	15	3	8 x DC	2		**05300**	
0.5	0.5	0.45	4.0	50	22	15	4	8 x DC	2		**05301**	
0.5	0.5	0.45	5.0	50	22	15	3	10 x DC	2		**05400**	
0.5	0.5	0.45	5.0	50	22	15	4	10 x DC	2		**05401**	
0.6	0.6	0.58	2.0	45	17	15	4	3,3 x DC	2	**06101**		
0.6	0.6	0.58	3.0	50	22	15	4	5 x DC	2	**06201**		
0.6	0.6	0.58	5.0	50	22	15	4	8,3 x DC	2		**06301**	
0.6	0.6	0.58	6.0	50	22	15	4	10 x DC	2		**06401**	
0.8	0.8	0.77	2.5	45	17	15	4	3,1 x DC	2	**08101**		
0.8	0.8	0.77	4.0	50	22	15	4	5 x DC	2	**08201**		
0.8	0.8	0.77	6.5	50	22	15	4	8,1 x DC	2		**08301**	
0.8	0.8	0.77	8.0	50	22	15	4	10 x DC	2		**08401**	
1.0	1.0	0.95	3.0	45	17	15	4	3 x DC	2	**10101**		
1.0	1.0	0.95	3.0	45	17	15	3	3 x DC	2	**10100**		
1.0	1.0	0.95	5.0	45	17	15	3	5 x DC	2	**10200**		
1.0	1.0	0.95	5.0	50	22	15	4	5 x DC	2	**10201**		
1.0	1.0	0.95	8.0	50	22	15	3	8 x DC	2		**10300**	
1.0	1.0	0.95	8.0	50	22	15	4	8 x DC	2		**10301**	
1.0	1.0	0.95	10.0	50	22	15	3	10 x DC	2		**10400**	
1.0	1.0	0.95	10.0	55	27	15	4	10 x DC	2		**10401**	
1.0	1.0	0.95	12.0	55	27	15	3	12 x DC	2			**10500**
1.0	1.0	0.95	12.0	55	27	15	4	12 x DC	2			**10501**
1.2	1.2	1.15	3.0	45	17	15	4	2,5 x DC	2	**12101**		
1.2	1.2	1.15	6.0	50	22	15	4	5 x DC	2	**12201**		
1.2	1.2	1.15	10.0	55	27	15	4	8,3 x DC	2		**12301**	
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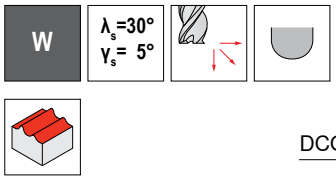
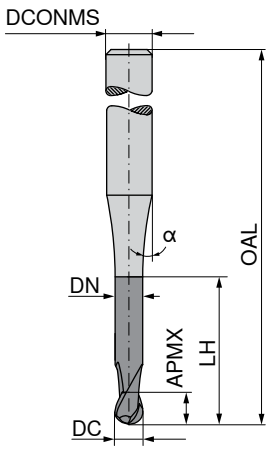
AluLine – Micro radius cutters

The specialist for machining non-ferrous metals

▲ Radius accuracy: ± 0,01 mm

▲ T_x = maximum engagement depth





DC -0,01 mm	APMX mm	DN mm	LH mm	OAL mm	LPR mm	α°	DCONMS h5 mm	T_x	ZEFP	Factory standard 53 903 ...	Factory standard 53 903 ...	Factory standard 53 903 ...
1.2	1.2	1.15	12.0	55	27	15	4	10 x DC	2		**12401**	
1.3	1.3	1.25	4.0	45	17	15	4	3,1 x DC	2	**13101**		
1.3	1.3	1.25	7.0	50	22	15	4	5,4 x DC	2		**13201**	
1.3	1.3	1.25	11.0	55	27	15	4	8,5 x DC	2		**13301**	
1.3	1.3	1.25	13.0	55	27	15	4	10 x DC	2		**13401**	
1.5	1.5	1.44	5.0	50	22	15	4	3,3 x DC	2	**15101**		
1.5	1.5	1.44	5.0	45	17	15	3	3,3 x DC	2	**15100**		
1.5	1.5	1.44	7.5	50	22	15	3	5 x DC	2	**15200**		
1.5	1.5	1.44	7.5	50	22	15	4	5 x DC	2	**15201**		
1.5	1.5	1.44	12.0	55	27	15	3	8 x DC	2		**15400**	
1.5	1.5	1.44	12.0	55	27	15	4	8 x DC	2		**15401**	
1.5	1.5	1.44	15.0	55	27	15	3	10 x DC	2		**15300**	
1.5	1.5	1.44	15.0	60	32	15	4	10 x DC	2		**15301**	
1.6	1.6	1.52	5.0	50	22	15	4	3,1 x DC	2	**16101**		
1.6	1.6	1.52	8.0	50	22	15	4	5 x DC	2	**16201**		
1.6	1.6	1.52	13.0	55	27	15	4	8,1 x DC	2		**16301**	
1.6	1.6	1.52	16.0	60	32	15	4	10 x DC	2		**16401**	
1.8	1.8	1.72	5.5	50	22	15	4	3,1 x DC	2	**18101**		
1.8	1.8	1.72	9.0	50	22	15	4	5 x DC	2	**18201**		
1.8	1.8	1.72	14.5	55	27	15	4	8,1 x DC	2		**18301**	
1.8	1.8	1.72	18.0	60	32	15	4	10 x DC	2		**18401**	
2.0	2.0	1.92	6.0	50	22	15	4	3 x DC	2	**20101**		
2.0	2.0	1.92	6.0	45	17	15	3	3 x DC	2	**20100**		
2.0	2.0	1.92	10.0	50	22	15	4	5 x DC	2	**20201**		
2.0	2.0	1.92	10.0	50	22	15	3	5 x DC	2	**20200**		
2.0	2.0	1.92	14.0	55	27	15	3	7 x DC	2		**20300**	
2.0	2.0	1.92	14.0	55	27	15	4	7 x DC	2		**20301**	
2.0	2.0	1.92	16.0	55	27	15	3	8 x DC	2		**20400**	
2.0	2.0	1.92	16.0	60	32	15	4	8 x DC	2		**20401**	
2.0	2.0	1.92	20.0	60	32	15	3	10 x DC	2		**20500**	
2.0	2.0	1.92	20.0	60	32	15	4	10 x DC	2		**20501**	
2.3	2.3	2.22	7.0	50	22	15	4	3 x DC	2	**23101**		
2.3	2.3	2.22	11.5	55	27	15	4	5 x DC	2	**23201**		
2.3	2.3	2.22	18.5	60	32	15	4	8 x DC	2		**23301**	
2.3	2.3	2.22	20.0	60	32	15	4	8,7 x DC	2		**23401**	
2.3	2.3	2.22	23.0	65	37	15	4	10 x DC	2		**23501**	
3.0	3.0	2.90	9.0	50	22	15	4	3 x DC	2	**30101**		
3.0	3.0	2.90	15.0	55	27	15	4	5 x DC	2	**30201**		
3.0	3.0	2.90	24.0	65	37	15	4	8 x DC	2		**30301**	
3.0	3.0	2.90	30.0	70	42	15	4	10 x DC	2		**30401**	

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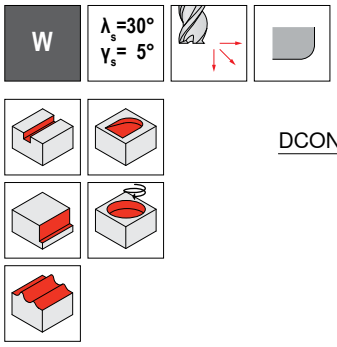
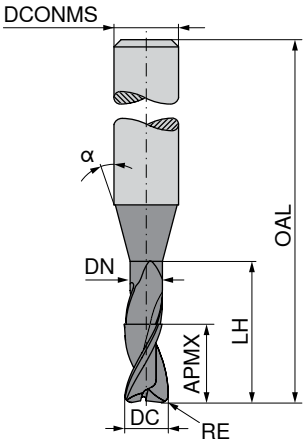
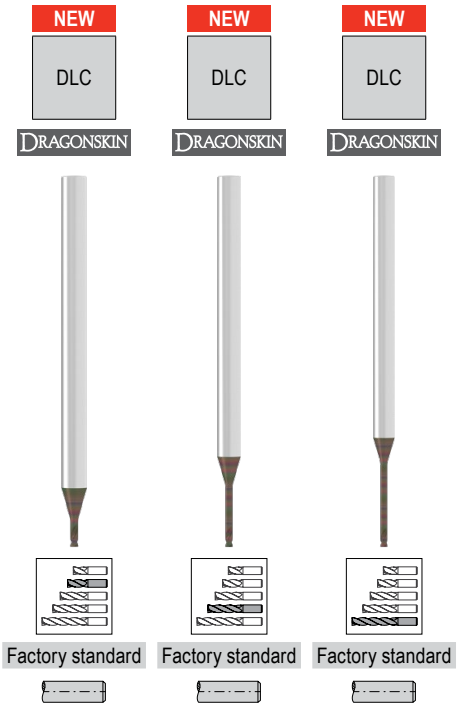
AluLine – Micro torus cutters

