

New Pasteurizer Treatment Program Allows Warranty Coverage for Polypropylene Mat Top Belts In Brewery Pasteurizers....and It's Green and Sustainable.

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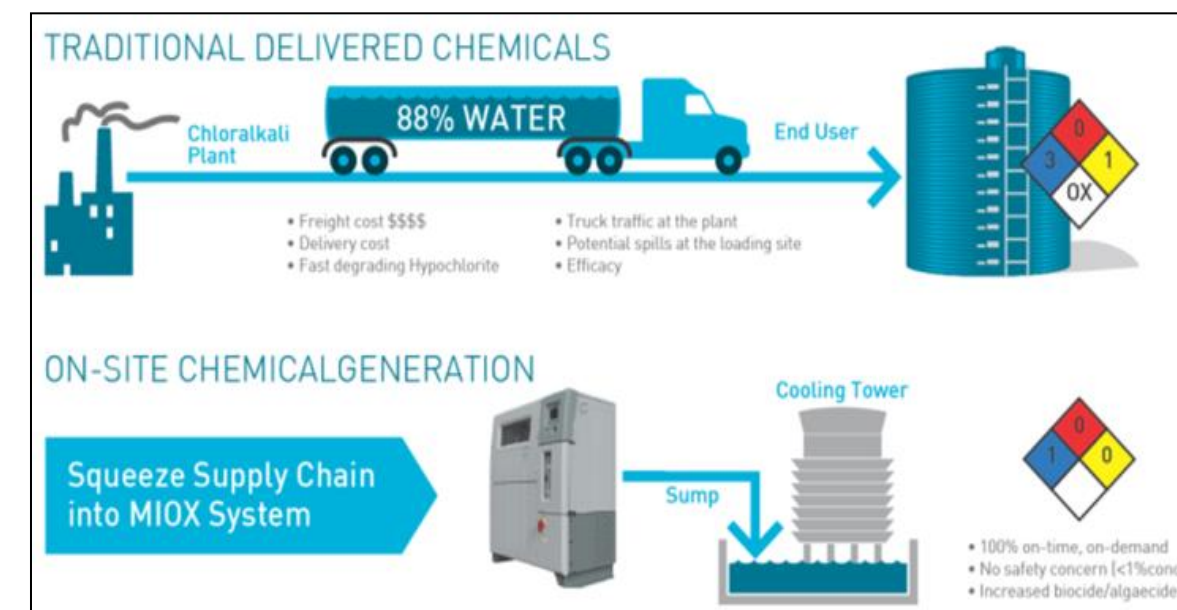
Abstract

For many years, tunnel type pasteurizers have been treated with a program consisting of liquid sodium hypochlorite and sodium bromide for primary biological growth control, along with phosphate/polymer corrosion and deposit inhibitors. While this program produced clean pasteurizers, the recent reduction in water usage has resulted in increased feed of commercial bleach and bromide to overcome the retention of any organic compounds in the pasteurizer water. These higher chemical feed rates have been linked to premature failure of numerous polypropylene mat top belts in many US breweries. In addition, new restrictions on phosphate residuals in the brewery effluent have dictated the use of nonphosphorous corrosion inhibitor technology. To overcome these obstacles, ChemTreat, in conjunction with Design Controls and MIOX®, developed a new treatment approach where a mixed oxidant solution (MIOX®) is generated on-site using a salt solution and DC electrical current for a variety of oxidant species, then delivered directly to the pasteurizer water. This mixed oxidant solution is much more effective (0.5-1.0 ppm as free chlorine) compared to the previous NaOCl :NaBr solution where 3.0-5.0 ppm as free halogen was required to maintain water and vapor area pasteurizer cleanliness. In conjunction with the MIOX® solution, a proprietary inhibitor formulation, FlexPro™ CL that contains no phosphorous compounds is added for corrosion and deposit control as well as can spotting and staining prevention. Bottle crown rust minimization is also a feature of the inhibitor program. The lower free halogen residuals and phosphate-free inhibitor combination allows warranty coverage of the polypropylene mat top belts, and is less corrosive to pasteurizer metallurgy compared to the previous industry standard treatment programs. This poster details the specifics of the treatment program and summarizes its advantages for long term operation and pasteurizer belt life expectancy.

MIOX® Process Flow



MOS Process



Demonstration Findings

- Over a two-month period, MOS solution cleaned up a very dirty pasteurizer.
- This was accomplished with lower ppm residuals, <1.0 ppm with MOS versus >3.0 ppm with bleach/bromine.
- Operations noted there were no odor complaints regarding the pasteurizer for the duration of the trial.
- MOS generator was safer and easier to operate than bleach/bromine system since salt was the only material handled.
- As system cleaned up, it stayed clean. Previous system started getting dirty from start up.

