

A close-up, perspective view of a spiral freezer's conveyor system. The conveyor is composed of numerous blue, diamond-shaped plastic links connected by metal hardware. The links are arranged in a dense, repeating pattern that recedes into the distance, creating a strong sense of depth. The background is slightly blurred, showing more of the industrial machinery and the repetitive structure of the conveyor. The overall scene is brightly lit, highlighting the texture and color of the plastic links.

ECOSENSE

Bio-Decontamination Services

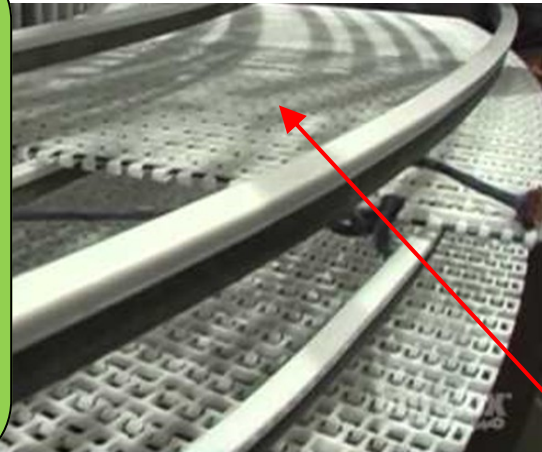
Spiral Freezer Decontamination

Issues With Cleaning Spiral Freezers

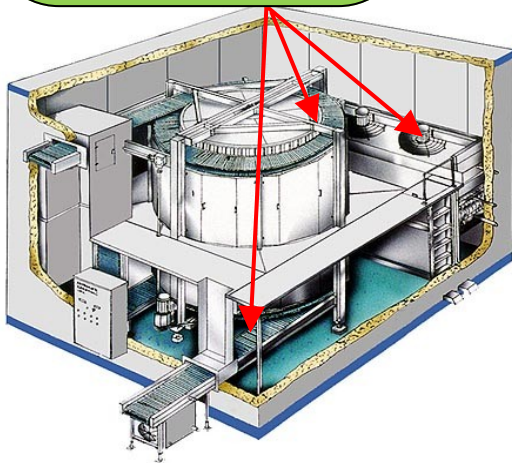
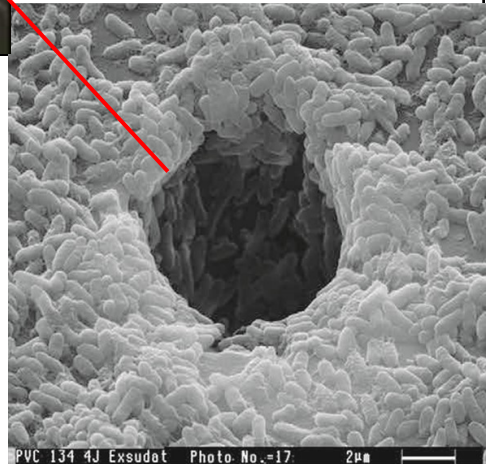
The biggest challenge in successfully cleaning spiral freezers is trying to reach all the surfaces. Spiral Freezers are constructed with minimal clearances, making it hard to use traditional cleaning techniques such as the spraying of liquid chemicals. The interior is too tight to maneuver cleaning equipment properly and operate it effectively. Countless locations reside within a spiral freezer in which bacteria can remain out of reach, such as hollow conveyor rollers, damp insulation, open bearings, standing water, hollow framework, cracked hoses, seals and roller guards (Tompkin et al. 1999). Cleaning every nook and cranny inside of a spiral freezer is a very difficult task when taking into consideration all of the internal components, all of the hard to reach crevices, the difficulty in maintaining the correct contact time of the chemical being used, and the difficulty in the agent reaching all surfaces.

Problem Areas:

- Conveyor Belt
- Penetrations into walls
- Wall seams
- Insulation behind wall panels
- Drains
- Cooling coils
- Hard-to-reach areas



Traditional cleaning methods have difficulty contacting all surfaces of a conveyor belt, creating harbor locations for organisms, like this colonization of *Pseudomonas fluorescens* CCL 134 in a 6-micron (6000 nm) hole in a PVC conveyor belt



The chlorine dioxide gas molecule is 0.124 nm, making it much smaller than any mold, virus, bacteria, or spore within the spiral freezer.

