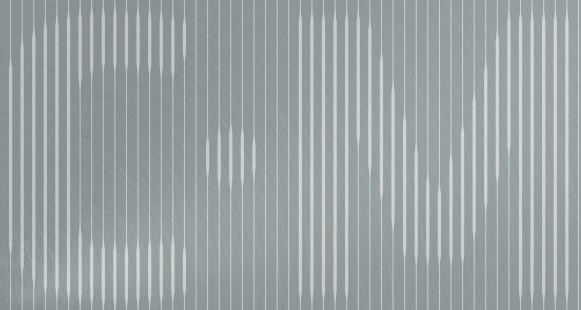
VERTOR C
VERTOR M



Vertical turning center

WEISSER
A HARDINGE COMPANY

As flexible as your manufacturing tasks - 360° turning solutions from WEISSER

Just as chameleons can adapt to their environment, WEISSER's precision turning machines and multifunctional turning centers adapt to the customer's workpieces in the best possible way. In addition, WEISSER keeps an eye on the complete manufacturing process and offers the most economical solution for all requirements with its TURNKEY solutions.

VERTOR C & M

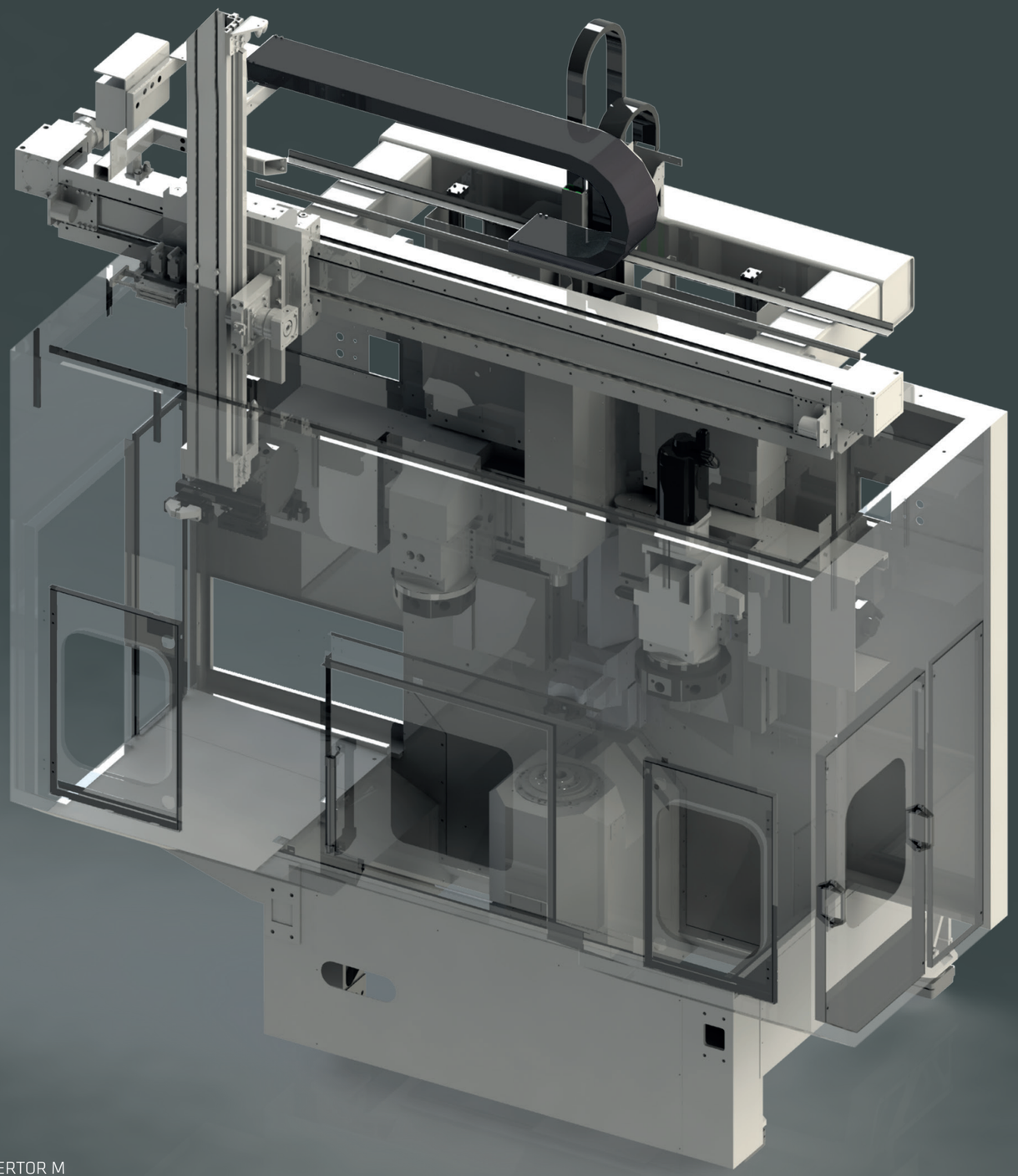
VERTOR C & VERTOR M

The machines of the Vertor C and M series are ideally suited for wet and dry machining of all common rotation-symmetrical workpieces with the highest precision, availability and continuous accuracy. The machines have very good accessibility with minimum space requirements and also offer the option for two or four axes. Technology integration of innovative processes such as out-of-round turning, hard turning, grinding, drilling or milling result in a significant reduction of in-house logistics processes and create high-precision machining results. The multifunctional vertical turning machines are among the world's best machine tools in their class in terms of operating speed, availability, stability and reliability.

