

Surface finishing of orthopedic implants and medical instruments



Vibratory finishing systems, working in perfect harmony



When it comes to dealing with surface finishing and surface preparation problems, Rosler offers **the total process solution!** Our customers can choose between two processing technologies, **Vibratory finishing or Shot blasting**, which offer virtually unlimited possibilities. Through extensive processing trials, we always find the right finishing solution for our customer's needs. This includes not only the development of a specific finishing process, but also the selection of the right equipment and consumables. We deliver the total solution to satisfy your surface finishing requirements.

It is not by chance that our innovative developments and our high quality standards have established Rosler as the world technology and market leader in surface finishing and surface preparation.

In more than 60 countries we support our customers with a closely-knit network of Rosler subsidiaries and sales representatives.

We are the only company in our field operating test and demonstration centres throughout the world. This allows us to run test trials under real production conditions similar to our customers. This offers several advantages: Our customers save time and money, and at the same time – through our professional processing trials and advice – they are assured of receiving the best process solutions and products available on the market!

Rosler Metal Finishing USA, LLC's headquarters in Battle Creek Michigan covers nearly 300,000 square feet and serves our customers with mass finishing and shot blasting equipment, consumables and the best after sales service support. Our campus features separate media production facilities, allowing us to be responsive to our customers' needs in both composition and supply. Over 95% of the media sold in North America - both ceramic and plastic - is made here in the US!



Test centres around the world

Our main test centers for vibratory finishing and shot blasting are located at the Rosler North American headquarters in Battle Creek, MI:

- ▶ Nearly 30 different mass finishing and shot blast machines
- ▶ On an area of about 15,000 sqft

