

## MEMBRANE BIOREACTORS ELIMINATION OF NONDEGRADABLE ORGANIC COMPOUNDS FROM INDUSTRIAL WASTE WATER

THE BIOLOGICAL TREATMENT OF WASTE WATER IN AN EISENMANN MEMBRANE BIOREACTOR (MBR) IS AN EFFICIENT PROCESS FOR REMOVING ORGANIC CONTAMINANTS FROM INDUSTRIAL WASTE WATER.

### **Biological waste water treatment**

Organic pollutants are generally removed from waste water using cost-effective biological processes. Aerobic microorganisms play a central role, breaking down organic contaminants. The composition of ecological communities, or biocenoses, within the system, is dependent on the nutrients present. The treatment of waste water with nondegradable organic contaminants such as tensides requires organisms with specialized metabolic characteristics. Conventional plants continually lose a portion of these microorganisms in system discharge. Specialized microorganisms have a low growth rate so they can easily be washed out or overwhelmed by other organisms, it is important to avoid this happening.

### **The membrane bioreactor**

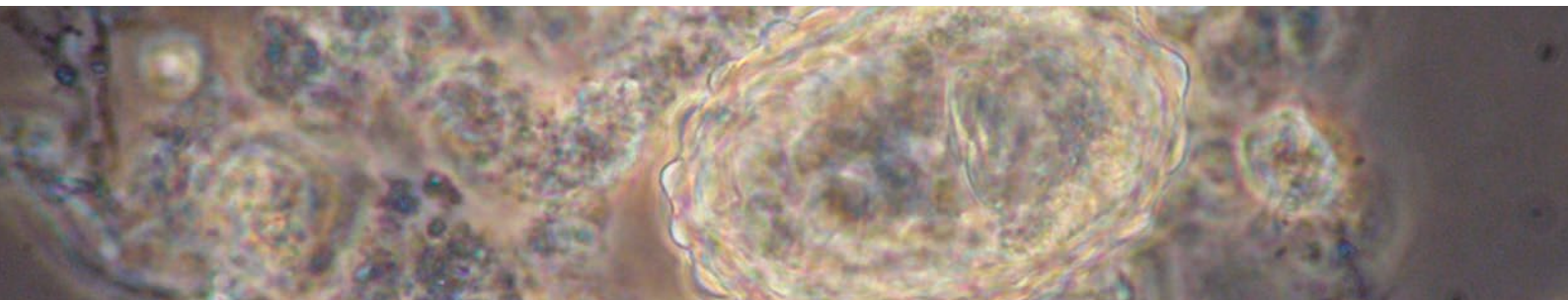
In an MBR, ultrafiltration membranes prevent the loss of metabolic microorganisms in discharge, allowing less competitive, specialized types to gain a lasting foothold. Due to its high concentration of biomass, the MBR can offer impressive performance combined with a compact footprint. Designed as a loop reactor, the MBR enables energy-efficient agitation and aeration of activated sludge. Conventional systems for treating waste water containing tensides can achieve residual chemical oxygen demand of around 600 mg/L. Discharge from an MBR, however, has a COD exceeding 100 mg/L only during pronounced peaks in load. In the design of MBRs, moving parts and fault-prone components are avoided wherever possible. A buffer system is used to even out fluctuating quantities of waste water and contaminant loads in the inlet.

### **MBR pilot plant**

Eisenmann can provide customers with a fully automated pilot plant, to help determine the correct size and design of their waste water plants. This compact system, featuring minimized interfaces and easy-to-use controls, records all relevant operational parameters, including temperature, oxygen levels and pH values over time. In an upcoming version, the pilot MBR will take the form of a container plant, meaning it could be deployed worldwide. Customers could then see the MBR's capabilities for themselves – under their specific waste water conditions. A biocenosis tailored to tensides is available. A multi-stage waste water treatment process can be trialed on-site by combining the MBR with additional pilot systems. For example, an Eisenmann pilot system for reverse osmosis can be used alongside the MBR to test the reusability of the treated water.

