



# Dry Cleaning for Hygienic Equipment

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3A Sanitary Standards Education Program  
*Design to Clean: Creating a Hygiene-focused Culture*



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

Soil removal without wet chemistry and especially without water.

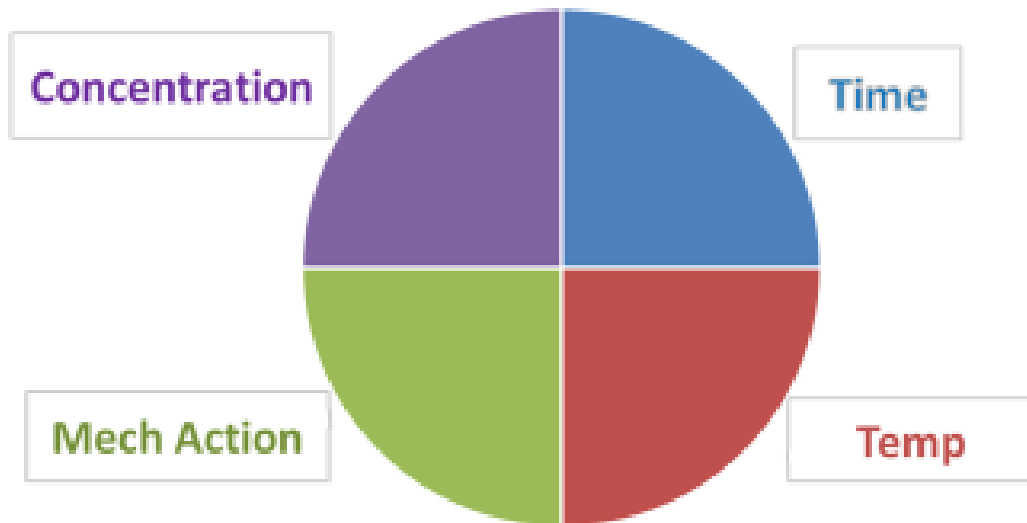
- Microbiological Control & Cleaning
  - Food source removal from equipment and environment without moisture introduction
- Allergen Control & Cleaning
  - Protein removal without chemical intervention



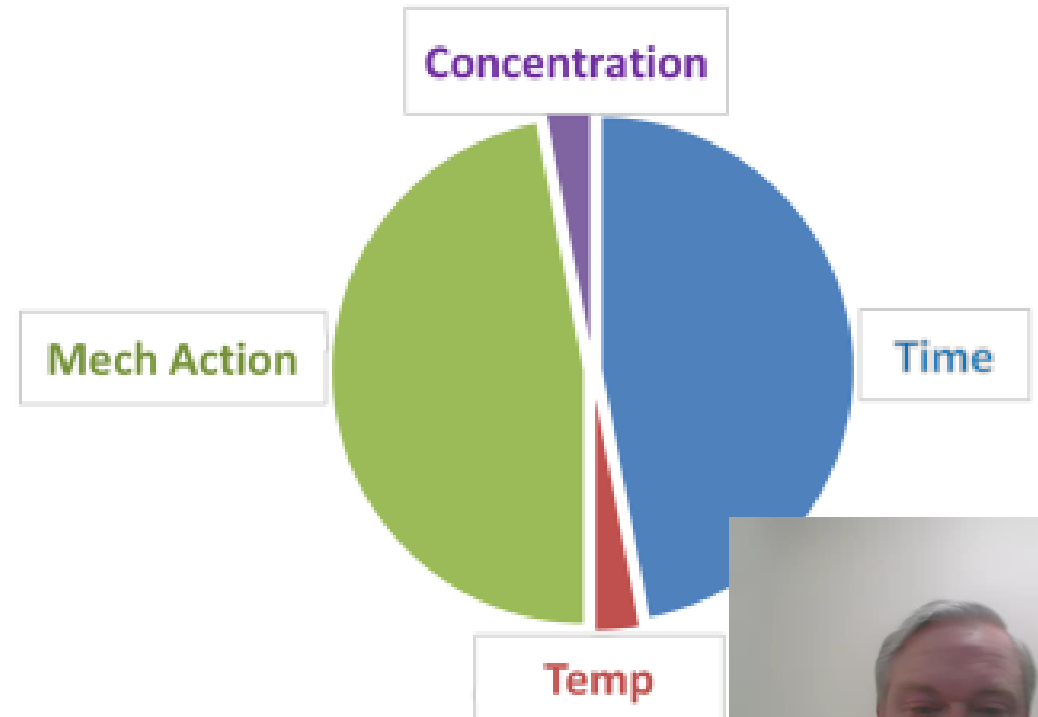
# THE CLEANING MATRIX

## DRY CLEANING VIEW

Cleaning Matrix (**Balanced**)



