DATA SHEET

Fixed bed bio module 13000

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Advantages of the ClearFox® FBBR modules

- Quick commissioning, cost savings during installation
- Flexible with underload and overload
- Modular system, adaptable to any application
- Both industrial and municipal wastewater
- High performance with high quality, Made in Germany
- Stable and robust process technology
- Low OPEX and simple, automatic operation

A plug and play, modular, expandable, cascaded FBBR module that can be used for municipal and industrial wastewater treatment

The ClearFox® fixed-bed bio modules are fully equipped bioreactors in a high-quality PE tank. All equipment, such as aeration system, distribution systems as well as the fixed bed material in a cubic tank are part of the pre-installed standard equipment of the high-performance bioreactors. The typical application is the reduction of carbon and/or nitrogen concentrations from any type of pre-treated (solids removed) wastewater of industrial or municipal source.

The tank is manufactured from one piece of highly resistant polyethylene by the seamless rotational moulding process.

The modules are designed for installation in the customer's tank (concrete chambers, steel frame systems) or HC sea containers (i.e. ClearFox® container modules). The interfaces to the customer are designed for quick and easy installation on site.

Multiple modules can be connected in series; for parallel installation. The scope of delivery includes a blower and an air distributor, which is matched to the number of units and the type of connection.

Screened wastewater (≤ 3mm) must be provided by the customer. A lamella clarifier is recommended after the modules to reduce TSS. Depending on the customer's requirements (influent concentration, wastewater demand, carbon and/or nitrogen removal), different biocarriers are

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PPU water systems

used in the modules.

The design is carried out according to the DWA guidelines, the cleaning performance is confirmed in field tests by external wastewater institutes. Test reports and certificates on statics, performance, origin, DWA guidelines are available on request.

Technical data:

	½ – FBBR-Module:	1 – FBBR-Module:
Dimensions: (l, w, h) / module [m]	1,35 x 2,10 x 2,57	2,74 x 2,10 x 2,57
Space requirement:	33% of a 20 ft. HC Container	50% of a 20 ft. HC Container
max. transport weight:	350 kg	650 kg
max. operating weight:	7.800 kg (water-filled)	15.000 kg (water-filled)
Area: [m²]	2,80	5,75
Manhole opening:	60 cm x 60 cm	60 cm x 60 cm
Connected load Fan (outlet C)	1.000 Watt	1.350 Watt
Connected load Fan (drain N)	1.200 Watt	1.500 Watt
Inlet: DN / height:	DN 100 / 2,45 m	
Drain: DN / Height:	DN 100 / 2,40m	
Ventilation system:	DN 75 (Connection DN 50)	

	Max. flow rate [m³/hr]				Removal rate per day [kg]				Biologically usable surface area [m²/m³] Cascaded:
	Single	Stakes (Parallel)	Inserts (Series)		Single	Stakes (Parallel)	Inserts (Series)		
Number of modules	½	1	1	2	1	2	1	2	
Carbon reduction (COD)	1 m³/hr	2 m³/hr	2 m³/hr	5 m³/hr	40 kg/d	80 kg/d	40 kg/d	100 kg/d	100-150-200
Nitrifi-cation (NH4-N)	1 m³/hr	2 m³/hr	2 m³/hr	5 m³/hr	8 kg/d	16 kg/d	8 kg/d	20 kg/d	150-300

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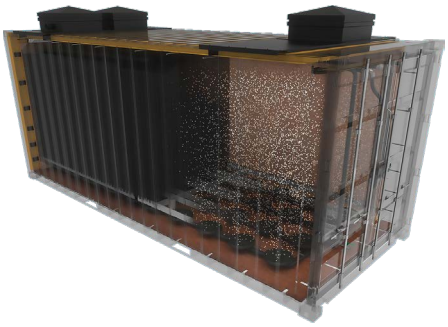
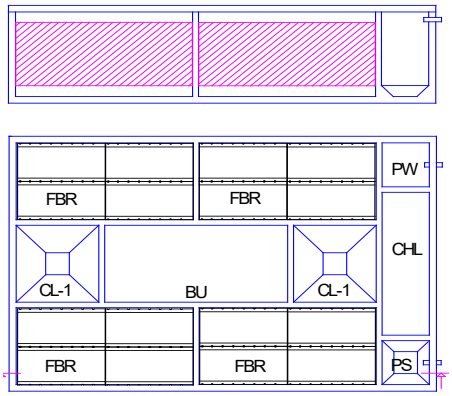
The specific surface area of the fixed bed material depends on the concentration of the influent. Degradation is calculated for municipal/domestic concentrations; higher concentrations, as in industrial applications, result in higher performance rates. Plants in series operate at a higher treatment efficiency, resulting in a higher degradation rate per day.

Nitrification requires COD reduction in advance. It must be ensured that after each reactor the TSS is reduced by a secondary treatment unit.

Installation of the bio module in a sea container



3D model of a sea container equipped with two FBBR modules



Treatment plant 8,000 p.e. in concrete with FBBR modules

PPU version: 20 feet or 40 feet HighCube sea container

PPU Umwelttechnik GmbH installs 2 or 4 FBBR modules in a reinforced ISO container. The bio-modules are connected in series or parallel. The container has ready-mounted flanges In/Out DN100, height = 2.45 m/2.40m. With CSC approvals they can be exported by sea anywhere in the world.

When connected in series, first bio-module corresponds to cascade no. 1. The second bio-module includes cascades 2 and 3. The sea container is equipped with an air distributor for all 3 cascades, both for individual aeration and backwash. One container is equipped with 3 access openings 600x600 mm with extensions, lids and a foam outlet pipe. Optionally, an automatic backwash can also be realised.

This design makes the container a plug & play system.

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