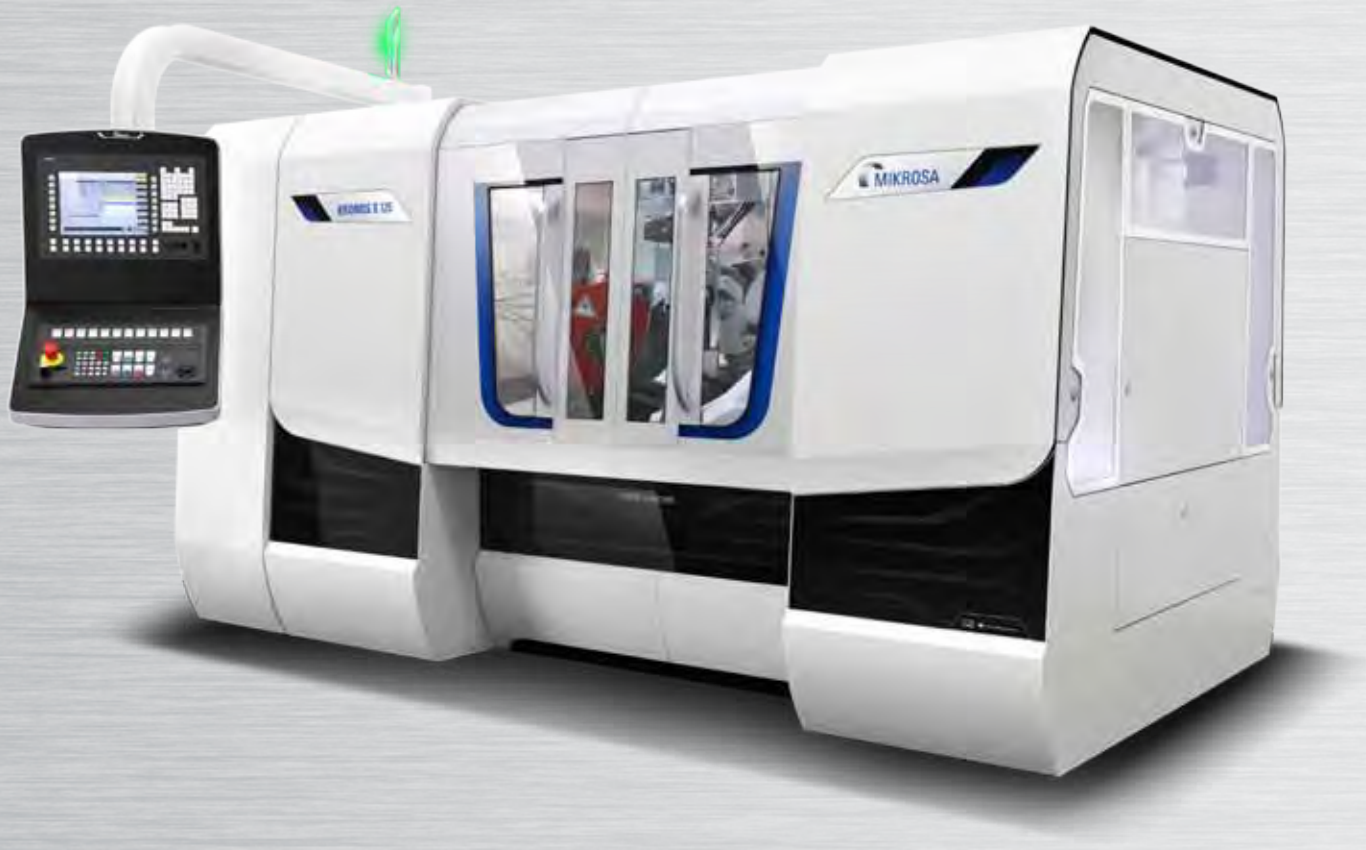
KRONOS S

Precision for small workpieces



Key data

The KRONOS S offers maximum precision for small workpieces. This compact and versatile centerless grinding machine combines speed with the highest quality requirements. The machine's broad technology spectrum extends from infeed grinding in single or multiple production to throughfeed grinding and oscillation grinding.

MIKROSA
KÖRBER SOLUTIONS

Schaudt Mikrosa GmbH

Schaudt Mikrosa GmbH is synonymous worldwide for cutting-edge technology in cylindrical, noncircular and universal grinding between centers, as well as in centerless external cylindrical grinding. Since 2009, the company combines the two long-established brands SCHAUDT and MIKROSA in a modern factory in Leipzig.

SCHAUDT is the brand for the automotive industry and its suppliers. It offers sophisticated technological solutions for cylindrical, noncircular and eccentric grinding. Our highly experienced experts also have unparalleled expertise in the high-precision grinding of long and heavy workpieces like those required for roll grinding, for example. Within this broad application range you obtain everything from a single source from SCHAUDT – application development, technology, assembly and sales.

