

HYDRACap[®]

Superior

Ultrafiltration



Membrane

Technology



HYDRANAUTICS
A Nitto Denko Company
www.membranes.com

HYDRACap®

High Performance Ultrafiltration

HYDRACap ultrafiltration membrane modules represent state-of-the-art capillary technology, with a nominal pore size of 0.02 micron, providing greater removal efficiency of giardia, cryptosporidium and other micro-organisms.



System supplied by Indeck

Superior Treatment of Surface Water

HYDRACap treats surface water and municipal effluents as either primary treatment or as a pretreatment step to RO. It replaces conventional pretreatment for potable applications, ground water recharging and water recycling.

Typical Industrial System

Providing Reliable and Cost-Effective Integrated Membrane Solutions® (IMS)

HYDRACap enhances RO and NF systems when used as a pretreatment step for desalination, treatment of surface waters, and municipal and industrial effluent.



System supplied by Leopold

Responding Effectively to a Range of Regulatory Requirements

HYDRACap modules are designed to respond effectively to the requirements of the Surface Water Treatment Rule and Drinking Water Inspectorate regulations for potable water use.

Typical Municipal System

Ultrafiltration

HYDRAcap[®] Advantage

- Low fouling hydrophilic polyethersulfone membrane
- Durable fiber structure, robust module design with lightweight and compact construction
- Resistant to chlorine, peroxide and a wide range of pH levels
- Exceeds the requirements of the U.S. Surface Water Treatment Rule (SWTR) and European standards by exhibiting over 5 log removal efficiency for bacteria and viruses, and reducing turbidity levels to <0.06 NTU
- Large diameter model (HYDRAcap LD) available for higher turbidity waters
- Direct or cross-flow service provides operating flexibility
- DHS(CA), DEP(MA), NSF/EPA and DWI (U.K.) certifications for materials of construction, operation and pathogen removal efficiency
- Over 20 years of capillary membrane manufacturing experience

Membrane Operation

Filter Mode

Feed water flows inside the fiber; filtrate is collected into the central core tube

Backwash Mode

Filtrate backwash flows from central core tube to inside of the fiber and out to drain

