

Cleaning without Water: Dry Ice Blasting and the Pet Food Industry



*Delivering Excellence
In Dry Ice*



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Executive Summary

Continental Carbonic Products, Inc. has introduced dry ice blasting to several top pet food manufacturing facilities. Since dry ice blasting is a waterless cleaning method, no moisture is introduced to the production area. Cleaning with dry ice blasting reduces current bacteria counts including *Salmonella*, *E. coli* and *Listeria* and removes the breeding grounds for future growth. Dry ice blasting also streamlines the cleaning process and reduces labor costs.

Background

The Pet Food Industry and Cleanliness Standards

The Federal Food, Drug and Cosmetic Act requires that all animal foods, like human foods, be safe to eat, produced under sanitary conditions, contain no harmful substances and be truthfully labeled.¹ In April of 2012, Michael R. Taylor, the Deputy Commissioner for Foods of the U.S. Food and Drug Administration, speaking at the Petfood Forum in Schaumburg, IL, remarked upon the important role the industry plays in both the health of pets and their owners. He specifically mentioned the control of *Salmonella* not because it can harm cats and dogs but because it could affect humans through cross contamination if mishandled in the home.²

The threat that bacterial contamination presents to pet food manufacturers is significant. According to The Humane Society of the United States' website, over twenty pet food recalls have been issued since January 2013. Many of these recalls were based on potential health risks due to *Salmonella* contamination.³

Moreover, as stated by David Acheson, MD at the Petfood Forum in April 2013, new threats to pet food safety such as Shiga toxin producing *E. coli* and multi-drug resistant strains of *Salmonella* are emerging. Consumer expectation is zero tolerance for unsafe food – and consumers have the ability to damage a brand through social media.⁴

Specifically addressing the cleaning process to reduce risk of contamination, Chestnut Labs VP/GM Kristen Dixon's presentation at Petfood Forum identified "Effective Sanitation Procedure and Controls" to prevent growth of *Salmonella* and reduce risks of microbial contamination. To prevent the growth of *Salmonella*, Ms. Dixon states that controlling water is critical and water should be eliminated where possible.⁵

Dry Ice Blast Cleaning Process

Dry ice blasting is a cleaning process whereby kinetic and thermal energy is transferred when accelerated dry ice pellets strike a surface being cleaned. Dry ice pellets are accelerated by compressed air to high speeds, fracturing the top layer of unwanted residue. Once the dry ice penetrates the residue, the temperature of both the residue layer and the substrate dramatically decreases. The different materials contract unequally and the adherence between them decreases. This thermal difference helps to separate the residue from the substrate. After the dry ice makes its initial impact, it instantaneously turns from a solid to CO₂ gas, or "sublimates." The volume expansion (by a factor of

700) causes a micro explosion that detaches the residue from the substrate. After blasting, the substrate is clean, dry and completely intact.

Dry ice blasting has proven to be an attractive alternative cleaning solution to water-based methods. Since the dry ice sublimates into CO₂ gas upon contact, no moisture is introduced into the cleaning process and no water has to be recovered. Moreover, dry ice blasting has proven to be a faster cleaning process than traditional cleaning methods, reducing labor costs.

Proposed Solution

When Continental Carbonic has met with representatives from the pet food industry, statements to the effect of “We need to get rid of water in order to reduce microbial counts” or “We need a faster way than cleaning by hand now that we don’t have drains” have been heard by Continental Carbonic sales managers.

Pet food manufacturers have used dry ice blasting to effectively clean the following equipment:

- Biofilms on plant surfaces
- Bucket elevators
- Coating equipment
- Conveyors
- Extruders
- Feed hoppers
- Ribbon mixers
- Ovens
- Packaging machinery
- Product elevators
- Surge bins
- Vertical coolers
- Vacuum tubes

In addition, dry ice pellets can be sent directly along mechanical conveyors or through pneumatic conveying piping for cleaning. Since the dry ice manufactured by Continental Carbonic is of food grade quality and shipped in sanitized stainless steel-lined containers for this application, it is safe to use directly on pet food production equipment. The ability to send dry ice through the bends and curves of the equipment provides an effective clean.

Using dry ice and dry ice blasting for equipment cleaning, pet food manufacturers can eliminate the need for additional or more time-consuming cleaning. Dry ice blasting offers a better alternative to other dry cleaning methods like brushing and scraping. It is more effective at removing stuck on residues with less labor than other dry cleaning methods.

Benefits

A Dry Process

Since dry ice sublimates (turns into carbon dioxide gas) upon contact, the process is dry. Dry ice blasting is non-conductive and safe for electrical applications where using water may not be advisable or permitted. As a dry cleaning process, dry ice blasting will not create an environment for bacterial growth and will reduce microbial counts.

Faster & More Effective

Compared to manual cleaning with solvents and a wire brush, dry ice blasting can cut cleaning time, leading to reduced costs. With dry ice blasting, equipment, molds, and dies can be cleaned on line and "in place." There is no longer any need to disassemble, mask, and then reassemble large complex machinery. Downtime is minimized, labor costs are reduced, and productivity increased.

No Media Waste

Frequently the "clean-up" from a current cleaning method is worse than the cleaning itself. Dry ice solves that problem by eliminating secondary waste. Dry ice pellets do the job and simply disappear, eliminating the high disposal costs associated with other materials.

Non-Abrasive

The non-abrasive nature of dry ice means that cleaning won't damage sensitive parts or production equipment, extending the useful life of equipment and minimizing the chances of defective products.

Environmentally Friendly & Safe

Dry ice cleaning is a "green" process that uses small pellets of recycled carbon dioxide to clean a surface. The pellets sublime (turning from solid directly to gas) during the cleaning process. The carbon dioxide gas is absorbed by trees and plants and converted into carbon (plant growth) and oxygen. Dry ice blasting is really "green" recycling at its best.

Dry ice blasting does not contribute to greenhouse gasses and no hazardous wastes are produced. With basic safety precautions, the work process is safe. No ozone-depleting chemicals are used and there is no exposure to Volatile Organic Compounds (VOC).

Call-To-Action

To learn more about how dry ice blasting can improve the cleaning process in your pet food manufacturing facility:

- Call Continental Carbonic at 1-800-DRY-ICE2
- Call Horizon Systems at 1-800-842-1600
- Email us at marketing@continentalcarbonic.com or info@horizonsystemsinc.com
- Visit www.continentalcarbonic.com and fill out an inquiry form
- Visit www.horizonsystemsinc.com to request more information

About Continental Carbonic

Continental Carbonic Products, Inc. specializes in the manufacture and distribution of dry ice and liquid carbon dioxide and is the nation's largest distributor of dry ice blasting equipment.

Continental Carbonic maintains a reliable network of 39 dry ice distribution facilities located strategically throughout its service area. This integrated distribution network ensures that Continental Carbonic can quickly react to customers' needs.

During its many years in business, Continental Carbonic has seen dry ice blasting expand across industries because of its cleaning effectiveness, affordability and versatility. The sale and rental of dry ice blasting equipment and blasting dry ice are areas of rapid growth for the company.

About Horizon

Since 1983, Horizon Systems has been focused on delivering engineering system solutions. By continually innovating our pneumatic conveying components to meet the ever-changing challenges of the industries we serve we are able to deliver reliable, value-added solutions. This “engineering first focus” has resulted to multiple innovations over the years and lead to Horizon Systems being the clear innovation leader in our industry.

Whether your process line requires bulk product storage, transfer, weighing, blending, safety, or product integrity, you can depend on us for responsiveness, total quality, and technology advancements. From complete system design to field service support, the Horizon Team is committed to your complete satisfaction.

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