S36

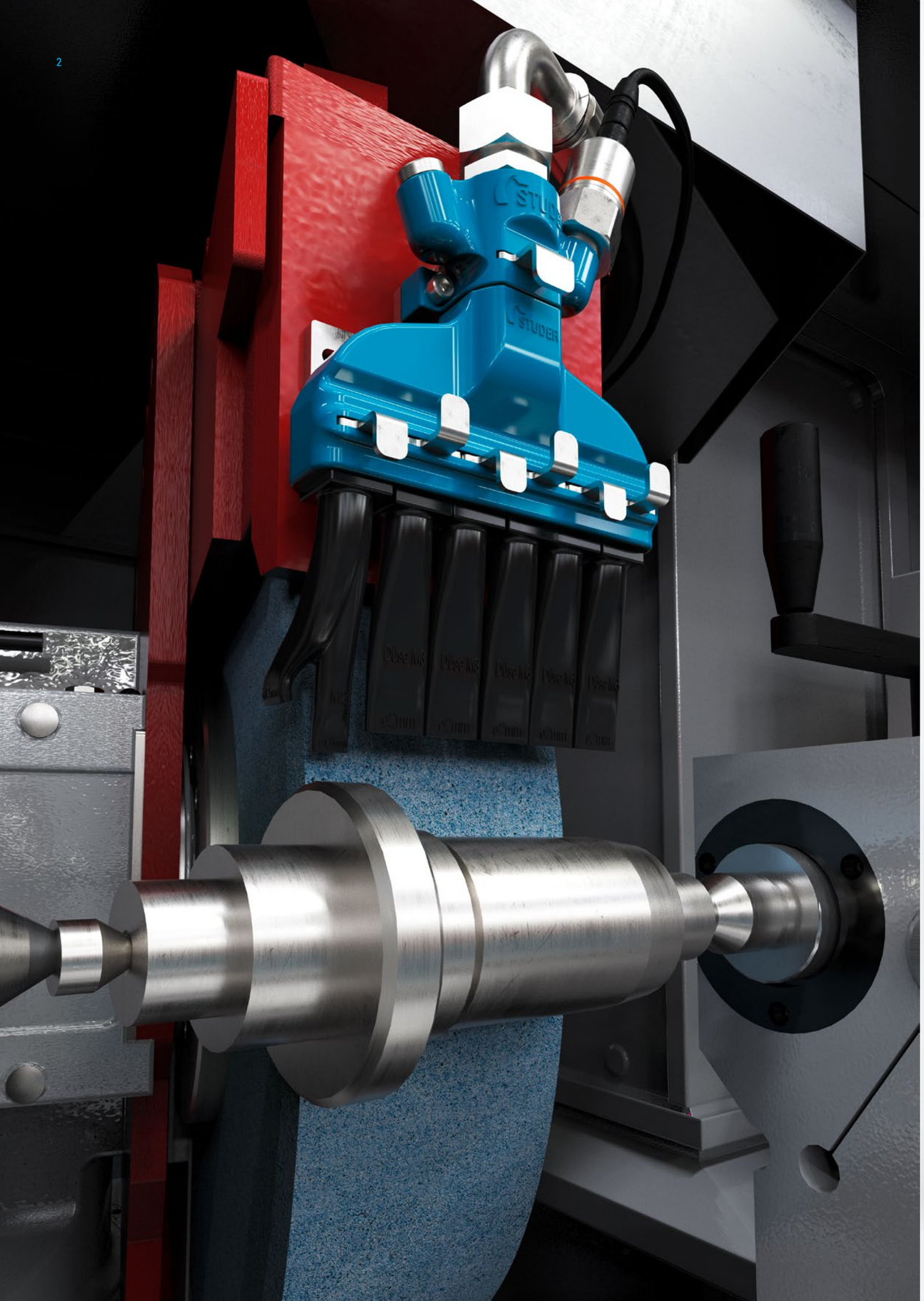
EXTERNAL CYLINDRICAL PRODUCTION GRINDING MACHINE

C.O.R.E.®

STUDER

STUDER S36 IN USE

The S36 CNC production external cylindrical grinding machine was developed to meet the growing demand for production solutions across various industries. It enables cost-effective and efficient grinding of both existing and future workpieces in this sector. The S36 can be equipped with a grinding wheel measuring 610 mm (20") in diameter and up to 160 mm (6.3") in width. High-performance grinding spindles up to 25 kW (33 hp) are available for this purpose. This ensures precise and reliable grinding, including components for e-mobility and hydraulics, in a single setup.



