

DVS Universal Grinding

Universal Hard-Fine Machining
for Small and Medium Batch Sizes

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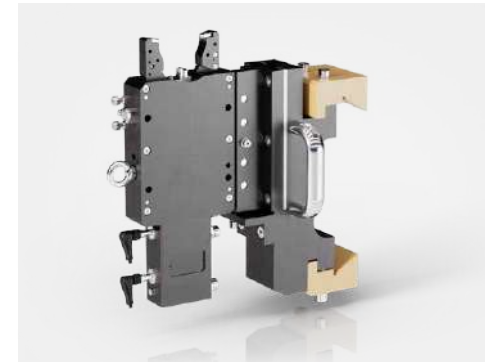
DVS Universal Grinding

The specialist for hard-fine machining of individual parts through to medium series production of shafts and chuck parts.

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Weitere Features

The in-process measuring system and steady rest open up new grinding possibilities – discover them now.



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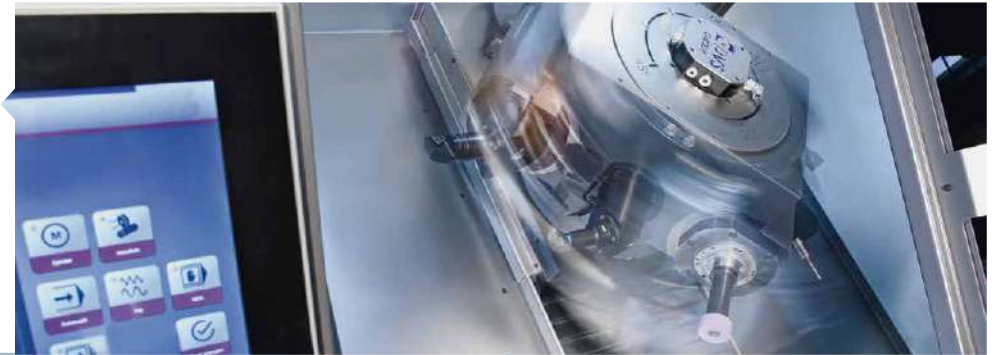
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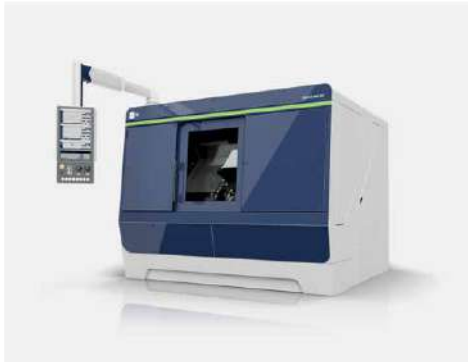
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The universal automation unit of the UGrind.







UNIVERSAL GRINDING

Universal Grinding GmbH, based in Butzbach near Frankfurt am Main in Hessen, manufactures combination machines for the hard fine machining of shafts and chuck components with a center width of up to 1800 mm.

The company specializes in component batch sizes from single to medium series production. Thanks to close cooperation with the machine and tool manufacturers of the DVS TECHNOLOGY GROUP, the company has vast technology at its disposal.

This close collaboration has resulted in the UGrind machine series, with which grinding, hard turning, and measuring applications can be carried out precisely and expediently in one clamping for the first time in small series machining.

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 1400 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 Tools & Automation:

Manufacture and sale of high-precision machine tools and automation systems and related services.

DVS Production:

Series production of small and large series on DVS machine tools.

DVS International Sales & Service:

DVS contact for sales and service in international markets.

DVS Tools & Components:

Customer-specific development, manufacturing, and sale of machine components, tools, and abrasives.

