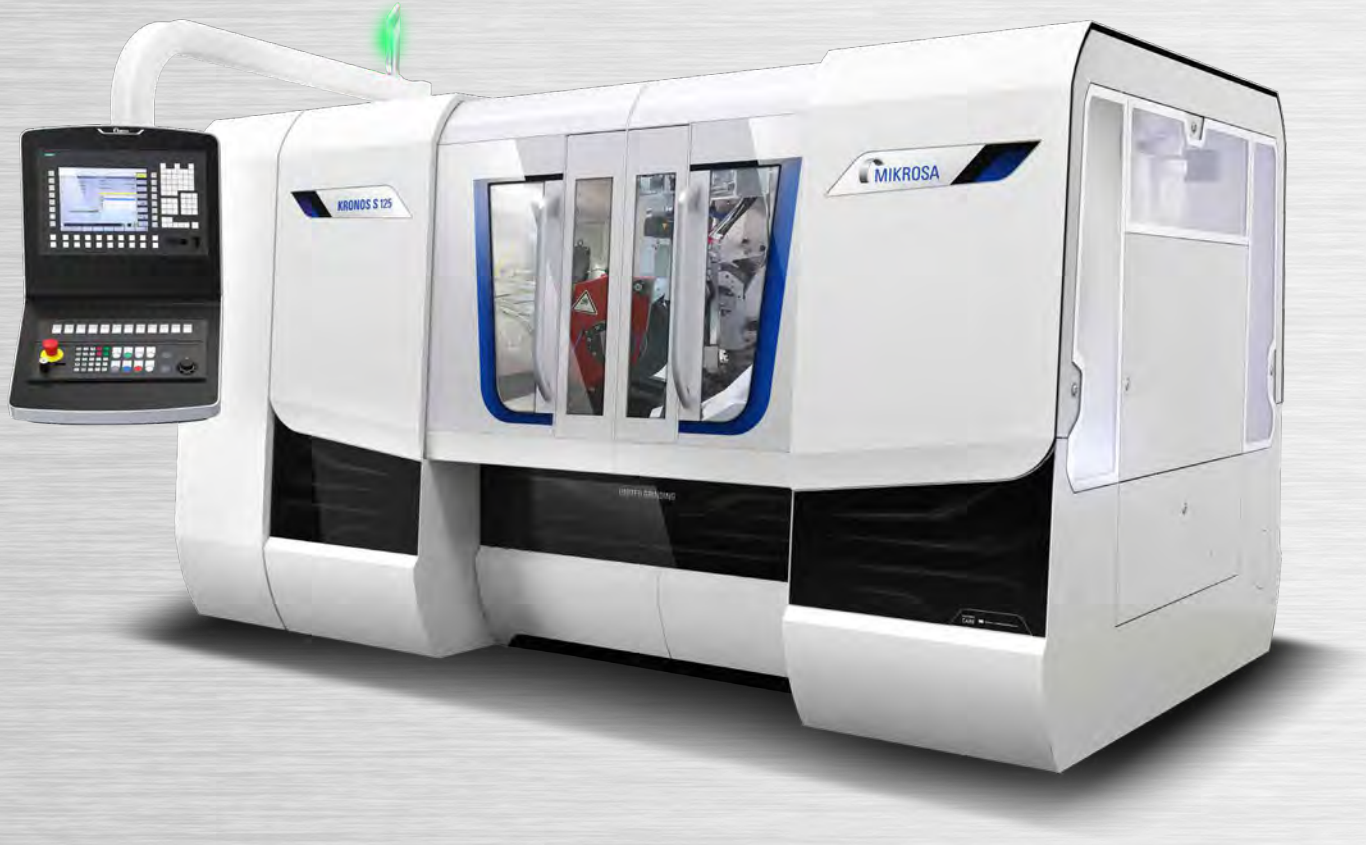
KRONOS S

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

Schaudt Mikrosa GmbH

Schaudt 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.

Schaudt 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 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® machine base
- Cross slide system on grinding and regulating wheel side
- Swiveling control panel for front and rear operation
- Arrangement of dressers on workpiece level for highest dressing precision
- Fixed grinding zone 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 zone 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. That, in combination with the CBN high-speed technology, allows for a significant reduction of the cycle time of the machine while it increases the cost effectiveness considerably.

