

Membralox IC ceramic elements are high surface area multichannel membranes designed for high capacity crossflow filtration of process fluids and effluents.

Membralox membranes are the key components of crossflow systems used in numerous food and beverage applications, such as the clarification of glucose syrups, fruit juices, beer tank bottom and fermentation broths, the purification and concentration of food and dairy products, CIP chemical recovery and wastewater treatment with ceramic membrane bioreactors.

Description

Membralox IC ceramic elements are asymmetric multi-channel membranes composed of a porous alumina support and filtering layers. Their innovative and highly compact design in unique 4 and 5.5 mm channel geometries provide superior filtration area per multi-channel element - up to 570 m²/m³.

The increased capacity of the Membralox IC filtration modules, up to 45% more than standard module configurations, enables optimized system loop design, which results in more compact systems, with smaller footprint and reduced hardware costs. The smaller hold-up volume of the system loops also results in a significant reduction of the related water and chemical cleaning costs.

Pall Membralox IC membranes, 100% ceramic and 100% bubble point tested, feature the same exceptional performance, mechanical and chemical resistance and service life as the well-recognized Membralox product range.

HCS and SD modules are available in a smart 3-A sanitary design, which meets the requirements of 3-A Sanitary Standards #10-04, and industrial compact design enable flexible loop design, optimum cleanability and long reliable operating life.

Features and Benefits

Features	Benefits
Unique and highly compact geometry, designed with increased surface area for higher flow rates	<ul style="list-style-type: none"> Optimization of membrane system loops Cost-effective solution requiring less filtration modules and smaller system footprint Reduced hold-up volume and shorter return on investment
Highly asymmetric structure with 12 µm ceramic support pore size	<ul style="list-style-type: none"> High flux and module capacity
High homogeneity and quality of the filtration layers	<ul style="list-style-type: none"> Optimum filtration performance and selectivity High recovery and process yields
Exceptional mechanical resistance	<ul style="list-style-type: none"> Suited to high fouling liquids, viscous products, high concentration factors Ability to withstand upset conditions and high frequency backpulsing cycles Long service life
Wide chemical and pH compatibility (0-14) Excellent thermal stability	<ul style="list-style-type: none"> Easily sanitizable and sterilizable Suited to continuous hot temperature operation and numerous cleaning-in-place (CIP) cycles Long service life
Patented alumina end-sealing	<ul style="list-style-type: none"> Superior resistance to corrosion and to cleaning cycles
100% integrity tested prior to dispatch	<ul style="list-style-type: none"> Lot traceable with documented quality

Membralox® IC Ceramic Membranes

For High Capacity Crossflow Filtration



Materials of construction

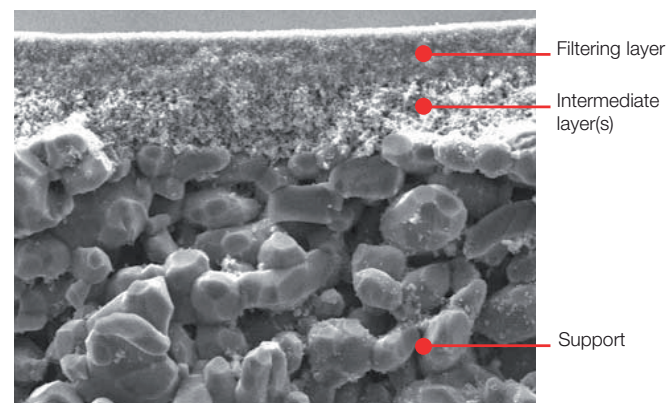
Components	Description
Membrane support	Ultrapure alpha-alumina
Filtrating layers	alpha-alumina and/or zirconia depending on pore size
End sealing	High purity α-alumina
Ceramic-to-housing gaskets	EPDM, FPM or PTFE depending on housing design

Quality

Manufactured under an ISO 9001:2008 certified Quality Management System

Food Contact Compliance

Please refer to the Pall website <http://www.pall.com/foodandbev> for a Declaration of Compliance to specific National Legislation and/or Regional Regulatory requirements for food contact use.



