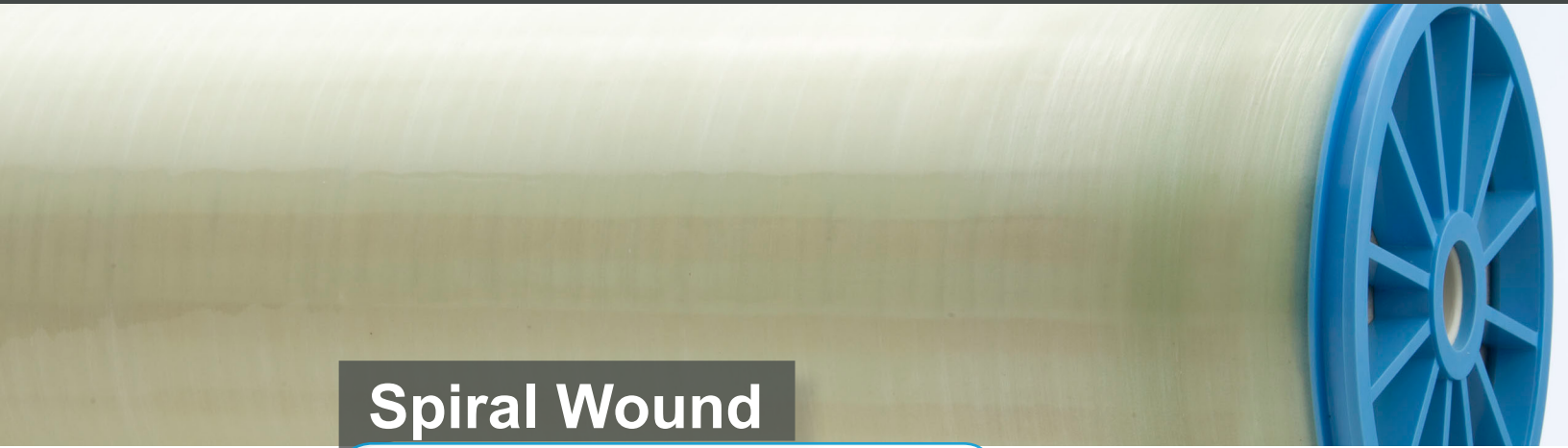




Spiral Wound

Solutions

Industry pioneers in spiral
membrane technology

LENNTECH

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K KOCH
MEMBRANE SYSTEMS



TM

Nobody knows spiral membranes better...

Koch Membrane Systems has been a leader in reverse osmosis (RO) and nanofiltration (NF) technology for more than 40 years, starting with the industry's first spiral-wound RO element.



Applications We Serve

- Seawater Desalination
- Brackish Water Treatment
- Potable Water
- Softening & Organics Removal
- Industrial Process Water
- Municipal & Industrial Wastewater Reuse
- High Purity Water
- TOC Removal

The Solution Provider

The FLUID SYSTEMS™ family of spiral-wound membranes from Koch Membrane Systems (KMS) provides cost-effective, highly advanced membrane filtration technology that reliably treats a variety of source waters.

FLUID SYSTEMS spiral-wound membranes excel at seawater desalination, brackish water treatment, water softening, organics removal, and more, allowing for high rejection without compromising yield.

Since no one membrane is right for every application, KMS offers a wide range of reverse osmosis and nanofiltration elements in the spiral

wound configuration suitable for a variety of separation requirements. When you team with KMS, we'll help you select the best solution from our line of low-energy, high-rejection, or chlorine-tolerant cellulose acetate spirals.

The technology we champion is only part of the picture. Our engineers will evaluate your particular needs to configure a standard or customized water treatment system, and recommend operating, cleaning and system maintenance procedures to allow your system to deliver peak performance and long-term cost efficiency.





Reverse Osmosis

RO is a filtration process known to be the most energy efficient method of removing dissolved salts from water. Membrane technologies such as RO play an integral part in addressing the demand for alternative drinking water supplies as the world's water shortage problem continues to escalate.

FLUID SYSTEMS™ TFC™ RO membranes are recognized for exceptional performance and dependability. TFC elements can tackle the most demanding water treatment environments, from the complex applications of seawater desalination to brackish water, electronics and pharmaceutical water purification, to softening applications for drinking water, power



generation, beverage production, chemical processes, boiler feed requirements, and more.

