

Containerised MBR



Containerised MBR (Membrane Bioreactor)

Key Features & Benefits:

- Municipal & Industrial Applications
- Meets Regulatory Requirements
- Small Footprint
- Very High Quality Effluent

How We Create Value:

- Easy Installation
- Reduces Land Use Costs
- Robust Design Reduces Whole Life Costs
- Easily Transportable



Process Introduction:

Jacopa's containerised MBR (membrane bioreactor) is a high performance plant for the treatment of domestic and industrial wastewater.

The containerised plant can treat low strength municipal waste or high strength industrial effluent.

Jacopa's containerised MBR package is capable of providing a Grade 2 water quality discharge which is suitable for reuse, wash down or irrigation. Additional disinfection systems, such as chlorination or UV, can be used with all our deployable treatment options to provide residual treatment or sterilization.

The process employs simple flat sheet membrane panels housed in stainless steel cases and aerated by a coarse bubble diffuser system. A series of these membranes are submerged within an activated sludge treatment tank. An advantage of this design is that the membrane panels are securely retained and cannot touch or abrade each other, while the cases also act as a flume to ensure effective tank mixing and even distribution of the biomass.

The membrane panels are manufactured using PVDF with an asymmetric structure, which enables excellent flux rates and exceptional resistance to fouling. They can be cleaned using a simple chemical process, and maintenance and replacement are also straightforward.



The panels have a pore diameter of less than 0.1 µm and provide an excellent effluent turbidity of under 5mg/l SS or less than 0.1NTU. The membrane also has excellent flux characteristics, with pure water permeability (PWP) flow rates of 0.4m³/m²/day to 0.6m³/m²/day.

The Jacopa MBR treatment produces a high quality disinfected effluent. The raw sewage generally only requires screening (to 1 mm) and de-gritting prior to entering the membrane bioreactor tank. The process requires no primary or secondary settlement stages and no additional tertiary treatment or UV stages to achieve quality typically better than 5:5 mg/l BOD: Suspended Solids & < 1 mg/l Ammonia.

Operation:

The membrane bioreactor plant receives raw effluent, either by gravity or a pumped system to a 1mm fine screen. The screened influent then gravitates from the screen to the MBR treatment tank.

The submerged membrane filtration process within the activated sludge in the membrane tank carries out the compact treatment.

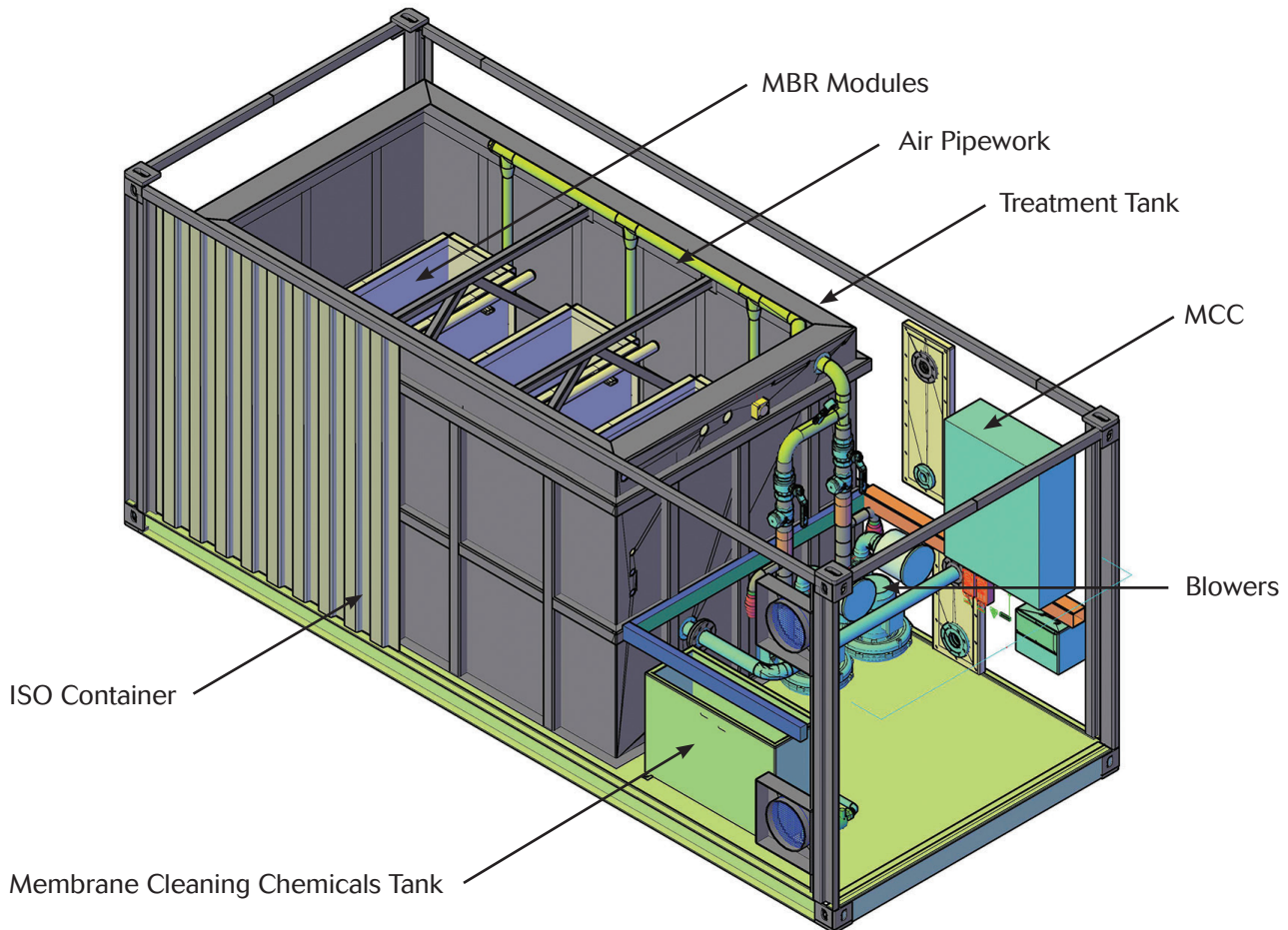
The aeration provided serves to oxidise BOD and ammonia, and produces a cross-flow effect across the membrane surfaces to minimise membrane fouling.