FOCUS ON CORE TECHNOLOGIES



HARD TURNING



INTERNAL GRINDING



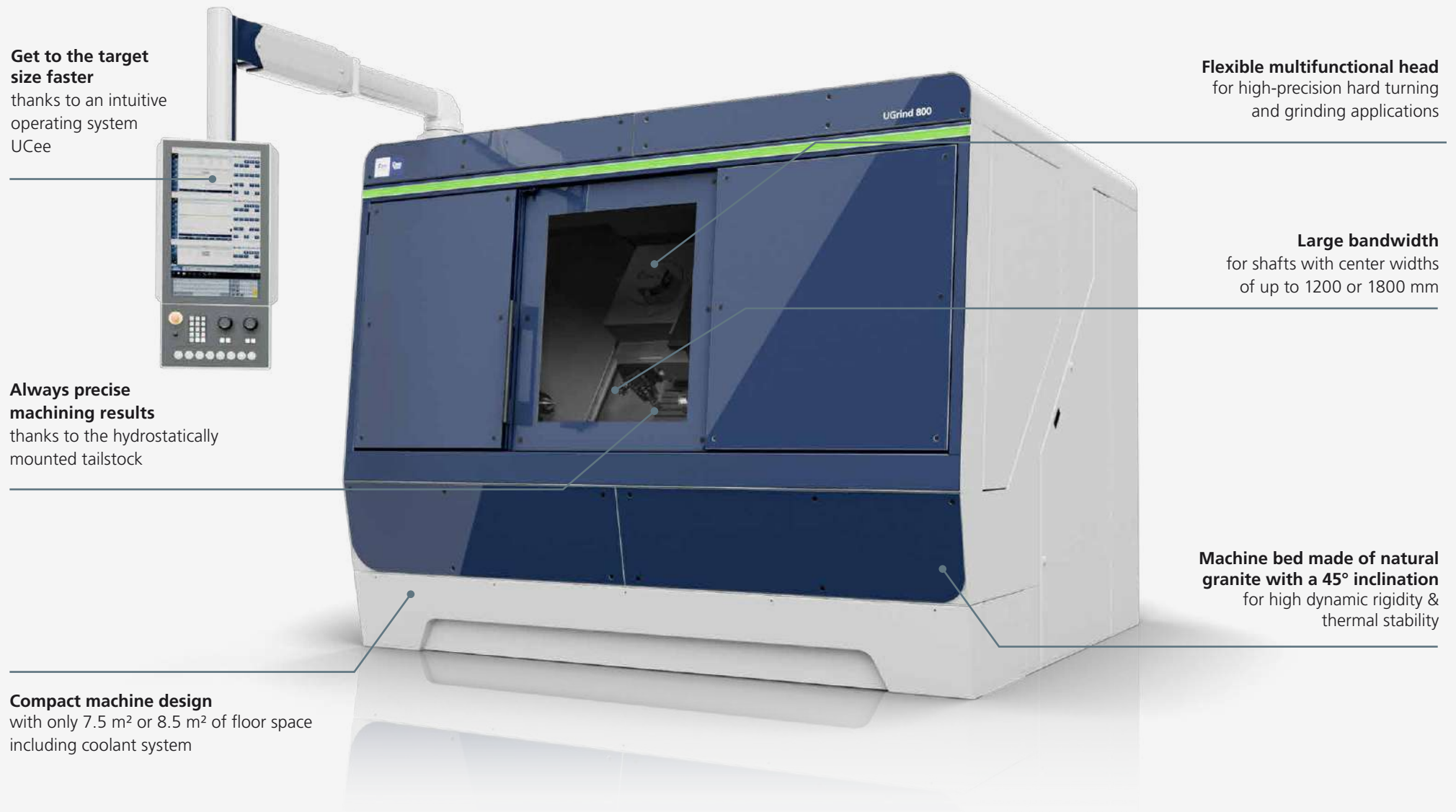
EXTERNAL GRINDING



MEASURING



DOUBLE FACE GRINDING



UGrind 800/1500

Extremely Impressive

A versatile machine for the hard-fine machining of shafts and chuck parts with a length of up to 1800 mm and a diameter of max. 350 mm. The UGrind can machine workpieces weighing up to 150 kg.

