

# FOCUS ON EMERGING TECHNOLOGY

## ADVANCED REVERSE OSMOSIS ELEMENTS

### Technology Description Art

Reverse Osmosis (RO) technology is used in the food processing industry, most commonly for processing whey and concentrating juice. RO systems use a series of filtration elements to remove excess water.

Current standard practices use “caged” elements with a polymer, net-like over-wrap to help maintain integrity and allow feed flow between the element and the housing needed to clean the space. That space can be excessive and reducing it can minimize the flow without impacting cleanliness. Reducing this flow results in lower energy demand. The current best practice technology, offered by several suppliers, uses a shell around the membrane element. This reduces the bypass flow and the energy needed for the process.

Optum elements, a technology introduced by Veolia Water Technologies & Solutions, advances the shell concept to help further reduce energy consumption. By using computational fluid dynamics, they created a sanitary exterior shape able to generate a small amount of local flow reversal near the surface of the shell. This reversal further limits flow bypassing the working parts of the element therefore reducing energy consumption.

### Benefits

1. Improved element scroll integrity helps maintain the required sanitary features.
2. Easier installation and removal process allows for faster reload and less down time.
3. Cost of the new technology is similar to currently available shell and caged elements.

### Customer Type

Food processing.

### Applications

Large scale Reverse Osmosis systems.

### Market Sectors

Industrial.

### Potential Energy Savings

A FOCUS ON ENERGY® measurement and verification study completed at a Wisconsin whey processor showed a 4.6% reduction in energy consumption across the entire RO system versus other shell elements (current best practice). A 10% reduction in energy consumption versus standard practice caged elements is expected.

### Potential Payback Range

One to three years pre-incentive.

### Incentives Available

Download and complete the [Custom Project Incentive Guide](#) [PDF] or [find an Energy Advisor](#) to get started.

#### REDUCING ENERGY WASTE ACROSS WISCONSIN

Focus on Energy, Wisconsin utilities' statewide program for energy efficiency and renewable energy, helps eligible residents and businesses save energy and money while protecting the environment. Focus on Energy information, resources, and financial incentives help to implement energy efficiency and renewable energy projects that otherwise would not be completed.

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