



NEOSEP® Membrane Bioreactor (MBR)

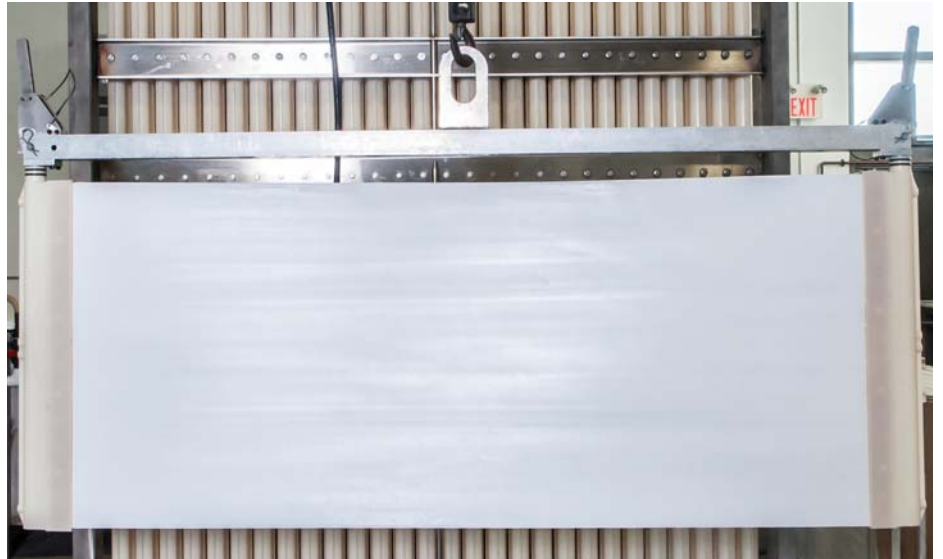
WATER TECHNOLOGIES

Veolia's NEOSEP® MBR

Incorporates Cutting Edge Wastewater Treatment
Process Knowledge With Membrane Quality Effluent

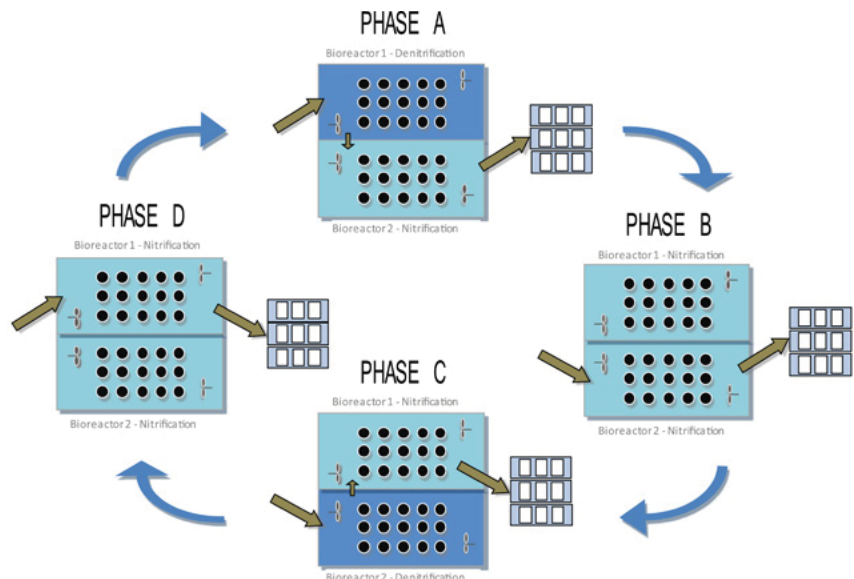
NEOSEP® combines the best attributes of hollow fiber and flat sheet membranes with the use of hybrid FibrePlate™ membranes

Owners of NEOSEP® MBR systems benefit from Veolia's experience in the design, supply and operations of over 230 MBR facilities around the world, using all types of submerged membranes.



NEOSEP® offers the smallest footprint and lowest energy use on the market today with the incorporation of the FibrePlate™ membrane. FibrePlate™ is a hybrid of hollow fiber and flat plate technologies that retains the strengths while eliminating the weaknesses of conventional MBR membrane technologies.

