

UP2DATE

The cool way to machine titanium alloys

MaxiMill – 211-DC with DirectCooling
Faster. Longer. Safer.

... ADDITIONAL PRODUCT HIGHLIGHTS

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

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

Tooling a Sustainable Future

ceratizit.com



CERATIZIT
GROUP

Welcome!



Get in touch

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On-site technical support

Your Local Technical Sales Engineer

Your customer number



Precision cooling strategy

with the additively manufactured
MaxiMill – 211-DC milling system


CERATIZIT

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

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

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



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

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



CERATIZIT

The cool way to machine titanium alloys

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



3D-printed tool holder with ideally positioned coolant holes

Advantages/benefits

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

Less insert wear

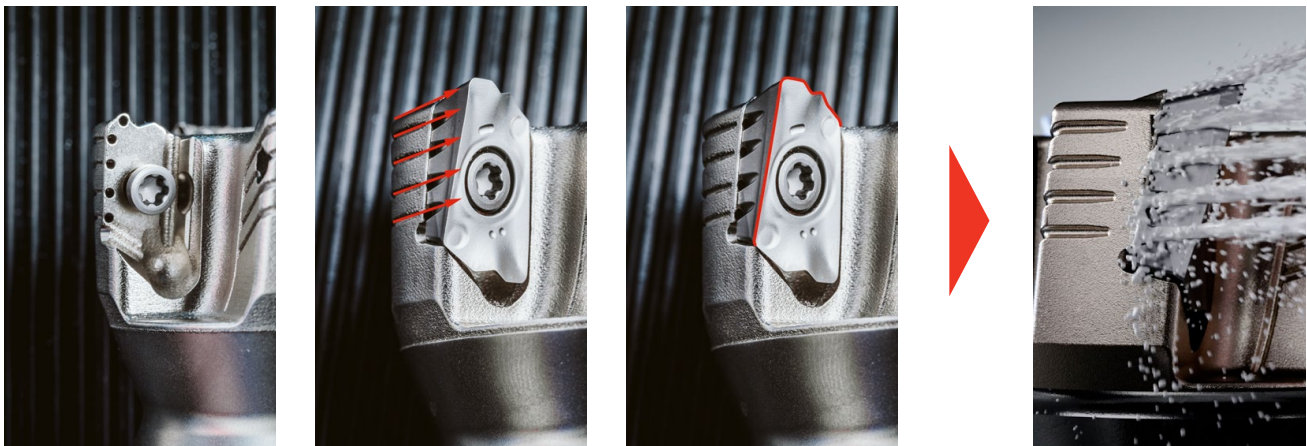
Higher machining parameters possible

→ Tool cost savings

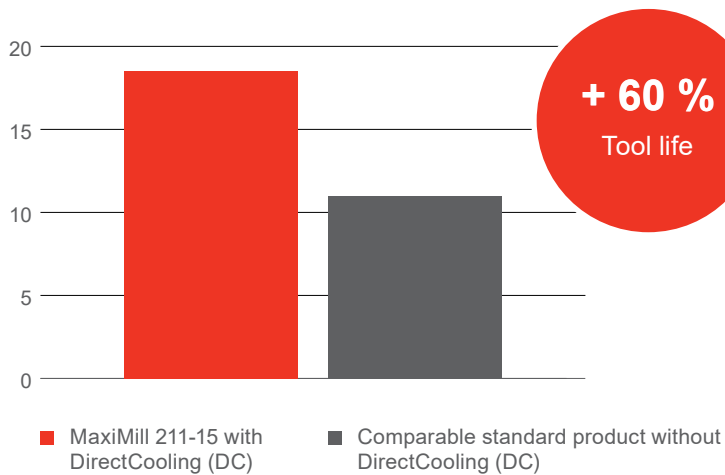
→ Production time optimization

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

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



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



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

“

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

Manuel Höfferer, Application Manager Aerospace & Defense

”





Small-scale aluminum machining

with AluLine – Micro



WNT

Micro cutter for complex micro components

AluLine – Micro: with DLC coating and minimal tolerances

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



→ from page 34

You can find further information on the product here.



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

Advantages of AluLine – Micro cutters

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

Large portfolio of micro tools for machining aluminum

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

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

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



Corner chamfer

Full radius



Torus






Cermet cutting material grades take finish turning to the next level

CERATIZIT

Coating update for cermet CTEP110-P grade

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

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



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

Why choose cermet?

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

Efficient production can be achieved with CERATIZIT cermet inserts.

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

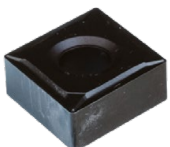
- ▲ Unique multilayer CVD coating
- ▲ Gold-colored indicator layer for insert detection
- ▲ Improved texture and grain of TiCN & Al₂O₃ layers
- ▲ Special post-treatment process
- ▲ Optimized chip breakers
- ▲ Perfect match between chip breakers and grade

- 
- **Best possible utilization of cutting edges**
 - **Reduced surface roughness**
 - **High wear resistance**
 - **Maximum cutting speed**
 - **Optimal chip control**
 - **Improved tool life**
 - **Lower costs per part (CPP)**

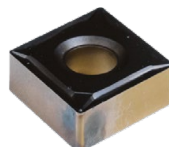


Ability to know when to change a tool before it breaks

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



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



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

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WNT Solid carbide drills

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CERATIZIT Indexable turning tools

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Micro cutters
AluLine – Micro





Cermet indexable inserts CTEP110-P

CERATIZIT Indexable milling tools


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CERATIZIT Adapters and accessories

- 48–53 HyPower – high pressure chuck
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WNT Workpiece clamping

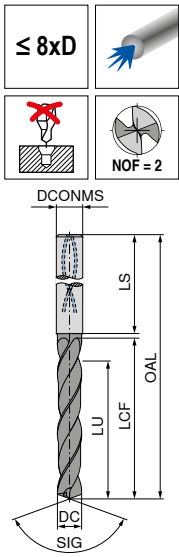
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Shoulder milling system MaxiMill – 211-DC

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 lbf/in ² / HB / HRC	10 701 ...					
				8xD					
				With through coolant					
				Ø 3–5	Ø 5–8	Ø 8–12	Ø 12–16	Ø 16–20	
				v _c (m/min)	f (mm/rev)				
P	Unalloyed steel	P.1.1	60900 lbf/in ² / 125 HB	165	0,12	0,17	0,23	0,28	0,31
		P.1.2	92800 lbf/in ² / 190 HB	160	0,11	0,16	0,22	0,26	0,30
		P.1.3	121800 lbf/in ² / 250 HB	150	0,11	0,15	0,20	0,25	0,28
		P.1.4	132000 lbf/in ² / 270 HB	145	0,10	0,15	0,19	0,24	0,27
		P.1.5	146500 lbf/in ² / 300 HB	135	0,10	0,14	0,18	0,23	0,26
	Low-alloy steel	P.2.1	88500 lbf/in ² / 180 HB	165	0,14	0,20	0,27	0,33	0,37
		P.2.2	134900 lbf/in ² / 275 HB	150	0,13	0,18	0,24	0,30	0,34
		P.2.3	146500 lbf/in ² / 300 HB	135	0,11	0,16	0,22	0,27	0,30
		P.2.4	174000 lbf/in ² / 375 HB	105	0,11	0,15	0,19	0,24	0,27
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in ² / 200 HB	115	0,11	0,16	0,22	0,27	0,30
		P.3.2	159500 lbf/in ² / 300 HB	90	0,10	0,13	0,18	0,22	0,25
		P.3.3	188500 lbf/in ² / 400 HB	90	0,08	0,11	0,14	0,17	0,19
	Stainless steel	P.4.1	98600 lbf/in ² / 200 HB	70	0,08	0,11	0,14	0,18	0,20
		P.4.2	117500 lbf/in ² / 250 HB	70	0,08	0,11	0,14	0,18	0,20
M	Stainless steel	M.1.1	88500 lbf/in ² / 200 HB	80	0,09	0,13	0,18	0,22	0,25
		M.2.1	300 HB	75	0,08	0,11	0,15	0,19	0,21
		M.3.1	113100 lbf/in ² / 230 HB	75	0,08	0,11	0,15	0,19	0,21
K	Grey cast iron	K.1.1	88500 lbf/in ² / 180 HB	150	0,15	0,24	0,33	0,41	0,47
		K.1.2	127600 lbf/in ² / 260 HB	125	0,14	0,20	0,27	0,33	0,37
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in ² / 160 HB	200	0,15	0,22	0,31	0,38	0,43
		K.2.2	122600 lbf/in ² / 250 HB	125	0,14	0,20	0,27	0,33	0,37
	Malleable iron	K.3.1	63800 lbf/in ² / 130 HB	115	0,15	0,21	0,29	0,35	0,40
		K.3.2	113100 lbf/in ² / 230 HB	100	0,12	0,17	0,23	0,28	0,32
N	Aluminum wrought alloy	N.1.1	60 HB						
		N.1.2	49300 lbf/in ² / 100 HB						
	Cast aluminum alloy	N.2.1	36300 lbf/in ² / 75 HB						
		N.2.2	43500 lbf/in ² / 90 HB						
		N.2.3	63800 lbf/in ² / 130 HB						
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in ² / 110 HB						
		N.3.2	43500 lbf/in ² / 90 HB	145	0,14	0,20	0,27	0,33	0,37
N.3.3	49300 lbf/in ² / 100 HB								
N.4.1	Magnesium alloys	70 HB							
S	Heat-resistant alloys	S.1.1	98600 lbf/in ² / 200 HB	35	0,07	0,10	0,14	0,17	0,19
		S.1.2	137800 lbf/in ² / 280 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.1	121800 lbf/in ² / 250 HB	25	0,05	0,07	0,10	0,12	0,14
		S.2.2	171100 lbf/in ² / 350 HB	20	0,06	0,09	0,12	0,15	0,17
		S.2.3	156600 lbf/in ² / 320 HB	20	0,05	0,07	0,10	0,12	0,14
	Titanium alloys	S.3.1	5800 lbf/in ²						
		S.3.2	152300 lbf/in ²	35	0,08	0,11	0,15	0,18	0,20
S.3.3	203100 lbf/in ² / 410 HB	30	0,06	0,09	0,12	0,15	0,17		
H	Hardened steel	H.1.1	46-55 HRC						
		H.1.2	56-60 HRC						
		H.1.3	61-65 HRC						
		H.1.4	66-70 HRC						
	Chilled iron	H.2.1	400 HB						
Hardened cast iron	H.3.1	55 HRC							
O	Non-metal materials	O.1.1	≤ 21800 lbf/in ²						
		O.1.2	≤ 14500 lbf/in ²						
		O.2.1	≤ 145000 lbf/in ²						
		O.2.2	≤ 145000 lbf/in ²						
		O.3.1							

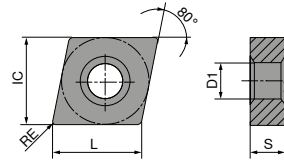
* Tensile Strength at Rupture (Rm)



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

CNMG

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



CNMG

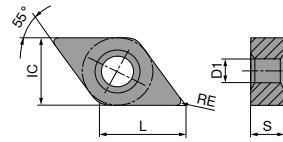
ISO	RE mm
120404EN	0.4
120408EN	0.8
120412EN	1.2

P	●	●
M	○	○
K	○	○
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S		
H		
O		

NEW	NEW
-CF20 CTEP110-P	-TFQ CTEP110-P
DRAGONSKIN	DRAGONSKIN
F CERMET CNMG	F CERMET CNMG
76 101 ...	76 110 ...
02801	02801
03001	03001
	03201

DNMG

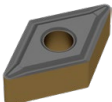
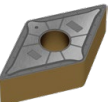
Designation	L mm	S mm	D1 mm	IC mm
DNMG 1104..	11.6	4.76	3.81	9.52
DNMG 1506..	15.5	6.35	5.16	12.70



DNMG

ISO	RE mm
110404EN	0.4
110408EN	0.8
150604EN	0.4
150608EN	0.8
150612EN	1.2

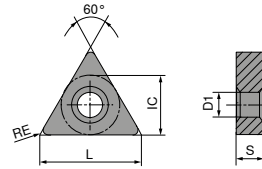
P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

NEW	NEW
-CF20 CTEP110-P	-TFQ CTEP110-P
DRAGONSKIN	DRAGONSKIN
○ ○ □	○ ○ □
	
F CERMET DNMG	F CERMET DNMG
76 102 ...	76 153 ...

00401	
00601	
02801	02801
03001	03001
03201	

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



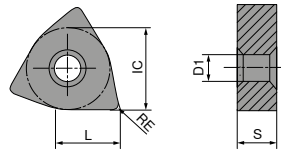
F
CERMET
TNMG

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



WNMG

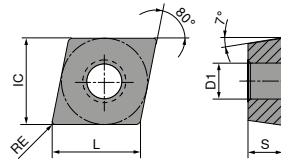
ISO	RE mm
060404EN	0.4
060408EN	0.8
080404EN	0.4
080408EN	0.8

P		
M		
K		
N		
S		
H		
O		

NEW	NEW
-CF20 CTEP110-P	-TFQ CTEP110-P
DRAGONSKIN	DRAGONSKIN
F CERMET WNMG	F CERMET WNMG
76 171 ...	76 177 ...
00401	
00601	00601
01801	01601
	01801

CCGT / CCMT

Designation	L mm	S mm	D1 mm	IC 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



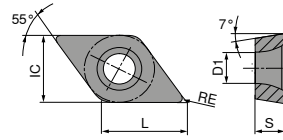
CCGT / CCMT

ISO	RE mm
060202EN	0.2
060204EN	0.4
09T302EN	0.2
09T304EN	0.4
09T308EN	0.8
120404EN	0.4
P	
M	
K	
N	
S	
H	
O	

	NEW	NEW
	-CF05 CTEP110-P	-CF55 CTEP110-P
	DRAGONSKIN	DRAGONSKIN
	F CERMET CCGT	F CERMET CCMT
	76 247 ...	76 248 ...
	00201	
	00401	00401
	01401	
	01601	01601
	01801	01801
	02001	02801
	●	●
	○	○
	○	○

DCGT / DCMT

Designation	L mm	S mm	D1 mm	IC 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

ISO	RE mm
070201EN	0.1
070202EN	0.2
070204EN	0.4
11T302EN	0.2
11T304EN	0.4
11T308EN	0.8

P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

NEW

-CF05
CTEP110-P

DRAGONSKIN

F
CERMET
DCGT

76 245 ...

