

The logo for AM solutions features the letters 'AM' in a stylized, white, sans-serif font. The 'A' is composed of two overlapping shapes, and the 'M' is a solid block letter. A registered trademark symbol (®) is positioned to the upper right of the 'M'. To the right of 'AM' is the word 'solutions' in a lowercase, white, sans-serif font. Below the 'AM' and 'solutions' text is a thick, horizontal orange bar.

AM[®] solutions

3D post processing technology

Your partner for industrial
3D post processing solutions

A brand of the Rösler Group | www.solutions-for-am.com

Your partner for industrial 3D post processing solutions

Independent of printing process, material and production volume

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We are AM Solutions – 3D post processing technology

With over 80 years of cross-industry know-how, Rösler is among the worldwide leading suppliers of innovative solutions in the field of surface finishing. In recent years, we have been increasingly dealing with requests for the surface finishing of 3D printed parts. In this sense, we have concluded quickly that, compared to traditional manufacturing processes, additive manufacturing poses entirely new challenges for post processing and surface finishing.

For example, the unmachined surface of additively manufactured components is significantly rougher and also the more complex geometries make smoothing and polishing much more difficult. In addition to that, there are new challenges like unpacking, the removal of loose or sintered powder residues, and, of course, the removal of support

structures. Often, these challenges are still solved manually, but this has a negative impact on cost-effectiveness and reproducibility.

To meet these requirements in the best possible way, we established the brand AM Solutions - 3D post processing technology, which is responsible for developing and offering tailor-made equipment, process technologies, and consumables for the automated post processing of 3D printed components. Regardless of material, printing process, or production volume, we will find the best technical and most economical solution for your post processing requirements. Our experts are here to provide advice and support starting at the design phase of your parts to guarantee perfect post processing.

If you think of Additive Manufacturing – think of AM Solutions!



Our offer – your added value!



>400 m² Customer Experience Center
at the location Germany



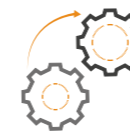
Own **development and production of consumables**



More than 80 years of cross-industry experience



15 locations – over 150 distributors – worldwide 1,500 employees



>80.000 m² Production and development
at the location Germany



Worldwide **Service**



Longtime experience in **Automation / System chaining**



Transfer of professional knowledge by certified trainers

Our portfolio

Machine solutions for the entire spectrum of 3D post processing

Automated, economical, repeatable

The surface finishing demands are as multifaceted as the spectrum of 3D printed components. They require treatment processes in line with the functional characteristics of a component and must produce absolutely repeatable results.

Be it unpacking, powder removal, removal of support structures, surface homogenizing and smoothing, or high gloss polishing and dyeing (coloring) - with our comprehensive know-how in the field of additive manufacturing and decades of experience in surface preparation and finishing we can offer the optimal solution for each and every post process task, irrespective of the component

material and the printing system; everything from one single source! The fully automatic treatment processes guarantee stable, repeatable results combined with considerable time and cost savings.

Our equipment, perfectly adapted to your specific requirements, can be supplied as stand-alone units or as fully automated, linked systems. Of course, the work piece handling can be manual, partially or fully automated, entirely in line with your preferences.

This allows you to consistently produce high-quality results for all post processing functions with a higher cost efficiency and, thus, provides you with a decisive competitive advantage!



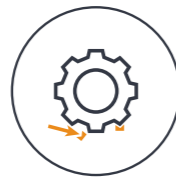
Post-Process



Powder Removal



Cleaning



Support Removal



Surface Finishing



Liquid Color Smoothing



Our service, your benefit:

- Decades of experience in the field of surface preparation and finishing
- Innovative, customer oriented process development in the field of additive manufacturing
- Processes that are adapted to your individual work pieces and process stage
- Tailor-made advice for the optimal work piece design
- Broad portfolio of equipment for surface preparation and surface finishing
- Consumables that have been specifically developed and adapted for AM components
- Broad service package that can deal with any post processing challenge
- Professional after sales support and worldwide branches for direct contact on site

