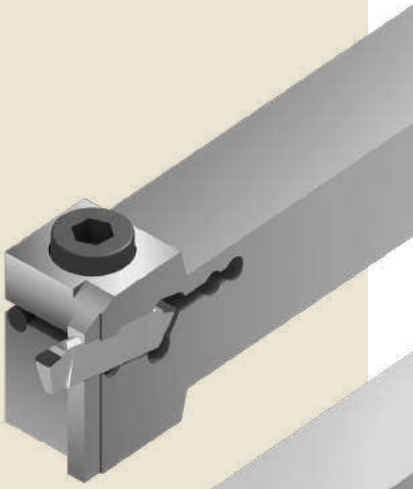
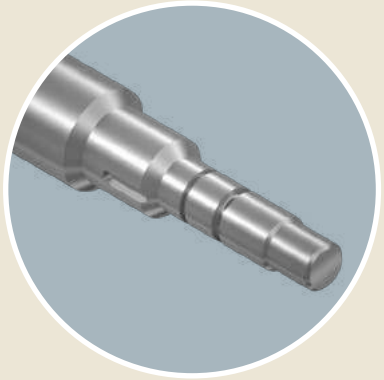
DTS GmbH
Diamond Tooling Systems

Grooving Systems
PCD, CVD-D, UltraDiamond, CBN

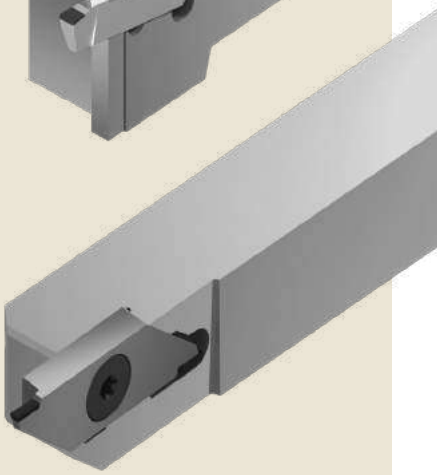
PCD Diamond | CVD-D Diamond | Ultra Diamond | CBN-H | CBN-K | CBN-X

Die and Mold
Industry



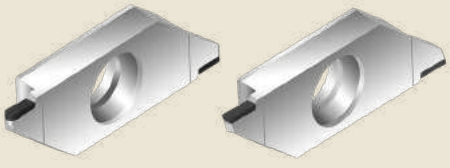


Automotive
Mechanical Engineering



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!

Contents

Grooving systems

DTS GmbH
Diamond Tooling Systems

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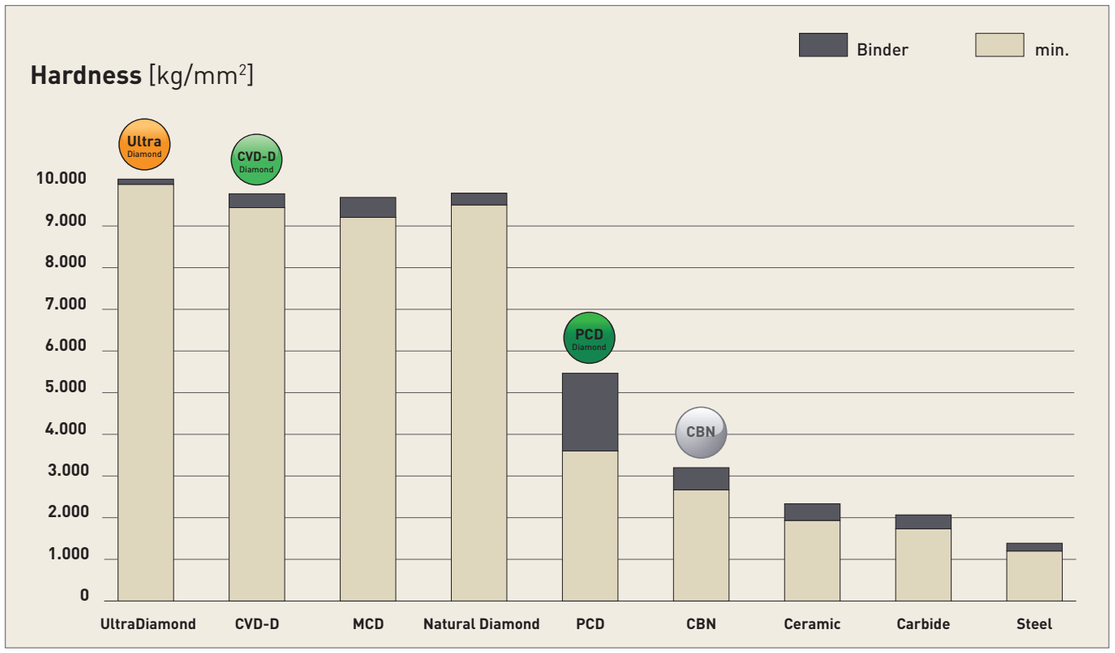
Technical Attachment

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

Our wide range of cutting materials allows us to offer the ideal solution for your applications.

