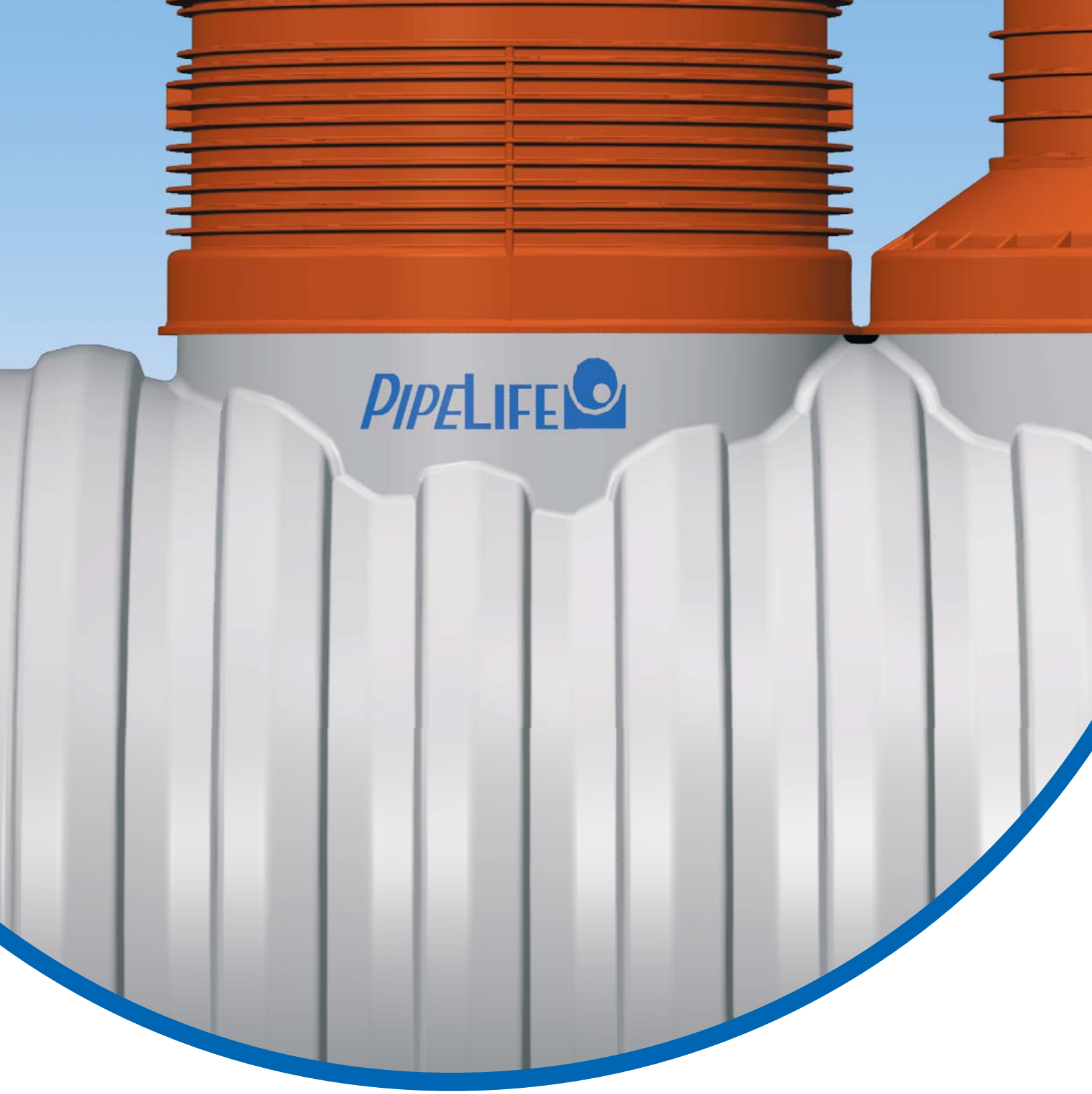


Pipelife Oil Separator

PIPELIFE

Contaminated water

The problem

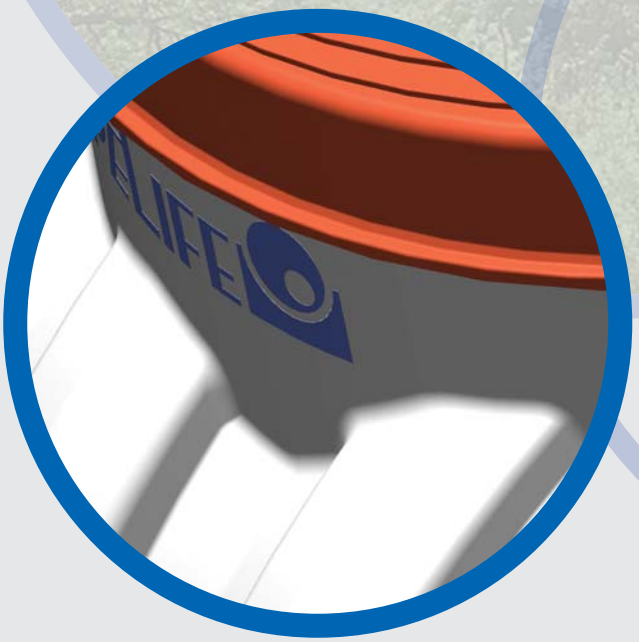
About 1.400.000.000 km^3 of the earth's volume consists of water. For the most part this amount is made up of saltwater. Sailors in the old days knew very well that you could die of thirst when sailing the ocean! The majority of the remaining fresh water is beyond our reach, locked into snow and polar ice. Only 1 % of the fresh water can be made usable for irrigation or drinking. Nevertheless the demand for fresh water doubles every 20 years...

In addition our scarce drinking water is constantly under pressure. Groundwater is polluted by oil and grease in diverse situations. Petrol stations, car washes and parking places are well-known examples of sites where the quality of groundwater is threatened by leaking oil. Mixed with water during washing or rain motor oil will easily flow into the environment.

In this brochure we proudly present our solutions to a cleaner and healthier world.

Water facts

- 97,2 % of earth's water is saltwater.
- only 2,8 % is fresh water.
- 0,01 % of the water amount can be used for irrigation or drinking.
- 66 % of the human body consists of water.
- each human drinks an average of 75.000 l water in a lifetime.
- The demand for water from 1900 to 1995 increased six fold.



PIPELIFE

Content

The Pipelife Oil separator

The effects of oil on water and the environment.

When released into a ditch, oil forms a thin layer on the water surface as a result of its lower density. Then the oil emulsifies in reaction to the water. The resulting emulsion releases toxic elements, which causes enormous problems for the environment.

When oil penetrates into the soil, the well being of flora and fauna runs a great risk. Consider for example the dramatic effects on the population of fishes and nestling birds. The purification process of contaminated water takes a long time.

Preserve the enviroment and protect water from the effects of spilled oil!

