The network of **specialists**, for **AM professionals**

Specific for **Metals**

INTEGR AM

IntegrAM is the cutting-edge technology that deals with integrating post-processessing and surface finishing related to AM (acronym for "Additive Manufacturing"). We integrate our knowledge in the field of surface finishing, with an interdisciplinary approach and a spirit of innovation, efficiency and automation of post-process technologies. **IntegrAM** is a network of specialists who have created **a program of innovative, original and competitive solutions for AM professionals**.

Integrated post processing and finishing technology for **AM**

SPENGLER, a French company founded in 2021 by two Italian engineers who are experts in the design and manufacture of SLS and Additive Manufacturing systems at pre-existing companies. Thanks to decades of consolidated experience in the AM sector, full of specialist and multidisciplinary projects, **SPENGLER** is dedicated to three main themes:
1. Consulting in AM projects
2. Development of "custom" systems and machines
3. Distribution of Post Processing and Finishing Plants

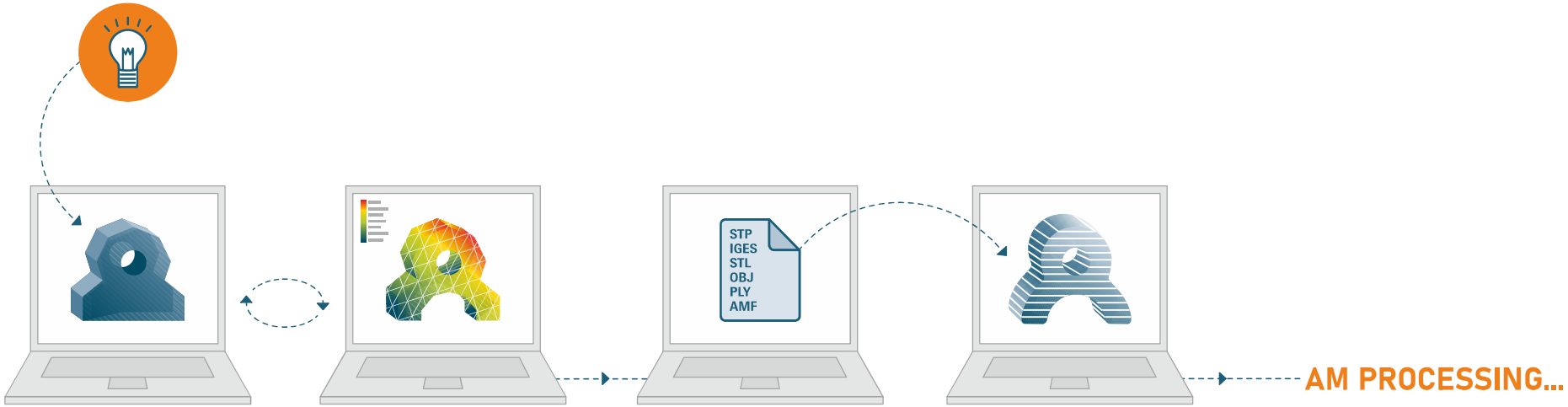
Rollwasch® is an Italian company founded in 1950 in Milan and specialized in surface treatment. Manufacturer of machines and consumer products, Rollwasch® is an **innovative SME**, always engaged in R&D, which in the last decade has developed a series of patents to revolutionize post-processing and finishing in AM.
In 2021 he won the first prize in the Innovation 4.0 Award, as part of the 15th edition of the A&T - Automation & Testing Fair, with **VibroBLAST** technology.

Techno Surface is an Italian company founded in 2015 and specialized in various technologies, **with strong convergence towards Additive Manufacturing**. Engaged since its inception in technological consultancy and R&D, it has filed a series of specific patents for post-process applications and surface treatments in AM. These innovations include the **Eco-Sonic 3D ultrasonic cleaning system**, the ecological **Eco-Dyeing** of polymers.
Techno Surface is the coordinator of the **IntegrAM** program and network.

