

SBR mini

Sewage treatment plants

Advanced biological treatment of wastewater



RECYCLE 100% of the Water You Have Already Paid For.

The Bioliff Wastewater Treatment Plant produces clear, odourless and environmentally safe water ideal for the following uses:

Irrigation

Car Wash

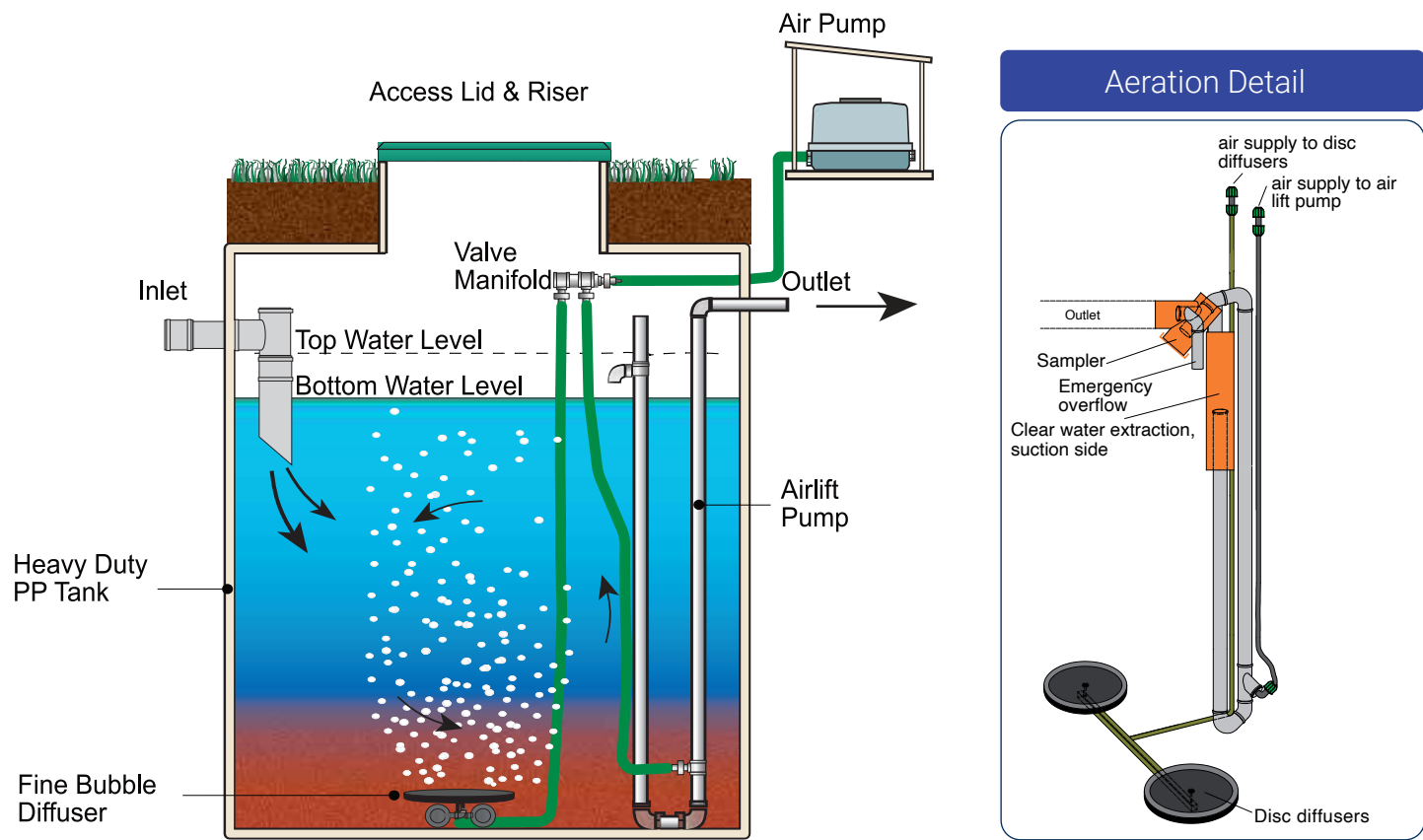
Toilet Re-Flush

Washing Down

Discharge to Environment

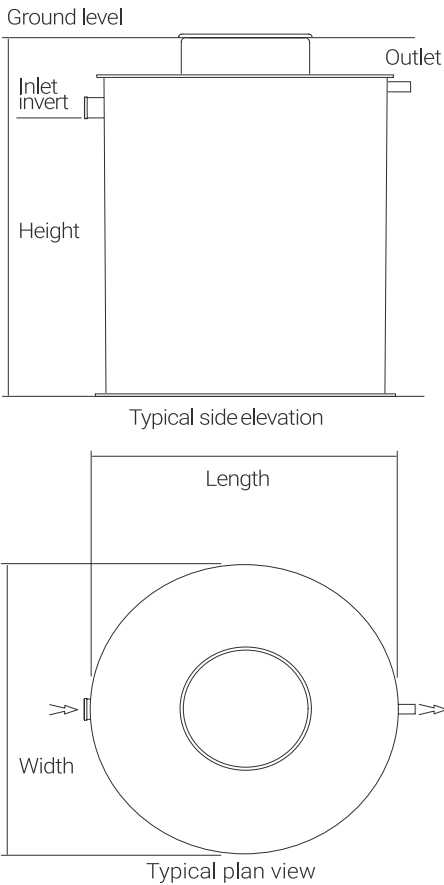
Overview

The SBR Mini technology provides a simplified and economic method to treat your sewage and wastewater to a high standard. The best results are obtained by utilising an Aerobic Biological process whereby beneficial bacteria and microorganism consume the waste and oxygen. The SBR tank and equipment can be considered as life support for the beneficial bacteria responsible for removing waste from the water.



Benefits

- Excellent economy for an advanced treatment process complete with tank.
- Compact unit provides fast convenient delivery & installation. Removes need for concrete work.
- Produces high quality effluent fit for discharge to the environment and/or water reuse applications such as irrigation.
- Heavy duty tank construction using 8mm Polypropylene plastic.
- Variable inverts for ease of installation at various depths - 250, 500 and 750mm risers are available.
- Energy efficient, near silent, air pump with integral controller & alarm. Approximate annual running cost of <5,000Kshs/year.
- Onsite aerobic sludge digestion & stabilisation - no need for exhausters
- Minimal operations & maintenance requirements.



Operating principle

The Bioliff SBR Mini Compact treatment plant is unique in that all treatment processes occur in a single chambered tank. The treatment process involves 2-4 cycles which are repeated within a 24hr period. Each cycle involves 4 steps:

1. Filling phase
Sewage enters the system via gravity and the tank begins fills; increasing the tank levels.

2. Aeration phase
Wastewater is diffused with oxygen via an air pump and circulated. Here aerobic bacteria forms an activated sludge responsible for the treatment.

3. Settling phase
The aeration is paused. In these quite conditions the activated sludge settles to the bottom. In the upper area, a clear water zone forms.

4. Discharge Phase
The treated clear water is now discharged from the tank leaving behind a lowered water level ready to fill with more inlet sewage.

Specifications

Model	Daily Flow	Power	Tank Volume	Diameter	Height	Inlet	
						Invert	Pipe
4PE	600	58	1680	1150	2100	600	110
6PE	900	58	2540	1450	2100	600	110
10PE	1500	58	3150	1600	2300	600	110
20PE	3000	186	6400	1950	2300	600	110
30PE	4500	372	8900	2300	2600	600	110
40PE	6000	372	2 x 6400	2 x 1950	2300	600	110
50PE	7500	460	2 x 8900	2 x 2300	2600	600	110

SBR max

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Overview

The Bioliff SBR Max wastewater treatment plants use the Sequential Batch Reactor process to provide economical but effective treatment of sewage water in various applications in scale from residential to large communities. The SBR process provides for full Carbon and Nitrogen removal and produces high quality effluent that is odour free and suitable for re-use including irrigation and toilet flushing. Due to its high quality it may also be discharged into sensitive water courses.

SBR systems use in-ground site constructed plastic, fiberglass, or concrete chambers with ancillary equipment including aerators and pumps centrally installed and controlled in an adjacent machinery housing room.