S36

DIMENSIONS

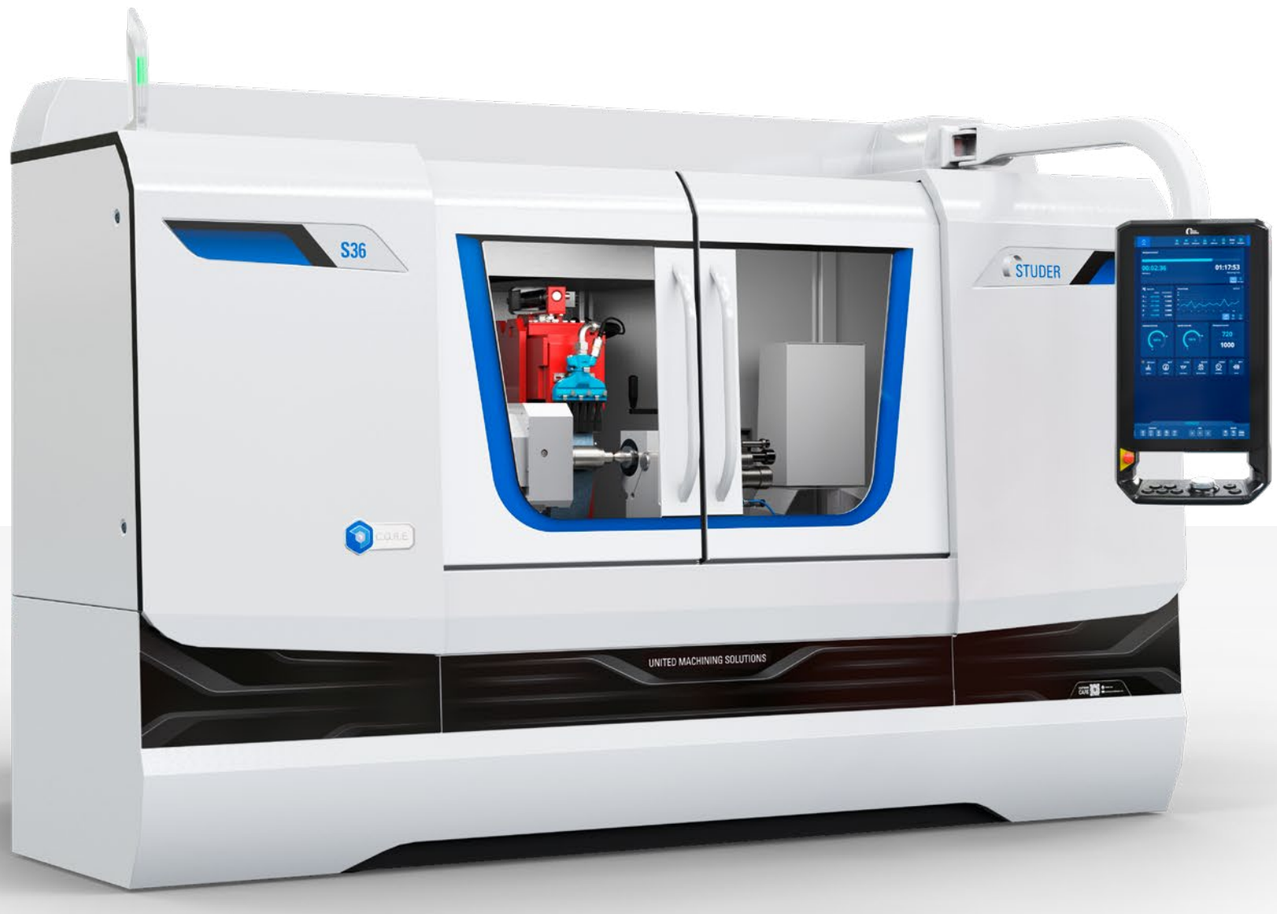
- Distance between centers 650 mm (25.6")
- Center height 225 mm (8.85")
- Grinding wheel diameter 610 mm (20")
- Grinding wheel width 160 mm (6.3")

HARDWARE

- External wheelhead with grinding wheel on right, 0°/15°/30°
- Frequency-controlled grinding spindle for external grinding
- C-axis on workhead spindle
- Worktable with integrated double T-slot for dressing unit
- C.O.R.E. Panel
- Portable control unit (PCU) for setting up close to the grinding process
- Full enclosure with two sliding doors
- Granitan® S103 mineral-cast machine base

SOFTWARE

- C.O.R.E. OS operating system
- Very simple programming thanks to Studer-Pictogramming
- Standardized interfaces for loader and peripheral units
- Flexibly upgradeable with integrated software modules
- StuderWIN programming software (optional) for creating grinding and dressing programs on an external PC



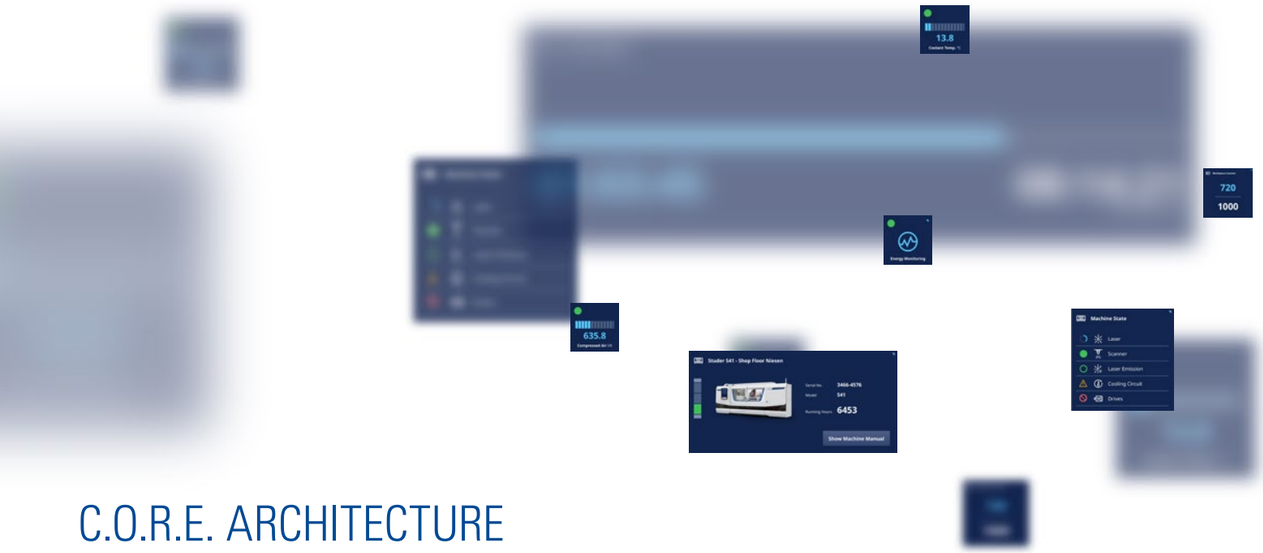
YOUR BENEFIT

- High productivity thanks to large grinding wheel and high spindle power
- Modern cooling thanks to SmartJet™
- Maximum precision due to perfect interplay between hardware and software
- Intuitive, user-friendly, and efficient operation
- Access to important information directly at the panel (e.g., production progress, job details etc.)
- Reduced programming effort for data exchange between C.O.R.E machines
- Use of Digital Solutions products directly at the machine
- Fast support thanks to interaction with our Customer Care team at the machine
- Targeted measures to reduce energy consumption
- Ergonomic thanks to large sliding doors and three service doors

