FORMING EXCELLENCE

WF

OUR MACHINES
FOR DRIVE-TRAIN COMPONENTS

Contents

Five good reasons for working with us

We are professionals.

The very first machine delivered by WF Maschinenbau took the form of a unit for the production of components for drive-trains. Just on fifty years later, we are proud to offer our customers seven series of machines for the most diverse applications and customer requirements.

We deliver quality.

Our machines are produced at Sendenhorst with the greatest possible depth of in-house production. We cooperate solely with high-quality German subsuppliers, enabling us to be sure that all the components installed satisfy our own high standards. At our R&D Center, we have been developing new processes for the production of drive-train components on four test machines for twenty years.

We provide service.

We have the right contact for every question. After commissioning, our comprehensive service, regular maintenance and guaranteed spares availability assure trouble-free operation of your machine for years and years.

We assure sustainability.

Chipless forming assures the effective use of all the material processed. On all of our machines, without exception, material efficiency has been carefully optimised (up to 60% savings of material). Production of certain complex drive-train components is only made possible by the use of our machines. The benefits include lower per item production costs, reduced end-product weight and high mechanical strength. In addition, the processes used on these machines save emissions.

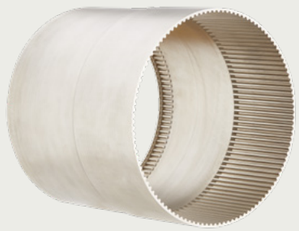
We shape the future.

SMART FORMING tools are our response to the rising demands in the field of Industry 4.0. Graphical programming support, process Quality Assurance and preventative maintenance are our way of deploying an extensive software suite to develop the link between people, processes and machines ever further.

Our series of machines – an overview

Series more information on page	VSTR → 10	HDC → 12	VUD → 14	NAM → 16	VBA → 18	VPA → 22	CWC → 24
Gear components							
CVT bevel-gear disc			●	●			
CVT bevel-gear disc, with hub			●	●			
Differential housing, with hub			●	●			
Pressure accumulators for automatic gearboxes, with hub			●	●			
Spring retaining cups, with sealing-ring slots or beading				●	●	●	
Gear components, externally toothed			●		●		
Clutch housings, internally toothed	●	●	●				
Clutch housings, with hub			●	●			
Clutch-plate carriers, externally toothed			●				
Clutch-plate carriers, internally toothed	●	●			●		
Clutch-plate carriers, with hub			●	●			
Sliding sleeves	●	●	●	●			
Sliding sleeves, with hub			●	●			
Converter housings			●	●			
Converter housings, with hub			●	●			
Drive-train components							
Constant-velocity (CV) joints			●				
Constant-velocity (CV) joints, with hub			●	●			
Belt pulleys				●	●	●	●
Belt pulleys, with hub			●	●			●
Starter ring gears							●
Components for alternative propulsion systems							
Hollow shafts	●	●	●				
Cooling jackets for electric motors	●	●	●				
Rotor carriers	●	●	●				
Rotor shafts	●	●	●				
Stator carriers	●	●	●				
Brake components							
Slave brake pistons					●	●	

Our series of machines for gear components



The propulsion concepts used in our vehicles are changing radically. The ongoing reorientation in production concepts and the ever greater demands made on the quality and precision of components necessitate solutions that can keep pace with them. Profound transformation processes result in new challenges to which we at WF Maschinenbau respond with the dependability of our machines and the implementation of Industry 4.0 components – with remarkable success.

The benefits for you of using our machines for gear components

- **Selection of the right production concept:** matched with your application, and dependent on production quantities and part variance
- **Costs:** reduction of material consumption and in-service weight by up to 20%, combined with minimised finishing and reworking (production to near-net shape)
- **Weight:** end-product weight reductions by up to 20%, reductions in fuel consumption and CO_2 emissions
- **SMART FORMING tools:** Industry 4.0 applications for optimisation of production

Highlights of our machines

- Robust, stress-relieving annealed welded-steel construction
- No need for a special machine foundation
- Ultra-modern SIEMENS control systems
- Ultra-high machine availability
- Excellent accuracy repeatability
- Ultra-high durability for decades of 24/7 operation
- Plug-and-Play delivery with fully developed and applied series application
- Numerous options for retrofitting
- Best price : benefit ratio on the market – designed for dedication
- Twenty-year guarantee of spares availability
- Option to extend machine guarantee to three years
- Large range of services available for repairs and retrofitting

Machine details and technical specifications see page

Our series of machines for drive-train components

You can produce drive-train components reliably and with maximum quality standards on five series of machines which have been in continuous operation for many years with renowned WF Maschinenbau customers. Our customers have been producing belt pulleys, poly-V belt pulleys, V-belt pulleys, clutch housings, clutch-plate carriers and starter ring gears for decades using these machines.