FLUID SYSTEMS ROGA™ cellulose acetate RO membranes are designed for highly organic-fouling environments where chlorine addition is desired. These membranes are ideal for high rejection, low-pressure processes where oxidizing agents are a concern.

Our product variety paired with sound technical support will easily—and economically—solve your challenges. We'll thoroughly model your process conditions using ROPRO™ software, predicting the effect of various design choices. Whatever your process requires, KMS has a solution for you.

Nanofiltration

NF is a technology closely related to RO and is often used for water softening and to lower the level of total organic carbon (TOC).

NF membranes excel at removing organics and only divalent and larger ions while allowing monovalent ions such as sodium and chloride to pass through, making them ideal for desalting the process stream.

In water treatment, NF membranes are used for hardness removal (in place of water softeners), pesticide elimination, and color reduction.

FLUID SYSTEMS TFC NF membranes are a cost-effective solution for these applications. We offer high-flow, low-pressure, and selective-rejection nanofiltration membranes that easily handle water softening and organics removal.

Solutions

ROPRO Design Software



To make it easier to sort through all the membrane choices, ROPRO 8.0 software allows a system designer to project how various membranes will perform under different operating conditions, such as different temperatures, recoveries, array configurations, and pH ranges.

There's no doubt that the RO system has done everything we had hoped it would...It was eight years before we reached the point when the KMS membranes underwent their first cleaning. It was pretty remarkable.

Roy Fallon

Chief Operator

Water Treatment Plant

Village of Tequesta

High-performance membranes for the most demanding water treatment environments

Our engineers can help you select from a broad portfolio of TFC™ RO and NF products which include: High Rejection (HR), Seawater (SW), Fouling Resistant (FR), High Flux (HF), Softening (S), Selective Rejection (SR), and Extreme Rejection (XR).

Seawater Desalination

The vast majority of the world's available water—seawater—is unsuitable for drinking. The use of RO for seawater desalination is one of the fastest growing markets to provide potable water in drought-prone or water-scarce regions.

TFC-HF Elements

- High flow
- Reduced pressure
- 99.7% rejection at 800 psi
- Seawater and high salinity brackish water treatment

TFC-SW Elements

- High Rejection
- Cost-effective long-term operation
- 99.75% rejection at 800 psi

Brackish Water Treatment

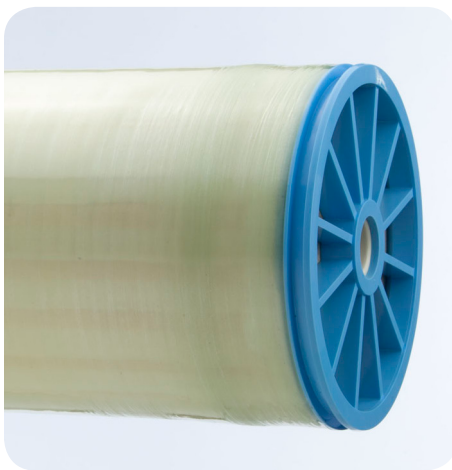
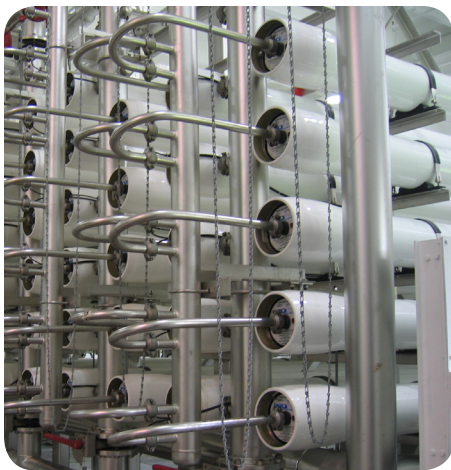
One of the most common RO applications is the treatment of brackish water. From towns relying on inland aquifers to coastal communities faced with seawater intrusion of fresh groundwater, RO can effectively remove dissolved salts and other water-borne contaminants to meet or exceed drinking water standards.