Conceptional advantages VERTOR C & M

- Heavily ribbed monoblock machine column
- Extremely high rigidity and thermal stability
- Large working volumes with compact outer dimensions of the machine
- Direct drives
- Slide design for high accuracies and dynamics
- Linear path measuring systems in horizontal and vertical direction
- Maintenance-free three-phase servo drives
- Machining of chuck turned parts or shafts with tailstock and steady rest support
- 4-axis design for reduced Machining times
- Driven tools
- Optimized for manual loading

Design VERTOR*



Base machine
Monobloc machine structure made of high quality cast iron. Heavily ribbed machine base.

Main spindle
Motor spindle with 35/40 kW power at 100/40%. ED with water cooling, maintenance-free spindle motor in digital drive technology.
- Spindle bearing Ø: 90 mm / 150 mm
- Spindle flange: A6 / A8 according to DIN 55026
- Speed limit: 3.500 min^{-1}
- Rated speed: 780 min^{-1}

Tool turret
- 8/12-station with electric drive
- VDI 40 interface
  (further tool interfaces possible)
- Optionally with driven tools

Gantry loading

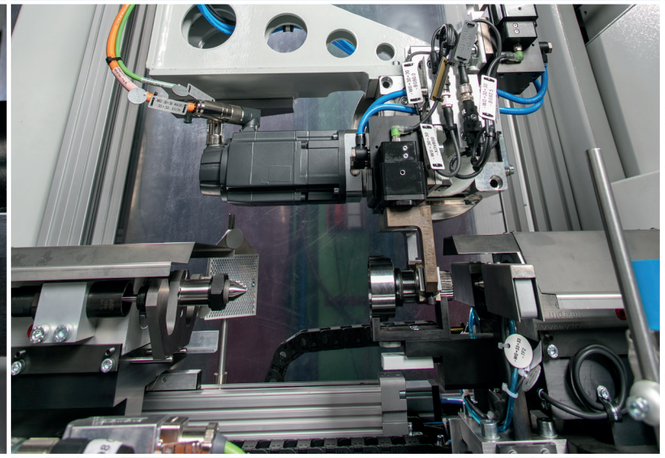
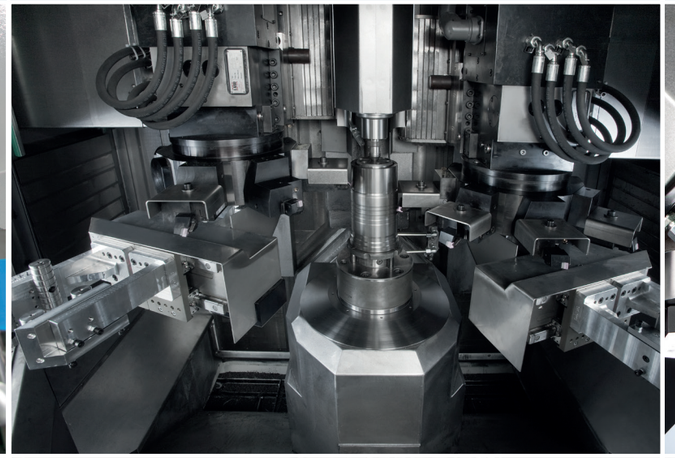
Technical extensions
- Tailstock
- Counter spindle
- Steady rest
- HOT unit
- Grinding spindle

