NAXOS-DISKUS

QUALITY WITH OUR TOUCH

Precision Grinding Tools for Ultimate Performance

NAXOS-DISKUS.DE
DVS-TECHNOLOGY.COM

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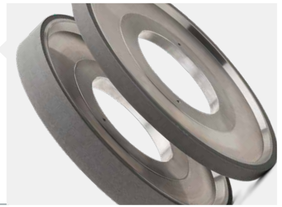

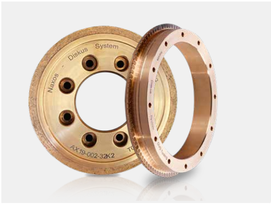

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AUMENTO enables cooler grinding and cost savings through higher feed rates; AUMENTO Pro increases this with better performance and strength.

NAXOS-DISKUS

NAXOS-DISKUS Schleifmittelwerke GmbH headquartered in Butzbach, Germany, is a successful international company engaged in grinding technology. Founded in 1871 in Frankfurt, Germany, under the name NAXOS-UNION, the company manufactures precision grinding tools for a wide range of applications. The product line comprises mostly grinding tools for double-sided surface grinding, external cylindrical grinding, centerless grinding, as well as gear grinding and gear honing from conventional abrasive grain to ultra-hard cutting materials such as CBN and diamonds.

As a member of the DVS TECHNOLOGY GROUP, NAXOS-DISKUS has access to the vast experience and know-how of the DVS Group's mechanical engineering and production companies, which is clearly evident in the quality and design of the grinding wheels. Special products such as grinding wheels, Nurit rollers, and loose abrasives complement the extensive product line.

A DVS TECHNOLOGY GROUP COMPANY

The DVS TECHNOLOGY GROUP is a group of experienced companies engaged in the machining technologies of turning, gear cutting, grinding and honing.
The DVS TECHNOLOGY GROUP employs more than 1050 staff worldwide and is considered a leading system provider of machines, tools, and manufacturing solutions for the soft and hard-fine machining of components.

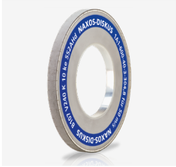
The DVS TECHNOLOGY GROUP includes the following divisions:

DVS Machine:
Manufacture and sale of high-precision machine tools and automation systems

DVS Services & Tools:
Customer-specific development, manufacturing, and sale of machine components, tools, and abrasives and related services.

DVS International Sales & Service:
Local DVS partners for sales and service in international markets.

PRODUCT HIGHLIGHTS



INTERNAL AND EXTERNAL CYLINDRICAL GRINDING

FACE GRINDING

SPECIAL PRODUCTS

ACCESSORIES

NAXOS-DISKUS **Company History**

1871

Company foundation
"Since its founding on October 15, 1871 as the 'Society of the real NAXOS emery' by Julius Pfungst, we have engaged exclusively in grinding technology."

The factory
around 1900, Frankfurt, Wittelsbacherallee.
All factory parts were produced in the same location in those days.

1900

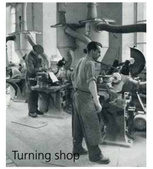
Start of production of grinding wheels from artificial corundum.

Large mixing facility

1905

Production of the first

ceramic-bonded grinding wheel for crankshaft machining



Turning shop

1910

Production of first

resin-bonded grinding wheel

1918
End of WWI

Thread-grinding wheels

Grain warehouse

1945
End of WWII

1950

Diamonds and cubic boron nitride (CBN) become part of the research and development work

Trade fair
"Schweißen
und Schneiden"
1969 in Essen

Departure of a
truck with a roller
grinding machine,
Frankfurt

Manual pendulum
grinding machine

1978

Production of the first CBN grinding wheel with a ceramic bond

1990
German
Reunification

1987

Construction of NAXOS Schleifmittelwerke in Butzbach

2005

Integration into the DVS TECHNOLOGY GROUP

2009

Partial acquisition of "Bonded" segment by The Carbo Group GmbH

2021

150 years of NAXOS-DISKUS

Construction of CBN manufacturing

Product Line

Perfect Pressure, Precise Grinding

We are renown for our leading products in the industrial abrasives industry, and our goal is to offer customers very high-quality products that are not only state of the art, but also precisely tailored to their processes. For us, putting the customer first is not just a guiding principle, but a fundamental corporate philosophy.

Our cutting-edge manufacturing and development processes enable us to offer fast production times at competitive prices. The above-average durability of our products and the optimization of your grinding operation through our application technology sets your company on course for the future.

On the following pages we will introduce you to some of our product categories from our extensive range. These product categories represent a general outline for potential or previously manufactured products, which we would be pleased to expand together with you.

HIGH-QUALITY PRODUCTS AT COMPETITIVE PRICING

INTERNAL & EXTERNAL CYLINDRICAL GRINDING

Discover the World of Precision Grinding

From highly specialized CBN and diamond external cylindrical grinding wheels to versatile, conventional external cylindrical grinding wheels: our product range covers all your grinding needs. Whether for demanding crankshafts, centerless grinding, or precise gear grinding, our grinding wheels are designed to ensure maximum quality and efficiency. With over 150 years of experience, we guarantee grinding tools that are tailored to your specific requirements and at the same time set new standards in terms of precision and durability.

CBN and diamond external cylindrical grinding wheels

Precise grinding operations and low wear: This is what the CBN and diamond external cylindrical grinding wheels from NAXOS-DISKUS stand for. We developed new ceramic and synthetic resin bonds for them. The CBN wheels are based on a specially coated CBN grain. These are used for machining very hard and carbide-containing alloys, as well as for tool steels, special steels, etc. The diamond grinding wheels are extremely hard and are used for machining amorphous and extremely hard materials.

