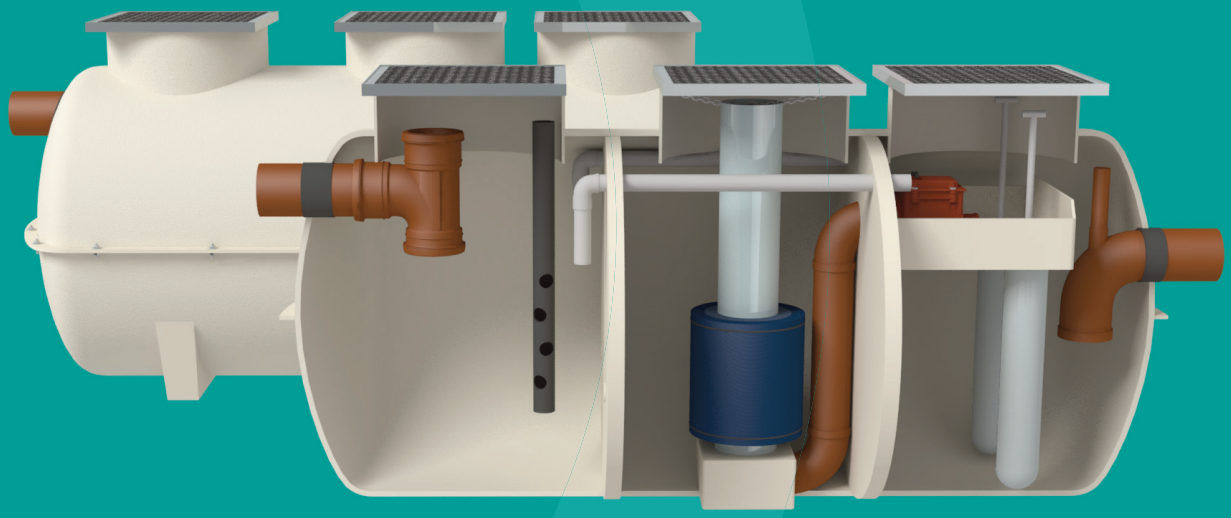
SuDS SAFE SEPARATORS

MI/OS2025

OIL SEPARATORS

ENGINEERED FOR EN 858 COMPLIANCE AND SUDS SAFE COMPATIBILITY



MARSH

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Contents

Appendices

1 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 any site where 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.

Note: For larger sites, more than one type of oil separator may be required.

Separator types and principles of operation

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 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.

2 BS EN 858-1 standards in summary

BS EN 858-1 standards pertain to separator systems used for separating hydrocarbons of mineral origin from wastewater. These systems, known as oil separators, are specifically designed to separate light liquids like oil and petrol. They work by leveraging the difference in density between water and light liquids, causing the lighter phase to rise and be collected from the water surface. Furthermore, coalescence separators offer an effective method where fine oil droplets adhere to a specialised filter insert, gradually forming an oil film. Once a certain thickness is reached, the oil film detaches, coalesces into larger drops, and rises through the water for separation.

Class	Max. permissible content of residual oil (mh/l)	Separator Technology
1 – Discharge to surface water	5	Coalescer
2 – Discharge to foul sewer	100	Gravity

Marsh Industries' range of Hydroil and Marator oil separators are compliant with the above targets.

Environmental concerns surrounding current standards

Current EN standard

The European Standard, BS EN 858 parts 1&2, was introduced in 2002 to normalise design and regulate testing of products across Europe. This standard settled on a two-tier quality level – class 1 and class 2.

Class 1 – designed to achieve a discharge concentration of less than 5mg/ltr of oil in the discharge
Class 2 – designed to achieve a discharge concentration of less than 100mg/ltr of oil in the discharge

Once testing is complete and approval achieved, manufacturers are free to bring their products to market.

The effects of current standards

A good starting point for any product is to set out relevant standards and levels of quality, both in product build and product performance. However, since the introduction of BS EN 858 in 2002, product development in gravity oil/liquid separation has remained static.

Manufacturers are only required to meet the testing standards to sell product. There has been no natural drive to improve product performance.

The current class 1 standard of less than 5mg/ltr of light liquid is only determined by test conditions. Our experience in this field tells us that this standard is rarely met once a product is installed.

The reality of current standards

With the current level of 5mg/ltr for a Class 1 discharge we ask; are Class 1 separators the very best that manufacturers can offer?

Studies have shown that most hydrocarbon pollutants entering the water system stems from urban developments. The table below shows the toxic effects of contaminants on humans and aquatic life.

Contaminant	Potential effect on humans	Recommended criteria	
		Drinking water	Aquatic life
Lead	Nephritis	50 mg/litre	0.01 LC50
Zinc	Metallic taste	5 mg/litre	0.01 LC50
Copper	Liver damage	1 mg/litre	0.01 LC50

(Source: Krenkel and Novotny, 1980)

Leaving aside the toxic effects of contaminants on human and aquatic life, when a hydrocarbon molecule spreads to one molecule thick and given enough surface area to spread, five litres of oil would be more than enough to contaminate five football pitches.

In addition, most hydrocarbon molecules are attached to silt particles; where Stokes law proves that these particles will sink rather than float as conventional separators require.

When mixed with other elements in real life scenarios, such as glycol, standard gravity separators become less efficient at contaminate removal.

In our view, the current testing standards covering products within the gravity separator market are outmoded and failing to protect the environment as they should. They do not reflect or address any 'real-life' scenario where hydrocarbon pollution is prevalent.

The solution

The solution to alleviate any environmental concerns is the Marsh:Marator, owing to its outstanding effluent treatment and discharge quality.

3 SuDS Safe in summary

"SuDS Safe" refers to the concept of Sustainable Drainage Systems (SuDS) that are designed and implemented to effectively manage and mitigate the impact of surface water runoff in a sustainable and environmentally responsible manner.

SuDS aim to mimic natural water management processes by allowing rainwater to be absorbed, filtered, and stored naturally, rather than quickly channelled away through conventional drainage systems. A development or area that is "SuDS Safe" ensures that its drainage infrastructure follows these principles, helping prevent flooding, reducing pollution, and supporting the overall health of the local ecosystem.

4 Mitigation indices

As the world focuses on green and environmentally friendly solutions, Marsh has examined how effective their separators are when incorporating them into sustainable drainage schemes.

Marsh:Hydroil range


PIA

The company tested the Hydroil separator range for total suspended solids and metal mitigation indices in line with industry-approved procedures at PIA, the notified test house in Aachen, Germany. With the same approach being applied to the first 10% of flow to enter their Bypass separators. This is in addition to an existing test procedure, whereby the Hydroil has already achieved EN858-1 certification for light liquid separators.

