PALL

Food and Beverage

Application Bulletin

Major Yogurt Producer Uses Pall Aria™ Ultrafiltration System for Product Protection and Reduced Operating Expenses

Overview

Modern yogurt production typically demands large volume continuous processing with critical attention to product quality. The product flow is controlled from the milk receipt in the pre-treatment section to the final packaging of the yogurt. In most cases, yogurt production takes place under aseptic conditions, using aseptic tanks that are permanently pressurized with sterile air, remote-controlled aseptic valves, aseptic metering devices for ingredients and aseptic filling machines. These components minimize airborne microorganisms that may infect products and the process surfaces they are in contact with.

The quality of water used directly in contact with the product and process surfaces is just as critical. The goal of the user is to have water that is optically clear, soft and sterile, free from color, tastes and odors and which meets local drinking water regulations.

Pall Aria ultrafiltration membrane systems are capable of retaining particles, bacteria, protozoa, certain viruses and large organic molecules such as colloids, proteins and pyrogens. Fully automated operation ensures consistent, reliable and predictable performances with minimal maintenance.

The benefits of Pall Aria ultrafiltration hollow fiber membranes come from their ability to be backwashed and air-scrubbed to enable an in-use life typically greater than three years. During the life of the membranes the only consumable costs are those linked to providing power to the pumps on the system and to the sanitizing reagent used in the backwashing. Both consumables are minimal expenses, much lower than the replacement costs associated with the traditional choice of disposable filter cartridges.

The Challenge

One subsidiary of a major global yogurt producer is located in an area susceptible to intermittent microbial contamination in municipal water. When the water is used for flushing yogurt in the process, product protection is a concern. Microbial contamination in the acidic environment could induce off flavors, whey separation and subsequent product losses. The customer water requirements were to maintain less than 100 CFU/mL total plate counts and be capable of accommodating usage rates of 40562 m^3/year (~10 million US gallons/year) for 300 days/year and 20h/day, including instantaneous peak flow requirements of 36.5 m^3/h (9600 gph), five times a day.

Initial plans were to install large capacity disposable particle pre-filters and sterilizing disposable filters at each point of use. The final filter ratings were considered sufficient to achieve the requested water quality. Trial work conducted on site indicated a biannual replacement frequency with a significant impact on operational costs (filter purchasing, downtime, maintenance etc).

The Solution

Pall offered a 6 m^3/h (1585 gph) ultrafiltration membrane system, with a three year warranty on the membranes.

The ultrafiltration system was composed of two ultrafiltration hollow fibre membranes with a MWCO of 80,000, thus able to provide a retention of moulds, yeasts, bacteria, bacteriophages and viruses.

The system surpassed the customer's original requirements for quality.

One centrally located filtration plant and buffer storage facility negated the requirement for a number of large capacity filters located at various point of use. The yearly operation costs per cubic meter of water produced (including consumption costs in energy, chemical as well as depreciation) were more than halved compared to the alternative disposable filter solution.

Consequently, the customer could save $ 0.86/m^3 ($0.003/gallon) water with Pall Aria ultrafiltration solution as opposed to the disposable filter solution, **which represented $34,883 US each year.**

The Benefits

All dairy producers, especially yogurt manufacturers can realize the benefits of Pall Aria ultrafiltration systems. Please contact Pall for details of local drinking water regulatory compliance.

Pall Aria Ultrafiltration system offers the following:

- High tolerance to suspended and variable solids loading.
- Uniform cross flow velocity prevents channeling (a cause of rapid fouling).
- Tight, smooth and uniform membrane structure prevents penetration of bacteria and colloidal suspended material.
- Virtual elimination of chemical cleaning. Reducing chemical costs, downtime and disposal costs.
- Fully automated operation ensuring consistent and reliable flux, predictable performance and minimal maintenance.
- Low circulation flow rates for minimal power consumption.
- Long service life.

In short, the system requires minimal operator intervention, offers significant reduction in operational costs and reduces the risk of product contamination and associated losses.

About Pall Corporation

Pall Corporation is the largest and most diverse filtration, separation, and purification company in the world. Pall serves the food and beverage industries with advanced membrane filtration technology and systems engineered for reliability and cost effectiveness. Membrane processes can concentrate products without heat, purify and clarify, selectively remove constituents, and minimize effluent. Our space-saving membrane filtration systems are easy to install, simple to use, and satisfy a wide range of filtration requirements – from removing particulates and spoilage microorganisms to providing high –quality air and gases.

50,000 m^3 is approximately 13 million US gallons
1 m^3 of water is approximately 264 US gallons

Alternate 1 = Disposable cartridge filtration
Alternate 2 = Pall Aria ultrafiltration system

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