IntegrAM stands for "**Integrated Post Process Solutions and Finishing Technologies for Additive Manufacturing**".
IntegrAM is a brand, a program and a network of companies dedicated exclusively to the specialization of AM.
The pillars of the IntegrAM network, in addition to the companies presented aside, are:
1. Multidisciplinary skills
2. Continued dedication to R&D projects
3. Interactivity with competence centers, universities and centers of excellence mainly in Italy and France
4. High coordination of Teamwork

What does **IntegrAM** mean?
IntegrAM stands for “Integrated Post Process Solutions and Finishing Technologies for Additive Manufacturing”.
The IntegrAM network is a partnership of specialists, manufacturers, solution developers, specifically dedicated to the Additive Manufacturing sector.
The IntegrAM network is evolving day by day and continuously adding new solutions to offer the best possible program of post processing and finishing technologies, but not only ...
... Get in touch with our sales or technical representatives to find out about the latest up-to-date opportunities.
Many of these solutions are designed by the IntegrAM team and produced in Italy by Rollwasch® Italiana Spa, a manufacturer with over 70 years of experience. Other solutions, services and products offered are produced by specialists under the guidance of the IntegrAM Team, to fully meet the expectations of AM professionals according to international standards.

PRE-PROCESSING



Manufacturing, CAD Design

CAE simulation and optimization

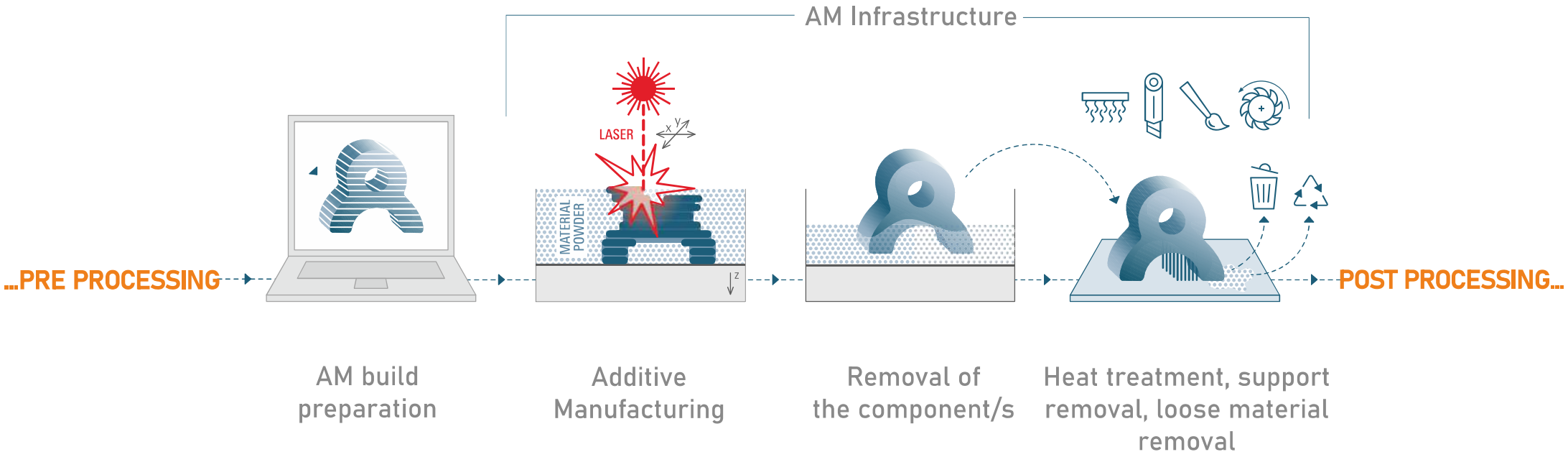
Creation of data exchange files

AM build preparation

QUESTIONS ABOUT **PRE-PROCESSING**

- What are the component and material properties that the AM component whould have in any case?
- Is the material generally or specifically qualified or validated for the intended application?
- What is specially important to «design for Additive Manufacturing»?
- Are there special design specifications for the AM compliant component design?
- What design possibilities result from AM compliant component design?
- In which way must the CAD data of the part model be available?
- Is a special AM process particularly suitable for the desired components?