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	Suitable for	Suitable for	Suitable for	Suitable for	Suitable for
Aluminum <10% Si	**Aluminum > 10%**	**Carbide** **G-Type < 10% Co** **K-Type > 12% Co** **with Ni-Binder)**	**Steel, hardened to 72 HRC**	**Grey Cast Iron (GG)**	**Tool Steel, hardened to 72 HRC**
Magnesium	**Magnesium**	**Acrylic (PMMA)**	**Sintered Steel, hardened**	**Ductile Cast Iron (GGG)**	**Stellite**
Carbide, Green	**Copper**	**Glass, Glass Ceramic**			**Stainless Steel, hardened**
Ceramic, Green	**Copper Alloys**	**Ceramic**			**Powder Steels like:** **- CPM** **- Vanadis** **- ASP** **- Böhler**
Copper	**Plastics**				
Copper Alloys	**Acrylic (PMMA)**				
Brass	**Composite Materials (CFK, GFK)**				
PEEK	**MMC**				
Tungsten Alloy	**Glass, Glass Ceramic**				
	Carbide >10% Co				
	Ceramic				
	Titanium				
	Precious metals				

Cooling Recommendations:

	KSS	Oel	Air	Dry	1. Choice	Alternative 1 - 2
continuous cut	● ○ ○	● ○ ○	● ○ ○	● ○ ○ ✕	● ○ ○ ✕	● ✕ ○
light interrupted cut	● ○ ○	● ○ ○	● ○ ○	✕ ○	● ✕	● ✕
heavy interrupted cut	● ○ ○	● ○ ○	● ○ ○	✕ ○	● ✕	✕ ○

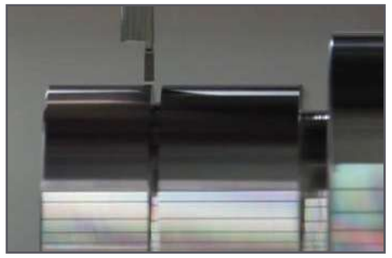
Application Examples

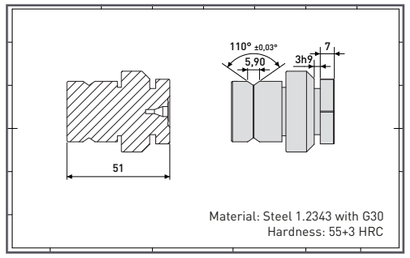
our cutting edges in use

DTS GmbH
Diamond Tooling Systems

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.

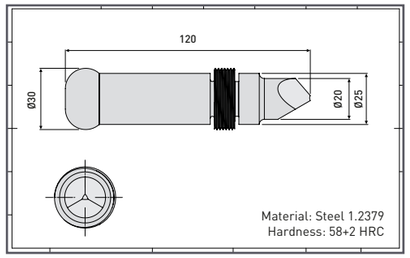
Also visit our YouTube Channel at dts-gmbh!





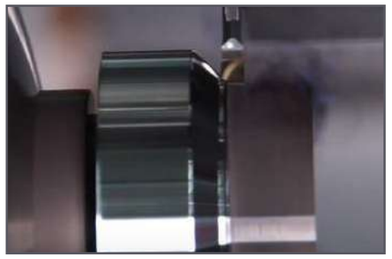
MICRO-Line
Steel 1.2343 52+2HRC
Corner B1,00

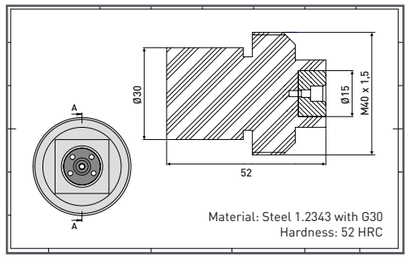
Here you can see the video!



