

# AMS NanoPro™ Acid Elements

## Acid Stable Nanofiltration Spiral Wound Elements

**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:

- 20% H<sub>2</sub>SO<sub>4</sub>
- 20% HCl
- 30% H<sub>3</sub>PO<sub>4</sub>
- 10% CH<sub>3</sub>COOH

Characteristics	Membrane	Cut-off Rate (Da)	Flux <sup>[1]</sup>	MgSO <sub>4</sub> Rejection <sup>[1]</sup>	Glucose Rejection <sup>[2]</sup>
	A-3011	100	22 LMH	98%	98%
	A-3012	200	25 LMH	96%	96%
	A-3014	400	30 LMH	90%	90%

Limits		
	Max Operating Pressure	55 bar (800 psi)
	Max Pressure Drop	1 bar (14.5 psi) for individual element
	Max. Operating Temperature	40 °C (104 °F)
	Max. Cleaning Temperature	40 °C (104 °F)
	Operating pH range	0-12
	Cleaning pH range	0-13
	Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 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> )	Size	1812	2540	4040	8040
	31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
	46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

<sup>[1]</sup> Test condition:

a. 2000ppm MgSO<sub>4</sub> solution, 225psi (15.5bar), 86°F (30°C), pH7.0.

b. Permeate flow for individual elements may vary ± 20%.

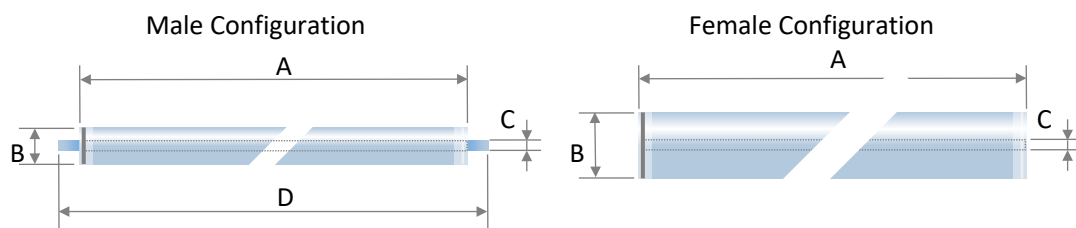
<sup>[2]</sup> Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH7.0.

<sup>[3]</sup> For the purpose of improvement, specifications may be updated periodically.

<sup>[4]</sup> Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

<sup>[5]</sup> Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

## Dimensions



Size mm(inch)	A <sup>[1]</sup>	∅B <sup>[2]</sup>	∅C <sup>[3]</sup>	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	965 (38)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

<sup>[1]</sup> Tolerance: ±0.5 mm

<sup>[2]</sup> Tolerance: -2~0 mm

<sup>[3]</sup> 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

## Handling

**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.

\* **NB:** Please do not use tap water while testing or cleaning the module since the residual chlorine contained in the tap water could negatively affect the membrane performance.

**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 ≤40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ≤40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ≤35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5% at pH 10.5 – 11, temperature ≤35 °C (91°F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** 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°C (39 – 86°F). Storage solutions should be made with: 1.5% w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

## Annex

Nomenclature: AMS–A-3011–8040–B

AMS	A-3011	8040	B
Design/Application	Membrane	Diameter & Length	Feed spacer
<b>AMS</b>	<b>A-3011</b>	1812	<b>B: 31mil /0.78mm (diamond)</b>
AMS Membrane series	A-3012	2540	C: 46mil /1.1mm (diamond)
	A-3014	4040	M: 34mil /0.86mm (diamond)
		<b>8040</b>	