



# SPIRA-CEL® OX Industry

## NP Series

SPIRA-CEL® OX modules have an outstandingly high stability against temperature and pH. They may be used to clean caustic solutions and may be used in biotechnological applications where extreme cleaning conditions are required. NADIR® NP polyethersulfone (PES) membranes exhibit nanofiltration properties after a high-pressure (40 bar) stabilization, offering unique separation properties for process applications.

### MEMBRANE CHARACTERISTICS

Membrane	NADIR® NP010	NADIR® NP030
Nominal M.W.C.O. (Da)	1,000 - 1,200	500 - 600
Na <sub>2</sub> SO <sub>4</sub> Salt Rejection (%) <sup>a</sup>	35 - 75	77 - 95

### DESIGN INFORMATION

Model	Membrane Area m <sup>2</sup> (ft <sup>2</sup> )	Feed Spacer Thickness (mil) <sup>b</sup>
SPIRA-CEL® OX NP010 2440C	1.8 (19)	46
SPIRA-CEL® OX NP010 2440D	1.8 (19)	47
SPIRA-CEL® OX NP010 4040B	7.5 (81)	31
SPIRA-CEL® OX NP010 4040C	6.0 (65)	46
SPIRA-CEL® OX NP010 4040D	6.0 (65)	47
SPIRA-CEL® OX NP010 8040B	32.0 (344)	31
SPIRA-CEL® OX NP010 8040C	25.0 (269)	46
SPIRA-CEL® OX NP010 8040D	25.0 (269)	47
SPIRA-CEL® OX NP030 2440C	1.8 (19)	46
SPIRA-CEL® OX NP030 2440D	1.8 (19)	47
SPIRA-CEL® OX NP030 4040B	7.5 (81)	31
SPIRA-CEL® OX NP030 4040C	6.0 (65)	46
SPIRA-CEL® OX NP030 4040D	6.0 (65)	47
SPIRA-CEL® OX NP030 8040B	32.0 (344)	31
SPIRA-CEL® OX NP030 8040C	25.0 (269)	46
SPIRA-CEL® OX NP030 8040D	25.0 (269)	47

<sup>a</sup> Test conditions: 5,000 ppm Na<sub>2</sub>SO<sub>4</sub>, 40 bar (580 psi), 20°C (68°F). Membrane specifications may change without notice as design revisions occur.

<sup>b</sup> All models on this sheet have an industry hard shell and one brine seal. Models ending in "D" have parallel feed spacers; all other models have diamond shaped feed spacers. All models on this sheet include anti-telescoping devices (ATDs) attached to the ends of the element as default. ATDs can instead be provided loose in the box on request.

### OPERATING PARAMETERS

Maximum Operating Pressure	40 bar (580 psi)
Maximum Operating Temperature	80°C (176°F)
Operating pH Range	3.0 - 14.0
Cleaning pH Range <sup>1</sup>	2.0 - 14.0
Maximum Pressure Drop	2 bar (29.0 psi) @ 5 - 50°C per element 1.3 bar (18.9 psi) @ 50 - 65°C per element 0.5 bar (7.3 psi) @ 65 - 80°C per element 2 bar (29.0 psi) @ 80°C per housing

<sup>1</sup> Refer to temperature and pH limits in Membrane Cleaning Guide - Water Application Elements (TSG-C001).

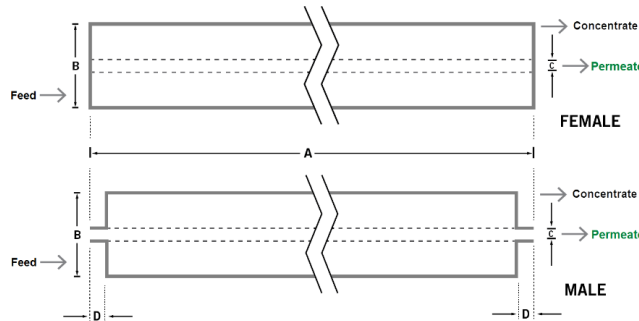
**PHYSICAL DIMENSIONS**

Model	Element Weight kg (lb) <sup>c</sup>	Dim. A mm (inches)	Dim. B mm (inches)	Dim. C <sup>d</sup> mm (inches)	Permeate Tube <sup>e</sup>
SPIRA-CEL® OX NP010 2440C	3 (7)	1,016 (40.0)	62.0 (2.44)	19.05 (0.75)	Male
SPIRA-CEL® OX NP010 2440D	3 (7)	1,016 (40.0)	62.0 (2.44)	19.05 (0.75)	Male
SPIRA-CEL® OX NP010 4040B	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP010 4040C	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP010 4040D	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP010 8040B	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female
SPIRA-CEL® OX NP010 8040C	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female
SPIRA-CEL® OX NP010 8040D	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female
SPIRA-CEL® OX NP030 2440C	3 (7)	1,016 (40.0)	62.0 (2.44)	19.05 (0.75)	Male
SPIRA-CEL® OX NP030 2440D	3 (7)	1,016 (40.0)	62.0 (2.44)	19.05 (0.75)	Male
SPIRA-CEL® OX NP030 4040B	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP030 4040C	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP030 4040D	4 (9)	1,016 (40.0)	101.5 (4.0)	16.0 (0.63)	Female
SPIRA-CEL® OX NP030 8040B	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female
SPIRA-CEL® OX NP030 8040C	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female
SPIRA-CEL® OX NP030 8040D	16 (36)	1,016 (40.0)	200.5 (7.9)	30.15 (1.187)	Female

<sup>c</sup> Shipping weight is dependent on packaging material and quantity shipped.

<sup>d</sup> Diameters for Dimension “C” are as follows. For Female elements, “C” is the Inner Diameter. For Male elements, “C” is the Outer Diameter.

<sup>e</sup> Male elements have a protruding permeate tube, indicated as “D” in the diagram. Dimension “D” is 25.4 mm (1.0 in).



**IMPORTANT INFORMATION**

**Start-up:** MANN+HUMMEL Water & Fluid Solutions recommends flushing elements for 30 minutes at low pressure and discarding permeate during the flush prior to operation. For a more detailed start-up procedure, please see Element Start-Up Guide – System Start-Up (TSG-O-005).

**Cleaning:** TRISEP® membrane elements must be cleaned periodically to ensure proper operation and to prevent membrane damage. Please see Membrane Cleaning Guide – Water Application Elements (TSG-C001).

**Storage:** TRISEP membrane elements must be stored appropriately to ensure proper operation and to prevent membrane damage. Please see Element Storage Guides (TSG-O-009 & TSG-O-010).

**CUSTOMIZABLE SPECIALTY ELEMENTS**

MANN+HUMMEL Water & Fluid Solutions offers a full range of membranes and element designs for challenging water and process applications. Technologies include low-fouling RO, submerged UF, continuous high temperature, ultra-high pressure, unique sanitary designs and more. Contact us to customize a product that satisfies your specific requirements.

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