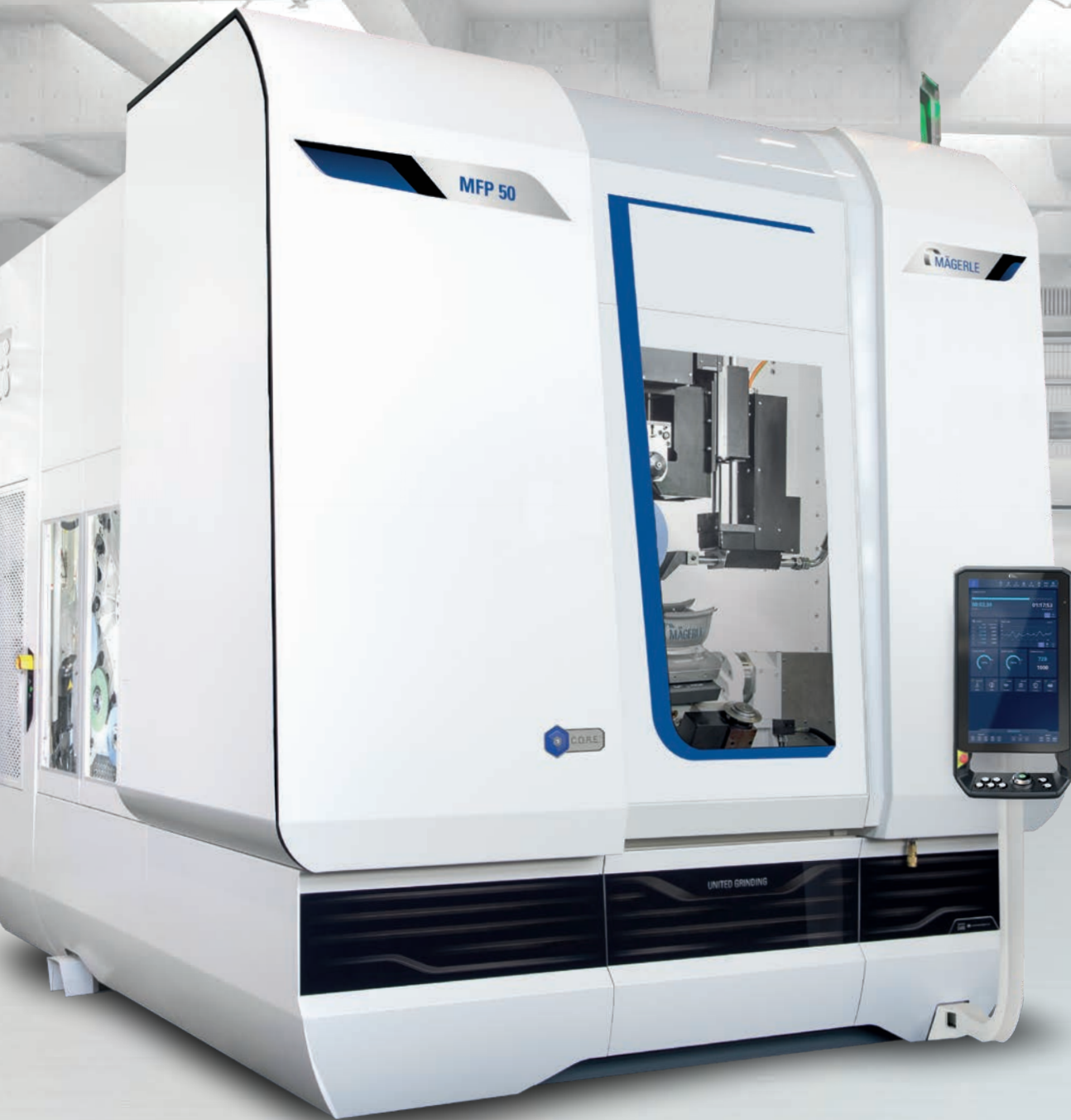


MFP 50

HIGHLY FLEXIBLE
FOR DEMANDING APPLICATIONS



A member of the United Grinding Group

MFP 50

HARDWARE

- 5 or 6-axis system
- Tool changer with 24 positions
- Grinding, milling and drilling in a single clamping
- Wear-free hydrostatic guideways
- Water-cooled drive
- Grinding spindle drive power: 25/50 kW
- C.O.R.E. Panel

SOFTWARE

- Pre-programmed grinding and dressing cycles
- Intuitive operation
- Focus on work and production safety
- C.O.R.E. OS operating system

DIMENSIONS

- X-axis – longitudinal stroke: 500 mm
- Y-axis – vertical stroke: 650 mm
- Z-axis – transverse stroke: 650 mm

The MÄGERLE MFP 50 combines flexibility and performance in a compact design. As a 5 or 6-axis system, this CD grinding and machining center shows its top form when dealing with challenging workpieces. An intelligent design principle takes manufacturing quality, safety and cost efficiency to a new level. The coolant nozzle,

controllable via two axes, allows unrestricted freedom of movement and precise positioning of the coolant jet. Spindle speeds of up to 10,000 revolutions per minute guarantee the highest machining precision. The grinding wheels are always mounted right at the front of the spindle, and the profile is changed through automatic positioning of the

diamond rolls in the direction of the Z-axis. This allows a generous machining clearance, as collisions between wheel flange and workpiece are practically excluded. In the MFP 50 the grinding wheel diameter is used to the maximum, resulting in significant cost savings.

YOUR BENEFIT

- Fast tool change
- Overhead dresser moveable in Z-direction
- Hydrostatic guideways
- Maximum grinding and cooling performance
- Maintenance-friendly design
- Process and system integration expertise
- Intuitive, user-friendly, and efficient operation
- Access to important information directly at the control panel (e.g. production progress, task details, etc.)
- Reduced programming when exchanging data between C.O.R.E. machines
- Use of UNITED GRINDING Digital Solutions™ products directly on the machine
- Fast support thanks to direct interaction with our Customer Care team on the machine



C.O.R.E. – CUSTOMER ORIENTED REVOLUTION

C.O.R.E. helps us make your production fit for the digital future.

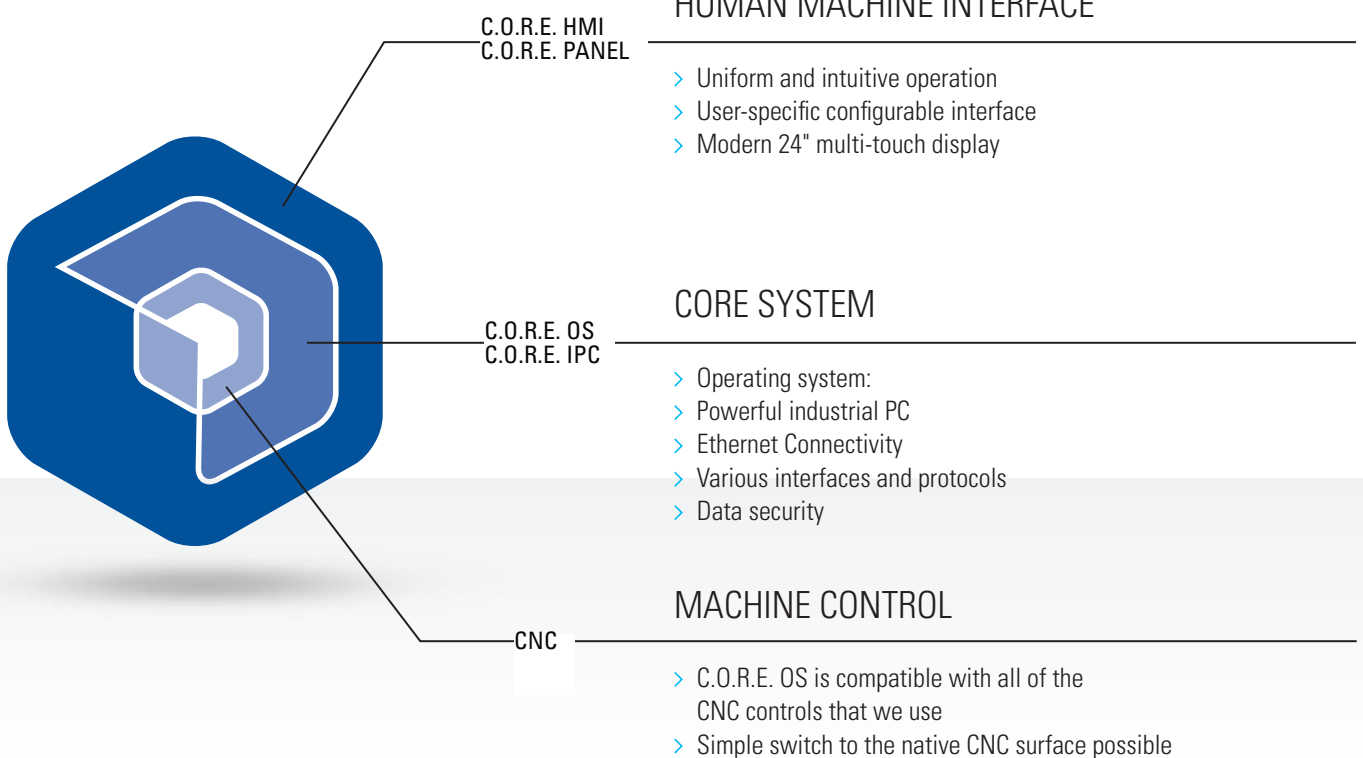
It's based on a new operating system, C.O.R.E. OS, that equips the machine with intelligence.