Your benefits from using our machines for drive-train components

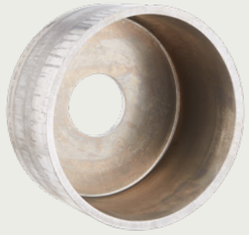
- **Selection of the right production concept:** matched with your application, and dependent on production quantities and part variance
- **Costs:** reduction of material consumption and in-service weight by up to 20% combined with minimised finishing and reworking (production to near-net shape)
- **Weight:** end-product weight reductions by up to 20%, reductions in fuel consumption and CO_2 emissions
- **Production:** from a single piece, from simple preforms (rounds), from forged performs (for safety-relevant components)
- Optimum **surface quality**
- **High-precision radial run-out**
- **SMART FORMING tools:** Industry 4.0 applications for optimisation of production

Highlights of our machines

- Ultra-modern SIEMENS control systems
- Ultra-high machine availability
- Excellent accuracy repeatability
- Ultra-high durability for decades of 24/7 operation
- Plug-and-Play delivery with fully developed and applied series application
- Numerous options for retrofitting
- Best price : benefit ratio on the market – designed for dedication
- Twenty-year guarantee of spares availability
- Option to extend machine guarantee to three years
- Large range of services available for repairs and retrofitting

Machine details and technical specifications see page

Our series of machines for components for alternative propulsion systems



The concepts for alternative propulsion systems, in particular, are evolving at breakneck speed. Many of these applications – some quite possibly new to you! – have been tested in our trials. The team at our R&D Center is working continuously on future patents. If you're interested, just ask! Our machines have already been producing hollow shafts and rotor shafts, stator carriers and rotor carriers, cooling jackets and constant-velocity joints for many years.

Your benefits from using our machines for alternative propulsion systems

- **Selection of the right production concept:** matched with your application, and dependent on production quantities and part variance
- **Part flexibility:** production from a single piece, production from simple preforms (rounds)
- **Production:** from forged preforms (for safety-relevant components)
- Optimum **surface quality**
- **High-precision radial run-out**
- **Costs:** reduction of material consumption and in-service weight by up to 20%, combined with minimised finishing and reworking (production to near-net shape)
- **Weight:** end-product weight reductions by up to 20%, reductions in fuel consumption and CO_2 emissions
- **SMART FORMING tools:** Industry 4.0 applications for optimisation of production

Highlights of our machines

- Ultra-modern SIEMENS control systems
- Ultra-high machine availability
- Excellent accuracy repeatability
- Ultra-high durability for decades of 24/7 operation
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Machine details and technical specifications see page

VSTR	Hollow shafts, cooling jackets, rotor carriers/stator carriers, rotor shafts	→ 10
VUD	Constant-velocity joints, rotor shafts	→ 14

Our series of machines for brake components

Your benefits from using our machines for brake components

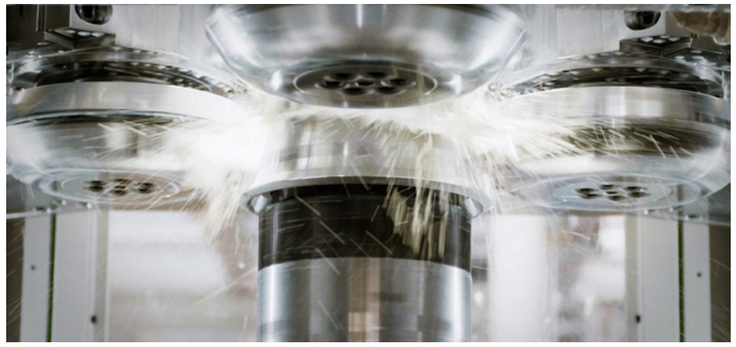
- **Selection of the right production concept:** matched with your application, and dependent on production quantities and part variance
- **Individual brake components:** for series production for cars and goods vehicles
- **SMART FORMING tools:** Industry 4.0 applications for optimisation of production