The base consists of a thermally stable and vibration-damping Granitan® machine bed. On this are mounted the cross-slide systems for the grinding and regulating wheel side, which guarantee enormous flexibility during grinding. With 4 CNC axes, they give the KRONOS S 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.

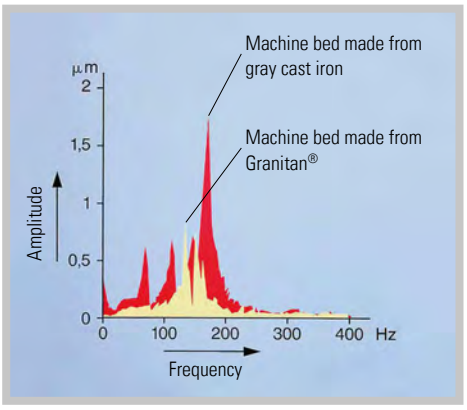
A standardized integrated handling system with an interface to external transport and palleting devices is optionally available.

Granitan® machine base

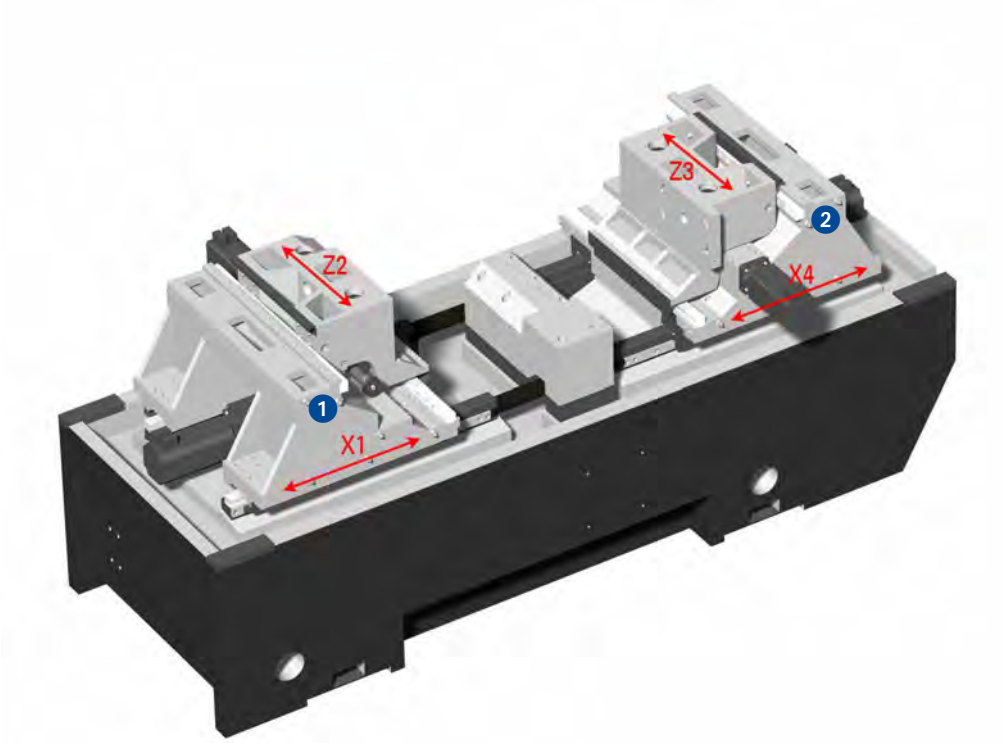
Your advantages

- Vibration-damping
- Thermally stable
- High dimensional stability

The basis of the KRONOS S 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.



