



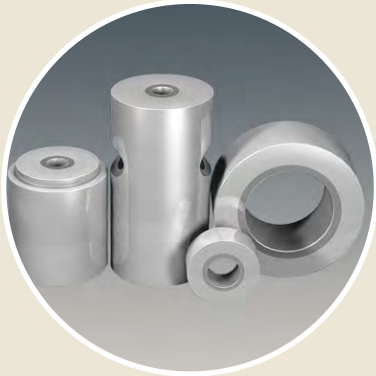
Rani Tool Corp.



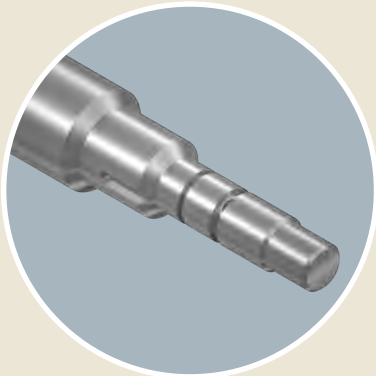
DTS GmbH

Diamond Tooling Systems

Grooving Systems
PCD, CVD-D, UltraDiamond, CBN



Die and Mold
Industry



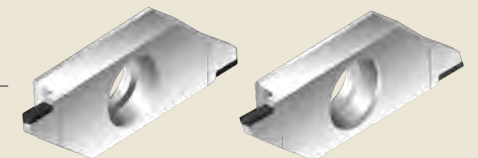
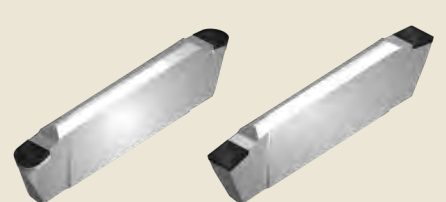
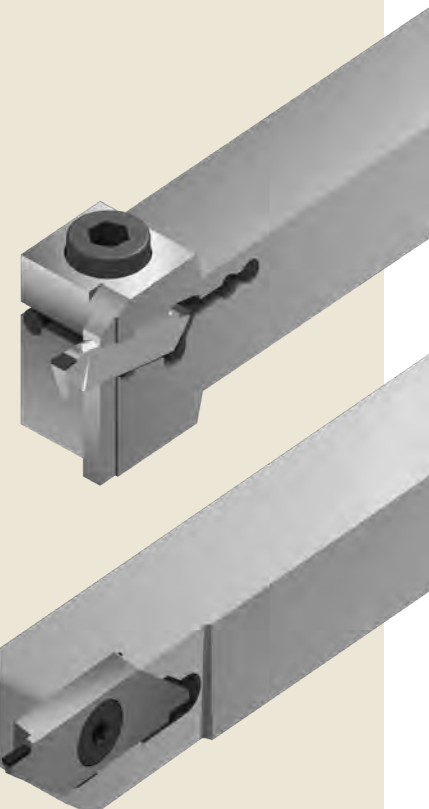
Automotive
Mechanical Engineering



Medical Technology
Micro Technology



Aerospace
Engineering



About us

DTS GmbH - Diamond Tooling Systems



Welcome to DTS - Diamond Tooling Systems GmbH!

Based in Kaiserslautern - Germany - we have specialized in the development, production and distribution of precision tools equipped with ultrahard cutting materials, such as PCD (polycrystalline diamond), CVD-D (CVD thickfilm diamond), UltraDiamond (monocrystalline binderless diamond) and CBN (cubic boron nitride). As a leading manufacturer for tools with lasered cutting edges, we offer machining solutions in the areas of turning, milling, grooving, drilling, reaming, threading, and tool holding.

To be able to economically process ultra-hard cutting materials such as PCD, CVD-D and CBN on precision tools we realized early on that we would have to move away from the traditional production technology of „grinding“ to new technologies such as the „laser removal process“. This decision has contributed to the fact that our customers regard us, DTS GmbH, as the pioneer and leading manufacturer of lasered tools for machining.

Ultra-hard high-performance cutting materials have a key function in metal-cutting manufacturing. Precision tools equipped with ultra-hard cutting materials are products that require a great deal of explanation. The economical use of the cutting materials is only ensured if the machining process and the cutting material are coordinated with each other.

This is exactly where we at DTS - Diamond Tooling Systems GmbH - step in: Tools and processes are subjected to a comprehensive analysis by our experienced application engineers. Subsequently, the new process optimization is presented to the customer and in the next step, it is implemented in their production. Only in that way is it possible to exploit the optimum potential of our high-tech cutting materials.

Our experienced application engineers are also available to advise you during ongoing production. This close cooperation and mutual trust is the basis of our success.

With more than 25 years of optimization experience in the processing industry, this is where we see our strength!

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Grooving systems

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Grooving Systems

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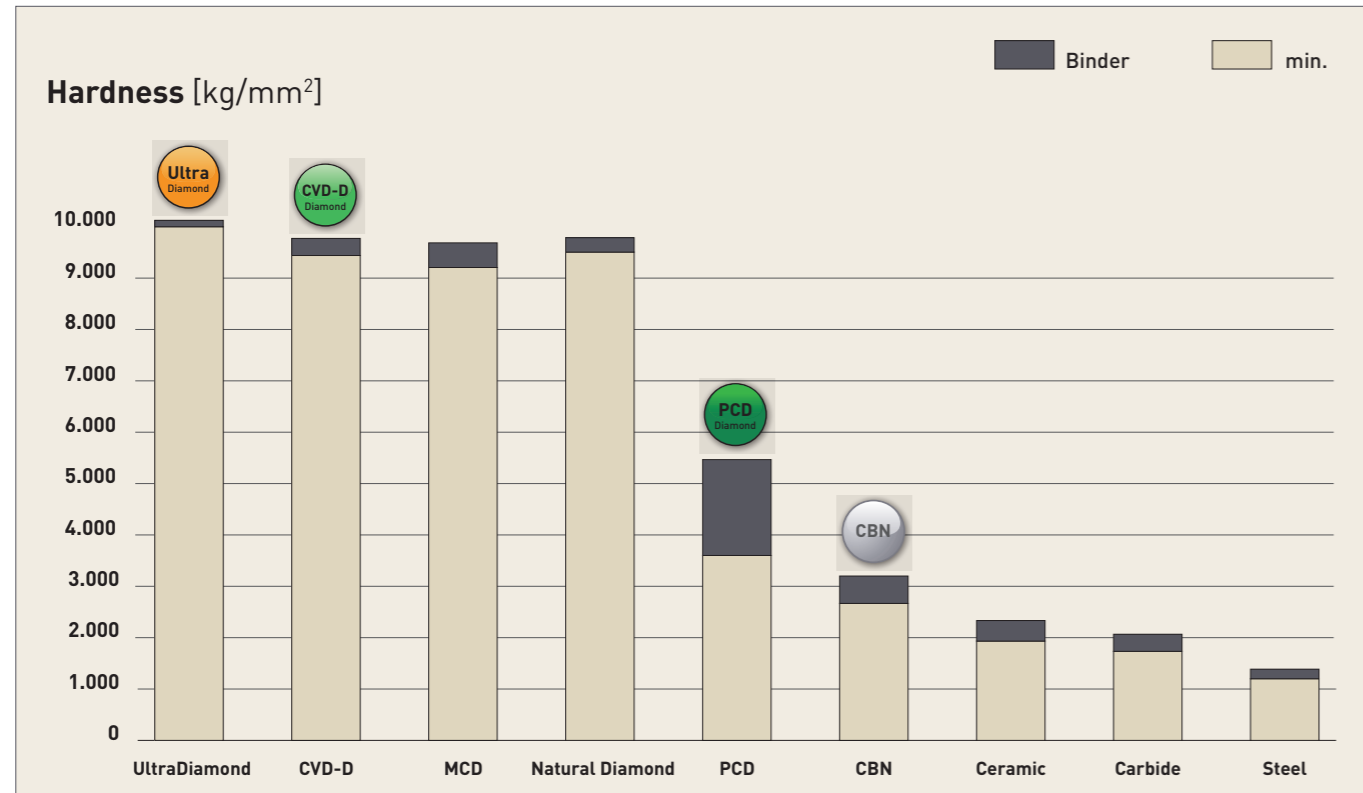


You can also get all of our products via our online shop - anytime, fast and easy.
www.diamond-tools24.com

PASSION FOR DIAMOND...

ultrahard cutting materials at a glance

... is not just a slogan for us - we live this passion in our daily dealings with our customers and we are your partner when it comes to diamond or CBN tools.



Polycrystalline diamond (PCD)

The well-known Standard Diamond

PCD is a synthetically produced, extremely tough, intergrown mass of diamond particles with a random orientation in a metal matrix. It is produced by sintering selected diamond particles under high pressure and high temperatures.

Graphite serves as a catalyst allowing the PDC crystals to intergrow. PCD has a high thermal conductivity and good heat dissipation away from the cutting edge. In addition, PCD has the highest bending fracture strength of all cutting materials.

PCD is very well suited for machining aluminum with a Si content of up to 10% and/or other abrasive fillers. The thermal hardness is about 750°C. The areas of application are like those of CVD thick-film diamond, but CVD thick film has a higher cost effectiveness with hard-brittle materials or aluminum from a Si content of 10%.