NEW

-CF55
CTEP110-P

DRAGONSKIN

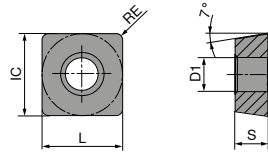
F
CERMET
DCMT

76 246 ...

00101	
00201	00201
00401	00401
01401	
01601	01601
01801	01801

SCGT / SCMT

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



SCGT / SCMT

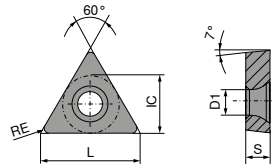
NEW	NEW
-CF05 CTEP110-P	-CF55 CTEP110-P
DRAGONSKIN	DRAGONSKIN
F CERMET SCGT	F CERMET SCMT
76 261 ...	76 260 ...
00401	00401
00601	00601

ISO	RE mm
09T304EN	0.4
09T308EN	0.8

P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

TCGT / TCMT



Designation	L mm	S mm	D1 mm	IC 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

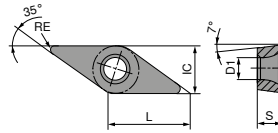
ISO	RE mm
110202EN	0.2
110204EN	0.4
110208EN	0.8
16T304EN	0.4
16T308EN	0.8

P	●	●
M	○	○
K	○	○
N		
S		
H		
O		

NEW	NEW
-CF05 CTEP110-P	-CF55 CTEP110-P
DRAGONSKIN	DRAGONSKIN
○ ○ □	○ ○ □
	
F CERMET TCGT	F CERMET TCMT
76 272 ...	76 266 ...
01401	
01601	01601
01801	
02801	
	03001

VCGT / VCMT

Designation	L mm	S mm	D1 mm	IC 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

ISO	RE mm	76 276 ...	76 292 ...
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			

NEW

-CF05
CTEP110-P

DRAGONSKIN

F
CERMET
VCGT

76 276 ...

NEW

-CF55
CTEP110-P

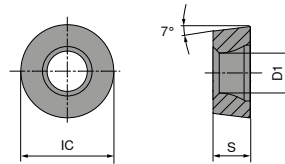
DRAGONSKIN

F
CERMET
VCMT

76 292 ...

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 ...

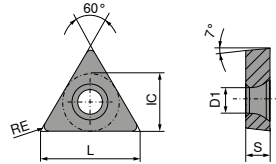
ISO	RE mm
0803M0SN	4

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 ...

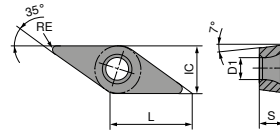
ISO	RE mm
16T302FN	0.2

72600

P	●
M	●
K	○
N	●
S	●
H	
O	○

VC GT

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



VC GT

ISO	RE mm
160402FN	0.2
160412FN	1.2

P	●	●
M	●	●
K		○
N	●	●
S	●	●
H		
O		○

-25P CTPX710	-27 CTPX715
DRAGONSKIN	DRAGONSKIN
○ ○ □	○ ○ □
M VC GT	M VC GT
70 282 ...	70 280 ...
72600	72600 73200

Cutting data standard values


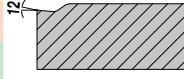

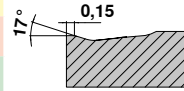
				CTCP115-P				
				DRAGONSKIN				
Material sub-group		Index	Tensile strength lbf/in ² / HB / HRC	v _c (m/min)				
P	Unalloyed steel	P.1.1	60900 lbf/in ² / 125 HB	500	P.1.1	370	340	275
		P.1.2	92800 lbf/in ² / 190 HB	440	P.1.2	315	300	235
		P.1.3	121800 lbf/in ² / 250 HB	380	P.1.3	270	260	200
		P.1.4	132000 lbf/in ² / 270 HB	360	P.1.4	250	250	190
		P.1.5	146500 lbf/in ² / 300 HB	330	P.1.5	230	235	170
	Low-alloy steel	P.2.1	88500 lbf/in ² / 180 HB	450	P.2.1	325	300	240
		P.2.2	134900 lbf/in ² / 275 HB	360	P.2.2	250	250	185
		P.2.3	146500 lbf/in ² / 300 HB	330	P.2.3	230	235	170
		P.2.4	174000 lbf/in ² / 375 HB	250	P.2.4	170	190	125
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in ² / 200 HB	380	P.3.1	200	150	140
		P.3.2	159500 lbf/in ² / 300 HB	310	P.3.2	140	95	80
		P.3.3	188500 lbf/in ² / 400 HB	230	P.3.3	85	35	25
	Stainless steel	P.4.1	98600 lbf/in ² / 200 HB	380	P.4.1	200	155	140
		P.4.2	117500 lbf/in ² / 250 HB	340	P.4.2	170	130	110
M	Stainless steel	M.1.1	88500 lbf/in ² / 200 HB	380	M.1.1		150	140
		M.2.1	300 HB		M.2.1		90	80
		M.3.1	113100 lbf/in ² / 230 HB		M.3.1		130	120
K	Grey cast iron	K.1.1	88500 lbf/in ² / 180 HB	450	K.1.1	255		200
		K.1.2	127600 lbf/in ² / 260 HB	340	K.1.2	235		160
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in ² / 160 HB	480	K.2.1	270		190
		K.2.2	122600 lbf/in ² / 250 HB	380	K.2.2	205		150
	Malleable iron	K.3.1	63800 lbf/in ² / 130 HB	460	K.3.1	250		210
		K.3.2	113100 lbf/in ² / 230 HB	280	K.3.2	210		180
N	Aluminum wrought alloy	N.1.1	60 HB		N.1.1		1840	1750
		N.1.2	49300 lbf/in ² / 100 HB		N.1.2		1600	1500
	Cast aluminum alloy	N.2.1	36300 lbf/in ² / 75 HB		N.2.1		1250	1200
		N.2.2	43500 lbf/in ² / 90 HB		N.2.2		1250	1200
		N.2.3	63800 lbf/in ² / 130 HB		N.2.3		750	700
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in ² / 110 HB		N.3.1		650	625
		N.3.2	43500 lbf/in ² / 90 HB		N.3.2		630	600
		N.3.3	49300 lbf/in ² / 100 HB		N.3.3		500	475
Magnesium alloys	N.4.1	70 HB		N.4.1		340	325	
S	Heat-resistant alloys	S.1.1	98600 lbf/in ² / 200 HB		S.1.1		110	40
		S.1.2	137800 lbf/in ² / 280 HB		S.1.2		85	30
		S.2.1	121800 lbf/in ² / 250 HB		S.2.1		75	30
		S.2.2	171100 lbf/in ² / 350 HB		S.2.2		45	25
		S.2.3	156600 lbf/in ² / 320 HB		S.2.3		45	20
	Titanium alloys	S.3.1	5800 lbf/in ²		S.3.1		100	110
		S.3.2	152300 lbf/in ²		S.3.2		60	70
S.3.3	203100 lbf/in ² / 410 HB		S.3.3		45	50		
H	Hardened steel	H.1.1	46-55 HRC		H.1.1			
		H.1.2	56-60 HRC		H.1.2			
		H.1.3	61-65 HRC		H.1.3			
		H.1.4	66-70 HRC		H.1.4			
	Chilled iron	H.2.1	400 HB		H.2.1			
	Hardened cast iron	H.3.1	55 HRC		H.3.1			
O	Non-metal materials	O.1.1	≤ 21800 lbf/in ²		O.1.1			140
		O.1.2	≤ 14500 lbf/in ²		O.1.2			
		O.2.1	≤ 145000 lbf/in ²		O.2.1			150
		O.2.2	≤ 145000 lbf/in ²		O.2.2			
		O.3.1			O.3.1			

* Tensile Strength at Rupture (Rm)


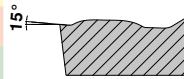

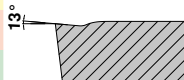


The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approximately ±20% according to the usage conditions.




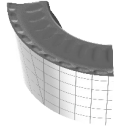


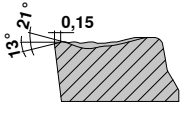
Standard chip breakers / application tips



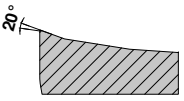



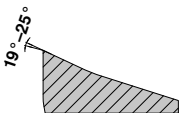
Negative		Model	Smooth cut	Interrupted cut	Interrupted cut	Cut		Geometry	
						a_p mm	f mm		
Main application steel and cast iron, secondary application stainless steels	-CF / -CF20		CTEP110-P / TCM10				0,30–1,50	0,07–0,25	CN.. DN.. TN.. WN..
	<ul style="list-style-type: none"> ▲ Finest finishing ▲ Sharp cutting edge for low cutting forces ▲ Good chip control even at small depths of cut 		CTEP110-P / TCM10						
Main application steel and cast iron, secondary application stainless steels	-TFQ		CTEP110-P / CTC115-P	CTCP115-P / CTC125-P			0,50–5,00	0,10–0,60	CN.. DN.. WN..
	<ul style="list-style-type: none"> ▲ Wiper geometry ▲ Finishing to medium machining ▲ Very high feeds ▲ High surface quality 		CTEP110-P	CTCP115-P / CTC125-P					

Positive

Main application steel and cast iron, secondary application stainless steels and super alloys	-CF05		CTEP110-P / TCM407	TCM10 / TCM407			0,20–1,30	0,06–0,25	CC.. DC.. SC.. TC.. VC..
	<ul style="list-style-type: none"> ▲ Fine finishing ▲ For all common steel materials, stainless steels, and nodular iron ▲ Good chip control ▲ High surface quality 		CTEP110-P	TCM10 / TCM407					
Main application steel and cast iron, secondary application stainless steels	-CF55		CTEP110-P	TCM10 / CTEP110-P			0,20–1,30	0,06–0,25	CC.. DC.. SC.. TC.. VC..
	<ul style="list-style-type: none"> ▲ Finishing to medium machining ▲ Suitable for general and stainless steels ▲ Low cutting force ▲ Good chip control ▲ High surface quality 		CTEP110-P	CTEP110-P					

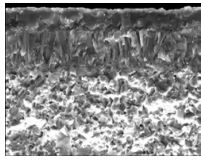
Standard chip breakers / application tips

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

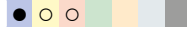
Positive									
Main application non-ferrous metals, secondary application stainless steels, steels, super alloys, cast iron	-25P	 	CTPX710	CTPX710			CC.. DC.. SC.. VC..		
	▲ Sharp cutting edge		CTPX710	CTPX710					
	▲ Good chip control with softer aluminum alloys		CTPX710 / H216T	CTPX710 / H216T	CTPX710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

Grade description

CTEP110-P



ISO | P10 | M10 | K05



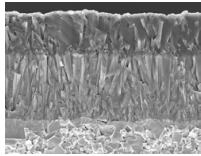
Specification:

Composition: Co/Ni 12.2%; additives 26.4%; Ti(C,N) balance | Grain size: 0.8-1.0 μm | Hardness: HV₃₀ 1650 | Layer system: CVD TiCN-Al₂O₃ + TiN cover layer

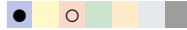
Usage recommendation:

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

CTCP115-P



ISO | P15 | K25



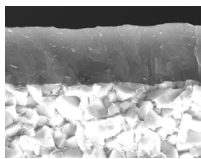
Specification:

Composition: Co 5.5%; mixed carbides 6.4%; WC balance | Grain size: 1 μm | Hardness: HV₃₀1530 | Layer system: CVD TiCN-Al₂O₃

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



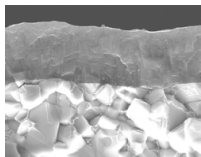
Specification:

Composition: Co 6.0%; WC balance | Grain size: 0.8 μm | Hardness: HV₃₀1820 | Layer system: PVD AlTiN

Usage recommendation:

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

CTPX715



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

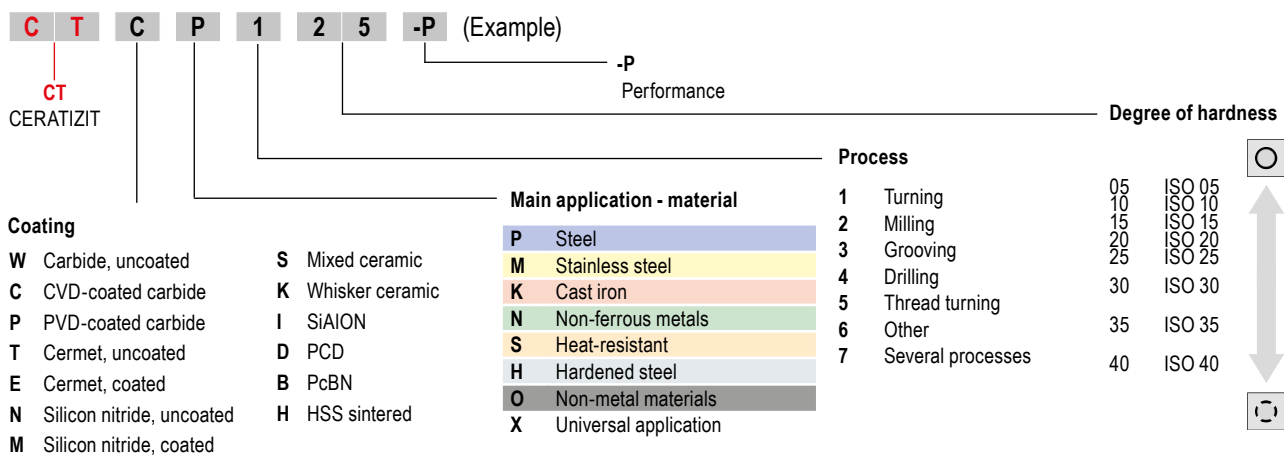


Specification:

Composition: Co 6.0%; WC balance | Grain size: 1 μm | Hardness: HV₃₀1650 | Layer system: PVD AlTiN

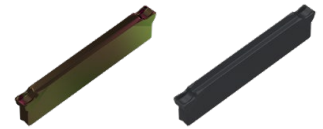
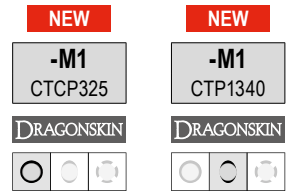
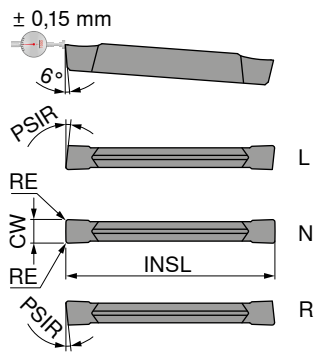
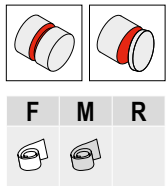
Usage recommendation:

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



Grooving insert GX 35

▲ For parting and parting off



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

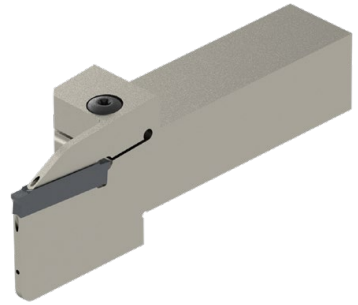
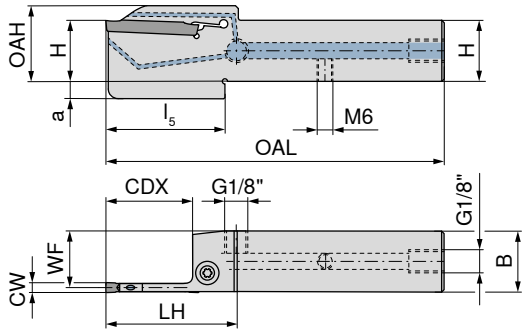
→ v_c Page 33

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

MonoClamp – Radial Monoholder GX-DC 35

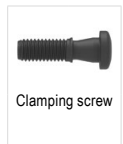
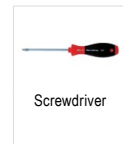
Scope of supply:

Monoholder includes key and clamping screw



Illustrations show right-hand versions

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	Right
E20 R/L 0034S3-2020X-S-DC-GX35	20	20	3	18.75	31	117	55	48	34	10	GX 35-E3.00	70 869 ... 32001	70 869 ... 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



Spare parts

For grooving inserts

GX 35-E3.00

80 950 ...	70 950 ...
T20 - IP	M6x22 - 20IP
129	92200



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

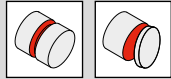
Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment	Tensile strength lbf/in ² / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C Annealed	60900 lbf/in ² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C Annealed	92800 lbf/in ² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3	< 0.45 % C Tempered	121800 lbf/in ² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C Annealed	132000 lbf/in ² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5	< 0.75 % C Tempered	146500 lbf/in ² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1	Annealed	88500 lbf/in ² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2	Tempered	134900 lbf/in ² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3	Tempered	146500 lbf/in ² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4	Tempered	174000 lbf/in ² / 375 HB	1.7225	4142	1.7223	4140
	High-alloy steel and high-alloy tool steel	P.3.1	Annealed	98600 lbf/in ² / 200 HB	1.4021	420	1.2379	D2
		P.3.2	Hardened and tempered	159500 lbf/in ² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3	Hardened and tempered	188500 lbf/in ² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic Annealed	98600 lbf/in ² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic Tempered	117500 lbf/in ² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic Quenched	88500 lbf/in ² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)	113100 lbf/in ² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic	88500 lbf/in ² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)	127600 lbf/in ² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic	78300 lbf/in ² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic	122600 lbf/in ² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic	63800 lbf/in ² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic	113100 lbf/in ² / 230 HB	0.8170	70003		
N	Aluminum wrought alloy	N.1.1	Non-hardenable	60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable	49300 lbf/in ² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminum alloy	N.2.1	≤ 12 % Si, non-hardenable	36300 lbf/in ² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable	43500 lbf/in ² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable	63800 lbf/in ² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %	54400 lbf/in ² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn	43500 lbf/in ² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper	49300 lbf/in ² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys	70 HB	3.5612	MgAl6Zn		
	S	Heat-resistant alloys	S.1.1	Fe - basis Annealed	98600 lbf/in ² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864
S.1.2			137800 lbf/in ² / 280 HB		1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
S.2.1			Ni or Co basis Annealed	121800 lbf/in ² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
S.2.2				171100 lbf/in ² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
S.2.3				Cast	156600 lbf/in ² / 320 HB	2.4674	Nimocast PK24	2.4670
Titanium alloys		S.3.1	Pure titanium	5800 lbf/in ²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys	152300 lbf/in ²	3.7165	TiAl6V4		
		S.3.3	Beta alloys	203100 lbf/in ² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr		
H	Hardened steel	H.1.1	Hardened and tempered	46-55 HRC				
		H.1.2	Hardened and tempered	56-60 HRC				
		H.1.3	Hardened and tempered	61-65 HRC				
		H.1.4	Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1	Cast	400 HB				
	Hardened cast iron	H.3.1	Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic	≤ 21800 lbf/in ²				
		O.1.2	Plastics, thermoplastic	≤ 14500 lbf/in ²				
		O.2.1	Aramid fibre-reinforced	≤ 145000 lbf/in ²				
		O.2.2	Glass/carbon-fibre reinforced	≤ 145000 lbf/in ²				
		O.3.1	Graphite					

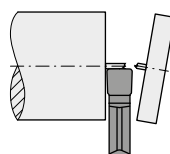
* Tensile Strength at Rupture (Rm)

Cutting data standard values for grooving inserts

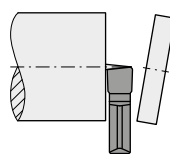
Index	GX	
	CTCP325	CTP1340
	DRAGONSKIN	
	v _c (m/min)	
P.1.1	220	180
P.1.2	195	150
P.1.3	170	125
P.1.4	165	115
P.1.5	150	100
P.2.1	200	155
P.2.2	160	110
P.2.3	150	100
P.2.4	120	70
P.3.1	150	110
P.3.2	95	75
P.3.3	45	40
P.4.1	150	110
P.4.2	125	95
M.1.1	150	110
M.2.1	95	80
M.3.1	135	100
K.1.1	170	150
K.1.2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

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

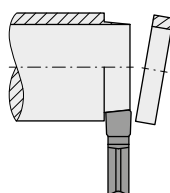
References for parting off



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

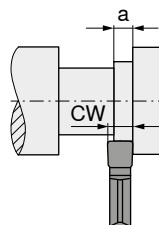


For "pip-free" parting off, use R or L inserts. To minimize lateral deflection forces, reduce the feed rate by approximately 20-50 %.

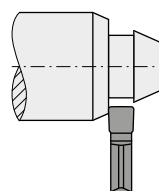


To prevent ring formation, use R or L inserts. Reduce feed "f" by approximately 20-50 % because of lateral deflection.

References for grooving



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



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

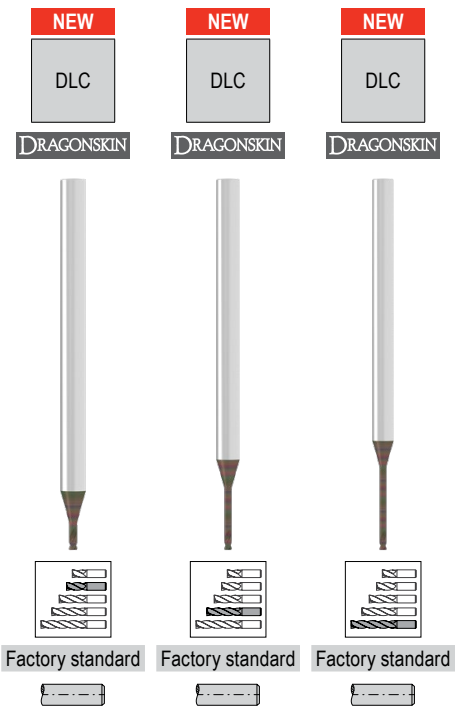
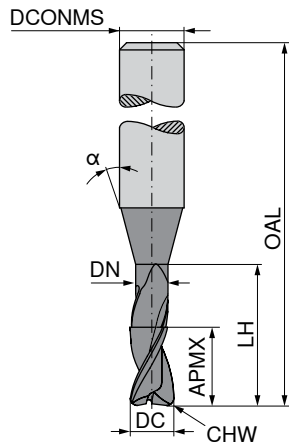
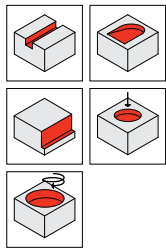
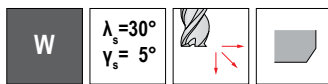


The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approximately ±20 % according to the usage conditions.

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▲ T_x = maximum depth of cut



DC _{0.01}	APMX	DN	LH	OAL	LPR	α°	DCONMS _{ns}	T _x	CHW	ZEPF
mm	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
0.2	0.2	0.18	1.0	45	17	15	4	5 x DC	0.02	2
0.2	0.2	0.18	1.6	45	17	15	4	8 x DC	0.02	2
0.2	0.2	0.18	2.0	50	22	15	4	10 x DC	0.02	2
0.3	0.3	0.28	0.9	45	17	15	4	3 x DC	0.03	2
0.3	0.3	0.28	1.5	45	17	15	4	5 x DC	0.03	2
0.3	0.3	0.28	2.4	50	22	15	4	8 x DC	0.03	2
0.3	0.3	0.28	3.0	50	22	15	4	10 x DC	0.03	2
0.4	0.4	0.37	1.2	45	17	15	4	3 x DC	0.04	2
0.4	0.4	0.37	2.0	45	17	15	4	5 x DC	0.04	2
0.4	0.4	0.37	3.2	50	22	15	4	8 x DC	0.04	2
0.4	0.4	0.37	4.0	50	22	15	4	10 x DC	0.04	2
0.5	0.5	0.45	1.5	45	17	15	4	3 x DC	0.05	2
0.5	0.5	0.45	1.5	45	17	15	3	3 x DC	0.05	2
0.5	0.5	0.45	2.5	45	17	15	4	5 x DC	0.05	2
0.5	0.5	0.45	2.5	45	17	15	3	5 x DC	0.05	2
0.5	0.5	0.45	4.0	45	17	15	3	8 x DC	0.05	2
0.5	0.5	0.45	4.0	50	22	15	4	8 x DC	0.05	2
0.5	0.5	0.45	5.0	50	22	15	3	10 x DC	0.05	2
0.5	0.5	0.45	5.0	50	22	15	4	10 x DC	0.05	2
0.6	0.6	0.58	2.0	45	17	15	4	3,3 x DC	0.06	2
0.6	0.6	0.58	3.0	50	22	15	4	5 x DC	0.06	2
0.6	0.6	0.58	5.0	50	22	15	4	8,3 x DC	0.06	2
0.6	0.6	0.58	6.0	50	22	15	4	10 x DC	0.06	2
0.8	0.8	0.77	2.5	45	17	15	4	3,1 x DC	0.08	2
0.8	0.8	0.77	4.0	50	22	15	4	5 x DC	0.08	2
0.8	0.8	0.77	6.5	50	22	15	4	8,1 x DC	0.08	2
0.8	0.8	0.77	8.0	50	22	15	4	10 x DC	0.08	2
1.0	1.0	0.95	3.0	45	17	15	4	3 x DC	0.10	2
1.0	1.0	0.95	3.0	45	17	15	3	3 x DC	0.10	2
1.0	1.0	0.95	5.0	45	17	15	3	5 x DC	0.10	2
1.0	1.0	0.95	5.0	50	22	15	4	5 x DC	0.10	2
1.0	1.0	0.95	8.0	50	22	15	3	8 x DC	0.10	2
1.0	1.0	0.95	8.0	50	22	15	4	8 x DC	0.10	2
1.0	1.0	0.95	10.0	50	22	15	3	10 x DC	0.10	2
1.0	1.0	0.95	10.0	55	27	15	4	10 x DC	0.10	2
1.0	1.0	0.95	12.0	55	27	15	3	12 x DC	0.10	2
1.0	1.0	0.95	12.0	55	27	15	4	12 x DC	0.10	2
1.2	1.2	1.15	3.0	45	17	15	4	2,5 x DC	0.10	2
1.2	1.2	1.15	6.0	50	22	15	4	5 x DC	0.10	2
1.2	1.2	1.15	10.0	55	27	15	4	8,3 x DC	0.10	2
1.2	1.2	1.15	12.0	55	27	15	4	10 x DC	0.10	2

