



WELCOME

THANKS
FOR JOINING



foodfocus

THE RIGHT WAY

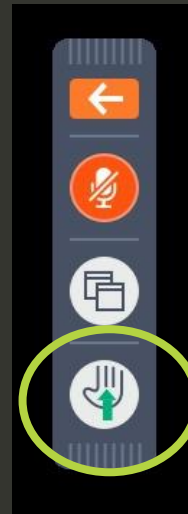
WEBINAR WEDNESDAY

WELCOME TO THE WEBINAR

We are so glad that you joined us.
Before we start,
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Audio is being transmitted over the computer
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HOW TO USE THE WEBINAR TOOLS



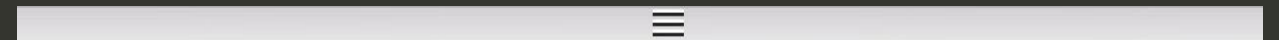
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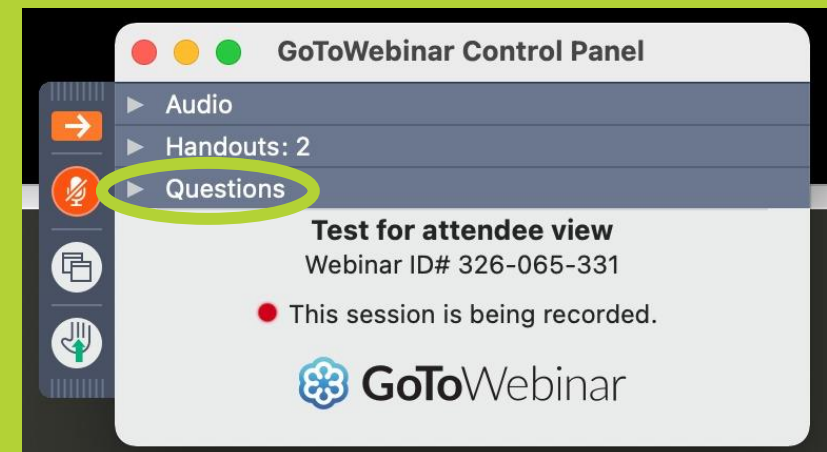
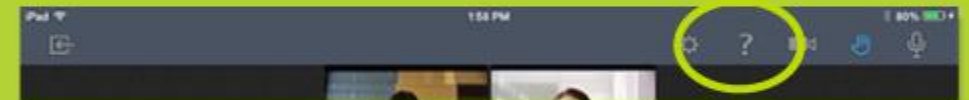
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so you can use this to propose
questions for the presenter.



QUESTIONS AND ANSWERS





TODAY

OUR SPONSORS ARE





TOPIC FOR TODAY

Join the Dairy Standard Agency for a series of insightful monthly webinars about the ins and outs of the local dairy industry.

Cost: FREE

Presenters:

Geoff Bayman (NutroChem)

John Cornford (AFCO ZEP)

**Click
here to
register
NOW.**

Date: **15 SEPTEMBER 10:00-11:00**

SEPTEMBER

**Cleaning & Sanitising
in the Dairy Industry**

**“TIME TO
SPRING CLEAN”**

*Healthy dairy demands a healthy industry
with healthy practices for peace of mind.*

**MOOOVE OVER
... its spring
CLEANING SEASON!**





SPEAKERS FOR TODAY



Geoff Bayman - Nutrochem



John Cornford – AFCO ZEP



SPEAKERS FOR TODAY



Geoff Bayman joined NutroChem in October 2019 as the National Sales Director. Actively selling specialty chemicals within the food & beverage industry since 1990. Focussed on providing best practice hygiene outcomes for all our customers.



SPEAKERS FOR TODAY



John has 50 years experience in food and beverage industry hygiene, with expert knowledge in cleaning chemistry application, CIP engineering and microbiological RCA.

He has worked for a variety of companies, most with leadership positions, dealing with the global leaders in food and beverage production, and has worked in most parts of the world, and lived in North America, Europe, Asia and Australia.

He has fulfilled several roles from business sector director, application specialist to director of engineering. Spent 5 years developing and executing a skills development program for all customer-facing personnel - a challenging task with around 3000 mature students, 25 languages and locations from Mongolia to Chile.

Recently he became interested in Biofuels technology based on fuels from crop and algal substrates and led a global cross-functional team developing solutions delivering process yield and productivity improvement. He retired from mainstream activities in 2014 and now runs his own consulting company Engineered Hygiene Solutions Pty Ltd.

A photograph of a dairy processing facility featuring large stainless steel tanks, complex piping systems, and metal walkways. A bright green diagonal line runs from the top right towards the bottom left, separating the image from a dark blue background on the right.

