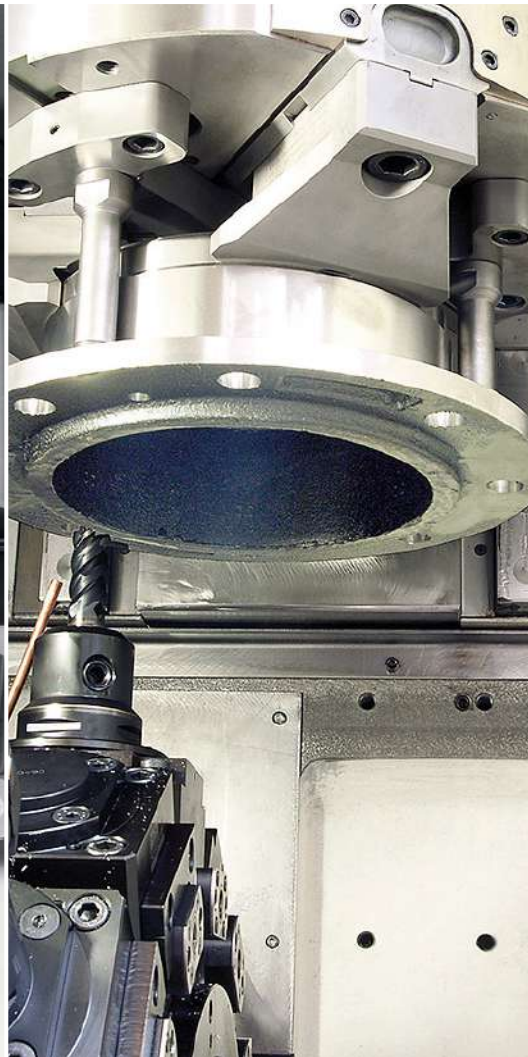


HESSAPP

DVH SERIES



Pick-Up Vertical Turning Machines



DVH Series – The Latest in Turning

Pick-up Turning Machines

A guarantee of maximum productivity and quality in modern production. More than 20 years of experience in the development and production of pick-up style vertical turning machines combined with continuous further development help you to master the process requirements of today.

The consistent focus on technological solutions has given rise to an enormous pool of knowledge and experience – from which you, too can benefit.

The series is divided into three basic models

► DVH – the classic single spindle pick-up model

An ideal combination of price and performance coupled with optimum manufacturing solutions

► DVH DUO – the highly productive dual spindle model

Dual spindle pick-up vertical turning machine for use in highly productive manufacturing

► DVH 4X – the highly productive single spindle model

Self-loading 4-axis vertical turning machine for the optimum accomplishment of machining operations, offering high potential savings of up to 45 % compared with conventional 2-axis machining



Technologies

- ▶ Turning
- ▶ Drilling
- ▶ Milling
- ▶ Grinding
- ▶ Hard turning
- ▶ Gear machining

Industries

- ▶ General mechanical engineering
- ▶ Aerospace
- ▶ Automotive
- ▶ Commercial vehicles
- ▶ Construction machinery
- ▶ Fittings

Extract from the workpiece range



Advantages

The Pick-up Principle

- ▶ Integrated automatic loading/unloading
- ▶ Low cost per piece through high productivity
- ▶ Multiple machine operation as the machine is decoupled from the operator

Components and Options

- ▶ Reliable, tried-and-tested components
- ▶ Numerous options for your individual DVH
- ▶ Highly versatile
- ▶ Rapid installation and production start-up

Expansions to the Basic Version

- ▶ X- and Y-axes for drilling operations
- ▶ Additional 4-axis cross slide (improves efficiency by up to 45 %)