Ideal for small to medium batch sizes of shafts & lining parts

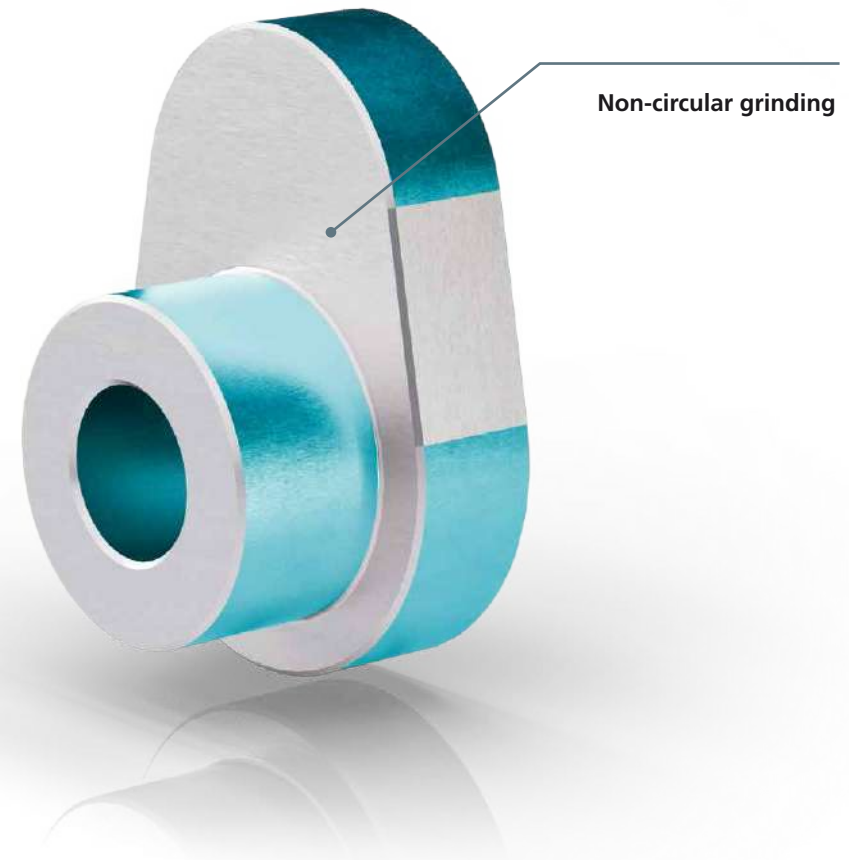


Machining Scope

Grinding and Turning, Externally and Internally

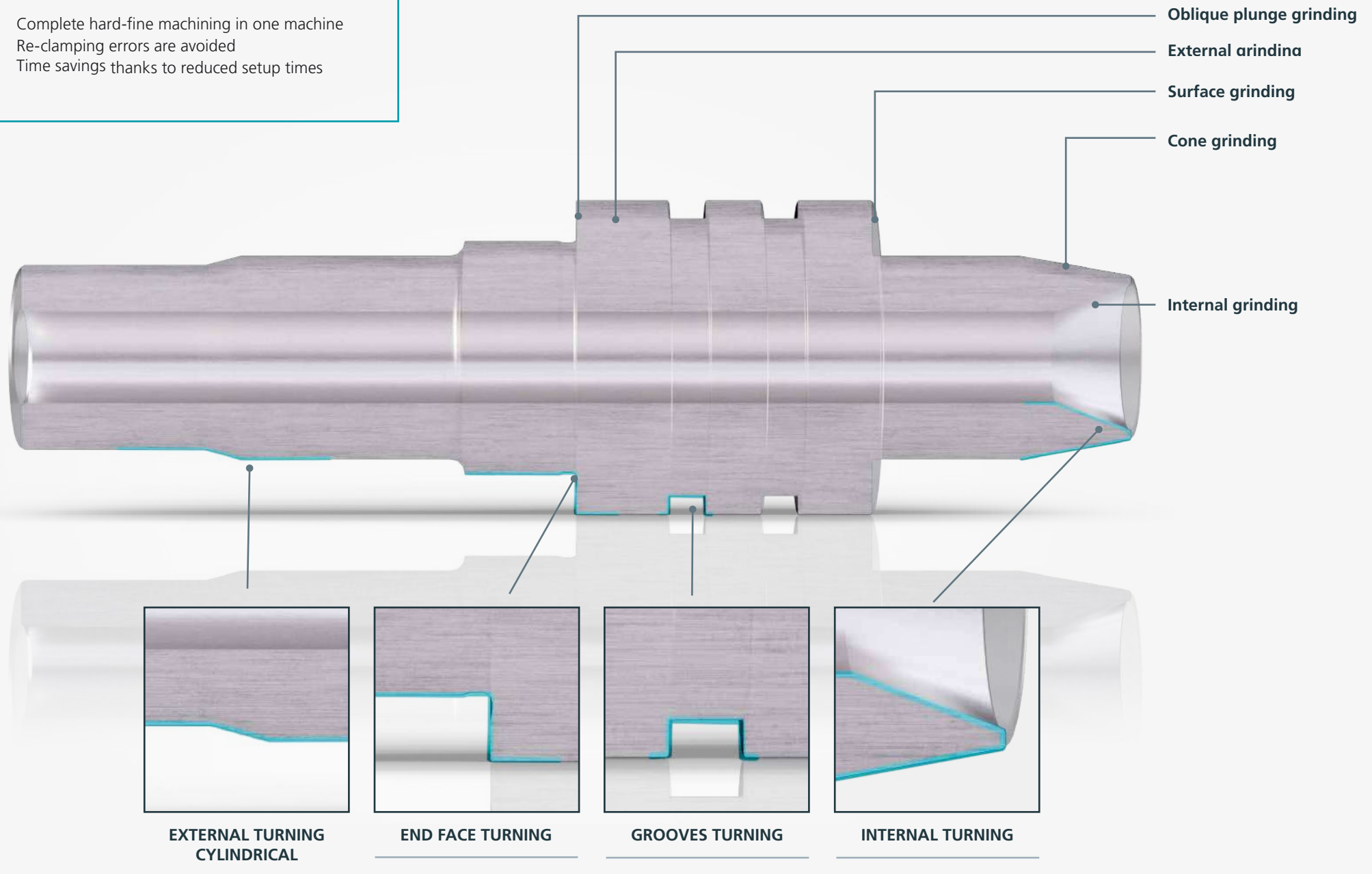
The UGrind combines all the steps of hard-fine machining in a single machine. Turning, measuring, and grinding applications on external and internal surfaces can be carried out in a single work step.

