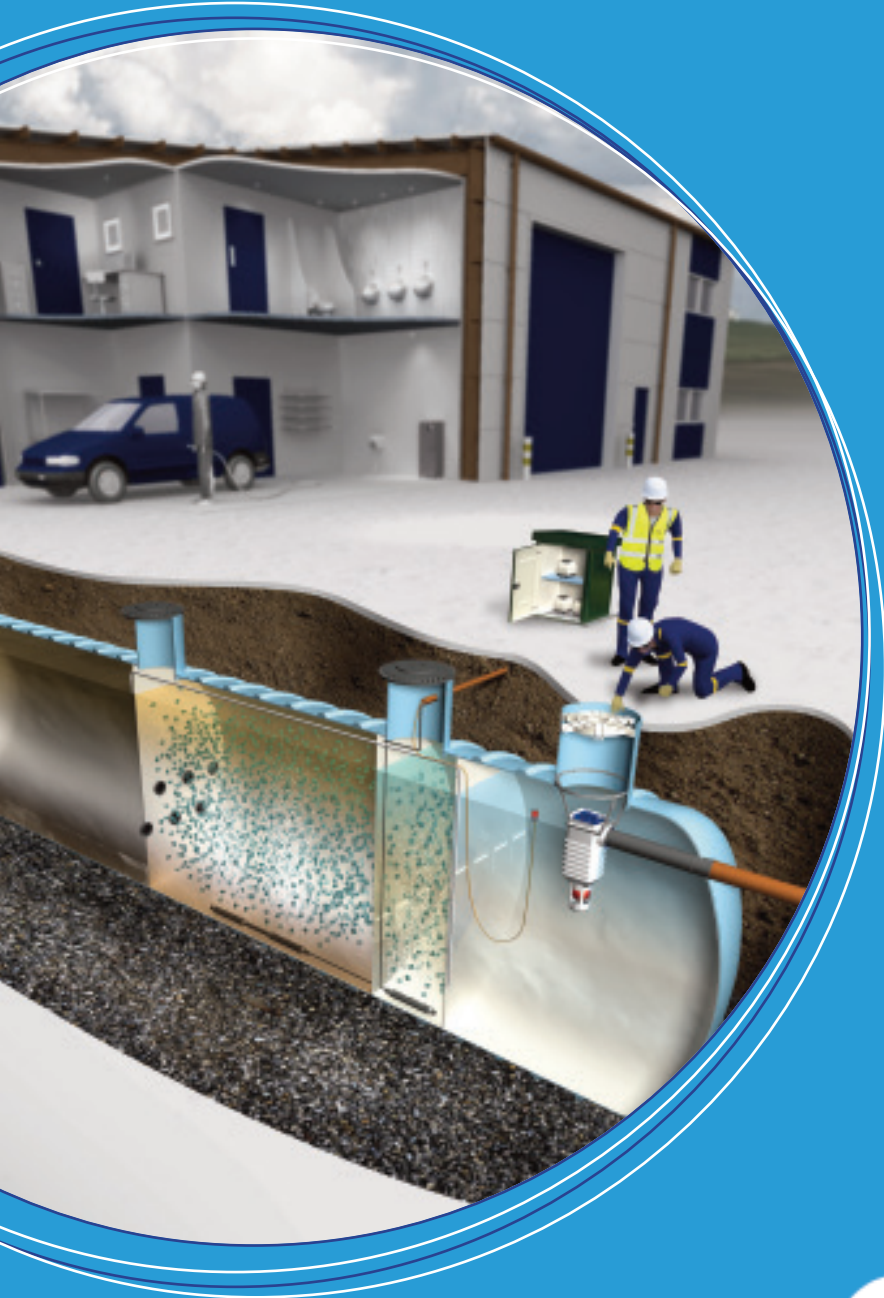


# Off-mains Drainage Products

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**mp** **40 YEARS**  
1979 - 2019  
**McVeigh Parker**  
Farming and Fencing Specialists

**WE** are the **innovators** in domestic, commercial and agricultural waste and surface water treatment products

## **WE** are Marsh Industries

Our brand communicates the straight talking approach we have become known for

WE deliver world-class water/wastewater treatment products and solutions to the domestic, commercial and agricultural sectors from our UK manufacturing plants in Kettering and Bridgwater.

## **WE** think smarter

Efficiently meeting the demands of our customers

We strive to be recognised as a collaborative and trusted partner for our customers, aligned to their business, and with a reputation for providing quality products that really do add value.

## **WE** innovate

Enabling technologies that deliver tangible benefits

Working across many areas of the UK and European construction sectors our specialist 'innovation' team combines 100+ years' experience of designing, manufacturing and testing wastewater treatment products that are proven to be economic, efficient and environmentally sensitive.

## **WE** comply

With UK/EU building and environmental regulations

Our products are fully type-tested and certified to ensure compliance with relevant environmental permitting programmes and Building Regulations.

## **WE** deliver

UK nationwide and overseas

With one of the largest merchant distributor networks available in Europe, customers specify Marsh products and services because they know WE deliver from a solid foundation of knowledge, experience, product quality and proven performance.

## **WE** support

Specialist services to further enhance customer requirements

There are times when our customers need a little extra support. Whether this is on-site advice, backup support, specialist testing or bespoke project solutions, WE offer a range of services when and where required.

## **TOGETHER** we are a strategic partnership

Our core strength lies in the knowledge, experience and enthusiasm of our staff and our customers combined



Marsh Hydrooil separators undergoing testing at PIA GmbH in Aachen, Germany

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# Domestic wastewater treatment products



# Domestic sewage treatment

## What are your options?

Choosing the right sewage treatment and disposal method for your site is essential to ensure effective long-term performance, protection of public health and the environment, and compliance with relevant legislation.

Sewage treatment and disposal can be provided by either public (foul) sewer or by a private sewage system. Use of a private system is only usually acceptable where connection to the public sewer is not possible, and as such should be discussed with your local Planning Authority at an early stage.

Before sewage effluent can be discharged to 'controlled waters' it must receive at least primary and secondary treatment:

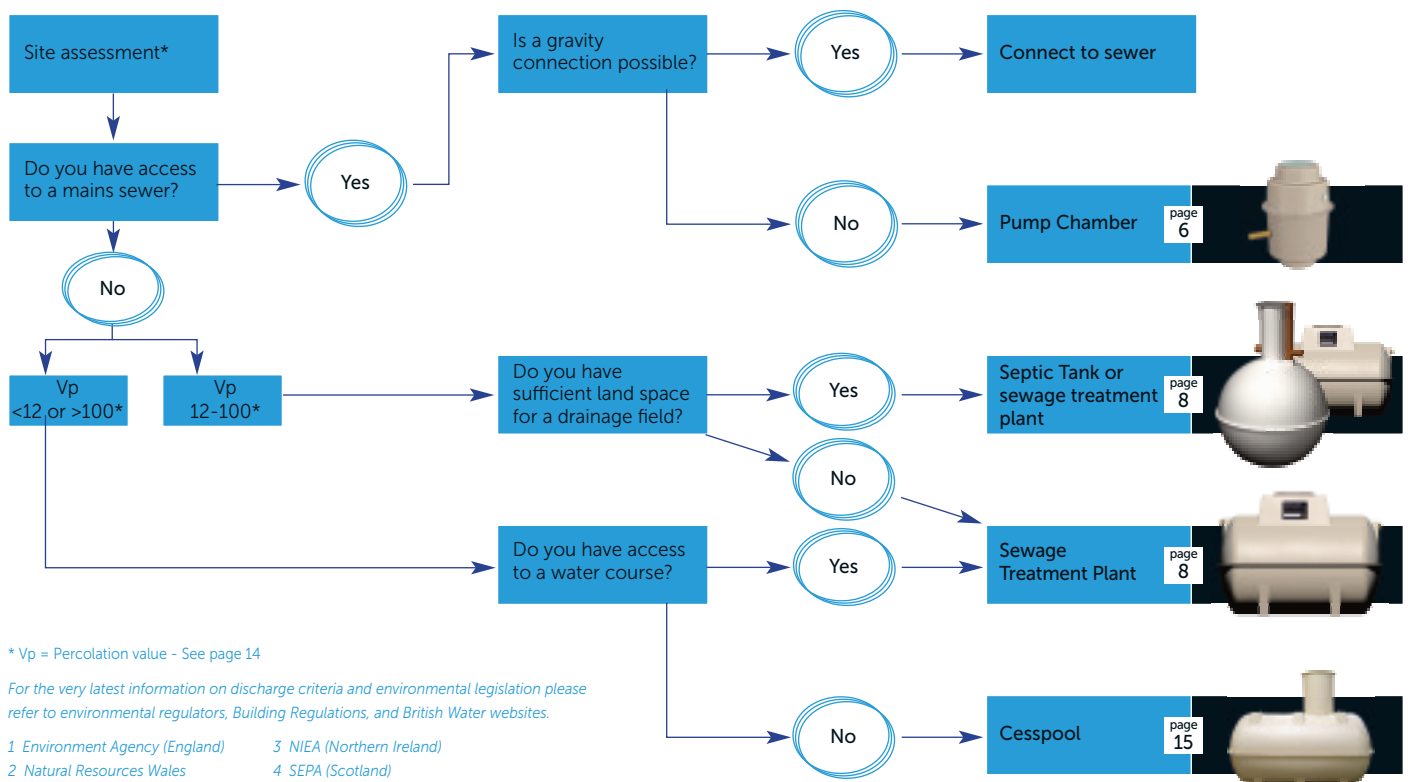
- For a discharge to ground the micro-organisms in the soil provide the secondary treatment
- For a discharge to a water course the sewage treatment must be provided by a Package Sewage Treatment Plant (PSTP) or equivalent

See page 14 for further guidance on sewage treatment.



## System selection

Hierarchy of off-mains discharge routes as laid out by the environmental regulators and British Water





# Pump chambers

For pumping sewage and water to mains

## Overview

When discharge to mains is required, but to do so by gravity is impractical, a pump chamber system will be needed. Although available as floor-mounted units for indoor applications such as basements, the vast majority are installed outdoors at levels to suit on-site conditions and topography.

The Marsh range incorporates systems for pumping surface water or domestic sewage to mains, septic/PSTP effluent to drainage fields/watercourses, and bespoke systems for larger domestic and industrial applications.



## Operating principle

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

In a **single pump chamber** there are three float switches:

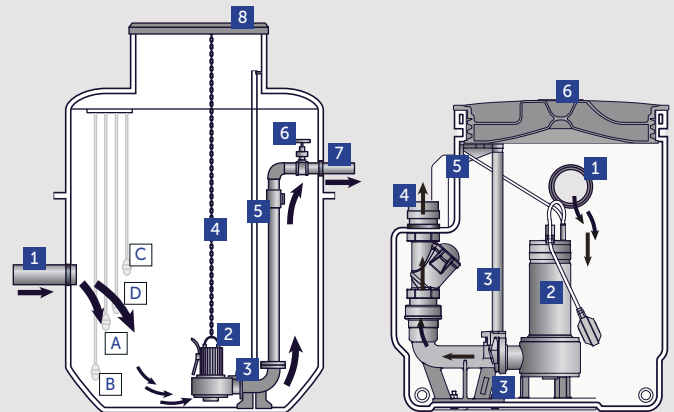
Float A: Actuates the pump cycle until level drops to low level.

Float B: Low level float stops the pump.

Float C: High level alarm – positioned above the pump actuator float (min 100mm).

For **twin pump chamber** operation there is an additional float switch (Float D) – usually positioned 150mm above first actuator (A) – which actuates the second pump in periods of higher flow.

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 chambers

- 1 Inlet
- 2 Submersible pump
- 3 Pump guide rails/pedestal
- 4 Pump retrieval chains
- 5 Non-return valve
- 6 Isolation valve
- 7 Outlet
- 8 Access cover

### Marmicro

- 1 110mm inlet (horizontal or vertical)
- 2 Submersible pump c/w integral float
- 3 Pedestal and guide rails
- 4 Outlet (2" BSP Female)
- 5 Vent/cable ports c/w rubber seals
- 6 Pedestrian access cover (100kg max)

## Pump chamber benefits

- Designed to BS EN12050 for structural strength and water-tightness and to BS EN752 to comply with hydrostatic and electrical requirements
- 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 (pump/control equipment separate)
- Heavy duty (industrial) 'peardrop' floats and Lowara (Xylem) pumps throughout ensure robust, reliable design and maximum efficiency of pump with minimal clogging or wear
- Unique 'keying-in' lip to assist anchoring into concrete surround
- High level alarm as standard
- Variable invert depths and orientations to suit individual site conditions

## Marmicro benefits

- Designed to BS EN12050 for structural strength and water-tightness
- Suitable for floor mounting or burying
- Chamber design and smooth internal walls improve pumping efficiency and eliminate 'dead spots' which can lead to odours and septicity
- 2" Lowara (Xylem) vortex pump with integral float ensures simple, robust and reliable design with minimal clogging or wear
- Pedestal positively locates pump in position for optimum performance, guide rails allow simple removal for easy maintenance
- Pre-assembled outlet pipework assists quick and easy installation
- Options include 300mm 'riser' for deeper installations (max 2), grinder pumps, and alarms

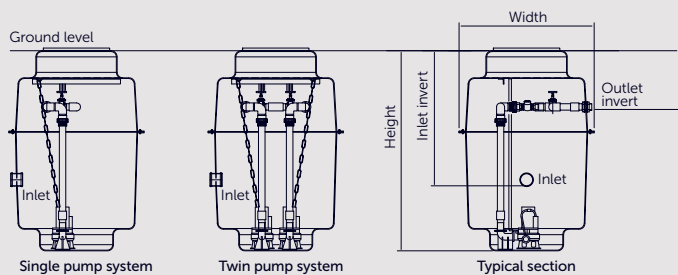
## Guidance notes

- Where foul water drainage from a domestic property is to be pumped to the mains the effluent receiving chamber should be sized to contain 24-hour inflow to allow for disruption in service, the minimum daily discharge being taken as 150 litres per person per day
- For other building types the capacity of the receiving chamber should be based on the calculated daily demand of the water intake for the building, or when only a proportion of the foul sewage is to be pumped then the capacity should be based pro-rata
- If the sewer is to be 'adopted' by a local water authority, please contact Marsh Industries as Sewers for Adoption (SFA) specification and additional local authority related criteria may apply

## Specifications

### Vertical pump stations

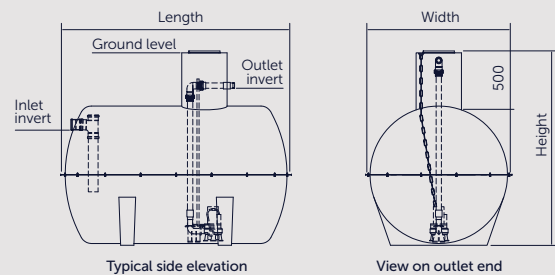
For housing projects and small commercial developments



Model	Dia	Height	Inlet		Outlet		Storage below invert	Total Storage Litres
			Invert	Ø	Invert	Ø		
Mini	600	1100	500	110	300	63	120	234
Midi	600	1500	500	110	300	63	280	421
Maxi	600	2000	500	110	300	63	421	561
CPS1	1100	1100	500	110	300	63	470	867
CPS2	1100	1500	700	110	300	63	780	1183
CPS3	1100	2200	900	110	300	63	1025	1735
CPS4	1100	2600	900	110	300	63	1340	2050
CPS5	1700	2100	900	110	300	63	2440	3700
CPS6	1700	3400	900	110	300	63	4000	6000

### Horizontal pump stations

For larger housing projects, and commercial/industrial developments



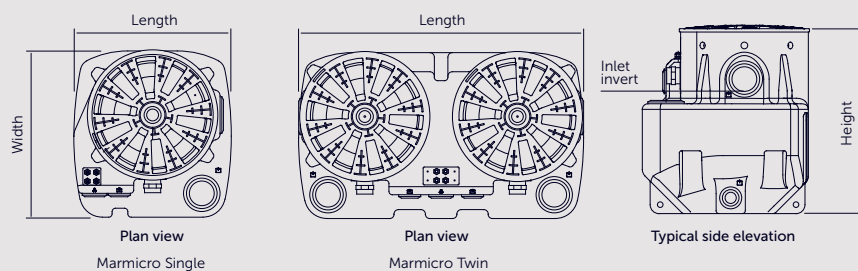
Model	Length	Width	Height	Inlet		Outlet		Total Storage Litres
				Invert	Ø	Invert	Ø	
AT2800	3000	1250	1750	800	110	300	63	2800
AT3800	4000	1250	1750	800	110	300	63	3800
AT4500	2650	1600	2100	800	110	300	63	4500
AT6000	2950	1900	2400	800	160	300	63	6000
AT8000	3640	1900	2400	800	160	300	63	8000
AT10000	4200	1900	2400	800	160	300	63	10000
AT12000	5200	1900	2400	800	160	300	63	12000
AT14000	5840	1900	2400	800	160	300	63	14000
AT16000	6700	1900	2400	800	160	300	63	16000
AT18000	7500	1900	2400	800	160	300	63	18000
AT20000	8100	1900	2400	800	160	300	63	20000

#### Notes:

- All pump chambers are available for dirty water (DW) or sewage (SW), in single pump (SP) and twin pump (TP) configurations. Pump chambers are usually bespoke.
- The dimensions given on this page are for guidance only
- For precise tank sizes and configurations, please contact Marsh Industries
- All dimensions in mm

### Marmicro

For small flows from single developments



Model	Length	Width	Height	Inlet		Outlet		Total storage Litres
				Invert	Ø	Invert	Ø	
Marmicro Single	700	740	840	350	110	250	50	270
Marmicro Twin	1270	740	840	350	110	250	50	550

All dimensions in mm

# Ensign™

## Package sewage treatment plants

Intensive biological processing for off-mains wastewater

### Overview

The Marsh Ensign is widely regarded as one of the most efficient, reliable and economical sewage treatment plants on the market.

