



Efficient wastewater purification with the membrane bioreactor

SIPAPER^{CIS} Water – Intelligent water concepts

Industrial Technologies

SIEMENS

Membrane bioreactor – innovative technology for clean water

Optimize your water resources – with the Siemens membrane bioreactor. The Siemens membrane bioreactor allows you to effectively purify wastewater with very low impact on the environment. Minimize your production costs by treating wastewater and reusing it – using the very latest membrane technology.

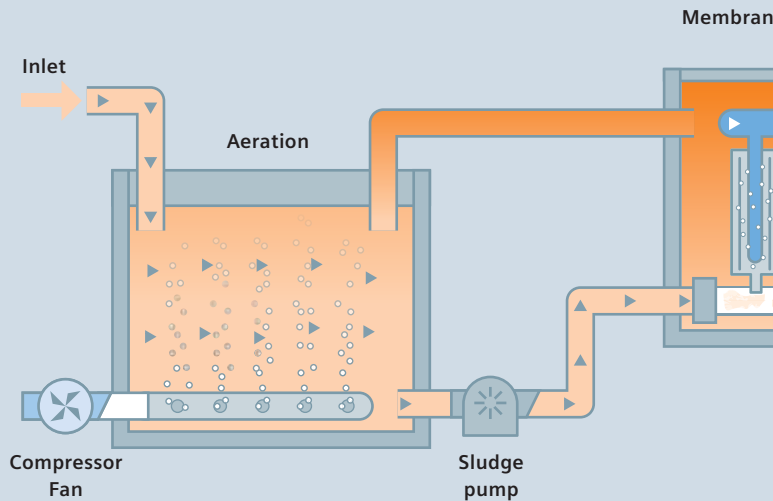
Your requirements: Treating water efficiently

Water is a crucial production and cost factor in the paper and pulp industry. High-performance purification plants are virtually indispensable in this sector. One method of treating wastewater effectively is the membrane bioreactor from Siemens. It operates economically and can be integrated in any existing plant with its compact, space-saving design. Thanks to its novel technology it produces high quality water.

Our solution: Membrane technology from Siemens

The membrane bioreactor from the SIPAPER^{CIS} Water product family is based on state-of-the-art technology. In sectors such as drinking water purification, or the food, oil and gas industries, membranes from Siemens are already the proven standard. They are tough and resistant against biofouling and scaling. The membranes, which are made of polyvinylidene fluoride (PVDF), can be produced at low cost and are easy to maintain. They are immune to attack by acids or chlorine, and can thus be cleaned easily and efficiently. Membrane modules are made up of individual wood fibers and are self-supporting and extremely resilient. They ensure a considerably much better water quality than water purification plants designed to comply with today's standard.

MBR Process Flow



Performance features of the membrane bioreactor

Flexible application options

With the membrane bioreactor, we supply you with a product of outstanding quality and flexibility. You'll be able to save fresh water throughout your entire production process. You can use the treated water in water ring pumps, as sealing or spray water, for adding to cooling water, for diluting auxiliary materials or for dissolving fibrous material for finishing coats. The membrane bioreactor can be used for full purification as well as for expanding an existing aerobic stage.

Large action over a small area

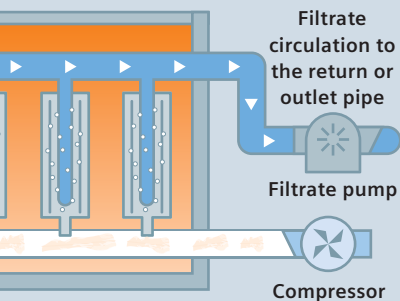
Unlike conventional plants, the biomass is not separated in a secondary settling tank but by means of membrane modules. Because of the small pore size, they are able to filter all sludge structures and colloidal substances contained in the water. Thanks to their nominal pore width of 0.04 m, the inherent coloration of the wastewater can also be reduced. The possibility of sludge runoff and sludge loss is entirely eliminated.