EFFECTIVE CLEANING AND DISINFECTION IN THE DAIRY INDUSTRY





EFFECTIVE CLEANING AND DISINFECTION IN THE DAIRY INDUSTRY





● INTRODUCTION

- The **Value Add** Role of the Chemical Supplier in Dairy Processing
- Geoff & John will share learnings from years of collaborative work place knowledge gained to:
- Extract **Maximum Value Add** from your chemical supplier to clean and disinfect a dairy
 - Hygiene Partner Program
 - Making a Difference
 - Best Practice
 - Cleaning & Disinfection
 - Result Focussed





**IMPORTANCE OF AN
ISO 9001 CERTIFIED
CHEMICAL COMPANY**



ISO 9001 CHEMICAL COMPANY

- Increasing consumer demand for food safety “Threat of Litigation”
- Food processing facilities require peace of mind “Managing Risk”
- Hygiene Products are Certified & Approved
- Suppliers must **consistently** produce products that meet customer quality and performance requirements
- QMS that allows for traceability and accountability

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

NutroChem Manufacturing (Pty) Ltd

Main Site: 17 Station Road,
Bethal, Mpumalanga, 2310, South Africa

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

The Design, Development, Manufacture and Supply of Chemicals and
Disinfectants Including Contract Blending.

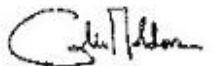
Certificate Number:
0084240

Initial Certification Date:
22 November 2018

Date of Certification Decision:
10 October 2019

Issuing Date:
10 October 2019

Valid Until:
21 November 2021



Calin Moldoveanu
President, Business Assurance

Intertek Certification Limited, 50A Victory
Park, Victory Road, Derby DE24 8ZF, United
Kingdom

Intertek Certification Limited is a
UKAS accredited body under
schedule of accreditation no. 014.



ROLE OF THE CHEMICAL SUPPLIER





● ROLE OF THE CHEMICAL SUPPLIER

● Hygiene Partner

- **Goal Setting** for Best Practice cleaning and disinfecting protocols to meet global bench marks
- Manage Product Performance to achieve Hygiene Outcomes aligned to Industry Specific Food Safety Requirements
- **Continuous Improvement** Culture

● Outcome Driven & Focused on

- Best Practice Hygiene Standards
- Process Ready Surfaces
- **Safe Food**
- Shelf Life
- Cost to Clean
- Supply Chain Management
- Reporting

HYGIENE PARTNER PROGRAM

- Establish Status Quo
- Supplier & Quality Team Work Shop objectives
- Identify Gaps
- Plan Actions
- Implement
- Training
- Monitor and Evaluate

Customer Hygiene Partner Program							
After Sales Support	Daily	Weekly	Monthly	3 Months	6 Months	12 Months	Other
Cleaning Observation Reports		Y					
Hygiene Audits			Y				
CIP Verification		Y					
CIP Reports			Y				
Chemical Usage Reports			Y				
3rd party micro analysis				Y			
Water Analysis						Y	
Training	Daily	Weekly	Monthly	3 Months	6 Months	12 Months	Other
Safe Handling Of Chemicals					Y		
Chemical Storage							
Personel Hygiene			Y				
Chemical Aplication				Y			
Science of Cleaning						Y	
Basic Micro						Y	
Performance Review	Daily	Weekly	Monthly	3 Months	6 Months	12 Months	Other
CIP Effectivness			Y				
CIP Efficiencies			Y				
Micro in Control			Y				
Budget In Use Chemical			Y				
Reporting			Y				
Signed by Customer				Date		20-Jan-21	
Signed by Nutrochem				Last Review		30-Aug-21	



● KEY PERFORMANCE INDICATORS

Plants -	Frequency	January	February	March	April	May	June	July	August
KPI 1 - Visit Frequency	2 Visits per month	Completed	Completed	Completed	Complete	Complete			
KPI 2 - Training	1 Training per QTR	Titration and Chemical Safety			Chemical Safety Training 5-28-13				
KPI 3 - Plant Goals	Annually Set/Quarterly Reviewed	Reduce Chem Inventory			KPI-17 / CIP Validations			Review/re-write	
KPI 4 - Chemical Spend Report	Monthly/Graphed	Completed	Completed	Completed	Complete	Complete			
KPI 5 - Business Review	Once per month	Completed	Completed	Completed	Complete	Complete			
KPI 6 - Cleaning Program Validation	As Needed	Completed	Completed	Completed	Complete	Complete			
KPI 7 - CIP Gap Assessment	Yearly								
KPI - 8 - Cleaning Program Audit	Monthly	Completed	Completed	Completed	Complete	Complete			
KPI - 9 CIP Control Book Audit	Yearly								
KPI 10 - Audit CIP Performance Check	Monthly	Completed	Completed	Completed	Complete	Complete			
KPI - 11 SSOP Review	Monthly	Completed	Completed	Completed	Complete	Complete			
KPI 12 Audit of Master Sanitation Schedule	Yearly								
KPI 13 - Dispensing Equipment Inspections	Ongoing	Completed	Completed	Completed	Complete	Complete			
KPI 14 - Water Analysis	Yearly	Water Samples sent in for Analysis on 5-13-13							
KPI 15 - Operational Cleaning/GMP Audits	Quarterly	Completed			Completed				
KPI 16 - TCO Savings Projects	Yearly	5 % Chemical Savings - Water Softener							
KPI 17 - CIP Maintenance Program	Monthly	Completed	Completed	Completed	Complete	Complete			
Comments: Chemical Safety Training set for 5-28-13									