The standard Ensign has been adapted to improve reliability and the Ensign:Ultra now brings unique enhancements to further improve noise level, treatment efficiency and final effluent quality.

#### Class leading performance

Tested and approved to BSEN12566-3/A1:2009 all Ensign units provide treatment well within national consent requirements. Published test results of 11.5:19.2:8.4mg/ltr (BOD:suspended solids:ammonia), with influent concentrations on test higher than those chosen by most competitor plants, effectively equates to 97% pollutant removal.

#### Unrivalled choice

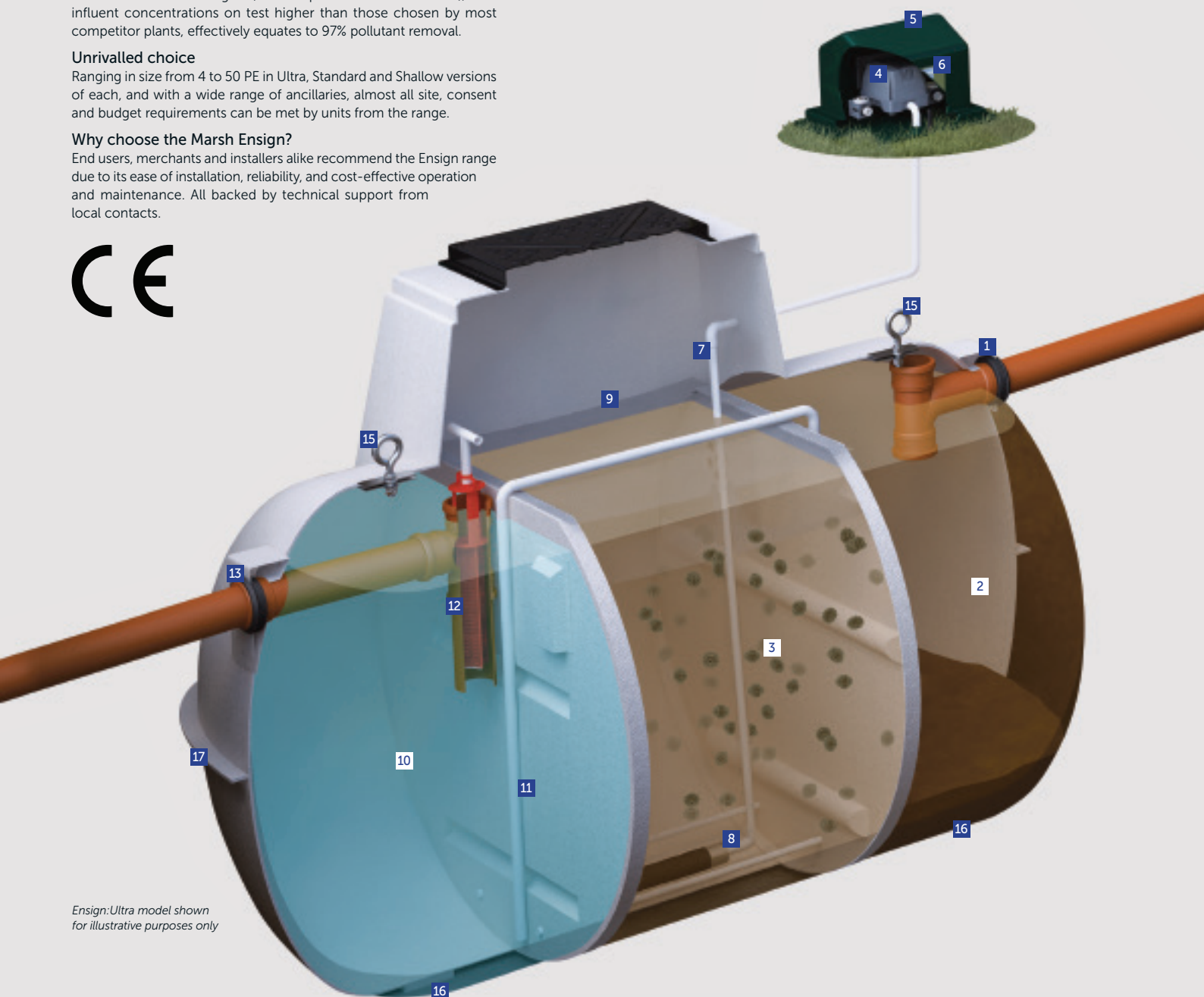
Ranging in size from 4 to 50 PE in Ultra, Standard and Shallow versions of each, and with a wide range of ancillaries, almost all site, consent and budget requirements can be met by units from the range.

#### Why choose the Marsh Ensign?

End users, merchants and installers alike recommend the Ensign range due to its ease of installation, reliability, and cost-effective operation and maintenance. All backed by technical support from local contacts.

### Operating principle

In addition to anaerobic digestion taking place in the primary settlement chamber **2** the Ensign:Ultra unit allows the clarified water to pass into a second 'aeration' chamber **3** where it is treated to remove the dissolved constituents. Here aerobic bacteria, supported by diffused air and mobile media, ensures full treatment is achieved before the treated effluent and 'sloughed off' bacteria flows to a final settlement chamber **10**. The final effluent is then discharged to the drainage field or watercourse via a Polylok filter.



Ensign:Ultra model shown  
for illustrative purposes only





## Benefits

- 1 Inlet with 'Forsheda seal'**  
Forsheda seal provides flexibility in the joint for easier installation.  
*Optional risers to increase invert depth are available.*
- 2 Primary settlement chamber**
- 3 Aeration chamber**
- 4 Advanced compressor with alarm** (Ensign:Ultra units only)  
Near silent compressor ensures minimal running, maintenance and servicing costs. Integral alarm detects low pressure in air line. (Regular Low-energy compressor on Ensign:Standard models).
- 5 Compressor housing - internal or external options available**  
The compressor can be housed internally or externally with no difference in cost.  
*External recommended to increase compressor life, and supplied as standard on 4PE, shallow and pumped outlet versions.*
- 6 RCD/Electrical connection** (Ensign:Ultra units only)  
The RCD box provides easier installation and provides a higher degree of safety. (Regular plug/socket connection on Ensign:Standard models).
- 7 PVC pressure pipe/diffuser(s)**  
Provides a protective conduit for the air diffuser line. Can be easily removed for maintenance and cleaning.
- 8 Bio-media**  
High specification bio-media (310m<sup>3</sup> per m<sup>2</sup>) and membrane diffusers ensure even circulation to eliminate 'dead spots'. The bio-media is contained by a stainless steel securing mesh to ensure no migration during handling or potential flooding.
- 9 Stainless steel mesh**  
Retains media in aeration chamber during transportation and handling, and in the event of flooding.
- 10 Final settlement chamber**
- 11 32mm sludge return**  
Larger diameter sludge return prevents the possibility of blockages and improves system circulation. Provides higher effluent quality whilst balancing flow over a 24 hour period or periods of intermittent use.
- 12 Unique Polylok tertiary filter** (Ensign:Ultra units only)  
The Polylok tertiary filter reduces suspended solids and BOD by a further 40% helping to extend drainage field life.
- 13 Outlet with 'Forsheda seal'**  
Forsheda seal provides flexibility in the joint for easier installation.  
*Optional pumped outlets are available.*
- 14 Impermeable lid** (Ensign:Ultra units only)  
Heavy duty lid/frame improves strength and durability whilst blending into the surrounding environment. (Regular lid on Ensign:Standard models).
- 15 Integral lifting eyes**  
For safe and secure on-site handling.
- 16 Stabilising feet**  
Stabilising feet prevents the tank from rolling and allows safe and steady transportation and installation.
- 17 Unique 'keying-in' lip**  
Assists anchoring into granular or concrete surrounds.

## Guidance notes

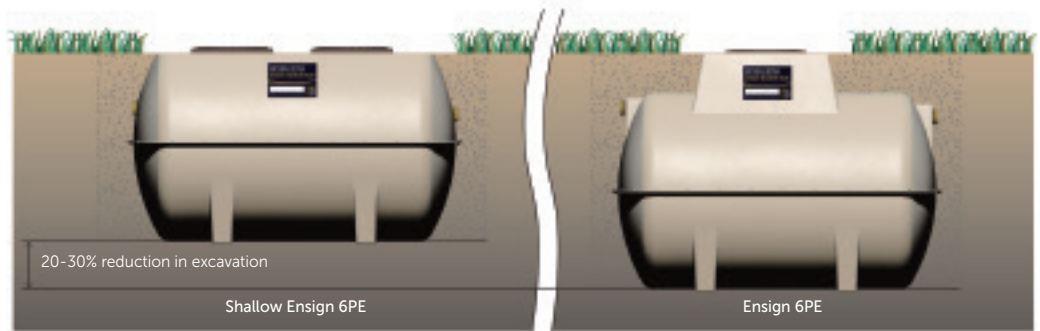
Package Sewage Treatment Plant's (or PSTP's) are often a suitable option where groundwater in the surrounding environment is vulnerable, drainage field percolation values are restrictive, or direct discharge to a drainage field/watercourse or surface water sewer is the preferred discharge method.

- PSTP's should be sized using the latest version of British Water Flows & Loads which provides detailed information on sewage production figures and sizing calculations
- Regulatory authorities for the control of pollution in the UK normally require treatment plants conforming to BS EN 12566:3 to be demonstrated as capable of producing a minimum effluent discharge quality of 20:30:20 (Biochemical Oxygen Demand; Suspended Solids; Ammoniacal Nitrogen in mg/ltr), although in certain areas more stringent site-specific qualities may be required
- No surface water should enter the system as this can reduce the system's capacity and cause solids to be flushed out which may prematurely block drainage field or cause pollution
- As with septic tanks sludge should be removed annually or in line with manufacturers instructions

## Shallow units

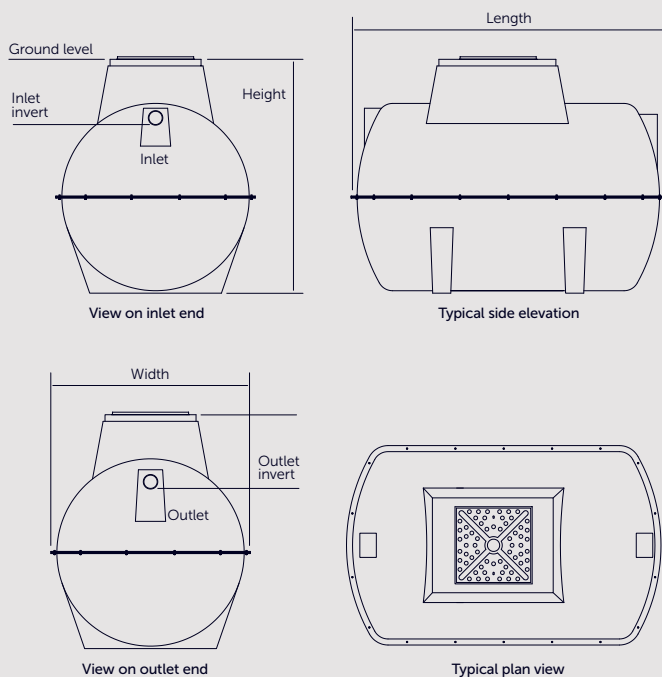
Common sewage treatment plants on the market often exceed 2.3m high. Marsh Industries offer a range of shallow plants from 4-35PE that are only 1.6m in height, meaning installation is not only possible\*, but easier and safer too.

*\*Shallow Ensign's are often favoured when hard rock site conditions mean deeper alternatives, involving costly and time-consuming excavation.*

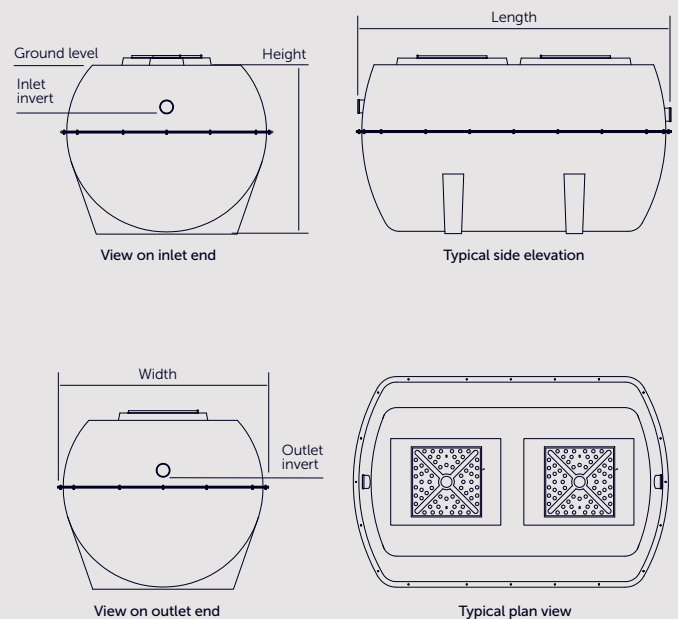


## Specifications

### Ensign:Ultra and Ensign:Standard



### Shallow Ensign:Ultra and Shallow Ensign:Standard



### Ensign:Ultra and Ensign:Standard

Model (Pop)	Length	Width +/-100mm	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
<b>4</b>	1600	1332	1575	540	110	600	110
<b>6</b>	2602	1650	1935	550	110	625	110
<b>8</b>	2602	1650	1935	550	110	625	110
<b>10</b>	2602	1650	1935	550	110	625	110
<b>12</b>	2860	1912	2139	550	110	625	110
<b>16</b>	2860	1912	2284	720	110	800	110
<b>20</b>	3650	1912	2284	720	160	800	160
<b>25</b>	3650	1912	2284	770	160	850	160
<b>30</b>	4200	1912	2284	770	160	850	160
<b>35</b>	4200	1912	2284	770	160	850	160
<b>40</b>	5200	1912	2284	770	160	850	160
<b>45</b>	5200	1912	2284	770	160	850	160
<b>50</b>	5200	1912	2284	770	160	850	160

### Shallow Ensign:Ultra and Shallow Ensign:Standard

Model (Pop)	Length	Width +/-100mm	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
<b>6</b>	2860	1912	1600	500	110	575	110
<b>8</b>	2860	1912	1600	500	110	575	110
<b>10</b>	2860	1912	1600	500	110	575	110
<b>12</b>	2860	1912	1600	500	110	575	110
<b>16</b>	3400	1912	1600	500	110	575	110
<b>20</b>	4200	1912	1600	500	160	575	160
<b>25</b>	4200	1912	1600	500	160	575	160
<b>30</b>	5200	1912	1600	500	160	575	160
<b>35</b>	5200	1912	1600	500	160	575	160

#### Notes:

- > Larger population sewage treatment plants may be supplied as multiple tank configurations.
- > For precise tank sizes and configurations, please contact Marsh Industries
- > All dimensions in mm

## Optional extras

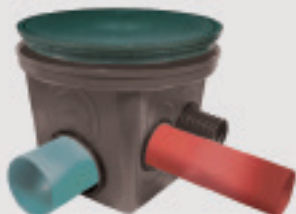
Carbon vents/covers



Elevated compressor housings



Distribution Boxes



Anti-flood valves

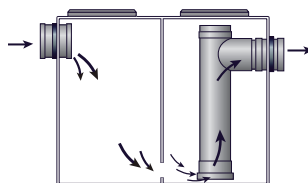


GRP kiosks



## Ancillary products

To aid the performance of sewage treatment plants



### Grease traps

**Fats, oils and grease (FOG) prevention**

Through a system of internal baffles and polylok filters, Marsh grease traps aid the performance of sewage treatment plants by preventing fats, oils and greases from entering the drainage channel.

