

MBR for treatment of wastewater from Renewable Fuel Production

Realization: 2009

Introduction

The technology of membrane bioreactors (MBR) is used successfully in industrial wastewater treatment. Also, in communal wastewater treatment the use of membrane technology is increasing.

MBR-Plant for the treatment of highly loaded organic wastewater

The highly loaded organic wastewater from a renewable fuel production and a used-fat refining plant contains 150 kg COD/m³ and only few nutrients. On the one hand the low emission limit for COD asked for a biological degradation process and on the other hand a straight forward approach with as less process components as possible was a precondition in order to keep operating costs low and process reliability high.



The central part of the MBR wastewater treatment is the membrane bioreactor with external cross-flow membranes.

The biological treatment takes place in the MBR tank. Due to the membrane, all biomass in the form of activated sludge is

held back and therefore, the sludge age can be freely chosen. Ejector-aeration through the tank walls ensures aerobic degradation of organic substances, as well as prevents sludge particles from settling.

The mainly carbon-based wastewater with high amounts of methanol, glycerol and fats makes it necessary to provide a wide range of nutrients. Therefore, as base supply for nitrogen, phosphorus and potassium an agricultural fertilizer is used.

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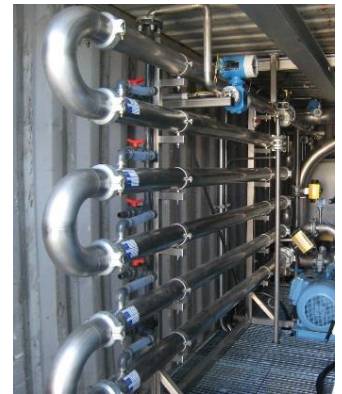
Graz, 24. October 2018

Below some key data to the MBR plant is presented:

- Capacity 30 m³/d
- Membrane area 40 m²
- COD-degradation > 95%
- Dry substance 20 g/l

Fluctuating amounts and quality of wastewater can be handled effectively by adaptation of the dry substance content.

Possible changes in sludge quality as well as high hydraulic loads do not cause a loss of biomass due to wash out.



The reduced space requirements in comparison to conventional activated sludge processes with a final sedimentation basin is an additional advantage especially for existing industrial plants with limited space.

Summary

The experiences gained by the application of MBR as treatment for highly loaded organic wastewater show that the process is stable and less sensitive to harmful ingredients. The main advantages include cost-effective construction works due to reduced space requirements and the freely selectable sludge age allows for high degradation rates, since the sludge is retained to 100%.

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