Thanks to the uniform C.O.R.E. software architecture, exchanging data between UNITED GRINDING machines is easy. The integrated umati API can be used to communicate with third-party systems as well. It also offers access to UNITED GRINDING Digital Solutions™ products directly on the machine. C.O.R.E. not only establishes the technical foundation for this and other IoT and data applications, it also forms the basis of revolutionary yet uniform operation.

What does this mean for you?

- The user-friendly, intuitive, and uniform operation makes work easier for machine setters, machine operators, and maintenance staff
- Standardized data collection and intelligent processing of data creates transparency and supports process optimization
- The uncomplicated and consistent use of modern digital software solutions is guaranteed - directly on the machine
- The technical platform for the use of modern IoT and data applications has been established

C.O.R.E. ELEMENTS



C.O.R.E. PANEL – THE FUTURE OF OPERATION

Intuitive

Thanks to intuitive design with self-explanatory icons, navigation through the machine menu and process steps is quick and easy. Instead of buttons, the user is presented with a modern and clearly arranged multi-touch display.

User-friendly

Each user configures their own user interface individually. This is called up automatically with the RFID chip after logging in. When the user leaves the machine, the panel switches to "Dark Factory Mode."

Production progress and the machine state are also clearly visible from a distance. And thanks to the ergonomic design, the panel can be tilted and individually adjusted easily.

Efficient

The uniform and intuitive operating philosophy reduces training time. The configurable and role-specific interface helps prevent errors and increases the efficiency and quality of programming. Information can be exchanged quickly and in realtime via the front camera and Bluetooth headset. UNITED GRINDING Digital Solutions™ products can be used directly on the panel.

INDUSTRIAL
MULTI-TOUCH DISPLAY

INTEGRATED
FRONT CAMERA

SELF-EXPLANATORY
ICONS

USER-
CONFIGURABLE
DISPLAY

STANDARDIZED
FUNCTION KEYS

ERGONOMIC
OVERRIDE SWITCH

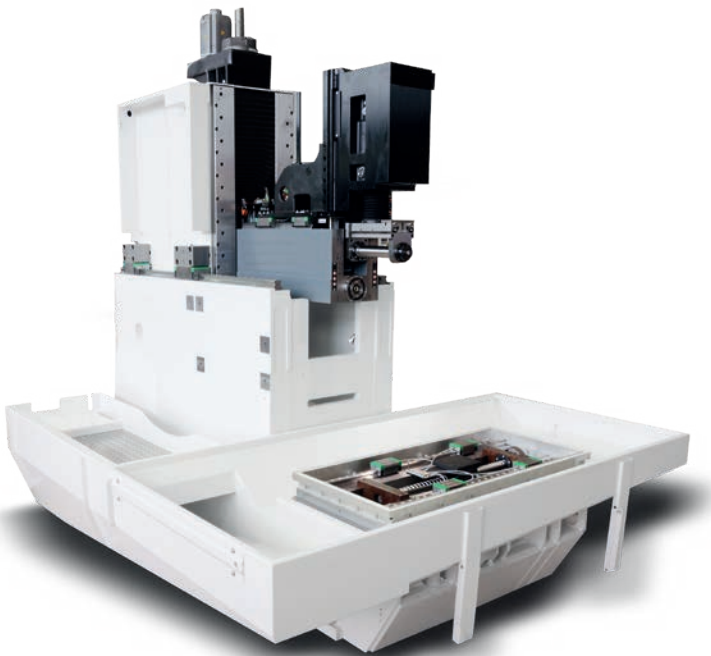
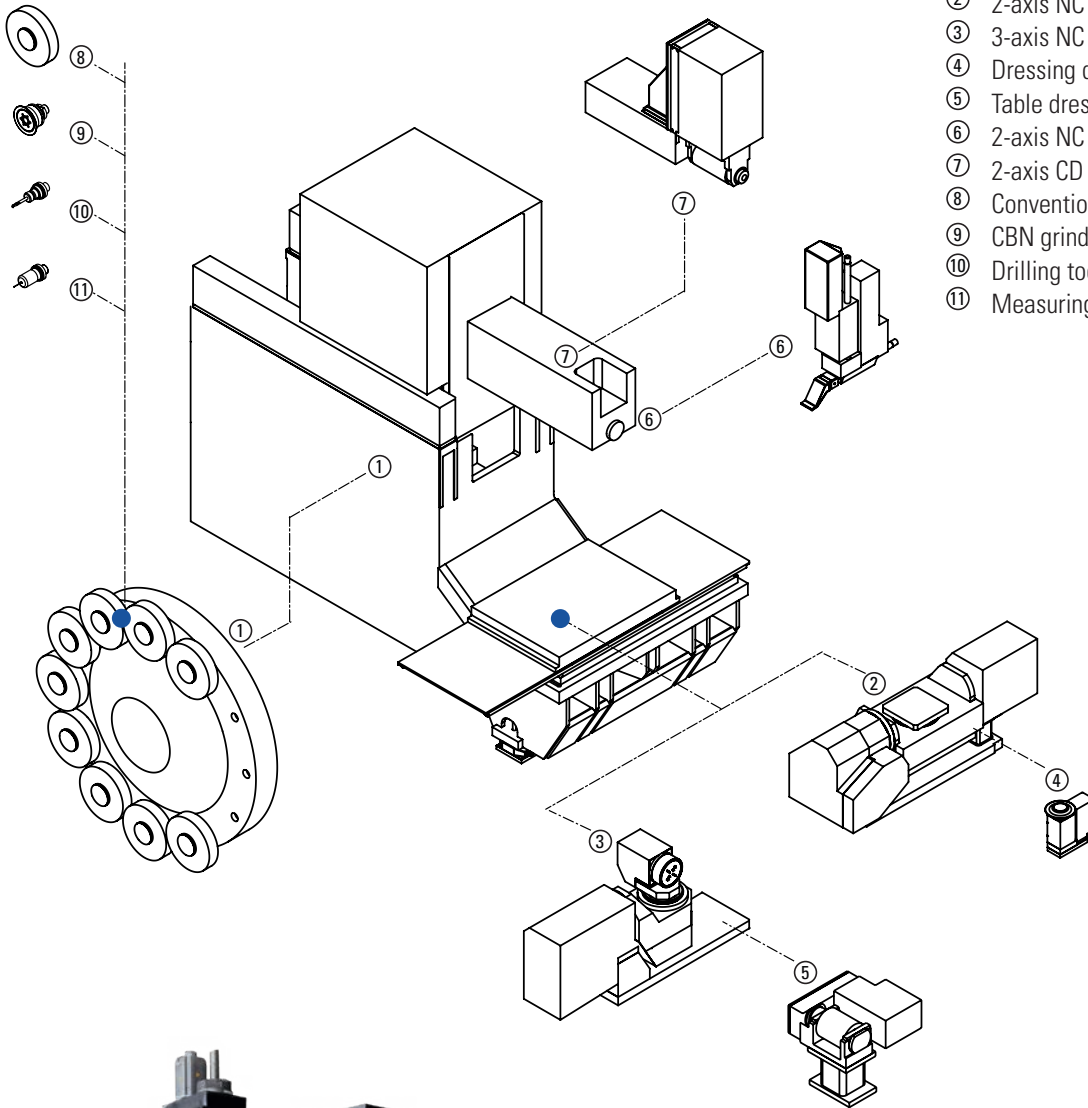