Highlights of our machines

- Ultra-modern SIEMENS control systems
- Ultra-high machine availability
- Excellent accuracy repeatability
- Ultra-high durability for decades of 24/7 operation
- Plug-and-Play delivery with fully developed and applied series application
- Numerous options for retrofitting
- Best price : benefit ratio on the market – designed for dedication
- Twenty-year guarantee of spares availability
- Option to extend machine guarantee to three years
- Large range of services available for repairs and retrofitting

Machine details and technical specifications see page

VPA	Beading in brake cylinders	→ 22



VSTR

Use the Vertical Flow-forming Machine (VSTR) to flexibly produce a whole range of different gear components. The VSTR produces from the simplest preforms precise cylindrical components without internal toothing in various diameters and featuring complex geometries.

Your benefits from using our VSTR

- Optimum exploitation of **gravitational forces** by the machine assisted by its vertical configuration
- **Minimum turning-machining requirement**/minimum finishing work
- **Lighter components** with higher mechanical strength
- **Small space footprint** (less than 50 m²)
- **No need for a special machine foundation**

Standard equipment on all machine types

- One main support and three radial units (four CNC axes)
- Machine table with main spindle and stripper
- High-power main-spindle drive with reduction gearbox for optimum torque
- Tailstock traverse with hydraulic cylinder and pressure head
- Central and circulation lubrication for all important machine components
- Cooling circuit for the forming process
- Efficient, high-power hydraulic system
- Siemens CNC control system

Special equipment for all machine types

- Feed unit or robot(s)
- Tool-changing aids
- Integrated tool-cleaning system
- Variable software solutions for program compilation, process monitoring and optimisation
- 3 x 2 CNC axes

VSTR 400-3

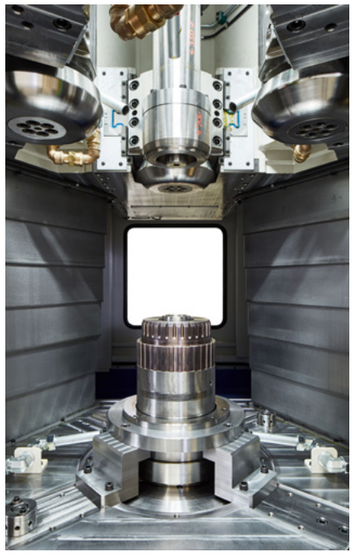
Vertical Flow-forming Machine (VSTR)
for forming of gear components of workpiece diameters up to 400 mm

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	400 mm
Workpiece length	max.	345 mm
Number of forming rollers	3	

VSTR 400-3 S

Vertical Flow-forming Machine (VSTR), extra-robust version,
for forming of gear components of workpiece diameters up to 400 mm

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	400 mm
Workpiece length	max.	345 mm
Number of forming rollers	3	



HDC

The Horizontal Flow-forming Center (HDC) produces, from simple round blanks or preforms, high-precision cylindrical components with or without internal toothing and in a range of diameters and complex geometries. Recommended in particular for clutch-plate carriers.

Your benefits from using our HDC machines

- **Freely moveable workpiece** thanks to horizontal design and fixed main support
- **Flow-forming** operations **in both directions**
- Improved materials properties **(enhancement of mechanical strength)**
- Reduction of component wall thickness, therefore **lower consumption of material**
- **Weight reductions**/lighter components
- **Minimal turning-machining** and minimal finishing work required
- Flexible use thanks to **combination of multiple forming processes** in a single clamping position – no need for reclamping