Combining these two test sets together and applying the simple index approach to proprietary/manufactured EN858 devices, the Hydroil separator range can achieve the following mitigation indices:

Total Suspended Solids (TSS)	0.84
Metals	0.63
Hydrocarbons	0.98

These results provide user confidence that the testing of this range is beyond reproach and cements the products as the complete surface water treatment solution for SuDS schemes.

Marsh:Marator range

The Marsh Marator is a class 1 high-performance full retention oil separator for sites where the 'industry standard' is just not good enough.

The Marator takes advantage of nanofiltration technology to produce discharge that is 50 times better than any current separator available on the market today; that is less than 0.1mg/ltr – the standard only requires less than 5mg/ltr for a 'class 1 discharge'.

Testing was analysed for hydrocarbon content using infrared spectroscopy at GEOTAIX UMWELTTECHNOLOGIE GmbHA.

During the sampling period, five samples of 500ml were taken via the sampling point. The quality of discharge from the Marator exceeded the measurable level of the test equipment not to mention the current EN standard.

Test results for the NS6 model:

Sample	Effluent result GC in mg/litre (Industry standard <5mg/litre)
NS 6-1	< 0.1
NS 6-2	< 0.1
NS 6-3	< 0.1
NS 6-4	< 0.1
NS 6-5	< 0.1
NS 6-6	< 0.1
NS 6-7	< 0.1
Average	< 0.1

5 Structural integrity

40% Stronger GRP Material

Marsh Industries places a significant emphasis on the durability and reliability of its products, as evidenced by the meticulous assessment of structural integrity. In line with the testing protocol outlined in ENISO 179-1/1eA: 2010-11, comprehensive evaluations were conducted to gauge the robustness of Marsh Industries' Glass Reinforced Plastic (GRP) materials in comparison to similar materials used by competing manufacturers.

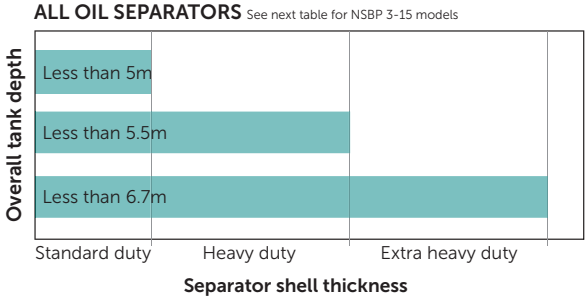
To establish a comprehensive benchmark, three distinct material samples were subjected to rigorous impact testing. These samples included Marsh GRP material in its original form (consisting of virgin unfilled resin), a variant incorporating calcium fillers, and another variant enriched with sand filler. The testing process involved analysing 12 samples of each material, all measuring 80x10x5mm. The pendulum energy utilized for impact assessment was set at 15J, with an accompanying impact velocity of 3.8m/s.

The findings were resoundingly in favour of Marsh Industries' GRP material, showcasing an impressive 40% increase in strength when compared to the other materials under scrutiny. This outcome underscores the superior quality and structural resilience inherent in Marsh's GRP material.

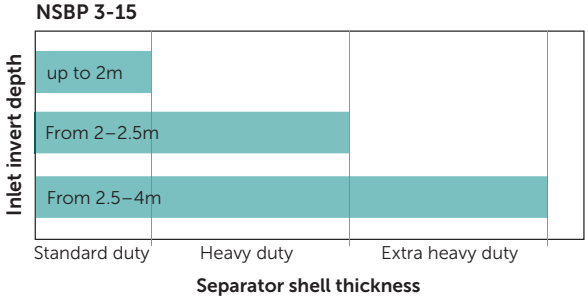
Shell duties

The following charts categorise oil separator tanks into their duties based on their installation depths (or inlet depths), providing a clear representation of the shell thickness classification for tank structural integrity.

ALL OIL SEPARATORS See next table for NSBP 3-15 models



NSBP 3-15



6 Material fire safety


PERFORMANCE RESULTS

Marsh Industries upholds stringent standards in product safety and adherence to regulations, as demonstrated by its material fire resistance testing. The focus of this evaluation was to ascertain the ignitability of products when exposed to direct flame impingement. Rigorous testing procedures were carried out to ensure compliance with EN ISO 11925-2:2010 standard.

The testing regimen encompassed practical scenarios designed to gauge the material's response to flame exposure. Marsh Industries' GRP material successfully passed all aspects of these fire resistance tests, achieving EN ISO 11925-2:2010 standard.

7 Oil separator sizing

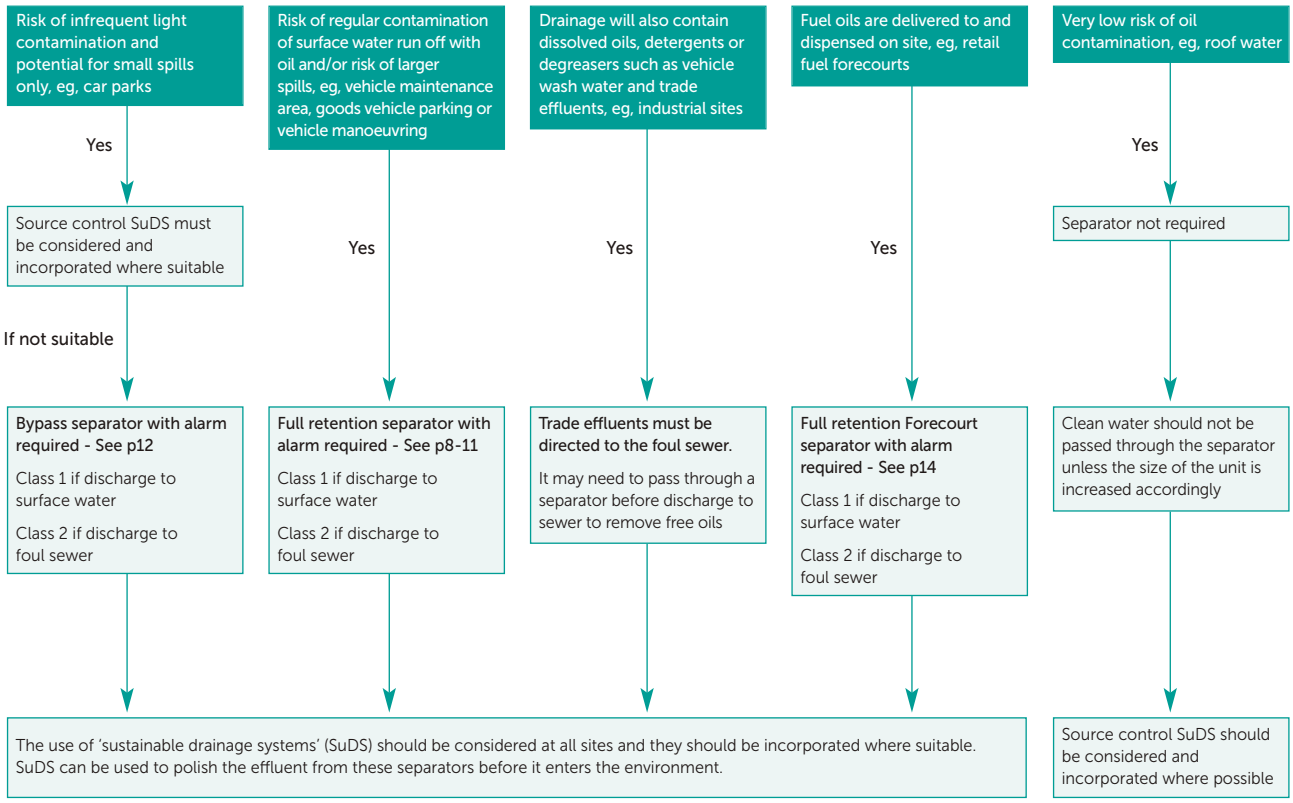
The most reliable approach to determining the appropriate size for an oil separator in the UK is outlined in British Standard BS EN 858-2:2003. This standard presents an equation NS = (Qr + Fx × Qs) Fd, which accounts for various factors such as the maximum flow rates of rainwater and trade effluent, the density of oil, and potential hindrances to effective separation like detergents.