CVD-Thickfilm Diamond (CVD-D)

The Star among Diamond Cutting Materials

For the machining of hard-brittle materials such as Ceramics, glass, glass-Ceramics, tungsten Carbide, MMC and fiber-reinforced composites such as CFRP and GFRP. Due to the lack of a bonding matrix, the diamond content is much higher than with PCD. In the group of ultra-hard cutting materials, binderless CVD-D is one of the hardest man-made diamond cutting materials.

CVD-D is characterized by high hardness as well as high wear resistance. These properties make CVD-D the perfect cutting material for machining abrasive materials. Compared to PCD, which is damaged by the abrasive particles due to its soft metallic binder phase, the CVD-D cutting edge remains stable due to its binderless anchoring in the diamond matrix.

With the correct use of CVD-D, the tool life can be increased by up to 10 times (and even more) compared to PCD!

Binderless Diamond (UltraDiamond)

The hardest Mono Crystal

Single-crystal elements are laser-cut from diamond blanks in a defined orientation using laser segmentation technology. This new technology makes it possible, in addition to polycrystalline cutting materials such as PCD and CVD-D, to also braze a monocrystal (UltraDiamond) under high vacuum on any tool carrier. Compared to PCD, the tool life can be increased by approx. 15 to 25 times and compared to CVD-D by approx. 2 to 5 times.

The areas of application are similar to PCD and CVD-D, but this monocrystalline cutting material offers a further significant increase in tool life in all applications where PCD and CVD-D reach the limits of economic viability. The UltraDiamond cutting material makes economical machining of very hard, highly brittle materials such as Ceramics, glass, glass-Ceramics and hard metals with low cobalt binder and nickel binder (<10%) possible.

Polycrystalline Cubic Boron Nitride (CBN)

Chemically resistant and stable at high temperatures

of up to 1,400°C. Boron nitride powder is the starting point for the production of CBN, which has been available since the end of the 1960s. It is produced under high pressure and at temperatures of over 1,500°C and the many different substrates are specifically adapted to the final application.

CBN is now considered the second hardest material after diamond cutting materials!

The applications of CBN take place in the automotive industry, aerospace, tool and die and mold making as well as in mechanical engineering. The wide range as cutting and abrasive material includes hardened steels, cast irons, chilled cast iron, sintered materials, stellites, nickel- and cobalt-based superalloys. In many applications, cubic boron nitride is preferred to diamond cutting materials because it is absolutely stable in air at temperatures up to 1,400°C. Diamond, on the other hand, begins to decompose at a temperature of approx. 750°C.

Compared to PCD, CBN is also characterized by its chemical resistance to ferrous materials.

Our cutting materials

and their main areas of application at a glance

We want to offer you the ideal solution for your application. Therefore, we also offer you a wide range of cutting materials on our internal turning tools.

Below you will find an overview of the different cutting materials.

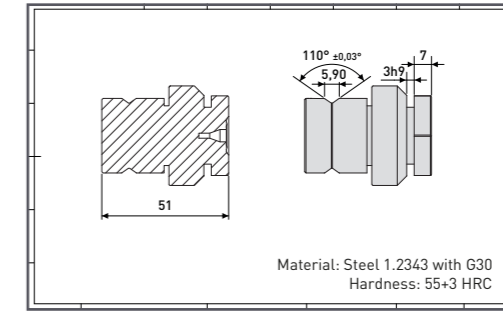
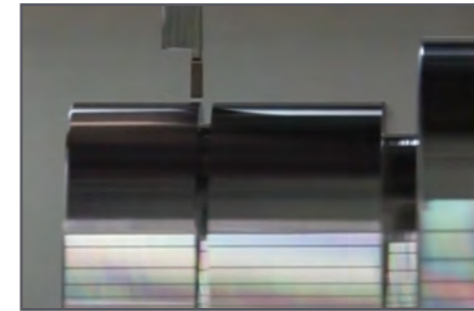
PCD Diamond	CVD-D Diamond	Ultra Diamond	CBN-H	CBN-K	CBN-X
MICRO - Line ECO - Line	MICRO - Line ECO - Line	MICRO - Line	MICRO - Line ECO - Line	MICRO - Line ECO - Line	MICRO - Line ECO - Line
Suitable for Aluminum <10% Si Magnesium Carbide, Green Ceramic, Green Copper Copper Alloys Brass PEEK Tungsten Alloy	Suitable for Aluminum > 10% Magnesium Copper Copper Alloys Plastics Acrylic (PMMA) Composite Materials (CFK, GFK) MMC Glass, Glass Ceramic Carbide >10% Co Ceramic Titanium Precious metals	Suitable for Carbide G-Type < 10% Co K-Type > 12% Co with Ni-Binder Acrylic (PMMA) Glass, Glass Ceramic Ceramic	Suitable for Steel, hardened to 72 HRC Sintered Steel, hardened	Suitable for Grey Cast Iron (GG) Ductile Cast Iron (GGG)	Suitable for Tool Steel, hardened to 72 HRC Stellite Stainless Steel, hardened Powder Steels like: - CPM - Vanadis - ASP - Böhler
Cooling Recommendations:        1. Choice Alternative 1 - 2					
<input type="radio"/> continuous cut					
  	  	  	   	   	 
<input type="radio"/> light interrupted cut					
  	  	  	 	 	 
<input type="radio"/> heavy interrupted cut					
  	  	  	 	 	 

Application Examples

our cutting edges in use

Not only theory - we would like to show you our tools in action. Below you will find a selection of our CBN application videos. Click on the QR code for more information and the video.

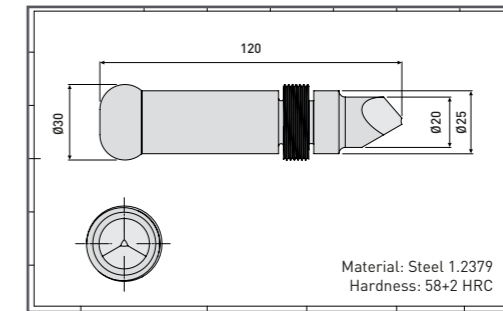
Also visit our YouTube Channel at [dts-gmbh!](https://www.youtube.com/dts-gmbh)



MICRO-Line
Steel 1.2343 52+2HRC
Corner B1,00



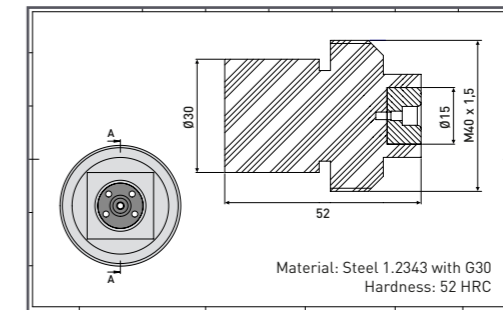
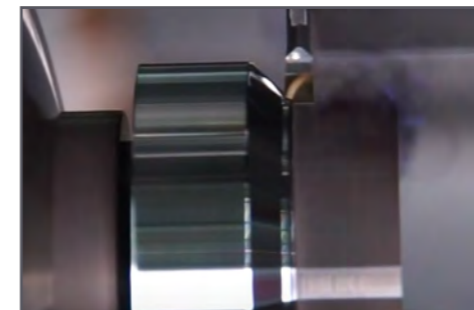
Here you can see the video!



ECO-Line
Steel 1.2379 50+2HRC
Radius B2,00



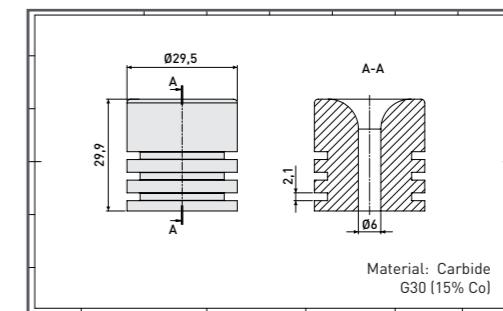
Here you can see the video!




ECO-Line
Steel 1.2343 52+2HRC
Corner B2,00



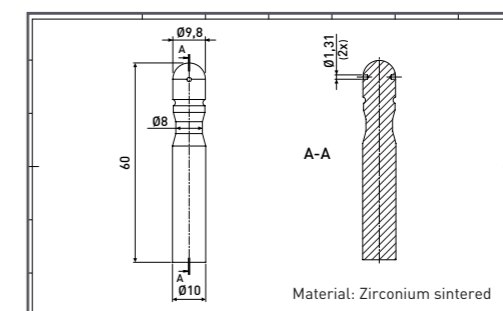
Here you can see the video!



ECO-Line
Carbide G30
Corner B2,00



Here you can see the video!



MICRO-Line
Zirconium oxide
Radius B1,00



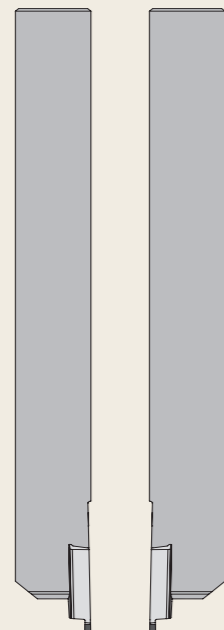
Here you can see the video!