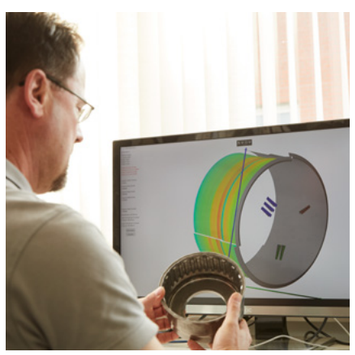
Standard equipment of all machine types

- One main support with up to six radial units (depending on application and machine type)
- Fixed installation of main support, workpiece is moved by support
- Machine bed with headstock, traverse and tailstock
- Stripper/ejector mounted on headstock
- High-power main spindle drive with reduction gearing for optimum torque
- Tailstock cylinder and pressure head
- Central and circulation lubrication for all important machine components
- Coolant circuit for the forming process
- Efficient, high-powered hydraulic system
- Siemens CNC control system

Special equipment for all machine types

- Feed unit or robot
- Tool-changing aids
- Integrated tool-cleaning system
- Variable software solutions for program compiling, process monitoring and optimisation
- Special roller mounting for flow-forming operations, hub forming, etc.
- Fixed support and moveable main spindle axis (depending on specific application)
- Multiple-speed gearbox for main-spindle drive

Workpiece optimisation using
WF SMART FORMING viewer



HDC 350-3

Horizontal Flow-forming Center (HDC)
for forming of gear components of workpiece diameters up to 350 mm

Workpiece diameter	min.	150 mm
Workpiece diameter	max.	350 mm
Workpiece length (forward mode)	max.	300 mm
Number of forming rollers	3	

HDC 600-3

Horizontal Flow-forming Center (HDC)
for forming of gear components of workpiece diameters up to 600 mm

Workpiece diameter	min.	150 mm
Workpiece diameter	max.	600 mm
Workpiece length (forward mode)	max.	400 mm
Number of forming rollers	3	

HDC 700-4

Horizontal Flow-forming Center (HDC)
for forming of gear components of workpiece diameters up to 700 mm

Workpiece diameter	min.	150 mm
Workpiece diameter	max.	700 mm
Workpiece length	max.	800 mm
Number of forming rollers	4	

The HDC 700-4 is the world's largest flow-forming machine for production of internally toothed gear components and is especially suitable for automatic gearing on heavy earthmoving machines, agricultural vehicles and high-capacity dumper and haul trucks.

VUD

The Vertical Universal Flow-forming Machine is a special machine for Research & Development purposes. It is the only machine of its type on the entire market and combines in itself practically all chipless technologies, such as, for example: flow-forming, shear-forming, cylinder flow-forming, forward and reverse flow-forming, profiling, splitting, collapsing, flanging, hub pressing, necking-in, butt-tapering, etc. It is suitable for both hot and cold forming and produces rotationally symmetrical hollow bodies, high-precision hollow bodies with constant or variable wall-thickness profiles, internally toothed clutch and gear components, belt pulleys and shock-absorber components, hubs and much, much more.

Your benefits from using our VUD machine

- Lower material consumption
- Weight savings
- Reduced space requirements
- Simple and easy tool changing
- Good accessibility for servicing and maintenance work and also manual/automated feed/discharge
- No need for a special machine foundation
- Short setting-up times, ideal for product development and short production runs
- High productivity, ideal for series production with high product numbers

Standard equipment on all machine types

- Two forming supports with two opposing CNC axes in each case (vertical and radial)
- Machine table with main spindle
- High-power main-spindle drive with reduction gearbox for optimum torque
- Tailstock traverse with hydraulic cylinder and pressure head
- Central and circulation lubrication for all important machine components
- Cooling circuit for the forming process
- Efficient, high-power hydraulic system
- Siemens CNC control system

Special equipment for all machine types

- Automatic feed system or robot(s)
- Tool-changing aids
- Integrated tool-cleaning system
- Stripper options: Central ejector cylinder integrated into the main spindle, external stripper system, stripper system under flow-forming/transverse supports
- Variable software solutions for program compilation, process monitoring and optimisation
- Special roller holders for e.g. flow-forming operations, hub forming, etc.
- Multiple-speed gearbox for main-spindle drive, etc.

Complex geometry drive-train component

VUD 400-2

Vertical Universal Flow-forming Machine (VUD) for combination of multiple forming processes in a single workpiece of diameters up to 400 mm

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	400 mm
Workpiece height	min.	15 mm
Workpiece height	max.	400 mm
Number of forming rollers	2	

VUD 600-2

Vertical Universal Flow-forming Machine (VUD) for combination of multiple forming processes in a single workpiece of diameters up to 600 mm

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	600 mm
Workpiece height	min.	15 mm
Workpiece height	max.	600 mm
Number of forming rollers	2	

Special solutions for the VUD machine:

VUD 600-2 WB
Equipped with two synchronously acting rack die units instead of forming rollers: an innovative potential for production of components of complex external toothing patterns using chipless forming.

