FORMING EXCELLENCE

WF

OUR MACHINES FOR WHEELS

Contents

Three good reasons for working with us

We are the innovation leader in metal spinning and flow forming.

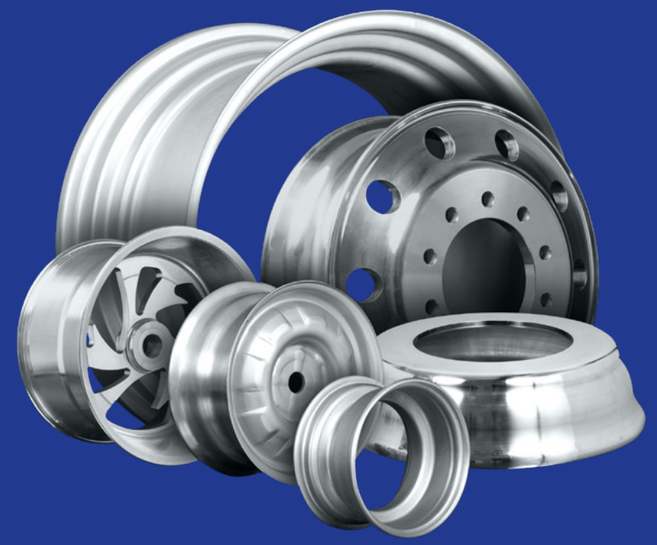
We are the only company in our industry with a far-ranging R&D Center, including its own range of machines for trials and tests. And our customers can always depend on that most important asset: the treasure of experience and extraordinary expertise provided by our long-serving employees.

We supply quality.

Our machines are constructed in Sendenhorst to the greatest possible in-house manufacturing depth. We work exclusively with high-quality German suppliers so that we are sure, every time, that all the components installed meet the very highest standards.

We assure service.

We support you throughout the purchase process and are the right address for every question. After commissioning of your machines, our comprehensive service, regular maintenance and guaranteed availability of spare parts assure the trouble-free long-term operation of your systems.



Our range of machines – an overview

black rims: © Htpix, Fotolia

End products	Rims	Wheel discs	Rim rings	Special rims	End products
Vehicle types	Cars and trucks	Trucks and busses	Cars and vans	Compacts	Vehicle types
Material	Aluminium	Steel	Steel	Steel	Material
Starting product	Cast, forged or rotationally forged preform	Disc	Welded bandage	Welded bandage	Starting product
Technology	Flow forming	Flow forming	Flow forming	Spinning and curling	Technology
Benefits	Greater stability Reduced rim weight Economy on materials and machining (up to 20%)	Universally used process in modern production of steel wheels Economy on materials and machining (up to 20%) Greater productivity (1 item every 18 seconds)	Reduction in rim-ring weight (up to 25%) Greater strength combined simultaneously with reduced weight Cost savings on materials and machining (up to 25%)	Wheel production WITH NO contour tools Free programming of wheel contours Efficient production even of small batches	Benefits
Designation	Vertical rim machine	Horizontal/vertical wheel disc machine	Vertical/horizontal flow forming machine and trimming machine	Vertical rim-ring spinning machine and vertical edge treatment	Designation
Series	VFM	HRM / VRM	HSTA + HABS / VSTA + VABS	VFD + VRB	Series

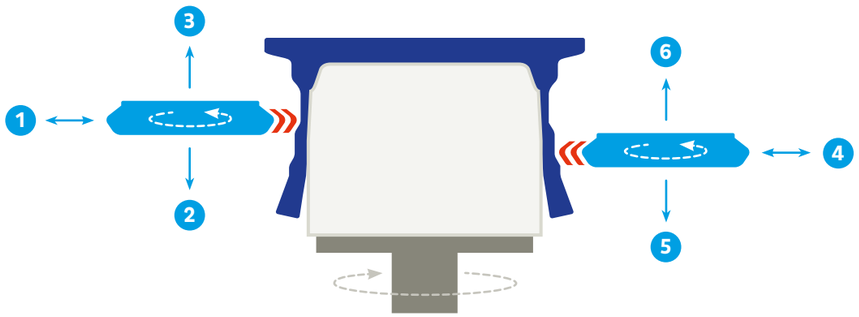
Our VFM series of machines has been specially designed for the production of one-piece aluminium wheels. Two forming rollers programmable independently of each other and a loading concept that permits simultaneous charging and discharge of the machine assures extremely short production cycles.

