

Electro-Chemical Activation (ECA)

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SANI-MATIC®

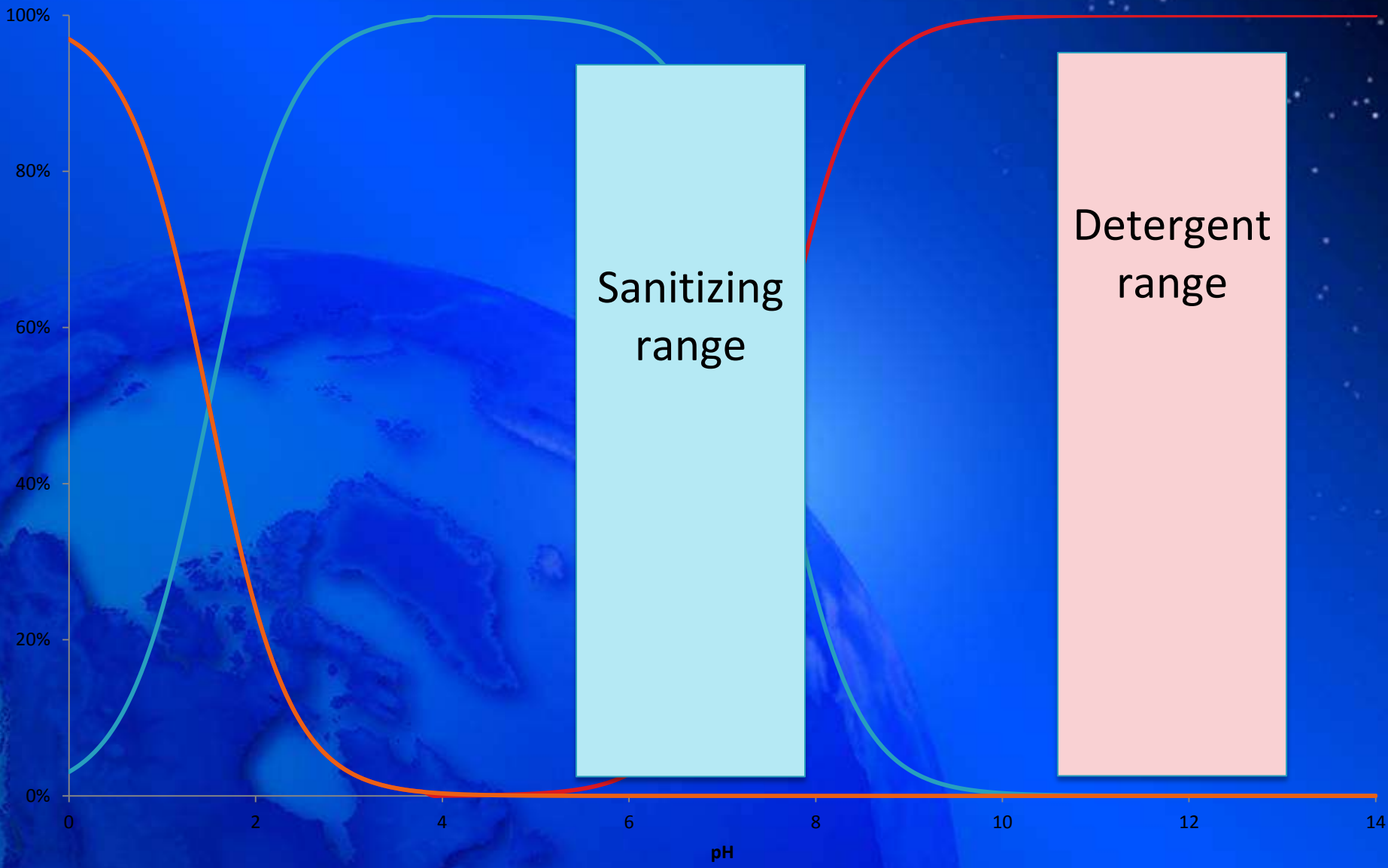
What is ECA?

