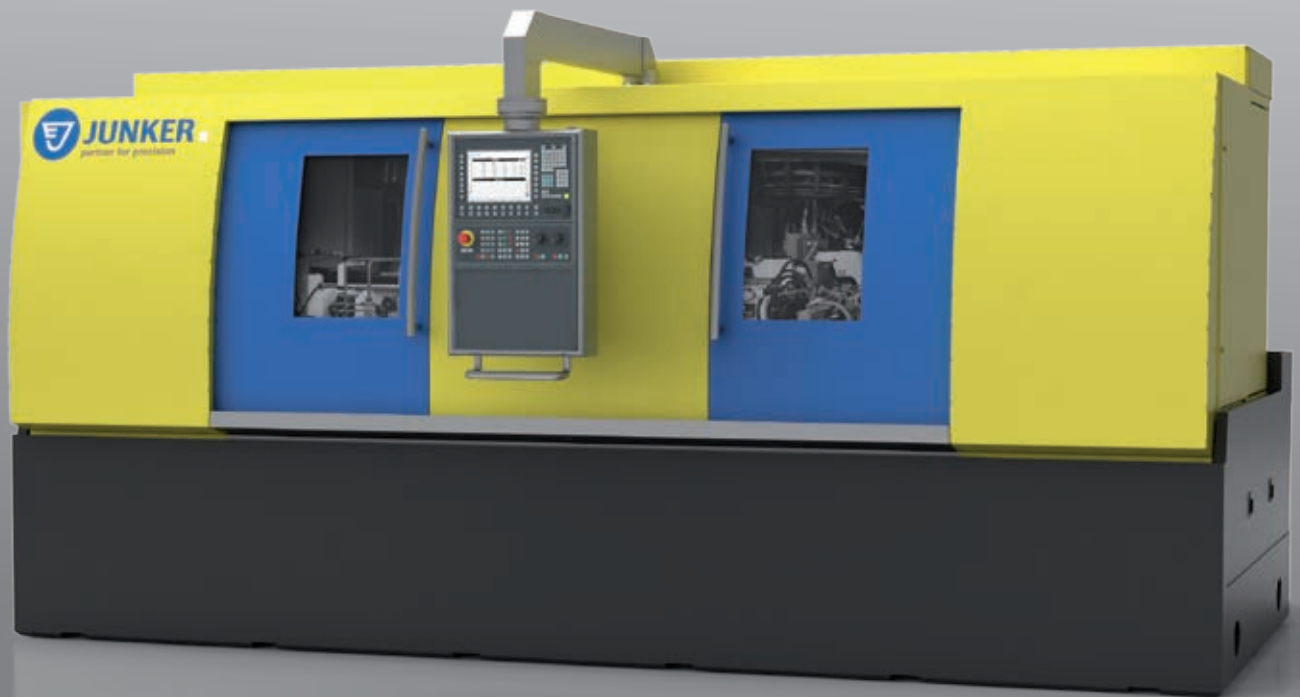


# JUCENTER

PRODUCTIVE CBN HIGH-SPEED GRINDING



# HIGH-PRODUCTION GRINDING FOR LARGE SERIES



The JUCENTER CBN high-speed grinding machine combines mutually complementary grinding possibilities under one hood. Instead of lining up individual grinding machines for different grinding tasks, both grinding processes take place in two separate clamping set-ups on one machine. The result: highly efficient grinding – all with top precision.

## MACHINE VERSIONS FOR NEARLY EVERY TYPE OF SHAFT

Whether it is for camshafts, crankshafts or gear shafts: the JUCENTER machine concept with its two grinding stations sets new standards. Grinding operations can be combined however the customer wants in one JUCENTER by combining different wheelhead versions. This allows for an optimal, workpiece-dependent machine design.

## THE TECHNICAL CONCEPT

JUCENTER allows for two grinding stations on one machine:

- Station 1 is generally for circular grinding with a grinding wheel (i.e. bearing seats on camshafts or main bearings on crankshafts).
- Station 2 is for non-circular grinding (i.e. cam shapes) or pendulum grinding (i.e. main bearings).
- Depending on workpiece-specific variants (tolerances / quality specifications,) a JUCENTER can be designed with a right-to-left or left-to-right production and part infeed direction.

## INVEST LESS, PRODUCE FASTER

Parts run through the machine in an uninterrupted sequence. The JUCENTER offers drastically reduced total investment volumes as compared with individual machines. This is because of savings on the loading and unloading unit, auxiliary equipment and controls. Further potential savings result from the fact that less space is required than for individual machines, because there is no interlinking of machines, and no interim storage facility required.