Our rim-ring machines - the benefits for you:

- **Strength:** Greater rim strength and robustness, increases in tensile strength by up to 15%, increases in elongation at fracture by up to 200%
- **Weight:** Reduction of fuel consumption and CO_2 emissions, increased payloads in trucks by up to 180 kg
- **Costs:** Material input reduced by up to 20%, melting costs for cast wheels reduced by up to 20%, minimised machining effort and reduced swarf recycling

Highlights of our machines:

- Vertical machine of enclosed and extremely torsion-resistant frame-type construction
- High-power main spindle with high-torque 1PH8 motor, designed as a CNC axis with orientated spindle stop point (M19)
- Two opposed compound rests with a total of four interpolating CNC axes (with the exception of VFM 600-1-2 W)
- Extremely stiff tailstock design; high thrust force thanks to two parallel hydraulic cylinders, position and thrust pressure can be freely programmed



The principle of the two-roller flow forming process on the VFM machine

Flow forming compresses the cast or forged aluminium wheels even further, increasing their strength. These models are used on both trucks and cars.

Machine description:

- Roller driven by means of speed-regulated hydraulic motors (not VFM 600-1-2 W)
- Integrated annular stripper around the main spindle
- Integrated internal short-stroke ejector located in the tailstock spindle (not VFM 600-1-2 W)
- Generously dimensioned bearings and guideways
- Extremely good access to the working area from front and rear
- Fastest possible charging and discharge times thanks to only one (!) robot

A VFM for hot forming is used for cast preforms and is always equipped with:

- Increased heat protection in the working area (spindle cooling coat, tailstock cooling coat)
- Boosted cooling rate for the circulation oil lubrication of the spindle and tailstock bearings
- Spray systems for rollers and tools (integrated into the automatic sequence)
- Heating system for spindle tools (manual, gas-fired, temperature-monitored)

A VFM for cold forming is used with forged preforms and is always equipped with:

- Coolant system for product cooling with flow-rate control and monitoring, integrated into the automatic sequence
- Expanded spray protection mounted on the machine cladding
- Optional accessories: paper band filter, self-cleaning continuous filter, oil-separator mounted on coolant tank

VFM 600-1-2 W

Vertical rim-ring machine (VFM)
for hot forming of cast aluminium car wheels up to 24"

Workpiece diameter	min.	300 mm (12")
Workpiece diameter	max.	600 mm (24")
Workpiece length	max.	300 mm (12")
Tool mounting	Size 11	DIN 55027
Number of forming rollers	standard/optional	1/2
Drive rating, main spindle	approx.	71 kW
Main-spindle speed	approx.	1000 rpm
Slide stroke	axial	1 x 400 mm
Slide stroke	radial	1 x 300 mm
Slide force	axial max.	1 x 70 kN
Slide force	radial max.	1 x 70 kN
Tailstock thrust force	max.	120 kN

Hand-made bronze guideways –
a WF quality feature

Optional:
- WF robot system for loading/unloading
- Double roller holder for use of two rollers
- 45° special roller holder
- Full machine enclosure
- Central lubrication system
- Dust collection (smog hog) system

The VFM 600-1-2 W is a new WF Maschinenbau development. Thanks to its simple mechanical structure, this machine is particularly suitable for companies whose priority is the production of small series, with lesser importance assigned to mass and cycle time. In addition, this is an extremely low-cost variant since, in addition to basic economy, the pre-heating furnace can be omitted, provided the machine is installed directly downstream a casting facility.

VFM 600-2-4 W

Vertical rim-ring machine (VFM)
for hot forming of cast aluminium car wheels up to 24" for series production with short cycle times

Workpiece diameter	min.	300 mm (12")
Workpiece diameter	max.	600 mm (24")
Workpiece length	max.	300 mm (12")
Tool mounting	Size 11	DIN 55027
Number of forming rollers	standard/optional	2/4
Drive rating, main spindle	approx.	120 kW
Main-spindle speed	approx.	1000 rpm
Slide stroke	axial	2 x 400 mm
Slide stroke	radial	2 x 350 mm
Slide force	axial max.	2 x 150 kN
Slide force	radial max.	2 x 150 kN
Tailstock thrust force	max.	300 kN

Working area, VFM 600-2-4 W

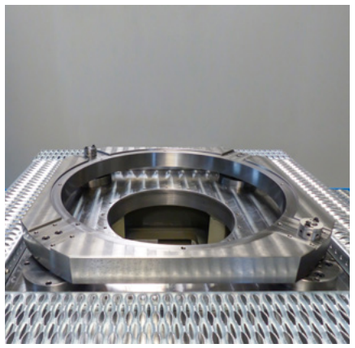
Optional:
- WF robot system for loading/unloading in a **single** linear movement
- Tool changing system for safe and reliable changing of tools
- Lockable tailstock for orientation to the main spindle
- Tailstock ejector
- Double roller holder – two rollers per compound rest
- 45° special holder for optimum flow forming of the rim flange
- Dust collection (smog hog) system

Turnkey solution:
- Rotary table oven for heating of preforms
- Quenching basin for cooling of the front face
- Rotary spray unit for wetting of the preforms
- Robot technology (including quick-change gripper/manipulator)
- Safety technology (safety fencing, controlled access system, etc.)
- Monitoring and conveying equipment