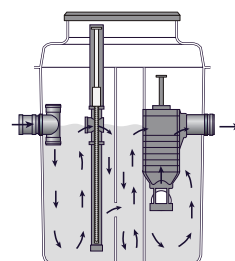


### Phoslok

**Tertiary phosphate treatment**

Available for domestic or commercial sites the Marsh Phoslok is single piece plant which adds timed doses of a coagulant to treated effluent to further remove phosphates.

Easily installed downstream from a sewage treatment plant, this tertiary treatment option is the best available method to prevent eutrophication in sensitive discharge locations such as protected waters.



### Ultra Polylok UV filter

**Ultraviolet disinfection**

Specifically designed for disinfecting the effluent from residential and commercial aerobic treatment plants by destroying viruses, parasites and pathogenic bacteria.

The Ultra Polylok UV chambers can be installed as part of a Marsh Ultra Polylok sewage treatment plant or as a stand-alone plant to further improve the effluent from an existing sewage treatment plant.

# Euro:Septic™ / Septic Tanks

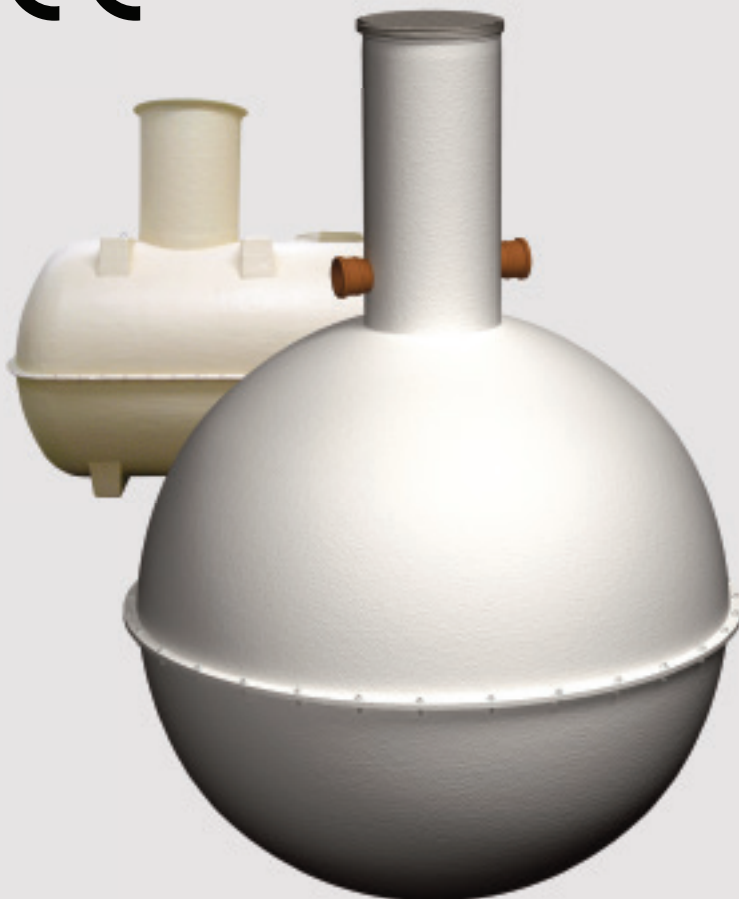
Basic treatment to off-mains wastewater

## Overview

The Euro:Septic offers significant technical improvements and cost-savings over current market options.

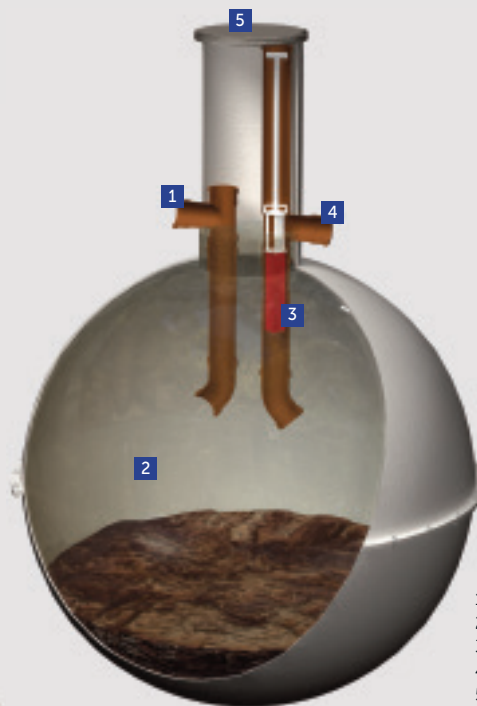
The range, available in capacities from 2800-4500 litres, is CE marked to comply with Construction Product Regulations and complements the company's existing range of horizontal septic tanks.

The Euro:Septic is tested and certified to EN12566-1 Annex B and benefits from an outstanding hydraulic efficiency of 99.63%. Horizontal septic tanks are also tested and certified to EN12566-1.



## 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.



**Euro:Septic**

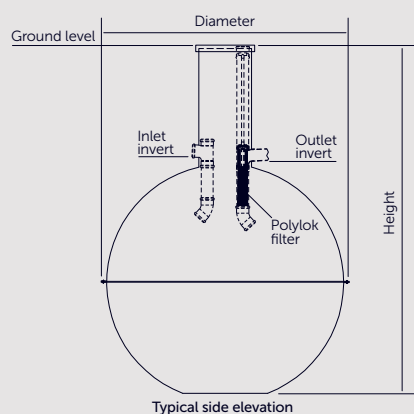
- 1 Inlet
- 2 Settlement chamber
- 3 Polylok filter
- 4 Outlet
- 5 Access cover

## Benefits

- Tested to BSEN12566:1 and CE-marked to ensure compliance with latest environmental and Building Regulations requirements
- Traditional 'onion-style' tanks for standard installations
- Low profile versions for high water table or hard rock site conditions
- Unique Polylok filter improves effluent quality and prolongs drainage field life (Euro:Septic units only)
- 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
- Pedestrian cover included as standard

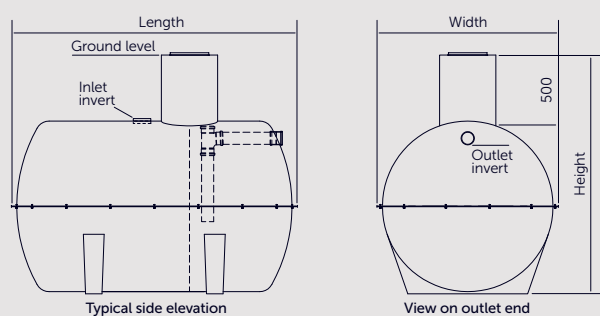
# Specifications

## Euro:Septic



Size	Dia	Height	Inlet		Outlet	
			Invert	Ø	Invert	Ø
2800L	1870	2780	1000	110	1040	110
3800L	2075	3000	1000	110	1040	110
4500L	2196	3100	1000	110	1040	110

## Horizontal septic tanks



Size	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
2800L	3000	1250	1750	500	110	800	110
3800L	4000	1250	1750	500	110	800	110
4500L	2650	1600	2100	500	110	800	110
6000L	2950	1900	2400	500	160	800	160
8000L	3640	1900	2400	500	160	800	160
10000L	4200	1900	2400	500	160	800	160
12000L	5200	1900	2400	500	160	800	160
14000L	5840	1900	2400	500	160	800	160
16000L	6700	1900	2400	500	160	800	160
18000L	7500	1900	2400	500	160	800	160
20000L	8100	1900	2400	500	160	800	160

- > For precise tank sizes and configurations, please contact Marsh Industries
- > All dimensions in mm

## Guidance notes

- For domestic dwellings the capacity of a septic tank should be a minimum of 2700ltrs for up to four users, with the size increased by 150ltrs for each additional user
- Sewage treatment is an ongoing process. For the micro-organisms to stay healthy the system should be deslugged regularly to prevent the build-up of sludge and to allow sewage to flow freely through the unit



# Uni:Gem™

## Septic conversion unit

### Overview

The Uni:Gem is an efficient, economical solution for sites where a new or replacement sewage treatment plant is unfeasible.

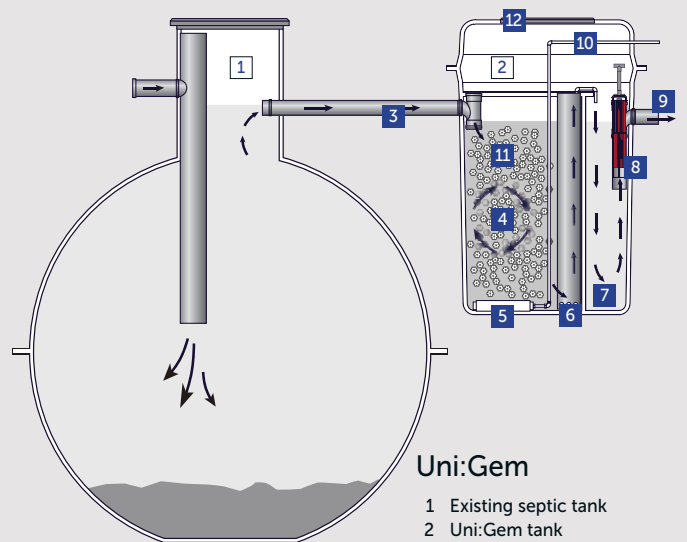
Available for sites up to 40+ persons, the Uni:Gem is a septic conversion unit which uses aerobic extended aeration, combined with biomass actuation to treat effluent from existing septic tanks or sewage treatment plants.

Uni:Gem units are suitable for domestic, commercial and agricultural applications. Hundreds of units have been successfully installed on sites throughout the UK and Europe.



### Operating principle

Effluent from the existing septic tank or sewage treatment plant is transferred to the Uni:Gem unit and enters the aeration chamber where it is treated to remove dissolved constituents. Here aerobic bacteria, supported by diffused air and mobile media, ensures full treatment is achieved before the treated effluent (and 'sloughed off' bacteria) flows to a final settlement chamber prior to discharge via Polylok filter.



Uni:Gem

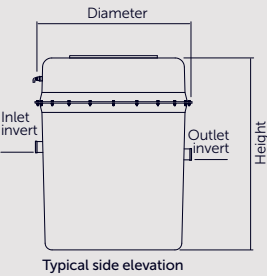
- 1 Existing septic tank
- 2 Uni:Gem tank
- 3 Inlet
- 4 Aeration chamber
- 5 Air diffuser
- 6 Transfer to final settlement
- 7 Final settlement
- 8 Integral Polylok tertiary filter
- 9 Outlet
- 10 Air diffuser feed
- 11 Bio media
- 12 Manway access

### Benefits

- Minimum effluent quality of 20:30:20 (BOD:SS:NH<sub>4</sub>) can be achieved to ensure discharges are within national consent standards (As long as the system is operating and maintained within its design criteria)
- Designed to meet BSEN12566-6 standards
- Compact design for ease of handling, access and installation enables suitability for all site conditions including bedrock or high water table
- Variable inverts and easy access for desludging
- Media bed surface area 310m<sup>2</sup> per m<sup>3</sup>
- Low energy compressor ensures minimal running, maintenance and servicing costs
- Unique 'keying-in' lip to assist anchoring into granular or concrete surround
- Optional extras include extensions for deep installations; pumped outlets for sites with adverse levels; and many more

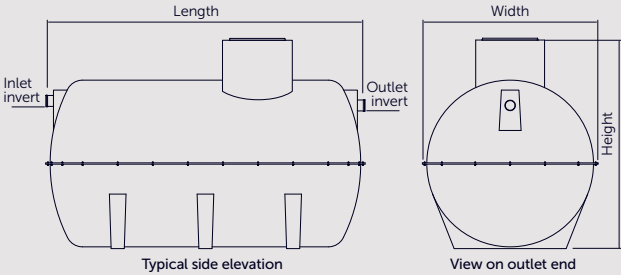
Specifications

Vertical Uni:Gem



Model	Dia	Height	Inlet		Outlet	
			Invert	Ø	Invert	Ø
Uni:Gem 6-10PE	1200	2200	1005	110	1000	110
Uni:Gem 12-18PE	1830	2100	700	110	775	110

Horizontal Uni:Gem



Model	Length	Width	Height	Inlet		Outlet	
				Invert	Ø	Invert	Ø
Uni:Gem 6PE shallow	1502	1295	1393	500	110	575	110
Uni:Gem 12PE shallow	2602	1650	1935	550	110	625	110
Uni:Gem 18PE shallow	2860	1930	2139	550	110	625	110
Uni:Gem 25PE	2860	1930	2300	700	110	875	160
Uni:Gem 30PE	3650	1930	2300	700	110	875	160
Uni:Gem 40PE	4200	1930	2300	700	110	875	160

- Notes:
- > All dimensions in mm
  - > Alternative tank sizes available
  - > For precise tank sizes and configurations, please contact Marsh Industries
  - > High Level Alarm systems and Polylok UV Chambers available
  - > The compressor is housed externally with an RCD box and alarm supplied as standard
  - > The Uni:Gem can be fitted with pumped outlets
  - > Standard MDPE fittings are either 50mm or 63mm

Cesspools

Basic storage and disposal of off-mains wastewater

Structurally sound units

A cesspool is a covered, watertight tank used for storing sewage. It has no outlet and relies on road transport for the removal of raw sewage. No treatment is involved.



Specifications

Model	Length	Width	Height	Inlet	
				Invert	Ø
AT2800	3000	1250	1750	500	110
AT3800	4000	1250	1750	500	110
AT4500	2650	1600	2100	500	110
AT6000	2950	1900	2400	500	160
AT8000	3640	1900	2400	500	160
AT10000	4200	1900	2400	500	160
AT12000	5200	1900	2400	500	160
AT14000	5840	1900	2400	500	160
AT16000	6700	1900	2400	500	160
AT18000	7500	1900	2400	500	160
AT20000	8100	1900	2400	500	160

- > All dimensions in mm
- > For precise tank sizes and configurations, please contact Marsh Industries

Guidance notes

- For domestic applications cesspools should have a capacity below the level of the invert of at least 18,000ltrs for two users, and should be increased by 6800ltrs for each additional user. Cesspools for commercial premises have no such restrictions
- Installation of a high level alarm is recommended to indicate when it is nearly full
- Whoever empties your cesspool (or septic/PSTP) should be a registered Waste Carrier and hold a current discharge licence from the local water authority
- Use of cesspool is not permitted in Scotland

# Sewage treatment

## General guidance as provided by environmental regulators

As stated in this brochure, for development proposals in sewered areas it is usually a legal requirement to connect to the public sewer, either by gravity or pumping, as the sewage is conveyed to a municipal sewage treatment works.

However, if it can be demonstrated that the proposed sewage disposal system offers a more sustainable solution to the overall water management of the site, then the regulators will consider the installation of a 'private' system.

For any such proposal you should:

- Check with your regulating body to confirm current status with regard to Registration/Consent, quality and volume limits, etc
- Take account of the requirements of Building Regulations and discuss with the local planning authority at an early stage - well before any planning application is made

## Drainage fields

If you have access to a suitable area of land, discharge from your septic tank or treatment plant to a properly designed and sized drainage field is the best environmental option as the treated effluent recharges groundwater, nutrients are retained in the soil, and nutrient loads on surface waters are reduced.

The most common form of drainage field is a subsurface percolation area comprising perforated infiltration pipes laid in shingle-filled trenches – normally within 1m of ground level to allow the micro-organisms in the soil to break down the organic matter, and at least 1.2m above the winter water table.

The drainage field has two principal purposes:

- 1 To allow percolation of partially treated/treated effluent to ground at a controlled rate
- 2 To allow further treatment of partially treated effluent before it reaches the groundwater level

Before you can dispose of effluent via a drainage field you first need to assess whether such a route is appropriate, ie, you have a good depth of well-drained, well-aerated soil away from watercourses, wells/boreholes, dwellings, and avoiding sloping sites and areas prone to waterlogging.

### Trial hole and percolation test method (See figure 1)

To calculate the exact area of land required for effective disposal an 'assessment' is required, usually by performing a percolation/water table test as outlined in BS6297 (Code of Practice for the Design and Installation of Drainage Fields for use in Wastewater Treatment) and the latest version of Building Regulations: H2.

A **trial hole** should be dug to determine the position of the standing groundwater table a minimum of 1m<sup>2</sup> in area and 2m deep, or a minimum of 1.5m below the invert of the proposed drainage field pipework. The groundwater table should not rise to within 1m of the invert level of the proposed effluent distribution pipes. If the test is carried out in summer, the likely winter groundwater levels should be considered.

A **percolation test** should then be carried out to assess the further suitability of the proposed area. A hole 300mm square should be excavated to a depth 300mm below the proposed invert level of the effluent distribution pipe. Where deep drains are necessary the hole should conform to this shape at the bottom, but may be enlarged above the 300mm level to enable safe excavation to be carried out.