To execute this calculation effectively, it's crucial to conduct a site-specific risk assessment in the local area. This assessment aids in identifying activities and potential risks within the catchment area. Moreover, a drainage plan is essential to ascertain the peak flow rate that the system might encounter.

Note: NS represents the nominal size of the separator. Qr stands for the maximum flow rate of rainwater, measured in liters per second (l/s), Qs denotes the maximum flow rate of wastewater, also in liters per second (l/s), and Fd represents the density factor for the relevant light liquid.

8 Choosing the right separator

When selecting the appropriate oil separator in the UK, adherence to British Standard BS EN 858-2:2003 is essential. This standard offers a reliable method for determining separator dimensions, considering factors such as rainwater and wastewater flow rates, oil density, and potential contaminants. Proper assessment and planning are vital for effective implementation.



9 Marsh:Marator full retention oil separator

High performance systems for sites where the "industry standard" is just not good enough

Marsh Industries has developed an innovative separator system that breaks the constraints of the current standards; the 'Marsh:Marator'.

The Marator takes advantage of nanofiltration technology to produce discharge that is 50 times better than any current separator available on the market today; that is less than 0.1mg/ltr – the standard only requires less than 5mg/ltr for a 'class 1 discharge'.

Testing was analysed for hydrocarbon content using infrared spectroscopy at GEOTAIX UMWELTTECHNOLOGIE GmbHA.

During the sampling period, five samples of 500ml were taken via the sampling point. The quality of discharge from the Marator exceeded the measureable level of the test equipment not to mention the current EN standard.

Sample	Effluent result GC (mg/l)
NS 6-1	< 0.1
NS 6-2	< 0.1
NS 6-3	< 0.1
NS 6-4	< 0.1
NS 6-5	< 0.1
NS 6-6	< 0.1
NS 6-7	< 0.1
Average	< 0.1

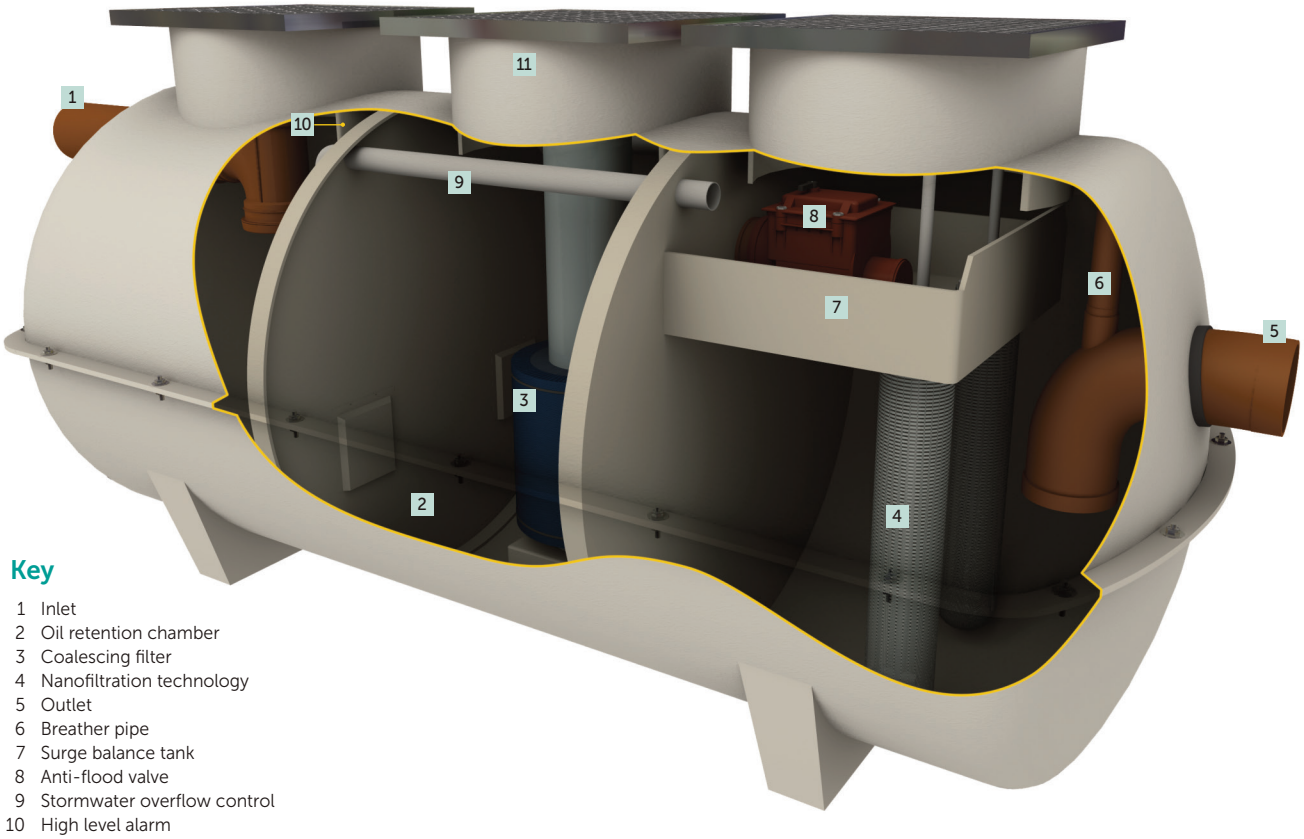
(Industry standard is <5mg/litre)

System 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 can dissipate excessive fumes and vapours