Pre-heating burner

VFM 800-2-4 W

Vertical rim-ring machine (VFM)
for hot forming of cast aluminium truck wheels up to 32"



4-times-guided main spindle stripper

Workpiece diameter	min.	300 mm (12")
Workpiece diameter	max.	800 mm (32")
Workpiece length	max.	450 mm (18")
Tool mounting	Size 15	DIN 55027
Number of forming rollers	standard/optional	2/4
Drive rating, main spindle	approx.	200 kW
Main-spindle speed	approx.	800 rpm
Slide stroke	axial	2 x 550 mm
Slide stroke	radial	2 x 500 mm
Slide force	axial max.	2 x 275 kN
Slide force	radial max.	2 x 275 kN
Tailstock thrust force	max.	500 kN

Optional:
- WF robot system for loading/unloading in a **single** linear movement
- Tool changing system for safe and reliable changing of heavy tools
- Lockable tailstock for orientation to the main spindle
- Tailstock ejector
- Double roller holder – two rollers per compound rest
- 45° special holder for optimum flow forming of the rim flange
- Dust collecting (smog hog) system

Turnkey solution:
- Rotary table oven for heating of preforms
- Quenching basin for cooling of the front face
- Rotary spray unit for wetting of the preforms
- Robot technology (including quick-change grippers)
- Safety technology (safety fencing, controlled access system, etc.)
- Monitoring and conveying equipment

VFM 800-2-4 K

Vertical rim-ring machine (VFM)
for cold forming of forged aluminium wheels up to 32"

One of our specialists assembling the guideway systems

Workpiece diameter	min.	300 mm (12")
Workpiece diameter	max.	800 mm (32")
Workpiece length	max.	450 mm (18")
Tool mounting	Size 15	DIN 55027
Number of forming rollers	standard/optional	2/4
Drive rating, main spindle	approx.	265 kW
Main-spindle speed	approx.	800 rpm
Slide stroke	axial	2 x 550 mm
Slide stroke	radial	2 x 500 mm
Slide force	axial max.	2 x 400 kN
Slide force	radial max.	2 x 500 kN
Tailstock thrust force	max.	500 kN

Optional:
- WF robot system for loading/unloading in a **single** linear movement
- Tool changing system for safe and reliable changing of heavy tools
- Coolant filter and oil-separator systems
- Lockable tailstock for orientation to the main spindle
- Tailstock ejector
- Double roller holder – two rollers per compound rest
- Split roller holder for splitting of aluminium discs
- 45° special holder for optimum flow forming to the of the rim flange

Special solution:
As an option, we can also supply a combination-type machine for hot and cold forming also including semi-solid metal casting processes:
- Hot forming of cast aluminium wheels
- Cold forming of forged aluminium wheels
- Semi-solid metal casting processes for aluminium wheels

Our range for steel wheel discs

The HRM and VRM series have been specially developed for the production of high-strength steel wheel discs with improved running characteristics for trucks and buses, vans, utility vehicles and tractors. Flow-formed wheel discs offer high-strength with a low wall thickness. Our machines' high productivity is achieved by means of short acceleration and retardation times for the main spindle, short travel paths and high speeds.

Our wheel-disc machines - the benefits for you:

- **Quality, thanks to unique WF-3x2 axes interpolation:** Independent interpolation of each auxiliary slide with the main support even for simultaneous programming of three different radii, guaranteeing smooth and clean workpiece surfaces
- **Weight:** 20% weight reduction in flow-formed wheel discs compared to punched discs
- **Costs:** Material consumption reduced by up to 20% per item
- **Productivity:** Up to 200 items/hour for certain selected wheel-disc contours

Highlights of our machines:

- Enclosed, extremely torsion-resistant frame-type machine construction
- High-power direct-drive main spindle with no high-maintenance belt-pulley arrangement
- Main slide driven by two servo-cylinders installed in parallel
- Radial slides guided by hand-made bronze guideways
- Tailstock designed as a CNC axis - position and thrust pressure can be programmed as required

Acceptance inspection of a HRM by the customer

Flow-formed steel wheel discs are used mainly in the truck and bus wheel sector.

Machine description:

- Roller-drive systems with speed-regulated hydraulic motors
- Annular, 4-times guided stripping unit around the main spindle
- Generously dimensioned bearings and guideways
- Ejection funnel consisting of HARDOX plates for targeted stripping
- Finished-product removal via the machine base on to a parts chute with integrated chain conveyor

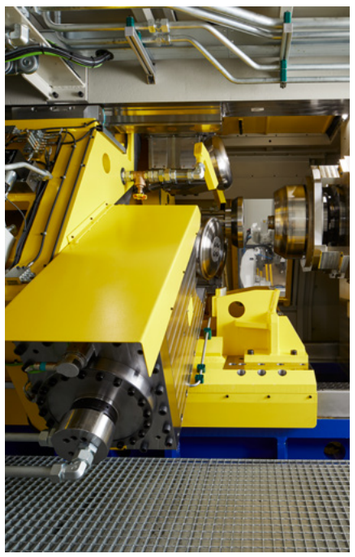
HRM 800-3

Horizontal wheel-disc machine (HRM)
for flow forming of steel wheel discs for trucks and buses