The tank also contains fine bubble aeration diffusers, which can add extra oxygen, which may be required with stronger loaded wastes e.g. industrial wastes.

The permeate passes through the membranes, via a header, where it is discharged utilising a suction pump or automated modulating valve controlled by a flow meter.

A pressure transducer on the permeate line calculates the differential pressure required to achieve the required flow. This data can be used to initiate a preemptive chemical clean of the membranes, whilst full flow to treatment is possible. A chemical clean is normally carried out every six months. A flow meter records the instantaneous and total permeate flow.

Surplus sludge is periodically removed from the bioreactor tanks under control of the PLC.



MBR Advantages:

- Very small foot print typically 50% less tank volume compared with conventional systems, plus no primary or secondary clarifiers required.
- Very high quality fully disinfected effluent typically > 6 log removal of coli forms and > 4 log removal of virus.
- Modular and easily expandable additional tanks or membrane units can be easily added for future flow increases.
- Low maintenance requirement plants can be operated remotely.
- Low sludge production typically 0.45 kgDS/kg BOD compared with conventional systems at ~ 0.7 kgDS/kg BOD.
- Highly mineralised and stabilised sludge typically ~ 40 days sludge age employed.
- Very long membrane life expected membrane life up to 10 years continuous operation.

Containerised MBR Applications:

Jacopa's Containerised MBR Units are designed with flexibility in mind: they can be installed as a permanent solution, to provide temporary treatment for emergencies or as part of a planned works maintenance program.

Applications include:

- Military field operations.
- Aid relief camps.
- Construction camps.
- Maldives holiday islands.
- Land based mobile drilling rigs wastewater management for small mobile camps.

Available Accessories Include:

Submersible Pumping Stations with grinder pumps can be supplied to feed a treatment plant. All our pumping stations are supplied with local control panels, gate and non-return valves. The stations can also be lagged and trace heated with quick fix plug and sockets.

Influent Screen Tanks can be provided with fine bar screen (1 mm) & level controls. Suitable for mounting on top of containers to provide gravity fed to MBR treatment tank.

Interconnecting Pipework work can be provided as a simple means of connecting site facilities and pumping stations with the treatment plant. Our pipe work offers lagged, quick fix plug and socket trace heating and threaded union fittings.

Balance Tanks can be provided to even out hydraulic surge from the pumping stations and ensure the wastewater treatment system are not overloaded. The tanks can be lagged and trace heated with quick fix plug and sockets.

Sludge Systems can be provided that dewater and bags the waste sludge from the MBR process.

