



# 3M™ Liqui-Cel™ EXF-14×28 Series Membrane Contactor

## Typical Properties

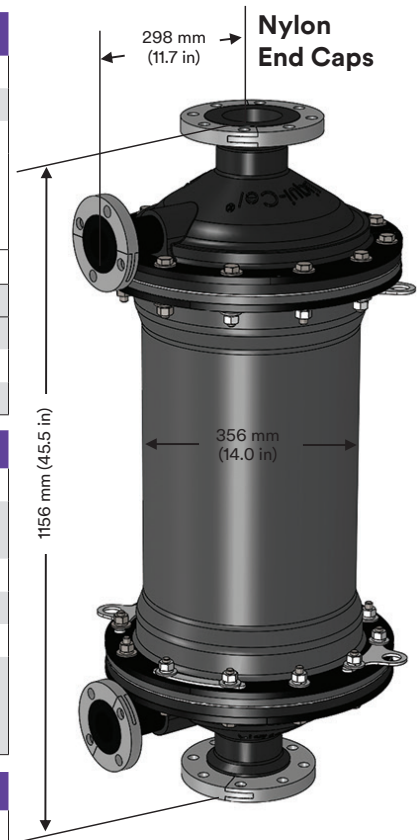
Membrane Characteristics				
Cartridge Configuration	Extra-Flow with Center Baffle			
Liquid Flow Guidelines	16 – 91 m <sup>3</sup> /hr (70 – 400 gpm)			
Membrane Type	X50 Fiber		X40 Fiber	
	Recommended for CO <sub>2</sub> removal from liquid and other gas transfer applications		Recommended for O <sub>2</sub> removal from liquid and other gas transfer applications	
Membrane/Potting Material	Polypropylene / Epoxy			
Priming Volume (approximate)	With Nylon End Caps		With Engineered Thermoplastic End Caps	
	X50 Fiber	X40 Fiber	X50 Fiber	X40 Fiber
Shellside	33.5 L (8.8 gal)	35.5 L (9.3 gal)	35.4 L (9.3 gal)	37.3 L (9.9 gal)
Lumenside	21.7 L (5.7 gal)	20.9 L (5.5 gal)	23.8 L (6.3 gal)	23.0 L (6.1 gal)

Pressure Guidelines*	
	X50 or X40 Fiber
Maximum Shellside LIQUID Working Temperature/ Pressure	5-25°C, 7.2 barg (41-77°F, 105 psig) 50°C, 2.1 barg (122°F, 30 psig)
If no vacuum is used, 1.0 barg (15 psig) can be added to pressures above.	
Maximum Applied Gas Pressure	4.1 barg at 25°C (60 psig at 77°F)
Maximum applied gas pressure is for integrity testing at ambient temperatures. Normal operating pressures are typically lower.	
*Pressures are based on fluid group 2 (other) liquids and gases per the European Union Pressure Equipment Directive 2014/68/EU. See Operating Guide for pressure limits in the European Union with fluid group 1 (hazardous) liquids and gases. See Operating Guide for complete listing of temp/pressure limits for housings and membrane. <b>Note:</b> Liquid pressure should always exceed gas pressure.	

Housing Characteristics	
Material	PVC Vessel with Engineered Thermoplastic or Nylon End Caps
Flange Backing Rings	SMC (Sheet Molding Compound)
Flange Connections	
Shellside (Liquid Inlet/Outlet)	4 inch class 150 raised face flange per ANSI B16.5 100A 10K raised face flange per JIS B2238
Lumenside	2 inch class 150 raised face flange per ANSI B16.5 50A 10K flat face flange per JIS B2238
Mounting Kit	A Mounting Kit with 2 cradles and 2 straps is available and sold separately. It will hold the contactor horizontally or vertically.