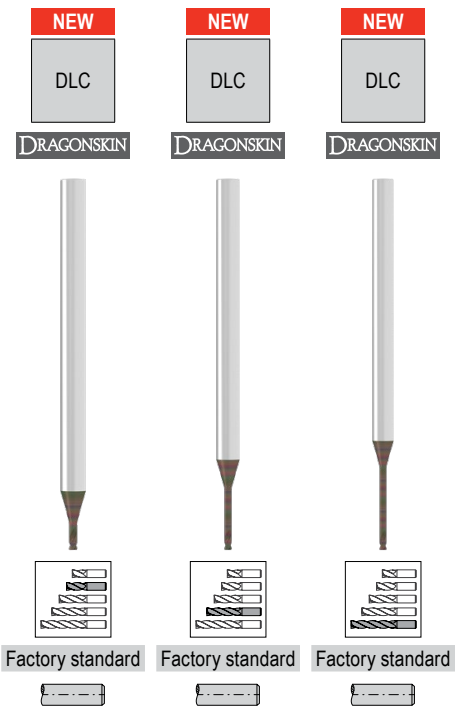
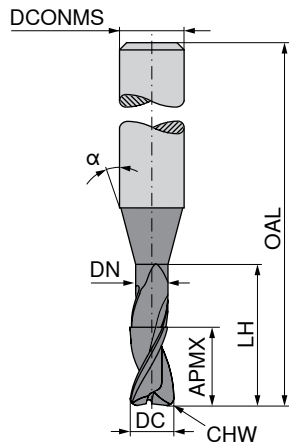
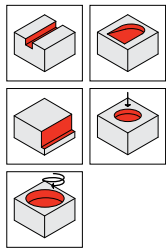
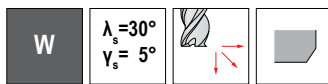
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02201		
	02301	02401
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03201		
	03301	03401
04101		
04201		
	04301	04401
05101		
05100		
05201		
05200		
	05300	05301
	05400	05401
06101		
06201		
	06301	06401
08101		
08201		
	08301	08401
10101		
10100		
10200		
10201		
	10300	
	10301	
	10400	
	10401	
		10500
		10501
12101		
12201		
	12301	
	12401	

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K			
N	•	•	•
S			
H			
O			

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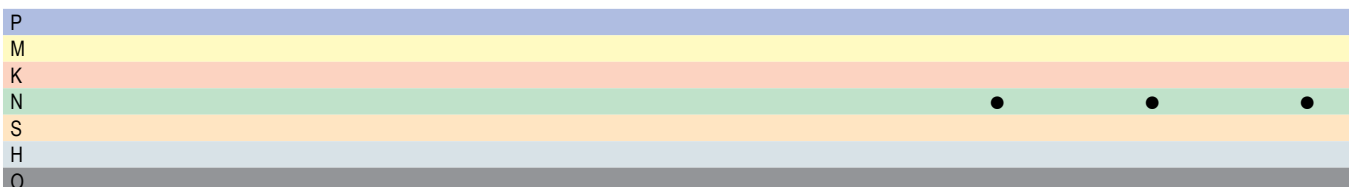
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▲ T_x = maximum depth of cut



DC _{0.01} mm	APMX mm	DN mm	LH mm	OAL mm	LPR mm	α°	DCONMS _{ns} mm	T_x	CHW mm	ZEPF
1.3	1.3	1.25	4.0	45	17	15	4	3,1 x DC	0.10	2
1.3	1.3	1.25	7.0	50	22	15	4	5,4 x DC	0.10	2
1.3	1.3	1.25	11.0	55	27	15	4	8,5 x DC	0.10	2
1.3	1.3	1.25	13.0	55	27	15	4	10 x DC	0.10	2
1.5	1.5	1.44	5.0	50	22	15	4	3,3 x DC	0.10	2
1.5	1.5	1.44	5.0	45	17	15	3	3,3 x DC	0.10	2
1.5	1.5	1.44	7.5	50	22	15	3	5 x DC	0.10	2
1.5	1.5	1.44	7.5	50	22	15	4	5 x DC	0.10	2
1.5	1.5	1.44	12.0	55	27	15	3	8 x DC	0.10	2
1.5	1.5	1.44	12.0	55	27	15	4	8 x DC	0.10	2
1.5	1.5	1.44	15.0	55	27	15	3	10 x DC	0.10	2
1.5	1.5	1.44	15.0	60	32	15	4	10 x DC	0.10	2
1.6	1.6	1.52	5.0	50	22	15	4	3,1 x DC	0.10	2
1.6	1.6	1.52	8.0	50	22	15	4	5 x DC	0.10	2
1.6	1.6	1.52	13.0	55	27	15	4	8,1 x DC	0.10	2
1.6	1.6	1.52	16.0	60	32	15	4	10 x DC	0.10	2
1.8	1.8	1.72	5.5	50	22	15	4	3,1 x DC	0.10	2
1.8	1.8	1.72	9.0	50	22	15	4	5 x DC	0.10	2
1.8	1.8	1.72	14.5	55	27	15	4	8,1 x DC	0.10	2
1.8	1.8	1.72	18.0	60	32	15	4	10 x DC	0.10	2
2.0	2.0	1.92	6.0	50	22	15	4	3 x DC	0.10	2
2.0	2.0	1.92	6.0	45	17	15	3	3 x DC	0.10	2
2.0	2.0	1.92	10.0	50	22	15	4	5 x DC	0.10	2
2.0	2.0	1.92	10.0	50	22	15	3	5 x DC	0.10	2
2.0	2.0	1.92	14.0	55	27	15	3	7 x DC	0.10	2
2.0	2.0	1.92	14.0	55	27	15	4	7 x DC	0.10	2
2.0	2.0	1.92	16.0	55	27	15	3	8 x DC	0.10	2
2.0	2.0	1.92	16.0	60	32	15	4	8 x DC	0.10	2
2.0	2.0	1.92	20.0	60	32	15	3	10 x DC	0.10	2
2.0	2.0	1.92	20.0	60	32	15	4	10 x DC	0.10	2
2.3	2.3	2.22	7.0	50	22	15	4	3 x DC	0.10	2
2.3	2.3	2.22	11.5	55	27	15	4	5 x DC	0.10	2
2.3	2.3	2.22	18.5	60	32	15	4	8 x DC	0.10	2
2.3	2.3	2.22	20.0	60	32	15	4	8,7 x DC	0.10	2
2.3	2.3	2.22	23.0	65	37	15	4	10 x DC	0.10	2
3.0	3.0	2.90	9.0	50	22	15	4	3 x DC	0.10	2
3.0	3.0	2.90	15.0	55	27	15	4	5 x DC	0.10	2
3.0	3.0	2.90	24.0	65	37	15	4	8 x DC	0.10	2
3.0	3.0	2.90	30.0	70	42	15	4	10 x DC	0.10	2

53 900 ...	53 900 ...	53 900 ...
13101		
	13201	
	13301	
	13401	
15101		
15100		
15200		
15201		
	15300	
	15301	
	15400	
	15401	
16101		
16201		
	16301	
	16401	
18101		
18201		
	18301	
	18401	
20101		
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	20301	
	20400	
	20401	
	20500	
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23101		
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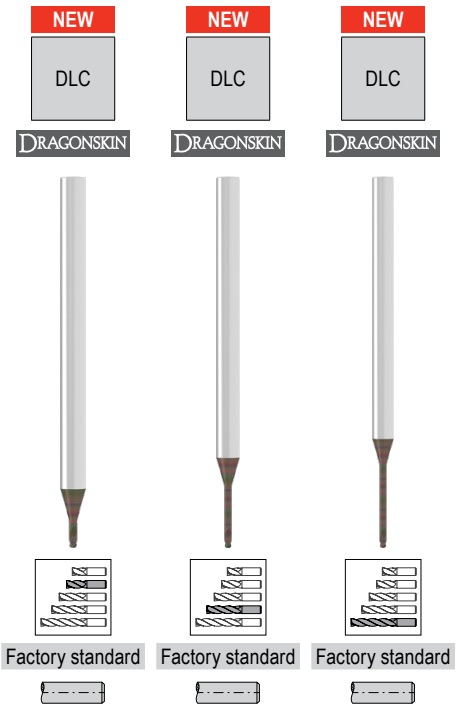
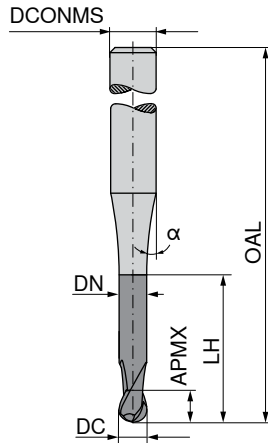
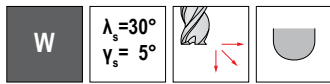


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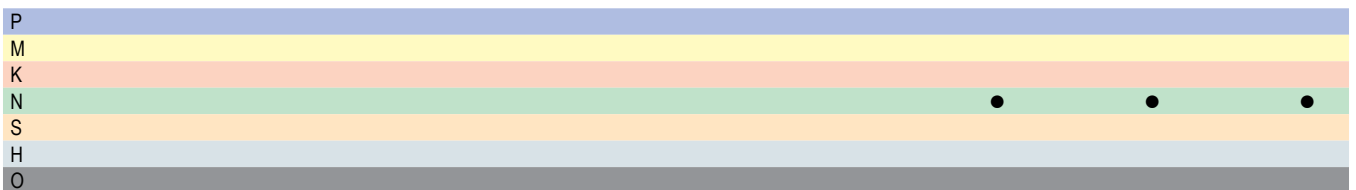
▲ Radius accuracy: ± 0,01 mm

▲ T_x = maximum engagement depth



DC _{±0,01}	APMX	DN	LH	OAL	LPR	α°	DCONMS _{±0,01}	T _x	ZEFP
mm	mm	mm	mm	mm	mm		mm		
0.2	0.2	0.18	0.6	45	17	15	4	3 x DC	2
0.2	0.2	0.18	1.0	45	17	15	4	5 x DC	2
0.2	0.2	0.18	1.6	45	17	15	4	8 x DC	2
0.2	0.2	0.18	2.0	50	22	15	4	10 x DC	2
0.3	0.3	0.28	0.9	45	17	15	4	3 x DC	2
0.3	0.3	0.28	1.5	45	17	15	4	5 x DC	2
0.3	0.3	0.28	2.4	50	22	15	4	8 x DC	2
0.3	0.3	0.28	3.0	50	22	15	4	10 x DC	2
0.4	0.4	0.37	1.2	45	17	15	4	3 x DC	2
0.4	0.4	0.37	2.0	45	17	15	4	5 x DC	2
0.4	0.4	0.37	3.2	50	22	15	4	8 x DC	2
0.4	0.4	0.37	4.0	50	22	15	4	10 x DC	2
0.5	0.5	0.45	1.5	45	17	15	4	3 x DC	2
0.5	0.5	0.45	1.5	45	17	15	3	3 x DC	2
0.5	0.5	0.45	2.5	45	17	15	4	5 x DC	2
0.5	0.5	0.45	2.5	45	17	15	3	5 x DC	2
0.5	0.5	0.45	4.0	45	17	15	3	8 x DC	2
0.5	0.5	0.45	4.0	50	22	15	4	8 x DC	2
0.5	0.5	0.45	5.0	50	22	15	3	10 x DC	2
0.5	0.5	0.45	5.0	50	22	15	4	10 x DC	2
0.6	0.6	0.58	2.0	45	17	15	4	3,3 x DC	2
0.6	0.6	0.58	3.0	50	22	15	4	5 x DC	2
0.6	0.6	0.58	5.0	50	22	15	4	8,3 x DC	2
0.6	0.6	0.58	6.0	50	22	15	4	10 x DC	2
0.8	0.8	0.77	2.5	45	17	15	4	3,1 x DC	2
0.8	0.8	0.77	4.0	50	22	15	4	5 x DC	2
0.8	0.8	0.77	6.5	50	22	15	4	8,1 x DC	2
0.8	0.8	0.77	8.0	50	22	15	4	10 x DC	2
1.0	1.0	0.95	3.0	45	17	15	4	3 x DC	2
1.0	1.0	0.95	3.0	45	17	15	3	3 x DC	2
1.0	1.0	0.95	5.0	45	17	15	3	5 x DC	2
1.0	1.0	0.95	5.0	50	22	15	4	5 x DC	2
1.0	1.0	0.95	8.0	50	22	15	3	8 x DC	2
1.0	1.0	0.95	8.0	50	22	15	4	8 x DC	2
1.0	1.0	0.95	10.0	50	22	15	3	10 x DC	2
1.0	1.0	0.95	10.0	55	27	15	4	10 x DC	2
1.0	1.0	0.95	12.0	55	27	15	3	12 x DC	2
1.0	1.0	0.95	12.0	55	27	15	4	12 x DC	2
1.2	1.2	1.15	3.0	45	17	15	4	2,5 x DC	2
1.2	1.2	1.15	6.0	50	22	15	4	5 x DC	2
1.2	1.2	1.15	10.0	55	27	15	4	8,3 x DC	2

53 903 ...	53 903 ...	53 903 ...
02101		
02201		
	02301	
	02401	
03101		
03201		
	03301	
	03401	
04101		
04201		
	04301	
	04401	
05101		
05100		
05201		
05200		
	05300	
	05301	
	05400	
	05401	
06101		
06201		
	06301	
	06401	
08101		
08201		
	08301	
	08401	
10101		
10100		
10200		
10201		
	10300	
	10301	
	10400	
	10401	
		10500
		10501
12101		
12201		
	12301	

