

# ICEsonic Dry Ice Blasting Systems

## -The Future of Cleaning Is Here-

The ICEsonic Brand of DRY ICE Blasting and Cleaning Systems (sometimes referred to as CO<sub>2</sub> or cryogenic blasting) are the most economical on the market, both in initial cost and in continued use. Because of design and manufacturing efficiencies, ICEsonic has been able to keep production and overhead costs low. ICEsonic does not spend enormous amounts of money on unnecessary advertising and does not have layer upon layer of marketing and distribution. Therefore, you save up to 50% or more over the price of competitors models.



# Dry Ice Blasting - An Overview

Dry ice blasting is a relatively new cleaning process using solid Co<sub>2</sub> pellets (known as dry ice). It is primarily used for industrial use in a variety of applications. The pellets sublime (convert directly from a solid blast pellet to a Co<sub>2</sub> vapor) leaving no residue, hazardous waste or toxic fumes.

Today, the dry ice method of cleaning is quickly becoming favored for environmental as well as production reasons. Because of tremendous environmental regulations, industry has need to minimize wastes. Further, there is a growing consciousness that many are placing now on the global environmental impact of their production practices. However, these benefits are accentuated due to the tremendous performance gains through dry ice blasting -- little or no production downtime, quality of clean and minimized damaged to equipment.

## What Is Dry Ice?

Dry ice pellets are made by taking liquid carbon dioxide (Co<sub>2</sub>) from a pressurized storage tank and expanding it at ambient pressure to produce snow. The snow is then compressed through a die to make hard pellets.

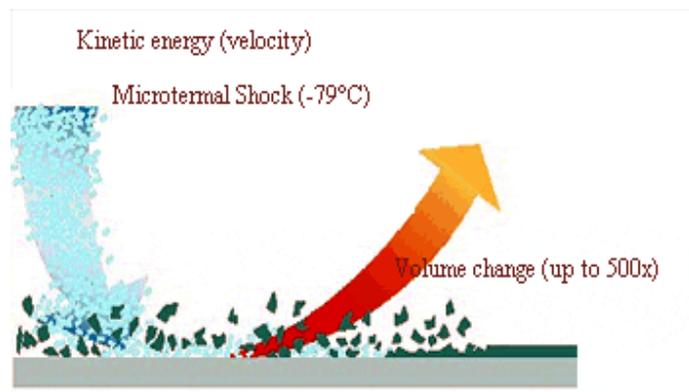
The dry ice, although hard in appearance, does not rely on its abrasive properties for effective cleaning.



## The Process

Dry ice blasting is similar to conventional shot blasting except that the shot is replaced by pellets of dry ice which literally disappear as soon as the cleaning cycle is complete. The dry ice particles are propelled to supersonic speed, to impact and clean a surface. The particles are accelerated by compressed air, available from standard industrial compressors.

When the pellets impact on a substrate with a tightly bonded layer of surface contamination, or unwanted coating, the dry ice creates a micro-thermal shock (caused by the dry ice temperature of -79° C) between the substrate and the surface layer. The temperature differential contraction plus the kinetic energy of dry ice pellets and the air pressure crack the surface layer and allows the pellets to penetrate. Once between the surface layer and the substrate, the pellets complete their sublimation creating a large volume of Co<sub>2</sub> gas which rapidly expands and simply pops off the contaminant or coating from inside out and the air stream removes it from the surface and into the airstream.



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With ICEsonic, you will find both quality and value.

Online at [www.ICEsonic.com](http://www.ICEsonic.com)

## **Benefits of Dry Ice Blasting Technology:**

- ✓ Decreased downtime : Cleaning In-Place
- ✓ Faster and more thorough cleaning
- ✓ Elimination of equipment damage
- ✓ Reduction or elimination of solvents
- ✓ Reduction in waste disposal
- ✓ Increased safety

## **Used in a Wide Range of Industries & Applications**

### **Industries**

- Automotive
- Plastics/Rubber Molding/Extruding
- Semiconductor
- Food Processing
- Plating/Printing
- Service Contracting
- Electrical/Electronic
- Foundries
- Aerospace/Aviation
- Utilities
- Metal Fabrication
- Paper
- Restoration/Remediation

### **Applications**

- Oil/Grease/Petroleum
- Adhesives
- Solvents
- Wood Preservatives
- Viscous Liquids
- Fire Remediation
- Resins & Polymers
- Miscellaneous Tooling
- Contact Information

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# In The Last 3 Years We've Had **ZERO** Reasons For You To Choose ICEsonic Dry Ice Blasters

**ZERO** requests for refunds  
**ZERO** sent back for replacement  
**ZERO** machines sent back for repair

We have had to replace the drive motor in two machines and did this under warranty.  
(We received the machines back empty of lubrication - - moving parts need lubrication.)