KPI Example we developed with customer

MANAGING CIP REGIMES

Focussed on

- Effective
- Efficient

Utilising Customised Tools

- Monitor & Evaluate CIP Performance
- In use Cost
- Energy & Water

Such As

- Tracking Templates
- Technology “VIP” Verification in Place

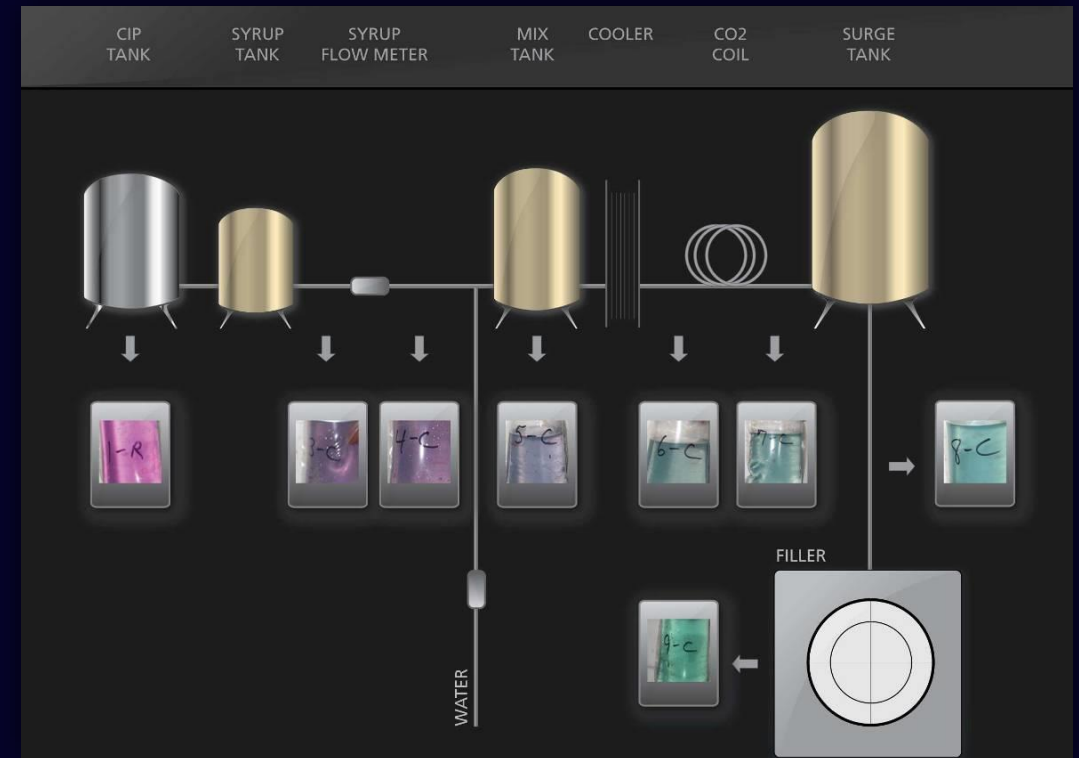


CIP TOOLS – MONITOR & EVALUATION

CIP Process Observation & Validation													
	Equipment Description												
	CIP Type/Set up												
	Parameter	Feed Conductivity (mS/cm)		Return Conductivity (mS/cm)		Feed Flow Rate (LPM)		Feed Temperature (°C)		Circulation Time (min)		Detergent Solution Concentration (%v)	
	Conditions	Design	Actual	Design	Actual	Design	Actual	Design	Actual	Design	Actual	Design	Actual
CIP Cycles	Pre-Rinse												
	Alkaline Wash												
	Intermediate Rinse												
	Acid Descale Rinse												
	Final Rinse												
	Sanitizer Rinse												
Remarks/Comments													
For Client							For Company						
Accepted By:							Compiled By:						
Date:							Date:						

● VERIFICATION IN PLACE

- Allows for **V.I.P.**
 - **V**erification
 - **I**n
 - **P**lace
- **Validation** of cleaning protocols, troubleshooting & monitoring
- **Proof** of Clean



Violet - Clean
Green - Dirty
Yellow - Very Dirty



● ROLE OF THE CHEMICAL SUPPLIER

● Technology Available

- Alignment to Global Trends
- Reduced Demand on Energy & Water
- Optimized CIP
- Access to Knowledge Pool
- Application Methodology

● Environmentally Conscious / Circular Economies

- Lead the way in responsible sustainable raw material selection:
- **Product Raw Material Exclusions:**
 - Formaldehyde (carcinogenic)
 - NP9's Bio Accumulation



● ROLE OF THE CHEMICAL SUPPLIER

● Considered Product Offerings

- Sodium free CIP chemicals – recovered water can be used for irrigation
- Biodegradable and digester safe chemicals

● Energy & Waste Management

- Rain water harvest
- Solar energy
- Effluent treatment
- Re-use of plastic containers
- Re-purposing and recycling of old IBC's, blowpacks and polycans





EFFECTIVE CLEANING AND DISINFECTION



DEFINITIONS





DEFINITIONS

Cleaning:

- The complete removal of residues and soil from surfaces using water, detergent or enzymatic products, leaving them visually clean so that subsequent disinfection treatment can be effective

Physically clean:

- Visually clean to a satisfactory standard
- Dry surfaces and a strong light source make a big difference

Chemically clean:

- No detectable soil by chemical analysis
- Water break free
- Camphor test

Microbiological clean:

- Any residue is insufficient to infect product contacting the clean surface

DEFINITIONS

- **Disinfectant:** A product used for its ability to kill specific micro-organisms, meeting specific standards of log reduction under specific conditions.
 - Used in a two-step process of cleaning followed by disinfecting.
- **Sanitizer:** A term associated with disinfection with different meanings around the world.
 - In South Africa generally used to describe personal hygiene products such as hand sanitizers.
- **Detergent disinfectant:** A product used in a single step process for cleaning and disinfecting.
 - Disinfecting efficacy depends on degree and type of surface soiling, as dirty surfaces cannot be effectively disinfected.