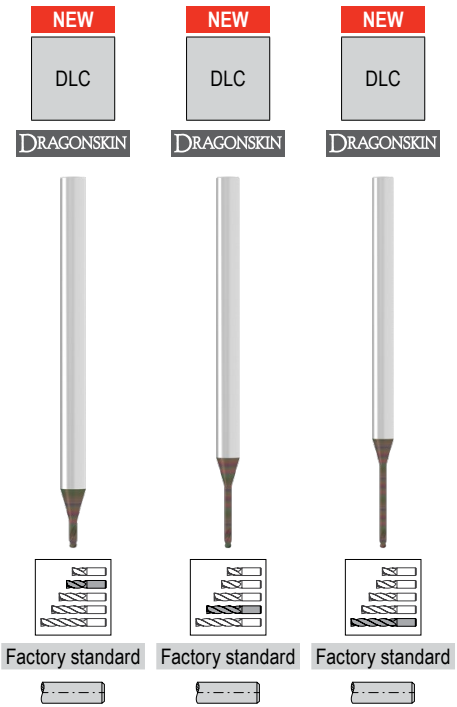
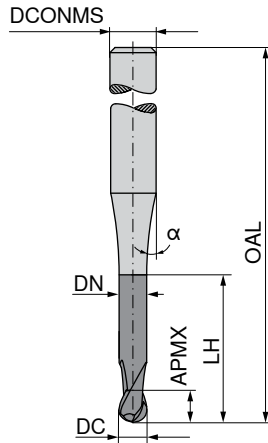
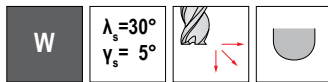


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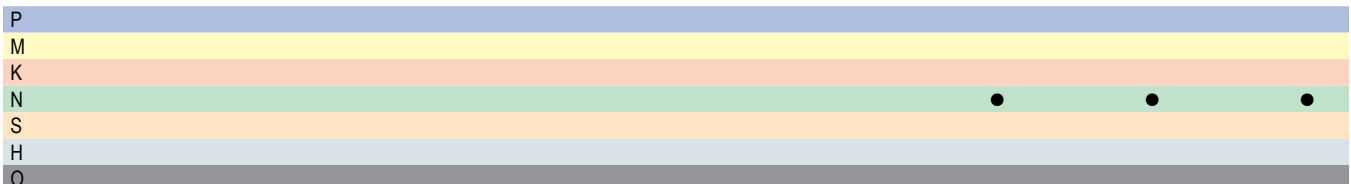
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▲ Radius accuracy: ± 0,01 mm

▲ T_x = maximum engagement depth



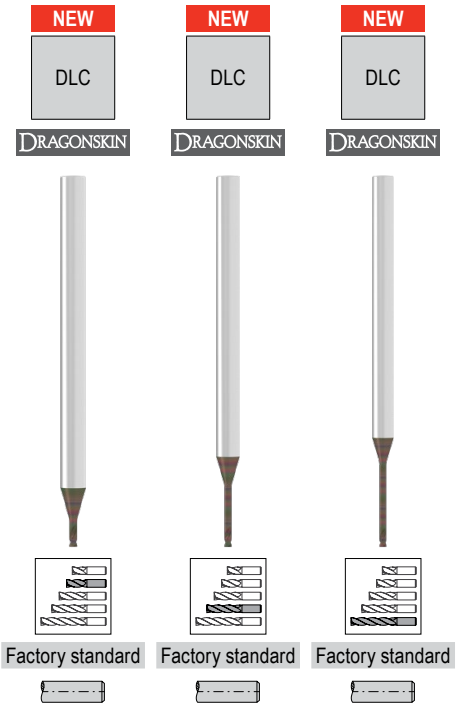
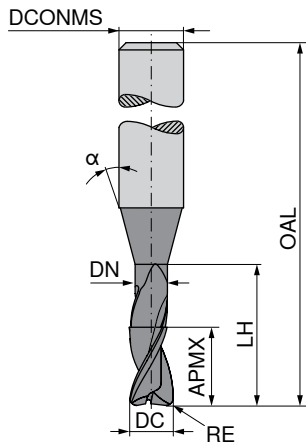
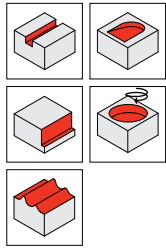
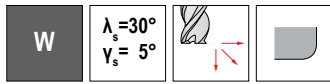
DC _{±0.01}	APMX	DN	LH	OAL	LPR	α°	DCONMS _{±0.05}	T _x	ZEFP	53 903 ...	53 903 ...	53 903 ...
mm	mm	mm	mm	mm	mm		mm					
1.2	1.2	1.15	12.0	55	27	15	4	10 x DC	2			
1.3	1.3	1.25	4.0	45	17	15	4	3,1 x DC	2	13101		12401
1.3	1.3	1.25	7.0	50	22	15	4	5,4 x DC	2			13201
1.3	1.3	1.25	11.0	55	27	15	4	8,5 x DC	2			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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▲ T_x = maximum depth of cut



DC _{-0.01} mm	RE _{±0.01} mm	APMX mm	DN mm	LH mm	OAL mm	LPR mm	α°	DCONMS _{h5} mm	T_x	ZEFP
0.2	0.02	0.2	0.18	0.6	45	17	15	4	3 x DC	2
0.2	0.02	0.2	0.18	1.0	45	17	15	4	5 x DC	2
0.2	0.02	0.2	0.18	1.6	45	17	15	4	8 x DC	2
0.2	0.02	0.2	0.18	2.0	50	22	15	4	10 x DC	2
0.3	0.03	0.3	0.28	0.9	45	17	15	4	3 x DC	2
0.3	0.03	0.3	0.28	1.5	45	17	15	4	5 x DC	2
0.3	0.03	0.3	0.28	2.4	50	22	15	4	8 x DC	2
0.3	0.03	0.3	0.28	3.0	50	22	15	4	10 x DC	2
0.4	0.04	0.4	0.37	1.2	45	17	15	4	3 x DC	2
0.4	0.04	0.4	0.37	2.0	45	17	15	4	5 x DC	2
0.4	0.04	0.4	0.37	3.2	50	22	15	4	8 x DC	2
0.4	0.04	0.4	0.37	4.0	50	22	15	4	10 x DC	2
0.5	0.05	0.5	0.45	1.5	45	17	15	4	3 x DC	2
0.5	0.05	0.5	0.45	1.5	45	17	15	3	3 x DC	2
0.5	0.05	0.5	0.45	2.5	45	17	15	4	5 x DC	2
0.5	0.05	0.5	0.45	2.5	45	17	15	3	5 x DC	2
0.5	0.05	0.5	0.45	4.0	45	17	15	3	8 x DC	2
0.5	0.05	0.5	0.45	4.0	50	22	15	4	8 x DC	2
0.5	0.05	0.5	0.45	5.0	50	22	15	3	10 x DC	2
0.5	0.05	0.5	0.45	5.0	50	22	15	4	10 x DC	2
0.6	0.06	0.6	0.58	2.0	45	17	15	4	3,3 x DC	2
0.6	0.06	0.6	0.58	3.0	50	22	15	4	5 x DC	2
0.6	0.06	0.6	0.58	4.2	50	22	15	4	7 x DC	2
0.6	0.06	0.6	0.58	5.0	50	22	15	4	8,3 x DC	2
0.6	0.06	0.6	0.58	6.0	50	22	15	4	10 x DC	2
0.8	0.08	0.8	0.77	2.5	45	17	15	4	3,1 x DC	2
0.8	0.08	0.8	0.77	4.0	50	22	15	4	5 x DC	2
0.8	0.08	0.8	0.77	6.5	50	22	15	4	8,1 x DC	2
0.8	0.08	0.8	0.77	8.0	50	22	15	4	10 x DC	2
1.0	0.10	1.0	0.95	3.0	45	17	15	4	3 x DC	2
1.0	0.10	1.0	0.95	3.0	45	17	15	3	3 x DC	2
1.0	0.10	1.0	0.95	5.0	45	17	15	3	5 x DC	2
1.0	0.10	1.0	0.95	5.0	50	22	15	4	5 x DC	2
1.0	0.10	1.0	0.95	8.0	50	22	15	3	8 x DC	2
1.0	0.10	1.0	0.95	8.0	50	22	15	4	8 x DC	2
1.0	0.10	1.0	0.95	10.0	50	22	15	3	10 x DC	2
1.0	0.10	1.0	0.95	10.0	55	27	15	4	10 x DC	2
1.0	0.10	1.0	0.95	12.0	55	27	15	3	12 x DC	2
1.0	0.10	1.0	0.95	12.0	55	27	15	4	12 x DC	2
1.2	0.12	1.2	1.15	3.0	45	17	15	4	2,5 x DC	2
1.2	0.12	1.2	1.15	6.0	50	22	15	4	5 x DC	2
1.2	0.12	1.2	1.15	10.0	55	27	15	4	8,3 x DC	2

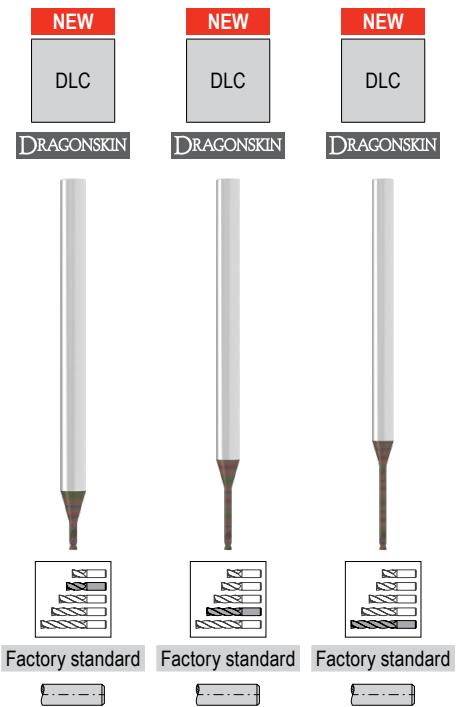
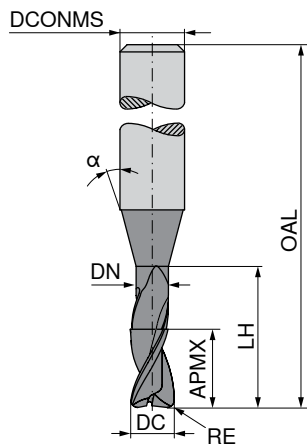
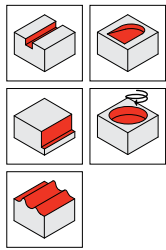
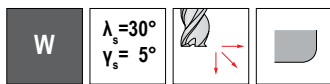
53 901 ...	53 901 ...	53 901 ...
02101		
02201		
	02301	
	02401	
03101		
03201		
	03301	
	03401	
04101		
04201		
	04301	
	04401	
05101		
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	05300	
	05301	
	05400	
	05401	
06101		
06201		
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	06501	
08101		
08201		
	08301	
	08401	
10101		
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10201		
	10300	
	10301	
	10400	
	10401	
		10500
		10501
12101		
12201		
	12301	



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▲ T_x = maximum depth of cut



DC _{-0.01} mm	RE _{±0.01} mm	APMX mm	DN mm	LH mm	OAL mm	LPR mm	α°	DCONMS _{h5} mm	T _x	ZEFP
1.2	0.12	1.2	1.15	12.0	55	27	15	4	10 x DC	2
1.3	0.13	1.3	1.25	4.0	45	17	15	4	3,1 x DC	2
1.3	0.13	1.3	1.25	7.0	50	22	15	4	5,4 x DC	2
1.3	0.13	1.3	1.25	11.0	55	27	15	4	8,5 x DC	2
1.3	0.13	1.3	1.25	13.0	55	27	15	4	10 x DC	2
1.5	0.15	1.5	1.44	5.0	50	22	15	4	3,3 x DC	2
1.5	0.15	1.5	1.44	5.0	45	17	15	3	3,3 x DC	2
1.5	0.15	1.5	1.44	7.5	50	22	15	3	5 x DC	2
1.5	0.15	1.5	1.44	7.5	50	22	15	4	5 x DC	2
1.5	0.15	1.5	1.44	12.0	55	27	15	3	8 x DC	2
1.5	0.15	1.5	1.44	12.0	55	27	15	4	8 x DC	2
1.5	0.15	1.5	1.44	15.0	55	27	15	3	10 x DC	2
1.5	0.15	1.5	1.44	15.0	60	32	15	4	10 x DC	2
1.6	0.16	1.6	1.52	5.0	50	22	15	4	3,1 x DC	2
1.6	0.16	1.6	1.52	8.0	50	22	15	4	5 x DC	2
1.6	0.16	1.6	1.52	13.0	55	27	15	4	8,1 x DC	2
1.6	0.16	1.6	1.52	16.0	60	32	15	4	10 x DC	2
1.8	0.18	1.8	1.72	5.5	50	22	15	4	3,1 x DC	2
1.8	0.18	1.8	1.72	9.0	50	22	15	4	5 x DC	2
1.8	0.18	1.8	1.72	14.5	55	27	15	4	8,1 x DC	2
1.8	0.18	1.8	1.72	18.0	60	32	15	4	10 x DC	2
2.0	0.20	2.0	1.92	6.0	50	22	15	4	3 x DC	2
2.0	0.20	2.0	1.92	6.0	45	17	15	3	3 x DC	2
2.0	0.20	2.0	1.92	10.0	50	22	15	4	5 x DC	2
2.0	0.20	2.0	1.92	10.0	50	22	15	3	5 x DC	2
2.0	0.20	2.0	1.92	14.0	55	27	15	3	7 x DC	2
2.0	0.20	2.0	1.92	14.0	55	27	15	4	7 x DC	2
2.0	0.20	2.0	1.92	16.0	55	27	15	3	8 x DC	2
2.0	0.20	2.0	1.92	16.0	60	32	15	4	8 x DC	2
2.0	0.20	2.0	1.92	20.0	60	32	15	3	10 x DC	2
2.0	0.20	2.0	1.92	20.0	60	32	15	4	10 x DC	2
2.3	0.23	2.3	2.22	7.0	50	22	15	4	3 x DC	2
2.3	0.23	2.3	2.22	11.5	55	27	15	4	5 x DC	2
2.3	0.23	2.3	2.22	14.0	55	27	15	4	6,1 x DC	2
2.3	0.23	2.3	2.22	18.5	60	32	15	4	8 x DC	2
2.3	0.23	2.3	2.22	20.0	60	32	15	4	8,7 x DC	2
2.3	0.23	2.3	2.22	23.0	65	37	15	4	10 x DC	2
3.0	0.30	3.0	2.90	9.0	50	22	15	4	3 x DC	2
3.0	0.30	3.0	2.90	15.0	55	27	15	4	5 x DC	2
3.0	0.30	3.0	2.90	24.0	65	37	15	4	8 x DC	2
3.0	0.30	3.0	2.90	30.0	70	42	15	4	10 x DC	2