CBN, diamond, V, B, steel, Al, carbon

Conventional external cylindrical grinding wheels

NAXOS-DISKUS manufactures conventional external cylindrical grinding wheels in any grain type depending on the customer's application. From different corundum types to silicon carbide or microcrystalline sintered corundum: every grain has different properties when processing materials. Our grinding technicians work with customers to continuously develop new specifications for different areas of application. This type of grinding wheel is also perfectly suited to all types of profiled designs.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, V, B

Crankshaft grinding wheels

Crankshaft grinding wheels are usually manufactured with ceramic bonds. The wheel can be constructed in one layer for bearing seats or in three layers if the shoulders and the bearing seat are to be ground in one pass. The three-layer design offers greater stability and longevity. NAXOS-DISKUS produces these multi-layer wheels extremely precisely. We consider the low production tolerances of engine manufacturers to be a testament to our expertise.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, V, B

XXL external cylindrical grinding wheels

With more than 150 years of experience in the production of abrasives, NAXOS-DISKUS also offers its expertise for large abrasives, such as 1600 mm grinding wheels. These are used, for example, for the precise grinding of large crankshafts in ship engines. Our XXL external cylindrical grinding wheels boast steady tolerances that decrease proportionally to the size and meet the most stringent requirements.

NK, EK, HKs, EKd, FF, EKa, EKt, KSB, SCg, SC, V, B

Centerless grinding wheels

There are two main types of centerless grinding: through-feed grinding and plunge grinding. The ability to select between one-piece or multi-piece grinding wheels makes changing the wheels easier. NAXOS-DISKUS has the expertise for the precise manufacture and matching of multi-piece wheels. As a result, through-feed grinding yields a high level of chip removal on the infeed side and a top-notch surface quality on the run-out side.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, V, B

Mounted points

Mounted points for internal cylindrical grinding can be made from conventional grain types or CBN. CBN points usually have a longer service life. Our mounted points particularly play to their strengths in hard-to-reach workpiece areas and at very high speeds under the most difficult conditions. For many application areas, the future of mounted points lies in the time-saving simultaneous grinding process. This is why you should rely on a single manufacturer for all abrasives.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, ZF, V, B

Grinding segments

NAXOS-DISKUS offers external cylindrical grinding segments in a variety of shapes, sizes, bonds, and grain types. They have the best possible concentricity due to the setting process. These are mainly used on grinding wheels and can be manufactured with a base (foot), which enables optimum mounting. They are also ideal for upgrading older machine types to the latest grinding technology: NAXOS-DISKUS is the proven partner when it comes to expertise and established procedures.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, ZF, V, B

FACE GRINDING
Impressive Expertise

Face grinding is a key technology for precision applications in the manufacturing industry. Our specialized CBN and diamond face grinding wheels stand for durability and precision: They are ideal for complex metal and ceramic processing. Our innovative grinding segments enable optimal surface quality and dimensional accuracy, which is the perfect solution for complex tasks, such as grinding engine blocks. Our conventional face grinding wheels, developed in collaboration with DISKUS-Werke, offer maximum quality and reliability. And for the ultimate precision and efficiency in double-sided surface grinding, we present CoolEdge GrindPro, our latest innovation, which we developed specifically for high material removal rates while keeping heat to a minimum.

CBN and diamond face grinding wheels

Made by professionals for professions – take advantage of the many years of experience of NAXOS-DISKUS in the manufacture of ceramic or resin-bonded CBN and diamond face grinding wheels. These products feature a long service life and dimensional accuracy of the ground workpieces. They are used for a wide variety of metal and ceramic machining processes, such as the grinding of piston rings. The grinding wheels can optionally be provided with a base body made of steel or aluminum.

CBN, diamond, V, B, steel, Al, carbon

Conventional face grinding wheels

Thanks to our long-standing collaboration with DISKUS Schleiftechnik, we are able to produce a suitable conventional face grinding wheel for every application. We produce high-quality, uniform, and dimensionally accurate wheels. The price-performance ratio is second to none. Conventional grinding wheels are used in the automotive industry (from engine blocks to connecting rods), the die cutting industry, the watch industry (watch plates), and ski manufacturers.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, ZF, V, B

Grinding segments

NAXOS-DISKUS grinding segments offer the perfect finish for various production processes used worldwide. They are easy to install and offer optimal dimensions and surface quality. Some of the possible uses include the grinding of engine blocks and the one-sided grinding of ball cages. Our grinding segments guarantee excellent cutting performance, self-sharpening ability, and low cutting temperatures, as with all our products.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, ZF, V, B

CoolEdge GrindPro

Developed for heat-sensitive workpieces, it enables cooler grinding with high durability and reduced machine load. The innovative resin system ensures soft-grinding, high-grit grinding wheels and reduces energy costs by up to 20%. They deliver precise results with lower energy consumption, which extends the service life of the machine and reduces operating costs. Perfect for complex industrial applications.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC

SPECIAL PRODUCTS

First Choice for Special Grinding and Milling Requirements

Our loose abrasives, ranging from normal to fine corundums, are ideal for a wide range of applications such as matting, deburring, or shot peening. Enjoy our fast delivery and customized quantities, including homogeneous mixed corundum. Our Nurit rollers are revolutionizing production in the textile industry by optimally moistening and guiding textile threads. Our grinding wheels set new standards in quality and precision in the food sector: The perfect solution from mustard to coffee. With NAXOS-DISKUS you get quality and innovation that is perfectly tailored to your needs

Nurit rollers

Nurit rollers, also known as thread guide rolls, are crucial for the textile industry. By partially immersing the thread in coolant, they offer optimal moistening and guidance at high rotational speeds. The superb heat-absorbing properties, high coolant absorption capacity and precise processing of NAXOS-DISKUS Nurit rollers prevent errors in textile thread production and ensure a flawless production process.

