



## The Complete MBR

by Smith & Loveless Inc.





**TITAN MBR™** is the complete MBR — developed by Smith & Loveless Inc., the company with 60 years of wastewater engineering and manufacturing experience.



### TITAN MBR™ Design & Technical Data

Flow Capacities:	5,000 GPD - 3 MGD+
Effluent Quality:	< 3 mg/l BOD & < 1 mg/l TSS
Turbidity:	< 0.2 NTU
TN	2-3 mg/l
NH <sub>3</sub>	< 1 mg/l

## The Complete MBR

Smith & Loveless Inc. proudly offers **TITAN MBR™**, our latest pre-engineered wastewater treatment system for municipal, onsite and industrial applications. The innovative **TITAN MBR™** marries the wastewater treatment engineering expertise of S&L with exciting submerged membrane technology. The combination yields a *dynamic* membrane biological reactor (MBR), a system that provides end-users with high-quality treatment performance, minimal operational requirements, and a robust design that will stand the test of time. **TITAN MBR™** delivers results with value-added engineering experience available only from S&L.



### S&L Design Benefits

- 60 years of S&L engineering & manufacturing expertise
- Easy-clean Flat-Plate membrane design
- Proven designs and quality-control
- Flexible process options that are operator friendly
- Clean in place
- Perform maintenance without shutting down operation
- Process guarantees and full customer support
- Exclusive epoxy & polyurethane coated V-Crimp walls



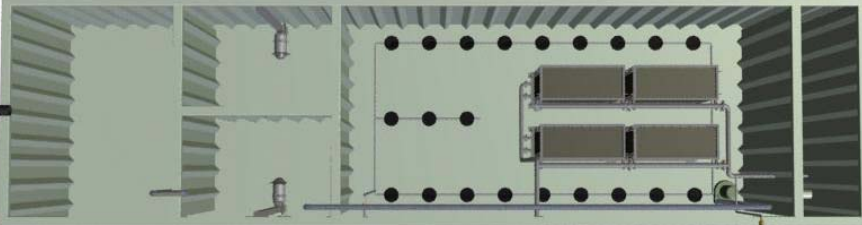


# TITAN™ System Overview

Systems come in standard and custom designs, and result in smaller footprints than conventional systems. The submerged membrane eliminates clarifiers and sand filters and produces *significantly better* effluent quality. Integral zones can be added to meet particular effluent goals, including nutrient removal, disinfection, sludge holding and post-aeration.

Top View [Typical 100,000 GPD System]

V-Crimp Tankage [Rectangular Only]



Flow Equalization

Dual Anoxic Zones [Denitrification]

Fine Bubble Aeration with Submerged, Flat-Plate Membrane Modules

Sludge Storage



For larger flows, S&L concentric tankage minimizes footprint.



Touchscreen PLC Controls

Blowers with Noise Limiting Covers

Chemical Feed Tank

## TITAN™ Flat-Plate Membrane Efficiently Delivers Results

TITAN MBR™ Flat-Plate Membranes (MF) maintain high permeability and flux rates even at peak-day rates. They stack within a fully submerged module inside the aeration zone. Transmembrane pressure created by gravity drives the flow through the membranes. Clean water discharges while blocked solids remain suspended in the aeration zone. Diffusers beneath the module scour the membranes *while also* providing air supply to the bacteria. Chemical cleaning occurs efficiently in-place—typically on a semi-annual basis\*—with simple chemical injection.

### Advantages

#### Provides Long-Term Durability

Composed of PVDF [polyvinylidene fluoride] and a non-woven polyester, the membrane sheets never collide during operation. A robust design prevents breakage experienced in other designs and produces higher flux rates over the life of the membrane.

#### Superior Alternative to Hollow Fiber Types which Clog

TITAN MBR™ membranes eliminate clogging problems experienced in hollow fiber membranes. The Flat-Plate design with its smooth, continuous surface negates bundling by stringy solids—like hair—and clogging of the membrane that often occurs hollow fiber membranes become bundled.

