

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.

Schautd Mikrosa GmbH

Schautd Mikrosa GmbH is synonymous worldwide for premium 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.

Our special strength lies in the high customer-individuality of our machines and the connection of units, automation components and process engineering to a highly productive grinding system.

Here, 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 rollers and turbine shafts. Within this broad application range, you obtain everything from a single source – application development, technology, assembly, and sales.

MIKROSA sets the standards in centerless external cylindrical grinding of rotationally symmetrical parts. The modular machine design 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 to super productive throughfeed grinding. This allows you to machine a very large variety of workpieces, from small jet needles through to large shafts.

Schautd Mikrosa GmbH is part of the UNITED GRINDING group, one of the leading suppliers of machines, applications, and services for hard-fine machining worldwide. The group comprises eight strong brands with own subsidiaries and sales partners around the world to be a strong partner for our customers.

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 length for infeed grinding 395 mm
- Grinding wheel \varnothing 610 x 400 x 304.8 mm /
Regulating wheel \varnothing 350 x 400 x 127 / 152 mm
optional: regulating wheel \varnothing 350 x 340 (400) x 177.8 mm

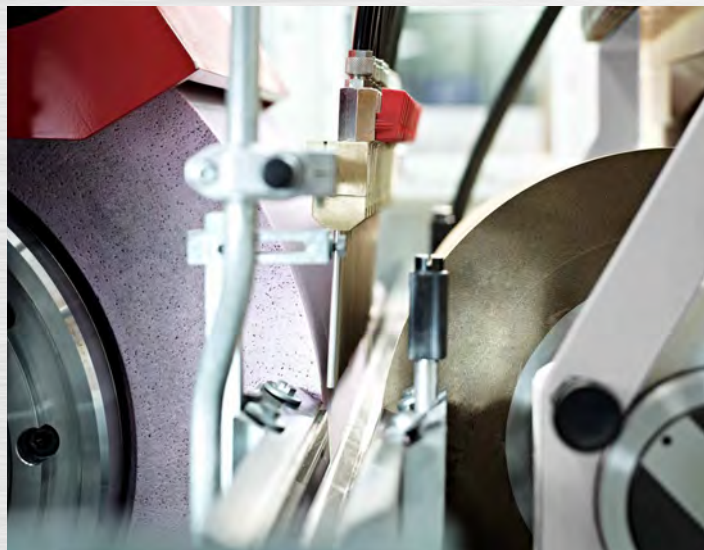
Hardware

- Granitan[®] machine base
- 3-slide system
- Patented arrangement of intermediate 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 zone geometry
- Standardized interfaces for loader and peripheral devices



