DVS TECHNOLOGY GROUP

Buderus SCHLEIFTECHNIK

NAXOS DISKUS

rbc robotics

Low Emission Brake Discs

Two sides. One process. Zero compromises.

BUDERUS-SCHLEIFTECHNIK.DE
NAXOS-DISKUS.DE
RBC-ROBOTICS.DE
DVS-TECHNOLOGY.COM

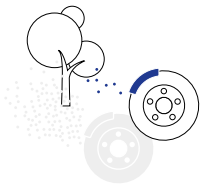
Precision and Innovation for Sustainable Mobility

Brake Disc Machining with the DVS TECHNOLOGY GROUP

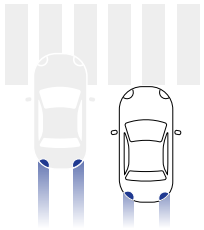
The automotive industry is facing a new challenge: in addition to reducing CO^2 emissions, fine dust emissions caused by brake wear are increasingly coming into focus. Especially in urban traffic, conventional grey cast iron brake discs generate significant amounts of fine dust particles that impact both the environment and

INNOVATION FOR REDUCED BRAKE DUST, LONGER DURABILITY, AND IMPROVED PERFORMANCE

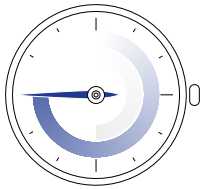
One of the most promising responses to this challenge is hard-coated brake discs. But why are automotive manufacturers increasingly turning to this technology?



Environment
High environmental compatibility thanks to 90% less fine dust formation



Safety
More safety through shorter braking distances



Efficiency
Sustainability and efficiency due to extreme durability

1. Significant reduction of fine dust emissions
A specially applied hard coating—usually made of titanium or silcium carbides—significantly reduces mechanical wear. As a result, up to 90% fewer fine dust particles are generated that would otherwise be released into the environment.

2. Longer service life and greater durability
While conventional brake discs wear out quickly due to abrasion, coated brake discs offer a significantly longer lifespan. The hard coating protects against wear, corrosion, and thermal stress, which considerably reduces maintenance costs.

3. Optimized braking performance and consistency
Thanks to their extremely smooth and wear-resistant surface, hard-coated brake discs provide consistent friction levels throughout their entire service life. This ensures more stable braking performance, shorter stopping distances, and improved safety.

4. Corrosion protection for extended durability
Especially in the electric vehicle sector, where braking is used less frequently due to regenerative braking, uncoated brake discs can rust more quickly. The hard coating protects against corrosion and prevents performance losses caused by rust formation.

PRECISION MACHINING FOR MAXIMUM EFFICIENCY

The production of these innovative brake discs requires the highest level of precision—from coating the raw disc to grinding the coating and applying the final finish. This is exactly where the DVS TECHNOLOGY GROUP comes in.

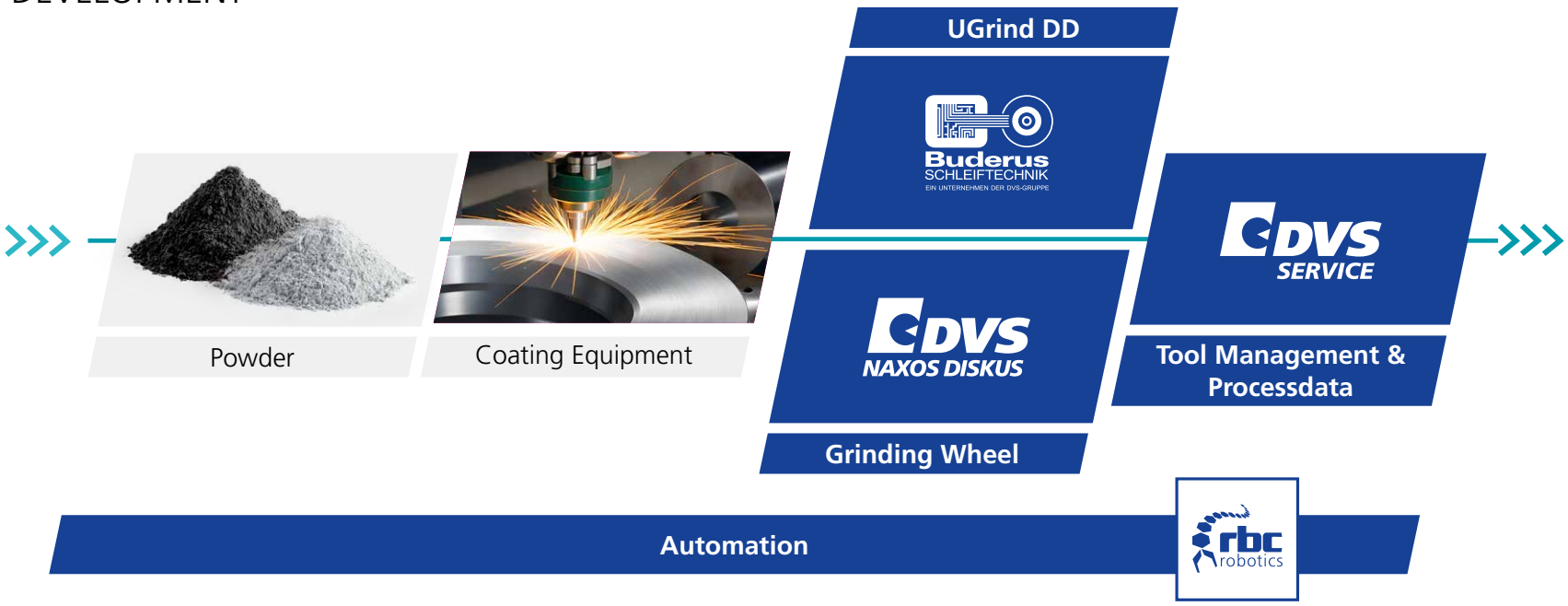
As experts in high-precision hard fine machining, we offer a comprehensive manufacturing concept within the group that covers all key processes required for machining modern brake discs:

- **Precise turning, grinding, and superfinishing** – for top surface quality and optimal functional areas
- **Efficient coating processing** – provided by our partners
- **Automated process chains** – for maximum cost-efficiency and consistent quality

With our specialized machines, tools and automation solutions, we enable reliable manufacturing processes. Our technologies not only reduce emissions but also enhance the durability and performance of modern braking systems.

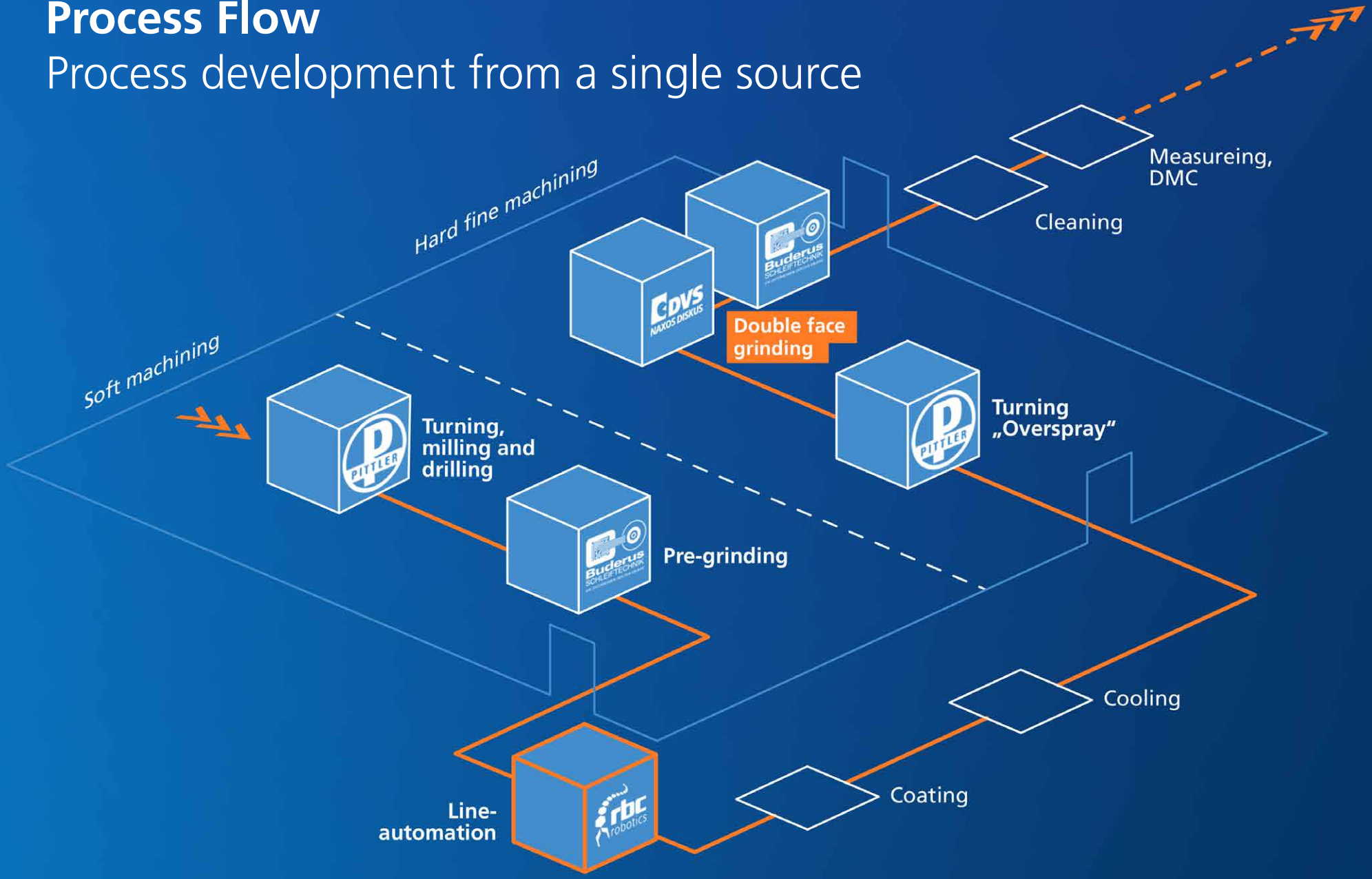
In this brochure, you will discover how the DVS TECHNOLOGY GROUP is shaping the future of brake disc machining with innovative manufacturing solutions—sustainable, efficient, and at the highest level of precision.