The specialist for machining non-ferrous metals

▲ T_x = maximum depth of cut







DC -0.01	RE ±0.01	APMX	DN	LH	OAL	LPR	α°	DCONMS h5	T_x	ZEFP	Factory standard	Factory standard	Factory standard
mm	mm	mm	mm	mm	mm	mm		mm			53 901 ...	53 901 ...	53 901 ...
0.2	0.02	0.2	0.18	0.6	45	17	15	4	3 x DC	2	**02101**		
0.2	0.02	0.2	0.18	1.0	45	17	15	4	5 x DC	2	**02201**		
0.2	0.02	0.2	0.18	1.6	45	17	15	4	8 x DC	2		**02301**	
0.2	0.02	0.2	0.18	2.0	50	22	15	4	10 x DC	2		**02401**	
0.3	0.03	0.3	0.28	0.9	45	17	15	4	3 x DC	2	**03101**		
0.3	0.03	0.3	0.28	1.5	45	17	15	4	5 x DC	2	**03201**		
0.3	0.03	0.3	0.28	2.4	50	22	15	4	8 x DC	2		**03301**	
0.3	0.03	0.3	0.28	3.0	50	22	15	4	10 x DC	2		**03401**	
0.4	0.04	0.4	0.37	1.2	45	17	15	4	3 x DC	2	**04101**		
0.4	0.04	0.4	0.37	2.0	45	17	15	4	5 x DC	2	**04201**		
0.4	0.04	0.4	0.37	3.2	50	22	15	4	8 x DC	2		**04301**	
0.4	0.04	0.4	0.37	4.0	50	22	15	4	10 x DC	2		**04401**	
0.5	0.05	0.5	0.45	1.5	45	17	15	4	3 x DC	2	**05101**		
0.5	0.05	0.5	0.45	1.5	45	17	15	3	3 x DC	2	**05100**		
0.5	0.05	0.5	0.45	2.5	45	17	15	4	5 x DC	2	**05201**		
0.5	0.05	0.5	0.45	2.5	45	17	15	3	5 x DC	2	**05200**		
0.5	0.05	0.5	0.45	4.0	45	17	15	3	8 x DC	2		**05300**	
0.5	0.05	0.5	0.45	4.0	50	22	15	4	8 x DC	2		**05301**	
0.5	0.05	0.5	0.45	5.0	50	22	15	3	10 x DC	2		**05400**	
0.5	0.05	0.5	0.45	5.0	50	22	15	4	10 x DC	2		**05401**	
0.6	0.06	0.6	0.58	2.0	45	17	15	4	3,3 x DC	2	**06101**		
0.6	0.06	0.6	0.58	3.0	50	22	15	4	5 x DC	2	**06201**		
0.6	0.06	0.6	0.58	4.2	50	22	15	4	7 x DC	2		**06301**	
0.6	0.06	0.6	0.58	5.0	50	22	15	4	8,3 x DC	2		**06401**	
0.6	0.06	0.6	0.58	6.0	50	22	15	4	10 x DC	2		**06501**	
0.8	0.08	0.8	0.77	2.5	45	17	15	4	3,1 x DC	2	**08101**		
0.8	0.08	0.8	0.77	4.0	50	22	15	4	5 x DC	2	**08201**		
0.8	0.08	0.8	0.77	6.5	50	22	15	4	8,1 x DC	2		**08301**	
0.8	0.08	0.8	0.77	8.0	50	22	15	4	10 x DC	2		**08401**	
1.0	0.10	1.0	0.95	3.0	45	17	15	4	3 x DC	2	**10101**		
1.0	0.10	1.0	0.95	3.0	45	17	15	3	3 x DC	2	**10100**		
1.0	0.10	1.0	0.95	5.0	45	17	15	3	5 x DC	2	**10200**		
1.0	0.10	1.0	0.95	5.0	50	22	15	4	5 x DC	2	**10201**		
1.0	0.10	1.0	0.95	8.0	50	22	15	3	8 x DC	2		**10300**	
1.0	0.10	1.0	0.95	8.0	50	22	15	4	8 x DC	2		**10301**	
1.0	0.10	1.0	0.95	10.0	50	22	15	3	10 x DC	2		**10400**	
1.0	0.10	1.0	0.95	10.0	55	27	15	4	10 x DC	2		**10401**	
1.0	0.10	1.0	0.95	12.0	55	27	15	3	12 x DC	2			**10500**
1.0	0.10	1.0	0.95	12.0	55	27	15	4	12 x DC	2			**10501**
1.2	0.12	1.2	1.15	3.0	45	17	15	4	2,5 x DC	2	**12101**		
1.2	0.12	1.2	1.15	6.0	50	22	15	4	5 x DC	2	**12201**		
1.2	0.12	1.2	1.15	10.0	55	27	15	4	8,3 x DC	2		**12301**	

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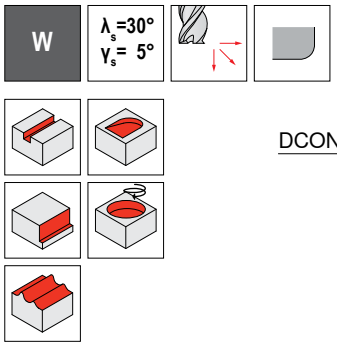
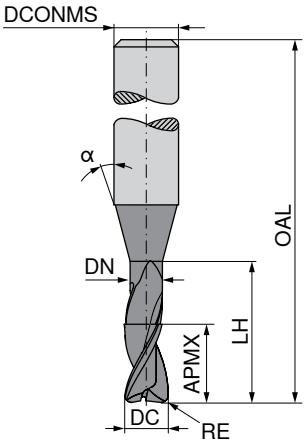
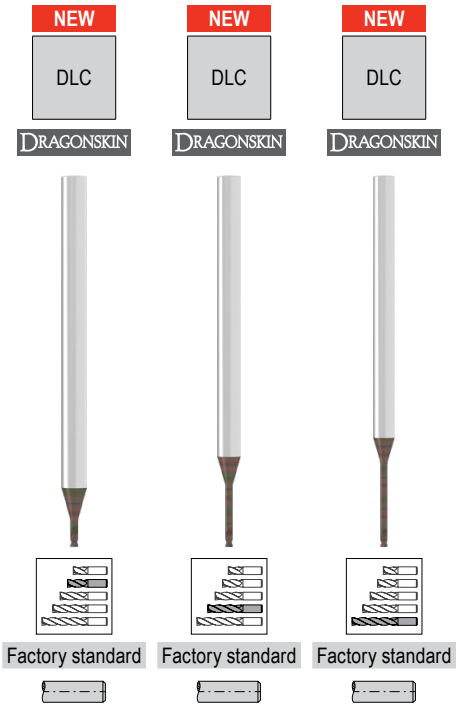
AluLine – Micro torus cutters

The specialist for machining non-ferrous metals

▲ T_x = maximum depth of cut







DC -0.01	RE ±0.01	APMX	DN	LH	OAL	LPR	α°	DCONMS h5	T_x	ZEFP	Factory standard	Factory standard	Factory standard
mm	mm	mm	mm	mm	mm	mm		mm			53 901 ...	53 901 ...	53 901 ...
1.2	0.12	1.2	1.15	12.0	55	27	15	4	10 x DC	2		12401	
1.3	0.13	1.3	1.25	4.0	45	17	15	4	3,1 x DC	2	13101		
1.3	0.13	1.3	1.25	7.0	50	22	15	4	5,4 x DC	2		13201	
1.3	0.13	1.3	1.25	11.0	55	27	15	4	8,5 x DC	2		13301	
1.3	0.13	1.3	1.25	13.0	55	27	15	4	10 x DC	2		13401	
1.5	0.15	1.5	1.44	5.0	50	22	15	4	3,3 x DC	2	15101		
1.5	0.15	1.5	1.44	5.0	45	17	15	3	3,3 x DC	2	15100		
1.5	0.15	1.5	1.44	7.5	50	22	15	3	5 x DC	2	15200		
1.5	0.15	1.5	1.44	7.5	50	22	15	4	5 x DC	2	15201		
1.5	0.15	1.5	1.44	12.0	55	27	15	3	8 x DC	2		15300	
1.5	0.15	1.5	1.44	12.0	55	27	15	4	8 x DC	2		15301	
1.5	0.15	1.5	1.44	15.0	55	27	15	3	10 x DC	2		15400	
1.5	0.15	1.5	1.44	15.0	60	32	15	4	10 x DC	2		15401	
1.6	0.16	1.6	1.52	5.0	50	22	15	4	3,1 x DC	2	16101		
1.6	0.16	1.6	1.52	8.0	50	22	15	4	5 x DC	2	16201		
1.6	0.16	1.6	1.52	13.0	55	27	15	4	8,1 x DC	2		16301	
1.6	0.16	1.6	1.52	16.0	60	32	15	4	10 x DC	2		16401	
1.8	0.18	1.8	1.72	5.5	50	22	15	4	3,1 x DC	2	18101		
1.8	0.18	1.8	1.72	9.0	50	22	15	4	5 x DC	2	18201		
1.8	0.18	1.8	1.72	14.5	55	27	15	4	8,1 x DC	2		18301	
1.8	0.18	1.8	1.72	18.0	60	32	15	4	10 x DC	2		18401	
2.0	0.20	2.0	1.92	6.0	50	22	15	4	3 x DC	2	20101		
2.0	0.20	2.0	1.92	6.0	45	17	15	3	3 x DC	2	20100		
2.0	0.20	2.0	1.92	10.0	50	22	15	4	5 x DC	2	20201		
2.0	0.20	2.0	1.92	10.0	50	22	15	3	5 x DC	2	20200		
2.0	0.20	2.0	1.92	14.0	55	27	15	3	7 x DC	2		20300	
2.0	0.20	2.0	1.92	14.0	55	27	15	4	7 x DC	2		20301	
2.0	0.20	2.0	1.92	16.0	55	27	15	3	8 x DC	2		20400	
2.0	0.20	2.0	1.92	16.0	60	32	15	4	8 x DC	2		20401	
2.0	0.20	2.0	1.92	20.0	60	32	15	3	10 x DC	2		20500	
2.0	0.20	2.0	1.92	20.0	60	32	15	4	10 x DC	2		20501	
2.3	0.23	2.3	2.22	7.0	50	22	15	4	3 x DC	2	23101		
2.3	0.23	2.3	2.22	11.5	55	27	15	4	5 x DC	2	23201		
2.3	0.23	2.3	2.22	14.0	55	27	15	4	6,1 x DC	2		23301	
2.3	0.23	2.3	2.22	18.5	60	32	15	4	8 x DC	2		23401	
2.3	0.23	2.3	2.22	20.0	60	32	15	4	8,7 x DC	2		23501	
2.3	0.23	2.3	2.22	23.0	65	37	15	4	10 x DC	2		23601	
3.0	0.30	3.0	2.90	9.0	50	22	15	4	3 x DC	2	30101		
3.0	0.30	3.0	2.90	15.0	55	27	15	4	5 x DC	2	30201		
3.0	0.30	3.0	2.90	24.0	65	37	15	4	8 x DC	2		30301	
3.0	0.30	3.0	2.90	30.0	70	42	15	4	10 x DC	2		30401	