- On-site, on-demand generation of detergent and sanitizer using three simple inputs.



Solutions Generated by ECA

- **ANOLYTE (sanitizer)**
- **Charged Hypochlorous Acid (HOCl); pH 5.5-7.0**
- **Destroys foodborne pathogens**
- **More effective than traditional chemical sanitizers**
- **CATHOLYTE (detergent)**
- **Charged Sodium Hydroxide (NaOH); pH 13.5**
- **Highly effectively surfactant and detergent**



Sanitizer Efficacy

- **FDA “Letter of No Objection”**
- **ECA Generators approved in 2011 PMO**
- **72 hour stability**
- **Successfully tested per EPA Sanitizer regulation**
- **ECA sanitizer destroys all form of microbes, including:**
 - **Foodborne: E. Coli, Salmonella, Listeria**
 - **Viruses: Avian Flu Virus, H1N1 Flu Virus, Norovirus**
 - **Health Care: MRSA, Tuberculosis**
 - **Other: Legionella, Cryptosporidium, Bacillus, Anthrax, Bio-Films**

2011 PMO

APPENDIX F. SANITIZATION

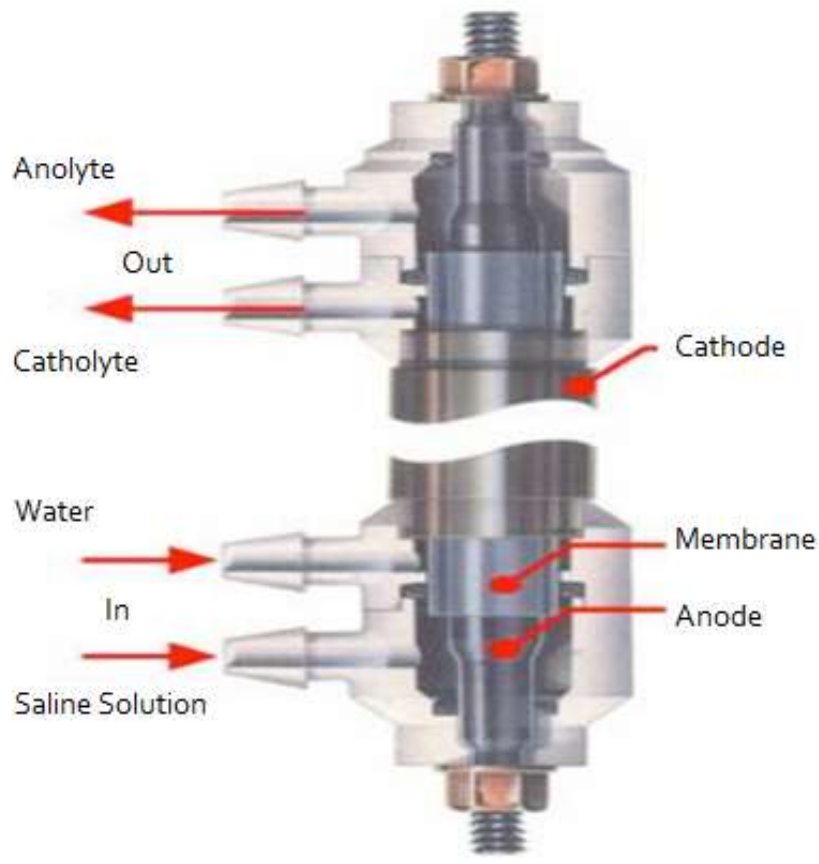
I. METHODS OF SANITIZATION

II. CRITERIA FOR THE ONSITE PRODUCTION AND USE OF ELECTRO-CHEMICAL ACTIVATION (ECA) GENERATED HYPOCHLOROUS ACID FOR THE SANITIZATION OF MULTI-USE CONTAINERS, UTENSILS, AND EQUIPMENT