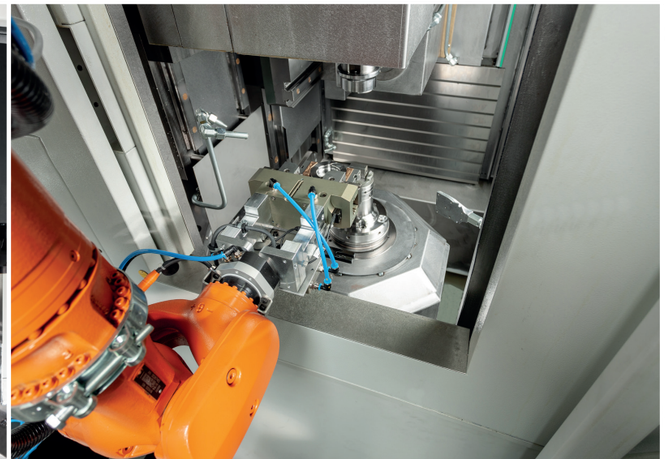
*using the example of a machine of type VERTOR M

Application examples

Bringing the application advance to the road...

Differential housings, brake discs, pistons: components manufactured on WEISSER machines can be found in countless vehicles. Intelligent production processes require innovative technologies and reliable, highly accurate machining centers designed for high-performance use. Therefore, WEISSER's precision turning machines and multifunctional turning centers are built with the highest level of technical maturity and high accuracy. This gives customers the assurance that nothing stands in the way of their production of safety-relevant components.