Grooving Systems MICRO - Line

The precise grooving system for high-precision grooving

with shank thicknesses from 8x8 mm up to 20x20 mm

DTS MICRO - Line

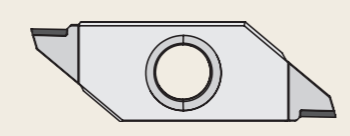



Right Left

for grooving widths 1,00 - 2,00 mm

2-edged Diamond and CBN grooving inserts


DTS MICRO - Line





EST

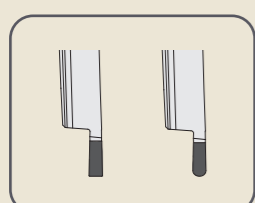
Precise Grooving



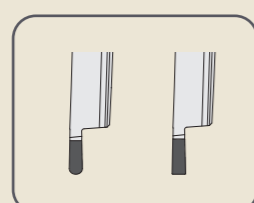
RST

Precise Grooving + Profile Turning

Grooving plates Right




Grooving plates Left



Maximum groove depths (Tmax:)

MICRO-Line Tmax 3,8 mm



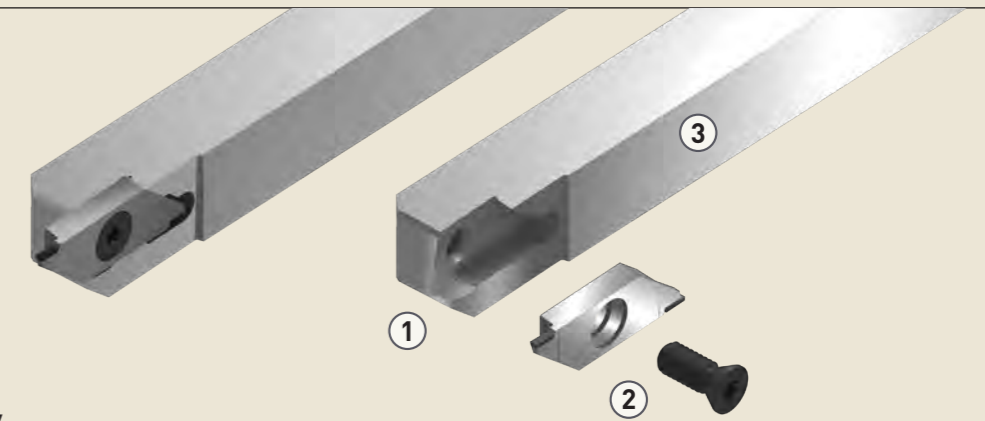
All inserts are equipped with 2 cutting edges with these DTS cutting materials:



* ECO-Line with UltraDiamond equipment available on request

Grooving System MICRO-Line

Overview and Applications

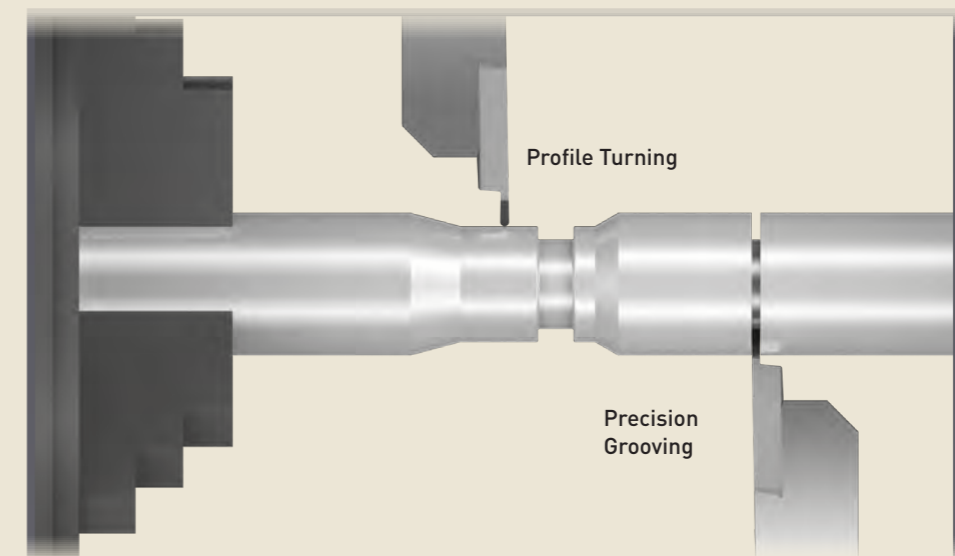


MICRO-Line Tool Holder System

- ① Precision machined base body
- ② Screw for directly clamping the insert
- ③ Precision machined, low vibration tool holder

MICRO-Line - Indexable Grooving Insert

- Laser cut Diamond or CBN cutting edge
- High vacuum brazed
- Precision machined carbide base body
- Precision machined center bore
- Tangential clamping provides the best stability
- Two cutting edges (Z2)
- In cutting materials: PCD / CVD-D / UltraDiamond / CBN

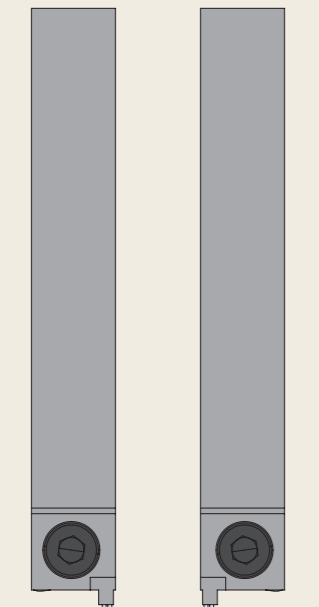


Grooving Systems ECO - Line

The highly economical universal grooving programme

with shank thicknesses from 12x12 mm up to 25x25 mm

DTS ECO - Line

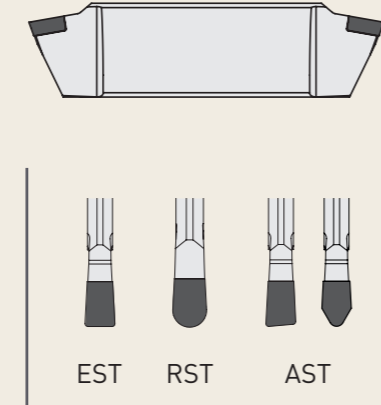


Right Left

for grooving widths 2,00 - 4,00 mm (RST to 6,0 mm)

2-edged Diamond and CBN grooving inserts

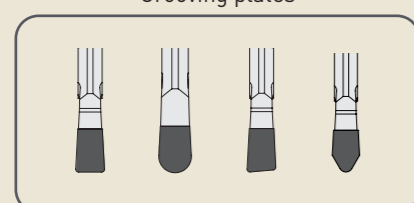
DTS ECO - Line




EST RST AST

Precise Grooving Precise Grooving + Profile Turning Cutting

Neutral Grooving plates



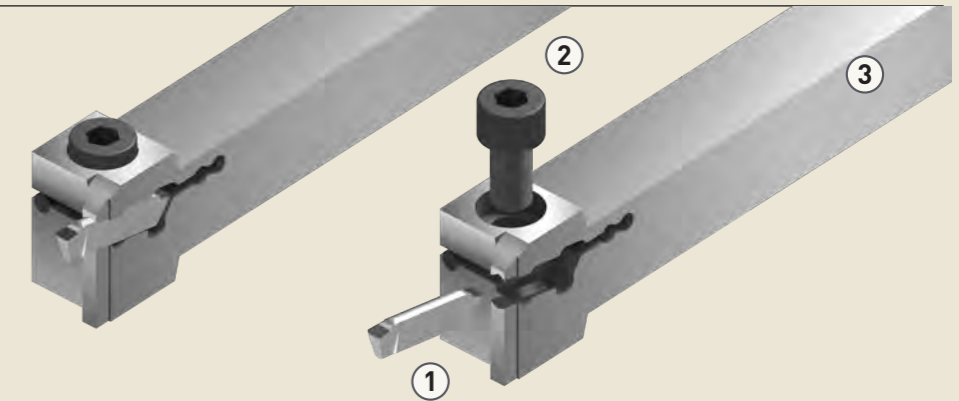
ECO-Line depending on Clamp Version
Tmax 12 mm or Tmax 25 mm



Versions deviating from the standard program are available on request.
Our technical consultants and application engineers are available at any time:
info@Diamond-toolingsystems.com

