Drumbeaters of America Inc.

THE WORLD LEADER IN DESIGN, MANUFACTURING AND INSTALLATION OF COMPLETE DRUM & TOTE CLEANING SYSTEMS

Cryo Cleaner System

MADE IN USA

Innovative patented system which cleans residues from containers without the use of soaps, solvents or water.

Clean metal or plastic containers without using soaps, solvents or water with our unique patented cryogenic cleaning system! Using the science of cryogenics, you can clean previously hard to handle products such as mastics, paints & resins (to name just a few) in an environmentally safe and economic fashion. Benefits include reduced plant operating costs, environmental compliance, a worker-friendly safe cleaning area, the ability to recycle residues for reuse and elimination of RCRA liability. Frozen plastic containers may also be smashed into small pieces for more economical disposal or recycling. By applying the science of cryogenics, we are able to provide companies an economical and efficient method to clean pails and drums.

This procedure results in not having to use solvents or other fluids to clean left over residues from containers and thereby reduces the volume of waste generated during the cleaning process.

What are the benefits of a Cryo-Cleaner® system?

- No Residue Contamination From The Cleaning Process: Residues are removed without any soaps, solvents or water. Therefore, a cryogenically removed residue is not contaminated with any cleaning solution. The pure residue can often be recycled back into the user's manufacturing process or into another product. This results in the complete elimination of any waste or the need for special waste treatment or incineration. If the cryogenically removed residue is not recycled, the residue can economically be disposed of because the residue has not been contaminated by hazardous chemicals, water or other fluids and there is a smaller volume of residue to be processed and transported.

- Clean Air: Because of the extreme cold temperatures used to remove residues, any high volatile organic compounds (V.O.C.'s) in residues cryogenically removed from a container are suppressed by the cold temperatures and not dispersed into the atmosphere. Therefore, no special ventilation equipment is required to recover the V.O.C.'s because the V.O.C.'s are suppressed

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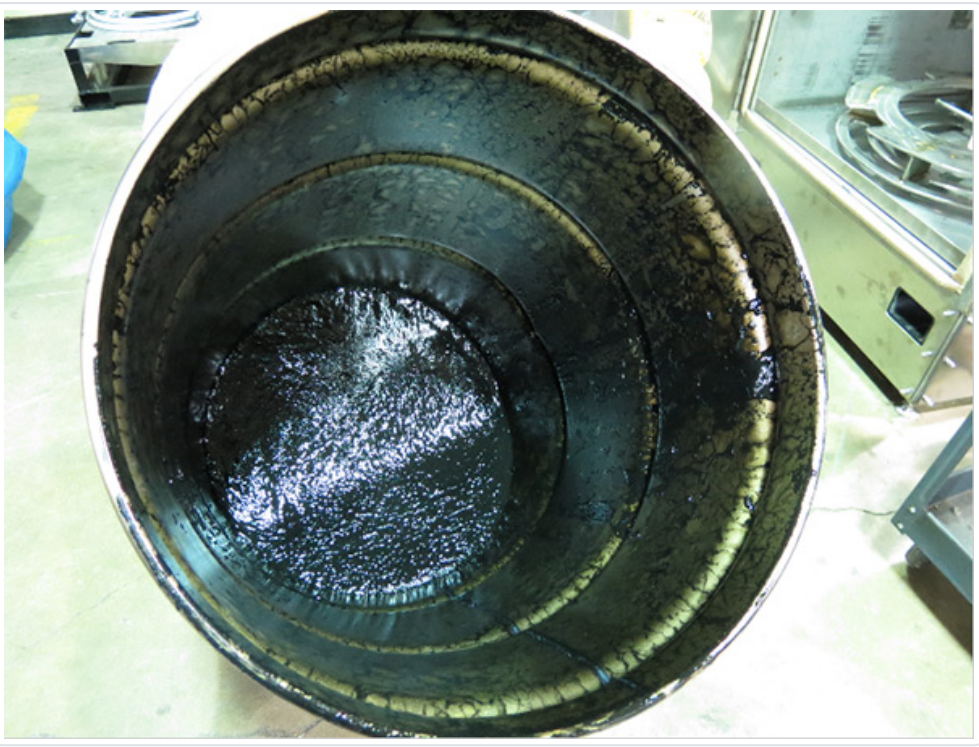
- **Waste Stream Not Increase:** Because no soaps, solvents, water or any other cleaning solutions are used to clean a container, the waste stream is not increased. When a company uses traditional cleaning solutions to clean containers, the volume of the material that must be disposed of is increased, i.e., you now have the removed residue co-mingled with the cleaning agent. The disposal problem has only been made worse. A company may now have a clean drum but must now dispose of or incinerate both the residue and the cleaning agent or else separate the residue from the cleaning agent in order to recycle the residue. Both of these alternatives are expensive. The Cryo-Cleaner® process does not increase the waste stream.
- **Worker Safety:** Workers are not subjected to harmful conditions and fumes. As previously stated, V.O.C.'s are suppressed by the Cryo-Cleaner® process so the workers do not have to breathe dangerous fumes. Further, the workers are not placed in conditions where they may be splashed during the cleaning process or have to come in contact with the residues. The types of safety protection required for the Cryo-Cleaner® process are safety glasses, heavy duty gloves such as welder gloves and standard steel toe type work shoes.
- **Environmentally Friendly:** Cryogenically cleaning containers with liquid nitrogen is the cleanest and most environmentally conforming system. Nitrogen constitutes four fifths of the air by volume making the Cryo-Cleaning® System a non-polluting process when the nitrogen escapes back into the atmosphere during the cleaning process. There is no contamination of the air, streams, rivers or the aquifer. You only have the pure residue removed from a container to dispose of or to recycle.
- **Non-Combustible & Non-Corrosive:** Nitrogen is inert and therefore is not combustible or corrosive like other cleaning agents.
- **Recycle Containers:** Drums and pails can be crushed and the crushed containers recycled or with a small amount of further remediation of a cryogenically cleaned container, a container can economically be reused. (Most labels can easily be removed as the result of the Cryo-Cleaner® process.)