System applications

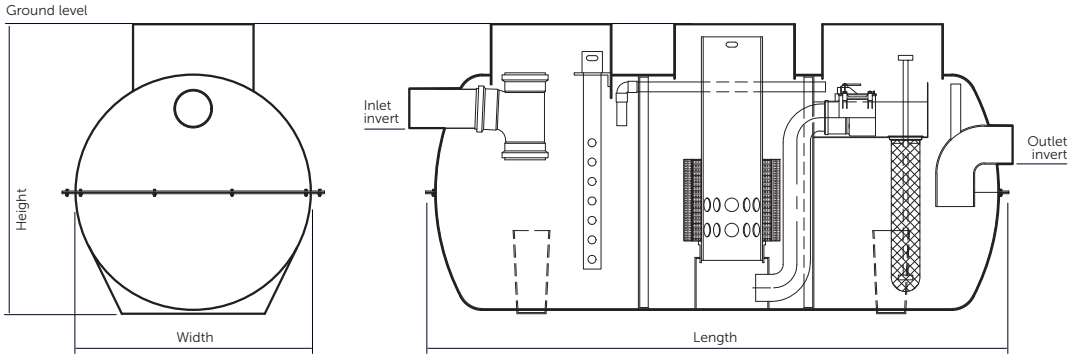
- ✓ Car parks
- ✓ Roadways
- ✓ Industrial estates
- ✓ Vehicle workshops
- ✓ Refuel facilities
- ✓ Fuel storage sites



Key

1 Inlet
2 Oil retention chamber
3 Coalescing filter
4 Nanofiltration technology
5 Outlet
6 Breather pipe
7 Surge balance tank
8 Anti-flood valve
9 Stormwater overflow control
10 High level alarm
11 Access turrets

Specifications



View on inlet end

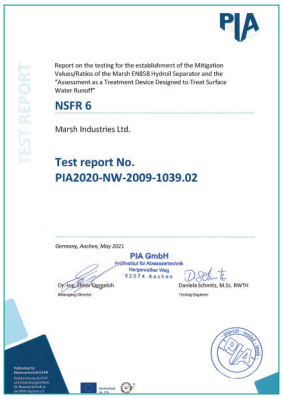
Section through tank centre

Model	Max flow litre/sec	Drainage area m²	Silt storage litres	Oil storage litres	Diameter +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Inlet invert	Outlet invert
Marator 6	6	340	600	60	1250	3040	1862	200	900	1100
Marator 10	10	566	1000	100	1250	4040	1862	200	900	1100
Marator 15	15	851	1500	150	1812	4240	2360	315	900	1100
Marator 20	20	1137	2000	200	1812	4240	2360	315	900	1100

Notes:
> *Larger systems are available, please contact Marsh Industries*
> *The dimensions given on this page are for guidance only*
> *For precise tank sizes and configurations, please contact Marsh Industries*
> *Number of access shafts will be built to suit site specifications and to maintain safe access for emptying*
> *All dimensions in mm*

Certification (See pages 20-25)


PERFORMANCE RESULTS


NSFR 6

Marsh Industries Ltd.

Test report No.
PIA2020-NW-2009-1039.02

10 Marsh:Hydroil full retention oil separator

For areas at 'high risk' of oil contamination

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

Mitigation indices	
TSS	0.84
Metalps	0.63
Hydrocarbons	0.98

Designed and tested to BS EN858 parts 1&2, Marsh Hydroil 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).

System benefits

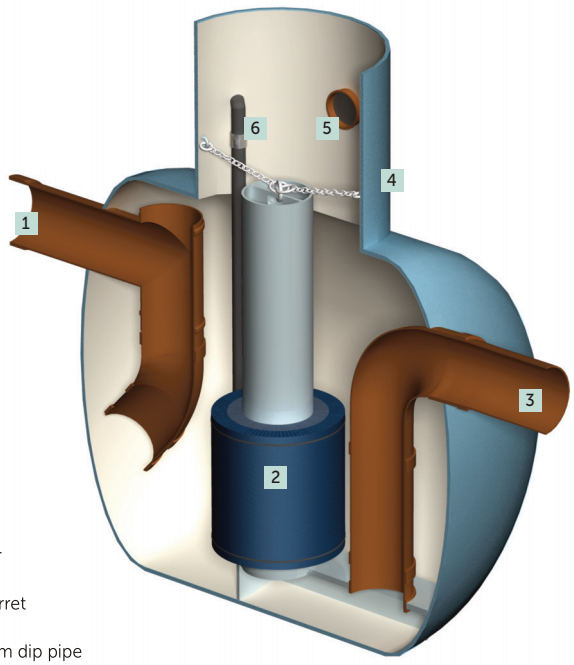
- ✓ Designed and tested to meet latest UK and European standards
- ✓ Corrosion resistant
- ✓ Tank shells guaranteed for 25 years with a design life of 50 years
- ✓ Heavy duty shells enable installation in all ground conditions
- ✓ Easy access turrets for maintenance and servicing (Turret guards optional)
- ✓ 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

Operating principle

Marsh Hydroil 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.

System applications

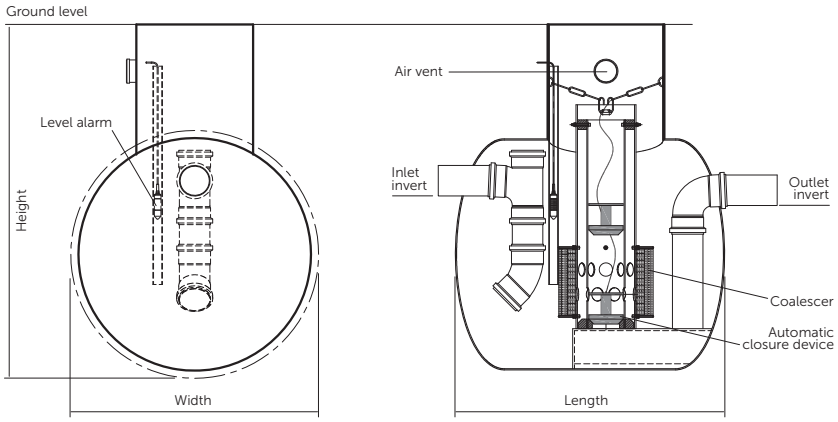
- ✓ Vehicle workshops
- ✓ Refuel facilities
- ✓ Fuel storage sites