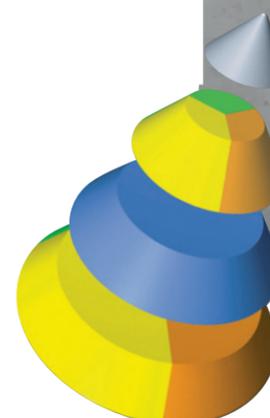
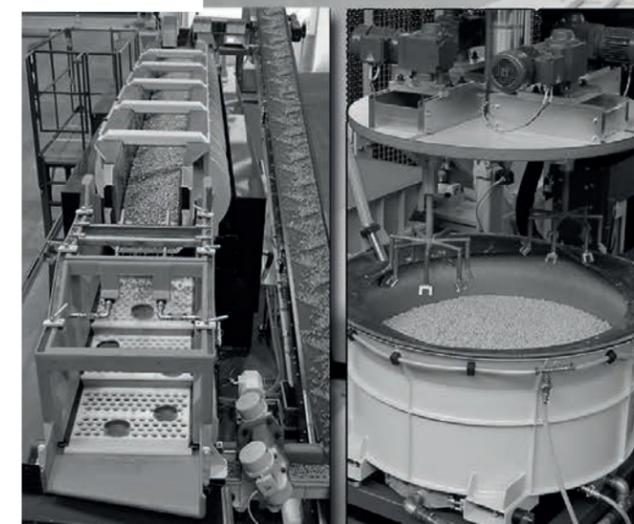
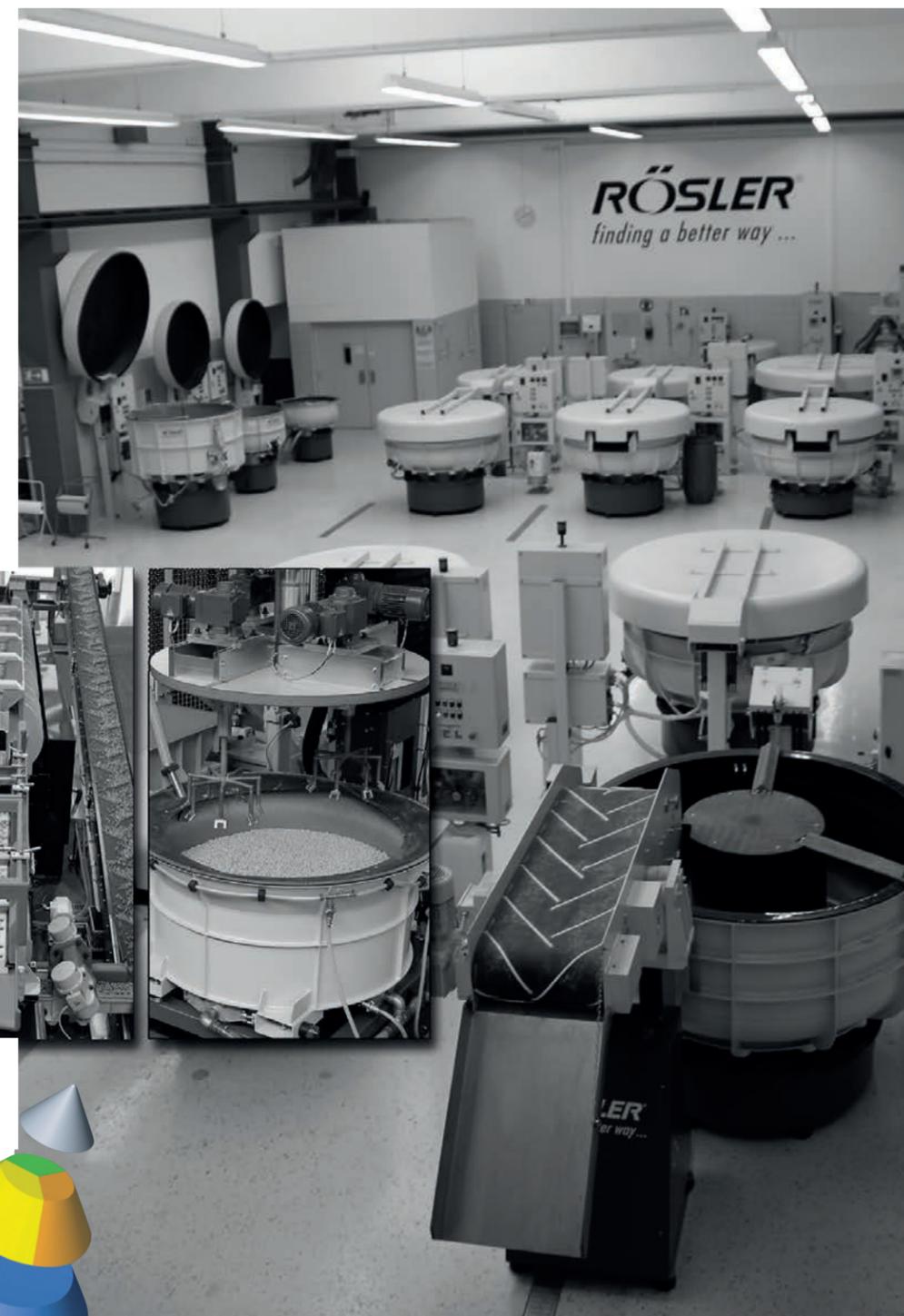
Similar test centres are located in the Germany, Great Britain, France, the Netherlands, Belgium, Switzerland, Spain, Italy, Austria, Brazil, India and Serbia.

Complete process solutions

- ▶ Machines, consumables and safety work in perfect harmony
- ▶ Efficiently linked mass finishing and shot blasting processes.
- ▶ Service teams available to perform installation and setup.
- ▶ Training for your staff and employees
- ▶ After-Sales support and service

