KRONOS M

Flexibility for medium-sized workpieces

Key data

The KRONOS M combines precision and highest productivity in a single machine. Its modular design allows the centerless grinding machine to be optimally adapted to any grinding task - whether for throughfeed or infeed grinding of medium-sized workpieces with the highest quality requirements.

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 M

Standardized machine concept · Modular system for spindles and dressing principles · Highest efficiency · Flexible applications · Special software for centerless grinding

Features

Dimension

- Workpiece diameter 1.5...100 mm
- Max. workpiece diameter for infeed grinding 245 mm / 395 mm
- KRONOS M 250: Grinding wheel Ø 610 x 250 x 304.8 mm / Regulating wheel Ø 350 x 250 x 127 / 152 mm
- KRONOS M 400: Grinding wheel Ø 610 x 400 x 304.8 mm / Regulating wheel Ø 350 x 400 x 127 / 152 mm

Hardware

- Granitan®
- 3-slide system
- Patented arrangement of swivel-type and upper slide on one guide system for high system rigidity
- NC functionality for simple and reducible generation of the hyperbolic profile of the regulating wheel
- Modular dressing system for stationary and rotating dressing tools, optionally also with acoustic gap control

Software

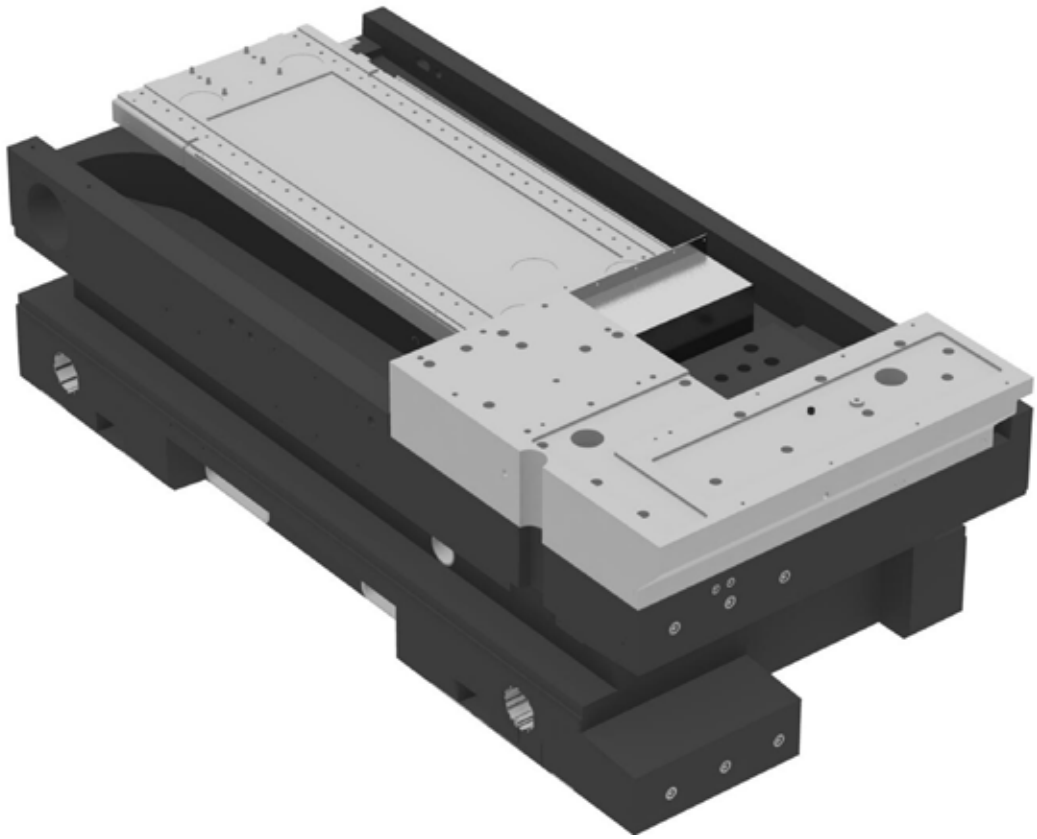
- Service-friendly SIEMENS SINUMERIK 840D sl control system
- MIKROSA software with special operator interface for centerless grinding
- Optional additional software modules such as HEUREEKA for optimizing the grinding gap geometry
- Standardized interfaces for loader and peripheral devices

The basis of the KRONOS M centerless external cylindrical grinding machine is the Granitan® machine bed, with its high temperature stability and excellent damping characteristics. The regulating spindle supported on both sides and the rigid design of the slide systems also guarantee a high system rigidity for optimum grinding results. Workpieces such as journals or rotor shafts, which must fulfill the highest quality requirements, can therefore be machined highly efficiently even under factory conditions. The modular design of the KRONOS M with 6 (optionally 8) CNC axes always enables optimal adaptation to the required grinding task.