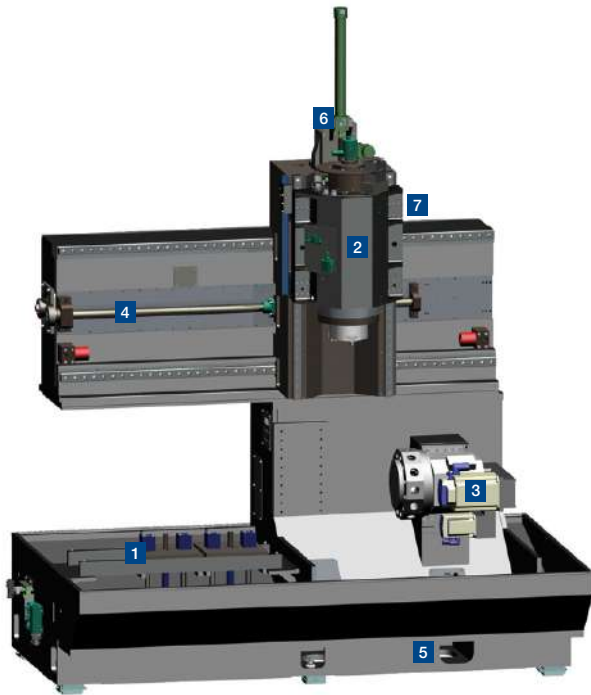
Excellent Ergonomics

- ▶ Easily accessible, generous work area
- ▶ Ideal setup conditions, ensuring extremely short unproductive downtimes
- ▶ Large window for monitoring the manufacturing process

Flexible Handling Systems

- ▶ Low-cost standard handling systems
- ▶ Flexible handling solutions adapted to the production flow
- ▶ Extremely diverse range of options (robot loading, connection to gantry loaders, batch hoppers, etc.)

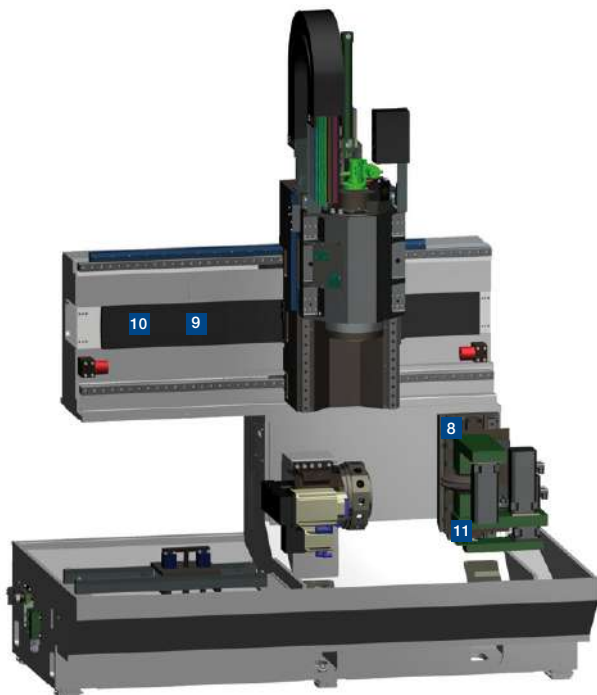
Functional Design – Transfer Technology



DVH Standard configuration

- 1 Automatic workpiece loading and unloading with hydraulic lift unit and run-over protection
- 2 Travelling motor spindle
- 3 Turret
- 4 Ball screw drive
- 5 Tray-type enclosure
- 6 Hydraulic counter balancing
- 7 Linear measuring system in all axes

DVH Pick-up vertical turning machine



DVH Auxiliary components

- 8 Y-axis
- 9 Linear drive
- 10 Linear guides with integrated measuring systems
- 11 Technology modules for grinding, NC-slide, drilling, milling

DVH with auxiliary units from the modular machine kit

Modular System



Motor spindle

- ▶ max. 42 kW (40 % duty)
- ▶ max. 5000 rpm



Motor spindle

- ▶ max. 71 kW (40 % duty)
- ▶ max. 4000 rpm



Motor spindle

- ▶ max. 80 kW (40 % duty)
- ▶ max. 4000 rpm

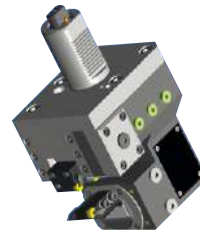


Drilling/milling unit

- ▶ 100 Nm / 3000 rpm
- ▶ B-axis*



Multiple drill head



**Tool holder with
NC lift-off slide**



Crown turret



Turret with live tools

- ▶ 100 Nm / 4000 rpm
- ▶ 250 mm tool length



Multifunction plate

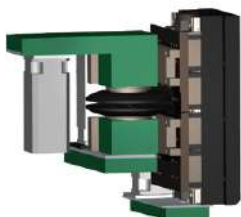


NC lift-off slide

- ▶ Stroke max. 40 mm
- ▶ For holding static tools
- ▶ Workpieces up to Ø 500 mm



Workpiece gauge



Grinding/milling unit

- ▶ Working stroke max. 80 mm
- ▶ Speed max. 3000 rpm



**Oval conveyor belt drag
conveyor**



**Inverted-tooth chain
driven conveyor**



Flat chain driven conveyor

Standard Options

Crown Turret



- ▶ For complex drilling tasks
- ▶ Sturdy design
- ▶ Short indexing times
- ▶ 6 tool holders
- ▶ Use of driven tools