Seal Options	
Material	Applications
EPDM	General Purpose

Weight (approximate)		
End Cap Material	With Nylon End Caps	With Engineered Thermoplastic Caps
Dry	62 kg (136 lbs)	54 kg (118 lbs)
Water-filled (shellside)	97 kg (213 lbs)	89 kg (196 lbs)



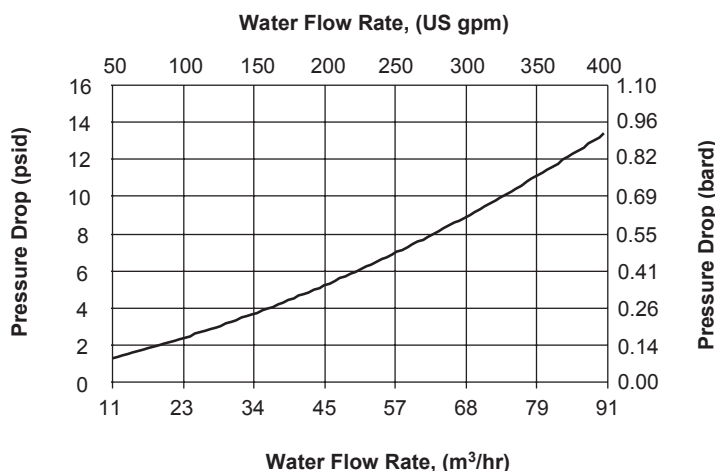
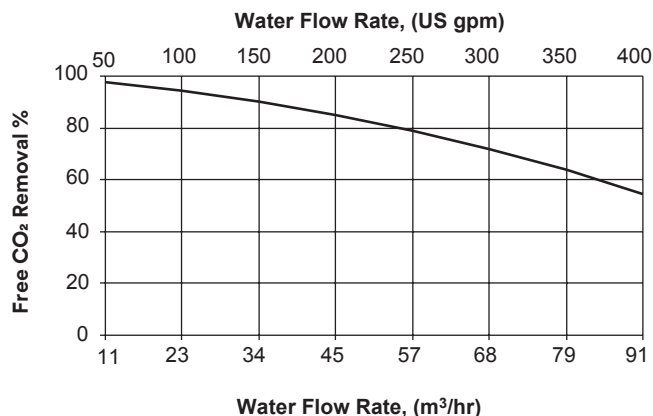
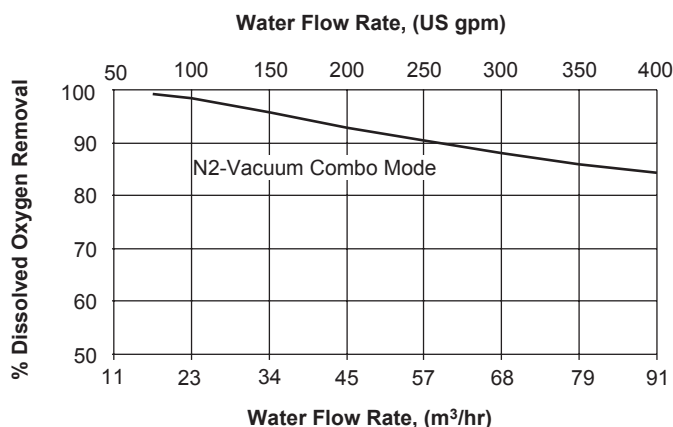
**NOTE:** Overall length with engineered thermoplastic end caps is 1158 mm (45.6 in). All dimensions are nominal values.

See full housing drawings on [3M.com/Liqui-Cel](http://3M.com/Liqui-Cel) for additional details.

## Typical Properties

### Regulatory

Complies with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.



**Note:** Performance can be improved by adjusting the sweep rate.

Curves represent nominal values, generated using water at 20°C. Characteristics may change under different operating conditions.

Test condition O<sub>2</sub> Removal: X40 membrane, N<sub>2</sub>-vacuum combo mode, vacuum: 75 mm Hg, N<sub>2</sub> Sweep 0.25 scfm.

Test condition CO<sub>2</sub> Removal: X50 membrane, Air vacuum combo mode, vacuum: 150 mm Hg, air sweep 8 scfm.

**Technical Information:** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

**Product Use:** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

**Warranty, Limited Remedy, and Disclaimer:** Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

**Limitation of Liability:** Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

3M and Liqui-Cel are trademarks of 3M Company. All other trademarks are the property of their respective owners. © 2017 3M Company. All rights reserved.



**Separation and Purification Sciences Division**  
 13840 South Lakes Drive  
 Charlotte, North Carolina  
 28273 USA  
 Phone: +1 980 859 5400  
 Fax: +1 980 859 5258

**3M Deutschland GmbH**  
**Separation and Purification Sciences Division**  
 Öhder Straße 28  
 42289 Wuppertal Germany  
 Phone: +49 202 6099 - 0  
 Fax: +49 202 6099 - 241