Pipelife purifies contaminated water and helps preserving the ecology!

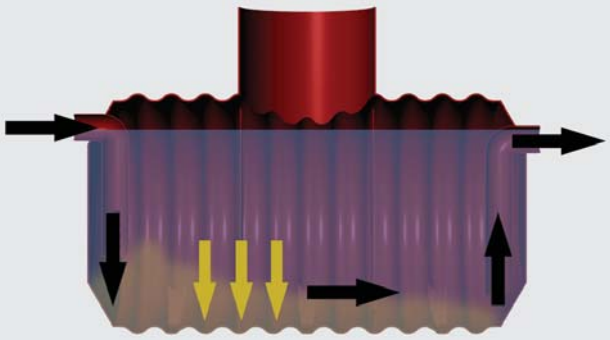
The Pipelife solution

System	Flow capacity	Maximum content of residual oil*
Oil Separator class I	3 l/sec	5 mg/l
Oil Separator class I	6 l/sec	5 mg/l
Oil Separator class I	10 l/sec	5 mg/l
Oil Separator class II	3 l/sec	100 mg/l
Oil Separator class II	6 l/sec	100 mg/l
Oil Separator class II	10 l/sec	100 mg/l
Sludge Separator	2000 l	
Sludge Separator	3000 l	
*according to EN858		

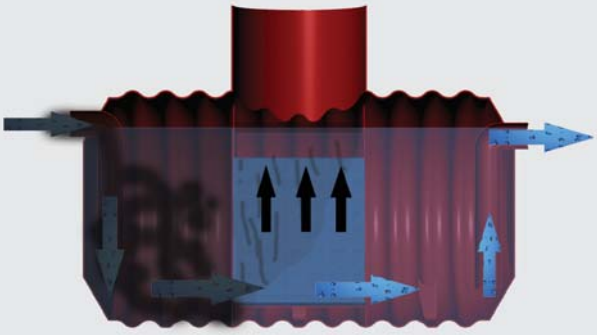
How does it work?

Working of the Pipelife Oil Separator

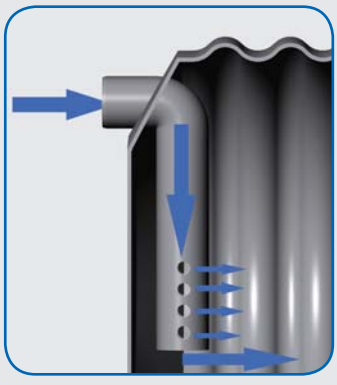
Mixed with rainwater sludge streams from the road's surface into the sewage system or directly into the nature. This sludge is often contaminated with oil. Pipelife's Oil Separators are designed to purify water from oil and sludge. Usually two tanks are used for an optimal effect. The first tank separates the sludge from the water. In addition the second tank separates the oil from the water.



Phase 1, the Pipelife Sludge Separator



Phase 2, the Pipelife Oil Separator

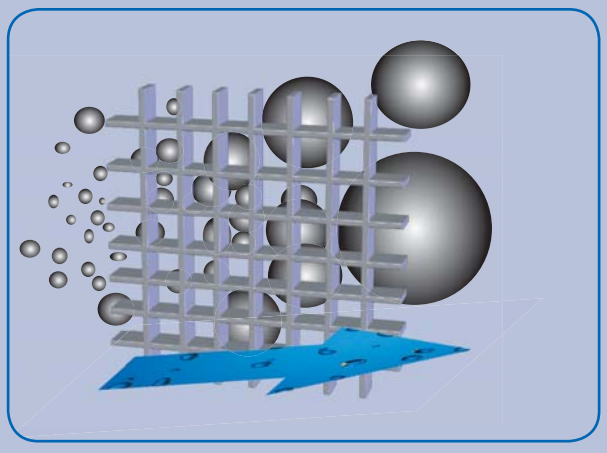


The interior of the tanks

Inside the Sludge Separator the following steps will take place:

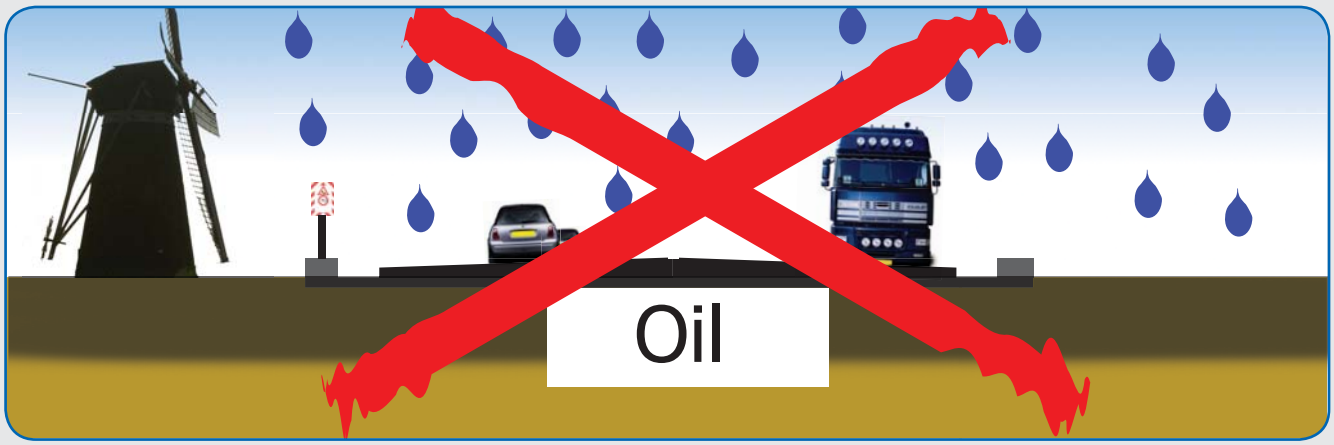
The water contaminated with oil and sludge enters the tank (1). Due to the special patented Pipelife water distribution system (2), the water will evenly be distributed through the tank. The sludge sinks to the bottom of the tank (3). When the water enters the outlet of the first tank, the sludge has been removed (4).

Inside the second tank, the oil is separated from the water. The contaminated water enters the separator (5) . Due to the patented Pipelife water distribution system (6), the water and oil are evenly distributed. The bigger oil drops will rise to the water surface due to their low density. The smaller droplets will coalescense and grow in size in the filter (7), and they will eventually rise to the surface. Now external companies can remove the oil (8). By doing so the water leaving the lower outlet is free from oil (9).