Fill the 300mm square section of the hole to a depth of at least 300mm with water and allow it to seep away overnight.

Next day, refill the test section with water to a depth of at least 300mm and observe the time, in seconds, for the water to seep away from 75% full to 25% full level (ie, a depth of 150mm). Divide this time by 150. The answer gives the average time in seconds (Vp) required for the water to drop 1mm.

The test should be carried out at least three times with at least two trial holes and the average figure from the tests should be taken. The test should not be carried out during abnormal weather conditions such as heavy rain, severe frost or drought.

Drainage field disposal should only be used when percolation tests indicate average values of **Vp of between 12 and 100**. This minimum value ensures that untreated effluent cannot percolate too rapidly into groundwater. Where Vp is outside these limits effective treatment is unlikely to take place in a drainage field.

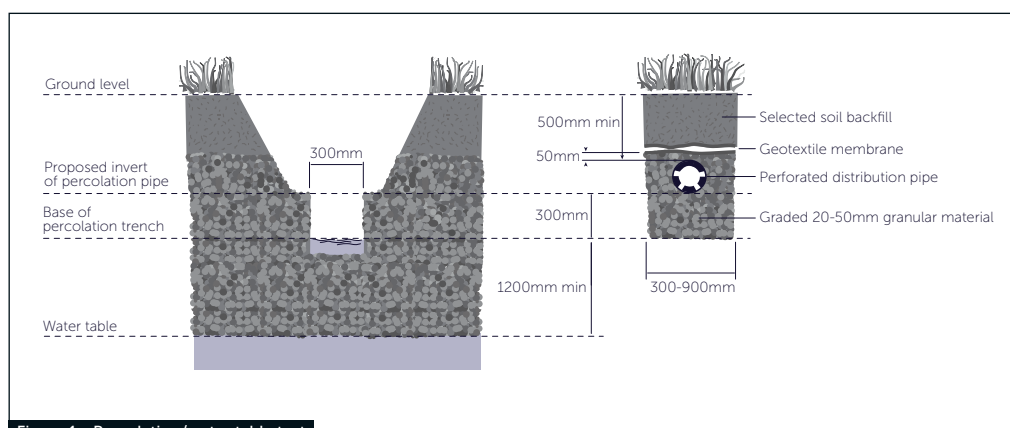


Figure 1 - Percolation/water table test

### Note:

- > The phrase 'soakaway' is often used in relation to septic/treatment plant discharges. However, the purpose of a 'soakaway' is to distribute surface water to ground as quickly as possible and does not provide the required features of a drainage field.

Drainage field construction (See figures 1 and 2)

Drainage fields should be designed and constructed to ensure aerobic contact between the liquid effluent and the subsoil using perforated pipe laid in trenches:

- Pipes should be laid on a 300mm layer of clean shingle or broken stone (graded between 20mm and 50mm) at a minimum depth of 500mm and a uniform gradient not steeper than 1:200
- Trenches should be filled to a level 50mm above the pipe and covered with a layer of geotextile to prevent the entry of silt. The remainder of the trench can be filled with soil
- Trenches should be from 300mm to 900mm wide with areas of undisturbed ground 2m wide being maintained between parallel trenches.
- An inspection chamber should be installed between the septic tank and the drainage field
- Drainage fields should be set out as a continuous loop fed from the inspection chamber

To calculate the floor area of the drainage field ( $A_t$  in  $m^2$ ), the following formulas should be used:

For septic tanks:  $A_t = p \times V_p \times 0.25$   
For treatment plants:  $A_t = p \times V_p \times 0.20$

Where  $p$  is the number of persons served by the tank and  $V_p$  is the percolation value (secs/mm) obtained.

If it is not possible to discharge to a drainage field but you can discharge to a watercourse, coastal water or surface water sewer you should consider installing a package sewage treatment plant to treat sewage to a sufficient standard as to allow direct discharge to the receiving waters.

Tank sizing

The size of sewage treatment system you will require depends on the number of people that occupy the site and their activities, and it is at this stage you should re-contact Marsh.

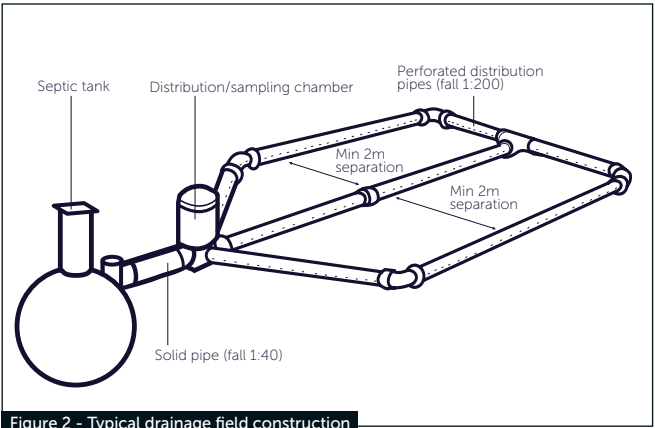


Figure 2 - Typical drainage field construction

You will need to provide detailed information about the sewage to be treated and its disposal method to enable calculation of the size of plant you will need. It is essential that you give accurate information as incorrect specification may result in the system you are provided with being inadequate and not treating the sewage effectively, leading to foul smells and possible pollution.

Distance from properties

Guidance collated from several sources recommends the following:

Distance from	Dwelling	Watercourse	Borehole/well
<b>Pump chamber:</b>			
1-5 dwellings	5m	-	-
6-20 dwellings	10m	-	-
20+ dwellings	15m	-	-
<b>Septic tank</b>	7m	10m	50m
<b>Treatment plant</b>	7m	10m	50m
<b>Cesspool</b>	7m	10m	50m
<b>Drainage field</b>	15m	10m	50m

Desludging

Sewage treatment is an ongoing process and the micro-organisms must stay healthy for the system to work. You should desludge the system regularly (usually annually or in line with manufacturer instructions) to prevent the build-up of sludge and solids to ensure sewage flows freely through the unit. It is recommended that not all sludge is removed as it can act as an anaerobic seed.

Tanks should be inspected monthly to check they are working correctly – the inlet chamber should be free-flowing and the effluent from the outlet should be free-flowing and clear.

Where emptying is by tanker, siting within 30m of suitable vehicle access point is recommended.

- Notes:
- > Septic tanks can only discharge to ground via a drainage field – discharge to a watercourse (stream, ditch, pond) is not allowed.
  - > Drainage fields are not permitted in Zone 1 groundwater protection zones.
  - > No underground services or access roads/driveways/paved areas should be located in the disposal area.
  - > Discharge from a sewage treatment plant requires a smaller (20% less) drainage field than a septic tank for effective treatment.
  - > Elevated drainage mounds can provide an alternative to drainage fields in certain circumstances as they provide an aerated layer of soil where a conventional drainage field is inappropriate due to occasional waterlogging.

# Commercial wastewater treatment products







# Project management

With extensive experience of managing the design, manufacture and despatch of pump stations, sewage treatment plants, attenuation tanks, rainwater harvesting systems and associated products, Marsh Industries' Civils Team works closely with clients to ensure projects are delivered on time and on budget.

The company trains its team to recognised competency standards to address the growing management requirements from order placement through to delivery and installation.

All products are backed by Marsh Industries commercial and technical support.

Post installation and commissioning visits are available, together with service and maintenance contracts if required.

## Gaia Sege<sup>©</sup>

### Process design software

Developed by Marsh Industries, the unique Gaia Sege process design software uses core information to accurately calculate and tailor key variables ensuring total optimisation for individual applications.

These precise calculations provide assurance to consultants, engineers, specifiers and contractors that the system is specifically designed to meet the appropriate standards of regulatory bodies.

### Sewage treatment plants

For sewage treatment plants, the software uses established core process equations to accurately calculate and tailor key variables ensuring total processing optimisation for Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Ammonia ( $\text{NH}_4$ ) reduction and removal.

Gaia Sege software also uses 'British Water Flows & Loads' data to calculate initial flows and loadings whilst also calculating peak flows and levels.

The programme can also calculate accurate sludge generation and storage on a daily basis, dependent upon final effluent standards required, ensuring the optimisation of primary chambers, individual clarifiers, diffused oxygen feed and final settlement chamber.

### Pump chambers

Gaia Sege utilises current building regulations to calculate precise storage chamber sizes. Pump systems are determined by using friction head loss calculations based on minimum self-cleansing velocities in order to specify the best possible pump(s) for the application.

### Grease traps

Appropriate grease trap sizes are generated by accounting for the amount of grease and flow generated from the grease producing facility whilst providing adequate retention time befitting of these variables.

### Storm Dammer water attenuation tanks

Marsh Industries' rainfall storage sizing programme, Gaia Storm Dammer, can simulate the calculated flood storage required for any prolonged period within a set geographic area (ie, 1 in 5 year or 1 in 100 year rainfall).



# Pump stations

For pumping sewage and water to mains

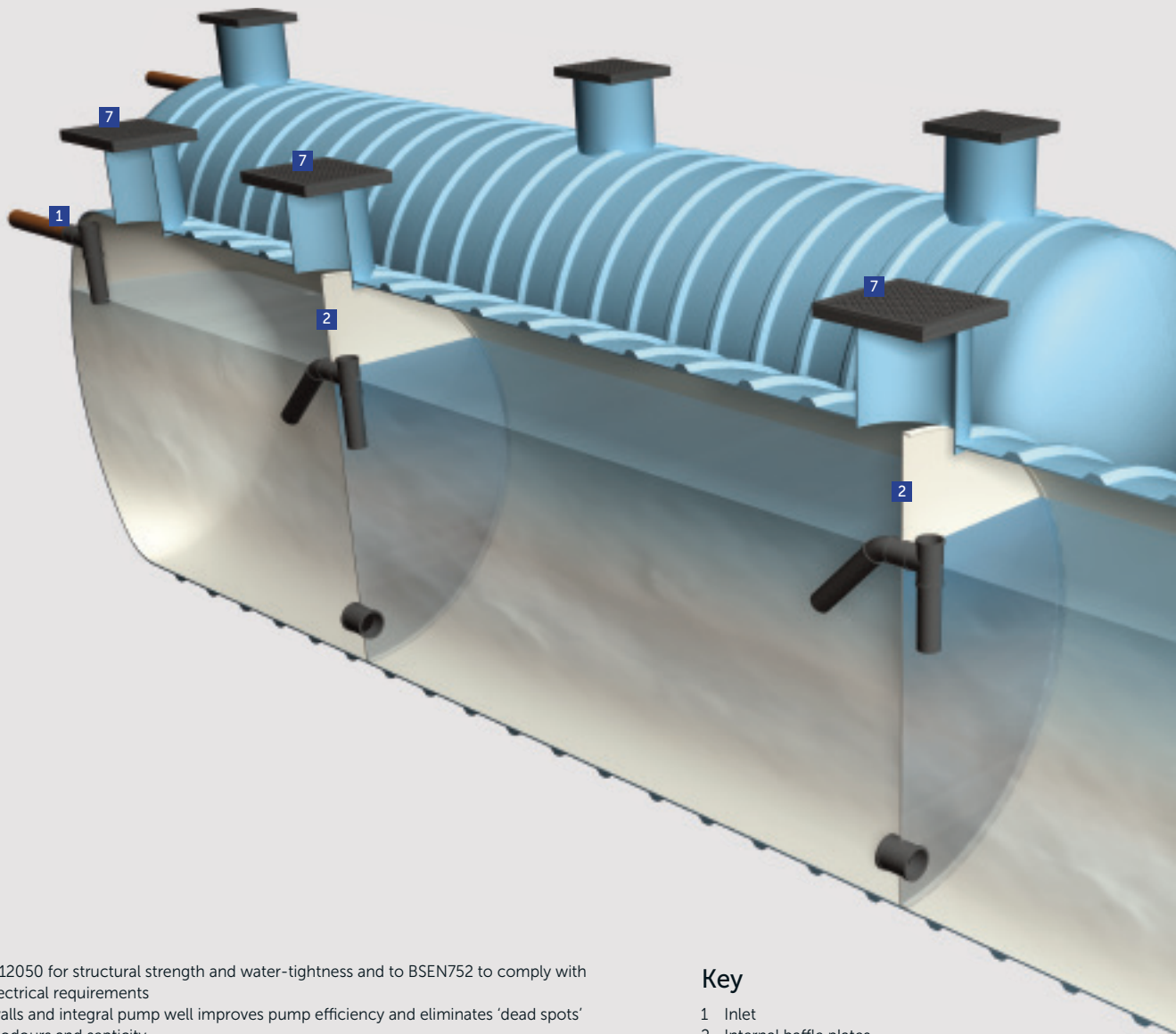
## Overview

When discharge to mains is required, but to do so by gravity is impractical, a pump chamber system will be needed.

Pump station systems are usually bespoke. However there are several factors that play a role in identifying precisely the right tank sizes and type that are required for your project.

Marsh Industries' system designers can work closely with you to identify all key requirements in accompaniment with Marsh Industries' unique process design software, Gaia Sege.

All pump stations are available for dirty water (DW) or sewage (SW), in single pump (SP) and twin pump (TP) configurations.



## Benefits

- Designed to BSEN12050 for structural strength and water-tightness and to BSEN752 to comply with hydrostatic and electrical requirements
- Smooth internal walls and integral pump well improves pump efficiency and eliminates 'dead spots' which can lead to odours and septicity
- Unique 'keying-in' lip to assist anchoring into concrete surround
- Variable invert depths and orientations to suit individual site conditions
- Pre-assembled pipework for fully automatic operation
- Heavy duty (industrial) 'peardrop' floats and Lowara (Xylem) pumps throughout ensure robust, reliable design and maximum efficiency of pump with minimal clogging or wear
- High level alarm as standard

## Key

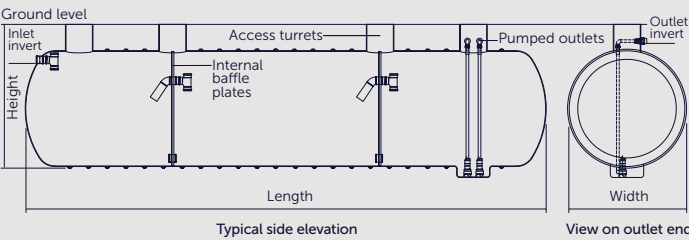
- 1 Inlet
- 2 Internal baffle plates
- 3 Submersible pumps
- 4 Outlets
- 5 Outlet valves (Internal as standard. External/chamber optional)
- 6 High level alarm
- 7 Manway access

# Guidance notes

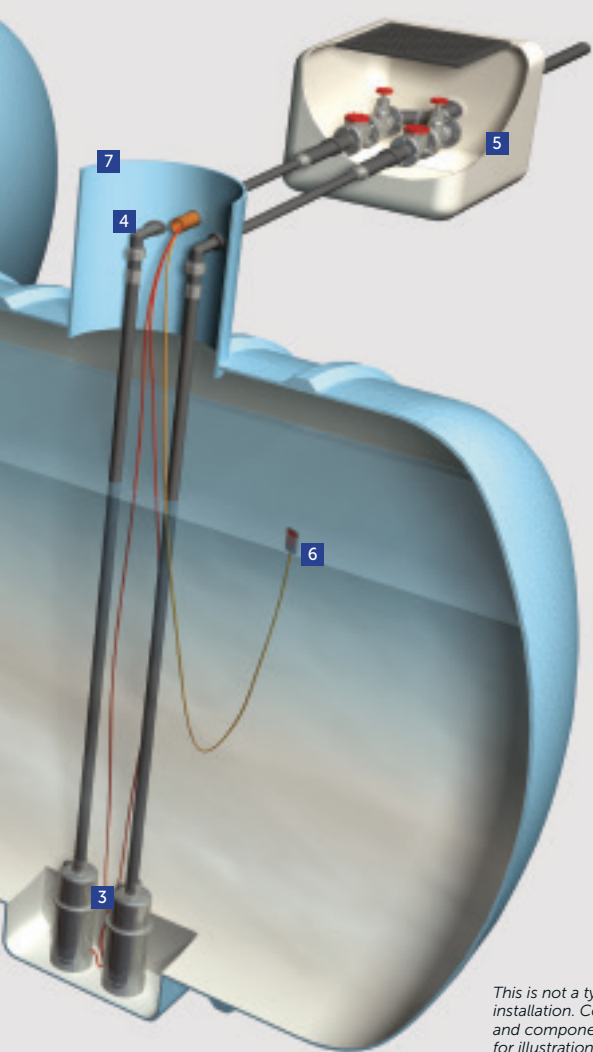
- Where foul water drainage from a domestic property is to be pumped to mains the effluent receiving chamber should be sized to contain 24-hour inflow to allow for disruption in service, the minimum daily discharge being taken as 150 litres per person per day
- For other building types the capacity of the receiving chamber should be based on the calculated daily demand of the water intake for the building, or when only a proportion of the foul sewage is to be pumped then the capacity should be based pro-rata
- If the sewer is to be 'adopted' by a local water authority, please contact Marsh Industries as Sewers for Adoption (SFA) specification and additional local authority related criteria may apply

## Specifications

### Commercial/industrial tank examples

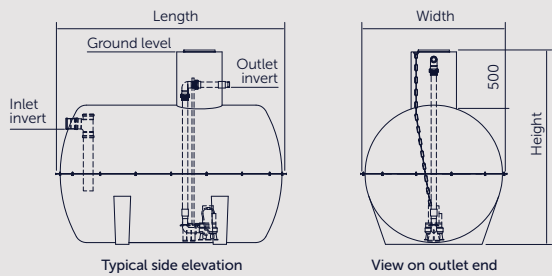


Maximum capacity litres	Tank length	
	Ø2.5m chamber	Ø3m chamber
30000	6500	
40000	8600	5900
50000	10600	7200
75000		10600
100000		13900



### Standard pump stations

For smaller housing projects, and commercial/industrial sites



Model	Length	Width	Height	Inlet		Outlet		Total Storage Litres
				Invert	Ø	Invert	Ø	
AT2800	3000	1250	1750	800	110	300	63	2800
AT3800	4000	1250	1750	800	110	300	63	3800
AT4500	2650	1600	2100	800	110	300	63	4500
AT6000	2950	1900	2400	800	160	300	63	6000
AT8000	3640	1900	2400	800	160	300	63	8000
AT10000	4200	1900	2400	800	160	300	63	10000
AT12000	5200	1900	2400	800	160	300	63	12000
AT14000	5840	1900	2400	800	160	300	63	14000
AT16000	6700	1900	2400	800	160	300	63	16000
AT18000	7500	1900	2400	800	160	300	63	18000
AT20000	8100	1900	2400	800	160	300	63	20000

- Notes:
- > The dimensions given on this page are for guidance only
  - > For precise tank sizes and configurations, please contact Marsh Industries
  - > All dimensions in mm

This is not a typical tank installation. Configuration and components are shown for illustration purposes only



# Ultra:Polylok™

## Sewage treatment plants

Advanced biological processing for off-mains wastewater

### Overview

Marsh Ultra Polylok sewage treatment systems provide advanced biological treatment to off-mains wastewater on sites ranging from 50-500PE.

