UP2DATE

Machining titanium the easy way!

MaxiMill – 211-DC with DirectCooling

Faster. Longer. Safer.

... ADDITIONAL PRODUCT HIGHLIGHTS

- **Cermet grade CTEP110-P:** Be amazed with our Coating update for finish turning
- Precise aluminum machining complex small components with the new **Micro milling cutters AluLine – Micro**

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

Tooling a Sustainable Future

ceratizit.com

CERATIZIT GROUP

Welcome!

It couldn’t be easier

Ordering via the Online Shop

https://cuttingtools.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 nozzle position for decisive added value when machining titanium and other heat-resistant materials

Want to achieve maximum process security despite high cutting speeds while working efficiently?

We offer you these exact advantages in a single tool – our 3D-printed MaxiMill – 211-DC indexable insert milling system manufactured here at CERATIZIT. The patented shoulder mill stands out for its decisive added value when machining titanium and other heat-resistant materials, thanks to an **optimum DirectCooling supply on the indexable insert flanks**. Because these materials in particular require the most effective possible cooling with emulsion to achieve a good machining result.

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

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

CERATIZIT

The cool way to machine titanium alloys

Optimising the flank cooling system for machining titanium and super alloys was a top priority for the base body of the MaxiMill – 211-DC. So our developers at CERATIZIT came up with a concept that wouldn't have been 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 perfectly positioned coolant channels

Advantage/benefit

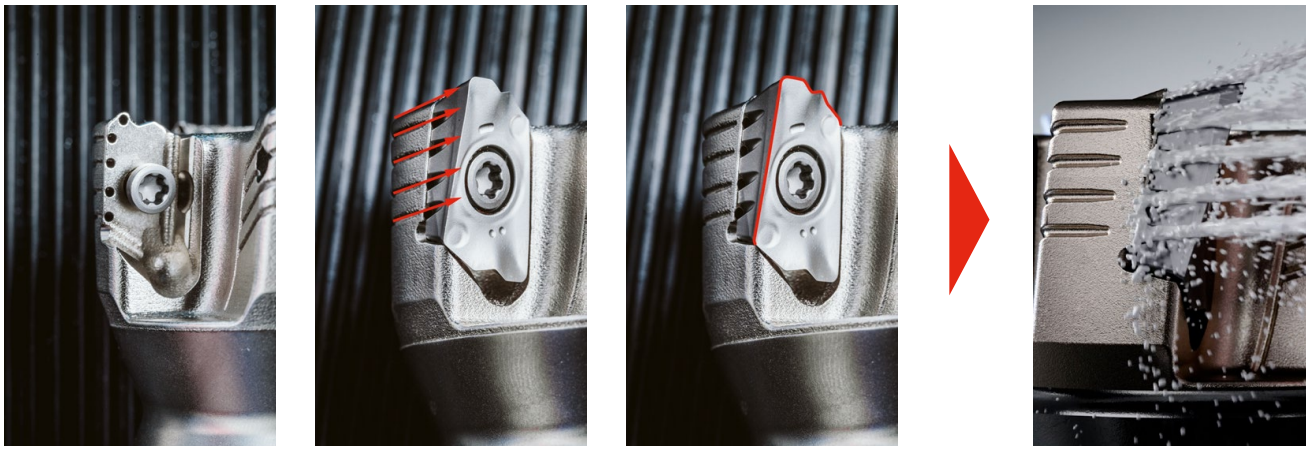
- ▲ Optimum DirectCooling supply on the indexable insert flanks
- ▲ Indexable insert geometry and nozzle position perfectly tailored to DirectCooling

Less wear to indexable inserts → **Lowers tool costs**

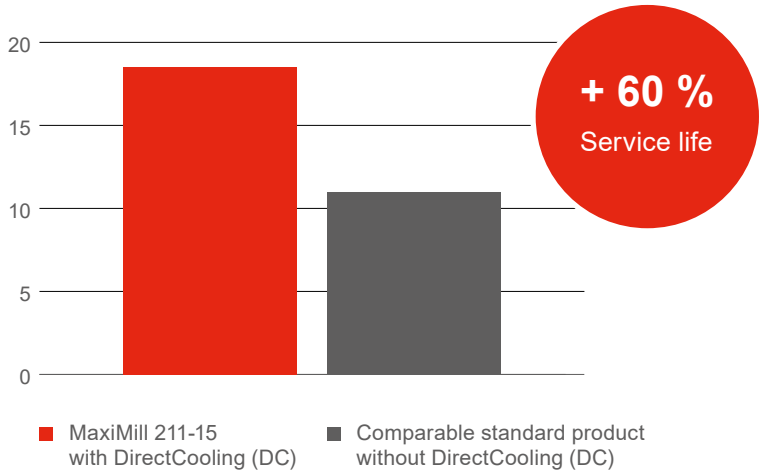
Enables higher machining parameters → **Optimises production time**

The perfect combination: an ideal nozzle position with matching insert geometry

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



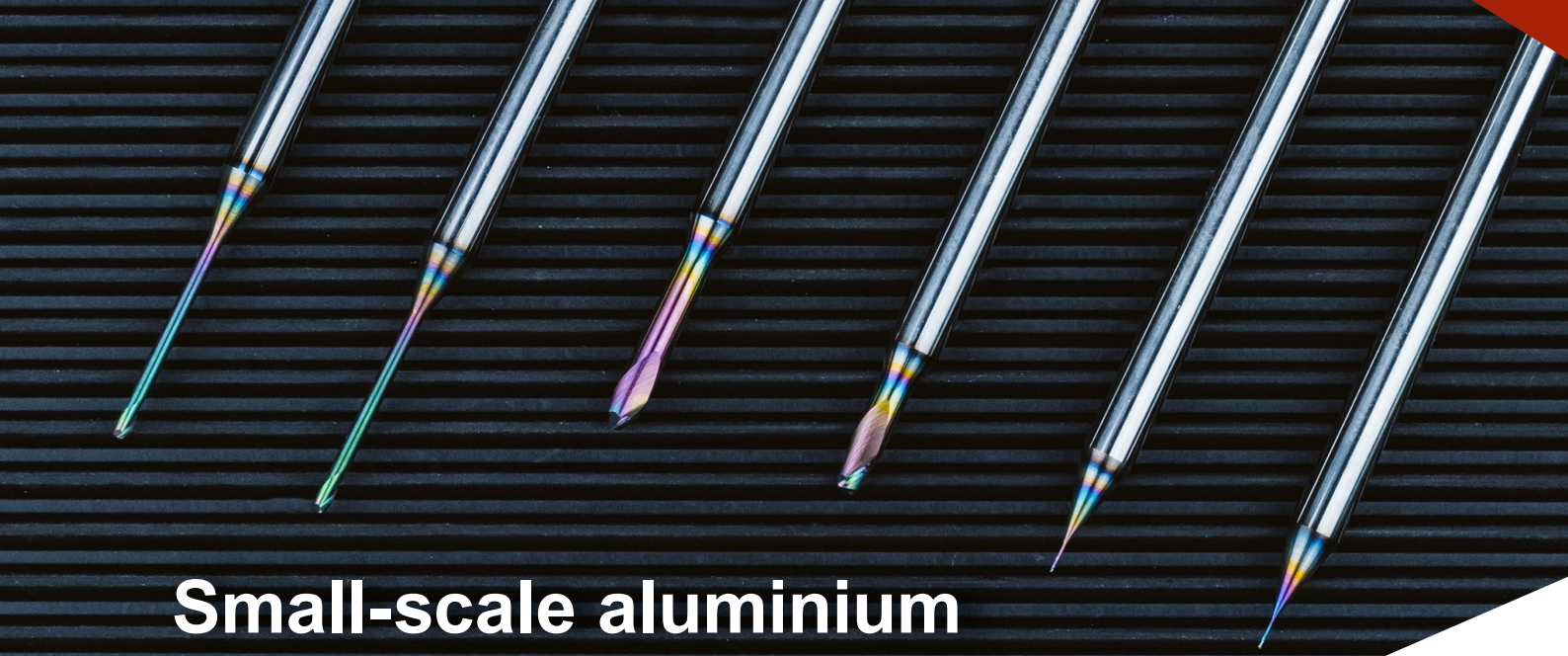
Test report: Service life [min] compared to standard tools



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 that extra time on the service life really takes the pressure off for our customers when machining titanium and super alloys. Plus, they benefit from a reliable process – with significantly lower tool usage.

Manuel Höfferer, Application Manager Aerospace & Defence



Small-scale aluminium machining

with AluLine – Micro

WNT

Micro cutter for complex micro components

AluLine – Micro: with DLC coating and minimal tolerances

Workpieces are getting smaller all the time – from the medtech sector, to the latest smartphones, through to elegant watch cases. This means the tools used to make these components are going miniature as well. So we decided to completely redesign the micro cutters in our AluLine – Micro range and adapt them to the industry's requirements.

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

cts.ceratizit.com/en/aluline-micro

Advantages of the 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-performance ratio
- ▲ Extensive, integrated range up to overhang lengths of 12xD
- ▲ Also suitable for shrinking with shank diameter of 4 mm
- ▲ Smallest tolerances, for maximum contour quality on the component (3 µm at diameter of 0.2 mm)

Large portfolio of micro tools for machining aluminium

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

- ▲ Radius and torus cutters, plus end mills with corner chamfer
- ▲ Various shank versions and geometries
- ▲ Diameters ranging from 0.2 mm to 3.0 mm
- ▲ Overhang lengths from 3xD to 12xD

With this product range, CNC machinists can be confident they have the right tool for most micro-cutting jobs involving aluminium 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 when finishing steel. These cutting inserts are more heat-resistant than those made of carbide, so CNC Machinists can use higher cutting data and shorten their processes. Other stand-out features include dimensional accuracy and long service lives, especially when the cutting inserts are equipped with a powerful DRAGONSKIN coating including insert detection – which is exactly what the new cermet inserts from CERATIZIT do.