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Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength lbf/in²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C	Annealed	60900 lbf/in² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C	Annealed	92800 lbf/in² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3		Tempered	121800 lbf/in² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C	Annealed	132000 lbf/in² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5		Tempered	146500 lbf/in² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1		Annealed	88500 lbf/in² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2		Tempered	134900 lbf/in² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3		Tempered	146500 lbf/in² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4		Tempered	174000 lbf/in² / 375 HB	1.7225	4142	17223	4140
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	98600 lbf/in² / 200 HB	1.4021	420	1.2379	D2
		P.3.2		Hardened and tempered	159500 lbf/in² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3		Hardened and tempered	188500 lbf/in² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	98600 lbf/in² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic	Tempered	117500 lbf/in² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	88500 lbf/in² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic	Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)		113100 lbf/in² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic		88500 lbf/in² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)		127600 lbf/in² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic		78300 lbf/in² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic		122600 lbf/in² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic		63800 lbf/in² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic		113100 lbf/in² / 230 HB	0.8170	70003		
N	Aluminum wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable		49300 lbf/in² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminum alloy	N.2.1	≤ 12 % Si, non-hardenable		36300 lbf/in² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable		43500 lbf/in² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable		63800 lbf/in² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		54400 lbf/in² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn		43500 lbf/in² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper		49300 lbf/in² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn		
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	98600 lbf/in² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2			137800 lbf/in² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis	Annealed	121800 lbf/in² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2			171100 lbf/in² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in² / 320 HB	2.4674	Nimocast PK24	2.4670	Nimocast 713
	Titanium alloys	S.3.1	Pure titanium		5800 lbf/in²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys		152300 lbf/in²	3.7165	TiAl6V4		
		S.3.3	Beta alloys		203100 lbf/in² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr		
H	Hardened steel	H.1.1		Hardened and tempered	46-55 HRC				
		H.1.2		Hardened and tempered	56-60 HRC				
		H.1.3		Hardened and tempered	61-65 HRC				
		H.1.4		Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 21800 lbf/in²				
		O.1.2	Plastics, thermoplastic		≤ 14500 lbf/in²				
		O.2.1	Aramid fibre-reinforced		≤ 145000 lbf/in²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 145000 lbf/in²				
		O.3.1	Graphite						

*** Tensile Strength at Rupture (Rm)**

Cutting data standard values – AluLine – micro cutter

Index	$T_x \leq 3xDC$			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MMS
				f_z (mm)											
N.1.1	400	0,15	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.1.2	400	0,15	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.1	400	0,15	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.2	300	0,15	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.3	200	0,15	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.3.1	140	0,08	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.2	100	0,08	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.3	150	0,08	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.4.1															

Plunging angle for ramping and helical milling = 3°

Index	$T_x > 3xDC$ – 5xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MMS
				f_z (mm)											
N.1.1	320	0,12	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.1.2	320	0,12	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.1	320	0,12	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.2	240	0,12	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.3	160	0,12	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.3.1	110	0,064	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.2	80	0,064	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.3	120	0,064	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.4.1															

Plunging angle for ramping and helical milling = 2°

Index	$T_x > 5xDC$ – 7xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MMS
				f_z (mm)											
N.1.1	240	0,105	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.1.2	240	0,105	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.1	240	0,105	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.2	180	0,105	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.3	120	0,105	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.3.1	85	0,056	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.2	60	0,056	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.3	90	0,056	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.4.1															

Plunging angle for ramping and helical milling = 2°

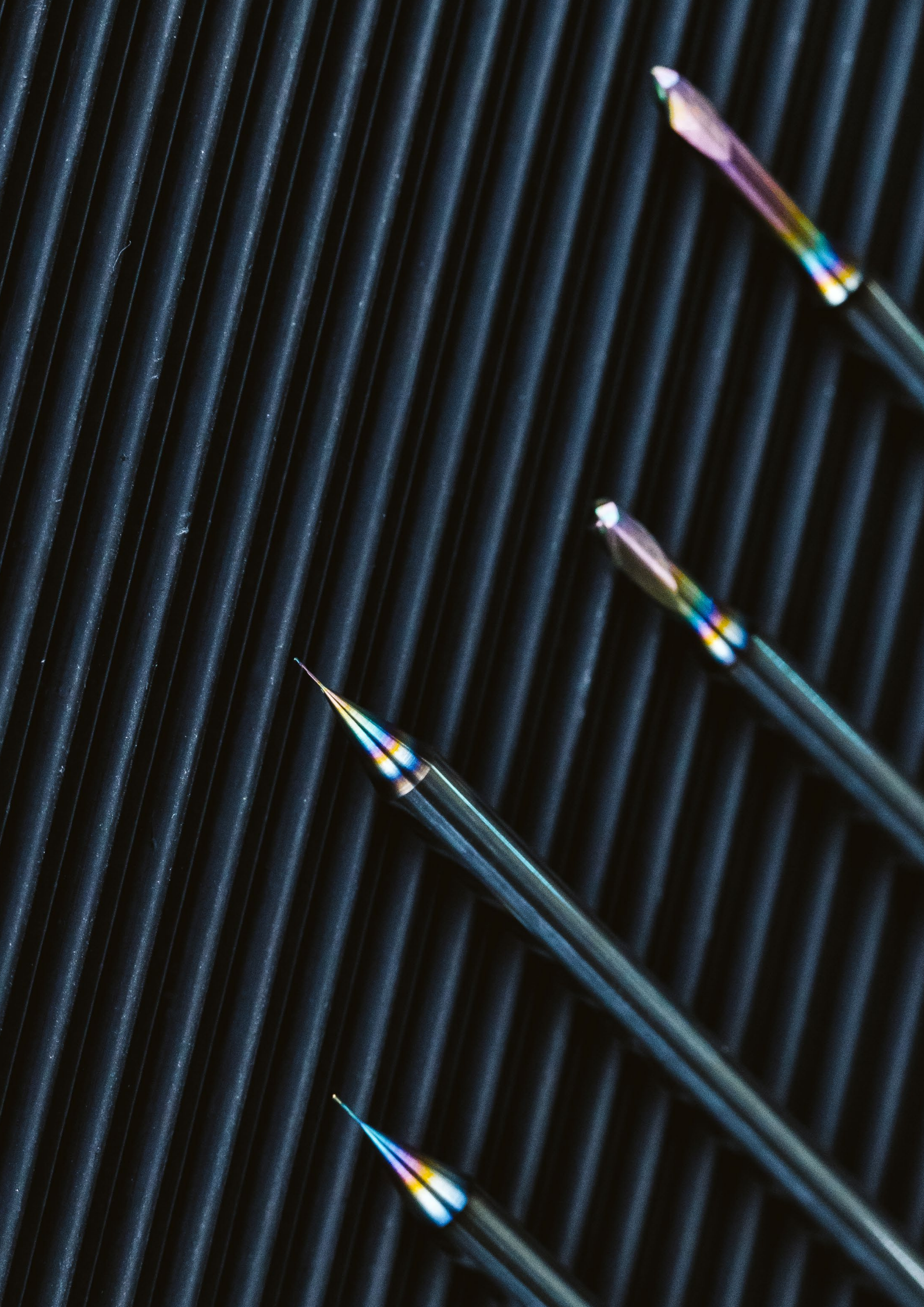
Cutting data standard values – AluLine – micro cutter