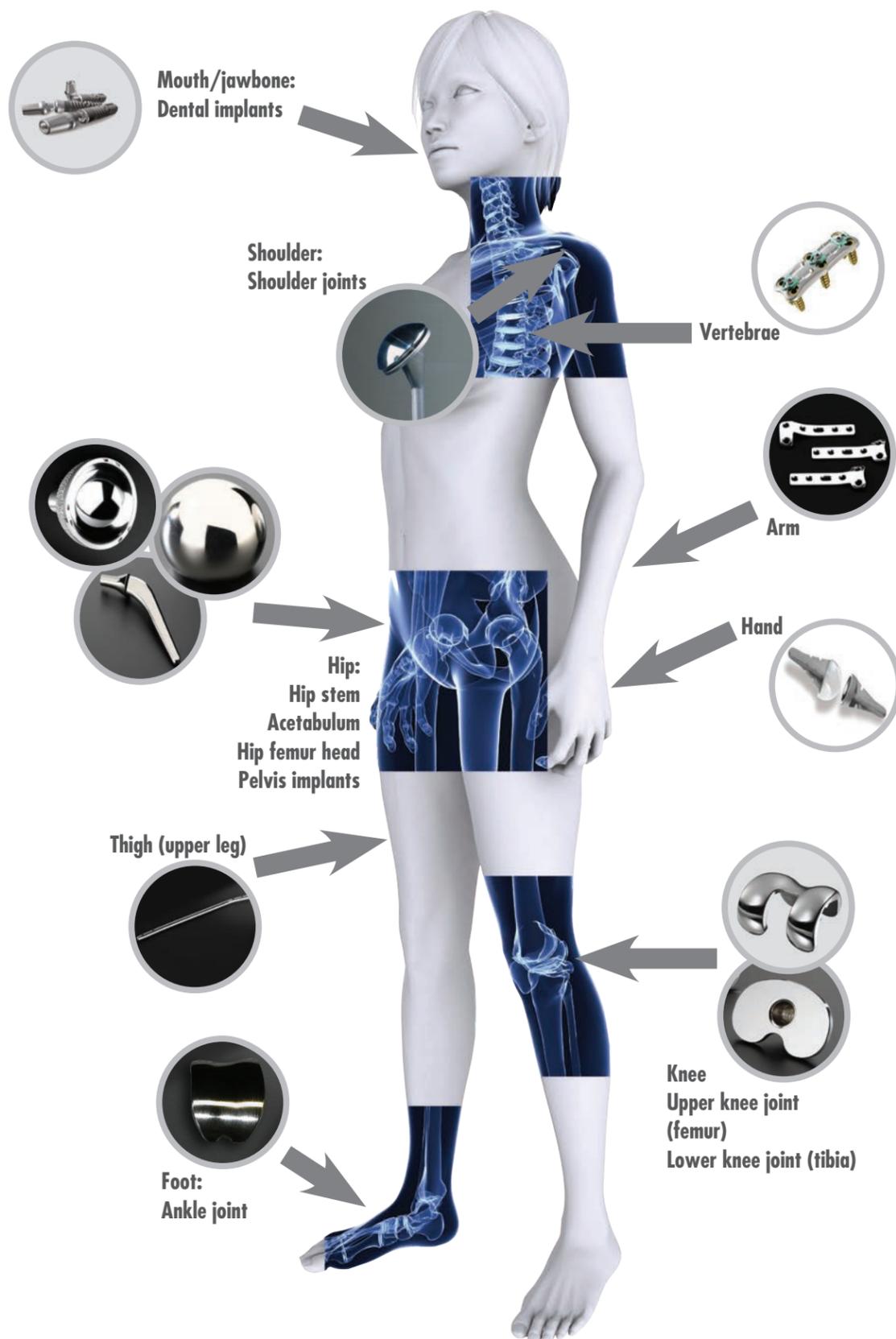
Team spirit

Rosler is a dynamic company, in which the initiative and commitment of each single employee plays a key role. Systematic, ongoing training and a cooperative management style combined with a lean organisational structure are key elements of our employee-focused philosophy. Naturally, our comprehensive training program ensures that today we are already grooming the skilled employees of tomorrow.



Fields of application / Examples of applications

Overview



Medical engineering

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Medical engineering

Casting, forging, injection molding, sintering, rapid prototyping and machining are the traditional production methods for manufacturing orthopedic implants, bone plates and medical instruments. All types of equipment, instruments, tooling and fixtures in the medical field have one thing in common: Precision, reliability and sustainability.

For more than 30 years Rosler surface finishing methods have been an essential part of orthopedic implant and medical device manufacturing technology.

In cooperation with leading companies in the industry, Rosler has been developing surface finishing solutions for the medical market's strict and constantly evolving technical requirements.

High quality surface finishes

From the beginning, mass finishing technology played an essential role in the surface finishing of medical instruments and implants, like knee joints. Over time Rosler was able to adapt its finishing methods to the changing work piece materials, geometries and sizes.

