

FORMING EXCELLENCE

WF



OUR MACHINES FOR WHEELS

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Three good reasons for working with us

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

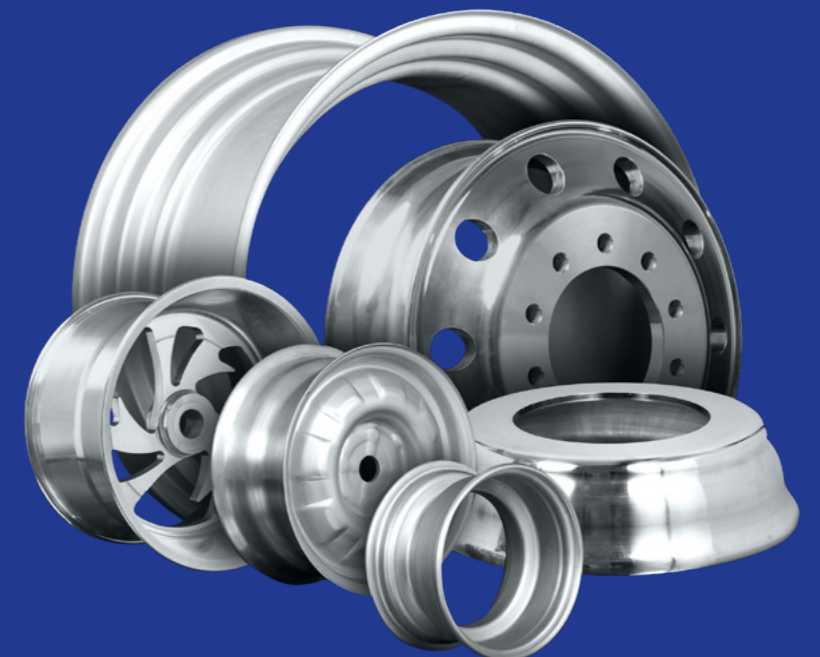
We are the only company in our industry with a far-ranging R&D Center, including its own range of machines for trials and tests. And our customers can always depend on that most important asset: the treasure of experience and extraordinary expertise provided by our long-serving employees.

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



blackrims © 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 range for aluminium wheels



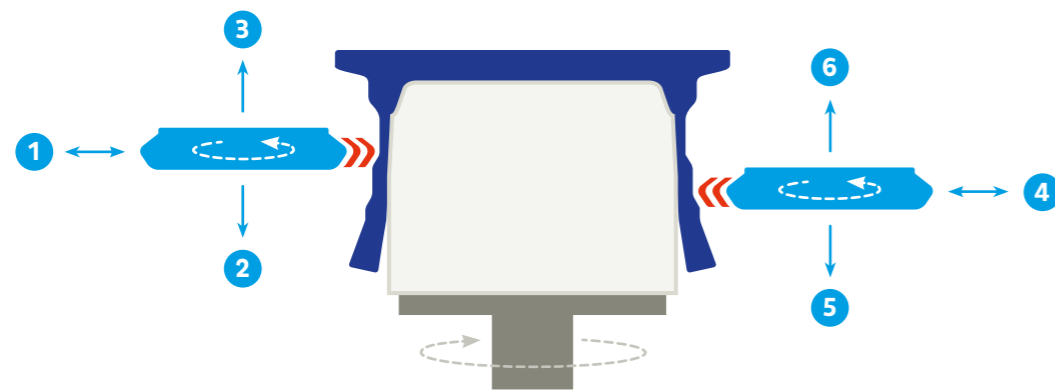
Our VFM series of machines has been specially designed for the production of one-piece aluminium wheels. Two forming rollers programmable independently of each other and a loading concept that permits simultaneous charging and discharge of the machine assures extremely short production cycles.

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 CO₂ 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

Our range for aluminium wheels



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 |

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.