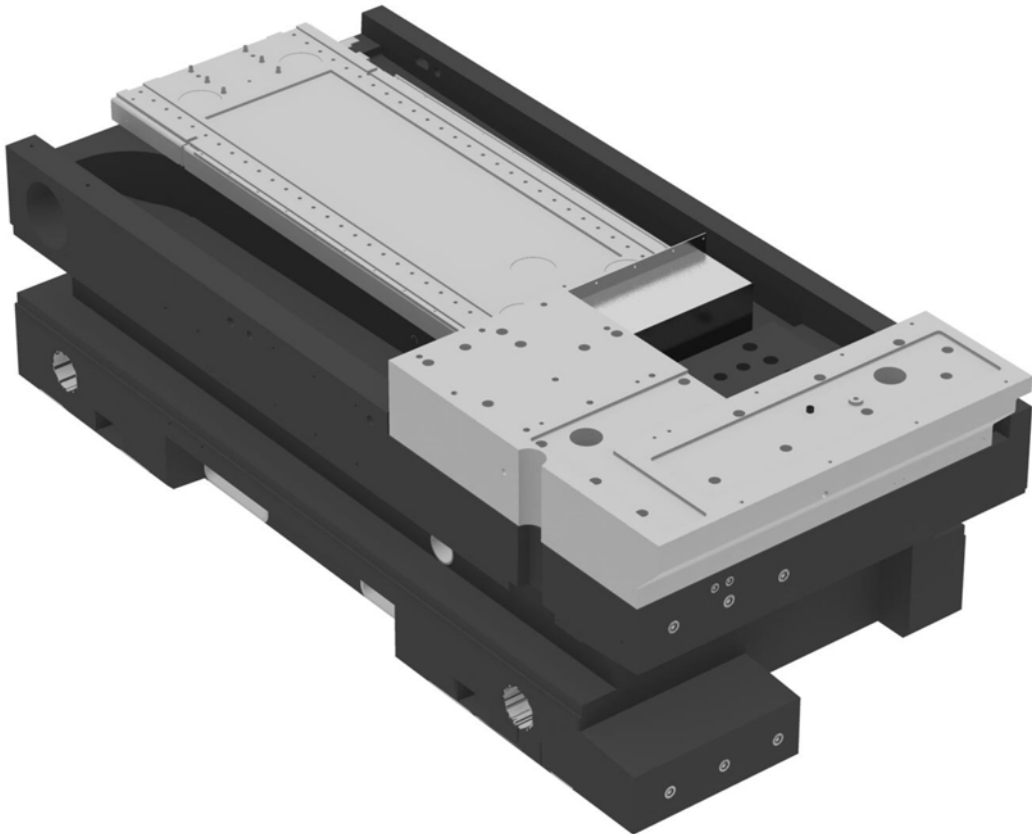
The basis of the KRONOS M centerless external cylindrical grinding machine is the Granitan[®] machine base, with its high temperature stability and excellent damping characteristics. The regulating spindle supported on both sides and the rigid design of the 3-slide system also guarantee a high system rigidity for optimum grinding results. Workpieces such as cross pins or rotor shafts with high 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 an 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 is also optionally available. Alternatively a grinding spindle with maintenance-free hybrid spindle bearings for peripheral speeds of up to 120 m/s is used. Thus, in combination with the CBN high-speed technology the cycle time of the machine is significantly reduced and the cost effectiveness considerably increased.