Dimensional accuracy, functionality and optimum surface finishes have always been at the center of the Rosler R & D efforts in the field of medical engineering. A major breakthrough was achieved with the adaptation of Rosler's drag finishing technology for use with orthopedic implants and other medical products. Drag Finishing's overwhelming market success can be attributed to significantly reduced finishing times, simple work piece handling, absolute process repeatability and perfect surface finishes.

The total solution from Rosler

The globally active Rosler group develops and manufactures mass finishing and shot blasting equipment, wastewater treatment/process water recycling systems, as well as grinding & polishing media and compounds. Strictly defined and controlled production methods are the basis for our high quality standards.



HAAS Schleifmaschinen GmbH & Rösler Oberflächentechnik GmbH Orthopedic Implant Alliance

... a technological partnership with comprehensive
know-how in the production of orthopedic implants ...

Precision grinding and milling of orthopedic implants, such as, knee and hip joints, combined with specialized drag finishing technology, produces high quality end products from the raw castings or forgings. The result is an absolutely repeatable and highly economical manufacturing process, without any interface issues or costly manual labor.

A seamless manufacturing process!



Drag finishing – the choice for impingement free surface finishing

The major design criteria for orthopedic implants are their functionality and their best possible biocompatibility. After the initial milling and grinding process, the raw work pieces undergo a fine grinding and polishing operation in a Rosler drag finisher without ever touching each other. This operation not only eliminates all machining lines, it also creates a perfect surface finish. Depending on starting surface conditions, two or three process stages may be required to achieve the required high gloss finish, with surface roughness readings of $Ra < 0.02 \mu m$. The drag finishing process is highly flexible and can be easily adapted to the various implants and sizes. It does not require any costly or time-consuming equipment programming and, above all, offers absolute process consistency and repeatability! With dozens of drag finishing installations at the the leading medical implant and device manufacturers around the globe, Rosler has the expertise to help develop the perfect solution for your needs.



Drag finishing system

Which components can be finished?

- Knee: Femur and tibia
- Hip: stem and ball joint
- Ankle joint
- Shoulder joint
- Medical instruments
- Prosthetic components



Bone screws, bone plates, surgical instruments, prosthetic components, special implants

To fully meet the patient's needs, bone plates and bone screws as well as prosthetic components must have different shapes and sizes. Instruments, like simple clamps, surgical tools and dental forceps pose a special challenge. When it comes to their surface finish, for hygienic and sterilization reasons, their surface must be ground, smoothed and polished without altering their required shape and functionality. For these difficult tasks Rosler rotary or trough vibrators are the ideal finishing systems. In these machines the parts are completely embedded and freely floating in the grinding or polishing media. The media acts as a cushion against part-on-part contact ensuring an all-around surface finish without having to mount the parts on special work piece fixtures. Only extremely delicate special implants require fixtures.



Rotary vibrator



Rotary vibrator



Trough vibrator



Dental implants, screws, connecting parts, small bone plates, vertebrae implants

The highly intensive, fluid media/part movement in centrifugal disc finishing machines is utilized to effectively finish small parts. In combination with specially developed Rosler micro finishing media or other loose media, these mechanical systems produce excellent surface finishes in extremely short cycle times. Somewhat longer bone screws can also be processed in centrifugal disc finishing systems with work bowl diameters of up to 1,050 mm.

Typical parts for centrifugal disc finishing

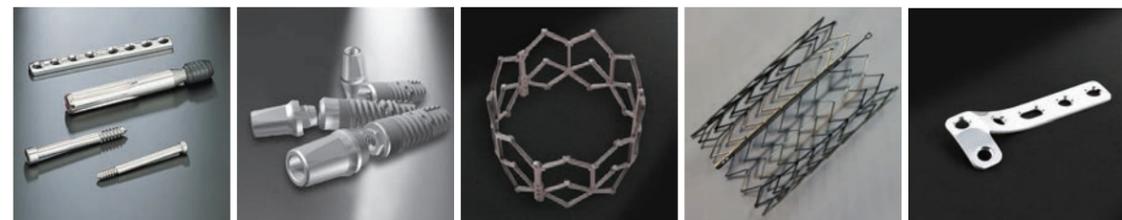
- Compression and pedicle screws
- Dental implants, dental implant abutments, dental screws
- Hand and elbow plates
- Femur screws
- Stents
- Spinal implants