Technical Specifications

- 24" Full HD multi-touch display
- 16-position rotary override switch
- Electronic key switch (RFID)
- Integrated front camera
- Bluetooth V4.0 for headset connection
- 2x USB 3.0 ports
- Adjustable tilt

MACHINE CONCEPT

- ① 24-position tool changer
- ② 2-axis NC table
- ③ 3-axis NC table
- ④ Dressing device
- ⑤ Table dressing device
- ⑥ 2-axis NC coolant nozzle
- ⑦ 2-axis CD overhead dresser
- ⑧ Conventional grinding wheels
- ⑨ CBN grinding wheels
- ⑩ Drilling tools / Cutting tools
- ⑪ Measuring probe



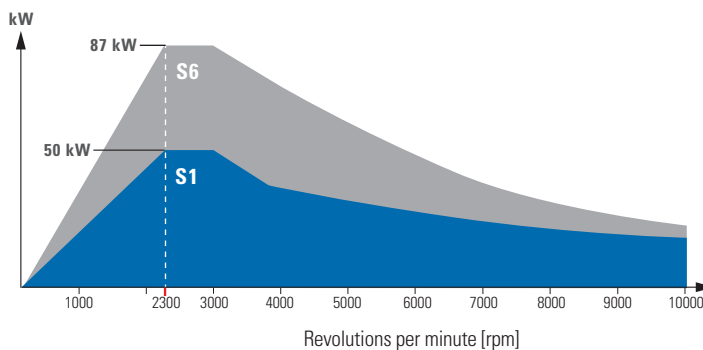
POWERFUL DRIVES AND HYDROSTATIC SYSTEM

High performance and high torque

The water-cooled direct drive motor for the grinding spindle enables high performance and torque in continuous operation across the entire speed range. This leads to outstanding results in terms of removal rates. The HSK flange mountings guarantee high rigidity, attributed to

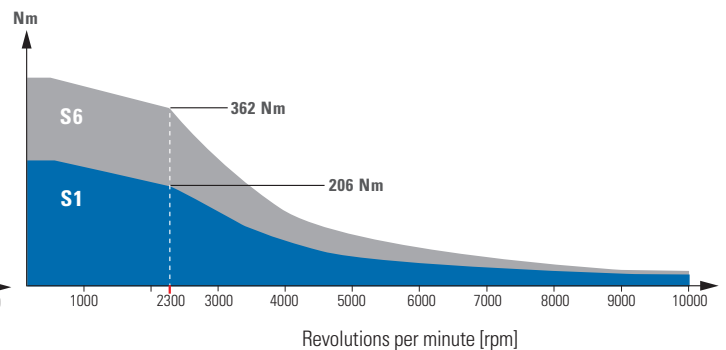
the generous support on the tool holding fixture via the collar. They are also the key to enabling quick tooling changes with absolute repeatability precision. An optional balancing system dynamically balances unequal forces in the rotating grinding wheel.

Spindle capacity



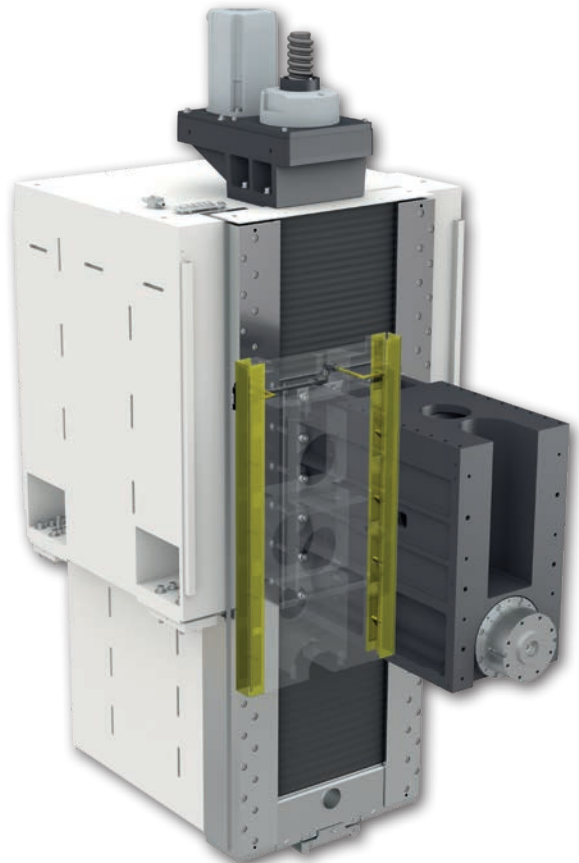
S6 = 40% duty cycle

Torque



Wear-free guide concept

The unique design principle of MÄGERLE machining centers forms the basis for the overall machine quality. The vertical axis is supported by hydrostatic wrap-around guideways on a thin oil film and is completely separated from the column upper section. This principle enables the machines to withstand very high stresses free of wear, even in long-term use. The oil film also has a vibration-damping effect and guarantees high-precision machining of simple or complex workpieces.

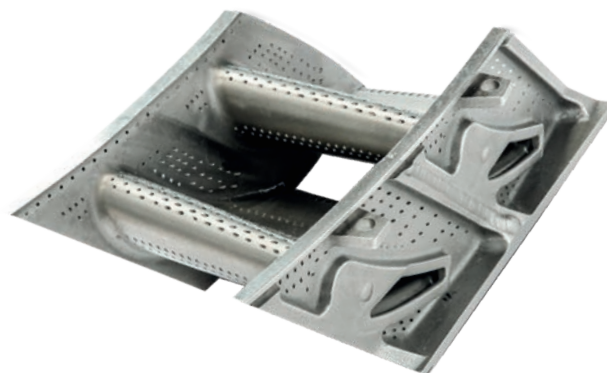
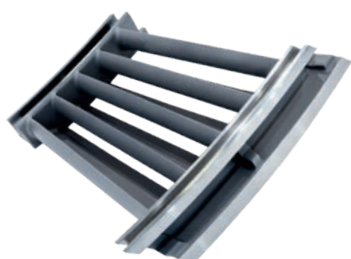




APPLICATION EXAMPLES AND MACHINING CAPABILITIES

Turbine vanes

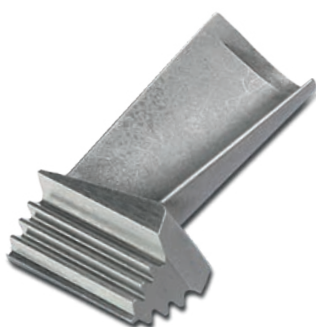
Turbine vanes are ground on the MFP 50 with minimal downtimes and a high degree of autonomy. The combination of automatic tool changer and CD overhead dresser enables several profiles to be ground in a single workpiece clamping, as well as ensuring dimensional stability.



Turbine blades

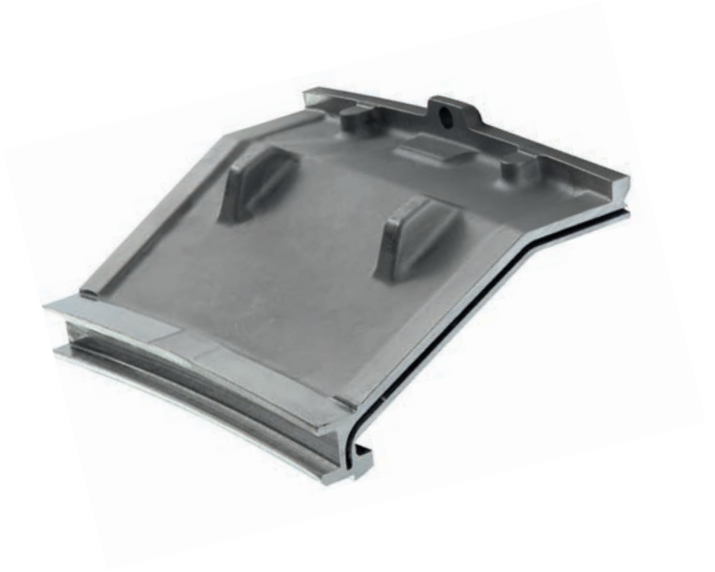
The capacity of the tool changer allows the machine to be prepared for several types of turbine blades. As a result changeover times can be

significantly reduced. The compact tool holding fixtures enable wide machining contours to be achieved, together with high removal rates.



