Know-how
You provide us with a complex workpiece or process, we develop the appropriate system solution (including clamping devices, tools and control system) that meet your individual demands.

Fields of applications
- Small to big part sizes (depends on machine type)
- Fully automated production including process monitoring (optional)
- Heavy machining
- Hard turning and super finishing

Advantages
- Precise and secure workpiece clamping utilizing workpiece weight
- Highest accuracy through the thermally-symmetric design of the spindle housing with closed circuit oil lubrication
- Extremely rigid machine base
- High flexibility for an optimal solution of complex turning tasks
- Many options
- Ergonomically convenient for operating and easy access to the work zone
- Optimal chip management through 45° angle of the machine base
- Machine bed available as mineral casting
Technologies
- Turning
- Drilling
- Milling
- Grinding
- Hobbing
- Hardturning

Industries
- General machining
- Aerospace
- Railway
- Wind energy
- Commercial vehicles

Extract from the workpiece range

- Bearing ring
- Gear wheel
- Truck hub
- Railway wheel
- Flange
VDM Modular System

2-axis

4-axis

Shuttle slide machine

Headstock with parallel drive
- Integrated C-axis
- Dual drive in master/slave design for backlash-free positioning

Tool turret
- With or without live tools
- Torque max. 100 Nm
- Speed 3000 U/min
- Modular tooling systems or VDI 60/80

Y-Axis with B-Axis
- Y-Travel +/- 150 mm
- Torque max. 380 Nm
- Swivel angle +/- 105

Tool holder
- Torque max. 380 Nm for static and rotating tools
- HSK 63/100/Capto C6/C8

Drilling- and milling unit
Machine Models
VDM 550/800/1000/1600/2000

Categories applied for machine designation
VDM XXXX-11

Number of cross slides
Number of spindles

VDM XXXX-11
VDM XXXX-12

2-axis with tool turret
2-axis with tool changer

4-axis with tool turret
4-axis with tool changer

Separate work zone for part loading during machining

VDM XXXX-21: Shuttle slide machine (slide moves across work area)

VDM XXXX-22: Shuttle slide machine (both slides move across work area)

VDM XXXX-12/XXXX-12: 4-axes with turret and tool magazine
Compact VDM for workpieces up to 680 mm swing diameter

The huge work zone of the VDM 550 facilitates retooling at the clamping device and the turret

Multiple options through integration of grinding, milling or drilling modules

Performance and flexibility features:
- powerful motorized spindles
- high axis speeds
- configuration of machine with modular system
- variable chip conveyor and cooling systems (high pressure cooling)
- variety of tools and tool holder systems
- user-friendly ergonomics
- Versions: VDM 550 T (Turning), VDM 550 TM (Turn-Mill), VDM 550 G (Grinding)

### Technical Data

<table>
<thead>
<tr>
<th>VDM 550</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Work Zone</strong></td>
<td></td>
</tr>
<tr>
<td>Turning diameter max.</td>
<td>mm</td>
</tr>
<tr>
<td>Swing diameter max.</td>
<td>mm</td>
</tr>
<tr>
<td>Workpiece height incl. clamping device</td>
<td>mm</td>
</tr>
</tbody>
</table>
VDM 1000

- New generation of our vertical turning centers for 5-axis machining with integrated B- and Y-axes
- Indexing B-axis to hold static and rotating tools
- Exact positioning due to headstock with integrated C axis
- Modular tool system (HSK 63/100, Capto C6/8 and VDI 60) for varying customer requirements

Performance and flexibility features:
- powerful geared spindle or parallel drive
- 5-axis machining with optional B- and Y-axes
- configuration of machine with modular system
- variable chip conveyor and cooling systems (high pressure cooling)
- variety of different tools and tool holding systems
- quick tool change offered by a variety of systems (chain-type, magazine-type and disk-type systems)
- different expansion stages up to a shuttle slide machine
- easy access for manual crane loading
- automation via gantry or pallet changer
- Versions: VDM 1000 T (Turning), VDM 1000 TM (Turn-Mill), VDM 1000 G (Grinding)

### Technical Data

<table>
<thead>
<tr>
<th></th>
<th>VDM 800</th>
<th>VDM 1000</th>
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<tbody>
<tr>
<td><strong>Work Zone</strong></td>
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<td></td>
</tr>
<tr>
<td>Turning diameter max.</td>
<td>mm</td>
<td>800</td>
</tr>
<tr>
<td>Swing diameter max.</td>
<td>mm</td>
<td>900</td>
</tr>
<tr>
<td>Workpiece height incl. clamping device</td>
<td>mm</td>
<td>750</td>
</tr>
</tbody>
</table>
VDM 1600

