



# PRODUCT SPECIFICATION

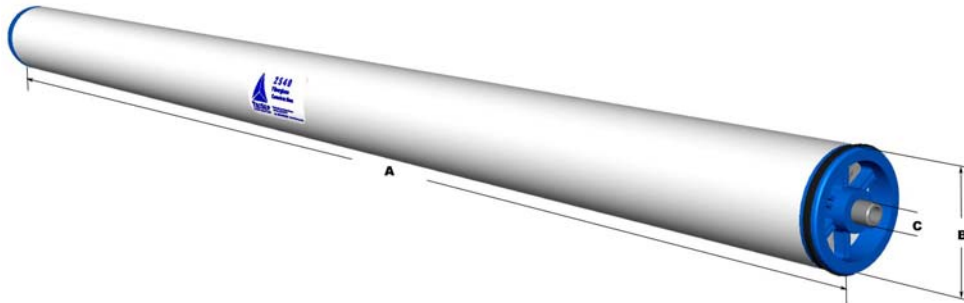
## 2.5" X-20 Low Fouling Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
2540-X201-TSF	650 (2.0)	99.00	98.00

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap
Active Membrane Area.....	26 ft <sup>2</sup> (2.4 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	6 GPM (1.4 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU



Element Weight : 7 (3.2)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 2.5 (63)    Permeate Tube (C) : 0.75 (19.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

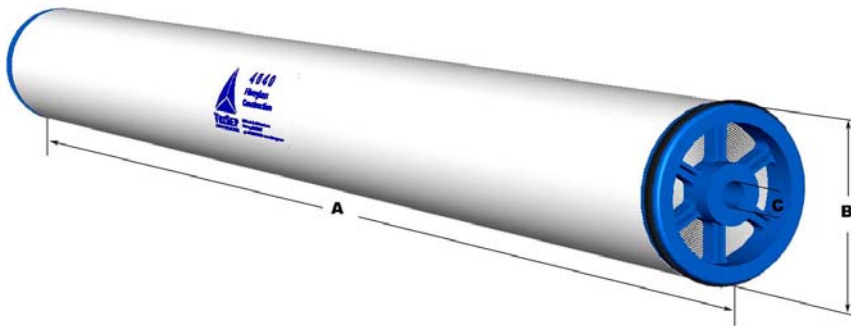
## 4" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-X201-TSA	2,450 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	88 ft <sup>2</sup> (8.2 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 15 (7)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 4.0 (101)      Permeate Tube (C) : 0.75 (19.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

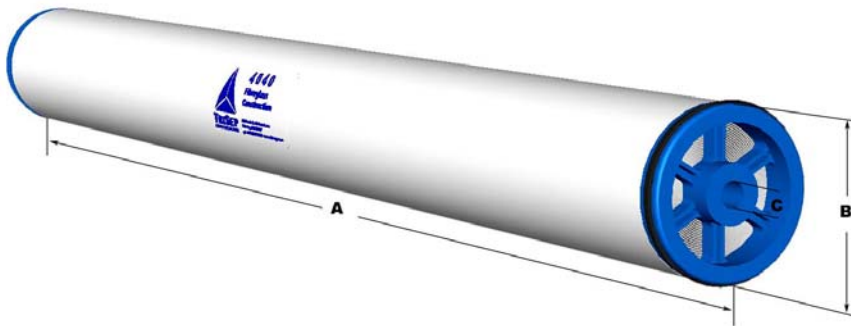
## 4" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-X201-TSDA	2,450 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	88 ft <sup>2</sup> (8.2 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 15 (7)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 4.0 (101)      Permeate Tube (C) : 0.62 (15.9)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Desal/DuPont Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