Hand-made bronze guideways –
a WF quality feature



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



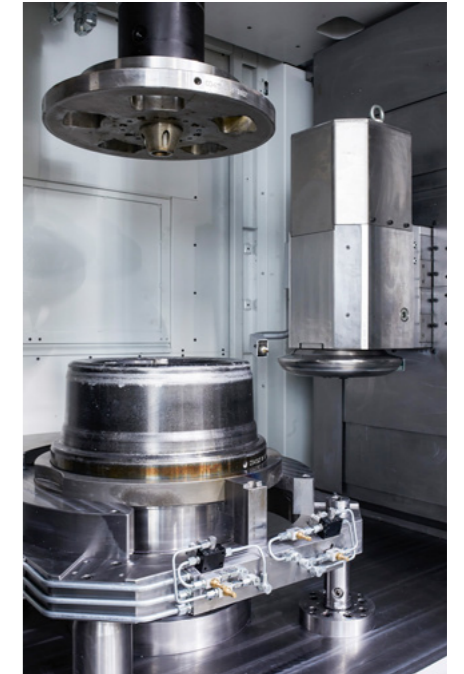
| | | |
|----------------------------|-------------------|--------------|
| Workpiece diameter | min. | 300 mm (12") |
| Workpiece diameter | max. | 600 mm (24") |
| Workpiece length | max. | 300 mm (12") |
| Tool mounting | Size 11 | DIN 55027 |
| Number of forming rollers | standard/optional | 2/4 |
| 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 |

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

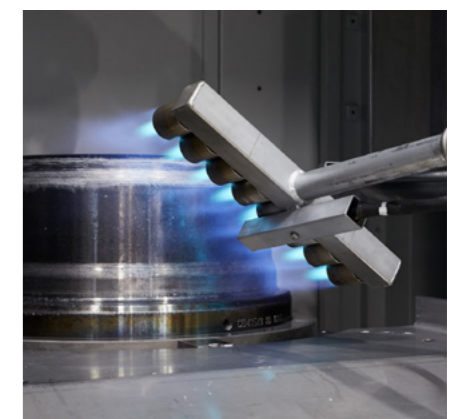
Turnkey solution:

- 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



Working area, VFM 600-2-4 W

Pre-heating burner



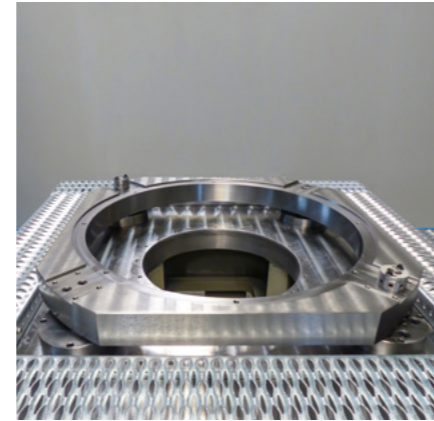
Our range for aluminium wheels



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

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




Acceptance inspection of a HRM by the customer

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

Our range for steel wheel discs

HRM 800-3

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



Simple positioning of stapled blanks

Working area of the HRM




| | | |
|----------------------------|-------------|------------|
| 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 |

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 |

Optional:

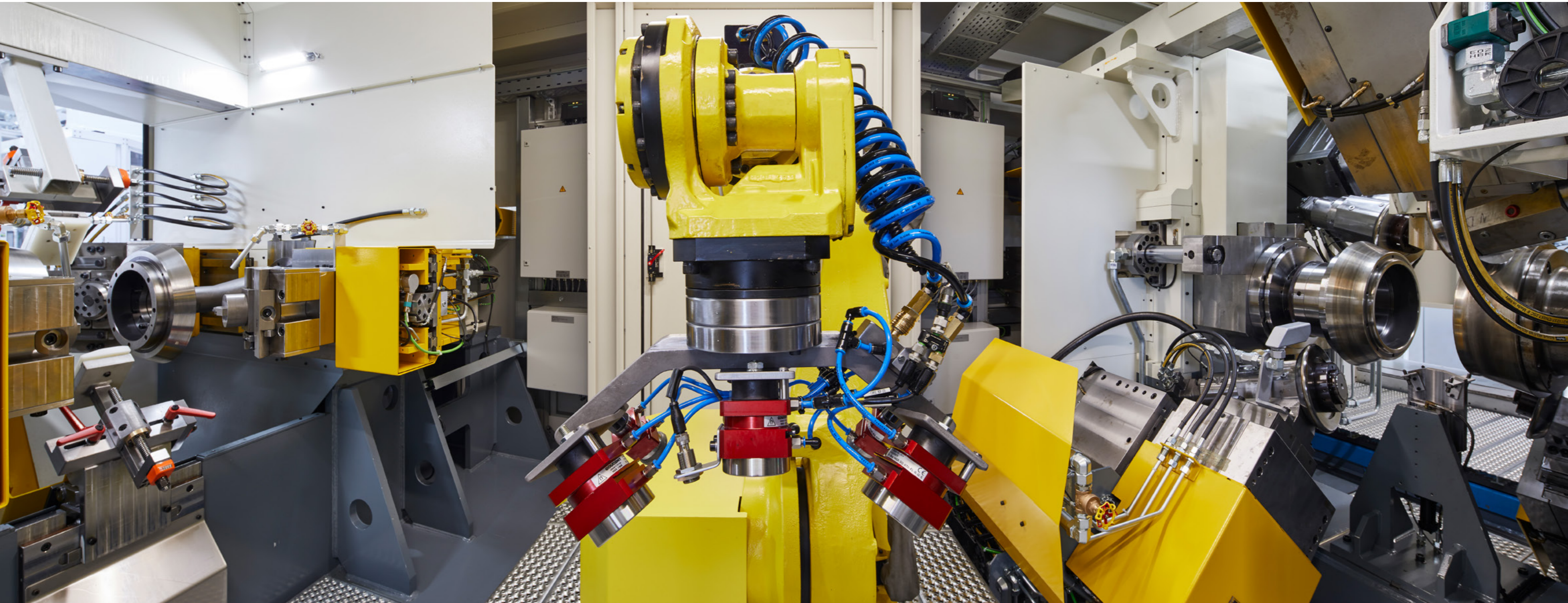
- WF robot system for loading/unloading
- De-stacking unit
- Tilting table unit
- Main spindle ejector
- Tool-changing cart