Technical Data – Crown Turret

| | | |
|--------------------------|-----|------|
| Speed range max | rpm | 2500 |
| Power max. (at 40% duty) | kW | 68 |
| Torque (at 40% duty) | Nm | 260 |

Drilling/Milling Unit



- ▶ For advanced drilling and milling operations
- ▶ Additional tool positions

Technical Data – Drilling/Milling Unit

| Rating class | | 1 | 2 |
|--------------|-----|------|------|
| Speed max. | rpm | 4500 | 3000 |
| Torque | Nm | 40 | 100 |
| Power | kW | 20 | 23 |

Drilling Turret



- ▶ Rigid design
- ▶ Short indexing times
- ▶ 12 tool stations
- ▶ Use of driven tools

Technical Data – Drilling Turret

| | | |
|--------------------------|-----|------|
| Speed range max. | rpm | 3000 |
| Power max. (at 25% duty) | kW | 24,8 |
| Torque (at 25% duty) | Nm | 79 |

Swiveling Turret (B-axis)



- ▶ Swiveling range 0 – 45°
- ▶ Programmable angle adjustment
- ▶ 12 tool stations
- ▶ No driven angle tools required

Multiple drill head



- ▶ Reduced cycle times
- ▶ Available as separate units
- ▶ Available as add-on for turrets

Highly Dynamic Motor Spindles



- ▶ High speeds
- ▶ High motor power
- ▶ Liquid-cooled, ensuring high thermal stability and low noise
- ▶ High-precision positioning through integrated C-axis
- ▶ Integrated clamping stroke monitoring / maintenance-free

CNC controls

SIEMENS
FANUC

- ▶ Siemens
- ▶ Fanuc

Machine Units and Options for Your Individual Machine

Driven Tools

Turning, drilling, milling and tapping in a single chucking offers the best machining quality. No setup is needed between operations and the number of fixtures required is reduced.

Workpiece Gauge

When gauging takes place in the machine, the motor spindle and the workpiece contact a measuring probe during a measuring cycle. Gauging outside the machine has the advantage of taking place during the machining time

A Choice of Two Systems

- ▶ Gauges with workpiece-specific parts such as snap gauges and measuring heads
- ▶ CNC gauging machine with freely programmable measuring cycles

Tool Gauge

By using our own special designed software, the operator is able to gauge new tools with maximum precision and automatically correct them in the tool magazine

Tool Breakage and Wear Monitoring

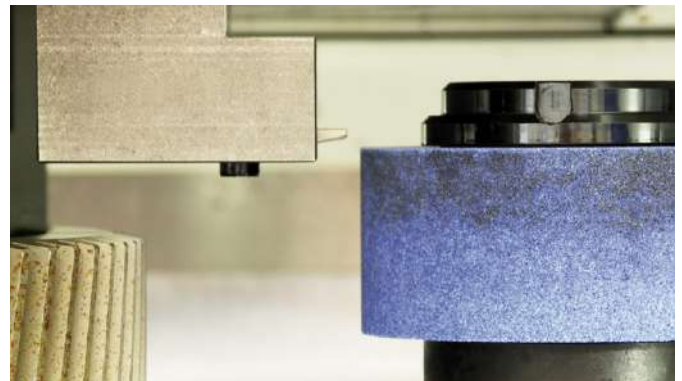
To increase the uptime of the DVH, the machines can be equipped with a tool edge and collision monitoring system. In the event of tool breakage, wear or collision, an emergency shutdown module brings the feed axes to an immediate halt.

Grinding

Grinding process with integrated automatic dressing and special grinding cycles. Grinding wheels of corundum, CBN and other materials are used. Special grinding devices are available for producing the parallel keys of gears.