0.8 mm
HYDRAcap Capillary

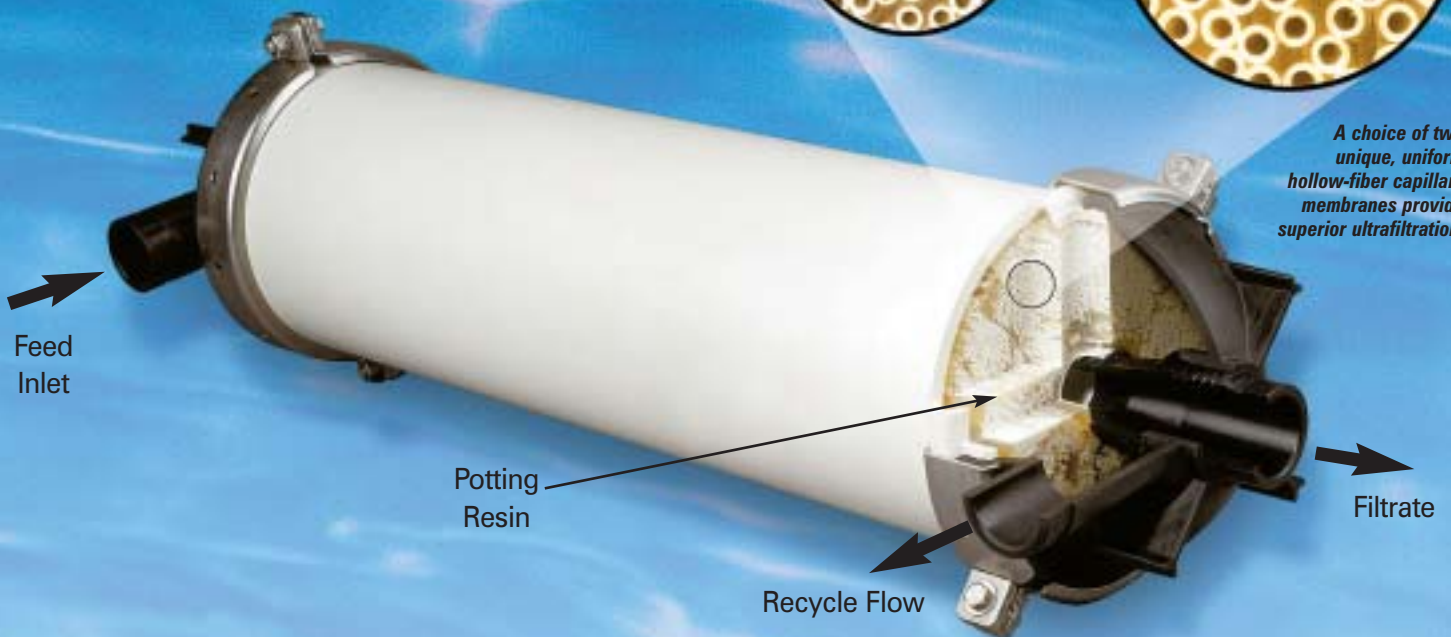


or

1.2 mm
HYDRAcap LD Capillary



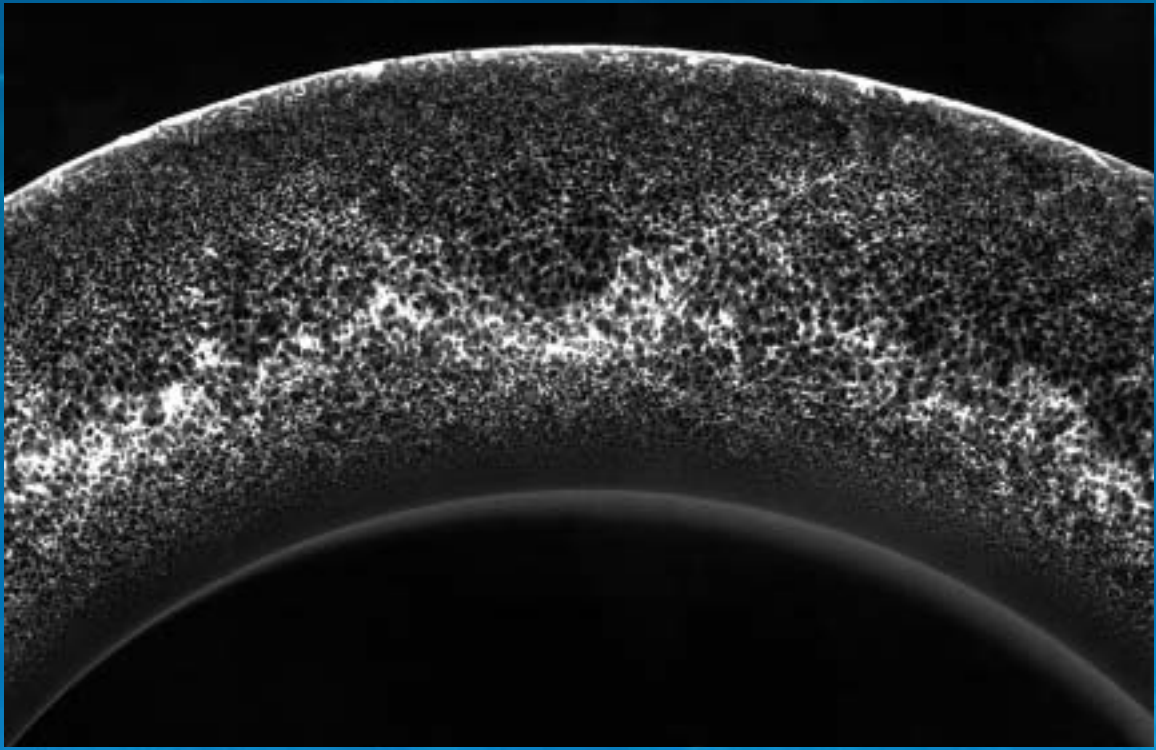
A choice of two unique, uniform hollow-fiber capillary membranes provide superior ultrafiltration.



HYDRAcap[®]

Capillary Technology vs. Conventional Pretreatment

- Significantly better filtrate quality as compared to conventional pretreatment, exhibiting 100% removal of colloidal material greater than 0.1 micron
- Product quality is stable even during feedwater variations
- Single-step treatment reduces operating costs, increases efficiency
- Dramatically reduces 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
- Low pressure feed and backwash operation



Capillary Technology from Hydranautics

Hydranautics' HYDRAcap® capillary ultrafiltration membrane is formed from pure chemicals using in situ polymer structure formation and a single-step patented manufacturing process. Designed for inside/out flow configuration, the inside surface of the capillary remains completely untouched during the manufacturing process. This provides a defect-free, uniform fiber structure with high surface integrity throughout the fiber. These unique properties make the HYDRAcap ultrafiltration capillary membrane an ideal barrier for pathogens and colloidal material.