Centrifugal disc finishing machine: FKS 02.1 - our smallest disc finisher, ideal for finishing very small parts



Centrifugal disc finishing machine: Fast finishing and quick separation – the E/SA machine range



Keramo-Finish® - high gloss polishing

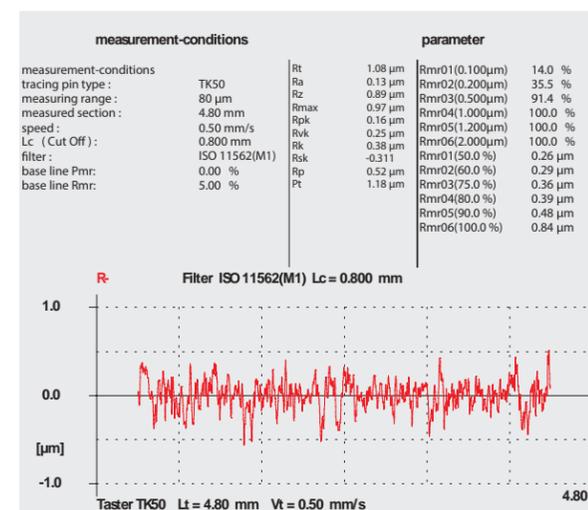
For surgical and obstetric instruments in the dental field and for cutting instruments (scissors, scalpels) esthetics and surface smoothness are especially important. At the time of its invention in the 1980's the pH-neutral Keramo-Finish® polishing system was absolutely revolutionary. It produces superb finishes and can be used as an important step prior to creating anti glare surface finishes, electro polishing and PVD coating.

ISF® - REM chemically supported surface finishing

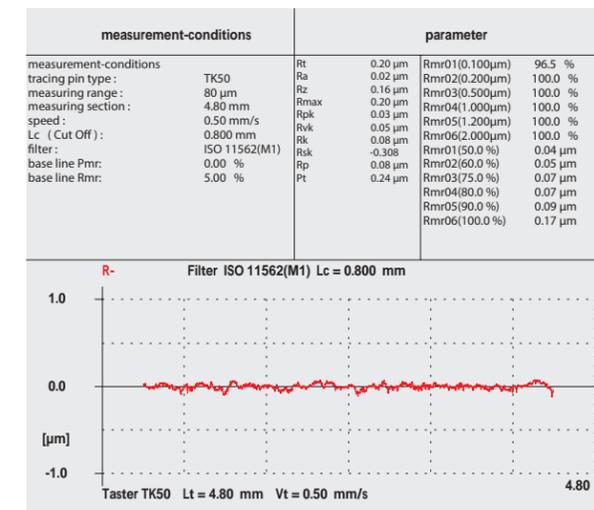
For forceps, scissors and clamps it is extremely important that their geometrical integrity is not compromised during the surface finishing process. Traces from prior production stages must be removed, and a very smooth, homogeneous surface must be created. This special finishing system is the ideal complement to the pH-neutral, traditional mass finishing methods.

Medical equipment and instruments

The manufacturing of medical equipment and instruments always requires a very fine, smooth, shiny surface without affecting their dimensional integrity. Deburring and targeted edge radiusing can frequently be combined with surface finishing as preparation for subsequent refinement steps. The respective finishing processes are then implemented in suitable finishing machines, ranging from simple vibrators to sophisticated, automated drag finishing systems.



A typical surface roughness reading prior to polishing



A typical surface roughness reading after polishing



Research & development – service

Finding a better way... our commitment to our customers

Process technology

Mass finishing is a highly versatile surface finishing technology. It is efficient, repeatable and economical! Through processing trials in our test centers, utilizing the customer's original work pieces, we develop tailor-made finishing solutions for a wide variety of surface finishing tasks. This approach provides you, the user, with a reliable basis for choosing the finishing process that is right for you.

Test centers all over the world

You can profit from the experience, creativity and know-how of the specialists in the Rosler mass finishing and shot blasting center nearest to you. Our promise: The best process technology for your finishing tasks. We support you throughout your search for the process that is most suitable for your requirements. Your visit in one of our test centers and the sample processing of your original work pieces will help you greatly in developing solutions for new finishing tasks or in optimizing existing finishing processes.