MIKROSA is the technology and market leader in centerless external cylindrical grinding of rotationally symmetrical parts. The modular design of the machines means that you obtain a solution with handling and automation individually tailored to your grinding task. The technology spectrum extends from precision infeed grinding in many different variations through to superproductive throughfeed grinding. This allows you to machine a very large variety of workpieces, from small jet needles through to large shafts.

Long tradition and cutting-edge precision and quality place SCHAUDT and MIKROSA among the world's market and technological leaders today.

KRONOS S

Broad technology spectrum thanks to cross slide systems · Highest precision · Highest efficiency · Cost-effective automation · Special software for centerless grinding

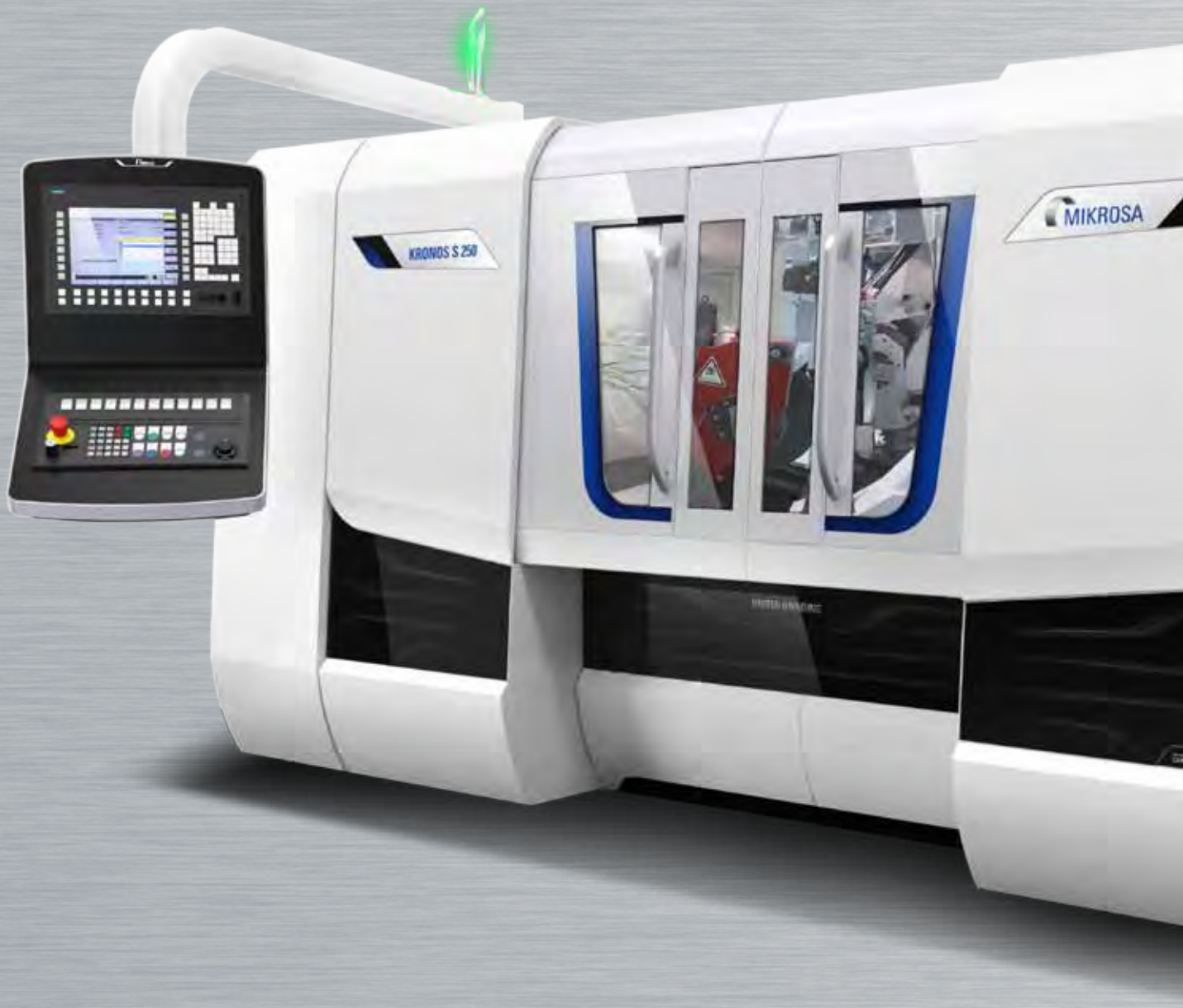
Features

Dimension

- Workpiece diameter 0.5...30 mm / 1.5...35 mm
- Max. workpiece length for infeed grinding 120 mm / 245 mm
- KRONOS S 125: Grinding wheel Ø 400 x 125 x 203.2 mm / Regulating wheel Ø 250 x 125 x 127 mm
- KRONOS S 250 grinding wheel Ø 450 x 250 x 203.2 mm / Regulating wheel Ø 250 x 250 x 127 mm