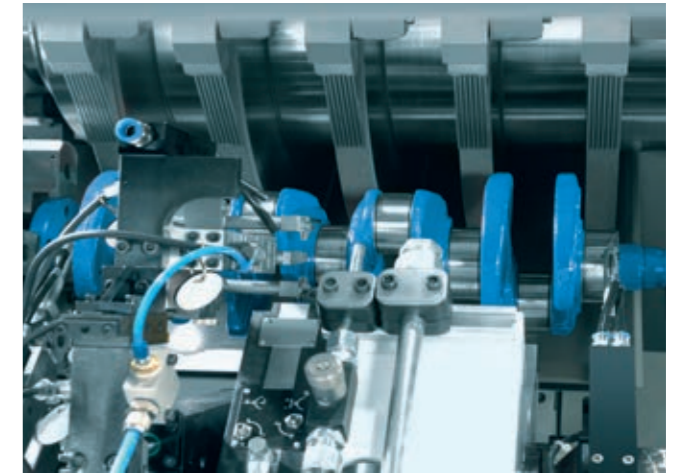
## COMMERCIAL ADVANTAGES

JUCENTER allows for two grinding technologies on one machine, and JUCENTER offers major advantages over interlinked individual machines:

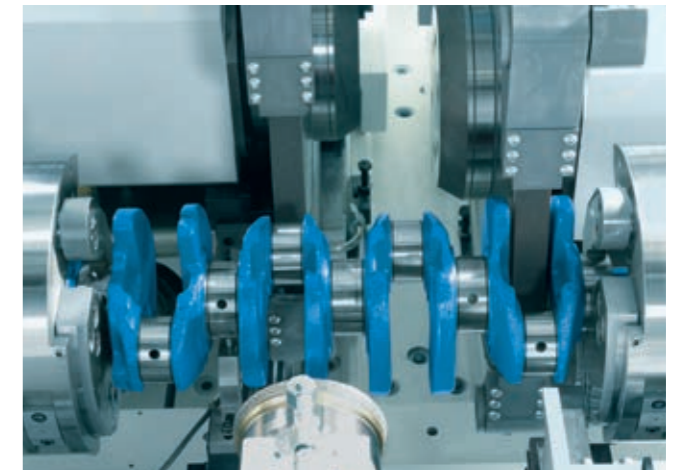
- Faster production time
- High process reliability
- Low overall investment
- Low space requirement
- Low operating costs
- Less man-power required

## TECHNICAL ADVANTAGES

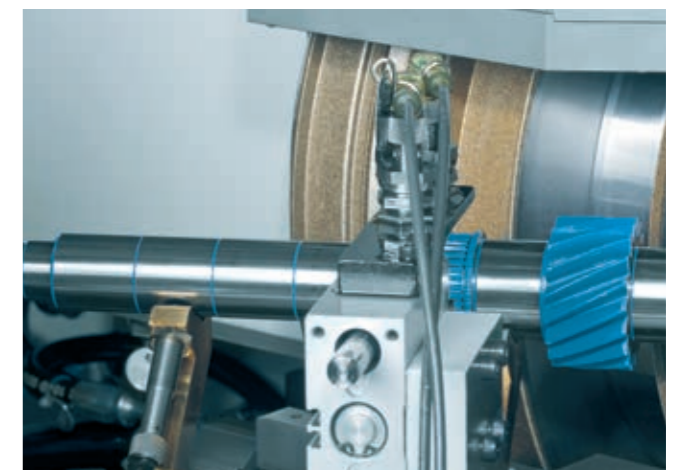
- Controlled dimensional accuracy using in-process gauging
- Controls with "Learning Function," including automatic compensation of roundness deviation and dimensional errors
- High long-term accuracy with hydrostatic circular guides (X-axis, infeed spindle, axial bearing)
- Uncoupled processes



Grinding station 1: Circular grinding of main bearings with grinding wheel set



Grinding station 2: Grinding of pin bearings



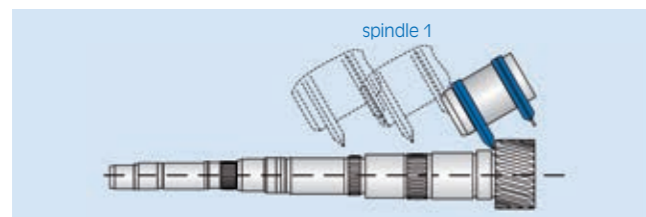
Grinding of diameters on transmission parts with sets of grinding wheels