Innovative technology

Complex cleaning processes take place in the membrane bioreactor. The fine hollow fibers are cast into modules and the wastewater sludge mixture is pumped against it by means of a circulation pump. The installed mechanical barrier enables the sludge concentration in the aeration stage to be increased by a factor of up to four. As a result, the tank size can be reduced by as much as 25% or overloaded systems can be expanded without the need to modify the existing sedimentation tanks.

OW

Membrane Operating System (MOS)



Your advantages

- Reduction in the amount of fresh water through recycling of waste water
- Space-saving construction
- Rapid installation possible due to container construction
- Maximum plant availability and reliability
- Expansion of fixed biological systems
- Reduction of wastewater disposal charges
- Compliance with legal regulations



Membrane Operating System – “Heart” of the membrane bioreactor

An important element of the membrane bioreactor is the Membrane Operating System (MOS), which performs the function of sludge separation. The mixture of aerated sludge and air is injected through a nozzle into the bioreactor with the aid of the unique, patented MemJet process from Siemens Memcor. This directs an optimum flow over the membranes and their surface is automatically cleaned while the process runs. That boosts the throughput rate and also increases the cleaning interval. The membranes are also extremely efficient, even with high CaCO_3 loads and sludge concentrations.

Combinable with expanded membrane filtration

The membrane bioreactor is thus the ideal preliminary stage for downstream nano filtration or reverse osmosis systems. These generate a desalinated filtrate totally free of solids that can be fed back to the production process with an even higher quality or larger quantity of wastewater.

Modular container construction

The membrane bioreactor can be made up of individual containers. In small plants, the system is fully operational after a construction phase of only two or three months. In this case, the containers are for the most part interconnected and the aeration unit, if there is one, is integrated in the system.

Turnkey total package

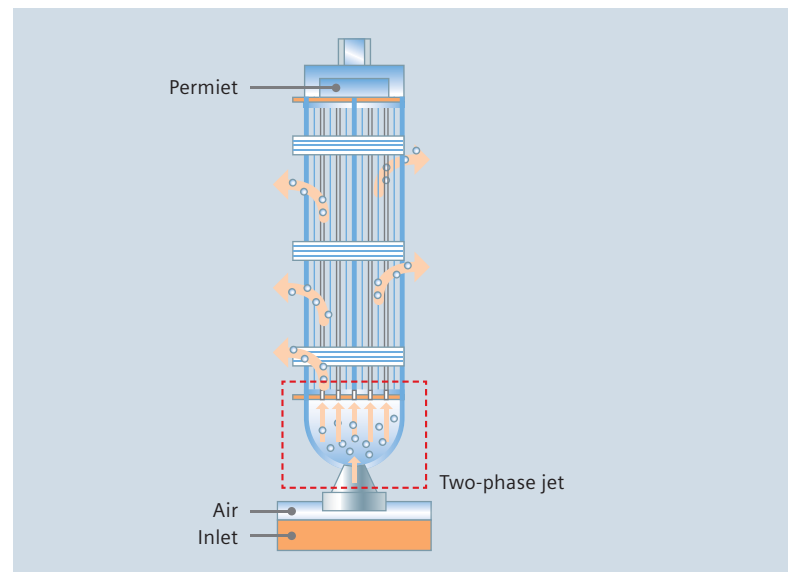
We supply you with a turnkey system for wastewater purification. This includes all approvals required, the engineering, the construction of the plant and all necessary services.

Ideal for the paper industry

The membrane bioreactor is perfectly suited for use in the paper industry, since it produces water of adequate quality to allow biologically purified wastewater to be recycled. The purification system is also extremely efficient with a space-saving design. The membrane bioreactor technology can be integrated in an existing purification plant with minimal time expenditure.

Environment compatible and cost-efficient

You not only benefit from the membrane bioreactor as a company, but you also make a contribution to environment protection. The German Federal Environmental Agency has thus proposed the membrane bioreactor from Siemens as a reference project for the program for the “promotion of investments with demonstration character for the reduction of environmental pollution.”



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