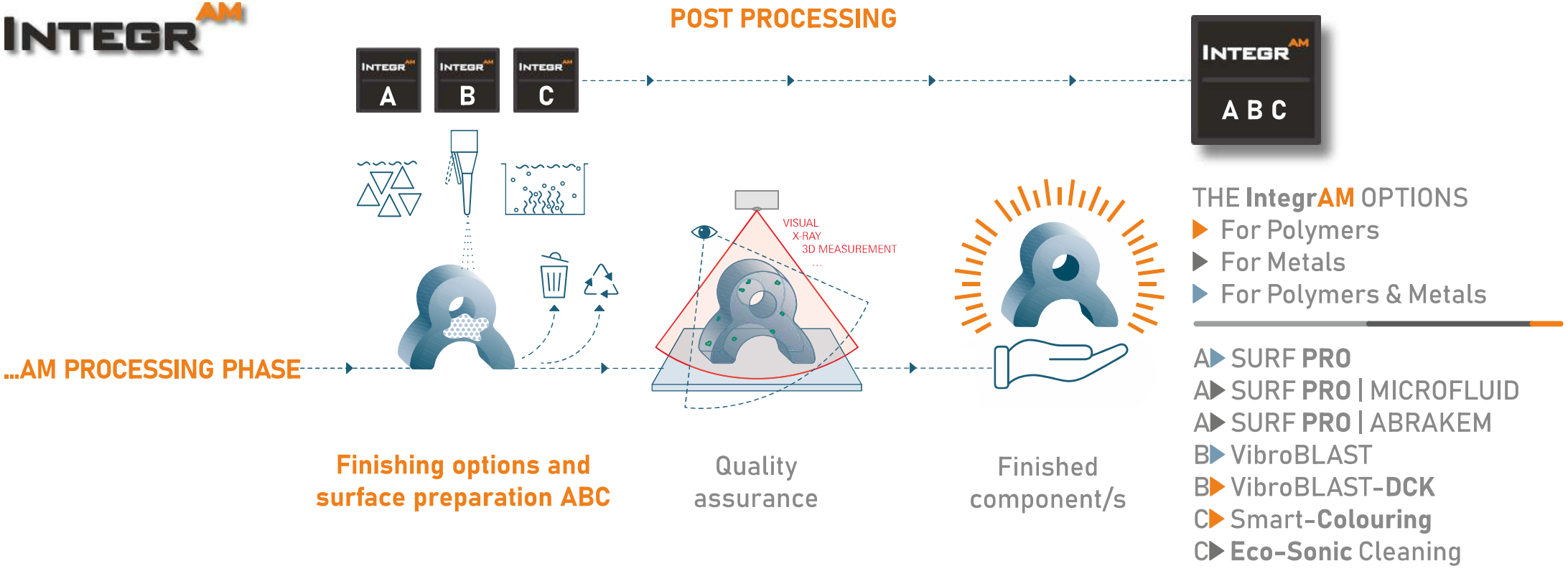
AM PROCESSING PHASE



QUESTIONS ABOUT **AM PROCESSING PHASE**

- Can the AM process be integrated into existing processes?
- How much support is required for the desired AM process?
- What maintenance costs are to be expected for the AM process?
- Are the materials freely available for purchase of can they only be purchased originally from the system manufacturer?
- Is the system a black box or can production parameters be individually adjusted?
- Are there special protection requirements for the people and the environment?
- What is the production / building speed of the AM process?

POST PROCESSING



THE **IntegrAM** OPTIONS

- For Polymers
- For Metals
- For Polymers & Metals

A▶ SURF **PRO**
A▶ SURF **PRO** | MICROFLUID
A▶ SURF **PRO** | ABRAKEM
B▶ VibroBLAST
B▶ VibroBLAST-**DCK**
C▶ Smart-**Colouring**
C▶ **Eco-Sonic** Cleaning

QUESTIONS ABOUT **POST-PROCESSING**

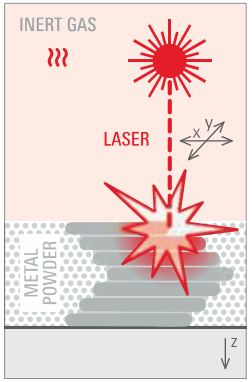
- Is there any special post-processing work on the AM components?
- Do the AM components have to be aftertreated in a further process step, e.g. a finishing process, a dyeing process?
- **What level of surface rugosity and final outlook is required for the finished component, must it be waterproof?**
- **The AM component has already the correct surface tension and final hardness?**
- Can material not used in the AM process be recycled?
- How must the unused material be handled?
- Does the component quality have to be proven by a qualification, e.g. by a non-destructive testing procedure?