### **End-to-end solutions from a single provider**

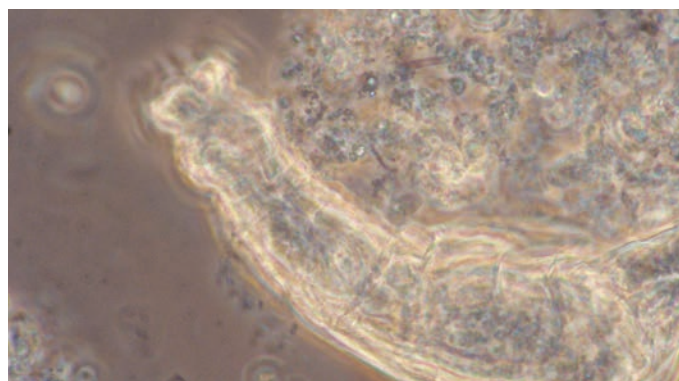
The MBR completes Eisenmann's product portfolio for waste water treatment – right up to achieving direct discharge quality. The filtrates do not contain sediment or microorganisms, and can be re-used as process water. The plant can be deployed in combination with other process steps, such as the upstream installation of a Fentox® system for oxidizing toxic organic contaminants, and other conventional physical/chemical treatments. Due to its compact size, the MBR can be integrated with almost any existing plant. The only condition is that the contaminants must be biodegradable.



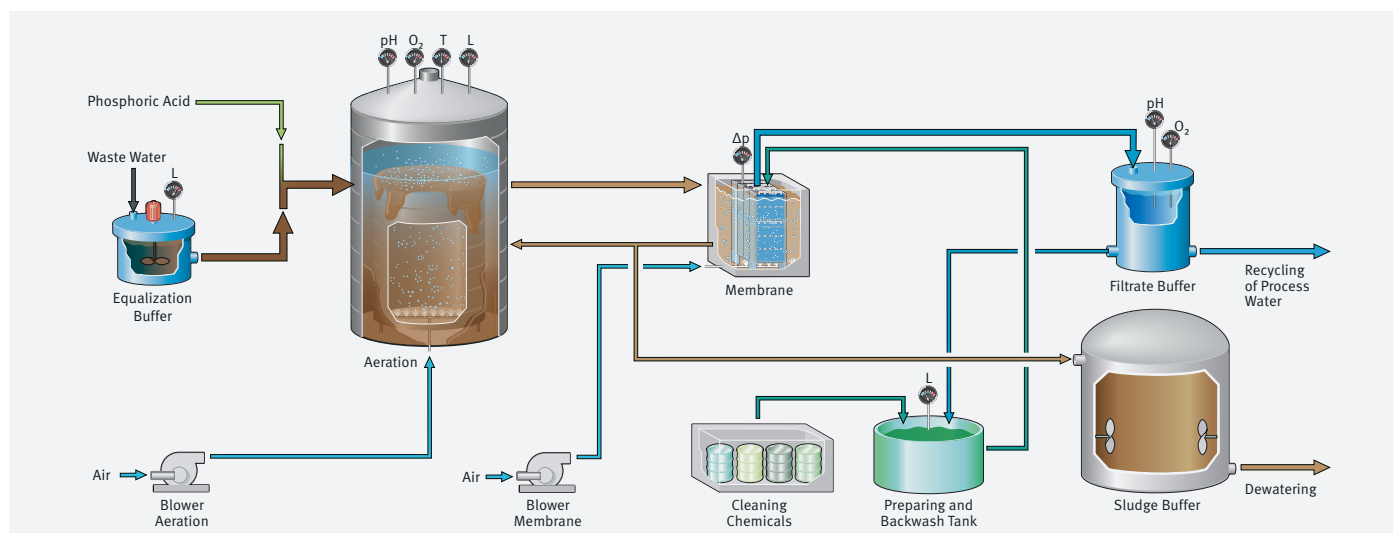
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### Advantages at a glance

- High reliability and low maintenance requirements due to durable membranes and robust components
- Simple integration with existing waste water plants
- Highly adaptable to fluctuating quantities and varying quality of waste water
- Highly efficient, due to its compact size and high specific volume turnover
- Near total degradation (up to 98 %) of organic contaminants in waste water
- Size can be tailored to the needs of the client, and the plant can be combined with other water treatment processes



*Rotifers are a sign of good aeration, stability and low sludge load.*



*Membrane bioreactors.*

**EISENMANN**

[www.eisenmann.com](http://www.eisenmann.com)

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