Even the standard version of the machine features a high-precision grinding spindle mounted on roller bearings for peripheral speeds of up to 63 m/s. For the highest grinding quality a grinding spindle mounted on hydrodynamic bearings with superb damping and a very long working life can also be optionally used. Alternatively a grinding spindle with maintenance-free hybrid spindle bearings for peripheral speeds of up to 120 m/s is used. In combination with the CBN high-speed technology the cycle time of the machine is thus significantly reduced and the cost effectiveness considerably increased.

A special form of the machine is the KRONOS K, a special machine for external grinding of tapered rollers using the through-feed process. The regulating wheel is replaced by a conveyor screw adapted to the dimensions of the tapered rollers.

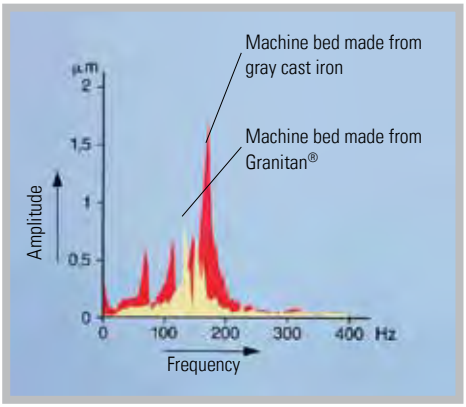
Granitan®



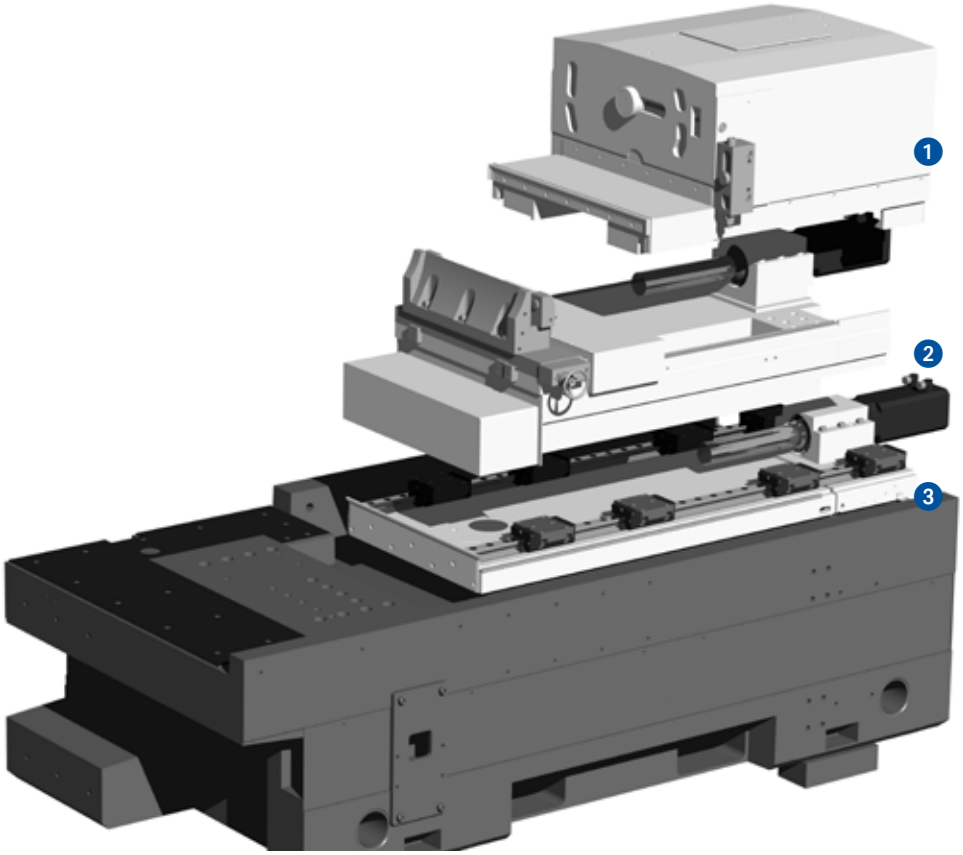
Your advantages

- Vibration-damping
- Thermally stable
- High dimensional stability

The KRONOS M 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.