DSV SOLUTION - HARD-COATED BRAKE DISK
PROCESS DEVELOPMENT



Process Flow

Process development from a single source

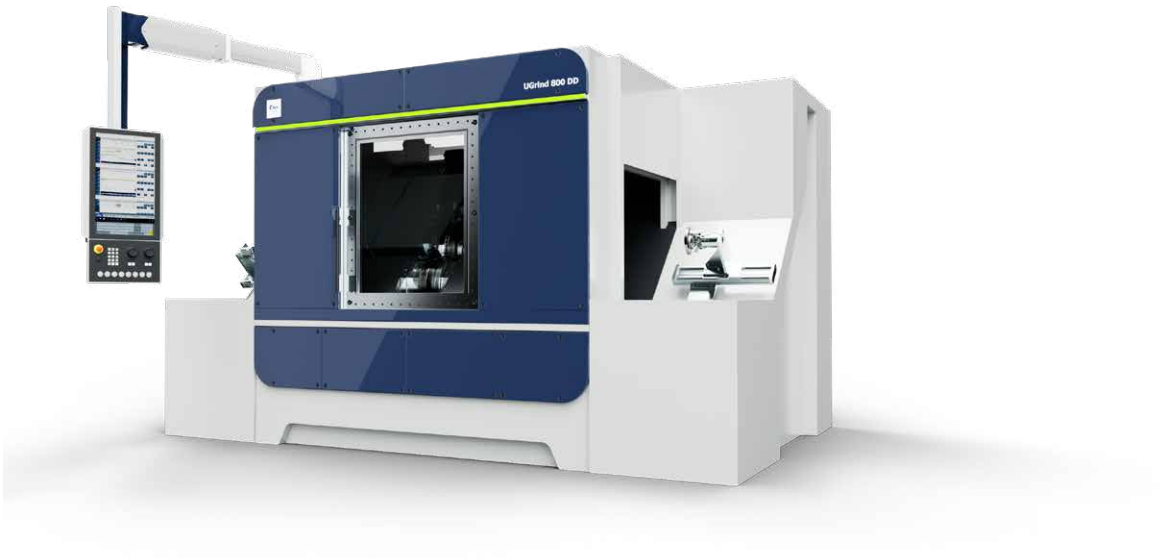


The Design.
Modern. Space saving. Solid.

The DVS UGrind impresses not only with its modern design and compact footprint of just 10 m², but also with its outstanding rigidity during production. This is achieved through its natural granite machine base, which ensures exceptional dynamic and thermal stiffness—enabling highly precise machining results.

Another key quality feature of the DVS UGrind is the cross-hatch pattern produced during machining. Especially in the double face grinding of brake discs, this cross-grinding technique ensures high dimensional accuracy and surface quality. Opposing grinding spindles and a double surface grinding process allow for maximum precision, further enhanced by in-process measurement prior to machining.

These characteristics make the DVS UGrind a highly efficient and precise solution for demanding machining tasks.



YOUR ADVANTAGE

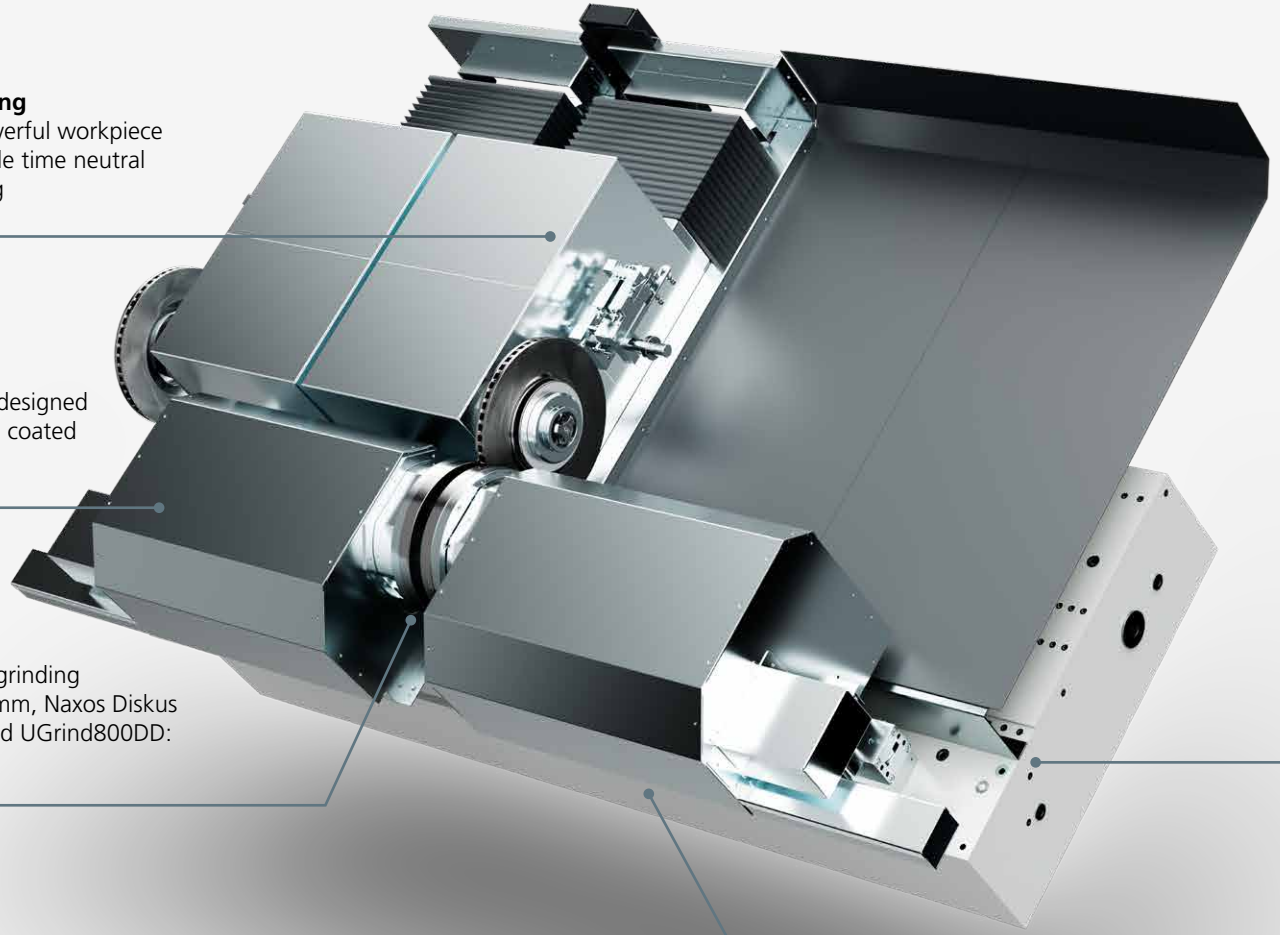
- Only 10 m² of installation space, including the coolant system
- Vibration-damping granite bed for thermal stability and maximum precision
- Easy loading and unloading thanks to easily accessible work area