Cross slide system



Your advantages

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

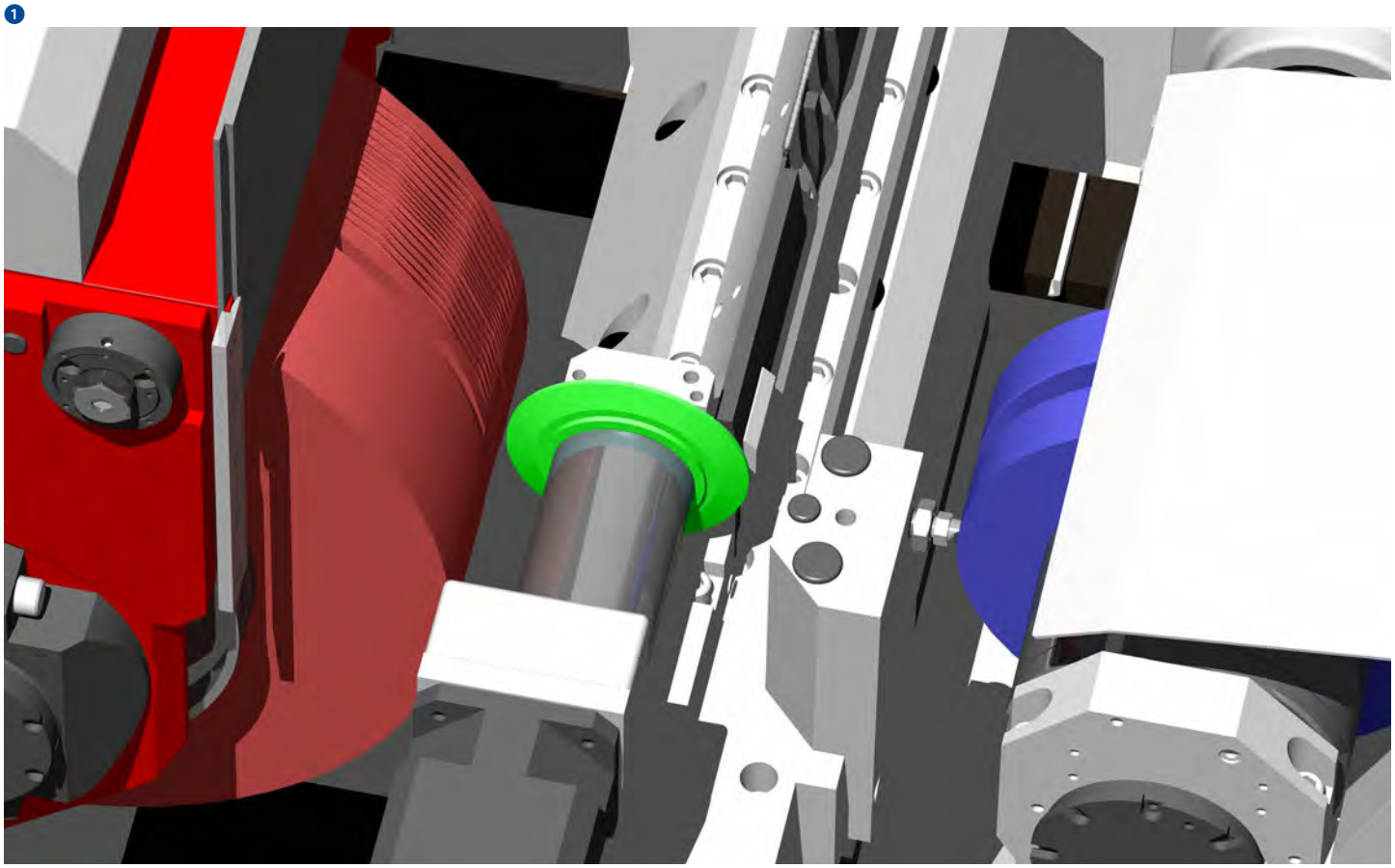
The KRONOS S has a fixed grinding zone. This means that the workpiece support is fixed in the center of the machine. All infeed and compensation movements are conducted by the cross slide system on the grinding wheel side (X1-axis / Z2-axis) and the cross slide system on the regulating wheel side (X4-axis / 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.

The guides are pre-tensioned recirculating roller guides. A digital servo motor and precision re-circulating ball screws are used for the axis drive with infeed steps for the X1- and X4-axis of 0.1 µm each, optionally even 0.01 µm. As standard the axes are equipped with glass scales as linear length measuring system.