VUD 600-2 SR
Equipped with two CNC-controlled swivelling roller holders, each with a swivel angle of 45°: a potential for changing the working angle of the rollers during program running.

VUD 400-2 H
A revolutionary innovation from WF: a universal machine permitting hot forming of the most diverse range of materials at up to 1,000° C with the exclusion of oxygen.

NAM

The Hub-Forming Machine uses a unique process patented by WF Maschinenbau to form hubs on gear-box components and belt pulleys of the most diverse designs. This unique series produces one-piece end products with no need for welding or brazing. Cold hardening achieves a reduction in the wall thickness of the hub, resulting in significant materials savings. Using hot forming, on the other hand, hubs of large lengths or wall thicknesses can be produced, a function particularly useful for trucks and other commercial and utility vehicle engineering.

Your benefits from using our NAM

- Fully proportionate production with respect to radial run-out, axial run-out, surface quality and accuracy
- High flexibility
- Short production cycles
- Short setting-up times
- Lower consumption of material possible (= cost-savings)
- Lower material consumption (up to 20%)
- Lower machine and tooling costs
- One-piece component design
- Same material for hub and component
- Large bandwidth (thickness and length) for hub dimensions
- Minimal or no finishing work
- No imbalance
- No cleaning
- No risk of corrosion
- Lighter components thanks to reduction of wall thickness due to higher mechanical strength

Standard equipment on all machine types

- Machine bed with tailstock traverse
- Extremely robust intermediate traverse as positioning axis
- Main and traverse spindle with robust roller bearings
- Two forming units, each with two CNC axes
- Integrated hydraulic main-spindle ejector
- Oil-circulation lubrication for the main and traverse-spindle bearings
- Central lubrication
- “Safe-Lock” locking system

Special equipment for all machine types

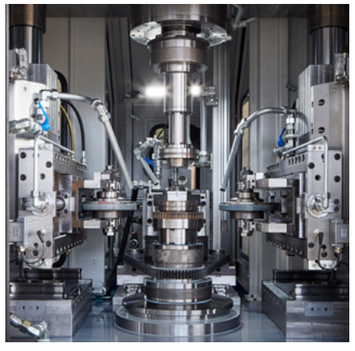
- Automatic feed and discharge system or robot(s)
- Integrated hydraulic traverse-spindle ejector
- Roller drives on flow-forming units
- Special roller holder for flow-forming operations
- Belt filter and oil separator
- Double tailstock cylinder

Feed material: round blank, finished component: twin hub with internal toothing

NAM 600

Hub-forming machine for flexible initial forming of hubs on gear and drive-train components

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	300 mm
Workpiece height	max.	135 mm
Number of forming rollers	2	



NAM 600 S

Hub-forming machine for flexible and exceptionally powerful initial forming of hubs on gear and drive-train components

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	300 mm
Workpiece height	max.	135 mm
Number of forming rollers	2	

VBA

Use the Vertical Automatic Flow-former Machine to produce all types of belt pulleys, such as split and folded disks or multiple-groove poly-V belt pulleys from rounds or other preforms of all types. The VBA is the world's most frequently purchased machine for the production of belt pulleys.

Your benefits from using our VBA

- Robust structure tried and proven in practice for maximum component quality and long tool service-lives
- Machine can be adapted very easily to the most diverse customer requirements
- Various VBA types exist depending on the application, thus assuring optimum adaptation to your needs and maximum productivity
- Trouble-free tool changing and programming, thus minimising setting-up times