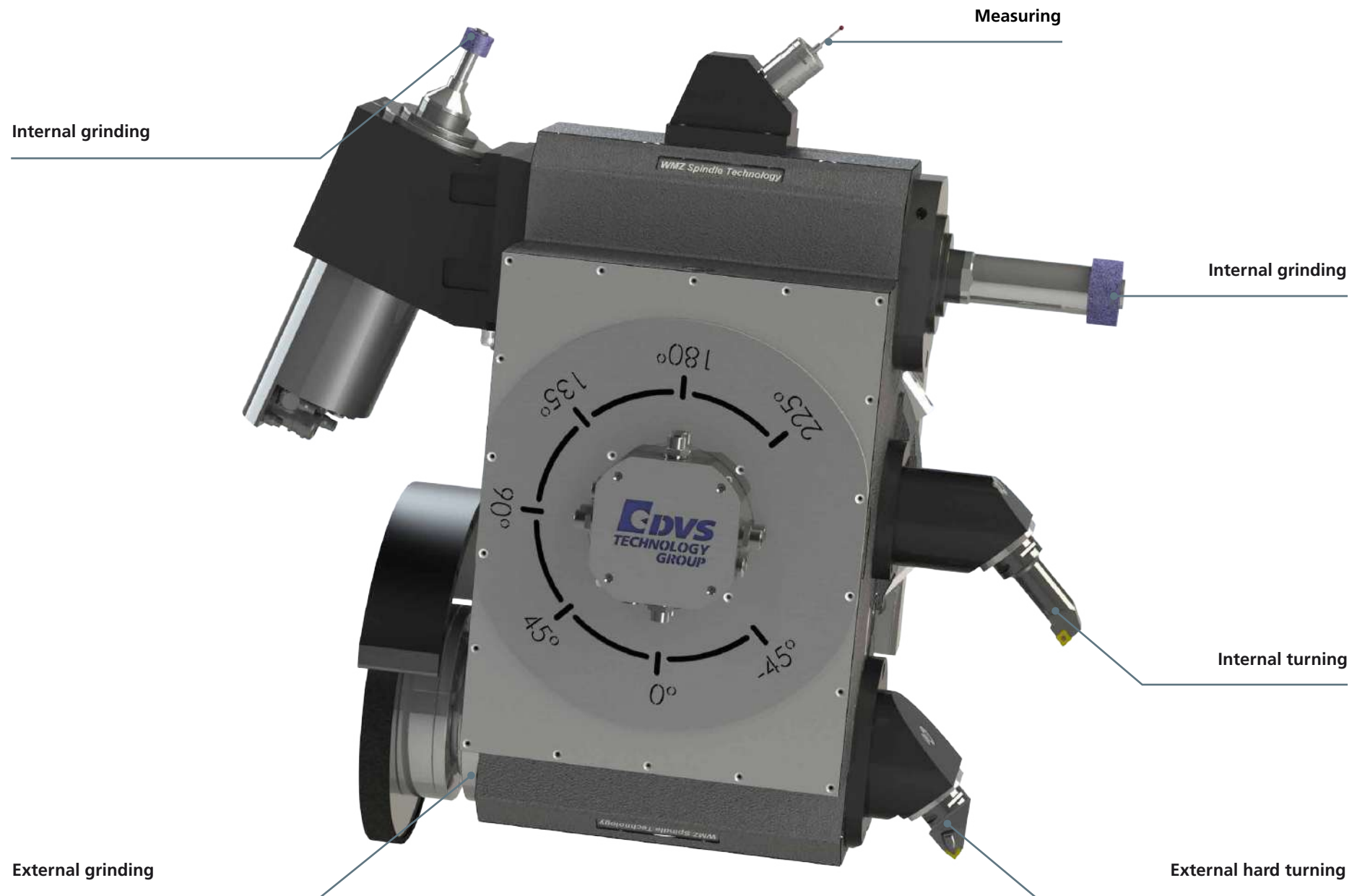
For example, various fitting seats can be turned and ground highly precisely in just one clamping without changing tools. Since the workpiece is only clamped once, setup times are reduced and re-clamping errors are avoided.



YOUR ADVANTAGE

- Complete hard-fine machining in one machine
- Re-clamping errors are avoided
- Time savings thanks to reduced setup times





Multifunctional Head

Flexible, Fast, and Precise.

The multifunctional tool head of the UGrind guarantees a high degree of flexibility and precision during machining.

With an action radius of 270°, processes such as internal and external grinding, surface grinding, conical grinding, and various hard turning operations are carried out efficiently and precisely.

An optional measuring probe integrated into the multifunctional head monitors and controls the machining process until the final dimension is achieved. Time-consuming manual work, such as re-measuring or successive feeds, is no longer necessary.

This significantly reduces the overall machining time.

YOUR ADVANTAGE

- Individually configurable multifunctional head
- Application-specific spindle and tool design
- Optional version with measuring probe for verification of allowance and finished dimensions



More Features

All features presented here can be easily installed on the UGrind 800/1500 and retrofitted at any time.

Y-AXIS

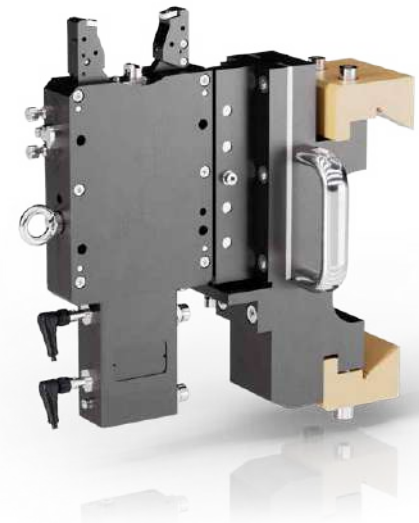
- Travel 60 mm per side (total: 120 mm)
- Axis is located under the workpiece spindle
- Grinding of surfaces, e.g., square is possible
- Glass scale for highly precise positioning

DRESSING MONITORING + BEVEL DETECTION

- Ring sensor mounted on workpiece spindle
- Via power consumption of the spindle

BALANCING

- Integrated in the external grinding spindle



WORKPIECE SPINDLE WITH VARIOUS CLAMPING & DRESSING OPTIONS

- Concentricity < 1 μ m
- Retooling in a wide variety with a large selection of clamping and dressing modules
- Large torque of up to 50 Nm
- Low maintenance
- Also available in a hydrostatic version upon request.

