

3M™ Liqui-Cel™ EXF-4×13 Series Membrane Contactor

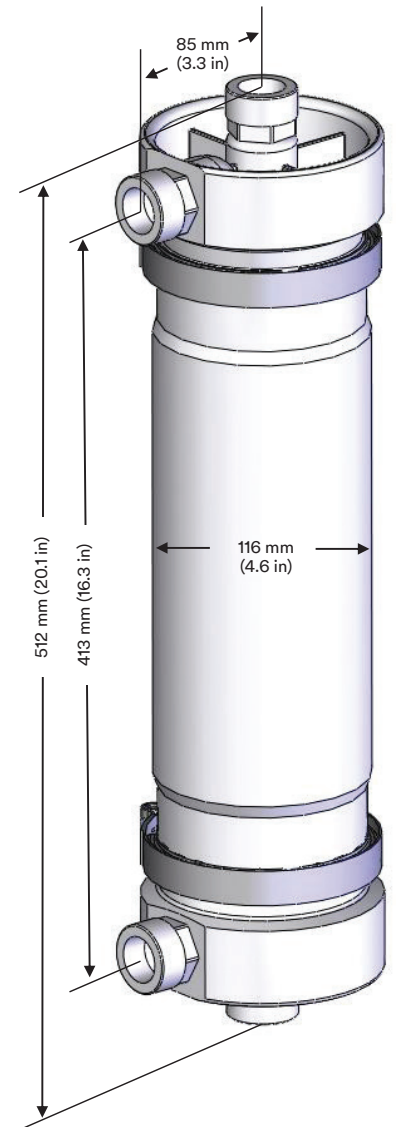
Typical Properties

Membrane Characteristics	
Cartridge Configuration	Extra-Flow with Center Baffle
Liquid Flow Guidelines	0.5– 3.4 m ³ /hr (2–15 gpm)
Membrane Type	X50
	Recommended for CO ₂ removal from water
	X40
	Recommended for all other gas transfer applications
Membrane/Potting Material	Polypropylene / Polyethylene
Priming Volume (approximate)	
Shellside X40 or X50	1.3 L (0.3 gal)
Lumenside X40	0.6 L (0.2 gal)

Pressure Guidelines*			
	PP X50 or X40	316L SS X50	316L SS X40
Maximum Shellside LIQUID Working Temperature/ Pressure	5-30°C, 7.2 barg (41-86°F, 105 psig) 40°C, 5.2 barg (104°F, 75 psig)	5-50°C, 7.2 barg (41-122°F, 105 psig) 70°C, 2.1 barg (158°F, 30 psig)	5-50°C, 9.3 barg (41-122°F, 135 psig) 70°C, 2.1 barg (158°F, 30 psig)
If no vacuum is used, 1 barg (15 psig) can be added to pressures above.			
Maximum Applied Gas Pressure	4 . 1 barg at 25°C (60 psig at 77°F)	6 . 2 barg at 25°C (90 psig at 77°F)	
Maximum applied gas pressure is for integrity testing at ambient temperatures. Normal operating pressures are typically lower.			
* See Operating Guide for complete temp/pressure limits for housings and membrane.			
Note: Liquid pressure should always exceed gas pressure.			

Housing Options and Characteristics		
Material	Polypropylene	316L SS Vessel and End Caps ≤ 0.8µm SI (32 RA)
Flange Connections		
Shellside (Liquid Inlet/Outlet)	1 inch Sanitary ¾ inch NPT Female 1 inch GF Rc ¾ per JIS B0203	1 inch Sanitary
Lumenside	1 inch 90° Sanitary ¾ inch 90° NPT Female Rc ¾ per JIS B0203	1 inch Sanitary

Seal Options	
Material	
FKM	
FFKM (K - UPW)	Only available with X40 fiber in PP housing with JIS or NPT connections.
Buna-N	Only available with X40 fiber in SS housing with sanitary connections or with X40 fiber in PP housing with JIS connections.



All dimensions are nominal values for the polypropylene housing with NPT connections. See full housing drawing on 3M.com/Liqui-Cel for additional details.

Not for consumer sale or use.