1 Grinding wheel side
2 Regulating wheel side

Dressing

1



2

3

4

Your advantages

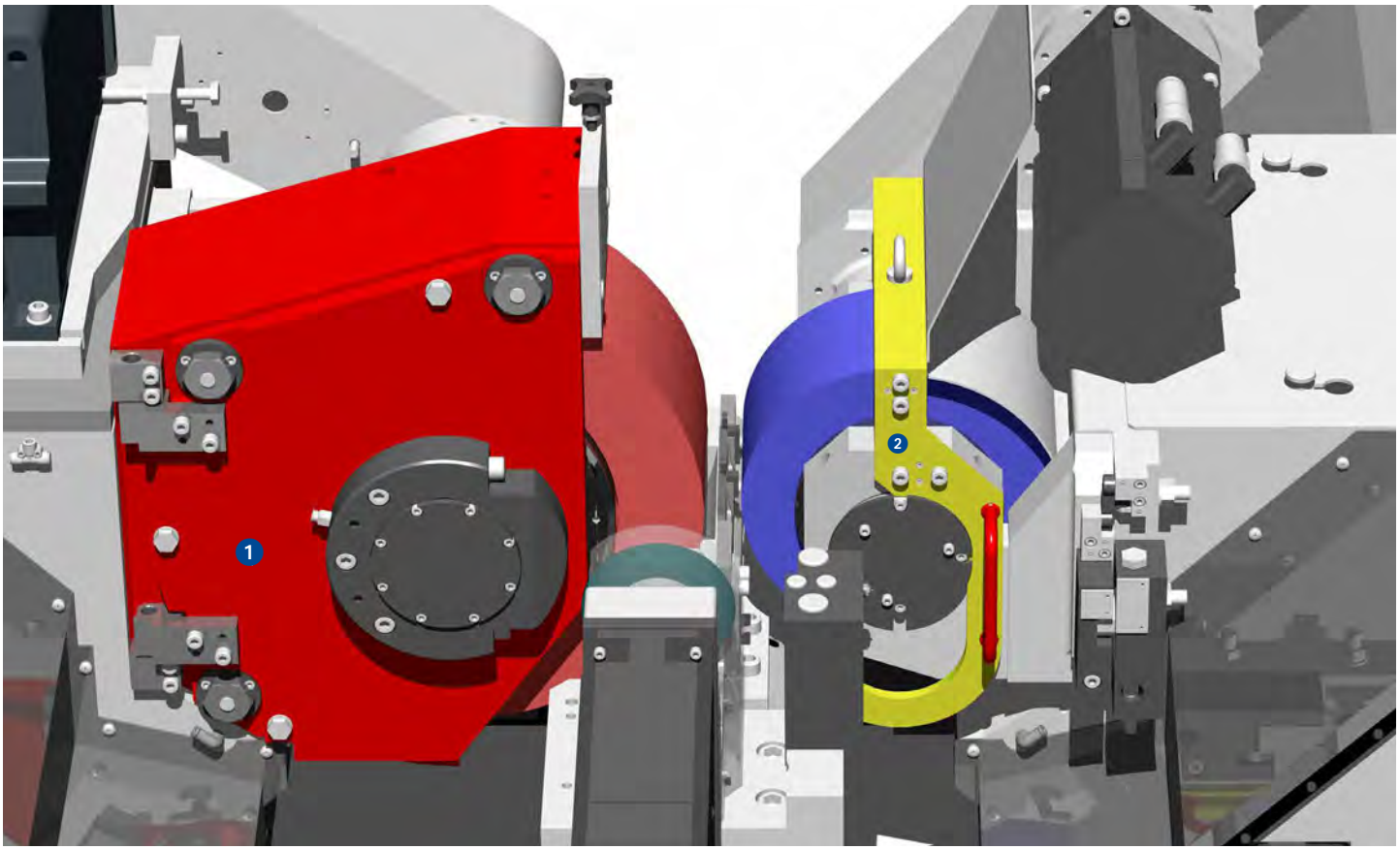
- Modular dressing system
- Extremely high dressing and profile accuracy
- Acoustic gap control

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.
Dressing of the regulating and grinding wheel occurs in the center of the machine on the workpiece plane. This way highest accuracies are achieved.