Key

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

Specifications



View on inlet end

Section through tank centre

Model	Max flow litre/sec	Drainage area m²	Silt storage litres	Oil storage litres	Diameter +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Inlet invert	Outlet invert
NSFR 3	3	170	300	30	1200	1400	1840	160	900	950
NSFR 4	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	2622	5200	3172	315	900	1000
NSFR 65	65	3670	6500	650	2622	5600	3172	315	900	1000
NSFR 70	70	4318	7000	700	2622	6000	3172	315	900	1000
NSFR 80	80	4533	8000	800	2622	6600	3172	315	900	1000
NSFR 100	100	5666	10000	1000	2622	8600	3172	315	900	1000
NSFR 125	125	7082	12500	1250	3128	7200	3678	400	900	1100
NSFR 150	150	8500	15000	1500	3128	8400	3678	400	900	1100
NSFR 165	165	9166	16500	1650	3128	9300	3678	400	900	1100
NSFR 175	175	9800	17500	1750	3128	10000	3678	400	900	1100
NSFR 200	200	11110	20000	2000	3128	11300	3678	400	900	1100
NSFR 210	210	11898	21000	2100	3128	11500	3678	400	900	1100
NSFR 250	250	13888	25000	2500	3128	13800	3678	400	900	1100
NSFR 275	275	15582	27500	2750	3128	14500	3678	400	900	1100

Notes:
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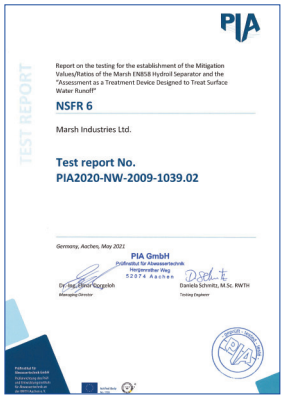
> *All dimensions in mm*

Certification (See pages 20-25)



Technical downloads including BIM files (RFA and IFC), DWG CAD files and other supporting documentation are available at **www.marshindustries.co.uk/bim-cad-library**

11 Marsh:Hydroil bypass oil separator

For areas at 'low risk' of oil contamination

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).

System 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

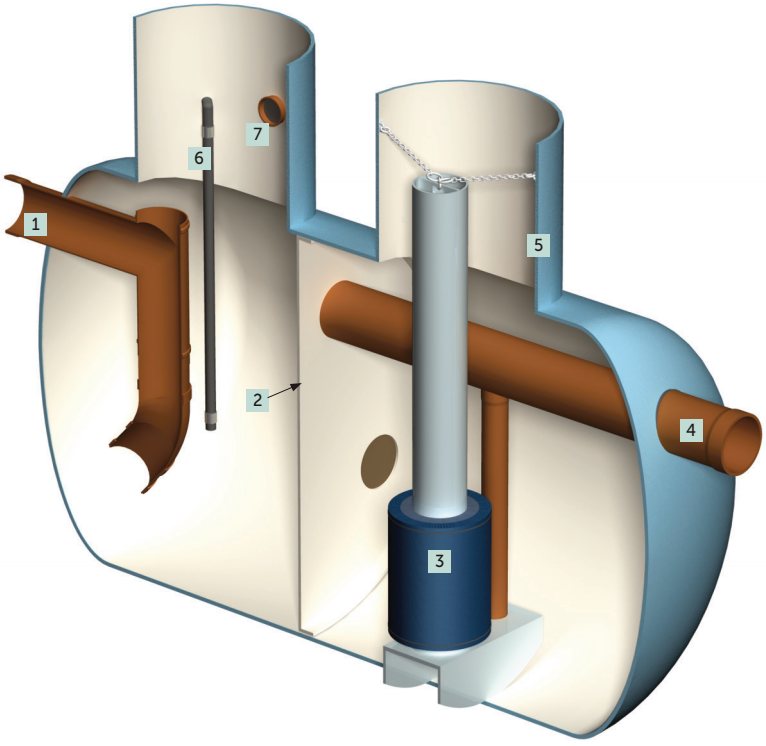
Operating principle

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=0.0018xA (catchment area in m^2). Flows from higher rainfall rates are allowed to bypass the main separation chamber.

System applications

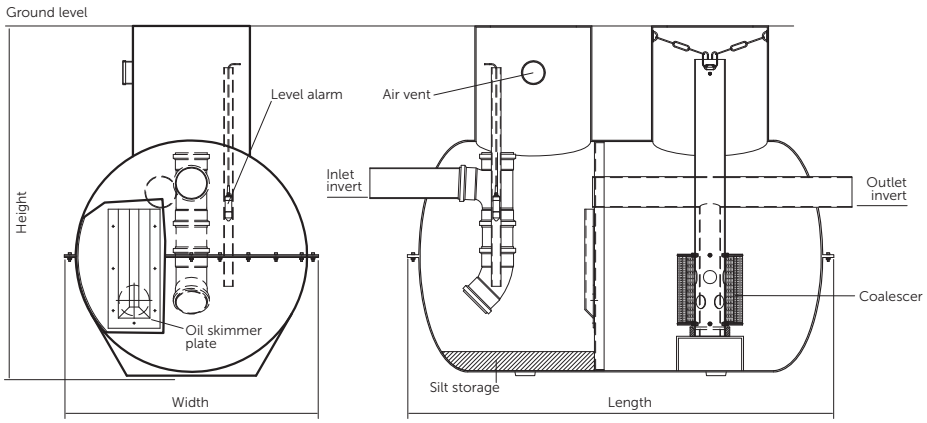
- ✓ Car parks
- ✓ Roadways
- ✓ Industrial estates
- ✓ SuDS



Key

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

Specifications



View on inlet end

Section through tank centre

Model	Max flow litre/sec	Drainage area m²	Silt storage litres	Oil storage litres	Diameter +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Inlet invert	Outlet invert
NSBP 3	30	1700	300	45	1354	2254	1784	160 O/D	900	950
NSBP 4	45	2550	450	67.5	1354	2254	1784	160 O/D	900	950
NSBP 6	60	3400	600	90	1354	2254	1784	200 O/D	900	950
NSBP 8	80	4530	800	120	1354	2254	1784	200 O/D	900	950
NSBP 10	100	5660	1000	150	1354	2914	1784	315 O/D	900	950
NSBP 15	150	8510	1500	225	1354	4184	1784	315 O/D	900	1000
NSBP 18	180	10198	1800	270	1818	2398	2418	400 O/D	1050	1150
NSBP 20	200	11370	2000	300	1818	2398	2418	400 O/D	1050	1150
NSBP 25	250	14185	2500	375	1818	3198	2418	400 O/D	1050	1150
NSBP 30	300	17000	3000	450	1818	3758	2418	500 O/D	1185	1285
NSBP 40	400	22650	4000	600	1818	4878	2418	500 O/D	1185	1285
NSBP 45	450	25325	4500	675	1818	5438	2418	500 O/D	1185	1285
NSBP 50	500	28330	5000	750	1818	5998	2418	500 O/D	1185	1285
NSBP 60	600	33996	6000	900	2622	4028	3172	600 I/D TW*	1350	1450
NSBP 65	650	36829	6500	975	2622	4303	3172	600 I/D TW*	1350	1450
NSBP 70	700	39620	7000	1050	2622	4578	3172	600 I/D TW*	1350	1450
NSBP 75	750	42495	7500	1125	2622	4908	3172	600 I/D TW*	1350	1450
NSBP 80	800	45330	8000	1200	2622	5415	3172	600 I/D TW*	1350	1450
NSBP 100	1000	56660	10000	1500	3128	4702	3678	750 I/D TW*	1525	1625
NSBP 125	1250	70820	12500	1875	3128	5741	3678	TBC**	TBC**	TBC**
NSBP 130	1300	73658	13000	1950	3128	6028	3678	TBC**	TBC**	TBC**
NSBP 150	1500	84990	15000	2255	3128	6780	3678	TBC**	TBC**	TBC**

