



## The First Choice in Seawater Desalination

### SWC - Seawater Composite Membrane Elements

Hydranautics is the world leader in seawater desalination, producing over 500 million gallons per day (2 million m<sup>3</sup>/d) of purified water. With more installed capacity than any other competitor, the SWC membrane provides unparalleled and consistent operating performance.

SWC elements are available from Hydranautics in both 4-inch and 8-inch diameters by 40-inch long spiral wound configurations for all desalination applications. Smaller diameter seawater elements are also available from Hydranautics' licensed manufacturer Oltremare, located in Fano, Italy. The high productivity SWC elements offer the highest levels of salt rejection with a consistently pure end product. The patented membrane formulations have been designed to accommodate varying levels of seawater salinities worldwide with reliable field-proven performance. The SWC5, for example, is state-of-the-art for seawater desalination providing the best combination of energy savings and high rejection. The SWC5 can be used in combination with the ESPA-B in a second pass to achieve stringent boron requirements. This combination of membrane element types is one example of our Integrated Membrane Solution® (IMS) which combines a range of RO, NF, UF and MF membrane technologies to achieve the most comprehensive, effective, low-cost results in the industry.

### Hydranautics' SWC membrane elements include:

#### SWC1 - 4 inch

The trusted barrier for making drinking water from seawater on-board ships

#### SWC3+

Offers high productivity resulting in lower operating pressure and a substantial cost savings

#### SWC4+

Ideal for warm water applications with the highest salt rejection in a high surface area membrane and the highest boron rejection available

#### SWC5

Offers the perfect combination of high flow, superior salt and boron rejection with low operating pressures



### Performance for Seawater Membranes

Element Type	Min. Salt Rej., %	Nom. Salt Rej., %	Permeate Flow GPD (m3/d)
SWC1-4040	99.5	99.6	1,200 (4.6)
SWC3+	99.7	99.8	7,000 (26.5)
SWC4+	99.7	99.8	6,500 (24.6)
SWC5	99.7	99.8	9,000 (34)

### Test Conditions for SWC

The stated performance is initial (data taken after 30 minutes of operation), based on the following conditions:

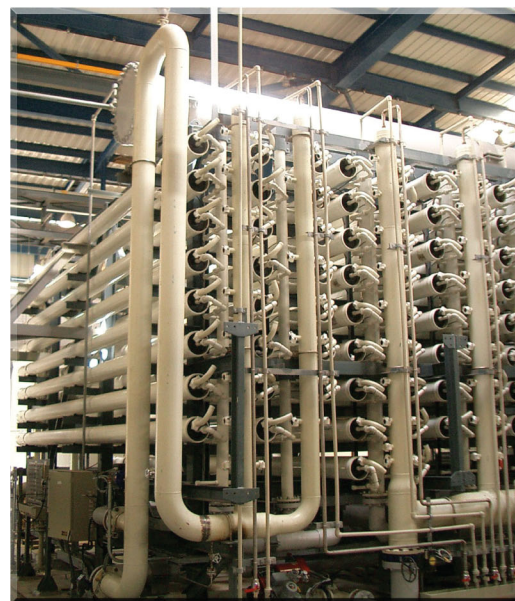
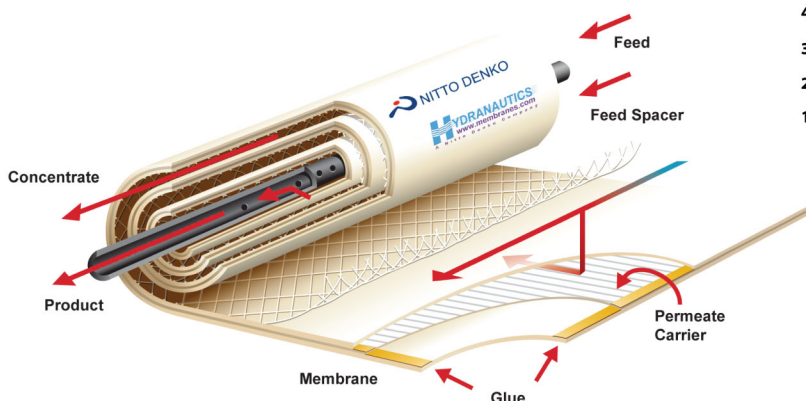
NaCl Solution, PPM	32,000
Applied Pressure, psig (MPa)	800 (5.5)
Operating Temperature, °F(°C)	77° (25°)
Permeate Recovery	10%
pH Range	6.5-7.0
Application Data*	
Maximum Applied Pressure, psig (MPa) 8-inch	1200 (8.27)
Maximum Applied Pressure, psig (MPa) 4-inch	1000 (6.9)
Maximum Feed Flow, GPM (m³/h)	4 inch -16 (3.6), 8 inch - 75 (17)
Maximum Operating Temperature, °F(°C)	113° (45°)
Feedwater pH Range†	3.0-10.0
Maximum Feedwater Turbidity, NTU	1.0
Maximum Feedwater SDI (15 mins)	5.0
Maximum Chlorine Concentration, PPM	<0.1
Minimum Ratio of Concentrate to Permeate Flow for any 8 inch Element	5:1
Maximum Pressure Drop for Each Element, psig	10