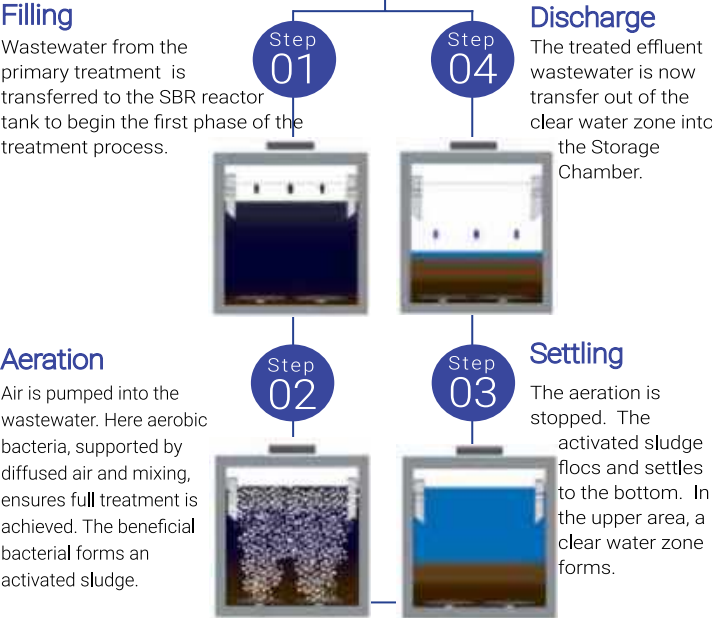
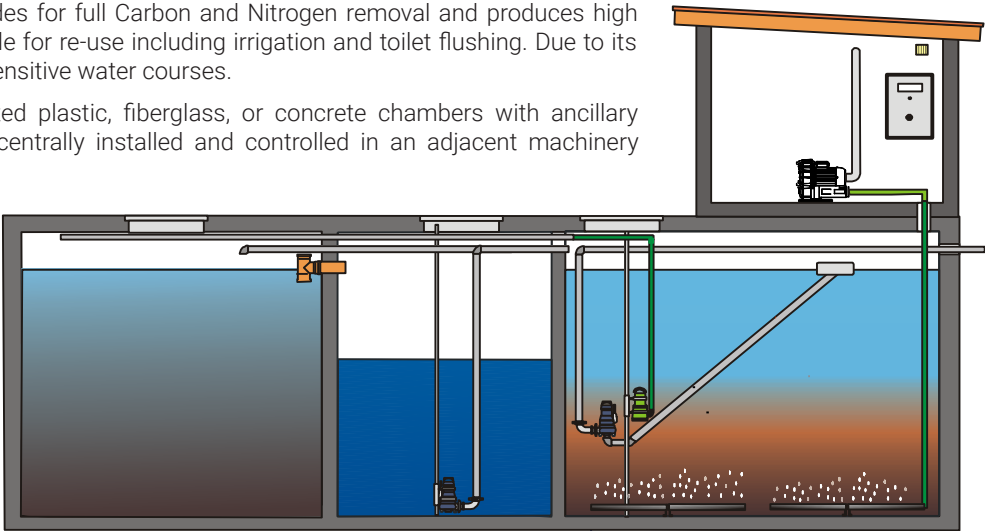
Operating principle

SBR systems use in-ground site constructed plastic, fiberglass, or concrete chambers with ancillary equipment including aerators and pumps centrally installed and controlled in an adjacent machinery housing room. The purification process includes:-

Primary Treatment: Raw sewage and grey water is first processed in a two stage Primary Treatment chamber where liquids and solids are separated and some sedimentation takes place. The resultant settled fluid is then pumped to the main reactor tank in a batch of about 25% of daily treatment load.

Secondary Treatment: Secondary treatment occurs in a four-phase process that includes filling, reaction, clarification and discharge. This process takes about six hours after which the treated water is transferred to the final stage chamber and a new batch of raw water is introduced.

Storage: Chlorine dosage is introduced in the storage chamber after which the water is either utilised for irrigation, wash down etc or safely discharged to waste.



Specifications

Model	100PE	150PE	200PE	350PE	500PE	650PE	800PE	1000PE
Population Equivalent (PE)	100	150	200	350	500	650	800	1000
Flow (m ³ /day)	15	23	30	53	75	98	120	150
Organic Loading (kg/BOD ₅ /day)	6	9	12	21	30	39	48	60
Nitrogen Loading (kg/NH/day)	0.8	1.2	1.6	2.8	4	5.2	6.4	8
Length (m)	6.5	8	7.5	14	8	8.5	9.5	11
Width (m)	4	5	4.7	3.7	6	3.5	4	4.5
Depth (m)	2	2	3.5	3.5	4	5	5	5
Foot Print (m ²)	26	40	35	52	48	30	38	50
Total Tank Volume (m ³)	52	80	123	181	192	149	190	248
Installed Power (kWh/month)	2.1	2.1	2.6	3.02	4	6	6	7.5