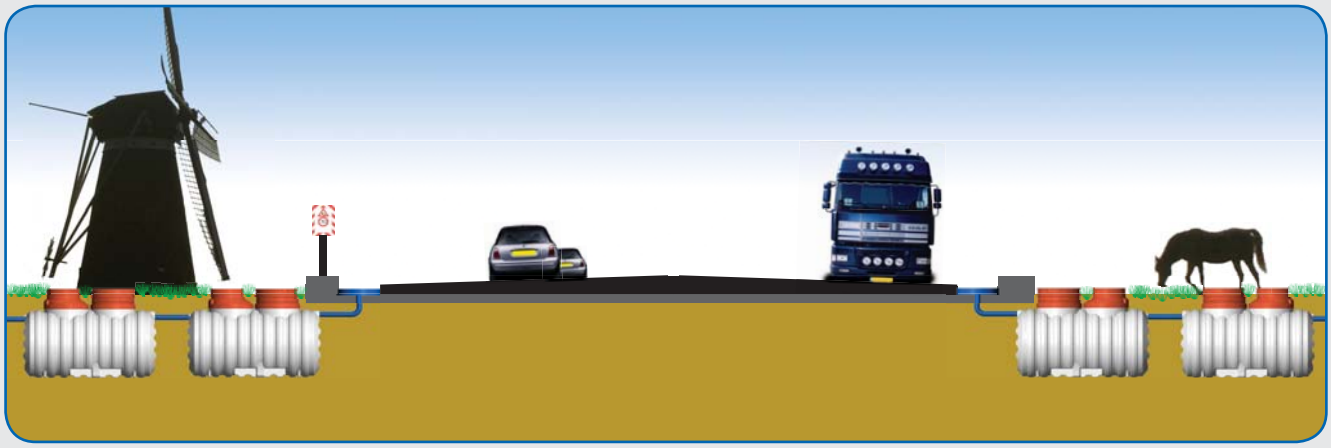


Sites of application

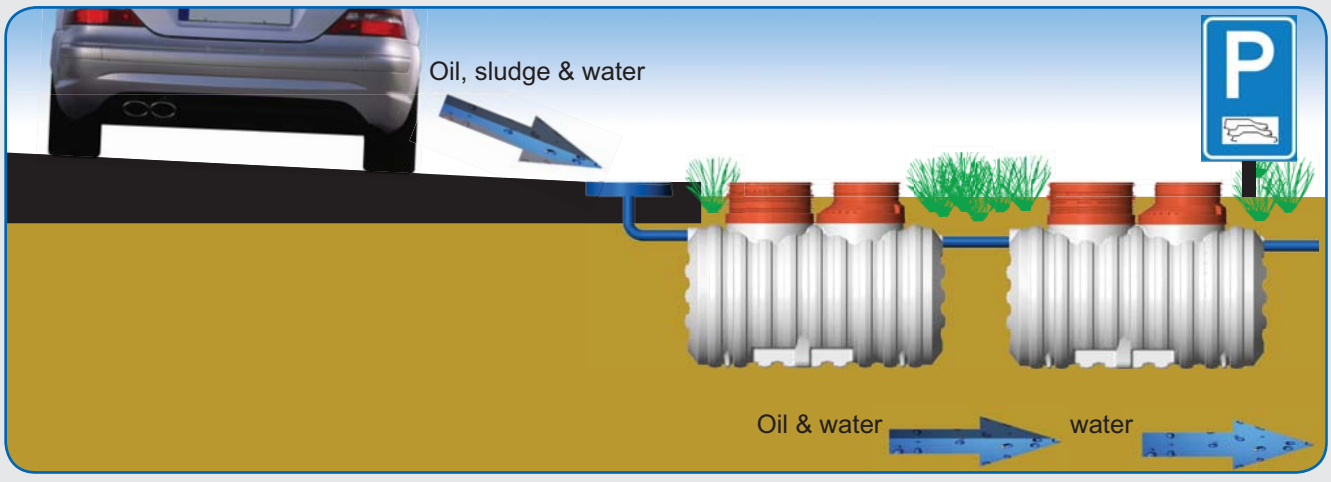
Is it really necessary to let spilled oil flow into the soil ...



...when it is possible to separate it from the water on the site of pollution? Pipelife's flexible system can be used for a broad range of applications. Placed beside the road, the Pipelife Oil Separator protects the soil against pollution by separating spilled oil.



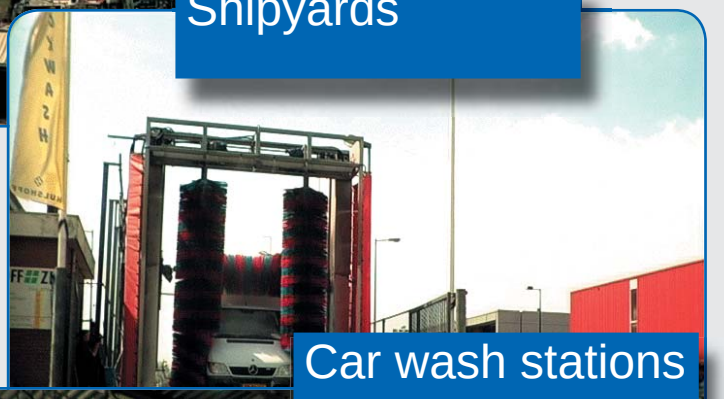
Moreover the soil next to parking places will be protected against the danger of contamination.



Sites of application

Petrol stations

Shipyards



Car wash stations

Garages

Industries

Parking places

Motorways

The choice for a Pipelife Oil Separating system

The Pipelife Oil Separator is available in four types of separation capacities. This will guarantee a compatible cleaning system for most situations. Each type of tank can be delivered in two classes (I or II), what discriminates in the maximum discharge of residual oil. More details about oil separators can be found in standard EN858 part I and II.

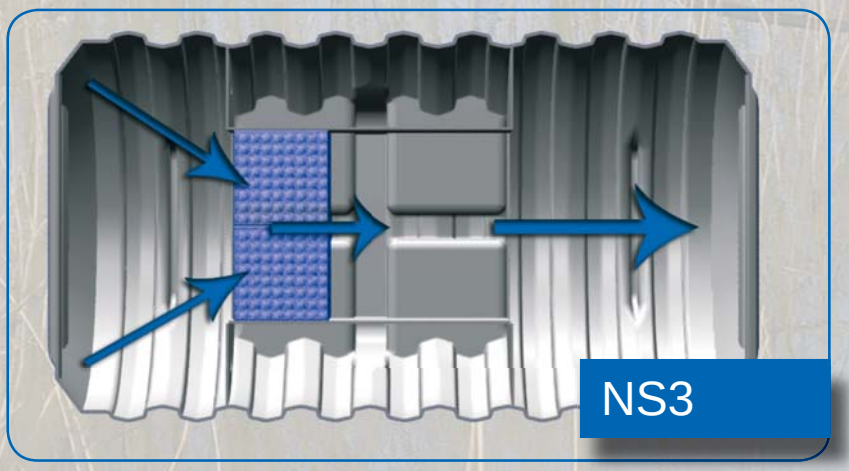
Flow rate	Nominal size
3 l/s	NS3
6 l/s	NS6
10 l/s*	NS10
15 l/s**	NS15