SIEMENS

EOS

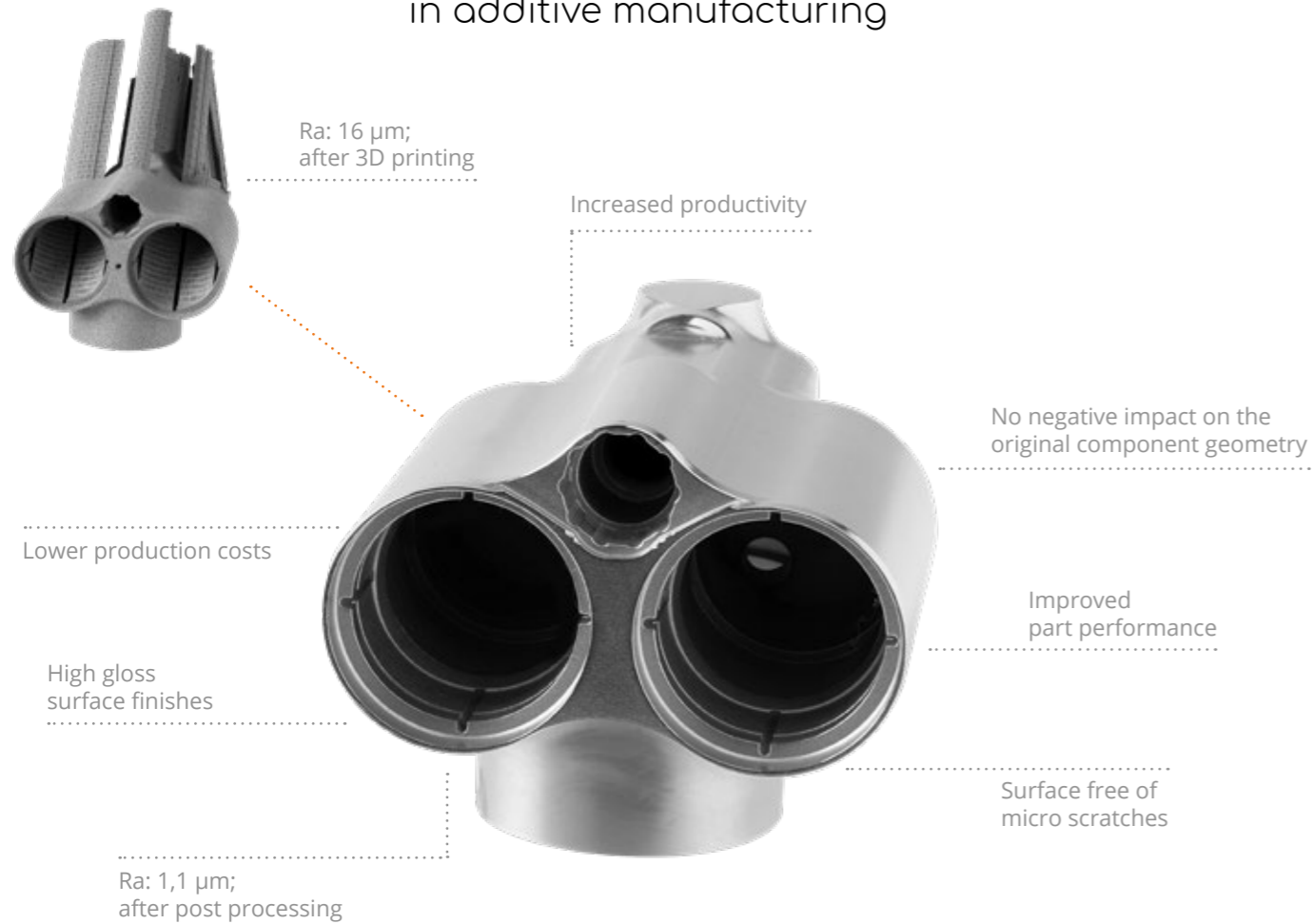
stratasys

Altair

gom

hp

3D post processing - a significant process step in additive manufacturing



M-Line

Cost efficient solutions for a perfect surface finish

M1 Basic – Compact entry-level finishing system for processing single components and small work piece batches



The compact, easy to operate M1 Basic can be perfectly integrated into your manufacturing flow and can be easily adapted to a variety of different tasks. Whether you must process small work piece batches or single components – you will always achieve perfect and absolutely repeatable results.

- Easily adaptable to different finishing tasks
- Several work pieces can be treated simultaneously in different processes
- Compact system with integrated process water recycling and process control

M2 – High performance for shortest cycle times

Besides their intuitive and simple operation, M2 systems distinguish themselves through their high productivity for surface finishing of 3D printed metal and plastic components. Thanks to their automatic operation and high adaptability to different applications, the M2

machines are ideal for processing large work piece volumes with absolutely repeatable quality. This true multi talent can be easily linked with an automatic work piece loading system and a work piece drier.

