RÖSLER®
finding a better way ...

# Drag Finishing

# Rösler provides total finishing solutions

*When it comes to surface finishing, Rösler is known to offer complete, well-engineered process solutions. Based on our comprehensive knowledge of* ***mass finishing*** *and* ***shot blasting technologies****, we can provide our customers with practically unlimited finishing solutions. In our state-of-the-art test lab, we conduct meaningful test trials to develop the optimum finishing processes for our customers because only complete solutions yield the best results. We are not simply offering specific surface finishing processes but we are also supply perfectly matched auxiliary equipment and consumables. This approach has proven to be highly successful and has established Rösler as the global technological and market leader, with groundbreaking innovations and extremely high quality standards.*

***In more than 60 countries we support our customers with a comprehensive network of Rösler sales branches and independent distributors.***

*Rösler is the only supplier in its field maintaining* ***test labs*** *all over the world, where we develop process solutions under actual operating conditions and select the most suitable equipment. This approach saves our customers not only long travel distances and high freight costs, but it also provides them with products and processes that have been extensively tested by our specialists under the most severe operating conditions.*

## Global network of test labs

Test labs for mass finishing and shot blasting at the Rösler headquarters in Untermerzbach:

- More than 95 mass finishing and shot blast machines.
- About 2,700 m² (27,000 sqft) workspace

Our teams in USA, Great Britain, France, Netherlands, Belgium, Spain, Turkey, Romania, Italy, Austria, Switzerland, Russia, Brazil, Serbia and India provide similar test lab services.

## Complete solutions

Besides demanding high quality, environmentally safe and efficient products, our customers also prefer to purchase all process components from one single source. That is why we offer not merely the processing equipment but the complete package with perfectly matched consumables. This guarantees the best finishing results and absolute process safety. Our global service teams take care of the delivery and the installation for you. Qualified engineers train our customers right at their location. And, of course, our after-sales service members will answer all of your questions. Quick supply of all spare parts and professional consultation by our experienced process specialists ensure that your finishing processes are always running smoothly.