Shrouds

Shrouds can be completely machined in just a few clampings on the MFP 50, including milling and drilling operations.



Compressor blades

Compressor blades for aircraft engines are manufactured from forgings, which comprise high-strength and in some cases also heat-

resistant material alloys. The complete blade root profile is produced in a single clamping.



before



after

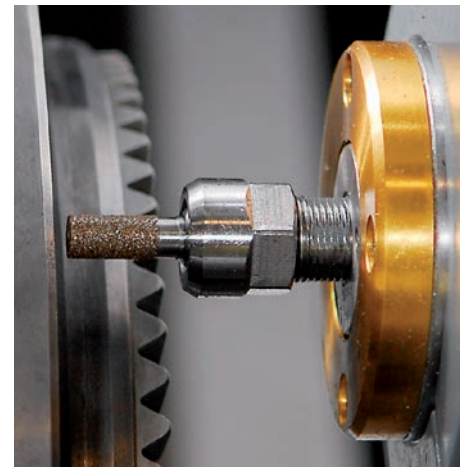


Gear grinding

Gear grinding on challenging workpieces is enabled by a tailored system configuration. To ensure dimensional stability, external and

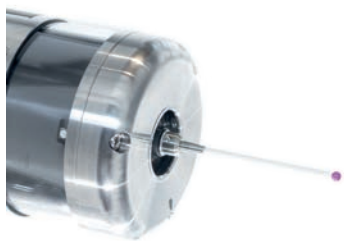
internal diameter can be ground in the same clamping. The process-optimized coolant sup-

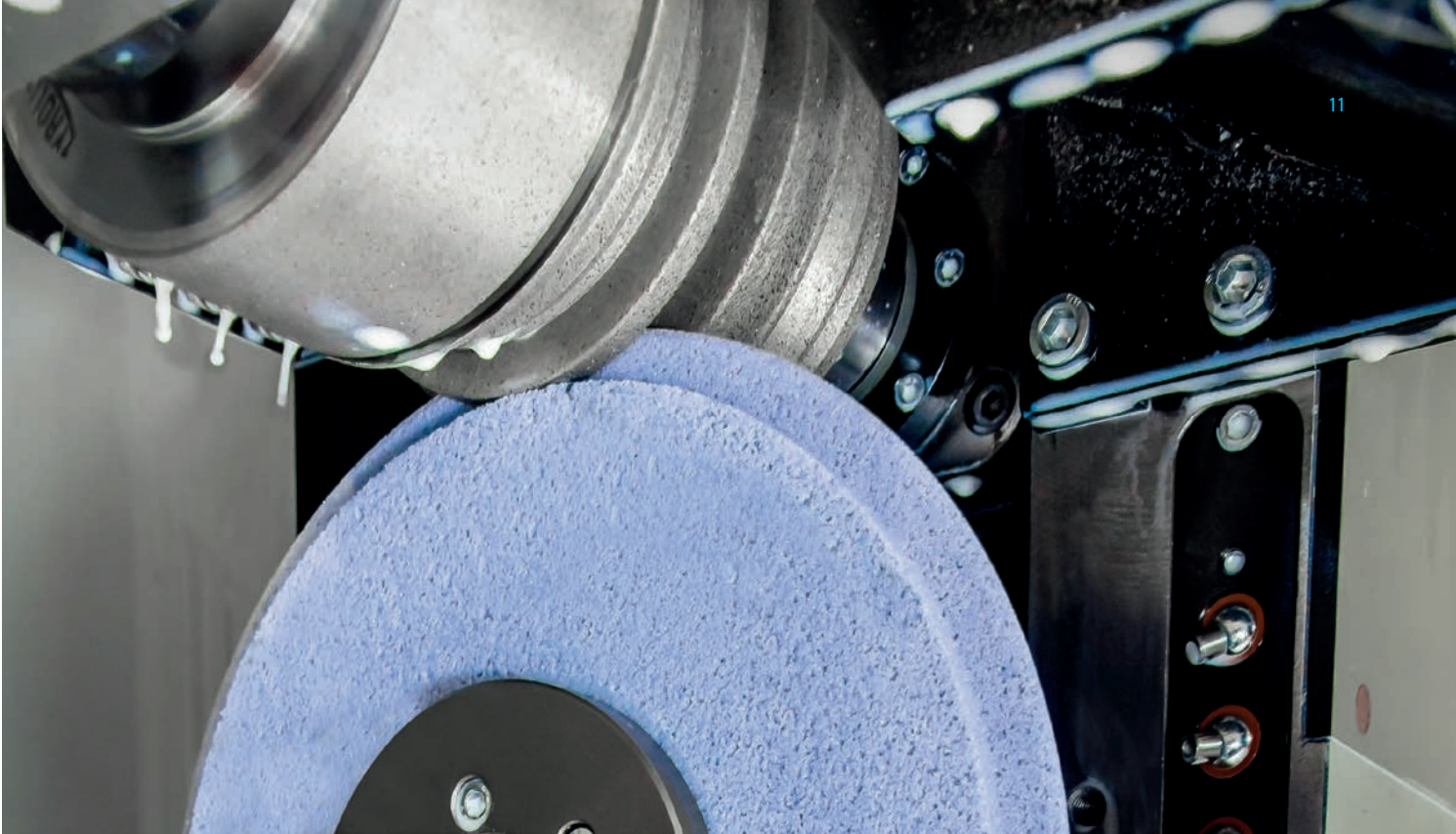
ply enables high removal rates with consistent production quality.



AUTOMATIC TOOL CHANGER

The tool changer includes 24 positions. It can be equipped with different grinding wheels according to the process requirements. The grinding process can be supplemented with the machine's drilling and milling capability, which supports a flexible machining platform for complex workpieces. In addition, the magazine can be loaded with a measuring probe which allows for dimensioning or workpiece position checks.