- Easy operation with intuitive controls
- Compact design
- High process stability through automatic monitoring of all relevant equipment functions
- Automated or manual batch processing



M3 – High performance and perfect results in every detail



The grinding or polishing media is evenly flowing around the firmly mounted work pieces in the working section of the M3. This ensures an intensive, even processing, even on internal surface areas. Since the work pieces do not touch each other, and because of the gentle processing

even very delicate components can be treated without the risk of nicking or any other damage. The intelligent equipment design allows finishing one single, large component (max. size = 650 mm) or treating several small work pieces in one single batch.

- Easy, ergonomic work piece handling
- Extensive equipment options for every task
- Suitable for machining internal channels and details
- Innovative control with many features such as live tracking of all process parameters

M4 – Mobile 2-in-1 system ensures highest process stability and excellent cost-efficiency

Rotary vibrator and cleaning centrifuge combined into one integrated system: the M4 finishing system is very easy to operate. For this reason, it is the ideal starter equipment for finishing the surface of 3D printed components. It allows the treatment of small to midsize metal and plastic components.

With the integrated cleaning centrifuge, the M4 saves not only valuable resources but is also highly cost-efficient. In addition, the system has a small footprint, is extremely flexible, and has a simple, straightforward design.

- Compact all-in-one solution for many surface finishing applications
- Suitable for handling small and midsize plastic as well as metal components
- Highest process stability due to optimal process water recirculation
- The space-saving, mobile system requires no fresh water / waste water connection
- Plug-and-play concept requires no time-consuming installation at the customer location
- Very easy to operate



S-Line

Effective solutions for cleaning and surface finishing

S1 – The smart multi-talent for cleaning and surface finishing

2-IN-1 SOLUTION

Data sheet:



The next generation of the S1 sets new standards in the post-processing of powder bed-based polymer printing processes. The smart plug-and-play solution enables cleaning, smoothing and homogenizing in just one system. The S1 is also suitable for surface finishing of de-powdered metal components made of non-reactive materials. It also impresses with its simple operation by means of software-controlled process

automation. Thanks to its compact and robust design, this multi-talent can be easily integrated into any production environment and offers maximum reproducibility, traceability and cost efficiency. The ergonomic design in conjunction with a process-optimized nozzle setup for automatic operation round off the overall package.

- 2-in-1 Solution for cleaning and surface finishing with easy blast media exchange
- Especially developed for polymer powder bed based technologies
- Blast media conditioning system for best and consistent quality of blasting media

S1 Wet – The versatile wet blast solution for cleaning and surface finishing

Irrespective of whether you must treat your metal or plastic components as single work pieces or in batches, the all-round S1 Wet system represents an excellent solution. Equipped with numerous accessories, it can be perfectly adapted to your cleaning, surface

homogenization and / or smoothing requirements. Among its many features is the machine's small footprint and the integrated media cleaning and recycling system that allows the re-use of the blast media. Of course, the process water is also recycled.

- Significantly reduced surface roughness values on the internal surface areas of metallic components
- Plug-and-Play system with integrated control panel as well as conditioning of the blast media, process water and air
- The wet blast process requires no ATEX accessories
- Manual, semi-automatic and fully automatic operation



S2 – Unique parts handling and fully automated post-processing



* A patent application covering the machine and the process is pending.

Just place your plastic components, produced with powder-bed printing systems, into the S2 – everything else takes place in a fully automatically. The special loop belt allows single piece flow and particularly gentle work piece handling. This ensures

uniform cleaning, surface homogenization and / or peening of the work pieces in continuous mode operation. The integrated blast media recycling system guarantees consistently good processing results.

- Plug-and-Play-System for 24/7 operation
- Continuous cleaning of the blast media
- Integrated reporting tool ensures consistent processing qualities
- The software can be integrated into higher level production control systems
- Excellent noise protection and effective seals ensure quiet and clean operation

S3 Duo – Process complex components efficiently and fully automatically

The S3 Duo plug-and-play system was specially developed for wet blasting applications and is also available as a dry blast solution. The robot-guided blast nozzle movement allows the targeted, gentle processing of large and complex metal or plastic work pieces. Continuous, fully automatic logging and monitoring of all process parameters guarantees

absolutely repeatable results for the removal of support structures, residual powder and surface finishing. In addition, the wide range of equipment options, including simplified robot programming, ensure a great deal of flexibility thanks to an innovative playback process. An intuitive and intelligent control system rounds off the profile.