Why Don't These Methods Work?

Hydrogen Peroxide—Quickly condenses onto surfaces leaving farther surfaces untouched, vapor cannot penetrate crevices to achieve kill everywhere, more corrosive

Ozone—Too short lived to achieve kill, more corrosive

Spraying Liquid Chemicals—Can't reach all surfaces or penetrate crevices to achieve kill everywhere, some are more corrosive

Other Chlorine Dioxide Gas Products—Not registered with US EPA for decontamination, less controlled process, more corrosive

Why ClorDiSys' Chlorine Dioxide Gas Works

In order to achieve complete kill, the process being used must:

- 1) Be effective against the organism in question
- 2) Be able to reach the organism in all places it exists
- 3) Stay in contact with the organism for the proper amount of time at the correct concentration

Our chlorine dioxide gas is registered with the US EPA as a sterilant capable of killing all viruses, molds, bacteria and spores. As a true gas, chlorine dioxide naturally fills the spiral freezer evenly and completely. The chlorine dioxide gas molecule is 0.124 nm (1.24×10^{-9} m), making it much smaller than any mold, virus, bacteria, or spore within the spiral freezer. This ensures that the gas will be able to reach and kill all microorganisms within the spiral freezer.

Chlorine Dioxide Gas


- **Completely fills the freezer**
- **Contacts every surface / part**
- **Reaches into crevices**
- **Kills in water**
- **Effective against biofilms**
- **Effective against all viruses, molds, bacteria and spores**



Material Compatibility

Chlorine dioxide gas is one of the most gentle decontaminating agents available. Our process generates a pure chlorine dioxide gas which is used to decontaminate sensitive materials ranging from scales, microscopes, and computers to machinery. It is compatible with fans, motors, cooling coils, stainless steel, aluminum, and galvanized metals. To the right is a list of common decontaminating agents and their oxidation (corrosion) potential. A higher oxidation potential means that the agent is a stronger oxidizer and more corrosive. Chlorine Dioxide has a relatively low oxidation (corrosion) potential, and is much lower than hydrogen peroxide, peracetic acid, and ozone. While some chlorine dioxide products can be corrosive, it is because of the impurities and byproducts which are specific to the product used. ClorDiSys generates and uses a pure chlorine dioxide gas, which is gentle on materials and is not comparable to any corrosive chlorine dioxide products.

Decontaminating Agent	Oxidation / Corrosion Potential (V)
Ozone	2.07
Peracetic Acid	1.81
Hydrogen Peroxide	1.78
Bleach	1.49
Chlorine Dioxide	0.95

 **More Corrosive**

The Ecosense Company - About Us

The Ecosense Company is a bio-decontamination service provider located in Northeast Ohio. We are a certified ClorDiSys service partner who uses their proven sterilization method for decontaminating high-risk and critical applications where complete sterility results must be achieved and validated. Our in-situ treatment capabilities range from treating individual pieces of equipment and single rooms to large buildings and confined spaces. We also offer contract sterilization services at our Ohio facility where we can accommodate a wide variety of items ranging from small products to large pieces of equipment.

Comprehensive Food Processing Solutions

Decontamination Services

Our decontamination services can turn around a spiral freezer in as little as a few hours. Decontamination can be performed on a one-time or routine basis for contamination remediation or routine prevention. Service contracts are available for facilities with routine needs.

Supplemental Biofilm Identification and Removal Services

We help you identify and remediate the source of many unpredictable spikes in microbial test results.

Supplemental Microbial Swabbing and ANAB 17025 Accredited Lab Testing Services

We provide you with extra assurance when it's not feasible for you to perform these tasks in-house

Other Food Processing Applications for CD Gas

Entire Facilities	Coolers	Aseptic Filling Lines
Rooms, Labs	HVAC Ductwork	Piping
Trailers & IBC's	Processing Equipment	Holding Tanks

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