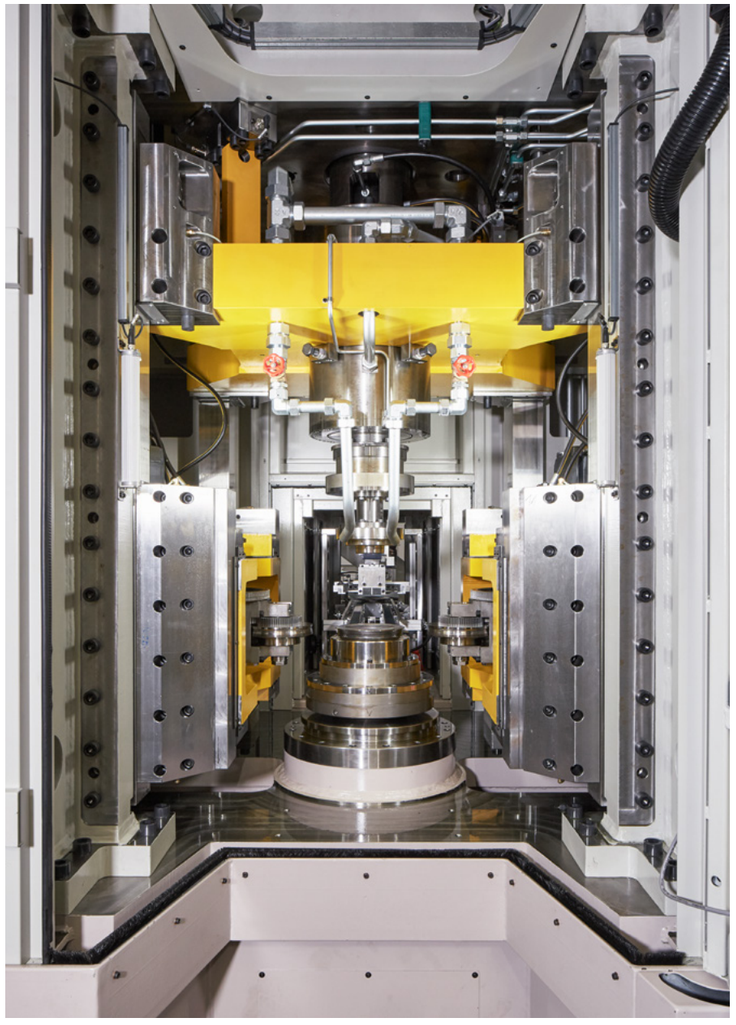
Standard equipment on all machine types

- Machine bed with tailstock traverse
- Extremely robust intermediate traverse as positioning axis
- Main and traverse spindle with robust roller bearings
- Two forming units with double roller holder
- Integrated hydraulic main-spindle ejector
- Oil-circulation lubrication for the main and traverse-spindle bearings
- Central lubrication
- “Safe-Lock” locking system

Special equipment for all machine types

- Automatic feed and discharge system or robot(s)
- Integrated hydraulic traverse-spindle ejector
- Roller drives on flow-forming units
- Belt filter and oil separator

WF Maschinenbau can supply a Vertical Turning System (VDV) to assure precision preparation of round blanks and/or to provide the perfect finish to the flow-formed product. This can be easily combined with the VBA machine, either upstream or downstream of the VBA.



VBA 200-2

Vertical Automatic Flow-forming Machine (VBA)
for production of simple belt pulleys of workpiece diameters up to 200 mm

Workpiece diameter	min.	50 mm
Workpiece diameter	max.	200 mm
Workpiece height	min.	15 mm
Workpiece height	max.	150 mm
Number of forming rollers	2	

more VBA machines →

VBA 300-2

Vertical Automatic Flow-forming Machine (VBA)
for production of simple belt pulleys of workpiece diameters up to 300 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	300 mm
Workpiece height	min.	15 mm
Workpiece height	max.	150 mm
Number of forming rollers	2	

VBA 300-4

Vertical Automatic Flow-forming Machine (VBA)
for production of poly-V belt pulleys of workpiece diameters up to 300 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	300 mm
Workpiece height	min.	15 mm
Workpiece height	max.	150 mm
Number of forming rollers	4	

VBA 600-4

Vertical Automatic Flow-forming Machine (VBA)
for production of special belt and rope pulleys of workpiece diameters up to 600 mm. This machine is especially suitable for the production of rope pulleys for ski lifts.

