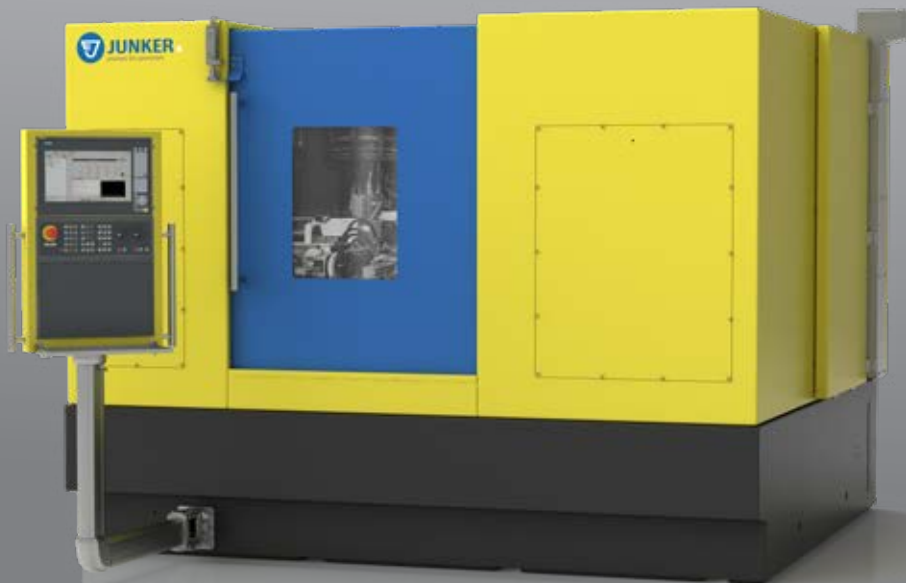
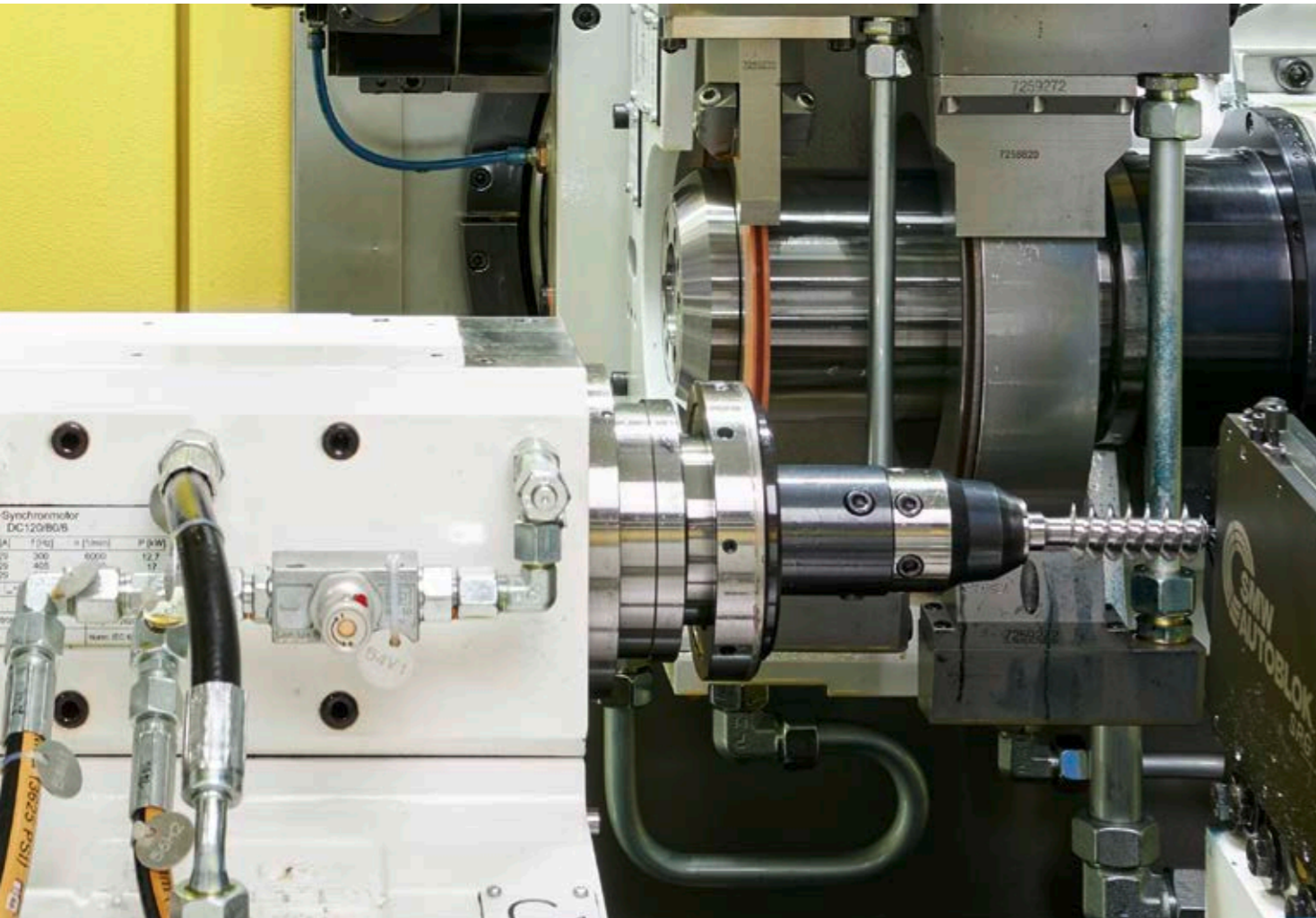