- Robot-guided, automatic processing
- Available as wet or dry blast system
- Integrated media conditioning system
- Integrated closed loop water recirculation (wet version)
- “L” shaped door allows work piece loading via crane
- Simple robot programming thanks to optional playback function



Data sheet.



C-Line

The next generation of post processing

C1 – Fully automatic and efficient support / resin removal from 3D printed plastic components



Data sheet:



Our C1 system is an excellent tool for the automated and cost-efficient post processing of photopolymer components. The perfectly adapted compound and the interplay between mechanical and thermal effects results in a highly consistent, effective and gentle removal of support structures / resin. In addition, our C1 machine contains various features to

guarantee the optimal use of the compound and to minimize the operating costs. These include a fill level control system and an integrated saturation (contamination) sensor. Key process parameters such as temperature, cycle times and the degree of contamination of the compound are continuously recorded and saved with a data logger.

- Fully automatic removal of support structures / resin of photopolymers (e.g. Polyjet, SLA, etc.)
- A special software package allows programming the entire process sequence (individually extendable)
- Continuous monitoring of the temperature and the degree of contamination of the compound
- Built-in grate with a drip edge guarantees clean and safe processing
- Suspended particle screen, easy to take and clean

C2 – Chemical smoothing and dyeing of polymers in one single machine

We streamline your manufacturing operations. For example, in our new 2-in-1 C2 system we combine chemical smoothing and dyeing in one single operation. In addition, the immersion smoothing technology reduces the processing times by up to 50 %. Compared to

alternative solutions, the C2 system can lower the costs per piece by up to 60 %. Our specially developed process media for this 2-in-1 process enables eco-friendly processing. Overall our solution is super effective, cost-efficient and demands very little manufacturing space.

- 2-in-1 process: chemical smoothing and dyeing in one single operation
- Significantly lower capital investment and small footprint
- Immersion smoothing technology reduces processing times by up to 50 %
- Compared to alternative solutions, the costs per piece can be up to 60 % lower
- Up to 80 % lower surface roughness
- Closed system with continuous cleaning and recycling of the process liquid
- Less toxic than other chemical smoothing processes
- Flexible quick-connect clamping system allows intuitive work piece handling



Processing equipment and finishing consumables for practically every material

The ideal basis for individual, customer-oriented process development



Additive manufacturing has special requirements:
We have the answer

Regardless of whether you print components from metal, plastic, ceramic or any other material – with AM Solutions – 3D post processing you have a technology partner who can support you at every stage of post processing. We offer not only a wide spectrum of machine equipment but can also supply the required media and compounds, which are constantly adapted to all kinds of AM applications. Our consumables product range includes grinding &

polishing media, compounds for customized mass finishing processes and shot blast media. This wealth of products paired with the knowledge and experience of our specialists in the Rösler test centers around the world allows the development of process solutions that can fully meet your specific technical requirements. The result: We can provide you with technically and economically optimal solutions for practically every application.

Our development partners



In order to offer an economical, safe and efficient post processing solution suitable for their new printer 3DUJ-2207, Mimaki have entered into a cooperation with AM Solutions – 3D post processing technology. The jointly developed compact post processing solution enables the fully automatic removal of support structures without compromising the high level of detail and color nuance of the 3D parts. The process, in which chemical, mechanical, and thermal effects interact according to the parameters selected, is up to three times faster than with equipment previously available on the market. "With AM Solutions,

we have a partner with extensive know-how and experience in the fields of mechanical engineering, industrial surface finishing, and the development and production of consumables. At the same time, the company is among the leading suppliers of automatized post processing equipment in the AM sector, where it pursues constant development", explains Arjen Evertse, General Manager Sales from Mimaki. The post processing solution is manufactured at the German location of the Rösler brand AM Solutions – 3D post processing technology.



