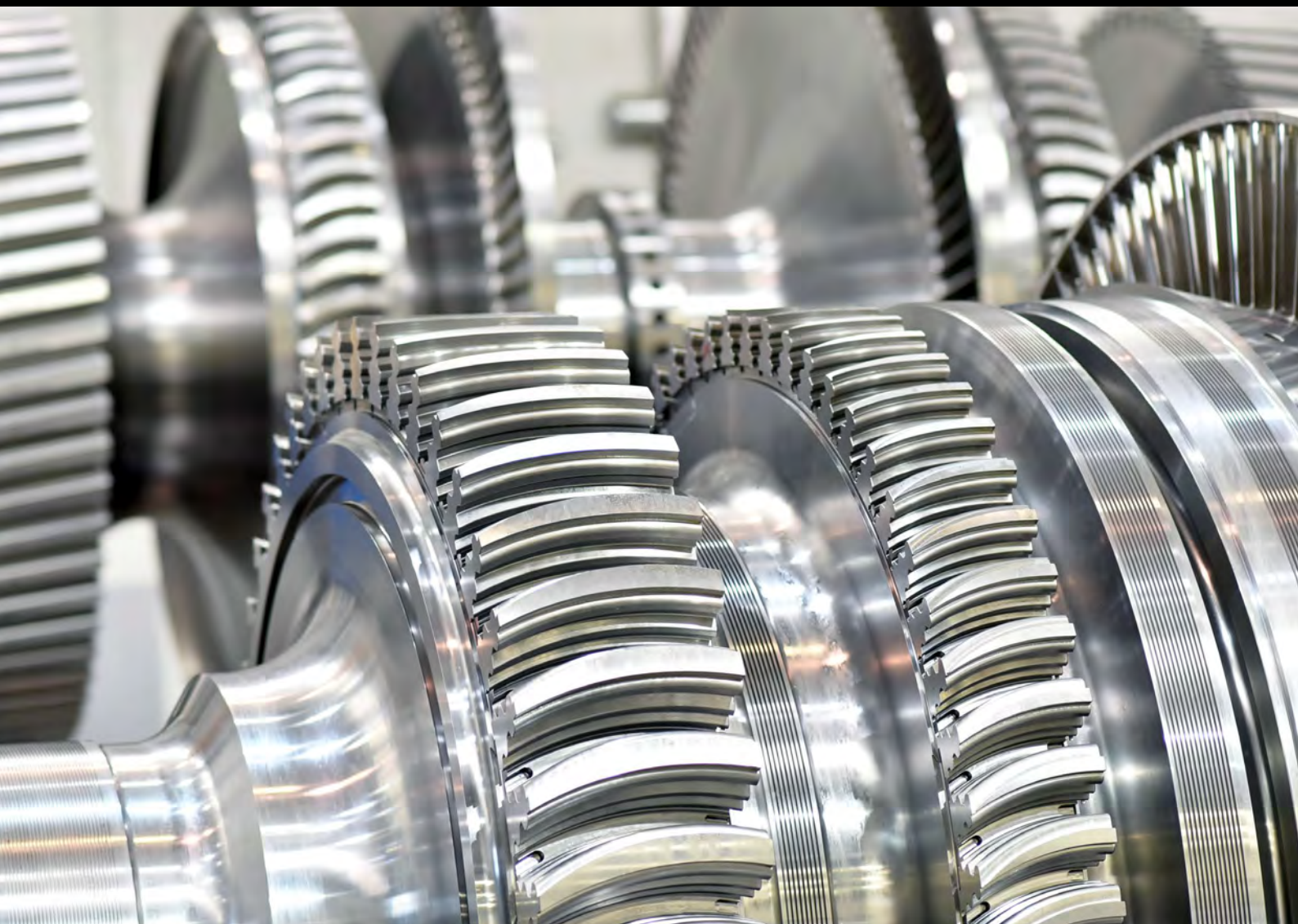


Mass Finishing



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.



DIN EN ISO 9001 and 50001



Test lab mass finishing

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.

