



Improved Filter Plant Cleaning with PEROXEGEN™ H₂O₂ Water Treatment System

PeroxEgen:

- Simultaneously produces caustic cleansers containing H₂O₂
- Removes organic foulants and microbial growth from filter membrane surfaces and restores membrane permeability
- Eliminates surfactants from the cleanser, representing significant cost savings
- Requires only water, air and electricity

Cleaning filter plants used in the dairy industry is time-consuming and costly. Yet, it's necessary to clean and disinfect filters, tanks, pipes and other process equipment every day by working through a series of caustic and acid flushes, followed by microbial disinfectant treatment. Typically, the holdup volumes of large filter plants are as much as 2,000 gallons, requiring a significant investment in filter plant maintenance.

Cleaning solutions are prepared from chemical concentrates (acids, caustics, surfactants, and a disinfectant) that are hazardous to handle, can be expensive, and might be harsh on filter membranes, reducing membrane life. Those solutions might not provide complete removal of foulants, which leads to higher membrane replacement costs and equipment down time. The spent cleansers often have high biological oxygen demand (BOD) and must be treated prior to discharge. Additionally, evolving regulations relevant to the discharge of chlorine residuals and harmful chlorinated byproducts are driving the need for a cost-effective replacement for chlorine.

Reduce Cost, Increase Performance

PeroxEgen, a turn-key, mobile electrolytic technology available from Eltron Water Systems, generates H₂O₂ on-site for a variety of water treatment, advanced oxidation, and cleansing applications. PeroxEgen requires only water, air, and electricity as consumables for water treatment and allows pH to be controlled for a variety of applications. PeroxEgen can be operated in flow-through mode for direct treatment at low H₂O₂ concentrations (<100 mg/L) or in batch mode, recirculating H₂O₂ to build up higher concentrations. Unlike bulk catalytic production methods, Eltron's electrolytic process is virtually insensitive to temperature.

Eltron Water Systems has developed a cleanser production system incorporating PeroxEgen that simultaneously produces caustic cleansers containing H₂O₂ for



about 1/5th the cost of leading high-performance cleansers. Several of the cost, performance, and safety issues associated with cleaning filter plants can be alleviated by cleansers produced by the PeroxEgen system.

In addition to water, air and electricity, the only consumables are benign electrolyte salts that deliver the proper acid and caustic compositions, pH balance and higher H₂O₂ concentrations. PeroxEgen scales to fit varying applications and can be interfaced with a clean-in-place (CIP) distribution system. In addition to being approved by the FDA, the cleansers are compatible with stainless steel process equipment and are safe to use on filter membranes. An additional benefit is that the organic material destruction by H₂O₂ and oxygen evolved from H₂O₂ greatly reduce BOD in discharge streams.

PeroxEgen cleanser solutions containing 300–500 mg/L H₂O₂ at pH 11.5–11.8 are extremely effective in removing organic foulants and microbial growth from filter membrane surfaces and restoring membrane permeability, without using surfactants. Eliminating surfactants from the cleanser represents a significant cost savings.

Maintaining high filter throughput is crucial to process efficiency. Typically, whey solutions are concentrated from about 5%–35% solids using ultrafiltration each day, followed by filter plant cleaning prior to the next filtration cycle. In a pilot ultrafiltration system simulating this process, PeroxEgen proved to be far superior in maintaining membrane permeability compared to conventional cleansers. PeroxEgen-generated cleansers also control microbial growth very effectively. Biostatic conditions were maintained for at least five days after using the PeroxEgen cleansers in the ultrafiltration system on cheese whey inoculated with problematic bacterial, spore-forming, and thermophilic species (*Escherichia coli*, *Bacillus subtilis*, and *Bacillus cereus*) as well as unidentified background species.

Simplifying the Logistics of Handling H₂O₂

Current methods for generating H₂O₂ require large, centralized industrial facilities. H₂O₂ has to be distributed by truck or rail. Transportation, handling, and storing concentrated H₂O₂ (50%–75%) creates a number of hazards, and meeting the associated regulations imposes more capital investment. Distributing H₂O₂ to remote locations potentially creates significant liability for distributors and increases costs for isolated water treatment and environmental remediation operations. All of these issues are hurdles that have made H₂O₂ use less common or impractical. Eltron's PeroxEgen technology provides a different method for H₂O₂ delivery – at the point of use, simplifying the logistics, eliminating distribution costs, and minimizing hazards associated with handling and storage.

Contact us

To learn more about PeroxEgen and innovative water treatment systems from Eltron Water, visit www.eltronwater.com.

To discuss the possibility of entering into a business relationship with Eltron, contact the Business Development Group at business@eltronresearch.com.



Eltron Water Systems LLC

Eltron Water invents, develops and commercializes innovative, cost-effective water treatment systems that are valuable to industries, utilities, and government organizations.