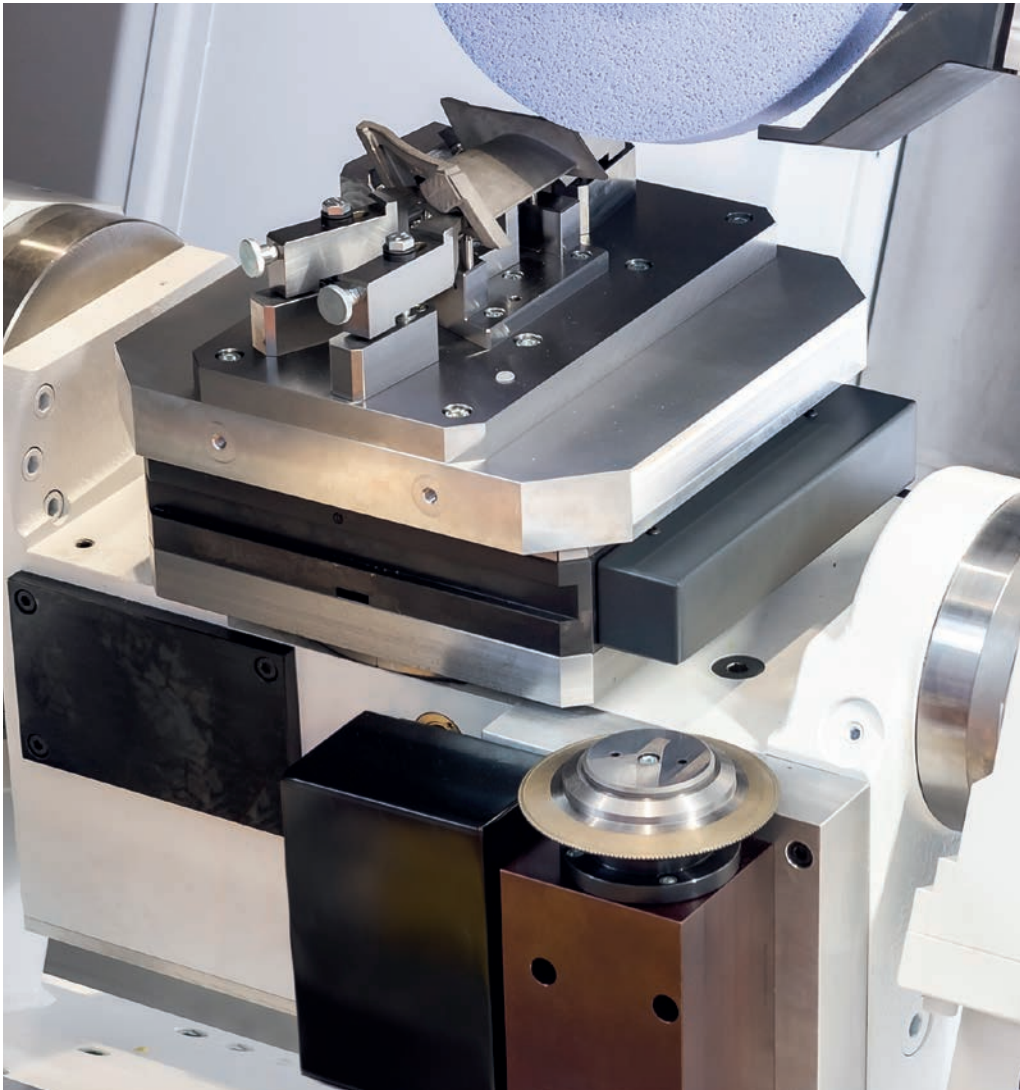




THE RIGHT DRESSING METHOD

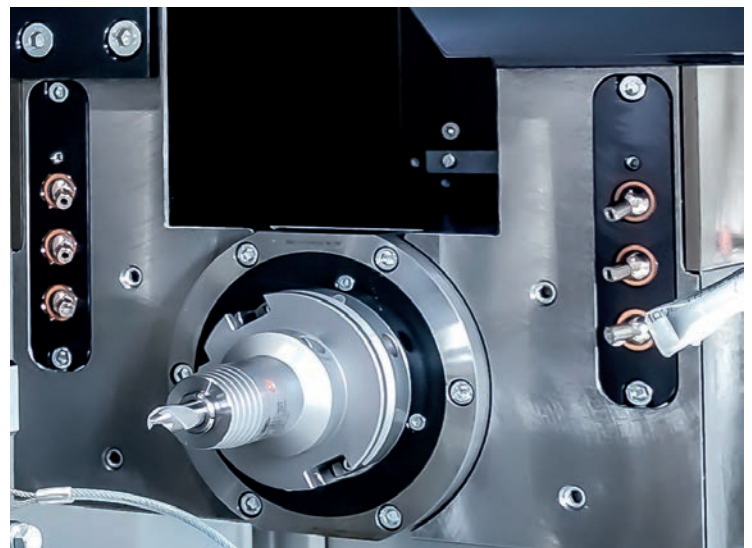
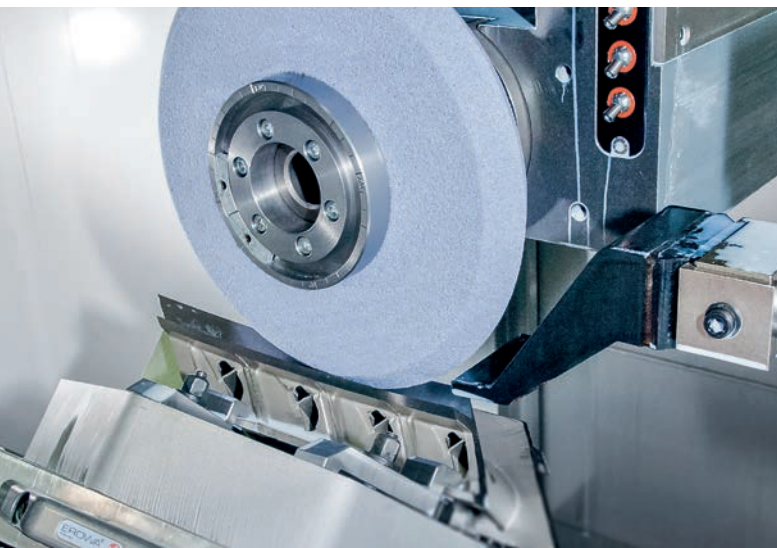
Dressing Method

The dressing of the grinding wheels is a crucial factor for the efficiency of the grinding process. With overhead and table dressing devices, MÄGERLE provides professional solutions for the various requirements of this process step. The potential of the overhead principle is developed in continuous dressing (CD) and inprocess dressing (IPD). MÄGERLE uses servo motors for the drive; these can be freely programmed across the entire rpm range. The compact tool holding fixtures significantly reduce susceptibility to vibrations and the continuously dressed grinding wheel enables high removal rates with high profile accuracy over long cuts.





COOLING INTELLIGENCE



Cost-saving cooling intelligence

The NC controls of the MÄGERLE grinding centers enable precise positioning of the coolant supply, taking into account the respective grinding wheel geometry. Labyrinth seals with a sealing air arrangement protect all bearings in the machining area from impurities and contribute to the long working life of the overall system.

Nozzles are available on the grinding support for drilling and milling tools, and a coolant supply can be optionally provided through the spindle.

COOLANT FILTRATION SYSTEMS

The optimal solution for every application

MÄGERLE considers the grinding process as a system of different components and thus creates the necessary conditions for a high cost effectiveness. The system concept for coolant supply and cleaning is of central importance. Correct dimensioning is essential for utilization of

the full coolant potential with low disposal costs. Taking account of these economic and ecological aspects, MÄGERLE in conjunction with the coolant system supplier matches integrated solutions to the customer-specific requirements.



AUTOMATION

Automation and machining cells

The MFP 50 is ideally suited for automatic loading and unloading. Flexible and efficient automation solutions are possible with a robot and linear system. The workpiece handling with robot technology is a quick and reliable step for increasing the capacity utilization and productivity of the MFP 50.

The integration of additional process steps such as cleaning and measuring is possible. MÄGERLE's expertise and experience with implemented automation solutions guarantee the highest productivity and quality and ensure your competitiveness.





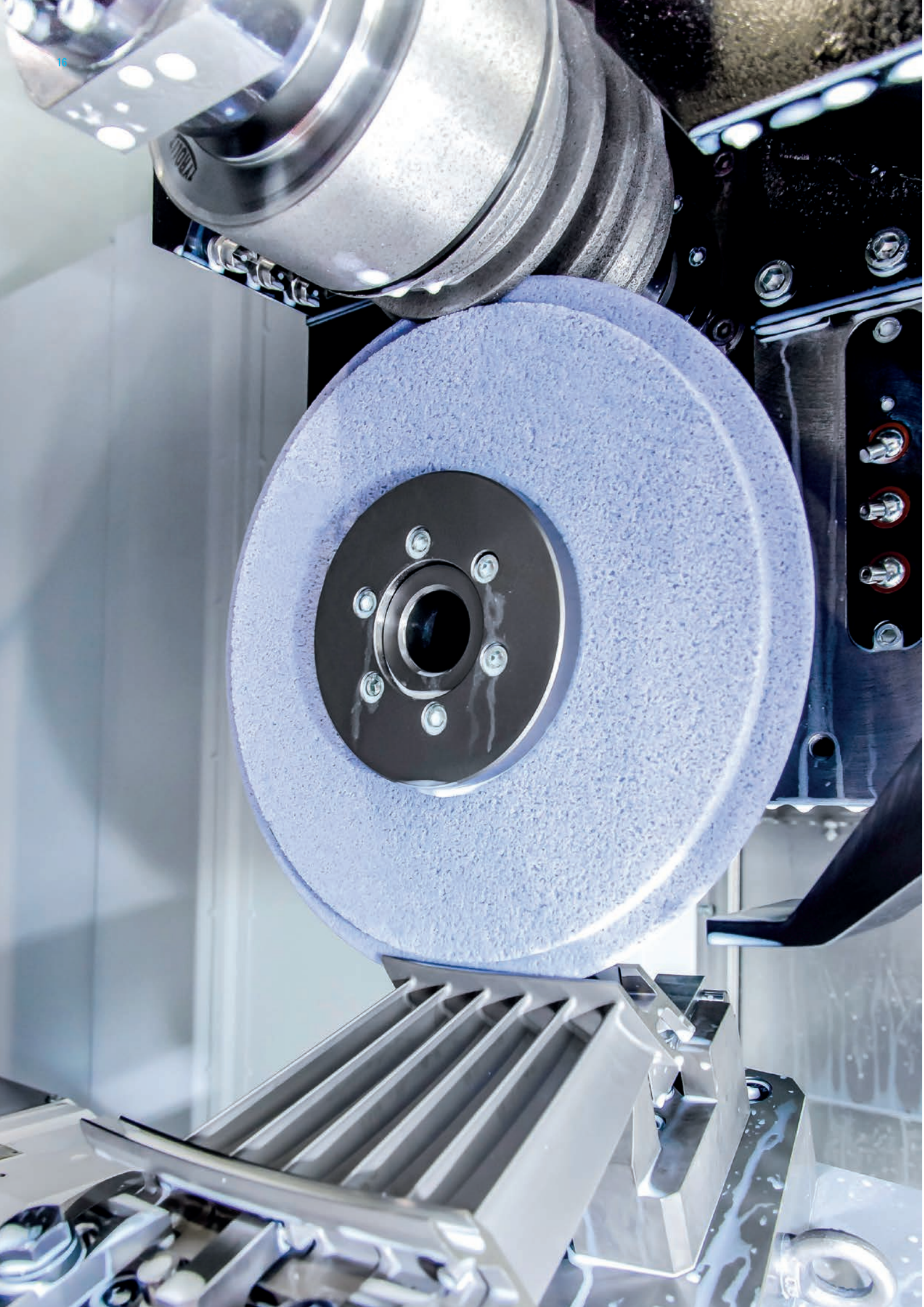
Part loading is done via ergonomic loading stations that are separated from the work area.