Grooving System ECO-Line

Overview and Applications

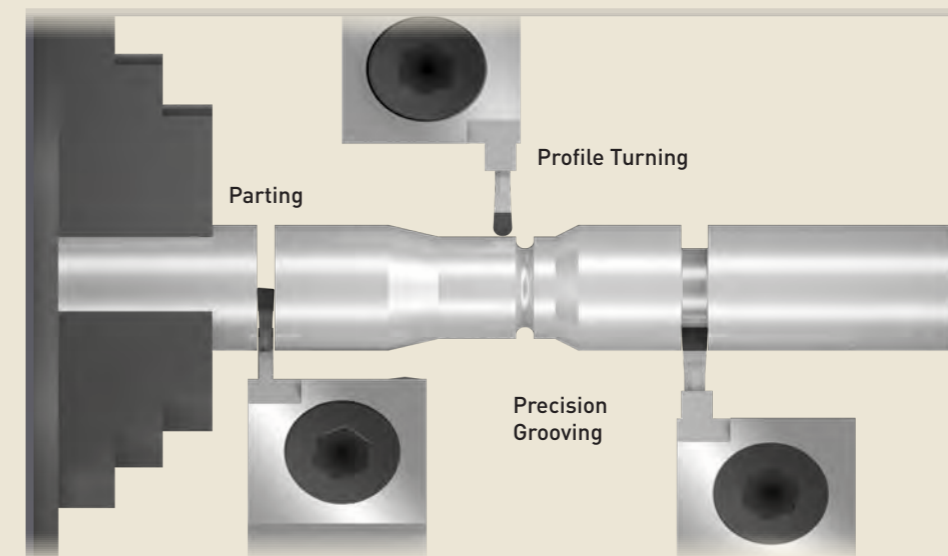
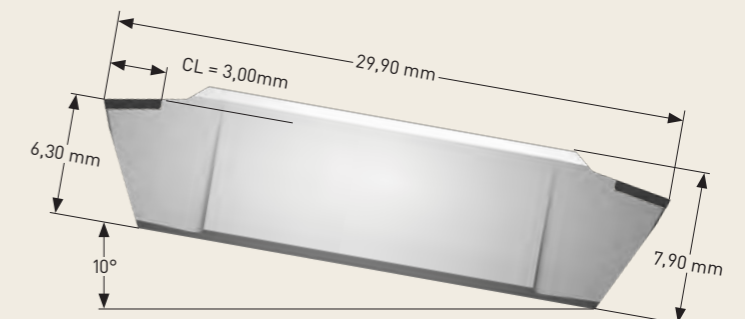


ECO-Line Tool Holder System

- ① Precision machined base body
- ② Screw for clamping the insert
- ③ Low vibration tool holder

ECO-Line - Indexable Grooving Insert

- Laser cut Diamond or CBN cutting edge
- High vacuum brazed
- Precision machined carbide base body
- Two cutting edges (Z2)
- In cutting materials: PCD / CVD-D / CBN



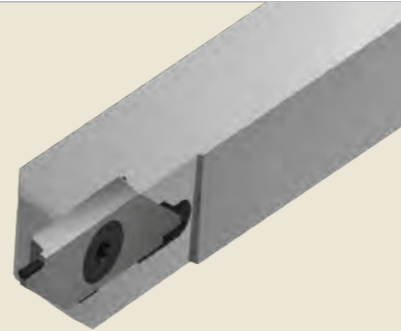
Corner and Full Radius Grooving Inserts

for Grooving, Profile Turning and Parting

MICRO-Line System | Tool Holder

Benefits:

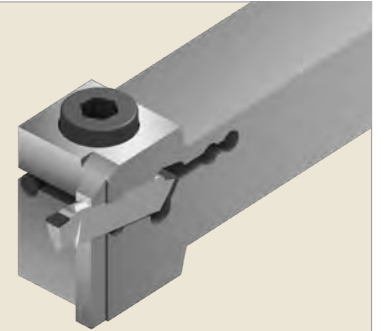
- Designed for grooving with Diamond and CBN cutting materials
- Right side and left side tool holders in different dimensions in stock
- Grooving depth up to 3,80 mm
- For continuous and interrupted cuts
- Stable and precise guiding of the grooving insert
- Easy and quick change of the grooving insert



ECO-Line System | Tool Holder

Benefits:

- Designed for grooving with Diamond and CBN cutting materials
- Right and left holders in different dimensions from stock
- Two grooving depths available in stock: 12,00mm and 25,00mm
- For continuous and interrupted cuts



System MICRO-Line EST and RST | Corner - and Vollradius Stechplatten

Benefits:

- Corner -Stechplatte 1,00 mm to 2,00 mm, Toleranz +/- 0,01 mm ab Lager
- Radien von 0,05 mm to 0,20 mm, Toleranz +/- 0,01 mm ab Lager
- Bestückt with 2 Schneiden (on request auch with Spanleitstufen)
- Vollradius-Stechplatte 1,00 mm to 2,00 mm, Toleranz +/- 0,01 mm ab Lager
- Vollradius von 0,50 mm to 1,00 mm, Toleranz +/- 0,01 mm ab Lager
- Bestückt with 2 Schneiden (on request auch with Spanleitstufen)
- Schneidkantenlänge 3,00 mm



MICRO-EST



MICRO-RST

ECO-Line EST and RST System | Corner and Full Radius Grooving Inserts

Benefits:

- Corner grooving insert, width 2,00 mm to 4,00 mm, tolerance +/- 0,01 mm in stock
- Radii from 0,10 mm to 0,20 mm, tolerance +/- 0,01 mm in stock
- Tipped with 2 cutting edges (on request also with chip breakers)
- Full radius grooving insert, width 2,00 mm to 6,00 mm, tolerance +/- 0,01 mm in stock
- Full radius from 1,00 mm to 3,00 mm, tolerance +/- 0,01 mm in stock
- Tipped with 2 cutting edges (on request also with chip breakers)
- Cutting edge length 3,00 mm



ECO-EST



ECO-RST

ECO-Line AST | Parting Inserts

Benefits:

- Parting insert left, width 2,00mm, tolerance +/- 0,01 mm in stock
- Tipped with 2 cutting edges (on request auch with Spanleitstufen)
- Parting insert right, width 2,00mm, tolerance +/- 0,01 mm in stock
- Tipped with 2 cutting edges (on request also with chip breaker)



ECO-AST-Left



ECO-AST 60°



ECO-AST-Right

You can get the following materials for our grooving systems:



You can get the following materials for our grooving systems:



Grooving Holder System MICRO-Line

Clamping Holder

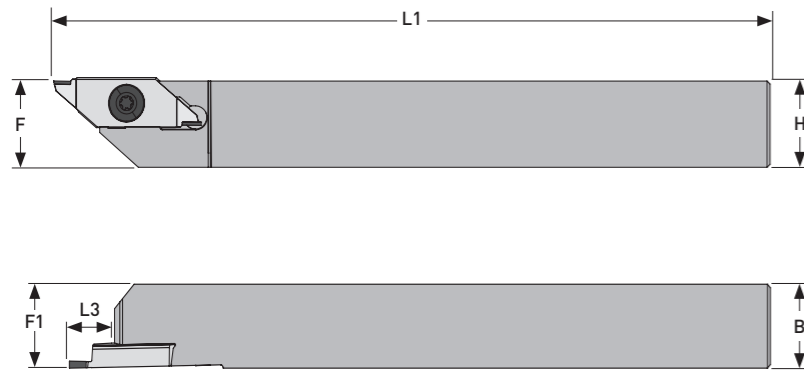


Figure shows right holder.

MICRO-Line	B	H	L1	L3	F	F1	Version	Item No.
	8,00	8,00	125,00	8,00	10,00	10,00	right	ST7060-0010
	8,00	8,00	125,00	8,00	10,00	10,00	left	ST7060-0015
	10,00	10,00	125,00	8,00	10,00	10,00	right	ST7060-0020
	10,00	10,00	125,00	8,00	10,00	10,00	left	ST7060-0025
	12,00	12,00	125,00	8,00	12,00	12,00	right	ST7060-0030
	12,00	12,00	125,00	8,00	12,00	12,00	left	ST7060-0035
	16,00	16,00	125,00	8,00	16,00	16,00	right	ST7060-0040
	16,00	16,00	125,00	8,00	16,00	16,00	left	ST7060-0045
	20,00	20,00	125,00	8,00	20,00	20,00	right	ST7060-0050
	20,00	20,00	125,00	8,00	20,00	20,00	left	ST7060-0055

Clamping Screw	01-SP9090-0410
Clamping Key	01-SP9091-0110

Application range:

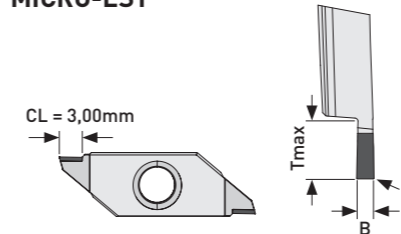
- PCD Aluminum < 10% Si, Plastics, Graphite coarse-grained, Brass, Zinc ...
- CVD-D Aluminum <10% Si, Carbide >10%, Brass, Brass bleifrei, Graphit, Composite Materials (CFK, GFK, MMC) ...
- UltraDia. Ceramic, Carbide <12% Binder, Zircon, Acrylic ...
- CBN-H Steel hardened up to 72 HRC
- CBN-K Grey Cast Iron (GG), Ductile Cast Iron (GGG) ...
- CBN-X Tool Steel to 72 HRC, Tool Steel low-alloy, Stellite, powder metallurgical Steels ...

You can find further application areas in the detailed overview starting on page 8.