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

cts.ceratizit.com/en/cermet-inserts

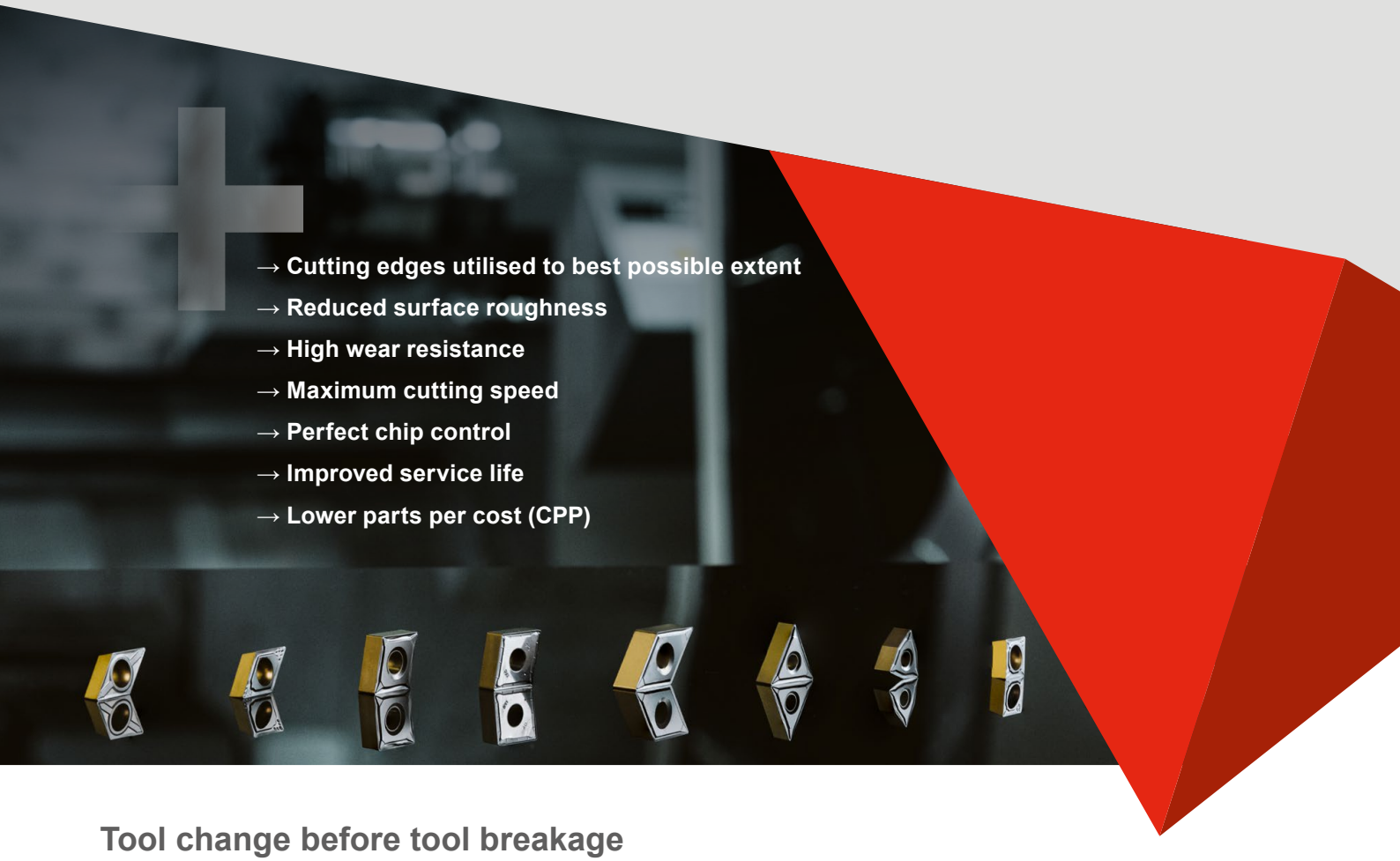
Why choose cermet?

Cermet offers a number of advantages over carbide in certain applications, creating the conditions for very high cutting speeds in combination with long service lives – while delivering extremely smooth surfaces on the workpiece.

Efficient production thanks to all-round package with optimised characteristics

Advantages of the CTEP110-P cermet cutting material with a new coating:

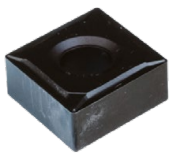
- ▲ Unique multilayer CVD coating
- ▲ Gold-coloured indicator layer for insert detection
- ▲ Improved texture and grain sizes of TiCN- & Al_2O_3layers
- ▲ Special post-treatment process
- ▲ Optimised chip breakers
- ▲ Perfect match between chip breakers and grade



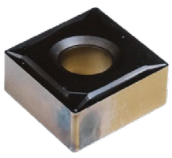
→ Cutting edges utilised to best possible extent
→ Reduced surface roughness
→ High wear resistance
→ Maximum cutting speed
→ Perfect chip control
→ Improved service life
→ Lower parts per cost (CPP)

Tool change before tool breakage

Thanks to the newly updated coating with insert detection, wear is more readily identified simply by taking a quick look at the cutting edges. This lets you utilise each individual cutting edge on the indexable insert to the best possible extent while avoiding tedious tool breakages.



Predecessor insert with coating / without insert detection



CTEP110-P with coating upgrade and insert detection

Table of contents

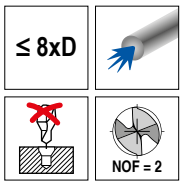
Cermet indexable inserts
CTEP110-P

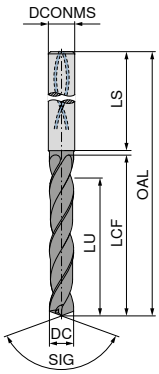
Continue to the product pages

Shoulder milling system
MaxiMill – 211-DC

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

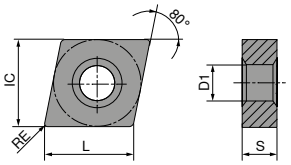
	Material sub-group	Index	Tensile strength N/mm²* / HB / HRC	10 701 ... with through coolant	8xD				
				v_c (m/min)	Ø 3–5	Ø 5–8	Ø 8–12	Ø 12–16	Ø 16–20
					f (mm/rev)				
P	Unalloyed steel	P.1.1	420 N/mm² / 125 HB	165	0,12	0,17	0,23	0,28	0,31
		P.1.2	640 N/mm² / 190 HB	160	0,11	0,16	0,22	0,26	0,30
		P.1.3	840 N/mm² / 250 HB	150	0,11	0,15	0,20	0,25	0,28
		P.1.4	910 N/mm² / 270 HB	145	0,10	0,15	0,19	0,24	0,27
		P.1.5	1010 N/mm² / 300 HB	135	0,10	0,14	0,18	0,23	0,26
	Low-alloy steel	P.2.1	610 N/mm² / 180 HB	165	0,14	0,20	0,27	0,33	0,37
		P.2.2	930 N/mm² / 275 HB	150	0,13	0,18	0,24	0,30	0,34
		P.2.3	1010 N/mm² / 300 HB	135	0,11	0,16	0,22	0,27	0,30
		P.2.4	1200 N/mm² / 375 HB	105	0,11	0,15	0,19	0,24	0,27
	High-alloy steel and high-alloy tool steel	P.3.1	680 N/mm² / 200 HB	115	0,11	0,16	0,22	0,27	0,30
		P.3.2	1100 N/mm² / 300 HB	90	0,10	0,13	0,18	0,22	0,25
		P.3.3	1300 N/mm² / 400 HB	90	0,08	0,11	0,14	0,17	0,19
	Stainless steel	P.4.1	680 N/mm² / 200 HB	70	0,08	0,11	0,14	0,18	0,20
		P.4.2	1010 N/mm² / 300 HB	70	0,08	0,11	0,14	0,18	0,20
M	Stainless steel	M.1.1	610 N/mm² / 180 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	780 N/mm² / 230 HB	75	0,08	0,11	0,15	0,19	0,21
K	Grey cast iron	K.1.1	350 N/mm² / 180 HB	150	0,15	0,24	0,33	0,41	0,47
		K.1.2	500 N/mm² / 260 HB	125	0,14	0,20	0,27	0,33	0,37
	Spherulitic graphite cast iron	K.2.1	540 N/mm² / 160 HB	200	0,15	0,22	0,31	0,38	0,43
		K.2.2	845 N/mm² / 250 HB	125	0,14	0,20	0,27	0,33	0,37
	Malleable iron	K.3.1	440 N/mm² / 130 HB	115	0,15	0,21	0,29	0,35	0,40
		K.3.2	780 N/mm² / 230 HB	100	0,12	0,17	0,23	0,28	0,32
N	Aluminium wrought alloy	N.1.1	60 HB						
		N.1.2	340 N/mm² / 100 HB						
	Cast aluminium alloy	N.2.1	250 N/mm² / 75 HB						
		N.2.2	300 N/mm² / 90 HB						
		N.2.3	440 N/mm² / 130 HB						
	Copper and copper alloys (bronze/brass)	N.3.1	375 N/mm² / 110 HB						
		N.3.2	300 N/mm² / 90 HB	145	0,14	0,20	0,27	0,33	0,37
		N.3.3	340 N/mm² / 100 HB						
	Magnesium alloys	N.4.1	70 HB						
S	Heat-resistant alloys	S.1.1	680 N/mm² / 200 HB	35	0,07	0,10	0,14	0,17	0,19
		S.1.2	950 N/mm² / 280 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.1	840 N/mm² / 250 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.2	1180 N/mm² / 350 HB	20	0,06	0,09	0,12	0,15	0,17
		S.2.3	1080 N/mm² / 320 HB	20	0,05	0,07	0,10	0,12	0,14
	Titanium alloys	S.3.1	400 N/mm²						
		S.3.2	1050 N/mm² / 320 HB	35	0,08	0,11	0,15	0,18	0,20
		S.3.3	1400 N/mm² / 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	≤ 150 N/mm²						
		O.1.2	≤ 100 N/mm²						
		O.2.1	≤ 1000 N/mm²						
		O.2.2	≤ 1000 N/mm²						
		O.3.1							

* Tensile strength

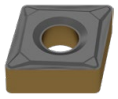
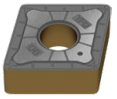
The cutting data depends extremely on the external conditions, the material and machine type. The indicated values are possible values which have to be increased or reduced according to the application conditions.

CNMG

Designation	L	S	D1	IC
	mm	mm	mm	mm
CNMG 1204..	12,9	4,76	5,16	12,7

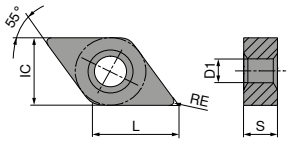


CNMG

		NEW	NEW
		-CF20	-TFQ
		CTEP110-P	CTEP110-P
		DRAGONSKIN	DRAGONSKIN
			
		F	F
		CERMET	CERMET
		CNMG	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			

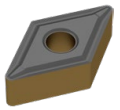
DNMG

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



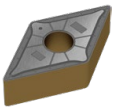
DNMG

NEW
-CF20
CTEP110-P
DRAGONSKIN



F
CERMET
DNMG
76 102 ...