Simple positioning of stapled blanks

Workpiece diameter	min.	265 mm
Workpiece diameter	max.	800 mm
Workpiece height	max.	210 mm
Workpiece thickness	max.	20 mm
Tool mounting	Size 15	DIN 55027
Number of forming rollers	fix	3
Drive rating, main spindle	approx.	300 kW
Main-spindle speed	approx.	800 rpm
Slide stroke	axial	650 mm
Slide stroke	radial	3 x 210 mm
Slide force	axial max.	800 kN
Slide force	radial max.	3 x 500 kN
Tailstock thrust force	max.	350 kN

Working area of the HRM



Optional:
- WF robot system for loading
- De-stacking unit
- Tilting table unit
- Main spindle ejector
- Tool-changing crane
- Installation mezzanine

VRM 600-2

Vertical wheel-disc machine (VRM)
for flow forming of steel wheel discs for vans and transporters

Acceptance inspection of a VRM

Workpiece diameter	min.	280 mm
Workpiece diameter	max.	600 mm
Workpiece height	max.	155 mm
Workpiece thickness	max.	11 mm
Tool mounting	Size 11	DIN 55027
Number of forming rollers	fix	2
Drive rating, main spindle	approx.	140 kW
Main-spindle speed	approx.	650 rpm
Slide stroke	axial	2 x 440 mm
Slide stroke	radial	2 x 190 mm
Slide force	axial max.	2 x 200 kN
Slide force	radial max.	2 x 200 kN
Tailstock thrust force	max.	300 kN

The blank de-stacking unit singles staples of up to 3x40 blanks and feeds them to the robot.

Optional:
- WF robot system for loading/unloading
- De-stacking unit
- Tilting table unit
- Main spindle ejector
- Tool-changing cart

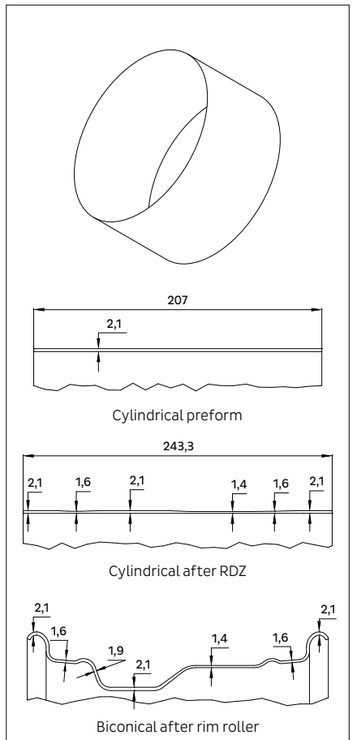
The VRM 600-2 is a low-cost alternative to our HRM. It has been specially designed for the production of smaller wheel discs, which are otherwise frequently produced on presses. The VRM makes it possible to exploit the benefits of flow forming for this product, too.

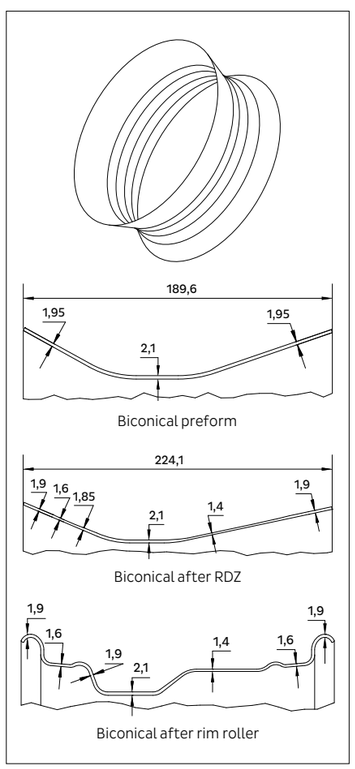
View into the machine chamber of a ring Flow forming Center (RDZ). At left: an HABS 550-4 for trimming and deburring of the rim rings.

At right: an HSTA 550-4 for flow forming of the rim rings. A central robot relays the workpieces from one machine to the next.

Exterior view of a ring Flow forming Center (RDZ)

Our range for weight-optimised steel rim rings





To produce even lighter steel wheels, machines have been developed which partially thin-out, and thus also widen, the blank (bandage) upstream of the rim roller. This permits production of steel wheels lighter by up to 25%.

The aim here has been to keep up with the trend toward the ever lighter light-alloy wheels.

We supply for this a modular machine concept. You can select between vertical and horizontal flow forming machines (HSTA and VSTA), or integrate a complete ring Flow forming Center (RDZ) jointly using the corresponding trimming machine (HABS and VABS).