Cryo-Cleaner® Gallery

GRK 830 (Black Dispersion) as Manufactured by Spectrum Dispersions Inc.

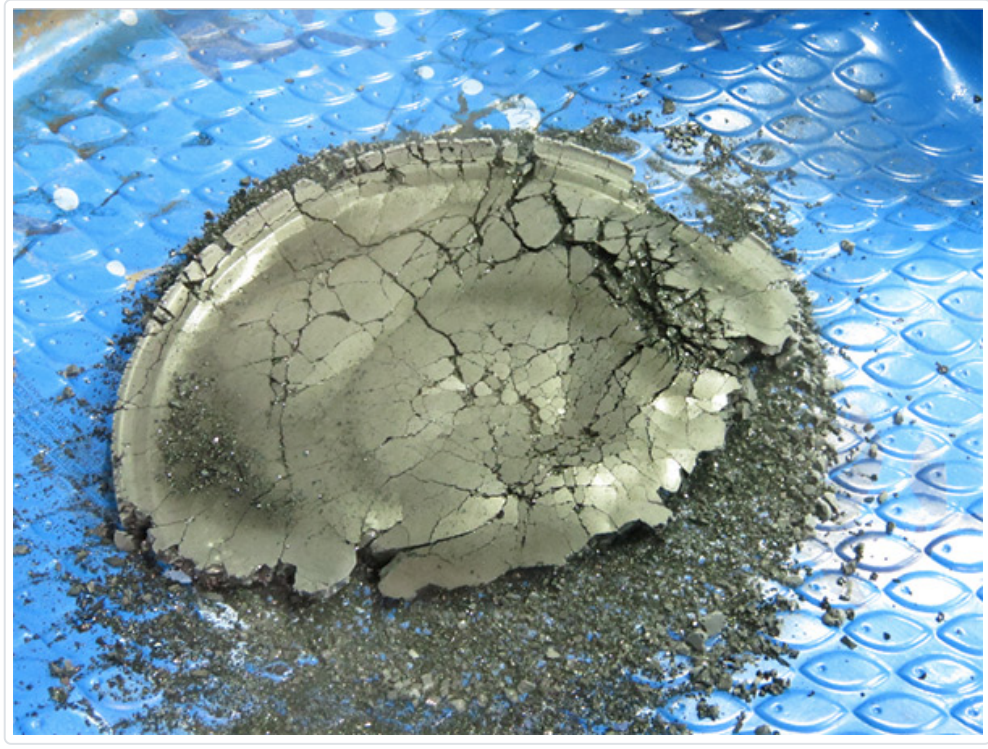
ABC Company uses a Black Dispersion material that is one of the ingredients used in their manufacturing process. The challenge that ABC company had was that there was always several inches of the Black Dispersion material left in the drum during the manufacturing process. This material is very expensive and could be reused if an efficient method to remove the black dispersion material could be found.