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

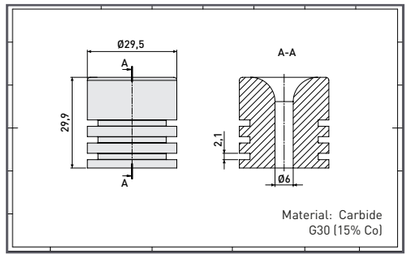
Here you can see the video!





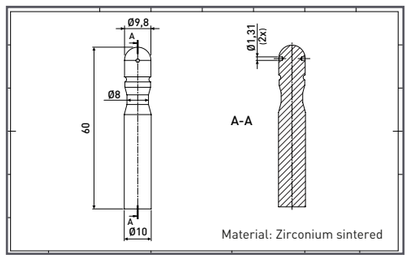
ECO-Line
Steel 1.2343 52+2HRC
Corner B2,00

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!

Our Cutting Materials Assignment

about the materials

DTS GmbH
Diamond Tooling Systems

DTS cutting materials are successfully used in many industries:

- Mechanical Engineering
- Die and Mold Industry
- Automotive
- Aerospace
- Medical Technology
- optical Industry
- Ceramic Industry

1. Choice ● Alternative ○

ISO	Materials	DTS Diamond Grades: PKD	CVD-D	Ultra Diamond	DTS CBN Grades: CBN-P	CBN-K	CBN-H	CBN-X	Materials	ISO
	Cold Work Steel, hardened to 72 HRC						○	●	**Cold Work Steel,** hardened to 72 HRC	
H	**PM- Steels** (ASP, CPM, Vanadis, Böhler)						○	●	**PM- Steels** (ASP, CPM, Vanadis, Böhler)	H
H	**Steel,** hardened to 72 HRC						●	○	**Steel,** hardened to 72 HRC	H
H	**Hot Work Steel**, hardened to 72 HRC						○	●	**Hot Work Steel**, hardened to 72 HRC	H
H	**Tool Steel,** hardened to 72 HRC						○	●	**Tool Steel,** hardened to 72 HRC	H
P	**Sintered Steel**							●	**Sintered Steel**	P
P	**Sintered Steel,** hardened						●	○	**Sintered Steel,** hardened	P
K	**Grey Cast Iron (GG)**					●	○		**Grey Cast Iron (GG)**	K
K	**Ductile Cast Iron (GGG)**					●	○		**Ductile Cast Iron (GGG)**	K
K	**Shell Chilled Cast Iron**					○	●		**Shell Chilled Cast Iron**	K
M	**Stainless Steel,** hardened						○	●	**Stainless Steel,** hardened	M
N	**Acrylic (PMMA)**		○	●						N
N	**Aluminum,** < 10% Si	●	○							N
N	**Aluminum,** > 10% Si		●	○						N
N	**Brass**	○	●							N
N	**Carbide Green Body**	●								N
N	**Carbide G-Grades,** < 12% Co		○	●	○			●	**Carbide,** > 20% Co*	N
N	**Carbide G-Grades,** > 10% Co		●	○					* for the machining of carbide	N
N	**Carbide K-Grades,** < 12% Co		○	●					we recommend the use of	N
N	**Carbide K-Grades,** > 10% Co		●	○					CVD-D cutting edges	N
N	**Carbide with Ni-Binder**			●						N
N	**Ceramics**	●	○							N
N	**Ceramics Green Body**	●								N
N	**Composites as CFK/GFK**	○	●							N
N	**Copper, Copper Alloys**	○	●							N
N	**Glass, Glass Ceramic**		○	●						N
N	**Gold, Silver, Platinum**		●	○						N
N	**Magnesium**	○	●							N
N	**MMC**		●	○						N
N	**PEEK**	●	○							N
N	**Plastics**		●							N
N	**Tungsten Alloy**	○	●							N

The cutting material combination you are looking for is not in the table?