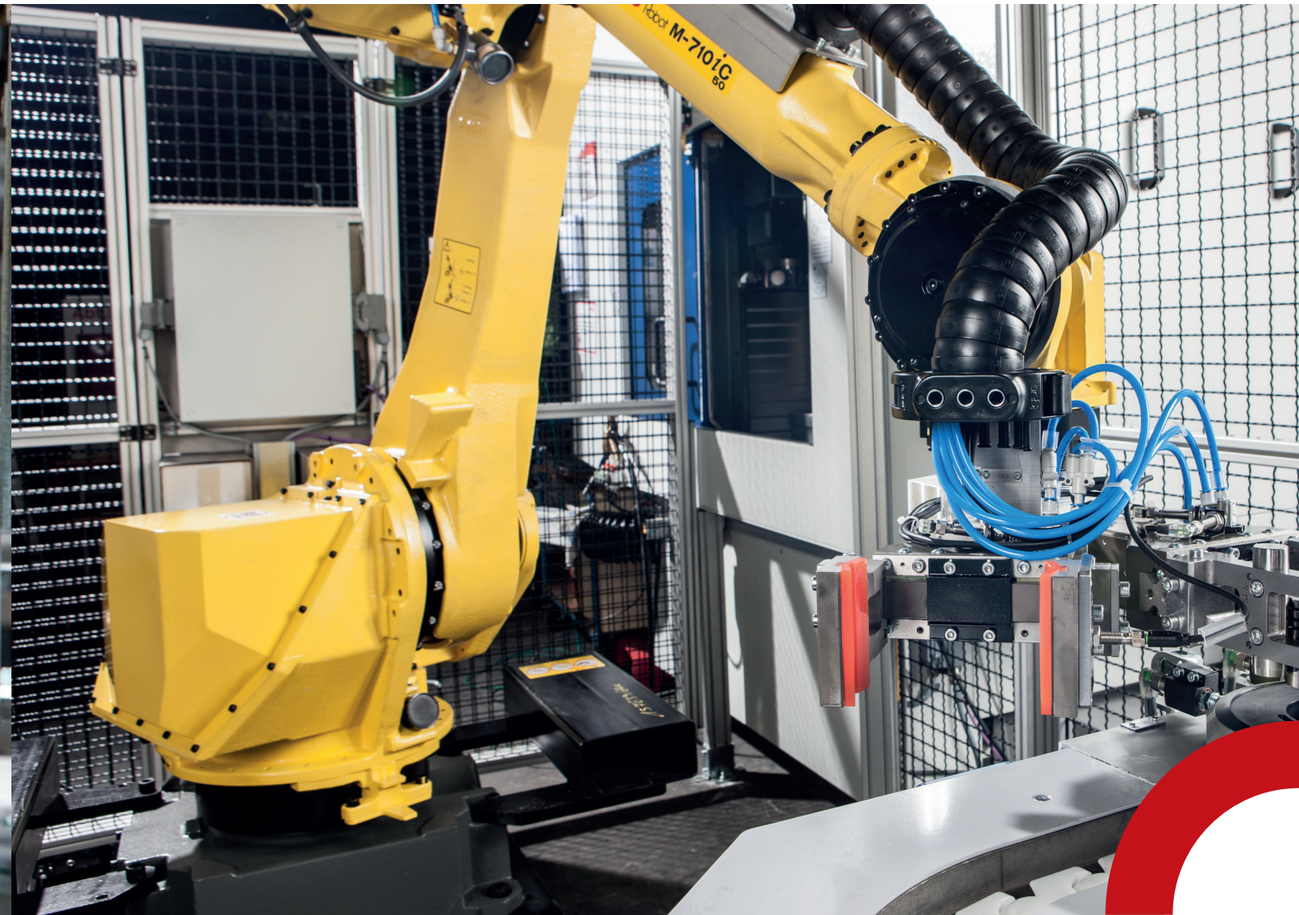
Automation

Transport systems

The automation options with different transport systems (e.g. pallet conveyor, drag frame, friction roller conveyor, etc.) offer highly variable application possibilities. Depending on the design, they can be adapted to the shape and weight of the workpieces to be transported. A variety of linking tasks, maximum flexibility and easy maintenance are part of the countless advantages offered by these customized automation solutions.

Robot automation

Robot automation offers a highly flexible loading and unloading method for your machine. Machining solutions with robot automation are configured according to the customer's requirements, so that related processes (e.g. measuring, signing, aligning) can also be operated in a space-saving manner and offer maximum availability.