- **EPA System Registration**
- **50-200 PPM**
- **Salt Purity – 99.6% minimum**
- **Non-Toxic**
- **Labeling Requirements**
- **Control**
- **Measurement**

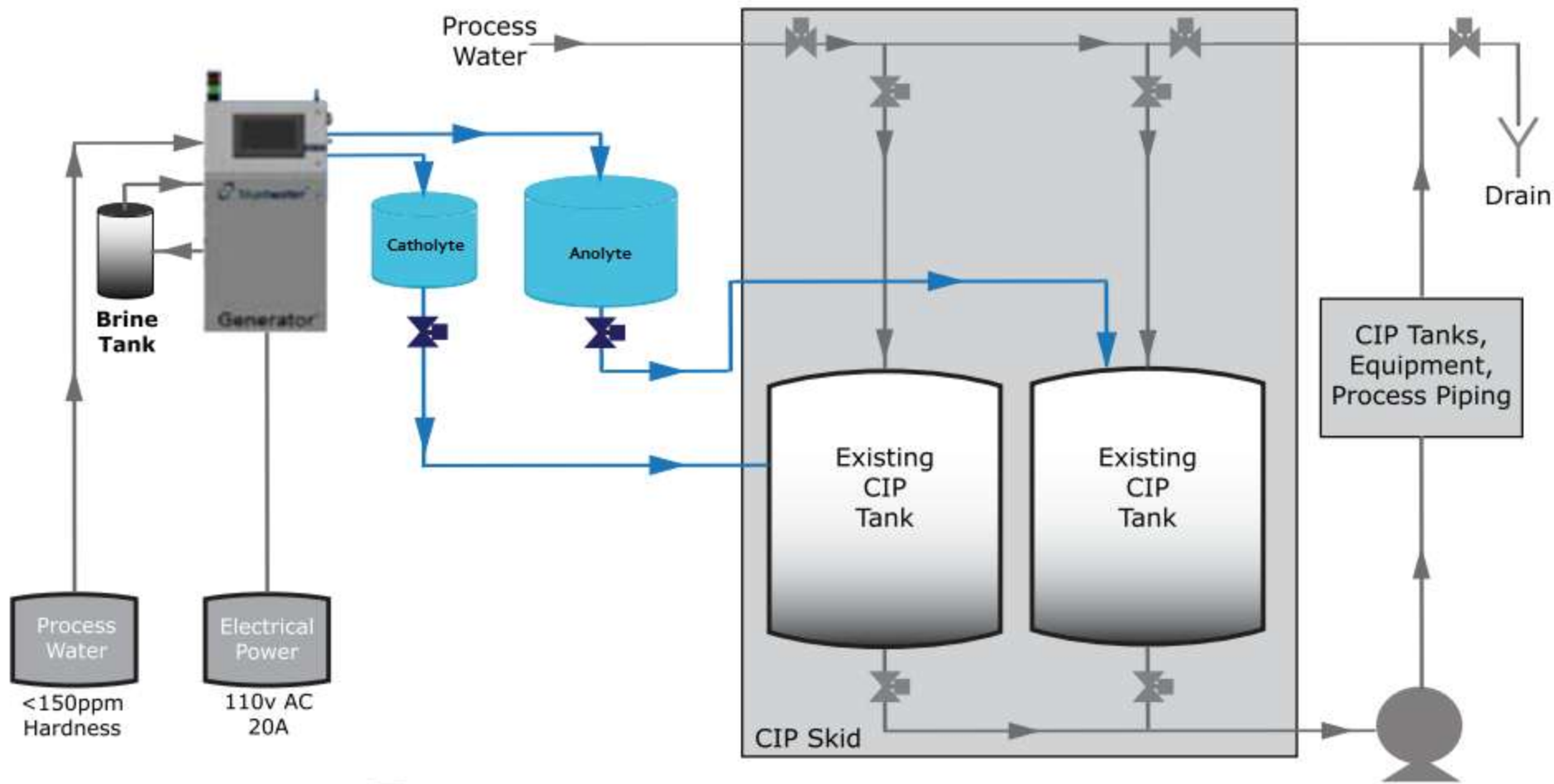
ECA Cell Technology

Sectional View

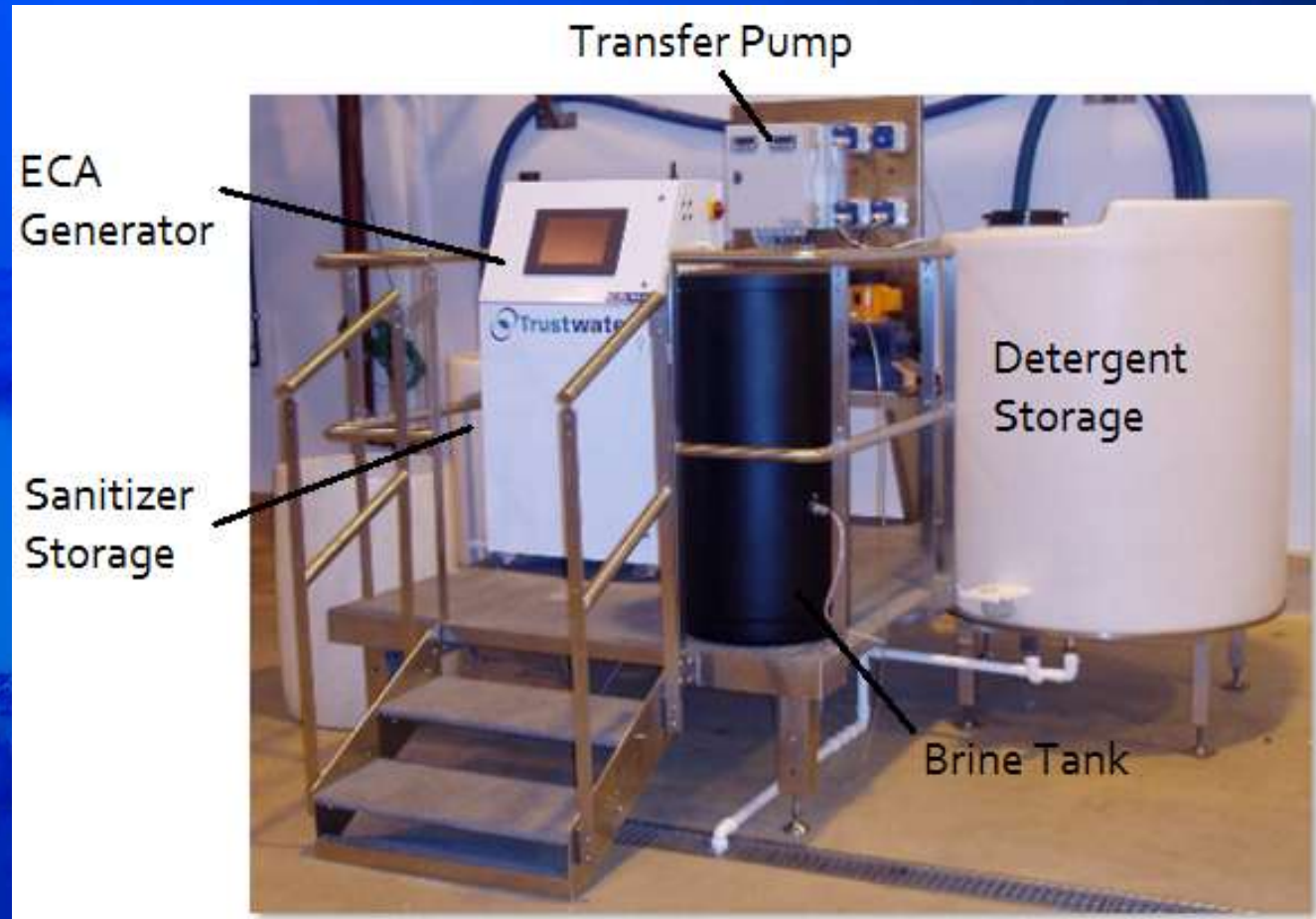


- Onboard RO removes minerals from water
- Saline passed through membrane: outer cathode, ceramic membrane, inner anode
- Current passed between anode & cathode
- Two Distinct solutions produced:
 - Caustic (Catholyte)
 - Sanitizer (Anolyte)

ECA CIP Process



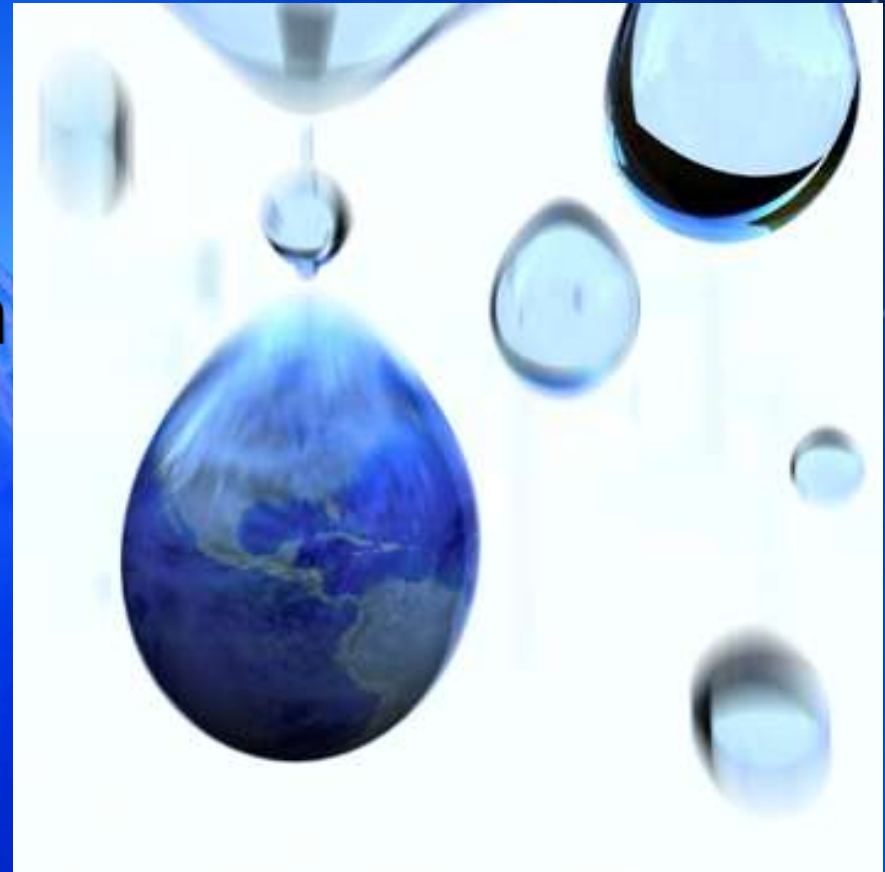
Typical Installation



- **8' x 8' skid replaces bulk chemical storage**

On-Site Generation Benefits:

- **Environmental**
- **Cost saving**
- **Operation safety**
- **Reduced Transportation**



Environment Benefits

- **Reduced Water Usage**
 - Intermediate rinse steps reduced or eliminated
 - Final rinse step eliminated
- **Reduced Energy Usage**
 - Solutions effective at lower temperature
 - No bulk chemical transportation
- **Reduced Effluent**
 - Reduced chemical discharge
 - Reduced drain volumes
 - Reduced pH extremes

Operation Safety

- Eliminates bulk caustic & sanitizer
- Lower operating temperature
- Lower usage concentrations
- Non-toxic