With our innovative 3D Automatic Unpacking Station, HP and AM Solutions – 3D post processing technology present our first jointly developed product. The scalable, industrial-grade post-processing solution allows the fully automated, reproducible unpacking of additively manufactured components from the HP Jet Fusion 5200 3D Printing System in a continuous workflow. Besides a significant productivity increase and a greatly improved cost efficiency, it also achieves a

considerably higher powder reclaim rate, depending on the geometry of the component. The Automatic Unpacking Station is manufactured at the German location of the Rösler brand AM Solutions – 3D post processing technology.

- Increased productivity / economic efficiency
- Best, reproducible results
- Higher powder reclaim rate

AM Solutions – your One-Stop-Partner on your way to the perfect surface



Work piece in powder bed



Work piece after powder removal

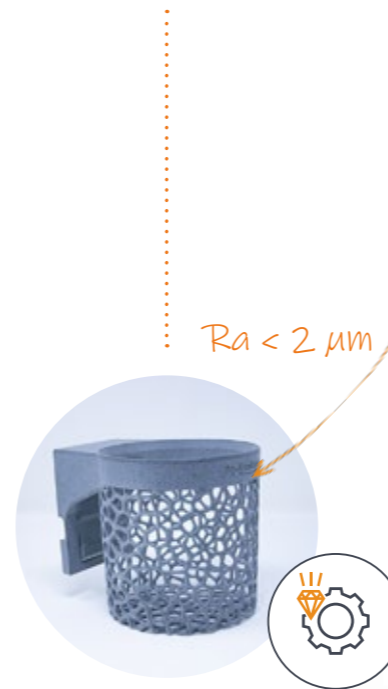
Step 1

Powder removal:
HP 3D Automatic Unpacking Station
(powered by AM Solutions)

- Simple transfer of the print job and all associated print data
- Automated, component-specific powder removal without any powder contact
- Significantly reduced material use thanks to maximized powder reclaim



Work piece after the blasting process



Work piece after surface finishing

Step 2

Cleaning:
AM Solutions S1

- Safe and ergonomic operation
- Automated blasting process ensures high efficiency and reproducible results
- Economic use of blast media thanks to integrated blast media conditioning



S1 – THE 2-IN-1 SOLUTION

Step 3

Smoothing:
AM Solutions M1 Basic

- Easy operation and highest reproducibility
- Fast and simultaneous processing of different components
- Perfect surfaces at a constantly high level



Customer Experience Center – Developing post-processing solutions for your individual applications



Ideal environment for process and product development

The dedicated AM Solutions Customer Experience Center, with over 400 m² of space, sets the benchmark for the development and design of customized processes and products for the post-processing of additively manufactured components. We ensure this with our complete equipment along the entire process

chain with state-of-the-art engineering software, diverse printing technologies, and a unique post-processing section. In this particular section, AM Solutions – 3D post processing technology uses its entire machine portfolio with an impressive range of post-processing technologies.

80,000 m² manufacturing space guarantees your success!



Exceptional manufacturing depth ensures total flexibility and top quality

AM Solutions – 3D post processing technology is a global leader in the field of post processing of 3D printed components. To meet customer demands for precision, reliability, consistency of results and excellent quality, we manufacture our products at our main manufacturing site in Germany on an area of more than 80,000 m².

This enables us to quickly respond to the specific requirements of our customers and to provide them with high-quality solutions. Moreover, because of our exceptional manufacturing depth, we are much less dependent on external suppliers and are not affected by the international supply chain uncertainties.

Rösler Academy – the central training center of the Rösler Group

The Rösler Academy is the central training center of the Rösler Oberflächentechnik GmbH and offers hands-on, practical seminars about all surface treatment technologies available from the Rösler Group. The goal of the

Rösler Academy is to support you by sharing our know-how with you. Certified coaches offer numerous seminars in the fields of mass finishing, shot blasting, lean management and additive manufacturing.

Seminar AM.1 - Post processing of 3D printed components: From support removal all the way to surface finishing.

With this seminar you will obtain comprehensive knowledge about post processing of 3D printed components. The seminar highlights different post processing methods for various print technologies and will help you choose the post processing technology that is most suitable for your AM application. Besides the most suitable data analysis for AM you will gain valuable knowledge allowing you to consider important post processing aspects during the product design phase and the printing process.

- The interdependence between 3D print and post processing
- Support removal
- Surface finishing
- The impact of data preparation on the post processing function

You find the complete training program under
www.rosler-academy.com.

AM[®] solutions

3D post processing technology



rapid



precise



tailor-made

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