## **ICEsonic Dry Ice Blasting Systems**

- . **Affordable:** 30% - 50% Less
- . **Rugged:** 304 Argon Welded Stainless Steel
- . **Simple:** Only Essential Gauges and Knobs
- . **Profitable:** More Bids, More Jobs
- . **Fully Pneumatic:** No Electric Hookup
- . **No Pop Rivets:** Need only an Allen Wrench and a spanner
- . **Lightweight & Compact:** 25kg up to 75kg (model dependable)
- . **Easily Maneuvered On Jobs**
- . **Broadest Range Of Jobs:** up to 1600 kPa (16 bar)
- . **Non-Corrosive:** 100% Stainless Steel
- . **5 or 10 meters Of Blasting Hose:** included



**Like anything mechanical, your equipment will wear and, sooner or later, "breakdown" on you, and, of course, it will be while you're on a job.** It's at a time like this that you need to be sure that you and your crew can easily fix and/or replace any worn part

**ICEsonic equipment is designed by a former dry ice blaster** who got sick and tired of the daintiness and continual job-site repairs needed for the "bells & whistles" models that are out there. ICEsonic is noted for its simple, straightforward engineering and crew-friendly repair.

**You can repair just about anything on an ICEsonic machine in under 30 minutes - max!** All you need is a screwdriver and pliers. So for those rare occasions when normal wear & tear stop your work, your ROI and daily earnings will be hardly affected

**Our ICEsonic Dry Ice Blasters  
Give You More Than Enough Cleaning Aggressiveness**

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# Dry Ice Blasting...A Better Cleaning

## Compare to Other Cleaning Methods

<b>Blast Cleaning Comparison Chart</b>					
<b>Blasting Cleaning Technique</b>	<b>Waste for Disposal</b>	<b>Abrasive</b>	<b>Toxic</b>	<b>Electrically Conductive</b>	<b>Performance Comparison</b>
Dry Ice	No	No	No	No	Excellent
Sand	Yes	Yes	No*	No	OK
Glass Beads	Yes	Yes	No*	No	OK
Walnut Shells	Yes	Yes	No*	No	Limited
Steam	No	No	No	Yes	Poor
Solvents	Yes	No	Yes	Yes	Limited

\* Each of these blast cleaning materials becomes contaminated upon contact if used to clean hazardous objects. When that happens, these materials are then classified as toxic waste requiring safe disposal.

### Dry Ice Blasting Applications

The following chart gives a sample of some specific uses of dry ice blast cleaning by listing different contaminants which can be removed from certain surfaces.

<b>Removes</b>	<b>Materials</b>
Paint Deposits	Steel
Oil	Stainless Steel
Grease	Mild Steel
Asphalt	Plastic
Tar	Cast Iron
Decals	Bronze
Soot	Aluminum
Dirt	Copper
Ink	Rubber
Resins	Fiberglass
Adhesives	Ceramics

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# Cleaning Solutions: Electric Motor Windings

Note: Is there a correct method for cleaning windings of electric motors in place? The quick answer is Yes. The problem is, many times on-site cleaning is attempted when it shouldn't. Electric motors are complex rotating machines. We strongly recommend that the disassembly and reassembly should be handled by trained technicians. Otherwise, damage to components may occur, resulting in loss of production and unexpected cost overruns.

## Three Methods for Cleaning in Place

### 1. Pressure washing and/or steam cleaning

- This method can be successful in thoroughly cleaning electric motor windings in place.
- This method requires a fairly time consuming process to dry the windings sufficiently.
- Depending on the size of the windings, it can take days or weeks to thoroughly dry the windings.
- Care must be taken to not exceed 200 Deg. F when drying out.
- If the windings are not thoroughly rinsed, the soap residue can serve as a contaminant and cause premature loss of insulation integrity.
- The washing solution must be disposed of properly.

### 2. Solvent based cleaning

- This method also can be successful in thoroughly cleaning electric motor windings in place.
- The drying time is considerably quicker than the pressure washing method. Sometimes hours.
- Care must be taken that the person applying the solvent not be overcome by fumes.
- Care must be taken that others in the vicinity are not adversely affected by solvent fumes.
- Care must be exercised around rubber products, especially rubber based lead wires.
- The solvent solution must be disposed of properly. Improper disposal can result in significant environmental consequences.

