

Dry Ice Blasting for Injection Moulding & Tools

Clean tools in the press, hot, with no wear

In injection moulding, a dirty tool costs money. Outgassing residue, release agent, plasticiser and degraded polymer build up in cavities, on parting lines and in vents. The result is short shots, burn marks, flash, poor surface finish and rising scrap.

Most sites clean tools by taking them out of the press, letting them cool, then working on them with solvents, brass brushes, abrasive pads or ultrasonic tanks. It works, but it means hours of lost production, handling and reheating, and every abrasive clean takes a little more off the tool.

Dry ice blasting offers a different approach. In this guide I want to explain how it works and where it delivers real advantages over traditional tool cleaning.

What is dry ice blasting?

Dry ice is solid carbon dioxide (CO_2) at around -78.5°C . Instead of melting, it turns straight back into gas when it warms, a process called sublimation.

In dry ice blasting, small pellets of this material are fired at a surface using compressed air. Three things happen on impact:

- **Impact energy** breaks up and dislodges the deposit.
- **Thermal shock** makes the residue brittle and weakens its bond to the surface beneath.
- **Sublimation** turns the pellet into gas, which expands rapidly and lifts the residue away from behind.

The pellets disappear into the air. The only thing left to collect is the residue that has been removed. There is no water, no detergent and no blast media to clean up afterwards.

Where dry ice blasting really outperforms traditional cleaning

1. Clean the tool in the press

Tools can usually be cleaned while still mounted, with the platens opened. There is no crane lift, no transport to the toolroom and no re-setting, so the tool goes back into production in its correct position.

2. Clean it hot

Moulds do not need to cool down first. Dry ice can be used on hot tools, and the temperature difference helps crack and release residue. That removes the cool-down and reheat cycle from the cleaning window.

3. No wear on cavities, textures or polish

Dry ice is non-abrasive. It removes deposits without changing cavity dimensions, rounding edges or damaging grained textures, polished faces or coatings. Abrasive cleaning slowly wears a tool out; dry ice does not.



4. Vents and fine detail

Blocked vents cause burns and short shots. The airstream reaches into vents, ribs, lettering and deep features that are hard to clean by hand, restoring venting without risk of opening it up.

5. No solvents and no water

There are no solvent residues to clean off before the next shot and no moisture on the steel, so there is less risk of rust or of contaminating the first parts after restart.

6. More uptime, less scrap

Faster cleans make it practical to clean more often, so tools run cleaner between scheduled maintenance. That usually shows up as fewer cosmetic rejects and more consistent cycles.

Environmental credentials

Moulders are under pressure to cut scrap, energy use and waste. Dry ice blasting can help on several fronts.

- **Recycled CO₂.** The CO₂ used to make dry ice is typically recovered as a by-product of other industrial processes, such as fertiliser production and fermentation, rather than produced specially. Blasting returns it to the atmosphere it would otherwise have reached, so the process adds no new CO₂ of its own.
- **Fewer solvents.** Cutting solvent tool cleans reduces VOC emissions and the chemicals bought, stored and handled under COSHH.
- **Less scrap.** Cleaner tools mean fewer rejects and less wasted polymer and energy per good part.
- **No reheating cycle.** Cleaning hot avoids the energy used to bring a cooled tool back up to temperature.
- **Longer tool life.** Non-abrasive cleaning preserves expensive tooling, so refurbishment and replacement are needed less often.

Taken together, dry ice blasting supports both quality targets and environmental reporting.

At a glance

	Manual, solvent and abrasive cleaning	Dry ice blasting
Tool removal	Often removed to the toolroom	Usually cleaned in the press
Cool-down	Must cool first	Can be cleaned hot
Tool wear	Brushes and pads wear surfaces	Non-abrasive
Vents	Hard to clear thoroughly	Airstream reaches into vents
Solvent residue	Must be removed before restart	None
Moisture	Ultrasonic and wet methods risk rust	None
Downtime	Hours or a shift	Often much shorter



Typical applications in moulding and tooling

- **Injection moulds:** cavities, cores, parting lines and vents, including textured and polished tools.
- **Rubber and silicone moulds:** release agent and burnt rubber build-up on compression and transfer moulds.
- **Blow moulding and extrusion:** moulds, die heads and calibrators.
- **Die casting dies:** release agent and residue build-up (see also our foundry work).
- **Moulding machines:** platens, tie bars, robots, guarding and hot runner surrounds.
- **Ancillaries:** dryers, hoppers, conveyors and granulator surrounds.

Our setup at Vortex Ice Labs, and why it matters for moulders

Vortex Ice Labs is a fully mobile service. We bring a complete, self-contained system to site, so there is no reliance on your own air supply. The air passes through four stages before it reaches the surface.

- 1 **Compressor.** This supplies the large, steady volume of air needed to drive the pellets. Consistent flow means consistent cleaning, with no drop in performance halfway through a job.
- 2 **Aftercooler.** Compressing air heats it, and hot air carries a lot of moisture. The aftercooler cools the air straight away so that moisture condenses and can be drained off. Without it, water would freeze inside the blaster, causing pellets to clump and block, and could be sprayed onto the surface being cleaned.
- 3 **Filtration.** Filters then remove the remaining water, any oil carried over from the compressor, and fine particles. That is critical on a tool. The point is to leave the steel cleaner than before, not to deposit oil or moisture into cavities and vents.
- 4 **Dry ice blasting unit.** The pellets are metered into the conditioned airstream and delivered through the hose and nozzle. Pressure, ice feed and nozzle choice are adjusted for each task, from fine textures and polished cavities to heavy release agent build-up.

Every stage protects the result. Clean, dry air means a clean, dry tool ready to go straight back into production.

Working safely, and where it fits

Dry ice blasting is a powerful tool, and it should be planned like any other maintenance activity on the shop floor.

- **Ventilation.** As the ice sublimates it releases CO₂ gas. In enclosed or poorly ventilated areas this has to be managed with suitable airflow and, where needed, gas monitoring.
- **Noise and PPE.** Blasting is loud, and operators use hearing protection, eye and face protection, and insulated gloves. People nearby need to be kept clear of the work area or protected too.
- **Containment.** Removed residue can travel, so we protect nearby machines, finished parts and material, and clear up afterwards.
- **Machine safety.** The press is made safe and locked out in line with your procedures before we work between the platens.



Used this way, it is most valuable for scheduled tool cleaning, problem tools with venting or cosmetic issues, and preparing tools for storage or transfer.

Final thoughts

Moulders need tools running and producing good parts. Traditional tool cleaning will always have a role, but it brings tool removal, cooling, solvents and wear with it.

Dry ice blasting removes those trade-offs. It cleans in the press, cleans hot, does not wear the tool, and gets production back up sooner.

If you would like to see how it could work on your tools, I would be happy to arrange a demonstration or trial clean on site. Get in touch with us at Vortex Ice Labs.

Ian Glover, Vortex Ice Labs

Tel: 07438 409188 | Email: ian@vortexicelabs.co.uk

Web: www.vortexicelabs.co.uk

[#InjectionMoulding](#) [#Plastics](#) [#Toolmaking](#) [#MouldCleaning](#) [#DryIceBlasting](#) [#Manufacturing](#) [#VortexIceLabs](#)