Our consultants and application engineers are available by phone or e-mail:

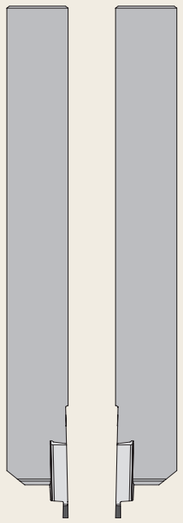
Tel.: +49(0)6301 32011-0
Mail: info@diamond-toolingsystems.com

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

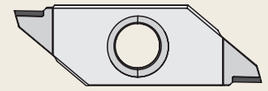


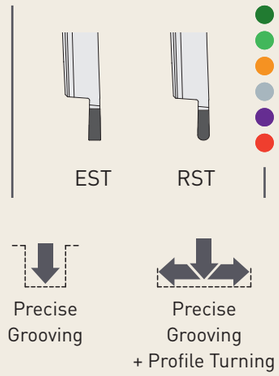
Right Left

for grooving widths
1,00 - 2,00 mm

2-edged
Diamond and CBN
grooving inserts

DTS
MICRO - Line



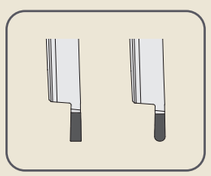


EST RST

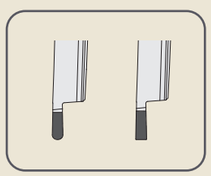
Precise Grooving

Precise Grooving + Profile Turning

Grooving plates Right

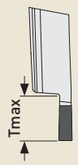


Grooving plates Left



Maximum groove depths (Tmax:)

MICRO-Line Tmax 3,8 mm



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

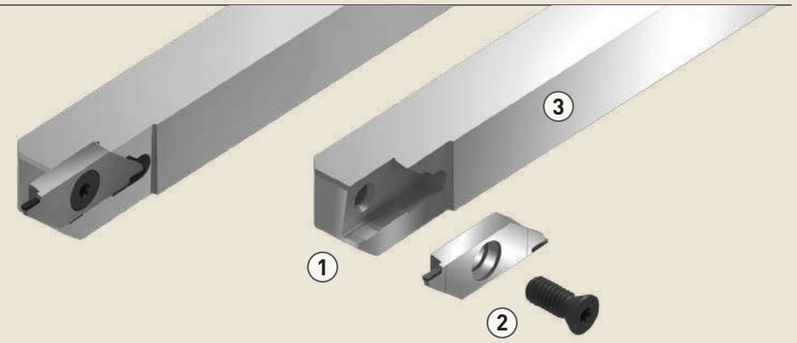
PCD Diamond · CVD-D Diamond · Ultra Diamond · CBN-H · CBN-K · CBN-X

