



SEWAGE TREATMENT PLANTS

Victor Marine Ltd are specialists in the design & manufacture of FBBR (Fixed Bed Biofilm Reactor) biological sewage treatment plants. The units are available in a range of sizes and with accompanying accessories.

victormarine.com

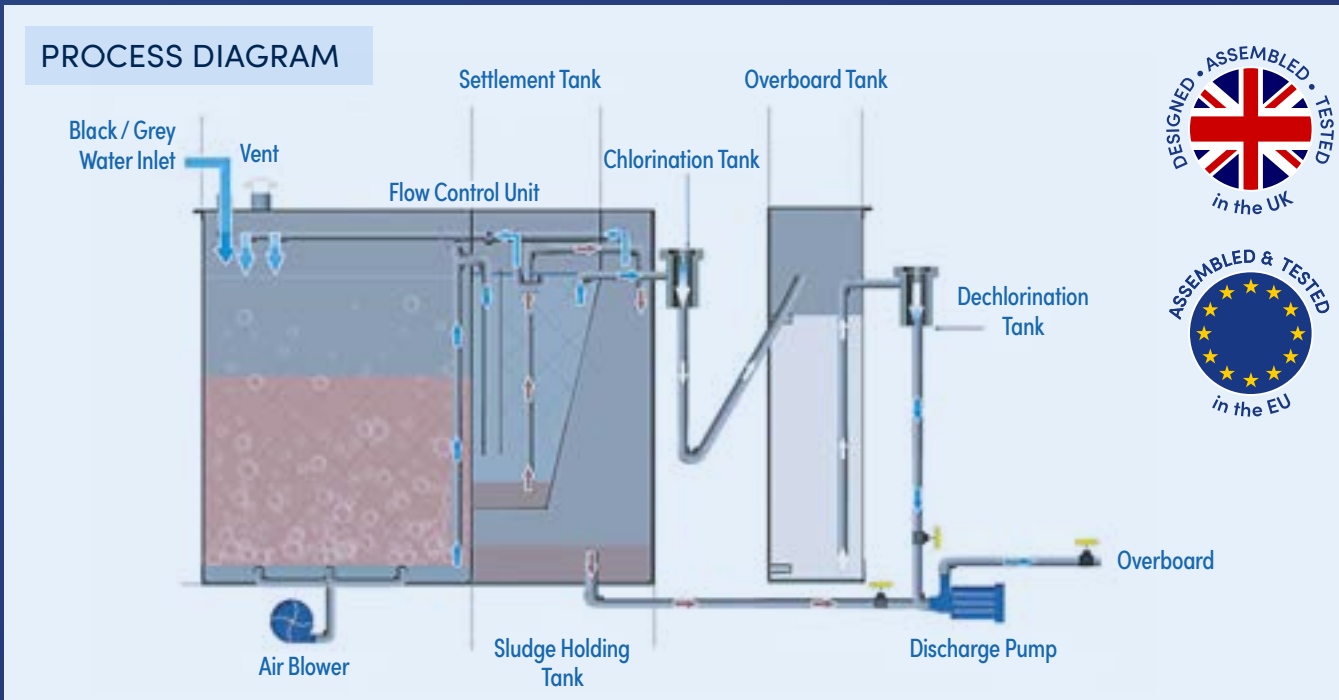


 Victor Marine
Globally focussed on cleaner solutions

Sewage Treatment Plants

Victor Marine's FBBR Series (Fixed Bed Bio Film Reactor) Biological Sewage Treatment Plant has been developed using the extremely well proven and compact fixed biofilm technology.

All equipment is manufactured to the highest quality. Sewage Treatment Plant spares are available worldwide and ex. stock. Recommended on-board spares include air filters, chlorine & dechlorine tablets, solenoids, gaskets and tank level switch.



Process Description

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 bacterial 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 caused by the motion of the ship. Due to the increased efficiency, the settlement tank is smaller than conventional settlers whilst producing a clearer effluent and better results than the required IMO standard.

Prior to overboard discharge, the effluent 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 the engineer time when operating. Finally, during discharge overboard, the effluent is pumped into a dechlorination unit which removes any excess chlorine, as per IMO requirements.

* Macerators are not included in the FBBR skid, client to source and fit separately

	IMO MEPC 227(64) Discharge Limits	FBBR Series Test Results
Thermotolerant Coliform	< 100/100 ml	1.75 coliforms/100ml
Total Suspended Solids (TSS)	< 35 Qi/Qe mg/l	11.46 mg/l
Biological Oxygen Demand (BOD/day)	< 25 Qi/Qe mg/l	2.99 mg/l
Chemical Oxygen Demand (COD)	< 125 Qi/Qe mg/l	36.53 mg/l
pH between	6 and 8.5	2.99 mg/l
Free Chlorine	< 0.5 mg/l	0.09 mg/l

Type approvals by:



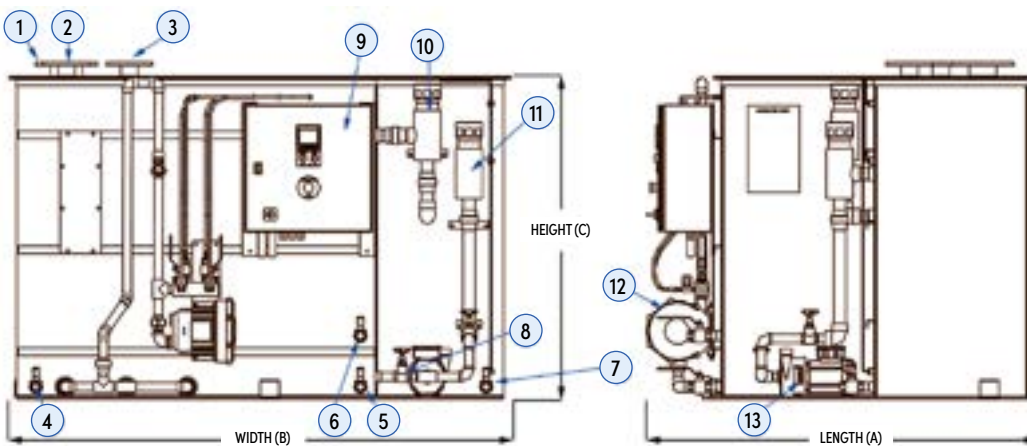
Victor Marine's FBBR Sewage Treatment Plant unique design features include:

- No high-speed moving parts, which results in less maintenance and lower lifetime costs;
- No delicate expensive membranes;
- No cleaning cycles or backwashing;
- Fully automated PLC-controlled system;
- Ability to process from a gravity or vacuum feed;
- Can be supplied as turnkey package or in modular form for ease of installation;
- Low power consumption;
- Fully Type Approved to IMO and Bureau Veritas standards.

FBBR Series

	FBBR Mini	FBBR 12	FBBR 15	FBBR 30	FBBR 50
Biological Load (kg BOD/day)	0.63	0.84	1.05	2.1	3.5
Hydraulic Load (m/Day)	1.8	2.4	3	6	10
Dimensions (mm)					
Length (mm) (A)	1161	1573	2182	2505	2813
Width (mm) (B)	1502	1475	1573	1917	2247
Height (mm) (C)	1413	1417	1385	1658	1987
Weight (kg)					
Dry	490	540	800	1000	1500
Wet	1500	1995	2600	4000	6600
Recommended No. of Persons*	6-8	9-12	13-16	17-30	31-50

*Use only as a guide, POB calculated on 24/7 operation using Helcom 11/10 guideline for capacity calculation of sewage systems. Actual capacities depend on the organic & hydraulic load required. The system capacity (POB) is higher when using a vacuum system



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 Unit
11. De-Chlorination Unit
12. Air Blower
13. Discharge Pump

Sewage Treatment Plant Ancillaries

Spares Kit

All equipment is manufactured to the highest quality. Sewage Treatment Plant spares are available worldwide and ex. stock. Recommended on-board spares include air filters, chlorine & dechlorine tablets, solenoids, gaskets and tank level switch.



Stand-by Air Blower

The side channel air blower supplies air to the diffuser tubes in the bio zone. It has the added benefits of low noise operation, small size and a virtually maintenance-free design.



Grease Trap

Recommended by Victor Marine to be fitted in the galley for removal of fats, oils and greases (FOGs). Galley water must first pass through a Grease Trap before entering any wastewater tanks as FOGs can have an adverse effect on the pipework and sewage treatment plant. Victor Marine manufactures a range of sizes to suit customers' requirements.



Please contact us for further information.

VICTOR MARINE SERVICES

DESIGN • COMMISSIONING & SERVICING • SUPPORT

DESIGN.

The designers at Victor Marine have a wealth of experience and industry knowledge. Customers can discuss their specific requirements for any project, and the development team will collaborate and create an innovative, bespoke solution.

Our comprehensive in-house engineering and testing facilities mean we can design, manufacture and build many systems under our own roof. Victor Marine can also provide a range of certification and process options.

COMMISSIONING & SERVICING.

Victor Marine Ltd offer engineers worldwide for all Commissioning and Servicing for our Oily Water Separator and Sewage Treatment Plants. Our engineers are fully qualified and trained to a high level on all of our products.

AFTER SALES & TECH SUPPORT.

Victor Marine maintains a worldwide network of agents who can provide customers with a comprehensive after-sales service for example installation, commissioning, technical support, servicing and spares.

Contact us today for more information

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The manufacturer reserves the right to alter the specification and data to incorporate improvements in design. © Copyright Victor Marine Ltd

Victor Marine Ltd are specialists in the design and manufacture of **Oily Water Separators, Tank Washing Machines, Sewage Treatment Plants and Gas Freeing Fans**. Formed in 2005 from the merger of two established brands in the marine industry, namely Victor Pyrate Ltd and Hodge Separators Ltd, the company has over 100 years of experience in supplying equipment to the marine industry.

Victor Marine is an autonomous company within the Samuel Hodge Group, a British engineering company founded in 1897, with its origins in ship repairing and machine tool rebuilding.