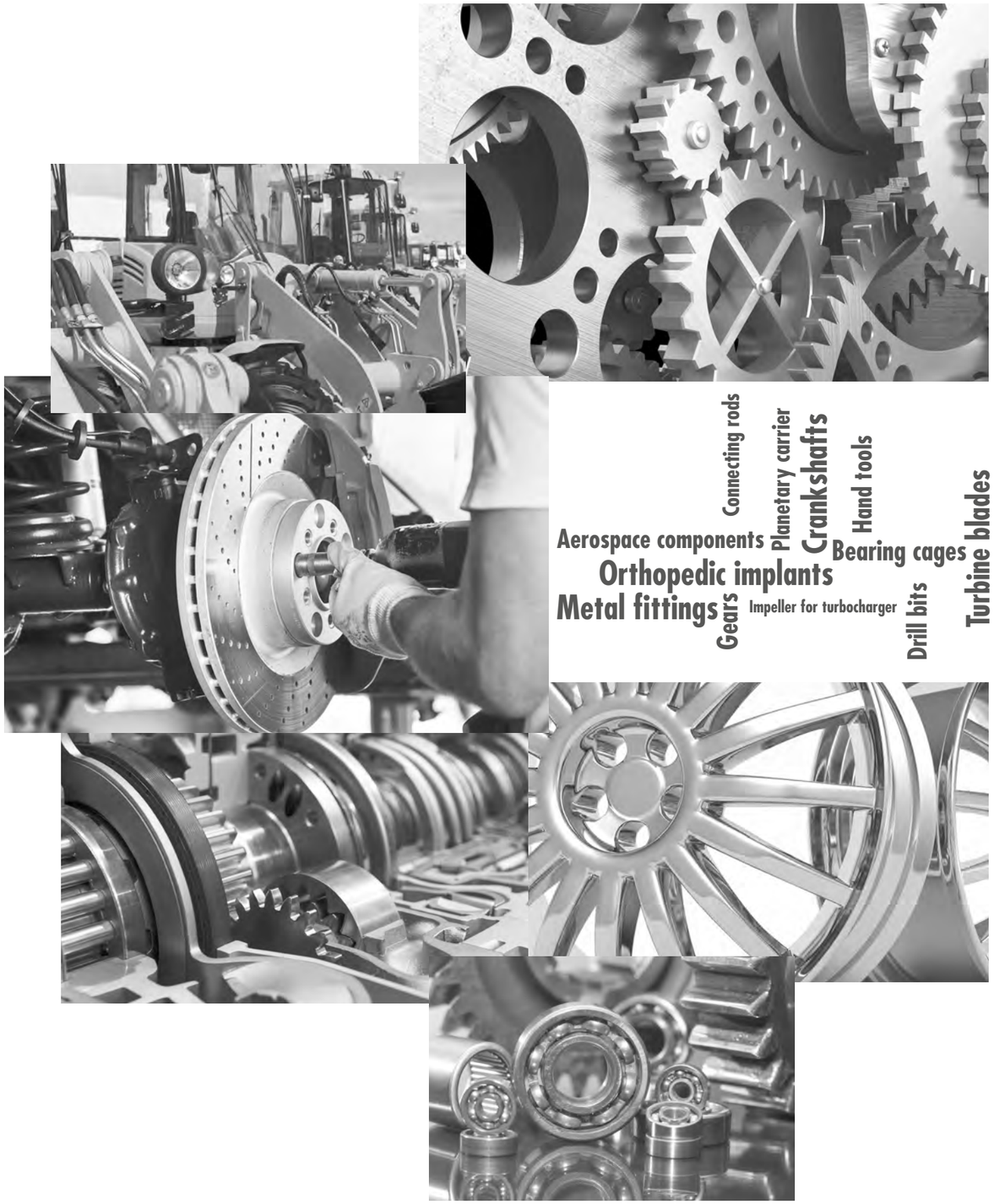
## Team spirit

Rösler is a dynamic company, where the initiative and dedication of each team member plays a central role. Systematic advanced professional training and cooperative, lean management are essential elements of our corporate philosophy. With our established internship programs, we are able to development of tomorrow's professional team members, today.


*DIN EN ISO 9001 and 50001*


*Test lab mass finishing*

# Typical applications




# Machine Overview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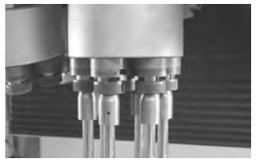

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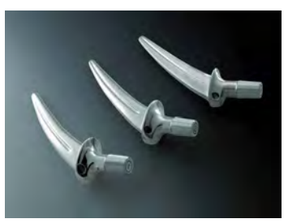
# Drag and plunge finishing – mass finishing at its best

Drag and plunge finishing, the most advanced mass finishing technologies, have a long tradition at Rösler. Initially, the focus was on large drag finishing systems for treating big, heavy work pieces from various industries like aerospace, medical and power generation. Subsequently, a highly successful range of compact drag finishers has been added to complement these heavy-duty "maxi drag" machines. They allow cost efficient finishing of low volume production batches of small to midsize high value components.






## Applications

The range of applications for mass finishing was considerably expanded by the introduction of drag and plunge finishing: With absolutely repeatable finishing results, this technology offers significant technical advantages over robotic grinding and polishing, mechanical brush and grinding systems, and manual grinding and polishing.

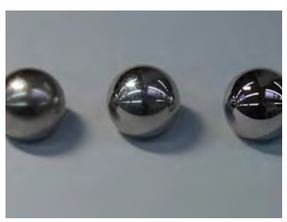
## Functional description

Drag and plunge finishing are highly specialized mass finishing methods. They are used for treating high value, delicate work pieces with complex shapes, which requires a precise and targeted mass finish. During the process the work pieces do not touch each other. The work pieces are mounted to special fixtures, which in turn are attached to the work stations/spindles of the drag or plunge finisher. The rotating work stations/spindles are immersed and "dragged" through a work bowl filled with grinding or polishing media. Water and compound ensure the consistency of the finishing process. Dry processing is also possible.