\*The limitations shown here are for general use. The values may be more conservative for specific projects to ensure the best performance and longest life of the membrane.

†See technical literature for extended pH limits

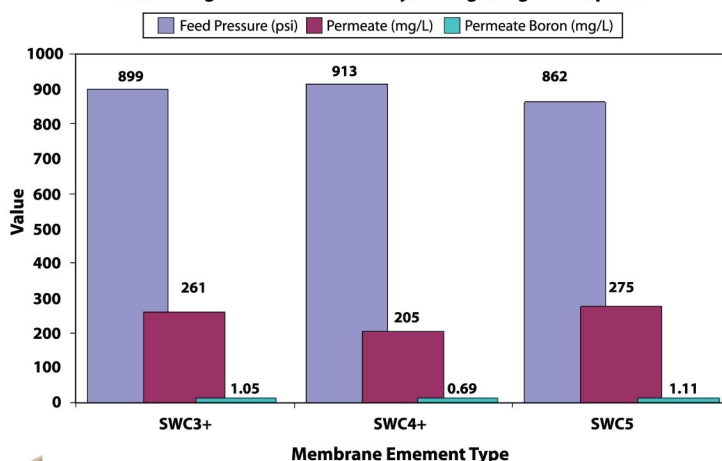
### Selected SWC Project References:

Fujairah, UAE	45 MGD (170,000 m3/d) of potable water from the Persian Gulf
Carboneras, Spain	32 MGD (120,000 m3/d) of potable water from the Mediterranean Sea
Cartagena, Spain	17 MGD (65,000 m3/d) of potable water from the Mediterranean Sea



SWC3 membrane installation, 45 MGD (170,000 m³/d) in Fujairah, U.A.E.

### Comparative Performance of Hydranautics Seawater Products (40,000 mg/L Feed, 45% recovery, 25 deg C, 8 gfd flux, pH 8)



**Hydranautics Corporate Office:** 401 Jones Road, Oceanside, CA 92058  
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# BRACKISH WATER RO MEMBRANES



## ESPA®

### Performance for Ultra Low Pressure Membranes

Element Type	Min. Salt Rej., %	Nom. Salt Rej., %	Permeate Flow GPD (m3/d)
ESPA1-4040	99.0	99.3	2,600 (9.8)
ESPA2-4040	99.4	99.6	1,900 (7.2)
ESPA3-4040	98.0	98.5	3,000 (11.4)
ESPA4-4040	99.0	99.2	2,500 (9.4)
ESPA1	99.0	99.3	12,000 (45.4)
ESPA2	99.5	99.6	9,000 (34.1)
ESPA2-365	99.5	99.6	8,200 (31.0)
ESPA2+*	99.5	99.6	12,000 (45.4)
ESPA3	98.0	98.5	14,000 (53.0)
ESPA4**	99.0	99.2	12,000 (45.4)
ESPA-B*	99.0	99.2	8,600 (32.6)

\*Boron Rej. @ pH = 10 is 93% for ESPA2+ and 96% for ESPA-B  
\*\*ESPA4 NaCl Solution tested at 500 PPM; tested at 100 psig

### Selected ESPA Project References:

Ulu Pandan, Singapore	39 MGD (148,000 m3/d) of industrial water from a waste water source
Orange County, California	70 MGD (265,000 m3/d) of reclaimed wastewater for a seawater intrusion barrier
Alameda County Water	8 MGD (30,000 m3/d) of potable water from a well water source

## LFC®

### Performance for Low Fouling Membranes

Element Type	Min. Salt Rej., %	Nom. Salt Rej., %	Permeate Flow GPD (m3/d)
LFC1	99.2	99.5	11,000 (41.63)
LFC3	99.5	99.7	9,500 (35.96)
LFC3-LD	99.5	99.7	11,000 (41.6)