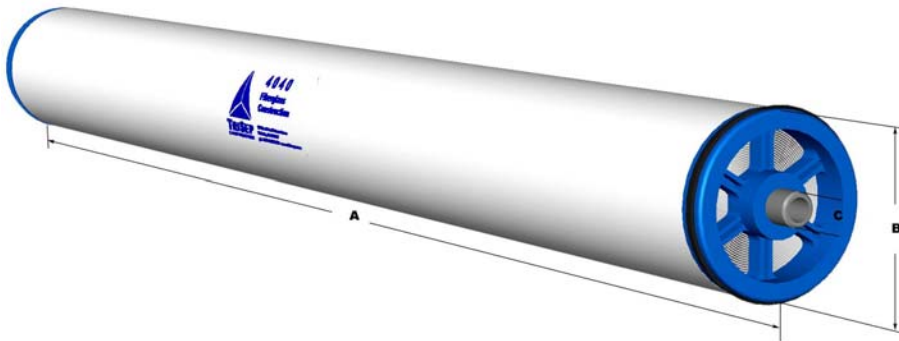
## 4" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-X201-TSF	2,400 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	85 ft <sup>2</sup> (7.9 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 15 (7)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 4.0 (101)    Permeate Tube (C) : 0.75 (19.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

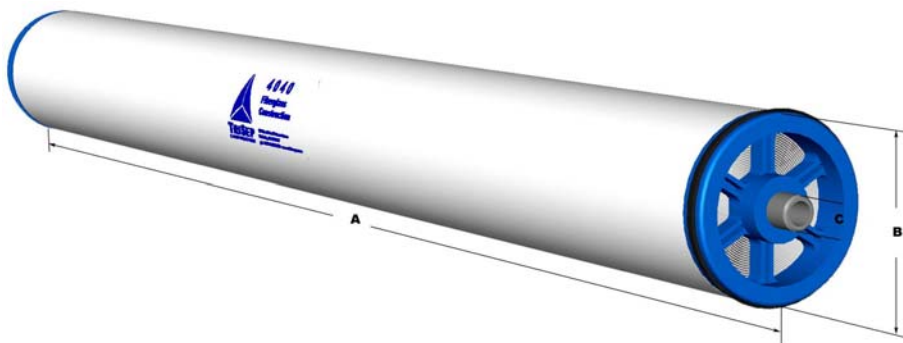
## 4" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-X201-TWF	2,400 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.00 ppm NaCl, 225.00 psi, 25°C, 15% recovery, pH 8.00, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	88 ft <sup>2</sup> (8.2 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 15 (7)  
 Length (A) : 40.00 (1,016)    Diameter (B) : 4.0 (101)    Permeate Tube (C) : 0.75 (19.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



**Engineered Membrane**  
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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-TSA	9,700 (36.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	365 ft <sup>2</sup> (33.5 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.50 (38.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



**Engineered Membrane**  
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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-TSAN	9,700 (36.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	365 ft <sup>2</sup> (33.5 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.50 (38.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



**Engineered Membrane**  
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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-TSFA	9,700 (36.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	365 ft <sup>2</sup> (33.5 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-UWA	10,400 (39.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.50 (38.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-UWAN	10,400 (39.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.50 (38.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-X201-UNA	11,000 (41.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.00 ppm NaCl, 225.00 psi, 25°C, 15% recovery, pH 8.00, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap with FoulGuard Technology
Active Membrane Area.....	430 ft <sup>2</sup> (40.0 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine	<0.1 ppm
Maximum Feed	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes)	5.0
Maximum	2 NTU



Element Weight : 45 (20)  
 Length (A) : 40.00 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.50 (38.1)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: TriSep Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8340-X201-TSOA	11,000 (41.0)	99.00	98.00

Performance is based on the following test conditions: 2,000.00 ppm NaCl, 225.00 psi, 25°C, 15% recovery, pH 8.00, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Fiberglass Outer Wrap
Active Membrane Area.....	415 ft <sup>2</sup> (38.1 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU

Element Weight : 50 (23)  
 Length (A) : 40.00 (1,016)    Diameter (B) : 8.3 (210)    Permeate Tube (C) : 1.14 (29.0)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Osmo Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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## OPERATING INFORMATION

- Recommended operating pressure is given as a guideline, and may vary depending on the application, feed-water quality, and temperature.
- Rated permeate flow is based on standard test conditions and may not apply depending on the feed-water quality. Individual element's permeate flow may vary  $\pm 15\%$ .
- Design data may be exceeded under certain circumstances. Contact TriSep for specific application information and approval.
- Elements are shipped with a preservative, therefore the permeate from the first one hour of operation must be discarded.
- New and/or unused elements must be stored in a cool, dry place out of direct sunlight.
- Elements taken out of operation for a period of more than one week must be treated with a suitable biocide. Contact TriSep for more information.
- This element is covered under TriSep's *Standard Guarantee for Spiral Wound Products*.
- If the operating parameters are not followed, the guarantee will be void.
- TriSep's maximum total liability for all causes including any breach of warranty or failure to deliver conforming goods shall not exceed the value of the contract.