Enpura MBBR

Sewage treatment plants

Advanced biological treatment of wastewater



Overview

MBBRs, or Moving Bed Biofilm Reactors, are a highly effective attached-growth biological treatment system designed to treat a variety of pollutants from wastewater sources and be used in aerobic and non-aerated applications. COD, BOD, TSS and Nitrogen and are effectively removed by MBBR biofilm carriers. Bioliff's Enpura MBBR system is engineered to provide the most energy efficient, most compact and maintenance free MBBR system available. Bioliff utilizes SSI's aeration technology with optimized biofilm carrier engineering to provide a truly superior MBBR treatment process.

Enpura systems use in-ground site constructed plastic, fiberglass, or concrete chambers with ancillary equipment including aerators and pumps centrally installed and controlled in an adjacent plant room. Alternative configurations for in-ground installation using a concrete structure or containerized for mobile systems are available.



Operating principle

- Step 01** The waste water (both black and grey) from the facility are gravity fed or pumped into the Primary Treatment Tank.
- Step 02** The effluent then passes through an Effluent Filter to the second tank of the Primary Treatment to ensure that no solids enter the reactors. The waste water is then gravity-fed into the Buffer Chamber.
- Step 03** The Buffer Chamber regulates the amount of effluent that is fed into the Reactor Tanks. The plant runs at a maximum efficiency when the effluent stream is at a steady, constant rate in a twenty-four hour period ensuring the most effective treatment.
- Step 04** Inside the Reactors, millions of bacteria grow and form a biofilm on the MBBR media. The microorganisms consume the waste and nutrients present in the wastewater. Fine bubble aeration provides oxygen to bacteria, and vigorous mixing on the contents.
- Step 05** The effluent then passes into the Clarifier where the sludge settles at the bottom and the clear water separates at the top. The accumulated sludge at the bottom of the clarifier is recycled back into the Primary Treatment Tank to aid in digestion.
- Step 06** The final product is a clear and odorless effluent ready for discharge either by means of irrigation or returning it to the environment.



Specifications

Model*	50PE	70PE	100PE	150PE	200PE	250PE	350PE	450PE	500PE	750PE
Population Equivalent (PE)	75	75	150	150	200	250	350	450	500	750
Flow, m ³ /day	7.5	12	15	23	30	38	53	68	75	112
Organic Loading (Kg/BOD5/day)	3	4.5	6	9	12	15	21	27	30	45
Nitrogen Loading (Kg/NH/day)	0.4	0.6	0.8	1.2	1.6	2	2.8	3.6	4	6
Length, m	4.5	5.5	7.5	7.5	7.5	9	10	12	12	15
Width, m	3.7	3.7	4.2	4.2	5	5	5.5	6.5	6.5	6.5
Depth	2	2	2	2.5	2.5	2.5	2.5	2.5	3	3
Foot Print (m2)	17	20	32	32	38	45	55	78	78	98
Total Tank Volume m ³	33	40	63	79	94	112	138	195	234	293
Installed Power kW	0.65	0.9	1.2	1.55	1.85	1.85	1.85	2.35	3.5	3.7

Septic tanks

Basic treatment of wastewater

Overview

If soil conditions, and enough ground coverage at site, are suitable then the septic tank is the most simple method for disposing of sewage & wastewater.

Note there are many iterations of the septic tank, including those that split grey & black wastewater, commonly known as 'biodigesters' but they are the same function which is to separate and store solids/sludge, and pretreat sewage before disposing it to an in ground drain field.

Bioliff septic tanks & biodigesters offers significant technical improvements, options, and reliability over current market options.