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



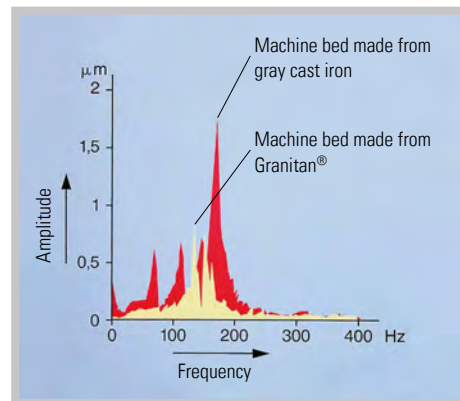
Granitan[®] machine base



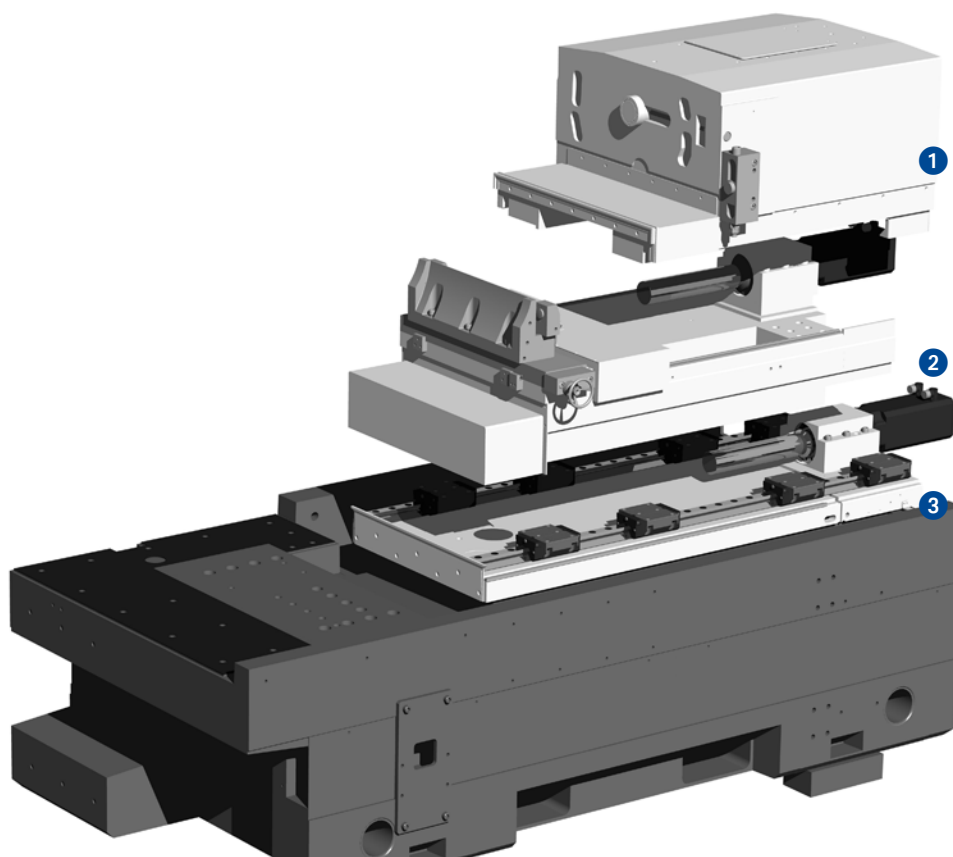
Your advantages

- Vibration-damping
- Thermally stable
- High dimensional stability

The basis of the KRONOS M is the proven Granitan[®] machine base. The 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 capacity to hold the tolerance can be guaranteed throughout the day.



3-slide system



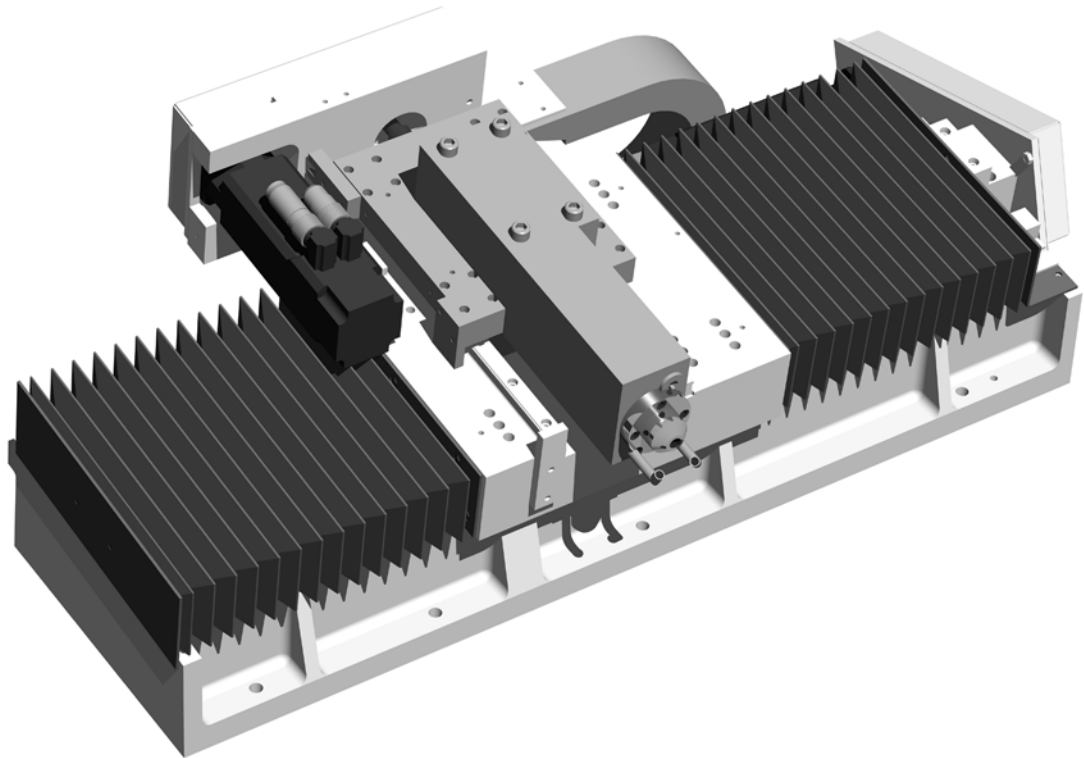
Your advantages

- 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. The swivel-type slide forms the base for the guide system, on which the intermediate and upper slide are arranged compactly. This guarantees a high system rigidity of the machine. The guide is a pre-tensioned recirculating roller guide. 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 . As standard the axes are equipped with glass scales as linear length measuring system.