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.



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

Our range for weight-optimised steel rim rings



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.

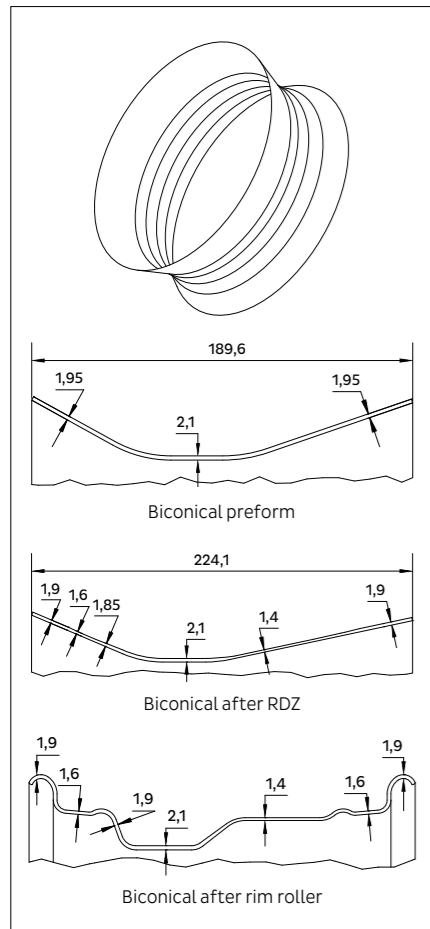
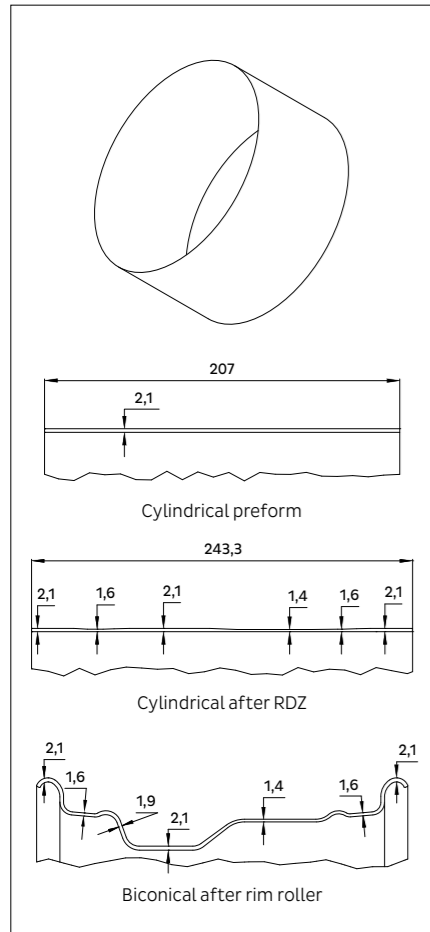
At right: an HSTA 550-4 for flow forming of the rim rings. A central robot relays the workpieces from one machine to the next.



