

MITSUBISHI/GRONTMIJ/WATEC

Main player in MBR market

Mitsubishi Rayon CO., established in 1933 as a producer of rayon staple, manufactures and markets a wide range of acrylic, polyester, acetate and other fibres as well as methyl methacrylate, ABS and MBS resins. Particular emphasis is placed on high-performance materials and products such as carbon fibres, composite materials, optical fibres and membranes. Last year company sales amounted to three billion USD, with a total of 4,500 employees. Mitsubishi Rayon Corporation houses manufacturing, engineering and research and development.

The hollow fibre membrane is produced by a sophisticated melt spinning and drawing process from a polyethylene material. Regarding quality control, the membrane production facilities have been awarded the ISO9002 standard and quality control is conducted accordingly.

The actual production capacity of the hollow fibre membrane factory is approximately two million kilometres per annum. MRC has the financial and technical ability to rapidly increase the production capacity of its factories to meet increasing membrane demand.

MRC is continuously conducting research and development for its products. R&D is focussed on the improvement of the present membrane as well as on the development of totally new membranes (including other materials). Product improvements have been and will be introduced regularly according to market demands and technological developments. A new module configuration and improved membrane is expected to be launched early 2002.

The engineering part of Mitsubishi Rayon provides water and wastewater treatment systems. Engineering works closely together with Manufacturing as well as Research and Development to meet market needs in water treatment and environmental protection (aqua-sustainability), primarily in the purification and treatment of drinking water, process water and wastewater.

History

Filtration equipment applied membrane technology developed by MRC was put into practical use in about 1980. The application

has been expanded widely and now includes filtration of active sludge as in membrane bioreactors. Since the early nineteen nineties, the use of Mitsubishi Sterapore membranes in membrane bioreactor applications is continuously increasing.

Membrane bioreactor

For membrane bioreactor applications a polyethylene hydrophilic hollow fibre membrane is used: the Sterapore membrane. The pore size is 0.4 micron, the outer diameter 540 micron and the inner diameter 360 micron. It is a clean, hygienic and safe membrane, as it contains no solvents and plasticizers.



Membrane unit of Mitsubishi.

The hollow fibre membrane is a very tough membrane that has a high tenacity and strong resistance to bending fatigue. In addition, it is not affected by any micro-organisms and acids, alkali and irradiation hardly have any affect at all. The packing density and volume efficiency is superior.

The fibres are assembled in membrane elements, which are connected into modules (see photograph). An industrial, cost efficient construction method is applied to the modules and the membrane elements,

Grontmij participates in Beverwijk

Grontmij Water & Waste Management is a leading player in the field of environmental engineering. Expert in all aspects of water management: from drinking and process water supply to sewage and industrial wastewater treatment. Since the early nineteen nineties Grontmij is active on the MBR market. Grontmij has extensive experience with MBR projects and provides a full range of activities ranging from feasibility studies to contracting and operation. Therefore, Grontmij provides not only engineering and technological expertise, but also manages integrated projects and can supply full process guarantees for governmental agencies and industrial clients.

At the Beverwijk trials, Grontmij supports MRC in design, operation, optimisation and evaluation of the Mitsubishi pilot tests. The tests are focussed on the technical development and optimisation of the Mitsubishi membranes for a MBR system under Dutch circumstances. In the Netherlands, large flow fluctuations and low ambient temperatures are present and Nitrogen and Phosphorus removal is required. However, rather than membrane and biological performance, the success of MBR systems for the municipal market is dominated by investment and operational costs, operational risks, guarantees and finally the need for higher effluent standards.

The developments of the last decade have shown to result in a wide range of MBR-applications, diversity in membrane properties and system configurations. Grontmij in co-operation with a variety of national and international research institutes, consultants, membrane suppliers and funding agencies is involved in the further development of MBR technology.