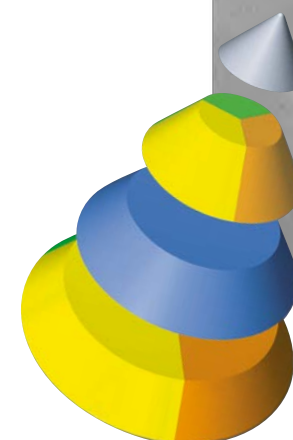
Complete solutions

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.

Rösler Academy

Knowledge transfer in the fields of mass finishing and shot blasting from a single source

As the only supplier in the world that offers both mass finishing and shot blasting, we are committed to passing our knowledge and knowhow to our customers through seminars covering a wide range of surface finishing subjects. Gain in depth knowledge of how mass finishing works, how blast media passes through a shot blast machine, and how you can increase your efficiency and productivity with optimum control and testing methods for cleaning and recycling your process water. You can find a complete list of our training seminars for mass finishing and shot blasting using the following link: www.rosler-academy.com.



What is mass finishing?

A mix of media and work pieces, embedded in the work bowl of the machine, is accelerated by vibration, rotation or centrifugal force. This causes the constant “rubbing” of the media against the work pieces resulting in bur removal, surface smoothing and even polishing. The specific equipment utilized for the process, its duration and the type of processing media and compound determines the finishing results.



Mass finishing can be used for work pieces made from a variety of materials

including; metal, plastic, wood, real and artificial stone, glass, ceramic and rubber.

Mass finishing methods are used for work pieces in practically all manufacturing processes

Die-casting/injection molding | press forming | cutting | stamping/blanking | embossing | laser cutting | casting | additive manufacturing/3D printing | steel sheets and beams | production tools | etc.

Components after heat treatment: Annealing, hardening | drawing, embossing | forging | roll forming | also after machining: Turning, milling | grinding | electrical discharge machining | bending | laser sintering | powdered metal sintering | fine blanking | etc.

Overview



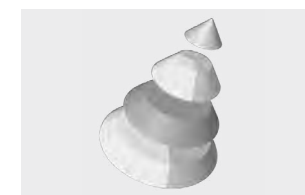
The capabilities of mass finishing

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Tub vibrator

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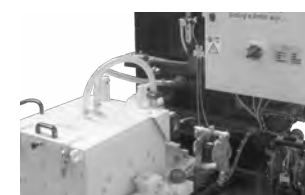
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Consumables (media and compounds)

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You can find detailed information on all machines and consumables in our individual catalogues and at www.rosler.com

Mass finishing guarantees – process stability, cost efficiency and a clean environment



Deburring

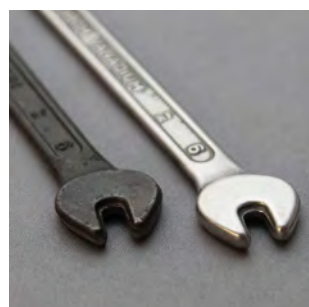
All kinds of burs on outer contours, as well as in drilled and blind holes, can be minimized or completely removed in a cost effective manner by the right machine and media selection.



Cleaning, de-oiling, degreasing

Contaminations on the work piece surface like lubricants or other pollutants must be removed to allow trouble-free downstream production operations:

- ▶ Cleaning of small mass-produced parts: Part-on-part processing
- ▶ Combined treatment methods: Simultaneous cleaning, deburring and/or edge breaking



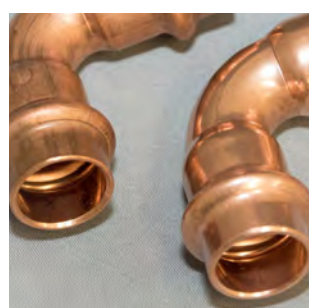
Descaling, pickling

Safe, economic and environmentally friendly removal of scale (oxide layers) from the surface of heat-treated parts with mechanical/chemical pickling methods.