Hardware

- Compact design with integrated control cabinet
- Granitan®
- Cross slide system on grinding and regulating wheel side
- Swiveling control panel for operation at front and back
- Arrangement of dressers on workpiece level for highest dressing precision
- Fixed grinding gap for easy automation



Software

- Service-friendly SIEMENS SINUMERIK 840D sl control system
- MIKROSA software with special operator interface for centerless grinding
- Optional additional software modules such as HEUREEKA for optimizing the grinding gap geometry
- Standardized interfaces for loader and peripheral devices

The KRONOS S is specifically designed for the use of corundum and CBN grinding technology. Even the standard version of the machine features a grinding spindle mounted on hybrid bearings for higher peripheral speeds. In combination with the CBN high-speed technology the cycle time of the machine can thus be significantly reduced and the cost effectiveness considerably increased. The basis consists of a thermally stable and vibration-damping Granitan® machine bed. On top of this are the cross-slide systems for the grinding and regulating wheel side, which guarantee enormous flexibility during grinding. They give the KRONOS S with 4 CNC axes the same functionality as a conventional centerless grinding machine with 7 CNC axes.

The KRONOS S was optimized in respect of rigidity and vibration behavior during development and underwent a modal analysis after manufacture. As a result workpieces with special quality requirements – like needles or pump pistons, for example - can be machined highly efficiently.

The axis resolution during such grinding processes is an outstanding 0.01 µm. This is another important prerequisite for being able to safely manufacture workpieces with a tolerance range of ±0.5 µm under production conditions.

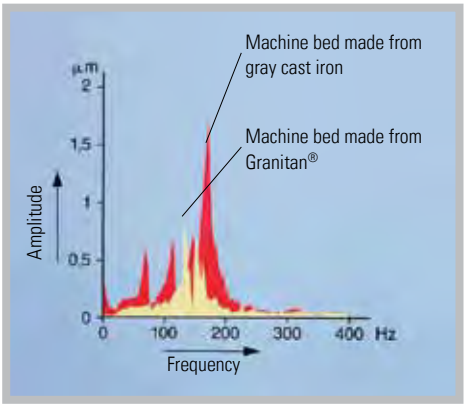
A standardized integrated handling system with an interface to external transport and palleting devices is optionally available.

Granitan®

Your advantages

- Vibration-damping
- Thermally stable
- High dimensional stability

The KRONOS S has a proven Granitan® machine bed. This material possesses excellent damping characteristics and high thermal stability. This is a big advantage when machining workpieces with high quality requirements. Temporary temperature fluctuations are extensively compensated and a high tolerance holding capacity can be guaranteed throughout the day.



Cross slide system

Your advantages

- Enormous flexibility during machine set-up, dressing and grinding
- Even pretensioning over the complete axis traversing range
- Glass scales as linear length measuring system