NEW
-TFQ
CTEP110-P
DRAGONSKIN

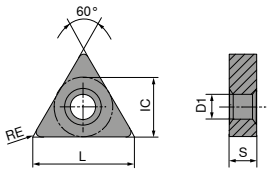


F
CERMET
DNMG
76 153 ...

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 mm	S mm	D1 mm	IC mm
TNMG 1604..	16,5	4,76	3,81	9,52



TNMG

NEW

-CF20
CTEP110-P

DRAGONSKIN

F
CERMET
TNMG

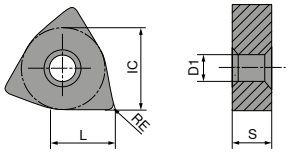
76 149 ...

ISO	RE mm	
160404EN	0,4	01601
160408EN	0,8	01801
160412EN	1,2	02001

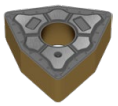
P	●
M	○
K	○
N	
S	
H	
O	

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

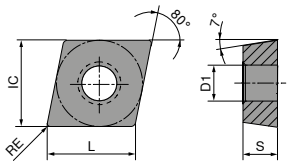


WNMG

		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

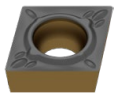


CCGT / CCMT

NEW

-CF05
CTEP110-P

DRAGONSKIN



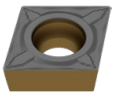
F
CERMET
CCGT

76 247 ...

NEW

-CF55
CTEP110-P

DRAGONSKIN



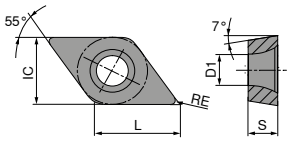
F
CERMET
CCMT

76 248 ...

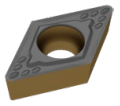
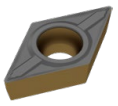
ISO	RE		
	mm		
060202EN	0,2	00201	
060204EN	0,4	00401	00401
09T302EN	0,2	01401	
09T304EN	0,4	01601	01601
09T308EN	0,8	01801	01801
120404EN	0,4	02001	02801
P		●	●
M		○	○
K		○	○
N			
S			
H			
O			

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

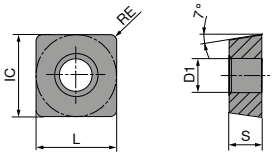


DCGT / DCMT

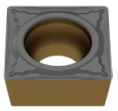
		NEW	NEW
		-CF05 CTEP110-P	-CF55 CTEP110-P
		DRAGONSKIN	DRAGONSKIN
			
		F	F
		CERMET DCGT	CERMET DCMT
		76 245 ...	76 246 ...
ISO	RE mm		
070201EN	0,1	00101	
070202EN	0,2	00201	00201
070204EN	0,4	00401	00401
11T302EN	0,2	01401	
11T304EN	0,4	01601	01601
11T308EN	0,8	01801	01801
P		●	●
M		○	○
K		○	○
N			
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

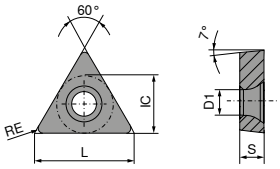


SCGT / SCMT

		NEW	NEW
		-CF05 CTEP110-P	-CF55 CTEP110-P
		DRAGONSKIN	DRAGONSKIN
			
		F	F
		CERMET SCGT	CERMET SCMT
		76 261 ...	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

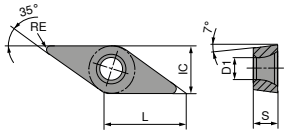
F
CERMET
TCMT
76 266 ...

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		

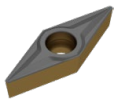
VCGT / VCMT

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



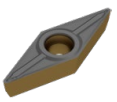
VCGT / VCMT

NEW
-CF05
CTEP110-P
DRAGONSKIN



F
CERMET
VCGT
76 276 ...

NEW
-CF55
CTEP110-P
DRAGONSKIN



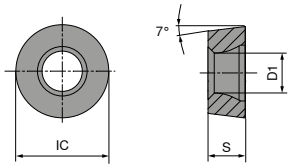
F
CERMET
VCMT
76 292 ...

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

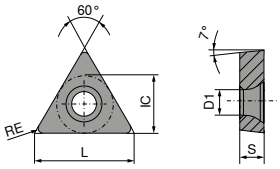
DRAGONSKIN

M
RCMT
74 121 ...

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

TCGT

Designation	L mm	S mm	D1 mm	IC mm
TCGT 16T3..	16,5	3,97	4,4	9,52



TCGT

-27
CTPX715

DRAGONSKIN

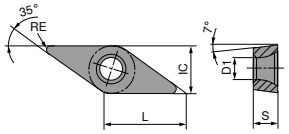
M
TCGT

70 276 ...

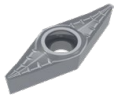
ISO	RE mm	
16T302FN	0,2	72600
P		●
M		●
K		○
N		●
S		●
H		
O		○

VCGT

Designation	L	S	D1	IC
	mm	mm	mm	mm
VCGT 1604..	16,6	4,76	4,4	9,52



VCGT

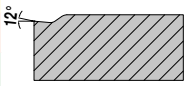
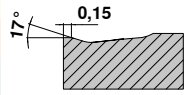
	-25P CTPX710	-27 CTPX715
	DRAGONSKIN	DRAGONSKIN
		
	M	M
	VCGT	VCGT
	70 282 ...	70 280 ...
ISO / RE mm		
160402FN / 0,2	72600	72600
160412FN / 1,2		73200
P	●	●
M	●	●
K		○
N	●	●
S	●	●
H		
O		○

	Material sub-group	Index	Tensile strength N/mm²* / HB / HRC	CTEP110-P DRAGONSKIN		CTCP115-P	CTPX710 -25P DRAGONSKIN	CTPX715 -27 DRAGONSKIN
P	Unalloyed steel	P.1.1	420 N/mm² / 125 HB	500	P.1.1	370	340	275
		P.1.2	640 N/mm² / 190 HB	440	P.1.2	315	300	235
		P.1.3	840 N/mm² / 250 HB	380	P.1.3	270	260	200
		P.1.4	910 N/mm² / 270 HB	360	P.1.4	250	250	190
		P.1.5	1010 N/mm² / 300 HB	330	P.1.5	230	235	170
	Low-alloy steel	P.2.1	610 N/mm² / 180 HB	450	P.2.1	325	300	240
		P.2.2	930 N/mm² / 275 HB	360	P.2.2	250	250	185
		P.2.3	1010 N/mm² / 300 HB	330	P.2.3	230	235	170
		P.2.4	1200 N/mm² / 375 HB	250	P.2.4	170	190	125
	High-alloy steel and high-alloy tool steel	P.3.1	680 N/mm² / 200 HB	380	P.3.1	200	150	140
		P.3.2	1100 N/mm² / 300 HB	310	P.3.2	140	95	80
		P.3.3	1300 N/mm² / 400 HB	230	P.3.3	85	35	25
	Stainless steel	P.4.1	680 N/mm² / 200 HB	380	P.4.1	200	155	140
		P.4.2	1010 N/mm² / 300 HB	340	P.4.2	170	130	110
M	Stainless steel	M.1.1	610 N/mm² / 180 HB	380	M.1.1		150	140
		M.2.1	300 HB		M.2.1		90	80
		M.3.1	780 N/mm² / 230 HB		M.3.1		130	120
K	Grey cast iron	K.1.1	350 N/mm² / 180 HB	450	K.1.1	255		200
		K.1.2	500 N/mm² / 260 HB	340	K.1.2	235		160
	Spherulitic graphite cast iron	K.2.1	540 N/mm² / 160 HB	480	K.2.1	270		190
		K.2.2	845 N/mm² / 250 HB	380	K.2.2	205		150
	Malleable iron	K.3.1	440 N/mm² / 130 HB	460	K.3.1	250		210
		K.3.2	780 N/mm² / 230 HB	280	K.3.2	210		180
N	Aluminium wrought alloy	N.1.1	60 HB		N.1.1		1840	1750
		N.1.2	340 N/mm² / 100 HB		N.1.2		1600	1500
	Cast aluminium alloy	N.2.1	250 N/mm² / 75 HB		N.2.1		1250	1200
		N.2.2	300 N/mm² / 90 HB		N.2.2		1250	1200
		N.2.3	440 N/mm² / 130 HB		N.2.3		750	700
	Copper and copper alloys (bronze/brass)	N.3.1	375 N/mm² / 110 HB		N.3.1		650	625
		N.3.2	300 N/mm² / 90 HB		N.3.2		630	600
		N.3.3	340 N/mm² / 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	680 N/mm² / 200 HB		S.1.1		110	40
		S.1.2	950 N/mm² / 280 HB		S.1.2		85	30
		S.2.1	840 N/mm² / 250 HB		S.2.1		75	30
		S.2.2	1180 N/mm² / 350 HB		S.2.2		45	25
		S.2.3	1080 N/mm² / 320 HB		S.2.3		45	20
	Titanium alloys	S.3.1	400 N/mm²		S.3.1		100	110
		S.3.2	1050 N/mm² / 320 HB		S.3.2		60	70
		S.3.3	1400 N/mm² / 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	≤ 150 N/mm²		O.1.1			140
		O.1.2	≤ 100 N/mm²		O.1.2			
		O.2.1	≤ 1000 N/mm²		O.2.1			150
		O.2.2	≤ 1000 N/mm²		O.2.2			
		O.3.1			O.3.1			

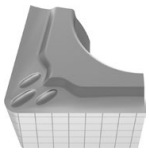
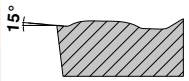
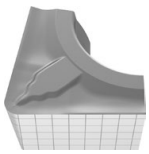
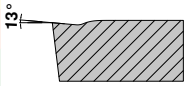
* Tensile strength

Standard chip breakers / application notes

Negative

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

Positive

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

Standard chip breakers / application notes

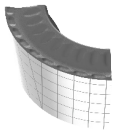
Positive

Model	Smooth cut	Irregular cutting depth	Interrupted cut	Sectional illustration		Geometry
				a_p mm	f mm	

Main application steel and cast iron, secondary application stainless steels and super alloys

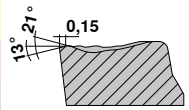
-M23

▲ Soft cutting geometry with outstanding chip breaking behaviour at low cutting depths in finish machining



F
M

Smooth cut	Irregular cutting depth	Interrupted cut
CTCP115-P / CTCP125-P	**CTCP125-P**	**CTCP125-P**
CTCP115-P / CTCP125-P	CTCP125-P	CTCP125-P



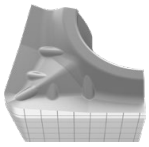
a_p mm	f mm	Geometry
0,30–4,0	1,0–0,45	RC..