Notes:
* TW = Twin Wall
** Pipework and inverts sized on application
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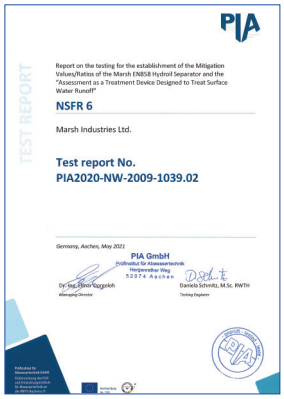
> *All dimensions in mm*

Certification (See pages 20-25)



Technical downloads including BIM files (RFA and IFC), DWG CAD files and other supporting documentation are available at **www.marshindustries.co.uk/bim-cad-library**

12 Marsh:Hydroil forecourt oil separator

For areas at 'significant risk' of oil contamination

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.

System 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

System applications

- ✓ Petrol stations
- ✓ Refuel facilities
- ✓ Fuel storage sites

Certification

Marsh Industries Ltd.
Units 2-20 Addington Park Industrial estate, Little Addington, NN14 4AS
Northants, Great Britian

Test Conducted to Assess the Performance & Mitigation Ratios of the Marsh NSFR6 EN858 Separator Range
For the Treatment of Surface Water Runoff

Light liquid separator NSFR6
Connected surface area: 340 m²

Test report PIA2020-NW-2009-1039.02

Particle retention (Millisil W4)	**84.35%**
Total metal reduction*	**63.26%**
Dissolved metal reduction	0%
Particulate metal reduction*	0.75 x 84.35%

*The metal reduction factor was derived from the particle retention as 0.75 times the particle retention factor. This has reference for the assumption, that 75% of metal reduction is done by particle reduction.

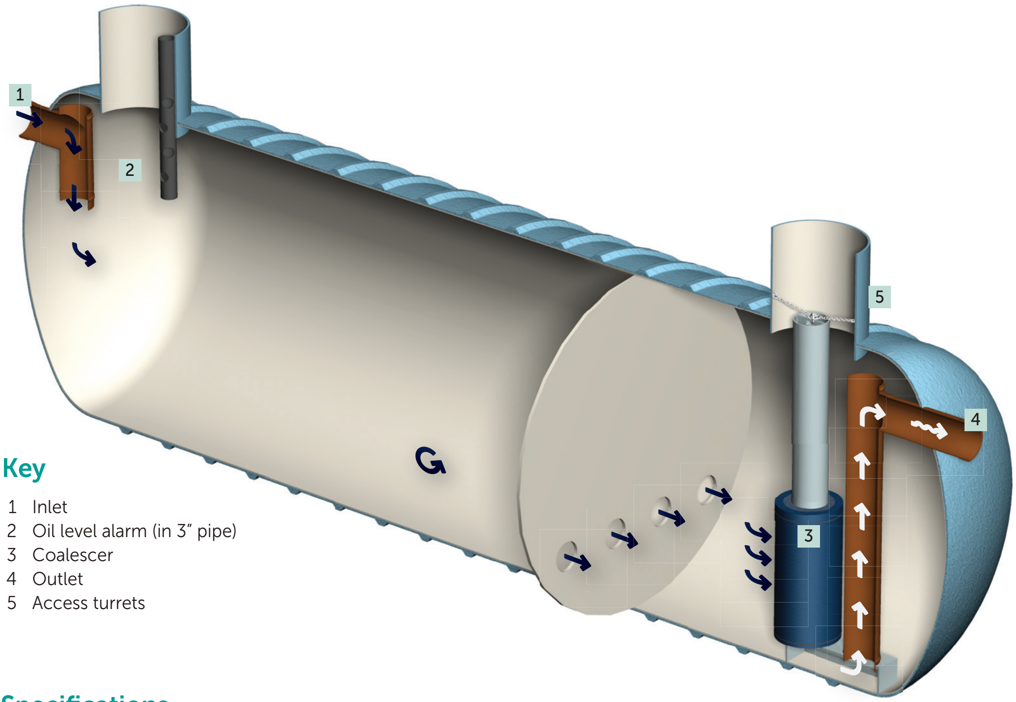
This document does not replace the test report.

PIA - Sustainable Certification

Schmitt/Dorgeloh May 2021

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

Specifications

Model	Capacity litres	Width +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Inlet invert	Outlet invert
Class 1	10000	1800	4200	2200	160	700	800
Class 2	10000	1800	4200	2200	160	700	800

Notes:
* The dimensions given on this page are for guidance only
> For precise tank sizes and configurations, please contact Marsh Industries
> Number of access shafts will be built to suit site specifications and to maintain safe access for emptying
> All dimensions in mm

Technical downloads including BIM files (RFA and IFC), DWG CAD files and other supporting documentation are available at **www.marshindustries.co.uk/bim-cad-library**

MARSH

13 Marsh:Hydroil wash-down separator

Available in capacities from 2800-20,000 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.

System 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 can further reduce pollutants from entering the drainage system
- ✓ Various alarm types available (Required by EN858-1)
- ✓ Corrosion resistant

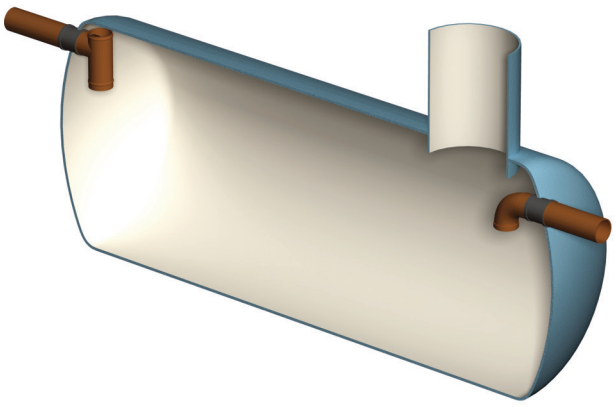
Operating principle

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.