HSTA or VSTA – the benefits for you:

- **Strength:** Greater durability, despite partially reduced wall thickness
- **Weight:** Reduction of fuel consumption and CO_2 emissions, greater payload thanks to lower vehicle weight
- **Costs:** Up to 25% less material needed, extremely high production rate of up to 300 rings/hour
- Easy integration into existing wheel production lines
- Optimum upright-standing access in the working area

Alternative production concepts:

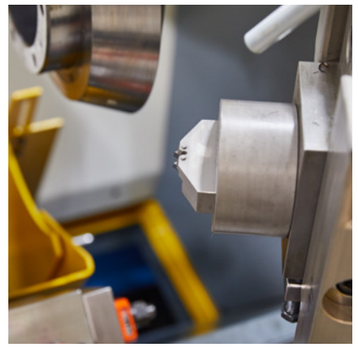
- **Cylindrical bandage route:**
  The partial thinning out of cylindrical bandages takes place in the VSTA. Using a so-called path-length evaluation system, the path length achieved as a function of material tolerance is continuously monitored and the flow forming process correspondingly controlled. The length of the bandage can then be trimmed on one side in the downstream VABS unit.

  Benefits:
  - Constant bandage length after the flow forming process
  - Minimal trimming requirements on only one side of the bandage
  - Especially suitable for truck wheels

- **Biconical bandage route:**
  A pre-shaped biconical bandage is partially thinned out in the HSTA. Here, due to the material tolerances, fluctuations in length result, but can initially be ignored, in order not to lose any cycle times. In a parallel and cycle time neutral operation on HABS, the bandages are then cut to standard length and get deburred.

  Benefits:
  - Constant length and thickness of all bandages after the machining process
  - Flow forming over the bandage edges possible, since the bandage is not clamped in the chuck
  - Easier machining in the rim roller thanks to biconical shape – optimum cycle times are achievable

black rims: © htpix_Fotolia



The discs are trimmed and deburred on an HABS during a second operation.

Weight-optimised car rim

Machine description for flow forming machines (HSTA/VSTA):

- Main and tailstock spindles driven and “master/slave” coupled
- CNC controlled stripper system for fastest possible discharge
- Servo-hydraulic feed drive units for four independent compound rests
- All radial axes mounted on four bronze guideways each
- Electronically controlled roller-drive system for each forming roller

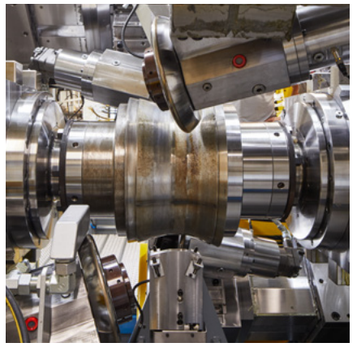
Machine description for trimming machines (HABS/VABS):

- Main and tailstock spindles driven and “master-slave” coupled
- Hydraulic feed units for trimming, rounding and deburring operations
- Driven trimming/deburring units machine both edges simultaneously
- Tool-free quick changing system for trimming and deburring units
- Integrated chip conveyor with automatically slewing “goose neck”

Our range for weight-optimised steel rim rings

HSTA 550-4

Horizontal automatic flow forming machine (HSTA)
for flow forming of biconical steel rim rings



Machine is part of the horizontal ring Flow forming Center (RDZ).

This system consists of:
- Separating of rim rings
- **Flow forming machine HSTA 550-4**
- Transfer from HSTA to HABS
- Trimming machine HABS 550-4
- Part-tilting station downstream HABS
- Full enclosed system

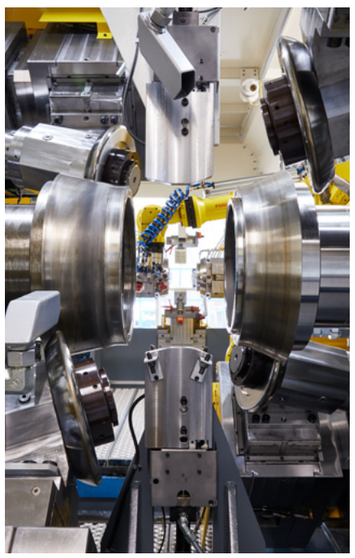
Drop-center diameter	min.	320 mm (12,5")
Drop-center diameter	max.	550 mm (21,5")
Workpiece width	min.	100 mm (4")
Workpiece width	max.	310 mm (12")
Tool mounting	2 x Size 15	DIN 55027
Number of forming rollers	fix	4
Drive rating, spindles	approx.	2 x 125 kW*
Spindle speed	max.	1500 rpm
Spindle feed stroke	max.	2 x 250 mm
Spindle-slide force	max.	2 x 150 kN
Slide stroke	axial	4 x 300 mm
Slide stroke	radial	4 x 160 mm
Slide force	axial	4 x 125 kN
Slide force	radial	4 x 125 kN

