Dow Liquid Separations

FILMTEC Elements

An Overview of Products, Applications, and Technical Resources

The Industry's Leader

FILMTEC® reverse osmosis (RO) and nanofiltration (NF) elements are products available from Dow Liquid Separations, the globally recognized leader in separations technologies and solutions for industrial, municipal, commercial and consumer water applications. FILMTEC elements are fabricated by FilmTec Corporation in an ISO 9002 certified manufacturing facility using the industry's most advanced precision manufacturing processes to ensure the highest product quality and performance. These elements offer high rejection of dissolved solids and organics and operate very efficiently at lower pressures. FILMTEC elements also provide excellent structural stability and are more productive than other elements. As the industry's leading RO and NF elements, FILMTEC elements have an unsurpassed track record of consistent, reliable and long-lasting performance.

Advanced Element Designs

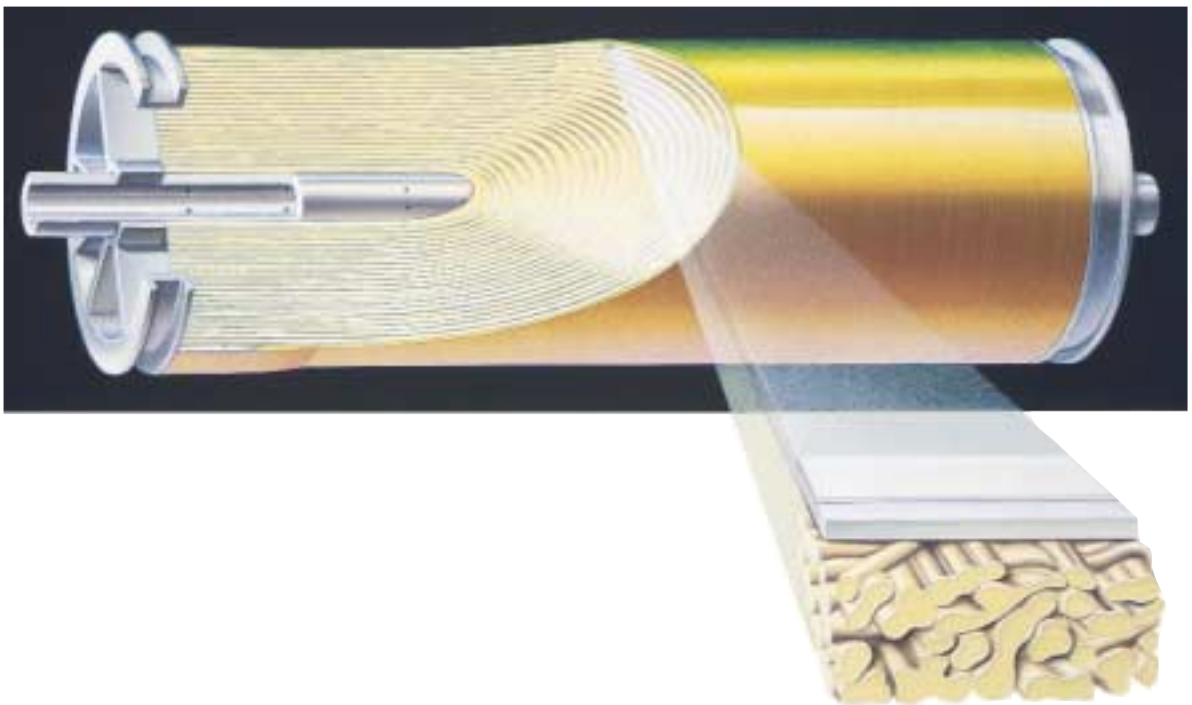
FILMTEC elements include highly innovative products that set new standards for performance and economy. FILMTEC RO elements offer higher active membrane surface area that increase permeate flow by 20 to 40 percent over conventional elements. An innovative full-fit design has been developed for semiconductor grade elements that eliminates sources of total organic carbon (TOC) contamination.