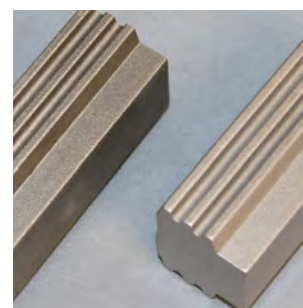
Surface smoothing, brightening, polishing, KeramoFinish®

Work pieces from various industries, such as, medical engineering (implants, surgical instruments, etc.), bearings, aerospace turbine components and transmission components, usually require very smooth functional surface finishes or an attractive decorative appearance with very low surface roughness readings ($R_a < 0.015 \mu\text{m}$, $R_z < 0.15 \mu\text{m}$, $R_k < 0.035 \mu\text{m}$). All these methods do not require acidic compounds.



Ball burnishing, pressure deburring, vibro-peening

Polishing media made from steel/stainless steel exert a high pressure on the work pieces.



Edge radiusing

Rounded edges, sometimes with defined radii, are frequently required to ensure the functionality in assembly operations: Edge radiusing is possible with batch operation with relatively short processing times of a few minutes, or continuous feed operation.



Surface grinding

Elimination of surface flaws, a uniform appearance and the reduction of surface roughness are the ideal pre-conditions for surface coating and plating. Even work pieces with complex shapes made from all kinds of material can be successfully processed.



Chemically accelerated mass finishing (ISF®-REM)

Chemically accelerated mass finishing systems utilizing low pH compounds produce very smooth finishes (for example, $R_a < 0.02 \mu\text{m}$, $R_z < 0.14 \mu\text{m}$) on work pieces made from steel.



Antiquing

Surface finishes that look “antique”, jagged edges and smooth finishes are adding value to natural stones like marble, granite, etc. The finishing process brings out natural material characteristics.



Surface finishing of small wooden work pieces

Wooden toys and decorative pieces (for example, made from hard wood) are deburred, their edges rounded and painted. Surface smoothing and the application of paint on different work pieces are achieved with special finishing technologies.

Rotary vibrator – the universal mass finishing system

The most commonly used machine in mass finishing is the rotary vibrator. This machine type can be used for many applications, has been used thousands of times and offers proven engineering down to the last detail. Either employed as a stand-alone machine or linked with handling systems like work piece loaders and post-treatment equipment (e.g. driers), rotary vibrators can be quickly developed into fully automatic mass finishing centers.



Rotary vibrator „DL“ und FBA Turbo/2 - Turbo/2A – mass finishing of delicate work pieces that must not touch each other during the finishing process

In these systems the work pieces are mounted directly to the vibrating work bowl or to special fixtures to prevent part-on-part contact. (FBA Turbo/2A: With mechanical lifting device). The ideal machine for complex finishing tasks on components with complex shapes:

- ▶ Smoothing of pump impellers
- ▶ Smoothing of blisks (aerospace)
- ▶ High gloss polishing of car and truck wheels made from aluminum
- ▶ Smoothing and polishing of orthopedic implants (Hip joints, knee femorals, etc.)

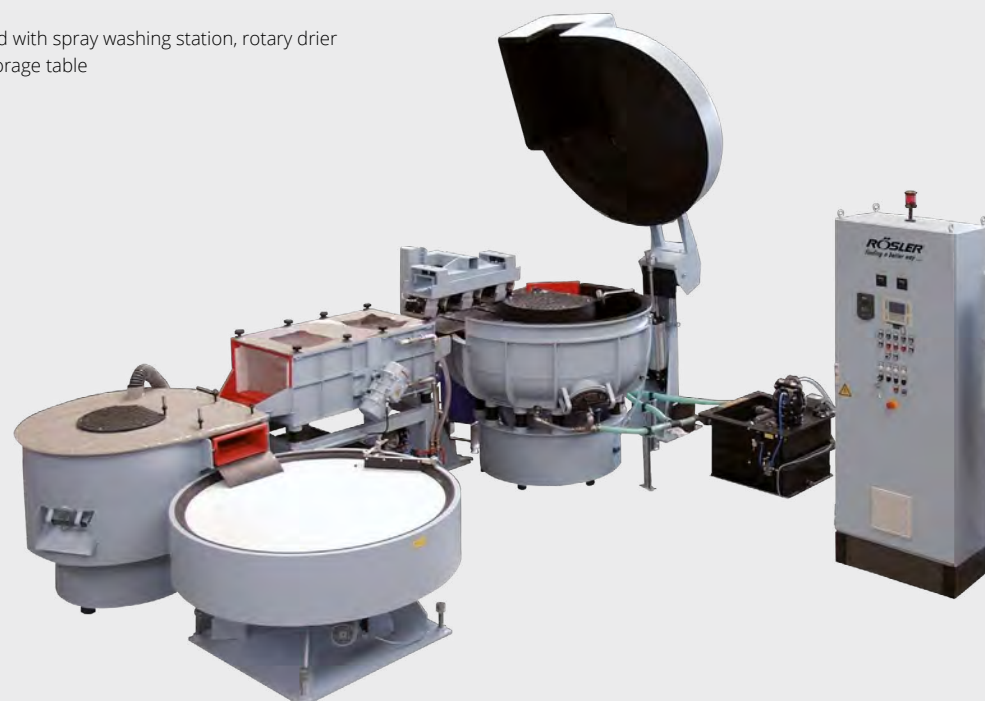
Rotary vibrator "DL"