TFC-HR Elements

- High rejection, low pressure
- Excellent choice for second-pass seawater
- 99.55% rejection at 225 psi
- High silica and salt removal
- Brackish water treatment

TFC-FR Elements

- Low pressure, high rejection
- Improved performance in presence of organics and high-fouling conditions
- 99.55% rejection at 225 psi
- Brackish water and wastewater treatment



TFC™-XR Elements

- Extra-high rejection, long life
- High quality permeate
- 99.75% rejection at 325 psi
- Excellent silica and TOC removal
- Brackish water and industrial wastewater treatment

Water Softening & Organic Removal

NF can remove hardness using fewer chemicals, while significantly reducing TOC. In industrial processes, RO elements are useful in recovering expensive compounds from wastewater streams.

TFC-S Element

- High hardness and organic removal
- Low pressure
- 99% hardness rejection at 80 psi
- Softening and THMFP reduction.

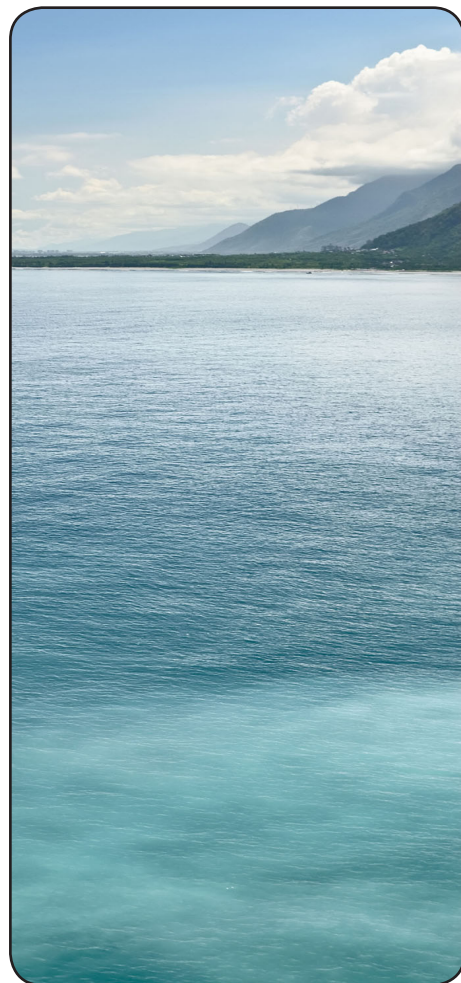
TFC-SR100™ Elements

- High flow, low pressure, selective rejection nanofiltration
- 99% hardness rejection at 75 psi
- 99% rejection of $MgSO_4$
- Softening and organics removal, concentration and de-ashing of expensive compounds

Chlorine-Tolerant RO Elements

ROGA™ elements are designed for high organic fouling environments and are widely used for applications where chlorine is dosed on a continuous basis. ROGA membranes perform exceptionally well in new or replacement systems, and are ideal for high-rejection, low-pressure processes where oxidizing agents are a concern.

- High-rejection, cellulose acetate membrane
- Strong resistance to organic fouling
- 98% rejection at 420 psi



Cost-effective, optimized solutions to meet your specific requirements

Our highly skilled and experienced engineers can design the right system to help you tackle the most complex challenges.



The Benefits Are Clear

- Flexible design, lower auxiliary equipment costs
- Fast installation and start-up
- Range of pressures and sizes

Reverse Osmosis Systems

Our pre-engineered, packaged water treatment systems using RO and NF technology offer optimum water treatment for brackish and seawater applications within a compact, skid-mounted package.

KMS offers two options to suit your needs:

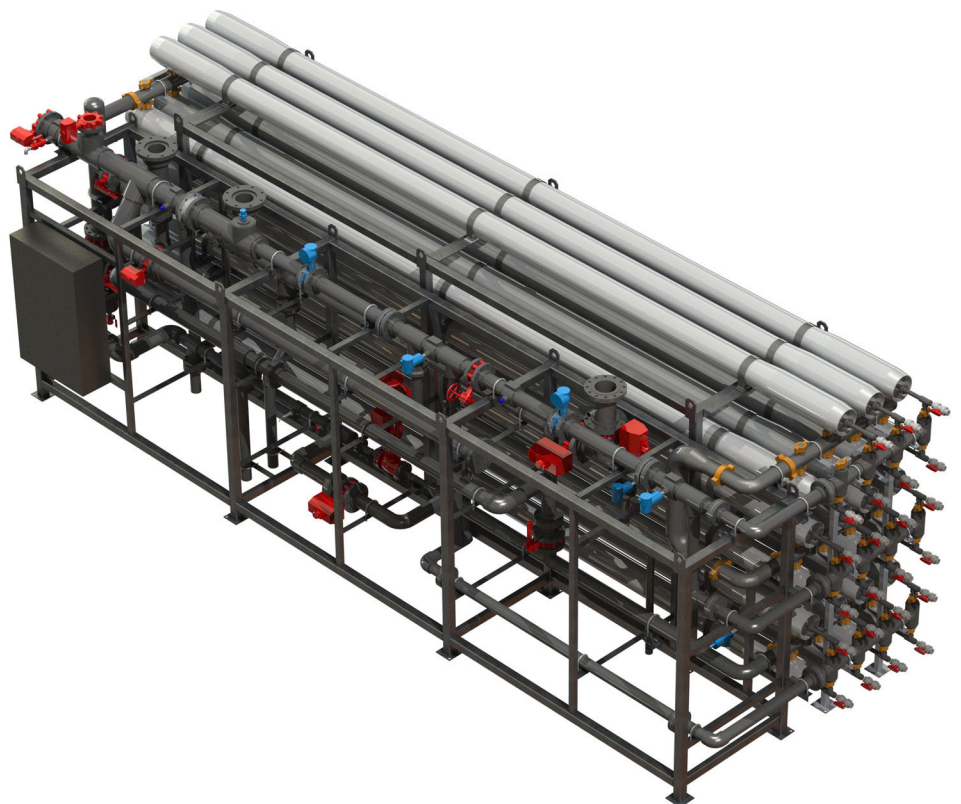
Standard pre-engineered RO packaged plants complete with all equipment.

Modular, reduced-scope Vessel Control Block suited to larger projects and operators who prefer to provide auxiliary equipment.

For larger systems, KMS engineers can design and build a custom system to meet your specific needs.

Both KMS packaged and custom water treatment systems offer:

- A flexible, cost-effective design with lower auxiliary equipment costs
- Fast installation and start-up
- Capacities ranging from 565-1,700 m³/d (150,000-450,000 GPD)
- Production of high-quality permeate water
- Drinking water and industrial wastewater recycling



Easily installed and serviced, our systems are configured for longevity and outstanding performance

Our best-in-class designs provide a truly integrated solution, from membrane chemistry and fabrication to process and application design, with dedicated technical support every step of the way.

KMS isn't just a membrane company. The KMS global team of engineers can offer you:

Engineering Expertise— Quality pre-engineered systems for MBR and tertiary treatment.

Process Design— An established track record of successfully designing membrane process solutions for even the most complex fluid processing challenges.

Project Management— Multidisciplinary teams led by dedicated Project Managers are committed to the technical success of your project. Project management metrics such as safety, on-time delivery, and meeting customer requirements are used to optimize project execution and provide you with excellent customer service throughout the process.

Start-Up and Commissioning— KMS Field Service and Process engineers will work with you on site to commission your new system, train your staff, and optimize the process to best fit your particular requirements.

Instrument and Controls— Robust, fully automated, easily-integrated intelligent control systems designed to handle process excursions.

Global Fabrication— The KMS global fabrication network consistently meets customers' schedules through careful planning and seamless material logistics.

Mechanical Design— Experienced engineers who strive to design systems for optimal value and performance.

KMS ASSIST™ Service and Maintenance Program

The KMS ASSIST Program is a comprehensive service program designed to optimize performance of your membrane system. Promoting long term efficiency by regular site visits, keeping plant personnel trained, and providing dedicated support are at the heart of the KMS ASSIST Program. When you sign up for the KMS ASSIST Program, you protect your investment by tapping skilled support that will help you keep your membrane system running smoothly...now and in the future.





For five decades, Koch Membrane Systems, Inc. has led the way in developing innovative membrane technologies that serve a diverse range of industries and applications around the globe. KMS provides solutions to markets including industrial and municipal water and wastewater, food and life sciences and industrial processes helping thousands of industries reduce their water footprint, increase productivity, and reduce costs. With an installed base approaching 20,000 systems throughout the world, KMS is setting the standard as a comprehensive membrane solutions provider.

KMS is based in Wilmington, Massachusetts, USA with factory direct representatives around the world and manufacturing locations in Wilmington, Massachusetts and Aachen, Germany.

Corporate Headquarters

Koch Membrane Systems, Inc.

Manufacturing Facilities

Wilmington, Massachusetts, USA
Aachen, Germany

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