Positive

Main application non-ferrous metals, secondary application stainless steels, steels, super alloys, cast iron

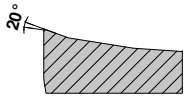
-25P

▲ Sharp cutting edge
▲ Good swarf control on soft aluminium alloys
▲ Low adhesion



F

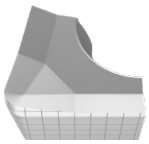
Smooth cut	Irregular cutting depth	Interrupted cut
CTPX710	CTPX710	
CTPX710	CTPX710	
CTPX710 / H216T	**CTPX710 / H216T**	**CTPX710 / H216T**
CTPX710	CTPX710	
CTPX710	CTPX710	



a_p mm	f mm	Geometry
0,50–4,50	0,05–0,60	CC.. DC.. SC.. VC..

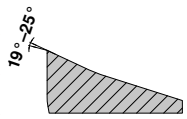
-27

▲ The universal Alu geometry
▲ Sharp cutting edge
▲ Extremely positive rake angle
▲ Low adhesion
▲ High feed rates



M
R

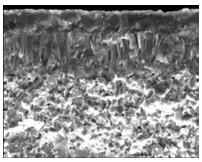
Smooth cut	Irregular cutting depth	Interrupted cut
CTPX715	CTPX715	
CTPX715	CTPX715	
CTPX715 / H216T	CTPX715 / H216T	
CTPX715 / H216T	**CTPX715 / H216T**	**CTPX715 / H216T**
CTPX715	CTPX715	
CTPX715 / H216T	CTPX715 / H216T	CTPX715 / H216T



a_p mm	f mm	Geometry
1,00–10,00	0,10–0,75	CC.. DC.. RC.. SC.. TC.. VC..

Grade description

CTEP110-P

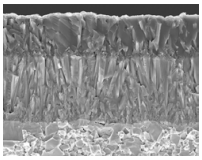


ISO | **P10** | M10 | K05

Specifications:
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

Recommended use:
Coated cermet grade with reserves of toughness for finish machining at high cutting speeds.

CTCP115-P

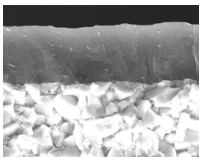


ISO | **P15** | K25

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

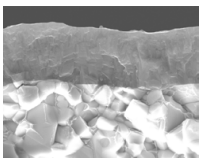


ISO | **P10 | M10** | K10 | **N10 | S15**

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 on 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 on 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

Application

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

Main application – material

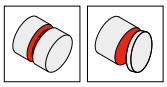
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metals
S	Heat-resistant
H	Tempered steel
O	Non-metal materials
X	Universal application

Coating

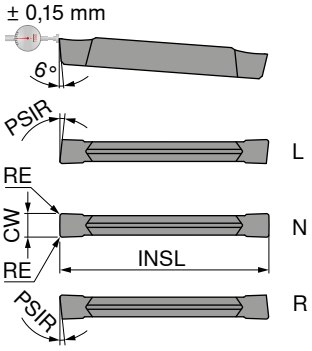
W	Uncoated carbide
C	CVD-coated carbide
P	PVD-coated carbide
T	Cermet, uncoated
E	Cermet, coated
N	Silicon nitride, uncoated
M	Silicon nitride, coated
S	Mixed ceramic
K	Whisker ceramic
I	SiAlON
D	PDC
B	PcBN
H	HSS sintered

Insert GX 35

▲ For parting and grooving



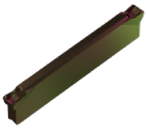
F	M	R
		



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								○

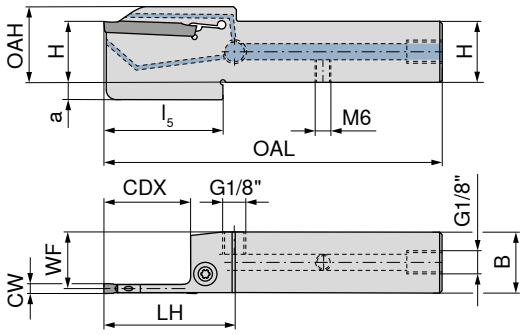
→ v_c Page 33

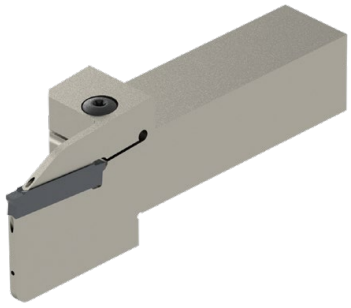
Note: reduce feed rate by 20–50 % with R/L version!
→ **Page 33**

MonoClamp – Radial Monoholder GX-DC 35

Scope of supply:
Mono holder incl. key and clamping screw

Direct Cooling





Illustrations show right-hand versions

ISO 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	NEW Left-hand 70 869 ...	NEW Right-hand 70 869 ...
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**

Key D

80 950 ...

Clamping screw

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 the suitable base adaptors.

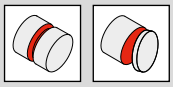
Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm² / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm² / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm² / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm² / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm² / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm² / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm² / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm² / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm² / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm² / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm² / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm² / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm² / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm² / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm² / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm² / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm² / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm² / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm² / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm² / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm² / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm² / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm² / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm² / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm² / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm² / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm² / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm² / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm² / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm² / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm² / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm² / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm²	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm² / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
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		≤ 150 N/mm²				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm²				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm²				
		O.3.1	Graphite						

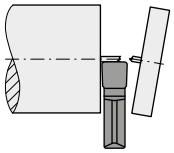
*** Tensile strength**

Cutting data values for grooving inserts

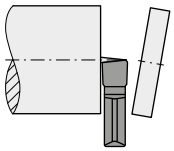
Index	GX	
	CTCP325	CTP1340
	DRAGONSKIN	
	v_c (m/min)	
P.1.1	220	180
P.1.2	195	150
P.1.3	170	125
P.1.4	165	115
P.1.5	150	100
P.2.1	200	155
P.2.2	160	110
P.2.3	150	100
P.2.4	120	70
P.3.1	150	110
P.3.2	95	75
P.3.3	45	40
P.4.1	150	110
P.4.2	125	95
M.1.1	150	110
M.2.1	95	80
M.3.1	135	100
K.1.1	170	150
K.1.2	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		

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

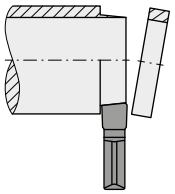
References for Parting off



From Ø 5 mm on, reduce feed “f“ by approx. 50 %. No parting across centre (risk of breakage).

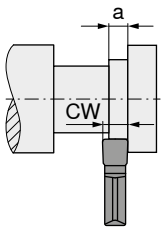


For parting pip-free, use R or L inserts. In order to minimize lateral deflection reduce feed by approx. 20–50 %.

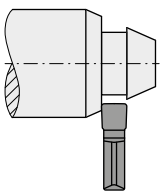


In order to prevent ring formation, use R or L inserts. Reduce feed “f“ because of lateral deflection by approx. 20–50 %.

References for grooving



When grooving with an axial displacement the width „a“ should amount to at least 70 % of the grooving width „CW“.



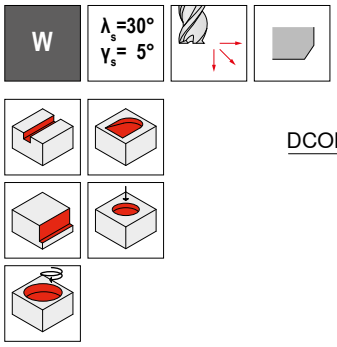
When grooving oblique surfaces the feed should be reduced by approx. 20–50 % until fully engaged.

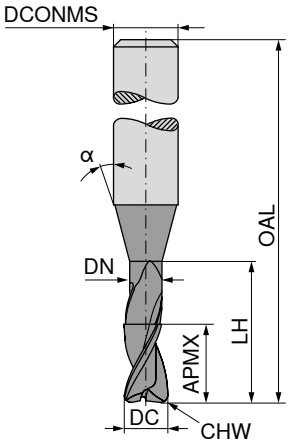
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

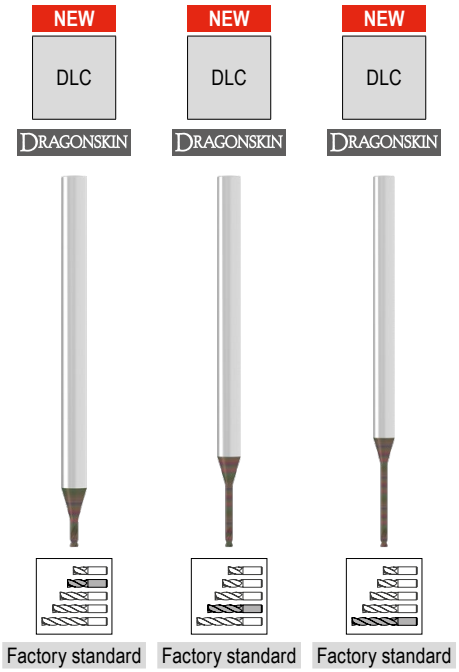
AluLine – Micro-end milling cutter

The specialist for machining non-ferrous metals

▲ T_x = maximum engagement depth







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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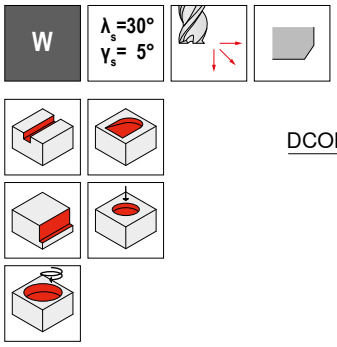
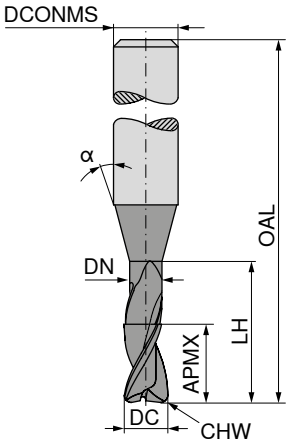
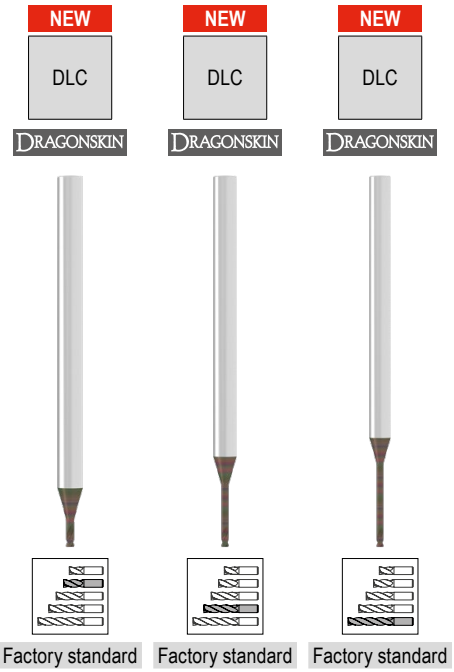
AluLine – Micro-end milling cutter