Dressing

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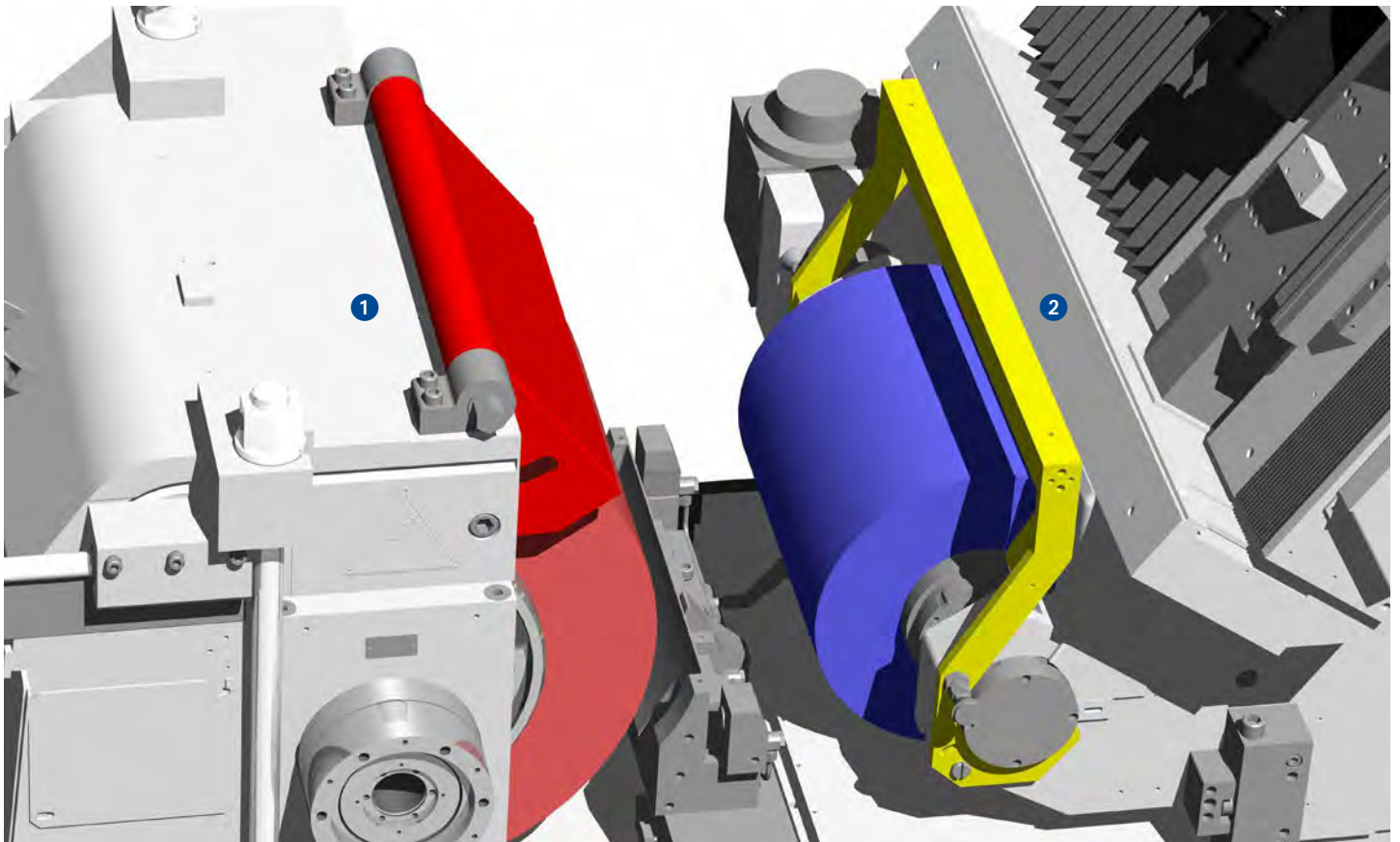
Your advantages

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

Depending on the grinding task, stationary dressing tools such as diamond blades and single-point diamonds or rotating dressing tools such as diamond dressing discs or diamond profile rolls are available.