HYDRABLOC®

Modular Ultrafiltration Design

- HYDRABLOC includes HYDRAcap modules, (3) stainless steel headers, double victaulic connections for all ports, skid, and all mounting hardware
- Pre-engineered design reduces engineering cost and time
- Modular double stacked design, easily expanded
- Smaller footprint results in lower building cost
- Easy access during operation and maintenance
- Quick-release end cap design
- Larger HYDRABLOC configurations also available



HYDRAcap 60
24-module
configuration

HYDRABLOC®

Specifications

	Typical Filtrate Flow	Footprint (W x L x H)
HYDRAcap 40 8-module configuration	50 - 140 gpm, (11 - 32 m ³ /hr)	4' x 4' x 7' (1.2 x 1.2 x 2.1m)
HYDRAcap 60 24-module configuration *	240 - 640 gpm, (55 - 145 m ³ /hr)	5' x 14' x 9' (1.5 x 4.3 x 2.7m)

*This modular sub-bloc can be stacked to create larger HYDRABLOCs. One HYDRABLOC can accommodate up to 144 HYDRAcap 60 modules in a 3 x 2 bloc configuration.

Specifications

Type

Configuration	.Capillary (Inside-out)	
Membrane Polymer	.Hydrophilic polyether sulfone	
MWCO, Daltons nominal	.100,000	
Nominal Membrane area, ft ² (m ²)		
HYDRAcap	.40-inch - 320 (30)	60-inch - 500 (46)
HYDRAcap LD	.40-inch - 210 (19.5)	60-inch - 325 (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 (l/m ² /hr)	.35 - 85 (59 - 145)	
Flow Rate Range, (gpm)		
HYDRAcap	.40-inch: 8 - 18	60-inch: 12 - 30
HYDRAcap LD	.40-inch: 5 - 12	60-inch: 7.8 - 19
pH Range	.2 - 13	
Instantaneous Chlorine Tolerance, PPM	.100*	
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)	
Transmembrane Pressure (TMP) range, psig (kPa)	.4 - 22 (27 - 152)	
Maximum Turbidity, (NTU)		
HYDRAcap	.15	
HYDRAcap LD	.Consult Technical Department	

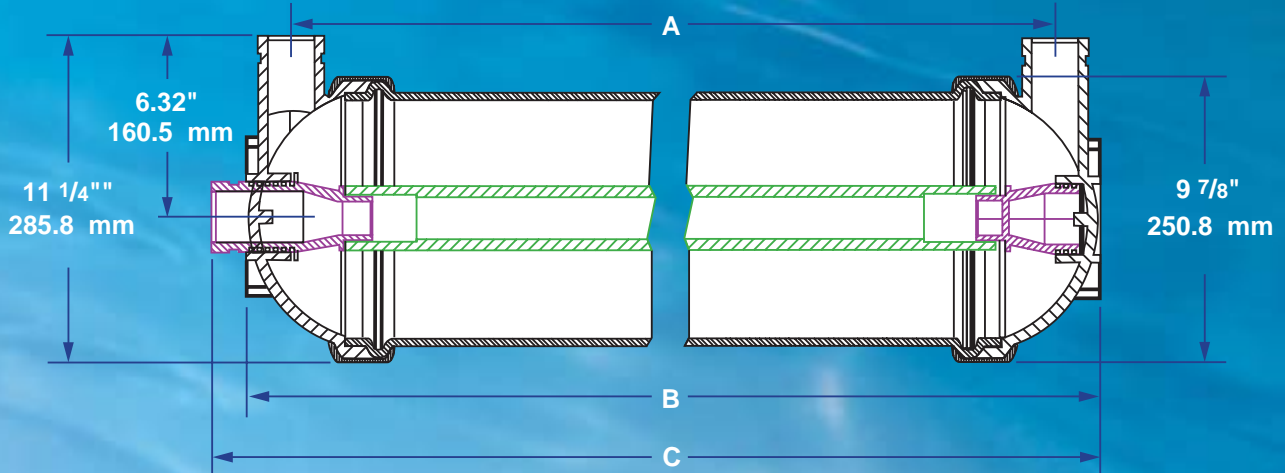
*5 minutes or less.

Typical Process Conditions

Operating Transmembrane Pressure (TMP):	4 - 22 psig (27 - 152 kPa)
Backwash Pressure:	35 psig (242 kPa)
Backwash Flux:	175 - 200 gfd (298 - 340 l/m²/hr)
Backwash Frequency:	once every 15 - 60 minutes
Backwash Duration:	30 - 60 seconds
Chemically Enhanced Backwash Frequency:	Maximum: same as backwash Minimum: 1 - 2 times per day
Chemically Enhanced Backwash Duration:	1 - 30 minutes
Disinfection Chemicals:	NaOCl (hypochlorite) or H₂O₂ (peroxide)
Cleaning Frequency:	once every 1 - 2 months
Cleaning Chemicals:	NaOCl + NaOH, Citric Acid

Selected Project References for Hydranautics' HYDRAcap UF Membranes for Surface Water Applications:

Two Rivers, WI	.3 MGD (11,350 m ³ /d)
Grandbury, TX	.7.3 MGD (27,600 m ³ /d)
Chelvey, United Kingdom	.4.8 MGD (18,000 m ³ /d)



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)

* ± 1/8"



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