### Selected LFC Project References:

Kranji, Singapore	10.5 MGD (40,000 m3/d) of industrial water from a wastewater source
Bedok, Singapore	8.5 MGD (32,000 m3/d) of industrial water from a wastewater source
LaSolana, Spain	1.3 MGD (4,800 m3/d) of industrial water from a surface water source

## CPA

### Performance for High Rejection Membranes

Element Type	Min. Salt Rej., %	Nom. Salt Rej., %	Permeate Flow GPD (m3/d)
CPA2-4040	99.2	99.5	2,250 (8.5)
CPA2	99.5	99.7	10,000 (37.9)
CPA3	99.6	99.7	11,000 (41.6)
CPA4	99.5	99.7	6,000 (22.7)

### Selected CPA Project References:

Kill Devil Hills, NC	2 MGD (7,600 m3/d) of potable water from a brackish well water source
Englewood Water District, FL	4 MGD (15,000 m3/d) of potable water from a brackish well water source
Muznib, KSA	3.2 MGD (12,000 m3/d) of potable water from a brackish ground water source

### Test Conditions for ESPA, LFC and CPA

The stated performance is initial (data taken after 30 minutes of operation), based on the following conditions:

NaCl Solution, PPM*	1500
Applied Pressure, LFC, CPA, psig (MPa)	225 (1.55)
Applied Pressure ESPA, psig (MPa)	150 (1.05)
Applied Pressure ESPA4, psig (MPa)	100 (0.69)
Operating Temperature, °F(°C)	77° (25°)
Permeate Recovery	15%
pH Range	6.5-7.0

### Application Data†

Maximum Applied Pressure psig (MPa)	600 (4.16)
Maximum Feed Flow, GPM (m³/h)	4 inch -16 (3.6), 8 inch -75 (17.0)
Maximum Operating Temperature, °F(°C)	113° (45°)
Feedwater pH Range**	3.0-10.0
Maximum Feedwater Turbidity, NTU	1.0
Maximum Feedwater SDI (15 mins)	5.0
Maximum Chlorine Concentration, PPM	<0.1
Minimum Ratio of Concentrate to Permeate Flow for any Element	5:1
Maximum Pressure Drop for Each Element, psig	10

†ESPA4 NaCl Solution tested at 500 PPM

\*\*See technical literature for extended pH tolerance





# Brackish Water Nanofiltration Membranes

# Seawater RO Membranes

## ESNA®

### Performance for Low Fouling Membranes

Element Type	Min. Salt Rej.,%	Nom. Salt Rej.,%	Ca Rej. Brackish Water, %	Permeate Flow GPD	(m3/d)
ESNA1-LF-4040	84-95.7	91	96	1,742	(6.6)
ESNA1-LF	84-95.7	91	96	8,200	(31)
ESNA1-LF2	80-92	86	92	10,500	(39.7)

### Test Conditions

Ca Cl <sub>2</sub> Solution, PPM	500
Applied Pressure, psig (MPa)	75 (0.52)
Operating Temperature, °F(°C)	77° (25°)
Permeate Recovery	15%
pH Range	6.5-7.0

### Application Data†

Maximum Applied Pressure, psig (MPa)	600 (4.16)
Maximum Chlorine Concentration, PPM	<0.1
Maximum Operating Temperature, °F(°C)	113° (45°)
Feedwater pH Range	3.0-10.0
Maximum Feedwater Turbidity, NTU	1.0
Maximum Feedwater SDI (15 mins)	5.0
Maximum Feed Flow, GPM (m³/h) - 8 inch	75 (17)
Maximum Feed Flow, GPM (m³/h) - 4 inch	16 (3.6)
Minimum Ratio of Concentrate to Permeate Flow for any Element	5:1
Maximum Pressure Drop for Each Element, psi	10

### Selected ESNA Project References:

Boca Raton, Florida	40 MGD (151,500 m3/d) of potable water from a well water source
Hollywood, Florida	18 MGD (68,000 m3/d) of potable water from a well water source
Deerfield Bch., Florida	12 MGD (45,500 m3/d) of potable water from a well water source
Pompano Bch., Florida	10 MGD (37,800 m3/d) of potable water from a well water source
Fort Myers, Florida	12 MGD (45,400 m3/d) of potable water from a well water source



SWC membrane installation, 45 MGD (170,000 m³/d) in Fujairah, U.A.E.