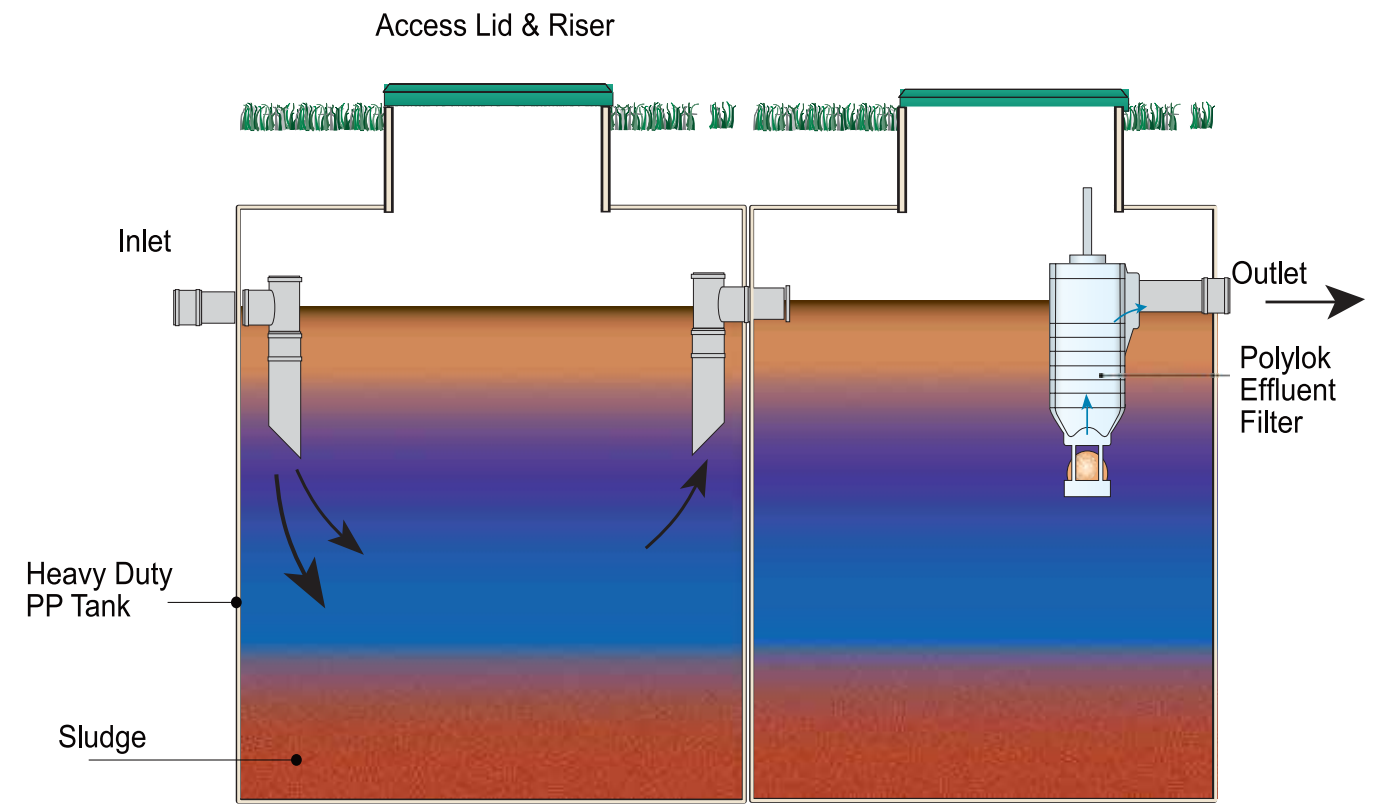
The range is available in capacities from 3,380-35,000 liters, though custom units with different dimensions and greater capacities can be requested.

Operating principle

Normally the simplest and most economical means of treating wastewater from small developments, a septic tank holds sewage and allows solids to settle into sludge at the bottom of the tank. Here it is naturally broken down by a process known as anaerobic digestion, which provides settlement and some biological treatment. The effluent is not fully treated and must receive additional treatment before discharge to the water environment –the most common method being to spread the effluent to land via an underground drainage field.

It is in the soil where the main treatment occurs, which is why it is vitally important to have suitable soils in order to avoid pollution of ground water sources.

As an optional extra, we can supply horizontal septic tanks with a unique Polylok filter that is designed to further reduce suspended solids by up to 40% – prolonging system efficiency and drainage field life.



Benefits

- Heavy duty shell as standard to enable installation in all ground conditions
- Integral lifting eyes for improved on-site handling
- 'Keying-in' assists anchoring into granular or concrete surround
- Fitted with all plumbing & fixtures as standard - including inlets and outlets.
- Fitted with manhole covers and risers as standard.
- Unique Polylok filter improves effluent quality and significantly prolongs drainage field life.
- Low profile versions for high water table or hard rock site conditions

Packaged pump stations

For pumping sewage and water to mains

Overview

When discharge by gravity is impractical, a pump station system will be needed to suit on-site conditions and topography.