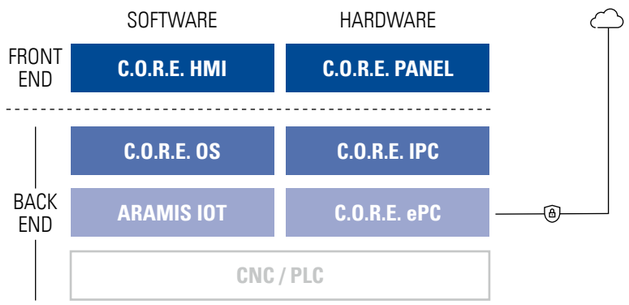
"The high-performance machine for automated processes."

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

With C.O.R.E., we make your production fit for the digital future.
The C.O.R.E. system from UNITED GRINDING is a future-oriented hardware and software platform that takes the operation, networking and digitalization of machine tools to a new level.
C.O.R.E. was developed to make our machines and your production environment fit for the digital industry of tomorrow. Operation is simple and intuitive via the multi-touch display, with a modern and customizable user interface. Thanks to the standardized hardware and software architecture, all UNITED GRINDING machines equipped with C.O.R.E. technology are network-compatible and can be easily integrated into digital factories. All common interface formats are supported. C.O.R.E.'s modern IoT technology core also enables data-based value-added services and integration and communication with cloud-based customer platforms.



C.O.R.E. ARCHITECTURE



C.O.R.E. PANEL & HMI – NEXT-GENERATION MACHINE OPERATION

Like a large smartphone
With C.O.R.E., UNITED GRINDING has redefined the interaction between man and machine tool. Modern design combined with the most advanced technology to meet the operator requirements of tomorrow. The 24" multi-touch display enables navigation by touch and swipe gestures, similar to a smartphone. The uniform HMI for all UNITED GRINDING machines facilitates set-up, operation and general maintenance. Customizable user roles enable the display and restriction to role-relevant information and thus increase user-friendliness and safety. With the integrated front camera on the panel, assistance can be provided directly at the machine via Remote Service.

Future-proof
The digital capabilities of your machine with C.O.R.E. technology continue to grow. The C.O.R.E. HMI is continuously being expanded with new functionalities, widgets and apps to make it even more user-friendly and personalizable. The arrangement, type and size of the tiles on the HMI can be customized so that every machine operator always has the information that is important to him or her at a glance.

In future, new software updates and functionalities will be easy to install via the customer portal, so you will always be up to date.

Technical data
- 24" Full HD multi-touch display
- Override rotary switch with cycle start
- Standardized function keys
- Integrated 2-hand start
- Electronic key system (RFID)
- Integrated front camera
- Tilt adjustment

USER INTERFACE
StuderWIN

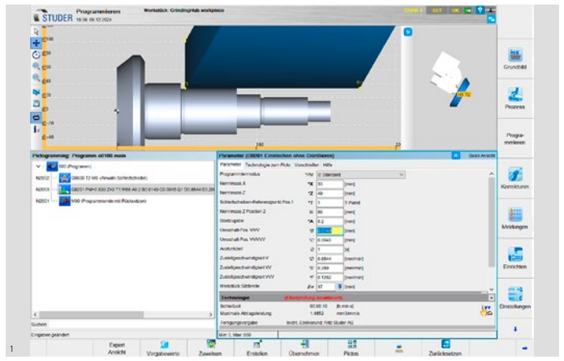
The user interface StuderWIN creates a stable programming environment and contributes to efficient use of the machine. The possibility of fully integrating the in-process gauging and sensor technology for process control as well as contact detection and automatic balancing systems in the operator interface enables standardized programming of the different systems. The software of an optional loading system is also integrated. The drive elements are optimally matched to the control system.

The sophisticated mechanical engineering concept of the S36 is completed by a grinding software program developed in-house by STUDER and which is continuously optimized in collaboration with users of the software. This software offers:

- StuderPictogramming: The operator strings the individual grinding cycles together – the control unit generates the ISO code.
- Microfunctions: Free programming of grinding and dressing process sequences for optimization of the grinding process.
- Integrated operating instructions assist safe machine operation.
- InOne Grind: The cylindrical grinding cycle can be programmed specifically for the individual grinding task via the clear menu.
- InOne Dress: The easy-to-use dressing cycle supports the machine operator with all dressing tasks.
- The expansion packages for InOne functions, including grinding technology calculation, optimized dressing, and contour, thread, and out-of-round grinding, further enhance the machine's capabilities.

StuderTechnology Integrated – more than 113 years of expertise

StuderTechnology Integrated drastically simplifies the operation of cylindrical grinding machines. Component quality, machining time, energy efficiency – all important production factors – with enormous benefits. What makes the software unique? Its history! Over 113 years of grinding experience have gone into it. It is a combination of grinding practice, empiricism, and years of expert knowledge. The program contains data from countless grinding tests, during which the best processing strategy was determined in each case for a wide range of components. StuderTechnology Integrated reverts specifically to these values depending on the application. This integrated grinding knowledge can be further optimized as required by the individual grinding experts and can be stored as a customer-specific production specification. This also enables grinders with little experience to benefit from STUDER expertise.