High performance FILMTEC commercial system elements increase productivity up to 50 percent. FILMTEC low energy elements operate at economical low system pressures without sacrificing salt rejection performance or system productivity. And, FILMTEC nanofiltration (NF) elements provide selective rejection of calcium, magnesium and other salts, including a new NF element that allows for high calcium passage while giving high pesticide rejection.

FILMTEC elements offer outstanding structural stability, low-pressure operation, and productivity.

Thin-Film Composite Membrane Structure

All spiral wound FILMTEC elements are based on the FT30 thin-film composite membrane which has long set the industry standard for RO performance. The FILMTEC FT30 membrane consists of three layers: an ultra-thin polyamide barrier layer, a microporous polysulfone interlayer and a high-strength polyester support web. Underlying structural support is provided by the non-woven web. The polyamide barrier layer provides high water flux, unsurpassed salt and silica rejection and excellent chemical resistance. The thick, microporous polysulfone support layer offers necessary porosity and strength properties and resists compaction under RO pressure conditions.



The FILMTEC FT30 thin-film composite membrane resists compaction, abrasion, and chemical degradation.

Precision Fabrication

FILMTEC elements are produced by precision production methods that reduce the chance of element failure. Beginning with the highest quality raw materials, FILMTEC elements are built to optimum physical tolerances using advanced automated manufacturing equipment and a highly controlled manufacturing process that features sonic-welding of critical fastening points. This ensures higher element consistency.

After fabrication, FILMTEC elements are subjected to extensive quality testing to make sure that our fabrication standards are met. The quality control process includes visual and vacuum glue line testing, and wet testing to confirm rejection and flow performance. As a result, FILMTEC elements exhibit minimum element-to-element variation and provide consistent, predictable and reliable performance.

FILMTEC Elements Offer

- Spiral wound design
- Proven FT30 thin-film composite
- Excellent membrane flux
- Excellent salt rejection
- Precision fabrication
- Revolutionary high active membrane surface area
- Durability for long-term performance
- Resistance to bacterial growth
- Tolerance to a wide range of operating conditions
- Easier cleaning
- NSF certified
- FDA clearance for food processing
- Elements shipped wet or dry
- Unsurpassed three-year warranty

FILMTEC elements are built using advanced, precision production methods that reduce element failure. (left)

FILMTEC elements are put through extensive quality testing to ensure predictable, reliable performance. (below)

Water Purification Applications

Process Water Treatment

Unlike other suppliers, Dow offers both FILMTEC elements and DOWEX* ion exchange resins. This, along with our experience with thousands of industrial water treatment systems qualifies us to help you meet your specific needs for high quality process water.

FILMTEC eight-inch brackish water elements are the most commonly used products for process water purification. Featuring 99.5 percent or greater typical salt rejection performance and an exclusive higher active membrane surface area technology, these elements are more productive than conventional RO elements. This could mean lower capital investment, reduced operating costs and greater flexibility for future system capacity expansions.

FILMTEC "LE" grade low energy brackish water elements are designed to meet emerging demand for lower pressure RO system operation. These elements operate at lower pressure levels than standard RO elements, reducing operating expense without sacrificing salt rejection or high productivity.

FILMTEC RO elements can serve as pretreatment for ion exchange resins in many industrial systems.

In many industrial systems, RO elements serve as pretreatment for ion exchange resin beds. When installed before ion exchange beds, FILMTEC RO elements reduce demineralizer operating costs dramatically. For example, pretreating water for boiler makeup with FILMTEC RO elements removes silica, dissolved solids and total organic carbon (TOC). This extends the life of ion exchange resins and lowers chemical regeneration usage, waste handling and maintenance costs.

FILMTEC RO elements are also frequently used in double-pass RO systems to produce high purity water in a simpler continuous process. For applications with less stringent water purity requirements, FILMTEC elements can be used cost-effectively in single-pass RO systems.