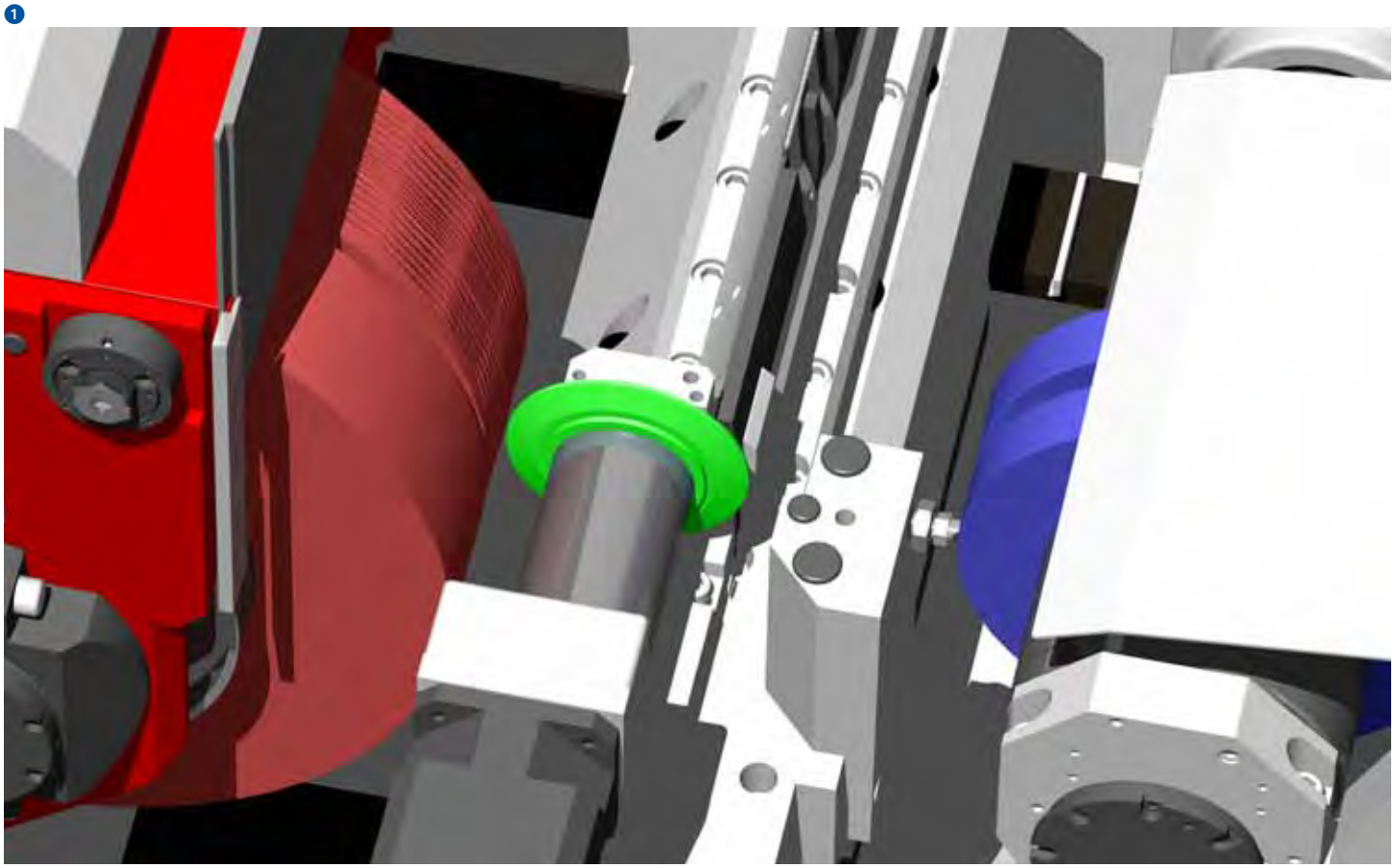
The KRONOS S has a fixed grinding gap. This means that the workpiece support is fixed in the center of the machine and all infeed and compensation movements are executed with the help of the cross slide system on the grinding wheel side (X1-axis / Z2-axis) and the cross slide system on the regulating wheel side (X4-axis / Z3-axis). Not only does this enable enormous flexibility during grinding, but it also gives the KRONOS S the same functionality as a conventional centerless grinding machine with 7 CNC axes.

Pretensioned recirculating roller guides are used as guides. A digital servo motor and precision re-circulating ball screws are used for the axis drive. The infeed steps for the X1- and X4-axis are 0.1 µm, and optionally even 0.01 µm. The axes are equipped with a linear length measuring system (glass scale) as standard.