The specialist for machining non-ferrous metals

▲ T_x = maximum engagement depth







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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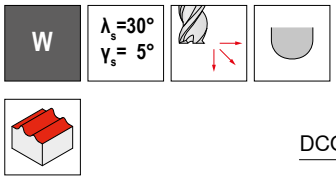
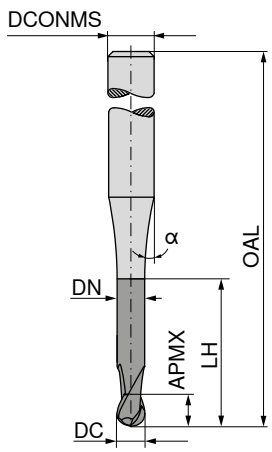
AluLine – Micro-ball nosed cutter

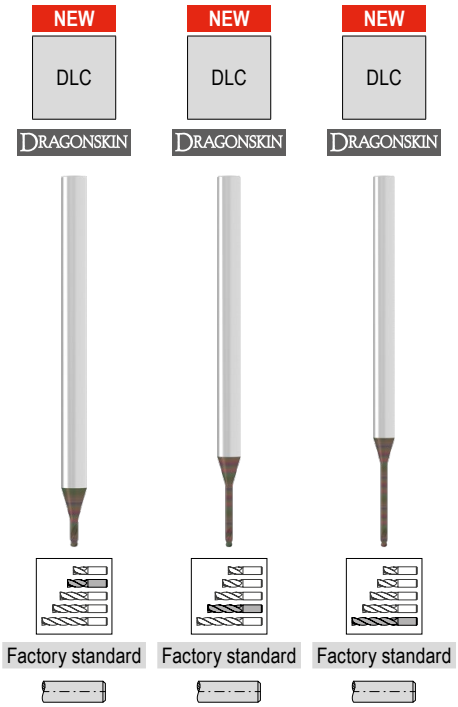
The specialist for machining non-ferrous metals

▲ 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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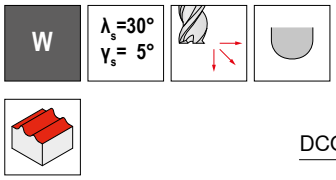
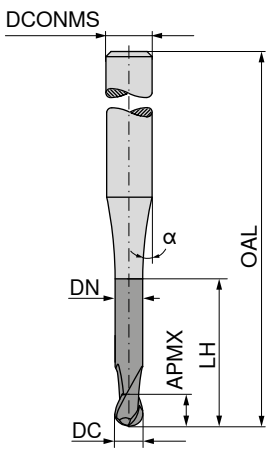
AluLine – Micro-ball nosed cutter

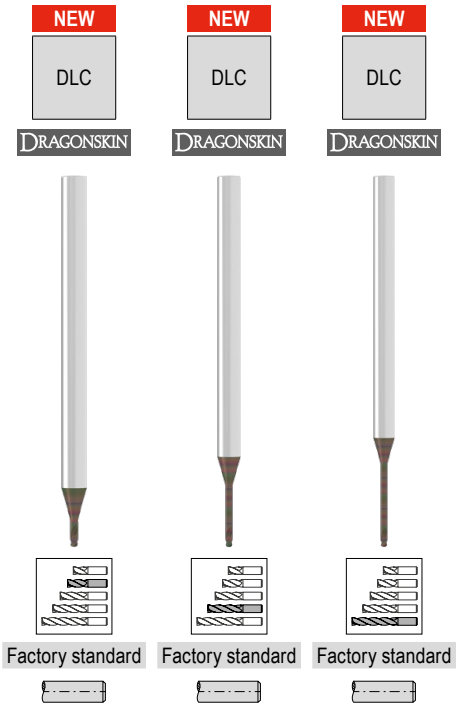
The specialist for machining non-ferrous metals

▲ Radius accuracy: ± 0,01 mm

▲ T_x = maximum engagement depth







DC -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			53 903 ...	53 903 ...	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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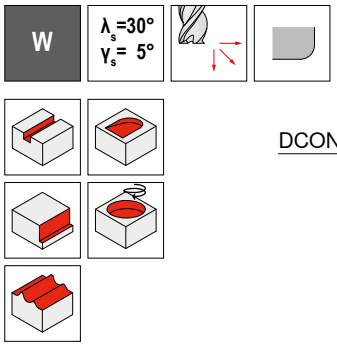
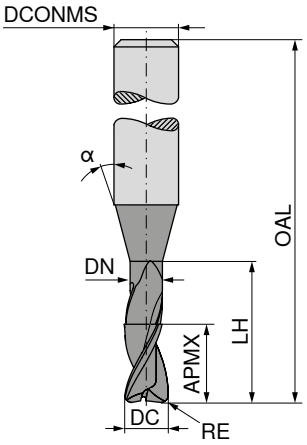
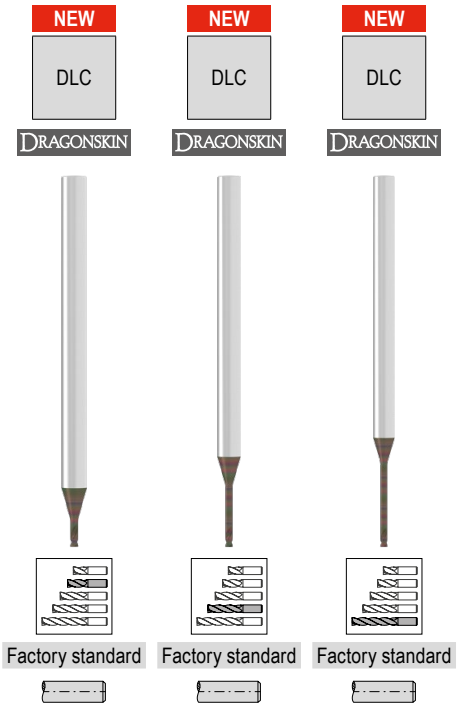
AluLine – Micro-torus cutter

The specialist for machining non-ferrous metals

▲ T_x = maximum engagement depth







											Factory standard	Factory standard	Factory standard
											53 901 ...	**53 901 ...**	**53 901 ...**
DC $_{-0,01}$	RE $_{\pm 0.01}$	APMX	DN	LH	OAL	LPR	α°	DCONMS $_{h5}$	T_x	ZEFP			
mm	mm	mm	mm	mm	mm	mm		mm					
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**	
P													
M													
K													
N											●	●	●
S													
H													
O													

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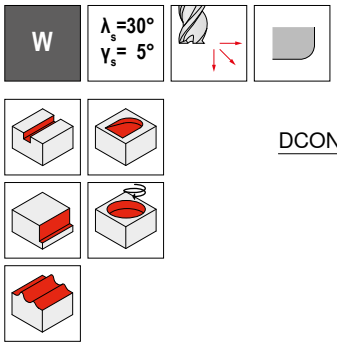
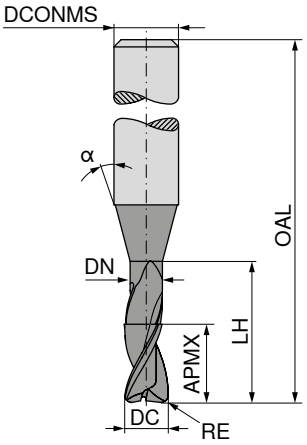
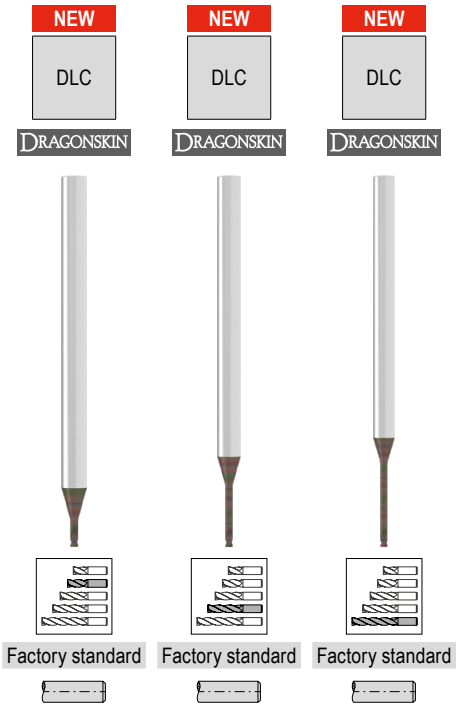
AluLine – Micro-torus cutter

The specialist for machining non-ferrous metals

▲ T_x = maximum engagement depth







											Factory standard	Factory standard	Factory standard
											53 901 ...	53 901 ...	53 901 ...
DC $_{-0,01}$	**RE** $_{\pm 0.01}$	**APMX**	**DN**	**LH**	**OAL**	**LPR**	**α°**	**DCONMS** $_{h5}$	**T_x**	**ZEFP**			
mm	mm	mm	mm	mm	mm	mm		mm					
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**	

