



WATER TREATMENT TECHNOLOGIES: GAS TRANSFER MEMBRANE SYSTEMS



WATER MANAGEMENT

- + SOURCING
- + WELL & PUMP MAINTENANCE
- + WATER TREATMENT TECHNOLOGIES
- + WATER RECYCLE & REUSE
- + WATER TRANSFER
- + WATER STORAGE

CONSTRUCTION

- + GEOTECHNICAL CONSTRUCTION
- + TREATMENT PLANT CONSTRUCTION
- + ALTERNATIVE DELIVERY
- + RENEWABLE ENERGY
- + SEWER SYSTEMS
- + TRENCHLESS REHABILITATION
- + WATER SUPPLY
- + WATER TRANSMISSION & DISTRIBUTION

DRILLING

- + EXPLORATION DRILLING
- + SPECIALTY DRILLING
- + WATER WELLS
- + BOREHOLE SERVICES

With continual emphasis on both minimizing environmental impact and footprint Gas Transfer Membrane Systems have been used around the world for over 20 years for the introduction and/or removal of carbon dioxide, oxygen, nitrogen and hydrogen sulfide.

Gas Transfer Membrane Systems from Layne are used extensively for the removal of dissolved gases in a number of industries, including pharmaceutical, power production, microelectronics, food and beverage, as well as municipal, for the treatment of potable water.

EVALUATION OF TREATMENT EFFICIENCY

Understanding the full life-cycle costs of each treatment option is imperative for responsible investment. Layne understands the design, construction and operation costs of infrastructure, and provides informed analysis of the costs and benefits of different solutions through pilot testing services.

COST-EFFECTIVE, MODULAR SYSTEM

Other technologies have offered only limited control and performance, creating operational inefficiencies. They also require large physical footprints for equipment, typically placed outside, making them costly to install and operate. Gas Transfer Membrane Systems are mounted on compact, modular skids that can fit inside existing buildings, thereby lowering installation costs and making future expansion easier. Because they do not require chemicals to operate, Gas Transfer Membrane Systems are environmentally friendly and safe for plant employees.

GAS/LIQUID INTERFACE

Gas Transfer Membrane Systems contains thousands of microporous hollow fibers knitted into an array that is wound around a distribution tube with a central baffle. Using the baffle to direct liquid across the membrane fibers, the membrane allows direct contact between the gas and liquid without dispersion. The gas/liquid interface is immobilized by applying a higher pressure to the liquid stream relative to the gas stream.

Four different polyolefin fibers, each with unique design qualities, are incorporated into various product designs to determine the optimal membrane for each individual application.





GAS TRANSFER MEMBRANE SYSTEMS (CONT)

EXTRA-FLOW DESIGN

During operation, the liquid flows over the shellside (outside) of the hollow fibers. The Extra-Flow design incorporates a baffle in the middle of the contactor, which directs the liquid radially across the membrane array. A strip gas or vacuum, either separately or in combination, is applied on the lumenside (inside) of the hollow fibers. Because of its hydrophobic nature, the membrane acts as an inert support to allow direct contact between a gas and liquid phase without dispersion. The gas/liquid interface is immobilized at the pore by applying a higher pressure to the liquid stream to the gas stream.

WATER BEFORE AND AFTER GAS TRANSFER MEMBRANE SYSTEM ENTRAINED AIR REMOVAL



GAS TRANSFER MEMBRANE SYSTEM ADVANTAGES

- + Cost-effective alternative to other forms of water treatment
- + One-step total gas control
- + Compact size allows for reduced footprint
- + Retrofits in existing buildings
- + Can be expanded easily
- + Operates under pressure with no repumping
- + Responsive to changes in flow rates
- + Low air flow capability
- + Can eliminate the number of transfer pumps required
- + Membranes can be chemically cleaned
- + Multiple contactors allow for redundancy
- + Reduces chemical requirements in water
- + Environmentally friendly and safe
- + Membranes are NSF certified

GAS TRANSFER MEMBRANE SYSTEM APPLICATIONS

- + Reduction of volatile organic compounds
- + Reduction of Trihalomethanes
- + Removal of entrained air
- + Reduction of radon, hydrogen sulfide, nitrogen and carbon dioxide

Product	Flow Range (one device)
Extra-Flow 6 x 28	5 – 50 gpm (1.1 – 11.4 m ³ /hr)
Extra-Flow 10 x 28	44 – 250 gpm* (10 – 57 m ³ /hr)
Also in INDUSTRIAL version	44 – 210 gpm (10 – 48 m ³ /hr)
Extra-Flow 14 x 28	70 – 400 gpm (16 – 90.8 m ³ /hr)

*X50 in our high-purity 10-inch contactor is currently rated to 210 gpm in one device.