Cleaning Matrix (**Dry Cleaning**)

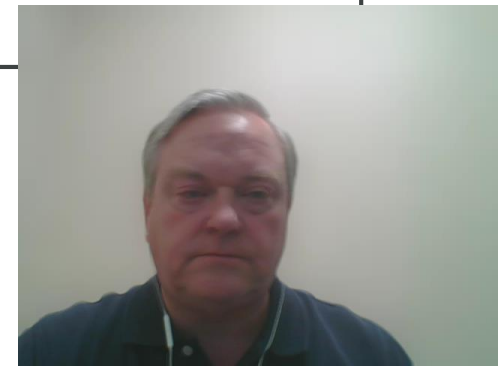
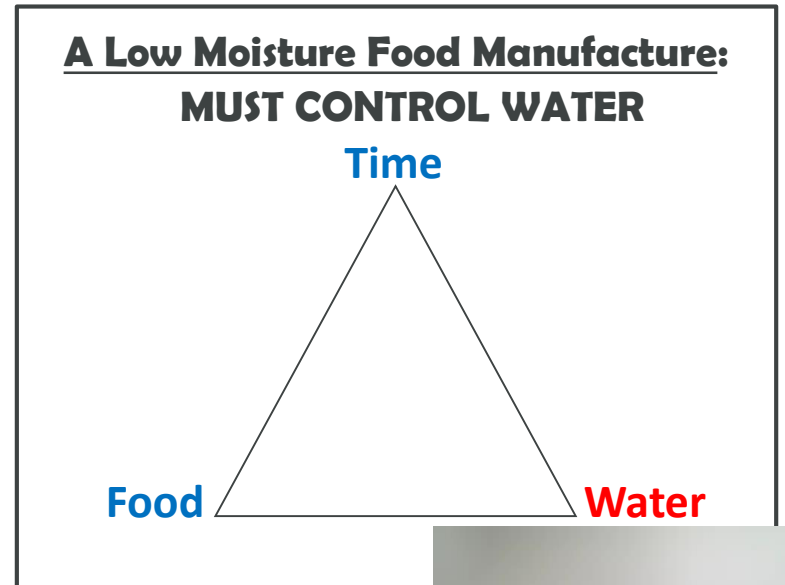


# MICROBIOLOGICAL CONTROL

## DRY CLEAN ONLY

Goal: Eliminate moisture in dry processing and packaging equipment and environments.

- Pathogens of concern are adaptive to dry and hot environments.
  - Salmonella
  - Cronobacter sakazakii
- Nutrients present in dry foods
  - Spray dried powders are not sterile

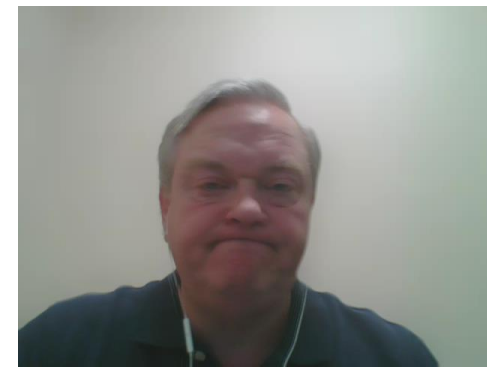




# BACTERIA ARE LIKE SEEDS – THEY NEED WATER, FOOD AND PREFER NICHES TO GROW!



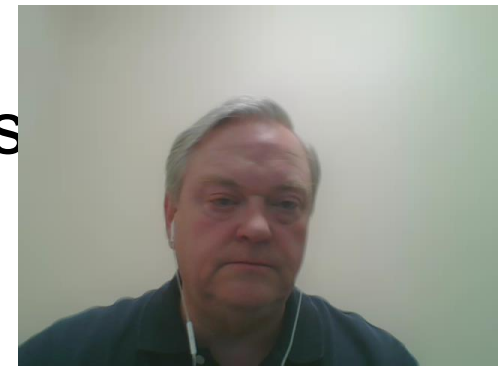
**WAR ON WATER**



# MICROBIOLOGICAL CONTROL

## DRY CLEAN ONLY

- Minimize food sources in equipment & environment
- Do not allow microbiological ingress or harborage
  - Hygienic Zoning & Barriers
  - Continuous Environmental Sanitation Program
    - MSS & Periodic
- Protect Product Contact Surfaces
  - Precautions during Interventions & Inspections