## SWC®

### Performance for Seawater Membranes

Element Type	Min. Salt Rej.,%	Nom. Salt Rej.,%	Permeate Flow GPD	(m3/d)
SCW1-4040	99.5	99.6	1,200	(4.6)
SWC3+	99.7	99.8	7,000	(26.5)
SWC4+	99.7	99.8	6,500	(24.6)
SWC5	99.7	99.8	9,000	(34)

### Test Conditions

The stated performance is initial (data taken after 30 minutes of operation), based on the following conditions:

NaCl Solution, PPM	32,000
Applied Pressure, psig (MPa)	800 (5.5)
Operating Temperature, °F(°C)	77° (25°)
Permeate Recovery	10%
pH Range	6.5-7.0

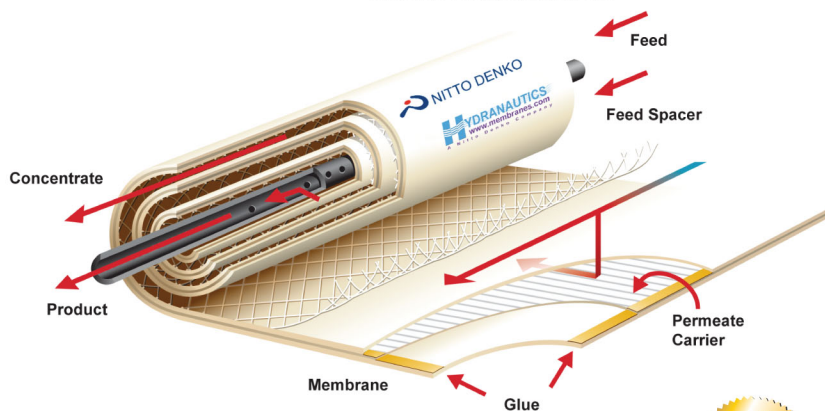
### Application Data†

Maximum Applied Pressure, 8 inch - psig (MPa)	1200 (8.27)
Maximum Applied Pressure, 4 inch - psig (MPa)	1000 (6.9)
Maximum Feed Flow, GPM (m³/h)	4 inch: 16 (3.6), 8 inch: 75 (17)
Maximum Operating Temperature, °F(°C)	113° (45°)
Feedwater pH Range*	3.0-10.0
Maximum Feedwater Turbidity, NTU	1.0
Maximum Feedwater SDI (15 mins)	5.0
Maximum Chlorine Concentration, PPM	<0.1
Minimum Ratio of Concentrate to Permeate Flow for any 8 inch Element	5:1
Maximum Pressure Drop for Each Element, psig	10
Minimum Recovery for any Element (4 inch)	10%

\*see technical literature for extended pH limits

### Selected SWC Project References:

Beni Saf, Algeria	53 MGD (200,000 m3/d) of potable water from the Mediterranean Sea
Escombreras, Spain	17 MGD (65,000 m3/d) of potable water from the Mediterranean Sea
Fujairah, UAE	45 MGD (170,000 m3/d) of potable water from the Persian Gulf
Carboneras, Spain	32 MGD (120,000 m3/d) of potable water from the Mediterranean Sea
Cartagena, Spain	17 MGD (65,000 m3/d) of potable water from the Mediterranean Sea



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†The limitations shown in the Application Data are for general use. The values may be more conservative for specific projects to ensure the best performance and the longest life of the membrane.



# HYDRAcap<sup>®</sup> Ultrafiltration

## Superior Ultrafiltration

HYDRAcap is used to treat surface water, ground water, seawater and waste waters as either primary treatment or as pretreatment to reverse osmosis (RO) and nanofiltration (NF). Compared to conventional pretreatment, HYDRAcap allows for higher fluxes for RO and NF systems while maintaining longer intervals between cleanings. In some cases it replaces conventional pretreatment for potable applications, ground water recharging and water recycling.

**1.2 mm**  
HYDRAcap LD  
(Large Diameters) Capillaries

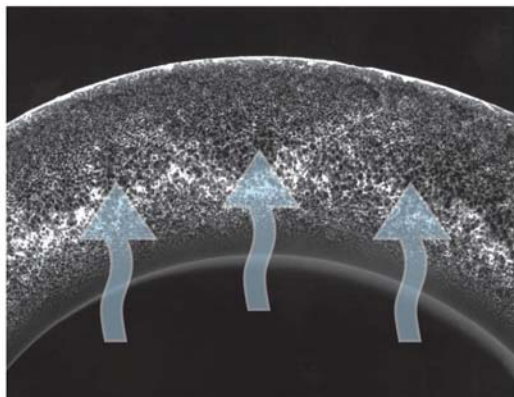
## Membrane Operation

**Filtration Mode:** Feed water flows inside fiber and filtrate is collected in the central core tube. This is known as inside/out filtration.