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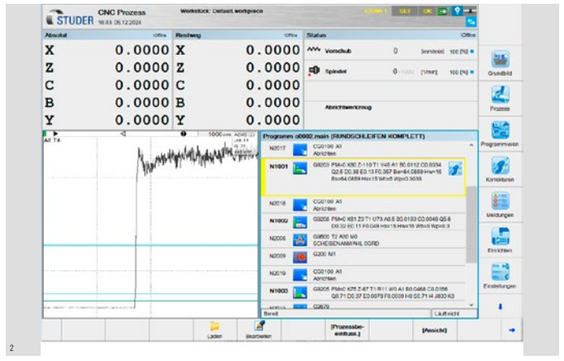


2

1 Programming interface with StuderPictogramming
2 Process screen
3 External programming station

Expansion packages

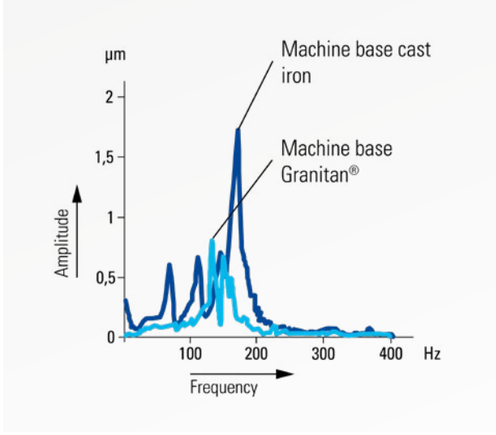
The wide range of Integrated Tools significantly enhances the functionality of STUDER grinding machines. STUDER offers the required software packages in the form of integrated tools.

- **StuderDress Integrated** reduces the profiling time of a grinding wheel by up to 80%.
- **StuderThread Integrated**, together with InOne Thread, offers the full functionality that is otherwise only possible with a special thread grinding machine.
- **StuderContourBasic Integrated** is ideal for traversing geometry contours with the grinding wheel in an easy, quick, and safe manner.
- **StuderContourPRO Integrated** generates the complete grinding program for complex external geometries, typically for peel grinding from solid material.
- **StuderForm Integrated** is the universal out-of-round grinding software for machining curves and polygons for standard applications in low volume production.

3

GRANITAN® S103 MINERAL-CAST MACHINE BASE

The material structure developed by STUDER on the basis of the company's own formula, which has proved its worth over many years, is produced in a plant using the most modern industrial techniques. The excellent damping properties of the machine base ensure that an outstanding surface quality is achieved in the ground workpieces. The service life of the grinding wheel is also increased, leading to reduced downtimes. Temporary temperature fluctuations are extensively compensated by the favorable thermal behavior of Granitan®. This results in a high level of dimensional accuracy throughout the day. The StuderGuide® guideway system for the longitudinal and cross slides is moulded directly into the machine base and finished with a wear-resistant Granitan® S200 surfacing material. The guideways offer the highest possible accuracy through the entire speed range with high load capacity and dampening levels. Thanks to the robust and low-maintenance design, these excellent guideway properties remain virtually unchanged over time.

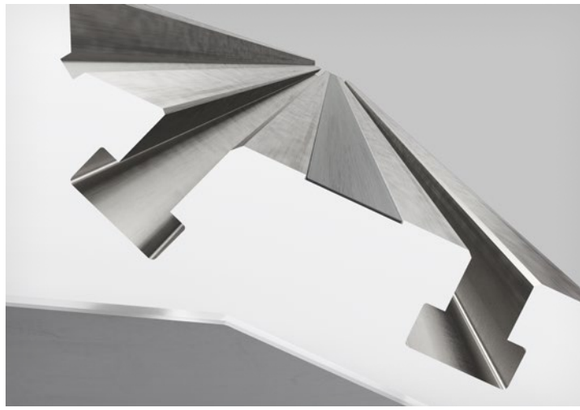


- Vibration-damping
- Thermally stable
- Wearproof

STUDERGUIDE® IN LONGITUDINAL AND CROSS SLIDES

The longitudinal and cross slides are manufactured from high-quality gray cast iron and have highly precise, ground V and flat guideways. With the distance between the guideways optimally suited to the machine's overall rigidity. The slides rest completely on the guideways of the machine bed through the entire speed range. This is the cornerstone for the excellent straightness of < 0.0025 mm (0.0001") over 630 mm (24.8") measured length. The top of the longitudinal slide has a surface that is ground over its entire length and acts as a support for the workhead, the tailstock, as well as accessories and devices. A set-up scale, recessed in the table, makes it easy to set up and reset the units on the table. An additional double T-slot enables the optimal utilization of dressing units. The patented StuderGuide® guideway system enhances the advantages of hydrostatic systems and guideways with specific surface structure. A huge advantage of StuderGuide® over hydrostatic guideways is the damping component in the direction of movement.

The slides are advanced by ball screws connected to a three-phase servomotor via torsion-resistant, bellows-type couplings.



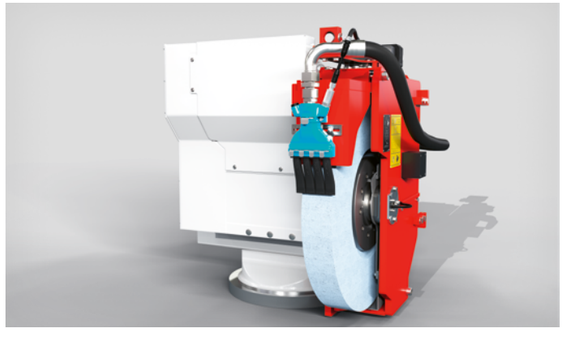
- High geometrical traverse precision
- Auxiliary scale for setup and resetting
- Longitudinal slide with double T-slot for dressing tool holder

WHEELHEAD

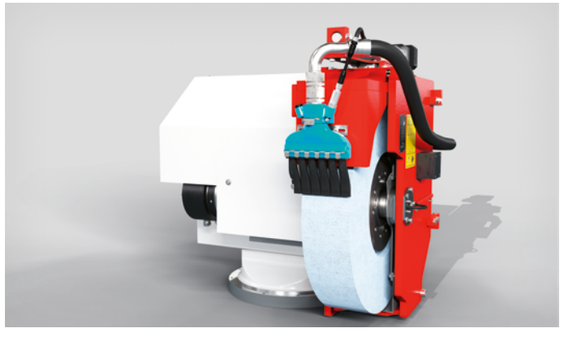
The S36 has a fixed wheelhead, available in 0°, 15°, or 30° configurations. The tool is in T2 (wheel on right) and is geometrically optimized for the grinding spindle that is used.