* ECO-Line with UltraDiamond equipment available on request

Grooving System MICRO-Line

Overview and Applications

DTS GmbH
Diamond Tooling Systems

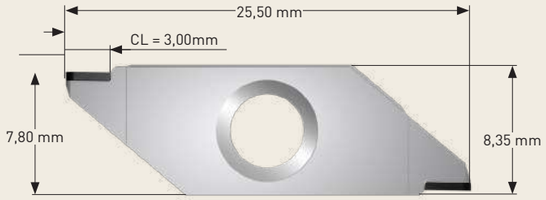


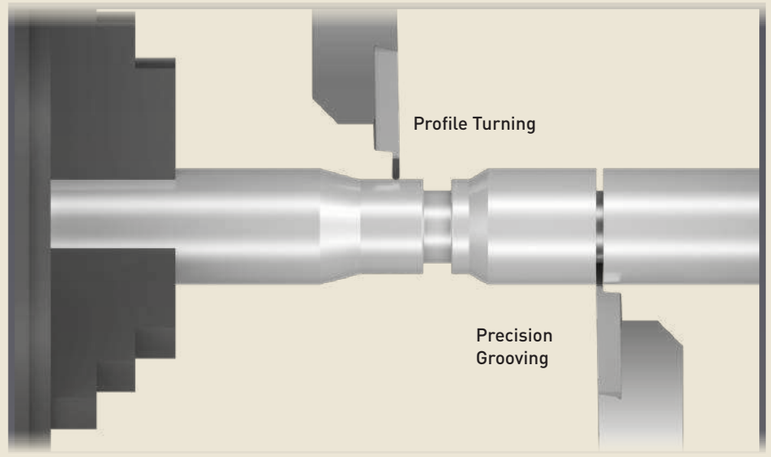
MICRO-Line Tool Holder System

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



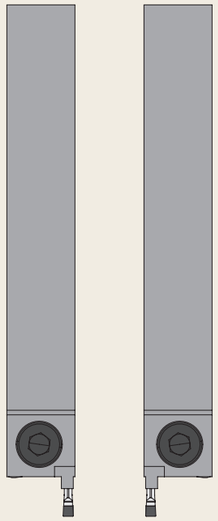


Grooving Systems ECO - Line

The highly economical universal grooving programme

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

DTS
ECO - Line

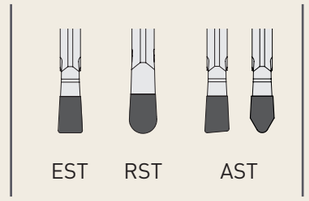


Right Left

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

2-edged
Diamond and CBN
grooving inserts

DTS
ECO - Line



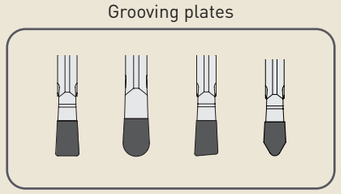
EST RST AST

Precise
Grooving

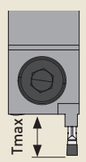
Precise
Grooving
+ Profile Turning

Cutting

Neutral
Grooving plates



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

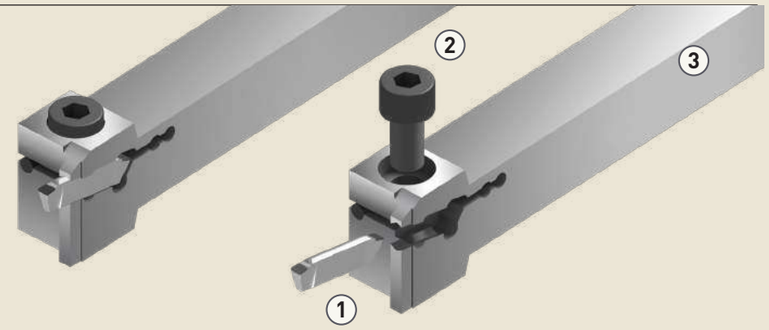


Versions deviating from the standard program are available on request.
Our technical consultants and application engineers are available at any time:
info@Diamond-toolingsystems.com

Grooving System ECO-Line

Overview and Applications

DTS GmbH
Diamond Tooling Systems



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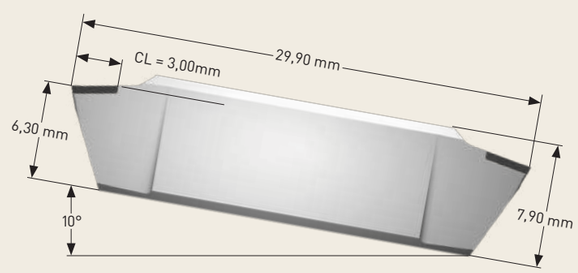
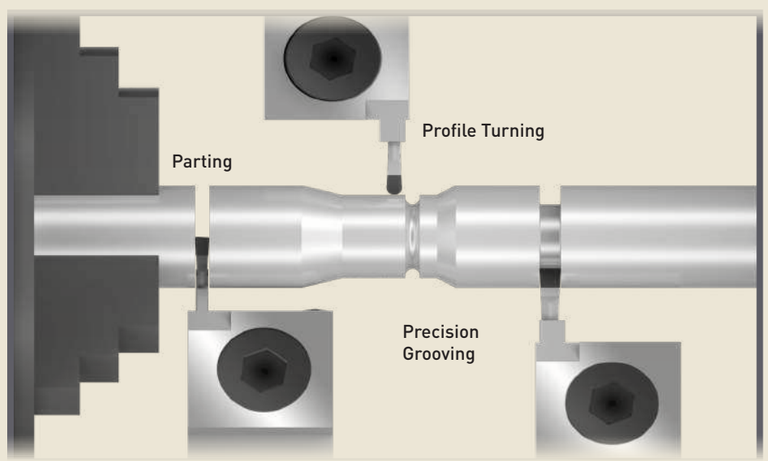




Corner and Full Radius Grooving Inserts

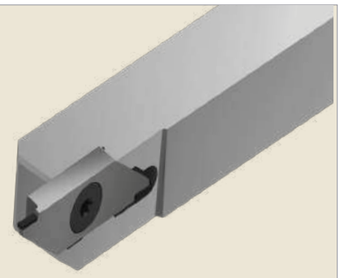
for Grooving, Profile Turning and Parting

DTS GmbH
Diamond Tooling Systems

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



System MICRO-Line EST and RST I 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)

MICRO-EST

- 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-RST

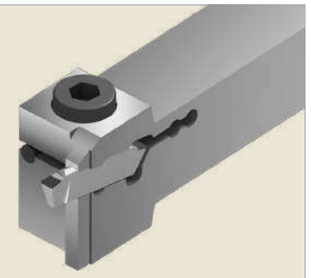
You can get the following materials for our grooving systems:

PKD Diamant | CVD-D Diamant | Ultra Diamant | CBN-H | CBN-K | CBN-X

ECO-Line System I 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



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)

ECO-EST

- 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-RST

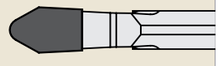
ECO-Line AST | Parting Inserts

Benefits:

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

ECO-AST-Left

- 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 60°

ECO-AST-Right

You can get the following materials for our grooving systems:

PKD Diamant | CVD-D Diamant | CBN-H | CBN-K | CBN-X

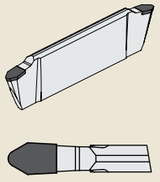
Internal and Special Grooving Systems

your individual request for special tools

On request we manufacture parting systems, special parting systems and internal parting systems equipped with our cutting materials.

PKD Diamant · CVD-D Diamant · Ultra Diamant · CBN-H · CBN-K · CBN-X

Cutting off

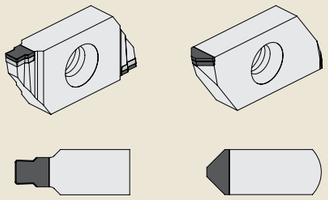


- Special cutting edge shapes for our **ECO - Line** series

The DTS special parting-off plate shown here is excellently suited for parting-off hard materials.

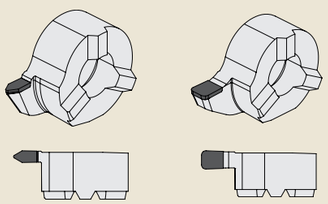
(CVD-D equipped already in the catalog program: ST2050-0299)

Form Cutting



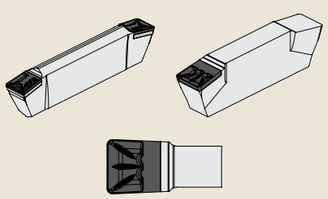
- Grooving tools with special cutting edge shapes according to customer specification
- On request, we can equip your proven tools with our cutting materials to make them even more efficient.

Inner grooving



- Equipping of internal grooving cutting tools according to customer specification
- Special tools for internal grooving, axial grooving or also for internal thread production

Chip control



Long chips for grooving in aluminum, lead-free brass, copper, plastic, hardened steel or tool steel?

With our lasered 3D chip grooves it is possible to create a controlled chip breakage

- The chips do not scratch the flanks of the groove and the finished turned surfaces
- The cutting pressure is reduced by approx. 40%

Your notes

DTS GmbH
Diamond Tooling Systems

Grooving Holder System MICRO-Line

Clamping Holder

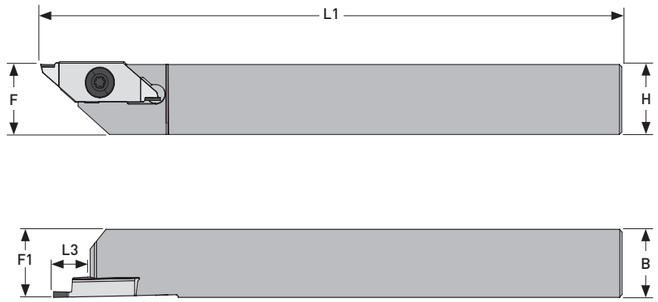


Figure shows right holder.

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 ...

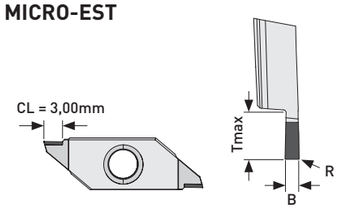
You can find further application areas in the detailed overview starting on page 8.

Grooving Indexable Insert System MICRO-Line

for Grooving and Profile Turning

DTS GmbH
Diamond Tooling Systems

MICRO-EST

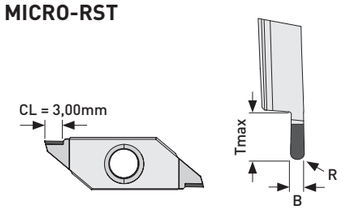


2-blade grooving plates
Picture shows right version

					PCD	CVD-D	Ultra-Dia.	CBN-H	CBN-K	CBN-X
Name	Version	B	R	Tmax	Item No.	Item No.	Item No.	Item No.	Item No.	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

