

## Pall® Membralox® Ceramic Membranes and Modules

### Description

**Pall Membralox** ceramic membranes are asymmetric multi-channel membranes composed of a porous alumina support and a filtering layer (alumina, zirconia, titania).

High compactness of the multichannel membrane combined with high permeability allows the treatment of large volumes with high throughput.

The **Membralox** GP ceramic membranes range with longitudinal permeability gradient, ensure an homogeneous and calibrated flux along the flow channel, thus optimum utilization of membrane surface within a stable microfiltration regime.

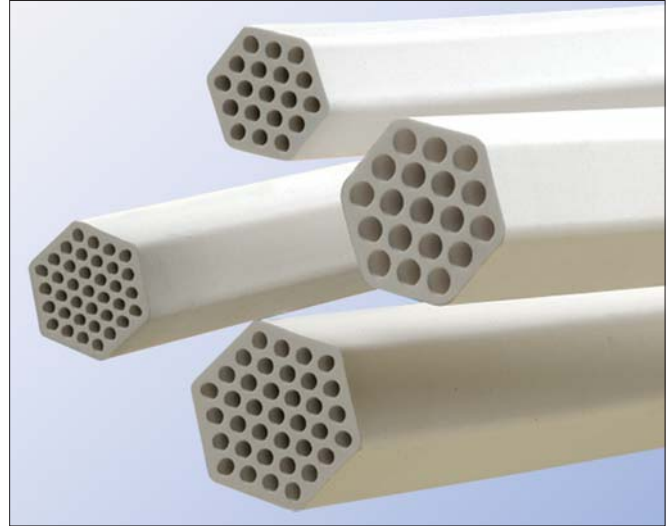
### Key Features

- High flux
- Wide chemical and pH (0-14) compatibility
- Excellent thermal stability
- Long term and reliable performance
- Sanitizable and sterilizable
- Ability to withstand high frequency backpulsing cycles
- 100% bubble point integrity tested during manufacturing
- Suited for high fouling fluids, viscous products, high concentration factors, fine filtration, diafiltration, automatic and easy cleaning in place (CIP)
- Meets the requirements for food usage<sup>1</sup>

### Pall Membralox Membranes Quality

- Unique ceramic support of the 12 µm pore size allows the highest flux.
- Patented alumina end-sealing provides superior resistance to corrosion and cleaning cycles.
- High homogeneity and quality of the filtration layers for optimum filtration performances and selectivity.
- Exceptional mechanical resistance for long service life

### Crossflow filtration of process fluids and effluents



### Applications

Clarification, concentration and fractionation of:

- Milk and dairy products
- Sugar and sweeteners
- Food ingredients and additives
- Beverages and potable water
- Biological molecules
- Process water and waste streams, in chemical, oil and gas, petrochemical and nuclear industries
- Acids, bases and solvents

### Widest Separation Range

The exceptional structure of **Membralox** filtering elements has enabled the development of the widest range of micro and ultrafiltration ceramic membranes. A complete range of modules helps for scale-up from laboratory separations to full size industrial needs.

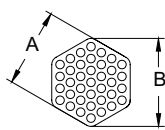
### Cost Effective Separations

The superior characteristics of **Pall Membralox** ceramic membranes provide economical solutions for high added value macro-molecule concentration, effluent recycling or reduction and difficult fluid clarification.

**Membralox** filtration modules are the key element in process reliability.

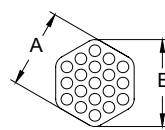
## Technical Information

EP3730



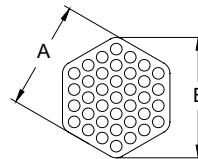
A = 28 mm  
B = 31 mm

EP1940



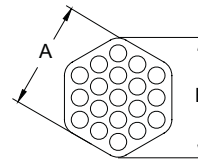
A = 28 mm  
B = 31 mm

EP3740



A = 38 mm  
B = 43 mm

EP1960



A = 38 mm  
B = 43 mm

### Membralox ceramic membranes

	EP3730 <sup>2</sup>	EP3740	EP1940 <sup>2</sup>	EP1960
Channel Diameter (mm)	3	4	4	6
Number of channels	37	37	19	19
Filtration surface area (m <sup>2</sup> )	0.35	0.47	0.24	0.36
Length (mm)	1020	1020	1020	1020

The 12 µm pore size Membralox standard membranes support is made up of ultrapure α-alumina.