#### More Economical Cleaning Method: Clean in Place

TITAN MBR™ membranes require less chemicals, operator time and equipment. They are cleaned in place. No backpulsing is required, which eliminates associated pumping equipment. TITAN MBR™ membranes facilitate air scouring much more effectively than hollow fiber designs by the simple fact of the flat surfaces.

### TITAN MBR™ Membrane Data [Typical]

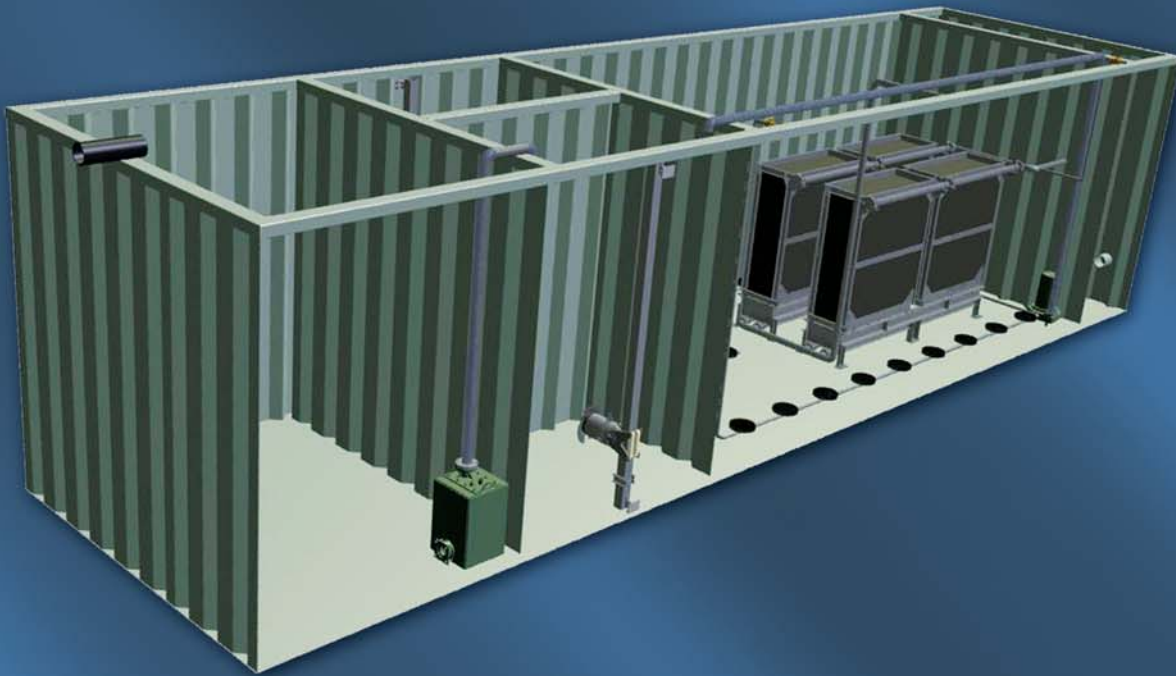
Type:	Submerged, PVDF+PET Flat-Plate
Design Flux:	15 gpd/sf
Pore Sizing:	.08 microns [MF]
TMP Range:	[Trans Membrane Pressure] 1.03 - 2.90 psi
Cleaning:	In-Place; Semi-annual cycle*; 4 hrs.

\* Depending upon the application



TITAN MBR™ Delivers Results.

## The Complete MBR.



Smith & Loveless Inc. knows wastewater treatment systems. Backed by 60 years of engineering, manufacturing, erecting and servicing thousands of pre-engineered biological treatment systems, we understand your preferences for performance, minimal operational costs, and long-term durability. We're proud of the knowledge and experience we bring to the table to help solve your wastewater needs. With TITAN MBR™, you receive the finest in system innovation backed by the value-added experience of Smith & Loveless.

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**MBR**

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