Membrane Technology Evolved

The LD Technology™
**Introduction**

When high performance is required under demanding conditions, the LD (Low Differential) reverse osmosis / nanofiltration membrane elements from Hydranautics - A Nitto Group Company set a new standard for high performance with lower colloidal and biological fouling.

**Key Features**

The LD Technology™ consists of enhanced membrane chemistry for increased chemical resistance, innovative spacer design to minimize trapping of small colloidal particles, and biostatic properties to minimize proliferation of bacteria in the membrane element. The LD Technology™ products are constructed with Hydranautics proprietary vented seal carrier which eliminates pressure-shock damage during system startup.

**The LD Advantages**

**Lower Colloidal Fouling**
- Innovative feed spacer design prevents trapping of small colloidal particles and reduces the colloidal fouling of RO/NF membranes.

**Reduced Biofouling**
- Novel HYDRAblock™ technology (patent pending) provides the biostatic properties to retard the growth of bacteria and reduce biological fouling.

**Increased Membrane Durability**
- Enhanced membrane chemistry provides increased chemical resistance to high pH operation.
- Patented seal carrier has air vents to allow quick passage of residual air between the membrane elements during the system start-up to prevent element damage due to pressure shock.

![NaOH tolerance of the CPAS-LD](chart)

**Enhanced Cleaning Performance**
- The LD Technology™ offers a wide pH cleaning range so that effective cleaning can be performed without degrading performance.

**Lower dP (Differential Pressure)**
- Lower differential pressure reduces power consumption, saving energy costs and decreasing the carbon footprint of the system.

**Improved Flux Distribution**
- Lower differential pressure also improves flux distribution between lead and tail element further reducing membrane fouling.

**Key Benefits**
- Longer membrane life
- Reduced cleaning costs
- Increased productivity
- Improved permeate quality

**Applications**
- Surface water and waste water sources with high fouling potential
- Ultrapure water production for semiconductor and pharmaceuticals industries
- Boiler feed water for power generation and manufacturing industries
- Waste water reuse
- Brackish water RO for drinking water
- Seawater RO for drinking water
**CPA5-LD**
The CPA5-LD is a composite polyamide brackish water membrane element with high rejection, high flow, low fouling propensity to achieve high performance in demanding applications. CPA5-LD has the highest rejection for impurities including silica and boron.

**Applications**
- Ultrapure water production for semiconductor and pharmaceuticals industries.
- Boiler feed water for power generation and manufacturing industries.
- Industrial waste water recycle
- Zero liquid discharge/ HERO process

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**LFC3-LD**
The LFC3-LD membranes offer breakthrough technology by combining the attributes of a neutral surface charge with hydrophilicity to minimize organic fouling to maintain membrane performance in demanding applications.

**Applications**
- Municipal waste water treatment
- Industrial waste water treatment
- Waste water with high biological and organic fouling potential.

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**ESPA2-LD**
The ESPA2-LD are high productivity, energy saving polyamide membrane elements. The ESPA2-LD offers significant cost savings due to the lower operating pressure requirements while providing optimal flow as well as high salt rejection.

**Applications**
- Municipal drinking water treatment
- Municipal waste water reuse
- Food and beverage industries
- Light industrial uses

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**SWC5-LD**
The high productivity SWC5-LD offers the highest levels of salt rejection with a consistently pure end-product. The SWC5-LD offers the perfect combination of high flow superior salt and boron rejection with low operating pressures. The SWC5-LD has been designed to accommodate varying levels of seawater salinities using conventional mode of pretreatment or seawater having high turbidity/suspended solids.

**Applications**
- Sea water desalination
- Industrial waste water treatment
- Boron reduction
Hydronautics - A Nitto Group Company is a global leader in research, development and manufacture of water filtration membranes including reverse osmosis, nanofiltration, ultrafiltration and microfiltration. Our membrane products (CPA, ESPA, LFC, SWC, HYDRAcap and HYDRAsub) are used extensively in municipal and industrial water and wastewater treatment.

Hydronautics and Nitto have 5 decades of experience in membrane technology. We remain committed to bringing innovative membrane technologies which provide clean water to a thirsty world.

Our global membrane division is headquartered in Oceanside, CA, USA. We have three state-of-the-art manufacturing sites located in Oceanside - CA, USA, Shiga - Japan and Shanghai - China with combined manufacturing area in excess of 131,000 m² (1,400,000 ft²). Our worldwide sales and customer service offices are located throughout Asia, Europe, the Middle East, North America and South America.

Please visit us online, www.hydronautics.com, or email us, info@hydronautics.com

Regional Headquarters for Sales and Technical Services

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