# WORM SHAFT GRINDING

PLATFORM 2000



# UNBEATABLE CYCLE TIME FOR COMPLETE PROCESSING



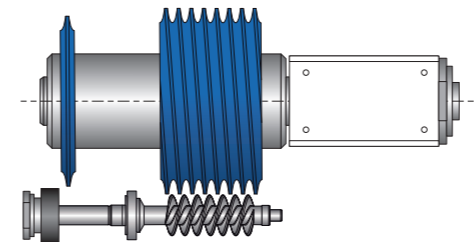
The high-speed grinding machine JUTWIST and JUMAT of JUNKERs 2000 platform is dedicated to manufacture worm shafts and work shaft profiles from blank. The worm shafts are used, for example, in the automotive industry and in general mechanical engineering, where they are used for transmission and power transmission, and are fitted in various steering systems, servomotors and parking brakes, for example. The production process can be easily transferred to other, geometrically similar workpieces.

## WORM SHAFT GRINDING

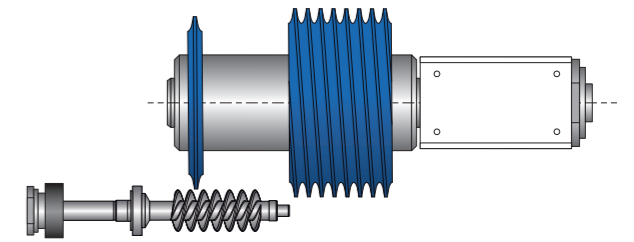
Thanks to the geometry calculation of the multi-tooth and single-tooth grinding wheel, the grinding wheel is perfectly shaped for the thread of the workpiece. The electroplated profile grinding wheel that is used for the pre-grinding allows for a high cutting capacity and is ideal to process soft but also hardest materials.

The threads are finish ground with aluminum oxide, this results in workpieces with outstanding geometry and surface quality.