## **TurboClean™ Sanitary Elements** **The New Standard of Performance**

Spiral membrane elements used in sanitary operations, such as in the dairy industry for lactose and protein whey separations, are required by the USDA to ensure that a percentage of the feed must be free to by-pass or flow around the outside of the membrane element to assure this annular area is continuously flushed and that there are no stagnant areas which are not fully exposed to CIP sanitizing procedures.

Conventional spiral membrane elements have been used historically in water, beverage, bottled water, and dialysis make-up water applications. These membrane elements use a brine or peripheral seal to prevent feed water from by-passing through the annular area formed between the vessel inner diameter and the membrane element outer diameter. This results in a dead or stagnant area between the outside of the membrane element and the inside of the housing that is prone to microbial contamination. Cleaning procedures, therefore, cannot adequately sanitize some areas of conventional membrane elements.

Different manufactures use different methods of enclosing their elements to maintain mechanical stability and to control the by-pass flow. Mechanical stability is important in both maintaining the integrity of the membrane element's configuration and maximizing element life. The enclosure type used has a major impact on both the element's mechanical stability and its efficiency in controlling by-pass flow. There are three basic design configurations for enclosing sanitary service elements. These three enclosure configurations are commonly designated as cage wrap, net wrap, and hard shell.

Controlling by-pass flow is critical for two reasons. First, if the individual element by-pass flows are different, there is no way of ensuring the membrane elements are operating as designed. This can have a detrimental effect on fouling rates and element life. Secondly, while there must be some by-pass flow around the element, any excess over the required minimum is a costly waste of power.

To determine the relative performance of each type of sanitary membrane element, tests were conducted first in our factory and then replicated by the engineering staff at the facility of one of the largest manufacturers of food and dairy processing equipment in North America. By-pass flows were reduced by up to 50% using the TurboClean element as opposed to standard net or cage wrapped elements.



## TurboClean™ Hot Water Sanitizable Membrane Elements

TriSep TurboClean™ hot water sanitizable (HWS) membrane elements are designed for use in dialysis, pharmaceutical, and beverage applications where sanitization is desired without the use of chemical biocides.



Typical spiral membrane elements are normally sanitized using chemicals such as chlorine or hydrogen peroxide. These biocides can contaminate feed streams if not properly rinsed from the system. TriSep TurboClean™ HWS elements can be sanitized at up to 85°C to eliminate the need for these chemical biocides.



Standard brine seal fiberglass wrapped elements (FRP) form a stagnant area between the outside of the element and the inside of the pressure tube. This stagnant area is difficult to sanitize and to insure adequate rinse out of cleaning or sanitizing chemicals.

The TurboClean™ element uses a polypropylene shell to allow a small by-pass flow around the outside of the element. The TurboClean™ element has advantages over standard net wrapped elements by reducing by-pass flow and having a more robust construction.

TurboClean™ elements are available for all TriSep membranes including reverse osmosis, nanofiltration, ultrafiltration, and microfiltration.