The dressing arbor supported on both sides allows an exceptionally high profile accuracy during dressing with rotating 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.

Grinding and regulating wheel



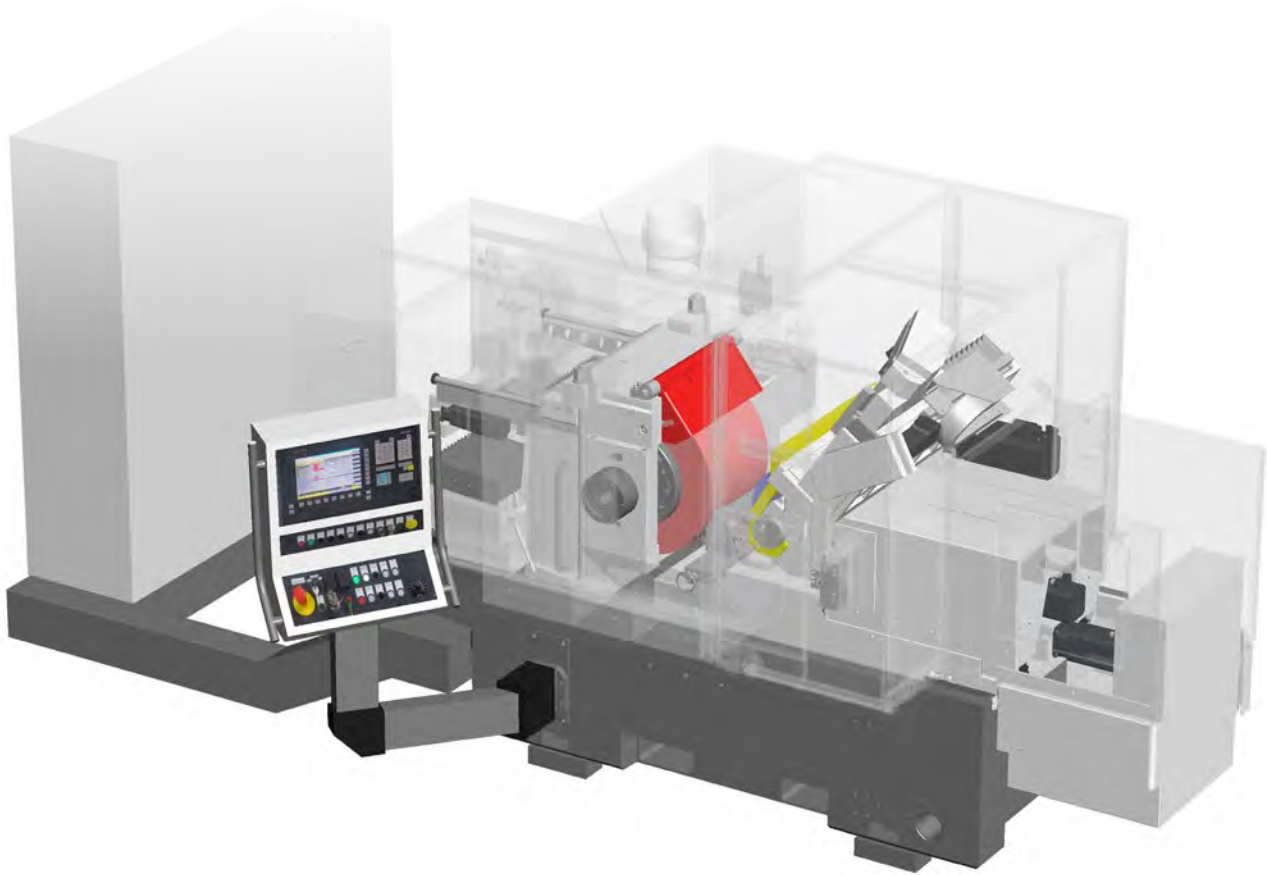
Your advantages

- Extremely stable, maintenance-free regulating spindle on double-sided bearings
- Grinding spindle with double-sided bearings

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

The regulating spindle is also designed as a double-sided bearing. High-precision, pretensioned spindle bearings are used. The regulating spindle is suitable for 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.