To dampen vibrations during machining, the UGrind machine bed is made of natural granite. The thermally stable structure guarantees optimal reproducibility of the desired surface qualities.

Versatile machining
Thanks to two powerful workpiece spindle, almost cycle time neutral loading / unloading

Very high torque
Grinding spindles, designed for machining hard coated brake disks

Tuned processes
Possible thanks to grinding wheels up to 400 mm, Naxos Diskus grinding wheels and UGrind800DD: the perfect duo



High rigidity
Machine bed made of natural granite, vibration damping and optimal thermal properties

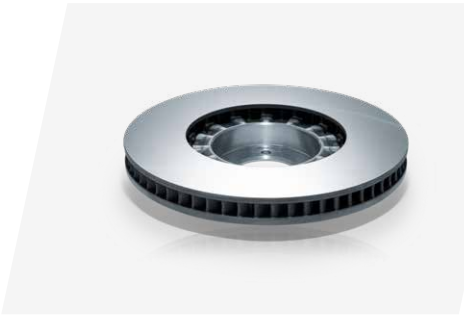
Specially designed guideways
Designed for the high torques of the machine

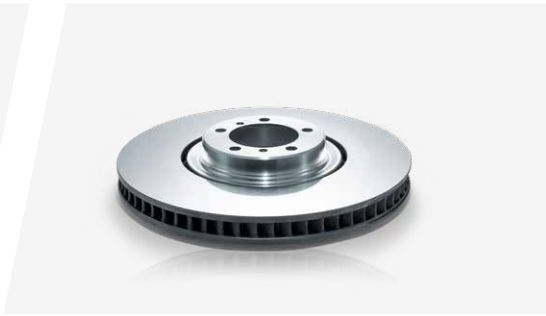
UGrind 800 DD

Two sides. One process. Zero compromises.

The UGrind 800 DD was specially developed for the double face grinding of brake discs. On the base of the standard machine are two grinding supports, which enable the simultaneously grinding of both friction ring surfaces. The grinding supports are equipped with CBN or diamond grinding wheels. The workpiece is clamped axially using a quick-change system. It moves along the axes between the two grinding wheels. The friction ring strength is checked and measured via the in-process measuring system.

Ideal for the efficient processing of different coatings





Machining Scope

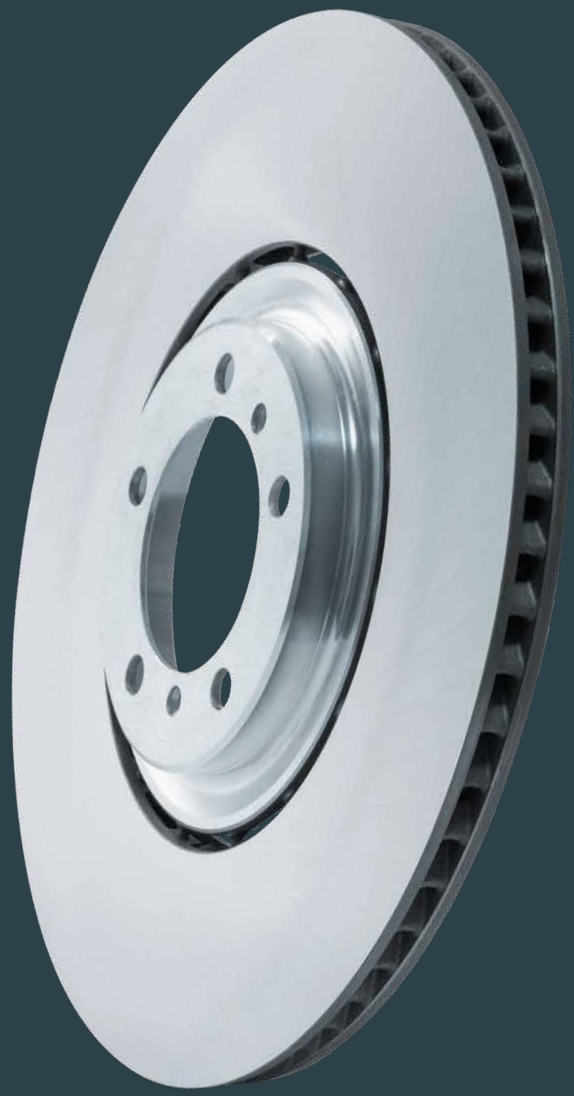
Double Face Grinding

The UGrind 800 DD has been specially optimized for the machining of hard-coated brake discs. But the machine can also be used for the soft machining of standard grey cast iron brake discs. The UGrind 800 DD is designed for the horizontal machining of workpieces.