3-slide system



Your advantages

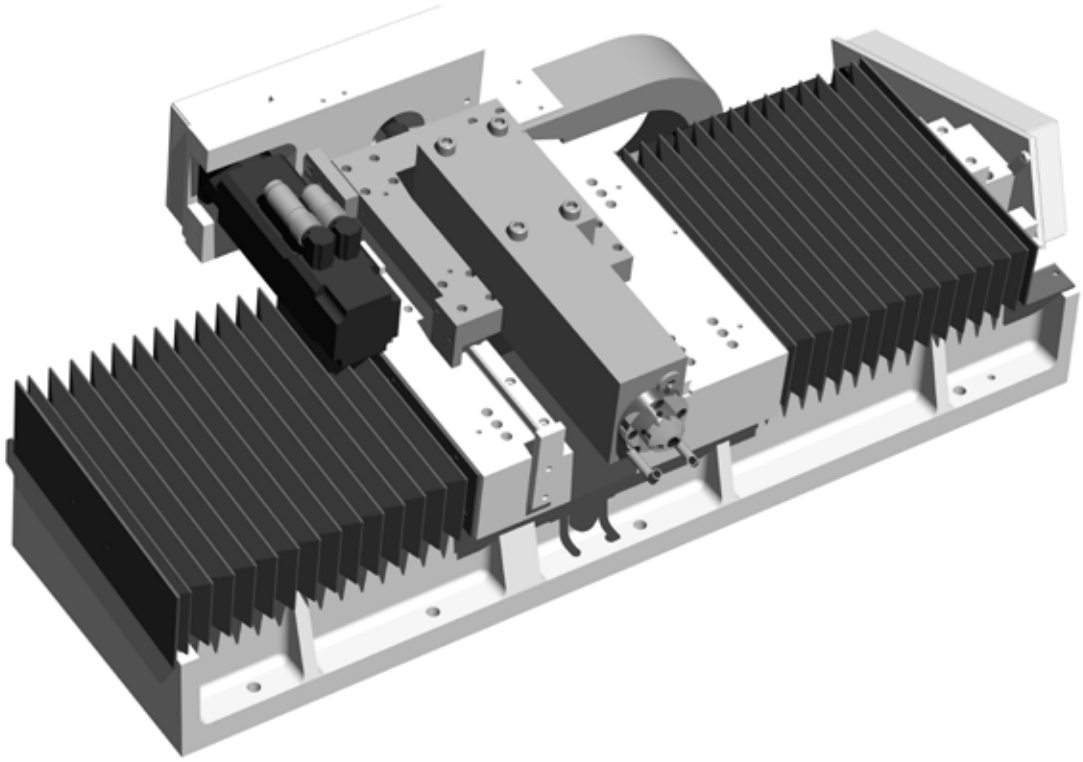
- High system rigidity
- Glass scales as linear length measuring system

The 3-slide system of the KRONOS M comprises a swivel-type slide, an intermediate slide and an upper slide, which are compactly arranged on a guide system. This guarantees a high system rigidity of the machine. 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. The axes are equipped with a linear length measuring system (glass scale) as standard.