Technology spectrum



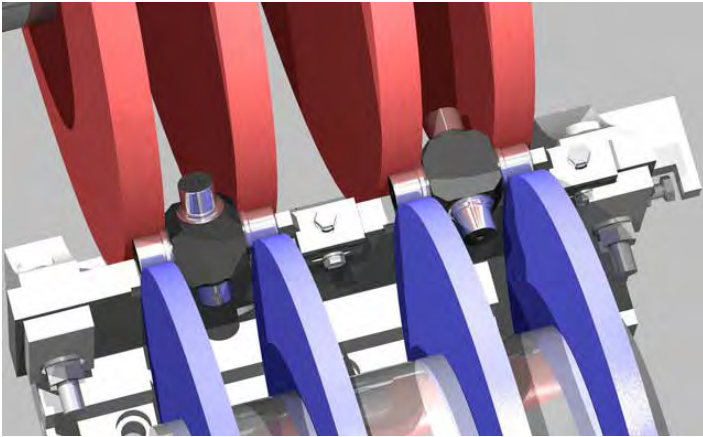
Centerless external cylindrical grinding is a superproductive method for the series and mass production of cylindrical, conical, and crowned workpieces. A distinction is made between two basic methods – infeed grinding and throughfeed grinding.

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, cross pins, gear and electric motor shafts.

The workpiece is not clamped by means of friction locking. It is placed in the so-called grinding zone between grinding wheel, regulating wheel and workpiece fixture. These components support the workpiece stably over its entire length or 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.

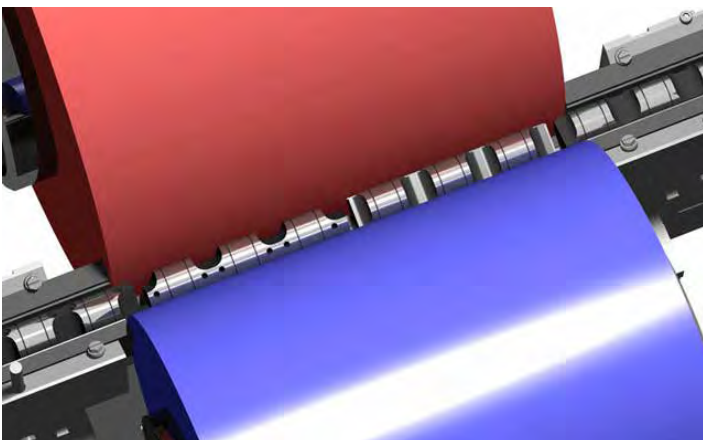
Available technologies

- Infeed grinding – straight
- Infeed grinding in single or multiple production
- Throughfeed grinding



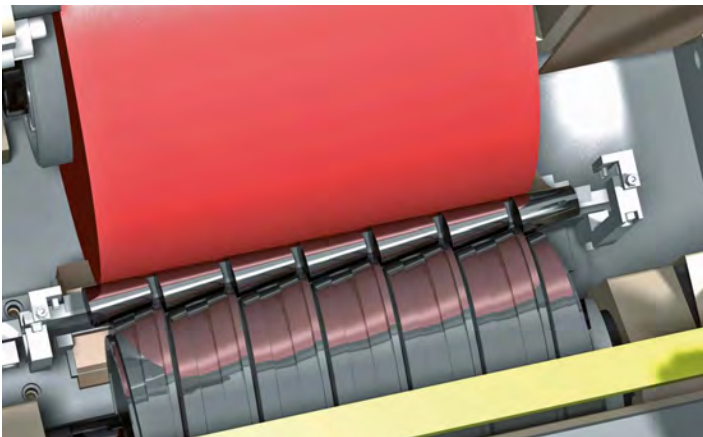
Straight infeed grinding – single and multiple production

