

# Industrial NF1 Series

## FACT SHEET

### Industrial High-Pressure Nanofiltration Elements

The Industrial NF1 nanofiltration elements feature a D-Series proprietary thin-film membrane to remove low solubility salts and organics from concentrated effluents and brines.

The Industrial NF1 will permeate sodium chloride NaCl and reject the sodium sulfate Na<sub>2</sub>SO<sub>4</sub>. The Industrial NF1 elements are high pressure elements that can operate up to 80 bar. This salt segregation combined with a high-pressure construction enables production of a pure highly concentrated (> 150 g/L) single salt. The thermal process for Zero Liquid Discharge or Minimum Liquid Discharge projects can greatly be simplified to a crystallizer only, strongly reducing the investment and the operational costs.

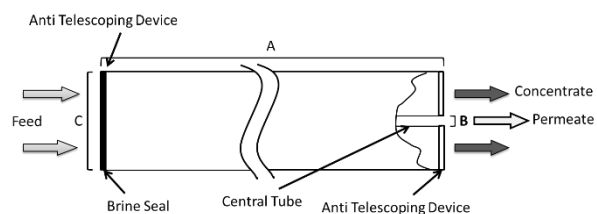
**Table 1: Element Specification**

| Membrane               | D-Series, Thin-film membrane (TFM*)                    |                                            |
|------------------------|--------------------------------------------------------|--------------------------------------------|
| Model                  | Average permeate flow gpd (m <sup>3</sup> /day) (1)(2) | Minimum MgSO <sub>4</sub> rejection (1)(2) |
| INDUSTRIAL NF1 4040F35 | 1,600 (6.1)                                            | 98.0%                                      |
| INDUSTRIAL NF1 8040F35 | 6,600 (25.0)                                           | 98.0%                                      |

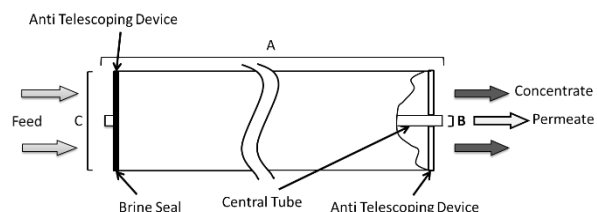
(1) Average salt rejection after 24h operation. Individual flow rate may vary ±25%.

(2) Testing conditions: 2,000 ppm MgSO<sub>4</sub> solution at 110psi (760kPa) operating pressure, 77°F, pH 7.5 and 15% recovery.

| Model                  | Spacer    | Active area | Outer wrap | Part    |
|------------------------|-----------|-------------|------------|---------|
| INDUSTRIAL NF1 4040F35 | 35 (0.89) | 75 (7.0)    | Fiberglass | 3154540 |
| INDUSTRIAL NF1 8040F35 | 35 (0.89) | 330 (30.7)  | Fiberglass | 3148906 |



**Figure 1 : Element Dimensions Diagram – Female**



**Figure 2: Element Dimensions Diagram – Male**

**Table 2: Dimensions and Weight**

| Model     | Type   | Dimensions, inches (cm) |              |            | Boxed Weight lbs. (kg) |
|-----------|--------|-------------------------|--------------|------------|------------------------|
|           |        | A                       | B            | C          |                        |
| **4040F** | Male   | 40.0 (101.6)            | 0.75 (1.90)  | 3.9 (9.9)  | 11 (5)                 |
| **8040F** | Female | 40.0 (101.6)            | 1.125 (2.86) | 7.9 (20.1) | 35 (16)                |

**Table 3: Operating and CIP parameters**

|                                   |                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------|
| <b>Typical Operating Flux</b>     | 5 - 20 GFD (8 – 34 LMH)                                                            |
| <b>Maximum Operating Pressure</b> | See Table 4                                                                        |
| <b>Maximum Temperature</b>        | Continuous operation: 122°F (50°C)<br>Clean-In-Place (CIP): 122°F (50°C)           |
| <b>pH Range</b>                   | Continuous operation: 3.0 – 9.0<br>Clean-In-Place (CIP): 2.0 – 11.0 <sup>(1)</sup> |
| <b>Maximum Pressure Drop</b>      | Over an element: 15psi (103kPa)<br>Per housing: 60psi (414kPa)                     |
| <b>Chlorine Tolerance</b>         | 500 ppm x hours,<br>Dechlorination recommended                                     |
| <b>Feedwater</b>                  | NTU < 1<br>SDI <sub>15</sub> < 5                                                   |

(1) Refer to Cleaning Guidelines Technical Bulletin TB1194.

**Table 4: Maximum Operating Pressure**

| <b>Temperature</b> | <b>Maximum Operating Pressure</b> |
|--------------------|-----------------------------------|
| < 77°F (25°C)      | 1,200psi (8,253kPa)               |
| < 86°F (30°C)      | 1,000psi (6,895kPa)               |
| < 95°F (35°C)      | 850psi (5,860kPa)                 |
| < 104°F (40°C)     | 750psi (5,171kPa)                 |
| < 113°F (45°C)     | 670psi (4,619Pa)                  |
| < 122°F (50°C)     | 600psi (4,137kPa)                 |