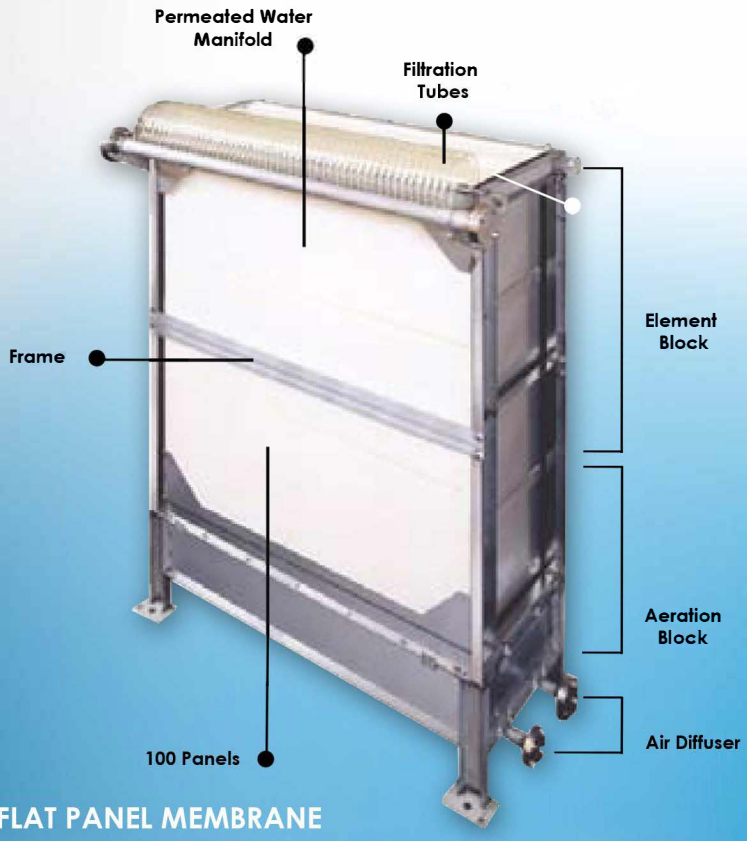
WATER SOLUTIONS LTD.

MEMBRANE BIOREACTOR
WASTEWATER TREATMENT PLANTS

AWC Water Systems offers packaged membrane bioreactor (MBR) wastewater treatment plants based on submerged membrane modules. Designed to treat domestic, commercial and industrial sewage for the removal of biochemical oxygen demand, total suspended solids, total nitrogen, ammonia and phosphorous, the AWC MBR plant achieves very high re-use quality water and can handle a wide variation in loading and flow rates. Automation and flexible operating parameters deliver a cost-effective, trouble-free treatment process.

HOW THE MBR TECHNOLOGY WORKS



FLAT PANEL MEMBRANE

1. Raw screened sewage is pumped at a controlled rate from an equalization tank into the treatment train(s), which typically include aerobic and membrane compartments.
Due to the long sludge age of the biomass, ammonia is almost completely nitrified minimizing potential aquatic toxicity concerns. Redundant equipment is provided to meet applicable regulations.

2. For advanced nutrient removal, an anoxic zone is added to the treatment train if total nitrogen reduction is required. To control phosphorous, a chemical precipitant system is also added.
AWC's MBR system will achieve <0.1 mg/L phosphorous levels due to the efficient removal of solids compared to conventional systems. Biological phosphorous removal to reduce chemical consumption is offered for larger systems (>1,000 m3/d). This involves the installation of an anaerobic tank to facilitate biological phosphorous uptake.

3. In the aeration tanks, aerobic micro-organisms feed on the soluble organics to reduce the biological oxygen demand of wastewater.
Typically, dissolved oxygen control and other advanced instrumentation such as oxidation-reduction potential and pH sensors are utilized to reduce power consumption and improve treatment performance.

4. Finally, treated water is either drawn under low pressure through the membranes using permeate pumps or forced through by hydraulic head. Where required, ultraviolet (UV) disinfection is provided.

The MBR greatly reduces coliform bacteria and produces clear effluent, resulting in smaller UV reactors and less UV power consumption.