53 901 ...	53 901 ...	53 901 ...
13101	12401	
	13201	
	13301	
	13401	
15101		
15100		
15200		
15201		
	15300	
	15301	
	15400	
	15401	
16101		
16201		
	16301	
	16401	
18101		
18201		
	18301	
	18401	
20101		
20100		
20201		
20200		
	20300	
	20301	
	20400	
	20401	
	20500	
	20501	
23101		
23201		
	23301	
	23401	
	23501	
	23601	
30101		
30201		
	30301	
	30401	

P			
M			
K			
N	•	•	•
S			
H			
O			

Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment	Tensile strength lbf/in ² / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C Annealed	60900 lbf/in ² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C Annealed	92800 lbf/in ² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3	< 0.45 % C Tempered	121800 lbf/in ² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C Annealed	132000 lbf/in ² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5	< 0.75 % C Tempered	146500 lbf/in ² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1	Annealed	88500 lbf/in ² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2	Tempered	134900 lbf/in ² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3	Tempered	146500 lbf/in ² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4	Tempered	174000 lbf/in ² / 375 HB	1.7225	4142	1.7223	4140
	High-alloy steel and high-alloy tool steel	P.3.1	Annealed	98600 lbf/in ² / 200 HB	1.4021	420	1.2379	D2
		P.3.2	Hardened and tempered	159500 lbf/in ² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3	Hardened and tempered	188500 lbf/in ² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic Annealed	98600 lbf/in ² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic Tempered	117500 lbf/in ² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic Quenched	88500 lbf/in ² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)	113100 lbf/in ² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic	88500 lbf/in ² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)	127600 lbf/in ² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic	78300 lbf/in ² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic	122600 lbf/in ² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic	63800 lbf/in ² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic	113100 lbf/in ² / 230 HB	0.8170	70003		
N	Aluminum wrought alloy	N.1.1	Non-hardenable	60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable	49300 lbf/in ² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminum alloy	N.2.1	≤ 12 % Si, non-hardenable	36300 lbf/in ² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable	43500 lbf/in ² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable	63800 lbf/in ² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %	54400 lbf/in ² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn	43500 lbf/in ² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper	49300 lbf/in ² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys	70 HB	3.5612	MgAl6Zn		
S	Heat-resistant alloys	S.1.1	Fe - basis Annealed	98600 lbf/in ² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2		137800 lbf/in ² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis Annealed	121800 lbf/in ² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2		171100 lbf/in ² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in ² / 320 HB	2.4674	Nimocast PK24	2.4670
	Titanium alloys	S.3.1	Pure titanium	5800 lbf/in ²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys	152300 lbf/in ²	3.7165	TiAl6V4		
S.3.3		Beta alloys	203100 lbf/in ² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr			
H	Hardened steel	H.1.1	Hardened and tempered	46-55 HRC				
		H.1.2	Hardened and tempered	56-60 HRC				
		H.1.3	Hardened and tempered	61-65 HRC				
		H.1.4	Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1	Cast	400 HB				
	Hardened cast iron	H.3.1	Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic	≤ 21800 lbf/in ²				
		O.1.2	Plastics, thermoplastic	≤ 14500 lbf/in ²				
		O.2.1	Aramid fibre-reinforced	≤ 145000 lbf/in ²				
		O.2.2	Glass/carbon-fibre reinforced	≤ 145000 lbf/in ²				
		O.3.1	Graphite					

* Tensile Strength at Rupture (Rm)

Cutting data standard values – AluLine – micro cutter

Index	T _x ≤ 3xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
	v _c (mm)	a _{p,max} x DC	a _{e,max} x DC	Ø DC (mm) =									Emulsion	Compressed air	MMS
				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			
				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		
	v _c (mm)	a _{p,max} x DC	a _{e,max} x DC	Ø DC (mm) =									Emulsion	Compressed air	MMS
				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			
				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		
	v _c (mm)	a _{p,max} x DC	a _{e,max} x DC	Ø DC (mm) =									Emulsion	Compressed air	MMS
				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			
				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 _r > 7xDC – 9xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
	v _c (mm)	a _{p,max} x DC	a _{e,max} x DC	Ø DC (mm) =									Emulsion	Compressed air	MMS
				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			
				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															

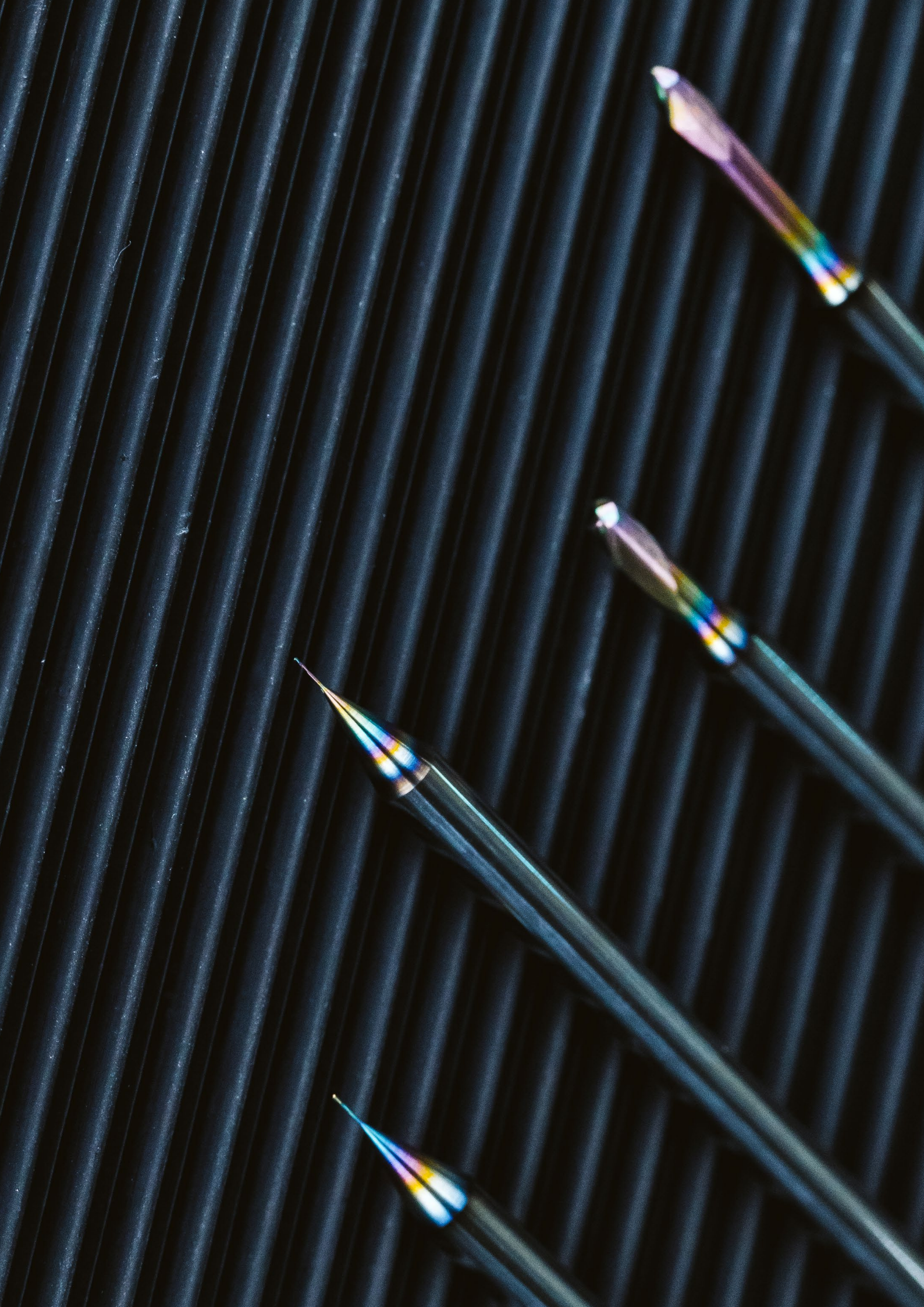


Plunging angle for ramping and helical milling = 1°

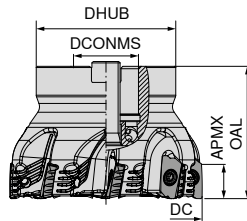
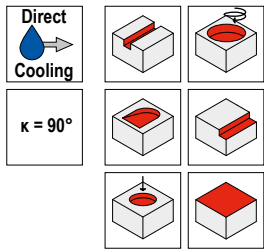
Index	T _r > 9xDC – 12xDC			53 900 ... / 53 901 ... / 53 903 ...									● 1st choice ○ Suitable		
	v _c (mm)	a _{p,max} x DC	a _{e,max} x DC	Ø DC (mm) =									Emulsion	Compressed air	MMS
				0,2	> Ø 0,2 ≤ Ø 0,4	> Ø 0,4 ≤ Ø 0,6	> Ø 0,6 ≤ Ø 0,8	> Ø 0,8 ≤ Ø 1,0	> Ø 1,0 ≤ Ø 1,2	> Ø 1,2 ≤ Ø 1,5	> Ø 1,5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



Plunging angle for ramping and helical milling = 1°



MaxiMill – 211-15-DC face mill



NEW

50 798 ...

Designation	DC mm	ZNF	APMX mm	OAL mm	DCONMS _{H6} mm	DHUB mm	RPMX 1/min.	Tightening torque Nm	Indexable 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

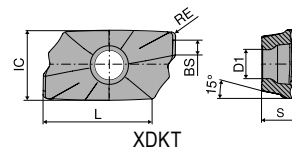
40 - 80

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

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

XDKT

Designation	IC mm	D1 mm	L mm	BS mm	S 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

ISO	RE mm
150508ER	0.8
150532ER	3.2
150540ER	4.0

P		
M		
K		
N		
S		
H		
O		

NEW	NEW
-F40 CTCS245	-F40 CTC5240
DRAGONSKIN	DRAGONSKIN
	
F XDKT	F XDKT
51 165 ...	51 165 ...
50801	10801
53201	13201
54001	14001

Cutting data standard values

			CTC5240		CTCS245		
			DRAGONSKIN		DRAGONSKIN		
							
			Cutting material hard (v _c ↑) → tough (v _c ↓)				
			v _c (m/min)				
Material sub-group	Index	Tensile strength lbf/in ² * / HB / HRC					
P	Unalloyed steel	P.1.1	60900 lbf/in ² / 125 HB				
		P.1.2	92800 lbf/in ² / 190 HB				
		P.1.3	121800 lbf/in ² / 250 HB				
		P.1.4	132000 lbf/in ² / 270 HB				
		P.1.5	146500 lbf/in ² / 300 HB				
	Low-alloy steel	P.2.1	88500 lbf/in ² / 180 HB				
		P.2.2	134900 lbf/in ² / 275 HB				
		P.2.3	146500 lbf/in ² / 300 HB				
		P.2.4	174000 lbf/in ² / 375 HB				
	High-alloy steel and high-alloy tool steel	P.3.1	98600 lbf/in ² / 200 HB				
		P.3.2	159500 lbf/in ² / 300 HB				
		P.3.3	188500 lbf/in ² / 400 HB				
	Stainless steel	P.4.1	98600 lbf/in ² / 200 HB				
		P.4.2	117500 lbf/in ² / 250 HB				
M	Stainless steel	M.1.1	88500 lbf/in ² / 200 HB				
		M.2.1	300 HB				
		M.3.1	113100 lbf/in ² / 230 HB				
K	Grey cast iron	K.1.1	88500 lbf/in ² / 180 HB				
		K.1.2	127600 lbf/in ² / 260 HB				
	Spherulitic graphite cast iron	K.2.1	78300 lbf/in ² / 160 HB				
		K.2.2	122600 lbf/in ² / 250 HB				
	Malleable iron	K.3.1	63800 lbf/in ² / 130 HB				
		K.3.2	113100 lbf/in ² / 230 HB				
N	Aluminum wrought alloy	N.1.1	60 HB				
		N.1.2	49300 lbf/in ² / 100 HB				
	Cast aluminum alloy	N.2.1	36300 lbf/in ² / 75 HB				
		N.2.2	43500 lbf/in ² / 90 HB				
		N.2.3	63800 lbf/in ² / 130 HB				
	Copper and copper alloys (bronze/brass)	N.3.1	54400 lbf/in ² / 110 HB				
		N.3.2	43500 lbf/in ² / 90 HB				
		N.3.3	49300 lbf/in ² / 100 HB				
N.4.1	Magnesium alloys	70 HB					
S	Heat-resistant alloys	S.1.1	98600 lbf/in ² / 200 HB	80		64	
		S.1.2	137800 lbf/in ² / 280 HB	70		56	
		S.2.1	121800 lbf/in ² / 250 HB	35		28	
		S.2.2	171100 lbf/in ² / 350 HB	25		20	
		S.2.3	156600 lbf/in ² / 320 HB	30		24	
	Titanium alloys	S.3.1	5800 lbf/in ²	80		64	
		S.3.2	152300 lbf/in ²	50		40	
S.3.3	203100 lbf/in ² / 410 HB	40		32			
H	Hardened steel	H.1.1	46-55 HRC				
		H.1.2	56-60 HRC				
		H.1.3	61-65 HRC				
		H.1.4	66-70 HRC				
	Chilled iron	H.2.1	400 HB				
Hardened cast iron	H.3.1	55 HRC					
O	Non-metal materials	O.1.1	≤ 21800 lbf/in ²				
		O.1.2	≤ 14500 lbf/in ²				
		O.2.1	≤ 145000 lbf/in ²				
		O.2.2	≤ 145000 lbf/in ²				
		O.3.1					

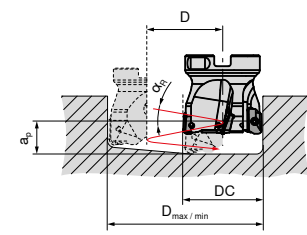
* Tensile Strength at Rupture (Rm)



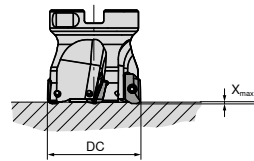
The cutting data is strongly influenced by external conditions, such as the stability of the tool and workpiece clamping, material and type of machine. The specified values represent guideline cutting data that can be adjusted by approximately ±20 % according to the usage conditions.