Workpiece diameter	min.	200 mm
Workpiece diameter	max.	600 mm
Workpiece height	min.	15 mm
Workpiece height	max.	150 mm
Number of forming rollers	4	

VBA 300-5R

Vertical Automatic Flow-forming Machine (VBA)
with 5-position tool turret for production of complex poly-V belt pulleys of workpiece diameters up to 300 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	300 mm
Workpiece height	min.	15 mm
Workpiece height	max.	85 mm
Number of forming rollers	per tool turret	5

VBA 300-10R

Vertical Automatic Flow-forming Machine (VBA)
with two 5-position tool turrets for production of highly complex poly-V belt pulleys of workpiece diameters up to 300 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	300 mm
Workpiece height	min.	15 mm
Workpiece height	max.	85 mm
Number of tool turrets	2	
Number of forming rollers	per tool turret	5

VBA 300-16R

Vertical Automatic Flow-forming Machine (VBA)
with two 8-position tool turrets for production of highly complex poly-V belt pulleys of workpiece diameters up to 300 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	300 mm
Workpiece height	min.	15 mm
Workpiece height	max.	85 mm
Number of tool turrets	2	
Number of forming rollers	per tool turret	8

VPA

The Vertical Automatic Profiling Machine is designed for forming of beading and grooves on clutch and gear components and on brake cylinders. The VDV is the optimum complement to the VPA; it pre-turns the blanks, assuring best-possible conditions for the forming process.

Your benefits from using our VPA

- **Lower material consumption**
- **Weight savings**
- **Improved materials properties** thanks to cold hardening and microstructure orientation
- **Short cycle times**
- Extremely good **dimensional accuracy** and **process stability**

Standard equipment on all machine types

- Machine bed with tailstock traverse
- Main and traverse spindle with robust roller bearings
- Two forming units with powered roller holder
- Integrated hydraulic main-spindle ejector
- Oil-circulation lubrication for the main and traverse-spindle bearings
- Central lubrication
- “Safe-Lock” locking system

Special equipment for all machine types

- Automatic feed and discharge system or robot(s)
- Integrated hydraulic traverse-spindle ejector
- Belt filter and oil separator

WF Maschinenbau can supply a Vertical Turning System (VDV) to assure precision preparation of round blanks and/or to provide the perfect finish to the flow-formed product. This can be easily combined with the VPA machine, either upstream or downstream of the VPA.

Feed belt / buffer storage unit on a VSTR

VPA 150-2

Vertical Automatic Profiling Unit (VPA)
for production of beading and grooves
in workpieces of diameters up to 150 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	150 mm
Workpiece height	min.	15 mm
Workpiece height	max.	40 mm
Number of forming rollers	2	

VPA 250-2

Vertical Automatic Profiling Unit
for production of beading and grooves
in workpieces of diameters up to 250 mm

Workpiece diameter	min.	80 mm
Workpiece diameter	max.	250 mm
Workpiece height	min.	15 mm
Workpiece height	max.	40 mm
Number of forming rollers	2	

CWC

The CWC series is specially designed for edge-flanging tasks, and in particular for the production of blanks for starter ring gears. Three stations operating in parallel assure extremely short cycle times, optimum production results and high flexibility. Edge-flanging reduces the necessary production operations from 15 to 8 compared to the conventional production process using bending and welding. Fivefold flanging on the outer edge can be achieved.

The result is a one-piece, non-welded starter ring gear (starter disc) with high long-term durability, and suitable, in particular, for the extreme demands made on vehicles fitted with automatic start-stop systems.

Your benefits from using our CWC

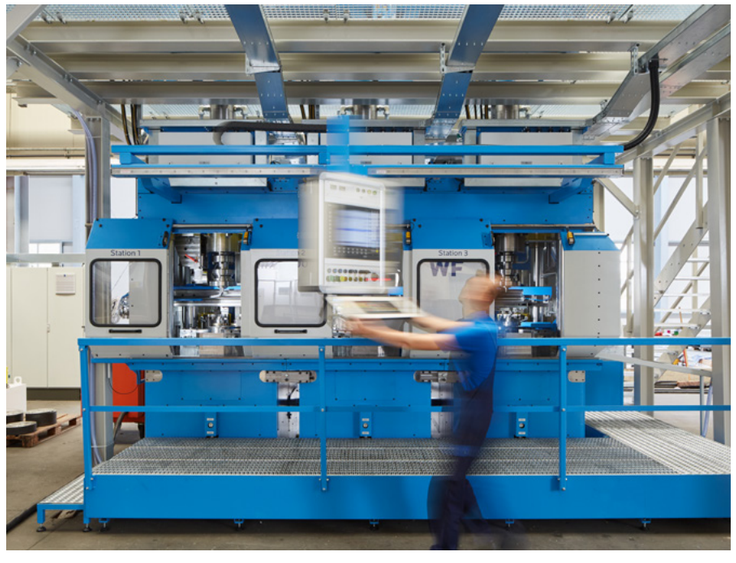
- Durable, high-quality results from the **simplest preforms**
- **Elimination** of complex welding work
- **Leaner production processes,** application of toothing immediately after CWC
- **Low disc distortio**n during downstream heat treatment
- **Low space requirements**