- 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

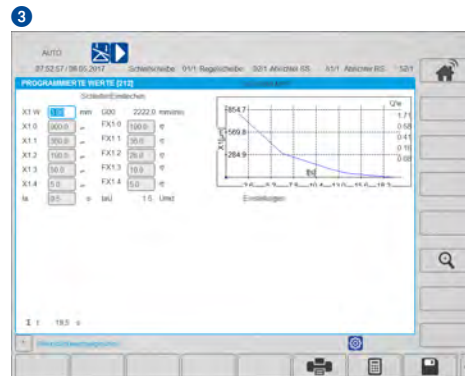
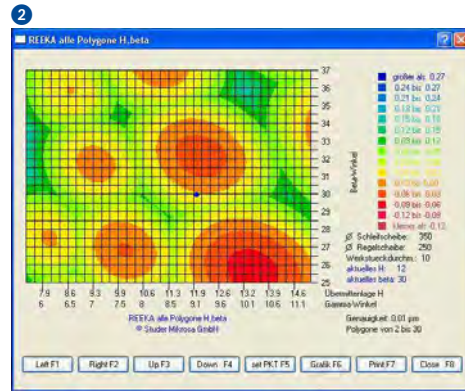
- Superproductive grinding method for the mass production of small, precision workpieces



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



Your advantages

- Application-specific software
- Special operator interface for centerless grinding
- Easy to understand pictograms

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. The added symbols and icons are easy to understand and make 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 software modules such as HEUREKA for grinding technology optimization
- Extensive operating and error messages for operator guidance 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

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



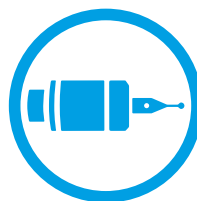
Prevention

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 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
Peripheral speed CBN (option)	m/s	90/120
Drive power	kW	37/51

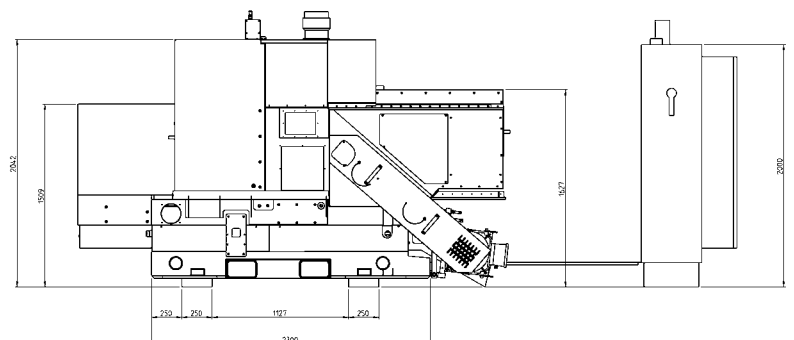
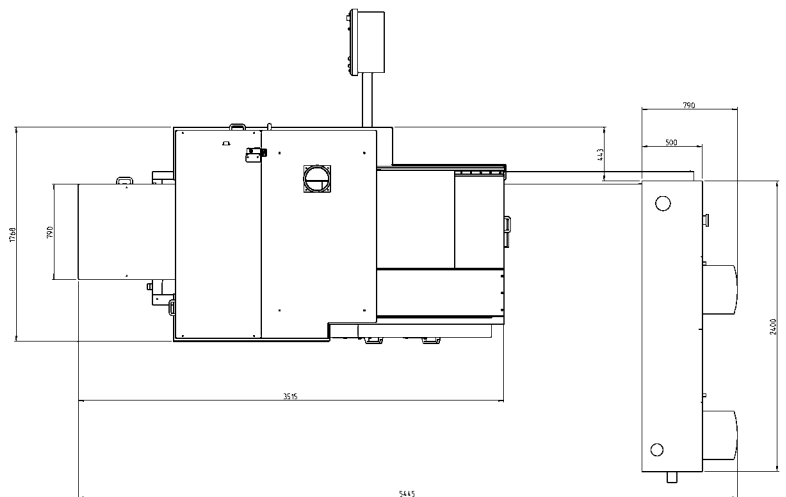
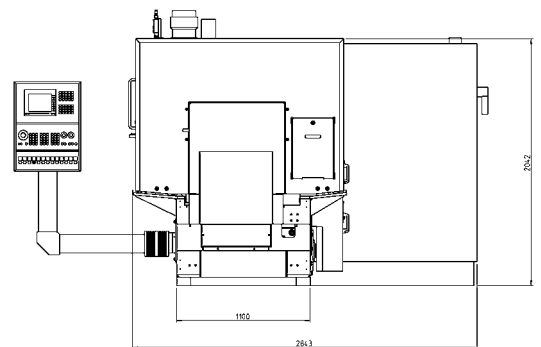
Regulating wheel