**SIFTER. THIS ROOM HAS BEEN RUNNING FOR 11 DAYS SINCE THE LAST DRY CLEAN.**



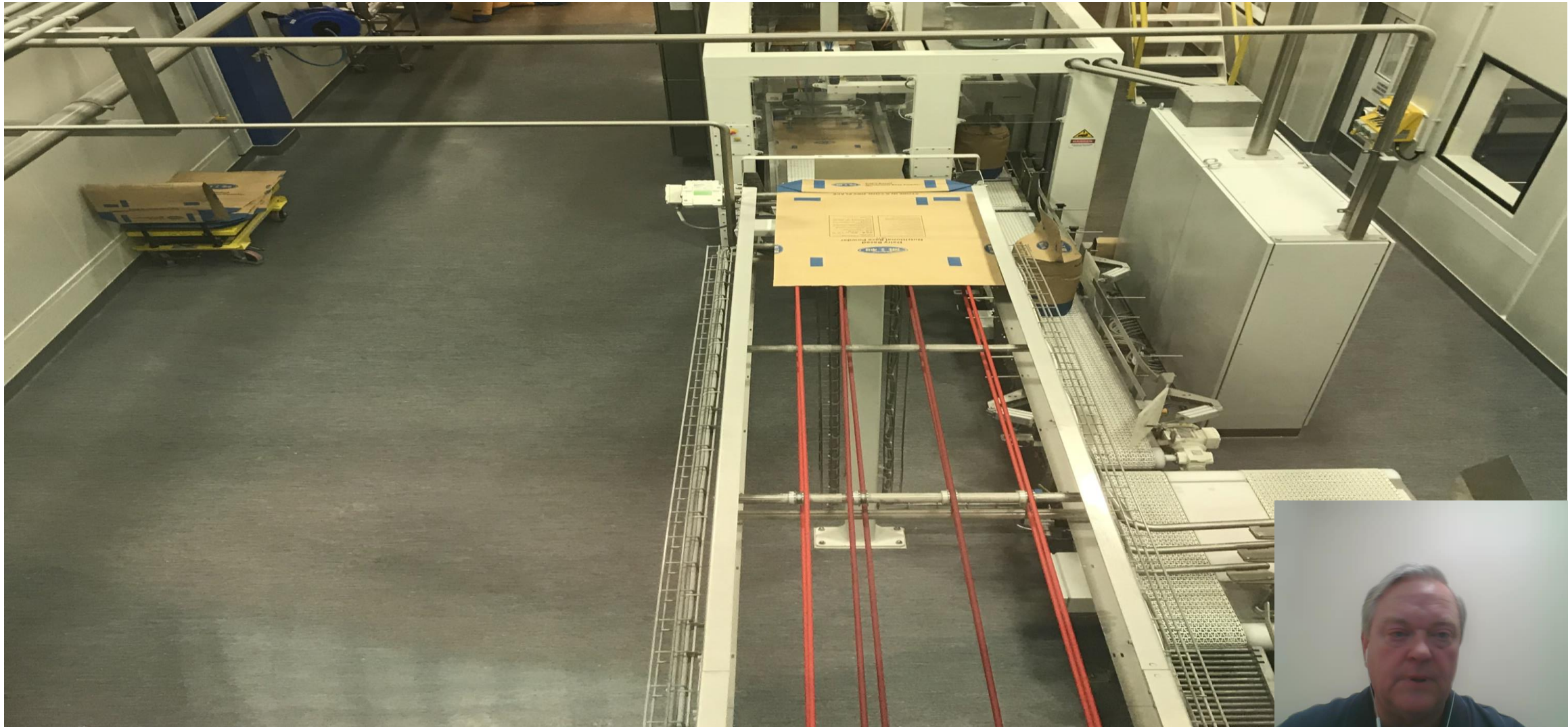


# POWDER BIN ROOM - 32 DAYS SINCE THE LAST DRY CLEAN.





**25 KG BAG LINE - BIG MECHANICAL FAILURE EARLIER IN THE DAY WHERE BAGS WERE THROWN OFF THE LINE & POWDER EVERYWHERE. THIS IS THE ROOM ABOUT 4 HOURS AFTER THE EVENT AND DRY CLEANING.**