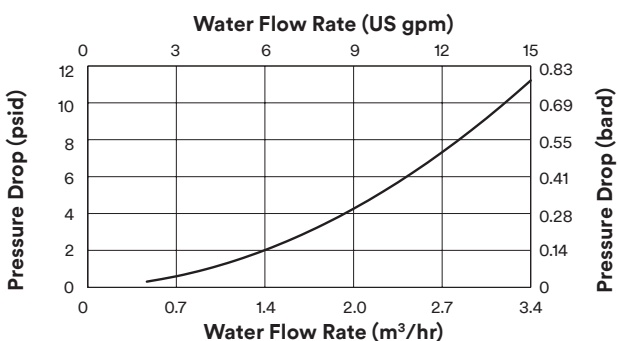
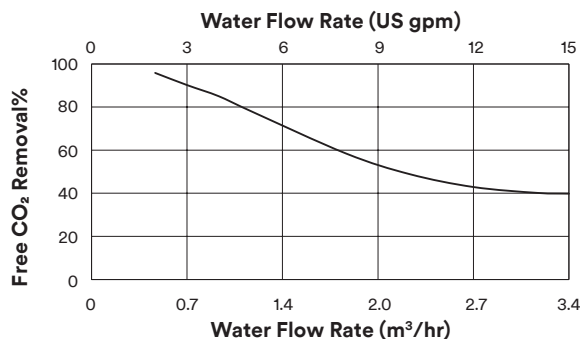
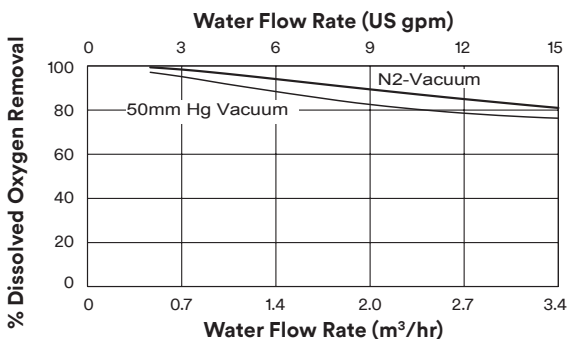
3M™ Liqui-Cel™ EXF-4×13 Series Membrane Contactor

Typical Properties

Weight (approximate)	PP	316L SS
Dry	3 kg (7 lbs)	6 kg (12 lbs)
Water-filled (shellside)	5 kg (10 lbs)	7 kg (15 lbs)

Regulatory

Complies with the limits as set by (EU) 2015/863 amending Annex II to the Restriction on Hazardous Substances (RoHS) Directive (2011/65/EU). 3M™ Liqui-Cel™ EXF-4×13 Series Membrane Contactors with FKM seals are constructed of FDA Title 21 CFR § 170-190 compliant materials for wetted parts only at ambient temperatures. 3M™ Liqui-Cel™ EXF-4×13 Series Membrane Contactors with FFKM (K-UPW) or BUNA-N seals **are not** constructed of FDA Title 21 CFR § 170-190 compliant materials and are not for use in food contact applications.



Curves represent nominal values, generated using water at 20°C (68°F). Characteristics may change under different operating conditions.

Test condition O₂ Removal with X40 membrane: N₂-vacuum combo mode, vacuum: 50 mm Hg, N₂ sweep: 1.4 L/min (0.05 scfm) at 20°C (68°F). Vacuum mode, vacuum: 50 mm Hg at 20°C.

Test condition CO₂ Removal with X50 membrane: Air-combo mode, vacuum: 150 mm Hg, N₂ sweep 2.8 L/min (0.1 scfm) at 20°C (68°F).

Technical Information: The technical information, guidance, and other statements contained in this document or otherwise provided by 3M are based upon records, tests, or experience that 3M believes to be reliable, but the accuracy, completeness, and representative nature of such information is not guaranteed. Such information is intended for people with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. No license under any 3M or third party intellectual property rights is granted or implied with this information.

Product Selection and 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. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer: Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature (in which case such warranty governs), 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, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 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 for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, 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. © 2021 3M Company. All rights reserved.



3M Company
3M Separation and Purification
Sciences Division
 13840 South Lakes Drive
 Charlotte, North Carolina 28273
 USA
 Phone: +1 980 859 5400

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

LC-1040
 70-2016-0199-7
 Rev. 04/2021

3M.com/Liqui-Cel