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

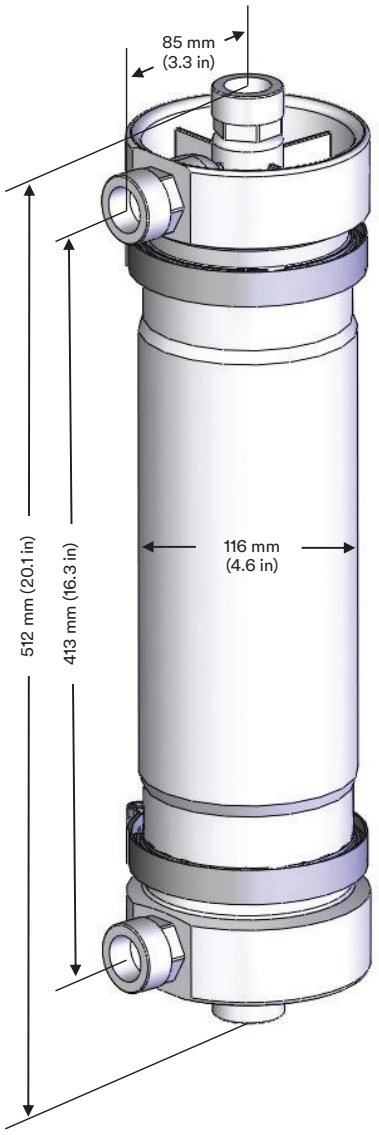
Typical Properties

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	X40
	Recommended for CO_2 removal from water	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.

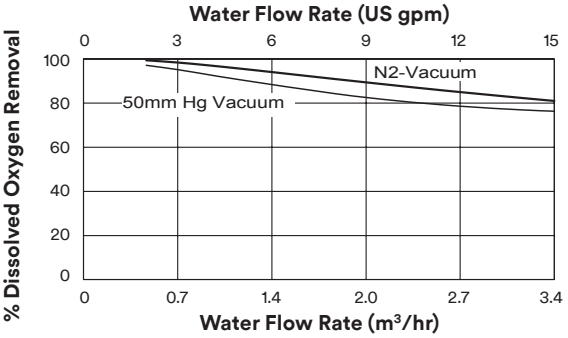
Not for consumer sale or use.

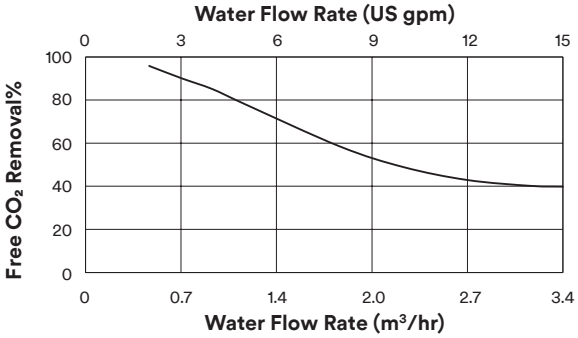
Typical Properties

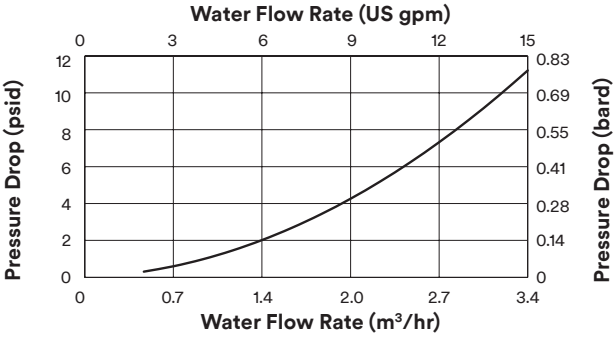
Weight (approximate)	PP	316L SS
Dry	3 kg (7 lbs)	6 kg (12 lbs)
Water-filled (shellside)	5 kg (10 lbs)	7 kg (15 lbs)

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 O_2 Removal with X40 membrane: N_2-vacuum combo mode, vacuum: 50 mm Hg, N_2 sweep: 1.4 L/min (0.05 scfm) at 20°C (68°F). Vacuum mode, vacuum: 50 mm Hg at 20°C.

Test condition CO_2 Removal with X50 membrane: Air-combo mode, vacuum: 150 mm Hg, N_2 sweep 2.8 L/min (0.1 scfm) at 20°C (68°F).

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