The Bioliff range incorporates systems for pumping water or sewage to mains sewer, wastewater treatment plant, and watercourses. Each system is supplied as a complete unit with either single or twin submersible pumps, with either free-standing or guide rails and high quality internal pipework/fittings as standard.

Pump station benefits

- Designed for structural strength and water-tightness
- Variable invert depths and orientations to suit individual site conditions
- Smooth internal walls and integral pump well improves pump efficiency and eliminates 'dead spots' which can lead to odours and septicity
- Pre-assembled pipework for fully automatic operation
- Heavy duty pumps & floats throughout ensure robust, reliable design and maximum efficiency of pump with minimal clogging or wear
- High level alarm as standard
- Dry running pump protection and automatic reset
- Fault indicators for low level and pump motor overload conditions



Operating principle

Each pump chamber contains a number of float switches linked to a SMART 2 control panel that automatically controls flow and levels.

In a single pump chamber there are three float switches:

Float A: Low level float stops the pump.

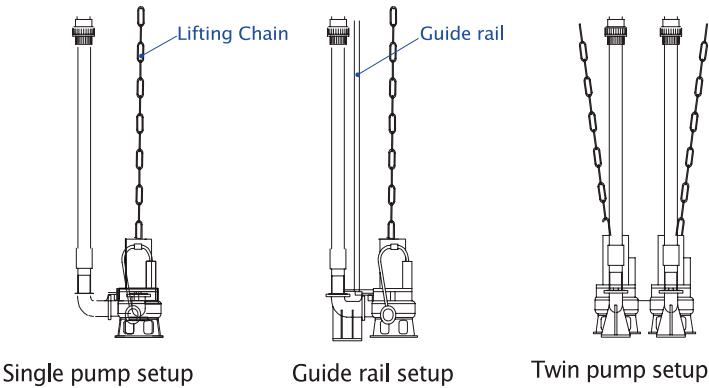
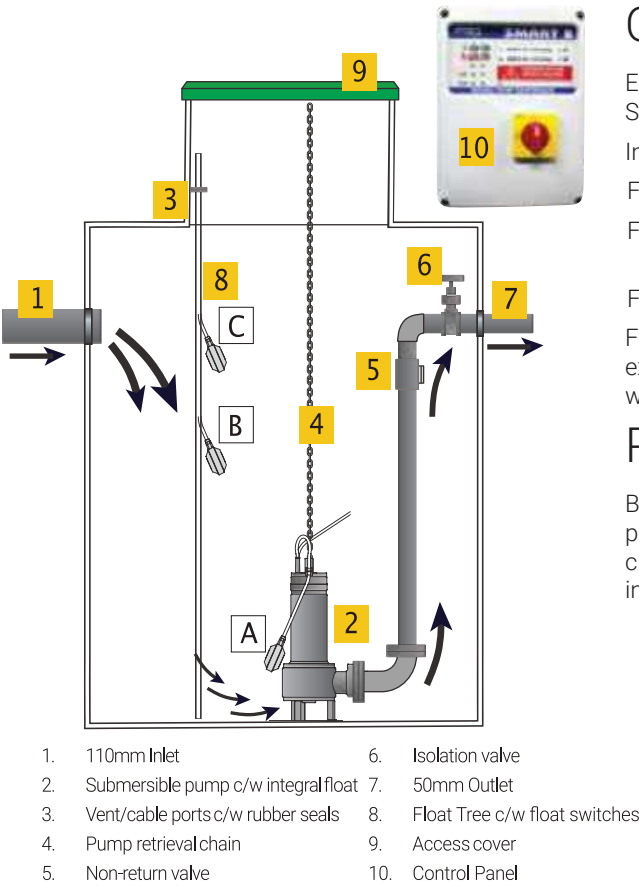
Float B: Starts pump 2 in periods of higher flow (only in twin pump applications).

Float C: High level alarm

For twin pump (duplex) operation - after each cycle the pumps alternate to extend pump life and are designed to run for a minimum of 60 seconds with no more than 15 starts per hour.

Pump options

Bioliff uses market-leading submersible pumps throughout its range of pump stations to ensure maximum reliability and efficiency with minimal clogging or wear. Pump stations can be specified with a single free-standing pump or single and twin pumps with guide rails as illustrated below.



