

OxypHresh15 is a food grade sanitizer used in the dairy, food and beverage processing industry for CIP pipeline cleaning and fruit and vegetable washing and sanitizing. (EPA Number 63838-2)

ADVANTAGES

- Pathogen inhibition and reduction
- Stability under high organic loads
- Organic ingredients

TYPICAL PROPERTIES

- Appearance – Clear liquid
- Odor – Acrid, vinegar-like
- pH – <1
- Density – 9.47 lb. per gal. at 20°C

APPLICATIONS

Fruit and vegetable wash

SHELF LIFE

At least 1 year without notable losses of active oxygen if stored properly

HANDLING & STORAGE

Do not store at temperatures above 86° F

REGULATORY

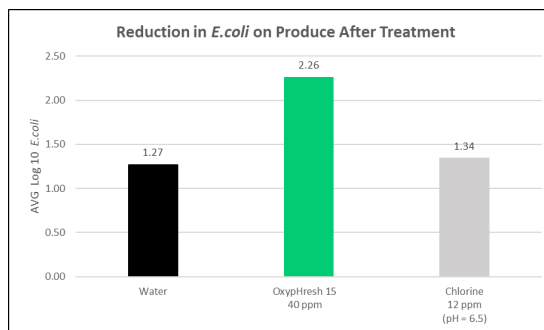
Safe under most conditions. Please refer to SDS.

The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of product evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. Such testing has not necessarily been done by CMS Technology, Inc. ("CMS"). The facts, recommendations and suggestions herein stated are believed to be reliable; however, no guaranty or warranty of their accuracy is made. EXCEPT AS STATED THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS, OR OTHERWISE. CMS SHALL NOT BE HELD LIABLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES. Any statement inconsistent herewith is not authorized and shall not bind CMS. Nothing herein shall be construed as a recommendation to use any product(s) in conflict with patents covering any material or its use. No license is implied or granted under the claims of any patent. Sales or use of all products are pursuant to Standard Terms and Conditions stated in CMS sales documents.



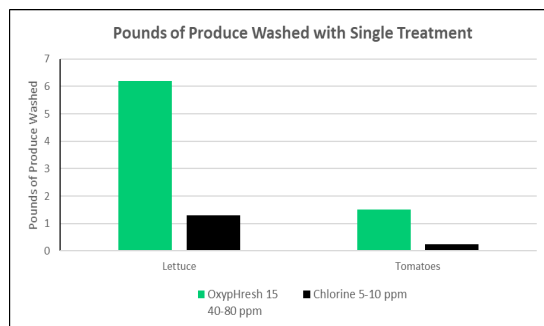
PATHOGEN REDUCTION

OxypHresh 15 is more effective at reducing *E. coli* and other pathogens in the wash water and on the surface of produce



TREATMENT CAPACITY

OxypHresh 15 is not depleted by high organic loads and can wash up to 6X more material without redosing



PROTECTING
BRANDS by
PROTECTING
LIVES

OxypHresh LP 15 is a food grade sanitizer used in the dairy, food and beverage processing industry for CIP pipeline cleaning and fruit and vegetable washing and sanitizing.

ADVANTAGES

- Pathogen inhibition and reduction
- Stability under high organic load
- Superior appearance and shelf life
- Organic ingredients

TYPICAL PROPERTIES

- Appearance – Clear liquid
- Odor – Acrid, vinegar-like
- pH – <1
- Density – 9.47 lb. per gal. at 20°C

APPLICATIONS

Fruit and vegetable wash

SHELF LIFE

At least 1 year without notable losses of active oxygen if stored properly

HANDLING & STORAGE

Do not store at temperatures above 86° F

REGULATORY

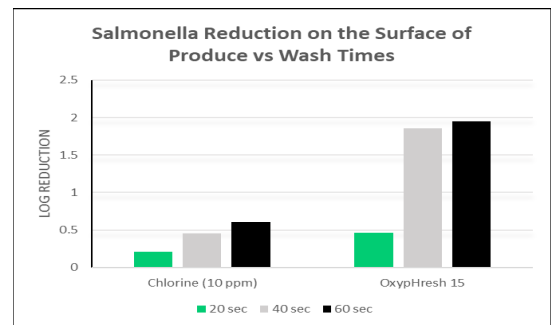
Safe under most conditions. Please refer to SDS.

The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of product evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. Such testing has not necessarily been done by CMS Technology, Inc. ("CMS"). The facts, recommendations and suggestions herein stated are believed to be reliable; however, no guaranty or warranty of their accuracy is made. EXCEPT AS STATED THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS, OR OTHERWISE. CMS SHALL NOT BE HELD LIA BLE FOR SPECIAL, INCIDENTAL, CONSEQUENTIAL OR EXEMPLARY DAMAGES. Any statement inconsistent herewith is not authorized and shall not bind CMS. Nothing herein shall be construed as a recommendation to use any product(s) in conflict with patents covering any material or its use. No license is implied or granted under the claims of any patent. Sales or use of all products are pursuant to Standard Terms and Conditions stated in CMS sales documents.



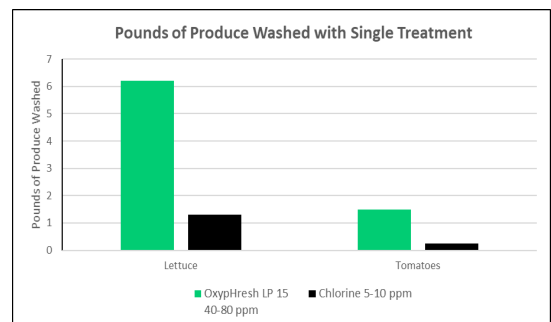
PATHOGEN REDUCTION

OxypHresh LP 15 is more effective at reducing *Salmonella* and *E. coli* in the wash water and on the surface of produce



TREATMENT CAPACITY

OxypHresh LP 15 is not depleted by high organic loads and can wash up to 6X more produce without redosing



PROTECTING
BRANDS by
PROTECTING
LIVES

Validation of Oxyphresh 15 in Commercial Processing of Mixed Bagged Salads

Objective. Validate efficacy and shelf life performance of Oxyphresh 15 (PAA) delivered and controlled utilizing the CMS D3S application system. It was compared to chlorine delivered and controlled via an in-house system.