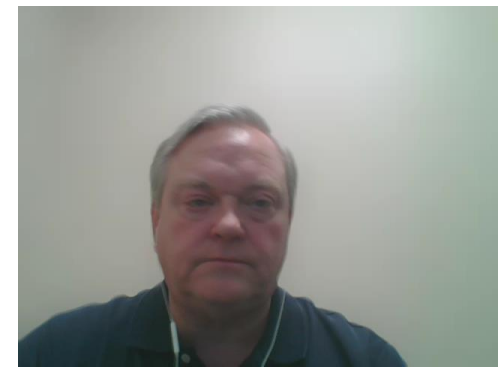




# ALLERGEN CONTROL

## DRY CLEAN ONLY

- Complete removal of product is even more critical
  - Any residue can contain allergen
- Multiple layers of inspection, verification and validation
  - Visual, ATP, Allergen swab
- Product purges and/or scouring
  - Push residual powder out with allergen free powder
  - Validation testing

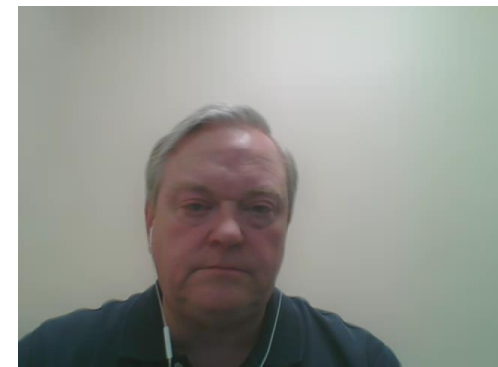




# ALLERGEN CONTROL

## DRY CLEAN ONLY

- Modified Wet Cleaning
  - Use of alcohol wipes
  - Localized wet cleaning
- Must validate complete dry out
  - Microbiology control but also allergen
- Multiple layers of inspection, verification and validation
  - Visual, ATP, Allergen swab





# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

Successful program requires the following:

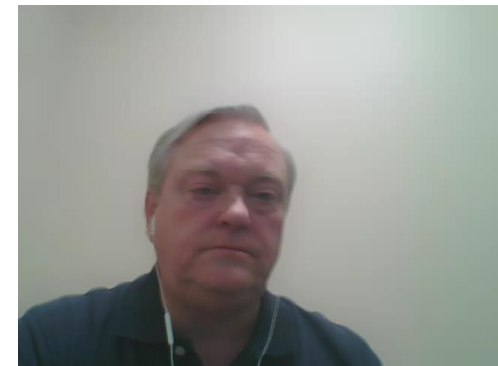
- Hygienic design of equipment and facility
- Defined cleaning process and procedures
- Effective and proper tools
- Consistent, uncompromising behaviors and execution



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

## Effective and proper cleaning tools

- Vacuums – HEPA filtered, explosion proof, dedicated
  - Collection point for environmental monitoring
  - Maintenance and cleaning plans
- Brushes – resin set, soft bristled, color coded
  - Job specific, dedicated, properly cleaned and stored, 5S
- Scrapers
  - Metal detectable
- Towels – dry versus alcohol wipes



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

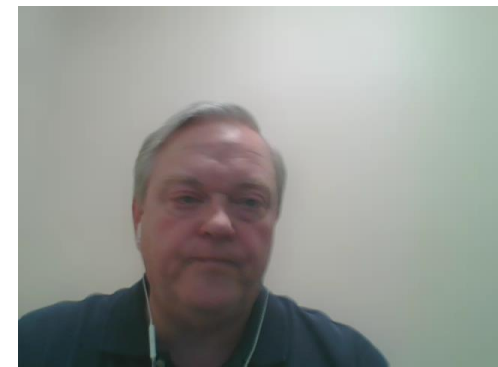
Alternative dry cleaning tools

Compressed air

Dry steam cleaning

Dry ice cleaning

Soda blasting (scouring)

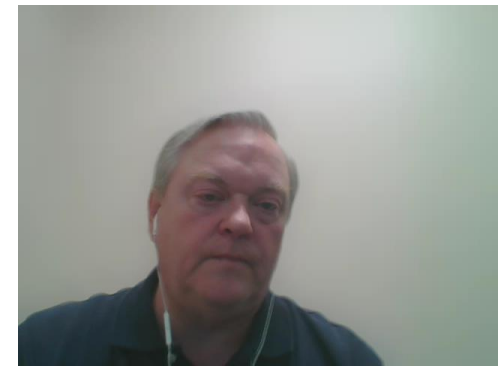




# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

## Defined Cleaning Process and Procedures

1. Pre-Sanitation Preparation
2. Secure & Dismantle
3. Pre-Clean
4. Detail Cleaning
5. Final Cleaning
6. Final Inspection/Documentation