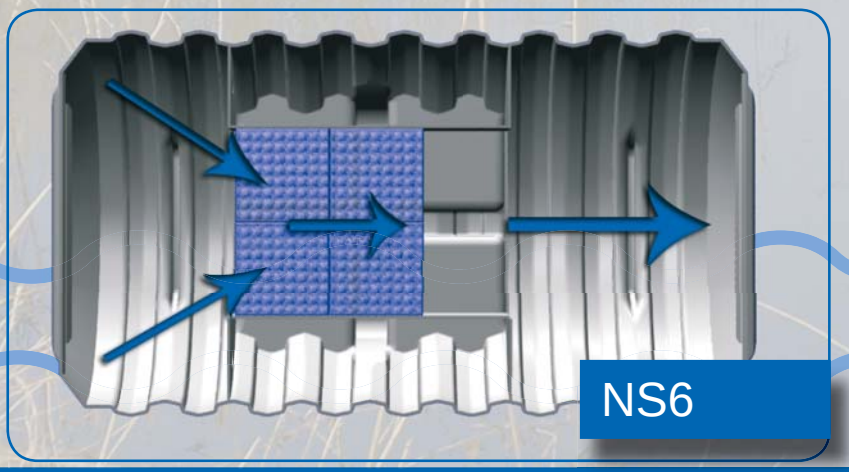
Class	Maximum allowed residual oil (mg/l)	Separating technique
I	5	Coalescing separator
II	100	Gravity separator

In the class II tanks the separation of oil and water is caused by gravity. Therefore no filters are needed. In the class II tanks the remaining oil residue is allowed to reach a maximum of 100 mg/l. The lower the flow rate, the less the remaining oil in the water will be. Due to a coalescence filter in the class II separators the remaining water will contain no more oil than 5 mg/l.

The NS3 has 2 filter blocks in the oil separation compartment. The integrated partitions force the water to flow though these filters. In addition the NS6 has 4 filter blocks, and the NS10 has 6. In this way the various configurations are suitable for all the different separation capacities.

Above of this; these filters are strong enough to be cleaned with high pressure washers!



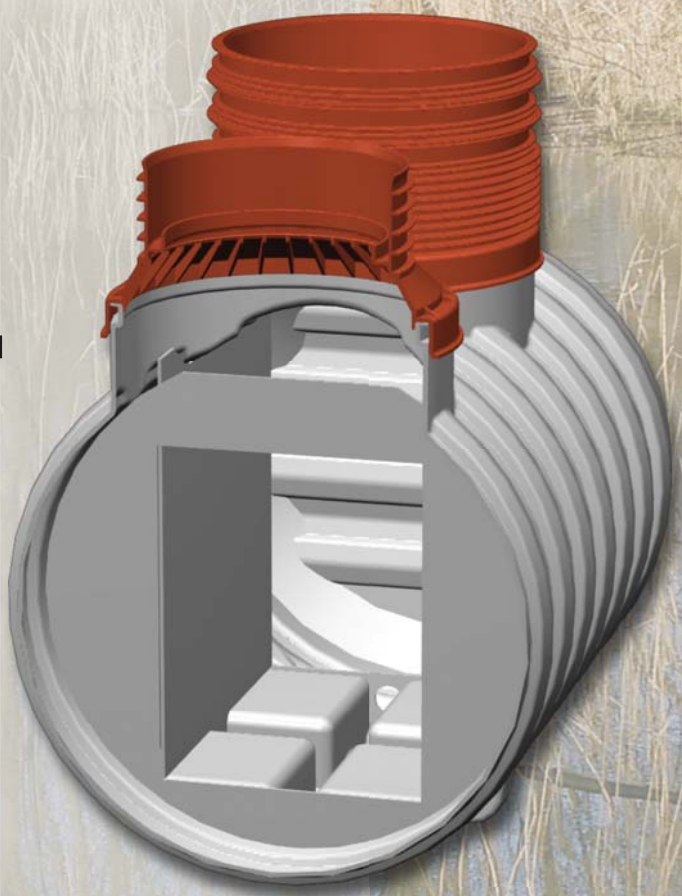


High-pressure cleanable!

* Acceptance expected end 2006
** Available 2007

The choice of your system

The Pipelife Oil Separator has to be used in combination whit a Sludge Separator and a sampling shaft. For this reason the sequence of the complete chain is: Sludge Separator-Oil Separator - sampling shaft. The standard EN 858-2 can be used for choosing the right system. According to this standard the nominal size is given by:



$NS = (Qr + fx * Qs) * fd$

NS = nominal Size in l/s
Qr = maximum flow rate of the rainwater in l/s
Qs = maximum flow rate of wastewater in l/s
fx = impediment factor depending on the nature of discharge (Table I)
fd = density factor for the relevant light liquid (Table I)

Table I

kind of use	fx
Industrial wastewater: car washing, petrol stations, cleaning of oil covered parts, and so on.	2
Oil contaminated rain water from impervious areas: car parks, roads, factory yards, and so on.	0
Retain any spillage of light liquids and protect surrounding areas	1

Table II

Density (g/cm^3) / Class	Up to 0.85	From 0.85 up to 0.90	From 0.90 up to 0.95
	Density factor fd		
Class II	1	2	3
Class I	1	1.5	2
Class I and II combination	1	1	1

Example

The oily water flowing from a car wash site cannot be left untreated. Assume that the wastewater produced by each cleaning unit is 2 l/s. In this case the operating car wash consists of 2 high-pressure washing units.

According to EN858-2 an amount of 1 l/s must be included for each extra unit. As an effect the total amount of water (Qr) collected by the area is 3 l/s. There is no other wastewater available besides the water from the car cleaning (Qs = 0). In case a class I separator is used, fd can be found in table II. It follows, that the density of engine oil is 0.89, so that fd = 1.5. In table I can be found that fx = 2.