Index	T_x > 7xDC – 9xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MMS
				f_z (mm)											
N.1.1	160	0,09	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.1.2	160	0,09	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.1	160	0,09	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.2	120	0,09	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.3	80	0,09	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.3.1	55	0,048	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.2	40	0,048	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.3	60	0,048	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.4.1															

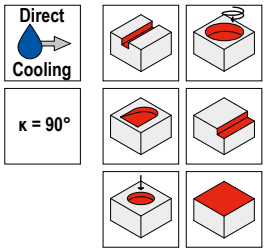
Plunging angle for ramping and helical milling = 1°

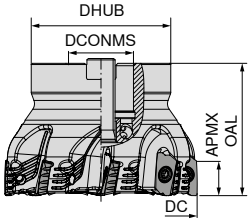
Index	T_x > 9xDC – 12xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MMS
				f_z (mm)											
N.1.1	120	0,075	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.1.2	120	0,075	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.1	120	0,075	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.2	90	0,075	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.2.3	60	0,075	1,0	0,0085	0,0115	0,0140	0,0170	0,0200	0,0230	0,0280	0,0350	0,0500	●	○	○
N.3.1	40	0,04	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.2	30	0,04	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.3.3	45	0,04	1,0	0,0050	0,0065	0,0080	0,0100	0,0115	0,0130	0,0160	0,0210	0,0300	●	○	○
N.4.1															

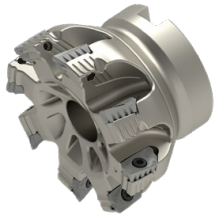
Plunging angle for ramping and helical milling = 1°



MaxiMill – 211-15-DC face mill







NEW

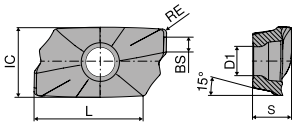
Designation	DC mm	ZNF	APMX mm	OAL mm	DCONMS H6 mm	DHUB mm	RPMX 1/min.	Tightening torque Nm	Indexable insert	50 798 ...
A211.40.R.04-15-DCA R08	40	4	14	45	16	38	18000	3,2	XDKT 1505..	**04004**
A211.40.R.04-15-DCA R40	40	4	14	45	16	38	18000	3,2	XDKT 1505..	**24004**
A211.50.R.05-15-DCA R40	50	5	14	45	22	45	15000	3,2	XDKT 1505..	**25005**
A211.50.R.05-15-DCA R08	50	5	14	45	22	45	15000	3,2	XDKT 1505..	**05005**
A211.63.R.06-15-DCA R40	63	6	14	50	22	48	14000	3,2	XDKT 1505..	**26306**
A211.63.R.06-15-DCA R08	63	6	14	50	22	48	14000	3,2	XDKT 1505..	**06306**
A211.80.R.08-15-DCA R08	80	8	14	55	27	58	12000	3,2	XDKT 1505..	**08008**
A211.80.R.08-15-DCA R40	80	8	14	55	27	58	12000	3,2	XDKT 1505..	**28008**

Spare parts DC	TORX® interchangeable blade 80 950 ...	Screwdriver 80 950 ...	Molykote 70 950 ...	Clamping screw 70 950 ...	Torque screw-driver 80 950 ...
40 - 80	**054**	**128**	**303**	**839**	**193**

The -DCA R08 cutters will accept only the XDKT 150508 insert.
The -DCA R40 will accept both the XDKT 150532 and the XDKT 150540 insert.

XDKT

Designation	IC	D1	L	BS	S
	mm	mm	mm	mm	mm
XDKT 150508..	9.3	4.4	14.8	1.6	5.56
XDKT 150532..	9.3	4.4	14.8	1.9	5.56
XDKT 150540..	9.3	4.4	14.8	1.2	5.56



XDKT

XDKT

		NEW	NEW
		-F40 CTCS245	-F40 CTC5240
		DRAGONSKIN	DRAGONSKIN
		F	F
		XDKT	XDKT
		51 165 ...	51 165 ...
ISO	RE mm		
150508ER	0.8	50801	10801
150532ER	3.2	53201	13201
150540ER	4.0	54001	14001
P			
M			
K			
N			
S		●	●
H			
O			

Cutting data standard values

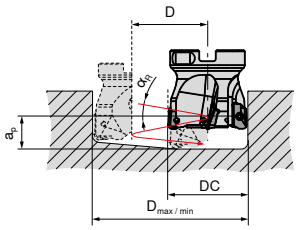
	Material sub-group	Index	Tensile strength lbf/in²* / HB / HRC	CTC5240 DRAGONSKIN		CTCS245 DRAGONSKIN	
				Cutting material **hard** (v_c↑) → **tough** (v_c↓)			
				v_c (m/min)			
P	Unalloyed steel	P.1.1	60900 lbf/in² / 125 HB				
		P.1.2	92800 lbf/in² / 190 HB				
		P.1.3	121800 lbf/in² / 250 HB				
		P.1.4	132000 lbf/in² / 270 HB				
		P.1.5	146500 lbf/in² / 300 HB				
	Low-alloy steel	P.2.1	88500 lbf/in² / 180 HB				
		P.2.2	134900 lbf/in² / 275 HB				
		P.2.3	146500 lbf/in² / 300 HB				
		P.2.4	174000 lbf/in² / 375 HB				
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in² / 200 HB				
		P.3.2	159500 lbf/in² / 300 HB				
		P.3.3	188500 lbf/in² / 400 HB				
	Stainless steel	P.4.1	98600 lbf/in² / 200 HB				
		P.4.2	117500 lbf/in² / 250 HB				
M	Stainless steel	M.1.1	88500 lbf/in² / 200 HB				
		M.2.1	300 HB				
		M.3.1	113100 lbf/in² / 230 HB				
K	Grey cast iron	K.1.1	88500 lbf/in² / 180 HB				
		K.1.2	127600 lbf/in² / 260 HB				
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in² / 160 HB				
		K.2.2	122600 lbf/in² / 250 HB				
	Malleable iron	K.3.1	63800 lbf/in² / 130 HB				
		K.3.2	113100 lbf/in² / 230 HB				
N	Aluminum wrought alloy	N.1.1	60 HB				
		N.1.2	49300 lbf/in² / 100 HB				
	Cast aluminum alloy	N.2.1	36300 lbf/in² / 75 HB				
		N.2.2	43500 lbf/in² / 90 HB				
		N.2.3	63800 lbf/in² / 130 HB				
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in² / 110 HB				
		N.3.2	43500 lbf/in² / 90 HB				
		N.3.3	49300 lbf/in² / 100 HB				
	Magnesium alloys	N.4.1	70 HB				
S	Heat-resistant alloys	S.1.1	98600 lbf/in² / 200 HB		80		64
		S.1.2	137800 lbf/in² / 280 HB		70		56
		S.2.1	121800 lbf/in² / 250 HB		35		28
		S.2.2	171100 lbf/in² / 350 HB		25		20
		S.2.3	156600 lbf/in² / 320 HB		30		24
	Titanium alloys	S.3.1	5800 lbf/in²		80		64
		S.3.2	152300 lbf/in²		50		40
		S.3.3	203100 lbf/in² / 410 HB		40		32
H	Hardened steel	H.1.1	46-55 HRC				
		H.1.2	56-60 HRC				
		H.1.3	61-65 HRC				
		H.1.4	66-70 HRC				
	Chilled iron	H.2.1	400 HB				
	Hardened cast iron	H.3.1	55 HRC				
O	Non-metal materials	O.1.1	≤ 21800 lbf/in²				
		O.1.2	≤ 14500 lbf/in²				
		O.2.1	≤ 145000 lbf/in²				
		O.2.2	≤ 145000 lbf/in²				
		O.3.1					

*** Tensile Strength at Rupture (Rm)**

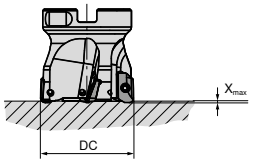
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approximately **±20 %** according to the usage conditions.