Process cooling is taken to a higher level thanks to SmartJet™. The newly developed flow-optimized nozzles enable the efficient, precise, and reproducible supply of cooling lubricant. Thanks to SmartJet™, cooling is now controlled directly by the machine's control system.

- Motor spindles, optionally available with a hollow shaft for automatic fine balancing
- High cutting speed
- 1 tool (external) for productive machining
- Energy-efficient SmartJet™ cooling lubricant nozzles

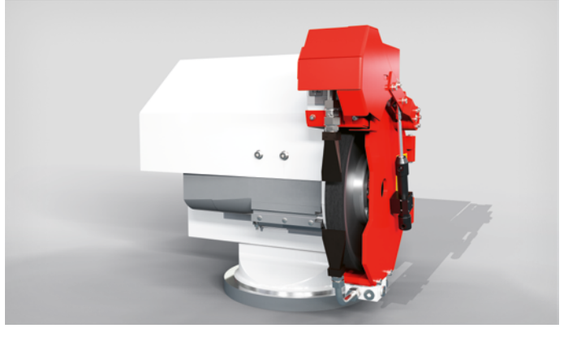


Belt-driven spindle 11.5 kW (15.5 hp)
Fitting taper Dia. 73 mm for grinding wheels Dia. 610 × 63 (80F5) / 20" × 2.5" (3.15" F5) up to 50 m/s (9842 sfpm)



Motor spindle 15 kW (20 hp)
Fitting taper Dia. 73 mm for grinding wheels Dia. 610 × 63 (80F5) / 20" × 2.5" (3.15" F5) or Dia. 610 × 100(125F5) / 20" × 4" (5" F5) up to 50 m/s, 63 m/s, or 80 m/s (9842 sfpm, 12,401 sfpm, or 15,750 sfpm)

Motor spindle 25 kW (33.5 hp)
Fitting taper Dia. 100 mm for grinding wheels Dia. 610 × 125 (160F5) / 20" × 5" (6.3" F5) up to 50 m/s, 63 m/s, or 80 m/s (9842 sfpm, 12,400 sfpm, or 15,750 sfpm)

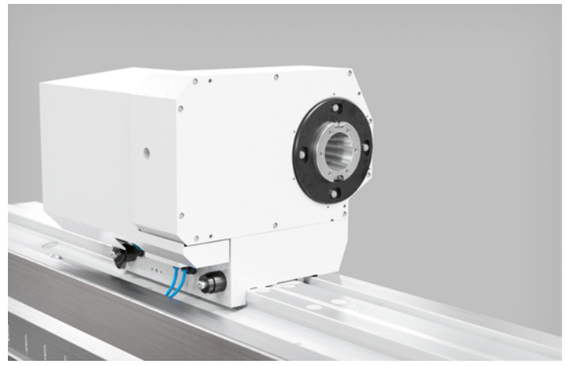


HSG motor spindle
For high-speed grinding applications. Mounting Dia.127 mm (5") for grinding wheels Dia. 400 × 40 (16" × 1.6") up to 140 m/s (27,560 sfpm)

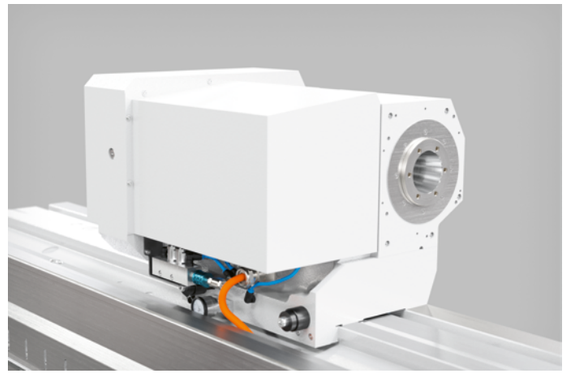
WORKHEAD

All requirements are covered by the wide range of workheads. They are all solidly built in the superior STUDER quality and achieve roundness accuracy of 0.0004 mm (0.000,016"), or even 0.0002 mm (0.000,008"), with live spindle grinding. The simple cylindricity correction contributes towards perfect live spindle grinding results. Customer-specific workpiece clamping and carrier systems can be easily used.

- High roundness accuracy
- Low-maintenance
- Air lift



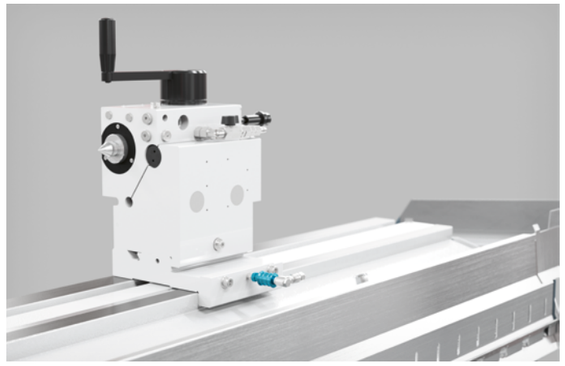
Universal workhead
For external grinding with a fixed center or for live spindle grinding. The spindle is blocked for grinding between fixed centers. C-axis applications are possible with the indirect measuring system.