- Proven railway wheel manufacturing machine
- Tool turret includes an automatic disk-type tool changing system
- Performance features up to 54 000 Nm and 170 kW
- For manual and automatic loading

Performance and flexibility features:
- powerful geared spindle three-phase drive
- double slide version with one support for turning and milling via motorized spindle
- configuration of machine with modular system
- variable chip conveyor and cooling systems (high pressure cooling)
- variety of tools and tool holding systems
- quick tool change offered by a variety of systems (chain-type, magazine-type and disk-type systems)
- different expansion stages up to a shuttle slide machine, also known as jump slide machine VDM XXXX-22
- Versions: VDM 1600 T (Turning), VDM 1600 TM (Turn-Mill) und VDM 1600 G (Grinding)

Technical Data

<table>
<thead>
<tr>
<th>VDM 1600</th>
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<tbody>
<tr>
<td>Work Zone</td>
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<tr>
<td>Turning diameter max.</td>
<td>mm</td>
</tr>
<tr>
<td>Swing diameter max.</td>
<td>mm</td>
</tr>
<tr>
<td>Workpiece height incl. clamping device</td>
<td>mm</td>
</tr>
</tbody>
</table>
4-axis machining for more efficiency
External X- and Z- drives for maximum safety, the problems caused through chips or cooling can be reduced to a minimum
The mineral casting machine bed ensures highest dampening

Performance and flexibility features:
- powerful geared spindle
- configuration of machine with modular system
- variable chip conveyor and cooling systems (high pressure cooling)
- variety of tools and tool holding systems
- quick tool change offered by a variety of systems (chain-type, magazine-type and disk-type systems)
- Versions: VDM 2000 T (Turning), VDM 2000 TM (Turn-Mill) und VDM 2000 G (Grinding)
Standard Options

1. Siemens 840 D control system with
   - optimal features, adjustable and expandable to suit the application
   - appropriate tool management
   - systematic service diagnosis

2. Ergonomics
   - Excellent accessibility to workpieces and tools
   - Excellent visibility of the machining process
   - Trouble-free access for maintenance
   - Optimal chip management through 45° angle of the machine base

3. Z-slide
   Generously designed vertical slides absorb forces occurring during heavy duty machining such as railway wheel machining or alloys such as Inconel and titanium.

4. Chip conveyor
   - With integrated coolant system
   - High discharge of chips
   - High pressure cooling of more than 120 bar as option

5. Driven tools
   Turning, drilling, milling and tapping in only one clamping position offers the best machining quality, as it is not necessary to set up the workpieces between the different machining processes. In addition, fewer clamping fixtures are required.

Disk turret with eight tool holders and driven tools
Headstock
The two-level gearing unit ensures high torque, also during four-axis machining. The headstock assures high accuracy through its thermally symmetric design with circulating oil lubricant.

Headstock with parallel drive
- Integrated C-axis
- Dual drive in master/slave design for backlash-free positioning

Machine bed
- Mineral casting or weldment
- Optimized guidance design
- Linear roller guides
- Linear measuring system in all axes
- Utilization of the latest casting technology in conjunction with FEA provides a machine base with optimum rigidity and stability without the need for additional anchoring of foundation
Automation

For the machining of larger parts it is getting more and more important today to reduce unproductive idle times and to increase productivity. We provide different approaches and solutions for the automation machining parts up to 2000 kg and eliminating manual part loading and unloading. This leads to high efficiency and repeat accuracy which is further increased by the integration of additional options such as turning stations, camera recognition and measuring systems.

Benefit from our know-how and experience. One of the core competencies of our company, Hessapp has provided our customers with complete automation solutions for more than 60 years.

Double disk magazine with quick change shuttle, positioned at the back of the machine and accessible from a single point

Pallet system with zero-point clamping

Turnkey system for railway wheel machining on Hessapp VDM vertical turning machines
## Technical Data

<table>
<thead>
<tr>
<th>Machine type</th>
<th>VDM</th>
<th>550</th>
<th>800</th>
<th>1000</th>
<th>1600</th>
<th>2000</th>
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<tbody>
<tr>
<td>Work area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning diameter max. (mm)</td>
<td></td>
<td>600</td>
<td>800</td>
<td>1150</td>
<td>1600</td>
<td>1900</td>
</tr>
<tr>
<td>Swing diameter max. (mm)</td>
<td></td>
<td>680</td>
<td>900</td>
<td>1450</td>
<td>1800</td>
<td>1950</td>
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<tr>
<td>Workpiece height incl. clamping device (mm)</td>
<td></td>
<td>600</td>
<td>750</td>
<td>1000</td>
<td>900</td>
<td>830</td>
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### Feed rate / rapid traverse