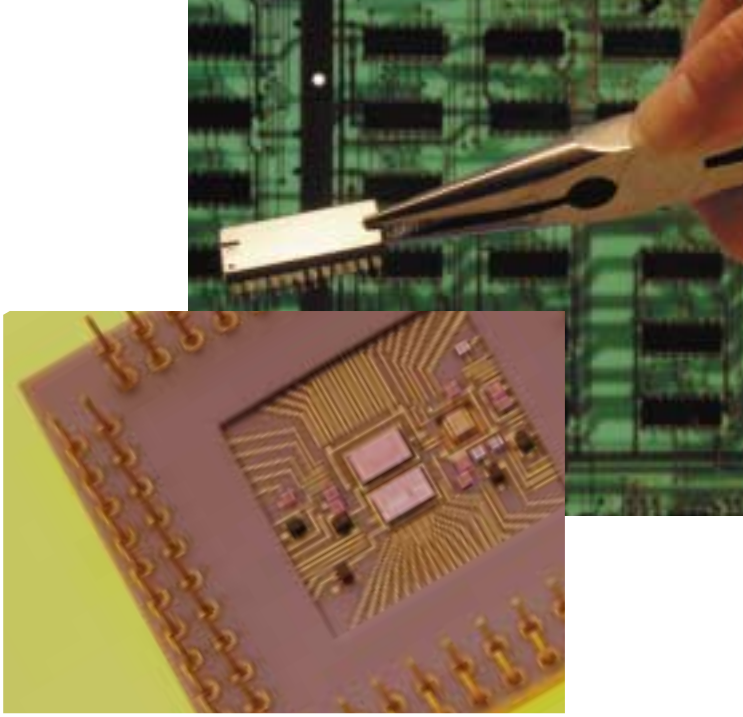
*Trademark of The Dow Chemical Company

Ultra Pure Water

The semiconductor manufacturing industry has extremely demanding water purification requirements. Water used to rinse integrated circuits typically must have a resistivity of 18.2 megohm/cm. To achieve this high level of purity, water treatment solutions incorporating special, highly pure grades of ion exchange resins and specialized RO elements are required.

As a supplier of both DOWEX ion exchange resins and FILMTEC elements, Dow can provide integrated, optimized solutions taking advantage of the full performance capabilities of both technologies. Our years of experience meeting the needs of integrated circuit manufacturers around the world has led to the development of ultra pure water grade ion exchange resins and semiconductor grade RO membrane products that are unsurpassed in separation performance, cleanliness and economical service.

Some FILMTEC semiconductor grade RO elements feature an innovative full-fit design that eliminates sources of TOC contamination and bacterial growth in ultra pure water processing systems. These elements have no tape or fiberglass outer wrapping, so TOC is reduced significantly. The full-fit design also ensures that fluid flow takes place across the entire cross-sectional area of the element, eliminating the bacteria-breeding dead space found in conventional elements.



FILMTEC elements offer unique separation performance, cleanliness, and economical service to meet the needs of integrated circuit manufacturers.

Other recent advancements include an RO element with TOC rinse down of less than 20 ppb in one hour and excellent IPA and silica rejection.

FILMTEC elements have also been tested and accepted for application in a process where higher feed pH allows higher rejection of weak acid anions like Boron and Silica.

Among the elements we offer for ultra pure water production is also an element which can be sanitized every two days at 65°C to eliminate flux-reducing surface biofoulants. This element's heat sanitation capability minimizes the need for, and the expense of, chemical cleaning.

Municipal Potable Water Supply

Seawater desalination using FILMTEC RO elements has spread globally because of their consistent reliability, long life, high salt rejection capability and resistance to bacterial attack. Water purification facilities from the Caribbean to Spain to the Middle East are taking advantage of FILMTEC elements to meet today's growing drinking water supply needs.

FILMTEC LE (low energy) brackish water elements are designed to meet the demand of treating large volumes of water for potable water supplies at low pressures allowing for low operating costs, and higher resistance to fouling, while maintaining high productivity.

