Vapormatt

Additive manufacturing

High-quality surface finishing and efficient sinter powder removal from hidden channels.

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Additive manufacturing (AM) is a process built for the future. With its many advantages over traditional manufacturing methods, it's transforming industries across the globe: from consumer products to aerospace, automotive to medical. Now, with the introduction of wet blasting, the AM industry is breaking into new dimensions.

Wet blasting offers numerous important benefits for any manufacturer using AM technology, especially those using polymer or metal powder bed fusion technologies like:

- Selective Laser Sintering (SLS)
- Laser Powder Bed Fusion (LPBF)
- Electron Beam Melting (EBM)
- Selective Laser Melting (SLM)
- Multi-Jet-Fusion (MJF)
- Direct Metal Laser Sintering (DMLS)

Wet blasting is also highly effective at finishing components manufactured by:

- Selective Deposition Modeling (SDM)
- Direct Energy Deposition (DED)
- Sheet Lamination, including composite fibre (SLCOM) components

By applying our wet blasting technology at the relevant point in the manufacturing process, you can ensure the components you produce are finished to a first-class standard of quality, in a dust-free environment.

To help you create components of the highest quality, our wet blasting machines offer an array of finishes for metal and polymer products. You can customise your wet blasting media to perfectly create your desired finish - from smooth to matte with complete confidence and uniformity. This process is significantly more repeatability and reliable than dry blasting, which can result in a non-uniform surface.

If you are preparing your manufactured components for painting or coating, you can create the optimum reactive 'wet-out' surface to ensure the best possible adhesion, in turn, improving the durability of the coating.

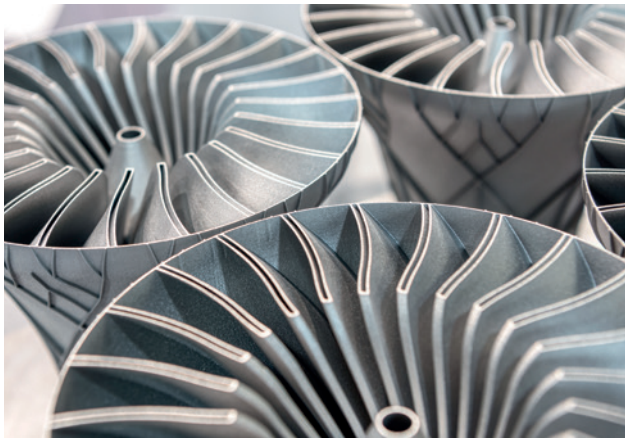
That same media customisation gives you unrivalled cleaning power too. De-powdering from hard-to-reach internal channels in your complex products with confidence – unlike with dry - or bead blasting, where an element of doubt can remain as to whether channels are properly clean of powder. In some cases, dry blasting can even compound the problem by adding media to a blocked channel. Wet blasting increases your flexibility, giving you the ability to clean complex mechanisms.

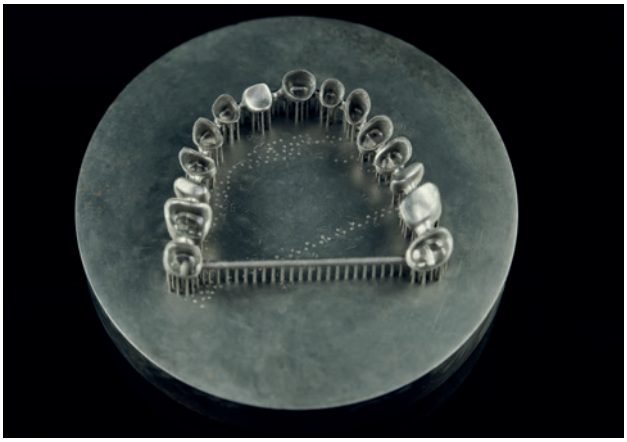
Our wet blasting machines are self-contained, closed-loop systems, and unlike dry blasting, wet blasting creates no dust residue and the water in the process acts as a barrier that helps prevent media particles from being embedded in the component.

The wet blasting applications suited to additive manufactured components are expanding all the time. This broad range of applications means one of the automatic or manual wet blasting machines in our range is going to be perfectly suited to the application in question.