ADDITIVE MANUFACTURING FOR METALS

Powder Bed Fusion

Fused with laser

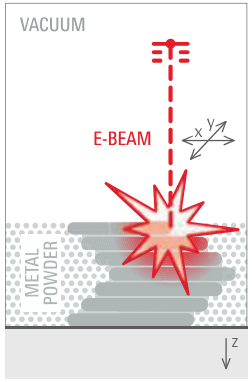
SLM
Selective Laser Melting



By means of a movable laser beam, metal powder is selectively melted locally layer by layer, thus solidifying a cross-section of the component.

Fused with electron beam

EBM
Electron Beam Melting

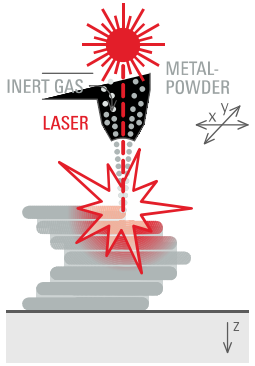


By means of a movable electron beam, metal powder is selectively melted locally layer by layer, thus solidifying a cross-section of the component.

Direct Energy Deposition

Fused with laser

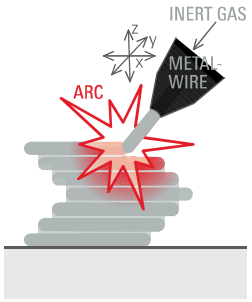
LENS
Laser Engineering Net Shape



Material is applied and melted simultaneously by a laser beam. The following solidification of the melt generates new layers which are arranged above and next to each other.

Fused with electric arc

WAAM
Wire and Arc Additive Manufacturing

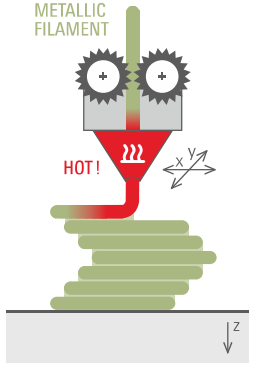


Metal wire is melted by arc welding and applied locally in layers to quickly produce large near-net-shape metal structures.

Material Extrusion

Green part is printed to be sintered afterwards

FDM
Fused Deposition Modeling

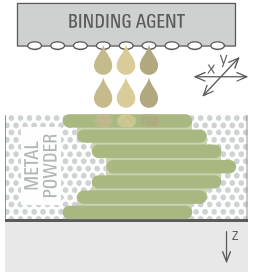


Wire-shaped metal-containing plastic, so-called filament, is plasticized in a nozzle unit and selectively dosed locally layer by layer.

Binder Jetting

Joined with bonding agent to be sintered afterwards

BJ
Binder Jetting

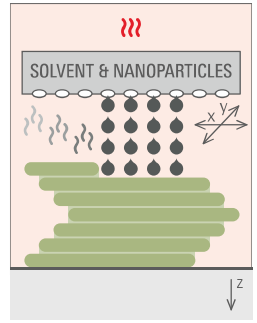


Tiny binder droplets are selctively applied locally through many nozzels and in layers onto metall powder. They stick the powder material together.

Material Jetting

Cured with heat to be sintered afterwards

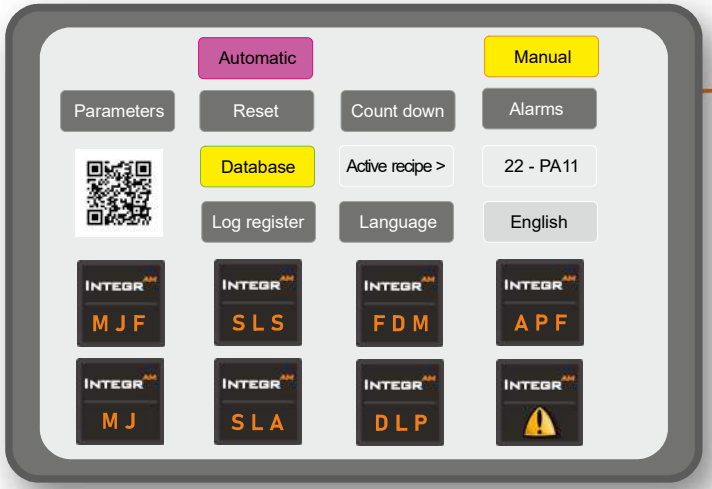
NPJ
Nano Particle Jetting



A metal particle solvent fluid is selectively dosed locally by a nozzle unit. The solvent evapora-tes and the nanoparticles bond together.