Depending on the requirements of the customer and project, various automation concepts for the entire production line (including SPC, measuring and cleaning station as well as cooling section) can be implemented by rbc robotics GmbH.

Technical Data

	UGrind 800 DD
WORKPIECE	
Workpiece diameter min./max. (mm)	130/500
Workpiece thickness max. (mm)	50
Workpiece weight max. (kg)	40
AXLES	
X-axis travel (mm)	250
Z-axis travel (mm)	1.200
travel grinding spindles (mm)	60
Control system	Siemens Sinumerik One
Optional accessories	Custom automation solutions, external coolant treatment, chucks adapted to the specific brake disc type with quick-release system
Technology	Double Face Grinding of brake discs: with hard coating (e.g., tungsten carbide, chromium carbide, aluminum oxide, silicon carbide)
Machine concept / design	Inclined machine bed with two grinding spindles movable in the Z-direction, workpiece spindle movable in both Z- and X-directions
Axes / Drives	Cross slide with X-axis (servo motor + ball screw) and Z1-axis (servo motor + ball screw), Z2 and Z3 axes (servo motor + ball screw), workpiece and tool spindles designed as motor spindles



CBN and Diamond Grinding Wheels

Tailored-made Precision

DIAMOND AND CUBIC BORON NITRIDE (CBN)

Today's demands on speed and precision in the manufacturing process are a challenge for the processing of highly wear- and abrasion-resistant materials. NAXOS-DISKUS has a wide range of diamond and CBN tools for the efficient processing of amorphous materials or alloys that contain carbide.

As the toughest substance known to mankind, diamonds are the ideal abrasive for very hard materials. However, it is not suitable for the processing of iron materials due to its conversion back into carbon. CBN, the second hardest known raw material after diamonds, is a better option for grinding these types of alloys.

In terms of cutting edge retention and wear resistance, diamonds and CBN are superior to all other materials. Our CBN and diamond grinding wheels enable extremely accurate grinding performance with outstanding repeatability. Specially coated CBN grain and newly developed ceramic and synthetic resin bonds are the basis for the CBN and diamond grinding wheels from NAXOS-DISKUS.

APPLICATION-SPECIFIC DEVELOPMENT

Machine planners are all to familiar with this problem: When using modified, product-specific machines, standardized grinding wheels are often out of the question. This requires individual solutions for individual machines! CBN and diamond grinding wheels from NAXOS-DISKUS are designed and manufactured specifically for the customer for use in areas such as round and face grinding.

Our competent application engineers will advise you personally on choosing the right abrasive in order to benefit from the advantages of diamonds and CBN to the fullest. NAXOS-DISKUS guarantees to optimize your processes as cost-effectively as possible.

Holistic grinding process development for a TiCN coating

Case-Study

Initial situation:

The development of an economical and cycle time-optimized grinding process was required for a new brake disc application with a TiCN coating system. The first prototypes were tested in benchmark trials together with the development partner.

Procedure & development steps:

- **Prototype 1:** Comparative tests with CBN tools in metallic, hybrid and ceramic bonds laid the foundation for the tool specification.
- **Prototype 2:** Optimization of the bond and specifications based on the initial results.
- **Benchmark test 2:** Target value for tool costs was achieved by using a CBN tool with a metallic bond.

Result:

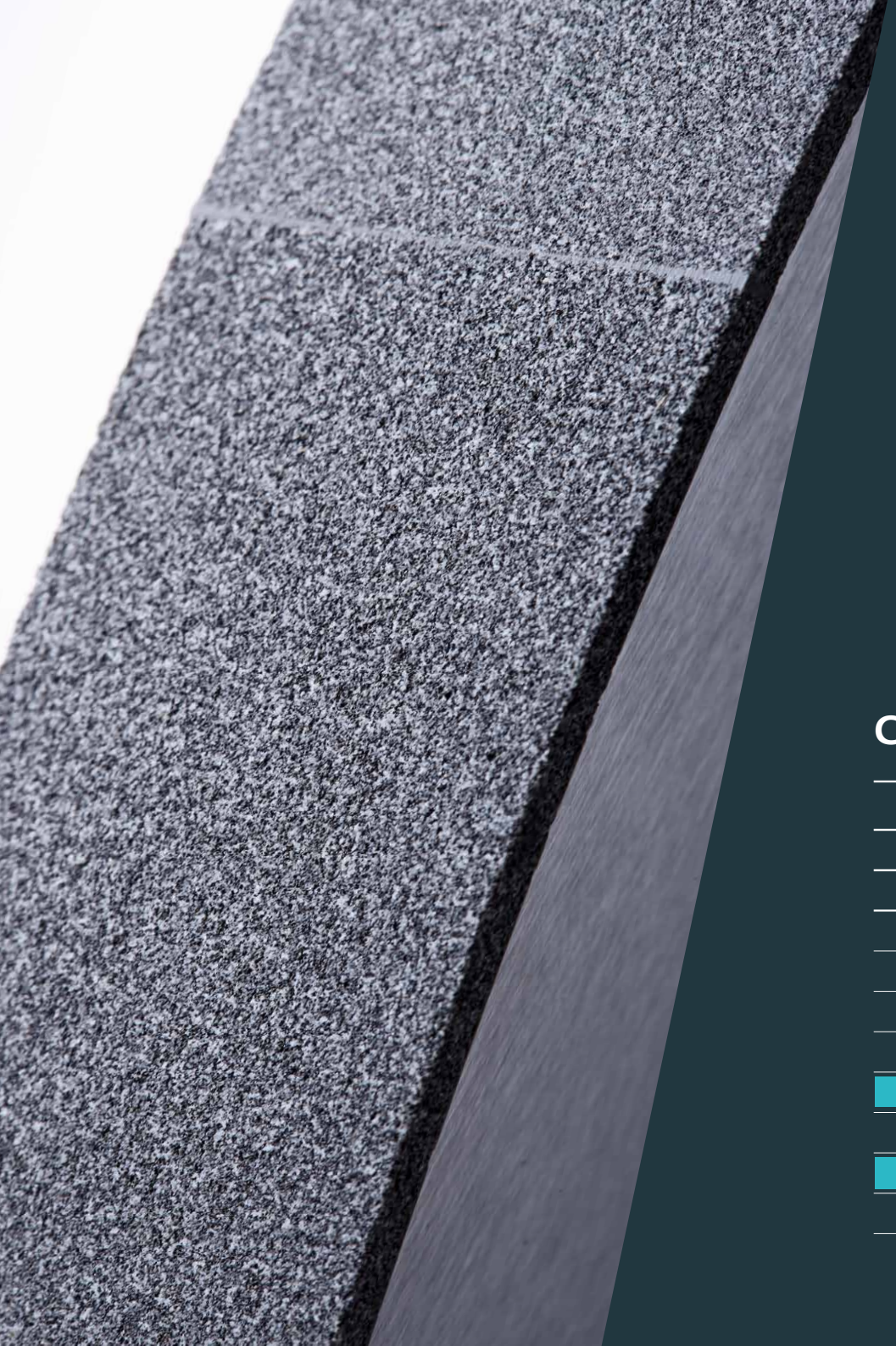
The final process parameters were coordinated in a close feedback loop between the tool manufacturer (NAXOS-DISKUS), machine manufacturer (BUDERUS Schleiftechnik) and with our partner. This enabled the cycle time and tool wear to be significantly improved.