### 3. Dry Ice blast cleaning - The Best Cleaning Solution

- **This method is very successful in thoroughly cleaning electric motor windings in place.**
- **This method uses pelletized dry ice that is accelerated by a specially designed machine to very high velocity. The dry ice instantly freezes the contaminant and breaks the bond with the substrate. The hyper velocity air removes the dirt and the dry ice instantly sublimates into a gas.**
- **There is no drying process required.**
- **There are no disposal issues.**
- **There is no potential damage to any components.**
- **In short, this method is quicker and safer than either of the previous methods.**

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# Cleaning Solutions: Foundry Industry

Significant challenges related to cleaning molds for metal, plastic or rubber castings include:

- core boxes and core machines covered with sand, binder or carbon build-up
- plastic and rubber molds and vents caked in mold release and grease and residues

Hand scraping and scrubbing, the use of chemicals and sand blasting are common cleaning methods. The drawbacks of these methods include the following:

- **Labor intensive:** Typically, items need to be taken off-line and cleaned.
- **Downtime:** The extensive time required to effectively disassemble, clean molds and then reassemble, results in costly production losses.
- **Mold wear:** Sand blasting can etch or wear down mold surfaces.
- **Grit entrapment:** Sand blasting can become entrapped and become difficult to remove.
- **Liability:** The use of chemicals poses safety hazards.
- **Cost :** Chemicals are expensive. Plus, they become an additional contaminated waste disposal cost.

## Dry Ice Blasting: The Perfect Solution

Dry ice blasting addresses each of the major issues regarding mold cleaning. They are as follows:

- **Benefit #1 Reduced labor hours.** The dynamics of cleaning with dry ice can dramatically reduce time requirements. The actual cleaning is faster. There is no need for disassembly/reassembly of equipment.
- **Benefit #2 Reduced downtime through cleaning in place.** Any cleaning labor for scrubbing and scouring is eliminated. Also, the time required to move equipment to a staging area for cleaning is eliminated. Production gains can be extremely significant.
- **Benefit #3 Reduced equipment damage.** Dry ice pellets do not chisel away contaminants as sand blasting does. Instead, CO2 pellets penetrate the contaminant, fracture into small particles when they impact the base material and instantly sublime. The contaminants are removed in a lift and flush action. Also, CO2 cleaning can be performed regularly; thereby, virtually eliminating the problem of completely plugged vent holes.
- **Benefit #4 Elimination of grit entrapment.** Since the dry ice pellets return to a vapor upon contact, there is no cleaning material that could be entrapped in the equipment.
- **Benefit #5 Reduced liability.** Chemical solvents can be eliminated removing the dangers they pose to workers. Also, dry ice poses no risk around electrical circuits.
- **Benefit #6 Reduced costs.** Dry ice sublimates eliminating a secondary waste stream thus minimizing waste disposal costs. Also, the cost of solvents is eliminated.



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# Cleaning Solutions: Paint Removal

## The Cleaning Challenges

The traditional methods of removing chipping and loose paint from various surfaces before repainting have included sandblasting, scraping and water-jetting. Sandblasting, for one, provides a good all-purpose removal technique. However, each of the techniques has serious drawbacks. They include:

- **Labor intensive:** Typically, items need to be taken off-line and cleaned. Then, if scraping is required, the process can be very slow to completely prepare a surface for painting. Sandblasting and water jetting can create a tremendous mess requiring more time for waste cleanup
- **Downtime Frequently,** equipment needs to be taken off-line and cleaned. The extensive time required to effectively disassemble, clean and then reassemble results in costly production losses. With the use of sandblasting or water, surfaces to be repainted are often either too rough or wet too long to permit a quick repainting.
- **Surface wear/Equipment damage:** Sandblasting can etch or wear down surfaces and also cause mechanical damage. Scraping can also wear down surfaces.
- **Water/Grit entrapment :** Sand and water can become entrapped in mechanical or electrical parts.
- **Cost Sandblasting:** can generate significant waste disposal costs.

## Dry Ice Blasting: The Perfect Solution

Dry ice blasting addresses each of the major issues regarding removal of loose and chipping paint. The benefits include:

**Benefit #1 Reduced labor hours.** The dynamics of cleaning with dry ice can dramatically reduce time requirements. The actual cleaning is faster. There is no need for disassembly/reassembly of equipment. The time required to collect the waste is lessened

**Benefit #2 Reduced downtime through cleaning in place.** Any cleaning labor for scrubbing and scouring is eliminated.

Also, the time required to move equipment to a blast media containment area for cleaning is eliminated. Further, there are no repainting delays due to moisture as when waterjetting is used. In sum, production gains can be extremely significant.