The units are ideally suited for large residential, commercial, industrial and leisure sites - particularly where onerous consent standards preclude the use of standard 'off the shelf' units.

Proven reliability of the simple but effective Submerged Aeration Filtration (SAF-MBBR) system offers both operating and financial benefits when compared to more complex alternatives that require frequent servicing and maintenance to sustain performance.

### Benefits

#### Plant sizing

Bespoke design with optional tank sizes ranging from Ø1.9-3m satisfies the demands of site conditions. Each option is the same price.

#### Class-leading effluent quality

Ensures effluent discharge is well within national consent standards.

#### Heavy duty shell as standard

Structurally sound and built to last. Enables installation in all ground conditions.

#### High media surface area

High specification bio-media (310m<sup>2</sup> per m<sup>3</sup>) and membrane diffusers provide even circulation to eliminate 'dead spots'.

#### Low energy compressor(s)

Easily accessible low energy compressor for minimal running, maintenance and servicing costs. Integral alarm detects low pressure in air line.

#### Internal recirculation

Continues the treatment process to provide higher effluent quality whilst balancing flow over 24 hour period or periods of intermittent use.

#### Polylok tertiary filter

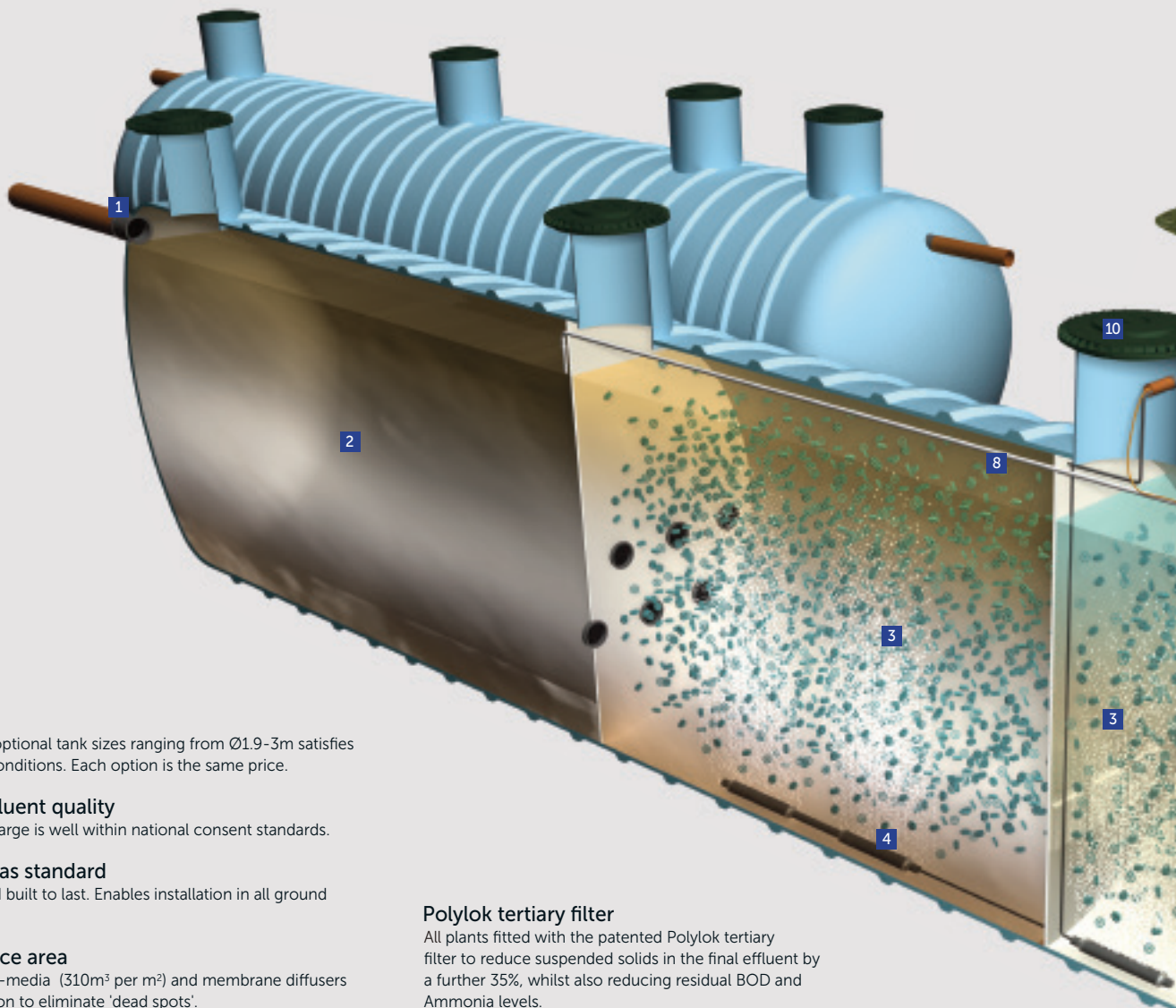
All plants fitted with the patented Polylok tertiary filter to reduce suspended solids in the final effluent by a further 35%, whilst also reducing residual BOD and Ammonia levels.

#### Carbon cover

600mm carbon cover provides significant strength and durability, and helps to reduce possible odours.

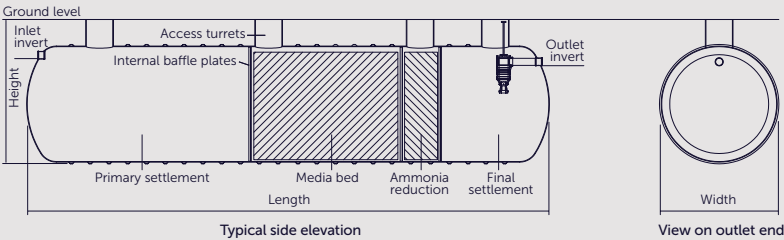
#### Optional extras

Optional extras include extensions for deep installations, pumped outlets for sites with adverse levels, sample chambers, Degreilleur trash barriers, phosphate reduction and UV treatment chambers.



# Specifications

## Ultra:Polylok tank examples



Model	Width Ø	Length	Height	Inlet		Outlet		Turret dia	Desludge Days
				Invert	Ø	Invert	Ø		
Up to									
55PE	1900	6540	2500	750	160	900	160	600	90
60PE	1900	7050	2500	750	160	900	160	600	90
75PE	2500	5730	3100	900	160	1000	160	600	90
100PE	2500	7080	3100	900	160	1000	160	600	90
125PE	2500	7980	3100	900	160	1000	160	600	75
150PE	2500	8640	3100	900	160	1000	160	600	60
175PE	2500	9930	3100	900	160	1000	160	600	60
200PE	2500	10200	3100	900	160	1000	160	600	45
225PE	2500	11360	3100	900	160	1000	160	600	45
250PE	2500	12530	3100	900	160	1000	160	600	45
275PE	3000	9060	3800	1100	160	1300	160	750	30
300PE	3000	9780	3800	1100	160	1300	160	750	30
350PE	3000	11220	3800	1100	160	1300	160	750	30
400PE	3000	12660	3800	1100	160	1300	160	750	30

Notes:

- > The dimensions given on this page are for guidance only
- > For precise tank sizes and configurations, please contact Marsh Industries
- > All dimensions in mm

### Key

- 1 Inlet
- 2 Primary chamber
- 3 Aeration chambers
- 4 Diffusers
- 5 Final (or 'humus') chamber
- 6 Polylok filter
- 7 Outlet
- 8 Recirculation to primary chamber
- 9 Turret guard
- 10 Carbon covers
- 11 High level alarm
- 12 Compressors
- 13 GRP kiosk

This is not a typical tank installation. Configuration and components are shown for illustration purposes only



# Agri:Silage Tanks

## Environmentally safe silage effluent storage

### Overview

Designed and manufactured in accordance with BS4994/ BSEN976, the Marsh range of silage tanks provides environmentally safe storage of silage effluent.

Available in capacities up to 100,000 litres in Ø2.5m and Ø3m diameters, the tanks are manufactured using GRP (virgin unfilled resin - no 'fillers' such as chalk) providing consistent wall thickness ensuring superior structural strength and durability. This also enables the tank to be significantly lighter for on-site handling/positioning and better suited to withstand greater hydrostatic pressures when in use.

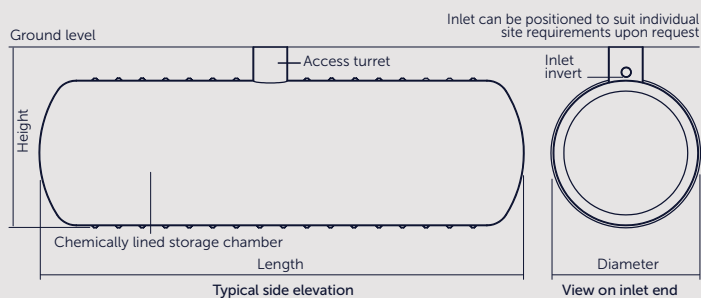
The tanks are supplied with a chemically resistant gel-coat that protects the fibres in the laminates and provides excellent water and chemical resistance. This inherent integrity allows Marsh to offer an unrivalled 50 year design life, backed by a 25 year structural guarantee.

### Guidance notes

- Reference should be made to DEFRA guidance notes 'The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations - UK' and gov.uk guidance 'Storing silage, slurry and agricultural fuel oil'

Industrial/commercial septic tanks and cesspools are available. Contact Marsh Industries for further details.

### Specifications



#### Ø2.5m tanks

Capacity Litres	Dia Ø	Length	Height	Inlet Invert	Turret size	No. of Turrets
20,000	2500	4500	3100	500	Ø600x600	1
25,000	2500	5500	3100	500	Ø600x600	1
30,000	2500	6500	3100	500	Ø600x600	1
35,000	2500	7550	3100	500	Ø600x600	1
40,000	2500	8600	3100	500	Ø600x600	2
45,000	2500	9600	3100	500	Ø600x600	2
50,000	2500	10600	3100	500	Ø600x600	2
55,000	2500	11600	3100	500	Ø600x600	2
60,000	2500	12600	3100	500	Ø600x600	2
65,000	2500	13650	3100	500	Ø600x600	2
70,000	2500	14700	3100	500	Ø600x600	2

#### Notes:

- > The dimensions given on this page are for guidance only
- > For precise tank sizes and turret configurations, please contact Marsh Industries
- > All dimensions in mm

### Benefits

- Available in capacities from 20,000 to 100,000 litres in Ø2.5 and Ø3m diameters
- Designed to meet latest UK and European standards
- Heavy duty shells enable installation in all ground conditions
- Variable invert depths and orientations to suit individual site conditions
- Optional high-level alarm available
- Guaranteed for 25 years with a design life of 50 years

#### Ø3m tanks

Capacity Litres	Dia Ø	Length	Height	Inlet Invert	Turret size	No. of Turrets
40,000	3000	5900	3600	500	Ø600x600	1
45,000	3000	6600	3600	500	Ø600x600	1
50,000	3000	7200	3600	500	Ø600x600	1
55,000	3000	7900	3600	500	Ø600x600	1
60,000	3000	8600	3600	500	Ø600x600	2
65,000	3000	9300	3600	500	Ø600x600	2
70,000	3000	10000	3600	500	Ø600x600	2
75,000	3000	10600	3600	500	Ø600x600	2
80,000	3000	11300	3600	500	Ø600x600	2
85,000	3000	11900	3600	500	Ø600x600	2
90,000	3000	12600	3600	500	Ø600x600	2
95,000	3000	13200	3600	500	Ø600x600	2
100,000	3000	13900	3600	500	Ø600x600	2

# Degrilleur™

Trash barrier for sewage treatment plants and pump chambers

## Overview

When non dissolvable objects are flushed into the sewer and then into a sewage treatment plant or pump station downstream, it can lead to blockages or worse - possible plant failure.

To combat this Marsh Industries has developed the 'Degrilleur' – a bar screen which prevents any unsuitable materials from entering the system.

The unit has no moving parts and requires no electrics, is available in two capacities, 2000 and 12,000 litres, and is suitable for domestic, commercial and industrial installations.

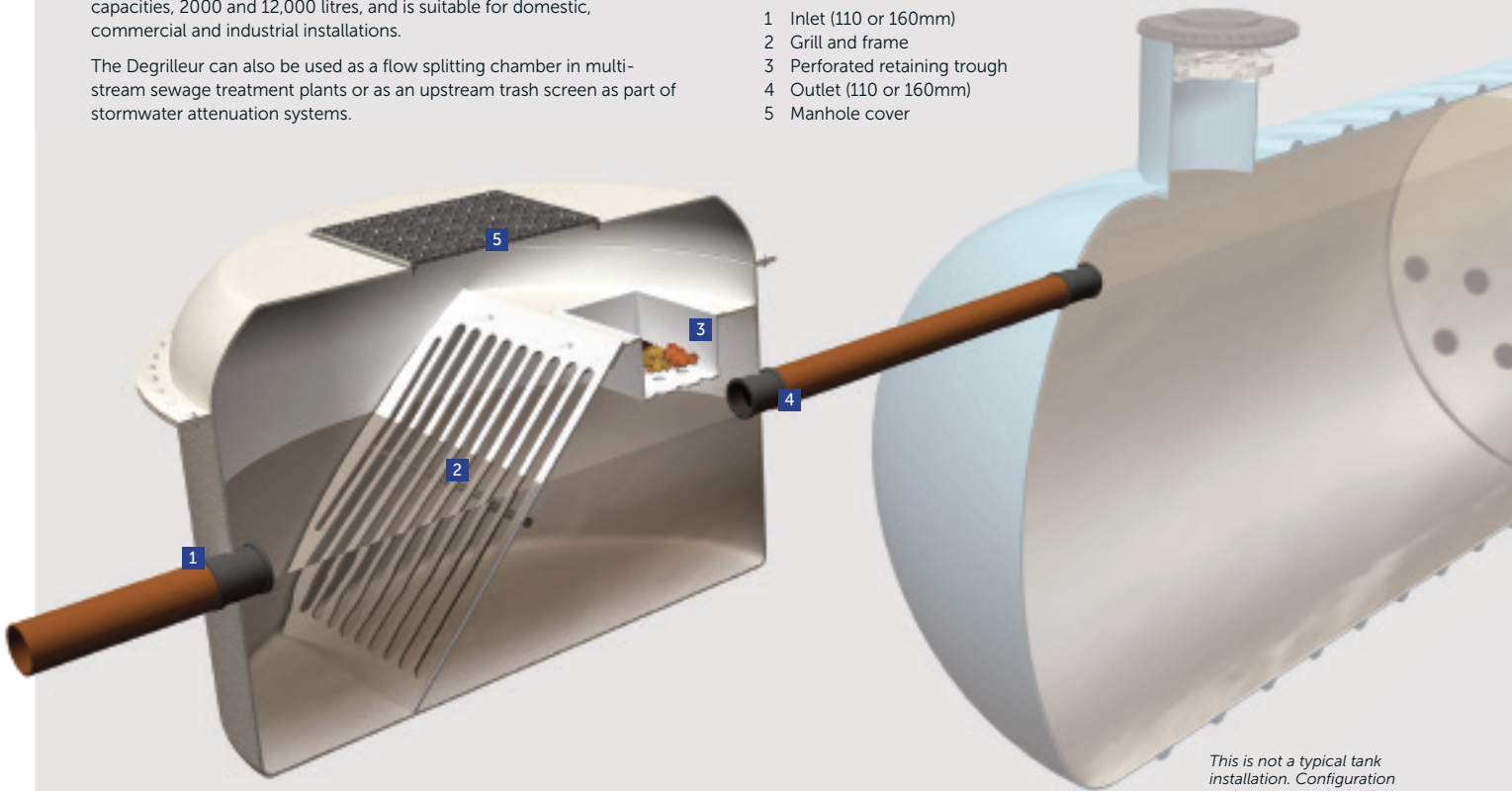
The Degrilleur can also be used as a flow splitting chamber in multi-stream sewage treatment plants or as an upstream trash screen as part of stormwater attenuation systems.

