

SaniBrane®

Membrane Bioreactors for Wastewater Treatment Systems



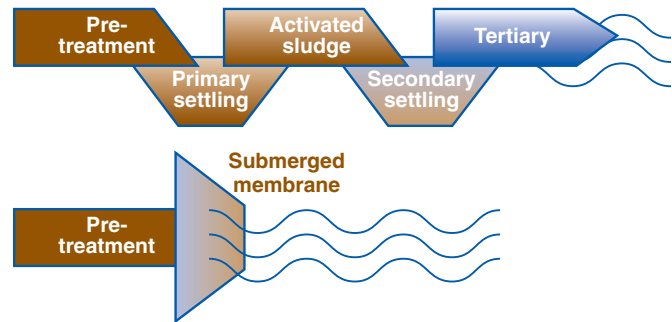
SANITHERM ENGINEERING LIMITED

Since  *1946*

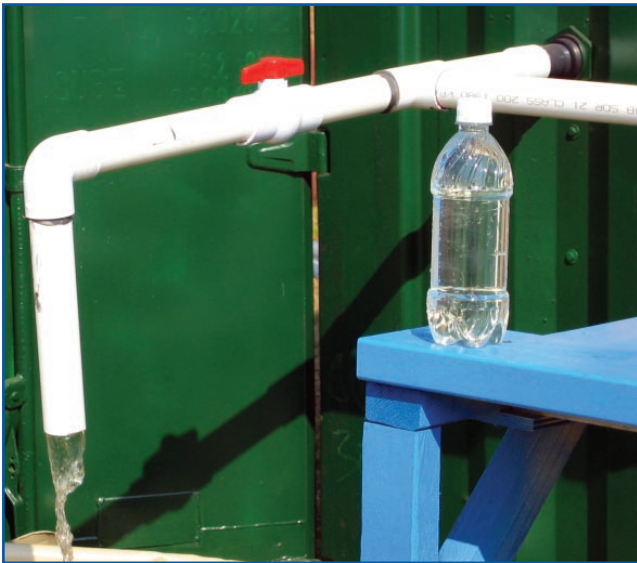
Membrane Bioreactor Treatment Technology: Revolutionizing Wastewater Treatment.

A membrane bioreactor (MBR) combines one of the oldest and most mature wastewater treatment technologies with the very newest. It is an activated sludge treatment plant combined with an extremely effective clarifier.

The basic operating theory behind membranes is conventional biological treatment combined with a semi-permeable barrier that precludes mixed liquor suspended solids (MLSS) from being discharged from the biological reactor. This semi-permeable barrier is generally an engineered plastic such as PVDF or PVC, perforated with innumerable tiny holes less than one micron in diameter – smaller than the size



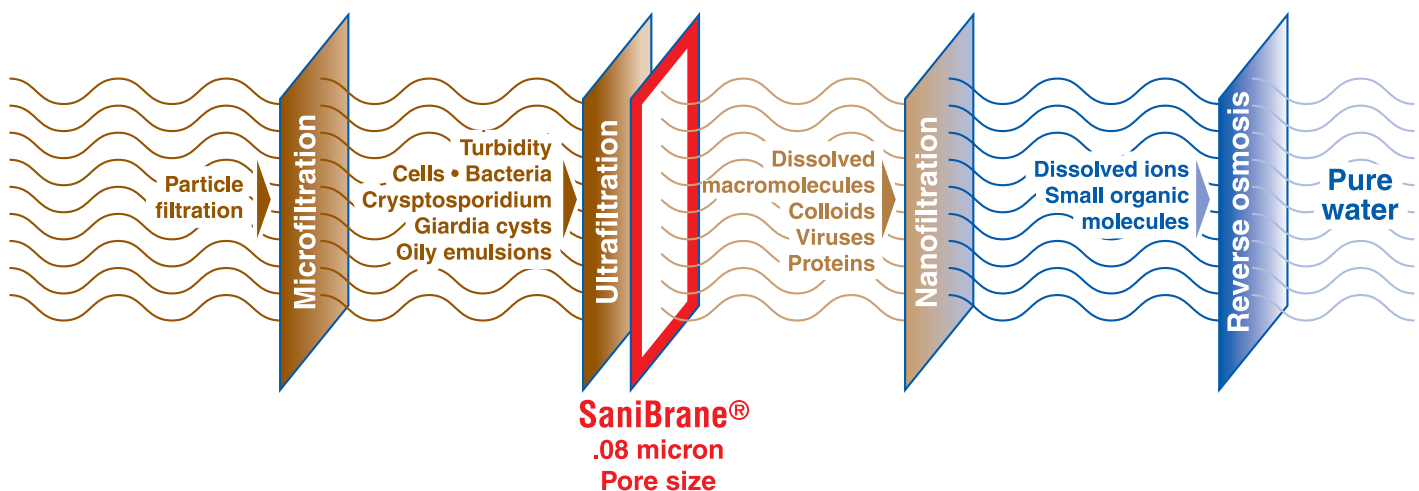
MBRs take fewer steps than conventional activated sludge plants to produce the required effluent. That means there is less room for operator error and equipment malfunctions – saving you money and time.



