

Pasteurized Equivalent Water
Hydro-Optic™ Technology

Replacing Thermal Pasteurization with Hydro-Optic™ UV Delivers Low Operating and Maintenance Costs for the Dairy Industry

Ultraviolet (UV) light has become a popular treatment for disinfection and pasteurization of process water in dairy plants because it is economical, environmentally friendly, and proven alternative to conventional chemical and thermal processes for inactivating microorganisms.

Unlike chemical biocides, UV treatment is a physical process that does not introduce a chemical residual into process water nor does it alter the chemical composition, taste, odor or pH.

This feature is especially important in the dairy industry where the chemical dosing of incoming process water can cause off-flavors and alter the chemical properties of the product.

Unlike thermal pasteurization with high electric, steam, and labor expenses, UV treatment is low in operating and maintenance costs. UV effectively treats process water on demand, minimizing the risk of costly production downtime, product recall, spoilage, and damage to brand equity.

Under the FDA Pasteurized Milk Ordinance (PMO) UV systems used to create pasteurized equivalent water must meet minimum dose requirements at all times and continuously measure lamp energy with the use of UV intensity sensors.

Atlantium's Hydro-Optic™ (HOD) UV system performs better than the FDA PMO requirements by measuring critical parameters in real-time to maintain the minimum required UV dose.

The parameters measured include:

- %UVT
- Flow rate
- UV lamp intensity (kW)

The HOD UV technology measures %UVT by connecting a UVT meter to the system controller and it employs a UV intensity sensor for each lamp. HOD UV is validated to FDA PMO and FSMA criteria for pasteurized equivalent water, coliform-free water, and COW water reuse.



The HOD UV system uses a proprietary Total Internal Reflection (TIR) based apparatus that when coupled with the comprehensive monitoring of critical parameters allows the system to achieve and maintain UV dose requirements. The patented TIR technology, which is similar to fiber optic science, recycles UV light energy within the HOD UV chamber (Figure 1).

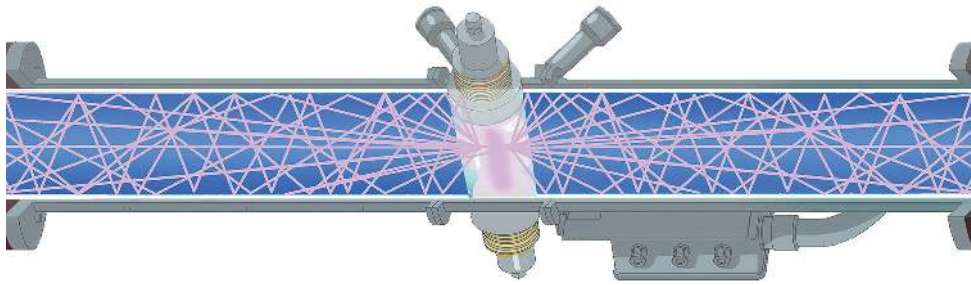


Figure 1. Atlantium Hydro-Optic™ UV Lamp and Chamber

Simply put, the UV wavelength is effectively lengthened (i.e., magnified) and provides a greater opportunity to inactivate microorganisms. The core of the technology is its water disinfection chamber made of high-quality quartz surrounded by an air block instead of traditional stainless steel. This configuration uses fiber optic principles to trap the UV light photons and recycle their light energy. The photons repeatedly bounce through the quartz surface back into the chamber, effectively increasing their paths and their opportunities to inactivate microbes.

Dairy Plant Replaces Thermal Pasteurization with HOD UV

A dairy plant replaced its conventional thermal pasteurization system with the HOD UV technology. A HOD UV system was installed to treat a capacity of 110 gpm (25 m³/hr). The system operates 12 hours per day over 300 days per year. Through the use of the HOD UV technology, the plant has significantly reduced its annual operating costs by more than \$60K.

HOD UV — A Proven Solution

- Atlantium has over 200 full compliance PMO/FSMA systems installed in dairies across the U.S. in the past 10 years.
- Every day, the HOD UV technology makes over 10 million gallons of PMO-compliant pasteurized equivalent water.
- The small footprint HOD UV technology is specially designed for energy efficiency — saving the dairy industry more than 30,000 KW per day — compared to heat pasteurization and guarantees complete microbial inactivation.
- Atlantium is the leader in UV measurement software that provides integrated PMO-compliant reporting to make it simple to verify PMO compliance. Atlantium's new Appendix T software continues this innovation and leadership.



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