Special rotary vibrator FBA Turbo/2



Rotary vibrator linked with spray washing station, rotary drier
and rotary buffer/storage table



Combined washing/drying system WTA

With suitable work pieces (shape, size, fragility) deburring, grinding, polishing, edge radiusing, etc. can also take place without media. The fully automatic system combines the wet finishing process with drying of the work pieces.



Long Radius Vibrator –

the long processing channel allows batch as well as continuous operation

Because of its compact design and relatively long processing channel the “Long Radius” machine is ideal for directly linking the mass finishing function to manufacturing cells. The continuously arriving work pieces are finished (deburring, edge radiusing, cleaning, etc.) in one pass through the machine in cycle times of up to 16 minutes. This simplifies logistics and reduces inventories. Of course, Long Radius machines can also be used for special finishing tasks in “batch” mode.



Multi Channel – continuous feed system with spiral processing channel

Multi Channel vibrators are ideal for continuous work piece processing. Frequently, they are directly linked to presses or machining centers.

Ideal for:

- ▶ Processing of delicate work pieces with a significant safety distance to each other to prevent mutual nicking, or
- ▶ For bulk processing of high volumes of mass-produced parts.

Processing channel lengths of up to 27 m (90 ft.) allow processing times of up to 30 minutes.



Tub vibrator –

for large and heavy work pieces

Tub vibrators allow the processing of large, heavy and bulky work pieces. Delicate work pieces can be mounted on work piece fixtures or processed in individual processing chambers created by dividers. This prevents any part-on-part contact. Greatly varying finishing tasks and work piece dimensions demand a wide spectrum of different machine sizes. Rösler offers machines with usable channel widths of up to 1,600 mm (63”) and lengths of 9,000 mm (30 ft.).



Extra long tub: Length of processing channel = 7,400 mm (25 ft.)



Tub vibrator with external media classification



Linear continuous flow vibrator – automatic mass finishing

Continuous feed finishing with linear vibrators increases the throughput of mass-produced small parts as well as larger, somewhat delicate work pieces. These machines can be directly connected to manufacturing cells, like presses or equipped with automatic work piece loading equipment. When linked to post-treatment systems, like washing and drying, they offer a high degree of automation requiring very little operator involvement.

Linear continuous flow vibrator linked with loading belt conveyor, rotary drier and various transport belt conveyors.



Drag finisher – mass finishing of high value components without part-on-part contact

Drag finishing technology allows the finishing of midsize work pieces without any part-on-part contact. Mounted to special fixtures the work pieces are “dragged” through a bed of stationary media. Overlapping rotational movements of the work pieces ensure an all-around exposure to the media. The high rotational speed with the resulting high pressure of media against work pieces allows a high metal removal rate with relatively short processing times. Applications include, deburring, surface grinding & smoothing and high gloss polishing.