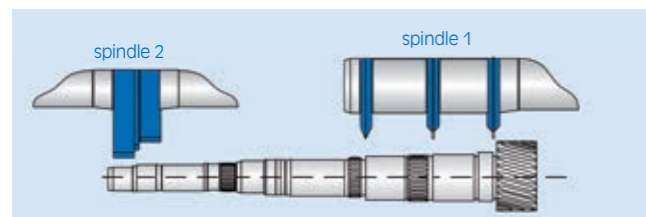
# GRINDING CONCEPTS FOR CAM, CRANK OR GEAR SHAFTS

## GEAR SHAFT GRINDING

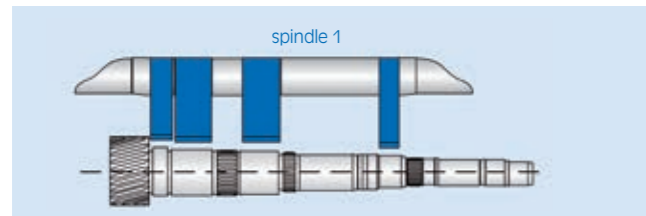
At station 1, JUCENTER grinds plunge-cuts and faces in a high-speed gear shaft grinding process. With the help of a B-axis, the grinding spindle can be swiveled to grind plunge-cuts, as well as faces with very fast cycle times. In station 2, multiple-bearing grinding of all centric diameters takes places.



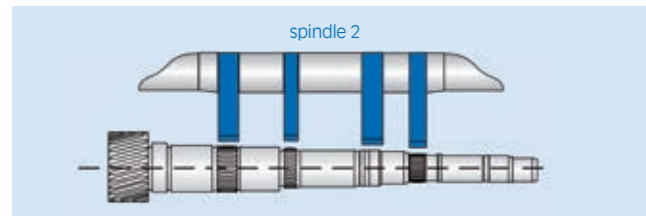
Station 1: Shoulder grinding



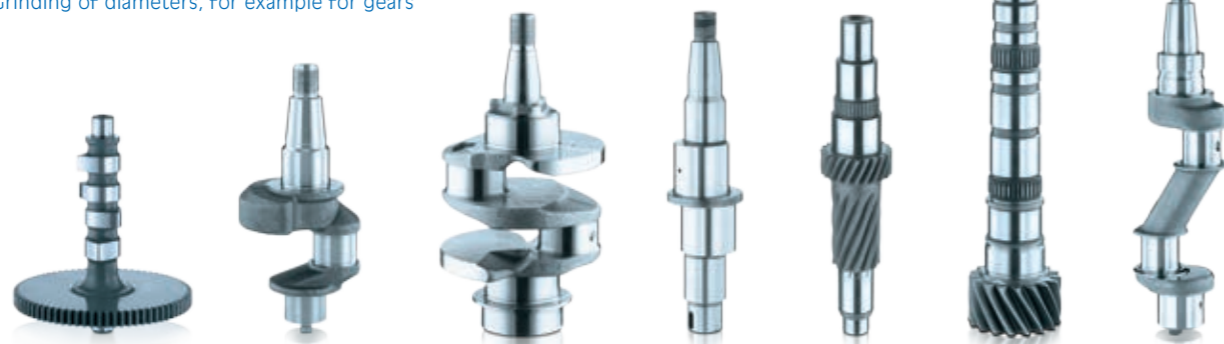
Station 1: Plunge-cut grinding



Station 2: Diameter grinding

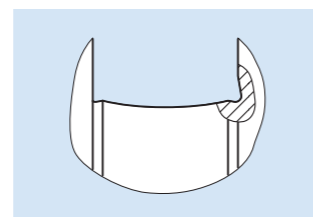


Station 2: Grinding of diameters, for example for gears

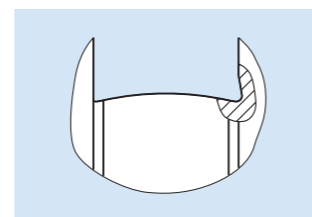


## CRANKSHAFT GRINDING

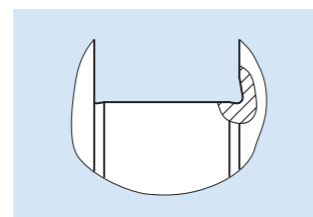
In station 1, CBN multiple-bearing grinding of all centric diameters (bearings and pivot) takes places. Parallel to this, other grinding carriages in the next clamping set-up (station 2) carry out non-circular grinding - that is, the grinding of main bearings. This is done using the pendulum grinding method with separately controlled CBN grinding wheels. Depending on workpiece-specific factors, workpieces can also be run in the opposite direction (from station 2 to station 1).