Technical highlights

Original WEISSER synchronous motor spindle with direct drive technology

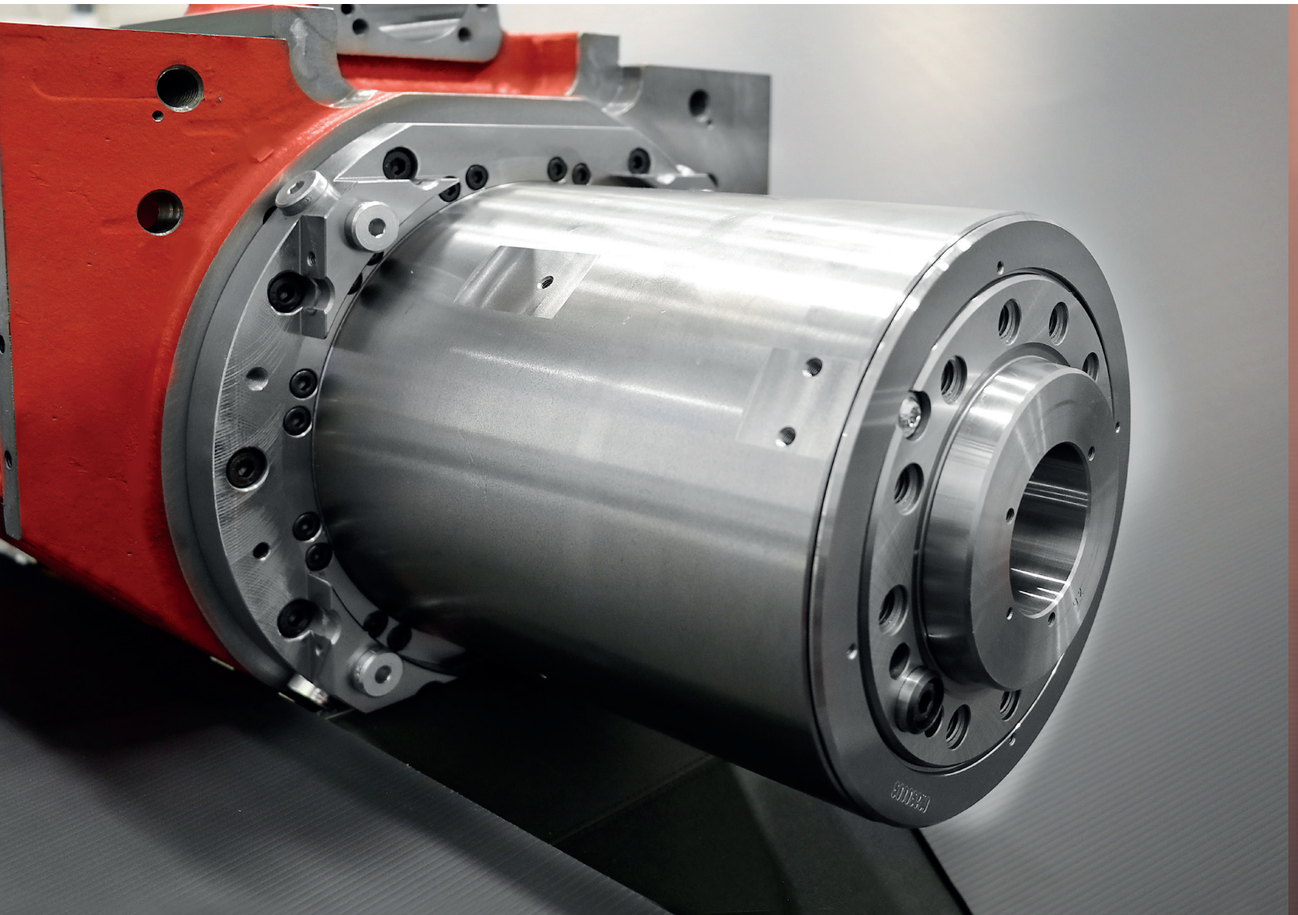
More than 160 years of experience in development, design and own production of motor spindles carried out an unmatched competence potential, which is beneficial for WEISSER customers,

especially when it comes to:

- Process safety
- High technical availability
- Maximum productivity
- Excellent manufacturing quality

Highest precision and accuracy

Measuring of all components and units relevant for the accuracy - despite high basic accuracies the individual components are „finely assembled“. As a result, mechanical deviations during assembly are minimized and wear is reduced. This ensures a high long-term stability of the complete machine system.