## MULTI-TOOTH PROCESS JUTWIST

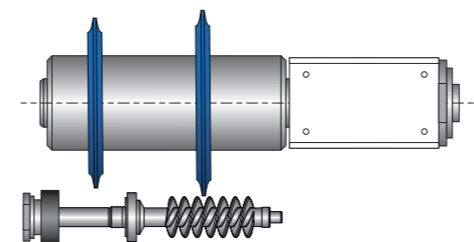


Pre-grinding

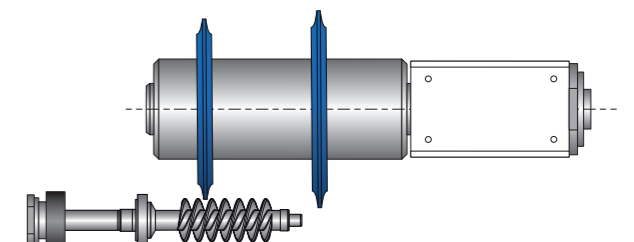


Finish-grinding

## MULTI-TOOTH PROCESS JUMAT

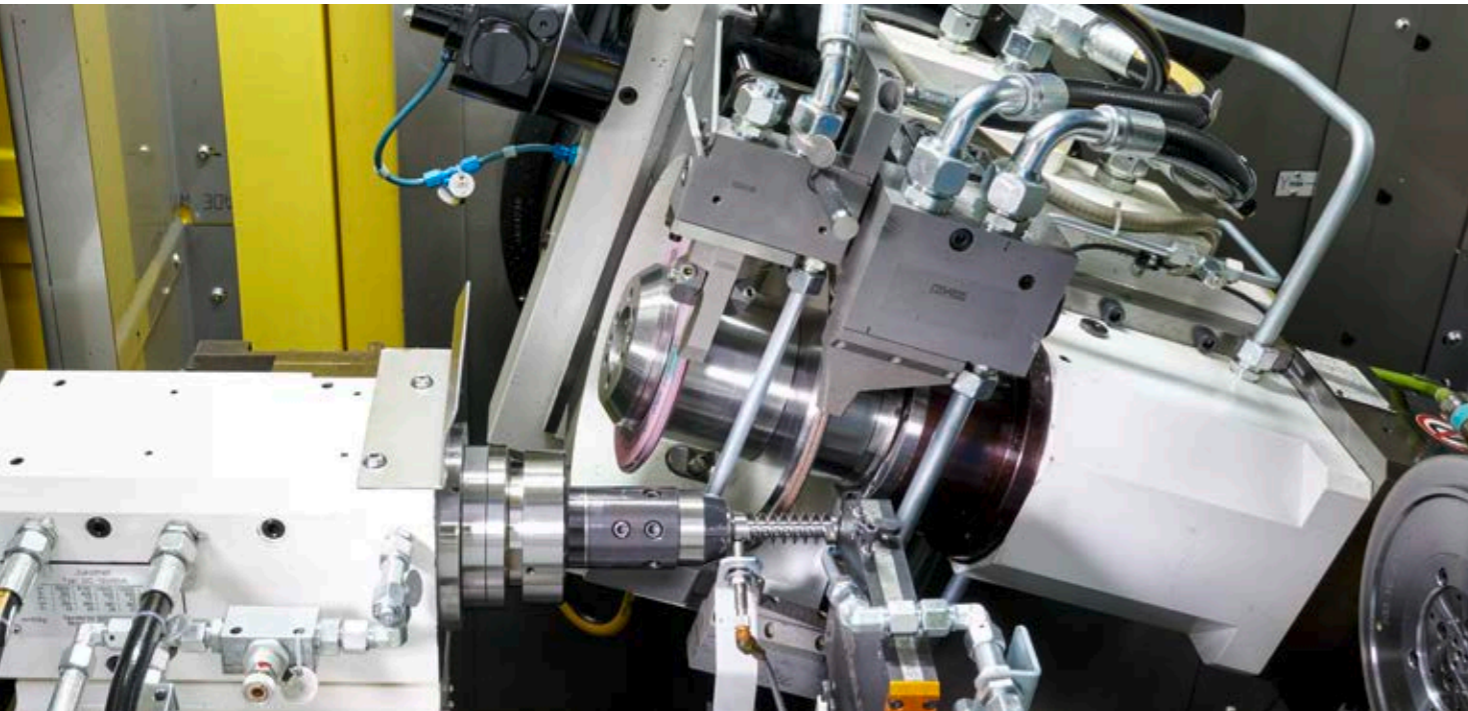


Pre-grinding



Finish-grinding

# OUTSTANDING SURFACE QUALITY

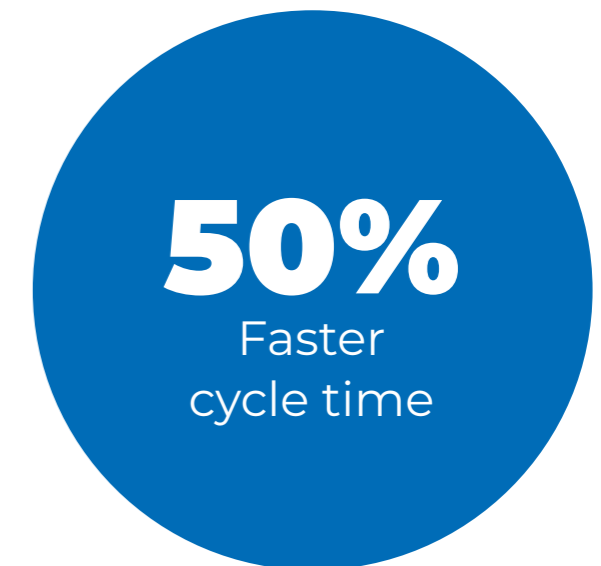
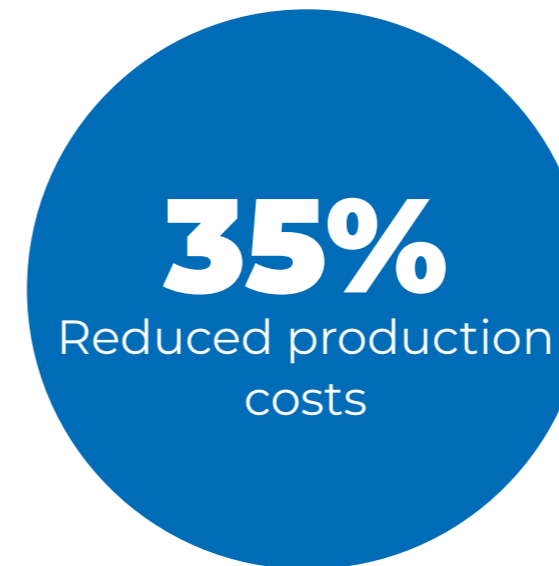


## RANGE OF WORKPIECES HIGHLIGHTS

The new machine platform allows wormshaft grinding of single and multi threaded parts up to a total clamping length of 300mm and a swing diameter of up to 80mm.

Which worm shafts can be ground?

- Right- and left-hand threads
- Open and closed profiles, as well as profiles that are closed on one side
- Single-thread and multi-thread parts
- Various materials



## HIGHLIGHTS

- Pre- and finish-grinding in a single setting
- Long service life for the tools
- Low tool costs
- High quality (roundness, concentricity, dimensional accuracy, diameter tolerance)
- Achievable surface quality of Rz 1 possible following the finish-grinding
- AQM traverse the process direction <20
- Process-reliable, high repeat accuracy
- Integrated deburring station
- Fast machine changeover

# EQUIPMENT AND OPTIONS

## DEBURRING STATION

With the integrated deburring station, JUNKER offers the reliable and process-reliable removal of the broken tooth on the worm shafts in parallel to the grinding process. The workpieces are transported directly to the clamping system via an internal loading gantry.



## SETTING

The worm shaft is clamped on the workhead using a collet chuck. Furthermore, the workpiece is centrally clamped using a steady rest for the stock reference and using the tailstock for the center reference.