Dairy Applications

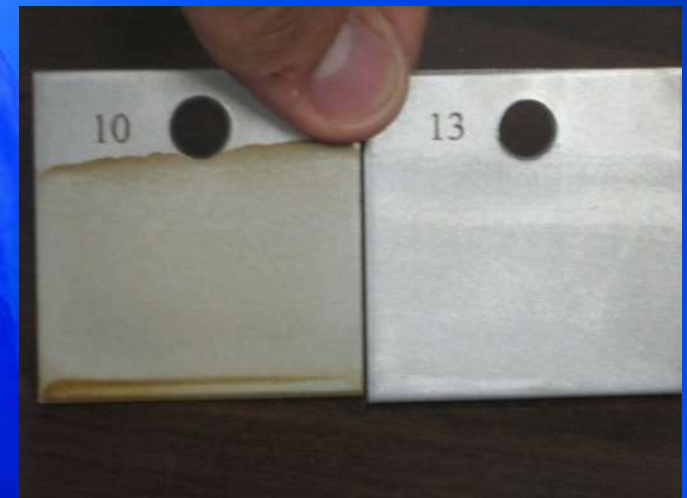
- **CIP**
- **COP**
- **Supply-water disinfection**
- **Crate & Can washing**
- **Plant wash-down**
- **Equipment sanitization**
- **Biofilm removal**
- **Doorway Foaming**
- **Fogging**

Does It Really Work???