NK, V, steel, AI

Loose abrasives

Our versatile normal and fine corundums are suitable as bonded and loose abrasives. With excellent surface results, they offer the perfect solution for matting, deburring, cleaning, and shot peening. Our vast storage capacity enables fast shipping in individual quantities, including homogeneous mixed corundum on request. Chemically neutral blasting media boast a high degree of purity, wear resistance, and safe processing.

NK, EK, HKs, EKd, FF, EKa, EKT, KSB, SCg, SC, ZF

Grinding wheels

We also offer high quality for the food sector. For the production of everything from mustard to cocoa, coffee and more, we produce grinding wheels for just about anything that needs to be ground: any size, any shape, and tailored to your requirements. The precise manufacturing of the grinding wheels, their consistent quality over decades, and their long durability are a matter of course for us. After all, as an OEM for grinder manufacturers, we offer extensive experience.

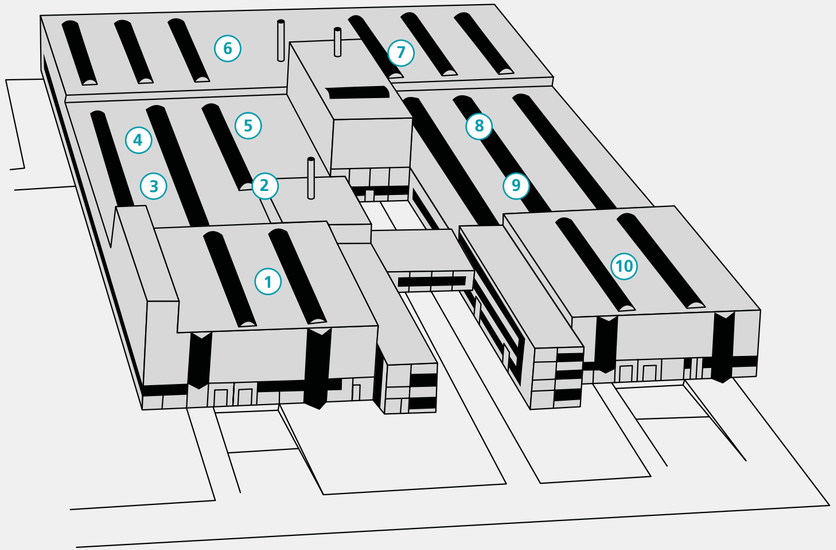
NK, V

ACCESSORIES

Dressing tools

Thanks to our close cooperation with machine manufacturers such as PRÄWEMA Antriebstechnik, we are always on the cutting edge of gear cutting technology. Our gear grinding wheels for gears and tooth flanks are precisely matched to the workpiece specifications and profiles. On request, we also offer wheels with an identical profile to the grinding worm wheel of the workpiece in order to ensure a continuous, linear-shaped contact over the entire width of the gearing.

1. Preparation
2. Mixing
3. Molding
4. Pressing
5. Hot pressing
6. Firing
7. Hardening
8. Finishing
9. Final inspection – labeling
10. Shipping



Manufacture of Grinding Wheel

Large Rings Made Easy

NAXOS-DISKUS takes its responsibility towards the environment seriously. We produce energy-efficiently in order to save resources. From preparation to shipping – every step in the production of grinding wheels is subject to our high standards on precision and quality. NAXOS-DISKUS is working with the best materials and machines. Our employees are highly motivated experts. All production processes are digitally checked and logged.

WE ARE COMMITTED TO PRECISION AND QUALITY.

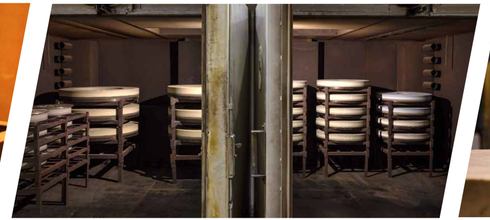
NAXOS-DISKUS **Grinding Wheel Manufacture**

Mixing/preparation

Sieving

Molding

Firing



Hardening

Final inspection

PREPARATION:

The first prerequisite for achieving our product quality is to ensure correct filling weights within very small tolerances. In the preparation process we work with electronic scales and we also monitor the removal of raw materials via a digital network.

MIXING:

Perfectly homogeneous grinding tools can only be guaranteed when the individual raw material components are mixed very carefully. We use state-of-the-art mixing systems that are operated by qualified employees.

MOLDING:

To avoid imbalances, exact molding of the finished mixture is also crucial for the uniform structure of the grinding wheel. We achieve this with the help of special feeding devices for the filling material, digitally controlled distributors, and modern weighing and measuring devices on the presses.

PRESSING:

Error-free presses, precise molding tools, and well-trained personnel are necessary when the abrasive body in ceramic or synthetic resin bond is given its raw shape by means of volumetric, path-controlled pressing.

The material must be compacted evenly over the entire surface and height of the wheel. NAXOS-DISKUS uses heavy presses with pressures of up to 25,000 Kn for large and wide grinding wheels, which are alternately fed by two to three forming tables. Smaller to medium-sized grinding wheels are formed and pressed on modern rotary table presses with several workstations. And again, our digital network facilitates the production of flawless and safe products by continuously checking the pressing process.

FIRING:

After the drying process, the blanks of ceramic-bonded abrasives are fired at 900–1300 °C.
The furnaces (carriage hearths or chamber furnaces) that work according to production requirements allow very complex firing curves. Depending on the wheel type and size, a wide variety of firing conditions are set.

HARDENING:

The resin-bonded abrasives are hardened in electrically heated chamber furnaces with hot air circulation. The temperature program is controlled via regulators and monitored by means of temperature recorders. Depending on the wheel type, the bond type, and the fire number, the temperature is between 160–200 °C. The process takes between 10–60 hours.