P			
M			
K			
N	●	●	●
S			
H			
O			

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Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength N/mm²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0,15 % C	Annealed	420 N/mm² / 125 HB	1.0401	C15	1.1141	Ck15
		P.1.2	< 0,45 % C	Annealed	640 N/mm² / 190 HB	1.1191	C45E	1.0718	9SMnPb28
		P.1.3		Tempered	840 N/mm² / 250 HB	1.1191	C45E	1.0535	C55
		P.1.4	< 0,75 % C	Annealed	910 N/mm² / 270 HB	1.1223	C60R	1.0535	C55
		P.1.5		Tempered	1010 N/mm² / 300 HB	1.1223	C60R	1.0727	45S20
	Low-alloy steel	P.2.1		Annealed	610 N/mm² / 180 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.2		Tempered	930 N/mm² / 275 HB	1.7131	16MnCr5	1.6587	17CrNiMo6
		P.2.3		Tempered	1010 N/mm² / 300 HB	1.7225	42CrMo4	1.3505	100Cr6
		P.2.4		Tempered	1200 N/mm² / 375 HB	1.7225	42CrMo4	1.3505	100Cr6
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	680 N/mm² / 200 HB	1.4021	X20Cr13	1.4034	X46Cr13
		P.3.2		Hardened and tempered	1100 N/mm² / 300 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
		P.3.3		Hardened and tempered	1300 N/mm² / 400 HB	1.2343	X38CrMoV5-1	1.4034	X46Cr13
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	680 N/mm² / 200 HB	1.4016	X6Cr17	1.2316	X36CrMo16
		P.4.2	Martensitic	Tempered	1010 N/mm² / 300 HB	1.4112	X90CrMoV18	1.2316	X36CrMo16
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	610 N/mm² / 180 HB	1.4301	X5CrNi18-10	1.4571	X6CrNiMoTi17-12-2
		M.2.1	Austenitic	Tempered	300 HB	1.4841	X15CrNiSi25-21	1.4539	X1NiCrMoCu25-20-5
		M.3.1	Austenitic / ferritic (Duplex)		780 N/mm² / 230 HB	1.4462	X2CrNiMoN22-5-3	1.4501	X2CrNiMoCuWN25-7-4
K	Grey cast iron	K.1.1	Pearlitic / ferritic		350 N/mm² / 180 HB	0.6010	GG-10	0.6025	GG-25
		K.1.2	Pearlitic (martensitic)		500 N/mm² / 260 HB	0.6030	GG-30	0.6045	GG-45
	Spherulitic graphite cast iron	K.2.1	Ferritic		540 N/mm² / 160 HB	0.7040	GGG-40	0.7060	GGG-60
		K.2.2	Pearlitic		845 N/mm² / 250 HB	0.7070	GGG-70	0.7080	GGG-80
	Malleable iron	K.3.1	Ferritic		440 N/mm² / 130 HB	0.8035	GTW-35-04	0.8045	GTW-45
		K.3.2	Pearlitic		780 N/mm² / 230 HB	0.8165	GTS-65-02	0.8170	GTS-70-02
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	Al99,5	3.3315	AlMg1
		N.1.2	Hardenable	Age-hardened	340 N/mm² / 100 HB	3.1355	AlCuMg2	3.2315	AlMgSi1
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		250 N/mm² / 75 HB	3.2581	G-AlSi12	3.2163	G-AlSi9Cu3
		N.2.2	≤ 12 % Si, hardenable	Age-hardened	300 N/mm² / 90 HB	3.2134	G-AlSi5Cu1Mg	3.2373	G-AlSi9Mg
		N.2.3	> 12 % Si, non-hardenable		440 N/mm² / 130 HB		G-AlSi17Cu4Mg		G-AlSi18CuNiMg
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		375 N/mm² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0410	CuZn44Pb2
		N.3.2	CuZn, CuSnZn		300 N/mm² / 90 HB	2.0331	CuZn15	2.4070	CuZn28Sn1As
		N.3.3	CuSn, lead-free copper and electrolytic copper		340 N/mm² / 100 HB	2.0060	E-Cu57	2.0590	CuZn40Fe
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn	3.5312	MgAl3Zn
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	680 N/mm² / 200 HB	1.4864	X12NiCrSi 36-16	1.4865	G-X40NiCrSi38-18
		S.1.2		Age-hardened	950 N/mm² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4876	X10NiCrAlTi32-20
		S.2.1	Ni or Co basis	Annealed	840 N/mm² / 250 HB	2.4631	NiCr20TiAl (Nimonic80A)	3.4856	NiCr22Mo9Nb
		S.2.2		Age-hardened	1180 N/mm² / 350 HB	2.4668	NiCr19Nb5Mo3 (Inconel 718)	2.4955	NiFe25Cr20NbTi
		S.2.3		Cast	1080 N/mm² / 320 HB	2.4765	CoCr20W15Ni	1.3401	G-X120Mn12
	Titanium alloys	S.3.1	Pure titanium		400 N/mm²	3.7025	Ti99,8	3.7034	Ti99,7
		S.3.2	Alpha + beta alloys	Age-hardened	1050 N/mm² / 320 HB	3.7165	TiAl6V4	Ti-6246	Ti-6Al-2Sn-4Zr-6Mo
		S.3.3	Beta alloys		1400 N/mm² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr	R56410	Ti-10V-2Fe-3Al
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		≤ 150 N/mm²				
		O.1.2	Plastics, thermoplastic		≤ 100 N/mm²				
		O.2.1	Aramid fibre-reinforced		≤ 1000 N/mm²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 1000 N/mm²				
		O.3.1	Graphite						

*** Tensile strength**

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	MQL
				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	MQL
				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	MQL
				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°

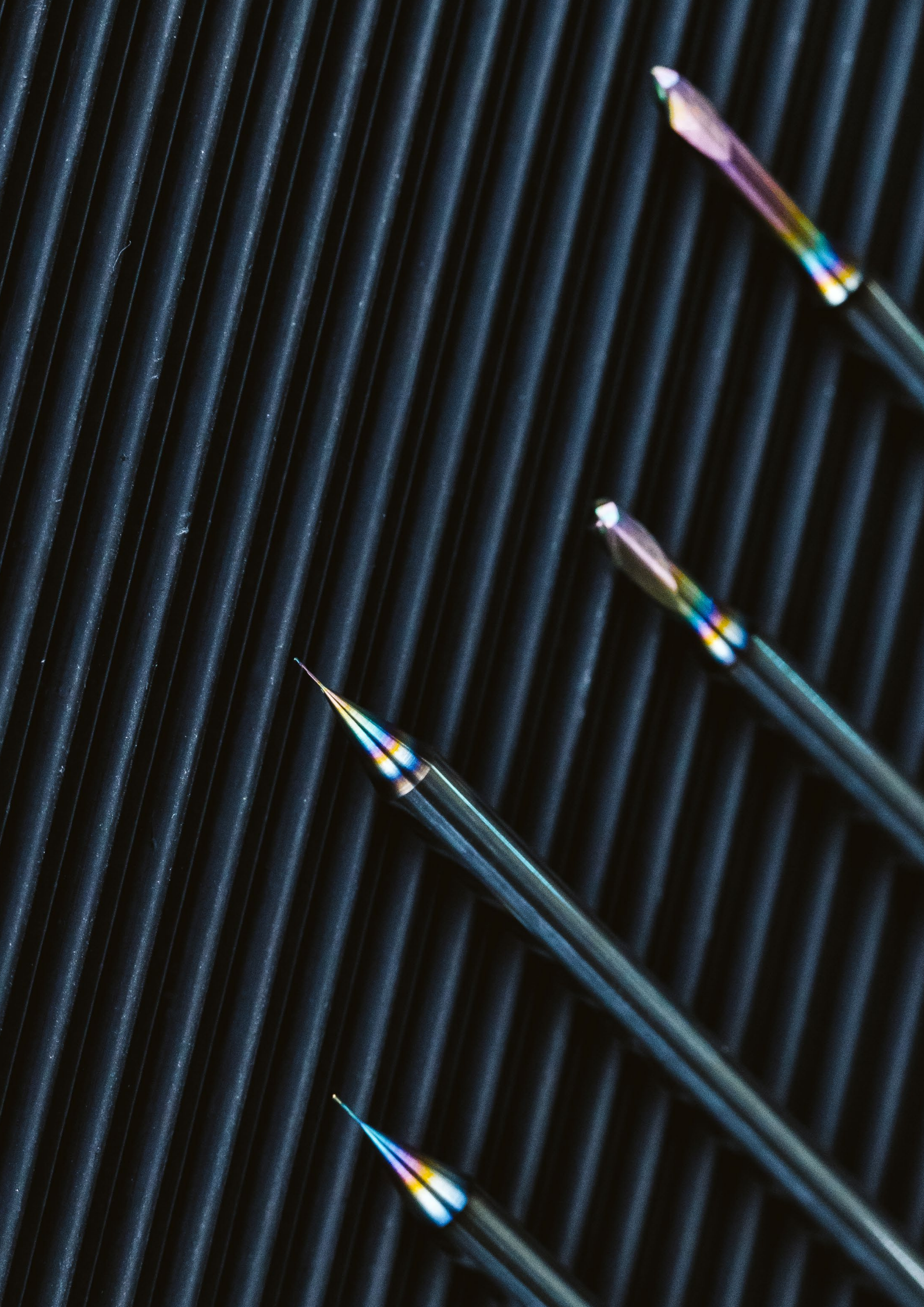
Cutting data standard values – AluLine – micro cutter

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	MQL
				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															

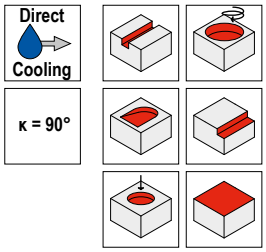
Plunging angle for ramping and helical milling = 1°

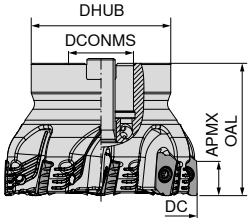
Index	T_x > 9xDC – 12xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ suitable		
				Ø DC (mm) =											
	v_c (mm)	$a_{p\,max.}$ x DC	$a_{e\,max.}$ x DC	0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5 ≤ Ø 2,0	> Ø 2,0 ≤ Ø 3,0	Emulsion	Compressed air	MQL
				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															

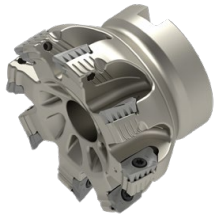
Plunging angle for ramping and helical milling = 1°



MaxiMill – 211-15-DC Shell mill







NEW

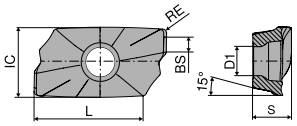
50 798 ...