By cryogenically freezing the drum using Drumbeaters of America Inc.'s patented Cryo-Cleaner® System, ABC Company is able to efficiently remove the approximately 2 inches of Black Dispersion material (worth approximately US$200) from the bottom of the drum without using any soaps, solvents or water and the Black Dispersion material can now be reused in their manufacturing process. An additional benefit is that the metal drum that contained the Black Dispersion material can now be crushed using one of Drumbeaters of America Inc.'s drum crushers and then the crushed drums recycled as scrap metal. The drum with the residue no longer had to be sent out as a special waste. What was once a problem and a liability became a generator of revenue.



Before: Black Dispersion Material

After: 99% of the Black Dispersion Material has been removed using Drumbeaters Cryo-Cleaner® System.



Frozen Black Dispersion Material After Removal from Drum

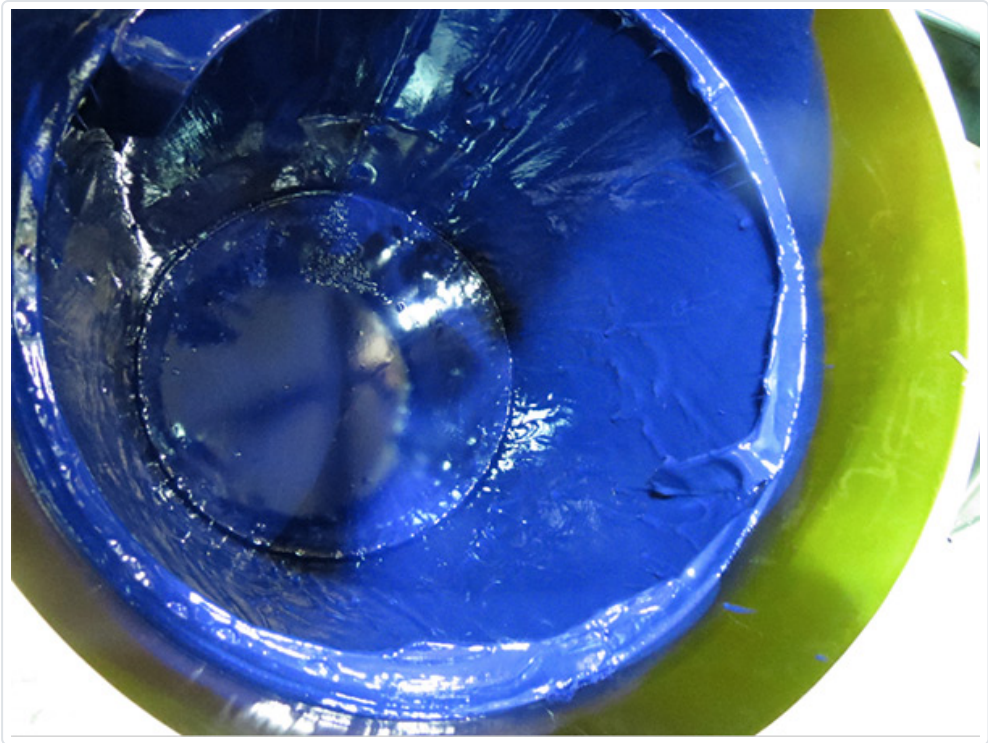
Thawed Black Dispersion Material ready to be consolidated into another drum for reuse

Henkel Technomelt Pur 798A (Known as Purmelt QR 798A) As Manufactured by Henkel

ABC Company uses a urethane adhesive that is shipped and used in metal drums. Urethane adhesive is solid at ambient temperature but when heated in the metal drums that the urethane adhesive was shipped in, the urethane adhesive softens for use in the manufacturing process.

ABC Company's challenge was that not all of the urethane adhesive could be removed from the drum during the manufacturing process and when the heated drum returned to ambient air temperature, the urethane adhesive returned to a solid state and was bonded to the metal drum. This meant that the metal drum with whatever material was adhered to the drum had to be sent out to be incinerated. ABC company wanted a way to recycle the unused urethane adhesive by removing the urethane adhesive from the drum plus clean the drum so that it could be crushed and recycled.

