3M | Liqui-Cel™ Membrane Contactors

LENNTECH Water Treatment Solutions

3M™ Liqui-Cel™ EXF-10×28 Series Membrane Contactor

Typical Properties

Membrane Characteristics				
Cartridge Configuration	Extra-Flow with Center Baffle			
Liquid Flow Guidelines	10 – 57 m^3/hr (44 – 250 gpm)			
Membrane Type	X50 Fiber		X40 Fiber	
	Recommended for CO_2 removal from liquid and other gas transfer applications		Recommended for O_2 removal from liquid and other gas transfer applications	
Membrane/Potting Material	Polypropylene / Epoxy			
Priming Volume (approximate)	FRP Housing		316 SS Sanitary/316 SS ANSI	
	X50 Fiber	X40 Fiber	X50 Fiber	X40 Fiber
Shellside	26.1 L (6.9 gal)	26.3 L (7.0 gal)	24.3/24.9 L (6.4/6.6 gal)	24.5/25.6 L (6.5/6.8 gal)
Lumenside	10.6 L (2.8 gal)	9.5 L (2.5 gal)	7.5/10.0 L (1.9/2.6 gal)	6.4/9.5 L (1.7/2.5 gal)

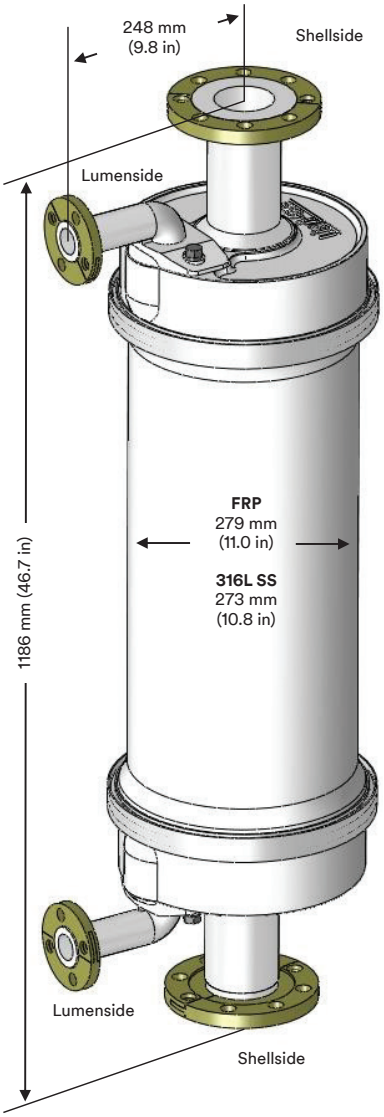
Pressure Guidelines*		
	X50 Fiber	X40 Fiber
Maximum Shellside LIQUID Working Temperature/ Pressure	5-50°C, 7.2 barg (41-122°F, 105 psig) 70°C, 2.1 barg (158°F, 30 psig)	5-25°C, 9.3 barg (41-77°F, 135 psig) 50°C, 7.2 barg (77-122°F, 105 psig) 70°C, 2.1 barg (158°F, 30 psig)
If no vacuum is used, 1.0 barg (15 psig) can be added to pressures above.		
	FRP	316 SS
Maximum Applied Gas Pressure	6.2 barg at 25°C (90 psig at 77°F)	9.0 barg at 25°C (130 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.
Note: Liquid pressure should always exceed gas pressure.

Housing Characteristics		
Material	Fiber Reinforced Plastic (FRP) with PVDF for all wetted surfaces and FRP flanges	316L SS Vessel/CF3M SS End Caps. ≤ 32RA (0.8µm SI) on schedule 10S pipe per ASTM A312.
Flange Connections		
Shellside (Liquid Inlet/Outlet)	• 3 inch class 150 raised face flange per ANSI B16.5 • 80A 10K flat face flange per JIS B2238	• 3 inch class 150 raised face flange per ANSI B16.5 • 80A 10K flat face flange per JIS B2238 • 3 inch sanitary
Lumenside (Gas/Vacuum)	• 3 inch class 150 raised face flange per ANSI B16.5 • 50A 10K flat face flange per JIS B2238	• 1 inch class 150 raised face flange per ANSI B16.5 • 25A 10K flat face flange per JIS B2238 • 1.5 inch sanitary

Mounting Kit

A Mounting Kit with 2 cradles and 2 straps is available and sold separately.
It will hold the contactor horizontally or vertically.



Note: All dimensions are nominal values for the PVDF-lined FRP housing. SS contactor uses a different end cap design. Sanitary connections are only available with 316 SS housing. See full housing drawing on 3M.com/Liqui-Cel for additional details.

