DuPont™ FilmTec™ elements

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Product Data Sheet | Reverse Osmosis

Dairy FilmTec™ Hypershell™ RO Elements

Reverse Osmosis Elements for Dairy Processing Applications

Key Features

- Full-fit element configuration that minimizes stagnant areas for a sanitary design.
- With a machined polypropylene rigid outer shell, FilmTec™ Hypershell™ elements do not deform, minimizing channeling and bypass compared to mesh wrapped elements (see Figure 1).
- Innovative FilmTec™ Hypershell™ XP RO-8038 element provides higher flow chemistry and 5% higher active area, helping to deliver up to 50% extra productivity without compromising product quality.
- All components comply with USA FDA and EU Food Contact regulations and are Halal certified (IFANCA).

Key Applications

- Dewatering and concentration of milk, whey protein, and lactose to reduce product volume and enable savings on transportation and storage cost.
- Concentration of process streams to reduce evaporator loads and energy cost for powdered product production.
- Polishing of RO/NF permeate and/or evaporator condensate.



Feed Flow vs. Pressure Drop

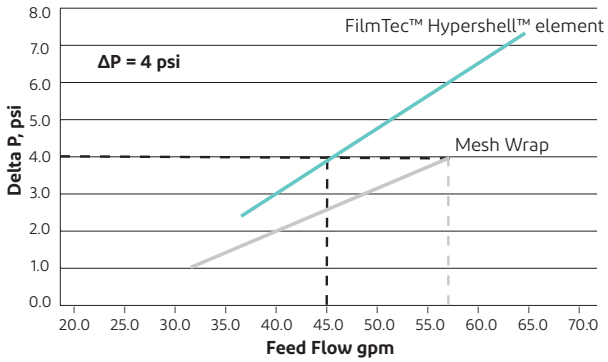


Figure 1: Feed Flow vs. Pressure Drop for Mesh Wrap and FilmTec™ Hypershell™ Elements.

FilmTec™ Hypershell™ elements have less exterior fluid bypass and require approximately 30% less flow than conventional full-fit, mesh wrapped elements for an equivalent pressure drop. This means more feed flows through the element for processing instead of around the element and through the mesh. This can result in up to 30% energy savings and up to 50% greater productivity, with higher crossflow velocity at the membrane surface.

The graph indicates the flow comparison at 4psi ΔP. Energy savings can be achieved by flow reduction.

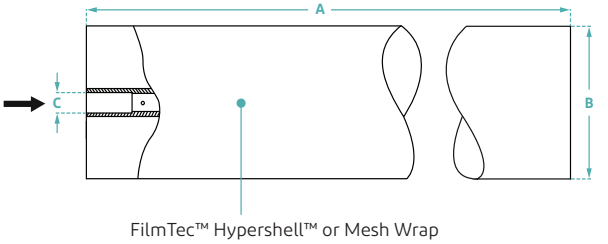
Typical Properties

Product	Part Number	Active Area ft² (m²)	Feed Spacer Thickness (mil)	Max. recirculation cross-flow gpm (m³/h)	Max. element ΔP* psi (bar)	Design Features
FilmTec™ Hypershell™ RO-8038 element	302218	370 (34.4)	33	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ Hypershell™ XP RO-8038 element	12119313	385 (35.8)	33	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ Hypershell™ RO-8038/48 element	360400	290 (27.0)	48	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ Hypershell™ RO-390 element	346364	390 (36.2)	27	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ RO-3838/30-FF element	80589	81 (7.5)	30	30 (6.8)	15 (1.0)	Mesh Wrap Full Fit
FilmTec™ RO-3840/30-FF element	108664	85 (7.8)	30	30 (6.8)	15 (1.0)	Mesh Wrap Full Fit

*Maximum pressure drop across entire vessel is 60 psi (4.1 bar)

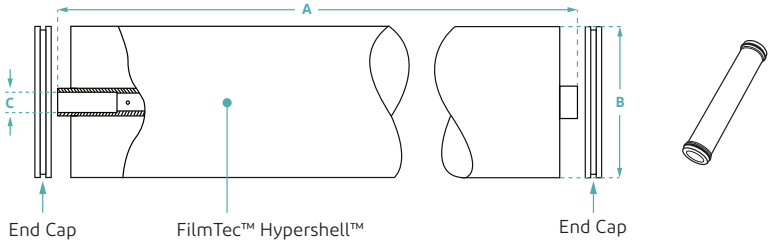
Element Drawing

Models RO-8038, RO-3838, and RO-3840



For these models end caps, coupler, and O-rings are not included.

