



Dry Ice Blasting in Food Manufacturing

Cleaner lines, less downtime, no water

In food manufacturing, cleaning is never just housekeeping. It protects product safety, brand reputation and audit outcomes. It is also one of the biggest sources of planned downtime on any production line.

Most sites still rely on the same core methods: wet washdowns, chemical detergents, high-pressure water and manual scraping. These work, but they come with costs that are easy to overlook. Lines are stopped for hours, equipment is stripped down and rebuilt, and water is introduced into areas where moisture is the last thing you want.

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

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. It is a dry process

This is the biggest difference. Wet cleaning puts large volumes of water into the production environment. That water collects in joints, bearings, drains, conveyor frames and hard-to-reach voids, and damp areas are exactly where bacteria such as *Listeria* can establish and persist.

Dry ice blasting introduces no liquid water. Surfaces are clean and dry immediately, so there is no standing water to manage and no long drying period before production can restart. For dry-goods producers such as bakeries, confectioners and snack, powder or cereal manufacturers, avoiding water is often essential, as moisture can cause product to cake, stick or spoil.

2. No chemical residue

Detergents and sanitisers are effective, but they have to be rinsed thoroughly. Any residue left behind is a potential contaminant, and rinsing brings more water back into the process.

Dry ice is made from CO₂ and leaves no residue of its own. This reduces the chemical load on the cleaning process. It does not replace sanitisation where your HACCP plan requires it, but it can remove the soil that sanitisers would otherwise struggle to penetrate.

3. Cleaning in place, without dismantling

Traditional deep cleans often mean stripping equipment down so parts can be soaked, scrubbed or washed, and then rebuilding and recommissioning them. That takes skilled labour and creates opportunities for damage, lost parts and reassembly errors.

Dry ice blasting can often clean equipment where it stands. Conveyors, mixers, moulds, depositors and oven chains can be treated in situ, with only guards or covers removed for access.

4. Cleaning hot equipment

Ovens, fryers, griddles and baking moulds normally have to cool before staff can clean them safely with water or chemicals. That cooling time is lost production.

Dry ice can be used on equipment while it is still warm, and the temperature difference can actually help to crack and release baked-on carbon. Equipment can go from production to clean and back again much faster.

5. Less downtime

Put together, no dismantling, no drying and no cool-down mean shorter cleaning windows. On many lines, jobs that once took a full shift can be reduced significantly. That time goes straight back into production.

6. Gentler on equipment

Scrapers, wire brushes and abrasive pads wear and scratch surfaces over time. Scratched stainless steel is harder to clean and gives bacteria more places to hide. High-pressure water can force contamination into bearings and seals and damage electrical components.

Dry ice is non-abrasive and non-conductive. It cleans without scoring stainless steel, non-stick coatings or tooling, and it can be used around motors, sensors and control panels where water would be a risk.

7. Less waste to deal with

Wet cleaning creates contaminated wastewater that has to be handled and disposed of. Grit or soda blasting leaves media that must be collected, and it should never be used near food contact surfaces.

With dry ice, the only waste is the residue removed from the equipment, which can simply be swept or vacuumed up.

Environmental credentials

For many food manufacturers, sustainability targets now sit alongside hygiene and output targets. 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.

- **Water savings.** A dry process uses no water at all. For sites running regular wet washdowns, that can mean a significant reduction in water consumption on the jobs it replaces.
- **No contaminated effluent.** With no detergents and no rinse water, there is no chemical-laden wastewater to treat, store or pay to dispose of, and less load on site drainage and effluent systems.
- **Fewer chemicals on site.** Reducing reliance on cleaning chemicals cuts their purchase, storage and handling, along with the associated COSHH risk.
- **Less energy for hot water.** Many wet cleaning regimes rely on heated water. Removing that step removes the energy used to heat it.
- **Minimal waste.** There is no blast media to send to landfill. The only waste is the residue taken off the equipment.
- **Longer equipment life.** Because the process is non-abrasive, moulds, tins, belts and stainless surfaces wear less, so parts are replaced less often.

The main energy input is the compressed air that drives the blaster, which we keep efficient through a properly sized and maintained system. Taken as a whole, dry ice blasting gives food manufacturers a cleaning method that supports their environmental reporting as well as their hygiene standards.

At a glance

	Traditional wet and chemical cleaning	Dry ice blasting
Water introduced	Large volumes	None
Chemical residue	Must be rinsed off	None from the ice itself
Drying time	Often hours	None
Dismantling	Often required for deep cleans	Usually cleaned in place
Hot equipment	Must cool first	Can be cleaned warm
Surface wear	Scraping and brushing can scratch	Non-abrasive
Electrical components	Must be protected or isolated from water	Non-conductive, no moisture
Secondary waste	Contaminated wastewater	Only the removed residue

Typical applications in food production

- **Bakery:** oven bands, tunnel ovens, baking trays and tins, proofers, dividers and moulders, where carbonised fats and sugars build up.
- **Confectionery and chocolate:** moulds, enrobers, depositors and cooling tunnels, where sticky residues and dried sugar are hard to shift without water.

- **Snacks and fried foods:** fryer hoods, conveyors, seasoning drums and extraction systems coated in oil and carbon.
- **Meat, poultry and ready meals:** grills, chargrills, spiral ovens, slicers and forming equipment.
- **Dry ingredients, powders and cereals:** mixers, blenders, hoppers and packing machinery, where any moisture would cause product to clump.
- **Packaging lines:** removing adhesive, label and film residue from sealing jaws, rollers and conveyors.
- **Production environment:** ceiling voids, extraction ducting, ventilation grilles and walls, including smoke, grease and mould removal.

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

Vortex Ice Labs is a fully mobile service. We bring a complete, self-contained system to site, so there is no reliance on your plant 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 your equipment.
- 3 **Filtration.** Filters then remove the remaining water, any oil carried over from the compressor, and fine particles. In a food environment this is critical. The whole point of the process is to leave surfaces cleaner than before, not to deposit a film of oil or moisture onto food contact areas.
- 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 moulds and coated trays to heavy carbon build-up on oven bands.

Every stage protects the result. Clean, dry air means a clean, dry surface, which is exactly what food manufacturers need.

Working safely, and where it fits

Dry ice blasting is a powerful tool, and it should be planned like any other cleaning activity on a food 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.
- **Containment.** Removed residue can travel, so we plan the work area, protect nearby product and packaging, and clear up afterwards.



- **Your hygiene procedures.** Dry ice blasting is excellent at removing soil and build-up. It sits alongside your existing cleaning and sanitation regime rather than replacing it. Any change to cleaning methods should be reviewed against your HACCP plan and verified in the usual way, for example with ATP swabbing or visual standards.

Used this way, it is most valuable for deep cleans, scheduled shutdowns, hot equipment, water-sensitive areas and stubborn carbon or sugar build-up that routine cleaning struggles to remove.

Final thoughts

Food manufacturers are under constant pressure to keep lines running while meeting ever-higher hygiene standards. Traditional wet and chemical cleaning will always have a role, but it brings water, residue, dismantling and downtime with it.

Dry ice blasting removes those trade-offs for many of the hardest cleaning jobs. It cleans in place, cleans hot, leaves surfaces dry, and gets production back up sooner.

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

[#FoodManufacturing](#) [#FoodSafety](#) [#DryIceBlasting](#) [#IndustrialCleaning](#) [#Hygiene](#) [#Bakery](#) [#Confectionery](#)
[#Maintenance](#) [#Sustainability](#) [#VortexIceLabs](#)