The biological process of the NEOSEP® MBR is extremely flexible and can be configured in nearly any activated sludge configuration to meet specific treatment objectives. It can also be configured using Kruger's Phased MBR system capitalizing on years of Phased Treatment technology to produce a reliable, unique and energy efficient MBR system for BNR.



NEOSEP® FibrePlate™ Membrane Modules

Value

Over Next Best MBR

- **Smallest Footprint**

Twice the packing density plus more efficient cassette and tank design = 50% smaller footprint.

- **Lowest Energy**

Flexible sheets and open MLSS flow paths from bottom to top with high packing density = Low Air Scour Energy

- **Resists Sludging**

No obstructions to MLSS flow paths such as top headers with potted fiber, criss-crossing or bent fibers

- **In Situ Recovery**

Automatically detect plant solid upsets and able to remove caked sludge in situ, without removing cassettes and cleaning manually

- **Developed and Manufactured in North America**

FibrePlate™ is an advanced membrane technology designed to leverage all the lessons learned in the industry into the next generation membrane platform for large scale municipal wastewater treatment plants. FibrePlate™ is a reinforced ultrafiltration membrane product which is constructed as a sheet of almost 500 “fibres”. Sixteen sheets are arranged side by side to form a FibrePlate membrane module.

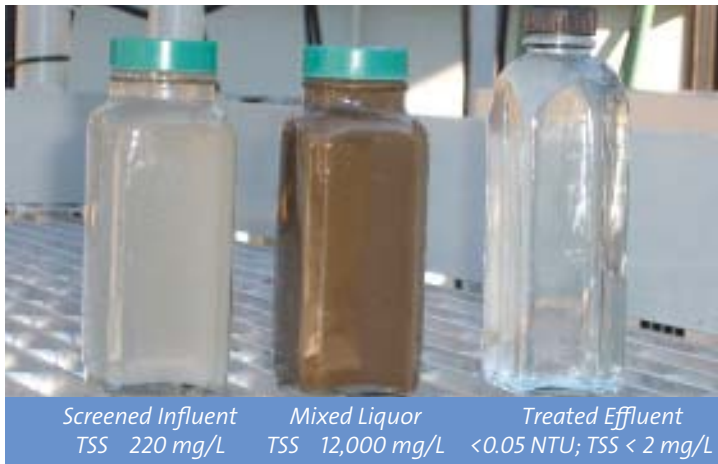


Individual FibrePlate™ modules are combined into a membrane cassette. Due to their unique configuration and high surface area per module, the arrangement of FibrePlate modules within a cassette is optimized to produce a very high packing density. This allows the membrane tanks to be smaller in volume for a given treatment capacity. Modules are configured in blocks which are combined vertically resulting in a cassette with modules stacked three rows high, minimizing footprint and maximizing air scour efficiency.



Simple Membrane Installation

- Integral support beams to hang cassettes
- Integral self-cleaning air scour diffusers
- Minimal piping connections needed due to high cassette capacity
- No wall penetrations and no connections below water surface

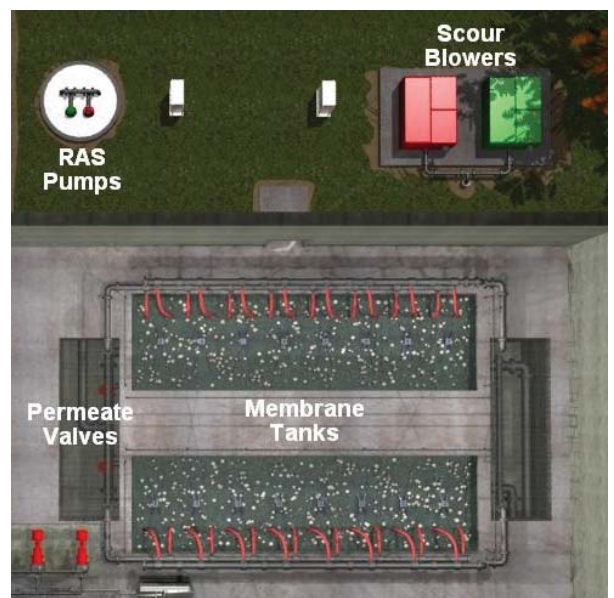


Sample Streams From Operating NEOSEP® MBR System

The samples shown are of typical screened influent with a total suspended solids (TSS) concentration of 220 mg/L and mixed liquor with a TSS concentration of 12,000 mg/L. The NEOSEP membrane removes all of the solids with typical effluent TSS in the non-detect range and turbidity of <0.05 NTU.