If a profile roll dresser is used to dress the grinding wheel, the dressing tool can be flexibly selected. The dressing arbor for rotating dressing tools can be replaced with a fixed shaft for stationary dressing tools as needed.
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



Your advantages

- Extremely stable, maintenance-free grinding and regulating spindles on double-sided bearings
- Grinding wheel with 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 is equipped with maintenance-free hybrid bearings. This allows speeds up to 7,200 rpm. As a result, peripheral speeds of up to 120/150 m/s can be achieved without difficulty. The spindle is suitable for the use of both conventional grinding wheels up to 63/80 m/s and super-abrasive cutting materials, such as CBN or diamond. The grinding wheel width is a maximum of 125 mm, respectively 250 mm with a bore diameter of 203.2 mm.

The regulating spindle has double-sided bearings. For that, high-precision, pre-tensioned spindle bearings are used. The regulating spindle allows for the use of 125 mm, respectively 250 mm wide regulating wheels. The drive is a digital servo motor and V-ribbed belt driven by a clutch, free of lateral forces. The operating speed range of 5...500 rpm can be continuously adjusted. For dressing the regulating wheel, a speed of up to 1,000 rpm is available.

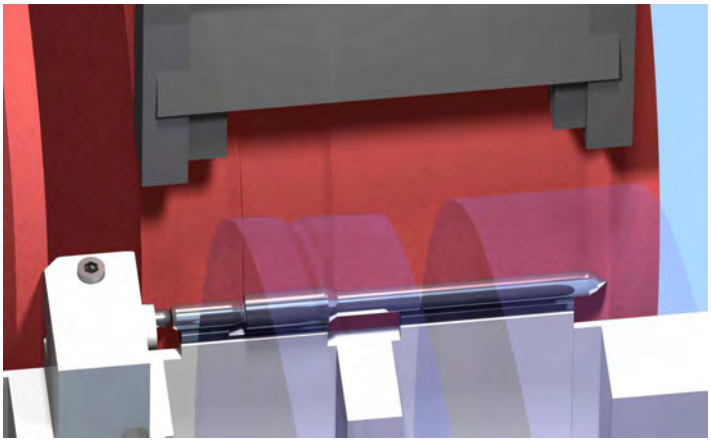
1 Grinding wheel side
2 Regulating wheel side

Technology spectrum

Centerless external cylindrical grinding is a superproductive method for the series and mass production of cylindrical, conical, and crowned workpieces. 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.

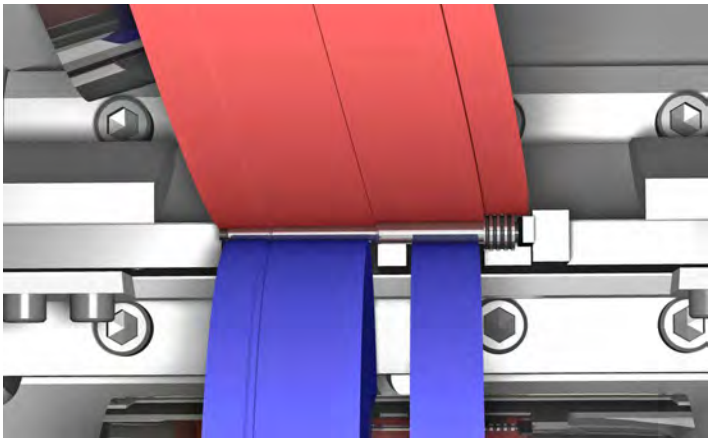
Available technologies

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



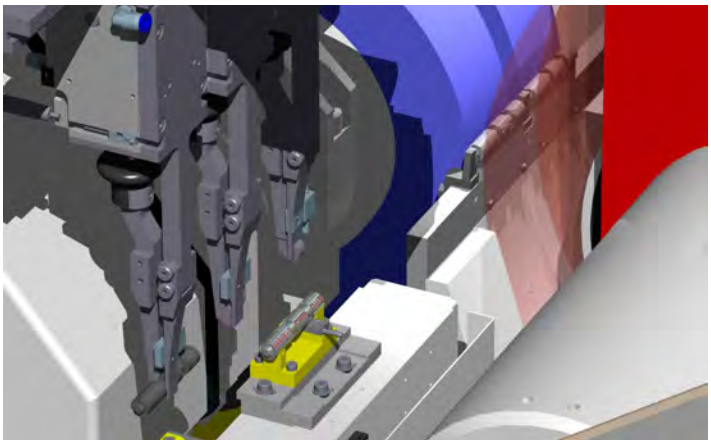
Straight infeed grinding – single production