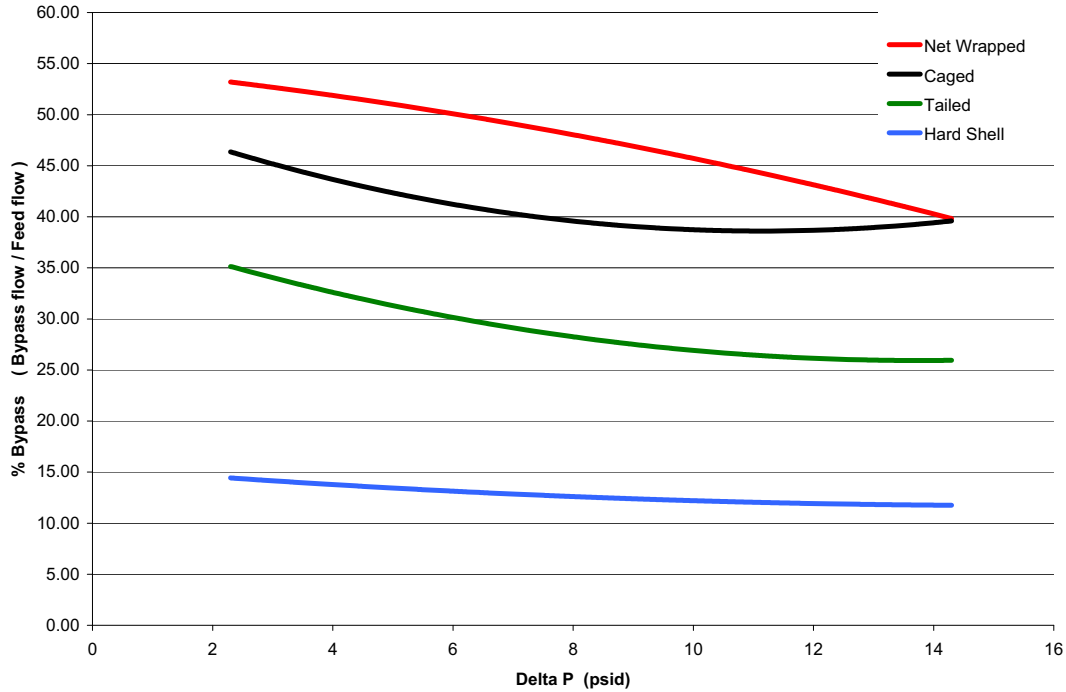
TurboClean™ HWS elements should not be subjected to changes in water temperature that exceed 3.5°F (2°C) per minute. Feed pressures should be kept below 60 psi (4 bar) during the sanitization process. During high temperature sanitization, feed - brine differential pressure drops should be kept below 5 psi (0.3 bar) per element or 30 psi (2 bar) per pressure tube.