*Master/slave coupled

Optional:
- WF robot system for loading/for transfer of workpieces
- Raised machine base can be used as a coolant tank
- Energy-saving solutions for hydraulics and spindle drive systems

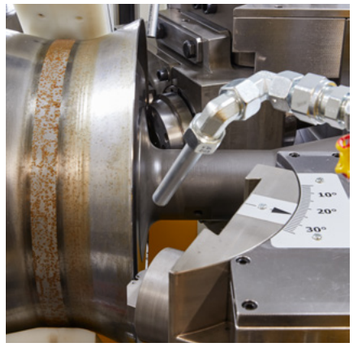
Starting from the center of the biconical rim ring, the HSTA flow forms in both directions simultaneously, using two forming rollers in each direction. Flow forming of the material up to the edges of the rim ring is possible, since the ring is not restrained by a chuck.

Working area of the HSTA



HABS 550-4

Horizontal turning and trimming machine (HABS)
for trimming and deburring of biconical steel rim rings



Machine is part of the horizontal ring Flow forming Center (RDZ).

This system consists of:
- Separating of the rim rings
- Flow forming machine HSTA 550-4
- Transfer from HSTA to HABS
- **Trimming machine HABS 550-4**
- Part-tilting station downstream HABS
- Full enclosed system

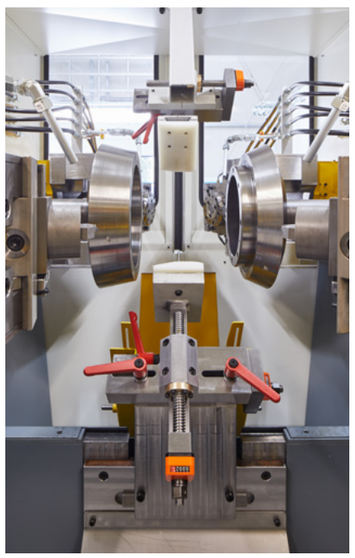
Drop-center diameter	min.	320 mm (12,5")
Drop-center diameter	max.	550 mm (21,5")
Workpiece width	min.	100 mm (5")
Workpiece width	max.	310 mm (12")
Tool mounting	2 x Size 8	DIN 55027
Drive rating, spindles	approx.	2 x 30 kW*
Spindle speed	max.	275 rpm
Spindle feed stroke	max.	2 x 200 mm
Spindle-slide force	max.	2 x 95 kN
Number of trimming units	fix	4
Number of deburring units	fix	2
Slide stroke	axial	4 x 130 mm
Slide stroke	radial	4 x 210 mm
Slide force	axial	4 x 25 kN
Slide force	radial	4 x 25 kN

*Master/slave coupled

Optional:
- WF robot system for loading/for transfer of workpieces
- Raised machine base
- If requested: Rotary milling cutters instead of trimming rollers

The flow forming operation of the HSTA takes place at both sides of the rim ring, trimming and deburring thus takes place in the HABS on both sides – simultaneously!

Working area of the HABS



VSTA 520-4

Vertical automatic flow forming machine (VSTA)
for flow forming of cylindrical steel rim rings

Machine is part of the vertical ring Flow forming Center (RDZ).

This system consists of:
- Separating of the rim rings
- **Flow forming machine VSTA 520-4**
- Transfer from VSTA to VABS
- Trimming machine VABS 520-4
- Part discharge downstream VABS
- Full enclosed system

Drop-center diameter	min.	320 mm (12,5")
Drop-center diameter	max.	520 mm (20,5")
Workpiece width	min.	125 mm (5")
Workpiece width	max.	325 mm (13")
Tool mounting	2 x Size 11	DIN 55027
Number of forming rollers	fix	4
Number of forming units	fix	4
Drive rating, spindles	approx.	230 kW*
Spindle speed	max.	1200 rpm
Spindle feed stroke	max.	425 mm
Spindle-slide force	max.	200 kN
Slide stroke	radial	4 x 300 mm
Slide force	radial	4 x 125 kN

*Master/slave coupled

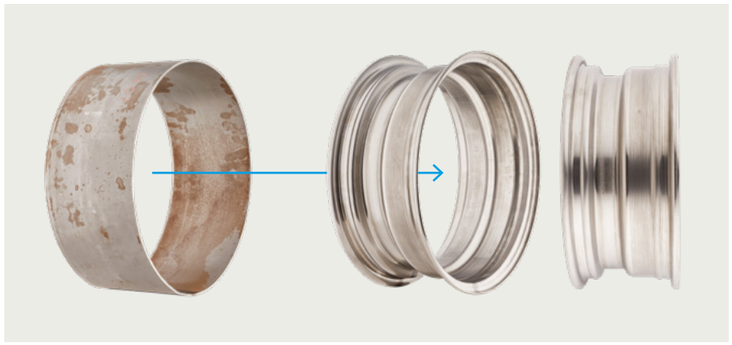
Optional:
- WF transfer system
- Automatic path-length evaluation system and wall-thickness measurement

The VSTA features four forming rollers fixed vertically. The rim ring is clamped in a chuck and then moved through the forming rollers by means of a vertical movement of the main spindle.

