

FBBR Series Biological Sewage Treatment Plant

Victor Marine's FBBR Series (Fixed Bed Biofilm Reactor) Biological Sewage Treatment Plant has been developed using the extremely well proven and compact fixed biofilm technology. The system has been approved to the latest **IMO standards MEPC 159(55)**.

The FBBR Series is a three-stage sewage treatment system which can process from a gravity or vacuum feed.

In the first stage, macerated sewage is fed to the **Bioreactor**, an aerobic biological system, using a fixed structured inorganic media bed with very high specific surface area to allow biofilm growth. This 'fixed bed' system maximises the biomass volume, increasing the efficiency of the bioreactor. It is also designed to direct the inflow sewage through an extended retention pattern to ensure maximum treatment and no bypass. A low pressure aeration system provides the bioreactor with a constant and uniform supply of oxygen to the biomass whilst preventing odours and hazardous gases from forming.

The scoured biomass passes into the second stage via a flow control unit (FCU) into the **Settlement Tank**. The FCU Controls and stabilises the system during peak and low flows. The advanced settlement tank employs tube settlers and skimmers which magnify the settlement effect and also prevents disturbances due to the motion of the ship. Due to the increased efficiency, the settlement tank is smaller than conventional settlers whilst producing clearer effluent and better results than the required IMO standard.

Prior to overboard discharge, the treated water is treated in the third stage, the **Chlorination unit**. This is a tablet dispensing unit which is both simple and easy to use, saving engineer's time when operating. Finally, during discharge overboard, the effluent is pumped into a **Dechlorination unit** which removes any excess chlorine, as per IMO requirements.

Supplied with the latest touch-screen **HMI display and PLC**, the FBBR Series STP can be easily monitored and controlled making the system very operator friendly.



Key Features:

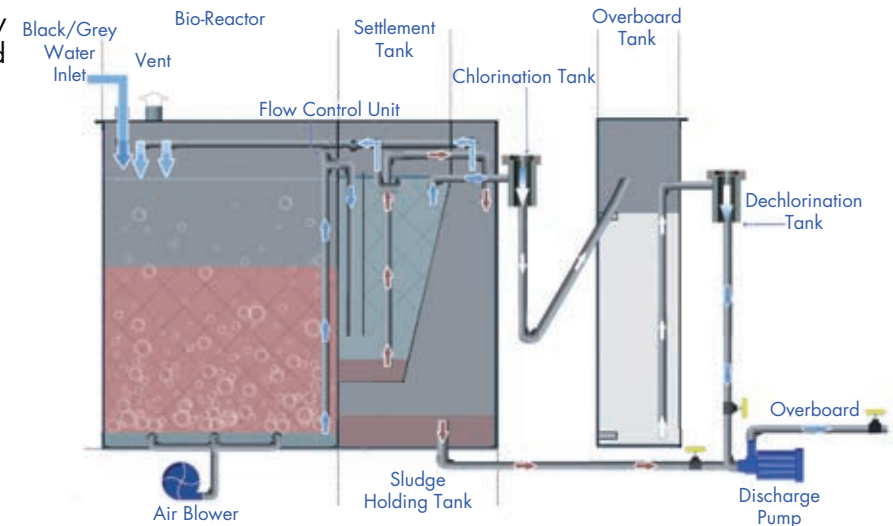
Fixed Bed Biofilm Reactor (FBBR) technology giving excellent performance, reliability and a low footprint;

Unique Flow Balancing System with a Flow Control Unit (FCU) improves process stability during peak flows;

Suitable for treating Black or Black/Grey water systems;