**Backwash Mode:** Filtrate is pressurized and flow is reversed such that accumulated solids are purged from the fibers.

## HYDRAcap Advantage

- Low fouling hydrophilic polyethersulfone membrane
- Tolerant to chlorine, peroxide and other oxidants. Resistant to pH extremes
- Exhibits 5 log (99.999%) removal for bacteria, giardia, cryptosporidium and 4 log removal for viruses, and reduces turbidity to <0.06 NTU
- Operating flexibility, direct or cross-flow filtration
- DHS (CA), DEP (MA), NSF/EPA, ACS (France), DWI (U.K.) certifications for materials of construction, operation and pathogen removal efficiency



Uniform structure with inside/out flow configuration



A choice of two unique hollow-fiber capillary membranes provide superior ultrafiltration.

## Capillary Technology vs. Conventional Pretreatment

- Significantly better filtrate quality when compared to conventional pretreatment, exhibiting 100% removal of colloidal material
- Product quality is stable even during feedwater variations
- Single-step treatment reduces operating costs and increases efficiency
- Can significantly reduce use of pretreatment chemicals
- Backwash disposal is less problematic
- Increased efficiency of RO membrane system design and operation, contributing to reduced capital and operational cost
- Maximizes RO performance by allowing elements to operate longer with less cleaning
- Low pressure operation



# Modular Ultrafiltration Design

## Integrated Membrane Solutions® (IMS)

**-South Houston Green, Texas City, TX.** 7.5 MGD (28,400 m<sup>3</sup>/d) of UF using 264 HYDRAcap 60 modules as pretreatment to RO for a boiler feedwater application. Start-up July 2003.



**-Calpine Los Medanos Energy Center, Pittsburg, CA.** 2.1 MGD (8,000 m<sup>3</sup>/d) of UF using 108 HYDRAcap 40 modules followed by 1 MGD (3,800m<sup>3</sup>/d) of RO using 234 of Hydranautics' ESPA1 & ESPA2 elements for a high pressure boiler feed application. Start-up August 2001.



**-Caltex Refinery, Cape Town, South Africa.** 2.4 MGD (9,100 m<sup>3</sup>/d) of UF using 225 HYDRAcap 60-LD modules followed by 1.6 MGD (6,100 m<sup>3</sup>/d mld) of RO using 308 of Hydranautics' LFC3 elements treat wastewater for boiler feed. Start-up Oct 2005.



## Typical Process Conditions

Operating Transmembrane Pressure (TMP):	2-20 psig (0.14-1.4 bar)
Max Backwash Pressure:	20 psig (140 kPa) or 1.4 bar
Backwash Flux:	100-150 GFD (170-255 l/mh)
Backwash Frequency:	Once every 15-60 minutes
Backwash Duration:	25-60 seconds
Chemically Enhanced Backwash Frequency:	Maximum: same as backwash Minimum: 1-2 times per day
Chemically Enhanced Backwash Duration:	1-30 minute soak
Disinfection Chemicals:	NaOCl (sodium hypochlorite) or H <sub>2</sub> O <sub>2</sub> (hydrogen peroxide)
Cleaning Frequency:	Once every 1-6 months
Cleaning Chemicals:	NaOCl + NaOH, Citric Acid

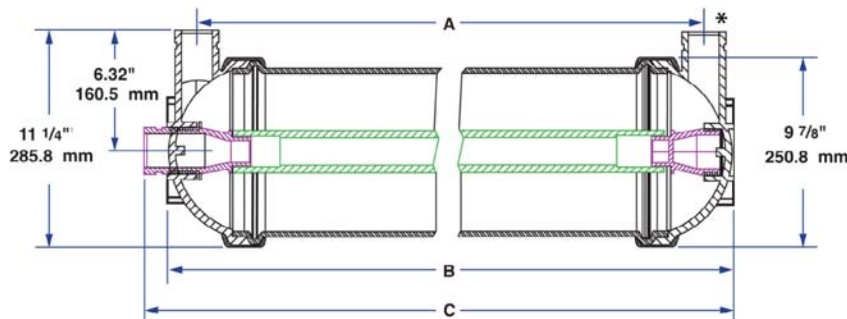
## Specifications

Configuration.....	Capillary (Inside-out)
Membrane Polymer.....	Hydrophilic polyethersulfone
Nominal MWCO, Daltons.....	.150,000
Nominal Membrane area, ft <sup>2</sup> (m <sup>2</sup> )	
HYDRAcap 40, 320 (30).....	HYDRAcap 60, 500 (46)
HYDRAcap 40-LD, 208 (19.3).....	HYDRAcap 60-LD, 323 (30)
Capillary ID, inches (mm)	
HYDRAcap.....	0.031 (0.8)
HYDRAcap LD.....	0.047 (1.2)
Capillary OD, inches (mm)	
HYDRAcap.....	0.051 (1.3)
HYDRAcap LD.....	0.08 (2.0)

