Nitto
Innovation for Customers

HYDRANAUTICS

# ESPA

## Energy Saving Polyamide Membrane Elements

Hydranautics offers a complete line of energy saving polyamide ESPA reverse osmosis membrane elements for a wide range of water treatment applications. ESPA's unparalleled performance characteristics can provide significant cost savings due to the lower operating pressures required, while still providing optimal flow as well as high salt and boron rejection

Hydranautics offers Integrated Membrane Solutions® (IMS) combining a range of RO, NF, UF and MF membrane technologies to achieve the most comprehensive, effective and low-cost solutions for the industry.

### ESPA Applications:

- Treatment of ground, surface and wastewater
- High purity industrial applications
- Boron reduction for potable and agricultural water
- Municipal waste water reclamation

### ESPA Product Offerings:

- **ESPA1:** ESPA1 is commonly used to produce potable water from low TDS feed waters.
- **ESPA2:** ESPA2 membranes provide optimum salt rejection and permeate flows. They are chosen when lower permeate TDS and lower feed pressures are needed. ESPA2 membranes offer highest energy efficiency at lowest costs and are used in large municipal wastewater reclamation plants.
- **ESPAB:** ESPAB are low pressure brackish water membranes having a high rejection for boron.
- **ESPA4:** ESPA4 are the lowest feed pressure membranes offering low energy consumption. ESPA4 membranes require ultra-low pressure without compromising high salt rejection and are commonly used in the second pass of a reverse osmosis system.

The ESPA2 and ESPA4 membranes are available in the LD variant. Low differential LD Technology® models are offered to minimize colloidal fouling when used with conventional pre-treatment equipment. These membranes offer consistently low feed pressures and longer intervals between cleanings.

ESPA2, ESPAB and ESPA4 membranes are available in the MAX variant with 440 $ft^2$ (40.9 $m^2$) active membrane surface area. Increased membrane area reduces capital costs by requiring fewer pressure vessels and less floor space

ESPA membranes are available in 4" and 8" diameters. ESPA2 and ESPAB membranes are also available in space saving 16" diameters.



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## Specified Performance* and General Product Description:

| Membrane Product | Model | Permeate flow gpd ($m^3/d$) | Salt Rejection* (nominal) | Feed Spacer Thickness (mil) | MembraneActiveArea $ft^2$ ($m^2$) |
|---|---|---|---|---|---|
| ESPA1 | **ESPA1-LD-4040** | 2,450 (9.3) | 99.4% | 34 | 80 (7.4) |
| | **ESPA1** | 12,000 (45.4) | 99.4% | 26-28 | 400 (37.2) |
| ESPA2 | **ESPA2-LD-4040** | 2,000 (7.6) | 99.6% | 34 | 80 (7.4) |
| | **ESPA2-LD** | 10,000 (37.9) | 99.6% | 34 | 400 (37.2) |
| | **ESPA2 MAX** | 12,000 (45.4) | 99.6% | 26-28 | 440 (40.9) |
| | **ESPA2-LD MAX** | 12,000 (45.4) | 99.6% | 34 | 440 (40.9) |
| ESPAB | **ESPAB MAX** | 9,000 (34.1) | 99.3% | 26-28 | 440 (40.9) |
| ESPA4 | **ESPA4-LD-4040** | 2,350 (8.9) | 99.2% | 34 | 80 (7.4) |
| | **ESPA4-LD** | 12,000 (45.4) | 99.2% | 34 | 400 (37.2) |
| | **ESPA4-LD HP** | 11,000 (41.6) | 99.2% | 34 | 400 (37.2) |
| | **ESPA4 MAX** | 13,200 (50) | 99.2% | 26-28 | 440 (40.9) |

*Specified Performance is based on data taken after approximately 30 minutes of operation. Actual testing of elements may be done at conditions which vary from these exact values; in which case, the performance is normalized back to these standard conditions. Permeate flow for individual elements may vary ±15 percent from the value specified



Hydranautics - A Nitto Group Company is a global leader in research, including reverse osmosis, nanofiltration, ultrafiltration, and microfiltration. Our membrane products (PRO series, CPA, ESPA, LFC, SWC, ESNA, HYDRAcapMAX and HYDRAsub) are used extensively in municipal & industrial water and wastewater treatment.

Hydranautics has over 50 years' experience in the membrane technology arena, and we are committed to creating innovative membrane technologies that provide clean water to a thirsty world.

Our Global Membrane Division is headquartered in Oceanside, CA, USA, and two state-of-the-art manufacturing sites are located in Oceanside, CA, USA, and Shiga, Japan. Our world-wide sales and customer service offices are located throughout Europe, Asia, the Middle East, North America, and South America.

# Solutions You Need.

# Technologies You Trust!


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Feb 2024