MaxiMill 211-15 system

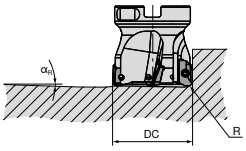
Machining strategy



① Helical plunging



② Axial ramping



③ Angled ramping

DC mm		① Helical plunging RE = 0,8 mm	② Axial ramping X_{max}	③ Angled ramping α_R
25	α_R	7,5 °	2,7 mm	9,5 °
	$D_{max.}$	48 mm		
	$D_{min.}$	37 mm		
32	α_R	5 °	2,5 mm	6,8 °
	$D_{max.}$	62 mm		
	$D_{min.}$	47 mm		
40	α_R	3,2 °	2,5 mm	5,1 °
	$D_{max.}$	78 mm		
	$D_{min.}$	63 mm		
50	α_R	2,5 °	2,5 mm	2,5 °
	$D_{max.}$	98 mm		
	$D_{min.}$	86 mm		
63	α_R	1,5 °	2,5 mm	2,5 °
	$D_{max.}$	124 mm		
	$D_{min.}$	111 mm		
80	α_R	1,3 °	2,5 mm	2,0 °
	$D_{max.}$	158 mm		
	$D_{min.}$	147 mm		
100	α_R	1,1 °	2,5 mm	1,5 °
	$D_{max.}$	198 mm		
	$D_{min.}$	190 mm		
125	α_R	0,9 °	2,5 mm	0,9 °
	$D_{max.}$	248 mm		
	$D_{min.}$	240 mm		
160	α_R	0,6 °	2,5 mm	0,7 °
	$D_{max.}$	318 mm		
	$D_{min.}$	310 mm		

Maximum speed related to overhang length n_{max} in min^{-1}			
DC mm	l_a = 2 x Ø mm	l_a = 3 x Ø mm	l_a = 5 x Ø mm
25	26560	19520	13320
32	24160	16720	9520
40	22160	14400	7200
50	20320	12320	4880
63	18640	10320	2960
80	17040	8480	
100	15680	6720	
125	14320		
160	13200		

$D_{max.}$ in mm = Largest diameter for flat bottom surface

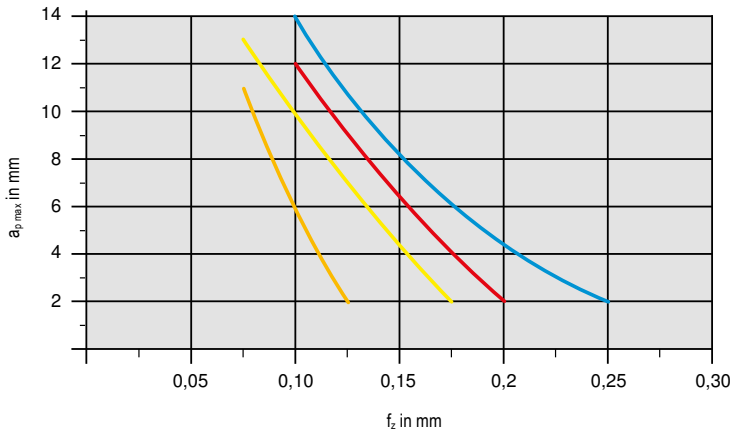
$D_{min.}$ in mm = Smallest diameter for flat bottom surface

a_p mm = D x π x tan (α_R) = Pitch

l_a in mm = Overhang length

Starting parameters

XDKT 15



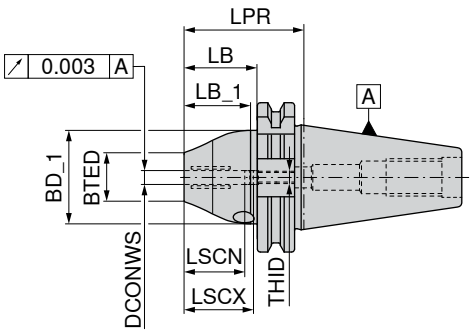
Material			Indexable insert		v_c in m/min	Cooling
Steel	P.2.2	40CrMnMoS 8-6	XDKT150508SR-M50	CTCP230	200	Dry
Stainless steel	M.1.1	X6CrNiMoTi 1712 2	XDKT150508SR-F50	CTPM240	100	Emulsion
Cast iron	K.1.1	EN-GJL-250 (GG25)	XDKT150508SR-R50	CTCK215	250	Dry
Heat-resistant	S.2.2	Inconel 718	XDKT150508ER-F40	CTC5240	35	Emulsion

Detailed information on cutting speed for each grade can be found on → page 46
From v_c > 1300 SFM, the tool must be balanced!

HyPower – Rough

- ▲ High pressure chuck – especially for milling
- ▲ Ideal for HSC and HPC applications
- ▲ High temperature resistance
- ▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with backstop screw and pressure screw



NEW

AD/B
G 2.5 $n_{max.}$ 25000

84 254 ...

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	
SK 40	25	110	38	57.0	65.3	90.9	57	47	M10X1	**12579**
SK 40	32	115	38	62.5	65.5	95.9	61	51	M12X1	**13279**

Clamping key T

80 397 ...

Pressure screw

83 950 ...

Backstop screw with internal cooling

83 950 ...

Spare parts DCONWS							
25	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
32	SW5	**050**	M10x12	**55000**	M12x1x13,5 - SW5	**422**

Accessories

→ 282

Reduction sleeve

→ 58, 60

Pull studs

→ 284

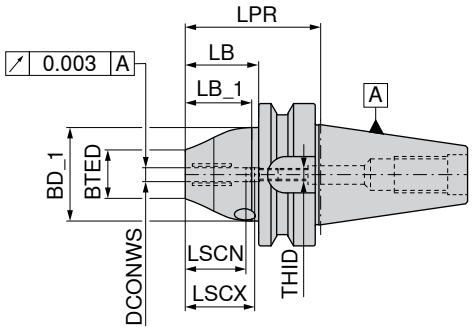
Others

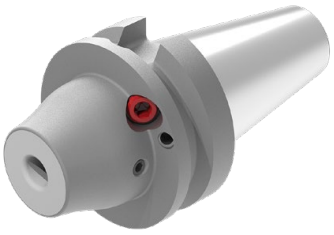
Accessories can be found in the clamping technology catalog → **Chapter 16, Adapters and accessories**

HyPower – Rough

- ▲ High pressure chuck – especially for milling
- ▲ Ideal for HSC and HPC applications
- ▲ High temperature resistance
- ▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with backstop screw and pressure screw





NEW NEW

AD
G 2.5 $n_{max.}$ 25000

AD/B
G 2.5 $n_{max.}$ 25000

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	84 254 ...	84 254 ...
BT 30	6	54	26	46	29.0	34	37	27	M5	**10670**	
BT 30	8	54	28	46	29.0	34	37	27	M6	**10870**	
BT 30	10	54	30	50	23.5	34	41	31	M8X1	**11070**	
BT 30	12	54	32	50	23.5	34	46	36	M10X1	**11270**	
BT 30	16	69	38	55	38.5	49	49	39	M12X1	**11670**	
BT 30	20	69	38	58	38.5	49	51	41	M12X1	**12070**	
BT 40	25	100	38	57	44.6	75	57	47	M16X1		**12569**
BT 40	32	105	38	62	50.0	80	61	51	M16X1		**13269**

Clamping key T

Pressure screw

Backstop screw with internal cooling

Spare parts DCONWS		80 397 ...		83 950 ...		83 950 ...
6	SW5	**050**	M10x12	**55000**	M5x12,5 - SW2,5	**418**
8	SW5	**050**	M10x12	**55000**	M6x12,5 - SW3	**419**
10	SW5	**050**	M10x12	**55000**	M8x1x13,5 - SW3	**420**
12	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
16	SW5	**050**	M10x12	**55000**	M12x1x13,5 - SW5	**422**
20	SW5	**050**	M10x12	**55000**	M12x1x13,5 - SW5	**422**
25	SW5	**050**	M10x12	**55000**	M16x1x13,5 - SW8	**424**
32	SW5	**050**	M10x12	**55000**	M16x1x13,5 - SW8	**424**

Accessories

→ 282
Reduction sleeve

→ 110+111
Pull studs

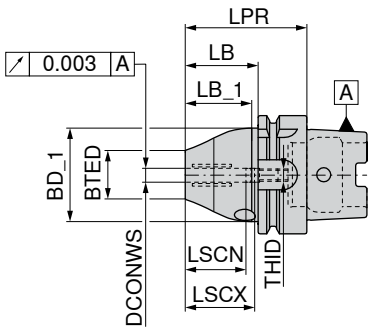
→ 284
Others

Accessories can be found in the clamping technology catalog → **Chapter 16, Adapters and accessories**

HyPower – Rough

- ▲ High pressure chuck – especially for milling
- ▲ Ideal for HSC and HPC applications
- ▲ High temperature resistance
- ▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with backstop screw and pressure screw



NEW

AD
G 2.5 $n_{max.}$ 25000

84 254 ...

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	
HSK-A 63	25	95	38	57.0	45.0	69	57	47	M10X1	**12557**
HSK-A 63	32	110	38	62.5	56.6	84	61	51	M10X1	**13257**
HSK-A 100	25	95	38	70.0	62.2	66	57	47	M10X1	**12555**
HSK-A 100	32	100	38	75.0	67.2	71	61	51	M10X1	**13255**

Clamping key T

80 397 ...

Pressure screw

83 950 ...

Backstop screw with internal cooling

83 950 ...

Spare parts DCONWS							
25	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
32	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**

Accessories

→ 282

Reduction sleeve

→ 156

Coolant transfer pipes

→ 284

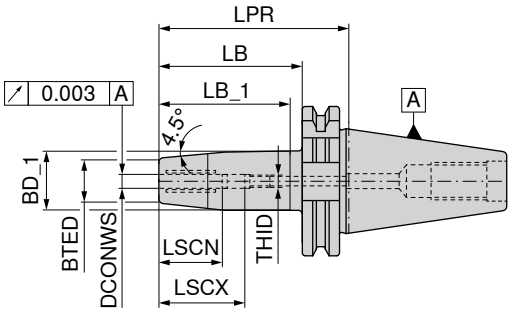
Others

Accessories can be found in the clamping technology catalog → **Chapter 16, Adapters and accessories**

HyPower – Access 4.5°

- ▲ High pressure chuck with slim contour, original dimensions of a 4.5° shrink contour
- ▲ Especially for reaming and drilling applications
- ▲ Ideal for tool and die production
- ▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with backstop screw and pressure screw



NEW

AD/B
G 2.5 $n_{max.}$ 25000

84 255 ...