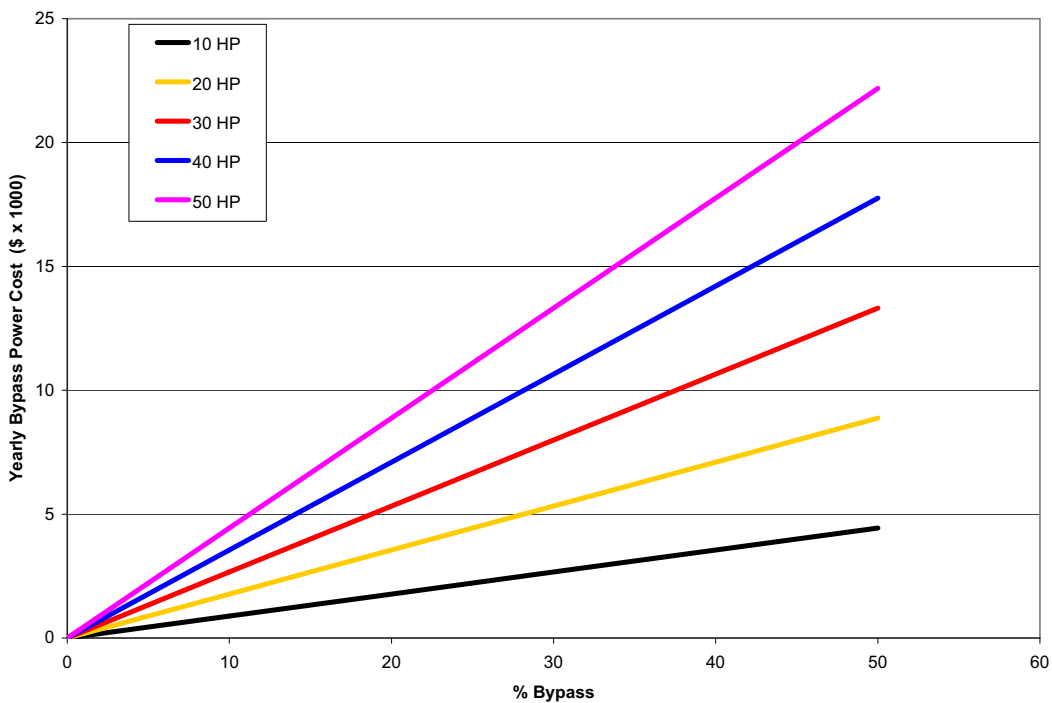


# TurboClean™ By-Pass Graphs versus Standard Sanitary Elements

Percent Bypass Flow vs Delta P



Annual Cost of Power Consumed by Bypass Flow for Various HP @ \$0.10/ kwh







## TurboClean™ Sanitary Elements for Beverage Applications

TurboClean elements have been used extensively in the beverage markets. From production of bottled water to purification of water used in beer, wine, or soft drinks, many bottlers see the advantage of using sanitary elements in their beverage applications. Although not required by law, and not classified as a food by the USDA, contamination of these products can incur huge costs if product recalls of contaminated products are required.

The sanitary nature of the TurboClean element provides a continuous by-pass flow around the outside of the element. This eliminates the stagnant area normally present on standard brine seal elements, which can result in bio-growth that can contaminate the beverage product. This stagnant area is difficult to clean or sanitize in place, as there is no flow of cleaning or sanitizing chemicals into this area. If cleaning or sanitizing chemicals do get into this area, it is difficult to predict the rinse out time for these chemicals.

Standard net wrap sanitary elements have traditionally been used in food and dairy applications. Due to the high by-pass flow inherent with these designs, food and dairy systems incorporate large recirculation pumps to insure a certain minimum flow through the elements. These net wrap elements cannot be used in standard 2-1 arrays normally used in water applications.

The TurboClean element minimized by-pass flow to 15-20% of the feed flow. This allows the TurboClean element to be used in standard water type applications like beverage water make-up. Following are some TriSep TurboClean elements specifically engineered for the beverage market.



# PRODUCT SPECIFICATION

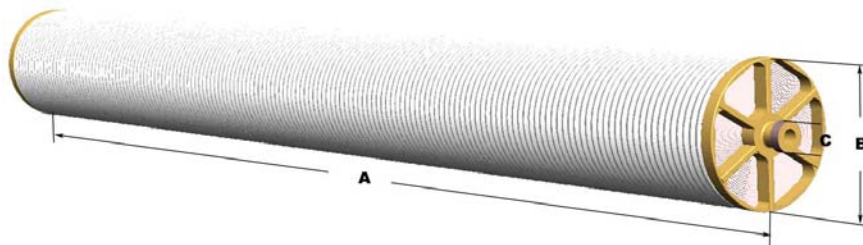
## 3.8" TS-80 High Temperature Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
3838-M7E5U8	1700 (6.0)	99.00	97.00

Performance is based on the following test conditions: 500 ppm MgSO<sub>4</sub>, 110 psi, 25°C, 15% recovery, pH 8, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ANM Aromatic Polyamide Advanced Nanofiltration Membrane
Configuration.....	Spiral Wound, High Temperature Turboclean Shell
Active Membrane Area.....	68 ft <sup>2</sup> (6.2 m <sup>2</sup> )
Recommended Applied Pressure.....	40 - 200 psi (3 - 14 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 140°F (2 - 60°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m <sup>3</sup> /hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beer Dealcoholization



Element Weight : 12 (5.4)  
 Length (A) : 38 (965)      Diameter (B) : 3.8 (96)      Permeate Tube (C) : 0.83 (21.2)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Sanitary Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

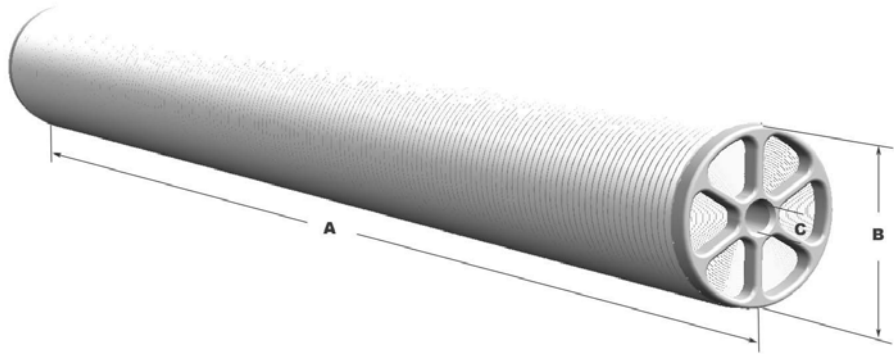
## 4" ACM RO Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-M2E6U5	2,400 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