DEFINITIONS

CIP

- Cleaning in Place: cleaning and disinfecting processing plant interior surfaces without the need to dismantle, including vessels, pipework, valves, heat exchangers, centrifuges, fillers interiors etc

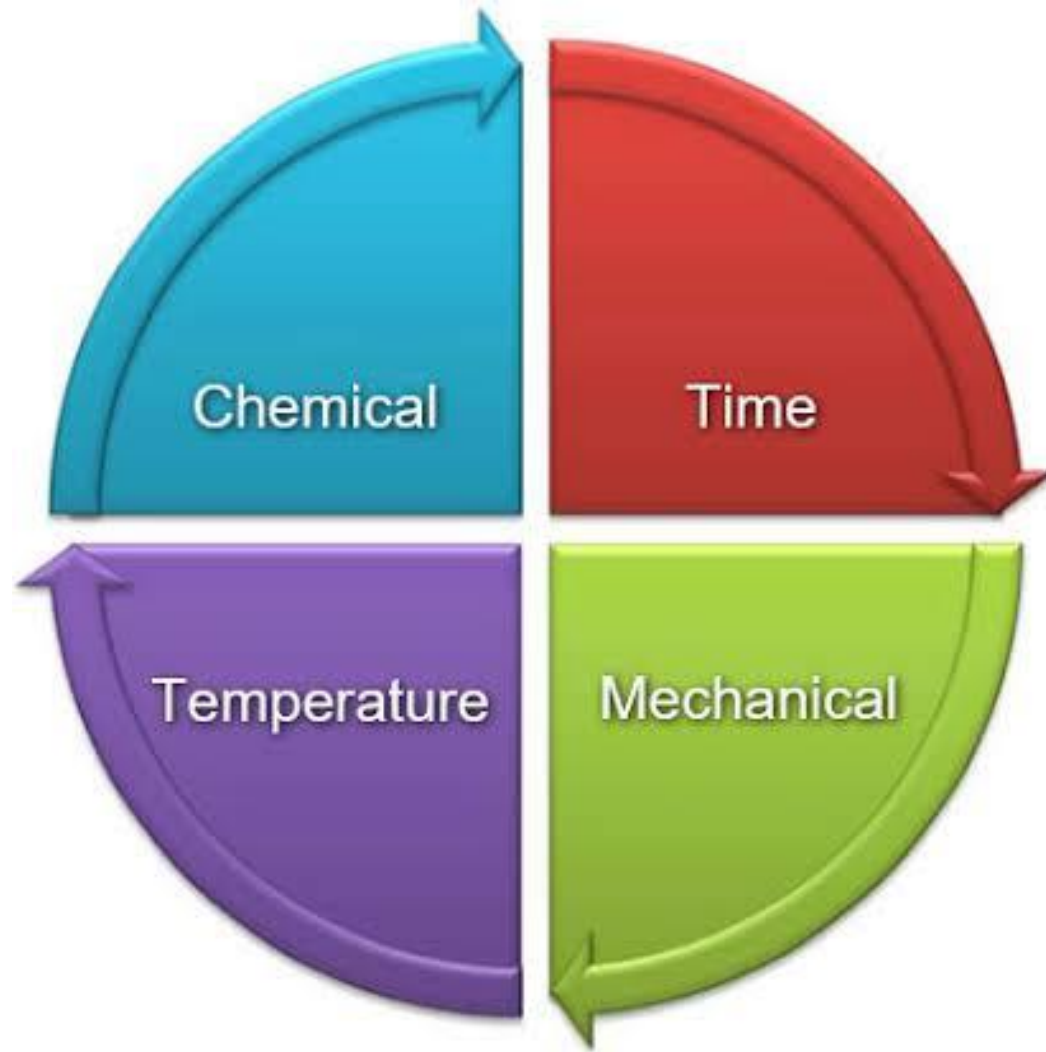
COP

- Cleaning out of Place traditionally involves stripping plant to component pieces and placing it in a tank of detergent which is circulated to provide mechanical action
- Disinfectant soak / storage tanks can fit in this category, and are used to disinfect parts after cleaning and store them in a process ready condition until next required

OPC

- Open Plant Cleaning: the process of cleaning and disinfecting plant exterior surfaces by spray, foam or manual cleaning
- EFC – Exterior filler cleaning is a subset of OPC usually specific to rotary fillers





FACTORS INFLUENCING CLEANING

● FACTORS INFLUENCING CLEANING

- All effective cleaning processes rely on a combination of 3 energy sources applied over time:
 - Mechanical energy
 - Chemical energy
 - Thermal energy