INTEGR AM SLM | INTEGR AM EBM | INTEGR AM LENS | INTEGR AM WAAM | INTEGR AM FDM | INTEGR AM BJ | INTEGR AM NPJ

INTEGR AM SURF PRO



Models/Versions	Used with:
SURF PRO 50 BS	Media + Liquid compound
SURF PRO 120 BS	Media + Liquid compound
SURF PRO 50 MF	Media + Microfluid process
SURF PRO 120 MF	Media + Microfluid process
SURF PRO 50 ABK	Media + Abrakem process
SURF PRO 120 ABK	Media + Abrakem process
SURF PRO 50 MS-SC	MS-SC MultiSteam Smart Color
SURF PRO 120 MS-SC	MS-SC MultiSteam Smart Color

The **SURF-PRO** series of finishing machines is based on pre-assembled compositions on easily positioned technological pallets and with the prerogative of being **PLUG & PLAY**. Depending on the preferences of the end user, the type of environment in which the finishing machine is destined or more simply the budget, all **SURF-PRO** machines can be supplied in the basic version or with "AM" cabin. All the basic machines have a color touch screen HMI interface, but those with an «AM» booth have a larger panel, ideal for managing recipes based on more types of «AM» processes. The **SURF-PRO BS** line combines the vibratory finishing unit with a control panel with PLC and inverter, a recycling tank for wet processes.

SURF PRO

Models with **AM** extension are equipped with aluminum cab and 18 "color HMI.

MF Micro Fluid

The **SURF-PRO** series of finishing machines is based on pre-assembled compositions on easily positioned technological pallets and with the prerogative of being **PLUG & PLAY**. Depending on the preferences of the end user, the type of environment in which the finishing machine is destined or more simply the budget, all **SURF-PRO** machines can be supplied in the basic version or with "AM" cabin. All the basic machines have a color touch screen HMI interface, but those with an «AM» booth have a larger panel, ideal for managing recipes based on more types of «AM» processes. The **SURF-PRO MF** line supports the vibratory finishing unit with a pneumatic discharge valve and a Microfluid station for automatic multi-tasking processes.

INTEGR AM SURF PRO

Models with **AM** extension are equipped with aluminum cab and 18 "color HMI.

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SURF PRO

Models with **AM** extension are equipped with aluminum cab and 18 "color HMI.

MSWB MULTISTEAM WETBLAST

The **SURF-PRO** series of finishing machines is based on pre-assembled compositions on easily positioned technological pallets and with the prerogative of being **PLUG & PLAY**. Depending on the preferences of the end user, the type of environment in which the finishing machine is destined or more simply the budget, all **SURF-PRO** machines can be supplied in the basic version or with "AM" cabin. All the basic machines have a color touch screen HMI interface, but those with an «AM» booth have a larger panel, ideal for managing recipes based on more types of «AM» processes. The **SURF-PRO MS-WB** line combines the vibratory finishing unit with a steam boiler and **a specific set of accessories to assure WET BLAST and/or MULTI STEAM process**.

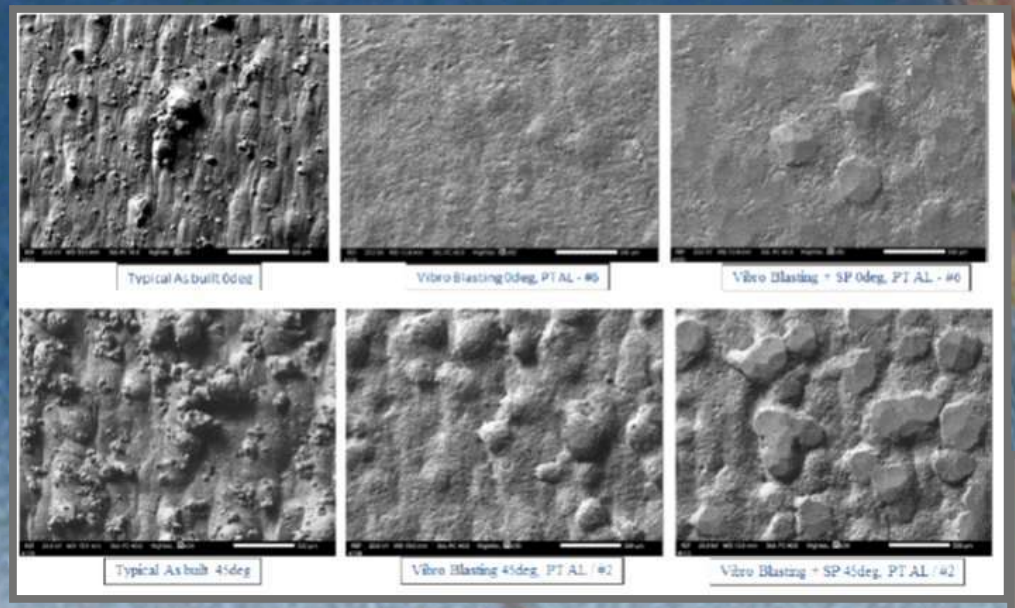
The **SURF-PRO-MS-WB** series of machines is specifically designed to apply the **MULTI STEAM, WET BLAST and/or STEAM SURFING** with the technology of vapour (Patent pending - I).
The use of **MS-WB** machines enables innovative blasting methods, where Atex Norms are not required and with interesting finishing results in fully automated modes.
Through a smart software it is possible to store in the memory recipes acting both, as automatic cycles manager with the system and, on the other hand, providing correct guidelines for the ratio of abrasives to use in the process.