Special features of the project:

- Flexibility in bonding systems (metallic / ceramic) and grain sizes (D/B 151 & 181)
- Use of customized concentrations: C125 / C175 and V300 / V420

Conclusion:

This project underlines the strength of NAXOS-DISKUS in holistic process development - from tool specification and machine integration to the optimization of grinding parameters. An example of a successful technology partnership in the field of highly wear-resistant brake disk coatings.



Grain sizes

Size depending on application and surface quality

FEPA	US-MESH	SIZE IN µm
181	80/100	180/150
151	100/120	150/125
126	120/140	125/106
107	140/170	106/90
91	170/200	90/75
76	200/230	75/63
64	230/270	63/53
54	270/325	53/45
46	325/400	45/35

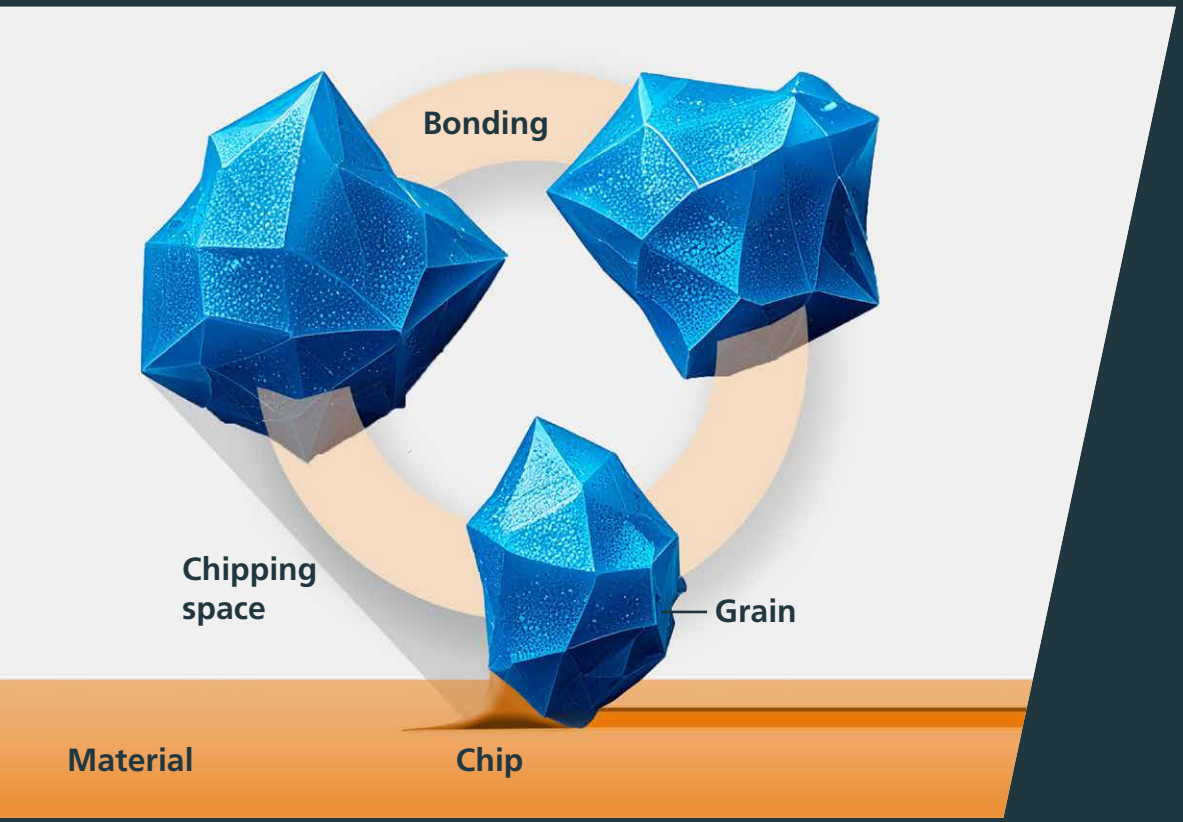
Concentration in volume coatings

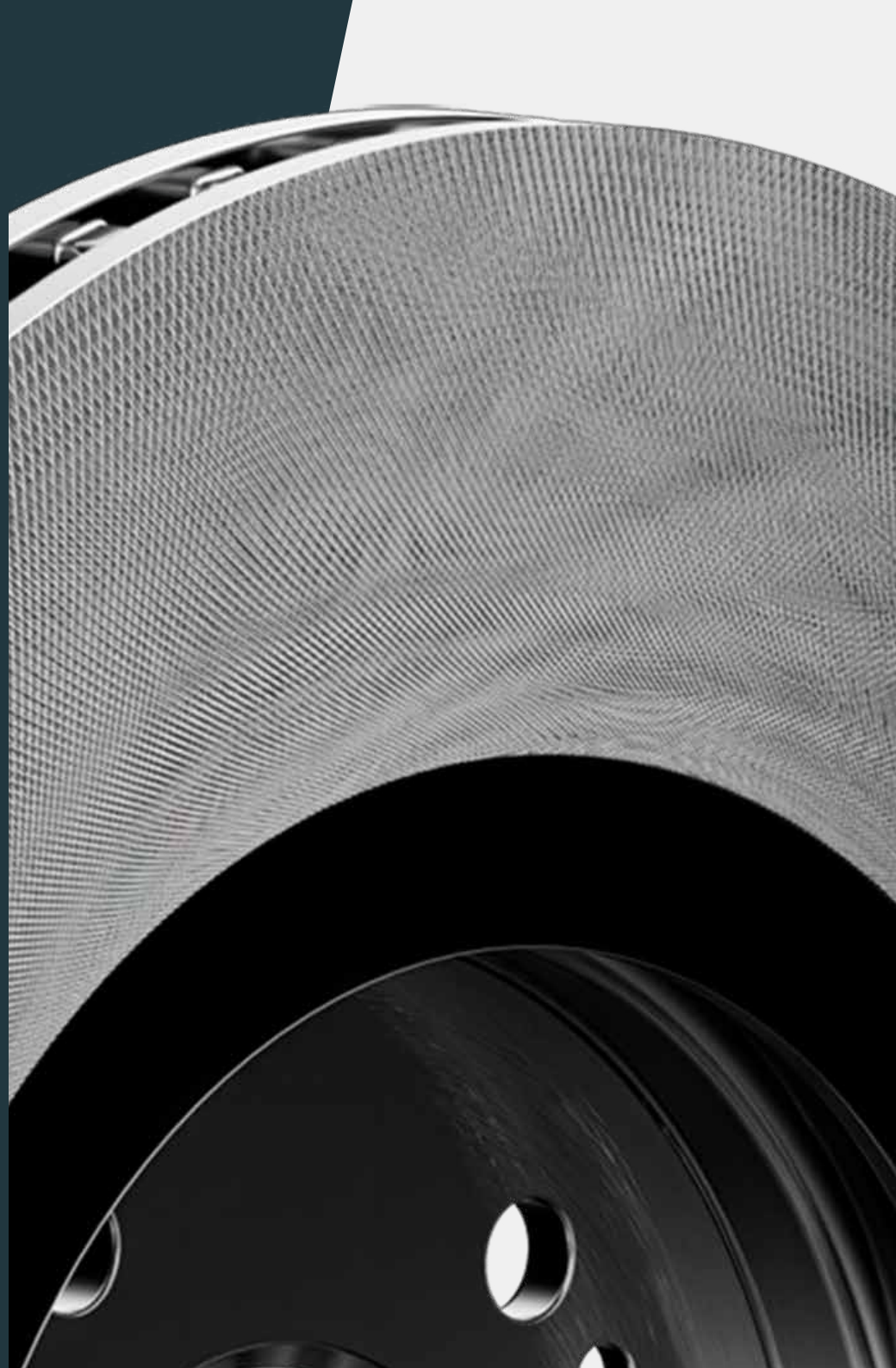
DIAMOND		CBN	
Density 3.52 g/cm³		Density 3.48 g/cm³	
C (V%)	in ct/cm³	V (V%)	in Vol.-%
C 25	1.1	V 60	6.25
C 50	2.2	V 120	12.5
C 75	3.3	V 180	18.75
C 100	4.4	V 240	25
C125	5.5	V 300	31.25
C150	6.6	V 360	37.5
C175	7.7	V 420	43.75
C 200	8.8	V 480	50