Technologies

Hard turning

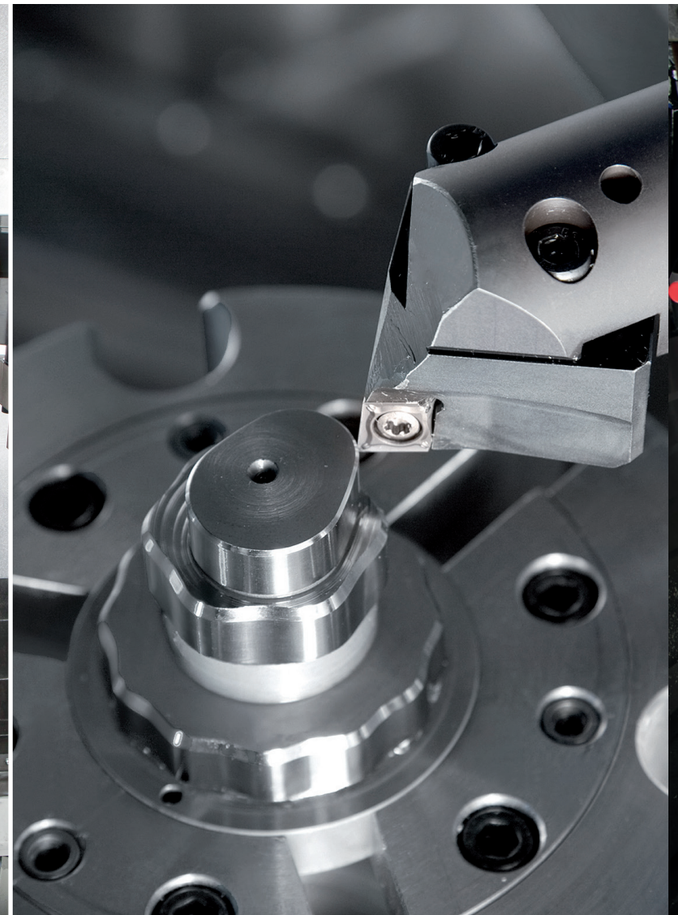
Hard turning describes the turning of steel with a hardness of more than 45 HRC. It is an efficient alternative for grinding hardened workpieces. The advantages of this process are shorter cycle, set-up and tooling times as well as the relatively lower investment costs and the options of wet and dry machining.