Model RO-390



For model RO-390 DuPont supplies two end caps (part number 113199) and one coupler (part number 255289). Each coupler includes two 3-912 EPR O-rings (part number 151705).

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Element Dimensions

Dimensions – inches (mm) 1 inch = 25.4 mm					
	FilmTec™ Hypershell™ RO-8038[1]	FilmTec™ Hypershell™ RO-8038/48[1]	FilmTec™ Hypershell™ RO-390[1,2]	FilmTec™ RO-3838/30-FF	FilmTec™ RO-3840/30-FF
A	38.00 (965)	38.00 (965)	40.00 (1,016)	38.00 (965)	38.75 (984)
B	7.9 (200)	7.9 (200)	7.9 (200)	3.8 (96)	3.8 (96)
C	1.125 (28.58)	1.125 (28.58)	1.125 (28.58)	0.831 (21.1)	0.831 (21.1)

1. FilmTec™ Hypershell™ Elements are designed to fit schedule 40, 8-inch stainless pipe (nominal 7.98-inch ID).
2. FilmTec™ Hypershell™ 390 Elements are designed in an 8040 style with 1-inch exposed product water tube instead of a flush cut end on each side. Model 390 is not full sanitary design and should only be used when permeate is the product.

Suggested Operating and Cleaning Conditions

Maximum Operating Temperature[1]	122°F (50°C)
Maximum Operating Pressure	800 psi (54.8 bar)
Maximum CIP Pressure	15 - 75 psi (1 - 5 bar)
pH Range	
Continuous Operation[1]	2 - 11
Short-Term Cleaning[2] (reference temperature 77°F / 25°C)	1.8 – 11 (122°F / 50°C)
Hydrogen peroxide usage limit[3]	
Continuous Operation	20 ppm
Short-Term Cleaning (77°F/25°C maximum)	1,000 ppm
Free Chlorine Tolerance[4]	Non-detectable

1. Maximum temperature for continuous operation above pH 10 is 95°F (35°C).
2. Refer to Food Processing and Sanitary Elements Cleaning Guide (Form No. 45-D01686-en). And to Temperature and pH best practices in preparation of Cleaning Solutions (Form No. 45-D04358-en).
3. Refer to Sanitizing RO&NF Membrane System (Form No. 45-D01630-en).
4. Oxidation damage is not covered under warranty, DuPont recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to Dechlorinating Feedwater (Form No. 45-D01569-en) for more information.

Important General Information

- Keep elements moist at all times after initial wetting.
- For successful operation of Reverse Osmosis (RO) and Nanofiltration (NF) membrane systems, the operation must follow the guidelines provided in the FilmTec™ Reverse Osmosis / Nanofiltration Elements Operation Excellence and Limiting Conditions Tech Fact (Form No. 45-D04388-en).
- To prevent biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution.
- The customer is fully responsible for the effects of incompatible chemicals and lubricants on elements.
- Avoid static permeate-side backpressure at all times.
- Permeate obtained from the first hour of operation should be discarded.
- The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system.

Please consider good operating practices for the optimal performance of the Reverse Osmosis membrane elements to assure damage free operation:

1. Loading of Pressure Vessels – Preparation & Element Loading (Form No. 45-D01602-en)
2. System Operation, including plant Start-Up Sequence (Form No. 45-D01609-en) and RO & NF Systems Shutdown (Form No. 45-D01613-en)
3. Handling, Preservation, and Storage (Form No. 45-D03716-en)

Full information of plant design, system operation, and troubleshooting is given in the FilmTec™ Reverse Osmosis Membranes Technical Manual (Form No. 45-D01504-en).

Regulatory Note

This product may be subject to drinking water application restrictions in some countries; please check the application status before use and sale.

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