3-POINT STEADY REST

- Clamping range: 10 – 90 mm
- User-friendly loading and unloading of workpieces
- Infinitely adjustable
- Fine adjustment up to 2 μ m



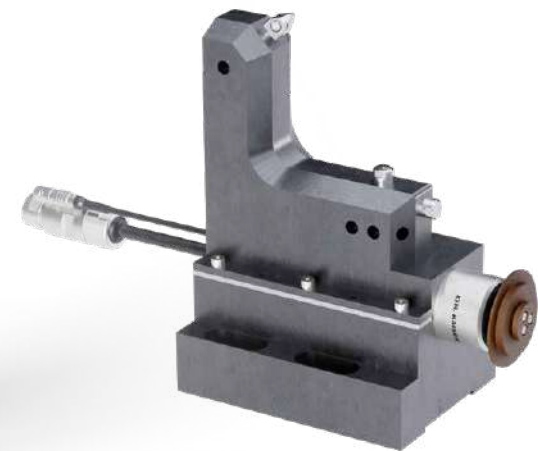
TAILSTOCK

- Highest running accuracy < 1 µm
- Various versions with 50 – 80 mm stroke
- Revolving and stationary center point
- Available as a mounted or hydrostatically mounted version
- Available with MK3 and MK4 interface



IN-PROCESS MEASURING SYSTEM WITH MEASURING PROBES

- Measuring accuracy < 1 µm
- Easy to assemble or disassemble if necessary
- For diameters up to 180 mm



DRESSING DEVICE

- Integrable dressing spindle
- With single grain diamonds; Triangular PCD plates as MK1 holders
- Dresser is customizable

Technical Data

	UGrind 800	UGrind 1500		UGrind 800	UGrind 1500
MAIN DIMENSIONS			MULTIFUNCTIONAL HEAD: B AXIS		
Center width (mm)	1200	1800	Swivel range (°)	- 45 bis + 225	
Max. external diameter	350		Positioning accuracy (°)	0.0002	
Max. workpiece weight between peaks (kg)	150		Repetition accuracy (")	< 1	
			Swivel time for 180° (sec)	< 3	
			Resolution (°)	0.001	
CROSS SLIDE: X-AXIS			Exterior machining		
Max. travel (mm)	500		Max. machining length (mm)	750	1450
Max. speed (m/min)	30		Circumferential speed (m/s)	50 corundum / 80 CBN	
Resolution (µm)	0.1		Drive power (kW)	15	
			Max. disc dimensions (mm)	Ø 400x50x152.4	
LONGITUDINAL SLIDE: Z-AXIS			INTERNAL MACHINING		
Max. travel (mm)	800	1500	Max. bore diameter (mm)	250	
Max. speed (m/min)	30		Max. drilling depth (mm)	235	
Resolution (µm)	0.1		Drive power S1 (kW)	1.8 – 7.5	
			Speeds (rpm)	3000 – 105000	
			MEASURING PROBE		
			Repeatability (µm)	1	
			Probing directions (-)	±X; ±Z	

	UGrind 800	UGrind 1500
WORKPIECE SPINDLE: C-AXIS		
Max. speed (rpm)	1500/5000	
Drive power (kW)	1.8/24	
Torque (Nm)	35/50	
Resolution measuring system (°)	0.001	
Roundness accuracy (µm)	< 0.8	
Positioning accuracy (°)	0.0001	
TAILSTOCK		
Sleeve stroke (mm)	50/80	
Sleeve diameter (mm)	60	90
Bearing (-)	hydrostatisch oder kugelgelagert	
Fine adjustment for cylindricity corrections (µm)	± 40	
3-POINT STEADY REST		
Clamping range (mm)	Ø 10 – Ø 90	
Coarse adjustment (µm)	40	
Fine adjustment (µm)	2	

	UGrind 800	UGrind 1500
CONNECTION VALUES		
Total connected load (kW)	40	
Air pressure (bar)	5	
DIMENSIONS/WEIGHT		
Width (mm)	2850	3450
Depth (mm)	2490	
Height (mm)	2290	
Total net weight (kg)	7000	10,000
OPTIONAL ACCESSORIES		
Measuring probe systems (in-process measuring)	Steady rests	
Balancing systems	Loading and unloading equipment	
Clamping devices	Combination holder for internal/external turning tools	
Workpiece-dependent accessories	Tool ranges with standard and special tools	
Chip conveyor	Y-axis	
Dressing monitoring		

Strong drive

thanks to powerful
workpiece spindle

Versatile

thanks to efficient
processing of different
workpiece coatings

High stability

thanks to the guided workpiece

High precision

through stable guidance
of the grinding wheels
on supports

Machine bed made of natural granite

for high rigidity, vibration damping
and optimal thermal properties

Efficient sharpening stone

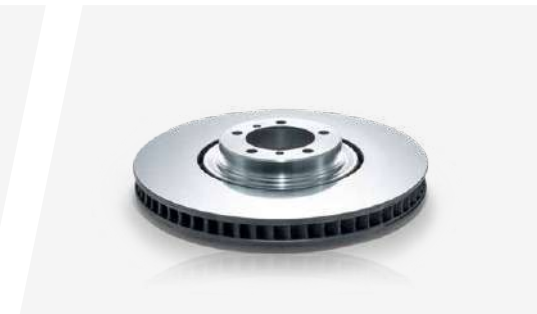
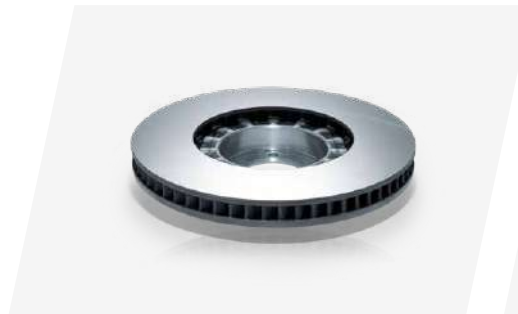
thanks to quick
position changes

UGrind 800 DD

Extremely Impressive

The UGrind 800 DD was specially developed for the two-sided machining of brake discs. On the base of the standard machine are two grinding supports on the dovetail guide, which enable the simultaneous grinding of both friction ring surfaces. The grinding supports are equipped with CBN or diamond grinding wheels. The workpiece is clamped axially using a bayonet 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