Pasteurizer Demonstration Test

MOS Generation System with Brine and MOS Tank



MOS Feed Skid with Free Cl2 Controller and Zone Delivery Pump



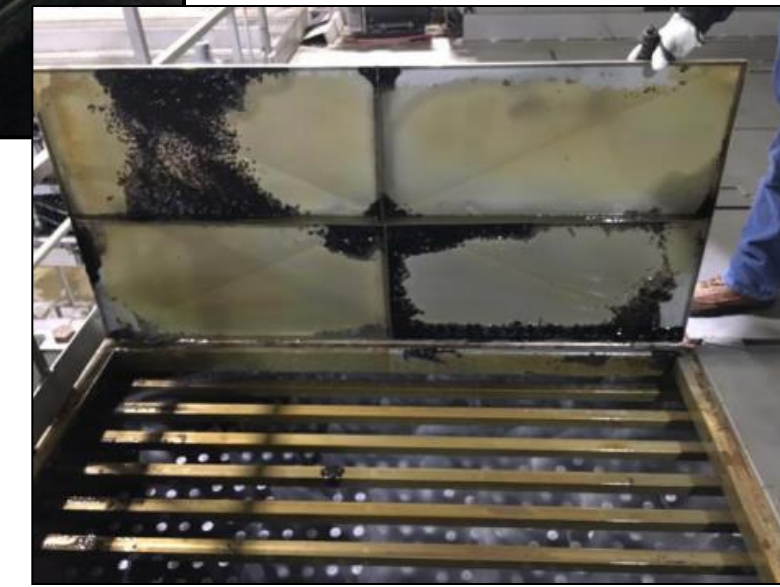
Where: Major brewery on the East Coast of U.S.
When: December 2015–January 2016
Pasteurizer: KHS pasteurizer, estimated volume: 18,000 gallons of water
Type: Bottle Line
Source H₂O: Plant reclaim water
Zones: 12
Replaced: 20:1 Bleach/Bromine Solution
MOS System: AE8 MOS Generator, 8 ppd F.A.H. Unit

Deck Lid/Spray Bar Photos: Before

Deck Lid Before



Cleaning Up



Spray Bar Before



Deposition

Cleaning Up



Comparison Photos

Before Miox 12-9-2015



With Miox 1-6-2016



Back on bleach/bromine 6-14-2016



Halogen Residuals Before and During Trial

Zone	12/10/2015		01/06/2016		01/26/2016	
	Free	Total	Free	Total	Free	Total
Z-1	2.6	3.8	0.04	0.44	0.10	0.62
Z-2	1.8	5.2	0.14	3.2	0.25	2.8
Z-3	2.2	8.3	0.81	8.1	0.21	6.9
Z-4	1.7	6.7	0.63	5.8	0.29	2.8
Z-5	0.50	1.4	0.12	0.35	0.19	0.5

FlexPro™ CL Deposit-Corrosion Inhibitor Program

- FlexPro™ CL inhibitor: Provides exceptional mineral and metal oxide deposit prevention.
- Contains no phosphates and provides exceptional fouling control in brewery pasteurizers.
- Significant reduction in halogen demand results in lower chlorine consumption in the pasteurizer.
- Truly Green technology to meet environmental regulations.

Water Savings

- Safer since hazardous chemical are no longer handled.
- More cost-effective since able to maintain cleaner systems with lower halogen levels and salt is the primary chemical used.
- Cleaner system means pasteurizer can go longer between boilouts: reduced maintenance.
- Fewer cleanings = water savings.
- Increased Mat top belt life: since we were able to maintain a clean pasteurizer with a lower ppm residual, lowered the risk of belt damage and corrosion resulting from high chlorine/bromine residuals.
- Results seen were achieved with an 8 ppd generator.

Water Savings	
Pasteurizer Makeup Water Savings / Day	Negligible
Halogen Skid Water Savings / Day / Past.	2,659 gal.
MIOX Skid Water Use / Day	- 259 gal.
Total Water Savings / Day for Line 72	2,400 gal.
Run Days / Year	300 days
Total Water Savings / Year for Line 72	720,000 gal.
Number of Operating Pasteurizers	6 past.
Total Gallons / Year of Water Savings	4,320,000/year

Summary of Program Benefits

- MOS generation produces a purer form of halogen which has no sodium hydroxide. Sodium hydroxide drives up pH, which can exacerbate dome staining, can spotting, and crown rusting.
- MOS is a superior halogen with the ability to maintain cleaner pasteurizers, requiring less maintenance and less water. No medicinal odors around the pasteurizer.
- MOS uses less water to treat than bleach/bromine systems, is less aggressive, and will support maximum equipment life.
- Eliminates premature belt failure resulting from high halogen residuals.
- Eliminates the transport, delivery, storage and handling of two hazardous chemicals, bleach and bromine. FlexPro™ CL offers numerous advantages over conventional phosphate-polymer treatment programs.
- Program offers return of belt warranty coverage for most new belt installations.