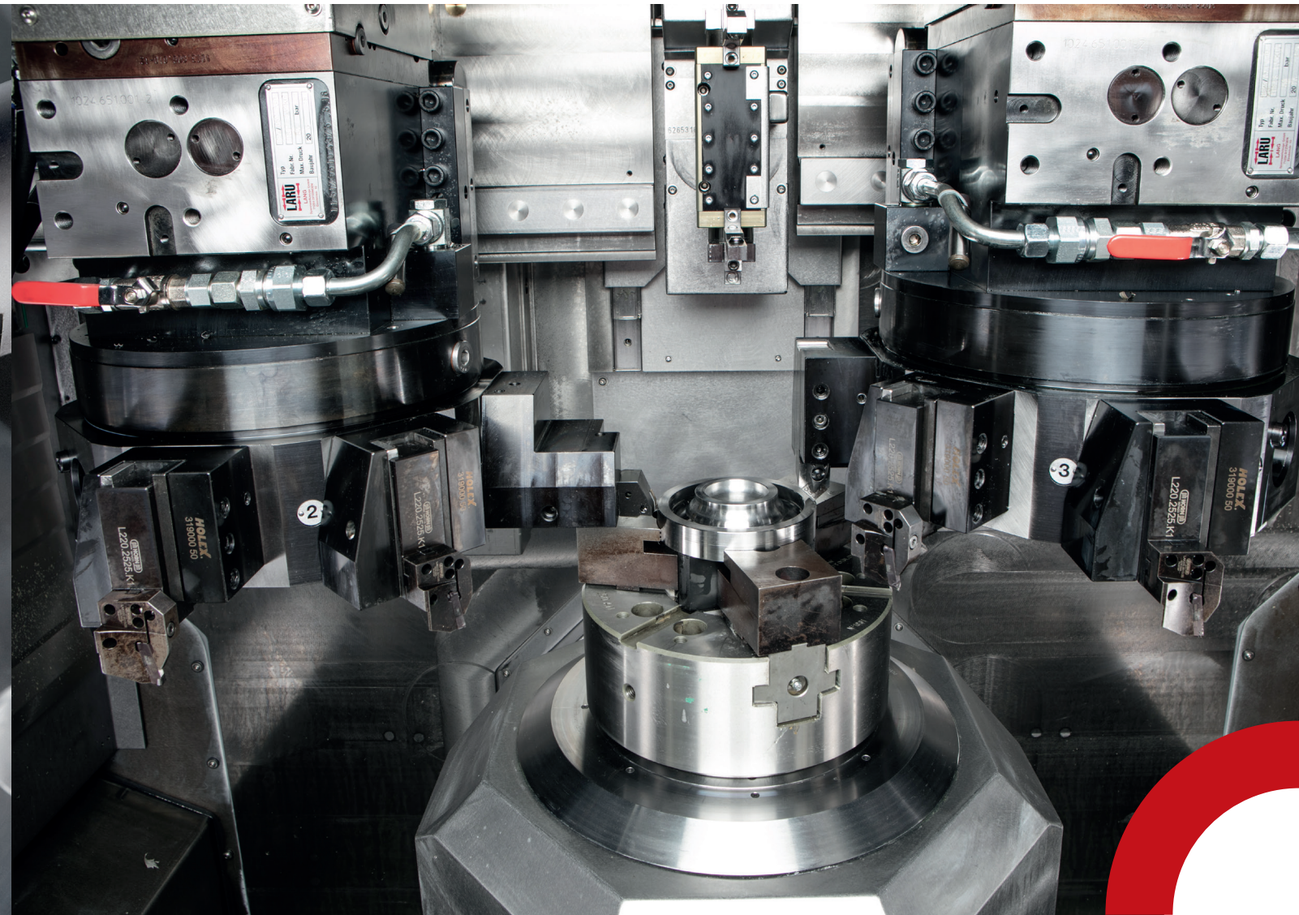
Out-of-round turning

3 times capacity with WEISSER HOT system for shorter piece times and lower piece costs. The technology enables the highly productive machining of a wide range of workpieces, such as pistons for combustion engines, camshafts, polygonal profiles or the production of polygon shapes (shaft-hub connections) with process-oriented perfection.

Highly productive 4-axes simultaneous machining

Highly productive simultaneous machining in one machine with two powerful disk turrets (4-axes). Intelligent technology processes and the combination of different machining steps offer high savings potential. Working with two tools simultaneously shortens the machining times of the workpiece
and thus reduces the cost per part.





Turnkey

Intelligent technology processes and complete Turnkey systems

WEISSER machining centers with integrated technology concepts are the solution to demands for shorter process times, productivity and process safety. Shorter cycle times and the associated lower unit costs are decisive competitive factors, especially when manufacturing high quantities. WEISSER turnkey solutions not only score at high quantities but also at small quantities with high set-up flexibility. We pass this competitive advantage on to our customers. With the experience of more than 160 years of development, construction and realization of customized machines, our engineers develop today the most economical solution upon your requirements. The development of the complete production process provides you full cost transparency and helps you to solve complex tasks in an optimal way. With three steps to success. WEISSER Turnkey.

OFFER PHASE AND PLANNING PHASE

- Process requirements
- Production boundary conditions
- Machine requirements & machine type
- Workpiece clamping / Tools
- MFU features
- Terms of acceptance
- Delivery instructions
- Processing strategy
- Inspection of critical MFU characteristics
- Number of fixings
- Number of spindles
- Design of the machine system
- Workpiece loading and automation
- Clamping device
- Tools

IMPLEMENTATION PHASE

- Construction and integration of the workpiece-specific
  - Clamping fixtures
  - Tools
  - Automation
- Approval process of the tooling plan, layout plan, etc.
- The verification procedure of the process capability through
  - the preliminary acceptance at WEISSER
  - the final acceptance at the customer

TARGET PHASE

- Assistance with production startup and support
- Training in operation, programming and maintenance
- Service e.g. with preventive maintenance, spare part support, qualified service personnel, etc.

Workpieces

Typical, machine-specific workpieces with cycle time and technical challenges.