Process steps

The workpiece is checked for its position in the fixture before machining. The machined parts are then cleaned prior to measurement.

Correction values are derived from the measured values and fed back into the production process for the next components.

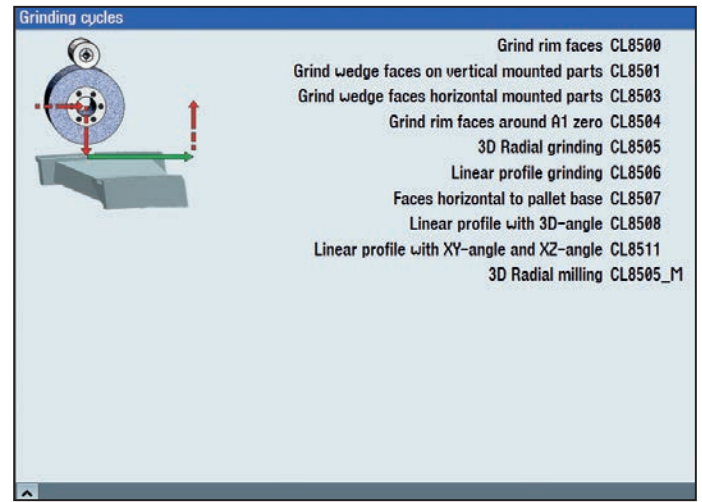
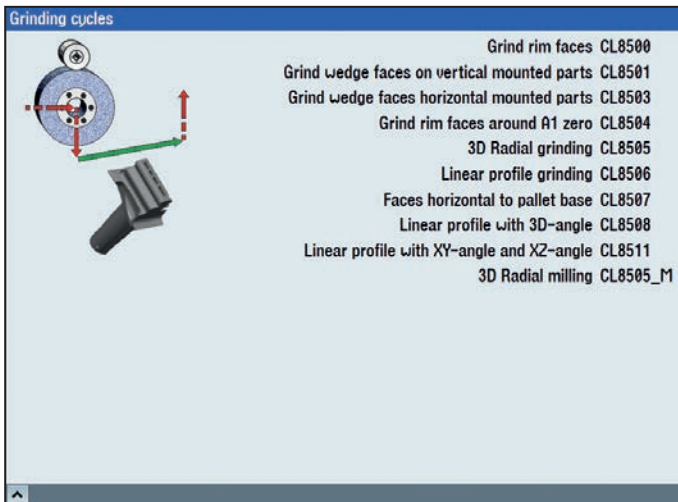




PROGRAMMING

The grinding center is equipped with the SIEMENS Sinumerik 840D Solution Line control. Specially visualized and parameterizable grinding and dressing cycles are available for efficient programming of the work-

pieces. In 5-axis machining, 3D grinding and auxiliary cycles can be programmed for milling and drilling operations.



CAD/CAM CONNECTION

A SIEMENS NX postprocessor is available for CAM process development. The generated NC programs take account of the MÄGERLE grinding cycles. As a result the programs can be easily edited on the machine

control unit via operator guidance. MÄGERLE provides a Vericut package for simulating and checking the programs.



WE ARE HERE FOR YOU!

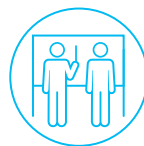
BRAND products are designed to meet customer demands for as long as possible, they are intended to operate efficiently, reliably and be available at any time.

From «Start up» through to «Retrofit» – our Customer Care is there for you throughout the working life of your machine. For this reason, you can rely on competent HelpLines worldwide and Service Engineers near you:

- We will provide you with fast, straight-forward support.
- We will help to increase your productivity.
- We work professionally, reliably and transparently.
- We will provide a professional solution to your problems.



Start up
Commissioning
Warranty extension



Qualification
Training
Production support



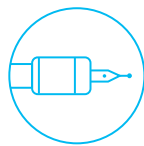
Prevention
Maintenance
Inspection



Service
Customer service
Customer consultation
HelpLine
Remote service



Digital Solutions
Remote Service
Service Monitor
Production Monitor



Material
Spare parts
Replacement parts
Accessories



Rebuild
Machine overhaul
Assembly overhaul



Retrofit
Modifications
Retrofits

UNITED GRINDING DIGITAL SOLUTIONS™

We develop solutions to support you in simplifying processes, boosting your machines' efficiency and increasing overall productivity under the UNITED GRINDING Digital Solutions™ brand.

Find out more about UNITED GRINDING Digital Solutions™ services on our website in the Customer Care section.

CUSTOMER CARE

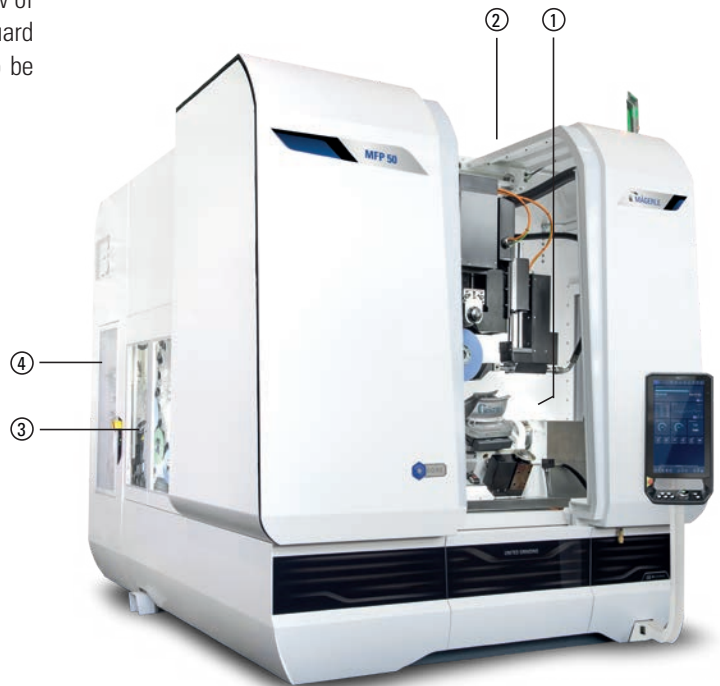


EASE OF OPERATION AND MAINTENANCE

Operation

The machine is operated via the swiveling control panel with a view of the working area in the front of the machine. When the splash guard is opened at the top, heavy workpieces including clamping fixtures can also be loaded from the top with a gantry or jib crane.