## POSITIONING AND MEASURING SYSTEMS

The positioning button measures the longitudinal and radial position. The measured values are automatically integrated into the grinding process by the control system. You can also use the positioning button to carry out numerous measuring operations, such as crown and root circle measurement.



## DRIVING AND GUIDING THE AXLES

The linear drive of the Z-axis allows for high moving and acceleration values. Furthermore, thanks to the interaction between the A-axis and the Y-axis, the profile's angle of inclination can be adjusted variably. As a result, the new technology provides the flexibility that is required in production.

The C-axis with direct drive allows for an extremely high speed range up to 10,000 rpm.

## CONTROL SYSTEM

With the comprehensive JUWOP II software, booth, JUTWIST and JUMAT, are optimally equipped and guarantee simple operation, fast loading and perfect programming results. The Erwin Junker Operator Touch Panel was specially developed for controlling grinding machines. All machine components are controlled via the control panel – irrespective of the series or the control system that is used. The identical structure, intuitive menu navigation and visualization of the workpiece geometry make it extremely user-friendly and flexible to operate. It is programmed directly via the control panel or via an external programming tool.



## MACHINE BED

The mineral cast machine bed impresses with its damping performance and high torsional stiffness. Thanks to the temperature stability, fluctuations in the environmental temperature can be effortlessly offset. This guarantees high dimensional accuracy even in a 3-shift environment.