Cleaning Process	Energy source			Time
	Mechanical	Chemical	Thermal	
CIP	✓✓	✓✓✓	✓✓	✓✓
Foam	✓	✓✓		✓✓✓
High Pressure	✓✓✓✓	✓		✓
Steam Cleaning	✓✓		✓✓✓	✓



CHEMICAL SUPPLIER INSTRUCTIONS





● CHEMICAL SUPPLIER INSTRUCTION

- There is both information and instructions required of suppliers
 - Product composition and efficacy information
 - Safe storage and usage of products information
 - Collaboration on the development of Standard Operating Procedures for cleaning and disinfection
- All cleaning and disinfection processes must be covered by detailed SOP's (Standard Operating Procedures) generally developed by the user and supplier detailing:
 - Frequency of cleaning
 - Frequency of disinfection including during periods of plant inactivity
 - Requirements in preparation for cleaning
 - A detailed cleaning program including for each step:
 - Post cleaning requirements (visual inspection, final rinse water analysis etc.)
 - Completion of cleaning records and record of any unusual events

VERIFICATION THROUGH COLOUR CHANGING TECHNOLOGY



**EFFICIENCY AND
EFFECTIVENESS OF
CLEANING**

If a surface is area is not clean, colour change technology will show the contaminated area

● CIP MANAGEMENT

● CIP can be classified as effective and efficient:

- Effective = After CIP the plant is clean, sanitary and process ready.
- Efficient = the plant is clean and process ready at a reasonable cost (utilities, chemistry, time)

● Key factors for effective CIP

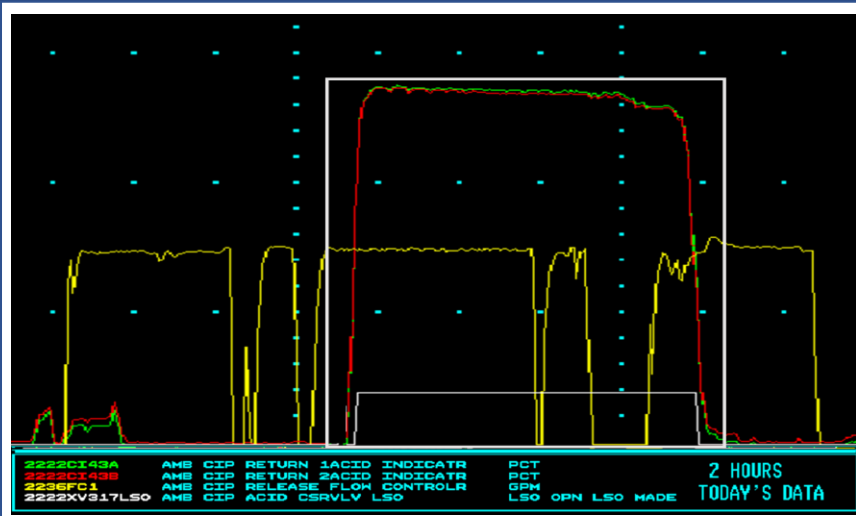
- Correct programs usually combining pre rinse, detergent wash post rinse, disinfection and final rinse steps if applicable. They may have multiple detergent steps if the soils are complex
- Correct flow rate and pressure for the plant item being cleaned, creating mechanical action
- Correct detergent chemistry for the soil and disinfectant selection for the application
- Correct temperatures for optimum cleaning
- Correct program times for detergent action, effective rinsing and disinfection



● CIP MANAGEMENT

● Key factors for efficient CIP

- Minimizing the losses of chemistry, water and thermal energy
- Most losses occur during phase changes (e.g., rinse water to detergent) as program steps change
- Minimizing losses depends on creating sharp interfaces between phases
- Creating specific steps in the CIP program to manage these interfaces is critical
- Efficient CIP would be characterized by:
 - Line CIP: loss of 6 - 10% of circuit volume (1000 L circuit at 2% = 1.2 L to 2 L concentrate)
 - Vessel CIP: loss 15 - 20 % of circuit volume (1000 L circuit at 2% = 3 L to 4 L concentrate)
- Efficient CIP interfaces have very characteristic conductivity signatures making them easy to monitor