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 CO₂ 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:

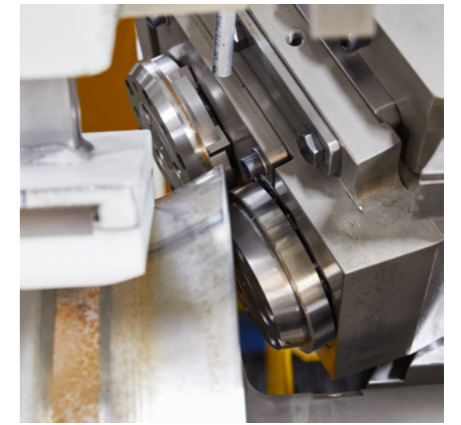
- Constant bandage length after the flow forming process
- Minimal trimming requirements on only one side of the bandage
- Especially suitable for truck wheels

- **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



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

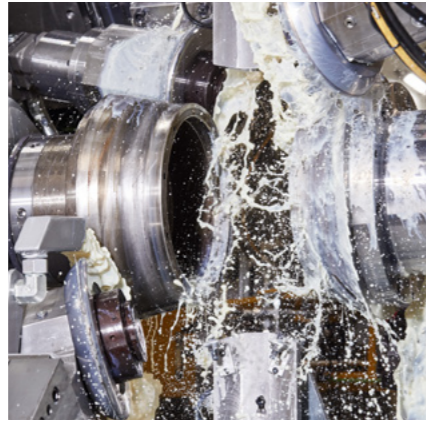
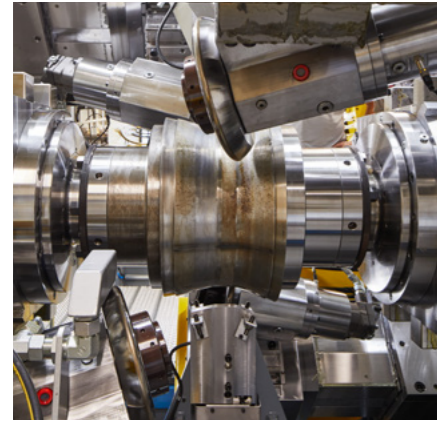
Machine description for trimming machines (HABS/VABS):

- 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 |

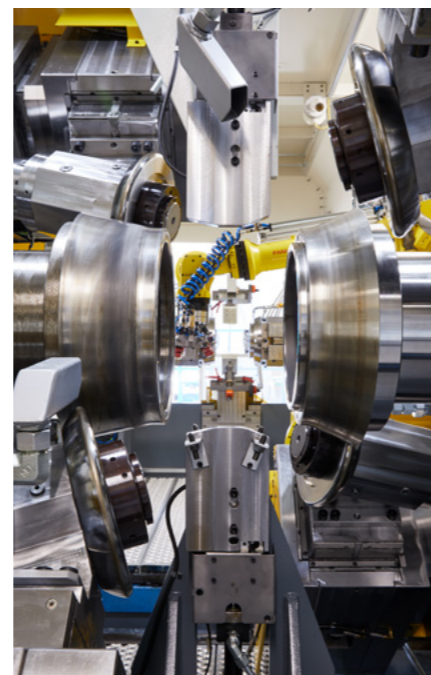
*Master/slave coupled

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

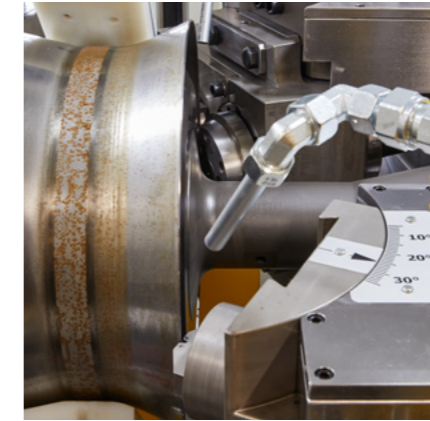
Starting from the center of the biconical rim ring, the HSTA flow forms in both directions simultaneously, using two forming rollers in each direction. Flow forming of the material up to the edges of the rim ring is possible, since the ring is not restrained by a chuck.

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



Our range for weight-optimised steel rim rings

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



WF-made rim with award certificate from Kawasaki

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



Our ranges for special-vehicle rims



VFD 500



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



| | | |
|---------------------------|-------------|--------------|
| 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



Working area of the VFD



VRB 500



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



| | | |
|---------------------------|------------|--------------|
| 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



Working area of the VRB

“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!

Our services

| | 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!

FORMING EXCELLENCE

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We are furthermore represented worldwide in

Canada – China – Denmark – England – France – Germany – India
Italy – Japan – Korea – Mexico – Russia – Taiwan – Turkey – USA