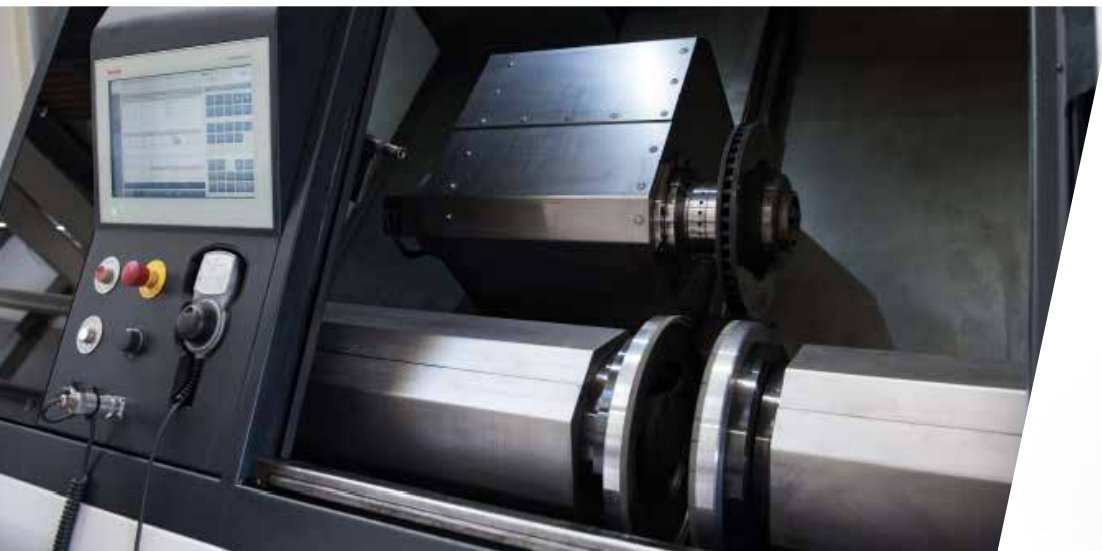


Machining Scope

Grinding and Turning, Externally and Internally

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 cast 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 max. (mm)	500
Workpiece diameter min. (mm)	250
Workpiece weight max. (kg)	40

AXLES

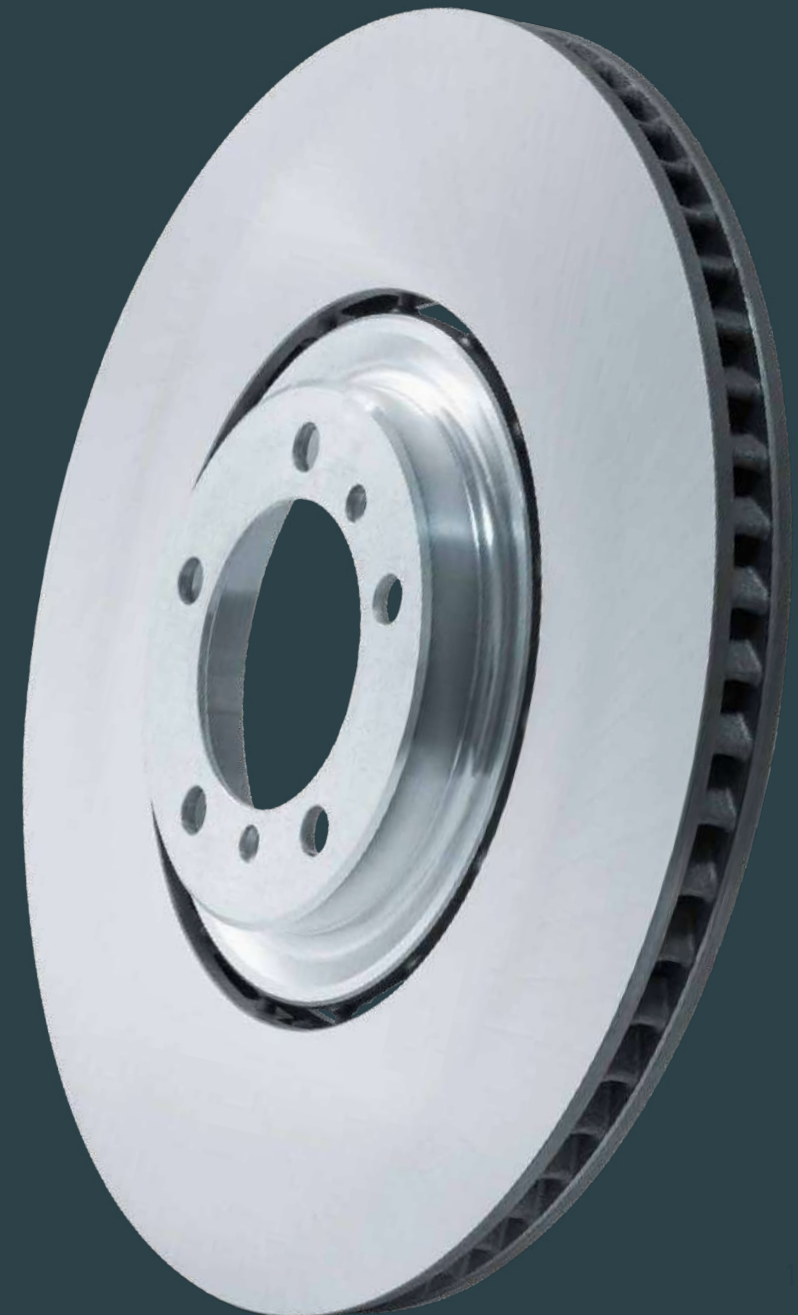
X-axis travel (mm)	490
Z-axis travel (mm)	790
Travel distance of grinding supports (mm)	50

WORKPIECE SPINDLE

Power (kW)	24
Torque (Nm)	50
Max. speed (rpm)	4500

GRINDING SPINDLE

Power (kW)	36
Torque (Nm)	70
Max. speed (rpm)	5000



The Work Area Very Accessible.