FINISHING:

Precision through meticulous finishing work. By machining the measurements on state-of-the-art CNC-controlled machines, we achieve the tightest tolerances and the greatest uniformity of the grinding wheel diameters.

FINAL INSPECTION:

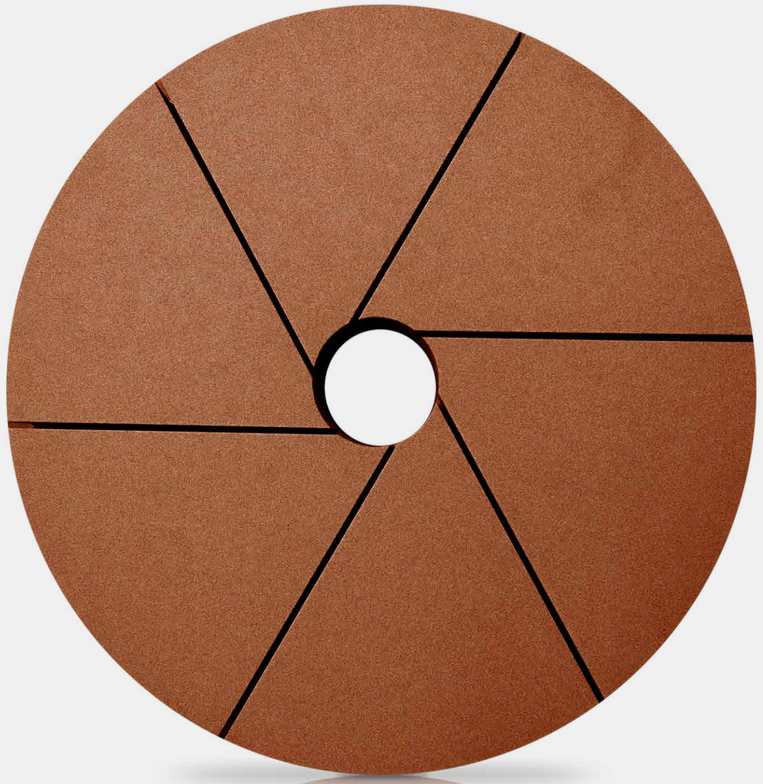
A reliable final inspection is critical. It is the final step to ensure that the customers get the grinding wheel quality and safety they demand.
We use state-of-the-art control systems to check every product according to the following criteria: material, structure, hardness, dimension, and unbalance. We carry out a crack test by means of a sound test and a visual inspection as well as a strength check by subjecting the product to a test run. NAXOS-DISKUS meets the manufacturing guidelines and accident prevention regulations of the standards DIN EN 12413 for grinding tools and DIN EN 13236 for grinding tools with diamond or boron nitride as well as its own in-house test specifications.

LABELLING:

The finished grinding wheels are labeled in accordance with the regulations. We also affix a label with all relevant product data.

SHIPPING:

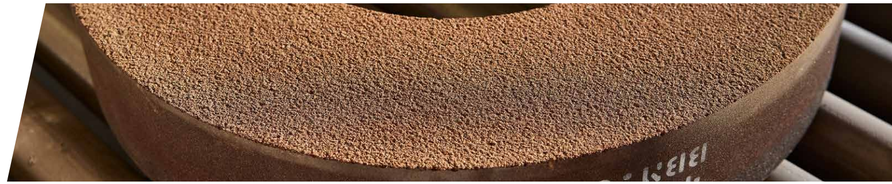
Shipping to the customer is safe, fast, and reliable. NAXOS-DISKUS ships to almost all countries worldwide. Our employees in the shipping department are familiar with the packaging requirements, international regulations, and how to manage the paperwork. We work with a number of global companies to ensure smooth transport.



CoolEdge GrindPro
The Revolution in Grinding Tools

CoolEdge GrindPro is the latest grinding wheel innovation, which is revolutionizing double face grinding. It is particularly relevant in the manufacturing industry. CoolEdge GrindPro is uniquely suited to the grinding of connecting rods as well as very heat-sensitive workpieces, such as ceramic components. It is used in machines that specialize in double-sided surface grinding. The challenge here is that the workpieces have to be ground in the micro range while the removal rate can still be up to 1.6 mm. It is also important that as little heat as possible is introduced to the process, as cooling slots cannot be installed on certain workpieces and the coolant nozzles often cannot be optimally positioned.

HIGH REMOVAL RATE OF UP TO 1.6 MM



The newly developed, innovative resin used in the grinding wheel ensures a low, adjustable bond amount. The grinding wheel is therefore high-grit, soft-grinding, and perfect for dressing. Another plus is the improved wet grinding resistance, which is also due to the newly developed resin.

CoolEdge GrindPro is ideal for both pre- and finish grinding. The low spindle power reduces the machine load, saving up to 20% in energy costs. The efficient sanding tool puts less strain on the machine, which works much more smoothly and is subject to less mechanical stress. The new CoolEdge GrindPro currently requires a maximum of 17 kW of spindle power, compared to 21 kW with conventional bonds.

CoolEdge GrindPro stands for high stability, cool grinding, and lower machine load: all of these aspects factor into the machining of materials, especially in the industrial sector.