2 drag finishers with robotic loading/unloading of the work pieces



Robot attaching a work piece to a workstation in the drag finisher



Plunge finisher – finishing of rotationally symmetric large components

The plunge finishing technology allows the finishing of single, somewhat larger work pieces with diameters of up to 600 mm (24"). A rotating spindle – sometimes with an eccentric or reciprocal movement - moves the work piece through the grinding or polishing medium.



Surf Finisher – for finishing of targeted surface areas on a work piece

Surf finishing technology also allows for the treatment of work pieces without any part-on-part contact. Multiple spindles, each holding one work piece, or a robot holding the work piece with a clamping device, immerse the work pieces into the rotating processing medium. While the design with multiple spindles limits the work piece movement in the media, the robot-based technology with its nearly unlimited work piece manipulation possibilities allows tackling practically any finishing task irrespective of how complicated it might be.

Surf Finish center with 2 robotic work stations and a roller conveyor system for staging of the work pieces



Compact surf finisher



Glimpse into the rotating work bowl:
Robot-guided work piece

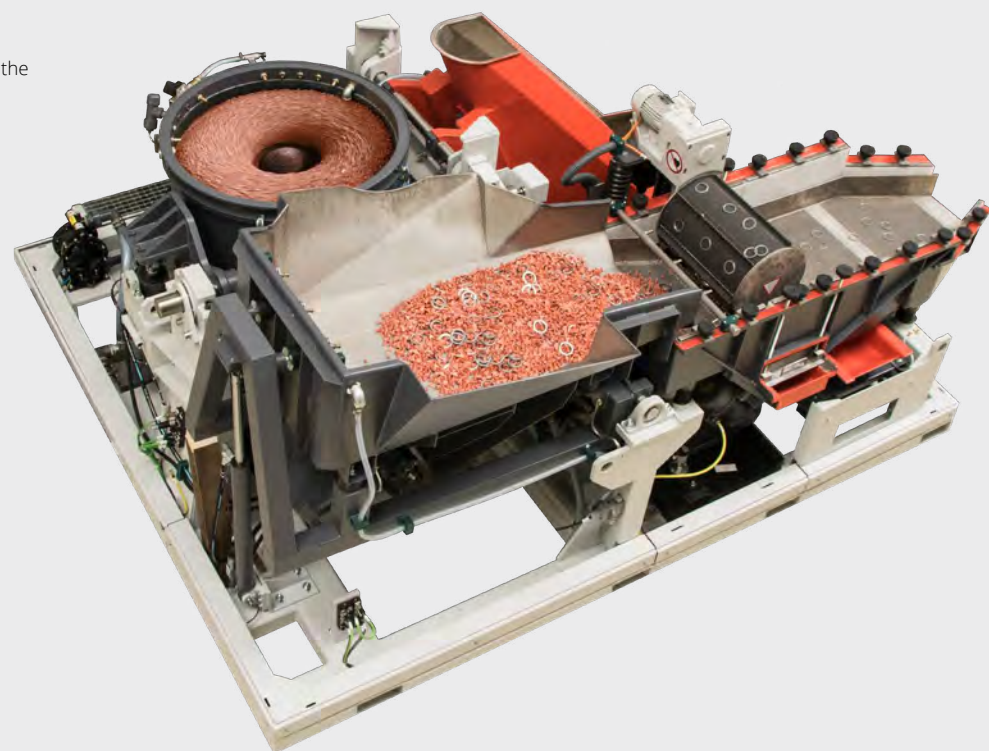


Centrifugal disk finishing machine – high performance finishing of mass produced parts