Designation	DC mm	ZNF	APMX mm	OAL mm	DCONMS H6 mm	DHUB mm	RPMX 1/min.	torque moment Nm	Insert	
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® blade	 Key D	 Molykote	 Clamping screw	 Torque screwdriver
	80 950 ...	**80 950 ...**	**70 950 ...**	**70 950 ...**	**80 950 ...**
40 - 80	**054**	**128**	**303**	**839**	**193**

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

-F40
CTCS245

DRAGONSKIN

F
XDKT

51 165 ...

NEW

-F40
CTC5240

DRAGONSKIN

F
XDKT

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

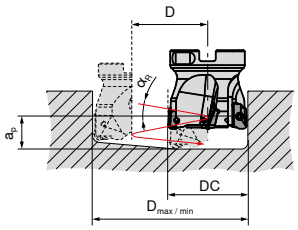
	Material sub-group	Index	Tensile strength N/mm²* / HB / HRC	CTC5240 DRAGONSKIN		CTCS245 DRAGONSKIN	
				Cutting Material **hard** (v_c↑) → **tough** (v_c↓)			
				v_c (m/min)			
P	Unalloyed steel	P.1.1	420 N/mm² / 125 HB				
		P.1.2	640 N/mm² / 190 HB				
		P.1.3	840 N/mm² / 250 HB				
		P.1.4	910 N/mm² / 270 HB				
		P.1.5	1010 N/mm² / 300 HB				
	Low-alloy steel	P.2.1	610 N/mm² / 180 HB				
		P.2.2	930 N/mm² / 275 HB				
		P.2.3	1010 N/mm² / 300 HB				
		P.2.4	1200 N/mm² / 375 HB				
	High-alloy steel and high-alloy tool steel	P.3.1	680 N/mm² / 200 HB				
		P.3.2	1100 N/mm² / 300 HB				
		P.3.3	1300 N/mm² / 400 HB				
	Stainless steel	P.4.1	680 N/mm² / 200 HB				
		P.4.2	1010 N/mm² / 300 HB				
M	Stainless steel	M.1.1	610 N/mm² / 180 HB				
		M.2.1	300 HB				
		M.3.1	780 N/mm² / 230 HB				
K	Grey cast iron	K.1.1	350 N/mm² / 180 HB				
		K.1.2	500 N/mm² / 260 HB				
	Spherulitic graphite cast iron	K.2.1	540 N/mm² / 160 HB				
		K.2.2	845 N/mm² / 250 HB				
	Malleable iron	K.3.1	440 N/mm² / 130 HB				
		K.3.2	780 N/mm² / 230 HB				
N	Aluminium wrought alloy	N.1.1	60 HB				
		N.1.2	340 N/mm² / 100 HB				
	Cast aluminium alloy	N.2.1	250 N/mm² / 75 HB				
		N.2.2	300 N/mm² / 90 HB				
		N.2.3	440 N/mm² / 130 HB				
	Copper and copper alloys (bronze/brass)	N.3.1	375 N/mm² / 110 HB				
		N.3.2	300 N/mm² / 90 HB				
		N.3.3	340 N/mm² / 100 HB				
	Magnesium alloys	N.4.1	70 HB				
S	Heat-resistant alloys	S.1.1	680 N/mm² / 200 HB		80		64
		S.1.2	950 N/mm² / 280 HB		70		56
		S.2.1	840 N/mm² / 250 HB		35		28
		S.2.2	1180 N/mm² / 350 HB		25		20
		S.2.3	1080 N/mm² / 320 HB		30		24
	Titanium alloys	S.3.1	400 N/mm²		80		64
		S.3.2	1050 N/mm² / 320 HB		50		40
		S.3.3	1400 N/mm² / 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	≤ 150 N/mm²				
		O.1.2	≤ 100 N/mm²				
		O.2.1	≤ 1000 N/mm²				
		O.2.2	≤ 1000 N/mm²				
		O.3.1					

* Tensile strength

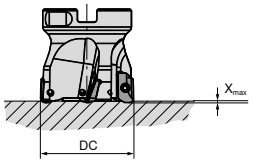
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approx. **±20%** according to the usage conditions.

System MaxiMill 211-15

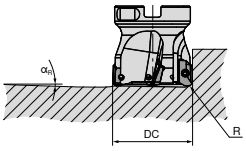
Machining strategy



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 projection 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 hole

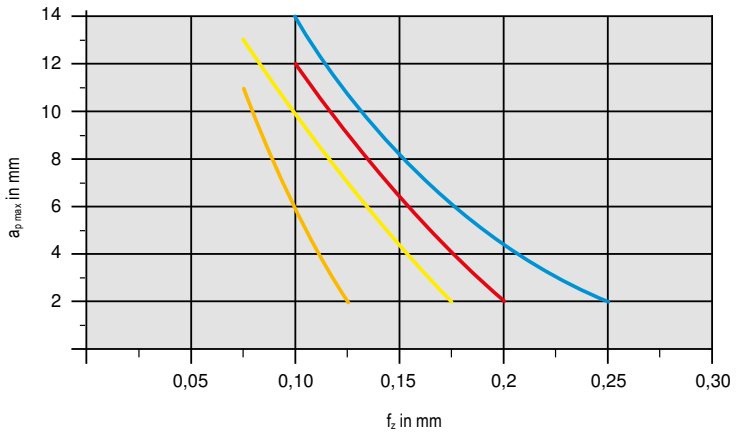
$D_{min.}$ in mm = Smallest diameter for flat bottom surface

a_p in mm = D x π x tan (α_R) = Pitch

l_a in mm = Overhang length

Starting Parameter

XDKT 15



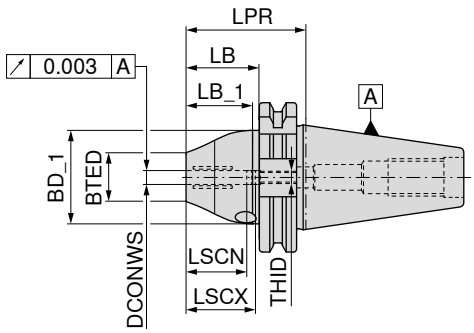
Material			Inserts		v_c in m/min	Cooling
Steel	P.2.2	40CrMnMoS 8-6	XDKT150508SR-M50	CTCP230	200	Dry
Stainless steel	M.1.1	X6CrNiMoTi 1712 2	XDKT150508SR-F50	CTPM240	180	Dry
Cast iron	K.1.1	EN-GJL-250 (GG25)	XDKT150508SR-R50	CTCK215	250	Dry
Heat-resistant	S.2.2	Inconel 718	XDKT150508ER-F40	CTC5240	35	Emulsion

Detailed information on cutting speed for each grade can be found on → page 46
From v_c > 400 m/min, the tool must be balanced!

HyPower – Rough

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

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 ...

Stop screw IK

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 stud

→ 284

Others

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

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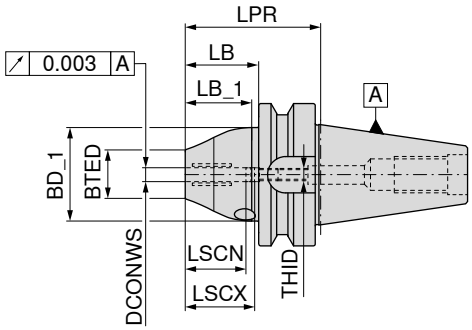

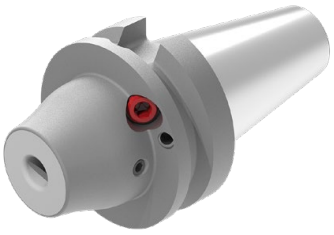

NEW NEW


AD
G 2,5 n_{max} 25000
84 254 ...


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				
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
80 397 ...


Pressure screw
83 950 ...


Stop screw IK
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**	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 stud


→ 284
Others

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

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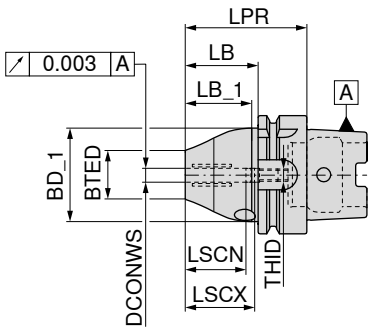


NEW

AD
G 2,5 n_{max} 25000

84 254 ...

Adapter	DCONWS	LPR	BTED	BD_1	LB_1	LB	LSCX	LSCN	THID	
	mm	mm	mm	mm	mm	mm	mm	mm		
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 ...

Stop screw IK

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 pipe

→ 284

Others

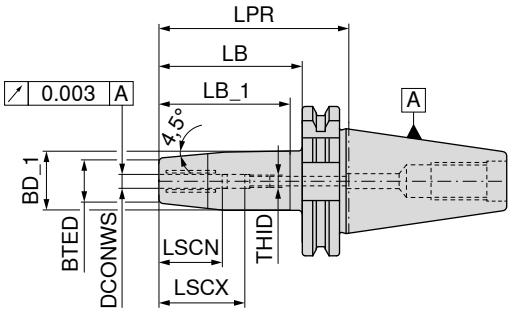
Accessories can be found in the clamping technology catalogue → **Chapter 16, Adapters and accessories**

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
- ▲ **Also available** with Balluff chip on request

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 ...

Stop screw IK

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 stud

→ 284

Others

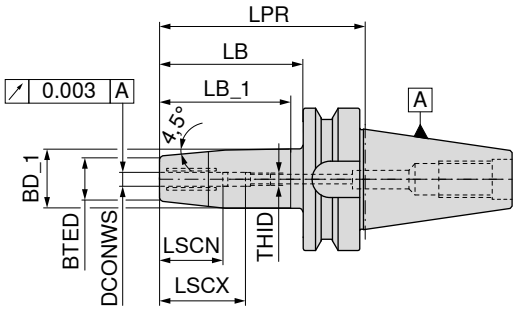
Accessories can be found in the clamping technology catalogue → **Chapter 16, Adapters and accessories**

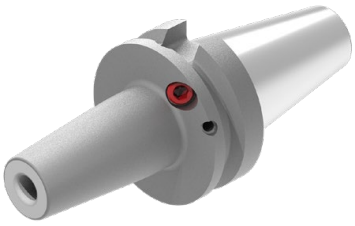
HyPower – Access 4.5°

- ▲ 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
- ▲ **Also available** with Balluff chip on request

Scope of supply:

Base body with backstop screw and pressure screw





NEW

AD
G 2,5 n_{max} 25000

84 255 ...