1 Grinding wheel side
2 Regulating wheel side

Dressing

1



2

3

4

Your advantages

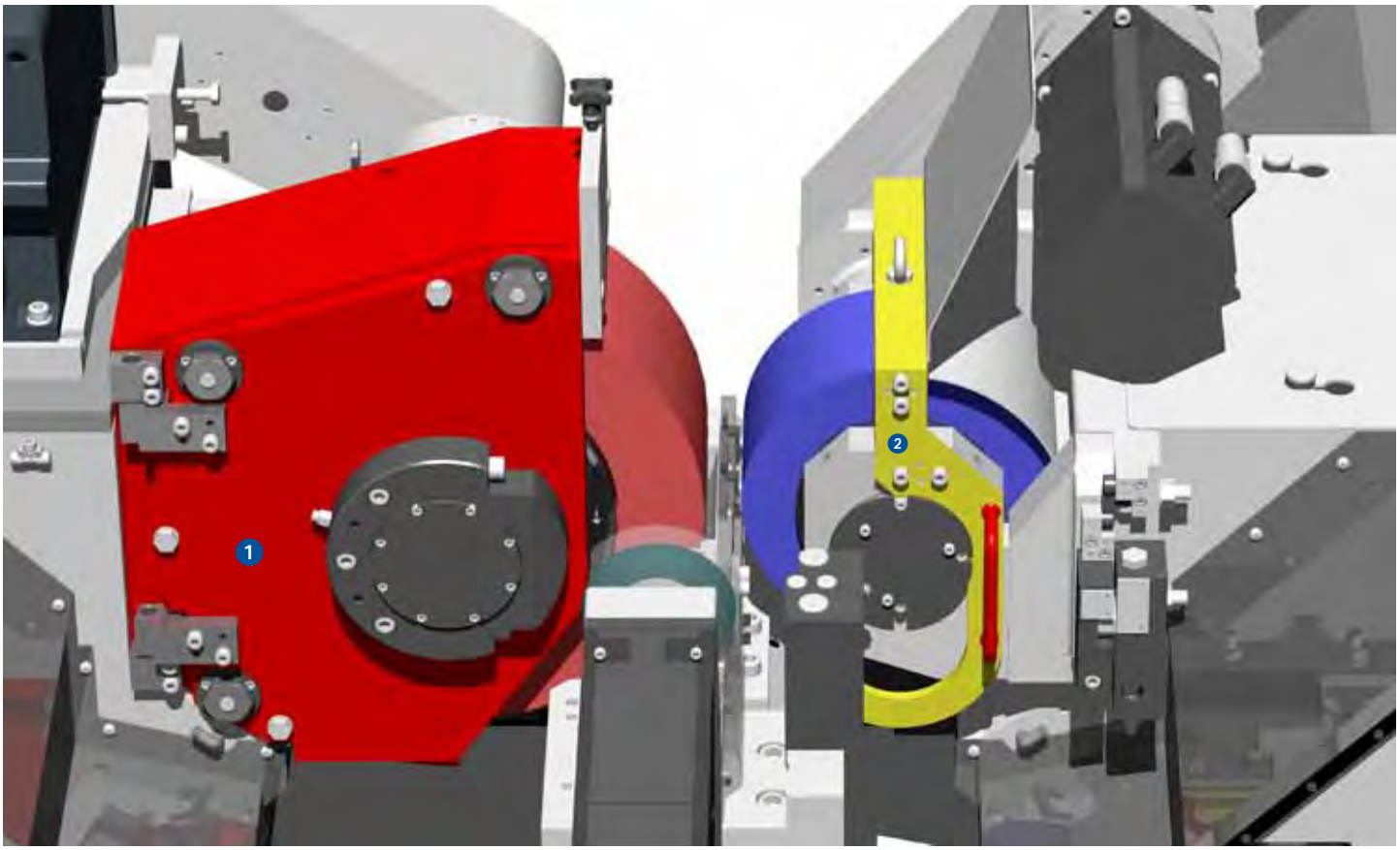
- Modular dressing system
- Extremely high dressing and profile accuracy
- Acoustic gap control

In addition to stationary dressing tools such as diamond blades and single-point diamonds, rotating dressing tools such as diamond dressing discs or diamond profile rolls can be used, depending on the grinding task.
Dressing of the regulating and grinding wheel occurs in the center of the machine on the workpiece plane. This enables the highest accuracies to be achieved.

If a profile roll dresser is used to dress the grinding wheel, the dressing tool can be flexibly selected. If required, the dressing arbor for rotating dressing tools can be replaced with a fixed shaft for stationary dressing tools.
The dressing times for the grinding and regulating wheel can be reduced to a minimum through the optional use of acoustic gap control for dressing detection.

1 Arrangement of the dressing tool on the workpiece plane
2 Profile roll dresser with form roll
3 Profile roll dresser with profile roll
4 Profile roll dresser with stationary dressing tool

Grinding and regulating wheel side



Your advantages

- Extremely stable, maintenance-free grinding and regulating spindles on double-sided bearings
- Grinding wheel: hybrid bearings as standard (peripheral speed up to 120/150 m/s)
- Short regulating wheel dressing times thanks to high dressing speed

The grinding spindle has maintenance-free hybrid bearings. This enables speeds of up to 7,000 rpm. Peripheral speeds of up to 120/150 m/s can also be achieved without any problem. The spindle is suitable for the use of both conventional grinding wheels up to 63/80 m/s and superabrasive cutting materials, such as CBN or diamond. The spindle is suitable for 125 mm or 245 mm wide wheels. The bore diameter of the grinding wheel is 203.2 mm.

The regulating spindle is designed as a double-sided bearing. High-precision, pretensioned spindle bearings are used. The regulating spindle is suitable for 125 mm or 250 mm wide regulating wheels. The drive is provided by a digital servo motor and V-ribbed belt. The operating speed range of 5...500 rpm can be continuously adjusted. The regulating spindle is driven by a clutch, free of lateral forces. A speed of up to 1,000 rpm can be set for dressing the regulating wheel.