**OPERATIONAL AND DESIGN DATA**

Membrane Type.....	ACM Fully Aromatic Polyamide Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	85 ft <sup>2</sup> (7.9 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m <sup>3</sup> /hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 15 (7)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 4.0 (101)    Permeate Tube (C) : 0.62 (15.9)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Desal/DuPont Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

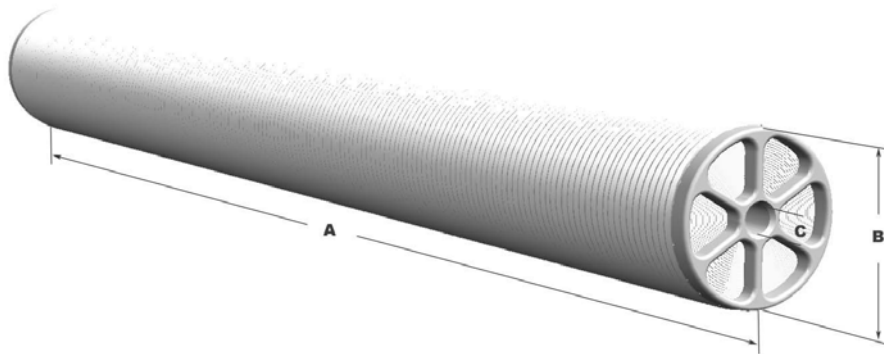
## 4" X-20 Low Fouling RO Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
4040-N1E6U5	2,400 (9.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	85 ft <sup>2</sup> (7.9 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	20 GPM (4.5 m <sup>3</sup> /hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 15 (7)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 4.0 (101)    Permeate Tube (C) : 0.62 (15.9)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Desal/DuPont Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM RO High Temperature Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M1F1W1	5,700 (21.0)	99.00	98.00

Performance is based on the following test conditions: 2,000.00 ppm NaCl, 225.00 psi, 25°C, 15% recovery, pH 8.00, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM Fully Aromatic Polyamide Advanced Composite Membrane
Configuration.....	Spiral Wound, High Temperature Turboclean Shell
Active Membrane Area.....	270 ft <sup>2</sup> (24.8 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	1000 psi (69 bar)
Recommended Operating Temperature.....	35 - 140°F (2 - 60°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	95 GPM (22 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Fruit Juice/Must Concentration



Element Weight : 40 (18)  
 Length (A) : 40.00 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.047" thick parallel spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM RO Turboclean Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M2E6T6	9,400 (35.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM Fully Aromatic Polyamide Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	355 ft <sup>2</sup> (32.6 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Make up Water



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM RO Turboclean Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M2E6X2	10,250 (38.0)	99.50	98.50

Performance is based on the following test conditions: 2,000.00 ppm NaCl, 225.00 psi, 25°C, 15% recovery, pH 8.00, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM Fully Aromatic Polyamide Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	390 ft <sup>2</sup> (36.3 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 45 (20)  
 Length (A) : 40.00 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM RO High Temperature Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M2L7S4	7,200 (27.0)	99.00	98.00

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 225.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM Fully Aromatic Polyamide Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	270 ft <sup>2</sup> (24.8 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 140°F (2 - 60°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	95 GPM (22 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beer Kettle Condensate Recovery



Element Weight : 40 (18)  
 Length (A) : 40.0 (1,016)    Diameter (B) : 7.9 (200)    Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.047" thick parallel spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM-LP Low Pressure RO Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M4E6T6	14000 (52.0)	99.00	98.00

Performance is based on the following test conditions: 2000 ppm NaCl, 225 psi, 25°C, 15% recovery, pH 8, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM-LP Fully Aromatic Polyamide Low Pressure Advanced Composite
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	355 ft <sup>2</sup> (32.6 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 45 (20)  
 Length (A) : 40 (1016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM-LP Low Pressure RO Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M4E6X2	15400 (58.0)	99.00	98.00