## Media and compound production

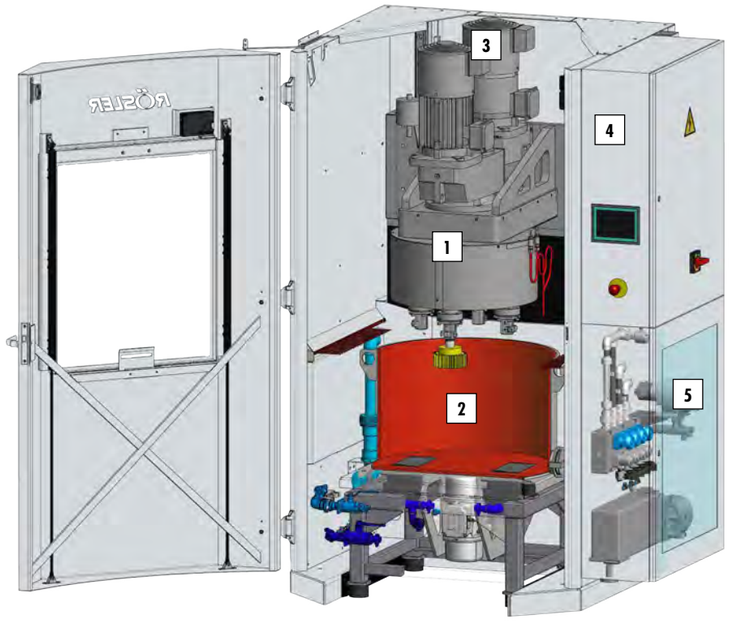
Rösler offers the largest range of mass finishing consumables. The result of over 60 years of experience in research and development is reflected in more than 15,000 different types of consumables, which are available to our customers around the world.



# “SF” compact drag finisher – state of the art finishing technology

The many technical features of the Rösler drag finishing systems offer a wide field of mass finishing, from aggressive grinding to high gloss polishing. Due to their robust, functional design, compact foot print and easy operation, the Rösler drag finishers have quickly established themselves as the best in the market.




## 1 Spinner (carousel) drive

Individual workstations are integrated into the rotating spinner. The rotary movements of the spinner and work stations are independent from each other and can be adjusted within a given speed range.

- Spinner drive with variable speeds and change of rotational direction
- Workstations:

  - Central drive system for compact drag finishers (SF)

  - Individual workstation drives for model R 4/1300 SF and the “A” range

  - All drives with variable speed and change of rotational direction

  - Depending on the machine type, the spinner may contain 2, 4, 6 or 12 workstations equipped with quick connect coupling system for the work piece fixtures
- Angle of the workstations is adjustable between 0 and 25° (optional)
- Hydraulic vertical movement of the spinner with special linear guide
- Control of immersion depth with photoelectric barrier (optional)

## 2 Work bowl

The work bowl contains the grinding or polishing media. Wet as well as dry processing is possible.

- Quick work bowl change. Can transport with manual pallet truck or forklift
- Media unload plug
- Wear resistant polyurethane lining
- Bottom drains with large screen area. Drain flush system (optional)
- Level control for the process water (optional)

### *Special accessories*

Wet processing:

- Vibratory motor for mixing of the grinding/polishing media
- Special bottom screens for undersize media discharge

Dry processing:

- Cooling system
- Dust extraction system with integrated dust collector

## 3 Overall machine design

All Rösler compact drag finishers have a small foot print and can be quickly installed (“plug and play”).

- Stylish and functional machine housing for noise reduction
- Access door with sliding window for easy machine operation with safety interlock
- Machine controls and dosing system integrated into the machine housing

## 4 Machine controls

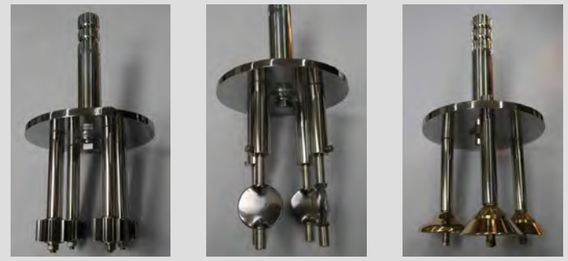
All equipment functions are available for manual and setup operation. For automatic operation all work piece specific processing programs can be stored in the PLC and selected by a bar code scanner (optional)

- PLC controls with 8” multi touch color screen
- Easy programming of the various processing alternatives
- Clear text display of all process stages

## 5 Handling of the process water

To ensure absolutely repeatable finishing results, the wet processing method requires the exact dosing of water and compound.