Typical Properties

Seal Options

Material	Applications
EPDM	All Purpose
HP1 Viton	High Purity/Electronics

Weight (approximate)

	FRP Housing	Stainless Steel Housing	
	ANSI/JIS	ANSI /JIS	Sanitary
Dry	33 kg (73 lbs)	76 kg (168 lbs)	81 kg (177 lbs)
Water-filled (shellside)	57 kg (126 lbs)	99 kg (218 lbs)	107 kg (235 lbs)
Cartridge only – dry	10 kg (23 lbs)	10 kg (23 lbs)	10 kg (23 lbs)

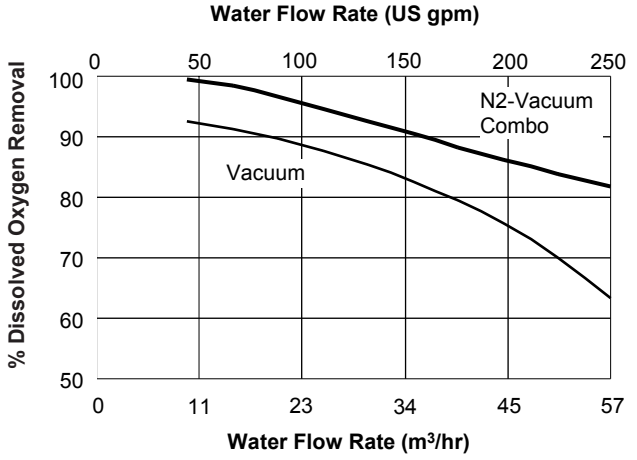
Regulatory

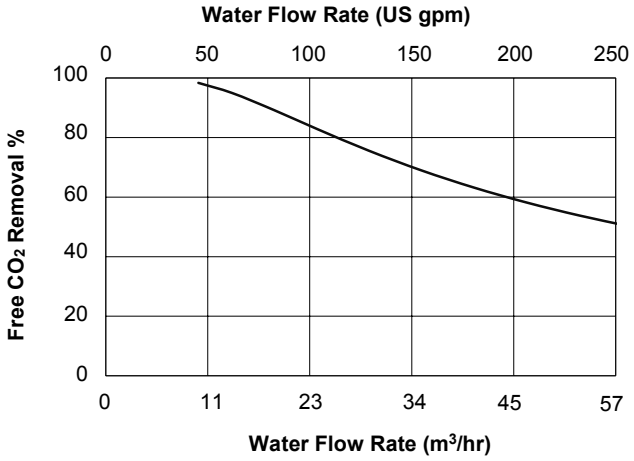
Complies with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC. Constructed of FDA CFR title 21 compliant materials for wetted parts only. For CFR title 21 compliance on the PVDF-lined FRP vessel 20,000 gallons of liquid should be flushed through the contactor prior to use.

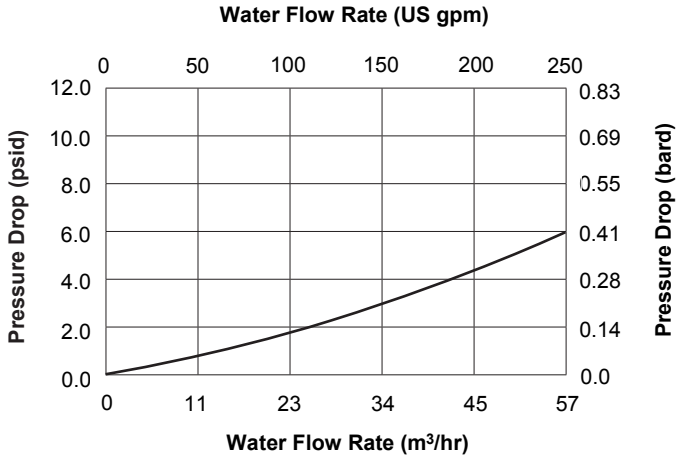
Curves represent nominal values using water. Characteristics may change under different operating conditions.

Test condition O_2 Removal with X40 membrane 20°C (68°F): N_2-vacuum combo mode, vacuum: 50 mm Hg N_2 sweep flow 0.40 Nm^3/hr (0.25 scfm).

Test condition CO_2 Removal with X50 membrane 25°C: Air-vacuum combo mode, vacuum 75 mm Hg, air sweep flow 1.6 Nm^3/hr (1 scfm).







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3M™ Liqui-Cel™ Membrane Contactors are tested and certified by WQA against NSF/ANSI 61.

ISO 9001

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