Specifications

Model	Capacity litres	Width +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Inlet invert	Outlet invert
WD2800	2800	1200	3000	1715	110	700	750
WD3800	3800	1200	4000	1715	110	700	750
WD4500	4500	1500	2650	2015	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	5200	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:
* The dimensions given on this page are for guidance only
> For precise tank sizes and configurations, please contact Marsh Industries
> Number of access shafts will be built to suit site specifications and to maintain safe access for emptying
> All dimensions in mm



14 Marsh:Hydroil silt trap

With a capacity from 830-3400 litres, Marsh silt traps provide effective storage of silt and debris from vehicle wash-down facilities.

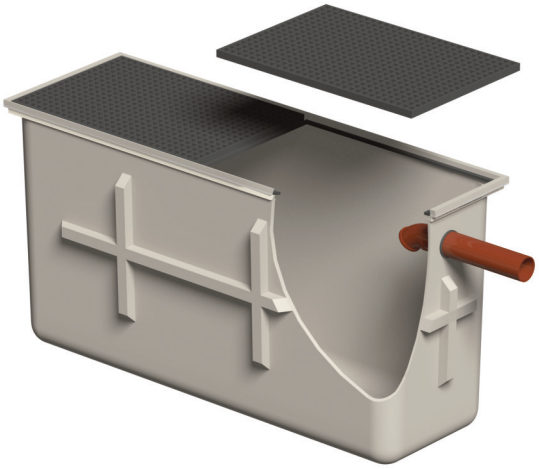
Positioned ahead of an oil separator, the silt trap gathers and stores silt and sediment, and prevents it from entering the oil separator system.

System benefits

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

Specifications

Model	Capacity litres	Width +/-50mm	Length +/-50mm	Height +/-50mm	Connection size	Outlet invert
CST1	830	1165	680	1060	110mm	240
CST2	1570	2180	680	1060	110mm	240
CST3	2300	3205	680	1060	110mm	240
CST4	3400	4230	680	1060	110mm	240



15 Alarm systems

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 EN 858 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.

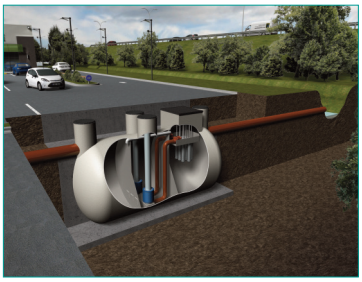
- ✓ Alert: Beacon or SMS text message (optional)
- ✓ High quality oil probe with 5m cable
- ✓ Intuitive control panel
- ✓ Supplied with battery plus backup battery
- ✓ Supplied with clean contact relay
- ✓ Alarm stand rotates 360 degrees

For advice and guidance on choosing the right alarm for your site please contact Marsh Industries.

16 Case studies

Marsh:Marator

Due to the Marator's outstanding discharge quality, Marsh supplied two units to a UK site with a Building Control permit that allowed for discharge into a ditch nearby. The only other option for the site, which would have cost tens of thousands of pounds, involved traversing a dual-carriageway intersection and connecting to the main drainage system in the distance.



Magna Park, Lutterworth

To comply with strict regulations for oil and hydrocarbon separation on discharge, the requirement for Marsh full retention oil separators was identified alongside two additional bypass separators and a forecourt separator to protect against major fuel spillages.

Titanic Docks, Belfast

Three Marsh full retention oil separators were specified and installed during summer 2020 to meet strict environmental regulations on this site for a global online retailer, located within the Titanic Quarter of Belfast.

Symmetry Park, Bicester

As part of the expansion of this industrial site, including a new warehouse development for a major parcel distribution facility, four Marsh full retention oil separators were specified alongside a forecourt oil separator to protect against major fuel spillages and to comply with strict regulations for oil and hydrocarbon separation on discharge.

Recovery site, near South Downs National Park

A Marsh:Marator65 was specified and installed at an HGV recovery site located close to the South Downs National Park. Owing to the sensitive environmental issues surrounding this site and with effluent being discharged into a river, the Marsh Marator was specified due to its exceptional discharge quality of 0.1mg/l (industry standard: 5mg/l).

17 What customers say about Marsh

> We would not hesitate to recommend Marsh Industries line of separators. Excellent service with knowledgeable technical assistance for the trickier jobs. Each quote has an exceptional level of detail and information, including all necessary spec sheets - invaluable for specialist merchants like ourselves. Highly recommended."

> Speaking to experts in their field, such as those at Marsh Industries, provides us with confidence that the correctly sized tank is supplied and installed. Their systems are innovative and generally on quick lead times.

> Marsh is our first point of call for all enquiries for oil separators. Their guidance covers everything from design, commercial advice, and on-site installation support. They take care to match the product with the customers' needs, providing quality products and an overall service that is second to none."

> We rely on Marsh as a knowledgeable, friendly supplier of oil separators. Their commercial guidance covers everything from design to installation support if required. They offer quality products and an excellent service, and they take care to match products to the requirements of the client."

> Their experienced and knowledgeable representatives promptly and accurately interpret our requirements. We put full confidence in Marsh from pricing to completion for all of our separator requirements."

> Marsh Industries is our first stop for our separator enquiries. Their extensive product knowledge and expertise not only includes for the specification and design of product, but also specific advice on separators requiring deep inverts and heavy-duty shells, as well as on-site installation and after sales support. They take particular care in matching the product with our customers' needs, and in doing so offer a first-class service and a quality product."

Appendix A

Marsh:Marator certificate

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library

PIA Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Portapura Limited.
Irthlingborough,
Northants NN9, Great Britain

EN 858-1
Separator systems for light liquids (e.g. oil and petrol)

"Marator Separator"

Test report PIA2018-AB-1804-1026.01

Material	Glass reinforced plastic
Nominal hydraulic load	6.0 l/s
Nominal Size	6
Effluent	< 0.1 mg/l
Class	I

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Daniel Verschitz August 2018

Appendix B

Marsh:Hydroil test certificate

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library

Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Marsh Industries Ltd.
Units 2-16 Addington Industrial Park, Irthlingborough Road
Little Addington, Northants NN14 4 AS Great Britain

EN 858-1
Separator systems for light liquids (e.g. oil and petrol)

Hydroil with coalescer

Test report PIA2017-AB-1607-1089

Material	Glass reinforced plastic	
Nominal hydraulic load	6.0 l/s, 10.0 l/s, 15.0 l/s	
	NS	Effluent
NS6	6	< 1.0 mg/l
NS10	10	< 1.0 mg/l
NS15	15	2.8 mg/l

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Daniel Verschitz March 2017

Appendix C

Mitigation indices certificate

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library

Marsh Industries Ltd.
Units 2-20 Addington Park Industrial estate, Little Addington, NN14 4AS
Northants, Great Britian

Test Conducted to Assess the Performance & Mitigation Ratios of the Marsh NSFR6 EN858 Separator Range
For the Treatment of Surface Water Runoff

Light liquid separator NSFR6
Connected surface area: 340 m²

Test report PIA2020-NW-2009-1039.02

Particle retention (Millisil W4)	**84.35%**
Total metal reduction*	**63.26%**
Dissolved metal reduction	0%
Particulate metal reduction*	0.75 x 84.35%

**The metal reduction factor was derived from the particle retention as 0.75 times the particle retention factor. This has reference for the assumption, that 75% of metal reduction is done by particle reduction.*

This document does not replace the test report.