<table>
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<tr>
<td>Rapid traverse Z-axis (m/min)</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<tr>
<td>Rapid traverse X-axis (m/min)</td>
<td>60</td>
<td>25</td>
<td>25</td>
<td>20</td>
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### Main spindle

<table>
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<tr>
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<th>2000</th>
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<tbody>
<tr>
<td>Diameter front bearing (mm)</td>
<td>180</td>
<td>240</td>
<td>527</td>
<td>800</td>
<td>800</td>
<td>800</td>
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<tr>
<td>Spindle flange DIN</td>
<td>55026</td>
<td>55026</td>
<td>6353</td>
<td>6353</td>
<td>6353</td>
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<tr>
<td>Spindle head size</td>
<td>A11</td>
<td>A15</td>
<td>ZA 520</td>
<td>ZA 1000</td>
<td>ZA 1000</td>
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### Main drive

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<tbody>
<tr>
<td>Power max. (40% duty cycle) kW</td>
<td>80</td>
<td>160</td>
<td>84</td>
<td>165</td>
<td>165</td>
<td>165</td>
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<tr>
<td>Torque max. (40% duty cycle) Nm</td>
<td>1150</td>
<td>6370</td>
<td>25 877</td>
<td>49 500</td>
<td>49 500</td>
<td>49 500</td>
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<tr>
<td>Speed max. rpm</td>
<td>2800</td>
<td>1200</td>
<td>630</td>
<td>400</td>
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### Tool system (option: modular)

<table>
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<tr>
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<tbody>
<tr>
<td>Stations number</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
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<tr>
<td>Tool holders (DIN 69880) ø mm</td>
<td>50</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Option Y-Axis</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</table>

### Machine foot print

<table>
<thead>
<tr>
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<th>1000</th>
<th>1600</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions L x B x H m</td>
<td>3.85 x 2.65 x 4.2</td>
<td>5.0 x 3.5 x 4.1</td>
<td>7.0 x 3.5 x 4.1</td>
<td>8.8 x 5.4 x 4.6</td>
<td>8.8 x 5.4 x 4.6</td>
<td></td>
</tr>
<tr>
<td>Weight kg</td>
<td>16 000</td>
<td>32 000</td>
<td>35 000</td>
<td>42 000</td>
<td>42 000</td>
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</tr>
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</table>

Technical data subject to change
Service for all Brands and Legacy Brands of FFG Werke GmbH

FFG Europe

Horizontal turning machines
Service Center Uhingen
Stuttgarter Strasse 169, 73066 Uhingen
Tel.: +49 800 000 5639

Vertical turning machines
Service Center Taunusstein
Aarstrasse 157, 65232 Taunusstein
Tel.: +49 6128 243 260

Horizontal machining centers
Service Center Mosbach
Steige 61, 74821 Mosbach
Tel.: +49 6261 66 123

Transfer lines, special machines
Service Center North / West
Stefansbecke 30, 45549 Sprockhoevel
Tel.: +49 2339 9278 0

Gear manufacturing
Service Center Chemnitz
Marienberger Strasse 17, 09125 Chemnitz
Tel.: +49 371 576 386

Multi-way rotary transfer machines, multi-spindle, multi-station machining centers
Service Center Offenburg
Am Holderstock 2, 77652 Offenburg
Tel.: +49 781 289 1121

FFG 24/7 Service and Support: www.ffg-werke.com/24x7
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
FFG Werke GmbH offers a broad range of turning, milling, and gear manufacturing technology, based on the knowhow of the renowned machine tool brands VDF Boehringer, Hüller Hille, Hessapp, Honsberg, Modul and Witzig & Frank. These brands are well known as reliable and innovative equipment suppliers for the automotive and truck, machine building, general machining, railway, aerospace, energy and heavy engineering industries. The company has a global footprint, which is enhanced by a network of strong sales & service partners. While being an independent group member, FFG Werke GmbH benefits from the strengths and opportunities of the global Fair Friend Group. The brand FFG Europe stands for premium technology within FFG. Apart from the German brands, it comprises the Italian manufacturers Jobs, Sachman, Rambaudi and Sigma.