- Processing with fresh water: Separate control of the water and compound flow.
- Process water recycling: Special package for recycling with centrifuges (optional)



*Work piece fixtures contain the work pieces and are attached to the workstations integrated into the rotating spinner. They are partially immersed in the grinding/polishing media. Work piece geometry and the finishing task determine their design.*
*We will gladly assist you in designing your work piece fixtures.*

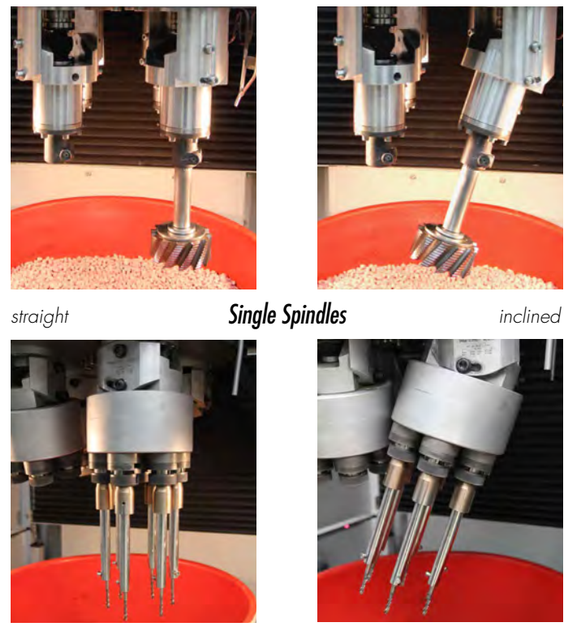
## *Special work stations – adjustable angle / workstations with multiple spindles*

### *Adjustable workstation angle*

To achieve homogeneous finishing results, work pieces with complex shapes must frequently be positioned at an angle. Depending on the machine type this is achieved by positioning the workstations / spindles at an angle of up to 25°.

### *Workstations with multiple spindles*

Larger work piece quantities can be handled by multi spindle workstations suitable for small to midsize work pieces. The additional rotation of the individual spindles guarantees an all-around, equal mass finish. With the integrated angle adjustment even difficult to reach work piece areas receive a perfect finish.



*straight* **Single Spindles** *inclined*

*straight* **Multiple Spindles** *inclined*

# The “SF” and “SF-A” compact drag finishing systems

The Rösler compact drag finishing systems are characterized by their intelligent, proven and robust design as well as their small footprint! Even highly complex grinding and polishing processes can be easily integrated into practically any manufacturing line.


***Model range “SF”***

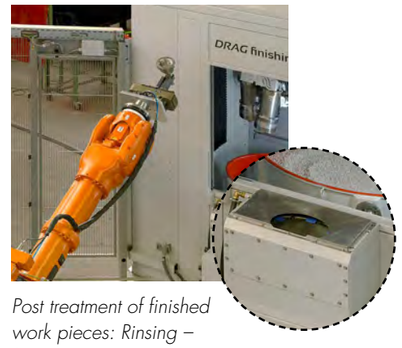
*A universal system for almost any processing task.*
*Designed for manual work piece handling.*

*Fixtures for placing multiple work pieces on a spindle without angle adjustment.*

## Model range “A”- for easy automation

Automated systems offer additional technical features. Precise positioning for work piece loading/unloading, automatic work piece clamping systems and an overall equipment design that facilitates robotic material handling.


*Workstations with servo drive and optional angle and radial adjustment*



*Post treatment of finished work pieces: Rinsing – Drying*

### Technical features:

- Torsion-resistant design
- Servo drive for the workstations/spindle heads, with precise spinner positioning
- Workstations:
  - Angle and radial adjustment
  - Automatic work piece clamping systems