Working area of the VSTA

VABS 520-4

Vertical turning and trimming machine (VABS)
for trimming and deburring of cylindrical steel rim rings



Machine is part of the vertical ring Flow forming Center (RDZ).

This system consists of:
- Separating of the rim rings
- Flow forming machine VSTA 520-4
- Transfer from VSTA to VABS
- **Trimming machine VABS 520-4**
- Part discharge downstream VABS
- Full enclosed system

Drop-center diameter	min.	320 mm (12,5")
Drop-center diameter	max.	520 mm (20,5")
Workpiece width	min.	125 mm (5")
Workpiece width	max.	325 mm (13")
Tool mounting	2 x Size 8	DIN 55027
Drive rating, spindles	approx.	15 kW
Spindle speed	max.	250 rpm
Number of trimming units	fix	2
Number of deburring units	fix	1
Number of edge rounding units	fix	1
Slide stroke per unit	axial	3 x 210 mm
Slide force per unit	radial	3 x 130 kN

Optional:
- WF transfer system
- Rotary milling cutters instead of trimming rollers

Overall view of a VABS

Our ranges for special-vehicle rims

Our set of machines “VFD and VRB” have been developed specially for cost efficient production of small batches of special-vehicle rims. They are notable for extremely flexible contour programming and for rapid changing from one rim type to the next. WF Maschinenbau is the only manufacturer in the world to enable the production of high-quality wheels for all-terrain vehicles (ATV), quads, golf caddies and smaller steel rims, etc. and without the need for a rim roller.

The use of one or more spinning rollers on a tool-free machine makes it possible to produce almost any pattern of contours in the rim base.

Our special-vehicle rim machines – the benefits for you:

- **Cost optimisation:** Rim production with no need for a rim roller
- **Flexibility:** Production of ultra-small batches (four wheels and above) possible quickly and without difficulty
- **Efficiency:** Rapid changing between various rim designs

Highlights of our machines:

- Machine combination: VFD 500 vertical rim spinning machine with two forming rollers plus VRB 500 vertical edge-treatment machine
- Production of practically any pattern of contours for drop-centers, rim base and rim flange thanks to the use of one or more spinning rollers in a tool-free machine

Machine description:

- Integrated ejector on tailstock side for detachment of the workpieces
- Integrated ejector on spindle side for easy removal of products
- All-round safety enclosure – with two means of access to the working area

VFD spinning machine:

- High-power servo-regulated spindle drive suitable for G96 operation (= constant cutting speed)
- Two opposed compound rests for forming
- Four CNC-controlled interpolating axes in the compound rests

VRB edge-trimming machine:

- Two PLC-controlled work units each with two pinch rollers for simultaneous expanding of both rim edges
- Two PLC-controlled work units for simultaneous curling of the rim edges (after expanding)
- All mechanical settings are equipped with tool-free quick fixings

Wheels for all-terrain vehicles, produced on a WF machine, in use

WF-made rim with award certificate from Kawasaki

VFD 500

Vertical rim spinning machine (VFD)
for free form spinning of special-vehicle rim rings

Working area of the VFD

Workpiece diameter	min.	150 mm (6")
Workpiece diameter	max.	500 mm (19")
Workpiece width	min.	150 mm (6")
Workpiece width	max.	400 mm (15")
Tool mounting	2 x Size 8	DIN 55027
Number of forming rollers	fix	2
Drive rating, spindles	approx.	90 kW
Spindle speed	max.	1000 rpm
Slide stroke	axial	2 x 450 mm
Slide stroke	radial	2 x 275 mm
Slide force	axial max.	2 x 120 kN
Slide force	radial max.	2 x 120 kN
Tailstock thrust pressure	max.	600 kN

Optional:
- WF robot system for loading/unloading
- Two-hand starting panel for manual loading
- WF SMART FORMING Assistant for generation of the CNC program
- Hydraulic roller-drive systems
- Can be fed by a central robot

VRB 500

Vertical edge-treatment machine (VRB)
for edge treatment of special-vehicle rims

Working area of the VRB

Workpiece diameter	min.	150 mm (6")
Workpiece diameter	max.	500 mm (19")
Workpiece width	min.	150 mm (6")
Workpiece width	max.	400 mm (15")
Tool mounting	2 x Size 8	DIN 55027
Drive rating, spindles	approx.	70 kW
Spindle speed	max.	1000 rpm
Number of expander units	fix	2
Stroke of expander units	radial	2 x 100 mm
Stroke of expander unit	axial	1 x 150 mm*
Force of expander units	radial	2 x 275 mm
Number of curling units	fix	2
Stroke of curling units	radial	2 x 100 mm
Stroke of curling unit	axial	1 x 150 mm*
Curling-unit force	radial	2 x 80 kN
Tailstock thrust pressure	max.	125 kN

*Upper unit only

Optional:
- WF robot system for loading/unloading
- Two-hand starting panel for manual loading
- Can be fed by using a central robot

“We at WF Maschinenbau put our faith in innovation. I enjoy working every day with my team on the development of the machines and processes of the future. Together, we find solutions, our aim is to lead the field and inspire - and we are always proud when having a newly granted patent in our hands.”