1 Grinding wheel side
2 Regulating wheel side

Technology spectrum

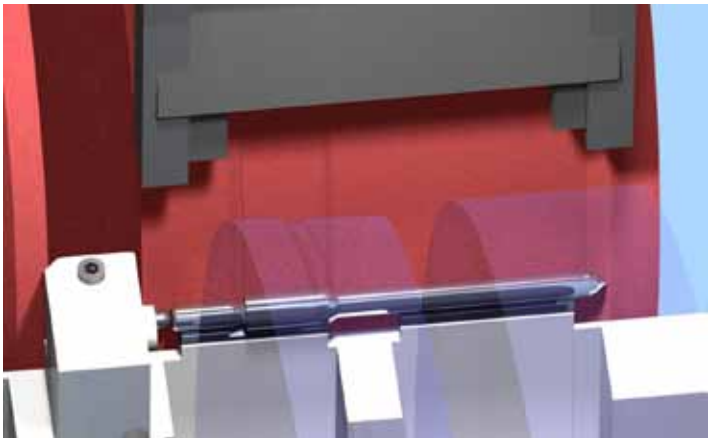
Centerless external cylindrical grinding is a superproductive method for the series and mass production of cylindrical, conical and crowned workpieces. It essentially comprises two different methods – infeed grinding and throughfeed grinding.

Throughfeed grinding is used for machining non-profiled workpieces, such as cylindrical and tapered rolls, rings, bars and hydraulic slides. The infeed grinding method is used to machine workpieces with lowered or profiled lateral surfaces, such as jet needles, valves, journals gear and electric motor shafts.

The workpiece is not clamped by means of friction locking. It is located in the so-called grinding gap between grinding wheel, regulating wheel and workpiece fixture. These components support the workpiece stably over its entire length or at least a considerable portion of it, and absorb the machining forces that arise. As a result even slender workpieces can be machined with high removal rates and very good quality.

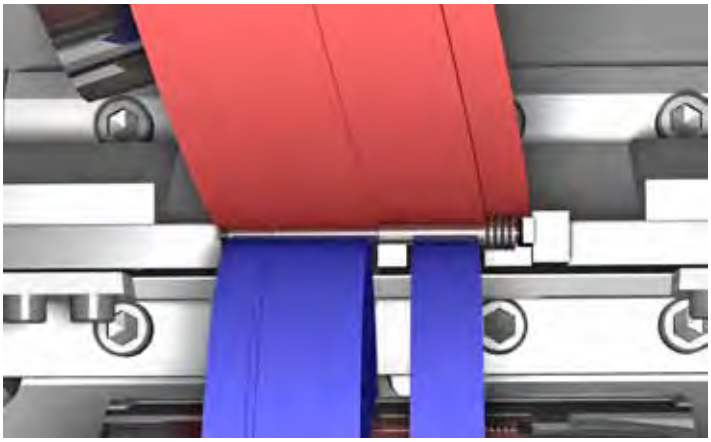
Available technologies

- Infeed grinding – straight or 6° / 15° angled
- Infeed grinding in single or multiple production
- Infeed grinding in several simultaneous or consecutive operations
- Oscillating infeed grinding
- Throughfeed grinding.



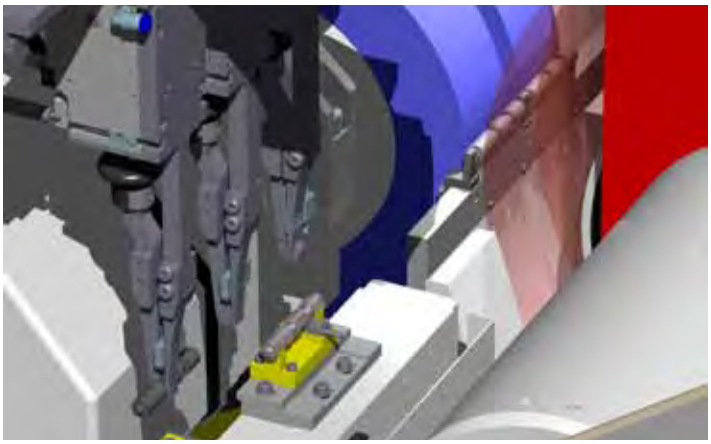
Straight infeed grinding - single production

- Highest workpiece precision with a maximum length-to-diameter ratio



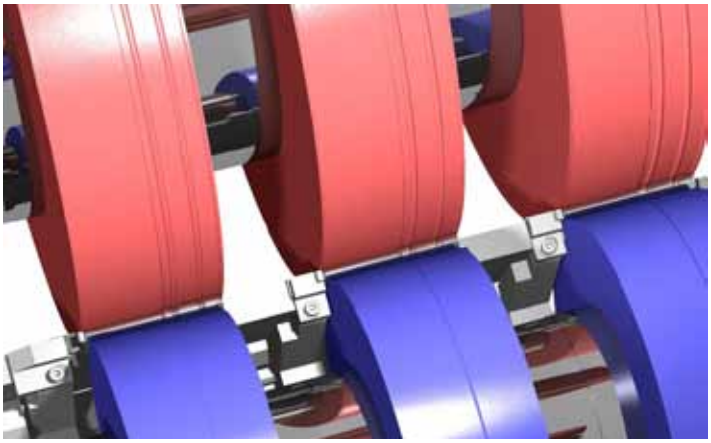
6° / 15° angled infeed grinding

- Targeted precision-grinding of diameter and faces in a single plunge
- Special axial infeed processes
- Optimization of contact ratios through lowering the regulating wheel