| | “SF” range | | | “SF-A” range | | | | |
|---|---|---|---|---|---|---|---|---|
| **Machine type** | **R 4/700 SF** | **R 4/700 SF/2** | **R 6/1000 SF** | **R 2/800 SF - A** | **R 3/800 SF - A** | **R 4/800 SF - A** | **R 4/1000 SF - A** | **R 6/1000 SF - A** |
| **Number of work bowls** | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **Work bowl Ø (mm)** | 700 | 700 | 1,000 | 800 | 800 | 800 | 1,000 | 1,000 |
| **Max work bowl height (mm)** | 430 | 430 | 480 | 430 | 430 | 430 | 540 | 540 |
| **Usable work bowl volume (l)** | 134 | 134 | 314 | 160 | 160 | 160 | 380 | 380 |
| **Total work bowl volume (l)** | 165 | 165 | 377 | 210 | 210 | 210 | 420 | 420 |
| **Number of workstations (pcs)** | 4 | 4 | 6 | 2 | 3 | 4 | 4 | 6 |
| **Power of main drive (kWh)** | 4 | 4 | 7.5 | 9.2 | 9.2 | 9.2 | 9.2 | 9.2 |
| **Power of spindle drive (kWh)** | 3 | 3 | 3.7 | 0.75 (direct drive) | 0.75 (direct drive) | 0.75 (direct drive) | 0.75 (direct drive) | 0.75 (direct drive) |
| **Power of work bowl drive (kWh)** | 0.3 | 0.3 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| **Total connected power (kWh)** | 9 | 11 | 12.5 | 8 | 9 | 13 | 13 | 14 |
| **Space requirements (lxwxh in m)** | 1.3 x 1.5 x 2.6 | 2.6 x 1.5 x 2.6 | 1.6 x 1.9 x 2.75 | 1.7 x 1.8 x 3.3 | 1.7 x 1.8 x 3.3 | 1.7 x 1.8 x 3.3 | 2.4 x 2.2 x 3.5 | 2.4 x 2.2 x 3.5 |

State: 03/2017

# The powerful "SF" compact drag finisher

The R 4/1300 SF is the "big brother" among the compact drag finishers. Its four (4) powerful, versatile workstations allow the finishing of large work piece batches or work pieces with up to 600 mm (24") and/or high individual work piece weights.

## Technical features:

- A sturdy single column holds the spinner (including all drive units) and provides the hydraulically activated up and down movement
- Modular concept allows the expansion into systems with two or three processing stations
- Independent spinner and workstation drives with adjustable speed
- Work bowl equipped with vibratory motor. Can be easily moved with a manual pallet truck or forklift
- Safety fence or protective cabin. Optional with noise insulation
- Work station options:
  - Angle adjustment
  - Radial adjustment

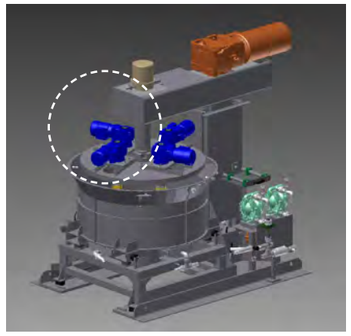
*R 4/1300 SF*

*Drag finisher with protective cabin: High work place safety combined with noise reduction.*

## Flexible workstations:

*Workstation option: Angle and radial adjustment*

*Work piece processing with workstation equipped with eight (8) spindles. Simultaneous processing of 32 work pieces in one batch.*



*Flexible workstations:*
*Workstation with radial adjustment; maximum work piece diameter up to 600 mm (24") with two (2) work pieces per batch.*

*Automatic media replenishment system*

| Machine type | R 4/1300 SF  | R 4/1300.2 SF  | R 4/1300.3 SF  |
|---|---|---|---|
| **Number of work bowls** | 1 | 2 | 3 |
| **Work bowl Ø (mm)** | 1,280 | 1,280 | 1,280 |
| **Max. work bowl height (mm)** | 460 | 460 | 460 |
| **Usable work bowl volume (l)** | 590 | 590 | 590 |
| **Total work bowl volume (l)** | 850 | 850 | 850 |
| **Number of workstations (pcs)** | 4 | 4 | 4 |
| **Power of main drive (kWh)** | 15 | 15 | 15 |
| **Power of spindle drives (kWh)** | 0.8 (direct drive) | 0.8 (direct drive) | 0.8 (direct drive) |
| **Power of work bowl drive (kWh)** | 3 | 3 | 3 |
| **Total connected power (kWh)** | 23 | 24 | 25 |
| **Space requirements (lxwxh in m)** | 2.34 x 3.2 x 3.25 | 6.2 x 3.5 x 3.25 | 9 x 3.5 x 3.25 |

State: 05/2015

# “Maxi drag” system for big, heavy work pieces

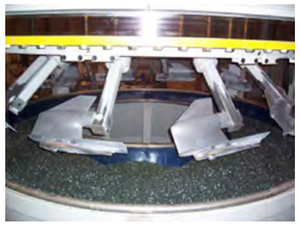
Designing and building large drag finishers poses special challenges: These are custom engineered systems entirely focused on the work piece shape, size & weight, the number of work pieces to be finished and the finishing process itself.

