DuPont™ FilmTec™ elements

DUPONT™

Product Data Sheet | Nanofiltration

Dairy FilmTec™ Nanofiltration Elements

Mesh Wrap and Hard Shell Elements for Dairy Processing Applications

Key Features

- Full-fit element configuration that minimizes stagnant areas for a sanitary design.
- Robust FilmTec™ nanofiltration membranes designed to reject organics with approximate molecular weight cut-off above 250-300 amu, while allowing transport of monovalent salts.
- 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).
- New XD generation with enhanced chemical resistance delivers up to 20% longer service life and improved 10% higher productivity.
- All components comply with USA FDA and EU Food Contact regulations and are Halal certified (IFANCA).

Key Applications

- Separation of lactose and whey protein from dairy streams.
- Partial demineralization of lactose and whey protein.

Feed Flow vs. Pressure Drop

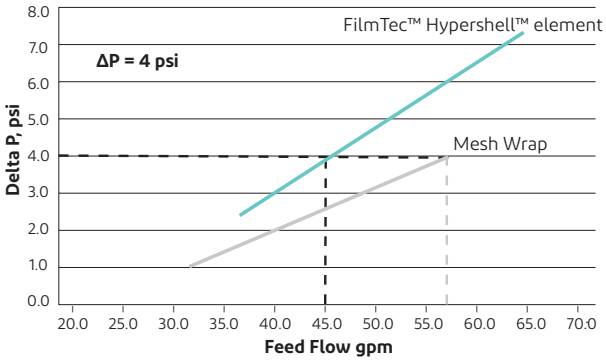


Figure 1: Feed Flow vs. Pressure Drop for Mesh Wrap and FilmTec™ Hypershell™ Elements.

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 10% greater productivity, with higher crossflow velocity at the membrane surface.

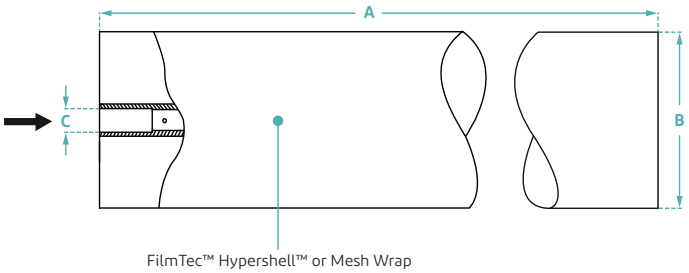
The graph indicates the flow comparison at 4psi ΔP. Energy savings can be achieved by flow reduction.

Typical Properties

Product Element	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™ NF245XD-8038 element	12100388	370 (34.4)	33	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ Hypershell™ NF245XD-8038/48 element	12100552	270 (25.0)	48	80 (18.2)	13 (0.9)	Outer shell Full Fit
FilmTec™ NF245XD-3838/30-FF element	12100410	79 (7.3)	30	30 (6.8)	15 (1.0)	Mesh Wrap Full Fit
FilmTec™ Hypershell™ NF245XD-3838/48 element	12100496	50 (4.7)	48	30 (6.8)	15 (1.0)	Outer shell Full Fit
FilmTec™ NF245XD-3840/30-FF element	12100389	81 (7.5)	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



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Element Dimensions

Dimensions – inches (mm) 1 inch = 25.4 mm			
	FilmTec™ Hypershell™ NF245XD-8038 FilmTec™ Hypershell™ NF245XD-8038/48	FilmTec™ NF245XD-3838/30-FF FilmTec™ Hypershell™ NF245XD-3838/48	FilmTec™ NF245XD-3840/30-FF
A	38.00 (965)	38.00 (965)	38.75 (984)
B	7.9 (200)	3.8 (96)	3.8 (96)
C	1.125 (28.58)	0.831 (21.10)	0.831 (21.10)

1. FilmTec™ Hypershell™ elements are designed to fit schedule 40, 8-inch stainless pipe (nominal 7.98-inch ID).
2. For these models end caps, coupler, and O-rings are not included.

Suggested Operating and Cleaning Conditions

Maximum Operating Temperature[1]	122°F (50°C)
Maximum Operating Pressure	800 psi (55 bar)
Maximum CIP Pressure	15 – 75 psi (1 – 5 bar)
pH Range	
Continuous Operation[1]	3 - 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 Nanofiltration 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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