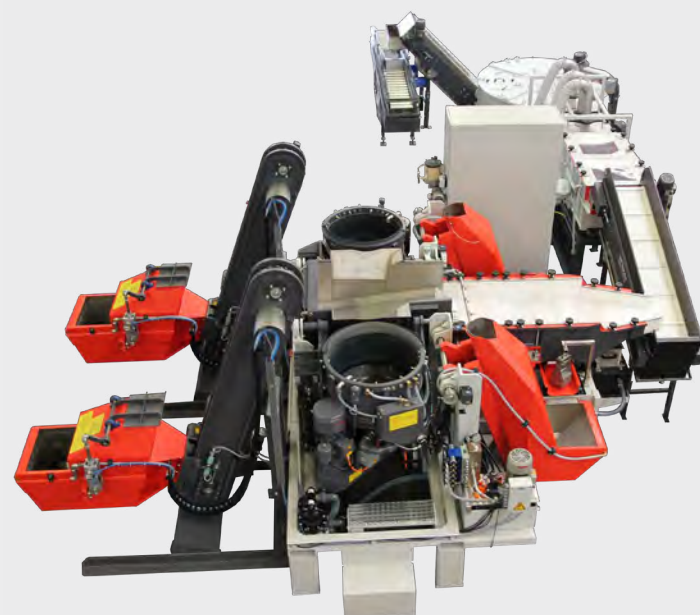
Compared to other vibratory finishing systems centrifugal disk machines offer a 15 – 20 times higher processing intensity. This results in short processing times and maximum throughput rates. Fully automatic double batch systems or semi-automatic compact units can be individually tailored to any finishing task.

The processing possibilities reach from extremely thin parts like prings and washers to substantial work pieces like gear components.

Fully automatic double batch centrifugal disk finishing machine with magnetic separation of the work pieces from the media



Fully automatic tandem centrifugal disk finishing machine (triple batch system) with work piece loading, spray washing & pre-drying station, rotary drier and staging system for the finished work pieces



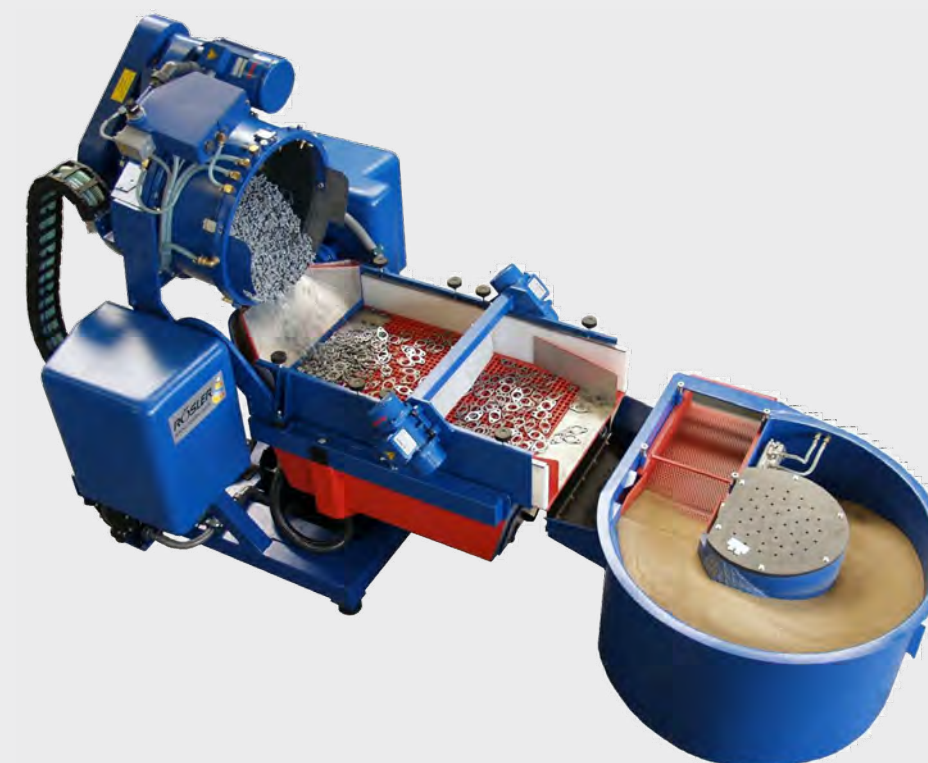
Semi-automatic compact centrifugal disk finishing machine with built-in separation unit



Semi-automatic compact centrifugal disk finishing machine with external separation unit



Automatic single batch centrifugal disk finishing machine linked to a rotary drier



Pre- and post-treatment systems

Industrial washing machines, spray and immersion protection systems

Cleaning, passivation, phosphating, placing a protective oil film on the work pieces and drying can be linked to mass finishing processes as pre-and post-treatment systems. Rösler offers a wide range of treatment systems that can be linked together for fully automatic operation or utilized as stand-alone units.