The solution

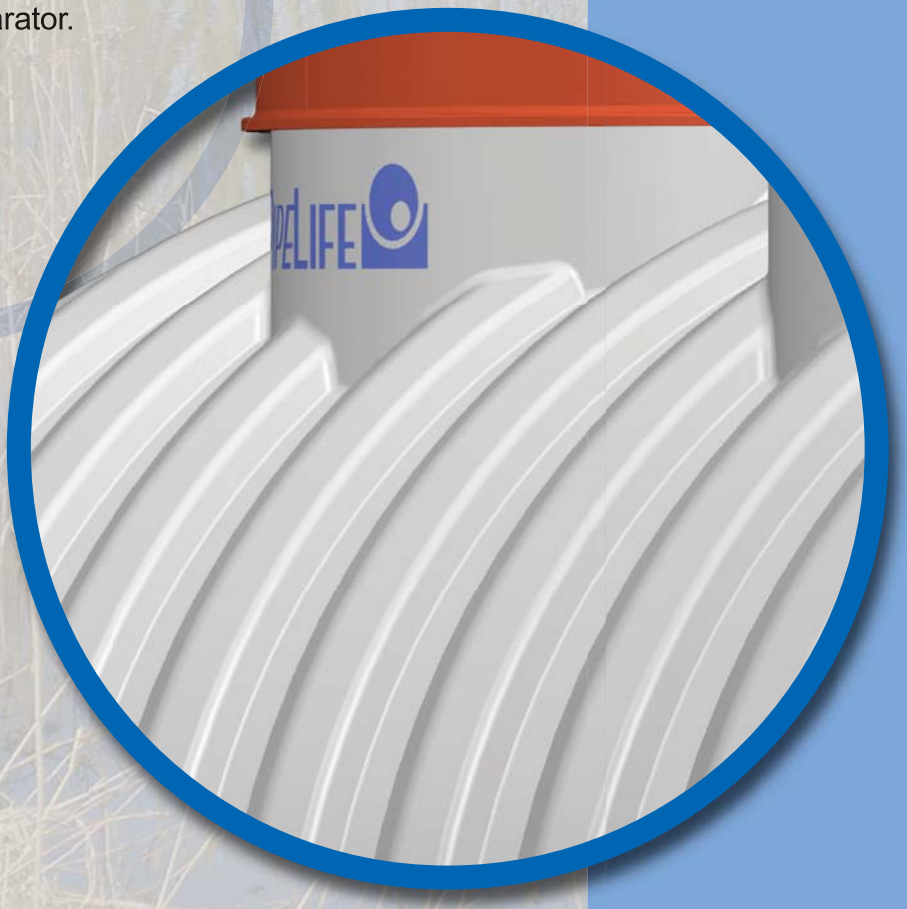
By filling in the formula, NS = (Qr + fx * Qs) * fd, it follows that NS = 9. The most suitable Pipelife Class I Oil Separator is the NS10. Now in combination with a sludge separator the wastewater can be cleaned from the light fluids according to EN858 with the NS10 Pipelife Oil Separator.

NS = (Qr + fx * Qs) * fd

Qs = 3 l/s
Qr = 0
fx = 2
fd = 1,5

NS = 9 l/s

Pipelife solution: NS = 10



Example

The oily water on a parking place of 1200 m^2 should not drain untreated. During a heavy rainfall about 0,015 $l/m^2/s$ water falls on the ground. In this case the total flow rate of the contaminated water (Qr), flowing away from the parking place, is 18 l/s and there is no extra wastewater (Qs = 0). In case that a class I separator will be used; fd can be found in table II. The density of engine oil is 0.89 so fd = 1.5 and NS = 27 l/s. In this case the flow rate of the contaminated water seems to be too high for Pipelife's largest Oil Separator.

NS = (Qr + fx * Qs) * fd

Qr = 18 l/s
Qs = 0
fx = 0
fd = 1.5

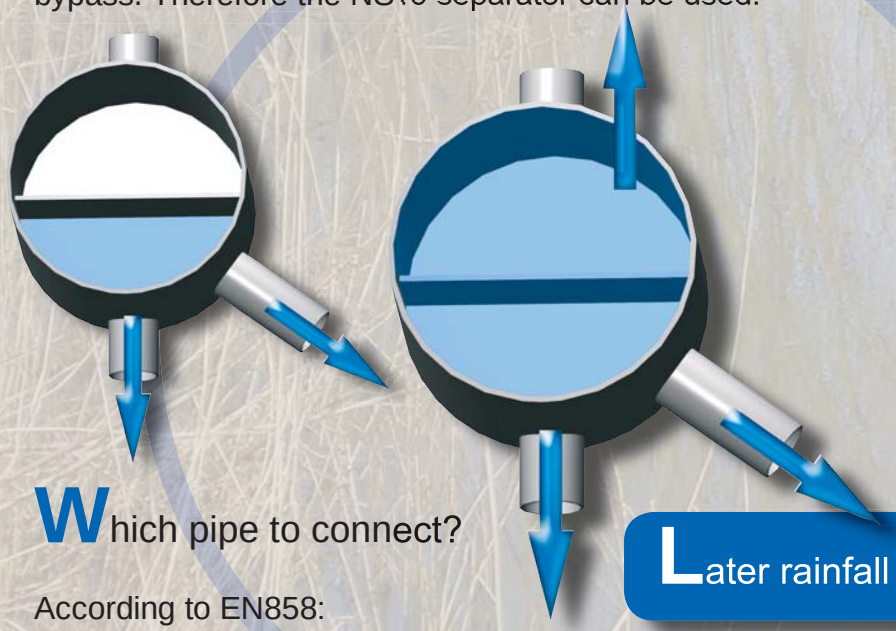
NS = 27 l/s

Nearest tank: NS = 30

In combination with a bypass
NS = 10

The solution

Using a bypass can solve the mentioned problem. The first flush theory assumes that almost all oil can be collected in the beginning of rainfall. For this reason later rainfall can be bypassed. In the example above, 2/3 of the rainwater can be allowed to bypass. Therefore the NS10 separator can be used.



Later rainfall will bypass directly to the exit

Which pipe to connect?