● CIP MANAGEMENT

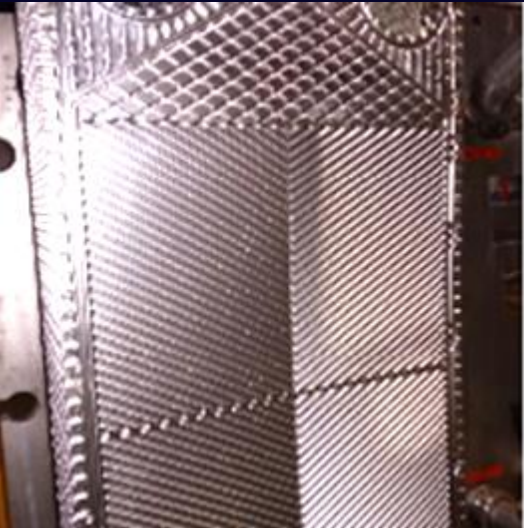
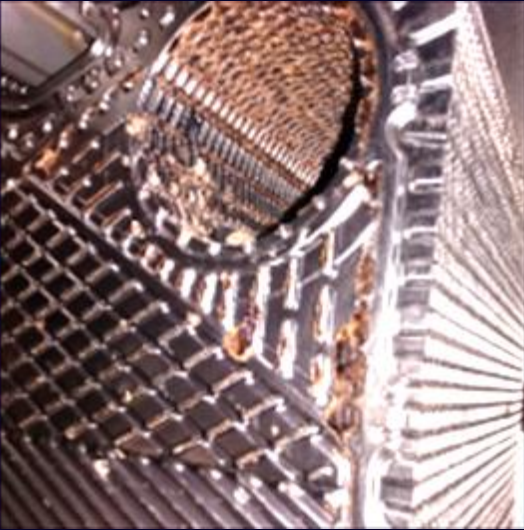
● Ineffective CIP Actions

- Check program operation with original protocol
- Check operation of CIP object, blockages, leaks, malfunctions
- Check for changes in manufacturing protocol impacting soils
- Check times, temperatures, flow rates, concentrations
- Check instrumentation
- Use data to resolve the issue

● Inefficient CIP Actions

- Check program operation with original protocol
- Check interface management steps and any changes to object configuration.
- Check water volumes, chemical concentration and usage, and energy usage, against original protocol.
- Check chemical recovery efficiency
- Check rinse endpoints
- Use the data to resolve the issue





● CLEANING AND DISINFECTION VALIDATION

● CIP

- Traditional CIP validation methods are:
 - Systems integrated into CIP control, recording and comparing key CIP parameters
 - Visual inspection: problematic as it breaks the post disinfection security, but satisfactory if it is performed before the final disinfection process
 - Microbiological swabbing and ATP testing
 - Sampling final rinsing from CIP cleans for microbiological testing
 - Colourmetric detergent technologies with colour change from soiled to clean during CIP

● Exterior cleaning

- Traditional visual inspection techniques with strong light sources
- Tradition swabbing techniques
- Use of dye techniques to clarify “shadow” areas and general cleanliness on automatically cleaned items like fillers

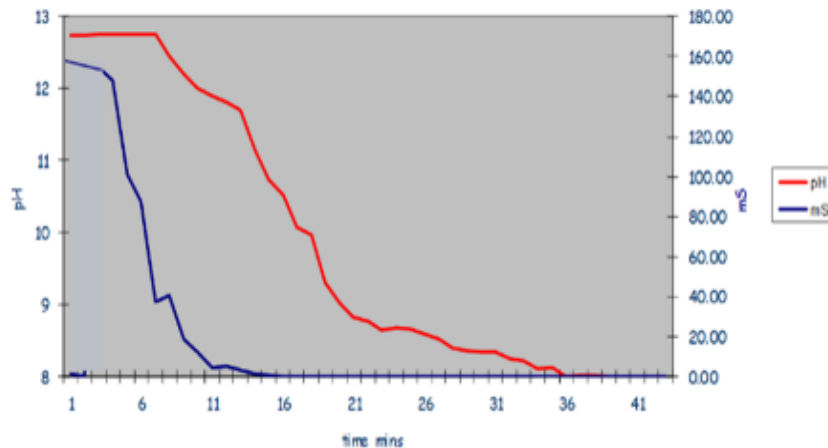
VERIFICATION OF RINSE WATER



● VERIFICATION OF RINSE WATER

- All rinsing steps must have a defined terminator that is not based on time
- Pre rinsing may use recovered water and its end point is usually managed on time or volume but is based of measuring the soil being removed
- Post rinsing is typically removing acid or alkaline detergent residues and is usually managed on conductivity
- Conductivity is a poor indicator of concentration at low levels and managing on time or volume, based on pH is much more effective

post alkali & final rinse pH and conductivity



● VERIFICATION OF RINSE WATER

● Microbiological quality of rinse water is important:

- Pre rinses are generally performed with recovered water, where possible
- Post detergent rinses performed with potable water
- Microbiological and Biofilm risk





EQUIPMENT TO USE



● EQUIPMENT TO USE

- Assuming 4 key cleaning methods:
 - Manual cleaning
 - COP
 - CIP
 - OPC
- Manual cleaning – brushes, squeegees and scourers of synthetic materials, colour coded by usage area and carefully stored to prevent them becoming an infection source
- COP (Cleaning and disinfection out of place) – Traditional COP comprises placing stripped down equipment into tanks fitted with a recirculating pump
- Disinfection out of place is where cleaned parts and hoses are left to soak in a bath of disinfectant until next required is standard practice in many plants