PIA - Sustainable Certification

Geprüft · tested · testé

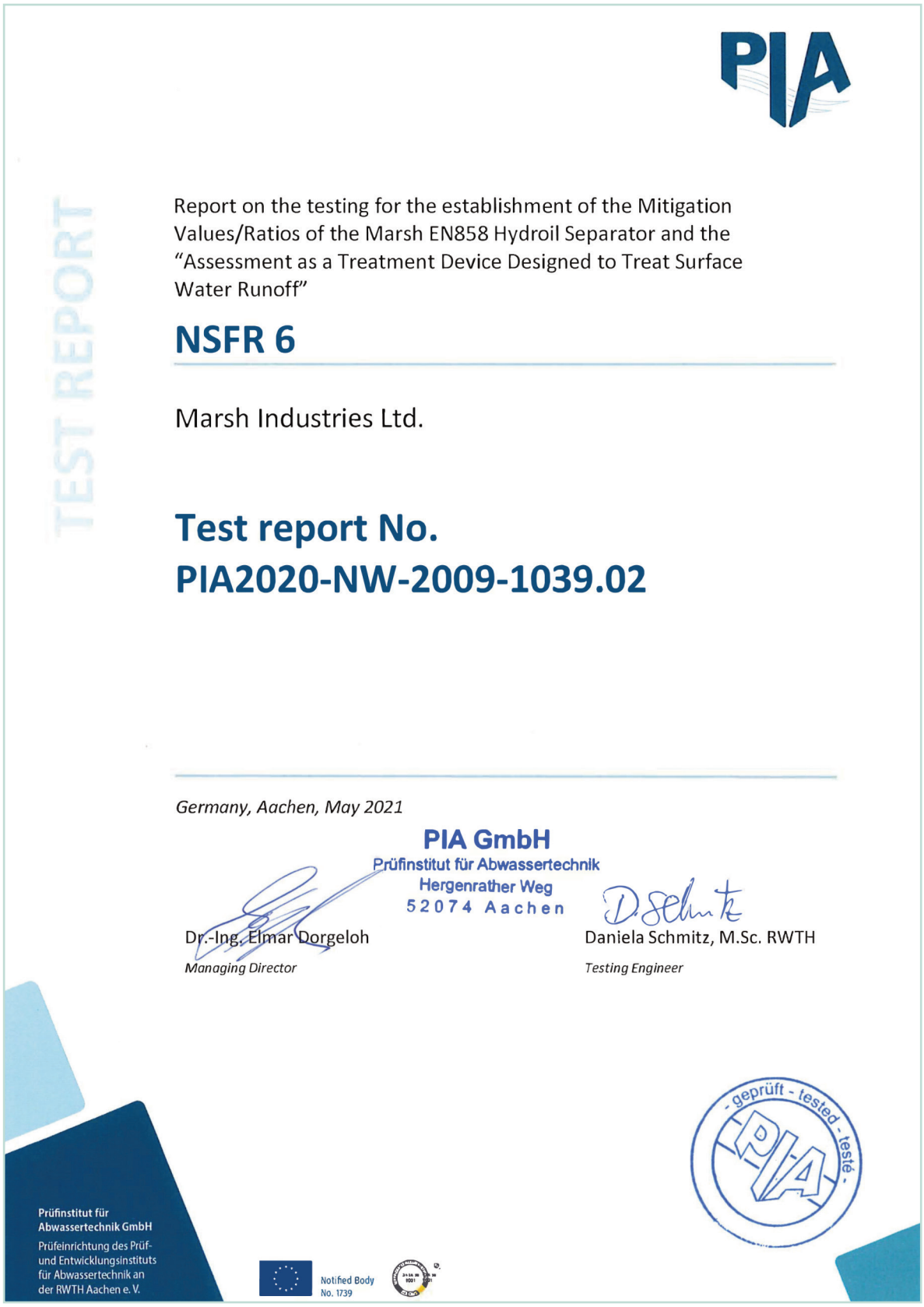
Schmitz/Dorgeloh May 2021

Appendix D

Mitigation indices test report

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library



TEST REPORT

Report on the testing for the establishment of the Mitigation Values/Ratios of the Marsh EN858 Hydroil Separator and the "Assessment as a Treatment Device Designed to Treat Surface Water Runoff"

NSFR 6

Marsh Industries Ltd.

Test report No.
PIA2020-NW-2009-1039.02

Germany, Aachen, May 2021

PIA GmbH
Prüfinstitut für Abwassertechnik
Hergenrather Weg
52074 Aachen

Dr.-Ing. Elmar Dorgeloh
Managing Director

Daniela Schmitz, M.Sc. RWTH
Testing Engineer

- geprüft - tested - testé -

Prüfinstitut für Abwassertechnik GmbH
Prüfeinrichtung des Prüf- und Entwicklungsinstituts für Abwassertechnik an der RWTH Aachen e. V.

Notified Body No. 1739

Appendix E

Structural integrity test certificate

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library

Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Marsh Industries Ltd.
Irthlingborough Road, Little Addington
Northants NN14 4AS, Great Britain

EN ISO 179-1/1eA: 2010-11
"Plastics – Determination of Charpy impact properties;
Part 1: Non-instrumented impact test"

"Marsh Material Specification"

Test report PIA2018-DH-1806-1035.01

Material	Glass reinforced plastic
Charpy notched impact strength	
- Resin	131 kJ/m²
- Filler	93 kJ/m²
- Sand	116 kJ/m²

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Daniel Verschitz October 2018

Appendix F

Fire test certificate

Certification

Full certification available atwww.marshindustries.co.uk/product-technical-library

Prüfinstitut für Abwassertechnik GmbH

PERFORMANCE RESULTS

Marsh Industries Ltd.
Irthlingborough Road, Little Addington
Northants NN14 4AS, Great Britain

EN ISO 11925-2:2010
"Reaction to fire tests – Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test"

"MIMMS"

Test report PIA2018-RF-1806-1034.01

Material	Glass reinforced plastic
Period of flame impingement	15 seconds
Number of tests	12
Height of flame	< 150 mm
Classification (EN 13501-1)	Class E

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

Certified according to ISO 9001:2008

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Daniel Verschitz October 2018

Contact the experts in advanced oil separator technology:

+44 (0)1933 654582
sales@marshindustries.co.uk
www.marshindustries.co.uk

MI-OilSepsGuide-0225-RevB