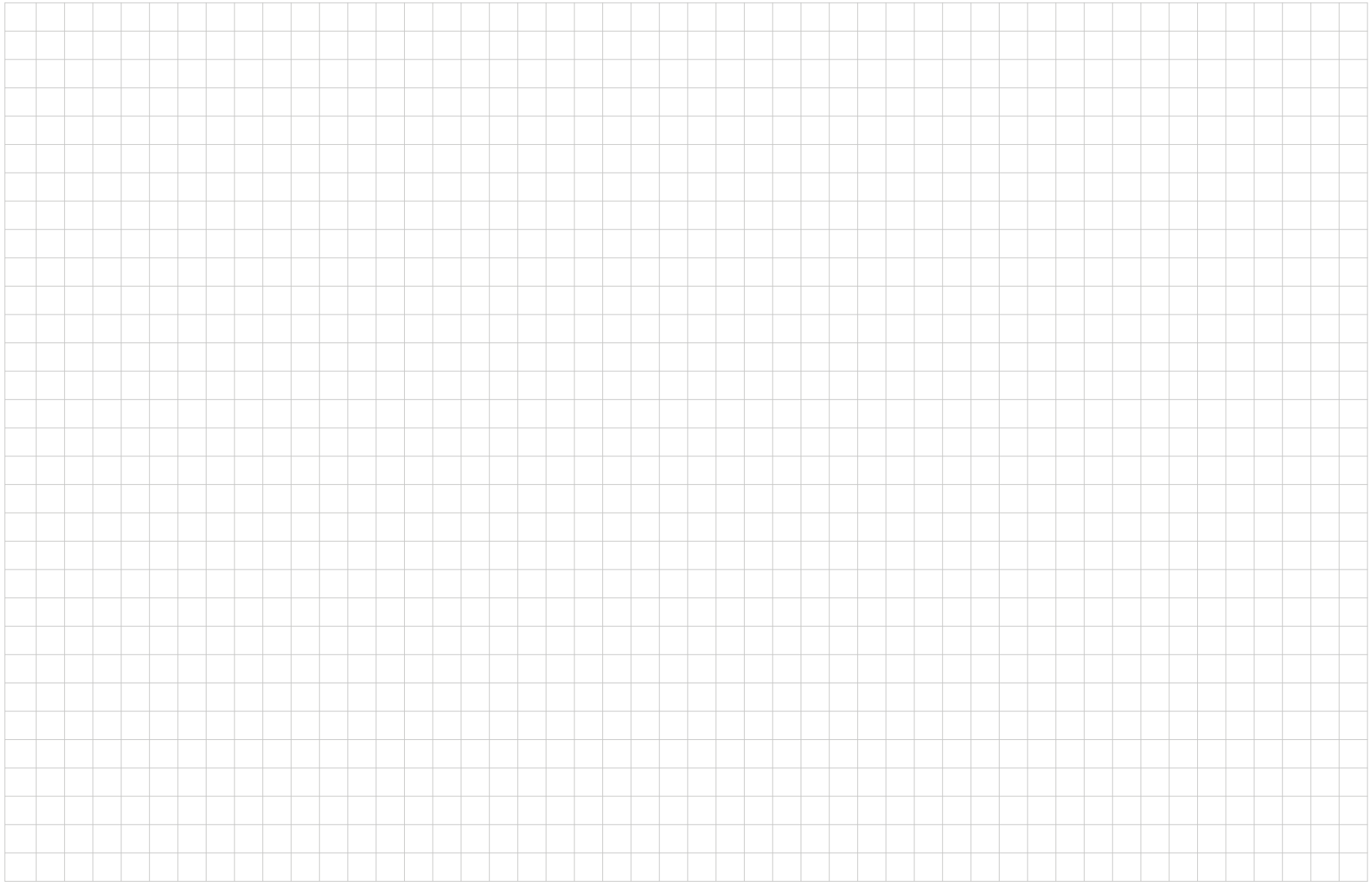
Grinding Wheel Structure

Basic body

NAXOS-DISKUS grinding wheels are optionally available with a base body made of steel, aluminum, wrought aluminum alloy, synthetic resin, ceramic, or CFRP. With our ceramic, resin-bonded CBN and diamond grinding wheels, you get a tool that you can rely on.







Contact us:

Buderus Schleiftechnik GmbH
Industriestraße 3
35614 Aßlar
Deutschland

Tel. +49 (0) 6441 80060
Fax +49 (0) 6441 800620
info@buderus-schleiftechnik.de
dvs-technology.com/buderus-schleiftechnik

Members of the DVS TECHNOLOGY GROUP

DVS MACHINE

BUDERUS Schleiftechnik GmbH | dvs-technology.com/buderus-schleiftechnik
I.D. grinding – O.D. grinding – Bore honing – Hard turning

PITTLER T&S GmbH | dvs-technology.com/pittler
Vertical turning center and Pick systems – Gear cutting for complete machining

PRÄWEMA Antriebstechnik GmbH | dvs-technology.com/praewema-antriebstechnik
Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering

rbc robotics GmbH | dvs-technology.com/rbc-robotics
Camera-guided robot automation systems

DVS INTERNATIONAL SALES & SERVICE

DVS Technology America, Inc. | dvs-technology.com
DVS Sales & Service in USA, Canada & Mexico

DVS Technology (Taicang) Co., Ltd. | dvs-technology.com
DVS Sales & Service in China

DVS SERVICES & TOOLS

DVS TOOLING GmbH | dvs-technology.com/dvs-tooling
Tool solutions and technology support for PRÄWEMA gear honing

NAXOS-DISKUS Schleifmittelwerke GmbH | dvs-technology.com/naxos-diskus
Conventional grinding tools – CBN and diamond tools

Werkzeugmaschinenbau Ziegenhain GmbH | dvs-technology.com/wmz
Motorspindles & Components

DVS Service GmbH | dvs-technology.com/dvs-service
Maintenance – Complete overhauls – Repairs

DISKUS WERKE Schleiftechnik GmbH | diskus-werke.dvs-gruppe.com
Face grinding – Double face grinding – Special machining

DVS PRODUCTION

DVS Precision Components (Taicang) Co. Ltd.
Precision powertrain components in series production for passenger cars and trucks on DVS machines

Bremsscheibe-2025.04-ENG