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	
SK 40	6	120	21	27	48.9	100.9	37	27	M5	**20679**
SK 40	8	120	21	27	48.9	100.9	37	27	M6	**20879**
SK 40	10	120	24	32	61.6	100.9	41	31	M8X1	**21079**
SK 40	12	120	24	32	61.6	100.9	46	36	M10X1	**21279**
SK 40	16	120		34	56.2	100.9	49	39	M12X1	**21679**
SK 40	20	120	33	42	68.9	100.9	51	41	M16X1	**22079**

Clamping key T

80 397 ...

Pressure screw

83 950 ...

Backstop screw with internal cooling

83 950 ...

Spare parts DCONWS							
6	SW5	**050**	M10x12	**55000**	M5x12,5 - SW2,5	**418**
8	SW5	**050**	M10x12	**55000**	M6x12,5 - SW3	**419**
10	SW5	**050**	M10x12	**55000**	M8x1x13,5 - SW3	**420**
12	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
16	SW5	**050**	M10x12	**55000**	M12x1x13,5 - SW5	**422**
20	SW5	**050**	M10x12	**55000**	M16x1x13,5 - SW8	**424**

Accessories

→ 282

Reduction sleeve

→ 58, 60

Pull studs

→ 284

Others

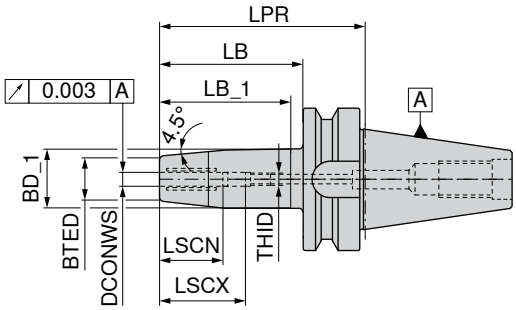
Accessories can be found in the clamping technology catalog → **Chapter 16, Adapters and accessories**

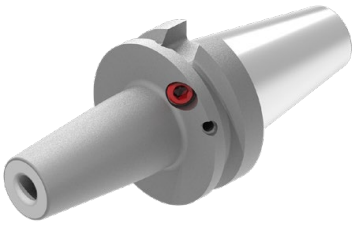
HyPower – Access 4.5°

- ▲ High pressure chuck with slim contour, original dimensions of a 4.5° shrink contour
- ▲ Especially for reaming and drilling applications
- ▲ Ideal for tool and die production
- ▲ **By request:** Also available with Balluff chip

Scope of supply:

Base body with backstop screw and pressure screw





	NEW	NEW
	AD	AD/B
	G 2.5 $n_{max.}$ 25000	G 2.5 $n_{max.}$ 25000
	84 255 ...	**84 255 ...**

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID		
BT 30	6	85	21	27	57.7	65	37	27	M5	**10670**	
BT 30	8	85	21	27	57.7	65	37	27	M6	**10870**	
BT 30	10	85	24	32	57.7	65	41	31	M8X1	**11070**	
BT 30	12	85	24	32	57.7	65	46	36	M10X1	**11270**	
BT 30	16	85	27	34	57.2	65	49	39	M10X1	**11670**	
BT 30	20	85	33	42	57.5	65	51	41	M10X1	**12070**	
BT 40	6	120	21	27	48.9	95	37	27	M5		**20669**
BT 40	8	120	21	27	48.9	95	37	27	M6		**20869**
BT 40	10	120	24	32	61.6	95	41	31	M8X1		**21069**
BT 40	12	120	24	32	61.6	95	46	36	M10X1		**21269**
BT 40	16	120	27	34	56.2	95	49	39	M12X1		**21669**
BT 40	20	120	33	42	68.9	95	51	41	M16X1		**22069**

	Clamping key T		Pressure screw		Backstop screw with internal cooling	
	80 397 ...		**83 950 ...**		**83 950 ...**	
Spare parts DCONWS						
6	SW5	**050**	M10x12	**55000**		
6	SW5	**050**	M10x12	**55000**	M5x12,5 - SW2,5	**418**
8	SW5	**050**	M10x12	**55000**		
8	SW5	**050**	M10x12	**55000**	M6x12,5 - SW3	**419**
10	SW5	**050**	M10x12	**55000**	M8x1x13,5 - SW3	**420**
10	SW5	**050**	M10x12	**55000**		
12	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
12	SW5	**050**	M10x12	**55000**		
16	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
16	SW5	**050**	M10x12	**55000**		
20	SW5	**050**	M10x12	**55000**		
20	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**

Accessories

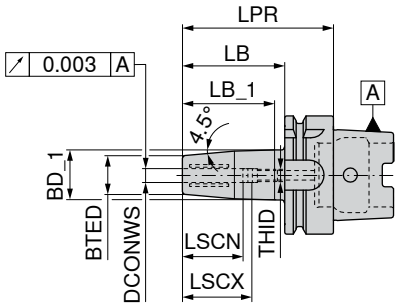
→ 282	→ 110+111	→ 284
Reduction sleeve	Pull studs	Others

Accessories can be found in the clamping technology catalog
→ **Chapter 16, Adapters and accessories**

HyPower – Access 4.5°

- ▲ High pressure chuck with slim contour, original dimensions of a 4.5° shrink contour
- ▲ Especially for reaming and drilling applications
- ▲ Ideal for tool and die production
- ▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with backstop screw and pressure screw



NEW

AD
G 2.5 $n_{max.}$ 25000

84 255 ...

Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	
HSK-A 63	6	120	21	27	48.9	94	37	27	M5	**20657**
HSK-A 63	8	120	21	27	48.9	94	37	27	M6	**20857**
HSK-A 63	10	120	24	32	61.6	94	41	31	M8X1	**21057**
HSK-A 63	12	120	24	32	61.6	94	46	36	M10X1	**21257**
HSK-A 63	16	120	27	34	56.2	94	49	39	M12X1	**21657**
HSK-A 63	20	120	33	42	68.9	94	51	41	M16X1	**22057**
HSK-A 100	6	120	21	27	48.9	91	37	27	M5	**20655**
HSK-A 100	8	120	21	27	48.9	91	37	27	M6	**20855**
HSK-A 100	10	120	24	32	61.6	91	41	31	M8X1	**21055**
HSK-A 100	12	120	24	32	61.6	91	46	36	M10X1	**21255**
HSK-A 100	16	120	27	34	56.2	91	49	39	M12X1	**21655**
HSK-A 100	20	120	33	42	68.9	91	51	41	M16X1	**22055**

Clamping key T

80 397 ...

Pressure screw

83 950 ...

Backstop screw with internal cooling

83 950 ...

Spare parts for article number						
84 255 20657	SW5	**050**	M10x10	**55100**	M5x12,5 - SW2,5	**418**
84 255 20857	SW5	**050**	M10x10	**55100**	M6x12,5 - SW3	**419**
84 255 21057	SW5	**050**	M10x10	**55100**	M8x1x13,5 - SW3	**420**
84 255 21257	SW5	**050**	M10x10	**55100**	M10x1x13,5 - SW5	**421**
84 255 21657	SW5	**050**	M10x10	**55100**	M12x1x13,5 - SW5	**422**
84 255 22057	SW5	**050**	M10x10	**55100**	M16x1x13,5 - SW8	**424**
84 255 20655	SW5	**050**	M10x12	**55000**	M5x12,5 - SW2,5	**418**
84 255 20855	SW5	**050**	M10x12	**55000**	M6x12,5 - SW3	**419**
84 255 21055	SW5	**050**	M10x12	**55000**	M8x1x13,5 - SW3	**420**
84 255 21255	SW5	**050**	M10x12	**55000**	M10x1x13,5 - SW5	**421**
84 255 21655	SW5	**050**	M10x12	**55000**	M12x1x13,5 - SW5	**422**
84 255 22055	SW5	**050**	M10x12	**55000**	M16x1x13,5 - SW8	**424**

Accessories

→ 282

Reduction sleeve

→ 156

Coolant transfer pipes

→ 284

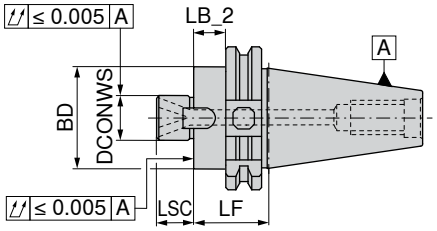
Others

Accessories can be found in the clamping technology catalog →**Chapter 16, Adapters and accessories**

Shell mill adapter with reduced flange diameter

▲ Screwed in drive keys
▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with retaining screw and drive key



NEW

AD
G 2.5 $n_{max.}$ 25000

82 315 ...