1 Upper slide
2 Intermediate slide
3 Swivel-type slide

Dressing

1



Your advantages

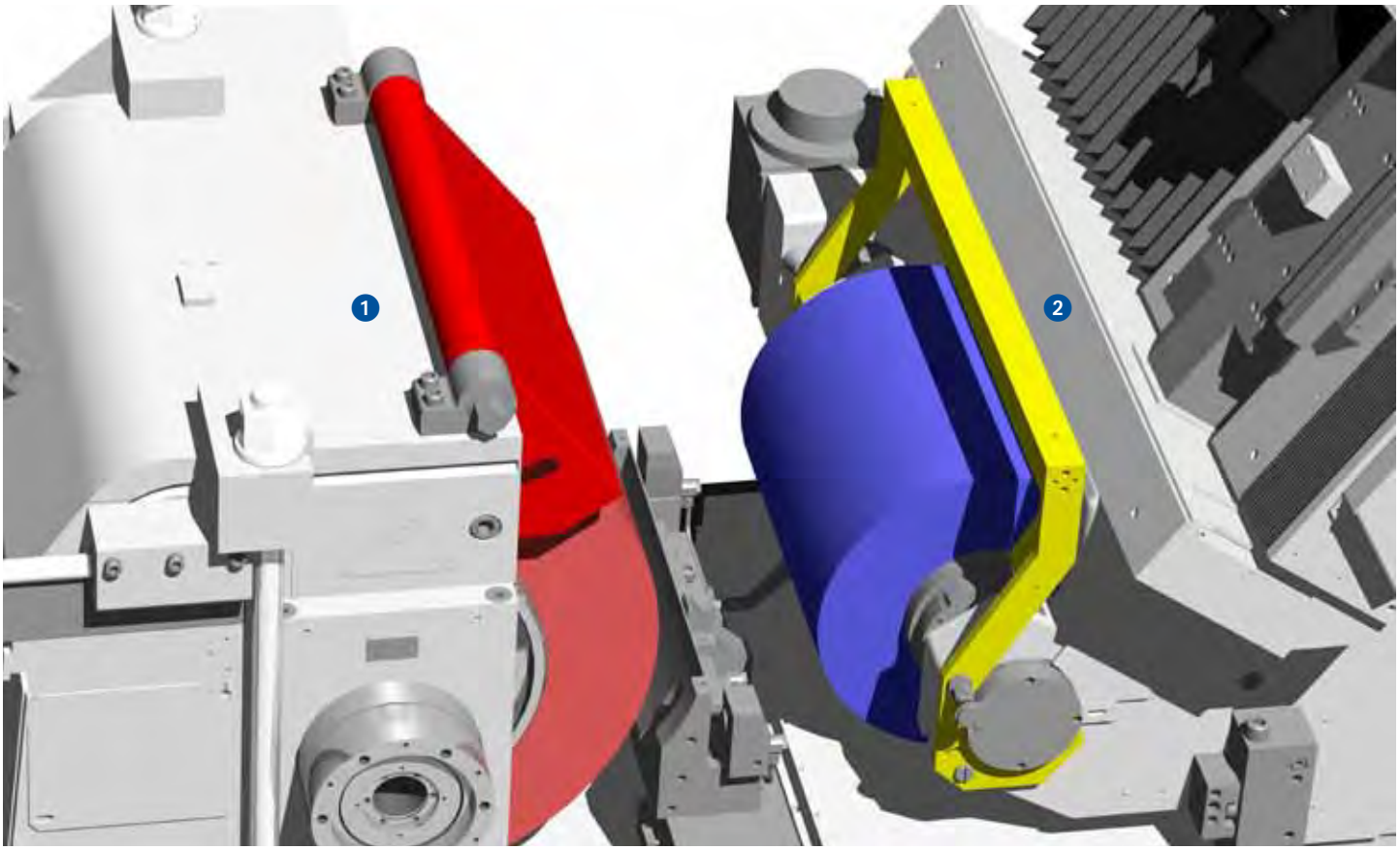
- Modular dressing system
- Extremely high dressing and profile accuracy
- Acoustic gap control

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 also be used, depending on the grinding task.

The dressing arbor supported on both sides allows an exceptionally high profile accuracy during dressing with rotating tools. The dressing times for grinding and regulating wheel can be reduced to a minimum through the optional use of acoustic gap control for dressing detection.