Belt washing machine



Rotary vibrator with belt spray washing station and hot air belt drier



Drying of the finished work pieces with drying medium

Glimpse into a rotary vibratory drier: Maizorb (granulated corn cobs) absorbs moisture and removes contaminants from the work piece surface.



Rotary vibratory drier

Rotary vibratory driers come in different sizes to match the capacity requirements of the different mass finishing machines. Filled with drying medium these units can dry the work pieces continuously in one single pass as well as with batch operation without leaving any residual spots.



Drum drier

The rotary drum driers, filled with drying medium, are used for drying work pieces that are cup shaped, not delicate and have relatively large surface areas.



Drying of the work pieces with hot air

Driers with drying medium are not suitable for drying work pieces with narrow blind openings and small drilled or threaded holes, because drying medium might get lodged in these cavities. For such cases hot air drying systems ensure trouble-free drying operations. By wetting the finished work pieces with de-mineralized water, residual spots on the work piece surface can be largely prevented.

Hot air drying centrifuge

The drying effect in these units is generated by centrifugal force and hot air. They are used for drying complete batches of very small, non-delicate and thin, flat work pieces that tend to stick to each other.



Hot air belt drier

When it comes to the gentle drying of housings, work pieces with threaded or drilled holes, undercuts or components with critical sealing surface areas, belt driers are the ideal solution. Placed on a wire mesh belt, the work pieces are passing through an electrically heated drying tunnel.



Hot air rotary vibratory drier

The work pieces are dried with hot air instead of drying medium by continuously passing through the vibrating processing channel. This drier type is used for relatively small, non-delicate or cup shaped parts. Even thin, flat components are dried without any residual water spots.



Hot air linear vibratory drier

Delicate, flat work pieces that must not nick each other, for example, polished coin blanks, are passing between two sheets of cloth through an electrically heated tunnel vibrating at low amplitude. The result: No dust, no water spots and no nicked work pieces.



Hot air drum drier

Work pieces with complex shapes, undercuts and blind and threaded holes are constantly tumbling over each other and dried with hot air without any drying medium.



Environmental technology

Process water recycling

Most mass finishing processes can be run with process water recycling systems constantly cleaning the process water and feeding it back into the mass finishing machine. For cleaning of more complex wastewater traditional floc & drop systems are available.

Fully automatic process water recycling system



Semi-automatic, compact recycling system



Cleaning of industrial liquids with centrifugal filters

Decades of experience in cleaning mass finishing wastewater contaminated with abrasive fines went into the development of centrifugal cleaning systems for other industrial liquids.

Cleaning and recycling of contaminated liquids from

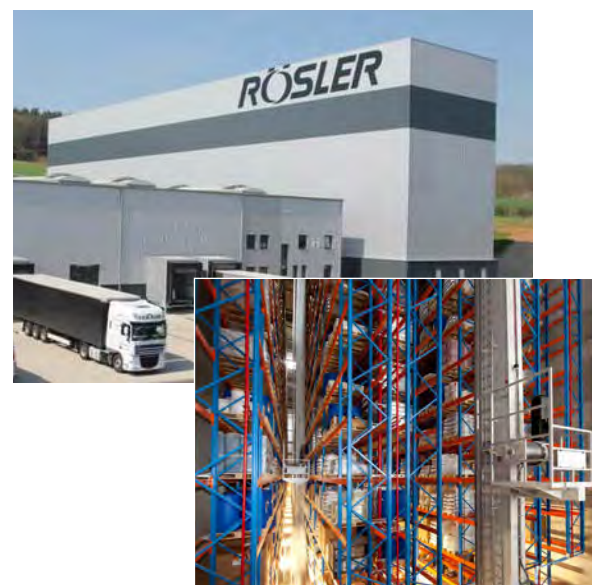
- ▶ Machining centers
- ▶ Grinding of glass (spectacle industry)
- ▶ Solar/wafer production (grinding, saw cutting)
- ▶ Paint booths
- ▶ ECM (electrochemical machining)
- ▶ High pressure water jet blasting
- ▶ Recycling systems for precious materials
- ▶ Dewatering of sludge