					PCD	CVD-D	Ultra-Dia.	CBN-H	CBN-K	CBN-X
Name	Version	B	R	Tmax	Item No.	Item No.	Item No.	Item No.	Item No.	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

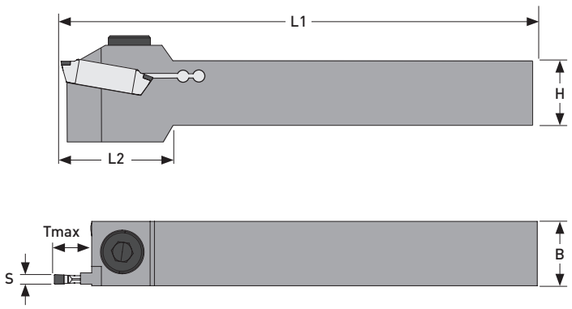


Figure shows right holder.

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

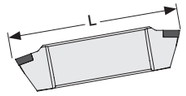
Grooving Indexable Insert System ECO-Line

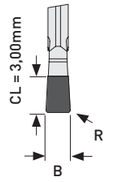
for Grooving, Profile Turning and Parting

DTS GmbH
Diamond Tooling Systems

ECO-EST

2-cutting edge corner grooving inserts



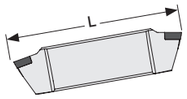


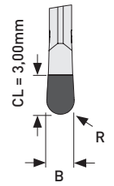
					PCD	CVD-D	CBN-H	CBN-K	CBN-X
Name	B	R	L		Item No.	Item No.	Item No.	Item No.	Item No.
EST-B2	2,00	0,20	29,90		ST1050-0200	ST2050-0200	ST5050-0200	ST5550-0200	ST5950-0200
EST-B3	3,00	0,20	29,90		ST1050-0300	ST2050-0300	ST5050-0300	ST5550-0300	ST5950-0300
EST-B4	4,00	0,20	29,90		ST1050-0400	ST2050-0400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



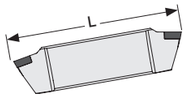


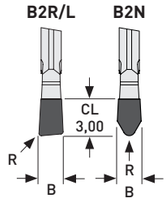
					PCD	CVD-D	CBN-H	CBN-K	CBN-X
Name	B	R	L		Item No.	Item No.	Item No.	Item No.	Item No.
RST-B2	2,00	1,00	29,90		ST1050-1200	ST2050-1200	ST5050-1200	ST5550-1200	ST5950-1200
RST-B3	3,00	1,50	29,90		ST1050-1300	ST2050-1300	ST5050-1300	ST5550-1300	ST5950-1300
RST-B4	4,00	2,00	29,90		ST1050-1400	ST2050-1400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





					PCD	CVD-D	CBN-H	CBN-K	CBN-X
Name	B	R	L		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.

Subject to technical changes.

Cutting Parameters

for our Diamond Grooving Inserts – MICRO-Line

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

Material		System MICRO-Line Cutting Parameters Diamond											
		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.	on request											
	max.												
Carbide G-Grades, <12%Co	min.												
	max.												
Carbide K-Grades, >10%Co	min.												
	max.												
Carbide K-Grades, <12%Co	min.												
	max.												
Carbide with Ni Binder	min.												
	max.												
Carbide Green Body	min.												
	max.												
Ceramics	min.												
	max.												
Ceramics Green Body	min.												
	max.												
Composites as GFK/CFK	min.					100	0,01	80	0,008				
	max.					800	0,15	500	0,10				
Copper/Copper Alloys	min.					100	0,01	100	0,01				
	max.					2.000	0,25	1.000	0,15				
Glass, Glass Ceramic	min.									50	0,005	30	0,003
	max.									160	0,015	100	0,01
Graphite, coarse-grained	min.	100	0,01	100	0,008								
	max.	4.000	0,15	2.000	0,10								
Graphite, fine-grained	min.					100	0,01	100	0,008				
	max.					5.000	0,22	3.000	0,12				
Gold, Silver, Platinum	min.					50	0,005	30	0,004	50	0,005	30	0,004
	max.					1.500	0,20	800	0,15	1.500	0,20	800	0,15
Magnesium	min.	100	0,008	100	0,005	100	0,008	100	0,008				
	max.	2.000	0,15	1.000	0,10	3.000	0,12	2.000	0,10				
MMC Composites	min.					100	0,01	80	0,008				
	max.					600	0,15	300	0,10				
Plastics	min.					100	0,01	100	0,01				
	max.					2.000	0,30	1.500	0,20				
PEEK	min.	100	0,01	80	0,01								
	max.	300	0,50	220	0,40								
Zircon	min.					50	0,008	30	0,004				
	max.					160	0,05	100	0,02				