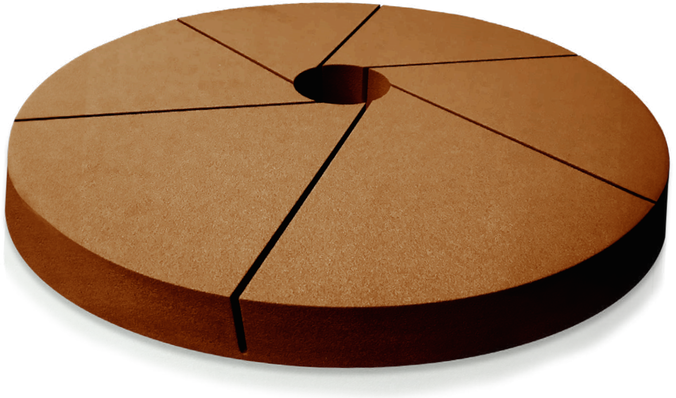
- **Durability** refers to the ability of a cutting tool (such as a grinding wheel) to operate effectively for extended periods of time without overheating, wearing out, or losing its grinding performance.

A tool with high durability maintains its grinding ability and efficiency over longer periods of time, resulting in fewer interruptions, higher productivity, and lower tool replacement costs.

- Grinding generates heat, which can lead to overheating. **"Cool grinding**" means that the grinding tool and the processed material are not heated excessively and heat is dissipated effectively. This is important because excessive heat can cause material deformation, tool wear, and even quality problems with the machined surface.

- During the double face grinding process, the machines and tools are subjected to particularly high loads. CoolEdge GrindPro reduces this load because the new bonding system puts less strain on the machine and tool. This leads to a significantly **longer service life and lower operating costs**.

- **Machine:** grinding machines from the brands DISKUS Schleiftechnik, FIVES GIUSTINA, Supfina, Wolters, and others
- **Application:** double face grinding
- **Industries:** automotive industry, engine production, machining of ceramics for sanitary industry, general tool and mold making
- **Dimension:** 475 mm to 1060 mm
- **Use:** suitable for pre- and finish grinding
- **Coolant:** oil and emulsion



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.

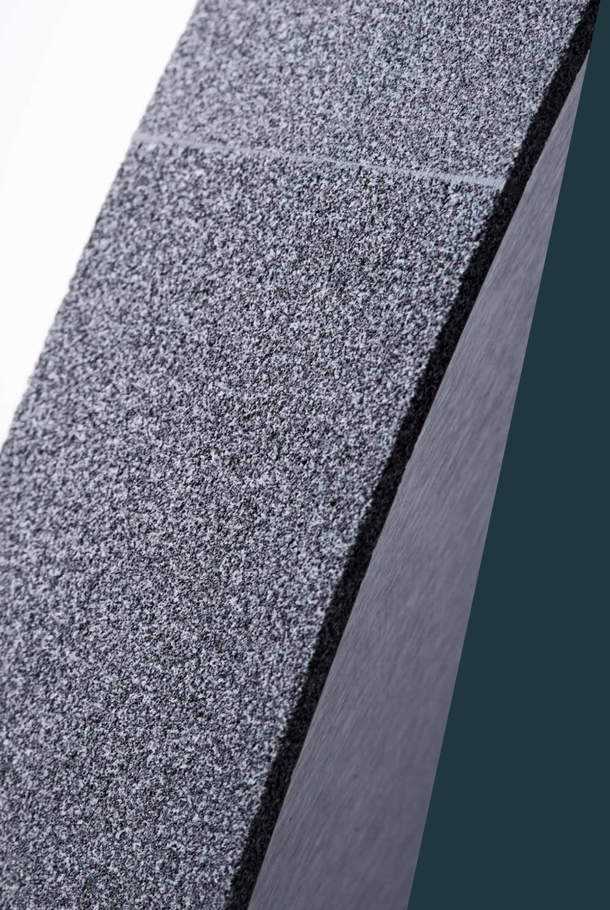
As the toughest substance known to mankind, diamonds are the ideal abrasive for very hard materials. However, it is not suitable for the processing of iron materials due to its conversion back into carbon. CBN, the second hardest known raw material after diamonds, is a better option for grinding these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



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 and resin-bonded CBN and diamond grinding wheels, you get a tool that you can rely on.

Grain types
Application for diamond and CBN tools

METALS		NON-METALS	
FERROUS METALS	**NON-FERROUS METALS**	**INORGANIC MATERIALS**	**ORGANIC MATERIALS**
Soft Unalloyed Low alloyed High alloyed Hard Low alloyed High alloyed Hard shell casting	Aluminum alloy Copper alloy Magnesium alloy Nickel base alloy Titanium alloy Hard metals	Cermets Ferrites Glass Semiconductor material Ceramics Rocks	Rubber (hard) Rubber (soft) Wood Plastics Foodstuff
CBN	**DIAMOND**		

CBN carrier body variants

MATERIAL	DIAMETER IN MM	V_c MAX IN M/S	HEAT EXPANSION	DAMPING	WEIGHT	COST
Steel	80–750	200	○○○○	●○○○	●●●●	●●○○
Aluminum	50–350	63	●●●●	●○○○	●●○○	●●●○
Aluminum wrought alloy	80–700	200	●●●○	●○○○	●●○○	●●●●
Synthetic resin	100–600	63	○○○○	●●●○	●○○○	●○○○
Ceramics	20–750	80	○○○○	●○○○	●○○○	●○○○
CFK	100–500	200	○○○○	●●●●	○○○○	●●●●

Low ○○○○ ↔ ●●●● High

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

MICROGRAINS		
M 40	600*	40/30
	700*	36/22
M 25	800*	30/20
	1100*	22/12
M 16	1200*	20/10
M 10	1600*	12/8
M 6.3	3000*	8/4

*Approximately equivalent MESH size

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

NAXOS-DISKUS **Diamond & PCD Diamond Dressing Rolls**

Diamond & PCD Diamond Dressing Rolls

Sharp Profile for Blunt Tools

Grinding tools are continuously subjected to high frictional forces. This increasingly wears down the abrasive grain.