Consumables (media and compounds) – essential tools for mass finishing processes

With their consistently high quality and cost efficiency our grinding and polishing media have evolved into precision tools meeting the highest quality standards, among others, in the medical engineering, aerospace and automotive industry. The size of our media and compound product portfolio is unmatched in the industry and guarantees total process flexibility.

At various locations around the world we develop and produce our mass finishing media, compounds and process water cleaners in line with stringent environmental standards: In Germany alone our production volume amounts to 27,000 metric tons.



Quick delivery: Our central warehouse in Germany stocks about 8,000 metric tons

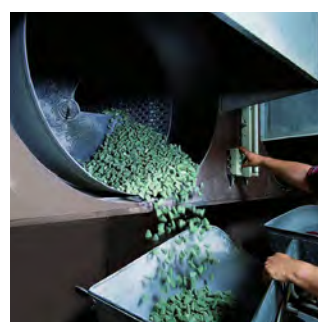
All our products are produced in compliance with DIN ISO 9001 and 50001

Regional warehouses around the world close to our customers

Direct deliveries in Germany with our company owned truck fleet



Continuous customer support by our application engineers



The Rösler total solution

The Rösler group is the global leader in the development and production of mass finishing consumables and equipment. With our broad R & D activities and close proximity to our customers we continuously develop solutions that meet the finishing requirements of our time.

1. Finishing task



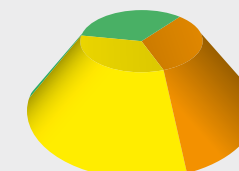
Work pieces from the customer

2. Process development

In-house test centers for:

Shot blasting

shot blast machine
blast media
dust collector

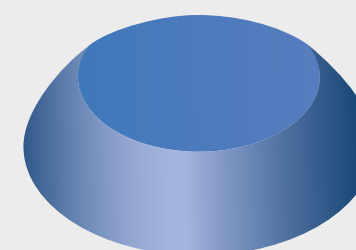


Mass finishing

mass finishing machine
grinding & polishing media
compounds

3. Engineering

Equipment manufacturing
Peripheral equipment
Interlinked systems

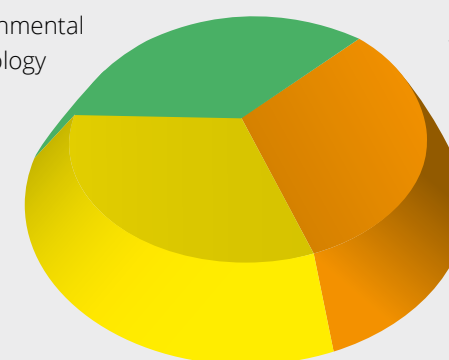


4. Customer support

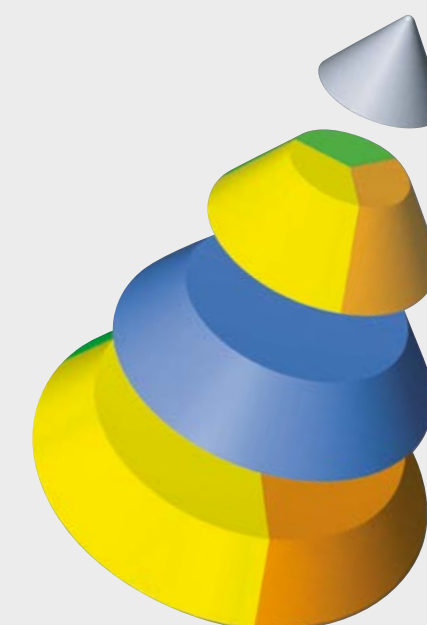
Environmental technology

Delivery assembly training

After Sales Service



5. Production at the customer site





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