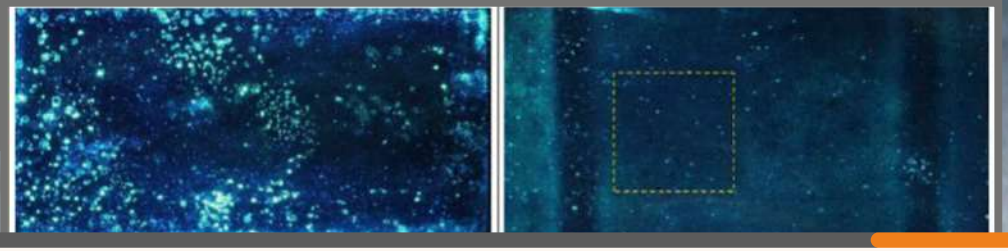
The **SURF-PRO-MS-WB** series of machines is specifically designed to apply the **MULTI STEAM** technology (Patent pending - I). The use of special kinds of «vectorial media» in the process, are exposing in 3D way the workpieces to be processed, to the nozzle which is blasting into the processing bowl. Each **MULTI STEAM** process is divided in at least two phases of which the first - STEAM SURFING - injects only hot steam to pre-heat the workpieces and the running mass. The second phase - **STEAM SURFING** (achronym of Surface Finishing) and/or **WET BLASTING** - injects the blasting abrasives, involving all the components into a complete wet blasting cycle where the use of steam is helping to provide sanitized as well as finished surfaces.

VIBRO BLAST

IntegrAM offers VibroBLAST machines with a level of automation suitable for all needs, including **Industry 4.0**. The **VibroBLAST** machines are the best first step to **PREPARE THE SURFACE** to following surface treatments, because reduces the main roughness. All **VibroBLAST** series machines are equipped with a microprocessor with color Touch Screen panel and, if required, it is possible to request the optional WiFinishing version, which can be connected remotely and wirelessly with a Windows 10 tablet. All the software loaded on our machines are made internally and, where necessary, can benefit from ad hoc customizations. If you are evaluating, for example, to use a **SURF-PRO MF** or a **SURF-PRO ABK**, the cycle duration will be reduce when the surface is prepared with the **VibroBLAST** technology, with important overall benefits in terms of costs and finishing quality.