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		
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

80 397 ...

Pressure screw

83 950 ...

Stop screw IK

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

Reduction sleeve

→ 110+111

Pull stud

→ 284

Others

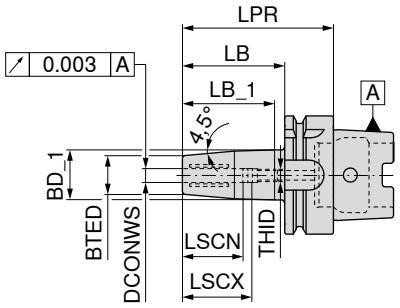
Accessories can be found in the clamping technology catalogue → **Chapter 16, Adapters and accessories**

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
- ▲ **Also available** with Balluff chip on request

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 ...

Stop screw IK

83 950 ...

Spare parts for Article no.						
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 pipe

→ 284

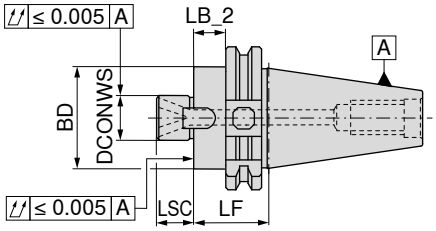
Others

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

Shell mill adapter with reduced flange diameter

▲ Screwed drive dogs
▲ also available with Balluff chip **on request**

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



NEW

AD
G 2,5 n_{max} 25000

	Adapter	DCONWS mm	LB_2 mm	LF mm	BD mm	LSC mm	82 315 ...
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, thanks to the adapted flange diameters.

Screw for drivers

Driver

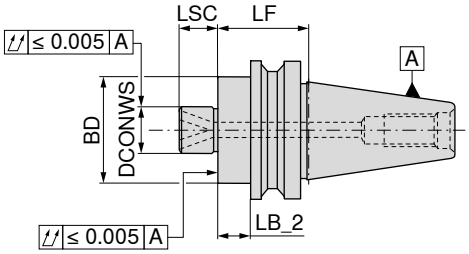
clamping screw

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 drive dogs
▲ also available with Balluff chip **on request**

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



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, thanks to the adapted flange diameters.

Screw for drivers

Driver

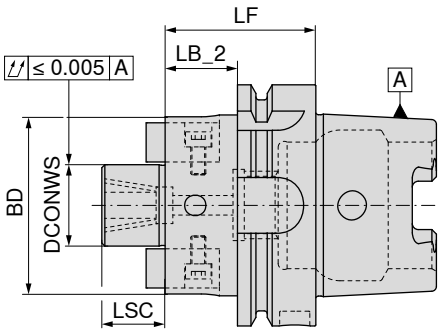
clamping screw

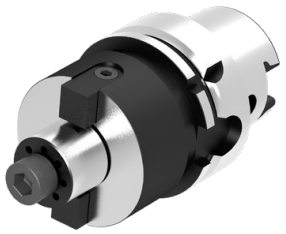
Spare parts DCONWS	83 950 ...		83 950 ...		83 950 ...	
22	M4x8	**51700**	10x7x20,5	**51500**	M10x25	**124**
27	M5x8	**51800**	12x9x24,3	**51600**	M12x30	**125**

Shell mill adapter with reduced flange diameter

▲ Screwed drive dogs
▲ also available with Balluff chip **on request**

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





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, thanks to the adapted flange diameters.


Screw for drivers

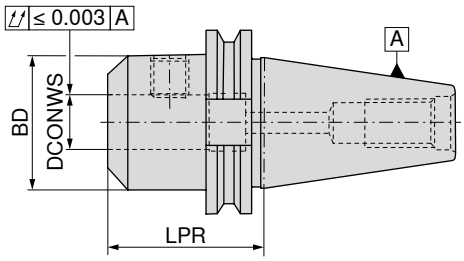

Driver


clamping 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
▲ also available with Balluff chip **on request**



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 grubscrews

Accessories

→ 58, 60

Pull stud

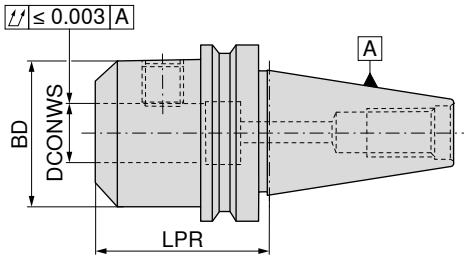
→ 284

Others

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

Cylindrical shank adapter (Weldon)

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



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 grubscrews

Accessories

→ 58, 60

Pull stud

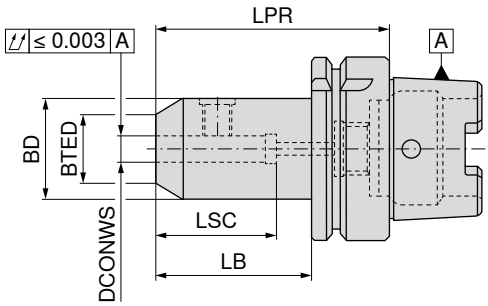
→ 284

Others

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

Cylindrical shank adapter (Weldon)

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



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**

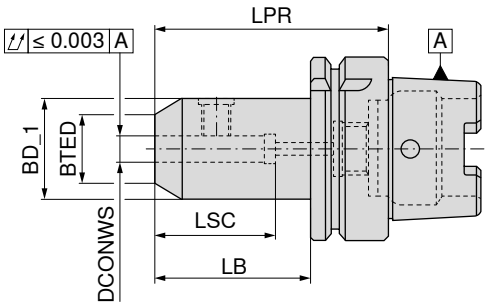
Grubscrew

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
▲ also available with Balluff chip **on request**



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

Accessories


→ 156

Coolant transfer pipe

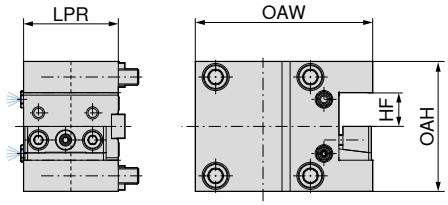

→ 284

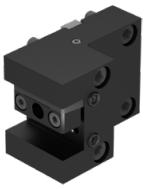
Others

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

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

▲ directly screwed version





NEW

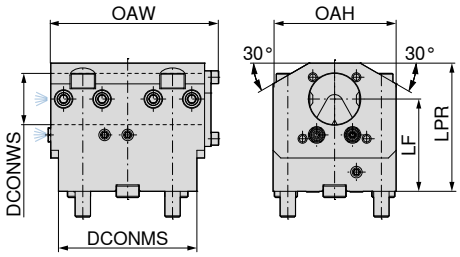
Left-hand

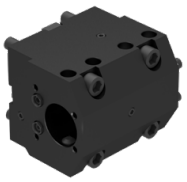
82 483 ...

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

IC

82 483 ...

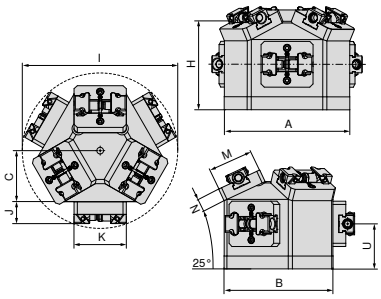
Adapter	Hole pattern	DCONWS mm	LF mm	OAH mm	LPR mm	OAW mm	DCONMS mm	
BMT 65	70 x 73	40	72	96	106	132	103	**03009**

CentriClamp – ZSG mini – 6-sided clamping tower

Scope of supply:

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

ZSG mini

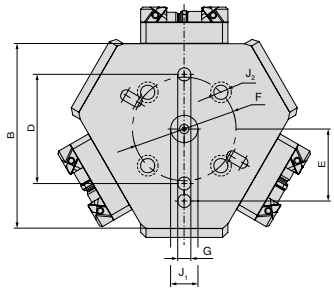


NEW

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

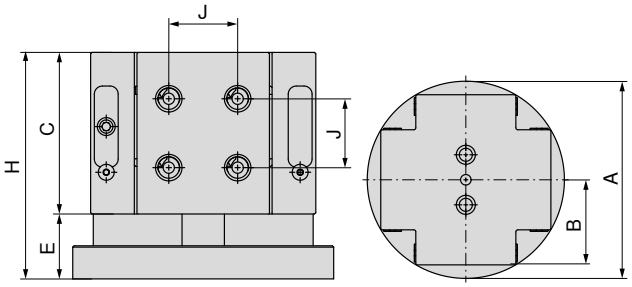


B	D ±0.015	E ±0.015	Ø F	G H7	J1 H7	Ø J2
mm	mm	mm	mm	mm	mm	mm
169,40	100	66	95	12	25	13

MNG mini – 4-sided clamping tower

- ▲ Incl. 4 x MNG mini zero point clamping systems
- ▲ Order mounting bolts separately
- ▲ Material: hard-anodised aluminium

MNG mini



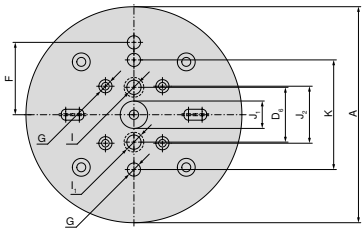
NEW

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

Protection plugs

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

MNG mini

NEW

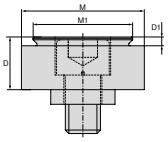
80 915 ...

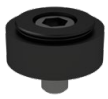
D_1 mm	
16	**51900**

System jaws overview

Insert jaws, round, grip 3 mm

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

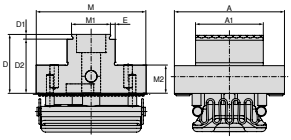


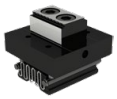


For vice width	A	A_1	D	D_1	D_2	E	M	M_1	M_2		NEW	NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
			18	3			42	34		**80 914 34500**											●	

Indexable jaw, fixed VS, grip 3 mm

▲ Price per piece
▲ VS = Larger clamping range

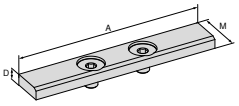




For vice width	A	A_1	D	D_1	D_2	E	M	M_1	M_2		NEW	NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
90	65	40	35	3	32	2,6	64	28	17	**80 914 34400**											●	
90	90		35	3	32	2,6	64	28	17	**80 914 34300**											●	

Support, hard for milling over

▲ Price per piece



For vice 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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