

A collage of three images related to a laboratory setting. The top-left image shows a pipette dispensing liquid into a series of glass test tubes. The top-right image shows a pipette tip near a vial. The bottom image shows a row of small, amber-colored vials with green caps on a laboratory bench.

# Medical Water

Medical water is key ingredient, raw material, or solvent in the development, formulation, and manufacturing of many pharmaceutical and biopharmaceutical products. It may be present as an excipient, employed during synthesis, used in the laboratory or even a key component of a dialysis systems. Heat sanitized reverse osmosis elements eliminate impurities providing the right level of sterility and clarity required by each application from water for injection to home dialysis.

FilmTec™ heat sanitizable (HSRO) elements are heat-sanitizable reverse osmosis elements that deliver outstanding quality water with the added capability to withstand sanitization with hot water, eliminating the need for chemical sanitizers.

## FilmTec™ HSRO

FilmTec™ HSRO elements, manufactured on advanced automated equipment, have the highest active membrane area allowing system designs with either lower operating flux or cost savings from fewer membrane elements. The full-fit configuration minimizes stagnant areas and is optimal for applications requiring a sanitary design such as Medical Water, Pure Water, and Ultra Pure Water systems. All components comply with U.S. Food & Drug Administration standards.

## High Purity Water / Water for Injections

Around the world, high purity water is essential for many health care procedures. This has never been as true as today with the upsurge in the number of chronic diseases like diabetes and cancer, the need for more convenient drug delivery systems for unit dose medication has grown, especially as biologics are increasingly becoming the driving forces of the pharmaceutical industry. Across the life sciences, wellness today is about convenient, sterile medicinal products and drug delivery systems. Thereby, enabling biologics and advanced medicinal products that are tailored specifically for the disease mechanisms. FilmTec™ HSRO elements have been developed through industry-leading research to address the very specific conditions and

requirements needed for success in applications needing high purity water and water for injection purification systems.

## Laboratory Water

Laboratories must follow stringent manufacturing practices when it comes to a majority of the research and development work for the life sciences industries. Bioprocessing, in vitro fertilization, tissue and cell cultures work, as well as DNA research, all require ultrapure water which needs to be both biologically pure and free of trace metals and dissolved organics. FilmTec™ HSRO elements have been developed through industry-leading research to meet special application requirements such as ultrapure water for research and academic institutes as well as biopharmaceutical and pharmaceutical companies.

## Dialysis

The quality of life for patients with chronic kidney disease depends heavily on regular dialysis. With hospitals around the world under a massive burden, the safe, reliable and simple treatment of water for dialysis is critical to be able to offer this life sustaining service. Modern FilmTec™ HSRO elements used in dialysis systems reliably provide high quality water that meets all standards set by regulatory bodies. Not only do our advanced membrane technologies used in these elements create an effective barrier for contaminants, but they are efficient, easy to use and maintain, and compact enough even to move dialysis systems to the patient's home.



## Typical Properties

Product	PartNumber	ActiveArea ft <sup>2</sup> (m <sup>2</sup> )	Applied Pressure psig (bar)	Permeate Flow Rate gpd(m <sup>3</sup> /d)	Stabilized Salt Rejection %
HSRO-390-FF	170701	390 (36)	150 (10.3)	9,000 (34)	99.5
HYPERSELL™ HSRO-390	346586	390 (36)	150 (10.3)	9,000 (34)	99.5
HSRO-4040-FF	98592	90 (8.4)	150 (10.3)	1,900 (7.2)	99.5
HSRO 4118 W	164869	52 (4.83)	125 (8.61)	1,547 (5.85)	99

1. Permeate flow and salt rejection based on the following test conditions: 2,000 ppm NaCl, pressure specified above, 77°F (25°C) and 15% recovery.
2. Elements must be conditioned prior to start-up. A one-time flux loss will occur during stabilization. Listed values apply after performance stabilization.
3. Permeate flows for individual elements may vary +/-20%.
4. For the purpose of improvement, specifications may be updated periodically

## Operating and Cleaning Limits

Membrane Type	Polyamide Thin-Film Composite
Maximum Operating Temperature <sup>a</sup>	113°F (45°C)
Maximum Sanitization Temperature (@ 25 psig)	185°F (85°C)
Maximum Operating Pressure	600psig (41bar)
Maximum Element Pressure Drop	15psig (1.0bar)
pH Range	
Continuous Operation <sup>a</sup>	2 - 11
Short-Term Cleaning (30 minutes) <sup>b</sup>	1 - 12
Maximum Feed Silt Density Index (SDI)	SDI 5
Free Chlorine Tolerancenc	<0.1ppm

a. Maximum temperature for continuous operation above pH 10 is 95° F(35°C).

b. Refer to Cleaning Guidelines (Form No. 45-D01696-en).

c. Under certain conditions, the presence of free chlorine and other oxidizing agents will cause premature membrane failure. Since oxidation damage is not covered under warranty, DuPont Water Solutions recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to Dechlorinating Feedwater (Form No. 45-D01569-en) for more information

FilmTec™ HSRO elements enable customers within the health-care industry to meet all regulatory requirements while:

- Lowering their life cycle cost compared to distillation systems
- Lowering their energy requirements
- Exceeding pure water requirements – very low conductivity, TOC, endotoxin and microbial levels
- Providing reliable operation with proper design and maintenance
- Operating with either intermittent or continuous heat sanitization

FilmTec™ HSRO-390-FF is the preferred membrane for Medical Water production - it lowers the operating cost of sanitization because it reduces the amount of chemicals & labor required for sanitization.

Find out more:



Picture credits p.1: iStock, Getty Images



Water Solutions

[www.dupontwatersolutions.com](http://www.dupontwatersolutions.com)

© 2021 DuPont. DuPont™, the DuPont Oval Logo, and all trademarks and service marks denoted with ™, SM or ® are owned by affiliates of DuPont de Nemours, Inc. unless otherwise noted.

All information set forth herein is for informational purposes only. This information is general information and may differ from that based on actual conditions. 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 government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. Please note that physical properties may vary depending on certain conditions and while operating conditions stated in this document are intended to lengthen product lifespan and/or improve product performance, it will ultimately depend on actual circumstances and is in no event a guarantee of achieving any specific results. DuPont assumes no obligation or liability for the information in this document. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. No freedom from infringement of any patent or trademark owned by DuPont or others is to be inferred.

Form No. 45-D03601-en