



Pall Aria™ System opens new markets for fresh fruit and provides an environmentally friendly solution

Overview

The consumption of fresh apples and apple products is an ongoing trend driven by the introduction of new varieties, a growing and more diverse global population, rising incomes, active consumer lifestyles, and an increased awareness of the health benefits of fruit.

Preserving fruit quality after harvest is critically important in order to maximize yield, command higher market prices, and reduce economic losses due to decay. Additionally, with foodborne illnesses associated with fresh produce on the rise, best management practices do not end with the harvest.

Post-harvest techniques of handling, washing, sorting, grading, storage and transport are designed to minimize bruising of the apples, to prevent microbial entry and enzymatic browning of the fruit tissue. Reducing the bioburden load in the surrounding packinghouse environment, wash water, and on the fruit itself is of utmost importance in preventing apple decay and preserving its marketable value.

Water plays a key role in washing, grading and transporting the apples in flumes. Commonly drawn from municipal, surface or ground water supplies, it is used in large quantities, and equally large quantities are discharged to the environment or wastewater treatment facilities. Increasing need for water savings, and stricter regulatory standards for water quality are an increasing reality in many of today's production environments.

The Challenge

A fruit cooperative representing over 300 fruit growers provides 24,000 tons of fresh apples per year to wholesalers and grocery stores in several countries. They receive the fruit from surrounding farms, clean, grade, package, and prepare it for sale.

The fruit is handled in a sophisticated system to wash and sort it according to various grades, sizes and varieties. This process involves a gentle water transport and separation method, which avoids any mechanical damage to the fruit.

More stringent EC regulatory requirements for the quality of the water in contact with the fruit gave the cooperative the primary impetus to investigate better water treatment methods. A process-improving investigation was done to achieve economically viable product protection, which would enable them to access new markets.



Pall Aria AP System

The Solution

A **Pall Aria** AP 4/28 membrane filtration system was chosen to satisfy the customer's requirements.

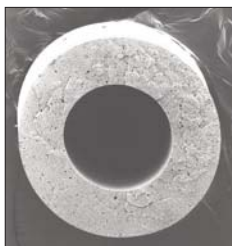
The system utilizes robust PVDF hollow fiber microfiltration membranes to retain virtually all suspended contaminants, while water and its soluble components pass through the membranes as filtrate. The retained solids are concentrated in a low volume waste stream that is discharged from the system, and a unique air scrubbing and flux maintenance process allows for uninterrupted performance and high yield characterized by over 98% recovery.

Downstream water quality is maintained, regardless of the variability of the feed water stream. At 0.1 micron the system can provide effluent quality far superior to traditional media filters. Typical filtrate turbidity achieved is < 0.1 NTU.

The 28-module fully automated system is installed on a 90 m³/hour (396 US gpm) continuous return water stream from the apple transport system, where it removes silt, sand, and debris and provides a purified effluent suitable for downstream treatment processes. The filtrate from the system is then combined with plant make-up water and brought back in a kidney loop to the beginning of the apple washing and transport system. Running 24 hours/day 250 days/year, the **Pall Aria** system forms an integral part of this plant's water conservation effort. The system is expandable for future use.



Module cutaway showing hollow fibers



Cross section of a hollow fiber membrane



Pall Aria AP System

Benefits

The **Pall Aria** water treatment system allowed this customer to access new markets by satisfying more stringent water quality regulations, and achieved an environmentally friendly solution for water management.

With this system, fresh produce suppliers can enjoy these benefits:

- Consistent and high effluent quality largely irrespective of raw water quality and turbidity spikes
- High process uptimes with minimal water losses due to efficient flux maintenance and mechanical cleaning
- Reduced waste and environmental impact due to long module life, and low energy and cleaning chemical consumption
- Operational simplicity due to low manpower and maintenance costs
- Easy integration into existing installations with a compact footprint and modular design
- Lowest cost of ownership for water treatment

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. Easy to install and simple to use, our systems satisfy a wide range of filtration requirements. Our Total Fluid Management approach offers customers solutions to address the needs of an entire process, encompassing filtration products, services, systems and training.



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Please contact Pall Corporation for product applicability to specific National legislation and/or Regional Regulatory requirements for water and food contact use.

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