1 Dressing unit
2 Stationary dressing tools
3 Form Roll
3 Profile role

Grinding and regulating wheel side



Your advantages

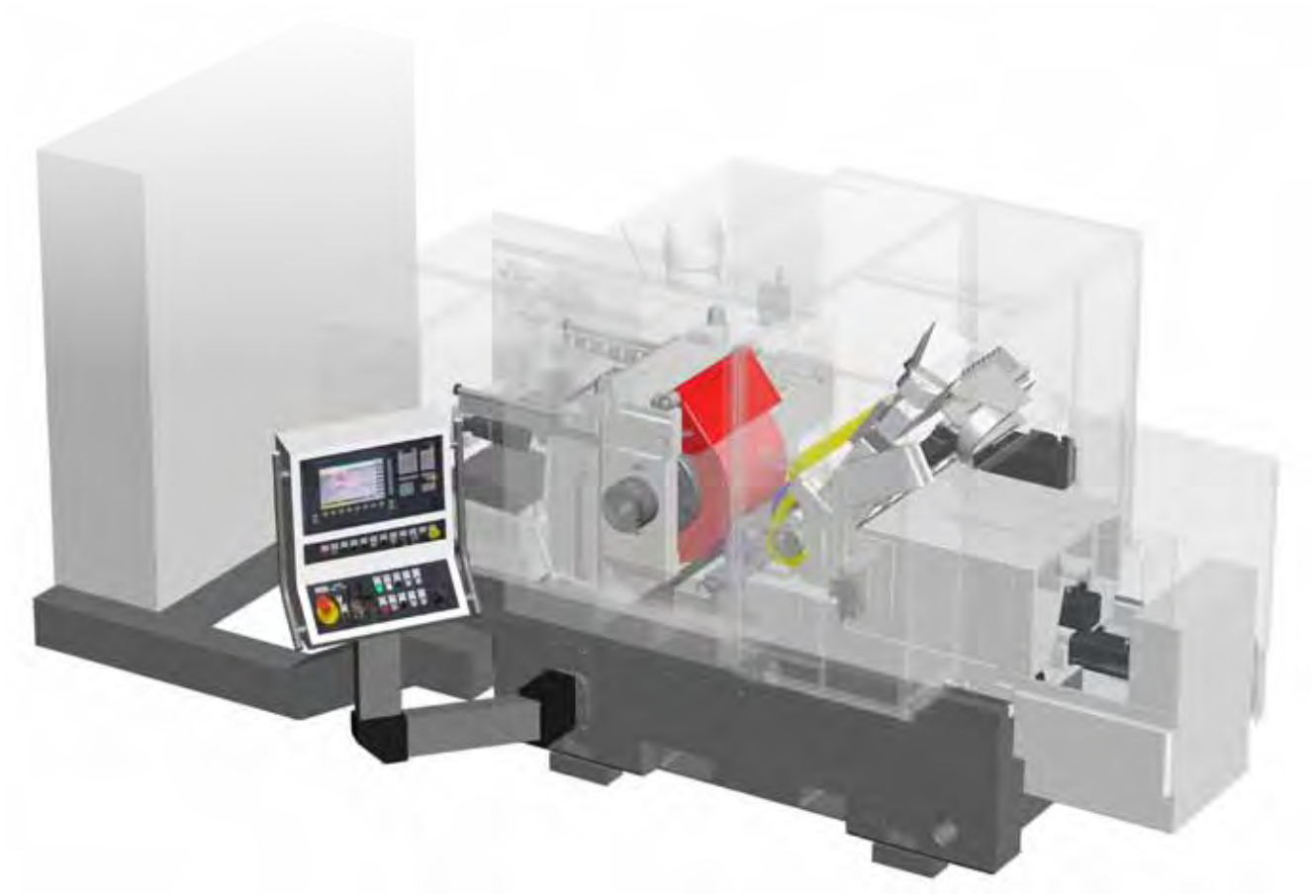
- Extremely stable, maintenance-free regulating spindle on double-sided bearings
- Double-sided bearing or overhung grinding spindle

The KRONOS M 250 has an overhung grinding spindle, while the KRONOS M 400 has a grinding spindle mounted on double-sided bearings. The roller-bearing grinding spindle is designed for the use of conventional grinding wheels up to 63 m/s. Spindles for the use of superabrasive cutting materials such as CBN or diamond up to 120 m/s can also be optionally used. The spindle can take wheels with a width of 250 mm or 400 mm and a bore diameter of 304.8 mm. The grinding spindle on the KRONOS M 400 is driven by a torsion bar, free of lateral forces.

The regulating spindle is designed as a double-sided bearing on both machine types. High-precision, pretensioned spindle bearings are used. The regulating spindle is suitable for 250 mm or 400 mm wide regulating wheels. The drive is provided by a digital servo motor and transmission. The operating speed range of 5...450/600 rpm can be continuously adjusted.

1 Grinding wheel side
2 Regulating wheel side

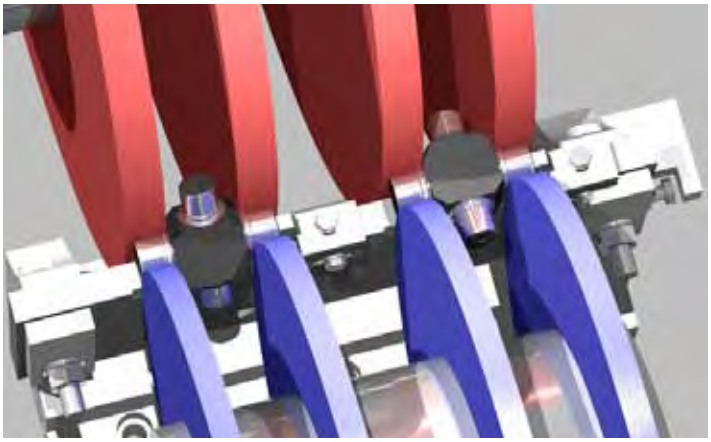
Technology spectrum



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.