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



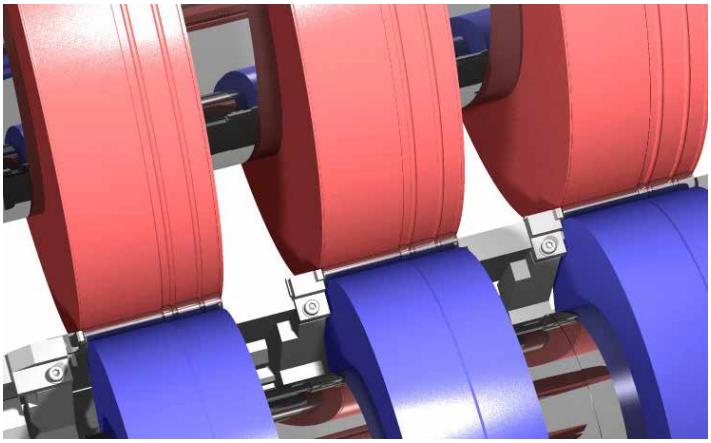
6° / 15° angled infeed grinding

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



Infeed grinding in several operations

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



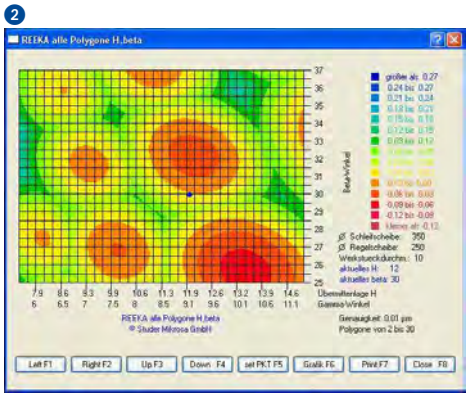
Straight infeed grinding – multiple production

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

Control system and software

1

2



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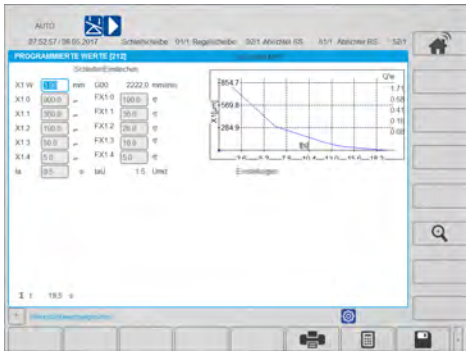


Your advantages

- 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 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. 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 HEUREEKA 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

1 Control panel
2 Additional module HEUREEKA
3 Software module “Grinding Technology”

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

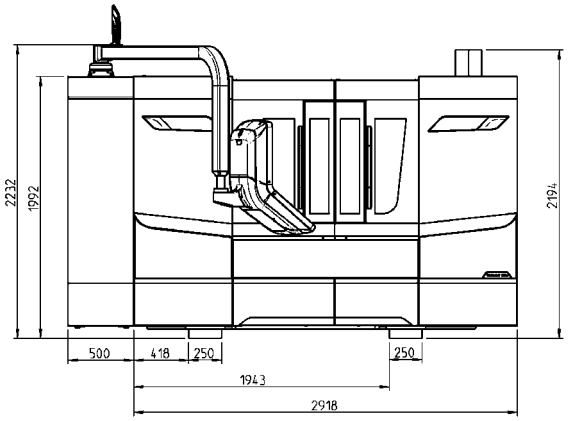
Diameter, max.	mm	400
Width, max.	mm	125
Bore	mm	203.2
Peripheral speed	m/s	63
Peripheral speed CBN (option)	m/s	120
Drive power	kW	11/15