MaxiMill 211-15 system

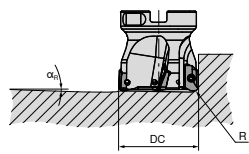
Machining strategy



① Helical plunging



② Axial ramping



③ Angled ramping



DC mm	Maximum speed related to overhang length		
	$l_a = 2 \times \varnothing$ mm	$l_a = 3 \times \varnothing$ mm	$l_a = 5 \times \varnothing$ 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		

DC mm	① Helical plunging		② Axial ramping	③ Angled ramping
	RE = 0,8 mm		X_{max}	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		

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

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

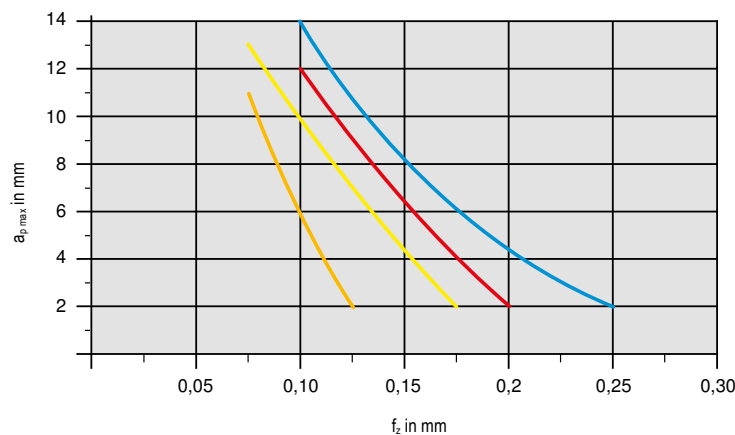
a_p mm = $D \times \pi \times \tan(\alpha_R) =$ Pitch

l_a in mm = Overhang length

Starting parameters



XDKT 15



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

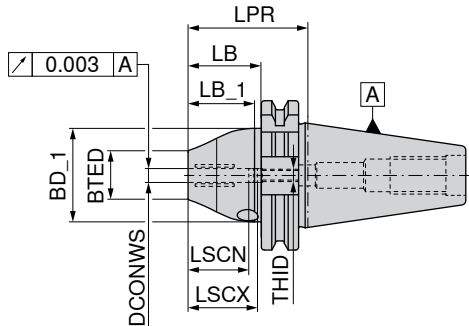
① Detailed information on cutting speed for each grade can be found on → page 46
From $v_c > 1300$ SFM, the tool must be balanced!

HyPower – Rough

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

Scope of supply:

Base body with backstop screw and pressure screw



NEW



AD/B
G 2.5 n_{max} 25000

84 254 ...

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



80 397 ...



83 950 ...






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	 → 58, 60	 → 284
Reduction sleeve	Pull studs	Others

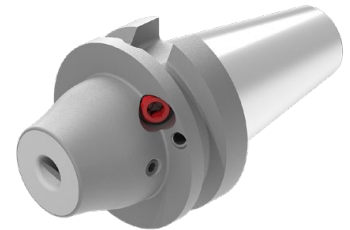
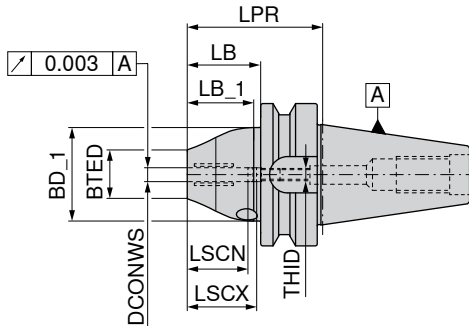
Accessories can be found in the clamping technology catalog → **Chapter 16, Adapters and accessories**

HyPower – Rough

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

Scope of supply:

Base body with backstop screw and pressure screw



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
BT 30	8	54	28	46	29.0	34	37	27	M6
BT 30	10	54	30	50	23.5	34	41	31	M8X1
BT 30	12	54	32	50	23.5	34	46	36	M10X1
BT 30	16	69	38	55	38.5	49	49	39	M12X1
BT 30	20	69	38	58	38.5	49	51	41	M12X1
BT 40	25	100	38	57	44.6	75	57	47	M16X1
BT 40	32	105	38	62	50.0	80	61	51	M16X1

10670
10870
11070
11270
11670
12070

12569
13269



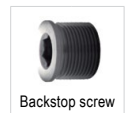
Clamping key T

80 397 ...



Pressure screw

83 950 ...



Backstop screw
with internal
cooling

83 950 ...

Spare parts

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

Accessories

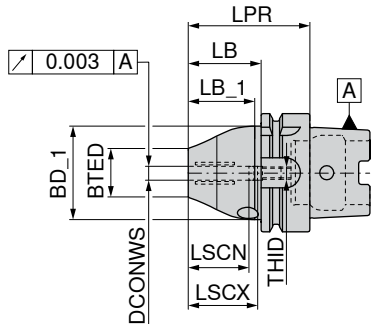
 → 282	 → 110+111	 → 284
Reduction sleeve	Pull studs	Others
Accessories can be found in the clamping technology catalog → Chapter 16, Adaptors and accessories		

HyPower – Rough

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

Scope of supply:

Base body with backstop screw and pressure screw



AD
G 2.5 n_{max} 25000

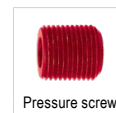
84 254 ...

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



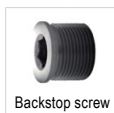
Clamping key T

80 397 ...



Pressure screw

83 950 ...






Backstop screw with internal cooling

83 950 ...

Spare parts

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

Accessories

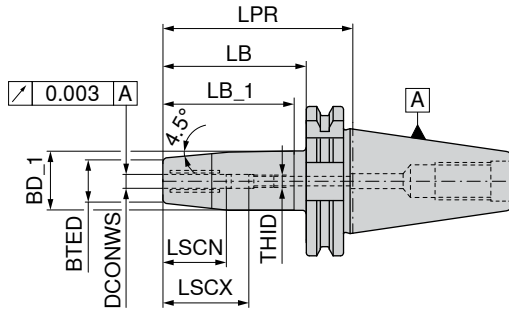
 → 282	 → 156	 → 284
Reduction sleeve	Coolant transfer pipes	Others
Accessories can be found in the clamping technology catalog → Chapter 16, Adaptors and accessories		

HyPower – Access 4.5°

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

Scope of supply:

Base body with backstop screw and pressure screw



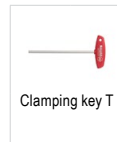
NEW



AD/B
G 2.5 n_{max} 25000

84 255 ...

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



Clamping key T

80 397 ...



Pressure screw

83 950 ...






Backstop screw with internal cooling

83 950 ...

Spare parts

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

Accessories

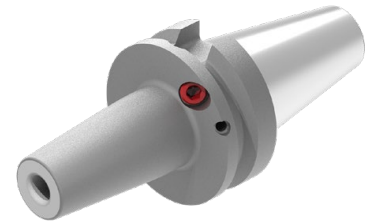
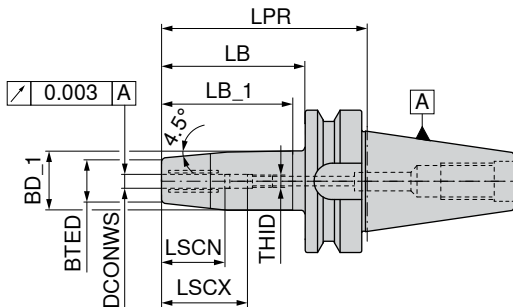
 → 282	 → 58, 60	 → 284
Reduction sleeve	Pull studs	Others
Accessories can be found in the clamping technology catalog → Chapter 16, Adaptors and accessories		

HyPower – Access 4.5°

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

Scope of supply:

Base body with backstop screw and pressure screw



NEW



AD

G 2.5 n_{max} 25000

84 255 ...

NEW

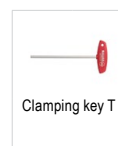


AD/B

G 2.5 n_{max} 25000

84 255 ...

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



80 397 ...



83 950 ...






83 950 ...

Spare parts
DCONWS

6	SW5	050	M10x12	55000		
6	SW5	050	M10x12	55000	M5x12,5 - SW2,5	418
8	SW5	050	M10x12	55000		
8	SW5	050	M10x12	55000	M6x12,5 - SW3	419
10	SW5	050	M10x12	55000	M8x1x13,5 - SW3	420
10	SW5	050	M10x12	55000		
12	SW5	050	M10x12	55000	M10x1x13,5 - SW5	421
12	SW5	050	M10x12	55000		
16	SW5	050	M10x12	55000	M10x1x13,5 - SW5	421
16	SW5	050	M10x12	55000		
20	SW5	050	M10x12	55000		
20	SW5	050	M10x12	55000	M10x1x13,5 - SW5	421

Accessories

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

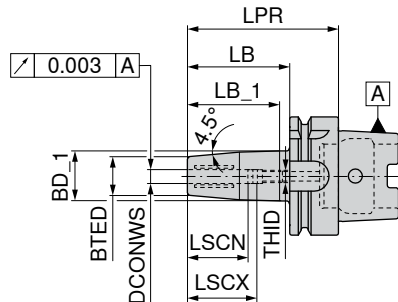
Accessories can be found in the clamping technology catalog
→ **Chapter 16, Adaptors and accessories**

HyPower – Access 4.5°

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

Scope of supply:

Base body with backstop screw and pressure screw



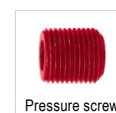
AD
G 2.5 n_{max} 25000

84 255 ...

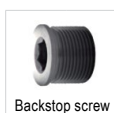
Adapter	DCONWS mm	LPR mm	BTED mm	BD_1 mm	LB_1 mm	LB mm	LSCX mm	LSCN mm	THID	
HSK-A 63	6	120	21	27	48.9	94	37	27	M5	20657
HSK-A 63	8	120	21	27	48.9	94	37	27	M6	20857
HSK-A 63	10	120	24	32	61.6	94	41	31	M8X1	21057
HSK-A 63	12	120	24	32	61.6	94	46	36	M10X1	21257
HSK-A 63	16	120	27	34	56.2	94	49	39	M12X1	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



Pressure screw



Backstop screw with internal cooling

80 397 ...



83 950 ...

83 950 ...

Spare parts for article number

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

Accessories

 → 282	 → 156	 → 284
Reduction sleeve	Coolant transfer pipes	Others

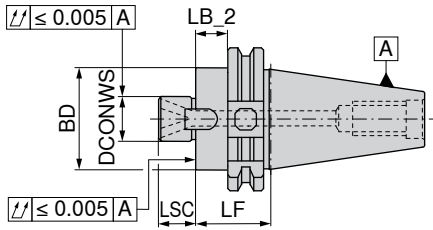
Accessories can be found in the clamping technology catalog → **Chapter 16, Adaptors and accessories**

Shell mill adapter with reduced flange diameter

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

Scope of supply:

Base body with retaining screw and drive key



AD
G 2.5 n_{max} 25000

82 315 ...

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

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



Carrier screws



Drive key



Tightening screw

83 950 ...

83 950 ...

83 950 ...

Spare parts
DCONWS

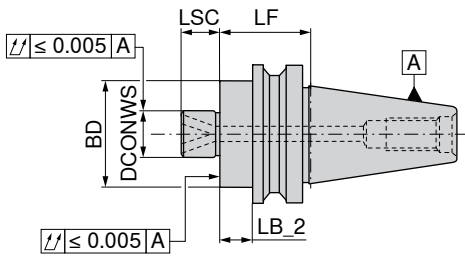
22	M4x8	51700	10x7x20,5	51500	M10x25	124
27	M5x8	51800	12x9x24,3	51600	M12x30	125

Shell mill adapter with reduced flange diameter

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

Scope of supply:

Base body with retaining screw and drive key



AD
G 2.5 n_{max} 25000

82 315 ...

	Adapter	DCONWS mm	BD mm	LB_2 mm	LF mm	LSC mm	
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

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



Carrier screws



Drive key



Tightening screw

83 950 ...

83 950 ...

83 950 ...

