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# DOW™ Specialty Membrane XUS120308 and XUS120304 Reverse Osmosis Elements

## Description

The DOW™ XUS120308 and XUS120304 High Temperature Reverse Osmosis Elements offer a distinct combination of features:

- Up to 80°C continuous operating temperature capability due to special element and membrane design
- Robust DOW FILMTEC™ SW30 based reverse osmosis (RO) membrane sheet
- DOW HYPERSHELL™ Reverse Osmosis technology, a machined polypropylene rigid outer shell:
  - Minimized channeling and control of premature element failures throughout product lifetime
  - Improved hydrodynamics of the element compared to mesh wrapped elements, which can result in energy savings and improved processing and Clean In Place (CIP) efficiency.
  - Improved safety and faster loading and unloading of elements from a system due to the rigid HYPERSHELL™ case, which doesn't expand over time.
  - Easy and permanent identification due to laser etched model names and serial numbers.
- The 48 mil parallel feed spacer lessens the impact of fouling, reduces the pressure drop across the pressure vessel and enhances cleaning effectiveness.
- The DOW™ XUS120308 and XUS120304 RO elements can reduce the size of cooling and heating systems, thus saving on both OPEX and CAPEX. Typical applications are:
  - Hot evaporator condensate reuse for process and rinsing purposes,
  - Concentration of thin juice sugars or components in chemical processing,
  - Production of water for the pharmaceutical industry.

**Figure 1. Pressure Drop vs. Feed Flow for Mesh wrap and DOW™ HYPERSHELL 8038 Elements**





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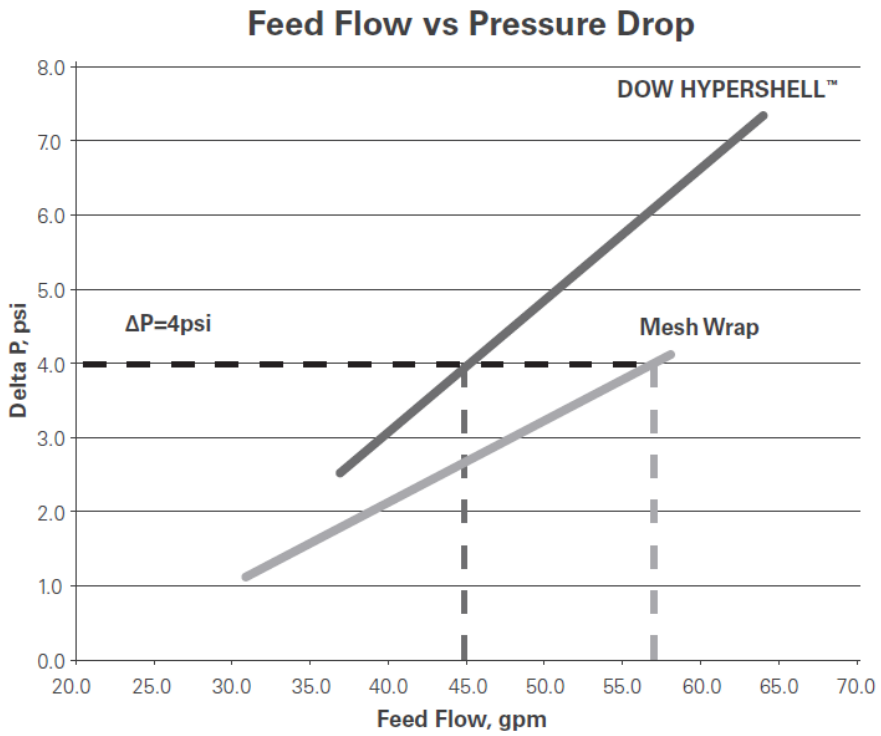
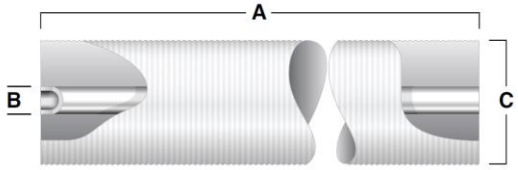
DOW HYPERSHELL™ Elements have less exterior bypassing and require approximately 30% less flow than mesh wrap for an equivalent pressure drop. The graph indicates the flow comparison at 4psi delta P. Energy can be saved by reducing flow.




## Product Specifications

| DOW™ Specialty Membrane | Active Area ($ft^2$) | Active Area ($m^2$) | Feed Spacer Thickness (mil) | Minimum ATD OD (inch) | ATD included |
|---|---|---|---|---|---|
| **DOW XUS120308** | 235 | 21.8 | 48 | 7.9 | No |
| **DOW XUS120304** | 42 | 3.9 | 48 | 3.9 | Yes |

## Element Dimensions




XUS120308( 8038)

| DOW™ Specialty Membranes | A (in.) | A (mm) | B (in.) | B (mm) | C (in.) | C (mm) |
|---|---|---|---|---|---|---|
| **XUS120308** | 38 | 965 | 1.125 ID | 29 ID | 7.9 | 201 |