Cross section view of Membralox ceramic membrane (with x1010 magnification)

Technical Information

Multichannel Element Characteristics

	EP4840	EP2760
Channel diameter ¹	4.0 mm	5.5 mm
Number of channels	48	27
Filtration surface area	0.7 m ² (7.4 ft ²)	0.5 m ² (5.38 ft ²)
Length	1020 mm (3.35 ft)	1020 mm (3.35 ft)

¹ based on equivalent open cross sectional area

Membrane Characteristics

	Pore Sizes ^{2,3}	Membrane Material
Microfiltration	0.8, 0.2 µm	Alpha-alumina
Ultrafiltration	100, 50 nm	Zirconia

The 12 µm pore size ceramic support of Membralox membranes is made of high purity alpha-alumina.

²as measured by Pall proprietary permeametry method

³other pore sizes available on request

Membralox IC Membrane Modules

Membralox IC ceramic membranes are available assembled in 3-A sanitary (HCS and SD modules) or industrial module types (HCB modules). Based on pilot test data, Pall's Scientific and Laboratory Services experts can provide guidance in selecting the best membrane and module configuration to match process requirements.

Ordering Information

This information is a guide to the part number structure and possible options. For availability of specific options and housings and gasket details, please contact Pall.

Example Part Number: EP 4840 GL 100nmZ

(Refer to bold references in the tables below)

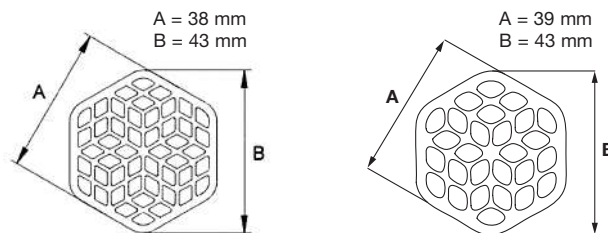
Part Number: EP GL
Table 1
Table 2

Table 1: Multichannel Element Type

Code	Description
4840	48 channels 4.0 mm
2760	27 channels 5.5 mm

Table 2: Membrane Pore Size

Code	Description
0.8µA	Alumina 0.8 µm microfiltration layer
0.2µA	Alumina 0.2 µm microfiltration layer
100nmZ	Zirconia 100 nm ultrafiltration layer
50nmZ	Zirconia 50 nm ultrafiltration layer



Drawings of P48-40 and P27-60 showing external dimensions

Membralox Compact HCB and 3-A HCS Module Designs

	M-19P ⁴	M-36P
Number of membranes	19	36
Filtration surface area	EP4840 13.1 m ² (141.1 ft ²) EP2760 9.5 m ² (102.3 ft ²)	24.8 m ² (267.4 ft ²) 18.0 m ² (193.8 ft ²)

⁴ only available in HCB design

Membralox 3-A SD Module Design

	M-1P	M-3P	M-12P	M-22P
Number of membranes	1	3	12	22
Filtration surface area				
EP4840	0.7 m ² (7.4 ft ²)	2.1 m ² (6.8 ft ²)	8.3 m ² (27.2 ft ²)	15.2 m ² (163.4 ft ²)
EP2760	0.5 m ² (5.4 ft ²)	1.5 m ² (16.1 ft ²)	6.0 m ² (64.6 ft ²)	11.0 m ² (118.4 ft ²)

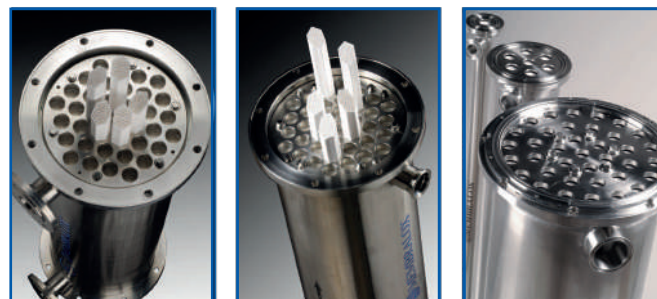
Operating Limits of Membralox Modules in Aqueous Liquids⁵

Maximum Continuous Temperature	95°C (203°F)
Maximum Pressure	10 bar (145.1 psi) ⁶

⁵ Any liquids belonging to group II from PED 97/23/EC art. 9-§

⁶ 1 bar = 100kPa

The limits of use of **Membralox modules** are determined mainly by the type of housing or gasket materials employed. For more information, please contact Pall.



HCB Module

3-A HCS Module

3-A SD Modules