FILMTEC nanofiltration (NF) elements are also used to purify public drinking water supplies. These elements are used to treat municipal water supplies in areas where the high level of sodium rejection possible with RO membranes is not needed, but where other salts such as calcium and magnesium must be removed. Compared to lime softening and sodium chloride (NaCl) zeolite softening technologies, membrane softening is a highly attractive treatment alternative.

The FILMTEC NF200B nanofiltration membrane offers high rejection of pesticides and other dissolved organics, low salt rejection, low energy consumption, and stable performance after repetitive cleaning. These features make the FILMTEC NF200B a prime choice for contaminated surface waters and other potable water supplies.

The combination of consistent reliability, high salt rejection, and resistance to bacterial attack make FILMTEC elements an excellent choice for potable water purification facilities around the globe.

Commercial and Institutional Water Treatment

With highly predictable performance and high salt rejection and flow rates, FILMTEC RO elements are used in a variety of commercial water purification applications. They can be found in systems serving restaurants, car washes, bottled water plants, hotel/motel drinking water installations, personal care product manufacturing, greenhouses, ice manufacturing plants and medical and scientific laboratories.

FILMTEC elements are available for systems of all sizes. Drinking water elements for treating feed water with salt concentrations between 50 and 1,000 mg/1 are available with diameters of 2", 2.5", 4" and 4.6". We also offer brackish water RO elements for systems using 2.5" or 4" elements to treat ground or surface water supplies with salt concentrations between 50 and 10,000 mg/1.

A new generation of high performance FILMTEC 4" brackish water elements is available, offering up to 50 percent greater productivity than conventional elements while maintaining excellent salt rejection and unmatched reliability.

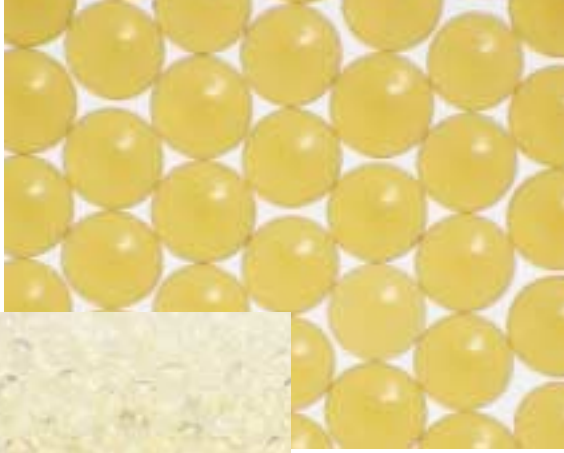
Most FILMTEC commercial system elements are available shipped either dry or in traditional wet form. Dry elements are easier to store because they have a longer shelf life than wet elements. Dry elements also weigh less, making shipping costs lower. Because there are no preservative solutions which must be flushed from the elements, dry elements can be installed faster and easier than wet elements.

Home Drinking Water

FILMTEC products for residential applications include low pressure drinking water elements capable of supplying whole-house water treatment systems as well as low pressure tapwater elements for point-of-use systems.

Like all FILMTEC RO elements, these home drinking water elements are precision fabricated and thoroughly tested to ensure that they provide predictable, trouble-free operation and consistent high performance. FILMTEC elements are offered to meet a wide range of pure water volume requirements, from 10 gallons per day to 75 gallons per day. FILMTEC home drinking water elements are available shipped either wet or dry.

FILMTEC elements are suitable for many different commercial water purification applications including systems serving restaurants, car washes, bottled water plants and medical laboratories.



Dow Also Offers Ion Exchange Resins

The best water treatment solutions often must take advantage of the strengths of both RO and ion exchange technologies. Since Dow offers both, we are able to provide the most highly integrated and cost-effective solutions for an entire range of water purification needs.

DOWEX ion exchange resins are known globally for outstanding performance in industrial demineralization applications. DOWEX MARATHON* uniform particle size (UPS) resins are designed to offer greater operating capacity for longer runs in multi-bed demineralization. DOWEX MONOSPHERE* UPS resins feature the fast kinetics and high separability required to meet demanding water purity requirements in boiler condensate polishing and other regenerable mixed beds.