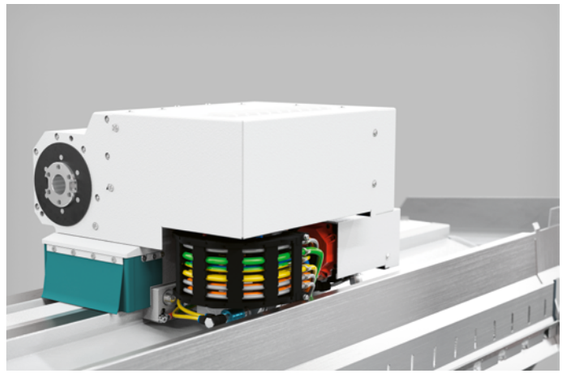
Chuck workhead
For live spindle grinding or external grinding with revolving center. Thanks to the design, with drive via a rear belt, high loads are possible with live spindle grinding. C-axis applications are possible with the indirect measuring system.

TAILSTOCK

Designed for the use of centers with morse taper 3 or 4, the generously dimensioned barrel slides inside the tailstock housing. The center pressure can be adjusted with the delicate precision required for grinding high-precision workpieces. The tailstock can be equipped with a hydraulically actuated barrel retraction for workpiece changeover. The fine adjustment enables cylindricity corrections in the range below 1 µm (40 microns) when grinding between centers. An air cushion lift-off facilitates simple movement during setup and resetting.
Coolant flows through the tailstock; the barrel and diamond holder are flooded to ensure optimum thermal stability.



Tailstock
Clamping is with a spring. This tailstock is suitable for workpiece weights up to 150 kg (330 lbs).



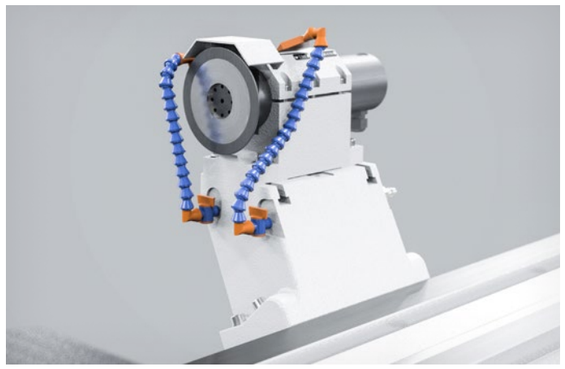
Synchronous tailstock
Use of the synchronous tailstock is particularly cost-effective when manufacturing part families, when grinding a workpiece over its entire length, or if the use of a conventional driver is not possible. Workpiece weight up to 80 kg (176 lbs).

- Programmable clamping force
- Cylindricity correction
- Thermal stabilization by flooding

DRESSING

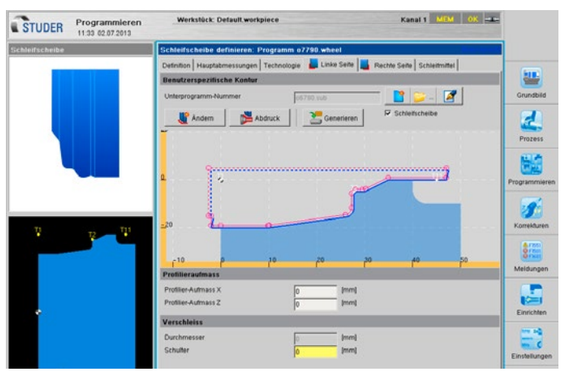
An easy-cutting grinding wheel is essential for cost-effective and high-quality grinding. STUDER offers a wide range of dressing units to make the dressing process flexible and optimally tailored to the specific properties of the workpiece, tool, and material. The grinding wheel profile and dressing parameters are easily defined via macros. Another STUDER specialty is the grinding wheel reference points (T-numbers). This enables programming with normal dimensions, which considerably simplifies the programming of grinding programs.

A software package is available to fine-tune the dressing process and includes additional dressing functions.



Rotary dressing
Rotary dressing tools are particularly suitable for dressing CBN grinding wheels.

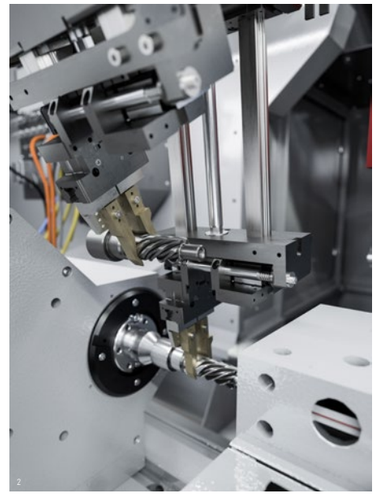
Diamond holder behind tailstock
The clamping surface with double T-slots is suitable for different dressing tools.

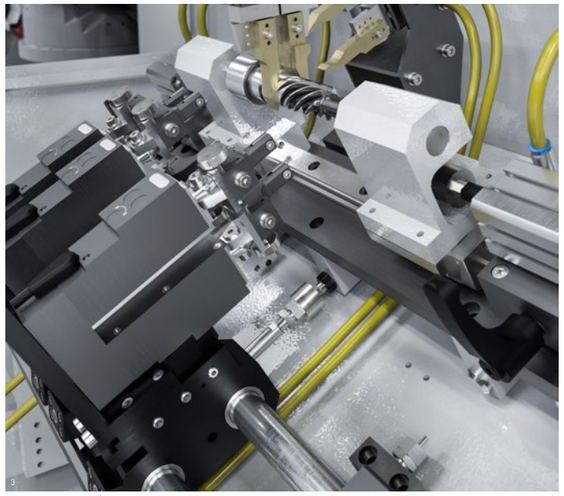


Dressing parameters dialog screen
Easy adjustment of free wheel shapes with grinding wheel imprint from workpiece drawing.