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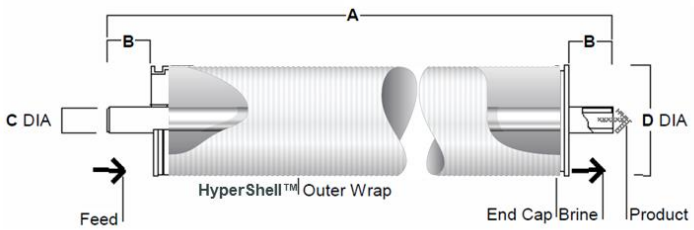


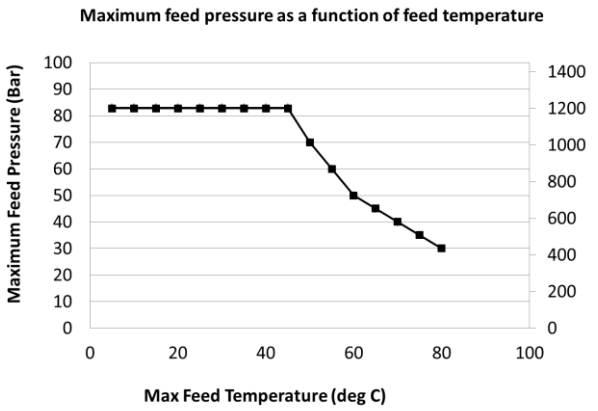

XUS120304 (4040)

| | A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|---|
| **DOW™ Specialty Membranes** | **(in.)** | **(mm)** | **(in.)** | **(mm)** | **(in.)** | **(mm)** | **(in.)** | **(mm)** |
| **XUS120304** | 40.0 | 1016 | 1.03 | 26 | 0.75 OD | 19 OD | 3.9 | 99 |

DOW HYPERSHELL™ 4040 elements are designed to fit standard 4040 pressure vessels.

## Operating Limits

| | |
|---|---|
| Maximum Operating Temperature | 80°C (176°F) |
| Maximum Operating Pressure at 80°C | 30 bar (435 psi) |
| Maximum Single Element Pressure Drop < 50°C | 0.9 bar (13.1 psi) |
| Maximum Single Element Pressure Drop < 80°C | 0.3 bar (4.4 psi) |
| Maximum Vessel Pressure Drop < 50°C | 4.1 bar (60 psi) |
| Maximum Vessel Pressure Drop < 80°C | 1.2 bar (17 psi) |
| pH Range, Continuous Operation (<45°C) | pH2 – pH11 |
| pH Range, Continuous Operation (< 80°C) | pH3 – pH8 |
| Hydrogen Peroxide Limit | 20 ppm |
| Free Chlorine Tolerance | Below Detectable Limits |
| Maximum Feed Silt Density Index ($SDI_{15}$) | SDI 5 |




| Temperature | Pressure | |
|---|---|---|
| degC | bar | psi |
| 5 | 83 | 1200 |
| 10 | 83 | 1200 |
| 15 | 83 | 1200 |
| 20 | 83 | 1200 |
| 25 | 83 | 1200 |
| 30 | 83 | 1200 |
| 35 | 83 | 1200 |
| 40 | 83 | 1200 |
| 45 | 83 | 1200 |
| 50 | 70 | 1015 |
| 55 | 60 | 870 |
| 60 | 50 | 725 |
| 65 | 45 | 653 |
| 70 | 40 | 580 |
| 75 | 35 | 508 |
| 80 | 30 | 435 |

## Clean in Place (CIP) Parameters

| | |
|---|---|
| Maximum CIP Pressure | 15 to 75 psi (1 to 5 bar) |
| pH Range, Cleaning (45°C to 50°C) | pH1.8 – pH11.0 |
| pH Range, Cleaning (< 45°C) | pH1 – pH13 |
| Hydrogen Peroxide Limit, Short-Term Cleaning | 1,000 ppm |

[a] Please refer to Dow Food & Dairy Cleaning Guide form 609-00077-0910 for more information.

[b] Under certain conditions, the presence of free chlorine and other oxidizing agents will cause premature membrane failure. Dow Water & Process Solutions recommends removing residual free chlorine using pretreatment, prior to membrane exposure. Please refer to the FILMTEC™ Technical Manual for more information.

## Important Start-Up Information

Normally, new elements are cleaned prior to initial use. The cleaning procedure should be based on the application for which the elements are to be used. If cleaning with formulated agents is not available, an alkaline wash with a wetting agent is recommended prior to initial use. Please refer to Dow Food & Dairy Cleaning Guide, form 609-00077 for more information.

Avoid any abrupt pressure or cross flow variations on the spiral elements during start-up, shutdown, cleaning or other sequences to prevent possible membrane damage. During startup, a gradual change from a standstill to operating state is recommended as follows:

- Feed pressure should be increased gradually over a 30-60 second time frame.
- Before initiating cross-flow at high permeate flux conditions (e.g., start-up with high temperature water), the set operating pressure should be maintained for 5-10 minutes.
- Cross-flow velocity at set operating point should be achieved gradually over 15-20 seconds.
- Avoid permeate-side backpressure at all times.
- Any concentrate or permeate obtained from the first hour of operation should be discarded.

**General Information :**

- Keep elements moist at all times after initial wetting.
- To control the spread of biological growth during system shutdowns, it is recommended that elements be immersed in a preservative solution.

**Warranty Information :**

Reference warranty document: Dow Specialty Membrane Prorated Element Warranty.
Before use or storage, review these additional resources for important information:

## Regulatory Note

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

## Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support.

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