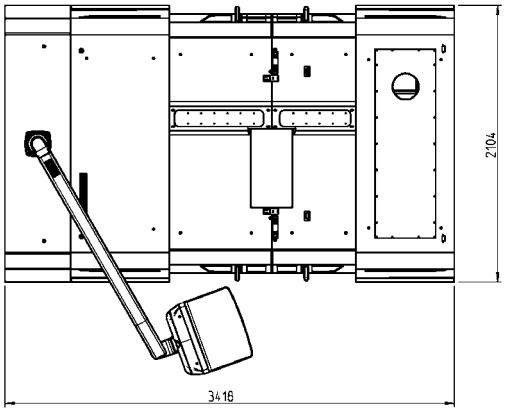
Regulating wheel

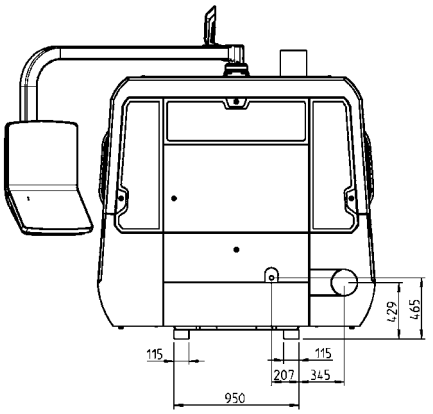
Diameter, max.	mm	250
Width, max.	mm	125
Bore	mm	127
Rpm range, infinitely variable	rpm	5...500
Dressing speed	rpm	1,000
Drive power	kW	5

Dimensions

Overall footprint (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
Peripheral speed CBN (option)	m/s	120/150
Drive power	kW	15

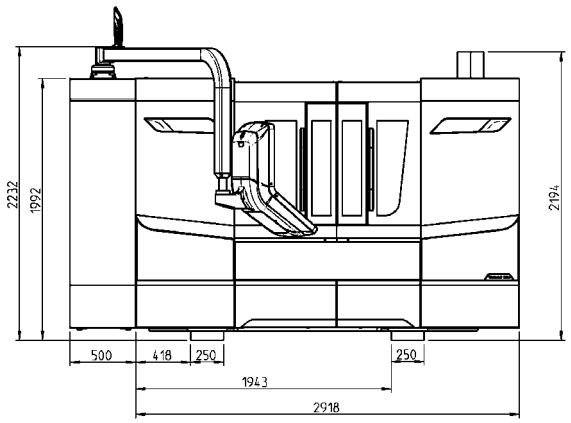
Regulating wheel

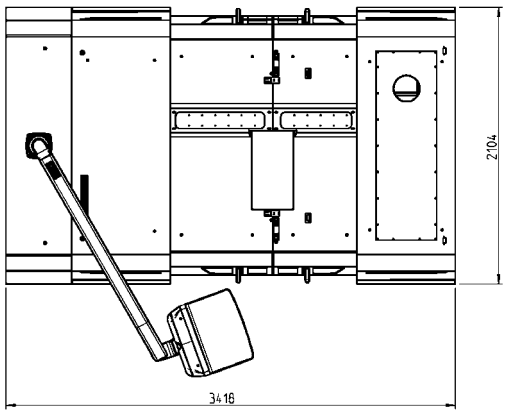
Diameter, max.	mm	250
Width, max.	mm	250
Bore	mm	127
Rpm range, infinitely variable	rpm	5...500
Dressing speed	rpm	1,000
Drive power	kW	5

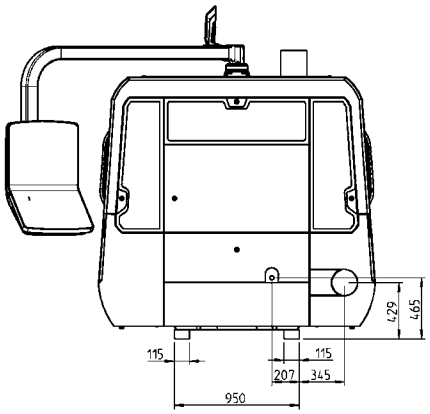
Dimensions

Overall footprint (incl. control cabinet)	mm	6,500 x 4,600
Height, max.	mm	2,232

Machine weight t 8.8







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