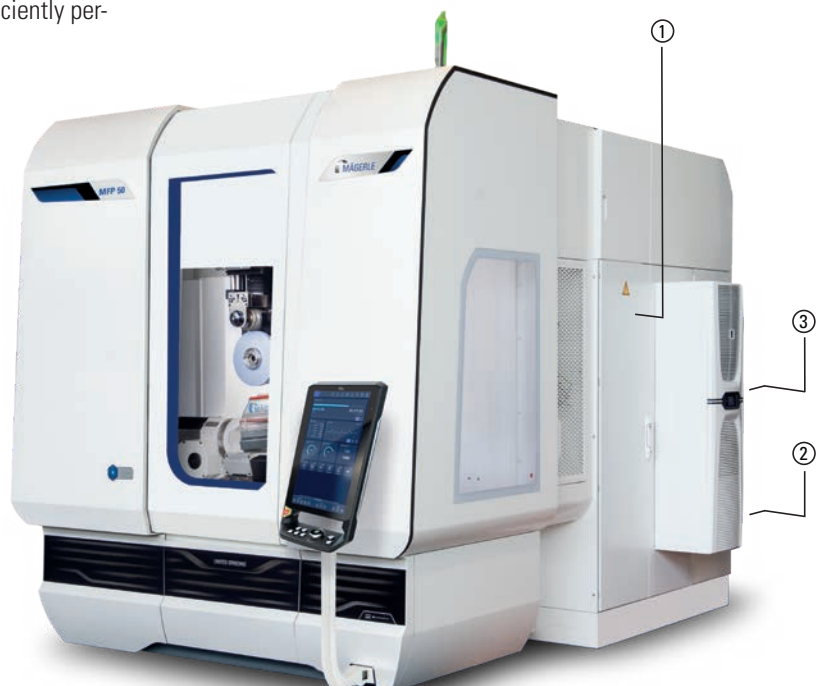
- ① Working area
- ② Splash guard opened at the top
- ③ Tool changer loading
- ④ Pneumatics



Maintenance

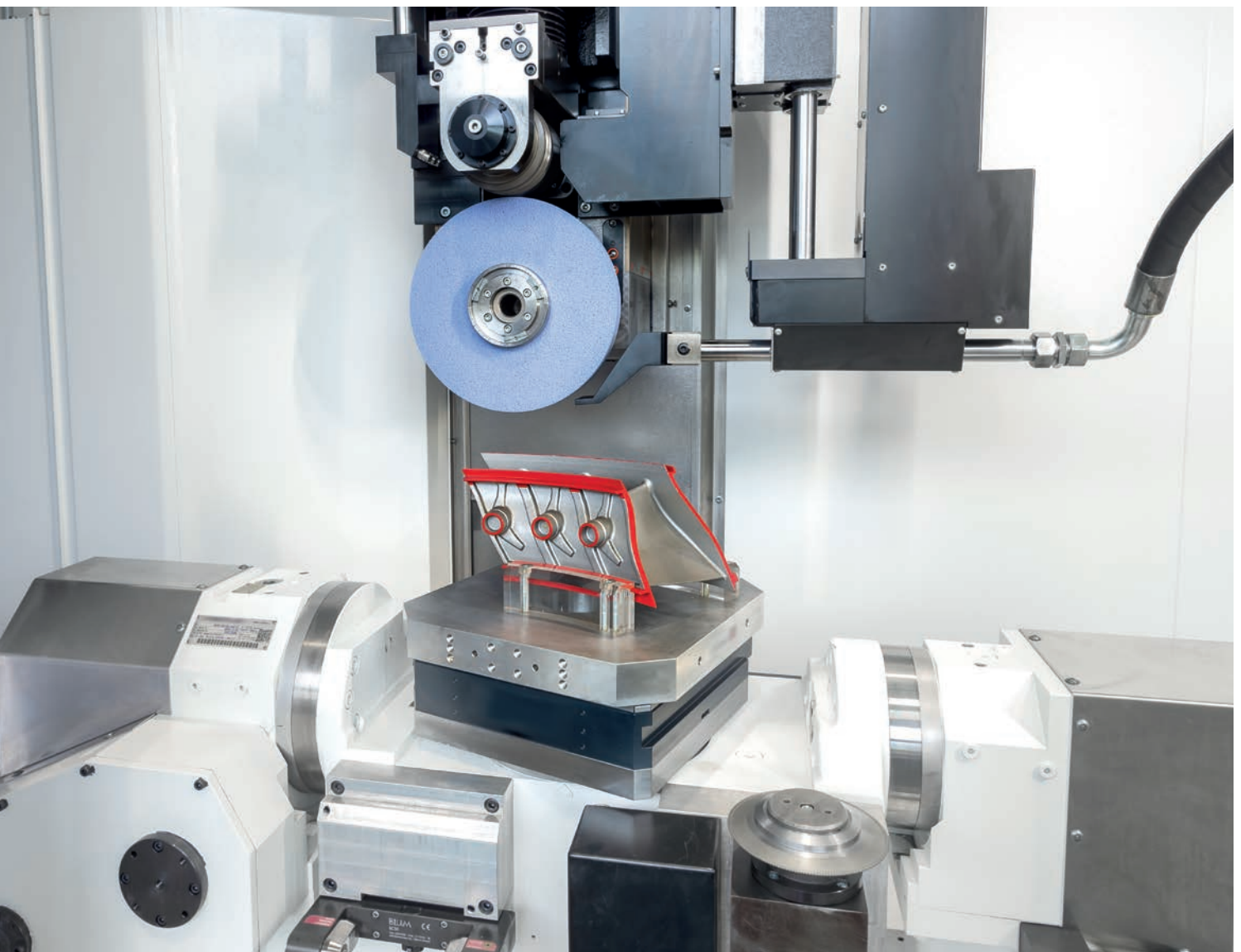
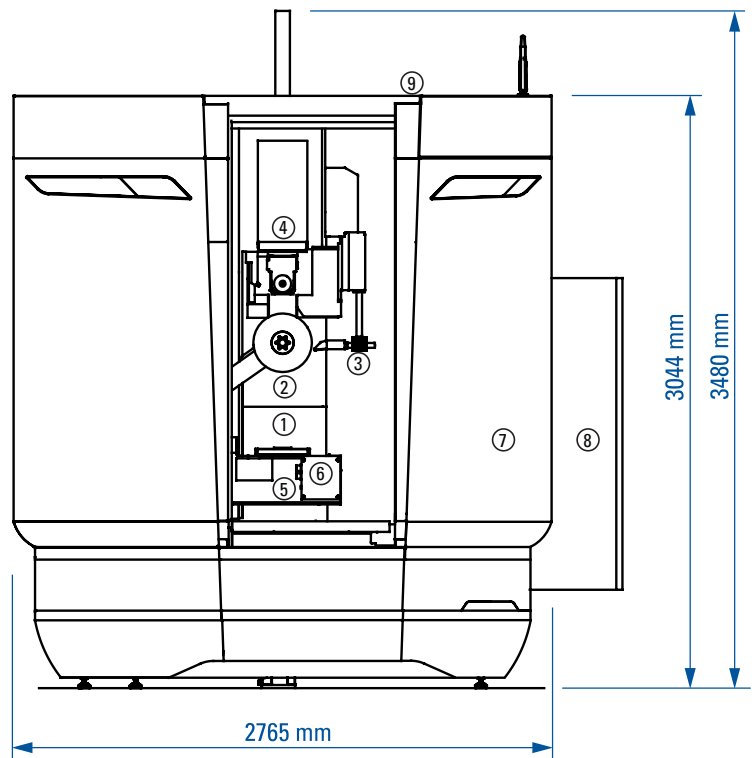
Access for maintenance of the respective units and components of the entire machine is centrally positioned and designed to make maintenance easy. Periodic maintenance activities can thus be efficiently performed.