The SaniBrane® system results in effluent that is often well above the standard required.

of the MLSS. Clear, treated liquid is drawn through the openings, either by gravity or by using a pump. Normally, such a semi-permeable barrier would plug immediately after being placed in the MLSS tank, but proper design prevents solids from accumulating on the membrane surface and “blinding” the holes.

Generally speaking, there are two wastewater membrane configurations. Hollow-fibre designs resemble spaghetti strands with hollow centres. Flat-plate designs consist of plates with membrane fabric on each side. SaniBrane® designs are strictly flat-plate, which allows optimum air-scouring to keep the membrane surfaces clean. This results in less maintenance: for example, no back pulsing.



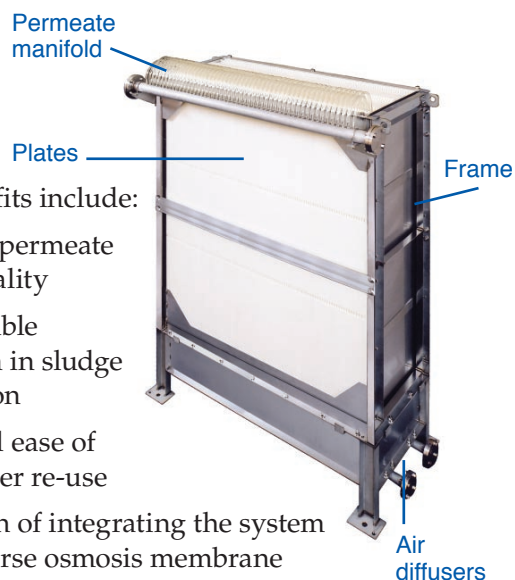
The SaniBrane® MBR: a Flat-Plate Design

The SaniBrane® flat-plate MBR design allows optimum air-scouring to keep the membrane surfaces clean. Use of PVDF for membrane surfaces results in the most consistent pore size and distribution.

The reliable air scouring and consistent, long-term flux rates make these membranes suitable for treating domestic sewage in both industrial and municipal environments.



SaniBrane® flat-plate unit being installed in a concrete tank.



Other benefits include:

- excellent permeate water quality
- considerable reduction in sludge production
- improved ease of wastewater re-use
- the option of integrating the system with reverse osmosis membrane
- two-year warranty on membrane life
- ability to operate with gravity flow (i.e., no pump required)
- significantly less operator intervention than is required with hollow-fibre membranes
- open-top flow-through design ensures effective scouring and MLSS mixing

TYPICAL APPLICATIONS

SaniBrane® Projects	Design Flow	Modules	MLSS	BOD	TSS	Fecal Coliform	Comments
Snap Lake NWT, Canada	5,283 gpd (20 m³/day)	1	12,000 – 18,000 (Design Range)	< 5 mg/L (detection limit)	< 2 mg/L	< 15 F.C./100 ml	Industrial Camp
Sooke BC, Canada	63,401 gpd (240 m³/day)	4	12,000 – 18,000 (Design Range)	< 5 mg/L (detection limit)	< 1 mg/L		Residential
Attawapiskat ONT, Canada	48,750 gpd (184.5 m³/day)	3	12,000 – 18,000 (Design Range)	10 mg/L	10 mg/L	100 F.C./100 ml	650 Man Industrial Camp
Attawapiskat ONT, Canada	17,250 gpd (65.3 m³/day)	1	12,000 – 18,000 (Design Range)	10 mg/L	10 mg/L	100 F.C./100 ml	230 Man Industrial Camp
Gahcho Kue NWT, Canada	7,000 gpd (26.5 m³/day)	1	12,000 – 18,000 (Design Range)	15 mg/L	15 mg/L	10 F.C./100 ml	Industrial Camp
Pemberton BC, Canada	3,963 gpd (15 m³/day)	1	12,000 – 18,000 (Design Range)	< 5 mg/L (detection limit)	< 3 mg/L	< 5 F.C./100 ml	Industrial Camp
Lake O' Hara Lodge BC, Canada	5,019 gpd (19 m³/day)	1		< 5 mg/L (detection limit)	< 1 mg/L		Ultraviolet treatment following SaniBrane®
Gulf Islands, BC, Canada	26,417 gpd (100 m³/day)	2	36,000	< 5 mg/L (detection limit)	< 1 mg/L	< 1 F.C./100 ml	Sludge thickening: activated sludge

Plants Custom-Designed to Meet Your Unique Requirements

SaniBrane® MBR technology is suitable for a wide variety of applications in both industrial and municipal environments. Sanitherm's range of configurations and housing systems will fit your needs perfectly, regardless of the remoteness of your location or the severity of the climate at your site.

Sanitherm's wastewater treatment plants are currently in use worldwide, in municipalities, rural gas stations, remote resorts, golf courses, schools, construction camps and oil and gas exploration camps. They are also suitable for cruise ships and offshore oil drilling facilities – anywhere needing reliable waste treatment with a small footprint.