## Operating principle

The Marsh Degrilleur, positioned ahead of the system inlet, blocks the debris and forces it to rise to the top of the chamber where it is collected in a retaining trough for disposal.

### Key

- 1 Inlet (110 or 160mm)
- 2 Grill and frame
- 3 Perforated retaining trough
- 4 Outlet (110 or 160mm)
- 5 Manhole cover



*This is not a typical tank installation. Configuration and components are shown for illustration purposes only*

## Specifications

### Cylindrical Degrilleur

Model	Dia Ø	Height
MID-1	1100	1100
MID-2	1500	1500
MID-3	1700	1700

### Horizontal Degrilleur

Model	Dia Ø	Length
MID-4	1900	2950
MID-5	1900	5200

Notes:

- > The dimensions given on this page are for guidance only
- > For precise tank sizes and turret configurations, please contact Marsh Industries
- > All dimensions in mm



# Marsh GMS★ Grease traps

Innovative and reliable grease management systems



## Overview

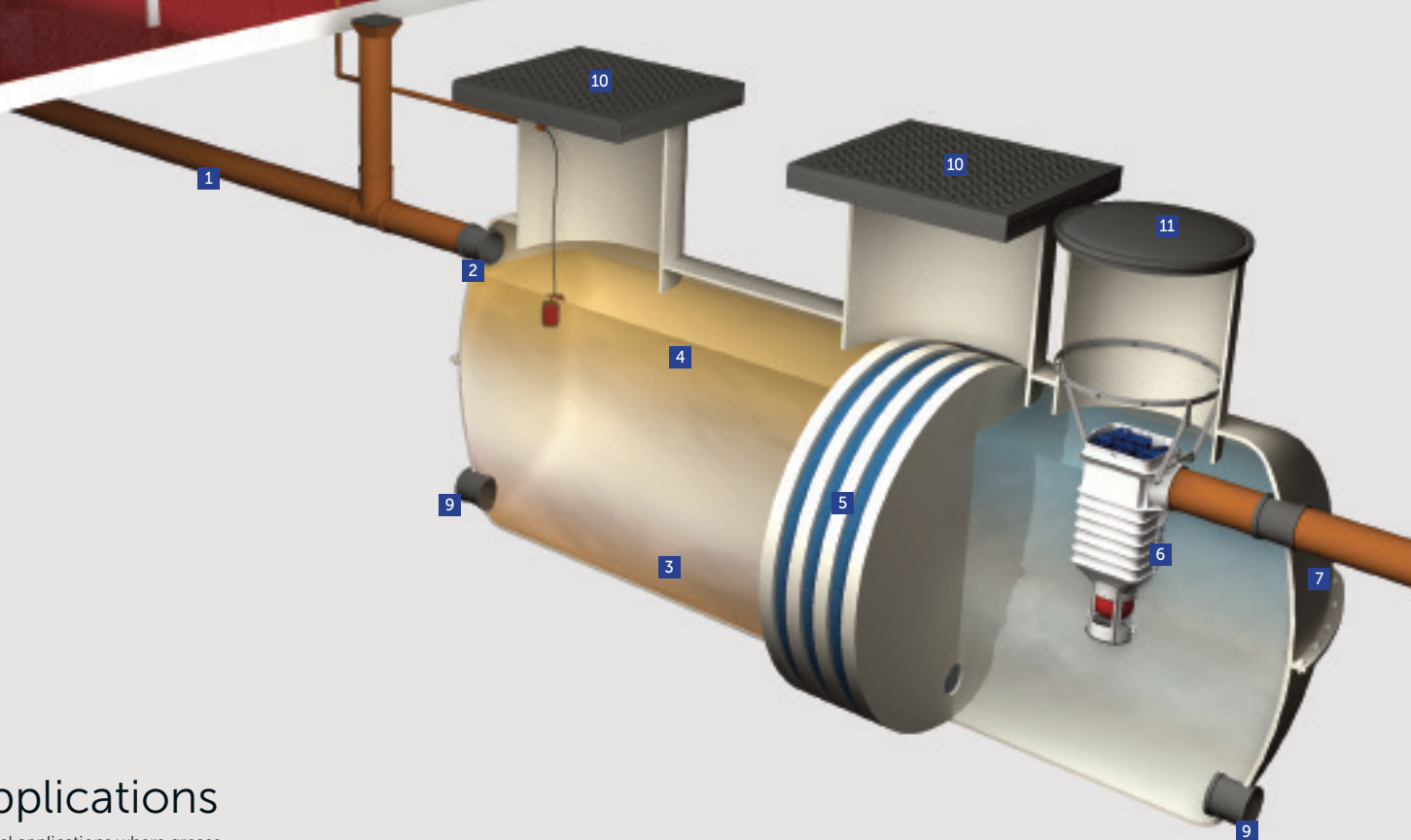
Available in capacities from 2800 to 20,000 litres, Marsh Industries' Grease Management System (GMS★) range of grease traps effectively prevents Fats, Oils and Grease (FOG) from entering the drainage network or sewage treatment plants.

### Testing and verification

Marsh Industries has reassessed the currently prescribed testing methods for grease traps and devised its own unique test rig and analysis at Loughborough University.

The rig, put to test for 12 months, addressed calls from the industry for clarity in testing procedures of grease trap technology. After completing trials, the new range of grease traps are the only products of its type that have been successfully tested using materials that match the FOG used in the food industry – as opposed to the traditional test method of using heating oils.

*A white paper, published by Marsh, titled 'A New way forward for Meaningful Testing of Grease Traps', reports on analysis from the tests carried out at Loughborough University and can be downloaded from [www.marshindustries.co.uk](http://www.marshindustries.co.uk)*



## 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

## Benefits

- Storage capacities ranging from 2800-20,000 litres
- Advanced coalescent filter system
- Bespoke design tailored to individual project specifications
- Adjustable turret and invert height
- Optional Polylok filter for further wastewater treatment
- Optional high level alarm

# Operating principle

Marsh GMS★ grease traps provides sufficient storage in its primary chamber allowing for adequate solidification of FOG molecule structures before passing through an advanced coalescing filtration system.

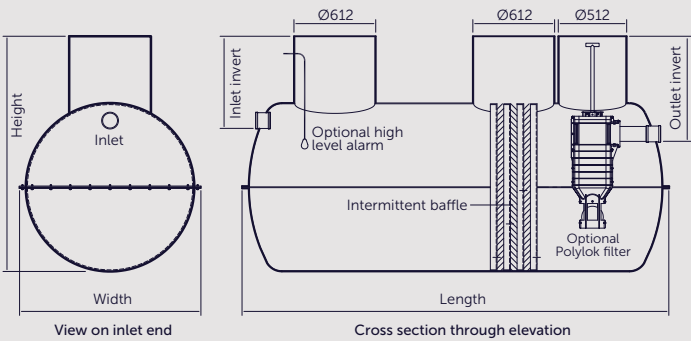
The coalescing filtration system contains three different grades of filter to prevent solids and waste passing into the final settlement chamber.

In larger units, an optional Ultra Polylok UV Filter is available which can provide further treatment to residual solids and can also destroy viruses, parasites and other pathogenic bacteria.

## Key

- 1 Wastewater pipe
- 2 Tank inlet
- 3 Solids retention
- 4 Fats, oils and grease (FOG) retention
- 5 Advanced coalescing filter
- 6 Polylok filter (optional)
- 7 Tank outlet
- 8 Mains sewer system
- 9 Additional desludge points (optional)
- 10 Heavy duty manhole cover
- 11 Outlet access
- 12 High level alarm (optional)

# Specifications



Model	Size Litres	Width	Length	Height	Inlet		Outlet	
					Invert	Ø	Invert	Ø
MG2800	2800	1250	3000	1600	685	110	800	110
MG3800	3800	1250	4000	1750	685	110	800	110
MG4500	4500	1600	2650	2100	685	110	800	110
MG6000	6000	1900	2950	2400	685	160	800	160
MG8000	8000	1900	3640	2400	685	160	800	160
MG10000	10000	1900	4200	2400	685	160	800	160
MG12000	12000	1900	5200	2400	685	160	800	160
MG14000	14000	1900	5840	2400	685	160	800	160
MG16000	16000	1900	6700	2400	685	160	800	160
MG18000	18000	1900	7500	2400	685	160	800	160
MG20000	20000	1900	8100	2400	685	160	800	160

Notes:  
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> For precise tank sizes and configurations, please contact Marsh Industries  
> All dimensions in mm



This is not a typical tank installation.  
Configuration and components are  
shown for illustration purposes only



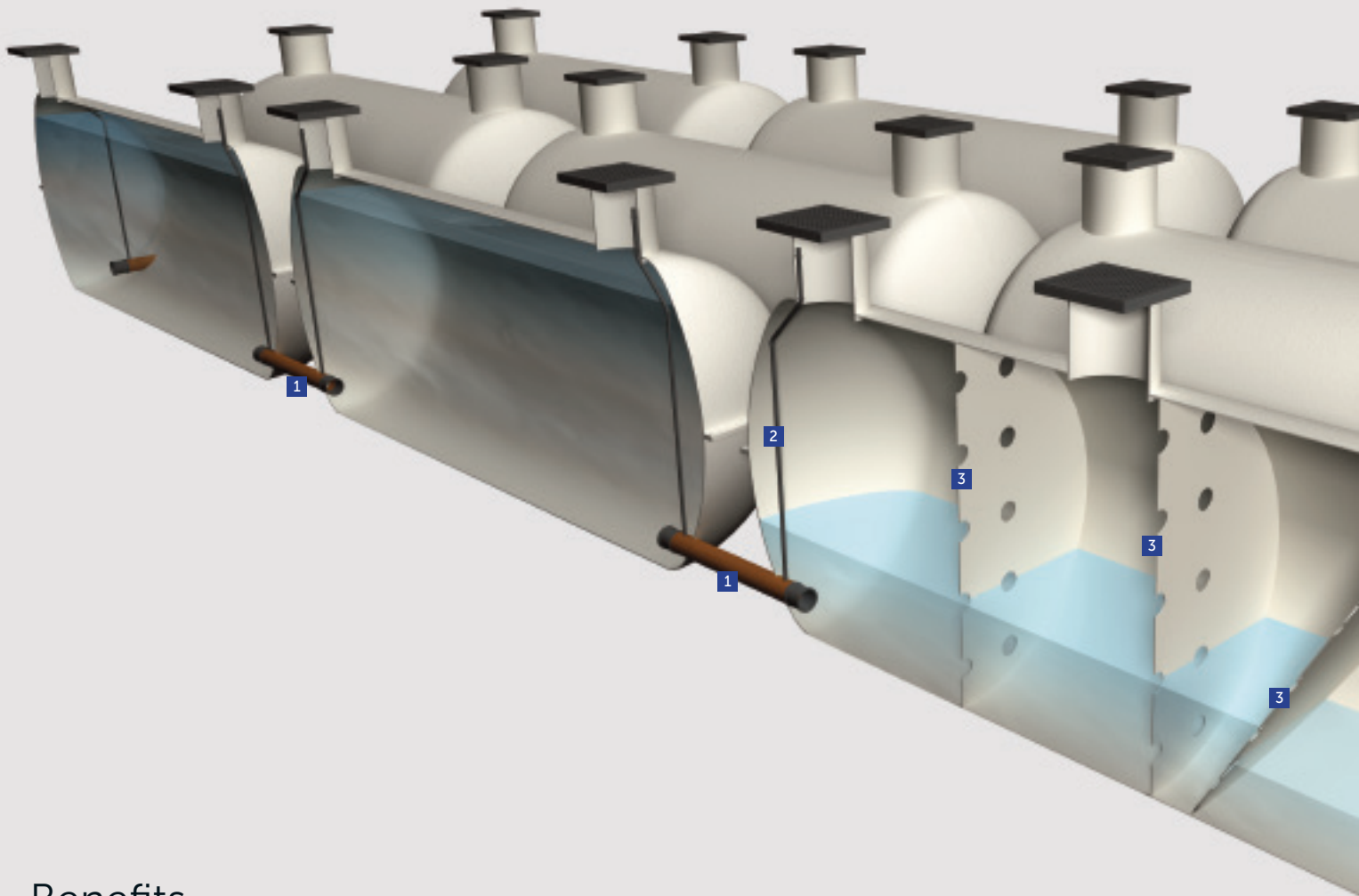
# Storm Dammer®

## Stormwater flow attenuation

### Overview

Available in capacities from 2800-110000 litres in multiple configurations with tank sizes ranging from Ø1.2m to Ø3m diameters, the Storm Dammer alleviates the risk of flooding and reduces pressure on drains/sewers by storing the excess flow of stormwater before controlled discharge downstream.

Greater capacity and ease of inspection and maintenance makes Storm Dammer the industry choice for developers, municipal planners and civil engineers.



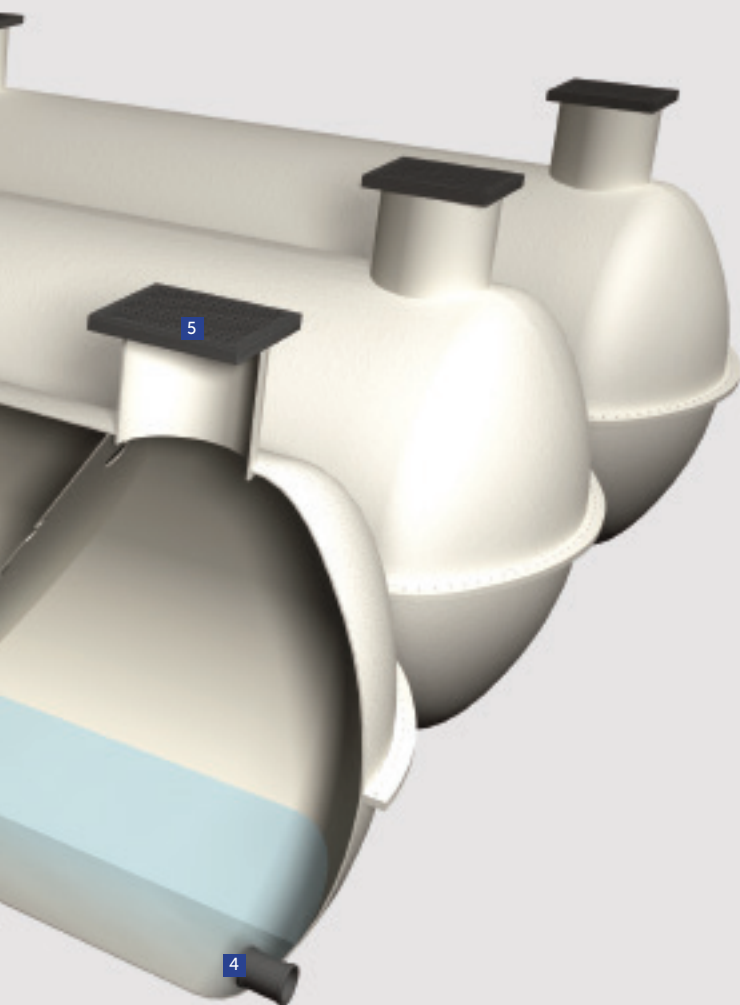
### Benefits

- Designed to meet latest UK and European standards
- Multiple tank configurations and inlet orientations to suit storage and site layout requirements
- Tank diameters range from Ø1.2 to Ø3m with length up to 20 metres
- Heavy duty shells manufactured from virgin unfilled resin provides superior structural strength and durability. This also enables the tank to be significantly lighter for on-site handling/positioning and better suited to withstand greater hydrostatic pressures when in use
- Tank design offers easy access for inspection, maintenance and cleaning when compared to inaccessible crate systems
- Systems can be fitted with flow control devices and orifice plates to regulate storage and discharge
- Easily accessible, low energy submersible pumps ensure minimal running, maintenance and servicing costs
- Guaranteed for 25 years with a design life of 50 years

### Key

- 1 Connecting pipework
- 2 Internal vent pipes
- 3 Flow control devices
- 4 Outlet
- 5 Access manways





## Fittings and accessories

### Orifice baffles

Utilising Marsh Industries' unique Gaia Storm Dammer program, in conjunction with the Micro Drainage Design program, the standard range of Storm Dammer tanks are designed using orifice baffles as the primary flow attenuation system.