### Membralox membrane pore sizes

Microfiltration	1.4 <sup>2</sup> , 0.8 <sup>2</sup> , 0.5, 0.2, 0.1 <sup>2</sup> µm	α-alumina
Ultrafiltration	100, 50, 20 nm	zirconia

Other pore sizes and surface modifications on request.  
Some pore sizes are not available on all support geometries.  
Please contact Pall for further information

### Operating limits of Membralox modules in liquids filtration<sup>3</sup>

Temperature	95°C (203°F)
Pressure	10 bar <sup>4</sup> (145.1 psi)

<sup>1</sup> The membranes based on high purity alumina are certified for use in contact with food fluids by Commission Directive 2005/31/EC.  
All membrane components are made from materials that our suppliers state meet the requirements for food contact use:  
Alumina and titania are GRAS. Zirconia layers on alumina support are listed in 21 CFR Sect.177.2910.

<sup>2</sup> Available in the Membralox GP membrane version.  
0.8µm and 1.4µm are available in a double layer version.

<sup>3</sup> Any liquids belonging to group II from PED 97/23/EC art 9 - § 2.2

<sup>4</sup> 1 bar = 100 kPa

The limits of use of Membralox modules are determined mainly by the type of housing or gasket materials employed. Based on valuable pilot test data, our Scientific and Laboratory Services can provide advice in selecting the best membrane and module configuration to match your process requirements.



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### Membralox HCB modules

Module Type	No. of Membranes	Membrane Type	Surface Area (m <sup>2</sup> )	Retentate Connections (RC) Permeate Connections (PC)
M-19P3740	19	EP3740	8.87	RC: Weldable flanges/O-ring gaskets
M-19P1960		EP1960	6.84	PC: Weldable flanges/ flat gaskets
M-36P3740	36	EP3740	16.81	RC: Weldable flanges/O-ring gaskets
M-36P1960		EP1960	12.96	PC: Weldable flanges/ flat gaskets
M-60P3730	60	EP3730	21	RC: Weldable flanges/O-ring gaskets
M-60P1940		EP1940	14.40	PC: Weldable flanges/ flat gaskets

Construction of wetted materials : 316L SS, ceramic, PTFE

### Membralox HCS 3-A modules

Module Type	No. of Membranes	Membrane Type	Surface Area (m <sup>2</sup> )	Retentate Connections (RC) Permeate Connections (PC)
M-36P3740	36	EP3740	16.81	RC: Weldable flanges/O-ring gaskets
M-36P1960		EP1960	13	PC: Weldable ferrules / 3-A gaskets
M-60P3730	60	EP3730	21	RC: Weldable flanges/O-ring gaskets
M-60P1940		EP1940	14.40	PC: Weldable ferrules / 3-A gaskets

Construction of wetted materials : 316L SS, ceramic, PTFE, FPM

### Membralox SD 3-A modules

Module Type	No. of Membranes	Membrane Type	Surface Area (m <sup>2</sup> )	Retentate Connections (RC) Permeate Connections (PC)
M-1P3730	1	EP3730	0.35	RC: Weldable collars/ 3-A gaskets
M-1P1940		EP1940	0.24	PC: Weldable ferrules/ 3-A gaskets
M-1P3740		EP3740	0.47	
M-1P1960		EP1960	0.36	
M-3P3730	3	EP3730	1.05	RC: Weldable collars/ 3-A gaskets
M-3P1940		EP1940	0.72	PC: Weldable ferrules/ 3-A gaskets
M-3P3740		EP3740	1.40	
M-3P1960		EP1960	1.08	
M-7P3730	7	EP3730	2.45	RC: Weldable collars/ 3-A gaskets
M-7P1940		EP1940	1.68	PC: Weldable ferrules/ 3-A gaskets
M-12P3740	12	EP3740	5.60	RC: Weldable collars/ 3-A gaskets
M-12P1960		EP1960	4.32	PC: Weldable ferrules/ 3-A gaskets
M-19P3730	19	EP3730	6.65	RC: Weldable collars/ 3-A gaskets
M-19P1940		EP1940	4.56	PC: Weldable ferrules/ 3-A gaskets
M-22P3740	22	EP3740	10.27	RC: Weldable flanges/ 3-A gaskets
M-22P1960		EP1960	7.92	PC: Weldable ferrules/ 3-A gaskets
M-37P3730	37	EP3730	12.95	RC: Weldable flanges/ 3-A gaskets
M-37P1940		EP1940	8.88	PC: Weldable ferrules/ 3-A gaskets

Construction of wetted materials : 316L SS, ceramic, EPDM, FPM

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