**Benefit #3 Reduced equipment damage.** Dry ice pellets do not chisel away contaminants as sand blasting does. Instead, CO2 pellets penetrate the contaminant, fracture into small particles when they impact the base material and instantly sublime. The loosely bonded paint is removed in a lift and flush action.

**Benefit #4 Elimination of grit entrapment.** Since the dry ice pellets return to a vapor upon contact, there is no cleaning material that could be entrapped in the equipment.

**Benefit #5 Reduced costs.** Dry ice sublimates eliminating a secondary waste stream minimizing waste disposal costs.

Also, labor costs can be dramatically lessened. Further, consumption of paint required per square foot is less because surfaces are even.

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# Cleaning Solutions: Printing Industry

The Cleaning Challenges The traditional method of cleaning printing press involved taking a press off-line, disassembling and cleaning parts by hand with solvents. There are several significant negatives to this method including:

Labor intensive Since cleaning is typically done by hand, the process is very slow requiring countless man hours.

- **Downtime** The extensive time required to effectively disassemble, clean and then reassemble results in costly production losses. Poorly cleaned machines or ink drips resulted in breakdowns and unplanned stoppages.
- **Poor Results** Very often, areas of the machines cannot be reached and go uncleaned potentially limiting performance, potential breakdowns and ink drips.
- **Safety Concerns** Hand cleaning with solvents exposes workers to hazardous chemicals.
- **Cost** The labor to clean machines, planned and unplanned downtime wasted paper supplies from ink drips all are major cost issues.

## Dry Ice Blasting: The Perfect Solution

Dry ice blasting effectively removes wet and dry ink, spray powder, paper dust and coatings from web presses and sheet feed presses. In sum, benefits include:

- **Benefit #1 Reduced labor hours.** The dynamics of cleaning with dry ice dramatically reduces maintenance time requirements. Also, there is no need for disassembly/reassembly of equipment.
- **Benefit #2 Reduced downtime.** Dry ice blasting can prevent web breaks. Also, the time required to clean presses is tremendously less than with hand cleaning. In sum, production gains can be extremely significant.
- **Benefit #3 More thorough cleaning.** Dry ice blasting cleans in crevices unreachable by hand.
- **Benefit #4 Improved performance.** The quality of the printing is better since the presses are cleaner. Plus, they run more smoothly
- **Benefit #5 Extended press life.** Improved performance and cleaner parts results in longer lasting equipment.
- **Benefit #6 Improved safety.** Chemical solvents can be eliminated removing the dangers they pose to workers.
- **Benefit #7 Reduced costs.** Collectively, the reduced labor hours, reduced downtime, longer press life and decreased waste disposal expenses result in making dry ice blasting extremely cost effective. Frequently, the cost savings pay for the dry ice systems in a very short period of time.

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# Cleaning Solutions: Utilities Industry

The Cleaning Challenges

A key challenge in the utilities industry is how to establish pro-active regular maintenance on critical electrical system components. Hindering the effort has been that traditional cleaning methods, typically hand wiping and high pressure washing, require switchgear and other gear connected in the system to be de-energized. Downtime is extended as equipment needs to dry before going on-line again. Infrequent or reactive maintenance leads to eventual dielectric breakdown and short circuits. With tracking present, linemen are reluctant to work on equipment.

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## Dry Ice Blasting: The Perfect Solution

Dry ice blasting effectively cleans switchgear, generator windings, transformers, bushings and other electrical equipment.

In sum, benefits include:

**Benefit #1 Supports pro-active maintenance.** Dry ice blast cleaning is faster, more thorough, requires no drying time, lessens downtime and can be performed throughout the year. Also, power interruptions are reduced.

**Benefit #2 Improved system reliability.** Raises equipment performance to a level of excellence .

**Benefit #3 No waste reclamation.** Reclamation of solvent or grit containment is eliminated.

**Benefit #4 Reduced labor hours.** As maintenance efficiencies improve and equipment failures diminish, manpower is freed up.

**Benefit #5 Improved safety.** The dangers linemen face from phase to phase or phase to ground tracking are reduced.

**Benefit #6 Reduced costs.** Collectively, the reduced labor hours, reduced downtime, longer press life and decreased waste disposal expenses result in making dry ice blasting extremely cost effective. Frequently, the cost savings pay for the dry ice systems in a very short period of time.

**Note:** Though dry ice blasting has been successfully used on energized equipment, we do not recommend doing so without significant testing.

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