Test center mass finishing



Test center shot blasting

For Rosler "service" is much more than just a word

We are here to help you, whenever you may face a technical problem!

Telephone consulting for equipment as well as for process questions helps to quickly diagnose the cause for the problem. Our fast delivery service for spare parts helps to keep equipment down times at an absolute minimum.

Installation, maintenance and repair service:

Our highly trained, mobile field service technicians stand ready to support you.

Technical training:

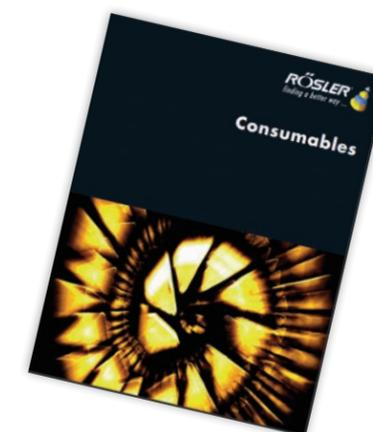
User training for equipment and process technology can be quickly organized at your work place or at our facility.



Top of the line media and compounds Rosler is the largest supplier of mass finishing consumables in the world

Production

When it comes to mass finishing consumables, no one in the industry can match the extent of the Rosler product line, or our industry experience. Starting over 60 years ago with the production of high quality ceramic media at our plant in Bad Staffelstein, Germany. We have expanded the production capabilities in Germany and the US to plastic media, compounds, waste water treatment chemicals and other auxiliary consumables for mass finishing. Currently we offer over 8000 different items to meet your specific surface finishing needs. Quality is another area in which Rosler cannot be matched. We manufacture our consumables to the highest quality control standards. Our standards for environmental protection are just as high. We use environmentally-friendly raw materials, and ensure that our manufacturing process maintains the highest standards for keeping the environment clean.



Download our new Consumables brochure at www.rosler.us/downloads/brochure

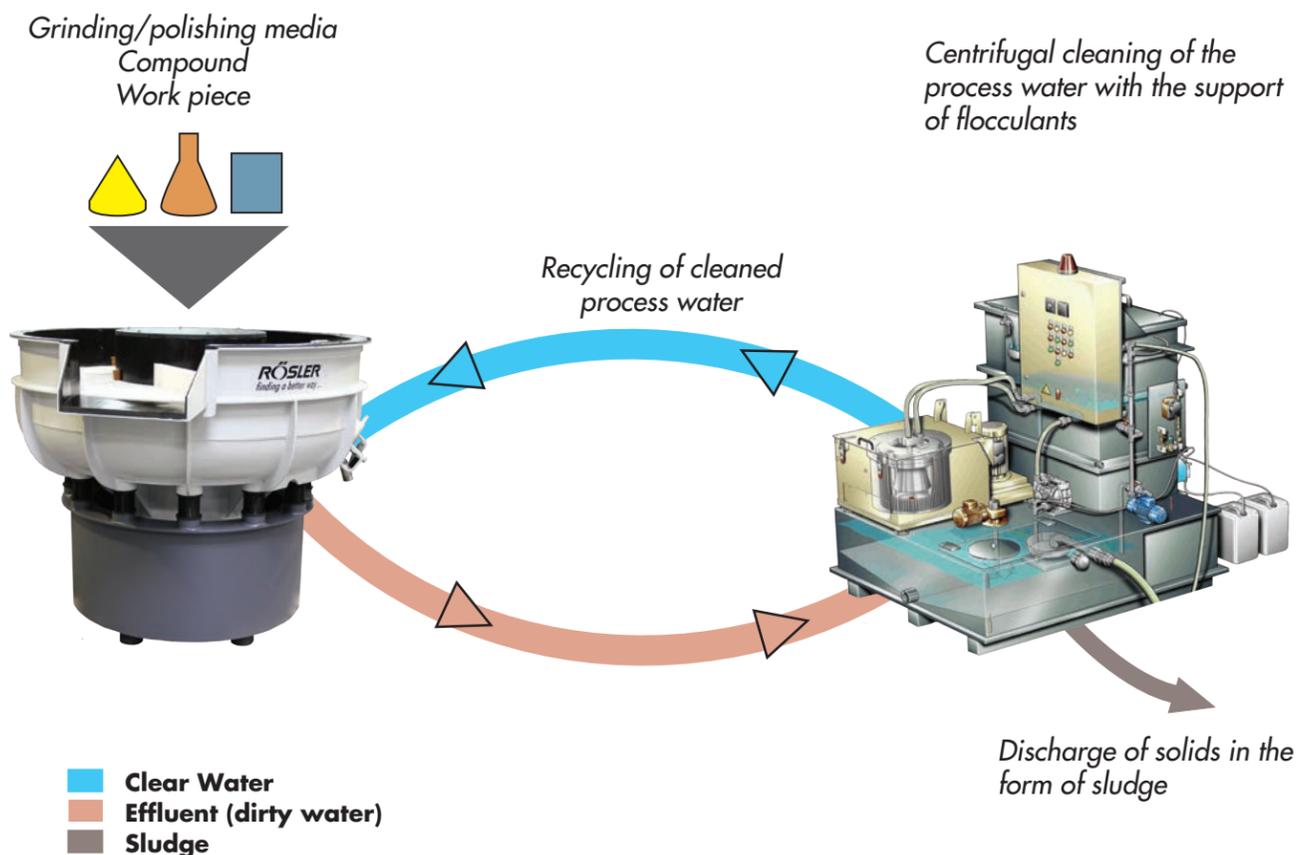
Media and compounds adapted to the finishing process