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

## Defined Cleaning Process and Procedures

### 1. Pre-Sanitation Preparation

Remove or 5s production related materials

Maintain hygienic barriers & keep product out of the environment

### 2. Secure & Dismantle

LOTO and disassemble as possible and needed

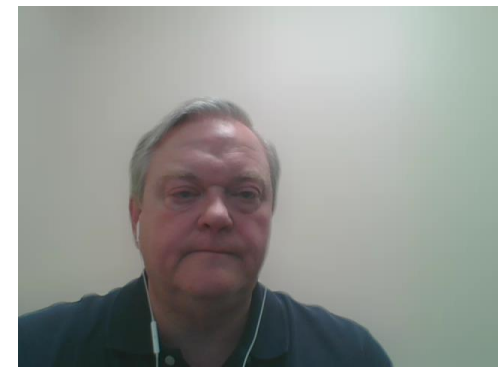
Gain access for cleaning and inspecting

### 3. Pre-Clean

Work Top-Down and Sequence the entire room

Protect the product contact surfaces

Knock down, vacuum up



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

## Defined Cleaning Process and Procedures

### 4. Detail Cleaning

Seek and remove hard to clean soils

Scrapers for caked on soils, disposable towels for grease, etc.

Knock down, vacuum up

### 5. Final Cleaning

Work Top-Down and Sequence the entire room

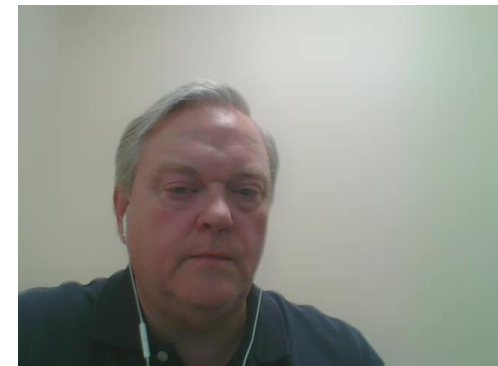
Seek out redeposited soils, hidden soils

Ensure complete dry out as needed

### 6. Final Inspection/Documentation

Inspect for soils and extraneous, double check as reassembled – LOTO

Complete all inspection & Pre-Op forms – document all activity

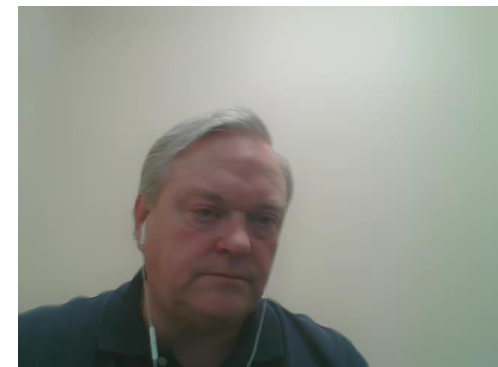




# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

Hygienic design of equipment and facilities

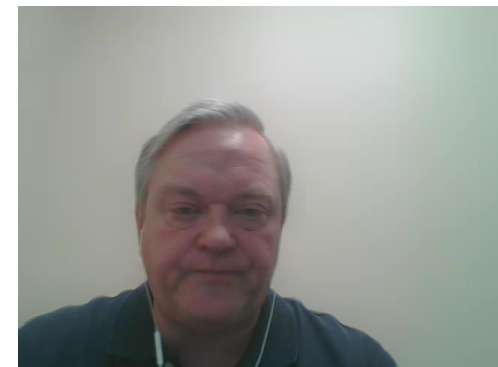
- Sanitary design considerations
  - Free flowing product zones with nearly complete evacuation of product
  - Protect the closed system when opening
    - Minimize the need to open the system
    - Build in safeguards to isolate the intrusion point
  - Keep the environment out of the product, and the product out of the environment
  - Dry Out capabilities.



# DRY CLEAN ONLY APPLICATIONS FOR DAIRY POWDERS

A parting thought on sanitizing

- Alcohol
- Chlorine Dioxide gassing
- Heat
- (steam, silver ion, UV)



# DRY CLEAN ONLY APPLICATIONS SANITARY DESIGN

In Summary, the following considerations will help improve Sanitary Design of Equipment in Dry Clean applications:

- Maximum removal of product
- Limited tools and methods for cleaning & sanitizing
- Keep the product out of the environment, and the environment out of the product
- War on Water







**Thank You!**