## LOADING SYSTEMS

Thanks to the optimized arrangement of the grippers for the blank and finished part, the internal V-loader allows for ideal workpiece handling. Within just a few seconds, the workpiece is changed and, thanks to the keyhole transfer, it is transferred to the external loading system – optimal production capacity while also easing the workload of the operating personnel. The loading systems can also be combined with various feeding and unloading systems, such as conveyor belts or systems that have been adapted to meet customer requirements.

As a full-service provider, the JUNKER Group provides tailor-made automation solutions.



## DRESSING UNIT

The dressing of the grinding wheel is controlled by CNC. A driven diamond dressing wheel or a workpiece-dependent diamond profile roller can be used. The dressing is carried out via an automatic dressing program with grinding wheel compensation. In parallel to the loading process, a dressing device can be used to dress the corundum grinding wheel. This reduces the auxiliary process times.



### ABRASIVE

An electroplated CBN grinding wheel is used for the pre-grinding. Corundum is used as the abrasive for the finish-grinding.

### FIRE PROTECTION AND LTA AIR FILTER

In the event of a deflagration, the inside of the machine is automatically hermetically sealed, meaning that a fire is extinguished before it can spread. If required, extinguishing systems (CO<sub>2</sub> or water mist fire extinguishers) and waste air purification plants can also be installed. LTA Lufttechnik GmbH is a competent partner for fire protection and filtration solutions. The company also belongs to the JUNKER Group and researches, develops and produces filter systems for industrial air purification.



## SKILLS

### TECHNOLOGY CENTER

Numerous grinding machines are available for presentations and customer-specific grinding tests in the JUNKER technology centers in Nordrach, Germany, and in Holic, Czech Republic. Many interested parties and customers are won over here – on their own workpieces – by the technical and economic performance of the JUNKER and ZEMA grinding machines.

### SERVICE

The group's sales and service network, which is continuously growing, guarantees customer satisfaction right across the world. The JUNKER premium service operates quickly and competently across the world, is available 24 hours a day, and provides planning security: The highly qualified employees find a solution to every problem.

### ENERGY EFFICIENCY

The characteristic value for the efficiency of a machine tool is the energy requirement per good part. With grinding machines from JUNKER this continuously decreases because more and more processing steps can be carried out in one machine, the auxiliary process times are reduced and the precision increases further. As part of the energy management, energy-saving potential is continuously recognized and exploited. Examples include frequency-controlled components, regenerated brake energy or the optimized blast air consumption of the grinding spindle that was developed in-house.

### PRODUCTION LINES

JUNKER has extensive references for the design and implementation of production lines that are perfectly tailored to the customer's requirements. As a general contractor, JUNKER places great importance on standardized interfaces, for example for workpiece transport, coolant systems or measuring equipment. This increases the efficiency and guarantees the long-term interaction of all system components.

### SPECIAL SOLUTIONS

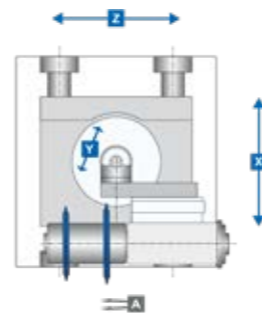
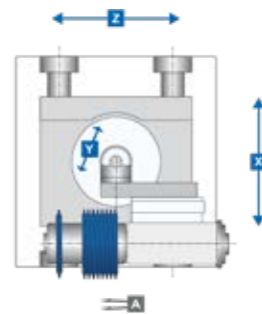
A new grinding challenge for JUNKER? „Tell us your grinding task and we will provide you with the perfect machine.“ With an enormous range of technologies, the engineers and technicians at JUNKER provide tailor-made solutions for all applications. Highest priority: Increase the workpiece quality, reduce the cycle time.

# TECHNICAL DATA



PLATFORM 2000	JUTWIST	JUMAT
Available Wheelhead variant	/30	/30
Number of wheelheads	1	1
Grinding spindle	50 kW	50 kW
Grinding length	300 mm	300 mm
Clamping length	300 mm	300 mm
Center height	150 mm	150 mm
Workpiece weight	4 kg	4 kg
Grinding wheel diameter (max.)	170 - 250 mm	170 - 250 mm
Swing diameter	80 mm	80 mm
W x D x H mm (without peripherals)	3000 x 2750 x 2430 mm	3000 x 2750 x 2430 mm
Weight	18,000 kg	18,000 kg
Control system	Siemens 840 DSL	Siemens 840 DSL

## WHEELHEAD VARIANTS



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