Workpiece gauging can be done in a clean environment outside the work area



Automatic dressing of a grinding wheel

DVH 200 / DVH 300



DVH 200 / 300

- ▶ For workpieces with a swing diameter of up to 200 / 300 mm
- ▶ Despite the compact design, all machine units – such as the spindle, chuck and tool turret – can be easily reached for setup work
- ▶ The multifunction plate offers space for various machining modules, e.g. drilling, milling and grinding, as a further option to the tool turret
- ▶ Electric turret drive for minimal thermal effects
- ▶ Machine bed available as mineral casting

Performance and flexibility features:

- ▶ Powerful motor spindle
- ▶ High axis speeds
- ▶ Wide range of configuration options from existing modular system
- ▶ Y-axis for complete machining
- ▶ Various chip conveyors, coolant systems (high pressure) and filtering methods
- ▶ Large selection of different tools and tool carrier systems
- ▶ Customized workpiece feed and removal



Ergonomic work area



Lift-off slide in turret

Technical Data

| | | DVH 200 | DVH 300 |
|-----------------------------|----|---------|---------|
| Work area | | | |
| Turning diameter max. | mm | 200 | 320 |
| Swing diameter max. | mm | 250 | 280 |
| Workpiece height with chuck | mm | 315 | 300 |

DVH 400 / DVH 500



DVH 400 / 500

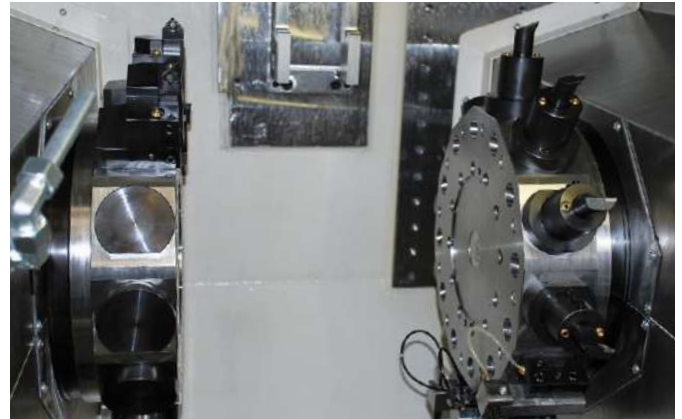
- ▶ For workpieces with a swing diameter of up to 510 mm
- ▶ Superior cutting performance and outstanding ergonomics coupled with ideal use of the installation space
- ▶ Extremely diverse range of options for optimum process organization
- ▶ Integration of additional tool carriers, grinding spindles, milling spindles and multiple drill heads

Performance and flexibility features:

- ▶ Powerful motor spindles achieving up to 80 kW set standards in this class
- ▶ High axis speeds
- ▶ Wide range of configuration options from proven modular system
- ▶ Y-axis for complete machining
- ▶ Various chip conveyors, coolant systems (high pressure) and filtering methods
- ▶ Large selection of different tools and tool carrier systems
- ▶ Customized workpiece feed and removal
- ▶ Modular tooling systems suitable for high pressure cooling up to 80 bar
- ▶ Tooling for NC lift-off operations

Technical Data

| | DVH 400 | DVH 500 |
|-----------------------------|---------|---------|
| Work area | | |
| Turning diameter max. | mm 450 | 500 |
| Swing diameter max. | mm 510 | 510 |
| Workpiece height with chuck | mm 450 | 450 |



Dual turret for max. 24 tools available



Turn-grinding

The surfaces of the brake are simultaneously ground on both sides with a rotating workpiece and a rotating tool in a single machining operation.



Turn-milling

Twin milling unit with milling spindles in opposing directions, for machining brake surfaces on the DVH 500.

DVH 630 / DVH 750



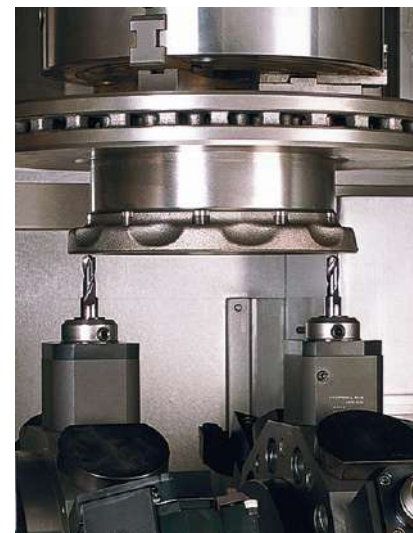
Thermo-symmetrical spindle construction employed consistently in all machines for maximum precision