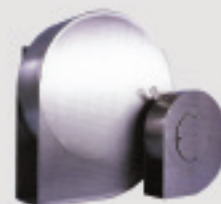
Precise calculations from the Gaia Storm Dammer program ensures that the correct type of orifice baffles are distributed throughout the system to deliver the optimum outflow required.



### Flood and storm control valves

Storm Dammer systems can be designed to include Vortex Storm Control units which can reduce out-flow on varying scales.

Pumps can also be fitted to upline chambers allowing stored water to be distributed to other chambers that may not be in the immediate area.



### Pumps

Marsh Industries works in partnership with major UK pump manufacturers to develop attenuation tanks and pump chambers that are designed to distribute water to the mains drainage network or to other off-site storage tanks. Pumps can be supplied as single, twin or multi-line installations in both single and three phase.



### AUTOadapt™ sump pump

Designed for a range of water and wastewater applications, the AUTOadapt pump removes the complexity of standard submersible pumps by combining all external sensors switches and cables from the pit within the pump itself. This simplifies installation and operation, and vastly increases reliability.



# Marsh Hydroil

Oil separators, wash-down separators and silt traps

# Oil separators

## Separation by flotation and settlement

Oil separators are designed to prevent oil and other hydrocarbons from entering the drainage system. They separate oil from water, and safely retain the oil until it is removed.

Oil cannot be treated easily and will therefore cause severe pollution if allowed to enter mains sewers or drainage fields. Statutory controls enforce strict regulations on the discharge of such pollutants.

Separators should be used in such applications as petrol stations, industrial yards and garages; or virtually anywhere that a risk of oil contamination exists.

Discharge requirements for oil separators may vary in different areas of the country and it is therefore essential to consult the appropriate environmental controlling authority prior to specifying an oil separator. If the discharge is to a public sewer then local Building Control, the Water Authorities and water companies should also be contacted.

## Separator types and principles of operation

### Classes

Separators are classed in two categories based on performance under standard test conditions.

**Class 1 separators** are designed to achieve a discharge concentration of less than 5mg/litre of oil. These separators are required for discharges to surface water drains and the water environment.

**Class 2 separators** are designed to achieve a discharge concentration of less than 100mg/litre of oil under standard test conditions. They are suitable for dealing with discharges where there is a lower quality requirement, such as discharges to the foul sewer.

Both classes can be produced as 'full retention', 'bypass' or 'forecourt' separators as explained below.

### Bypass separators

Bypass separators treat all flows from rainfall events of up to 6.5mm/hr. This covers over 99% of all rainfall events. Flows higher than 6.5mm/hr are designed to bypass the separator.

These separators are used in a 'low risk' environment where there is no requirement to provide full treatment for the flow; for example a car park where the risk of a significant spillage is small.

### Full retention separators

Full retention separators treat the full flow that is delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

These separators are used where there may be a 'high risk' of a significant fuel spillage, such as vehicle workshops

### Forecourt separators

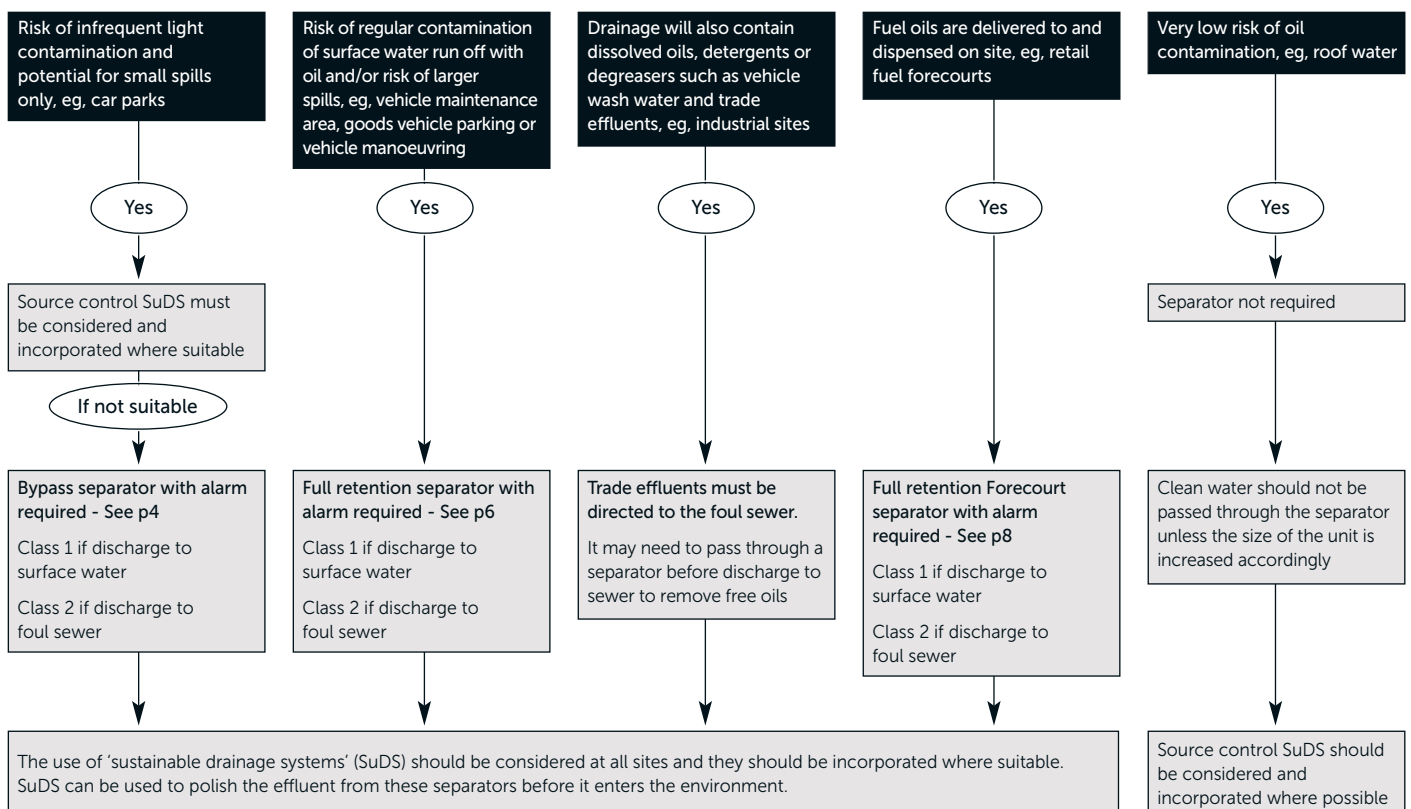
Forecourt separators are a type of full retention separator, however they are specifically designed to store the maximum spillage likely to occur on a petrol station forecourt.

These separators are manufactured to a specific size in order to retain the potential spillage from a single compartment of a road tanker – currently up to 7,600 litres in the UK.

### Wash-down separators and silt traps

It is a legal requirement to install a silt trap or wash-down separator on commercial sites, such as vehicle wash bays, where there is an environmental risk of contamination from dirt, brake dust, traffic film residue, cleaning agents, oil, etc.

## Choosing the right separator



# Bypass separators

For areas at 'low risk' of oil contamination

## Overview

Bypass separators are used in a 'low risk' environment where there is no requirement to provide full treatment for the flow; for example a car park where the risk of a significant spillage is small.

Designed and tested to BS EN858 parts 1&2, Marsh Hydroil bypass separators are manufactured from virgin unfilled resin offering exceptional durability, impact resistance and are guaranteed to be watertight and of uniform thickness. These combined properties ensure that the full range of separators stand up to the most rigorous conditions during their service life.

Internal working components, such as coalescing filters, weirs, oil skimmer plates, and their configurations offer the most modern and efficient oil/water separation capability available to the market today.

A wide choice of inlet and outlet positions are available on the units - detailed requirements should be provided at time of order (standard inlet and outlet positions will otherwise be fitted).

## Operating principle

Marsh Hydroil bypass separators are designed to treat 10% of peak flow.

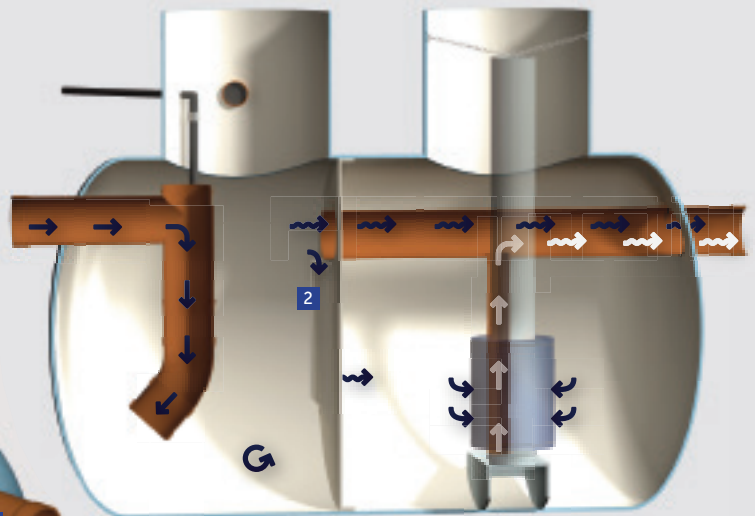
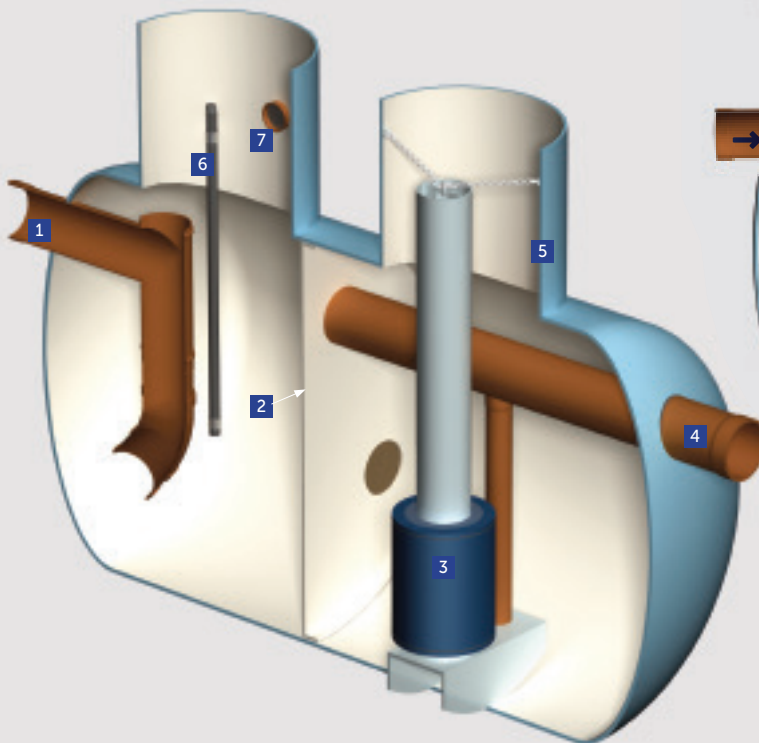
The drainage areas served by each separator are determined in accordance with both BS EN858 parts 1&2, but also with reference to a formula provided by the Environment Agency, where  $NSB=0.0018 \times A$  (catchment area in  $m^2$ ). Flows from higher rainfall rates are allowed to bypass the main separation chamber.

### Key

- 1 Inlet
- 2 Oil skimmer plate
- 3 Coalescer
- 4 Outlet
- 5 Access turret
- 6 Level alarm dip pipe
- 7 Air vent

### Flowpath

- ➡ Oil/water mixture  
➡ Water



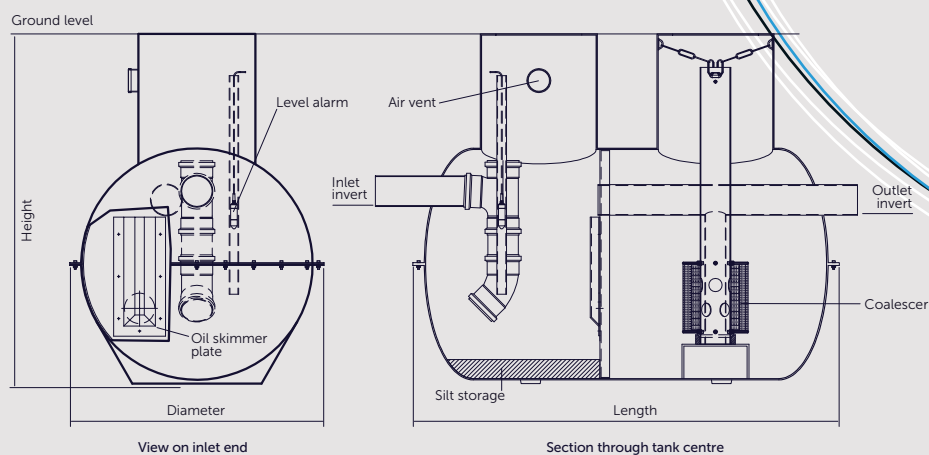
## Benefits

- Designed and tested to meet latest UK and European standards
- Corrosion resistant
- Tank shells guaranteed for 25 years with a design life of 50 years
- Heavy duty shells enable installation in all ground conditions
- Easy access turrets for maintenance and servicing (Turret guards optional)
- Various alarm types available (Required by EN858-1)
- Variable invert depths and inlet/outlet configurations to suit individual site conditions
- Vented turrets dissipate excessive fumes and vapours

## Typical applications

- Car parks
- Roadways
- Industrial estates
- SuDS

## Specifications



### Bypass separator range

Model	Max flow litre/sec	Drainage area m <sup>2</sup>	Silt storage litres	Oil storage litres	Diameter	Length	Height	Connection size	Inlet invert	Outlet invert
NSBP 3	3	1700	300	45	1200	2100	1840	160	900	950
NSBP 4.5	4.5	2550	450	67.5	1200	2100	1840	160	900	950
NSBP 6	6	3400	600	90	1200	2100	1840	160	900	950
NSBP 8	8	4530	800	120	1200	2110	1840	160	900	950
NSBP 10	10	5660	1000	150	1200	2760	1840	160	900	950
NSBP 15	15	8510	1500	225	1200	4030	1840	200	900	950
NSBP 18	18	9940	1800	270	1800	2380	2440	200	900	1000
NSBP 20	20	11370	2000	300	1800	2620	2440	200	900	1000
NSBP 25	25	14185	2500	375	1800	3180	2440	250	900	1000
NSBP 30	30	17000	3000	450	1800	3740	2440	250	900	1000
NSBP 40	40	22650	4000	600	1800	4860	2440	315	900	1000
NSBP 45	45	25325	4500	675	1800	5420	2440	315	900	1000
NSBP 50	50	28000	5000	750	1800	5980	2440	315	900	1000
NSBP 60	60	32333	6000	900	2500	4006	3140	315	900	1000
NSBP 70	70	36665	7000	1050	2500	4566	3140	315	900	1000
NSBP 75	75	41000	7500	1125	2500	4886	3140	315	900	1000
NSBP 80	80	45330	8000	1200	2500	5126	3140	315	900	1000
NSBP 100	100	56660	10000	1500	3000	4674	3640	315	900	1000
NSBP 125	125	70820	12500	1875	3000	5713	3640	400	900	1000

#### Notes:

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- > Number of access shafts will be built to suit site specifications and to maintain safe access for emptying
- > All dimensions in mm



# Full retention separators

For areas at 'high risk' of oil contamination

## Overview

Full retention separators are used where there may be a 'high risk' of a significant fuel spillage, such as vehicle workshops

Designed and tested to BS EN858 parts 1&2, Marsh Hydrooil full retention separators are manufactured from virgin unfilled resin offering exceptional durability, impact resistance and are guaranteed to be watertight and of uniform thickness. These combined properties ensure that the full range of separators stand up to the most rigorous conditions during their service life.

