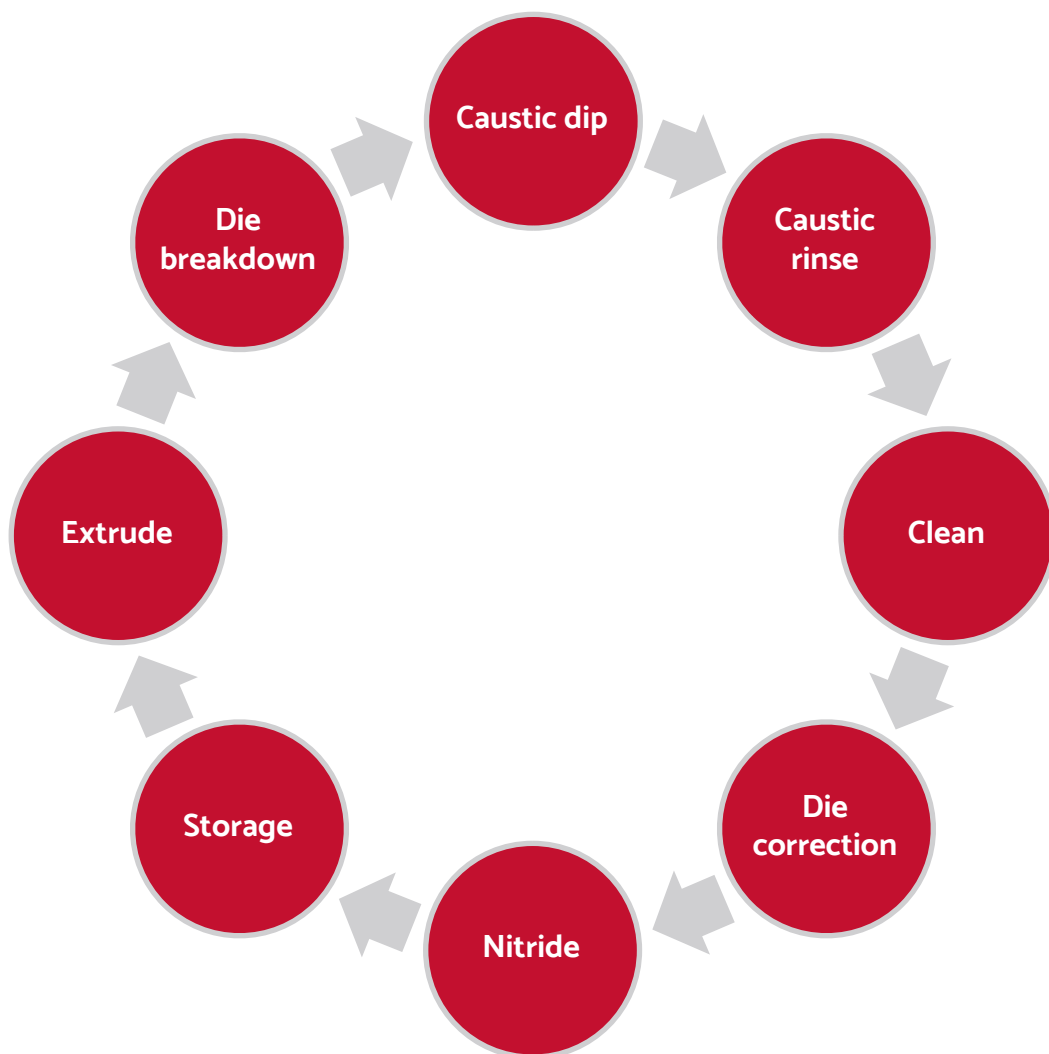


USA based aluminium extruder

Improving the quality and consistency of die cleaning whilst boosting productivity and extending the life of extrusion dies.

A US based manufacturer of aluminium windows and doors*, process approximately 240 extrusion dies per day. Each die goes through the process outlined in the diagram and table below.

Prior to the installation of their Vapormatt Cougar wet blasting machine, the process was time consuming, labour intensive, dusty and inaccurate. The table below also explains the issues with their old dry blasting process and how their Cougar overcame them.



Die cycle in the extrusion plant

Issues with the old dry blasting process and how wet blasting overcame them

Process	Description	Dry blasting issues	Wet blasting benefits
Extrude	Die is preheated and placed in the extrusion press. It is removed when the order is complete or if it needs pulling.	Compromised extrusion due to variations in the die's surface.	Uniform and consistent cleaning and polishing results in fewer pulled dies.
Die breakdown	Die is disassembled (if required).		
Caustic dip	Die is placed in caustic soda solution to remove residual aluminium.		
Caustic rinse	Die is rinsed to remove caustic residue.	Die needs to be completely dry before cleaning.	Unlike dry blasting, no need to wait for drying since parts can be cleaned wet.
Cleaning	Dry blasting the surface of the die with steel shot.	Dry blasting generates a considerable amount of dust on the floor and in the air.	<p>A gentler cleaning action than dry blasting with less substrate damage. This helps to extend the life of the die and minimises the risk of damaging delicate edges – there is no edge burring or excessive 'rounding.'</p> <p>Surface defects, such as micro-cracks, are also more easily identified following wet blasting as the process produces a fine-grained surface.</p> <p>Wet blasting also continually washes the surface to remove trace elements of caustic materials that remain in cracks.</p>
Die correction	Hand polishing.	<p>Very intensive when using a dry blaster to clean dies.</p> <p>Hand polishing introduces operator variability.</p>	<p>Wet blast abrasive media 'flows' over surfaces, as opposed to the impact action of shot blasting. The 'flow' action cleans the die bearing such that hand polishing is eliminated or at least minimised.</p> <p>Water eliminates static electricity and dust.</p>
Nitride	Dies are treated with nitride to enhance performance.	Residual caustic traces can be trapped in surface cracks with dry blast cleaning. The trace caustic disrupts the nitride coating.	<p>Wet blasting continually washes the surface to remove trace elements of caustic materials that can remain in cracks.</p> <p>As dies are often nitride coated following cleaning, this can help to ensure better coating adhesion.</p>
Storage	Dies stored until required for the production process.	Possibility of rust whilst in storage.	Rust preventative added in the wet blast machine protects dies for extended storage periods.



Extrusion die pre and post processing

In summary, the Vapormatt Cougar wet blasting machine combines cleaning and polishing steps to massively reduce the labour required, and hence improve productivity. Additional benefits resulting from the move to wet blasting include:

- Reduced die polishing
- Higher extrusion recoveries
- Fewer pulled dies
- Longer die life – no edge damage
- Improved housekeeping and hygiene - no dust
- Enhanced safety – loading and unloading dies
- Improved nitride coating – removal of caustic traces
- Cleans blind holes

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*Our wet blasting systems deliver distinct productivity and quality competitive advantages to our customers, because of this we are often asked to sign Non-Disclosure Agreements (NDAs) to keep our customers' details confidential. That is why we cannot include the name of the manufacturer in this case study.