The benefits of wet blasting Additive Manufactured components

Application	Benefit
Uniform surface finishing	Wet blasting helps achieve smoother and more uniform finishes on AM components, to beyond the quality achieved by CNC. The process removes imperfections such as build lines, layering artifacts, and rough surfaces, resulting in improved aesthetics and texture. This results in components that are consistently superior in quality to die-case equivalents.
Customised surface finishing	Wet blasting can be tailored to produce the perfect finish for your products thanks to it being more controllable than other finishing processes and the wide range of blast media options available.
Damage-free processing	Unlike dry blasting, the cushioning effect of the water in the blast slurry prevents damage to delicate component surfaces.
Control over surface roughness	Wet blasting allows for precise control over the level of surface roughness (Ra) achieved on AM components. In fact, wet blasting allows for more control than any other surface finishing process. By adjusting factors such as the type of abrasive material, nozzle size, blasting pressure, and dwell time, manufacturers can tailor the process to meet their precise requirements.
Enhanced surface cleanliness	Wet blasting effectively removes residual powder, support structures, and contaminants from AM components. This is particularly important for parts produced using powder bed fusion technologies like Selective Laser Sintering (SLS), Selective Laser Melting (SLM) or Direct Metal Laser Sintering (DMLS), as it ensures the removal of excess powder and improves the overall cleanliness of the part.
Powder removal from channels	Wet blasting is particularly effective at removing un-sintered or partially sintered powder from the complex internal channels that are frequently a feature of AM components. The wet blast slurry even gives a visible indication that the channel is clear when it exists the channel.
Reduced stress concentration	Wet blasting can help alleviate stress concentration points that may exist in AM parts. The process gently removes material from the surface, smoothing out irregularities and minimizing the risk of stress cracks or failures due to localised stress concentrations.
Improved fatigue performance	The surface treatment provided by wet blasting can enhance the fatigue performance of AM components. It can peen the surface transforming tensile stresses into compressive stresses to help reduce the risk of component failure in known areas of weakness and in so doing extend the life of the part.
Surface preparation for coating and bonding	Wet blasting can be used as a preparatory step for subsequent post-processing operations such as painting, coating, or bonding. By creating a clean and uniformly textured surface, it enhances the adhesion and quality of subsequent coatings or treatments applied to AM components. The process creates a 'wet-out' surface that ensures an even and complete application of adhesives and coatings.
Surface preparation for sterilisation	Wet blasting can produce a surface on AM components with an optimum Ra surface roughness for sterilisation.
Coating enhancement	Once an AM component has been coated, wet blasting can be used to ensure the coating is consistent and free from imperfections like coating droplets, to leave a uniform surface with an optimum Ra.
Coating performance improvement	The conversion of tensile stresses to compressive stresses by wet blasting, as mentioned above, can be applied to coatings to help improve coating durability.
Substrate compatibility	Additive manufacturing processes can produce parts from various materials like polymers, metals, composites, and ceramics. Wet blasting is a versatile finishing process that can be tailored to accommodate these different materials, making it suitable for a wide range of AM components.
Safe and eco-friendly	Wet blasting does not use hazardous solvents and because the abrasive media is contained within water, there are none of the dust-related health issues or explosion risks associated with dry blasting. This helps reduce costs too as there is no need for costly chemical disposal or dust filtration. In addition, our machines recirculate water and only filter out spent media making them relatively eco-friendly.





Why work with us?

Vapormatt isn't just the world leader in wet blasting. We invented the process and remain solely focused on it to this day.

Since Norman Ives Ashworth developed the first wet blasting machines in the 1940s, we've been developing, improving and refining wet blasting for edge radiusing, surface preparation and peening. And we're still led by the Ashworth family today, continuing to design and manufacture bespoke machinery and aftermarket services built to the specific requirements of your additive manufacturing business.

Our expertise spans many different sectors: from tooling carbide insert manufacturing, to additive manufacturing. Our breadth of knowledge means we can explore a wider range of applications that benefit a business like yours.

Because at Vapormatt, while we might be pioneers of wet blasting technology, we never believe the job is done. We're constantly researching, developing our techniques and discovering new technological enhancements that we can apply to additive manufactured components. Consequently, we hold and have patent applications pending in significant areas of process control and repeatability.

When working with you, we'll build a long-term technical partnership, giving you access to our know-how and world-leading wet blasting services. As a result, we understand you may need us to develop methods and processes in confidence. You'll benefit from our discretion too – in fact, we have a long track record of doing just that with our key customers across a number of high-tech sectors.

What can you expect of us?

- **Integrity -** We always conduct business with you in a confidential, honest, open and ethical manner
- **Commitment -** Every member of our team aims to exceed your expectations at every level
- **Innovation -** We're at the forefront of wet blasting technology, implementing our technical expertise
- **Value -** You gain value from us through our high levels of service and technical excellence
- **Collaboration -** As a customer focused company, we work collaboratively to ensure you enjoy the best possible experience

The Vapormatt Promise

In designing and manufacturing specialist machines that meet your exact requirements, we're always improving. Always refining. Always pushing the boundaries. We build on the successes of the past, incorporating proven designs and approaches, and combine them with innovative thinking to meet the specific challenges we face together with you.

Throughout that collaborative process, we're also completely honest and discreet. And it's in this respect that we make a promise to you.

As we develop more efficient, more seamless and more effective ways to deliver the benefits of wet blasting to you, any off-the-shelf solution is unlikely to be suitable. So complete validation of every design detail is practically impossible, and some functions – software, for example – will inevitably need modification as they're integrated into your processes.

Equally, once the equipment is installed on your premises, things are unlikely to be up and running without a glitch from the first moment, in a plug-and-play manner. Performance will always improve as operators and maintenance teams become familiar with the machines and their operations.

Other manufacturers might shy away from such an honest admission. However, we accept that this is simply part of building and refining the right wet blasting machines for you. That's why we promise to make the entire Vapormatt team, including our engineers, designers and sales specialists, available to offer advice, guidance and practical assistance once the equipment is installed and integrated into your workplace.

And we won't be satisfied until it's working to its full potential and this promise is kept.

The four pillars of our promise:

- To continuously improve the design and manufacture of our equipment
- To provide you with machines of the highest possible quality
- To support you in achieving optimal performance from your machines
- To collaborate with honesty and discretion

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