

## AMS NanoPro™ A–3014

### Acid Stable Nanofiltration Spiral Wound Element

Description	The AMS NanoPro™ membrane is developed for long-term performance with high and stable fluxes in very acidic environment, featuring high pressure and temperature compatibility. AMS NanoPro™ elements are used for acid purification and metals concentration in low pH streams. Typical solutions include:: <div><div>● 20% H<sub>2</sub>SO<sub>4</sub></div><div>● 20% HCl</div><div>● 30% H<sub>3</sub>PO<sub>4</sub></div><div>● 10% CH<sub>3</sub>COOH</div></div>				
Performance	Cut-off Rate <sup>(1)</sup> :	400 dalton			
	Water Flux <sup>(2, 3)</sup> :	90 liter/m <sup>2</sup> /hour (53 gal/ft/day)			
	MgSO <sub>4</sub> Rejection <sup>(2, 4)</sup> :	≥ 92 %			
Limits	Typical operating pressure:	15-40 bar (217-580 psi)			
	Max Pressure Drop:	0.5 bar (7.3 psi)			
	Max Temperature <sup>(5)</sup> :	Operating: 50 °C (122 °F) Cleaning: 50 °C (122 °F)			
	pH Range <sup>(5)</sup> :	Operating: 0 – 12 Cleaning: 0 – 13			
	Recirculation Flow:	1.8" element: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2.5" element: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4" element: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8" element: 90 – 167 liter/min (23 – 42.7 gal/min)			
	Pressurization& Depressurization rate	< 0.7 bar/second (10psi/second)			
	Heating & cool down rate	< 5°C /minute (41 °F/minute)			
Area	m <sup>2</sup> (ft <sup>2</sup> )	1812	2540	4040	8040
	B 31 mil Spacer	0.32 (3.4)	1.8 (19)	6.2 (67)	29 (312)
	C 46 mil Spacer	0.25 (2.7)	1.6 (17)	4.9 (53)	24 (260)

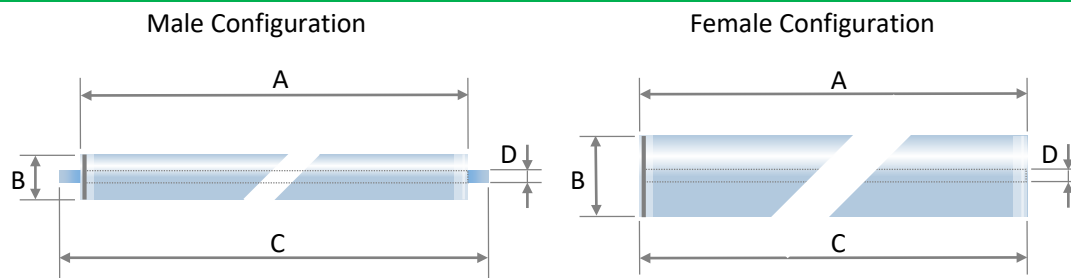
(1) Only for indication;

(2) Test conditions: pressure 40 bar (580 psi), temperature 30 °C (86 °F);

(3) Flux measured with demineralized (RO) water, flux may vary for individual element within ±20% range;

(4) Feed solution is 0.2% MgSO<sub>4</sub> in demineralized (RO) water;

(5) Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature or concentrations.

**Dimensions**

mm (inch)	1812	2540	4040	8040
Type	Female	Male	Male	Female
A	305 (12)	965 (38.0)	965 (38.0)	1016 (40.0)
B (ø)	46 (1.8)	62 (2.4)	99.4 (3.9)	200.5 (7.9)
C	305 (12)	1016 (40.0)	1016 (40.0)	1016 (40.0)
D (ø)	16 (0.6)	19 (0.75)	19 (0.75)	28.8 (1.13)

**Handling**

**Recommended Cleaning Materials.** Depending on the nature of the feed material, a choice can be made among the following cleaning agents:

- Sodium hydroxide at pH 10 – 12, temperature  $\leq 40\text{ }^{\circ}\text{C}$  (104  $^{\circ}\text{F}$ );
- Hydrochloric acid at pH 1 – 2, temperature  $\leq 40\text{ }^{\circ}\text{C}$  (104  $^{\circ}\text{F}$ );
- Nitric acid at pH 1 – 2, temperature  $\leq 40\text{ }^{\circ}\text{C}$  (104  $^{\circ}\text{F}$ );
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature  $\leq 35\text{ }^{\circ}\text{C}$  (91  $^{\circ}\text{F}$ );
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH 10.5 – 11, temperature  $\leq 35\text{ }^{\circ}\text{C}$  (91  $^{\circ}\text{F}$ ).

Only demineralized (RO) water must be used for cleaning. Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

**Lubricants.** During installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and void any warranty.

**Preservation and Storage.** Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30  $^{\circ}\text{C}$  (39 – 86  $^{\circ}\text{F}$ ). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

**Chemical Exposure.** Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.