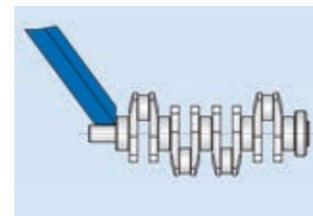
concave roll, undercut



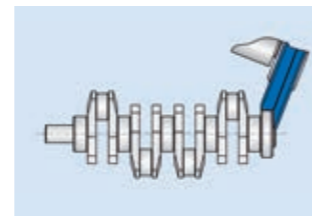
crowned roll, undercut



cylindrical roll, undercut



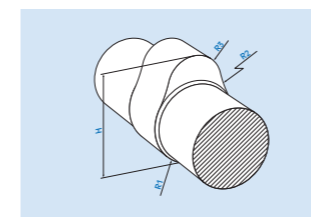
Pivot grinding



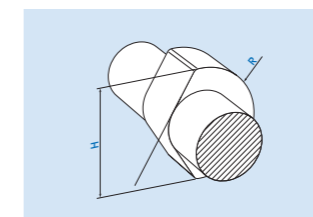
Flange grinding

## CAMSHAFT GRINDING

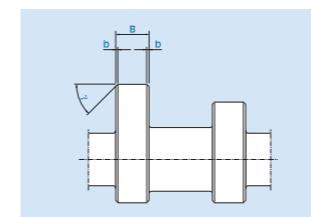
In station 1, sets of bearings are ground with one plunge-cut, using multiple-bearing technology. In station 2, JUNKER offers a versatile solution for grinding a variety of cam shapes. By using two independent infeed axes on station 2 for non-circular grinding, the machine can grind cams with unequal radial alignment just as fast as when using a set of grinding wheels.