AUTOMATION

There are various loading systems available that, thanks to their modular design, can be precisely matched to your machine use and machining processes. The appropriate peripherals ensure seamless integration into the respective production process. Using a data matrix code reader or a laser labeling machine, each workpiece is assigned its own identity. Process data can be traced at all times. The handling systems communicate with the machine via the standardized loader interface enabling even complex handling tasks to be solved. Project-specific components such as pre- and post-measurement stations, deburring and blowing off stations, calibration part repositories, etc., can be implemented in the system. Comprehensive quality control is possible during the grinding process. This entails: in-process, post-process, recording, evaluation, and correction. In grinding, especially in match grinding, such quality assurance is crucial.





1 STUDER *easyLoad*
2 V gripper
3 Post-process station

CUSTOMER CARE

WE ARE HERE FOR YOU!

Our 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.

DIGITAL SOLUTIONS

Digital Solutions stand for products and services that open up the data space of your machine through IoT-based networking, enable seamless integration across the entire store floor in digital value-added networks and provide data-based value-added services and digital services – for greater efficiency, productivity and competitiveness.

You can find out more about the services of Digital Solutions on our website under the Customer Care section.

Start up
Commissioning
Warranty extension

Qualification
Training
Product support

Prevention
Maintenance
Inspection

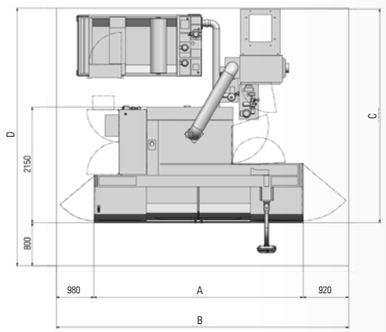
Service
Customer service
Customer consultation
HelpLine

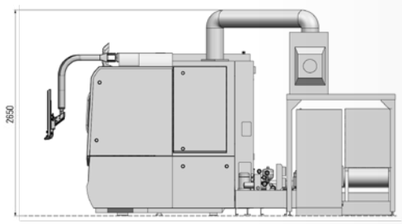
Digital Solutions
Remote Service

Material
Spare parts
Replacement parts
Accessories

Rebuild
Machine overhaul
Assembly overhaul

Retrofit
Modifications
Retrofits





DIMENSIONS

A	B	C	D
3,200 mm	5,100 mm	4,000 mm	4,800 mm

TOTAL WEIGHT

Center distance 650 mm / 26"	9,500 kg

The information given is based on the technical levels of our machine at the time of this brochure going to print. We reserve the right to further develop our machines technically and make design modifications. This means that the dimensions, weights, colors, etc. of the machines supplied can differ. The diverse application possibilities of our machines depend on the technical equipment specifically requested by our customers. The equipment specifically agreed with the customer is therefore exclusively definitive for the equipping of the machines, and not any general data, information or illustrations.

TECHNICAL DATA

MAIN DIMENSIONS

Distance between centers	650 mm (25.6")
Center height	225 mm (8.85")
Max. workpiece weight between centers	80/150 kg (176/330 lbs)

CROSS SLIDE: X AXIS

Max. travel	370 mm (14.5")
Speed	0.001 – 15,000 mm/min (0.000,04 - 590 ipm)
Resolution	0.00001 mm (0.4 mill inch)

LONGITUDINAL SLIDE: Z AXIS

Max. travel	800 mm (31.5")
Speed	0.001-20,000 mm/min (0.000,04 - 787 ipm)
Resolution	0.00001 mm (0.4 mill inch)

UNIVERSAL WORKHEAD

Speed range	1 – 1,500 rpm
Fitting taper	MT4 / dia. 70 mm
Bar capacity	dia. 26 mm (1.02")
Drive power	3 kW (4 hp)
Load during live grinding	70 Nm (51.6 ft-lb)
Roundness accuracy during live spindle grinding	0.0004 mm / 0.000,016" (Option 0.0002 mm / 0.000,008")

Speed range	1 - 1,000 rpm
Fitting taper	MT5 / dia. 110 mm
Bar capacity	dia. 38 mm (1.495")
Drive power	4 kW (5.35 hp)
Load during live spindle grinding	180 Nm (132 ft-lb)
Roundness accuracy during live spindle grinding	0.0004 mm / 0.000,016" (Option 0.0002 mm / 0.000,008")

C-axis, indirect measuring system

CHUCK WORKHEAD

Speed range	1 - 1,000 rpm
Fitting taper	ISO50 / dia. 110 mm
Bar capacity	dia. 50 mm (1.97")
Drive power	4 kW (5.35 hp)
Load during live spindle grinding	250 Nm (184.4 ft-lb)
Roundness accuracy during live spindle grinding	0.0004 mm / 0.000,016" (Option 0.0002 mm / 0.000,008")

C-axis, indirect measuring system

WHEELHEAD

Belt-driven spindle	11.5 kW (15.4 hp)
Plunge angle:	0° / 15°/ 30°
Fitting taper	dia. 73 mm
Drive power	max. 11.5 kW (15.4 hp)
Grinding wheel, dia. x width x bore	610 × 80(F5) × 203 mm (20" × 2.15" × 8")
Circumferential speed	up to 50 m/s (9842 sfpm)

Motor spindle	15 kW (20 hp)	25 kW (33.5 hp)	HSG
Plunge angle	0° / 15°/ 30°	0°/15°/(30°)* *Not for 160 mm (6.3") width	0°
Fitting taper	dia. 73 mm	dia.100 mm	dia.125 mm
Drive power	max. 15 kW (20 hp)	max. 25 kW (33.5 hp)	max. 18.5 kW (24.8 hp)
Grinding wheel, dia. x width x bore	610 × 125(F5) × 203 mm (20" x 5"(F5) x 8")	610 × 160(F5) × 203mm (20" x 6.3"(F5) x 8")	400 × 40 mm (16" x 1.6")
Circumferential speed	up to 80 m/s (15.748 sfpm)	up to 80 m/s (15.748 sfpm)	up to 140 m/s (27,560 sfm)