DVH 630 / 750

- ▶ For workpieces with a swing diameter of up to 630/750/900 mm
- ▶ Superior cutting performance and outstanding ergonomics coupled with ideal use of the installation space
- ▶ Very diverse range of options for optimum process organization
- ▶ Integration of additional tool carriers, grinding spindles, milling spindles and multiple drill heads

Performance and flexibility features:

- ▶ Powerful motor spindles for use in heavy cutting with a torque of up to 3000 Nm
- ▶ Workpiece weight of up to 300 kg
- ▶ Rigid machine construction for holding workpiece and chuck weights
- ▶ Y-axis for complete machining
- ▶ Broad range of configuration options from existing modular system
- ▶ Variable chip conveyors, coolant systems (high pressure) and filtering methods
- ▶ Large selection of different tools and tool carrier systems
- ▶ Customization of workpiece feed and removal
- ▶ Modular tooling systems suitable for high pressure cooling up to 80 bar



Two drilling turrets and additional Y-axis



Hard turning / grinding option

Technical Data

| | | DVH 630 | DVH 750 |
|-----------------------------|----|---------|---------|
| Work area | | | |
| Turning diameter max. | mm | 570 | 630 |
| Swing diameter max. | mm | 630 | 750 |
| Workpiece height with chuck | mm | 450 | 500 |

Material Handling Systems – Flexible, Trouble-free, Adapted to the Job

Handling Systems

The Hessapp portfolio includes low-cost standard solutions or, as an alternative, customized versions adapted to the task at hand.

Ultra-flexible Standard Handling Systems

The oval conveyor system comes equipped with workpiece frames adapted to the workpiece diameter, for default positioning in the frame. Setup is easy with no mechanical work, as the diameter is simply entered in the machine control system. If workpiece positioning is required, the user can easily produce a guide himself and insert it in the existing workpiece frame.

Customized Solution

Special customized solutions are designed based on the user's requirements in terms of components, space conditions and linking with other machines. Complete automated handling systems with logistics software are also possible. Connection to palletizers for highly productive manufacturing systems is available for medium to large-scale batch production.

Closed-loop Recirculating Pallet Conveyor for Workpiece Frames

The workpieces are moved by easily replaceable workpiece frames

DVH 200: Three Frame Sizes

| | | |
|------------|-------------|--------------|
| ø 50–80 mm | ø 80–130 mm | ø 130–200 mm |
| 32 frames | 22 frames | 16 frames |

DVH 400 / 500: Three Frame Sizes

| | | |
|--------------|--------------|--------------|
| ø 150–250 mm | ø 250–350 mm | ø 350–450 mm |
| 20 frames | 15 frames | 12 frames |



Line of pallets



Roller/chain combination



Chain driven conveyor with pallets



Chain driven conveyor



Pallet (close-up)

Technical Data

| Machine type | | DVH 200 | | DVH 300 | | DVH 400 |
|-----------------------------------|-----------|-----------------|------|-----------------|--|-----------------|
| Working area | | | | | | |
| Turning diameter max. | mm | 200 | | 320 | | 450 |
| Swing diameter max. | mm | 250 | | 280 | | 510 |
| Part height with chuck | mm | 315 | | 300 | | 450 |
| Motor spindle | | | | | | |
| | | RC* 1 | | RC* 2 | | |
| Front bearing diameter | mm | 100 | | 100 | | 150 |
| Spindle nose | DIN | 55 026 | | 55 026 | | 55 026 |
| Spindle taper | size | A6 | | A6 | | A11 |
| Speed max. | rpm | 6500 | 5500 | 5500 | | 4000 |
| Motor power at 40% duty | kW | 35 | 34 | 36 | | 80 |
| Torque at 40% duty | Nm | 210 | 360 | 360 | | 795 |
| Feed rate / rapid traverse | | | | | | |
| Rapid traverse Z-axis | m/min | 30 | | 30 | | 30 |
| Rapid traverse X-axis | m/min | 60 | | 60 | | 75 / 90 |
| Tool turret | | | | | | |
| Tool positions | number | 12 | | 12 | | 12 |
| Cylinder shank ø mm | DIN 69880 | 40 | | 40 | | 40 |
| Tool length max. | mm | 180 | | 170 | | 250 |
| Machine foot print | | | | | | |
| Dimensions L x W x H | m | 2.5 x 2.4 x 2.9 | | 2.5 x 2.4 x 2.9 | | 3.2 x 2.7 x 3.3 |
| Weight | kg | 6500 | | 6500 | | 9500 |