Out-of-round machining

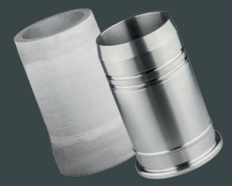
Processing of workpieces with different profiles

- Out-of-round turning (HOT) inside and outside
- Manufacturing of shaft-hub connections
- Out-of-round machining Piston
- Cycle time: Depending on the task

Balance shaft

Machining Diameter and end face

- Clamping technology shaft chuck
- Turning all functional surfaces
- 4-axes machining
- Cycle time: approx. 60 seconds



Cylinder liner

Complete machining in three clampings

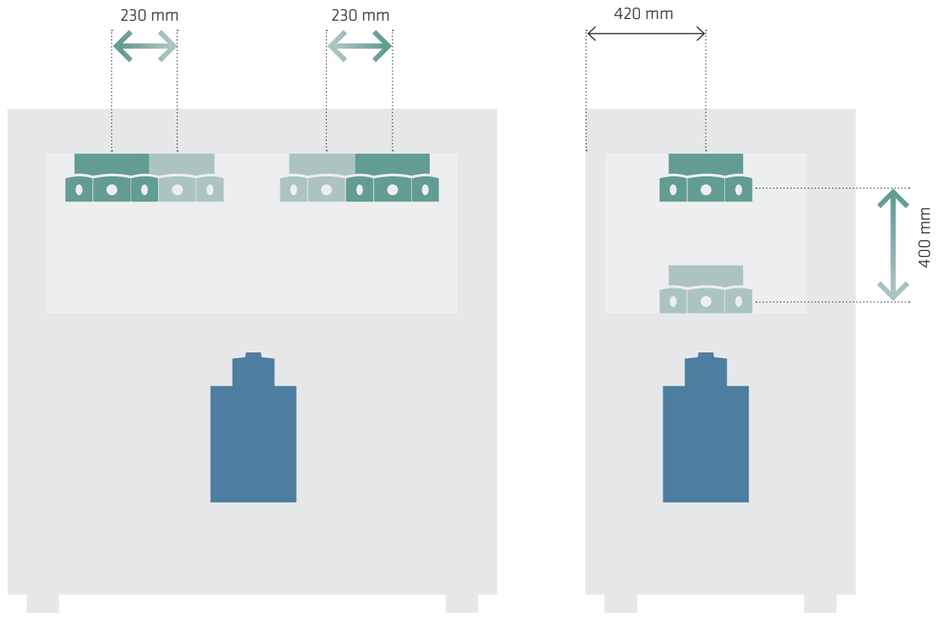
- Individual clamping technology
- Turning off the casting skin outside
- Turning of the casting skin inside and finish machining
- Drilling
- Finish machining outer contour
- Cycle time: 60 - 120 seconds depending on the part dimensions

Steel piston

Processing in several processing steps

- Grooving grooves
- Oil holes drilling
- Finish turning of groove flanks
- Oval turning (pre- and finish turning)
- Line cycle: 30 seconds

Technical data VERTOR



Max. Turning diameter	mm	450	
Max. Chuck diameter	mm	600	
Max. Feed force X/Z (40 % CDF)	kN	9 / 9	
Working stroke X/Z-axis	mm	230 / 280 (280 / 400)	
Max. Process speed X/Z	m/min	30 / 30	
Ball screw diameter X1/Z1	mm	40 / 40	
Number of tools		12 (2 x 12)	
Tool holder		VDI40 / 50	
Tool flight circle	mm	620	
Main spindle			
		VERTOR C	VERTOR M
Spindle bearing diameter	mm	90	150
Spindle flange	DIN55026	A6	A8
Drive power 100 % CDF	kW	18	52
Drive power 40 % CDF	kW	23	67
Rated speed	rpm	1.500	1.100
Max. Speed	rpm	6.000	3.500
Torque 100 % CDF	Nm	115	580
Torque 40 % CDF	Nm	146	450

Tailstock		
Working stroke	mm	200
Spindle bearing	mm	Rigid, without bearing
Max. peak distance	mm	639
Pressing force	daN	850
Center point adapter	MK	MK4
Max. Speed	rpm	-
Dimensions (2-axes)		
Dimensions basic machine (LxWxH)	mm	1.900 x 1.900 x 2.600
Weight	kg	9.000
Dimensions (4-axes)		
Dimensions basic machine (LxWxH)	mm	3.000 x 1.900 x 2.600
Weight	kg	11.000

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