Process Control Features

- Customizable PLC-based control using open architecture software, allowing for ease of future modifications
- Point-and-click navigation and control
- KrugerLink™ remote process monitoring and control, providing our engineers limited access to process specific information for advising plant personnel on optimizing the operation of the plant
- Award winning plant-wide SCADA system, including 2-D and 3-D rendered graphics



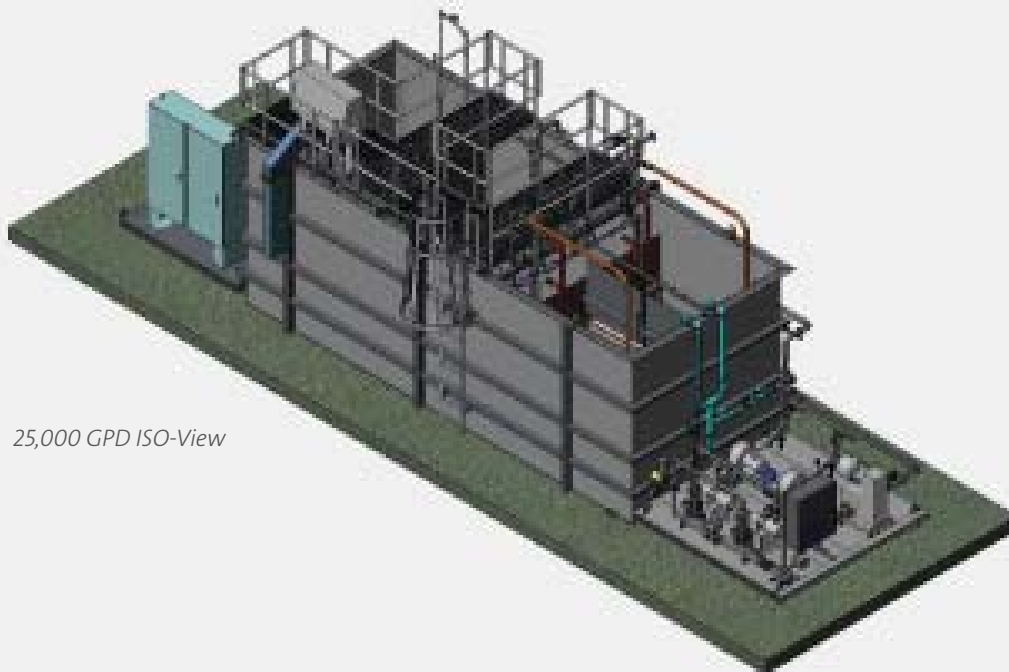
NEOSEP® MBR Package System

The NEOSEP® Package System is a self-contained modular wastewater treatment plant ideal for nominal operating flows between 25,000 and 75,000 gallons per day (GPD). Each unit is pre-engineered, skid mounted and factory tested, allowing for savings on installation time and cost.

The MBR process is robust and requires minimal operator attention. The process is designed in an MLE configuration with submerged flat sheet membranes handling the liquid solid separation step. The membranes allow for a compact footprint and a superior effluent; CBOD5 < 5 mg/L, TSS < 1 mg/L, TN < 10 mg/L and Turbidity < 0.1 NTU. Phosphorus removal can be accomplished with the addition of coagulant.

Features and Benefits

- Minimal Site Work
- Compact Footprint
- Exceptional Effluent Quality
- Advanced Nitrogen and Phosphorus Removal
- Minimal Operator Attention



25,000 GPD ISO-View

Included Equipment

- Membrane Cassettes
- Painted steel tank (Anoxic, Aeration and Membrane Zones)
- Painted steel pump and blower skids
- Drum screen
- Mixed Liquor Feed Forward pump
- Internal Recycle pump
- Permeate pumps
- Anoxic zone submersible mixer
- Automated and Manual valves
- CIP System
- Process Aeration blowers
- Scour Aeration blowers
- Fine Bubble Aeration Grid
- Control and Power Enclosure
- Instrumentation
- Industrial Computer/SCADA System

Resourcing the world

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