TAILSTOCK

Fitting taper	MT3	MT4
Barrel stroke	35 mm (1.38")	60 mm (2.36")
Barrel diameter	50 mm (1.97")	60 mm (2.36")
Fine adjustment for cylindricity corrections	±40 µm (+/- 0.0016")	±80 µm (+/- 0.0032")

SYNCHRONOUS TAILSTOCK

Fitting taper	MT4
Stroke	120 mm
spindle nose	dia. 70 mm
Programmable clamping force	Up to 4000 N (900 lbf)
Workpiece weight between centers	80 kg
Fine adjustment for cylindricity corrections (optional: automatic)	±80 µm (+/- 0.0032")

EXTRA-FINE GRINDING TAILSTOCK

Fitting taper	MT3
Barrel stroke	35mm (1.38")
Barrel diameter	50 mm (1.97")
Fine adjustment for cylindricity corrections (optional: automatic)	±40 µm (+/- 0.0016")

CONTROL

Fanuc 0*i*-TFP

GUARANTEED WORKING PRECISION

Straightness	
Gauge length 650 mm (25.6")	0.0025 mm (0.0001")

CONNECTED LOADS

Total connected load	31 kVA
Air pressure	5.5-7 bar (80-101 psi)

FRITZ STUDER AG

The name STUDER stands for more than 113 years of experience in the development and production of precision cylindrical grinding machines. "The Art of Grinding." is our passion, highest precision is our aim and top Swiss quality is our benchmark.

Our product line includes both standard machines, as well as complex system solutions in high-precision cylindrical grinding for machining small and medium-sized workpieces. In addition, we offer software, system integration, and a wide range of services. As well as receiving a complete tailor-made solution, the customer also benefits from over 113 years of know-how in relation to the grinding process.

Our customers include companies from the machine tool industry, automotive, tool and die, the aerospace industry, pneumatics/hydraulics, electronics/electrical engineering, medical technology, the watch industry, and job shops. They value maximum precision, safety, productivity, and longevity. As one of the market and technology leaders in universal, external, internal cylindrical, and out-of-round grinding, with 25,000 systems delivered, STUDER has stood for precision, quality, and durability for decades. STUDER's products and services include hardware, software, and a wide range of services in the pre-sales and after-sales sector.

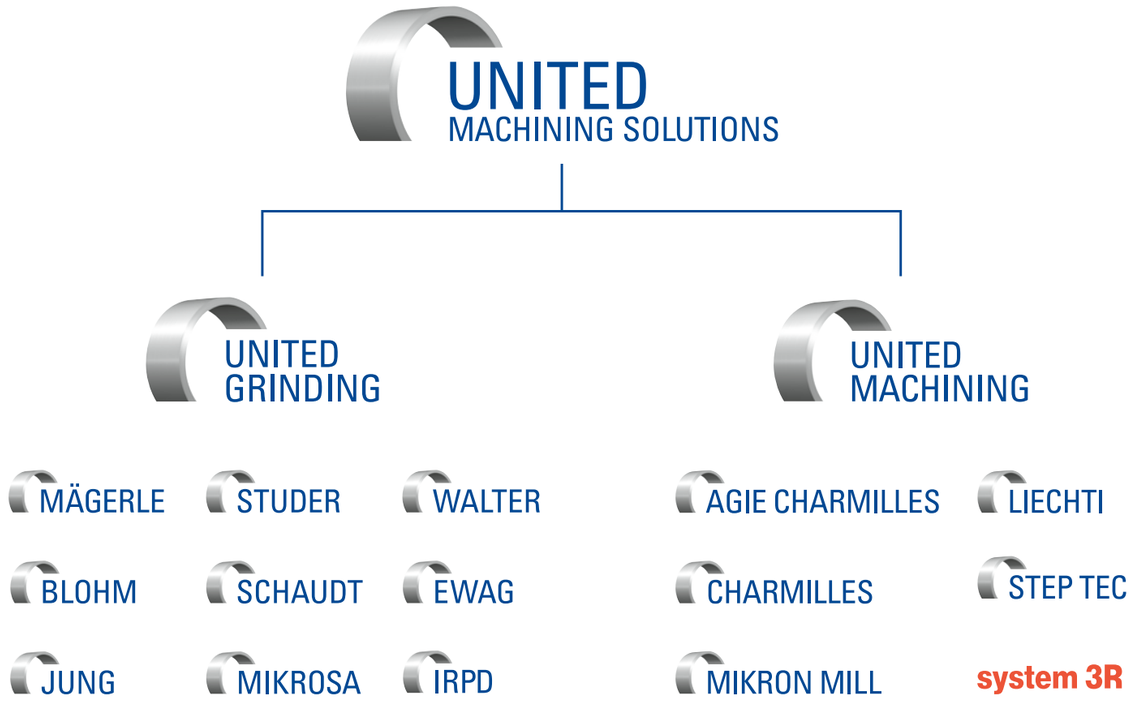
UNITED MACHINING SOLUTIONS

UNITED MACHINING SOLUTIONS is one of the largest machine tool manufacturers in the world. With around 5,000 employees at over 50 global production, service and sales locations, UNITED MACHINING SOLUTIONS is close to its customers and highly efficient. The group is organized into two divisions: UNITED GRINDING and UNITED MACHINING.

UNITED GRINDING includes the brands MÄGERLE, BLOHM, JUNG, STUDER, SCHAUDT, MIKROSA, WALTER, EWAG and IRPD. Its technologies include surface and profile grinding machines, cylindrical grinding machines, machines for tool machining and machine tools for additive manufacturing.

The UNITED MACHINING division includes the brands AGIE CHARMILLES, CHARMILLES, MIKRON MILL, LIECHTI, STEP TEC and SYSTEM 3R. It includes machines for EDM (Electrical Discharge Machining), high-speed milling and laser technology as well as spindle production and automation solutions.

«We want to make our customers even more successful»



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