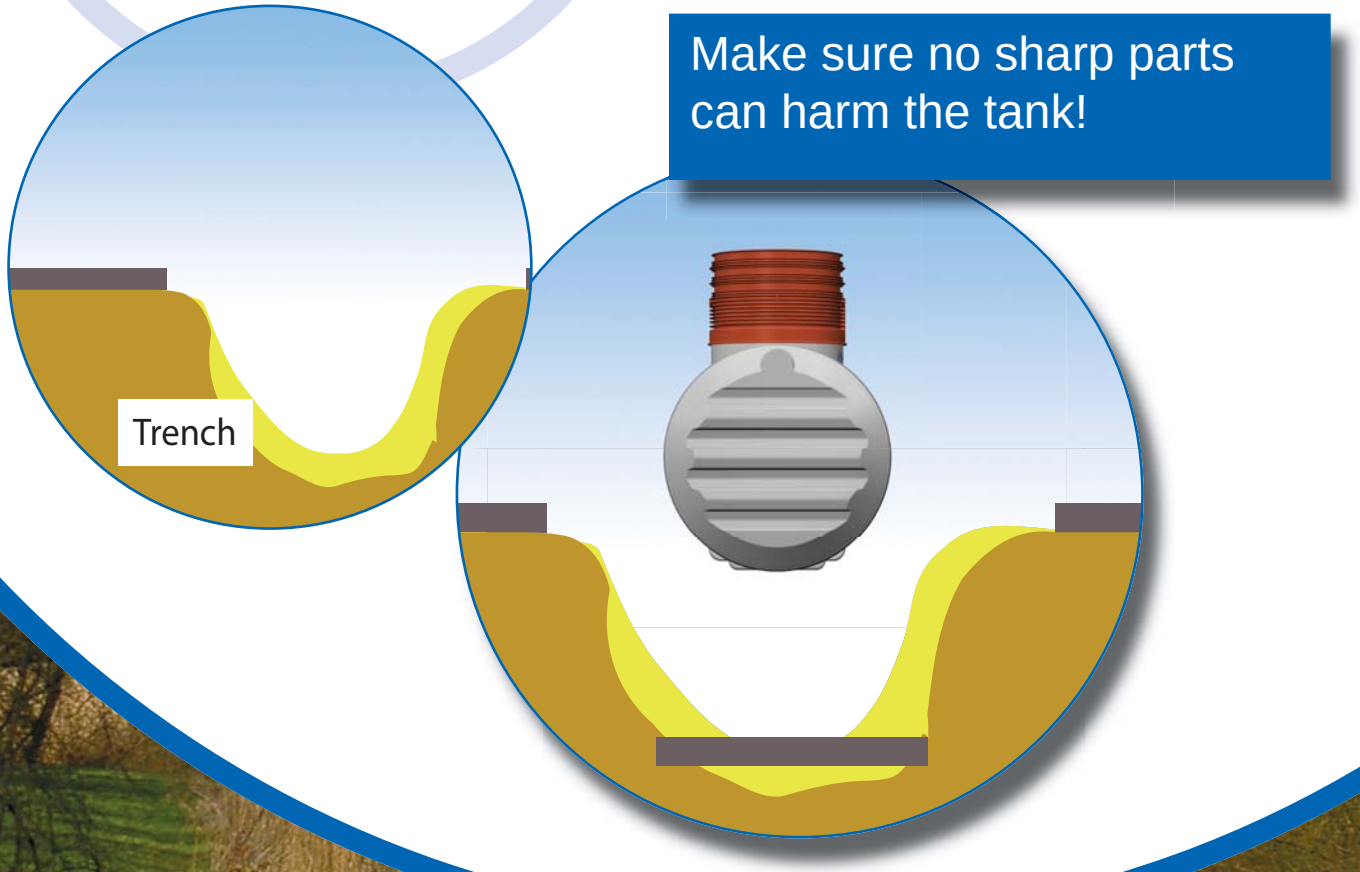
According to EN858:

Nominal Size	Pipe diameters
NS3	110 mm
NS6 and NS10	160 mm
Larger than NS10	210 mm

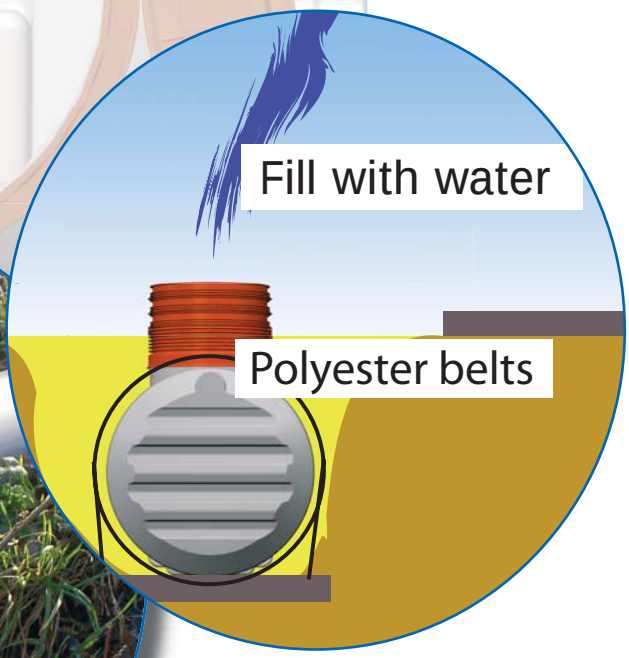
Placement of the Pipelife Oil Separator

To place the system the next guidelines should be followed:

- The trench has to be about 50 cm wider than the tank. In this way arond the tank a layer of compact sand can be formed. Take care for a good compacted layer under the filter blocks area. The standard maximum installation depth is 2.5 meter. In case the tank is placed on a lower level, a reinforced construction has to protect the tank against collapsing. Besides, make sure no sharp parts can harm the tank!
- A foundation for anchoring belts has to be placed in order to avoid floating (the buoyancy-effect).



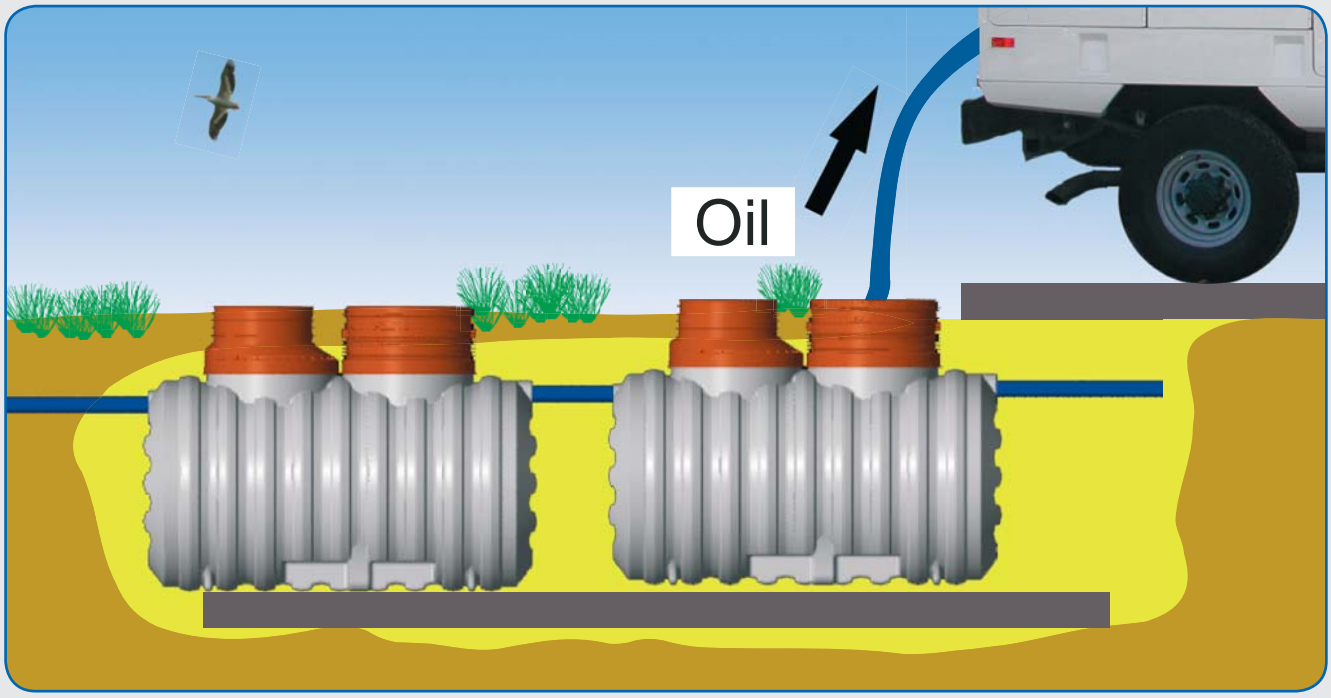
- After inspection the tank can be placed into the trench. For stabilising and proper positioning, the tank can partly be filled with water.
- The tank should be anchored to the ground by non-stretching polyester belts. At least 3 anchoring belts with a nominal capacity of at least 2500 kg are needed and they will preferably be equipped with stainless steel or zinc coated ratchet wheels.
- Fill the total system with water in order to:
  - Ensure proper working directly from the start.
  - Avoid floating of the tank as a result of high groundwater.
  - Ensure clean sensors of the electronic warning device.