Infeed grinding in several operations

- Infeed grinding in several simultaneous or consecutive operations, by offsetting the workpiece or grinding wheel



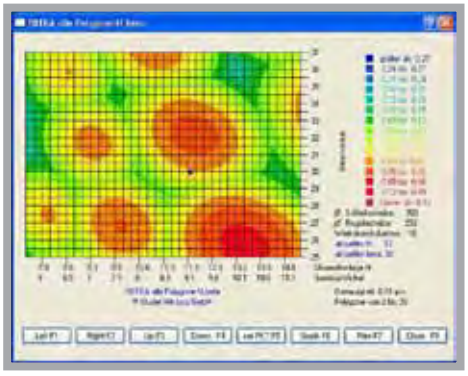
Straight infeed grinding – multiple production

- Simultaneous infeed grinding of several workpieces in a single operation for outstanding productivity together with highest precision

Control system and software

1

2



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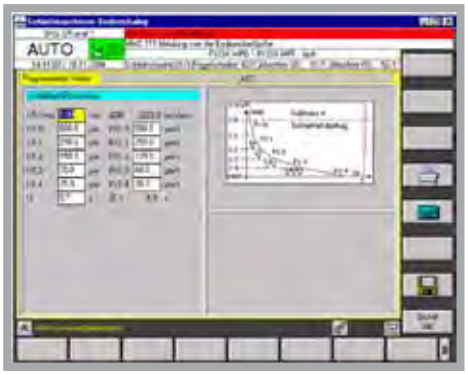


Your advantages

- Application-specific software technology
- Special operator interface for centerless grinding
- Pictogramming

A user-friendly control system is also important for efficiency. The KRONOS S comes with a SIEMENS SINUMERIK 840D sl control system and Simodrive drive technology as standard. These digital drives offer the highest precision and fast travel speeds. Operation, set-up, changeover, dressing and the programming of complex grinding tasks are easy to learn.
MIKROSA has integrated a special operator interface for centerless grinding into the SIEMENS interface and added easily understood symbols and images. This makes programming even easier.

- Application-specific software to support every grinding task
- Integrated comprehensive expert system to provide technological support for throughfeed and infeed grinding
- Optional additional software modules such as HEUREEKA for grinding technology optimization
- Extensive operating and error messages for operator prompting and error diagnosis
- Systematic use of Safety Integrated
- Machine and personal protection in accordance with EU directives
- Observance of EMC and low voltage requirements
- Reduction of set-up and changeover times through the use of auxiliary programs and semi-automated processes
- Integrated maintenance menu
- Dynamic status monitoring of all NC-controlled axes

1 Control panel
2 HEUREEKA additional module
3 "Grinding Technology" software module

Customer Care

MIKROSA centerless grinding machines should fulfill the customer's requirements for as long as possible, work cost-effectively, function reliably and be available at all times. From "start up" through to "retrofit" – our Customer Care is there for you throughout the working life of your machine. 12 professional helplines and more than 60 service technicians are available in your area, wherever you are in the world.

- We will provide you with fast, uncomplicated 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

Material
Spare parts
Replacement parts
Accessories

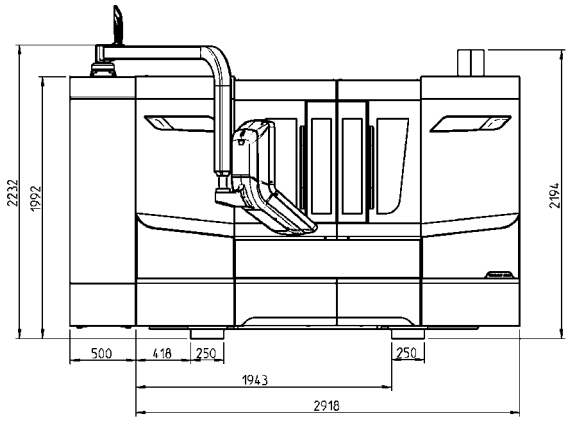
Rebuild
Machine overhaul
Assembly overhaul