## Application Data:

Typical Filtrate Flux Range, GFD (lmh).....	30 - 75 (51 - 128)
Flow Rate Range, (gpm)	
HYDRAcap 40, 7-17.....	HYDRAcap 60, 10.5-26
HYDRAcap 40-LD, 4.5-11.....	HYDRAcap 60-LD, 7 - 17
Operating pH Range.....	4-10
Cleaning pH Range.....	2-13
Instantaneous Chlorine Tolerance, PPM.....	100*
Total Chlorine Tolerance, PPM•HR.....	200,000
Instantaneous Hydrogen Peroxide Tolerance, PPM.....	200*
Operating Mode.....	Cross-flow or dead-end, backwashable
Maximum Operating Temperature, °F (°C).....	104 (40)
Maximum Feed Pressure, psig (bar).....	.73 (5)
Maximum TMP, psig (bar).....	20 (1.4)
Maximum Turbidity, (NTU)	
HYDRAcap.....	100
HYDRAcap LD.....	Consult Technical Department

\*5 minutes or as advised by Technical Department



## Module Length:

	A**	B	C
HYDRAcap 40/HYDRAcap 40-LD	43" (109.2 cm)	46 1/8" (117.2 cm)	47 1/4" (120.0 cm)
HYDRAcap 60/HYDRAcap 60-LD	63" (160.0 cm)	66 1/8" (168.0 cm)	67 1/4" (170.8 cm)

\* 2" Grooved Fitting at all ports  
\*\* ± 1/8"

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## A New Generation of ESNA Performance

### ESNA - Energy Saving Nanofiltration Membrane Element

High performance energy savings ESNA nanofiltration membrane elements are ideal for softening applications and the removal of pesticides, bacteria or viruses. They provide 50%-90% salt rejection with ultra-low-pressure operations, increased energy savings, and significantly lower installation and operating costs. They can effectively remove organics which can form disinfection by-products in municipal water distribution lines. At the Boca Raton plant THM formation potential was reduced from 0.60 mg/L to less than 0.020 mg/L, well below the 0.042 mg/L limit.

ESNA elements are available from Hydranautics in both 4-inch and 8-inch diameters by 40-inch long spiral wound configurations for many applications. Smaller diameter elements are also available from Hydranautics' licensed manufacturer Oltremare, located in Fano, Italy.

Our ESNA elements can be used as either a stand alone product or part of our Integrated Membrane Solution® (IMS) which combines a range of RO, NF, UF and MF membrane technologies to achieve the most comprehensive, effective, low-cost results in the industry.

### Product Offering:

#### ESNA1-LF-8040 / ESNA1-LF-4040

Ideal for low salinity brackish feed water sources for municipal potable applications, especially those with high organic loading. Significantly reduces operating costs and provides optimum hardness rejection for softening applications, available in 4-inch and 8-inch diameter configurations

#### ESNA1-LF2

Designed to provide high rejection of natural organic materials and moderate rejection of total hardness, while running below 100 psi, offering energy and cost savings.



## ESNA®

### Performance for Low Fouling Membranes

Element Type	Min. Salt Rej., %	Nom. Salt Rej., %	Ca Rej. Brackish Water, %	Permeate Flow GPD (m3/d)
ESNA1-LF-4040	84-95.7	89	96.0	1,742 (6.59)
ESNA1-LF	84-95.7	89	96.0	8,200 (31.04)
ESNA1-LF2	73-92	87	92	10,500 (39.7)

#### Test Conditions

Ca Cl <sub>2</sub> Solution, PPM	500
Applied Pressure, psig (MPa)	75 (0.52)
Operating Temperature, °F(°C)	77° (25°)
Permeate Recovery	15%
pH Range	6.5-7.0