The consequences:

- Loss of shape and profile accuracy
- Lower cutting performance
- Longer grinding and cycle times
- Increased grinding forces
- High workpiece temperatures
- Dimensional fluctuations
- Scrapping of certain workpieces

To counteract this, grinding tools can be reconditioned to micrometer precision using the dressing processes. This involves restoring the circumferential profile of the grinding wheel and resetting the bond. In the process, the new grain edges are brought forward.

This increases the cutting performance of the tools. At the same time, the cutting forces and the associated workpiece temperatures decrease during the grinding process.

Production Method and Characteristics

The consistent quality of our products enables the diverse and continuous production of workpieces, even under tight time constraints.

Depending on the application, the coatings on our form dressing rolls are either electroplated, sintered, or covered with PCD plates. During sintering, the diamond grain is bonded to the carrier material using a special technology in a positive direct process and then sintered directly onto the carrier body in a matrix.

This manufacturing process is mainly used for the production of shape dressing rolls for conditioning superabrasive CBN and diamond grinding tools, as conventional grinding tools would not deliver the desired result when processing extremely hard materials and with more abrasion.

In another manufacturing process, form dressing rolls are coated with (polycrystalline) PCD plates. By using high-precision grinding technology, the coverings of the form rolls have a very precise profile. This profile features outstanding accuracy. In addition, the grinding technology protects the forming roll.

Form Dressing Rolls versus Profile Dressing Rolls

Stationary or rotating dressing tools can be used for the conditioning of grinding wheels. When it comes to rotating dressing rolls, a distinction is made between form and profile dressing rolls. Profile dressing rolls can only be used for a single contour on the grinding wheel circumference. Form dressing rolls, on the other hand, can be used in a variety of ways for a wide variety of path-controlled dressing processes.

The reason for this flexibility lies in the geometries and edge shapes of the form dressing rolls. That is why they are mainly used in small and medium series production as well as for frequently changing workpiece profiles.

YOUR ADVANTAGE

- Lower purchase costs compared to profile dressing rolls
- Usable independent of grinding wheel and workpiece profile
- Lower dressing forces during the dressing process
- Shorter manufacturing time

Diamond dressing rolls

Diamond dressing rolls can not only significantly optimize grinding applications, but also increase the cost-effectiveness of the entire grinding process. Thanks to our extensive product portfolio of highly accurate and precise diamond dressing rolls, you can rest assured that your grinding operations are carried out with consistent quality.

Support Materials and the Right Size

The materials of the carrier materials are particularly important for the base body of a form dressing roll. They are critical for the quality of the processes. In order to achieve the lowest dimensional and shape tolerances, we use high-alloy carrier bodies made of steel, brass, or bronze, depending on the application.

When it comes to the dimensions of the form dressing rolls, we offer application-specific and individually definable sizes.
Of course, we would be pleased to help you select the carrier material and the dimensions for your optimal form dressing rolls.

Parameters for Effective Roughness Depth

The effective roughness depth of a grinding tool is largely dependent on the dressing process. While certain processes such as roughing require a high roughness depth, other grinding methods such as fine grinding prefer a lower roughness depth.
The roughness depth of a grinding tool is largely generated during the dressing process by the following parameters:

- Direction of rotation of the dressing roll to the grinding wheel (synchronous/counter-rotating, GL/GGL)
- Speed ratio from the dressing roll to the grinding tool (qd), dressing feed/feed speed radial (frd)/axial (fad)
- Dressing infeed (ad)
- Degree of coverage (Ud)
- Number of coasting revolutions (nRa)

Factors when Dressing with Diamond Dressing Rolls

- Type of diamond setting
- Position of diamond setting
- Type of diamond grain
- Diamond size
- When using PCD or MKD plates, selection based on contours and setting patterns
- Production of the carrier body with the lowest dimensional and shape tolerances

Our specially trained staff will be happy to advise and support you in the implementation of the dressing tool, taking your production process into account.

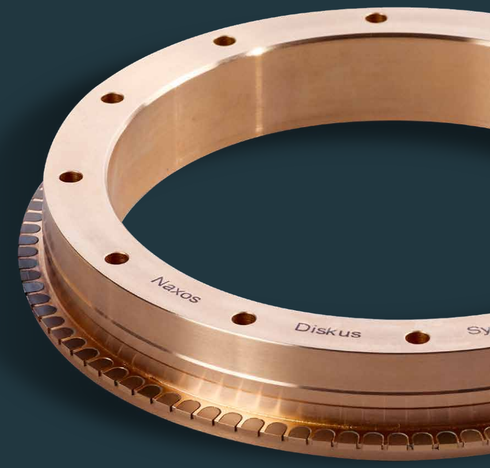
Dressing under Process Conditions

During dressable grinding, the profile in the ceramic bonded tool is repeatedly re-profiled and sharpened using diamond-coated dressing tools. It should be noted that grinding tools must be dressed at the same cutting speeds as in the grinding process.

Thanks to the perfectly coordinated system, the "iCompact" can perform complete processing.

Diamond Grain Sizes for Form Dressing Rolls

FEPA STANDARD (METRIC)			US standard ASTM-E-11	
Scatter range		Sieve mesh width	Scatter range	
narrow	**wide**	**µm**	narrow	wide
D1181	**D1182**	1180–1000	16/18	-
D1001		1000–850	18/20	-
D851	D852	850–710	20/25	20/30
D711		710–600	25/30	
D601	D602	600–500	30/35	30/40
D501		500–425	35/40	
D426	D427	425–355	40/45	40/50
D356		355–300	45/50	
D301	-	300–250	50/60	-
D251	D252	250–212	60/70	60/80
D213		212–180	70/80	
D181	-	180–150	80/100	-
D151	-	150–125	100/120	-
D126	-	125–106	120/140	-
D107	-	106–90	140/170	-
D91	-	90–75	170/200	-
D76	-	75–63	200/230	-



A Perfect Bond

Hardness and Flexibility in 50+ Grinding Solutions

Bonds have four purposes:

1. They hold the abrasive grain together.
2. They release the grain when it has become dull, so that the next, sharp grains can be used.
3. Their pores reduce frictional heat.
4. They influence the hardness, elasticity, and grinding properties of the abrasive.