Diameter, max.	mm	350
Width, max.	mm	400
Bore	mm	127/152/177,8
Rpm range, infinitely variable	rpm	5...450
Dressing speed	rpm	450
Drive power	kW	5.7

Dimensions

Overall footprint (incl. control cabinet)	mm	5,696 x 3,330
Height, max.	mm	2,300

Machine weight	t	11
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KRONOS K

Grinding range

Workpiece diameter	mm	4.5...35
Workpiece length, max.	mm	50

Grinding wheel

Diameter, max.	mm	610
Width, max.	mm	300
Bore	mm	304.8
Peripheral speed	m/s	63
Drive power	kW	37

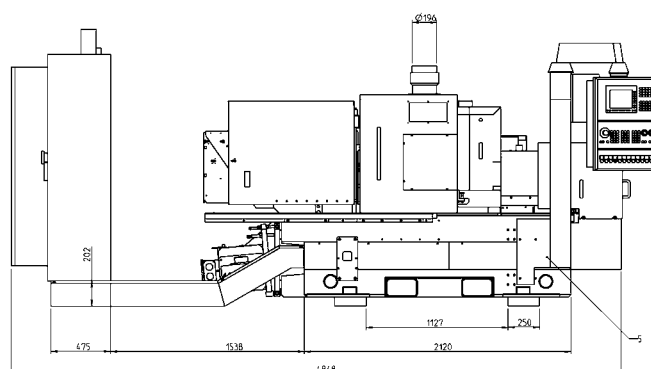
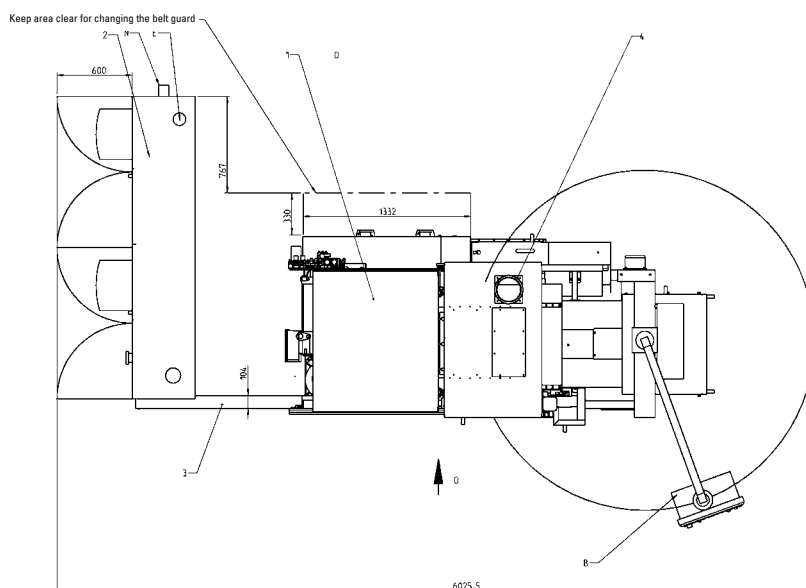
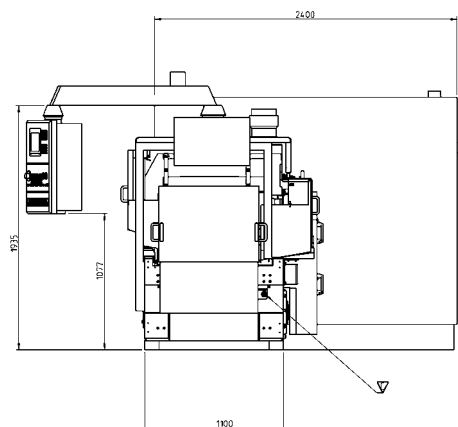
Conveyor screw

Diameter, max.	mm	310
Width, max.	mm	420
Bore	mm	204.5
Rpm range, infinitely variable	rpm	5...600
Dressing speed	rpm	600
Drive power	kW	5.7

Dimensions

Overall footprint (incl. control cabinet)	mm	5,450 x 3,050
Height, max.	mm	2,000

Machine weight	t	11
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