MEMBRANE DEAERATION (MDA™)

State of the Art Dissolved Oxygen Removal with Reduced Weight, Footprint and Chemical Consumption

WHY MDA™?

Dissolved oxygen removal from water mitigates corrosion and bacterial growth, extending the lifespan of equipment and pipelines. It simplifies operation and maintenance, and preserves the integrity of unique assets such as offshore reservoirs. Compared to conventional deaeration technologies, Water Standard's MDA™ systems offer:

- Significant footprint & weight savings
- Superior oxygen removal performance
- Reliable operation & low maintenance
- Reduced chemical consumption
- Competitive capital cost

Photo: Water Standard graphical representation of an offshore installation.

TRUSTED OEM FOR TURN-KEY MEMBRANE SOLUTIONS

As a qualified OEM for 3M's Liqui-Cel® membrane contactors, Water Standard delivers turn-key MDA™ solutions and operations support to the oil and gas and other industries.

Photos: Water Standard MDA™ pilot.

4265 San Felipe, Suite 620
Houston, TX 77027
P: +1 (713) 400-4777
E: sales@waterstandard.com

MDA™ PRODUCT

Water Standard offers three MDA™ standard skid-mounted packages whose modular designs provide the flexibility to treat flows up to several hundred thousand barrels per day. Customized systems are available upon request.

Model #	Capacity (bpd)	Weight (kg)		Footprint (m^2)	Power Requirement (kW)	N_2 Feed Required (Nm^3/hr)	N_2 Purity	Vacuum Pressure (Torr)	Outlet Oxygen (ppb)
		Dry	Operating						
WSMDA 4x4 - 16	30,000	5,600	6,900	13	19	13	99.9%	50	< 10
WSMDA 5X5 - 25	50,000	7,200	8,900	15	37	20			
WSMDA 6X6 - 36	80,000	9,900	12,100	17	56	29			

The standard scope of supply includes:

- Vacuum pump skid package
- Nitrogen generator
- Piping, valves, instrumentation, and controls
- Optional CIP skid package with tank, pump, and filter

HOW IT WORKS

3M's Liqui-Cel® technology is commercially proven in industrial operations. It uses hollow fiber membranes to remove gases from liquids. The liquid is passed over the outside (shell) of the hydrophobic membrane, while the gas is stripped from the liquid using vacuum pumps and sweep gas on the inside of the fiber (lumen).

Water Standard's designs allow for uninterrupted operation during cleanings and oxygen removal to <10 parts per billion (ppb), without chemical oxygen scavenger.

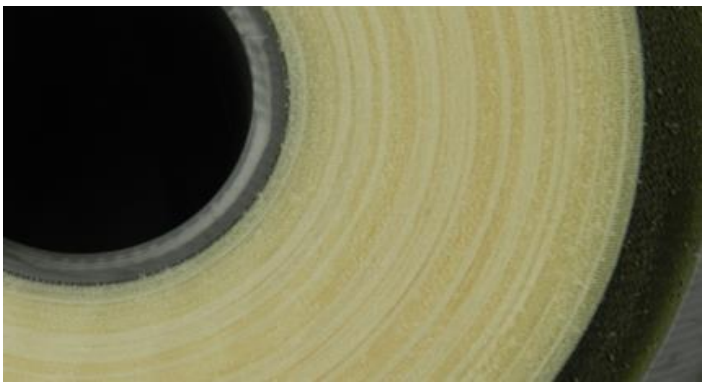
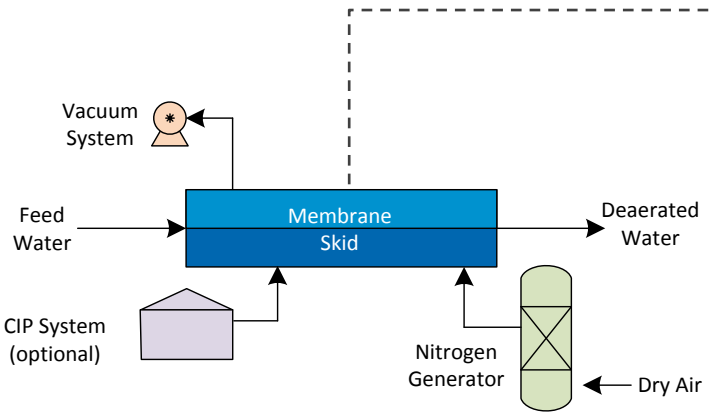
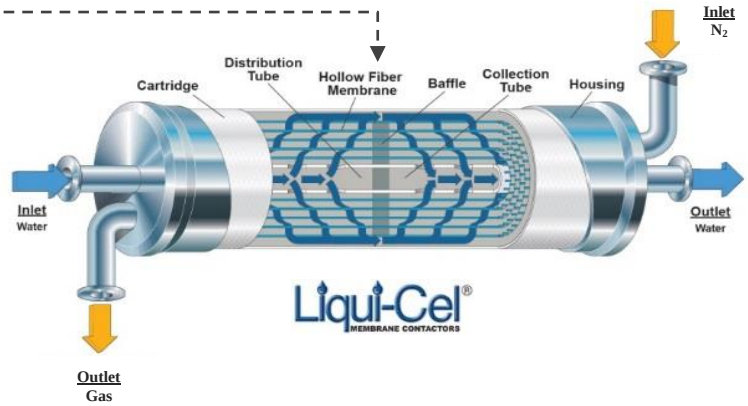


Photo: Cross section view of Liqui-Cel® membrane.





4265 San Felipe, Suite 620
Houston, TX 77027
P: +1 (713) 400-4777
E: sales@waterstandard.com