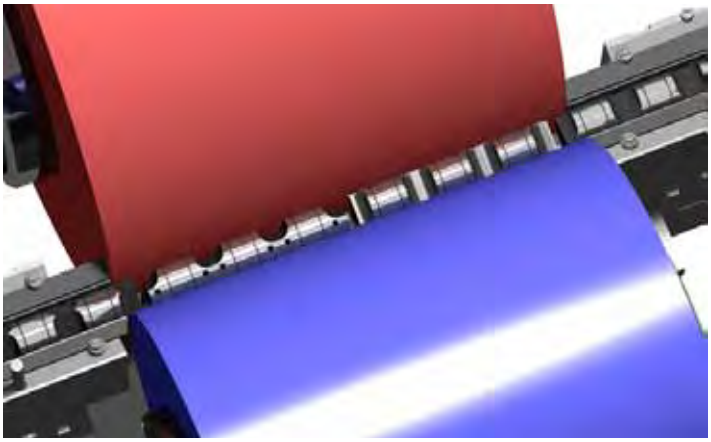
Available technologies

- Infeed grinding – straight
- Infeed grinding in single or multiple production
- Grinding of faces and diameters (KRONOS M 250 with grinding spindle on hydrodynamic bearings and motorized axial adjustment)
- Throughfeed grinding



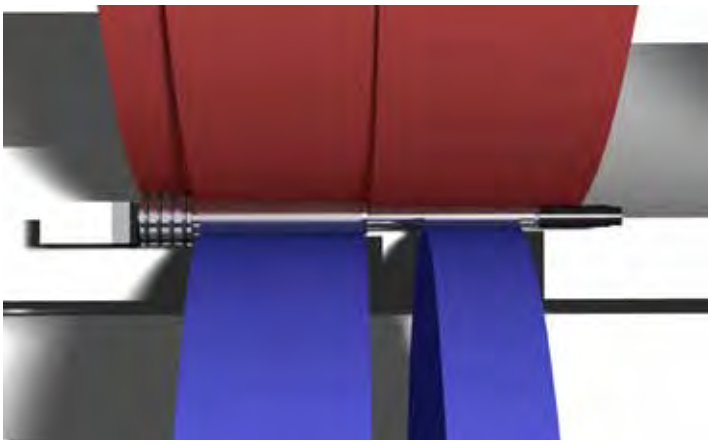
Straight infeed grinding – single and multiple production

- Simultaneous infeed grinding of several workpieces in a single operation for outstanding productivity together with highest precision
- Highest workpiece precision with a maximum length-to-diameter ratio



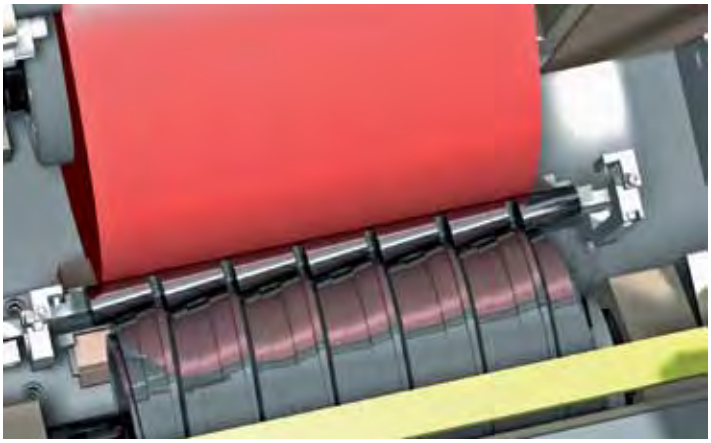
Throughfeed grinding

- Superproductive grinding method for the mass production of small, precision workpieces



Grinding of diameters and faces

- Infeed grinding of diameters and faces thanks to axial adjustability of the overhung grinding spindle