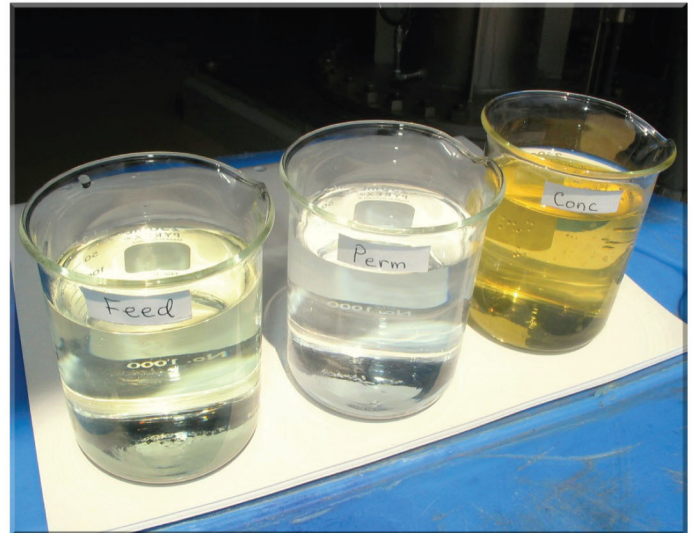
#### Application Data†

Maximum Applied Pressure, psig (MPa)	600 (4.16)
Maximum Chlorine Concentration, PPM	<0.1
Maximum Operating Temperature, °F(°C)	113° (45°)
Feedwater pH Range	3.0-10.0
Maximum Feedwater Turbidity, NTU	1.0
Maximum Feedwater SDI (15 mins)	5.0
Maximum Feed Flow, GPM (m³/h)	75 (17)
Minimum Ratio of Concentrate to Permeate Flow for any Element	5:1
Maximum Pressure Drop for Each Element, psi	10

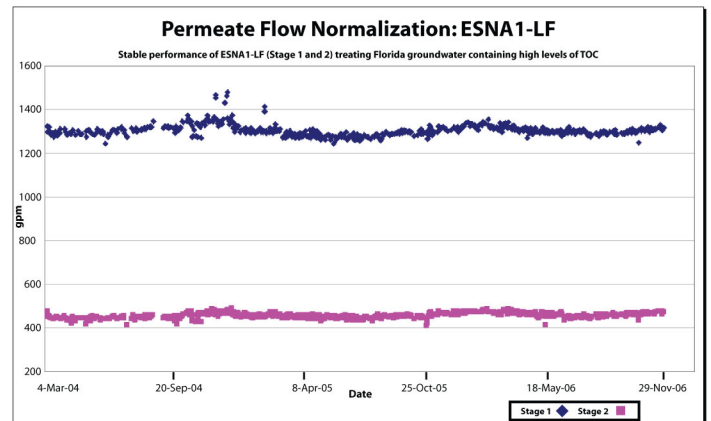
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### Selected ESNA Project References:

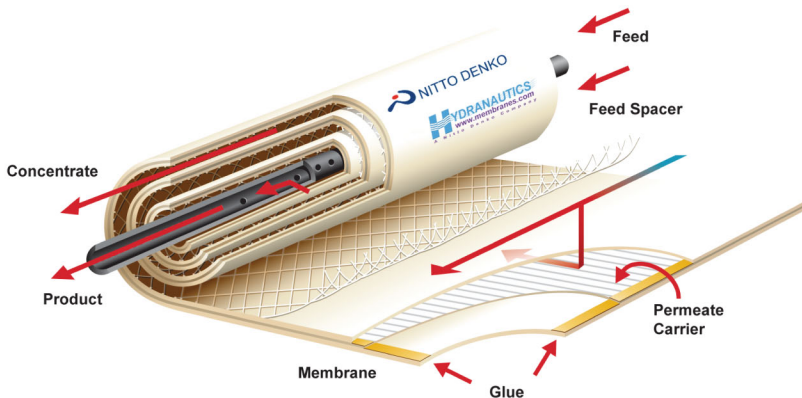
Boca Raton, Florida	40 MGD (151,500 m3/d) of potable water from a well water source
Hollywood, Florida	18 MGD (68,000 m3/d) of potable water from a well water source
Deerfield Bch., Florida	12 MGD (45,500 m3/d) of potable water from a well water source
Pompano Bch., Florida	10 MGD (37,800 m3/d) of potable water from a well water source
Fort Myers, Florida	12 MGD (45,400 m3/d) of potable water from a well water source



Water samples taken from the feed, permeate and concentrate of an ESNA1-LF2 system



Over 2 years of stable performance treating Florida groundwater containing high levels of TOC



**Hydranautics Corporate Office:** 401 Jones Road, Oceanside, CA 92058  
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# QUALSEP<sup>TM</sup> DairyRO



## High Performance Dairy Process Membranes

Hydranautics' 30 years of spiral membrane technology experience is built in to every QUALSEP DairyRO membrane. Maximum permeability combined with durable construction make DairyRO the natural choice for high performance and extended membrane life.