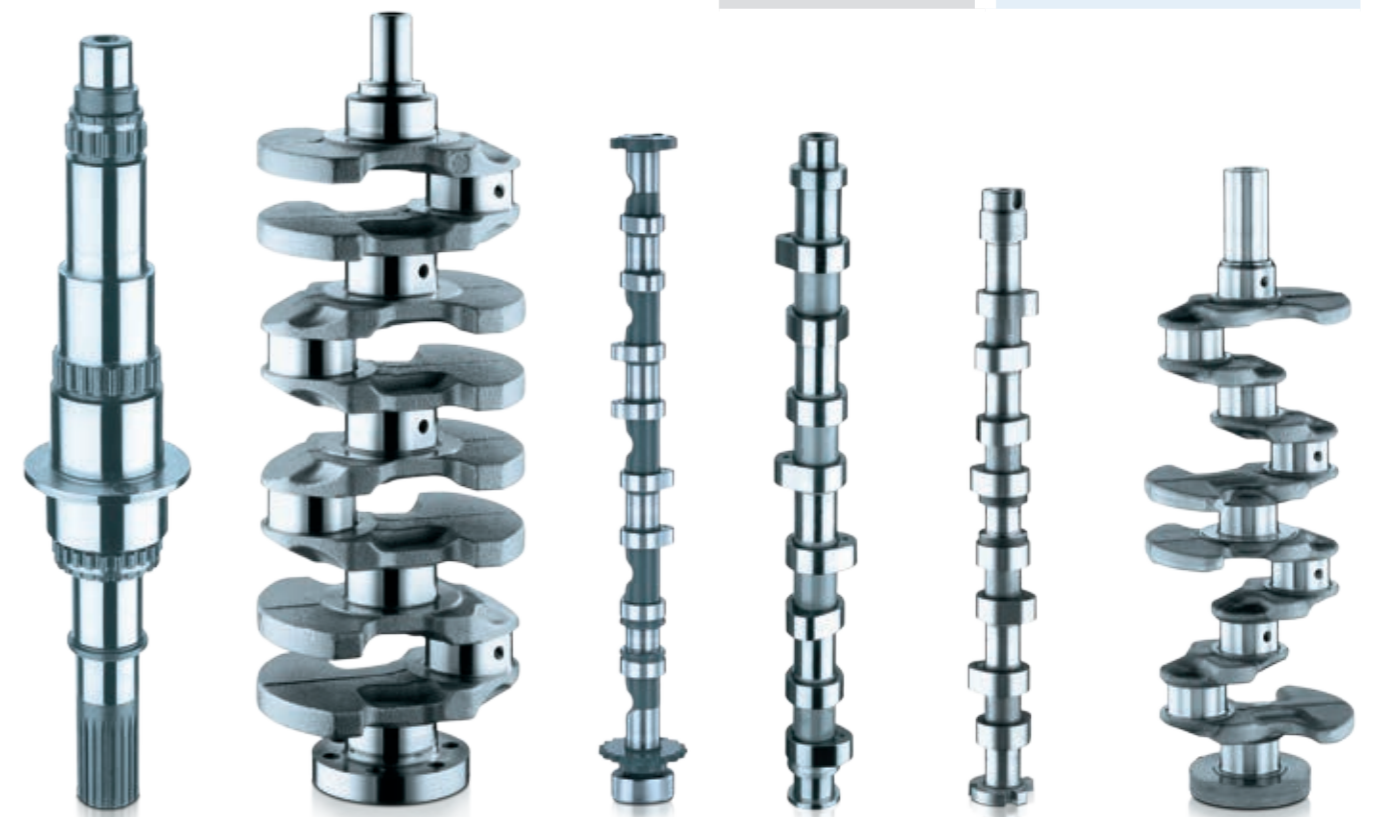
Cam shape with concave geometry



Polygonal shapes



Cylindrical cam shape; with/without chamfer, with/without radius



Technical Specifications	
Workpiece data	
Center height	max. 170 mm
Swing diameter	max. 280 mm
Clamping length	max. 500 mm
Grinding length	max. 500 mm
Workpiece weight between centers	max. 30 kg
Machine data	
Abrasive	CBN
Infeed	X-axis, CNC
Longitudinal motion	Z-axis, CNC
Infeed axis resolution	0,0001 mm
Maschine specifications without coolant plant	
Dimensions (WxDxH)	4,500 x 3,000 x 2,250 mm
Weight	Approx. 28,000 kg

# JUNKER'S CENTRALIZED CNC SYSTEM CONCEPT



## A COMPREHENSIVE OPEN SYSTEM

The idea: central control technology for all components in the grinding machine. All data and information is entered using the Erwin Junker Operator Panel. On the JUCENTER machines, this makes up the user interface for a FANUC CNC-control system.

## TELESERVICE – FAST AND EFFECTIVE

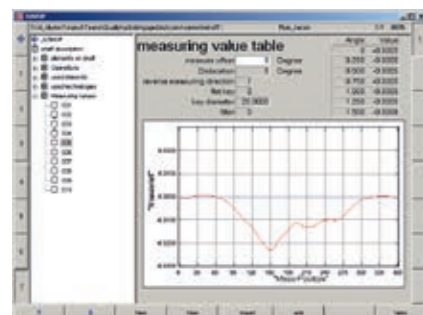
Your main go-to for all questions and issues is JUNKER Services. When required, all of the available data on the machine status can be analyzed online. JUNKER provides this service to increase machine availability while keeping service costs down.

## ERWIN JUNKER OPERATOR PANEL – STANDARDIZED FOR ALL MACHINES

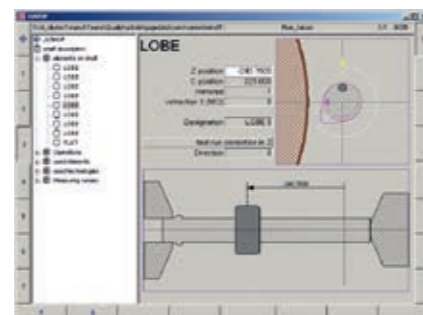
- Graphic interface and interactive processes for programming and operation
- Reduced training costs
- Minimizes the risk of operator errors
- Quick changeover and set-up
- Storage of all grinding parameters
- Machine programming, can also be done centrally, i. e. basic mask for process engineering

## Advantages of the hardware and software concept

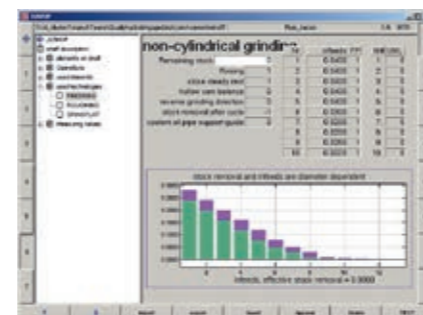
- All components are accessible via Teleservice
- Identical operation of different machines, regardless of the controls used
- Standardized user interface for all components
- Automatic data backup, including settings for all components from third-party vendors