Grooving Indexable Insert System MICRO-Line

for Grooving and Profile Turning

MICRO-EST

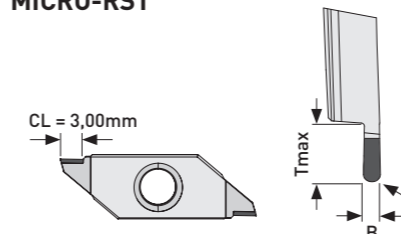


2-blade grooving plates
Picture shows right version

Name	Version	B	R	Tmax	PCD Item No.	CVD-D Item No.	Ultra-Dia. Item No.	CBN-H Item No.	CBN-K Item No.	CBN-X Item No.
EST-B1	right	1,00	0,05	3,80	ST1050-2100	ST2050-2100	ST1950-2100	ST5050-2100	ST5550-2100	ST5950-2100
EST-B1	left	1,00	0,05	3,80	ST1050-2101	ST2050-2101	ST1950-2101	ST5050-2101	ST5550-2101	ST5950-2101
EST-B1	right	1,00	0,10	3,80	ST1050-2102	ST2050-2102	ST1950-2102	ST5050-2102	ST5550-2102	ST5950-2102
EST-B1	left	1,00	0,10	3,80	ST1050-2103	ST2050-2103	ST1950-2103	ST5050-2103	ST5550-2103	ST5950-2103
EST-B1,5	right	1,50	0,05	3,80	ST1050-2150	ST2050-2150	ST1950-2150	ST5050-2150	ST5550-2150	ST1950-2150
EST-B1,5	left	1,50	0,05	3,80	ST1050-2151	ST2050-2151	ST1950-2151	ST5050-2151	ST5550-2151	ST1950-2151
EST-B1,5	right	1,50	0,10	3,80	ST1050-2152	ST2050-2152	ST1950-2152	ST5050-2152	ST5550-2152	ST1950-2152
EST-B1,5	left	1,50	0,10	3,80	ST1050-2153	ST2050-2153	ST1950-2153	ST5050-2153	ST5550-2153	ST1950-2153
EST-B2	right	2,00	0,05	3,80	ST1050-2200	ST2050-2200	ST1950-2200	ST5050-2200	ST5550-2200	ST5950-2200
EST-B2	left	2,00	0,05	3,80	ST1050-2201	ST2050-2201	ST1950-2201	ST5050-2201	ST5550-2201	ST5950-2201
EST-B2	right	2,00	0,10	3,80	ST1050-2202	ST2050-2202	ST1950-2202	ST5050-2202	ST5550-2202	ST5950-2202
EST-B2	left	2,00	0,10	3,80	ST1050-2203	ST2050-2203	ST1950-2203	ST5050-2203	ST5550-2203	ST5950-2203
EST-B2	right	2,00	0,20	3,80	ST1050-2204	ST2050-2204	ST1950-2204	ST5050-2204	ST5550-2204	ST5950-2204
EST-B2	left	2,00	0,20	3,80	ST1050-2205	ST2050-2205	ST1950-2205	ST5050-2205	ST5550-2205	ST5950-2205

We are glad to offer you any special geometries on request.

MICRO-RST



2-blade grooving plates
Picture shows right version

Name	Version	B	R	Tmax	PCD Item No.	CVD-D Item No.	Ultra-Dia. Item No.	CBN-H Item No.	CBN-K Item No.	CBN-X Item No.
RST-B1	right	1,00	0,50	3,80	ST1050-3100	ST2050-3100	ST1950-3100	ST5050-3100	ST5550-3100	ST5950-3100
RST-B1	left	1,00	0,50	3,80	ST1050-3101	ST2050-3101	ST1950-3101	ST5050-3101	ST5550-3101	ST5950-3101
RST-B1,5	right	1,50	0,75	3,80	ST1050-3150	ST2050-3150	ST1950-3150	ST5050-3150	ST5550-3150	ST5950-3150
RST-B1,5	left	1,50	0,75	3,80	ST1050-3151	ST2050-3151	ST1950-3151	ST5050-3151	ST5550-3151	ST5950-3151
RST-B2	right	2,00	1,00	3,80	ST1050-3200	ST2050-3200	ST1950-3200	ST5050-3200	ST5550-3200	ST5950-3200
RST-B2	left	2,00	1,00	3,80	ST1050-3201	ST2050-3201	ST1950-3201	ST5050-3201	ST5550-3201	ST5950-3201

We are glad to offer you any special geometries on request.

Subject to technical changes.

Grooving Holder System ECO-Line

Clamping Holder

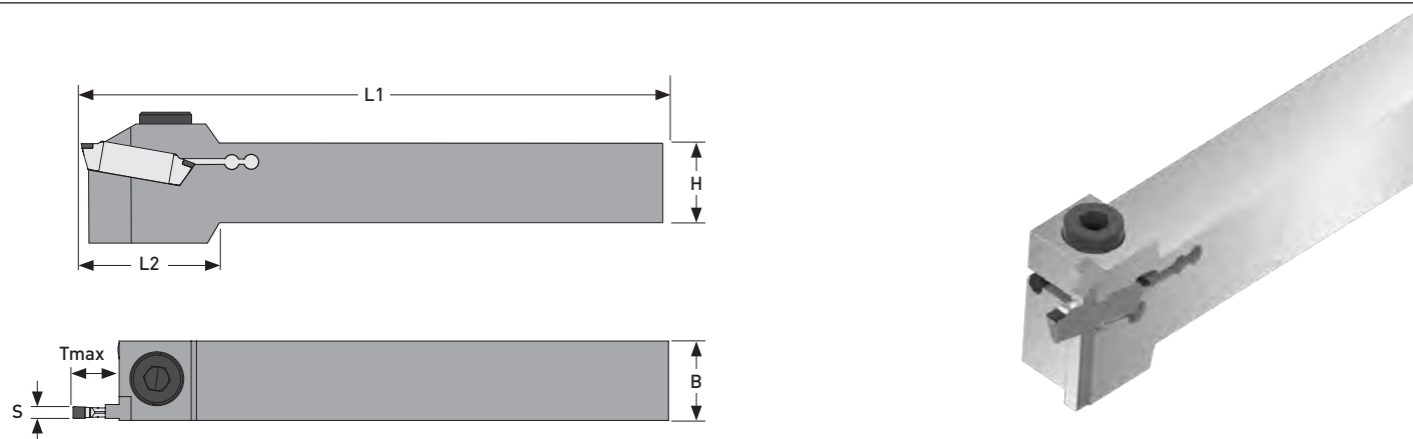


Figure shows right holder.

ECO-Line						Item number	
S	H	B	Tmax	L1	L2	right	left
2,00	12,00	12,00	12,00	125,00	35,00	ST7060-1200	ST7060-1201
2,00	16,00	16,00	12,00	125,00	35,00	ST7060-1210	ST7060-1211
2,00	20,00	20,00	12,00	150,00	35,00	ST7060-1220	ST7060-1221
2,00	25,00	25,00	12,00	150,00	-	ST7060-1230	ST7060-1231
2,00	20,00	20,00	25,00	150,00	45,00	ST7060-3220	ST7060-3221
2,00	25,00	25,00	25,00	150,00	-	ST7060-3230	ST7060-3231
3,00	12,00	12,00	12,00	125,00	35,00	ST7060-1300	ST7060-1301
3,00	16,00	16,00	12,00	125,00	35,00	ST7060-1310	ST7060-1311
3,00	20,00	20,00	12,00	150,00	35,00	ST7060-1320	ST7060-1321
3,00	25,00	25,00	12,00	150,00	-	ST7060-1330	ST7060-1331
3,00	20,00	20,00	25,00	150,00	45,00	ST7060-3320	ST7060-3321
3,00	25,00	25,00	25,00	150,00	-	ST7060-3330	ST7060-3331
4,00	20,00	20,00	12,00	150,00	35,00	ST7060-1420	ST7060-1421
4,00	25,00	25,00	12,00	150,00	-	ST7060-1430	ST7060-1431
4,00	20,00	20,00	25,00	150,00	45,00	ST7060-3420	ST7060-3421
4,00	25,00	25,00	25,00	150,00	-	ST7060-3430	ST7060-3431
5,00	20,00	20,00	12,00	150,00	35,00	ST7060-1520	ST7060-1521
5,00	25,00	25,00	12,00	150,00	-	ST7060-1530	ST7060-1531
5,00	20,00	20,00	25,00	150,00	45,00	ST7060-3520	ST7060-3521
5,00	25,00	25,00	25,00	150,00	-	ST7060-3530	ST7060-3531
6,00	20,00	20,00	12,00	150,00	35,00	ST7060-1620	ST7060-1621
6,00	25,00	25,00	12,00	150,00	-	ST7060-1630	ST7060-1631
6,00	20,00	20,00	25,00	150,00	45,00	ST7060-3620	ST7060-3621
6,00	25,00	25,00	25,00	150,00	-	ST7060-3630	ST7060-3631

Clamping Screw 01-SP9090-0801

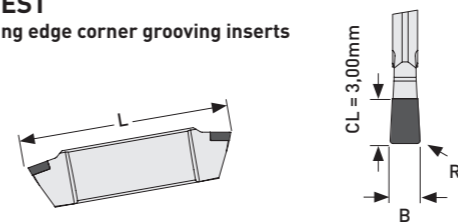
Clamping Key 01-SP9095-0160

Grooving Indexable Insert System ECO-Line

for Grooving, Profile Turning and Parting



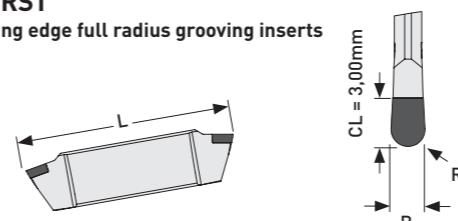
ECO-EST 2-cutting edge corner grooving inserts



Name	B	R	L	PCD	CVD-D	CBN-H	CBN-K	CBN-X
				Item No.	Item No.	Item No.	Item No.	Item No.
EST-B2	2,00	0,20	29,90	ST1050-0200	ST2050-0200	ST5050-0200	ST5550-0200	ST5950-0200
EST-B3	3,00	0,20	29,90	ST1050-0300	ST2050-0300	ST5050-0300	ST5550-0300	ST5950-0300
EST-B4	4,00	0,20	29,90	ST1050-0400	ST2050-0400	ST5050-0400	ST5550-0400	ST5950-0400

Also available in other grooving widths and with UltraDiamond on request.