## Technical features:

- The sturdy mainframe with four (4) connected columns holds the spinner and provides the up and down movement (by spindle drive)
- Rotating or fixed work stations with optional angle adjustment
- Central variable speed drive for spinner and workstations
- Ratio of workstation speed to spinner speed = 2:1
- Independent drives for workstations optional
- Work bowl equipped with vibratory motor for mixing the grinding/polishing media
- Bottom of work bowl equipped with large area screens

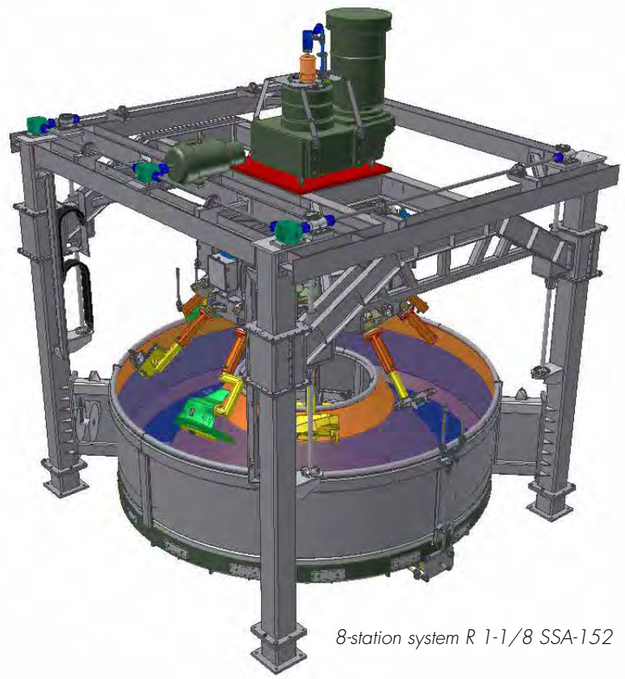
*R 1-1/12 SA drag finisher equipped with 12 workstations*


*12-station system enclosed by noise absorbing cabin*



*Fixed workstations*

*Production center with two (2) “maxi drag” systems*



*8-station system R 1-1/8 SSA-152*

*Rotating workstations with adjustable angle and adjustable speed*

| Machine type | R 1-1/12 SSA | R 1-1/6 SSA-125 | R 1-1/6 SSA-126 | R 1-1/8 SSA-152 | R 1-1/10 SSA-114 | R 1-1/10 SSA-170 |
|---|---|---|---|---|---|---|
| Number of work bowls | 1 | 1 | 1 | 1 | 1 | 1 |
| Work bowl Ø (mm) | 2,220 | 3,175 | 3,216 | 3,870 | 2,900 | 4,318 |
| Max work bowl height (mm) | 750 | 991 | 1,016 | 1,016 | 800 | 1,016 |
| Number of workstations (pcs) | 12 | 6 | 6 | 8 | 10 | 10 |
| Total connected power (kWh) | 54 | 93 | 40 | 65 | 80 | 93 |
| Processing channel width (mm) | 750 | 1,016 | 1,067 | 1,067 | 740 | 1,067 |

State: 12/2013

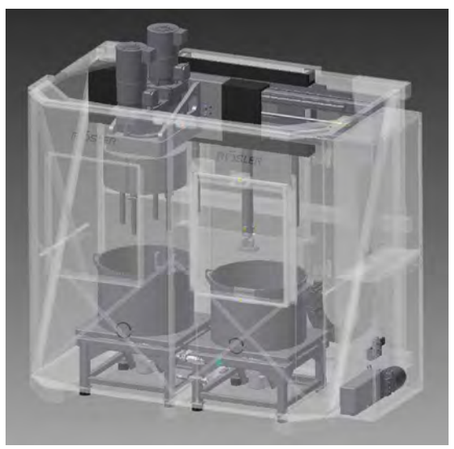
# Individual equipment design

The design of drag as well as plunge finishing systems must always evolve around the work pieces to be finished.
Special or robotic material handling systems with particular work piece staging concepts reduce the need for manual work piece handling and intervention.


