

Norit Airlift™ MBR

Municipal wastewater

Challenge

Due to more stringent international and governmental legislation, in terms of wastewater discharge consents, the disposal cost of municipal wastewater is increasing. In addition to this, the abstraction of ground water is being limited to prevent a dehydration of the soil which has a destructive influence on nature's flora and fauna. With these factors in mind the need for a closed water cycle is increasing rapidly. For efficient wastewater treatment, the Membrane Bio-Reactor (MBR) has been developed.

Solution

The Norit Airlift™ MBR is a compact-built purification system combining the biological degradation step with a membrane separation step. This combination offers several significant advantages over a conventional activated sludge system, such as a higher biomass concentration and less sludge carry-over. The higher biomass concentration results in a more compact system. The decrease in sludge carry-over reduces the need of post-treatment of the effluent. The Norit Airlift™ MBR configuration offers an ultrafiltration (UF) membrane solution placed outside the reactor allowing the maintenance of the plant to be simple and clean. The side stream set-up also allows easy expansion of existing WWTP. Energy consumption is at the same level of submerged membranes or even less, due to the efficient usage of process conditions for flux enhancement.

Norit X-Flow's tubular 5 mm UF membrane will allow a bioreactor to run up to 15 g/l MLSS biomass. Norit X-Flow's 5 mm membranes found their way in MBR applications in the municipal market.

The Norit X-Flow membrane modules are being produced with ISO 9000 certification.

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Features and benefits

Membrane placement	Outside bioreactor
Permeate quality	True ultrafiltration Turbidity < 0.1 NTU SIDI < 3
Maintenance & cleaning	Accessible & clean environment Fully automated cleanings Use of low cost chemicals
Airlift filtration	Low energy < 0.25 kWh/m ³ Simple lay out High flux rates Low TMP
Fully automatic operation	Logging of operating parameters
Atmospheric system	Fully enclosed No operator exposure to fumes or aerosols Small footprint

Examples

Norit X-Flow provides membranes for MBRs for a growing number of plants world wide. Capacity ranges from less than 240 m³/day (0.06 MGD) to more than 17,000 m³/day (4.5 MGD).

Grand Traverse – USA	WWTP
Capacity	380 m ³ /day (0.1 MGD)
Year of start up	2004
Technology	Norit Airlift™ MBR
Ootmarsum – The Netherlands	WWTP
Capacity	3,600 m ³ /day (0.95 MGD)
Year of start up	2006/2007
Technology	Norit Airlift™ MBR
Xuzhou – China	Cigarette factory
Capacity	2,000 m ³ /day (0.52 MGD)
Year of start up	2006
Technology	Norit Airlift™ MBR
Millsborough – USA	WWTP
Capacity	4,200 m ³ /day (1.1 MGD)
Year of start up	2007
Technology	Norit Airlift™ MBR
Frisian Water Alliance – The Netherlands	De-central WWTP
Capacity	75 m ³ /day (0.02 MGD)
Year of start up	2007
Technology	Norit Airlift™ MBR

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Norit Membrane Technology BV reserves the right to make changes in the technical specifications at any time.