Standard equipment

- Three stations
- Two forming units per station
- One integrated parts transfer system per station

Special equipment

- Upstream destacking system for singling of rounds
- Handling and conveying equipment
- Safety equipment



CWC 300-3 ST

Compact Working Center (CWC)
with three work stations for flanging of the outer edges
of plates for starter-motor ring gears

Workpiece diameter	min.	150 mm
Workpiece diameter	max.	450 mm
Number of work stations	3	
Number of forming rollers	per station	2

Our service packages

	Includes	★ Basic	★★ Advanced	★★★ Excellence
Troubleshooting	**WF helpdesk:** Service portal linked with digital lifecycle record for trouble-free service processes	●	●	●
	Personal contact		●	●
	Remote support: For identification of cause(s) of problems with the machine via on-line link		●	●
	SMART glasses support: Determination of causes of problem(s) using augmented-reality goggles			●
	On-site support: For identification of cause(s) of problems on the actual machine			●
On-line and off-line training events	**General operation:** General instruction in the operation of the machine during pre-commissioning at WF	●	●	●
	Machine operation: User knowledge on setting machine up, tool changing, programming and safe handling and use of operating equipment		●	●
	Machine maintenance: Know-how on machine mechanics and hydraulics, fault diagnosis and troubleshooting		●	●
	Programming and forming process: Detail knowledge on programming and technologies			●
	Follow-up: Individual practical training for advanced practitioners, around four months after commissioning, for optimisation of operation			●
Maintenance	**Spares package 4000:** Recommended spare parts for the first 4,000 hours of operation		●	
	Spares package 8000: Recommended spare parts for the first 8,000 hours of operation			●
	Remote maintenance: Remote inspection for ascertainment of machine condition, including recommendations for action		●	●
	SMART glasses maintenance: Inspection using AR goggles and remote access for ascertainment of machine condition, including recommendations for action			●
	On-site maintenance agreement: Entire on-site maintenance of the machine at specified maintenance intervals			●

With our service packages, we ensure long and reliable operation of your machine.
The “Basic” package is included in the purchase price of your machine.
Please contact us for customised packages or to book individual services!

Further services	
SMART FORMING tools – WF Maschinenbau's Industry 4.0 solutions	**SMART FORMING assistant** for graphical programming support for NC programs **SMART FORMING viewer** for visual display and evaluation of forming forces on the product **SMART FORMING cam** for video supervision of the machine's working chamber **SMART FORMING inspector** for Quality Assurance of the forming process **SMART FORMING diagnostics** for support of preventative maintenance and continuous self-diagnosis
Automation	**Setting-up** of feed/discharge systems, robots and transfer systems
Innovation engineering	**Product developments,** feasibility studies and fundamental tests in our R&D Center **Small production runs** to bridge shortages of machine capacity or peak orders, performance of ultra-small runs **“WF Future Zone” workshop –** What else is possible? YOU shape the future of your industry! **Machine setting-up** for optimised start of a new production line
Overhaul and retrofitting	**General overhaul** for minimisation of risk of failures and/or **retrofitting** to assure regular production operation

You can book additional services as you need them.
Please contact us directly for more information, we'll be pleased to help you!

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Headquarter

WF Maschinenbau
Sendenhorst, Germany

Locations

WF Machinery
Schaumburg, USA

WF China
Beijing, China

WF Korea
Incheon, Korea

Representations

Canada – England – France – India – Italy – Japan – Mexico – Portugal – Spain – Taiwan – Turkey

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