



Vapormatt

Aluminium extrusion die
cleaning and preparation
for nitriding

The initial purchase cost and subsequent cleaning, inspection and correction costs required to keep extrusion dies performing as they should are significant.

Costs associated with stopping production runs due to pulled dies are also substantial.

With the financial pressure to produce the tonnage needed to make a profit, dies need to perform without issue between runs. Hence, the need for thorough and accurate inspection and correction.

Die inspection and correction challenges

Following removal from the extrusion press, dies are usually dipped in a caustic soda solution to remove surplus aluminium, they then undergo a water rinse.

A cleaning stage is then required to remove any residual aluminium particles and discolouration from the heat and pressure of the extrusion process.

With dry blasting, a lengthy drying-off period is necessary following the water rinse before dry blasting can commence. The cleaning process should leave the die as clean as possible for inspection and correction but without damaging the die edges in the process - something shot or wheel blasting can potentially do.

Before



After



The benefits of the wet blasting process

Wet blasting is more effective at cleaning extrusion dies between production runs than other finishing processes, for several reasons:

- Wet blasting is highly effective at removing all caustic trace and residual aluminium after the caustic soda dip operation because of the abrasive action of the wet blast slurry, combined with additional degreasers and inhibitors.
- Unlike dry blasting, dies do not have to be dry from the caustic soda dip before wet blasting, saving a significant amount of time.
- Wet blasting is particularly good at cleaning complex profiles right down to the bearing surface thanks to the lubricating action of the abrasive flow.
- The surface of the die is continually washed during the wet blast process to remove trace elements of caustic materials that can remain in cracks.
- Because of the effectiveness of wet blasting some users are able to reduce the time needed in the caustic soda dip or the concentration of caustic soda dip itself can potentially be reduced.

Wet blasted dies are left extremely clean making inspection, for defects like micro-cracks, and correction significantly quicker and more accurate. As a result, die correction is done to a much higher degree of accuracy, production runs are longer and there is less chance of failure and dies being pulled.



Extrusion die process

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Aluminium billets

Gentle cleaning action

Another benefit of the wet blasting process is its gentle cleaning action. Wet blasting is sensitive enough to polish the critical bearing faces without damage and thanks to the cushioning effect of water, it does this without producing any changes to the geometry of the die profile or surface roughness. There is no need to worry about damaging the edges, like the production of edge burring or 'rounding', which can happen with aggressive shot or wheel blasting.

This reduction in damage to the bearing surfaces helps extend the life of the die and because the process creates a finer surface, dies can be utilised for longer periods before re-cleaning due to the build-up of surface contamination.

Vapormatt Cougar + wet blasting machine



Preparation for nitride

Nitride is a key aluminium extrusion plant operation. It is a process that diffuses nitrogen into the surface of the metal to create a hardened surface.

Surface activation aids the nitriding process, and the production of a reactive surface is yet another benefit of the wet blasting process. To prevent any corrosion from surface activation the wet blasting system is heated to aid drying and a corrosion inhibitor can be added to prevent oxidation.

Cougar + wet blasting machine for rapid and thorough extrusion die cleaning

Designed to cope with tough extrusion die cleaning operations the robust automatic Cougar + wet blasting machine can also be configured to precisely match your extrusion die cleaning needs.



Aluminium extrusion dies in storage

Configurable elements include:

- Single load end with automatic door for improved productivity and ease of die loading and unloading. A Cougar + configured with a single load end can easily process up to 80 dies a day.
- Double load end with twin automatic doors, so one turntable of dies can be unloaded and loaded whilst the other turntable is being wet blasted. A Cougar + configured with a double load end can process up to 200 dies or more a day.
- Top and bottom wet blasting crowns to speed up the cleaning time of the dies.
- Heavy duty turntables that can each handle a load of 1,000Kg.
- Turntables and mats specifically designed for the processing of extrusion dies.
- Manual workstation for one off dies or other wet blasting work.

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 after-market services built to the specific requirements of your aluminium extrusion business.

Our expertise spans many different sectors: from tooling carbide insert manufacturing, to aluminium extrusion die cleaning. 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 aluminium extrusion die cleaning. 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 you can 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

Vapormatt, Robins Drive, Bridgwater, TA6 4DL, UK
 t +44 (0) 1823 257976 e sales@vapormatt.com

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 operation.

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 in 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