	Adapter	DCONWS mm	LB_2 mm	LF mm	BD mm	LSC mm	
Medium length	SK 40	22	81	100	38	19	**22279**
	SK 40	27	81	100	48	21	**22779**
	SK 50	22	81	100	38	19	**22278**
	SK 50	27	81	100	48	21	**22778**
Long	SK 40	22	111	130	38	19	**32279**
	SK 40	27	111	130	48	21	**32779**
	SK 50	22	111	130	38	19	**32278**
	SK 50	27	111	130	48	21	**32778**

These shell mill adapters have been specially developed for MaxiMill 211-KN porcupine cutters.
Now they can be clamped perfectly, due to the adapted flange diameters.

Carrier screws

Drive key

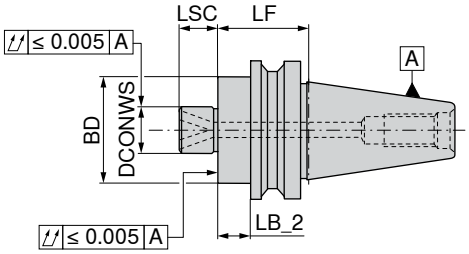
Tightening screw

Spare parts DCONWS		83 950 ...		83 950 ...		83 950 ...
22	M4x8	**51700**	10x7x20,5	**51500**	M10x25	**124**
27	M5x8	**51800**	12x9x24,3	**51600**	M12x30	**125**

Shell mill adapter with reduced flange diameter

▲ Screwed in drive keys
▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with retaining screw and drive key



NEW

AD
G 2.5 $n_{max.}$ 25000

	Adapter	DCONWS mm	BD mm	LB_2 mm	LF mm	LSC mm	82 315 ...
Medium length	BT 40	22	38	73	100	19	**22269**
	BT 40	27	48	73	100	21	**22769**
	BT 50	22	38	62	100	19	**22268**
	BT 50	27	48	62	100	21	**22768**
Long	BT 40	22	38	103	130	19	**32269**
	BT 40	27	48	103	130	21	**32769**
	BT 50	22	38	92	130	19	**32268**
	BT 50	27	48	92	130	21	**32768**

These shell mill adapters have been specially developed for MaxiMill 211-KN porcupine cutters.
Now they can be clamped perfectly, due to the adapted flange diameters.

Carrier screws

Drive key

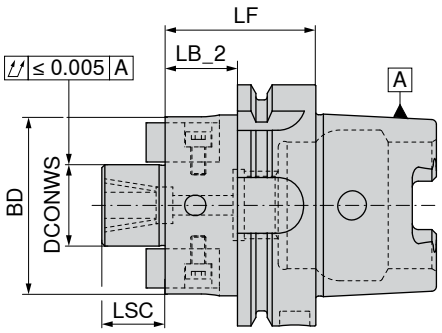
Tightening screw

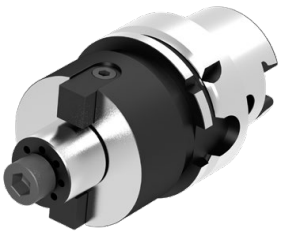
Spare parts DCONWS		83 950 ...		83 950 ...		83 950 ...
22	M4x8	**51700**	10x7x20,5	**51500**	M10x25	**124**
27	M5x8	**51800**	12x9x24,3	**51600**	M12x30	**125**

Shell mill adapter with reduced flange diameter

▲ Screwed in drive keys
▲ **By request:** Also available with Balluff chip

Scope of supply:
Base body with retaining screw and drive key





NEW

G 2.5 $n_{max.}$ 25000

	Adapter	DCONWS mm	LB_2 mm	LF mm	BD mm	LSC mm	82 315 ...
Medium length	HSK-A 63	22	74	100	38	19	**22257**
	HSK-A 63	27	74	100	48	21	**22757**
	HSK-A 100	22	71	100	38	19	**22255**
	HSK-A 100	27	71	100	48	21	**22755**
Long	HSK-A 63	22	104	130	38	19	**32257**
	HSK-A 63	27	104	130	48	21	**32757**
	HSK-A 100	22	101	130	38	19	**32255**
	HSK-A 100	27	101	130	48	21	**32755**

These shell mill adapters have been specially developed for MaxiMill 211-KN porcupine cutters.
Now they can be clamped perfectly, due to the adapted flange diameters.

Carrier screws

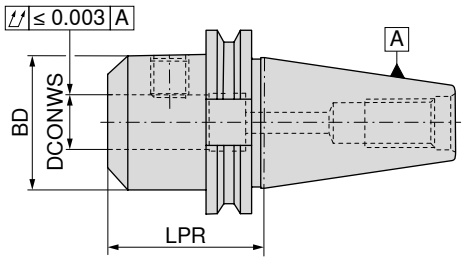
Drive key

Tightening screw

Spare parts DCONWS		83 950 ...		83 950 ...		83 950 ...
22	M4x8	**51700**	10x7x20,5	**51500**	M10x25	**124**
27	M5x8	**51800**	12x9x24,3	**51600**	M12x30	**125**

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat
▲ **By request:** Also available with Balluff chip



NEW

AD/Be
G 2.5 $n_{max.}$ 25000

82 404 ...

	Adapter	DCONWS $_{H4}$ mm	LPR mm	BD mm	
Short	SK 40	6	50	25	**106**
	SK 40	8	50	28	**108**
	SK 40	10	50	35	**110**
	SK 40	12	50	42	**112**
	SK 40	14	50	44	**114**
	SK 40	16	63	48	**116**
	SK 40	18	63	50	**118**
	SK 40	20	63	52	**120**
	SK 40	25	100	65	**125** [1]
	SK 40	32	100	72	**13200** [1]
	SK 50	6	63	25	**30600**
	SK 50	8	63	28	**30800**
	SK 50	10	63	35	**31000**
	SK 50	12	63	42	**31200**
	SK 50	14	63	44	**31400**
	SK 50	16	63	48	**31600**
	SK 50	18	63	50	**31800**
	SK 50	20	63	52	**32000**
	SK 50	25	80	65	**32500** [1]
	SK 50	32	100	72	**33200** [1]
	SK 50	40	120	90	**34000**
Medium length	SK 40	40	120	80	**54000** [1]

1) Version with two clamping screws

Accessories

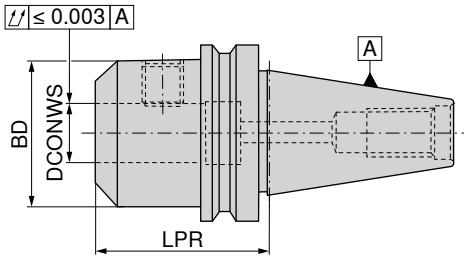
→ 58, 60 Pull studs

→ 284 Others

Accessories can be found in the clamping technology catalog
→ **Chapter 16, Adapters and accessories**

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat
▲ **By request:** Also available with Balluff chip



NEW

AD/Be
G 2.5 $n_{max.}$ 25000

82 504 ...

	Adapter	DCONWS $_{H4}$ mm	LPR mm	BD mm	
Short	BT 40	6	50	25	**106**
	BT 40	8	50	28	**108**
	BT 40	10	63	35	**110**
	BT 40	12	63	42	**112**
	BT 40	14	63	44	**114**
	BT 40	16	63	48	**116**
	BT 40	18	63	50	**118**
	BT 40	20	63	52	**120**
	BT 40	25	100	65	**125** [1)]
	BT 40	32	100	72	**13200** [1)]
	BT 40	40	120	90	**14000**
	BT 50	6	63	25	**30600**
	BT 50	8	63	28	**30800**
	BT 50	10	80	35	**31000**
	BT 50	12	80	42	**31200**
	BT 50	14	80	44	**31400**
	BT 50	16	80	48	**31600**
	BT 50	18	80	50	**31800**
	BT 50	20	80	52	**32000**
	BT 50	25	100	65	**32500** [1)]
	BT 50	32	105	72	**33200** [1)]
	BT 50	40	120	90	**34000**

1) Version with two clamping screws

Accessories

→ 58, 60

Pull studs

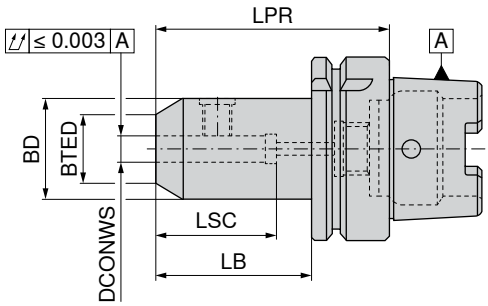
→ 284

Others

Accessories can be found in the clamping technology catalog
→ **Chapter 16, Adapters and accessories**

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat
▲ **By request:** Also available with Balluff chip



NEW

G 2.5 $n_{max.}$ 25000

82 404 ...