A basic distinction is made between organic and inorganic bonds. Organic bonds include synthetic resin, rubber, and shellac bonds. Inorganic bonds are ceramic, silicate, and magnesite bonds. NAXOS-DISKUS primarily produces about 50 types of ceramic and synthetic resin bonds as well as many other variations.

Ceramic Bonds (V)

Robust, Precise, Versatile

The ceramic bond consists of clay minerals, feldspar, quartz, and kaolin as well as synthetically produced frits (glass with a defined composition), which serve as flux during firing.

To create an open structure, pore formers can be used in ceramic-bonded grinding tools.

These burn without leaving any residue and are used during grinding in the contact zone (workpiece/grinding wheel) to absorb and remove the abraded material. If a coolant is used, it is transported to the grinding point. Once a homogeneous mass has been produced, it is preformed by pressing, dried, and then fired. The ceramic firing process can last up to twelve days at a firing temperature of 900–1300 °C. The powder melts or sinters and solidifies as it cools into a glass-like to porcelain-like mass, which envelops the abrasive grains and binds them together.

Ceramic bonds are characterized by high temperature resistance and are chemically resistant to oils and water. However, they are brittle and therefore very sensitive to shock and temperature changes.

They enable the grinding of highly precise surfaces. They are often used in shaping grinding as well as in precision applications, such as external and internal cylindrical grinding or surface and deep grinding.

Resin Bonds (B)

Efficient, Elastic, Advanced

Synthetic resin bonds are mainly composed of phenolic resins. Added to this are fillers that decompose during grinding, which makes the grinding process cooler.

Glass fabric or fibrous materials can also be added to the grinding wheel for strengthening. The pressed abrasives harden within 10 to 60 hours at a temperature of 150 to 200 °C, which means that abrasives with synthetic resin bonds are available more quickly than ceramic-bonded abrasives.

Synthetic resin products are more elastic and less sensitive to impacts and lateral pressure. High-density wheels (HP wheels) can be produced using the hot pressing process. They have to be able to withstand high pressures when grinding slabs, for example.

Resin-bonded abrasives can be used to achieve high material removal rates as well as good surfaces and low roughness. That's why they are often used in processes such as centerless grinding, groove, surface, and face grinding as well as external cylindrical operations.

The NAXOS-DISKUS application technology department can advise customers on which abrasive composition to use for any given application. The NAXOS-DISKUS team is constantly working on the optimization of tools and new developments. The focus is on quality, on-time delivery, cost-effectiveness, and a technological edge.

The choice of grain determines the quality of the cut. An optimal result can only be achieved if the grain is matched to the material of the workpiece to be machined. Depending on the variety of industrial materials, NAXOS-DISKUS uses a whole range of different grain types and grain sizes for the grinding wheels. They differ in toughness and hardness.

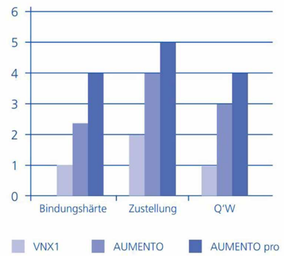
GRAIN TYPE	COMPOSITION	OPERATION AREA
Standard corundum	95–97% Al_2O_3	Low-alloy steels, especially for high cutting performance during roughing.
Fine corundum, white	99.9% Al_2O_3	Commonly used in precision grinding, e.g., tool, round, and surface grinding.
Melted semi-precious corundum	98% Al_2O_3	The primary uses are precision and tool grinding.
Fine corundum, pink	>99% Al_2O_3 0.2–0.3 Cr_2O_3	Excellent for flat profile grinding, saw sharpening.
Ruby corundum	98% Al_2O_3 2% Cr_2O_3	Used in precision grinding of high-alloy steels.
Single crystal corundum	99.2% Al_2O_3	For grinding HSS steels and tool grinding. High profile retention.
Chromium titanium oxide Alloyed corundum	99.35% Al_2O_3 0.25% TiO_2	Machining of alloys and thermally sensitive steels.
Sintered corundum	Microcrystalline 96% Al_2O_3	Used for almost all grinding processes with maximum cutting performance with appropriate machine configuration.
Zirconium corundum	75% Al_2 25% ZrO_2	Roughing applications in the steel industry.
Silicon carbide, green	98% SIC	Application for hard metal, non-metallic materials, e.g., gray cast iron and austenitic steels.
Silicon carbide	97% SIC	For roughing of cast materials.
Cubic boron nitride	100% BN	Machining of hardened steels with the highest removal performance with the highest quality requirements. (Tool steels, special steels, HSS, etc.)
Diamond Carbon	100% C	Machining of extremely hard materials such as ceramics, hard metals, and rock.

The AUMENTO Bond

More Pore Space for Cooler and More Efficient Grinding

AUMENTO is a ceramic bond. The advantage of this is that the proportion of the bond in the grinding wheel can be reduced, thereby increasing the relative pore space. The result: cooler grinding. A test on a BUDERUS CNC 235 has also shown that significantly higher feed rates can be achieved with the same workpiece quality when plunge grinding gear shafts, resulting in cost savings for the end customer.

AUMENTO Pro is a further development of the AUMENTO Bond and performs even better. AUMENTO Pro also has an even higher bond strength.