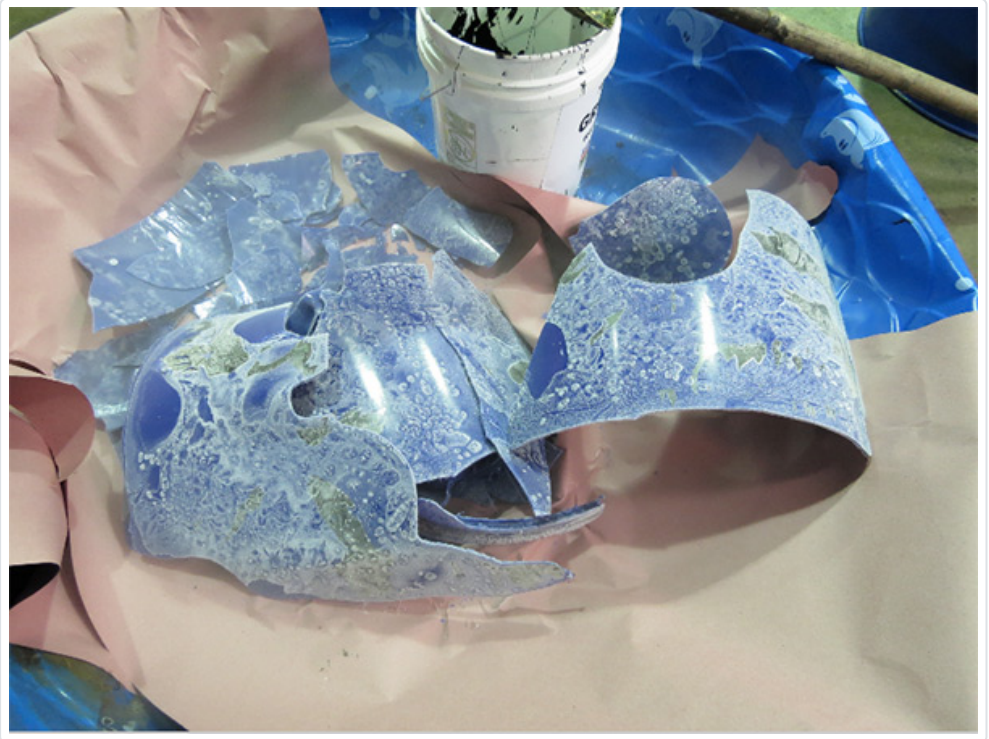
Before: Hardened Urethane Adhesive adhered to the sides of the metal drum with a 4-1/2 inch slug of hardened material at the bottom of the drum.



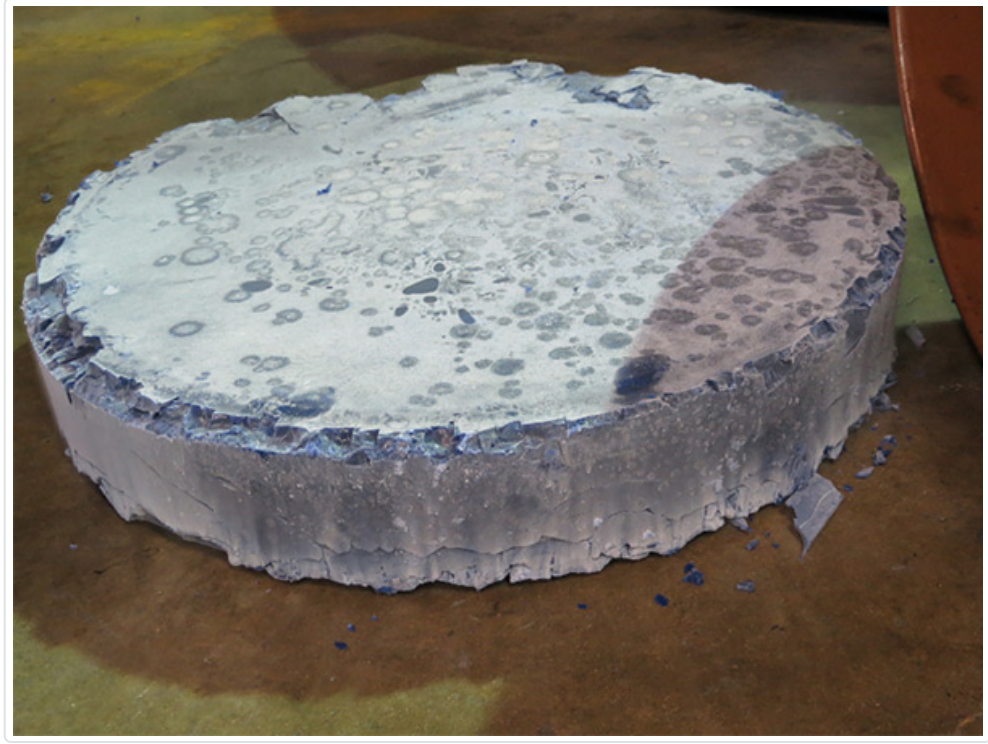
Before: Hardened Urethane Adhesive adhered to the sides of the metal drum with a 4-1/2 inch slug of hardened material at the bottom of the drum.