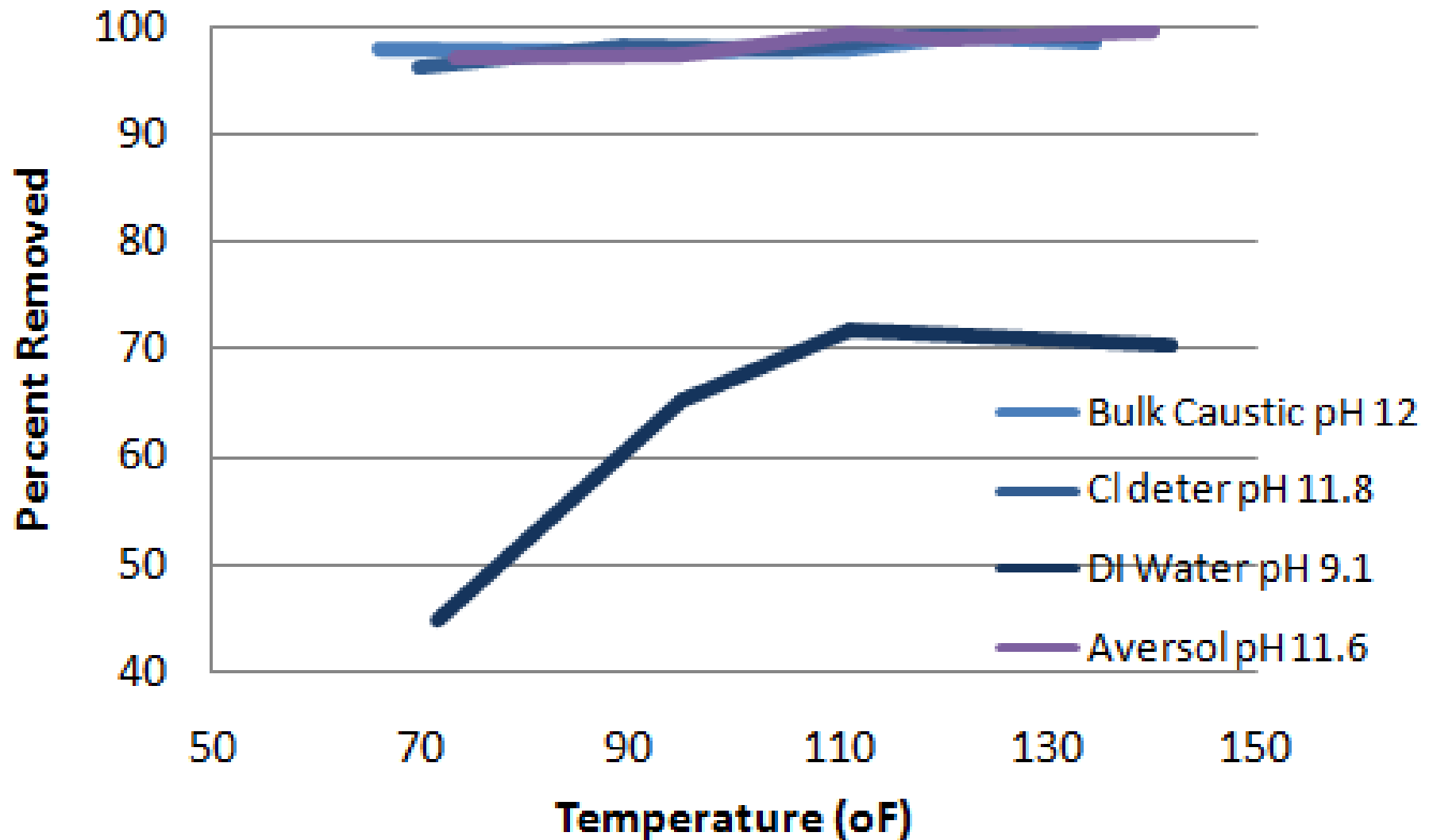


Dairy Soil Removal

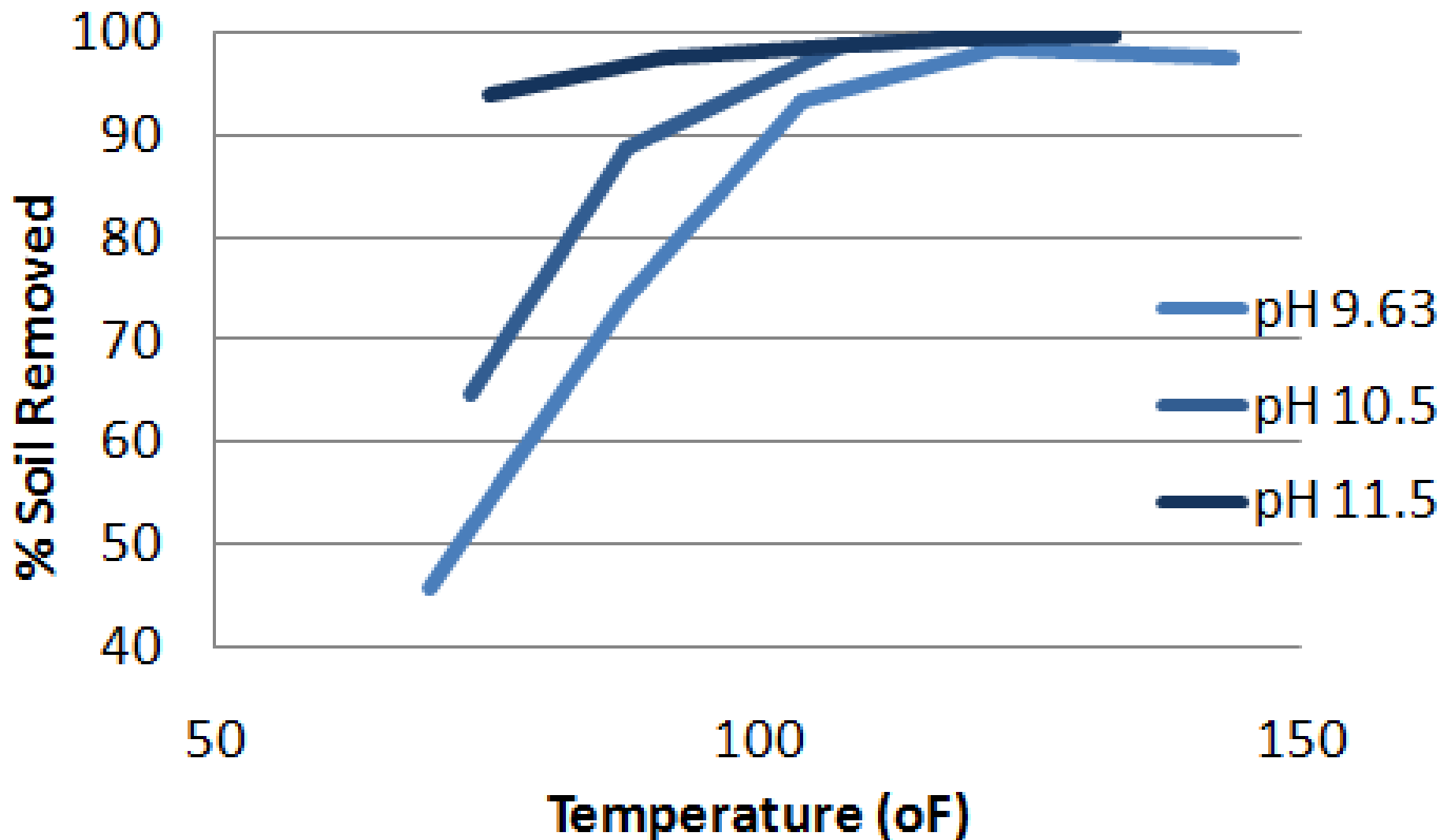
- ECA detergent was tested to find the ideal temperature, concentration & pH
- Test Procedure
 - Coupons soiled with heated cream
 - Effectiveness determined by weight loss
- Tests showed that pH was the critical factor in cleaning effectiveness