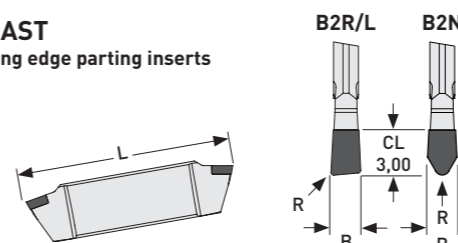
ECO-RST 2-cutting edge full radius grooving inserts



Name	B	R	L	PCD	CVD-D	CBN-H	CBN-K	CBN-X
				Item No.	Item No.	Item No.	Item No.	Item No.
RST-B2	2,00	1,00	29,90	ST1050-1200	ST2050-1200	ST5050-1200	ST5550-1200	ST5950-1200
RST-B3	3,00	1,50	29,90	ST1050-1300	ST2050-1300	ST5050-1300	ST5550-1300	ST5950-1300
RST-B4	4,00	2,00	29,90	ST1050-1400	ST2050-1400	ST5050-1400	ST5550-1400	ST5950-1400
RST-B5	5,00	2,50	29,90	ST1050-1500	ST2050-1500	ST5050-1500	ST5550-1500	ST5950-1500
RST-B6	6,00	3,00	29,90	ST1050-1600	ST2050-1600	ST5050-1600	ST5550-1600	ST5950-1600

Also available in other grooving widths and with UltraDiamond on request.

ECO-AST 2-cutting edge parting inserts

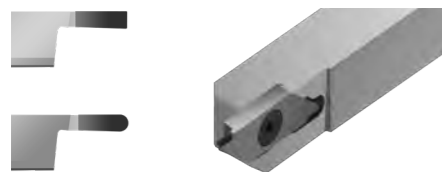


Name	B	R	L	PCD	CVD-D	CBN-H	CBN-K	CBN-X
				Item No.	Item No.	Item No.	Item No.	Item No.
AST-B2R	2,00	0,20	29,90	ST1050-0290	ST2050-0290	ST5050-0290	ST5550-0290	ST5950-0290
AST-B2L	2,00	0,20	29,90	ST1050-0291	ST2050-0291	ST5050-0291	ST5550-0291	ST5950-0291
AST-B2N 60°	2,00	0,50	29,90		ST2050-0299			

Also available in other grooving widths and with UltraDiamond on request.

Cutting Parameters

for our Diamond Grooving Inserts – MICRO-Line



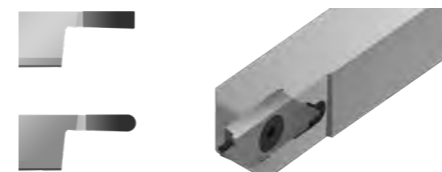
You can use all our grooving inserts in continuous and interrupted cut.

System MICRO-Line Cutting Parameters Diamond

Material		PCD				CVD-D				UltraDiamond			
		● ○		○ ○		● ○		○ ○		● ○		○ ○	
		V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]
Acrylic (PMMA)	min.	100	0,005	100	0,005	100	0,005	100	0,005	100	0,005	100	0,005
	max.	3.000	0,25	2.000	0,10	3.000	0,20	2.000	0,15	3.000	0,20	2.000	0,15
Aluminum <12%Si	min.	100	0,005	100	0,005								
	max.	5.000	0,30	2.000	0,15								
Aluminum >10%Si	min.					100	0,005	100	0,005				
	max.					3.000	0,25	1.500	0,15				
Aluminum >20%Si	min.					100	0,005	80	0,005				
	max.					1.500	0,18	800	0,12				
Brass	min.	100	0,008	100	0,005	100	0,005	100	0,005				
	max.	3.000	0,15	1.500	0,15	5.000	0,12	2.500	0,10				
Carbide G-Grades, >10%Co	min.												
Carbide G-Grades, <12%Co	min.												
Carbide K-Grades, >10%Co	min.												
Carbide K-Grades, <12%Co	min.												
Carbide with Ni Binder	min.												
Carbide Green Body	min.												
Ceramics	min.												
Ceramics Green Body	min.												
Composites as GFK/CFK	min.					100	0,01	80	0,008				
Copper/Copper Alloys	min.					100	0,01	100	0,01				
Glass, Glass Ceramic	min.									50	0,005	30	0,003
Graphite, coarse-grained	min.	100	0,01	100	0,008								
Graphite, fine-grained	min.					100	0,01	100	0,008				
Gold, Silver, Platinum	min.					50	0,005	30	0,004	50	0,005	30	0,004
Magnesium	min.	100	0,008	100	0,005	100	0,008	100	0,008				
MMC Composites	min.					100	0,01	80	0,008				
Plastics	min.					100	0,01	100	0,01				
PEEK	min.	100	0,01	80	0,01								
Zircon	min.					50	0,008	30	0,004				

Cutting Parameters

for our CBN Grooving Inserts – MICRO-Line



You can use all our grooving inserts in continuous and interrupted cut.

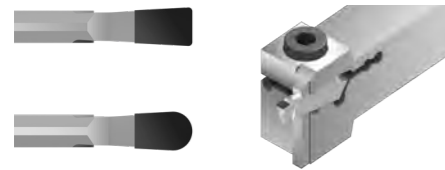
System MICRO-Line Cutting Parameters Diamond

Material		CBN-H				CBN-K				CBN-X			
		● ○		○ ○		● ○		○ ○		● ○		○ ○	
		V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]
Carbide Steel Combinations, > 20% Co*	min.												
	max.												
Steel hardened up to 55 HRC	min.	100	0,007	80	0,007								
	max.	220	0,060	160	0,040								
Steel hardened up to 62HRC	min.	80	0,007	60	0,007								
	max.	200	0,060	140	0,040								
Steel hardened up to 72 HRC	min.	60	0,007	60	0,007								
	max.	180	0,040	120	0,030								
Tool steel hardened up to 72 HRC	min.									80	0,007	40	0,006
	max.									180	0,035	120	0,028
Powder metallurgical steels up to 72 HRC	min.									60	0,007	40	0,006
	max.									160	0,040	140	0,030
Hard/soft machining	min.	80	0,007	60	0,007								
	max.	280	0,060	140	0,035								
Sintered metal	min.					100	0,007	80	0,060				
	max.					300	0,07	160	0,040				
Sintered metal hardened	min.	100	0,006	80	0,006								
	max.	250	0,040	160	0,030								
Grey cast iron (GG)	min.					200	0,007	100	0,007				
	max.					2.000	0,140	600	0,040				
Ductile cast iron (GGG)	min.					100	0,007	80	0,007				
	max.					800	0,070	240	0,040				
Ni-,Co-,Fe- u. Cr-Alloys	min.									80	0,007	60	0,007
	max.									360	0,040	180	0,035
Stellite (Co-Chrom-Alloys)	min.									80	0,007	60	0,007
	max.									180	0,060	140	0,040
Stainless steel, hardened	min.									80	0,007	60	0,007
	max.									250	0,040	140	0,030
Titanium Alloys	min.									80	0,006	60	0,006
	max.									200	0,040	160	0,025

*for machining of carbide we recommend the use of CVD-D cutting edges

Cutting Parameters

for our Diamond Grooving Inserts – ECO-Line



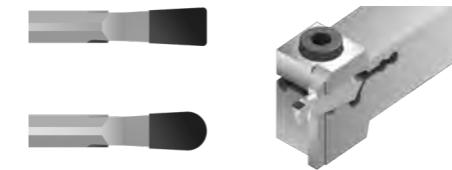
You can use all our grooving inserts in continuous and interrupted cut.

System ECO-Line Cutting Parameters Diamond

Material		PCD				CVD-D				UltraDiamond			
		● ○		○ ○		● ○		○ ○		● ○		○ ○	
		V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]
Acrylic (PMMA)	min.	100	0,005	100	0,005	100	0,005	100	0,005				
	max.	3.000	0,25	2.000	0,10	3.000	0,20	2.000	0,15				
Aluminum <12%Si	min.	100	0,01	100	0,01								
	max.	5.000	0,50	2.000	0,30								
Aluminum >10%Si	min.					100	0,01	100	0,01				
	max.					3.000	0,30	1.500	0,25				
Aluminum >20%Si	min.					100	0,01	80	0,01				
	max.					1.500	0,25	800	0,15				
Brass	min.	100	0,01	100	0,01	100	0,008	100	0,008				
	max.	3.000	0,25	1.500	0,15	5.000	0,20	2.500	0,08				
Carbide G-Grades, >10%Co	min.												
Carbide G-Grades, <12%Co	min.												
Carbide K-Grades, >10%Co	min.												
Carbide K-Grades, <12%Co	min.												
Carbide with Ni Binder	min.												
Carbide Green Body	min.												
Ceramics	min.												
Ceramics Green Body	min.												
Composites as GFK/CFK	min.					100	0,01	80	0,008				
Copper/Copper Alloys	min.					100	0,01	100	0,01				
Glass, Glass Ceramic	min.												
Gold, Silver, Platinum	min.					50	0,005	30	0,004				
Graphite, coarse-grained	min.	100	0,01	100	0,01								
Graphite, fine-grained	min.					100	0,01	100	0,01				
Magnesium	min.	100	0,01	100	0,01	100	0,008	100	0,008				
MMC Composites	min.					100	0,02	80	0,01				
Plastics	min.					100	0,01	100	0,01				
PEEK	min.	100	0,01	80	0,01								
Zircon	min.					50	0,008	30	0,004				

Cutting Parameters

for our CBN Grooving Inserts – ECO-Line



You can use all our grooving inserts in continuous and interrupted cut.