Only constant technical improvements of equipment and consumables guarantee optimum finishing results. In this respect we are guided by innovations taking place in medical engineering. Working closely with our global customers, our research labs and process engineers are developing process solutions that can meet the most stringent finishing challenges presented to us by the latest breakthroughs in medical engineering. Handling of new materials, changing production methods and the search for cost savings are typical challenges we face on a regular basis. A number of our recently developed media and compounds – all produced in house – have been approved along with the respective finishing processes within the strict standards of the US Food and Drug Administration (FDA).

Let us assist you in selecting the media and compounds that are right for your products!

Process water treatment – a contribution to ecological sustainability

Most mass finishing methods utilize water and chemical compounds. This offers many advantages regarding the efficiency and repeatability of the finishing process. Above all, it keeps the work piece surface clean. Rosler centrifugal process water recycling systems offer many advantages; they are economical while helping to save water and protect the environment.



Z 800 – semi automatic process water recycling centrifuge



Z 1000 – fully automatic process water recycling centrifuge

Rosler shot blasting technology

Shot blasting is also an important technology for creating different surface finishes on orthopedic implants, instruments and other engineered medical products. Dry shot blasting as well as wet blasting systems optimize the functional surface characteristics of a part while improving its looks. Our comprehensive know-how in the field of shot blasting is available to you.

Dry shot blasting



The applications for dry shot blasting range from simple deburring to highly specialized surface finishing tasks. For example, it is possible to roughen the surface of parts for better adhesion of coatings as well as applying highly decorative surface finishes on other parts.

Wet blasting



Unlike dry shot blasting, wet blasting systems work with a mix of fine abrasives and water. This slurry and cleaning additives or inhibitors are “thrown” at the part’s surface with special blast guns. This helps to achieve decorative, extremely fine and absolutely homogeneous surface finishes. Robots or CNC systems are utilized for material handling ensuring absolute repeatability of the blasting results. The effluent created by the blast operation can be cleaned in one of our centrifugal filters and can be re-used in the blast process. This helps to drastically reduce water consumption as well as wastewater treatment costs.





Rosler Metal Finishing USA, LLC offers the widest range of surface finishing equipment in the industry, including mass finishing and shot blasting equipment, media, compounds and effluent treatment. We serve North American customers from our 300,000 sq. ft. manufacturing campus in Battle Creek and support global customers through our worldwide network.

Our company slogan "finding a better way..." is exactly what we do. After evaluating what the end result should be, our highly-trained employees choose from the most extensive product range in the industry to develop unbiased, cost-effective solutions. Send us your challenge.



ROSLE, USA

ROSLE, GERMANY, WORLD HEADQUARTERS

 Branch Locations

In addition to branch locations, Rosler has representative located world-wide, visit www.rosler.us for more information.

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