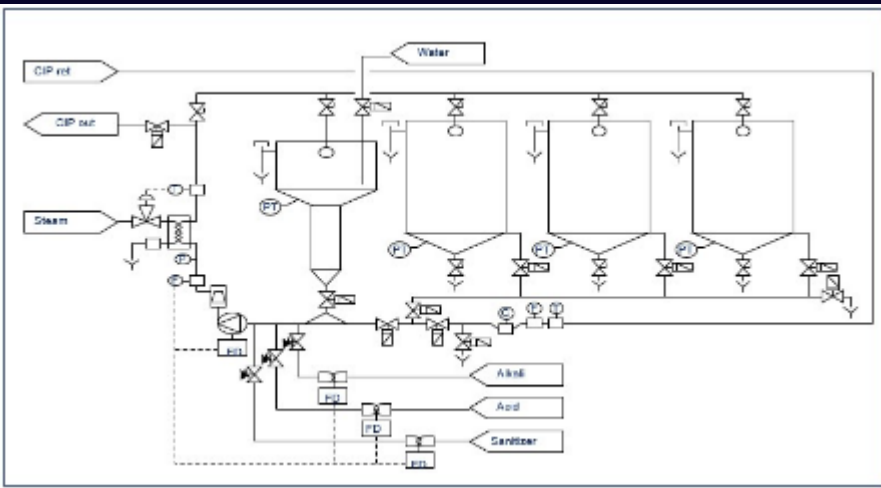
● EQUIPMENT TO USE

● CIP – there are two traditional CIP equipment styles:

- Single Use
- Recovery
- Assuming the correct parameters both will clean effectively.
- Perhaps the best systems available are hybrid systems that recover and store water and chemistry for reuse, but only take enough solution into a local circuit to clean the plant item

● OPC

- Most proprietary Foaming equipment works on similar principles injecting / venturi feeding chemical into a pressurized water supply and metering in air to create the foam

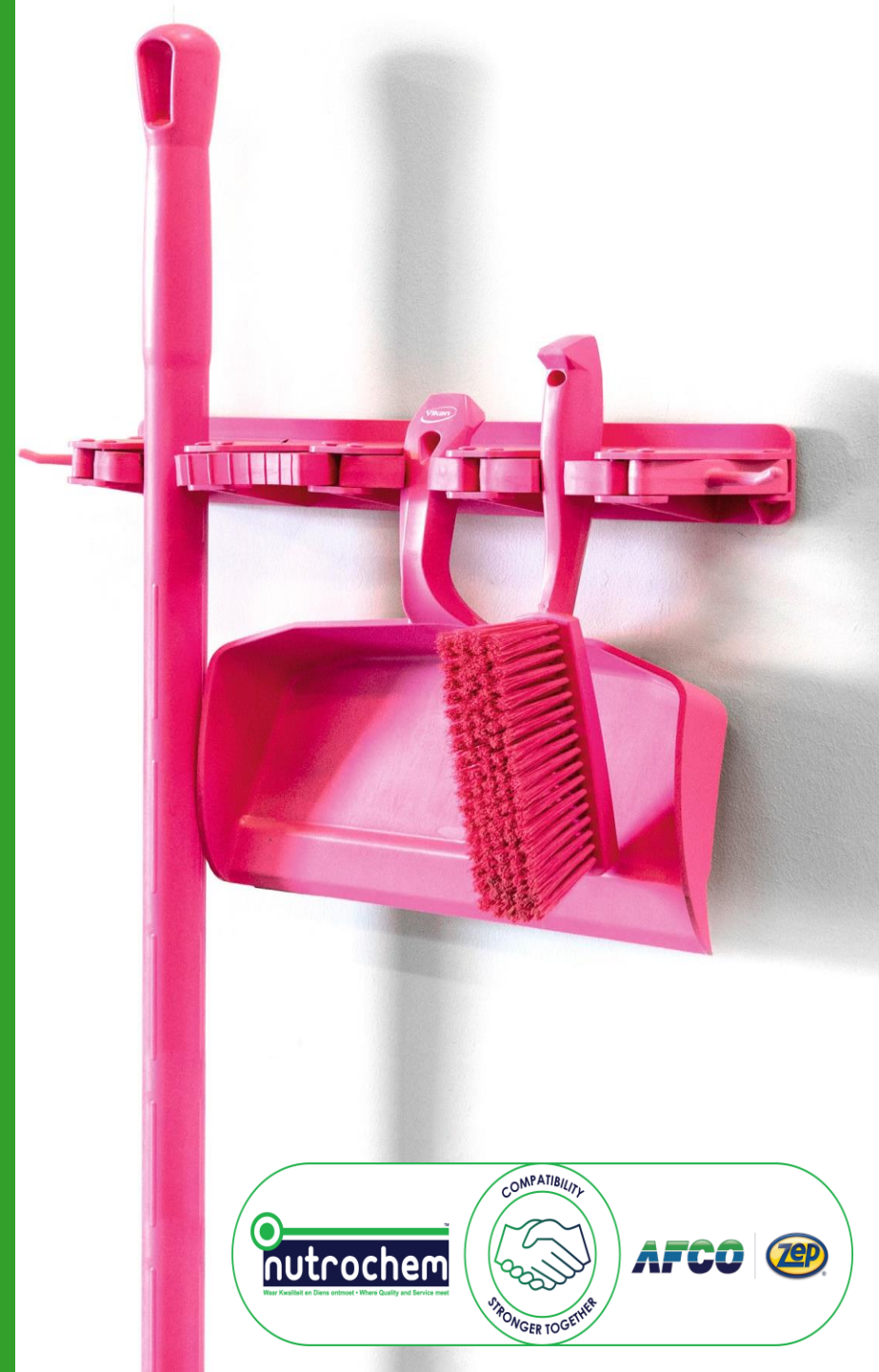


COLOUR-CODING AS PREVENTATIVE CONTROL



● THE ADVANTAGES OF COLOUR CODING

- Reduces the risk and cost of product rejection and recall as there is a lower risk of cross-contamination in your finished products
- A colour coding system is easy to understand and learn – irrespective of language skills
- Reduces the quantity of tools and equipment used in food production
- Help improve hygienic zone