### DairyRO is ideal for:

- Pre-concentrating milk or whey, reducing equipment and operating costs
- Concentrating whey UF permeate, minimizing effluent volume and reducing discharge fees
- Polishing whey or milk RO permeate for plant reuse, reducing costs and reliance on outside water supplies

All QUALSEP membranes are manufactured using highly controlled, ISO 9001-compliant processes, ensuring the highest quality and most consistent, reliable performance available. Experience a new level of product confidence, cost savings and technology excellence with QUALSEP.

- Hydranautics' ultra-high rejection RO membranes provide maximum solids yields and effluent BOD reduction

- Meets FDA, Title 21 Regulations and 3A Sanitary Standards for Crossflow Membrane Modules

- USDA Accepted – sizes 3838, 3840 and 8038

- All membranes individually tested to ensure reliable field performance



**HYDRANAUTICS**

A Nitto Denko Company  
[www.membranes.com](http://www.membranes.com)

# DairyRO

## Specifications

### Type

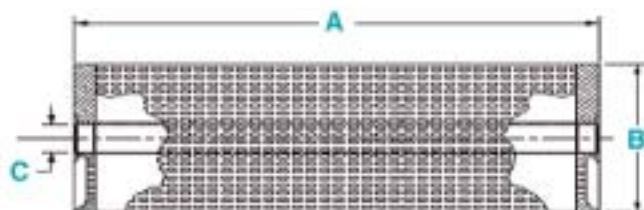
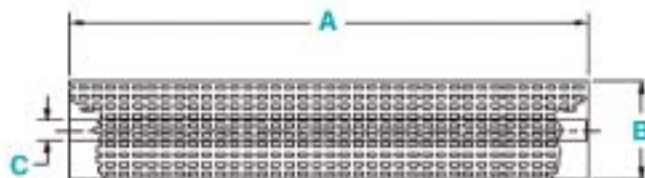
Configuration .....Sanitary (Full-Fit)  
Membrane Polymer .....Composite Polyamide

### Application Data

Maximum Applied Pressure, psig (bar) ..... 600 (41.4)  
Maximum Chlorine Concentration, PPM ..... <0.1  
Maximum Operating Temperature, °F (°C) .....122° (50°)  
Operating pH Range .....3.0 - 10.0  
Cleaning pH Range .....2.0 - 11.0  
Maximum Pressure Drop for a Vessel, psig (bar) .....60 (4.1)

### Nominal Element Performance

Element Type	Maximum Feed Flow GPM (m³/hr)	Maximum Pressure Drop per Element, psig (bar)
DairyRO 3838-30	.30 (6.8)	.15 (1.0)
DairyRO 3840-30	.30 (6.8)	.15 (1.0)
DairyRO 8038-30	.80 (18.2)	.13 (0.9)
HydraPolish 8040-28	.80 (18.2)	.13 (0.9)



3838, 3840, 8038 Style



8040 Style with ATDs

Model	Feed Spacer inches (cm)	Area ft² (m²)	A inches (cm)	B inches (cm)	C inches (cm)
DairyRO 3838-30	.030 (0.076)	.80 (7.4)	.38.00 (96.5)	.3.78 (9.6)	.0.83 (2.11)
DairyRO 3840-30	.030 (0.076)	.80 (7.4)	.38.75 (98.4)	.3.78 (9.6)	.0.83 (2.11)
DairyRO 8038-30	.030 (0.076)	.360 (33.4)	.38.00 (96.5)	.7.90 (20.1)	.1.125 (2.86)
HydraPolish 8040-28	.028 (0.071)	.380 (35.2)	.40.00 (102.0)	.7.90 (20.1)	.1.125 (2.86)



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**HYDRANAUTICS**

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[www.membranes.com](http://www.membranes.com)

Elements are vacuum sealed in a polyethylene bag containing less than 1.0% sodium meta-bisulfite solution, and then packaged in a cardboard box. Hydranautics believes the information and data contained herein to be accurate and useful. The information and data are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control. It is the user's responsibility to determine the appropriateness of Hydranautics' products for the user's specific end uses.

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