Grease traps & interceptors

For trapping grease, oil & fat

Overview

A simple solution to a common problem - In kitchens, when fats, oils & grease (FOG) are flushed into the drains it causes blockages or damages to downstream infrastructure, septic tanks, drain fields or systems such as sewage treatment plants and pump station stations, it leads to blockages or worse - possible plant failure.

FOG buildup in drains, manholes & lifts stations is also a major cause of bad odours & smells.

There is no question about it, all commercial kitchens & canteens should be fitted with grease traps/interceptors because without them FOG causes so many problems for the users & municipalities.

Applications

Typical applications where grease traps/separators may be required:

- Bakeries
- Canteens/kitchens
- Fast food restaurants
- Food processing factories
- Hotels
- Public houses
- Restaurants
- Social clubs

Operating principle

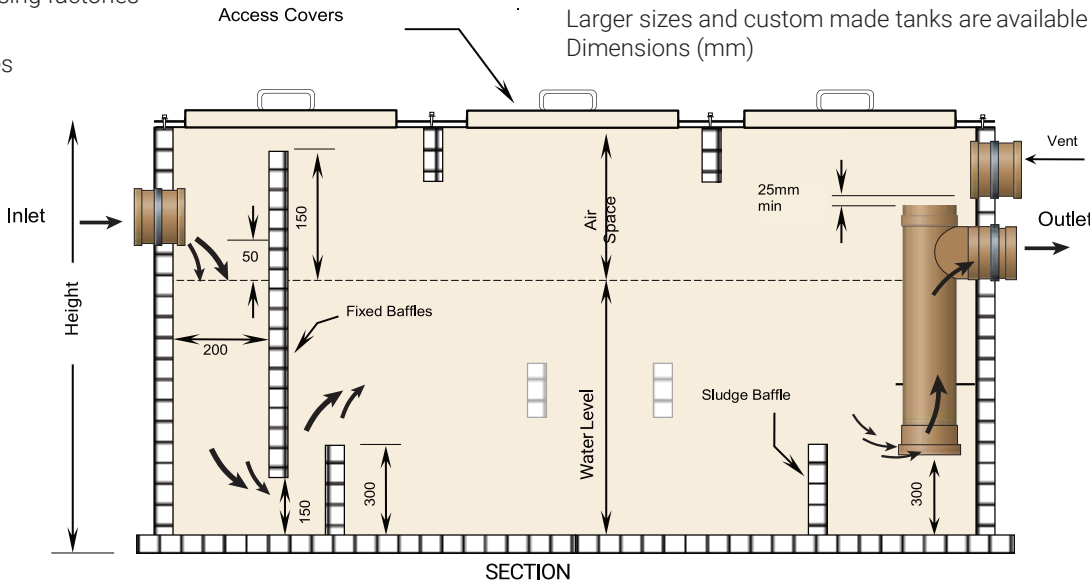
The function of a grease trap is to slow the flow of warm/hot greasy water thus allowing it to cool. As the water cools, the grease and oil separate and float to the top, solids to settle on the bottom of the tank and the cleaner/ cooler water flows out to sewer.

Specifications

Typical applications where grease traps/separators may be required:

- External structure comes prefabricated using Paneltim 50mm PP plastic for longest service life.
- Manufactured from Polypropylene – Paneltim[®]
- Standard tanks are fitted with 110mm. Inlet and Outlet pipe and 50mm Vent
- When space limitations dictate, equivalent capacity tanks can be manufactured to order
- In larger units, an optional Ultra Polylok Effluent Filter is available which can provide further treatment to residual solids.

Larger sizes and custom made tanks are available on request. Dimensions (mm)



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Model	Capacity (litres)	Internal Dimensions				Inlet dia	Outlet dia	Vent dia
		Length	Width	Water	Height			
GT2500	2,500	2800	900	1000	1300	100	100	100
GT3000	3,000	3000	1000	1000	1300	100	100	100
GT4000	4,000	3000	1350	1000	1300	100	100	100
GT5000	5,000	3000	1500	1120	1420	100	100	100
GT6000	6,000	3000	1800	1120	1420	100	100	100
GT7500	7,500	3600	1800	1200	1500	100	100	100
GT10000	10,000	4000	2000	1250	1550	150	150	100