By cryogenically freezing the drum using Drumbeaters of America Inc.'s patented Cryo-Cleaner® System, ABC Company is able to remove the solid urethane adhesive from the metal drum. The solid urethane adhesive is collected/consolidated and then melted again in the manufacturing process. The 99% clean metal drum is crushed and recycled as scrap metal using one of Drumbeaters of America Inc.'s drum crushers. What was once a problem and a liability became a generator of revenue.

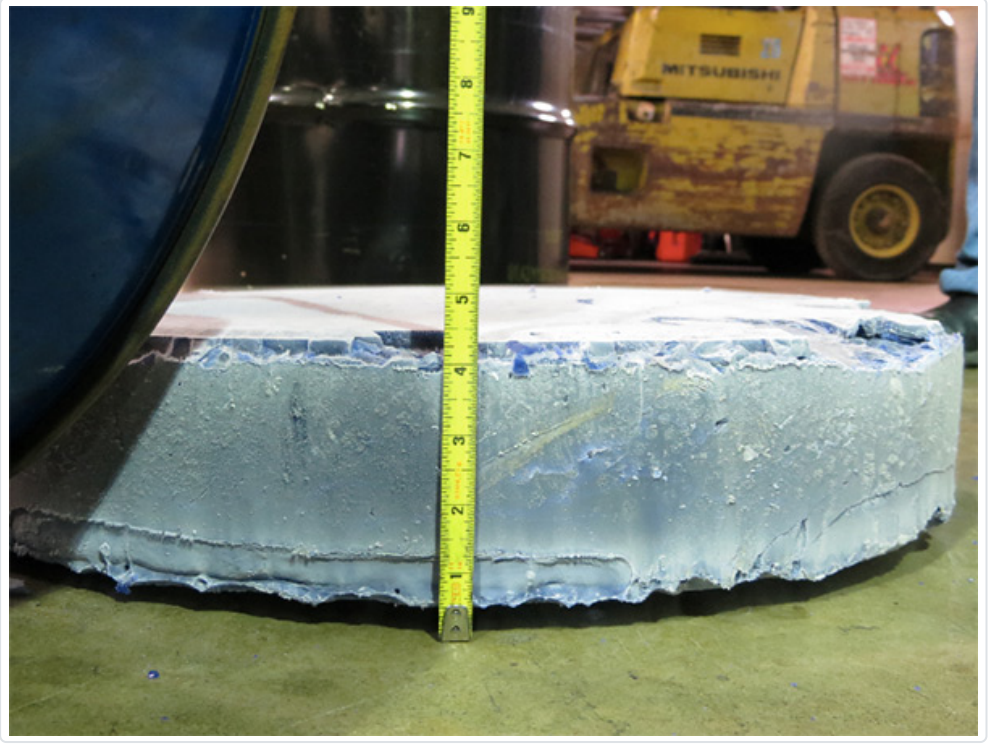
After: 99% of the Urethane Adhesive that was solid and adhered to the side and bottom of the drum was removed.



After: Urethane Adhesive that was solid and adhered to the side wall of the drum was removed.



After: 4-1/2 inch solid urethane adhesive slug removed from the bottom of a drum which equates to 13% of the material that was originally in the drum. Using Drumbeaters of America Inc.'s Cryo-Cleaner System, this virgin material is 100% reusable since no soaps, solvents or water were used to remove the urethane adhesive.



After: 4-1/2 inch solid urethane adhesive slug removed from the bottom of a drum and 100% reusable.

Dynacoll 7320 Residue in Drum

Dynacoll 7320 has hardened and is adhered to the side wall and bottom of a drum. ABC company can recycle the Dynacoll material if the material is detached from the drum wall and bottom and can recycle the drum if the residue is removed.

By cryogenically freezing the drum using Drumbeaters of America Inc.'s patented Cryo-Cleaner® System, Dynacoll is able to efficiently remove the material from the bottom of the drum without using any soaps, solvents or water.

Before

Before

After: 99% of the residue was removed.

After: Solid residue pieces that was cryogenically removed and is 100% reuseable.

Dynacoll 7250 Residue in Drum

ABC company wanted to recapture the remaining fluid residue in the drum. Pouring the residue would still leave a residual amount of the material in the drum. By cryogenically removing the fluid residue from the drum, 99% of the product is recaptured for recycling.

By cryogenically freezing the drum using Drumbeaters of America Inc.'s patented Cryo-Cleaner® System, Dynacoll is able to efficiently remove the material from the bottom of the drum without using any soaps, solvents or water.

Before

After: 99% of the residue was removed.

After: The frozen residue can be collected and consolidated into a drum for reuse.

For more detail information contact our drum disposal specialists at (630)365-5527.

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