



Dry Ice Blasting for Industrial Machinery

Clean machines in place, without water, grit or downtime

On any production floor, machines collect oil, grease, swarf, dust, carbon and process residue. It hides leaks and wear, makes inspections harder, causes overheating and adds to fire risk.

Most sites still clean machinery with degreasers, rags, scrapers, pressure washers or grit blasting. These work, but each brings a problem: solvents and chemicals, water around electrics and bearings, grit that gets into everything, or hours of stripping down and rebuilding.

Dry ice blasting offers a different approach. In this guide I want to explain how it works and where it delivers real advantages for industrial machinery.

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. Cleaning in place, without dismantling

Machines can usually be cleaned where they stand, with only guards and covers removed. There is less stripping down, less skilled labour tied up and less risk of reassembly errors.

2. Safe around electrics

Dry ice is non-conductive and leaves no moisture, so it can be used on motors, generators, switchgear, control panels and cable trays where water would be a serious risk. Equipment should still be isolated in line with your safe systems of work.

3. No grit and no water

Grit gets into bearings, slideways and gearboxes and causes wear long after the job. Water causes corrosion and needs drying. Dry ice leaves neither. The only thing to collect is the dirt removed.

4. Non-abrasive

Dry ice removes oil, grease and process residue without scoring machined faces, slideways, paint or labels. Pressure is adjusted for delicate parts.

5. Hot equipment

Ovens, kilns, furnace surrounds and hot process equipment can often be cleaned warm, removing cool-down time from the shutdown.

6. Better inspections and maintenance

Clean machines show leaks, cracks and wear early. Maintenance teams work faster and safer on clean equipment, and audits and customer visits go better.

Environmental credentials

Manufacturers are asked to cut chemicals, water 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 chemicals.** Reducing degreasers and solvents cuts purchase, storage and COSHH risk.
- **No oily wash water.** There is no contaminated water to collect, treat or send to an interceptor.
- **No blast media waste.** Nothing to send to landfill except the dirt removed.
- **Longer equipment life.** Cleaner machines run cooler and wear less, especially motors and bearings.

At a glance

	Degreasing, washing and grit blasting	Dry ice blasting
Water introduced	Pressure washing adds water	None
Chemicals	Degreasers and solvents	None
Media left behind	Grit in bearings and slideways	None
Dismantling	Often needed	Usually cleaned in place
Electrical components	Must be protected from water	Non-conductive, no moisture
Surface wear	Grit and brushes can damage	Non-abrasive
Secondary waste	Oily water or spent grit	Only the removed dirt

Typical applications for industrial machinery

- **Electric motors and generators:** windings, stators, housings and cooling fins.
- **Switchgear and control panels:** dust and contamination (isolated and planned with your electrical team).
- **Machine tools:** coolant residue, swarf and oil on CNC machines, lathes and presses.
- **Conveyors and handling:** belts, rollers, frames and chains.



- **Foundry and casting:** core boxes, die casting dies and shot blast surrounds.
- **Ovens, dryers and heat exchangers:** carbon and process build-up.
- **Machines for sale or relocation:** cleaning equipment before inspection, transport or resale.

Our setup at Vortex Ice Labs, and why it matters on your site

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. This matters on machinery. The aim is to remove contamination, not to leave a film of oil or moisture on electrics, bearings or machined faces.
- 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 delicate motor windings to heavy grease and carbon build-up.

Every stage protects the result. Clean, dry air means a clean, dry machine.

Working safely, and where it fits

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

- **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 dirt and dust can travel, so we plan the work area, sheet off nearby equipment and product, and clear up afterwards.
- **Isolation.** Machines are made safe and isolated in line with your permits and lock-out procedures before work starts.

Used this way, it is most valuable for planned shutdowns, motor and electrical maintenance, preparing machines for inspection or sale, and jobs where water or grit is not an option.

Final thoughts

Manufacturers need machines running reliably. Traditional cleaning will always have a role, but it brings water, chemicals, grit, dismantling and downtime with it.

Dry ice blasting removes those trade-offs for many of the hardest jobs. It cleans in place, is safe around electrics, leaves no residue, and gets production back up sooner.



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

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