Summary of Results. Oxyphresh 15 in combination with the D3S delivery system provided better concentration and pH control vs chlorine. Both treatments provided similar microbial reductions in APC and EB. Oxyphresh 15 demonstrated a significantly higher (2 log) reduction in Coliforms. Oxyphresh 15 performed well in 21-day shelf life testing with less purge, browning and decay vs chlorine.

Produce types:

Mixed bagged salads that included carrots and cabbage with iceberg or Romaine lettuce. Several mixed slaws were also tested.

CMS D3S:

Fully automated distribution and control system which pre-blends PAA and caustic to achieve PAA concentrations of 60-80 ppm at a pH of 9.0-9.5

Process Conditions:

Triple washed
13,000 lb./hr.

Chlorine system :

Calcium carbonate pretreated city water injected with Chlorine gas and pH adjusted (6.5-7) with citric acid.

Sample Collection:

Pre-wash
Post final wash
Finished bagged product

Process Parameters :

	Target Concentration		Target pH	
	Chlorine	Oxyphresh 15	Chlorine	Oxyphresh 15
Flume 1	40	60	6.5	9.0
Flume 2	60	60	6.5	9.0
Flume 3	80	60	6.5	9.0

Micro:

Eb, Coliforms, E. Coli
Shelf life 7,10,14 days

Concentrations measured every hour using Kemio water analyzer (Palintest)



Concentration Control. Oxyphresh 15 delivered via the D3s system showed a consistent concentration. The lower control limits of chlorine were below zero indicating a potential risk of cross contamination.

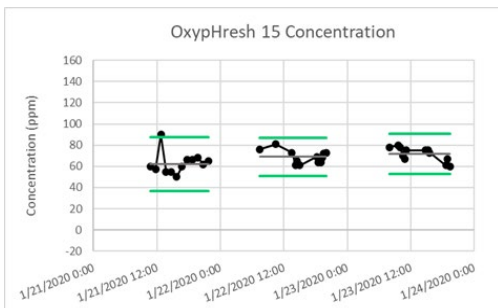


Figure 1. Oxyphresh 15 in flume 3 concentration with mean, UCL, LCL in Flume 1 over three-day production scale trial

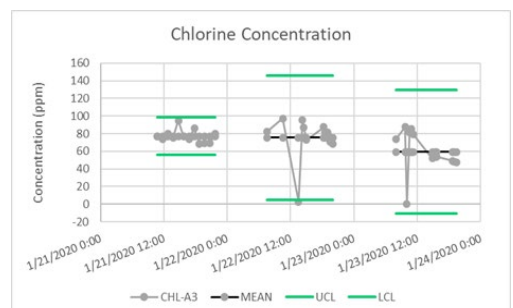


Figure 2. Chlorine concentration in flume 3 with mean, UCL, LCL in Flume 1 over three-day production scale trial

Validation of OxypHresh 15 in Commercial Processing of Mixed Bagged Salads

Microbial Reductions. APC, EB and coliforms were tested pre and post treatments and reductions in the pathogens were calculated (figure 7). Chlorine and OxypHresh 15 showed +1.5 log reductions in APC and EB. OxypHresh 15 showed a significantly higher 2-log reduction in *Coliforms* vs Chlorine. Figure 8 shows the coliform reduction vs the concentration in each wash point. OxypHresh 15 demonstrated a very consistent concentration across all wash areas allowing for maximum reduction.

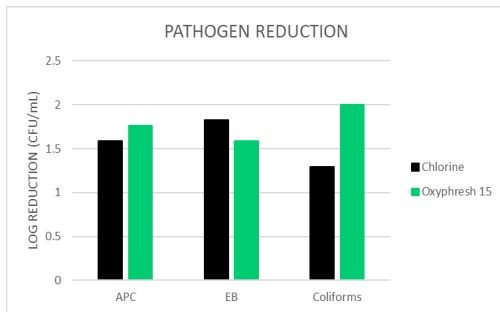


Figure 7. Pathogen reduction on bagged salad treated with Chlorine and OxypHresh 15

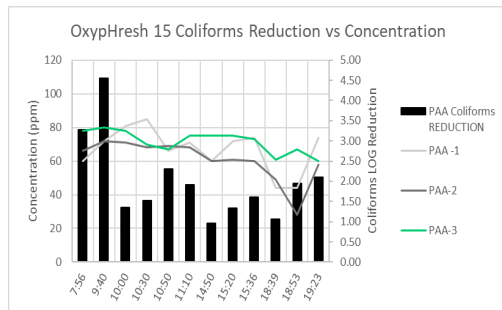


Figure 8. Coliform reduction vs concentration in triple wash application system for OxypHresh 15

Shelf Life. APC, EB and coliforms were measured for the mix bagged salads at 7, 14 and 21 days. Chlorine and OxypHresh 15 showed similar APC and EB results. The coliforms for OxypHresh 15 remained significantly lower through day 14. At day 21 the coliforms were similar for Chlorine and OxypHresh 15. In a sensory evaluation the bagged mixes treated with OxypHresh 15 showed less purge, browning and decay vs chlorine.