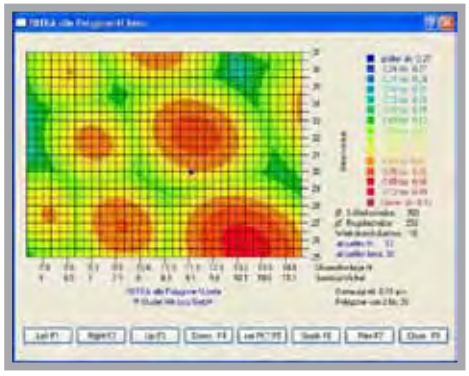
Special purpose solution: KRONOS K

- External machining of tapered rollers using throughfeed grinding
- Special design of the regulating wheel side as a conveyor screw

Control system and software

1

2



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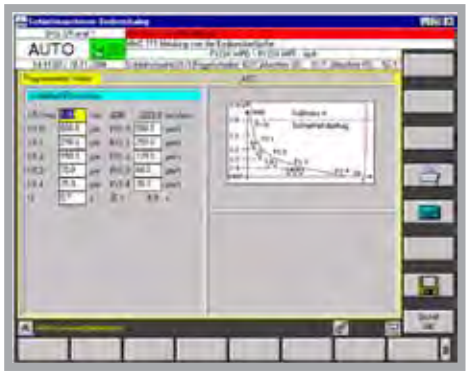


Your advantages

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

A user-friendly control system is also important for efficiency. The KRONOS M 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

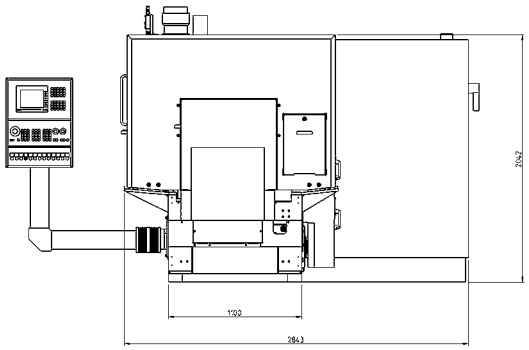
Rebuild
Machine overhaul
Assembly overhaul