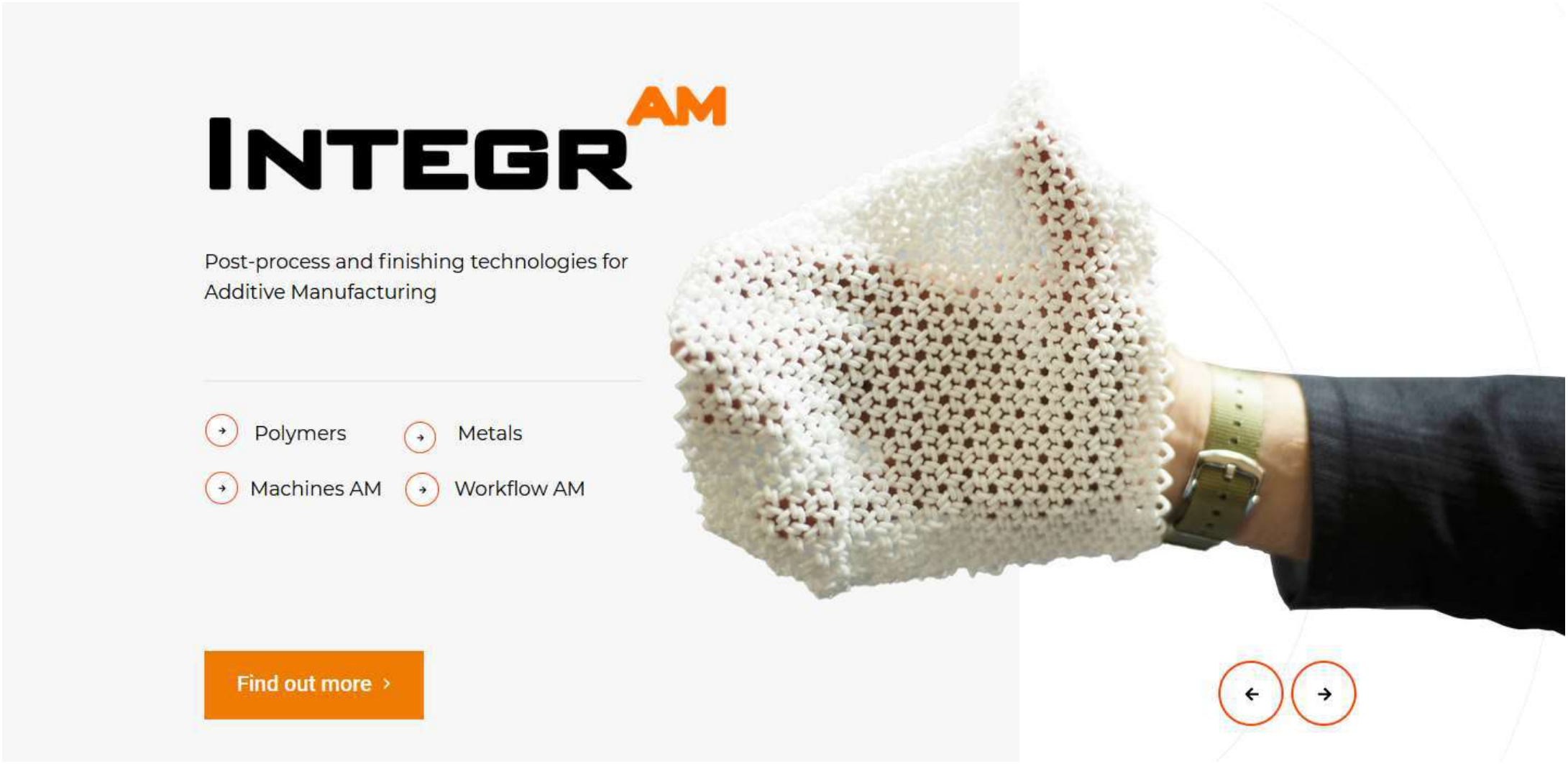
USP Ultrasonic Shot Peening





Very interesting results are emerging from combining the **VibroBLAST** process, for example made on square samples of AM metals, to limited areas of 30 x 30 mm with **Ultrasonic controlled Shot Peening**. The positive effect is detected with a roughness tester where the surface, already optimized around 4.0 µm RA levels, if sandblasted by hand with the same pressure and the same shot peening media used in the **VibroBLAST** process, resulted in an increase of roughness up to 5.2 µm RA!

The **USSP** solutions program, - UltraSonic Shot Peening, in this example, is reporting one of the most extraordinary results of multidisciplinary tests run by **IntegrAM** team, with its specialist ultrasonic partners and the laboratory of an aerospace manufacturer.



To find out more about the continuous evolution of our program and the IntegrAM Team, visit our website: https://integram.eu/

The network of **specialists**, for **AM professionals**

Specific for **Metals**

INTEGR AM

This brochure is for guidance only. Its content can change depending on the development of the product.
La presente brochure è da considerarsi puramente orientativa. Il contenuto potrà variare in conseguenza dell'evoluzione dei prodotti.

The **IntegrAM** program was born from a network of specialists **designed for AM professionals**

Techno SURFACE

ROLL WASCH

spengler

Integrated post processing and finishing technology for **AM**

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