*R 4/1300 SF with protective cabin*

*R 6/1000 "SF-A" with robotic work piece handling (complete production center)*

*R 4/1300 SF with automatic media replenishment system*

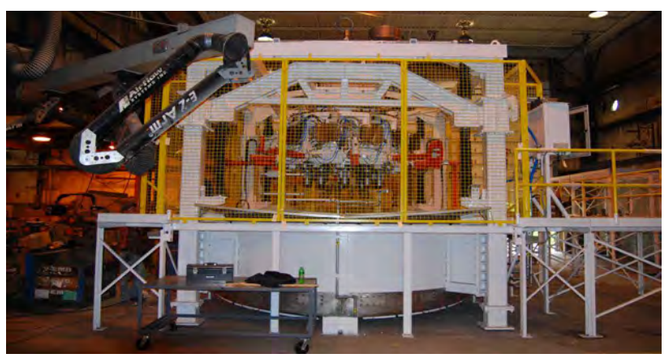


*SF - compact drag finisher for 2-stage processing*



***3-station system with automatic media replenishment:***
*Allows cut down, fine grinding and high gloss polishing without having to remove the work pieces from the workstations.*

*System with work bowl shuttle*



*"Maxi drag" finishing system*

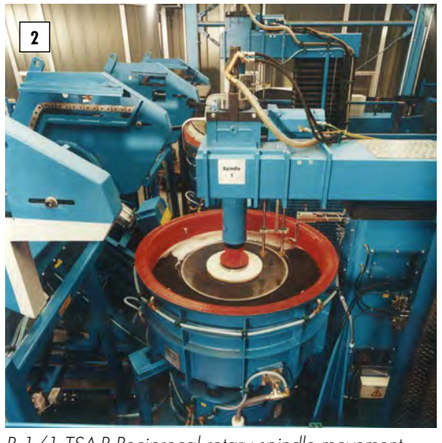
*R 4/1300 SF*

# Plunge finishing systems

Plunge finishing systems are available in different versions. Different rotary movements, sometimes combined with alternating vertical movements allow the finishing of a wide range of work pieces with complex shapes. Generally, one work piece is clamped to a single working spindle. During the finishing process the spindle with the clamped work piece is immersed into the work bowl filled with grinding/polishing media and makes an orbital movement.

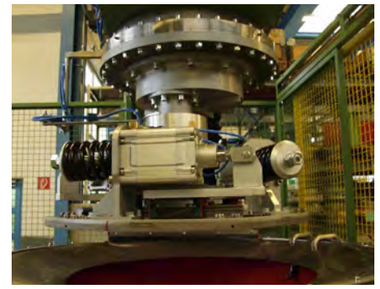

*R 1/1 TSA-O/VS*
*Rotary drive with eccentric and up/down work piece movement - Finishing of automotive wheels made from aluminum*


*R 1/1 TSA-R plunge finisher with reciprocal rotary spindle movement*




*R 1/1 TSA-R Reciprocal rotary spindle movement*


*R1/1 TSA-Z/IS - Special plunge finishers for polishing of truck wheels made from aluminum; Centered rotary carousel movement with rotating inner spindle*



*Automatic work piece clamping*


*R 1/1 TSA-O-2*
*Plunge finishing in two separate work bowls - Grinding and polishing*


*R 1/1 TSA-O - Special plunge finishing system for milling-rollers and other circular components*

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Machine type** | **R 1/1 TSA-O/VS** | **R 1/1 TSA-R** | **R 1/1 TSA-Z/IS** | **R 1/1 TSA-O** |
| **Working movement** | Carousel/spindle – Rotational direction change and variable speed possible Spindle with reciprocating rotary movement | Reciprocal rotary spindle movement | Rotary carousel with independent inner spindle – rotational direction change and variable speed possible | Combined carousel/ spindle drive – rotational direction change and variable speed possible |
| **Up/down movement** | Distance/time variable | – | variabel | Distance/time variable |
| **Work bowl diameter (mm)** | 1,170 | 1,200 | 1,050 | 1,050 |
| **Work bowl height (mm)** | 680 | 606 | 680 | 650 |
| **Total connected power (kWh)** | 20 | 33 | 16 | 16 |
| **Power of carousel drive (kWh)** | 7.5 | – | 9.2 | 7.5 |
| **Power of spindle drive (kWh)** | 7.5 | 30 | 2.2 | – |

State: 05/2015

**European Patent No. 2108481**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