System ECO-Line Cutting Parameters CBN

Material		CBN-H				CBN-K				CBN-X			
		● ○		○ ○		● ○		○ ○		● ○		○ ○	
		V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]	V _c [m/min]	F [mm/rev]
Carbide Steel Combinations, > 20% Co*	min.												
	max.												
Steel hardened up to 55 HRC	min.	100	0,01	80	0,01								
	max.	220	0,08	160	0,06								
Steel hardened up to 62HRC	min.	80	0,01	60	0,01								
	max.	200	0,08	140	0,06								
Steel hardened up to 72 HRC	min.	60	0,01	60	0,01								
	max.	160	0,06	120	0,04								
Tool steel hardened up to 72 HRC	min.									80	0,01	40	0,008
	max.									180	0,05	120	0,04
Powder metallurgical steels up to 72 HRC	min.									60	0,01	40	0,008
	max.									160	0,05	140	0,04
Hard/soft machining	min.	80	0,01	60	0,01								
	max.	280	0,08	140	0,05								
Sintered metal	min.					100	0,01	80	0,08				
	max.					300	0,10	160	0,05				
Sintered metal hardened	min.	100	0,008	80	0,008								
	max.	250	0,06	160	0,04								
Grey cast iron (GG)	min.					200	0,01	100	0,01				
	max.					2.000	0,20	600	0,06				
Ductile cast iron (GGG)	min.					100	0,01	80	0,01				
	max.					800	0,10	240	0,06				
Ni-,Co-,Fe- u. Cr-Alloys	min.									80	0,01	60	0,01
	max.									360	0,06	180	0,05
Stellite (Co-Chrom-Alloys)	min.									80	0,01	60	0,01
	max.									180	0,08	140	0,05
Stainless steel, hardened	min.									80	0,01	60	0,01
	max.									250	0,06	140	0,04
Titanium Alloys	min.									80	0,008	60	0,008
	max.									200	0,06	160	0,035

*for machining of carbide we recommend the use of CVD-D cutting edges.

Cooling According to Cutting Situation

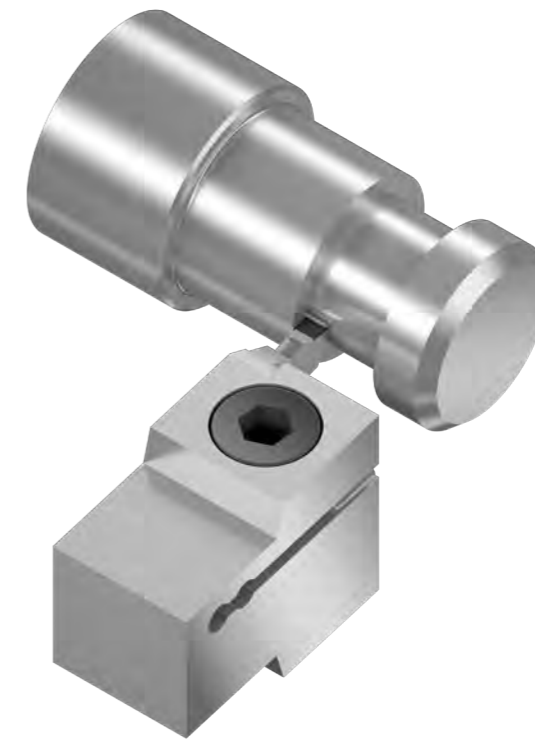
when using DTS Grooving Tools

		Dry	Air	Emulsion	Oil
CBN-H	○	4. Choice	3. Choice	1. Choice	2. Choice
	◐	1. Choice	2. Choice		
	◑	1. Choice	2. Choice		
CBN-K	○	3. Choice	2. Choice	1. Choice	
	◐	2. Choice	1. Choice		
	◑	1. Choice	2. Choice		
CBN-X	○	4. Choice	3. Choice	1. Choice	2. Choice
	◐	2. Choice	1. Choice		
	◑	2. Choice	1. Choice		
PCD Diamond	○		3. Choice	1. Choice	2. Choice
	◐		3. Choice	1. Choice	2. Choice
	◑				
CVD-D Diamond	○		3. Choice	1. Choice	2. Choice
	◐		3. Choice	1. Choice	2. Choice
	◑				
Ultra Diamond	○		3. Choice	1. Choice	2. Choice
	◐		3. Choice	1. Choice	2. Choice
	◑				

○ continuous cut
 ◐ light interrupted cut
 ◑ heavy interrupted cut

Formulas

Grooving



V_f	Feed rate	mm/min
f_n	Feed per revolution	mm/rev
n	Spindle speed	rev/min
v_c	Cutting speed	m/min
D_c	Cutter diameter	mm
t_c	Cutting Time	min
Z	Teeth Count	
Q	Stock removal rate	cm ³ /min
a_p	Cutting depth	mm
a_e	Cutting width	mm