Performance is based on the following test conditions: 2000 ppm NaCl, 225 psi, 25°C, 15% recovery, pH 8, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM-LP Fully Aromatic Polyamide Low Pressure Advanced Composite
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	390 ft <sup>2</sup> (36.3 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 45 (20)  
 Length (A) : 40 (1016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.028" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" AUM UF High Temperature Turboclean Element

Model	Permeate flow GPD (m3/day)*	M.W.C.O.
8040-M8F2W6	10,000 (37.0)	3,500

Performance is based on the following test conditions: 500.0 ppm Dextran, 110.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	AUM Advanced Ultrafiltration Membrane
Configuration.....	Spiral Wound, High Temperature Turboclean Shell
Active Membrane Area.....	252 ft <sup>2</sup> (23.4 m <sup>2</sup> )
Recommended Applied Pressure.....	20 - 200 psi (1.4 - 14 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 140°F (2 - 60°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	10.0 ppm
Maximum Feed Flow.....	95 GPM (22 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Fruit Juice/Must Refining



Element Weight : 40 (18)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.047" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" ACM-LP Low Pressure RO Element Series

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M5E6T6	11,000 (41.6)	98.50	97.50

Performance is based on the following test conditions: 2,000.0 ppm NaCl, 150.0 psi, 25°C, 15% recovery, pH 8.0, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ACM-LP Fully Aromatic Polyamide Low Pressure Advanced Composite
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	355 ft <sup>2</sup> (32.6m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make Up



Element Weight : 45 (20)  
 Length (A) : 40.0 (1,016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" TS80 Nanofiltration Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-M7E6T6	8000 (30.0)	99.00	97.00

Performance is based on the following test conditions: 2000 ppm MgSO4, 110 psi, 25°C, 15% recovery, pH 8, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	ANM Aromatic Polyamide Advanced Nanofiltration Membrane
Configuration.....	Spiral Wound, Turboclean Shell
Active Membrane Area.....	355 ft <sup>2</sup> (32.6 m <sup>2</sup> )
Recommended Applied Pressure.....	40 - 200 psi (3 - 14 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m3/hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	1 NTU
Application.....	Beverage Water Make-up



Element Weight : 45 (20)  
 Length (A) : 40 (1016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)  
 Units in pounds and inches, units in paranthesis in kilograms and millimetres.  
 Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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# PRODUCT SPECIFICATION

## 8" X-20 Low Fouling RO Turboclean Element

Model	Permeate flow GPD (m3/day)*	Average Salt Rejection (%)	Minimum Salt Rejection (%)
8040-N1E6T6	9400 (35.0)	99.50	98.50

Performance is based on the following test conditions: 2000 ppm NaCl, 225 psi, 25°C, 15% recovery, pH 8, 30 minutes operation.

### OPERATIONAL AND DESIGN DATA

Membrane Type.....	X20 Fully Aromatic Polyamide-Urea Advanced Composite Membrane
Configuration.....	Spiral Wound, Turboclean Shell with FoulGuard Technology
Active Membrane Area.....	355 ft <sup>2</sup> (32.6 m <sup>2</sup> )
Recommended Applied Pressure.....	100 - 300 psi (7 - 21 bar)
Maximum Applied Pressure.....	600 psi (41 bar)
Recommended Operating Temperature.....	35 - 113°F (2 - 45°C)
Feedwater pH Range.....	2 - 11 continuous
Chlorine Tolerance.....	<0.1 ppm
Maximum Feed Flow.....	80 GPM (18 m <sup>3</sup> /hr)
Minimum Brine Flow/Permeate Flow Ratio....	5:1
Maximum SDI ( 15 minutes) .....	5.0
Maximum Turbidity.....	2 NTU
Application.....	Beverage Water Make-up



Element Weight : 45 (20)  
 Length (A) : 40 (1016)      Diameter (B) : 7.9 (200)      Permeate Tube (C) : 1.12 (28.6)

Units in pounds and inches, units in paranthesis in kilograms and millimetres.

Mechanical Configuration: Filmtec Style Core Tube  
 Feed Spacer: 0.031" thick diamond spacer

\* Permeate flow is clean water flux at standard conditions above. Not applicable for all feedwater conditions. Individual element's permeate flow may vary +/- 15%.



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