Sanitherm's design team will work with you to determine the most suitable size and configuration for your project, based on population and environmental considerations. Then Sanitherm will build and install your system. Once in place, you will find it versatile and easy to operate.



SaniBrane® Container Systems

Sanitherm is at the forefront of addressing wastewater challenges in remote areas. The SaniBrane® Container System is suitable if you have limited land mass, a small population and need a complete, compact and self-contained wastewater treatment system.

The plant is built in a shipping container, which makes shipping easy to any location in the world. A 15 m³/d plant weighs approximately 15,000 pounds or 6,800 kg, which means that it's transportable with a heavy-lift helicopter. On-site, it has a small footprint.

A SaniBrane® container system can be set-up and operating in just a few hours – no building required. All you need is the sewage inlet connection, the treated effluent connection and the power connection. The system is very low-maintenance and you will find that in most cases the effluent is of higher quality than required.

Several standard sizes are available, all complete with flow equalization, treatment tankage, heat, lights and controls. A long list of available options will ensure compatibility with your specific requirements. For example:

- Larger heaters (standard is 5kW)
- Effluent discharge pump chamber
- Inlet screens
- Air conditioning
- Effluent disinfection

Let Sanitherm custom-build a compact and cost-effective wastewater treatment solution for your site.



Clients for this efficient plant include mines, oil fields, industrial camps, remote municipalities, resorts, rural rest stops and . . .



Standard sizes include:

- 4,000 gpd (15m³/d), built inside a 40-ft "hi-cube" container
- 8,000 gpd (30m³/d), inside a 48-ft container
- 12,000 gpd (45m³/d), inside two 40-ft "hi-cube" containers
- 16,000 gpd (60m³/d), inside two 48-ft containers
- Custom containers



If a helicopter can get there, so can a SaniBrane® Container System.

SaniBrane® Concrete Tank Systems

Customers with large volumes to treat may prefer the SaniBrane® Concrete Tank option. These permanent tanks are ideal for in-ground installations. They are space-saving, as you can build offices or equipment rooms above them. They can also be built in stages: pour the tanks now, install equipment as it is required.

Sanitherm can help you design an MBR to treat flows of 1 MGD (3800 m³/d) and greater. Sanitherm's packages can include all of the ancillary equipment required, including aeration blowers, permeate pumps, mixers, supplemental aeration, and level controls. As well, you can incorporate process controls and starters using major manufacturers such as Sutorbilt, Gorman-Rupp, Flygt, Allen-Bradley or any other that you



A concrete tank is ideal for isolated municipalities.

prefer. The plant controls can be simple or as comprehensive as you need.

Sanitherm also supplies miscellaneous fabricated components such as access stairways, grating and handrails.

Because of the modular design of the SaniBrane® membrane units, which do not require chemical dip tanks or back-pulse piping, plants are simple to build and expand. In-situ chemical cleaning reduces the long-term maintenance costs. Sanitherm has been designing plants since 1946 and troubleshooting sewage treatment plants in some of the most remote parts of the globe since the early 1990s. Sanitherm can offer your team real-world, practical experience.



Installing the MBR units.

SaniBrane® Pre-Fabricated Steel Plants

To minimize site labour, time and expense, a Sanitherm pre-engineered steel plant is the recommended solution. They handle large volumes, are portable, self-contained, and pre-piped. Sanitherm has built hundreds of pre-fabricated treatment plants utilizing professionally-engineered tankage, fabricated to ASME, CWB and AWS standards.

Standard plants are built within a 12-ft (3.66-m) width and height envelope. Shipping

requirements are also considered during design. Transporting via cargo plane, container ship or helicopter is feasible. To

ensure minimum delay when reassembling on site, external piping is factory-installed and then removed for transport.

SaniBrane® pre-fabricated steel plants can be installed on-grade, on concrete pads or compacted gravel bases or they can be buried, to suit your specific site conditions. Depending on the local climate, the plants can be totally free-standing or they can be housed within pre-engineered or site-built buildings.

Safe service access is assured with industrial-grade stairways, handrailing and grating over all tanks.

Typical installations include remote industrial sites as well as residential subdivisions. By reducing the installation time, the sites can be populated sooner and the subdivision lots can be sold more quickly.



Municipal application: at a residential resort.



Industrial application: at a diamond mine. Right: prefab plants are easy to ship.





SANITHERM ENGINEERING LIMITED

Since 1946

Sanitherm has earned a worldwide reputation for quality equipment and service and continues to acquire new and proven technologies capable of meeting the toughest of regulations.

Sanitherm's experienced team will work with you to create a custom design to suit your requirements. With Sanitherm, you are assured a wastewater treatment system that is operator-friendly, economical, reliable and effective.

Sanitherm has designed, manufactured and installed hundreds of SaniBrane® systems, giving Sanitherm the experience necessary to provide you:

- Standard systems that are pre-plumbed, pre-wired and tested
- Custom designs to suit your requirements
- Designs and systems that are operator-friendly and economical

Please call for details on how Sanitherm can design, build and install a wastewater treatment system that is tailored to your needs and budget.

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