

BIO-CEL[®] MBR Modules

Part of a comprehensive solution to eliminate micro pollutants



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**MICRODYN
NADIR**

ADVANCED SEPARATION TECHNOLOGIES

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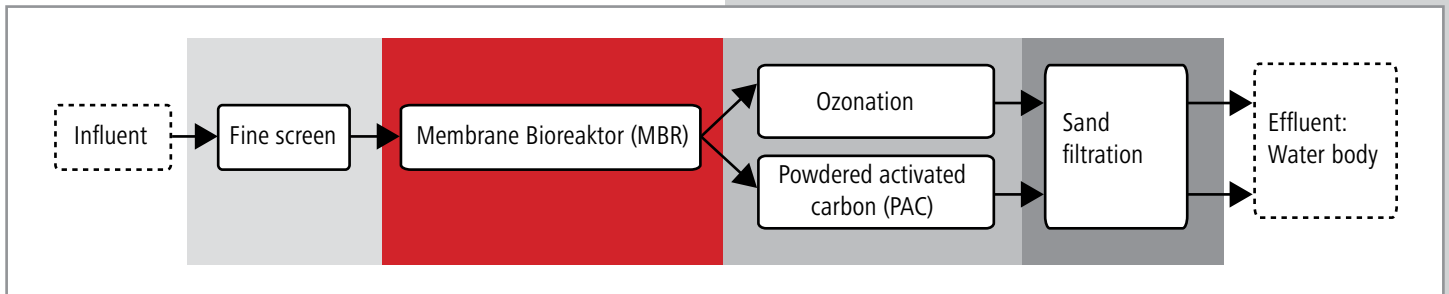
In July 2011, the waste water plant at Marienhospital in Gelsenkirchen, Germany was put into operation. It is the first European waste water treatment plant that focuses on the elimination of micro pollutants as well as the purification of the waste water from the hospital. The plant was built in line of an EU-project called "PILLS" (Pharmaceutical Input and Elimination from Local Sources) under the aegis of the Emscher-genossenschaft.

The project's goal is to eliminate micro pollutants from the sewage water on site, which especially incur in hospitals as residues from pharmaceuticals and radio-opaque substances.



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For the ultrafiltration, three submerged BC400 modules by MICRODYN-NADIR have been installed. In total these modules have a membrane area of 1,200 m² through which the biologically purified sewage water is being removed from the aeration tank. The ultrafiltration permeate, which is now free of particles and bacteria, will afterwards be led to an ozonization and an activated carbon filtration. Ozone, a strong oxidizer, provokes the cleavage of the micro pollutants in solution and converts them into non-hazardous substances. In addition, the micro pollutants are being absorbed by pulverized activated carbon, which is then removed from the water including these trace substances.



About 75,000 patients are being treated by approximately 1,200 staff members at the Marienhospital per year. Thereby effluents amounting up to 200 m³/d incur. Until now, these effluents have been discharged into the nearby river "Schwarzbach" via the municipal canalization. This creek currently still serves as an open sewage water drain outlet but is targeted to be renatured and operated effluent-free in the course of the conversion. Amongst others, it will also absorb the purified water from the new clarification plant. This new waste water treatment plant encompasses, besides a mechanical and biological clarification, a variety of treatment processes, such as an ultrafiltration with submerged modules (MBR technology), an ozonization as well as an activated carbon filtration.

The chemical and pharmaceutical industry is facing a multitude of economical and environmental challenges. Not only is it detrimental for a chemical plant's continuous existence in today's global environment to become more and more cost-effective, the environmental regulations are also becoming increasingly stringent. Hence, the MBR technology with its high quality effluent proves to be a good fit for the waste water plants in the chemical industry. The MBR reference at the Marienhospital in Gelsenkirchen, Germany is a good example of a waste water plant that is using MBR because of high effluent quality requirements.

Design data of the MBR plant

Qd, average	200 m ³ /d
Qh,max	25 m ³ /h
COD	1900 mg/L (85%il)
Average flux	10 LMH
Peak flux	28 LMH

Plant design with the BIO-CEL®-MBR system

Overall number of installed modules BC400F-C100-UP150	3
Total membrane area	1.200 m ²
Date of commissioning	April 2011