After filling with water the separator works!

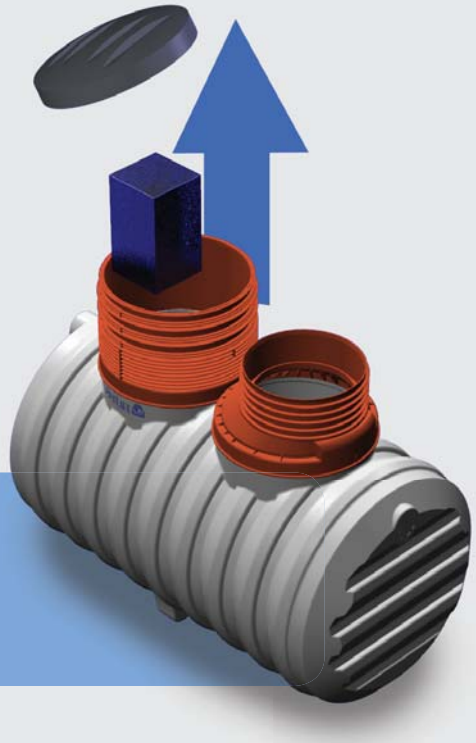
Maintenance

A certified cleaning company should perform the maintenance. The oil will be removed and after this will be transported for further processing.



During maintenance the side walls of the tank, the inlet holes and the oil removal pipe have to be cleaned with high-pressure washers. Riser and cover should be visually checked.

After cleaning, the probes of the electronic warning device have to be cleaned with a soft cloth, so the sensors will not be damaged. Fill the tank with clear water in order to ensure proper working directly from the start of operation.

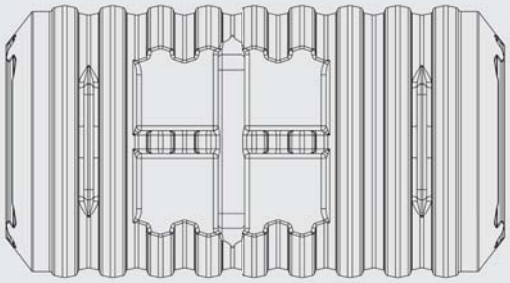


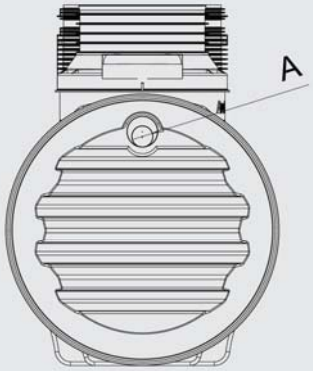
Easy disassembling for cleaning!

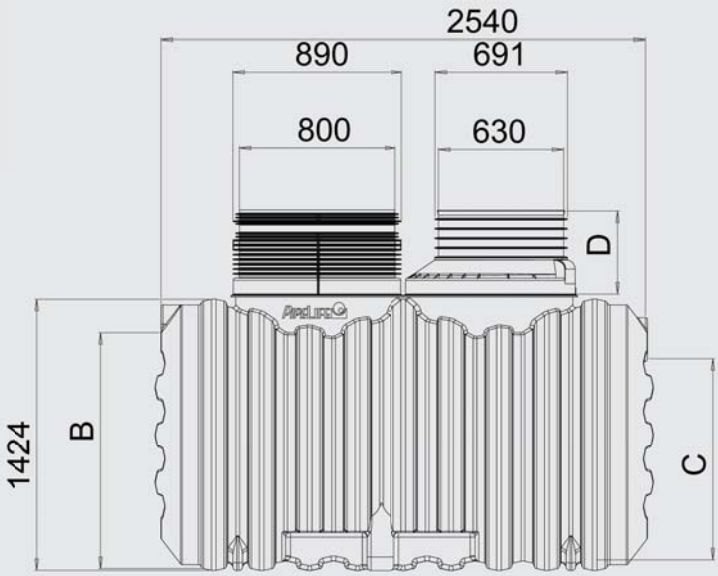
Technical drawings

Capacity	Max. volume water	Oil storage capacity	Height inlet (B)	Height outlet (C)	Number of filters	Size of A
NS3	2600 liter	350 liter	1275 mm	1205 mm	2	110 mm
NS6	2525 liter	350 liter	1300 mm	1230 mm	4	160 mm
NS10	2200 liter	350 liter	1300 mm	1230mm or 1200 mm	6	160 mm

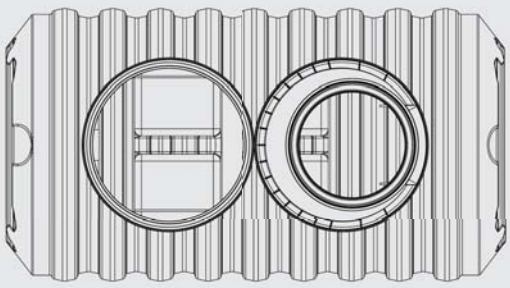
- Material: PE (Tank) and PP (top solution)
- Optional automatic closure device.
- Optional electronic warning device.
- Optional sampling shaft.