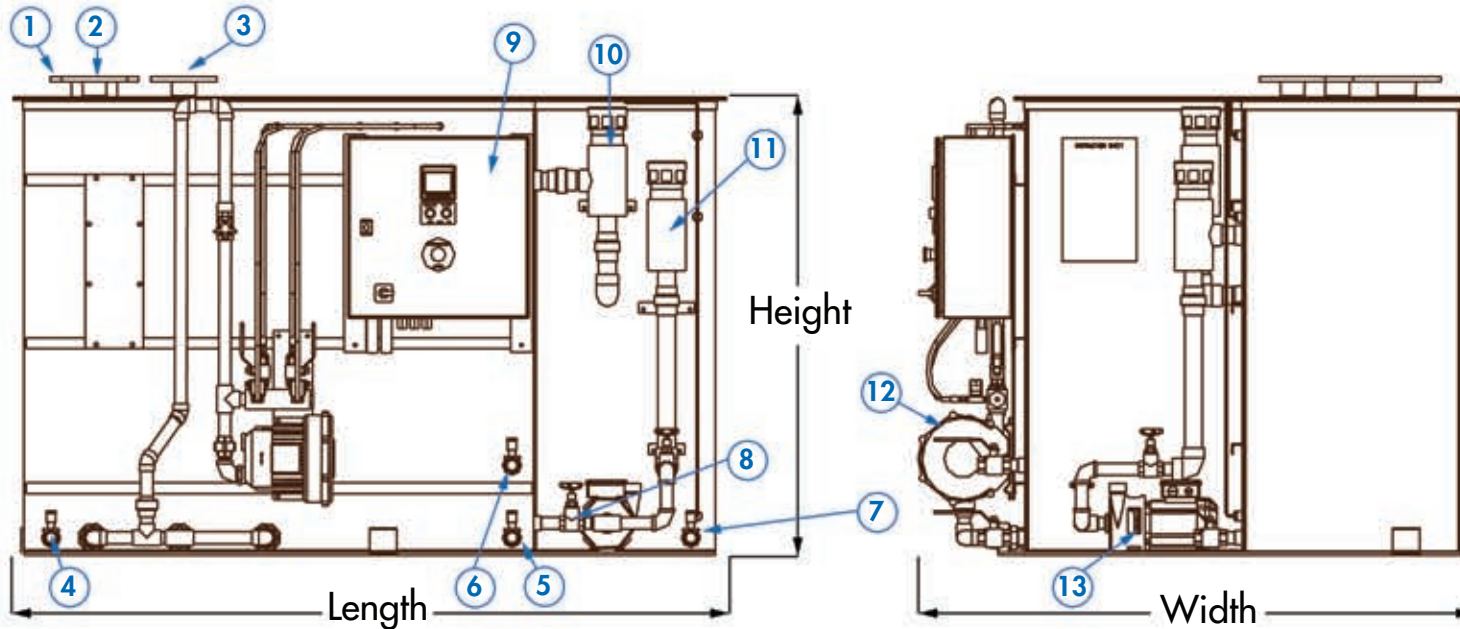
Fully automated system with PLC controller requiring minimal operator input;

Type Approval according to the latest IMO regulation MEPC 159(55) by Bureau Veritas.



Model	Number of Persons	Hydraulic Load (m ³ /Day)	Biological Load (kg BOD/Day)	Wet Weight (kg)	Dry Weight (kg)	Dimensions		
						Length (mm)	Width (mm)	Height (mm)
FBBR15	15	3.00	1.05	2600	800	1972mm	1532mm	1264mm
FBBR30	30	6.00	2.10	4000	1000	2272mm	1832mm	1514mm
FBBR50	50	10.00	3.50	6600	1500	2572mm	2162mm	1844mm

General Arrangement:



- 1 Black Waste Water Connection
- 2 Grey Waste Water Connection
- 3 Vent Connection
- 4 Biozone Drain Connection
- 5 Sludge Tank Drain Connection
- 6 Settlement Tank Drain Connection
- 7 Overboard Tank Drain Connection
- 8 Overboard Tank Discharge Connection
- 9 Control Panel
- 10 Chlorination Tank
- 11 De-Chlorination Tank
- 12 Air Blower
- 13 Discharge Pump

	IMO MEPC 159(55) Limits	IMO Test Results
Thermotolerant Coliform	> 100/100ml	1.75/100ml
Total Suspended Solids (TSS)	> 35 mg/l	11.5 mg/l
Biological Oxygen Demand (BOD) ₅	> 25 mg/l	3.0 mg/l
Chemical Oxygen Demand (COD)	> 125 mg/l	37.0 mg/l
pH Level	between 6 and 8.5	8.0
Chlorine	> 0.5 mg/l	0.09 mg/l

Optional Items:
Standby Air Blower
Vacuum Feed Pump System
Grease Trap
Macerator Feed Pump/ Standby Macerator Feed Pump

The manufacturers reserve the right to alter the specification and data to incorporate improvements in the design. Certified drawings will be issued on request.

Victor Marine Limited