Internal working components, such as coalescing filters, automatic closure devices, weirs, oil skimmer plates, and their configurations offer the most modern and efficient oil/water separation capability available to the market today.

A wide choice of inlet and outlet positions are available on the units - detailed requirements should be provided at time of order (standard inlet and outlet positions will otherwise be fitted).

## Operating principle

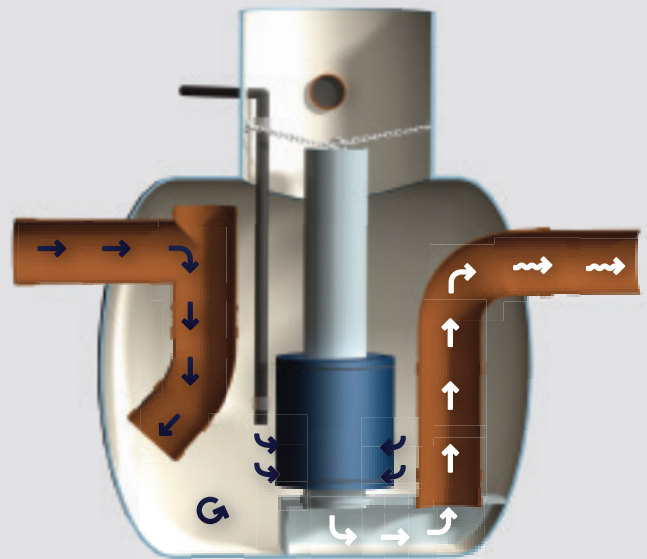
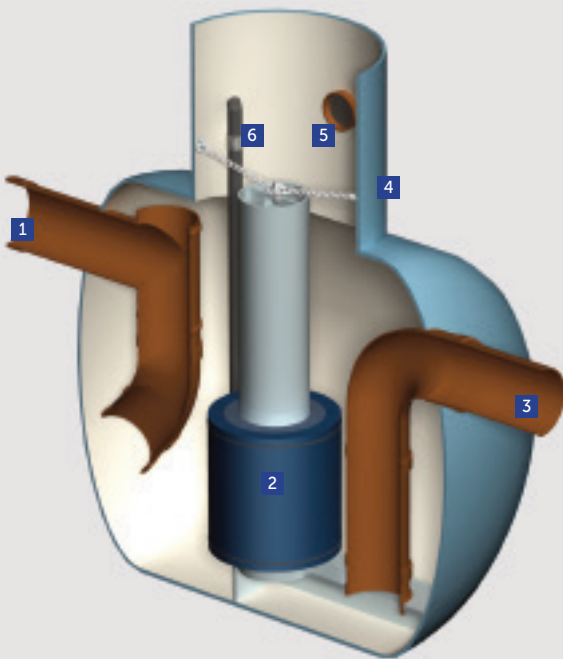
Marsh Hydrooil full-retention separators treat the full flow that is delivered by the drainage system, which is normally equivalent to the flow generated by a rainfall intensity of 65mm/hr.

### Key

- 1 Inlet
- 2 Coalescer
- 3 Outlet
- 4 Access turret
- 5 Air vent
- 6 Level alarm dip pipe

### Flowpath

- ➡ Oil/water mixture  
➡ Water



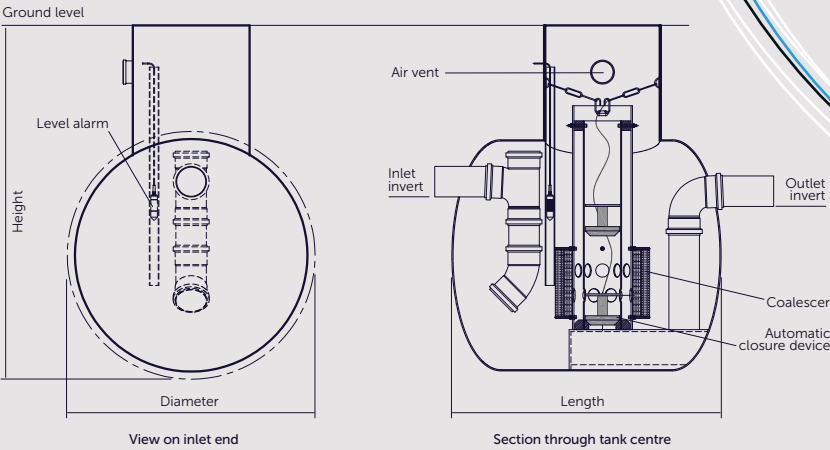
## Benefits

- Designed and tested to meet latest UK and European standards
- Corrosion resistant
- Tank shells guaranteed for 25 years with a design life of 50 years
- Heavy duty shells enable installation in all ground conditions
- Easy access turrets for maintenance and servicing (Turret guards optional)
- Various alarm types available (Required by EN858-1)
- Variable invert depths and inlet/outlet configurations to suit individual site conditions
- Vented turrets dissipate excessive fumes and vapours

## Typical applications

- Vehicle workshops
- Refuel facilities
- Fuel storage sites

# Specifications



## Full retention separator range

Model	Max flow litre/sec	Drainage area m <sup>2</sup>	Silt storage litres	Oil storage litres	Diameter	Length	Height	Connection size	Inlet invert	Outlet invert
NSFR 3	3	170	300	30	1200	1400	1840	160	900	950
NSFR 4.5	4.5	255	450	40	1200	1700	1840	160	900	950
NSFR 6	6	340	600	60	1200	2400	1840	160	900	950
NSFR 8	8	453	800	80	1200	3200	1840	160	900	950
NSFR 10	10	566	1000	100	1200	3500	1840	160	900	950
NSFR 15	15	851	1500	150	1800	3600	2440	200	900	1000
NSFR 20	20	1137	2000	200	1800	4000	2440	200	900	1000
NSFR 30	30	1700	3000	300	1800	4800	2440	250	900	1000
NSFR 40	40	2265	4000	400	1800	6200	2440	315	900	1000
NSFR 50	50	2800	5000	500	1800	7500	2440	315	900	1000
NSFR 60	60	3233	6000	600	2500	5200	3140	315	900	1000
NSFR 65	65	3670	6500	650	2500	5600	3140	315	900	1000
NSFR 70	70	4318	7000	700	2500	6000	3140	315	900	1000
NSFR 80	80	4533	8000	800	2500	6600	3140	315	900	1000
NSFR 100	100	5666	10000	1000	2500	8600	3140	315	900	1000
NSFR 125	125	7082	12500	1250	3000	7200	3640	400	900	1000
NSFR 150	125	8500	12500	1500	3000	8400	3640	450	900	1000

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  - > Number of access shafts will be built to suit site specifications and to maintain safe access for emptying
  - > All dimensions in mm

# Forecourt separators

For areas at 'significant risk' of oil contamination

## Overview

Designed and tested to BS EN858 parts 1&2, Marsh Hydroil forecourt separators are manufactured from virgin unfilled resin offering exceptional durability, impact resistance and are guaranteed to be watertight and of uniform thickness. These combined properties ensure that the full range of separators stand up to the most rigorous conditions during their service life.

Internal working components, such as coalescing filters, weirs, oil skimmer plates, and their configurations offer the most modern and efficient oil/water separation capability available to the market today.

A wide choice of inlet and outlet positions are available on the units - detailed requirements should be provided at time of order (standard inlet and outlet positions will otherwise be fitted).

## Operating principle

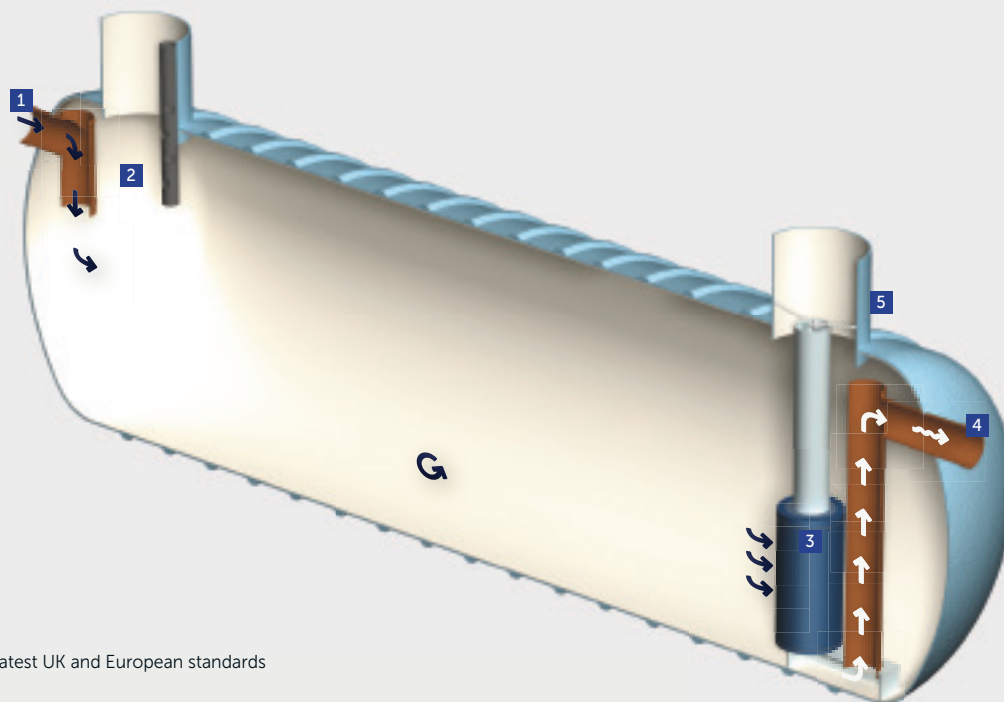
Marsh Hydroil forecourt separators are manufactured to a specific size in order to retain the potential spillage from a single compartment of a road tanker – currently up to 7,600 litres in the UK.

### Key

- 1 Inlet
- 2 Oil level alarm (in 3" pipe)
- 3 Coalescer
- 4 Outlet
- 5 Access turrets

### Flowpath

- ➔ Oil/water mixture  
➔ Water



## Benefits

- Designed and tested to meet latest UK and European standards
- Corrosion resistant
- Tank shells guaranteed for 25 years with a design life of 50 years
- Heavy duty shells enable installation in all ground conditions
- Easy access turrets for maintenance and servicing (Turret guards optional)
- Various alarm types available (Required by EN858-1)
- Variable invert depths and inlet/outlet configurations to suit individual site conditions
- Vented turrets dissipate excessive fumes and vapours

## Typical applications

- Petrol stations
- Refuel facilities
- Fuel storage sites

## Forecourt separator range

Model	Capacity litres	Diameter	Length	Height	Connection size	Inlet invert	Outlet invert
Class 1 C	10000	1800	4200	2200	160	700	800
Class 2 C	10000	1800	4200	2200	160	700	800
Class 1 PS	10000	1800	4200	2200	160	700	800
Class 2 PS	10000	1800	4200	2200	160	700	800

### Notes:

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- > All dimensions in mm

Illustrations shown for visual reference only

# Wash-down separators / silt traps

Pollution prevention

## Wash-down separators

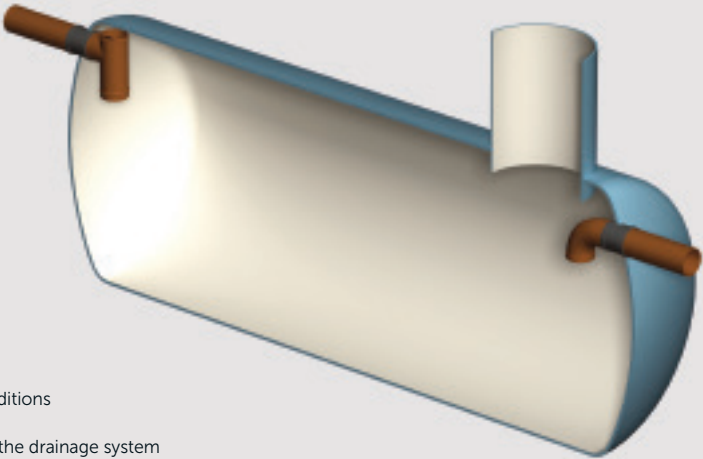
Available in capacities from 2000-20,000 litres, Marsh wash-down separators safely remove silt and debris from vehicle wash-down facilities.

These units are primarily used on car wash bays, pressure wash facilities or other cleaning facilities where the effluent must be discharged to the foul water drainage system.

It is a legal requirement to install a silt trap or wash-down separator on commercial sites, such as vehicle wash bays, where there is an environmental risk of contamination from dirt, brake dust, traffic film residue, cleaning agents, oil, etc. In all cases, you should contact your local building control or environmental agency for specific site requirements.

### Benefits

- Heavy duty shells enable installation in all ground conditions
- Tank shells guaranteed for 25 years with a design life of 50 years
- Variable invert depths and inlet/outlet configurations to suit individual site conditions
- Easy access turrets for maintenance and servicing (Turret guards optional)
- Optional Polylok filter (illustrated) can further reduce pollutants from entering the drainage system
- Various alarm types available (Required by EN858-1)
- Corrosion resistant

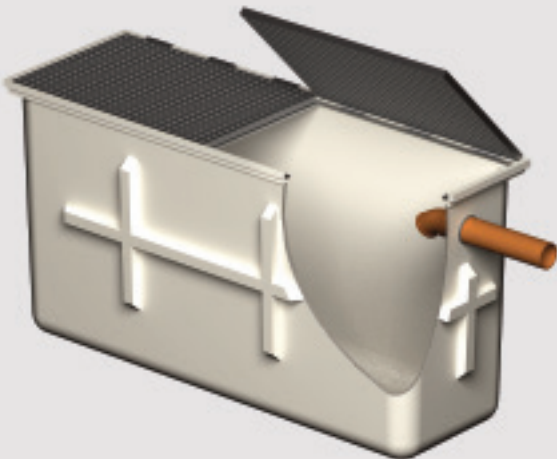


### Wash-down separator range

Model	Capacity litres	Diameter	Length	Height	Connection size	Inlet invert	Outlet invert
WD2800	2800	1250	3000	1750	110	700	750
WD3800	3800	1250	4000	1750	110	700	750
WD4500	4500	1600	2650	2100	110	700	750
WD6000	6000	1800	2950	2300	110	700	750
WD8000	8000	1800	3600	2300	160	700	750
WD10000	10000	1800	4200	2300	160	700	750
WD12000	12000	1800	5000	2300	160	700	750
WD15000	15000	2500	3100	3000	160	700	750
WD18000	18000	2500	4100	3000	160	700	750
WD20000	20000	2500	4500	3000	160	700	750

Notes:

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- > All dimensions in mm



## Silt traps

With a capacity of 1050 litres, Marsh silt traps provide effective storage of silt and debris from vehicle wash-down facilities.

Positioned ahead of an oil separator, the silt trap gathers and stores silt and sediment, and prevents it from entering the oil separator system.

### Benefits

- Heavy duty body enables installation in all ground conditions
- Hinged, galvanised steel grating provides structural integrity and easy emptying
- Tank body guaranteed for 25 years with a design life of 50 years

### Silt trap

Model	Capacity litres	Length	Width	Height	Connection size	Outlet invert
CST1	1050	2110	720	1140	110mm	315

# Alarm systems

## For oil separators, wash-down units and silt traps

Oil separator alarms monitor the level of liquid in separator units. An alarm signal is generated when there is an excessive level of oil, liquid or silt, or when the unit requires emptying.

An oil separator alarm is required on all separators to prevent hydrocarbons from entering the drainage system, and to ensure safe and economic operation of the unit.

Marsh Industries can supply various types of oil level, silt level and high level alarms, as well as bespoke options as required.

All alarms supplied by Marsh comply with EN858 parts 1&2, provide explosion protection and are ATEX approved.

### Mains alarm

Suitable for sites where mains supply is available.

- Alert: Beacon or SMS text message (optional)
- High quality oil probe with 5m cable
- Probe range 200 metres max (dependent on cable style)
- 240V control panel
- IP65 ABS enclosure
- Supplied with junction box



### Battery alarm

Battery alarms are suitable for sites where mains supply is not readily available or for retrofitting.

- Alert: Beacon or SMS text message (optional)
- Probe range: 200 metres max (dependent on cable style)
- Powered by 4x1.5V alkaline D cell batteries
- IP65 ABS enclosure
- Manual probe status check



### Solar alarm

Suitable for remote locations and where mains power is unavailable.

- Alert: Beacon or SMS text message (optional)
- High quality oil probe with 5m cable
- Intuitive control panel
- Supplied with battery plus backup battery
- Supplied with clean contact relay
- Alarm stand rotates 360 degrees



For advice and guidance on choosing the right alarm for your site please contact Marsh Industries on +44 (0)1933 654582 or email [separators@marshindustries.co.uk](mailto:separators@marshindustries.co.uk)





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