

Water Spirals Portfolio



Leadership in Filtration

**MANN +
HUMMEL**

Reverse Osmosis and Nanofiltration Elements Portfolio

Reverse osmosis (RO) is a membrane filtration technology that **removes particles larger than 0.0001 microns in size from a liquid**. This includes ions, such as sodium and chloride, as well as organic molecules, such as pesticides and herbicides. RO is used in a variety of applications, including water and wastewater treatment, food and beverage processing, and pharmaceutical manufacturing.

RO membranes are typically **made of thin-film composite (TFC) materials**. TFC membranes consist of a thin layer of polyamide on top of a support layer made of polysulfone or polyethersulfone. RO membranes are configured into modules that typically operate in crossflow where the feed liquid is pumped across the surface of the membrane. This creates a shear force that helps to prevent fouling of the membrane.

RO is a very effective technology for removing impurities from water.

RO KEY ADVANTAGES:

- Effective removal of dissolved solids
- Versatile - can be used in a variety of application
- Produces high-quality water
- Cost-effective technology when compared to thermal processes

MANN+HUMMEL Water & Membrane Solutions has a **wide portfolio of RO membranes that can cover different applications, sizes and configurations**. We can also produce **customized product** in accordance with specific requirements.



High Rejection Brackish Water RO Elements

Constructed using Thin-Film Composite Polyamide. The series of elements are certified with NSF/ ANSI Standard 61/ Halal, fits mostly for drinking application. Available in 2.5", 4" and 8" spiral wound design but also in several other size.

APPLICATIONS:

- Municipal drinking water
- Semiconductor
- Pharmaceutical
- Food and beverage
- Production of boiler feed water

PRODUCT OFFERINGS:

- OLTREMARE BR2 and BR3 series
- MICRODYN NADIR BW series

High Rejection, Low Energy Brackish Water RO Elements

One of a very unique membranes in the current market. Most ideal for high rejection combined with lower energy consumption. Can easily fits the requirement for newly design system and also retrofitted system. Available in 2.5", 4" and 8" spiral wound design but also in several other size.

APPLICATIONS:

- Treatment of ground, surface and wastewater
- High purity industrial applications
- Municipal wastewater reclamation

PRODUCT OFFERINGS:

- OLTREMARE LOW1, LOW2, LOW3, LOW4 and LOW7 series
- MICRODYN NADIR XLE, HRLE and XRLE series



Fouling Resistant Membranes

Highly focused toward the concerned in highly foulant feed water. These elements feature fouling resistant membrane. Available in 2.5", 4" and 8" spiral wound design but also in several other size.

APPLICATIONS:

- Wastewater with organic fouling potential
- Industrial wastewater treatment
- Municipal wastewater treatment

PRODUCT OFFERINGS:

- OLTREMARE FOUL1 and FOUL2 series
- MICRODYN NADIR FR series

High Rejection / High Productivity Sea Water RO Elements

Our High Rejection series of Seawater RO membranes is ideal for high salinity water purification and "High Rejection", meanwhile the High Production is ideal for a very "High Productivity" purposes. Both models are available in 2.5", 4" and 8" spiral wound design but also in several other size.

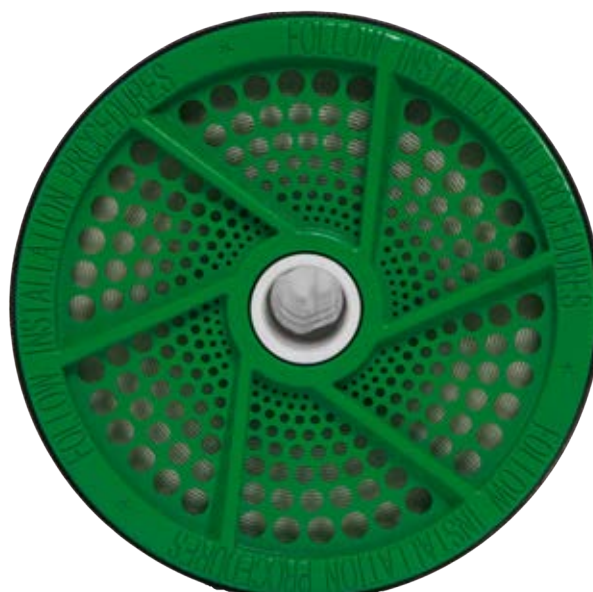
APPLICATIONS:

- Conventional and hybrid seawater desalination plants

PRODUCT OFFERINGS:

- OLTREMARE SEA1, SEA2, SEA5 and SEA6 series
- MICRODYN NADIR SWL, SWH and SWM series

MANN+HUMMEL Water & Membrane Solutions provides sea water RO elements in different size, configuration and performance.



Cellulose Acetate Membranes

The TRISEP® SB series of cellulose acetate membranes features a cellulose acetate / triacetate blend that delivers an excellent combination of solute rejection, fouling resistance, and chlorine tolerance. The combination of high chlorine tolerance and smooth surface morphology makes these membranes a perfect fit for applications where biofouling is an issue. SB20 is a high rejection CA RO membrane; SB50 is a higher flowing CA RO membrane. Both models are available in 2.5", 4" and 8" spiral wound design but also in several other size.

APPLICATIONS:

- Demineralization of feed water with high foulant potential

PRODUCT OFFERINGS:

- TRISEP SB20 and SB50

Oltremare Specialties

OLTREMARE elements are ideal to purify every type of water and are suitable for a wide range of industrial and commercial applications. When your project calls for a non-standard size or a commercial element, we have what you need. Applications include spot-free rinse and wash water recycling at car washes; drinking water treatment in self-service vending machines; RO drinking water production for residential use; Ultra High Pressure membranes for ZLD/MLD applications and potable water generation, among many others. Our compact elements are simple to install and replace; they act as an all-in-one vessel and element solution.

When you need a private label spiral element, OLTREMARE is the answer. The capabilities of the brand span a broad range of water applications. The completed elements will feature a fully customized label approved by you. Whether it's a standard, non-standard, or commercial element used in typical operating conditions, we can private label elements to meet your needs.

PRODUCT OFFERINGS:

- OLTREMARE specialties with private labels and module custom design

MANN+HUMMEL Water & Membrane Solutions can manufacture in a ISO 9001:2015 European facility customized and private label membranes to meet specific technical and branding requirements.



Nanofiltration (NF) is a membrane filtration technology designed to eliminate particles larger than 0.001 microns in size from liquids. It plays a crucial role in various drinking water purification processes, including water softening, decolorization, and micropollutant removal. In industrial applications, nanofiltration effectively removes specific components such as coloring agents. This pressure-driven process relies on the separation of substances based on ionic charges and molecular size.

The primary focus of nanofiltration is the removal of organic substances like micropollutants and divalent ions, with elements demonstrating low to moderate retention for monovalent salts.

NF KEY APPLICATIONS:

- Removal of pesticides from groundwater
- Removal of heavy metals from wastewater
- Water softening, serving as an alternative to ion exchange softeners

Nano Filtration Membranes

Our NF 7 offer selective rejection of divalent and polyvalent ions while permitting the monovalent ions to pass through membranes. Meanwhile our NF 9 offers a very high solute rejection at very low pressures. Available in 2.5", 4" and 8" spiral wound design but also in several other size.

APPLICATIONS:

- Reclamation of water in industrial waste
- Sulfate removal from seawater or mining water
- Removal of TOC, NOM and many other organics
- Brackish water softening

PRODUCT OFFERINGS:

- OLTREMARE NANO7 and NANO9
- MICRODYN NADIR NF7, SWH and NF9



MANN+HUMMEL Water & Membrane Solutions NF portfolio includes high rejection and high flow to meet the project specifications.

Should you need any additional information, please consult www.water-membrane-solutions.mann-hummel.com

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