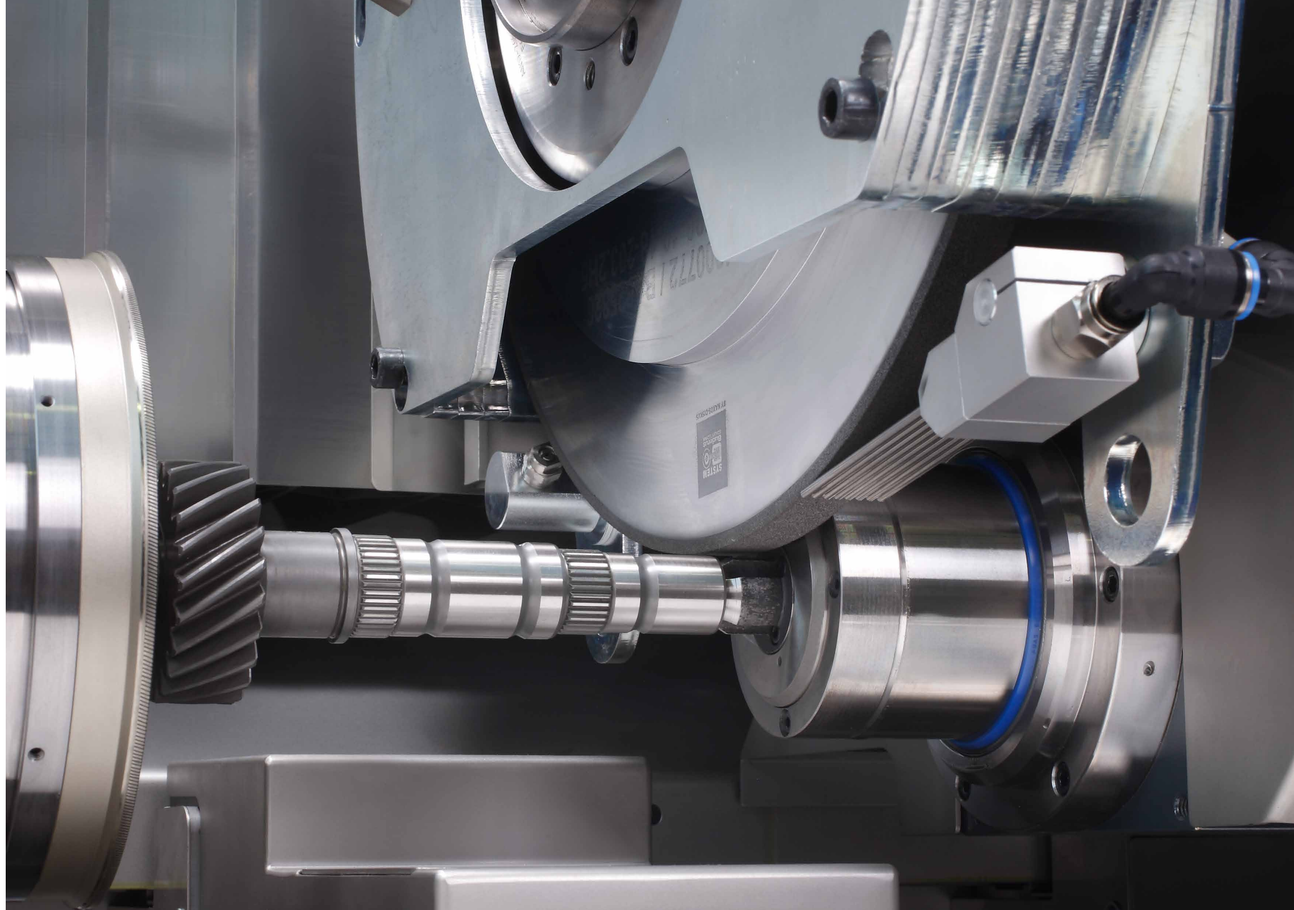
AUMENTO Pro – Maximum Performance

The lower bond ratio leads to an increase in the pore space, which increases the supply of abrasive coolant to the abrasive contact zone and thus facilitates the removal of abrasive sludge and abrasive temperature. In addition, a reduction in the grinding forces that occur is achieved and the grinding pressure that occurs in the process is reduced.

Thanks to the optimized resistance of AUMENTO Pro, the CBN abrasive grain is very firmly integrated into the matrix. This enables a further reduction of the bond ratio while at the same time increasing the bond strength of the abrasive grain. In practice, this further improves the performance of the grinding wheel. It also yields improved parameters for feeds and infeeds.

The test results clearly show that with the further development of the AUMENTO Pro, the feed and infeed per revolution could be increased by 20% compared to the AUMENTO. The resulting shorter processing time enables more production resources and reduces the costs per workpiece.

BOND	STRENGTH	INTEGRATION CAPACITY	BOND TYPE	APPLICATION
VNXi	Low	Medium	Ceramic (glass-like)	Precision grinding, low to medium load
ALUMENTO	High	High	Ceramic (glass-like)	Precision grinding, high load (crankshaft, camshaft, peel grinding)
ALUMENTO pro	Very high	Very high	Ceramic (glass-like)	Precision grinding, high load (crankshaft, camshaft, peel grinding)
VND1	High	High	Ceramic (glass-like)	Bond for diamond, developed on the basis of AUMENTO
BNX1	Medium	Medium	Synthetic resin	Synthetic resin bond for external cylindrical grinding Good attenuation properties
B26	Medium	Medium	Synthetic resin	Synthetic resin bond for surface grinding and surface fine grinding Excellent damping properties with good grain integration Precision grinding for, e.g., piston rings or pump blades
B36	Medium	Medium	Synthetic resin	Synthetic resin bond for surface grinding and surface fine grinding Excellent damping properties with good grain integration Very cool grinding with large workpieces



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