► Cutting speed

$$V_c = \frac{D_c \times \pi \times n}{1000} \quad [\text{m/min}]$$

► Spindle speed

$$n = \frac{v_c \times 1000}{\pi \times D_c} \quad [\text{U/min}]$$

► Feed per revolution

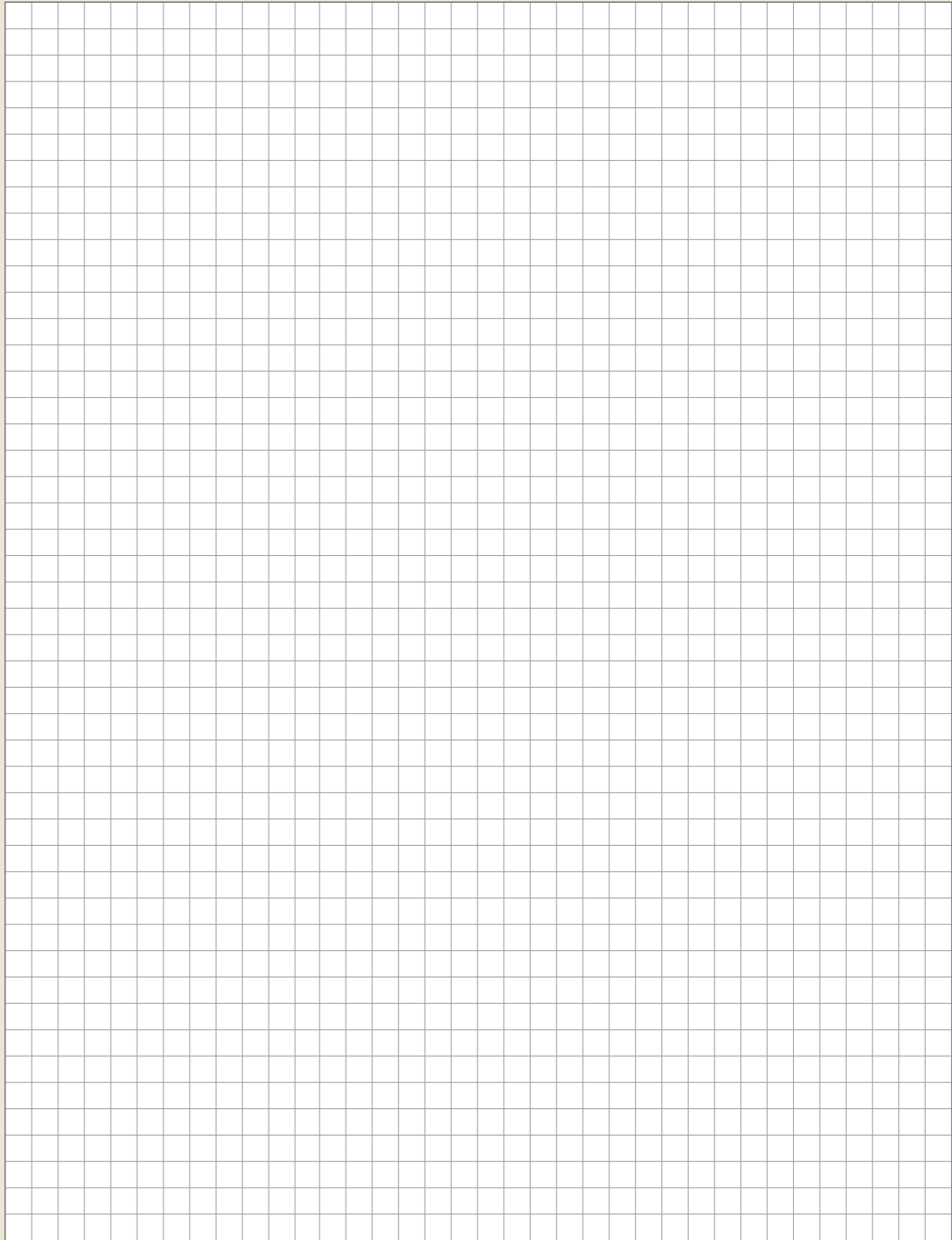
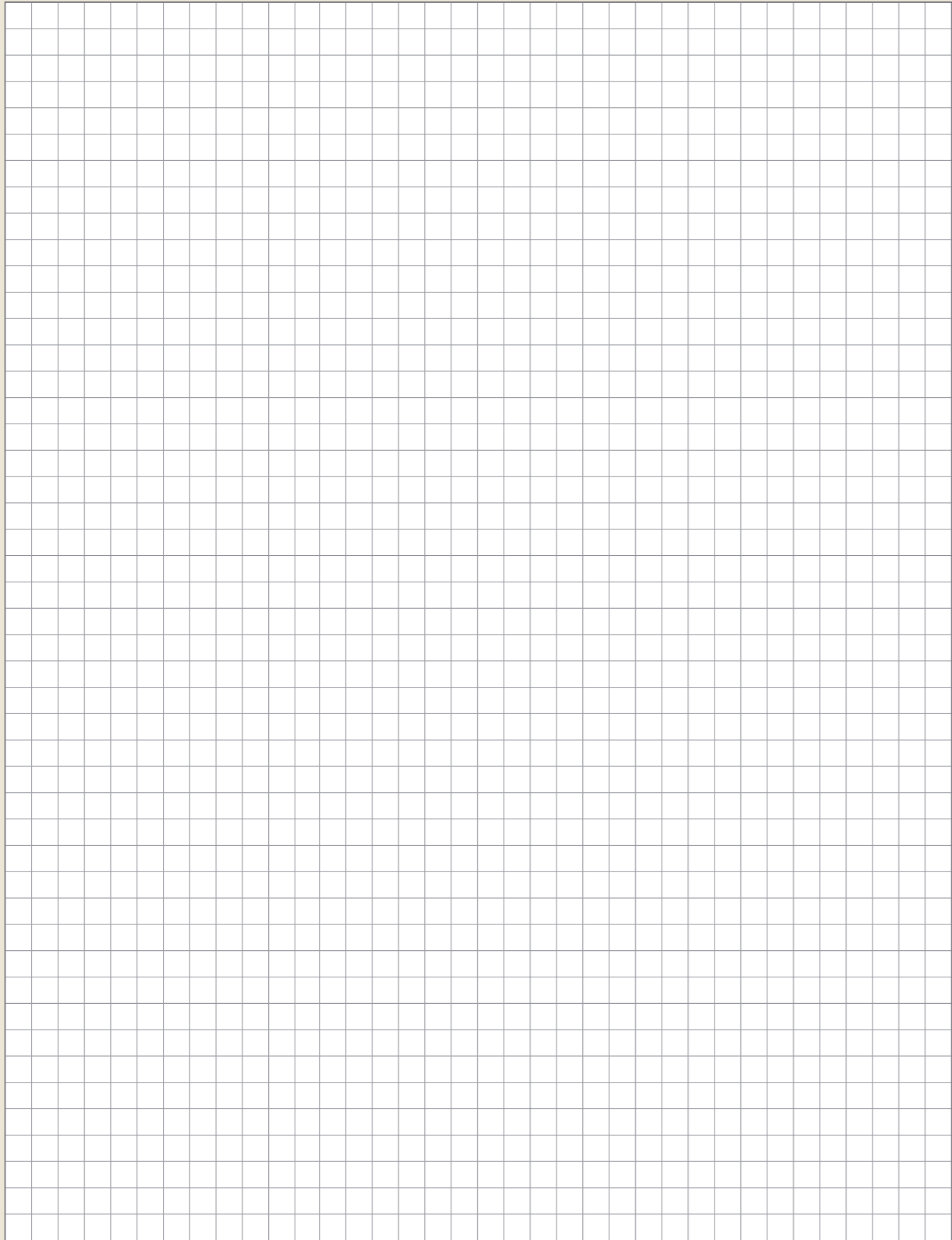
$$f_n = \frac{V_f}{n} \quad [\text{mm/U}]$$

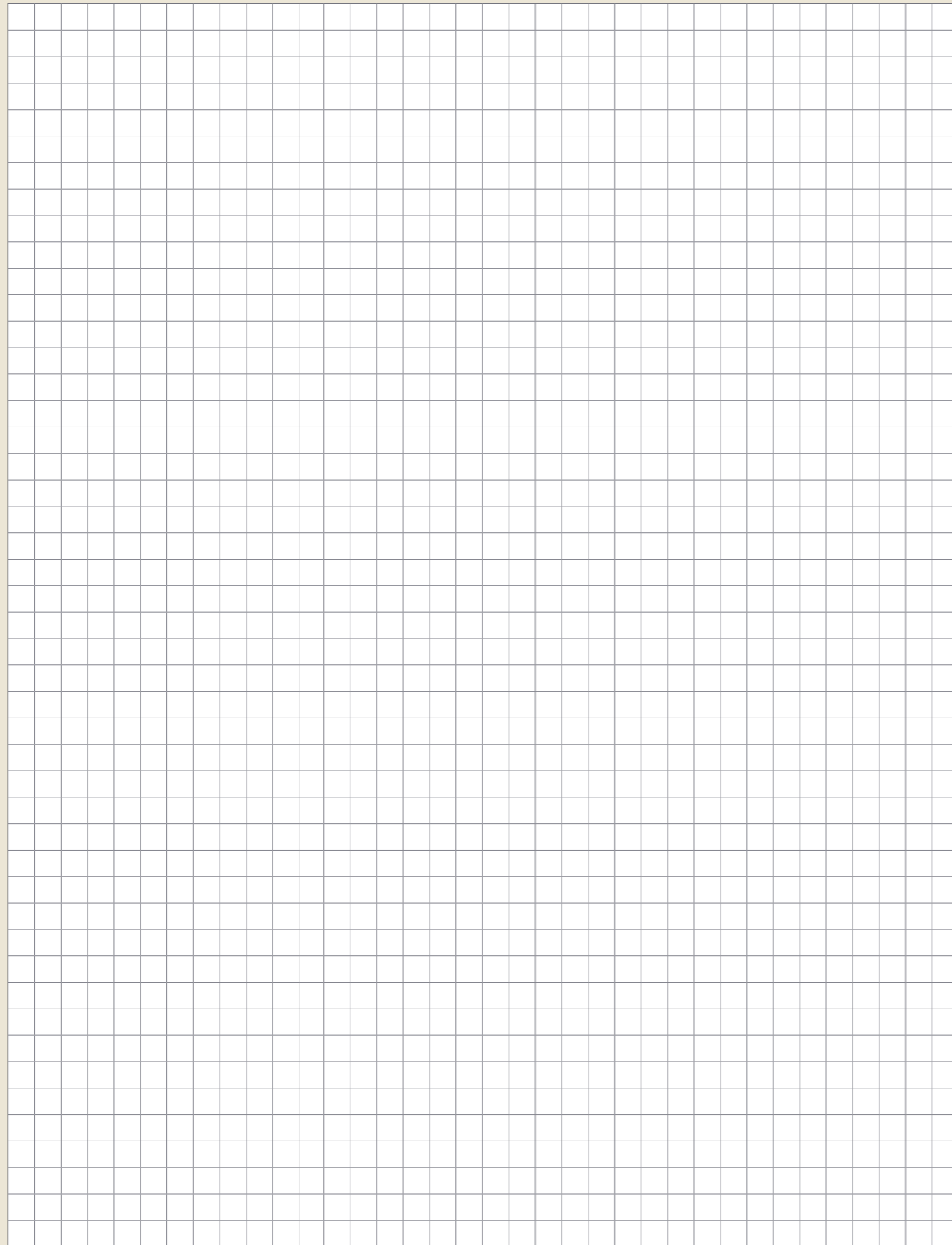
► Cutting time

$$t_c = \frac{l_m}{f_n \times n} \quad [\text{min}]$$

► Stock removal rate

$$Q = v_c \times a_p \times f_n \quad [\text{cm}^3/\text{min}]$$





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We reserve the right to make production-related technical changes and changes to the delivery program. The cutting values given are guide values which must be adjusted according to the process environment.

Safety Instructions:

- ▶ DTS tools equipped with ultra-hard cutting edges are very sharp laser cut tools.
- ▶ Careful handling of the tools during unpacking and their use is recommended.
- ▶ Wearing protective gloves reduces the risk of injury.
- ▶ Material chipping and tool breakage may occur during machining, wearing safety glasses is recommended.
- ▶ Balanced holders are recommended for speeds above 10,000 rpm.
- ▶ We do not accept any responsibility for tools that have been modified, reground or used incorrectly and beyond their normal service life.
- ▶ Protective goggles are recommended when using DTS tools, sparks may also occur, make sure that no fire can occur.



DTS GmbH

Diamond Tooling Systems



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DTS Shop



DTS Website



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