



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

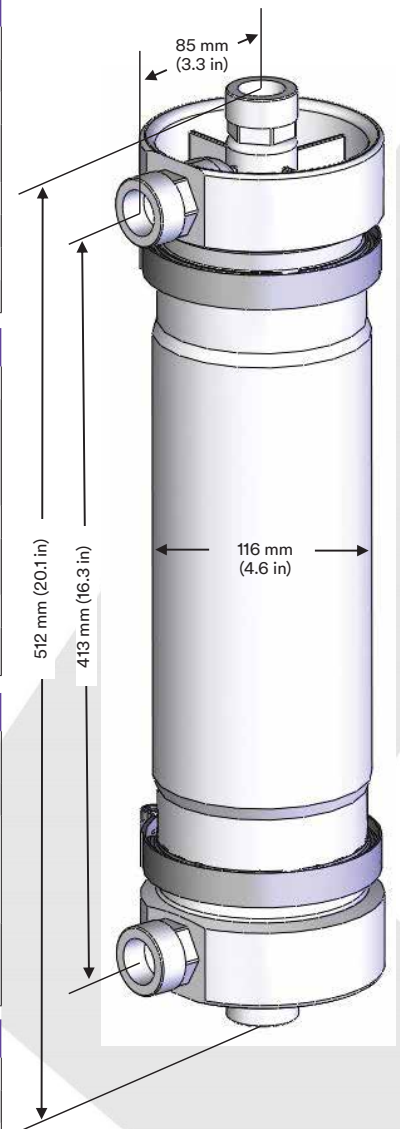
Typical Properties

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	1.3 L (0.3 gal)
Lumenside	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	Applications
Viton	General Purpose
K - UPW	Ultra Pure Water
K - EXT	Chemical Extraction
Buna-N	Beverage



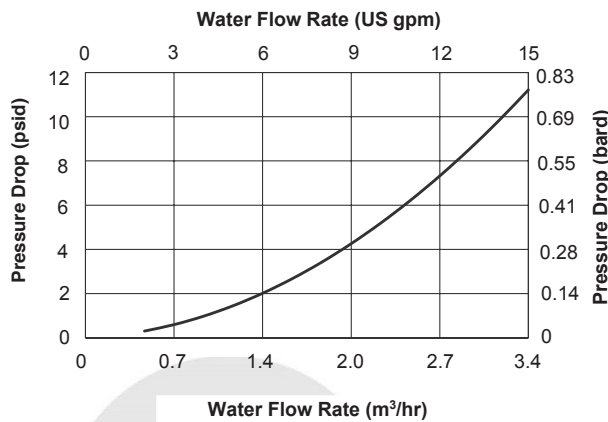
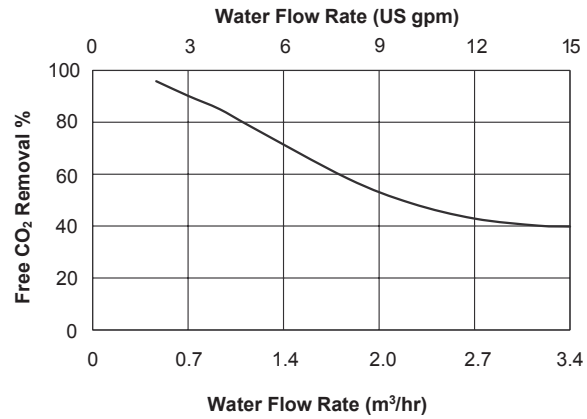
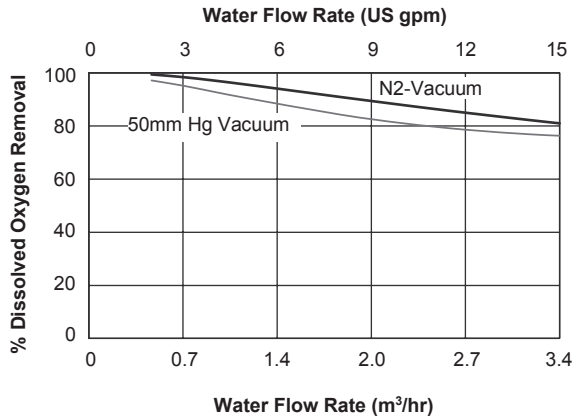
All dimensions are nominal values for the Polypropylene housing. See full housing drawing on 3M.com/Liqui-Cel for additional details.

Typical Properties

Weight (approximate)	PP	316L SS
Dry	3 kg (6 lbs)	5 kg (11 lbs)
Water-filled (shellside)	4 kg (8 lbs)	7 kg (16 lbs)

Regulatory

Complies with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.
Constructed of FDA CFR title 21 compliant materials for wetted parts only at ambient temperatures.



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).

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