Spare parts
DCONWS

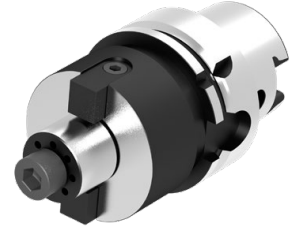
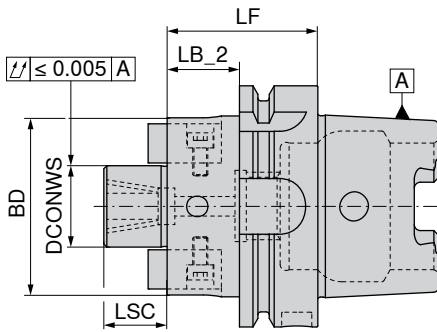
22	M4x8	51700	10x7x20,5	51500	M10x25	124
27	M5x8	51800	12x9x24,3	51600	M12x30	125

Shell mill adapter with reduced flange diameter

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

Scope of supply:

Base body with retaining screw and drive key

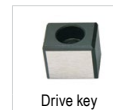
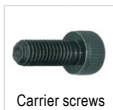


G 2.5 n_{max} 25000

82 315 ...

	Adapter	DCONWS mm	LB_2 mm	LF mm	BD mm	LSC mm	
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

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

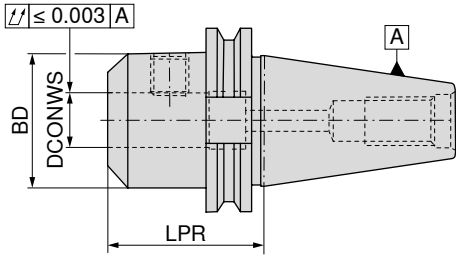


Spare parts	Carrier screws	Drive key	Tightening screw
DCONWS	83 950 ...	83 950 ...	83 950 ...
22	M4x8 51700	10x7x20,5 51500	M10x25 124
27	M5x8 51800	12x9x24,3 51600	M12x30 125

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat

▲ **By request:** Also available with Balluff chip



AD/Be
G 2.5 n_{max} 25000

82 404 ...

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

1) Version with two clamping screws

Accessories



→ 58, 60



→ 284

Pull studs

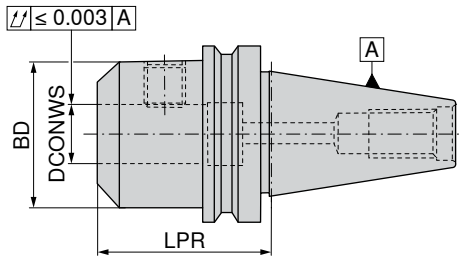
Others

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

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat

▲ **By request:** Also available with Balluff chip



AD/Be
G 2.5 n_{max} 25000

82 504 ...

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

1) Version with two clamping screws

Accessories



→ 58, 60



→ 284

Pull studs

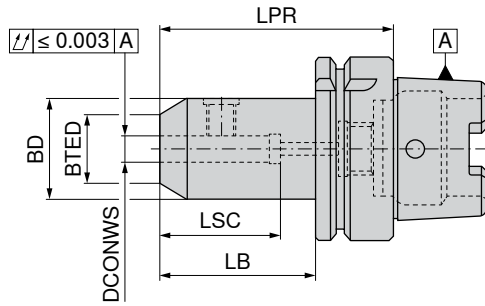
Others

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

Cylindrical shank adapter (Weldon)

▲ For shanks according to DIN 6535 HB / 1835 B with lateral clamping flat

▲ **By request:** Also available with Balluff chip



G 2.5 n_{max} 25000

82 404 ...

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



Set Screw

62 950 ...

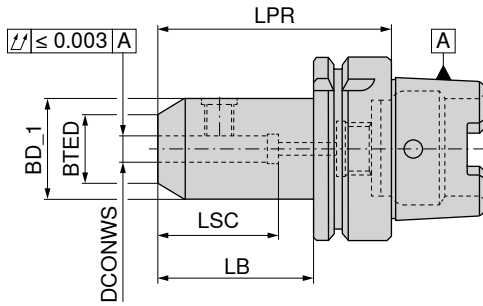
Spare parts

DCONWS

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

Cylindrical shank adapter (Weldon)

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



NEW



NEW



G 2.5 n_{max} 25000

G 2.5 n_{max} 25000

82 740 ...

82 741 ...

	Adapter	DCONWS _{H5} mm	LPR mm	BTED mm	BD_1 mm	LB mm	LSC mm		
Short	HSK-A 63	40	120	60	80	94	68		
	HSK-A 63	40	120	60	80	94	68	14057	14057



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

Accessories



→ 156



→ 284

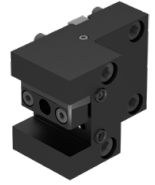
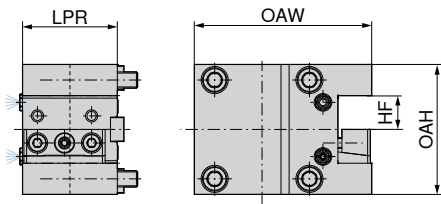
Coolant transfer pipes

Others

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

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

▲ Directly screwed version



NEW

Left

82 483 ...

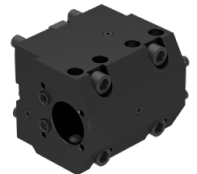
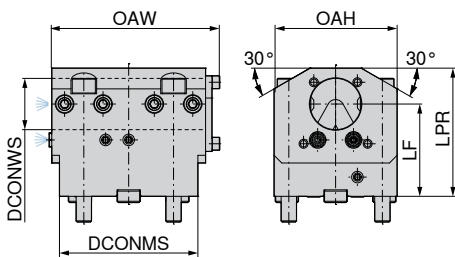
Adapter	Hole pattern	HF mm	LPR mm	OAH mm	OAW mm
BMT 65	70 x 73	25	75	97	131

00008

HAAS/Doosan – BMT 65 – combi tool holder

▲ Directly screwed version

▲ Double-sided version



NEW



Through coolant

82 483 ...

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

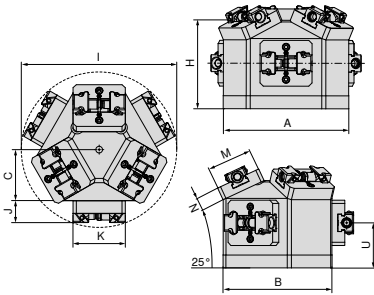
03009

CentriClamp – ZSG mini – 6-sided clamping tower

Scope of supply:

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

**ZSG
mini**



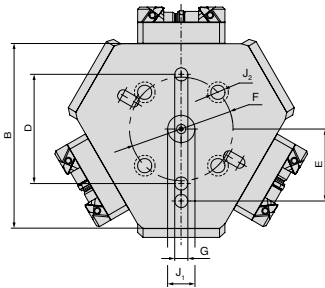
NEW

80 912 ...

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

55000

Underside dimensions of ZSG mini – 6-sided clamping tower

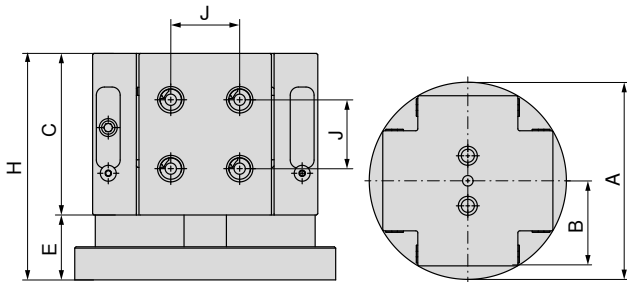


B	D ±0.015	E ±0.015	Ø F	G H7	J ₁ H7	Ø J ₂
mm	mm	mm	mm	mm	mm	mm
169,40	100	66	95	12	25	13

MNG mini – 4-sided clamping tower

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

**MNG
mini**




NEW

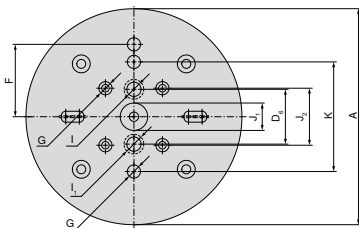
80 915 ...

A	B	C	E	H	J ± 0.015	WT
mm	mm	mm	mm	mm	mm	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	D ₆	F ± 0.015	G $H7$	I $H7$	I ₁ $H7$	J ₁ $H7$	J ₂ ± 0.015	K ± 0.015
mm	mm	mm	mm	mm	mm	mm	mm	mm
197	50	66	12	13	19	25	52	100

System accessories overview

Sealing plugs

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

**MNG
mini**



NEW

80 915 ...

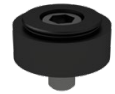
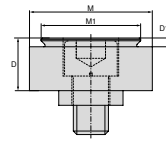
D ₁
mm
16

51900

System jaws overview

Insert jaw, round, grip 3 mm

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



NEW

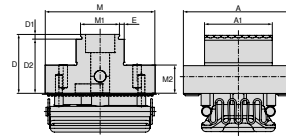
For vise width	A	A ₁	D	D ₁	D ₂	E	M	M ₁	M ₂
			18	3			42	34	

80 914 34500

NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
									●	

Indexable jaw, fixed VS, grip 3 mm

- ▲ Price per piece
- ▲ VS = Larger clamping range



NEW

For vise width	A	A ₁	D	D ₁	D ₂	E	M	M ₁	M ₂
90	65	40	35	3	32	2,6	64	28	17
90	90		35	3	32	2,6	64	28	17

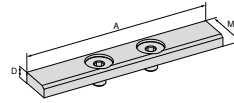
80 914 34400

80 914 34300

NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
									●	
									●	

Support, hard for milling over

- ▲ Price per piece



NEW

For vise width	A	A ₁	D	D ₁	D ₂	E	M	M ₁	M ₂
90	40		5,4				15		
90	90		5,4				15		

80 914 51200

80 914 51100

NCG	H5G / -S / -Z	X5G-Z / -S	ESG 4	ESG 5	HDG 2	ZSG 4	ZSG mini	DSG 4	Verso	HSG
									●	
									●	

Sustainability is not a goal, it's a mission.

We have an ambitious sustainability mission that will affect and change the entire supply chain. But we can only achieve true sustainability together. That's why our mission goes beyond our own scope:

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



Mission #1:
Climate neutral by 2025



Mission #2:
Minimise the use of
virgin raw materials



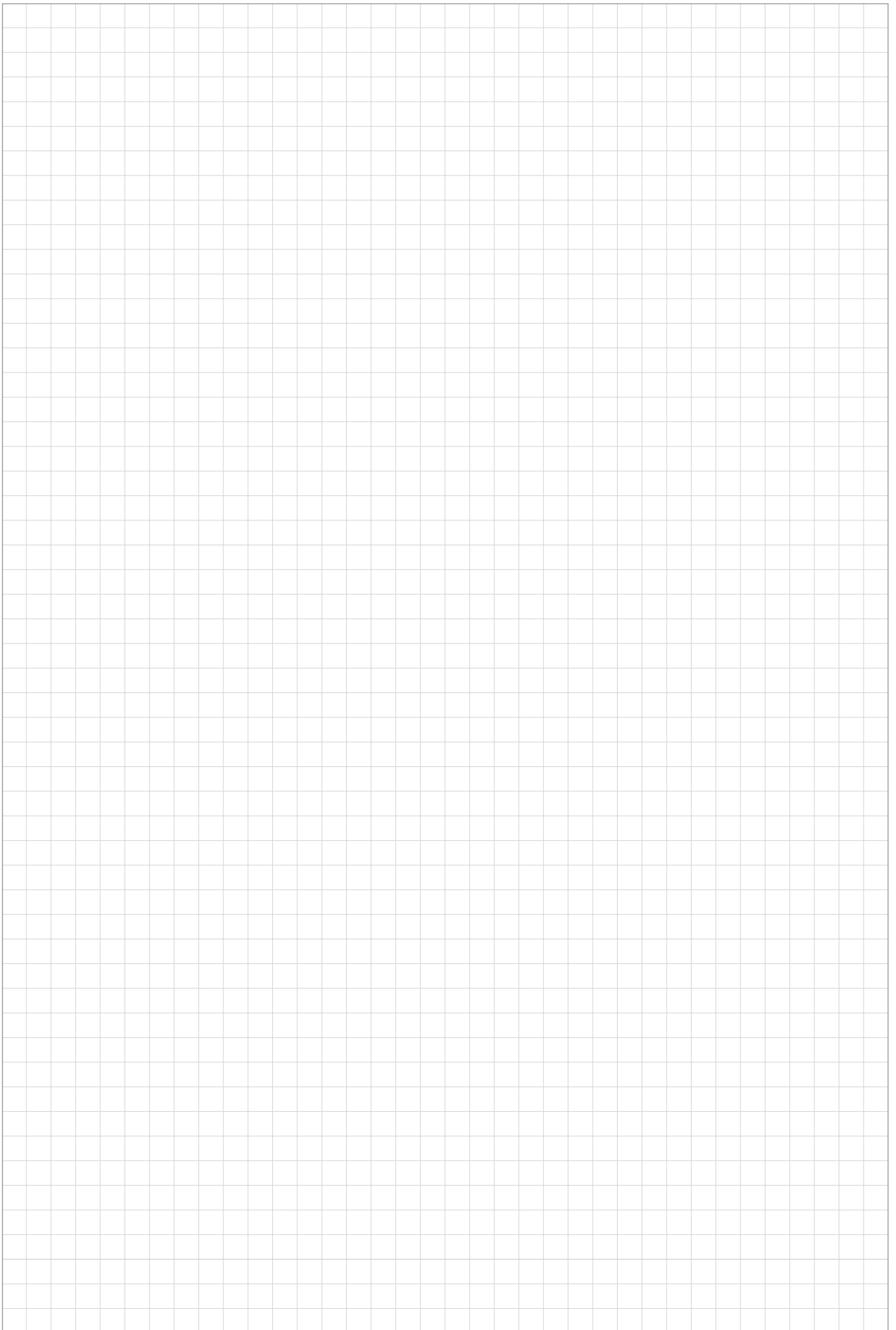
cutting.tools/us/en/sustainability

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Tooling a Sustainable Future

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