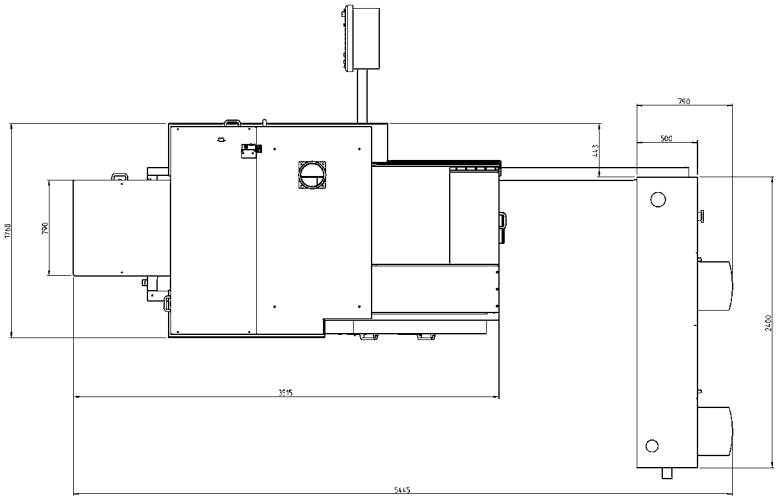
Retrofit
Modifications
Retrofits

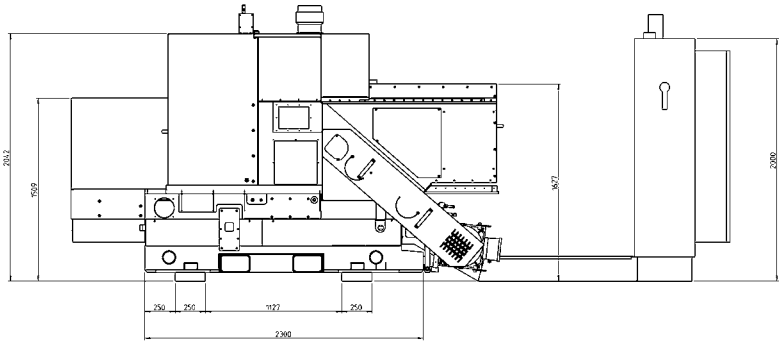
Technical data

KRONOS M 250

Grinding range		
Workpiece diameter	mm	1.5...100
Workpiece length, max. for infeed grinding	mm	245
Grinding wheel		
Diameter, max.	mm	610
Width, max.	mm	250
Bore	mm	304.8
Peripheral speed	m/s	63
CBN peripheral speed (option)	m/s	90/120
Driving power	kW	22
Regulating wheel		
Diameter, max.	mm	350
Width, max.	mm	250
Bore	mm	127/152
Rpm range, continuously adjustable	rpm	5...600
Dressing speed	rpm	600
Driving power	kW	5.7
Dimensions		
Total installation area (incl. control cabinet)	mm	5,696 x 3,330
Height, max.	mm	2,300
Machine weight	t	10.5

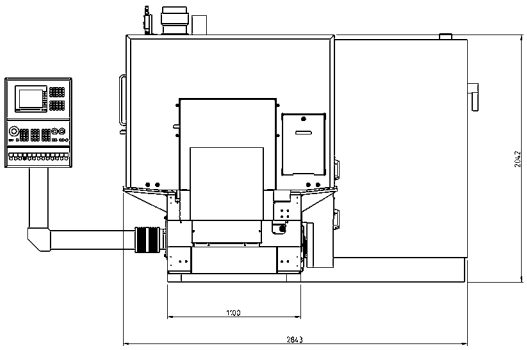


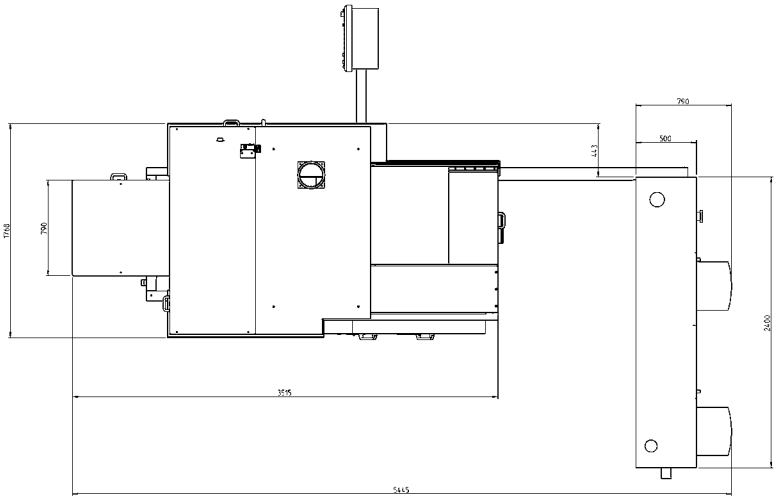


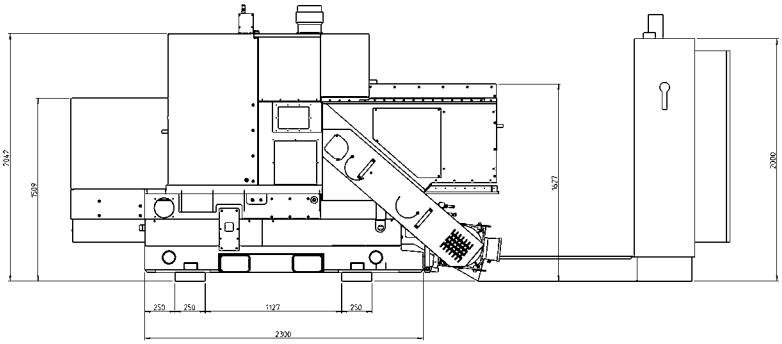


KRONOS M 400

Grinding range		
Workpiece diameter	mm	1.5...100
Workpiece length, max. for infeed grinding	mm	395
Grinding wheel		
Diameter, max.	mm	610
Width, max.	mm	400
Bore	mm	304.8
Peripheral speed	m/s	63
CBN peripheral speed (option)	m/s	90/120
Driving power	kW	37/51
Regulating wheel		
Diameter, max.	mm	350
Width, max.	mm	400
Bore	mm	127/152
Rpm range, continuously adjustable	rpm	5...450
Dressing speed	rpm	450
Driving power	kW	5.7
Dimensions		
Total installation area (incl. control cabinet)	mm	5,696 x 3,330
Height, max.	mm	2,300
Machine weight	t	11







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KRONOS M · V3 · 06/2015 · en · Printed in Germany