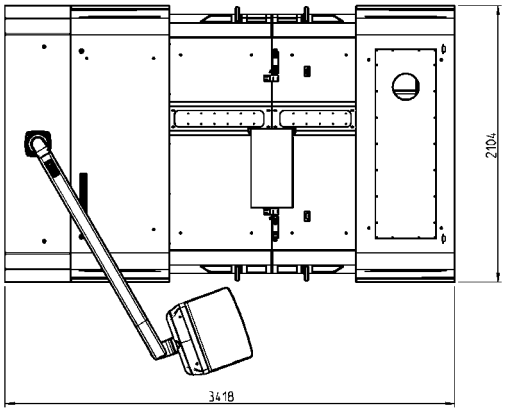
Retrofit
Modifications
Retrofits

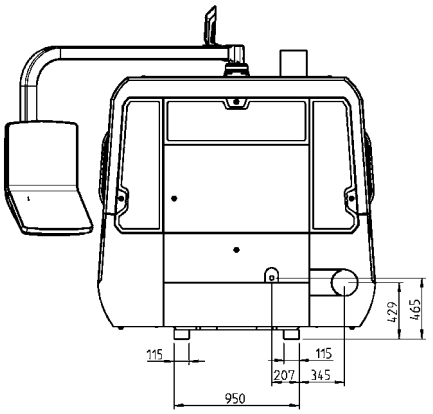
Technical data

KRONOS S 125

Grinding range		
Workpiece diameter	mm	0.5...30
Workpiece length, max. for infeed grinding	mm	120
Grinding wheel		
Diameter, max.	mm	400
Width, max.	mm	125
Bore	mm	203.2
Peripheral speed	m/s	63
CBN peripheral speed (option)	m/s	120
Driving power	kW	11/15
Regulating wheel		
Diameter, max.	mm	250
Width, max.	mm	125
Bore	mm	127
Rpm range, continuously adjustable	rpm	5...500
Dressing speed	rpm	1,000
Driving power	kW	5
Dimensions		
Total installation area (incl. control cabinet)	mm	6,500 x 4,600
Height, max.	mm	2,232
Machine weight	t	7.2

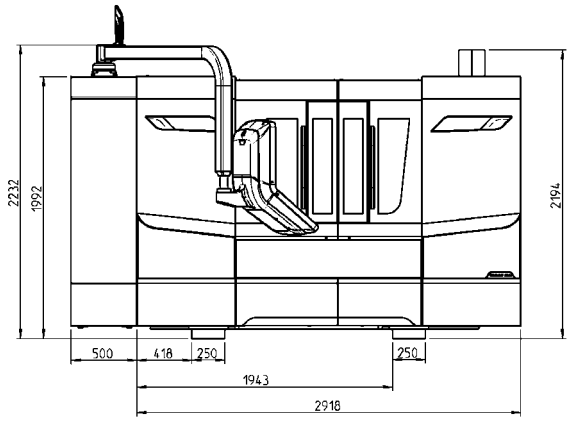


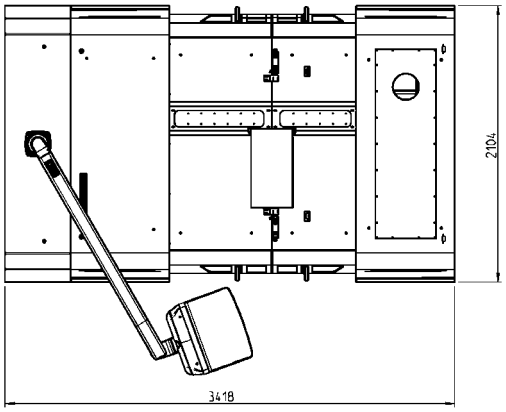


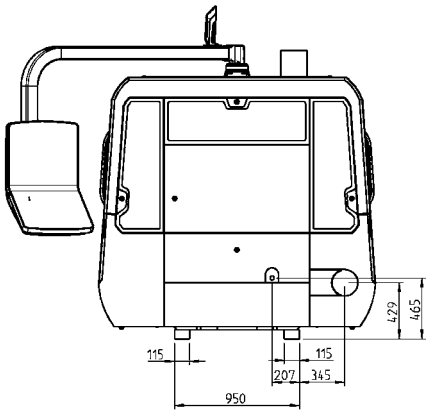


KRONOS S 250

Grinding range		
Workpiece diameter	mm	1,5...35
Workpiece length, max. for infeed grinding	mm	245
Grinding wheel		
Diameter, max.	mm	450
Width, max.	mm	250
Bore	mm	203.2
Peripheral speed	m/s	80
CBN peripheral speed (option)	m/s	120/150
Driving power	kW	15
Regulating wheel		
Diameter, max.	mm	250
Width, max.	mm	250
Bore	mm	127
Rpm range, continuously adjustable	rpm	5...500
Dressing speed	rpm	1,000
Driving power	kW	5
Dimensions		
Total installation area (incl. control cabinet)	mm	6,500 x 4,600
Height, max.	mm	2,232
Machine weight	t	8.8







MIKROSA

KÖRBER SOLUTIONS

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