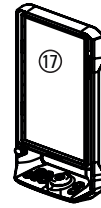
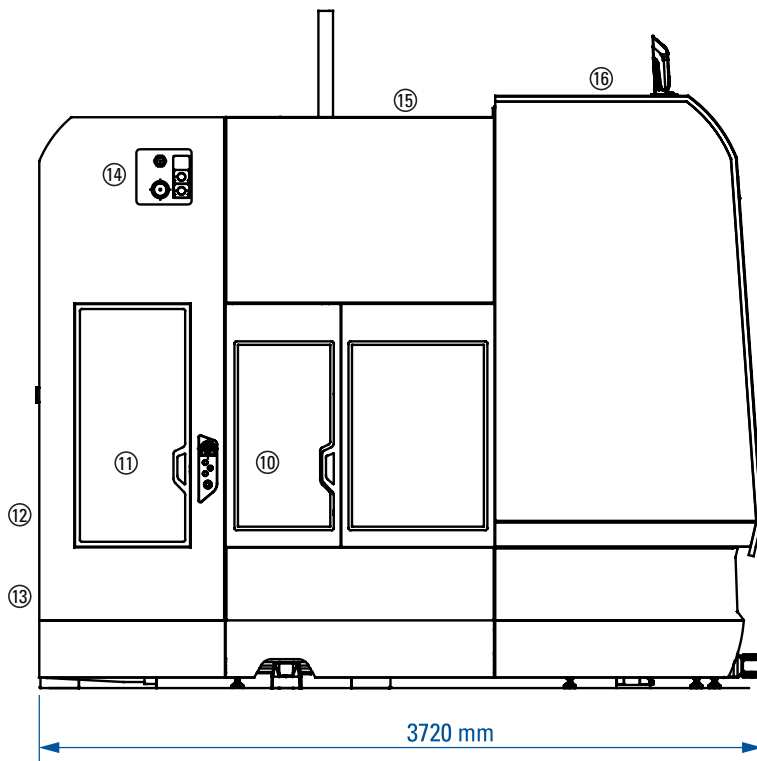
- ① Electric cabinet
- ② Fluidics
- ③ Central lubrication



LAYOUT

- ① Working area
- ② Quick-change spindle for machining tools
- ③ Automatic coolant nozzle
- ④ Overhead dresser
- ⑤ NC indexing head 2/3 axes
- ⑥ Dressing device (optional)
- ⑦ Safety splash guard
- ⑧ Electrical cabinet
- ⑨ Automatic door drive





- ⑩ Tool change magazine
- ⑪ Pneumatics
- ⑫ Centralized lubricating system
- ⑬ Hydrostatic/Hydraulic unit
- ⑭ Interface to coolant processing system
- ⑮ Mist extractor (interface)
- ⑯ Machine status lamp
- ⑰ Operating panel

TECHNICAL DATA FOR MFP 50

| | | | |
|--|---------------------|-----------------|------------|
| X-axis | longitudinal stroke | mm | 500 |
| | travel speed | mm/min | 0...30.000 |
| Y-axis | vertical stroke | mm | 650 |
| | travel speed | mm/min | 0...20.000 |
| Z-axis | transverse stroke | mm | 650 |
| | travel speed | mm/min | 0...20.000 |
| Quick-clamping spindle | type | HSK-B80 | |
| Maximum continuous power grinding spindle | kW | 25/50 | |
| Rpm range max. | min ⁻¹ | 0...10.000 | |
| Grinding wheel dimensions (D x T x H) | mm | 300 x 60 x 76,2 | |
| V-axis profile dressing device, roll width, max. | mm | 215 | |
| Tool changer positions | n/pos | 24 | |
| Tool length max. | mm | 200 | |
| Tool holder | HSK-B80 | | |
| NC combination - rotary/swivel axes | n/axes | 2/3 | |

We reserve the right to make technical changes

MÄGERLE AG MASCHINENFABRIK

Precision, quality and flexibility are key attributes of the products manufactured by Mägerle AG Maschinenfabrik. A technology leader for high-performance surface and profile grinding systems, the company founded in 1929 primarily specializes in customized solutions.

At the heart of the international success of our high-quality Swiss machinery is the unique design principle of the MÄGERLE modular system. Thanks to state-of-the-art technology, MÄGERLE can offer customers from many branches of industry reliable grinding centers. The high machining precision of the grinding centers ensures that our customers remain competitive.

Alongside decades of accumulated expertise, our highly motivated and dedicated employees play a key role in the success of the company.

As part of the UNITED GRINDING Group, MÄGERLE is a strong member of the group of globally leading machinery engineering companies for grinding machines. All over the world, this gives MÄGERLE customers access to an extensive network of experienced service and engineering technicians.



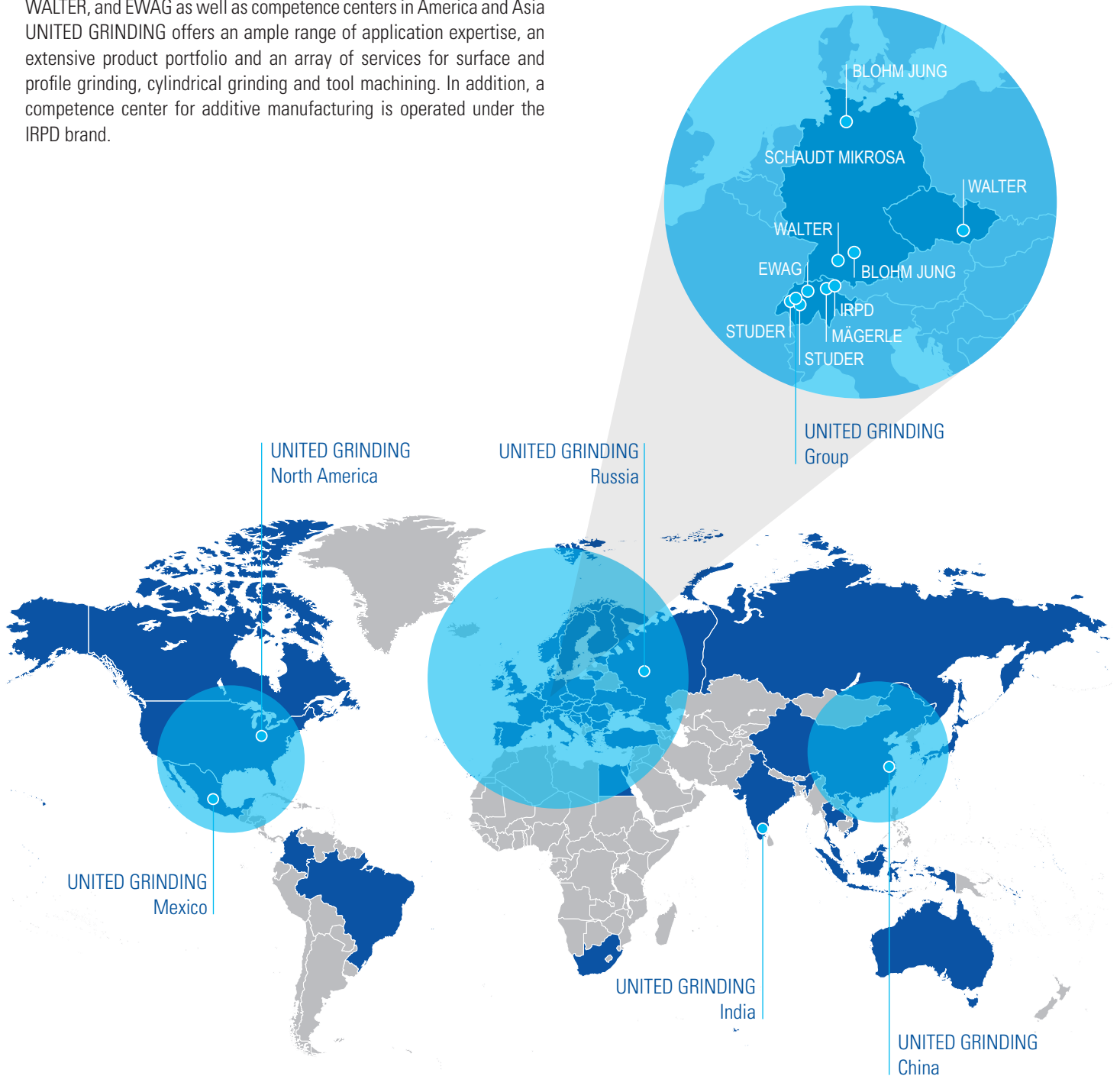
ABOUT US

UNITED GRINDING GROUP

UNITED GRINDING Group is one of the world's leading manufacturers of precision machines for grinding, eroding, laser, measuring and combination machining. With around 2,500 employees at more than 20 production, service and sales sites, the Group is organized in a customer-oriented and efficient way.

With its brands MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, and EWAG as well as competence centers in America and Asia UNITED GRINDING offers an ample range of application expertise, an extensive product portfolio and an array of services for surface and profile grinding, cylindrical grinding and tool machining. In addition, a competence center for additive manufacturing is operated under the IRPD brand.

«We want to make our customers even more successful»





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