	Adapter	DCONWS $_{H4}$ mm	LPR mm	BD mm	BTED mm	LB mm	LSC mm	
Short	HSK-A 63	6	65	25	15	39	34	**10657**
	HSK-A 63	8	65	28	20	39	34	**10857**
	HSK-A 63	10	65	35	25	39	39	**11057**
	HSK-A 63	12	80	42	30	54	44	**11257**
	HSK-A 63	14	80	44	32	54	44	**11457**
	HSK-A 63	16	80	48	36	54	47	**11657**
	HSK-A 63	18	80	50	38	54	47	**11857**
	HSK-A 63	20	80	52	40	54	49	**12057**
	HSK-A 63	25	110	65	45	84	54	**12557**
	HSK-A 63	32	110	72	52	84	58	**13257**
	HSK-A 63	40	125	80	60	99	71	**14057**
	HSK-A 100	6	80	25	15	51	34	**10655**
	HSK-A 100	8	80	28	20	51	34	**10855**
	HSK-A 100	10	80	35	25	51	39	**11055**
	HSK-A 100	12	80	42	30	51	44	**11255**
	HSK-A 100	14	80	44	32	51	44	**11455**
	HSK-A 100	16	100	48	36	71	47	**11655**
	HSK-A 100	18	100	50	38	71	47	**11855**
	HSK-A 100	20	100	52	40	71	49	**12055**
	HSK-A 100	25	100	65	45	71	54	**12555**
	HSK-A 100	32	100	72	52	71	58	**13255**
	HSK-A 100	40	110	80	60	81	68	**14055**

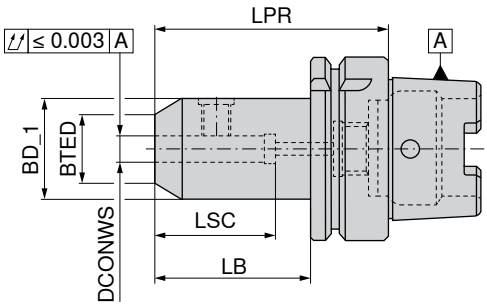
Set Screw

62 950 ...

Spare parts DCONWS	
6	**006**
8	**008**
10	**010**
12	**012**
14	**012**
16	**016**
18	**016**
20	**020**
25	**025**
32	**032**
40	**032**

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat
▲ **By request:** Also available with Balluff chip



NEW NEW

	Adapter	DCONWS $_{H5}$ mm	LPR mm	BTED mm	BD_1 mm	LB mm	LSC mm	G 2.5 $n_{max.}$ 25000 **82 740 ...**	G 2.5 $n_{max.}$ 25000 **82 741 ...**
Short	HSK-A 63	40	120	60	80	94	68	**14057**	
	HSK-A 63	40	120	60	80	94	68		**14057**

The M3 screws supplied with WAF 1.5 mm can be used to seal the two additional coolant holes.

Accessories

→ 156

Coolant transfer pipes

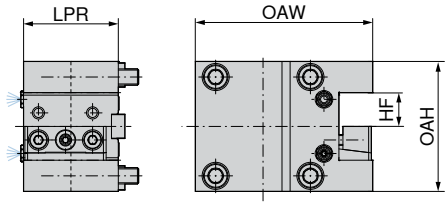
→ 284

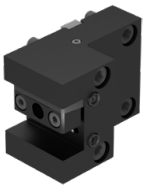
Others

Accessories can be found in the clamping technology catalog
→ **Chapter 16, Adapters and accessories**

HAAS/Doosan – BMT 65 – axial square section tool holder

▲ Directly screwed version





NEW

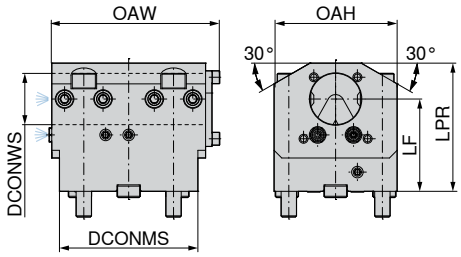
Left

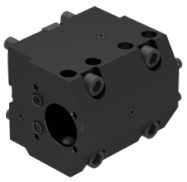
82 483 ...

Adapter	Hole pattern	HF mm	LPR mm	OAH mm	OAW mm	
BMT 65	70 x 73	25	75	97	131	**00008**

HAAS/Doosan – BMT 65 – combi tool holder

▲ Directly screwed version
▲ Double-sided version





NEW

Through coolant

82 483 ...

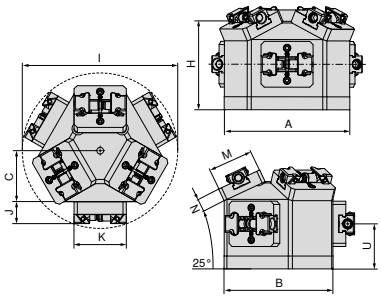
Adapter	Hole pattern	DCONWS mm	LF mm	OAH mm	LPR mm	OAW mm	DCONMS mm	
BMT 65	70 x 73	40	72	96	106	132	103	**03009**

CentriClamp – ZSG mini – 6-sided clamping tower

Scope of supply:

6-sided clamping tower including ZSG mini L-80 mm without system jaws

ZSG mini

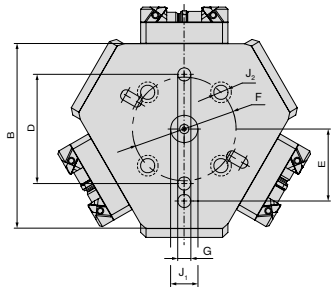


NEW

80 912 ...

A	B	C	H	I	J	K	M	N	U	WT	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg	
193,24	169,40	78	135,7	236	33,7	80	70,4	20	70	13.5	**55000**

Underside dimensions of ZSG mini – 6-sided clamping tower

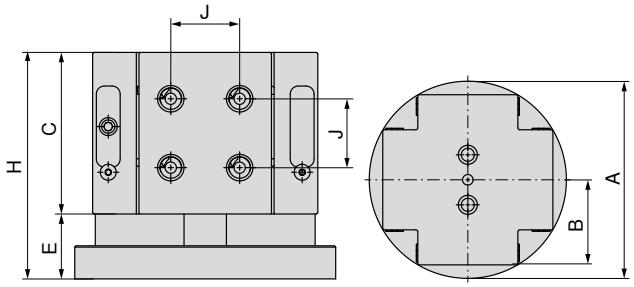


B	D ±0.015	E ±0.015	Ø F	G H7	J1 H7	Ø J2
mm	mm	mm	mm	mm	mm	mm
169,40	100	66	95	12	25	13

MNG mini – 4-sided clamping tower

- ▲ Including 4 x MNG mini zero point clamping systems
- ▲ Order mounting bolts separately
- ▲ Material: Hard-anodized aluminum

MNG mini



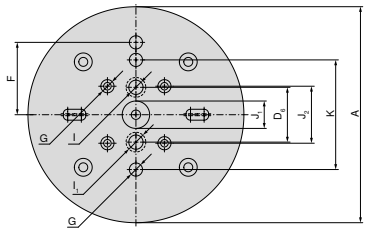
NEW

80 915 ...

A mm	B mm	C mm	E mm	H mm	J ±0.015 mm	WT kg	
197	85	122	49	171	52	12	**54000**

Suitable for: ESG 5 – 80 L-130 / ZSG 4 – 80 L-130 / ZSG mini – 70 L-80 / ZSG mini – 70 L-100

Underside dimensions of MNG mini – 4-sided clamping tower



A mm	D_6 mm	F ±0.015 mm	G H7 mm	I H7 mm	I_1 H7 mm	J_1 H7 mm	J_2 ±0.015 mm	K ±0.015 mm
197	50	66	12	13	19	25	52	100

System accessories overview

Sealing plugs

- ▲ Protective cover to shield changeover interface
- ▲ Price per piece

MNG mini

NEW

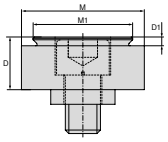
80 915 ...

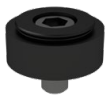
D_1 mm	
16	**51900**

System jaws overview

Insert jaw, round, grip 3 mm

▲ Price per piece
▲ For adapter jaw **80 914 34000**

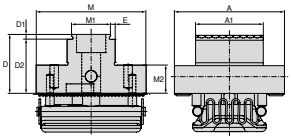


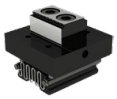


For vise width	A	A_1	D	D_1	D_2	E	M	M_1	M_2		NEW	NCG	H6G / -S / -Z	X6G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
			18	3			42	34			**80 914 34500**										●	

Indexable jaw, fixed VS, grip 3 mm

▲ Price per piece
▲ VS = Larger clamping range

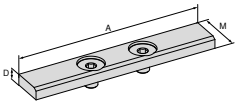




For vise width	A	A_1	D	D_1	D_2	E	M	M_1	M_2		NEW	NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
90	65	40	35	3	32	2,6	64	28	17		**80 914 34400**										●	
90	90		35	3	32	2,6	64	28	17		**80 914 34300**										●	

Support, hard for milling over

▲ Price per piece



For vise width	A	A_1	D	D_1	D_2	E	M	M_1	M_2		NEW	NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
90	40		5,4				15				**80 914 51200**										●	
90	90		5,4				15				**80 914 51100**										●	

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We want to enable our customers to produce more sustainably with our products and services. With our ambitious mission, we want to make an important contribution to tackling the climate crisis.

Mission #1:
Climate neutral by 2025

Mission #2:
Minimise the use of virgin raw materials

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