Measurements, polar coordinates



Description of shaft design, details



Technologies used

# VARIABLE EQUIPMENT AND INDIVIDUAL OPTIONS

## INTEGRATED LOADING GANTRY

An integrated loading gantry reduces downtimes to an absolute minimum: it picks the blank up from the conveyor, brings it to station 1 and removes the ground part, which is then brought to station 2. The transfer options for blanks and finished parts outside the machine can be defined by the customer.

## MORE EXPERIENCE – MORE SAFETY

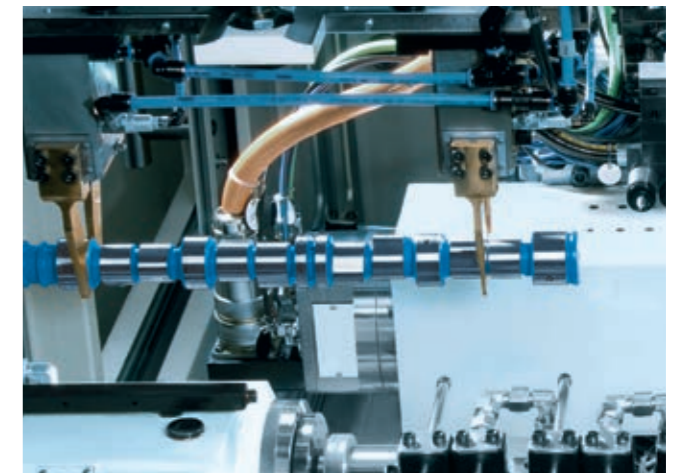
JUNKER is a pioneer in the use of CBN grinding wheels for high-speed grinding. This advantage with regards to experience and knowledge makes the company one of the leaders on the market. This is reflected in the long list of reputable customers that have enjoyed JUNKER technology for years. In addition, JUNKER grinding machines offer a sophisticated safety concept, which counteracts, for example, the risk of explosion that ensues from using oil as coolant.

## STANDARD EQUIPMENT

- Vibration-reducing, torsion-resistant polymer concrete machine base
- Hydrostatic circular guides, no stick-slip effect and with a 5-year guarantee with proper handling
- 3-point mounting system for grinding spindle, work spindle and tailstock center sleeve
- Wheelhead with automatic dynamic balancing system
- Grinding spindle for high-speed grinding over 140 m/s
- Workhead with hydraulic clamping

## RELIABLE FIRE PROTECTION CONCEPT – “THE JUNKER SAFETY SYSTEM”

Since the machines partly use oil for coolant, there is a risk of fire and explosion. The JUNKER safety system prevents damage to machines and facilities. In the case of explosion, the machine interior is automatically sealed off, preventing fire from breaking out (tested by the Institute for Safety Technology IBExU). Upon request, additional extinguishers (CO<sub>2</sub> or water-atomizing) and exhaust filters can be installed.



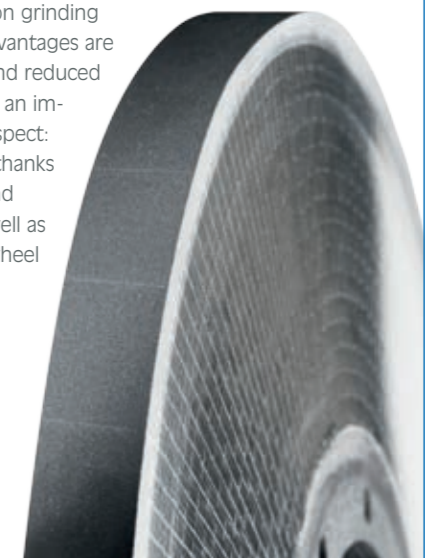
Integrated loading gantry

## Options

- Measuring equipment
- Longitudinal and radial positioning
- Air filter plants
- Steady rests
- Coolant plant
- Integrated loading gantry
- External loading system

## Option: Carbon grinding wheel

All JUCENTER versions can also be equipped with carbon grinding wheels. Technical advantages are higher cushioning and reduced weight. There is also an important economic aspect: higher productivity thanks to longer tool life and dressing cycles, as well as significantly fewer wheel changes.



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