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Biosphere® Rental Moving Bed Biofilm Reactor (MBBR)

Evoqua Water Technologies, now part of Xylem, provides the Biosphere® rental MBBR system for industrial wastewater treatment

General Description

A Moving Bed Biofilm Reactor (MBBR) is a biological treatment technology for wastewater that uses microbial biofilm formed on media “carriers” to remove organic contaminants dissolved in water. Biofilm carriers are suspended in the wastewater flowing through the reactor and thoroughly mixed to create a protected surface to develop a biofilm community. This biofilm subsists on the organic molecules while treated wastewater leaves the system. MBBR systems are commonly used by industrial facilities due to their compact sizing and high treatment rate. They can be used to remove soluble BOD/COD and nitrogen-based contaminants (TKN, Ammonia, Nitrate/Nitrite) that are common in industrial wastewater.

The Biosphere® rental MBBR System is a skid-mounted system that does not require a permanent foundation for installation. This makes Biosphere an effective solution to quickly deliver MBBR capabilities on demand, avoiding the long lead times for permanent biosystem installations. Our rental MBBR systems fit a number of potential applications, including:

- Rapid replacement of failed equipment
- Providing a bridge solution during permanent system construction, retrofits or maintenance turnarounds
- Meeting pretreatment discharge limits
- Soluble BOD/COD removal
- Biological nutrient removal
- Piloting: partial and full scale

Designed for Performance and Efficiency

- Advanced vertical reactor design for significant footprint reduction and superior oxygen transfer
- Modular standalone components for flexibility in configuration and equipment placement
- 4 to 6 times higher treatment capacity than a conventional MBBR in the same footprint
- Up to 2 times the performance of a standard rectangular high-cube design
- Turnkey ready-to-operate system with preprogrammed PLC control of dosing, air, valves, and sensors based on site-specific conditions

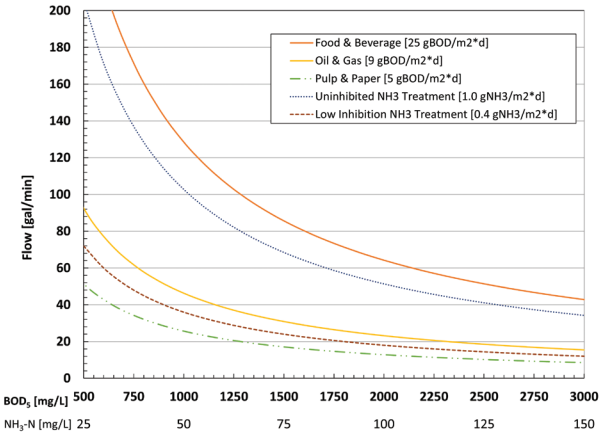
Biosphere® Features

Our Biosphere system consists of three primary components: the bioreactor, the aeration blower, and the system control skid. The chart illustrates the potential treatment capacity of a single MBBR across several different industries. Multiple units can be systematized in parallel or series configurations to treat additional wastewater capacity or to meet different treatment goals.

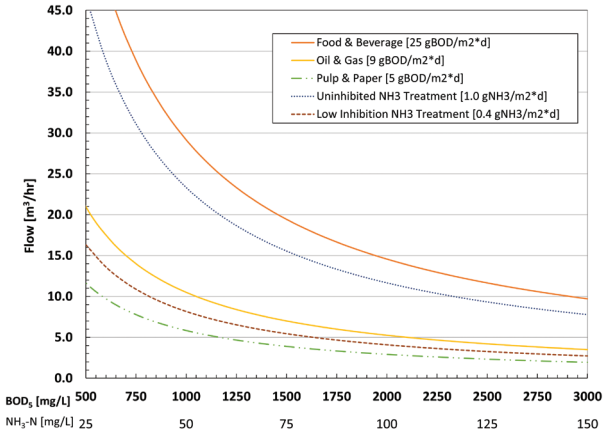
- Biosphere system with rugged standup frame, capable of rapid installation on site
  - Internal aeration grid with coarse bubble diffusers and external riser with ground-level connection
  - Influent downcomer with external riser with groundlevel connection
  - pH and DO monitoring probes with insertion manifolds
  - Level monitoring and control with high level alarm switch
  - Delivered to site pre-loaded with biofilm carriers
- Aeration Blower Skid
  - Weather enclosure
  - Stainless flexible hose for connection to the aeration grid
- MBBR Control Skid with PLC, chemical dosing pumps, & flow control system
  - Includes a PLC and HMI system to operate the entire system
  - Injection quills to allow chemical addition to all system influent
  - Includes four (4) dosing pumps to deliver any necessary chemicals to sustain the MBBR system. Dosing pumps include containment enclosures and are mounted on the same skid as the flow control manifold and PLC
  - Stainless flexible hose for connection between the flow control manifold and the bioreactor
  - Pre-wiring of all on skid components to run from a single power connection
  - Tubular stainless support frame to combine all skid components and allow for easy placement on site

Leases for the Biosphere are available for any duration longer than 6 months. Xylem offers high-rate RT-Series dissolved air flotation (DAF) clarification systems for lease alongside the Biosphere system for applications that require clarification.

Biosphere® Flow vs BOD Loading (US)



Biosphere® Flow vs BOD Loading (EU)



*The estimated treatment capacities in the charts above are for wastewater at 68°F/20°C.

MBBR Reactor

	North America Region	Europe Region
Shipping Dimensions* (L/W/H)	27'-10" / 8'-0" / 12'-0"	8,484 mm / 2,468 mm / 3,658 mm
Installed Dimensions** (L/W/H)	12'-0" / 8'-0" / 27'-10"	3,658 mm / 2,468 mm / 9,348 mm
Shipping Weight	Approx. 32,000 lbs.	Approx. 14,500 kg
Operating Weight	Approx. 144,500 lbs.	Approx. 65,770 kg
Water Height	279"	7.09 m
Developed Surface Area	301,400 ft^2	28,000 m^2
Influent Connection	3"	DN80
Air line Connection	6"	DN150
Effluent Connection	6"	DN150

* Shipping horizontally
** Vertical installation; top handrail included (CE model only)

Control and Dosing Skid

	North America Region	Europe Region
Dimensions (L/W/H)	5'-1" / 5'-0" / 6'-5"	1,531 mm / 1,525 mm / 1,926 mm
Weight	800 lbs	362 kg
Electrical Requirement	120 V, 60 Hz, 1 phase	230 V, 50 Hz, 1 phase
Influent Connection	3"	DN80
Effluent Connection	3"	DN80
Control System	Allen Bradely with HMI	Siemens with HMI

* Shipping loose to be installed at the site

Air Supply System

	North America Region	Europe Region
Dimensions (L/W/H)	4'-11" / 5'-5" / 5'-5"	1,294 mm / 1,070 mm / 1,435 mm
Electrical Requirement	480 V, 60 Hz, 3 phase	400 V, 50 Hz, 3 phase
Motor Power	30 hp	22 kW
Outlet	4"	DN80
Air Flow Capacity	325 scfm @ 11.5 psi	607.16 Nm^3/hr @ 900 mbar

Connection Components

	North America Region	Europe Region
Air Line	“4" Flexible Stainless Steel / 12' 6" X 4" Reducer”	“DN80 Flexible SS Hose / 4 m DN150 X DN80 Reducer”
Influent Line	3" Flexible SS Hose / 12’ length	DN80 Flexible SS hose / 4 m length

HVY-MBBRMOB-BR-0226

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