Detergent Comparison



Effective Cleaning at a pH of 11.5



Summary of Results

- ECA detergent performed as effectively as bulk caustic and chlorinated detergent at a pH of 11.5 and temperature of 110°F



- Note: Our testing determined that ECA detergent at a pH of 12.5 is equally effective at room temperature

Environmental Disinfection Fogging

- Moyne Institute
- Trinity College, Dublin
-

Ecasol 250ppm
 Fogger at 2 metres
 Challenge doses > 7 log



Organism	15 mins	30 mins	15 mins	30 mins	15 mins	30 mins	15 mins	30 mins
Surface	Steel	Steel	Vinyl	Vinyl	Tile	Tile	Timber	Timber
S.aureus	7 log	7 log	7 log	7 log	7 log	7 log	2 log	4 log
P.aeruginosa	6 log	7 log	7 log	7 log	7 log	7 log	3 log	5 log
B.subtilis	4 log	6 log	4 log	7 log	5 log	7 log	2 log	3 log
C. albicans	6 log	7 log	5 log	7 log	6 log	7 log	1 log	4 log
Asp.nidulans	4 log	6 log	4 log	6 log	6 log	6 log	1 log	3 log

Profitable Sustainability

- CIP water savings
 - Reduces need for rinse steps
 - Average 33% water savings
- CIP energy savings
 - Average 50% energy savings
 - 2.089kJ to heat 1 liter H₂O 1°F
 - Consumes 0.8kW per hour
- Reduced CIP time
- Increased line utilization
- Reduced product change-over time
- Improved operator safety
- Reduced transportation cost



A blue-tinted image of Earth from space, showing the curvature of the planet and some cloud patterns. The background is a dark blue sky with many small white stars. The word "Questions?" is written in a bold, yellow, sans-serif font with a black outline, centered in the upper half of the image.

Questions?

A blue-tinted image of Earth from space, showing the curvature of the planet and some landmasses. The background is a dark blue sky with many small white stars. The text "Thank You!" is overlaid in the center in a bold, yellow font with a black outline.

Thank You!