The UGrind also boasts uncomplicated operation when it comes to loading. Loading can be done by hand or, for heavy parts, by crane. The magnetic chuck makes it easier to clamp the workpiece precisely and allows free access to all surfaces to be machined.

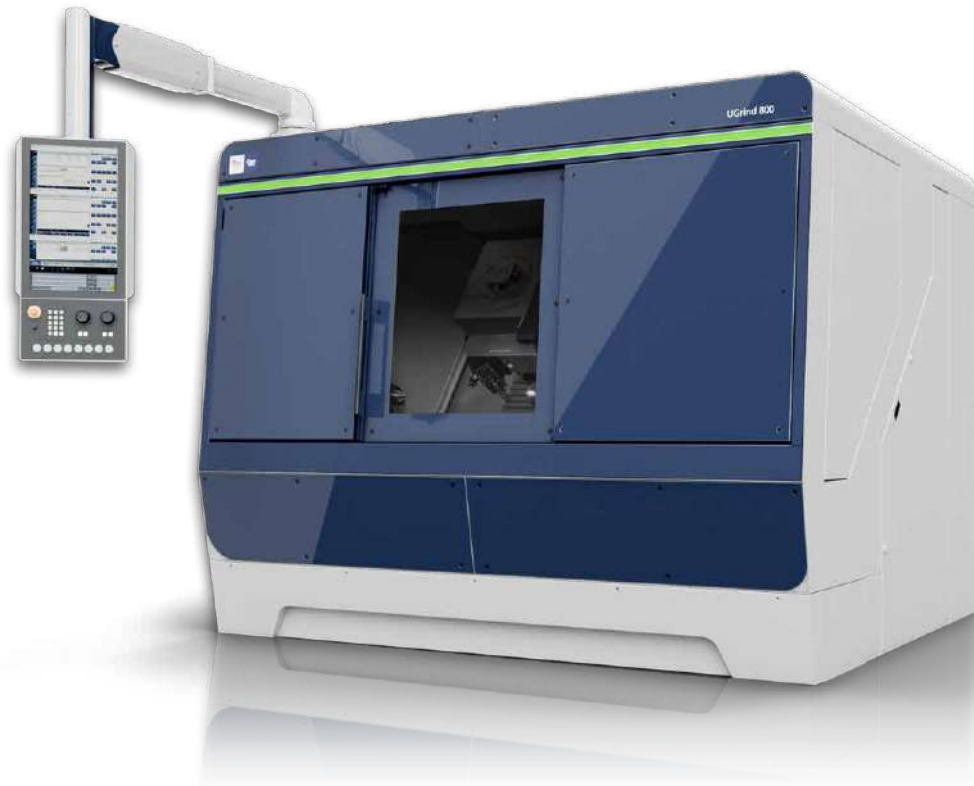
For medium-sized series production, the UGrind can be equipped with various automation systems. Depending on the requirements, robot arms or gantry loaders can be used.

The Design.

Modern. Space saving. Solid.

On just 7 m² of installation space (with UGrind 1500: 8.5 m² installation space), the DVS UGrind combines a modern design, the most efficient technologies in hard precision machining, and a solid construction. Another advantage of the compact design of the UGrind is the integrated coolant processing system. This enables a closed coolant circuit without the need to expand the installation area.

Depending on the workpiece length, the UGrind is available in two different versions. The UGrind 800 was designed for workpieces with center widths of a maximum of 1200 mm. Components with a center width of up to 1800 mm can be machined with the UGrind 1500 type.



YOUR ADVANTAGE

- Only 7 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



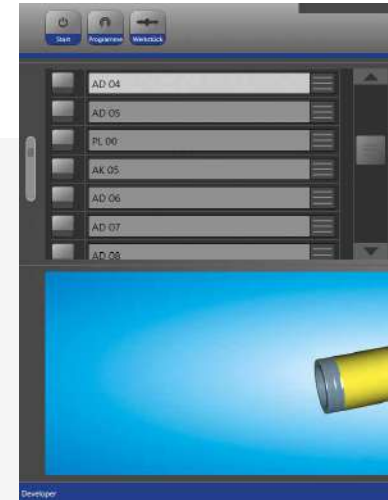
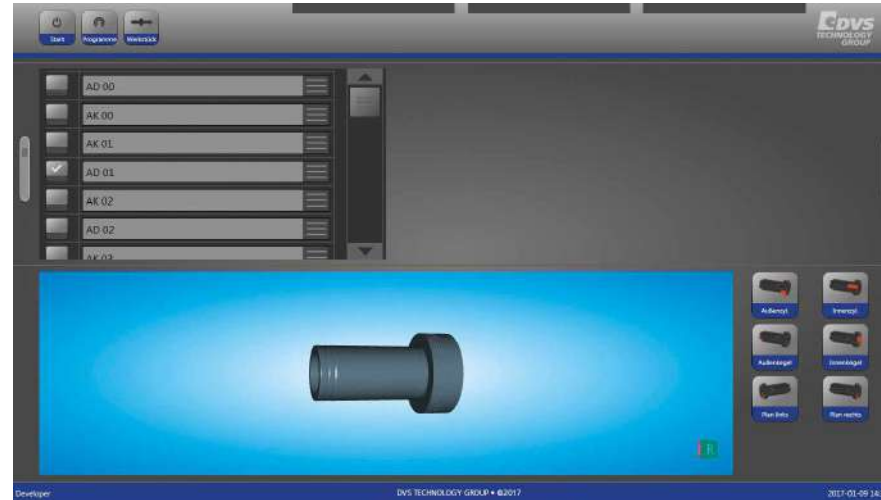
To dampen vibrations during machining, the UGrind machine bed is made of natural granite. The thermally stable structure guarantees optimal reproducibility of the desired surface qualities.