Christian Malkemper, CTO

A glance into our R&D Center

What makes us different from other machine manufacturers in our industry is our R&D Center. Together with our customers, we develop new ideas and put them into practice. We use four highly flexible trial machines to validate the practicability of new plans, perform multiple series of tests and even determine the profitability of the result. Again and again, we are rewarded by new patents for our work.

The hybrid wheel – a combination of aluminium front face and a steel rim

The one-piece steel wheel – a successful series of trials at WF Maschinenbau

We aim to shape the future and we are working continuously on innovative solutions. Here a short survey of our current work:

- **The magnesium wheel**
  The magnesium wheel is around 30% lighter than a comparable aluminium wheel. We consider the forming of magnesium alloys and the development of a machine for series production of such wheels to be possible.

- **The hybrid (or two-component) wheel**
  The hybrid wheel is one which combines the high-grade optics of aluminium front faces with those of rational-cost steel rims. We are currently developing a machine to join these components.

- **The one-piece steel wheel**
  Constant series of tests on the one-piece steel wheel are going on in our R&D Center. This wheel will be produced entirely from a single simple steel blank – without any complicated welds and almost without chips.

- **The tool-free production of cast aluminium wheels**
  Flow forming of a cast aluminium wheel without investing in costly and complex tooling – WF Maschinenbau already has a machine concept that is capable of producing almost any aluminium wheel.

- **Production of extremely large steel wheels up to 56" for agriculture**
  The numbers produced in this wheel sector are low. Due to the extreme size of these wheels, the machines for automatic production are extremely expensive. Their cost-optimised production is a further challenge for our R&D Center.

In the sectors mentioned, in particular, and also in many others, we perceive great development potentials. You have a vision? You are looking for a specific solution? You want to know what can be done?

Talk to us!

	Content	★ Smart	★★ Advanced	★★★ Excellence
Training	**“General operation” training** Operation of the machine during preliminary acceptance examination at WF Maschinenbau	●	●	●
	Training I “Machine operation” Detailed operation of the machine, use and handling of operating equipment, setting-up, tool changing, programming		●	●
	Training II “Machine maintenance” Machine maintenance, instruction in technical documentation, trouble-shooting, elimination of faults/errors		●	●
	Training III “Programming/forming processes” Programming, forming processes, or individually, as per customer requirements			●
	Training “Follow-up” Some 2 to 6 months after commissioning, for further optimisation of operation and handling/use of the machine			●
Maintenance	**Information in case of spares shortages** – in case of product discontinuations or supply-chain bottlenecks		●	●
	Spares package I Containing the spare parts recommended for the first approx. 4,000 hours of operation		●	
	Spares package II Containing the spare parts recommended for the first approx. 8,000 hours of operation			●
	Remote inspection Online examination of the machine(s) for determination of condition and evaluation of any faults or problems		●	●
	Maintenance agreement Complete on-site maintenance of the machine(s) in acc. with Maintenance agreement/maintenance intervals noted			●
If attention is needed	**Service Hotline**	●	●	●
	Online fault diagnosis		●	●
	On-site fault diagnosis			●
	Warranty (in months)	12	18	24

Our various service packages assure long and reliable operation of your machine.
The “Smart” package is always included in our standard quotation.
Just contact us for customised service and maintenance packages!

Further contents	
Automation (conveying equipment)	**Retrofitting** of loading/unloading systems, handling robots and transfer systems
General overhaul	For **minimisation of the risk** of failures and of the scope of maintenance plus assurance of regular production operation
Additional services	Retrofitting of **additional machine functions** individually as per customer requirements
	Product developments, feasibility studies and fundamental tests at our R&D Center
	Production of **small series** for bridging customer machine bottlenecks or order peaks, execution of ultra- small orders
	“WF Futurezone” workshop – What is still possible? GET INVOLVED in shaping the future of your industry!
SMART FORMING Tools	**SMART FORMING Assistant** for simulation and generation of NC programmes from CAD drawings
	SMART FORMING Viewer for evaluation of current forming forces, avoidance of force peaks and minimisation of roller wear
	SMART FORMING Cam for monitoring of process operations using an HD camera system
	SMART FORMING Diagnostics for continuous machine self-diagnosis (Industry 4.0), sensors and software modules for preventive maintenance

Our additional services can be booked as and when needed.
Please contact us directly for more information!

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BUILT IN SENDENHORST.

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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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