● MAINTAINING THE INTEGRITY OF PROCESS-BASED HYGIENIC ZONES

Every year, Listeria and Salmonella cross-contamination incidences are significantly responsible for food illness outbreaks and food recalls globally



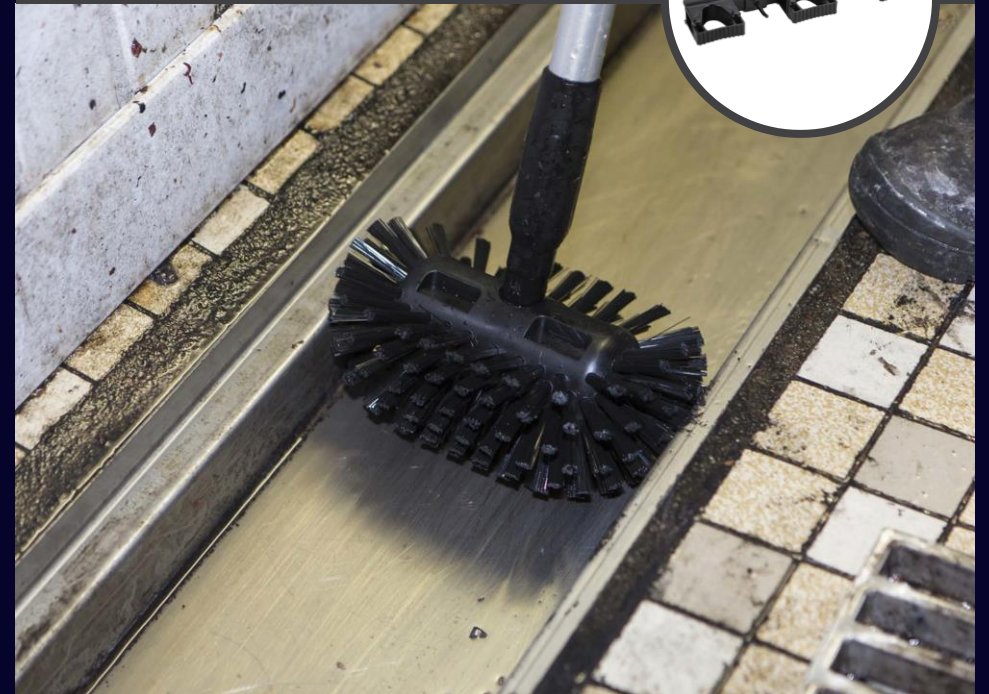
● TOOLS FOR ENVIRONMENTAL SURFACES

Food-contact (FCS) tools must not be mixed with non-food contact (NFCs) tools and hence must be identified and stored separately

FOOD TANKS



DRAINS



🎯 COMMUNICATE USING A COLOUR-CODING PLAN

Colour-coding plan for tools used

Colour Scheme	Area/Zone/Process	Key Comments
Red	Receiving, Storage and Mixing Areas	Medium-Risk Zone
Blue	RTE	High-Risk Zone
Black	Floors and Drains	At Medium and High-Risk Zones
Lime	Allergen Zone	When dealing with Soy at RTE at Food-Contact Zones
Gray	Warehouse and Corridors	Low-Risk Zone



COLOUR CODING TIPS

KEEP IT SIMPLE

**COMMUNICATE THE
PLAN**

BE CONSISTENT

COLOUR CODING CHEMICALS

Colour	Chemical Type	pH Range
Purple	Highly Alkaline / caustic-based products	11-14
Brown	Alkaline products	9-11
Green	Neutral products	5-9
Red	Acidic products	1-5
Yellow	Chlorinated products	Chlorine
Blue	Disinfectants	Neutral Disinfectants

- The most hazardous nature of the product will dictate the colour code
- The chemical storage area should be well lit and ventilated and clearly demarcated
- All acidic products should be isolated from chlorinated, alkaline and neutral product
- Oxidising agents should be stored away from organic material such as wood and cardboard



IN CLOSING...



nutrochem
Wear Kwikfil on Stars and Stripes • Where Quality and Service meet



COMPATIBILITY
STRONGER TOGETHER



AFCO



Zep

🎯 ROLE OF THE CHEMICAL SUPPLIER

🎯 Holistic - After Sales Support

- Committed People
- Customer Partner Programming
- Sharing Global Technology & Trends
- **24/7** - Trouble Shooting
- Supply Product On Time Every time

🎯 Drive Standards with **Industry** Application Knowledge

- Training
- Monitoring Results
- Record Keeping

🎯 Health & Safety Conscious





Big Thank You to all participants
and Food Focus for setting up the
webinar





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are just getting started.

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Questions & Answers

THANK YOU
FOR JOINING US



foodfocus
THE RIGHT WAY

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