DOWEX MONOSPHERE ultra pure water (UPW) grade ion exchange resins include anion, cation and mixed resins with UPS distribution that facilitates a sharp column wave front, faster kinetics and higher operating capacity without premature ion leakage.

The UPCORE* countercurrent regeneration system is extremely efficient in industrial demineralization systems, offering significant productivity and economic advantages over fluidized beds and air and water hold-down systems.

DOWEX UPS resins feature greater operating capacity and the high separability to meet stringent water purity requirements. (top)

DOWEX ion exchange resins are available for multi-bed and mixed-bed ion exchange systems. (bottom)

Dow also offers softening resins for commercial and residential use as well as specialized resin grades for nuclear power plant service and other demanding applications.

For more information about DOWEX ion exchange resins or the UPCORE system, contact the Dow office serving your area, listed on the back of this brochure.

*Trademark of The Dow Chemical Company

Comprehensive Service and Support

To help you realize the full potential of FILMTEC elements, extensive service and support capabilities are offered. These include unbiased applications assistance based on expertise in ion exchange and membrane separations technologies.

ROSA

The ROSA reverse osmosis system analysis program lets system designers and specifiers quickly and easily predict the performance and operating economics of FILMTEC elements in specific systems. To ensure that designers and specifiers have the most complete and accurate information possible, ROSA includes an interactive library of technical data. Also included is an Internet access to link users to the Dow Liquid Separations home page on the World Wide Web where they can obtain updated information about FILMTEC elements.

Three-Year Warranty

We're so confident of the quality and performance of FILMTEC elements that we back them with an unprecedented three-year limited warranty. Most other RO and NF element suppliers warrant their products for one year or less.

To Learn More

Product data sheets are available containing detailed information on specific FILMTEC elements. To receive sheets for the products of interest to you, download sheets from our home page at www.dow.com/liquidseps, or contact the Dow Liquid Separations office serving your area (listed on the back of this brochure). We look forward to working with you to provide the best water treatment solution for your application.

With our improved ROSA program, you can quickly and easily predict the performance of FILMTEC elements in specific systems.

Available service and support capabilities include unbiased applications assistance, plant trials, operator training programs, and system optimization assistance.

Dow Liquid Separations Offices

Dow Europe

Dow Information Centre
Liquid Separations
Schurenbergweg 5
1105 AP Amsterdam Zuidoost
P.O. Box 12121
1100 AC Amsterdam
The Netherlands
Tel. +31 20 691 6268
Fax +31 20 691 6418

Dow Pacific

Dow Chemical Australia Ltd.
Liquid Separations
26 Rodborough Road
French's Forest
New South Wales 2086
Australia
Tel. 61-2-9776-3226
Fax 61-2-9776-3299

Dow Pacific

Dow Chemical Japan Ltd.
Liquid Separations
Tennoz Central Tower
2-24, Higashikanagawa 2-chome,
Shinagawa-ku, Toyko 140
Japan
Tel. (813) 5460 2100
Fax (813) 5460 6246

Dow Latin America

Dow Quimica S.A.
Liquid Separations
Rua Alexandre Dumas, 1671
Sao Paulo-SP-Brazil
CEP 04717-903
Tel. 55-11-5 188 93 45
Fax 55-11-5 46 99 19

Dow North America

The Dow Chemical Company
Liquid Separations
P.O. Box 1206
Customer Information Center
Midland, MI 48641-1206
Tel. 1-800-447-4369
Fax 517-832-1465

Internet

http://www.dow.com/liquidseps

ISO 9002
Certificate Number: 31391

Water Quality Association
MEMBER

FilmTec Corporation is a wholly owned subsidiary of The Dow Chemical Company.

NOTICE: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

Published December 1997.

DOW*

*Trademark of The Dow Chemical Company

Form No. 609-00002-1297AMS
CH 172-020-E-1297