* RC = Rating class

| Machine type | | DVH 500 | DVH 630 | DVH 750 |
|-----------------------------------|-----------|-----------------|-----------------|-----------------|
| Working area | | | | |
| Turning diameter max. | mm | 500 | 570 | 630 |
| Swing diameter max. | mm | 510 | 630 | 750 |
| Part height with chuck | mm | 450 | 450 | 500 |
| Motor spindle | | | | |
| Front bearing diameter | mm | 150 | 180 | 220 |
| Spindle nose | DIN | 55 026 | 55 026 | 55 026 |
| Spindle taper | size | A11 | A11 | A15 |
| Speed max. | rpm | 4000 | 2800 / 800 | 2000 / 800 |
| Motor power at 40% duty | kW | 80 | 80 / 68 | 55 / 68 |
| Torque at 40% duty | Nm | 795 | 1150 / 2950 | 1780 / 2950 |
| Feed rate / rapid traverse | | | | |
| Rapid traverse Z-axis | m/min | 30 | 30 | 20 |
| Rapid traverse X-axis | m/min | 75 / 90 | 45 / 60 | 32 |
| Tool turret | | | | |
| Tool positions | number | 12 | 12 | 8 |
| Cylinder shank ø mm | DIN 69880 | 50 | 50 | 60 |
| Tool length max. | mm | 260 | 270 | 300 |
| Machine foot print | | | | |
| Dimensions L x W x H | m | 3.4 x 2.7 x 3.3 | 2.5 x 2.3 x 3.2 | 4.8 x 2.6 x 4.1 |
| Weight | kg | 13 500 | 15 000 | 20 000 |

Subject to change without notice

OEM Service for our Brands and Legacy Brands

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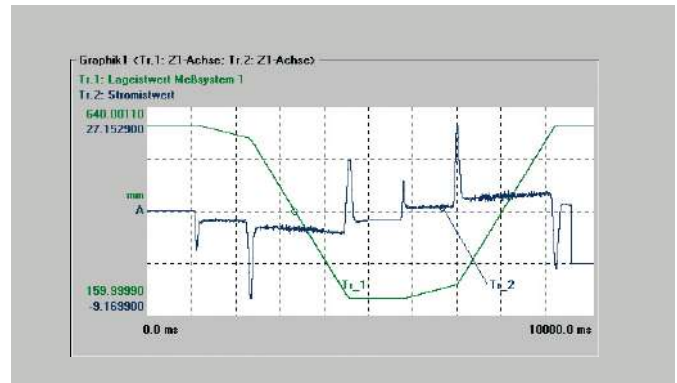
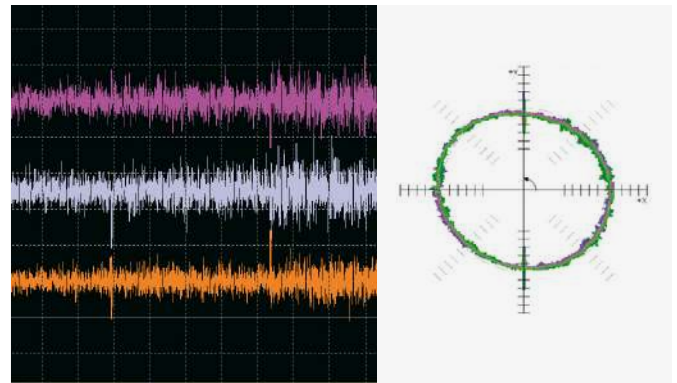
Service and support

- ▶ Commissioning
- ▶ Maintenance and inspections
- ▶ Repair service
- ▶ Spindle service
- ▶ Overhaul and retrofit
- ▶ Used machines
- ▶ Service contracts
- ▶ Machine relocation



Process and production optimization

- ▶ Process optimization
- ▶ Programming
- ▶ Software: machine data acquisition, diagnosis, condition monitoring, energy management, virtual machine



Machine condition monitoring "Finger print" via vibration analysis, ballbar test and trace measurement.