Cutting Parameters

for our CBN Grooving Inserts – MICRO-Line

DTS GmbH
Diamond Tooling Systems

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

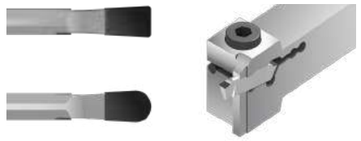
Material		System MICRO-Line Cutting Parameters Diamond											
		CBN-H				CBN-K				CBN-X			
		V_c [m/min]	F [mm/rev]	V_c [m/min]	F [mm/rev]	V_c [m/min]	F [mm/rev]	V_c [m/min]	F [mm/rev]	V_c [m/min]	F [mm/rev]	V_c [m/min]	F [mm/rev]
Carbide Steel Combinations, > 20% Co*	min.	on request											
	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

Subject to technical changes.

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.	on request											
	max.												
Carbide G-Grades, <12%Co	min.												
	max.												
Carbide K-Grades, >10%Co	min.												
	max.												
Carbide K-Grades, <12%Co	min.												
	max.												
Carbide with Ni Binder	min.												
	max.												
Carbide Green Body	min.												
	max.												
Ceramics	min.	on request											
	max.												
Ceramics Green Body	min.												
	max.												
Composites as GFK/CFK	min.					100	0,01	80	0,008				
	max.					500	0,2	250	0,12				
Copper/Copper Alloys	min.					100	0,01	100	0,01				
	max.					2.000	0,25	1.000	0,15				
Glass, Glass Ceramic	min.	on request											
	max.												
Gold, Silver, Platinum	min.					50	0,005	30	0,004				
	max.					1.500	0,30	800	0,20				
Graphite, coarse-grained	min.	100	0,01	100	0,01								
	max.	4.000	0,50	2.000	0,25								
Graphite, fine-grained	min.					100	0,01	100	0,01				
	max.					5.000	1,00	3.000	0,30				
Magnesium	min.	100	0,01	100	0,01	100	0,008	100	0,008				
	max.	2.000	0,25	1.000	0,15	3.000	0,25	2.000	0,15				
MMC Composites	min.					100	0,02	80	0,01				
	max.					600	0,25	300	0,15				
Plastics	min.					100	0,01	100	0,01				
	max.					2.000	0,40	1.500	0,30				
PEEK	min.	100	0,01	80	0,01								
	max.	300	0,50	220	0,40								
Zircon	min.					50	0,008	30	0,004				
	max.					160	0,05	100	0,02				

Cutting Parameters

for our CBN Grooving Inserts – ECO-Line

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Diamond Tooling Systems

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.	on request											
	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.

Subject to technical changes.

Cooling According to Cutting Situation

when using DTS Grooving Tools

		Dry	Air	Emulsion	Oel
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

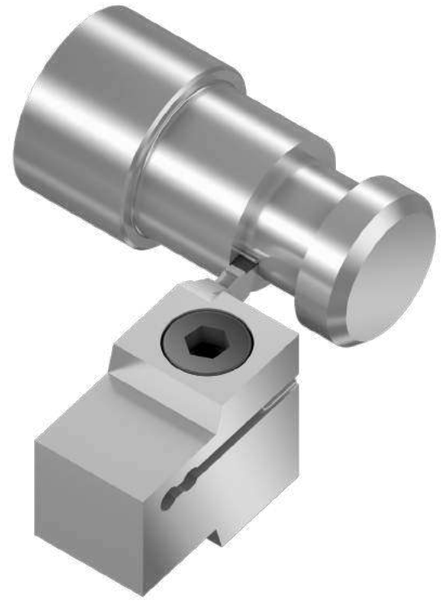
⌒ light interrupted cut

⌒⌒ heavy interrupted cut

Formulas

Grooving

DTS GmbH
Diamond Tooling Systems



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

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

▶ Spindle speed

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

▶ Feed per revolution

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

▶ Cutting time

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

▶ Stock removal rate

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

Your notes

Your notes

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Your notes

Copyright and Safety Instructions

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All rights are reserved. Errors, misprints or printing errors do not entitle to claims. The pictorial and graphic representation of our tools do not necessarily have to correspond to the actual tool in all details.

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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