Bar screens

For screening sewer & storm water trash

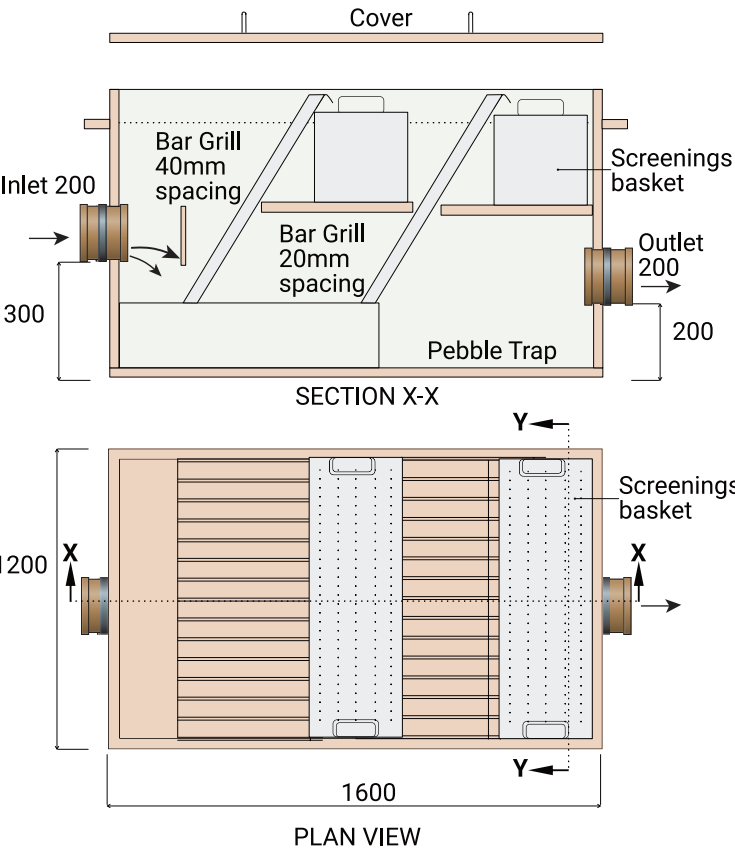
Overview

A simple solution to a common problem - When trash & non dissolvable objects are flushed into the sewer or storm drains it causes blockages or damages to downstream infrastructure or technical systems such as sewage treatment plants and pump station stations, it can lead to blockages or worse - possible plant failure.

Bioliff has developed a bar screen which prevents any unsuitable materials from entering the system. The unit has no moving parts and requires no electrics and is suitable for domestic, commercial and industrial installations.

The bar screen can also be used as a flow splitting chamber in multi-

stream sewage treatment plants or as an upstream trash screen as part of stormwater attenuation systems.



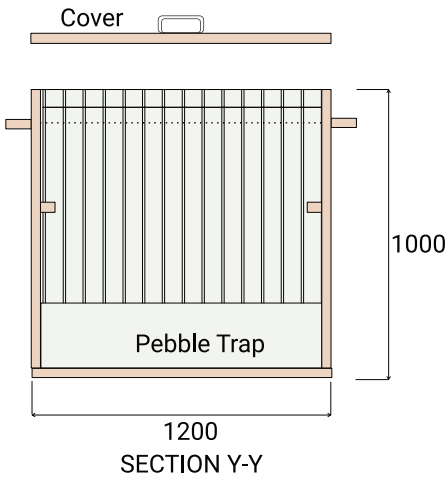
Operating principle

The Bar screen blocks the debris and forces it to rise to the top of the chamber where it is collected in a retaining trough for disposal.

The Bar screen comes into capacities with peak flows of 20m³/hr and 40m³/hr respectively. Both capacities can be configured as a single stage grill of 20mm spacing, or a double stage grill of 40mm followed by 20mm spacing. Optionally a finer spacing of 10 to 20mm may be chosen as second stage.

Specifications

- External structure comes prefabricated using Paneltim 50mm PP plastic for longest service life.
- Removable grill, with 5mm thick, 20mm spacing (see options for double grills).
- Rake & tray to hold and drain screenings.
- Incorporated pebble trap.
- Internal steel components fabricated with 304 stainless steel.



Model	Peak Flow Rate m ³ /hr	Length mm	Width mm	Height mm	Inlet Pipe	Outlet Pipe
					mm	mm
BS20	20	1600	500	1000	160	160
BS40	40	1600	1200	1000	200	200