UCee Operating System Easy to Use.

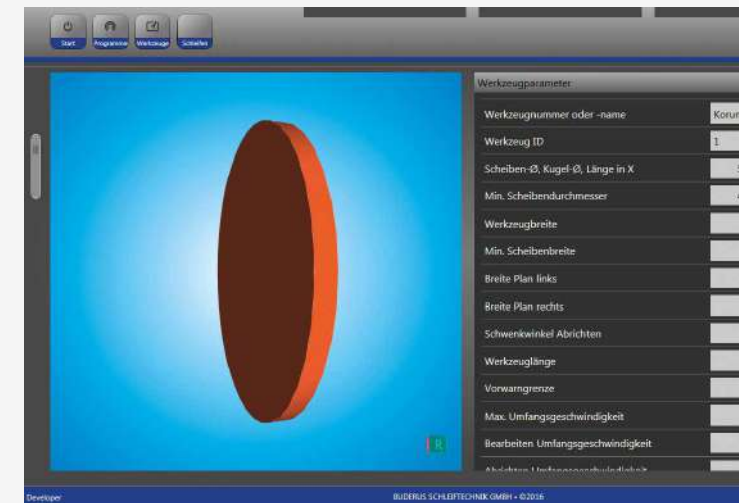
The DVS UGrind can be operated easily and efficiently via the UCee operating system. Machining processes can be created in just a few steps and without in-depth programming knowledge using the control's touchscreen. First, the workpiece geometry, the desired machining surfaces, and the tool parameters are defined. All you then need to do is select a processing cycle and start processing at the push of a button. The quick and easy operation saves a lot of time, which means that more can be produced at a lower cost in the same period of time.

Alternatively, the geometry data and the tool assignment can also be created on the PC and transferred to the machine via USB or Ethernet. The Ethernet line also enables the UGrind to be integrated into digitalized production networks.

With the help of the integrated workpiece management, the various machining programs can be stored and be accessed at any time.



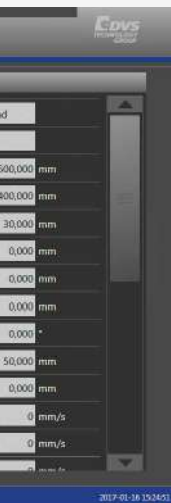
Step 1: Enter the geometry data of the workpiece



Step 3: Enter the geometry data of the tool



◀ **Step 2:** Definition of the machining areas



▲ **Step 4:** Switch to cockpit view & start

YOUR ADVANTAGE

- Machining programs can be created without in-depth programming knowledge
- Integration of the machine into digitalized production networks via Ethernet
- Transfer programs from PC to machine via USB
- Workpiece management for quick access to archived machining processes

ULoad - The Universal Automation Unit of the UGrind

With the new ULoad automation cell, the UGrind hard finishing machine can process small and medium-sized production orders for shaft and chuck parts even more efficiently in the future. The universal loading unit allows the UGrind to be automated for a wide variety of workpieces up to 150 mm in diameter.

At the heart of the automation is the flexible swivel gripper for fast and accurate loading and unloading.

During machining, the gripper unloads the finished part onto the cantilever conveyor belt integrated into the ULoad cell, removes a raw part and parks it behind the loading hatch to the work area. Once the machining process is completed, the loader travels a short distance to remove the finished part, pivots, and loads a new raw part. As soon as the loading hatch has been passed, a new machining process can be started immediately.

The self-sufficient design of the ULoad loading cell with its own control and independent peripherals can be easily integrated into already operating UGrind machines and without lengthy production down-times. The reason: ULoad automation cells can also be programmed and put into operation without a connected machine.

A suitable chip conveyor can be installed under the automation, so that the space required is no more than the footprint of the machine.



**TECHNICAL DATA****ULoad****MACHINE**

Workpiece weight max (kg)	10
Workpiece length (mm)	400 (for UGrind 800)
Workpiece diameter (Ø mm)	150
Loading cycle (sec.)	10
Loading stroke (mm)	70
Swivel range (°)	2400

YOUR ADVANTAGE

- Flexible automation cell for the loading of shaft and chuck parts with different diameters
- Fast and precise loading using the swivel loading system
- Independent programming and peripherals for quick integration into installed UGrind machines
- Good accessibility thanks to the integrated, self-supporting conveyor belt

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Conventional grinding tools – CBN and diamond tools

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