Spare parts

- ▶ 24/7 delivery
- ▶ Central warehouse
- ▶ Individual service concepts



Training

- ▶ Operator training
- ▶ Maintenance training (mechanical, electrical)
- ▶ Programming training



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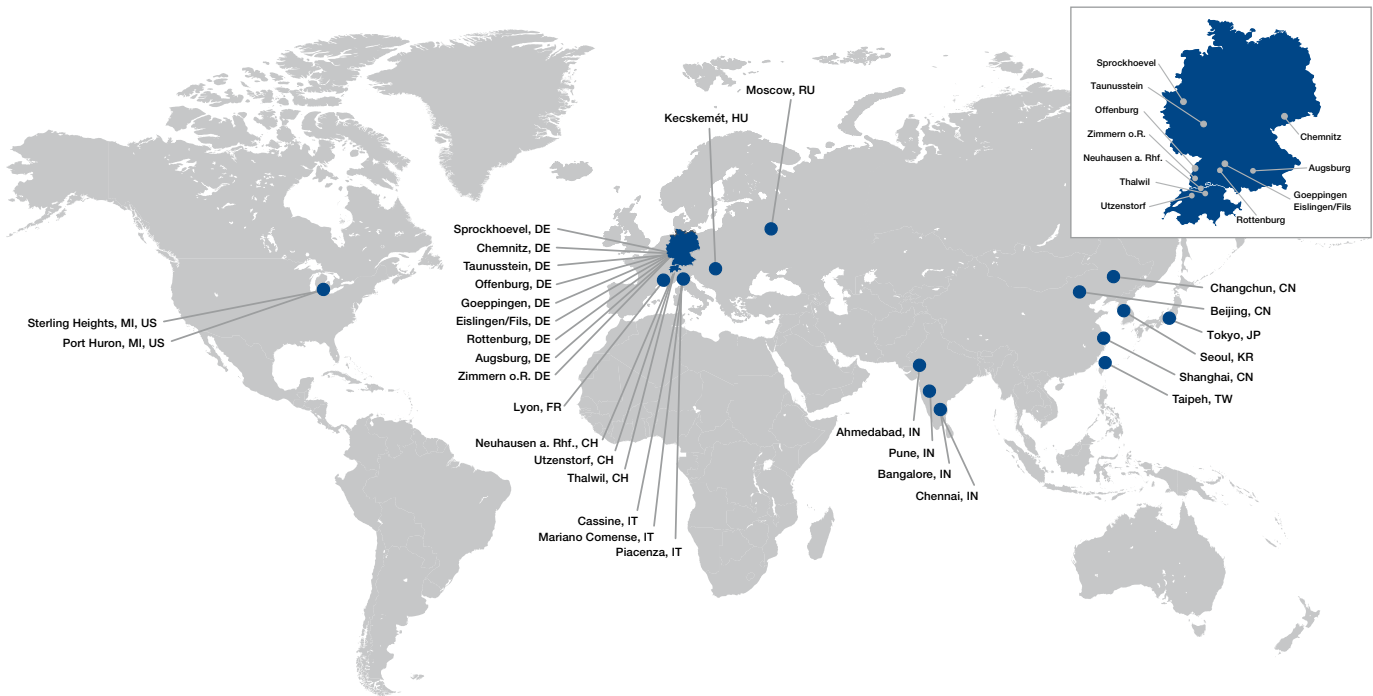


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About FFG Europe & Americas

The FFG entities in Europe and the Americas unite major players from the German, Italian, Swiss and American machine tool industry with a broad range of milling, turning, grinding, and gear manufacturing technology, and the knowhow of the renowned machine tool brands VDF Boehringer, Hessapp, IMAS, Jobs, MAG, Meccanodora, Modul, Morara, Pfiffner, Rambaudi, Sachman, Sigma, SMS, Tacchella and Witzig & Frank. Since 1798, these brands have substantially contributed to the progress in industrial manufacturing and are well known as reliable and innovative equipment and systems solutions suppliers for the automotive and truck, aerospace, machine building, general machining, railway industry, energy and heavy engineering industries. While being an independent group, these entities benefit from the strengths and opportunities of the global Fair Friend Group. They stand for premium technology within FFG.



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