PLANT FEATURES

ADVANCED MEMBRANE TECHNOLOGY

The membranes feature submerged flat sheet modules made of polyvinylidene fluoride for the functional layer, with a polyester non-woven fabric as the support layer. These materials provide superior physical strength and chemical stability for extended membrane life. Additional features include:

Uniform 0.08 micron pore size

- Reliably achieves clean effluent quality and disinfection by forming a physical barrier that blocks suspended solids and bacteria
- Provides disinfection by high rejection of coliform bacteria
- Protects sensitive aquatic environments by blocking suspended solids and reducing phosphorous precipitates to very low levels
- Improves membrane life and minimizes membrane fouling

Flat sheet configuration

- Improves reliability, as solids cannot get tangled in panels (as with hollow fiber membrane systems)
- Enables effective cleaning of membranes through coarse bubbles and periodic relaxations of the permeate flow. No complicated backpulse system is required. This maintains high permeability, decreases fouling and reduces chemical cleaning requirements. The simplified cleaning process (as compared to hollow fiber systems) also reduces equipment maintenance costs

Large panel design with larger surface area and tight panel spacing

- Reduces equipment footprint to build more compact plants or to retrofit existing tanks
- Reliable high MLSS operation (up to 16,000 ml/L) permits very small tank volumes for smallest possible plant

QUALITY TANK CONSTRUCTION

AWC constructs its tanks out of highly corrosion-resistant marine grade 5086 aluminum alloy. This construction eliminates the need for corrosion-protection coatings and prevents premature failures, which can occur with poor coating application or coating failures. Sacrificial anodes are used to further increase protection against corrosion. All fasteners in contact with the aluminum are 316 stainless steel to minimize galvanic corrosion. Stainless steel tanks are also available for critical applications.

Our skid-mounted equipment systems can also be supplied for installation into site-constructed concrete tanks or retrofitted into existing tankage. In these circumstances, AWC can provide tank dimensions and other civil criteria.

ELECTRICAL SYSTEM & CONTROL PANELS

AWC designs, builds, programs and commissions fully integrated automated control and electrical systems. Our systems feature:

- Integrated UL and CSA approved MCC's and control panels
- Fully automatic operation with advanced instruments and controls
- Remote monitoring, control and SCADA options
- Industrial quality PLC's with simple plug-in, pre-programmed modules

CHEMICAL SYSTEM

We offer a full range of chemical mixing and dosing systems, including solution tanks, mixers, dosing pumps and safety equipment.

PLANT ADVANTAGES

CORROSION-RESISTANT

Our plants are fabricated with marine-grade aluminum alloy with sacrificial anodes or 304 stainless steel. This provides superior resistance to chemicals and corrosion, resulting in longer life. Unlike mild steel tanks, recoating is not required.

UNCOMPLICATED MEMBRANE MAINTENANCE

Due to the efficient scouring action of the membrane, chemical cleaning is required less frequently and fewer chemicals are used, minimizing handling and operating costs. Complicated backwash cycles are not required, improving system reliability, reducing complexity and minimizing operator labor.

UNIQUE MEMBRANE TECHNOLOGY

Due to advanced manufacturing processes and flat panel configuration, the membranes have superior physical strength, operate with reduced membrane flux pressure, are less vulnerable to fouling and are highly resistant to clogging.

They also deliver stable, clear treated effluent with minimal operator input.

COMPLETE PROCESS

As a single source of responsibility, AWC delivers the complete system from the influent pump station to the sludge dewatering.

COST EFFECTIVE

Our modular MBR plants feature an uncomplicated and easily maintained design for economical, trouble-free and long-term operation.

COMPACT FOOTPRINT

The membrane's larger panel size, tight panel spacing, high MLSS operation and elimination of clarifiers provide a compact footprint for ease of installation and flexibility in retrofitting existing tanks.

ENVIRONTMENTALLY FRIENDLY

Our plants produce clear effluent with reduced nutrient loads, protecting our environment and aquatic habitat.

ABOUT AWC WATER SYSTEMS

AWC Water specializes in providing innovative packaged and modular water and wastewater treatment solutions for municipal and industrial applications. With more than 500 plants delivered around the world, we offer unmatched expertise and a reputation for delivering reliable, high quality water and wastewater solutions.

Contact AWC today to discuss your project needs.

AWC WATER SOLUTIONS LTD.

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