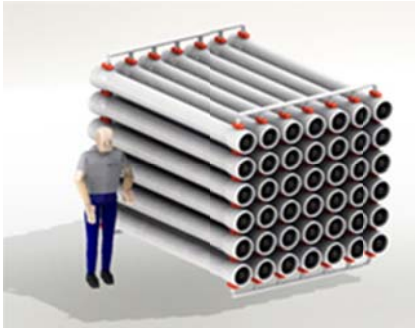


## Degassing Sea Water was never this Compact, Efficient, and Adaptable



This represents Liqui-Cel® modules that can process 75,000 - 125,000 BPD

Liqui-Cel® Membrane Contactors offer a modular skid option for off-shore oil platforms that removes the weight and reduces the footprint compared to vacuum towers on a platform.

Utilizing compact Liqui-Cel Degassing

Contactors on platforms is now a viable option based on the new high pressure degassing modules designed for ASME code stamped RO vessels. High pressure RO vessels are already proven and accepted on platforms; now they can be utilized to greatly reduce the footprint and the weight of degassing technology.

Figure 1.

Design Criteria	Option 1	Option 2	Option 3
Contactor Size	8 x 80	8 x 80	8 x 80
Membrane Type	X-40	X-40	X-40
Feed Flow (BPD)	75,000	125,000	200,000
Feed Flow (USGPM)	2188	3646	5833
Temperature (F)	64	64	64
Temperature (C)	18	18	18
<b>Component Concentrations (ppb)</b>			
Inlet O <sub>2</sub>	9,415	9,415	9,415
N <sub>2</sub>	15,443	15,443	15,443
Average Outlet O <sub>2</sub>	5	6	6
Maximum Outlet O <sub>2</sub>	9	10	10
Minimum Gas Removal O <sub>2</sub>	99.90%	99.89%	99.89%
No. of Contactors Required	32	52	84
No. of Parallel Trains	32	52	84
No. in Series	1	1	1
Min. Pressure Drop through train, less pipe loss (psi)	25.7	26.9	26.4
Operating Mode	Combo/N <sub>2</sub>	Combo/N <sub>2</sub>	Combo/N <sub>2</sub>
Total Sweep Rate, scfm	16	26	42
<b>Sweep Composition</b>			
Oxygen	0.010%	0.010%	0.010%
Nitrogen	99.990%	99.990%	99.990%
Carbon Dioxide	0.000%	0.000%	0.000%
Vacuum Volume Flow (acfm)	429	702	1131
Liquid Ring Vacuum Level (mm Hg abs)	50	50	50

The benefits are huge. The amount of weight on the platform is substantially reduced when using Liqui-Cel Contactors. This simplifies and lowers the cost of the physical structure required to support a liquid-full vacuum tower. The space and weight of the vacuum tower is a burden that is removed by installing a compact Liqui-Cel System.

Liqui-Cel Contactors have been degassing water streams around the world for over 20 years. They offer a robust technology that is easy to size and fit into any application. Compared to vacuum towers, Liqui-Cel Contactors have 10 times the surface area per volume which is a huge advantage on an off shore platform.

Figure 1 shows a few system scenarios that demonstrate the small compact nature of the Liqui-Cel systems. These systems are also fully expandable so you can build a system to accommodate 75,000 BPD today and expand it to handle 200,000 BPD at any time in the future. It can be turned down or expanded to meet your demands with its tremendous flexibility.

To learn more about Liqui-Cel technology and how it can be integrated on your existing or new platforms, please visit [www.Liqui-Cel.com](http://www.Liqui-Cel.com) or contact your Membrana representative.



Liqui-Cel® 8 x 80-inch high pressure ASME code rated degassing system

Liqui-Cel<sup>®</sup> Membrane Contactors are field proven in many diverse applications such as in nuclear and coal fired power plants and in many boiler feed water applications.

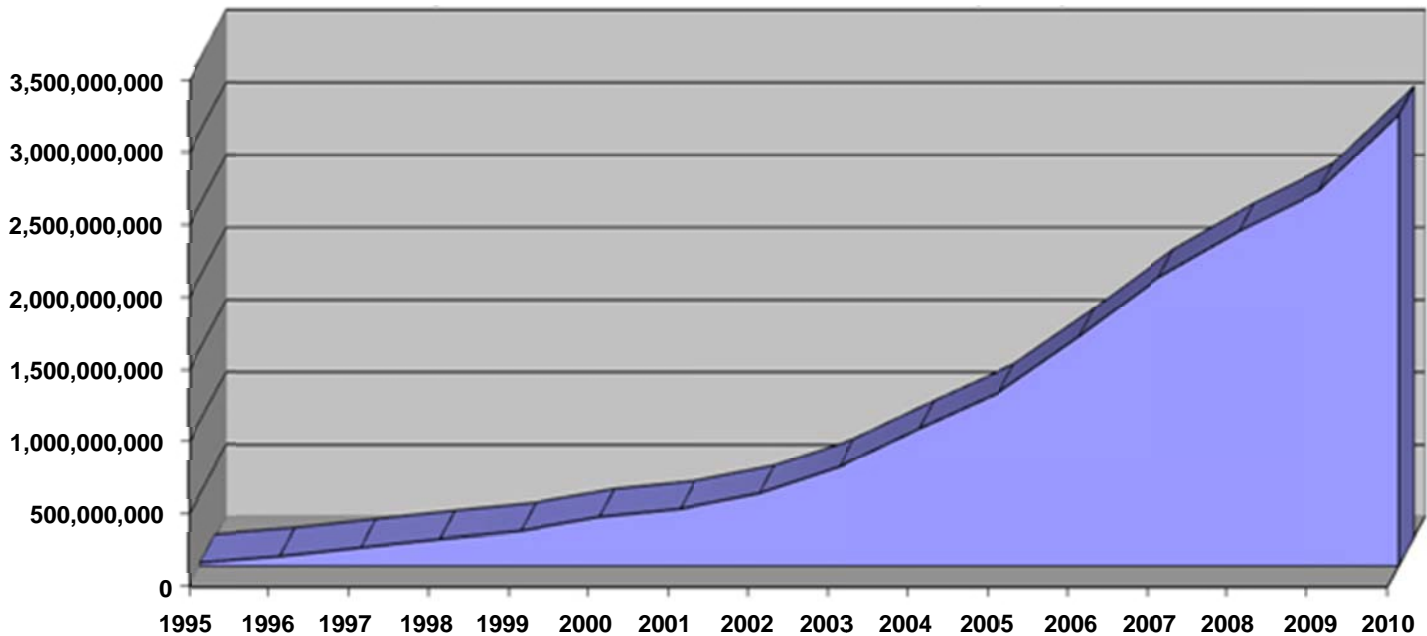
Additionally they are used extensively in the food and beverage, pharmaceutical, semiconductor and digital printing sectors for O<sub>2</sub> and CO<sub>2</sub> removal.

Liqui-Cel Membrane Contactors have become the

standard degassing technology of choice in many of these industries.

The chart below demonstrates the increased acceptance of Liqui-Cel Contactors with the growth of installed systems over the years. Most systems that were started up over a decade ago are still reliably degassing the water streams they were installed to degas.

### Liquid Processed with Liqui-Cel<sup>®</sup> Membrane Contactors (GPD)



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