- Optional second access hole for maintenance and inspection. The internal diameter can be reduced from 800 mm to 630 mm through cones from the PRO630 series.
- Height D can be increased by using extra rings (3 rings max.). Each ring will be 500 mm (D=500 mm)

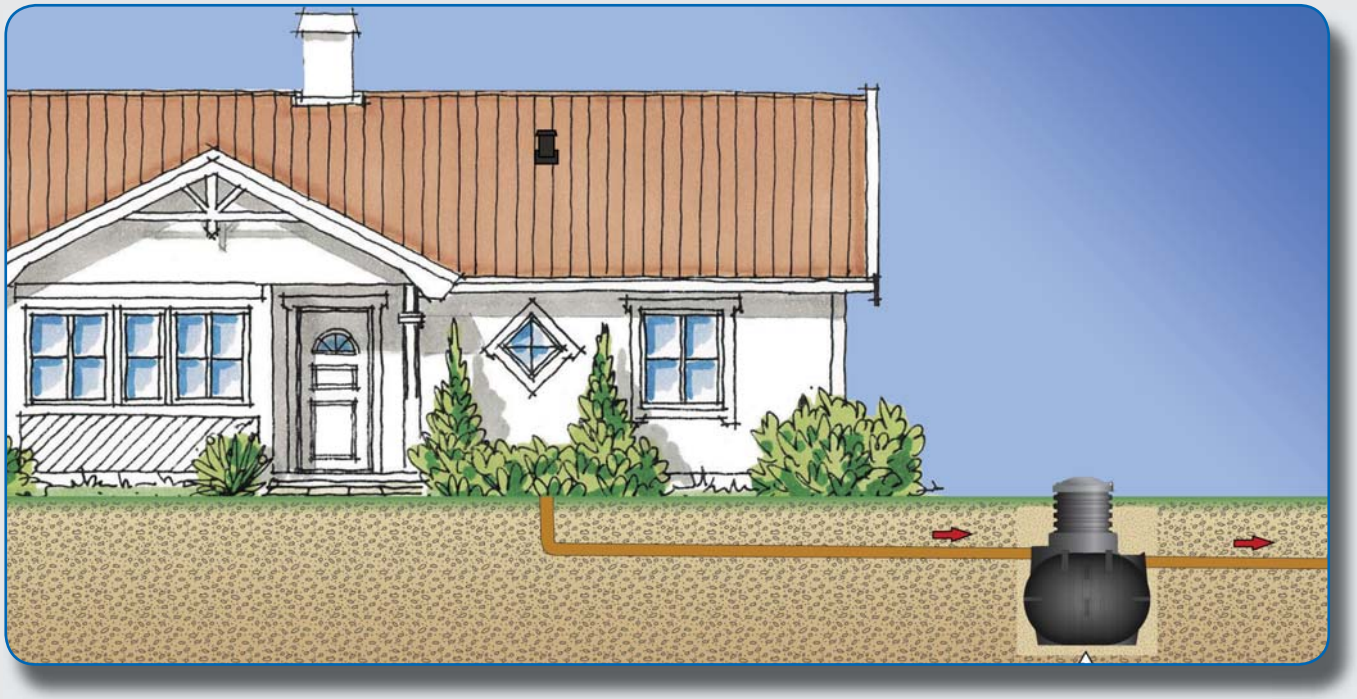


The Pipelife Septic Tank

Cleaning for households

Pipelife produces a series of septic tanks, which are combined with a ground infiltration system. The 2000 liter tanks are all made out of rotational moulded polyethylene and have 2, 3 or 4 chambers for an optimal effect. Compact cassettes are especially designed for optimal infiltration into the ground when no space is available. The Pipelife Septic Tank ensures an optimal cleaning!

Let nature clean our sewage water!



The Pipelife SBR system

Pipelife offers a small sewage treatment plant, based on the Sequential Batch Reactor (SBR) process, to clean waste water for households from 4 till 16 persons!

In more and more countries it is not allowed to drain untreated sewage water into the environment directly.

SBR systems are the solution, when it is not possible to make an easy connection to the main sewer system.

In the first tank suspended solids will settle down. In the second tank the cleaning process takes place by a biological and chemical reaction. During this process nitrogen, phosphates, sulphates and harmful micro-organisms are removed.

The Pipelife SBR system

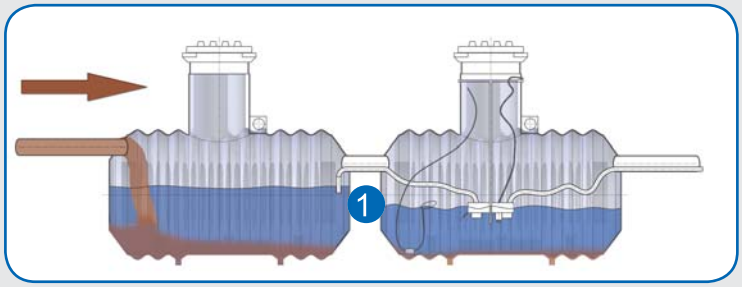
Functioning of the SBR system:

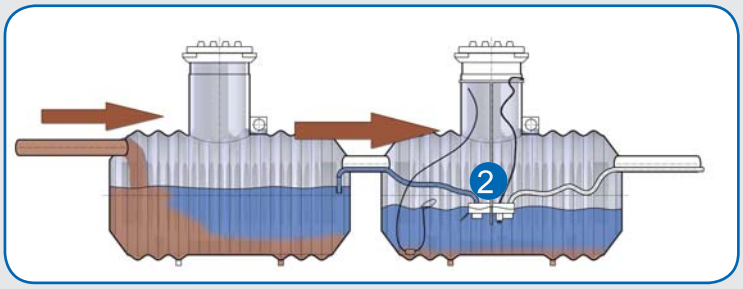
In the first tank the non solvable particles settle down. Batch wise the water is transported from the first to the second tank 1, while the residue remains in the first tank 2.

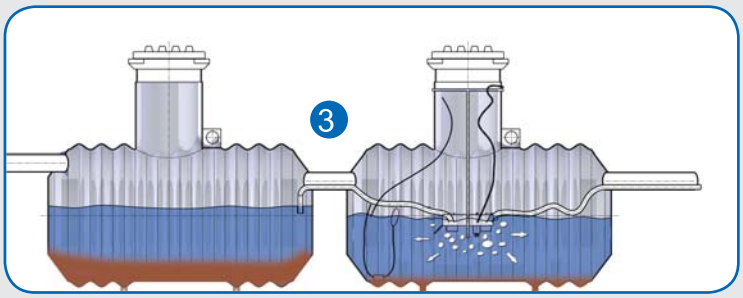
As soon as the second tank is filled, the water flow between the tanks comes to an end and the cleaning process starts. Cleaning takes place in the second tank during an aeration program 3 .

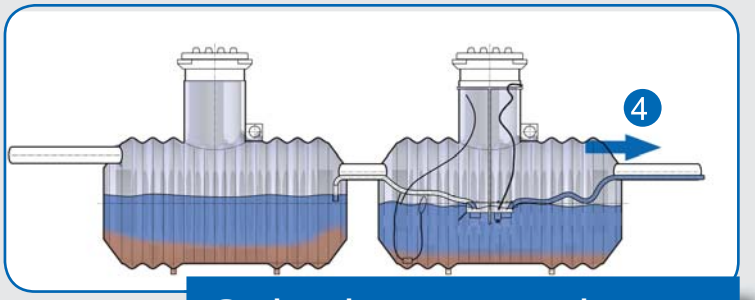
If necessary, chemicals can be added to improve further cleaning. The exact program can always be adapted to different needs.

As soon as the treatment cycle has been finished, clear water will be pumped out 4 and a new cycle will start.









Only clean water leaves the SBR system !

Pipelife's SBR System helps you to protect our environment!

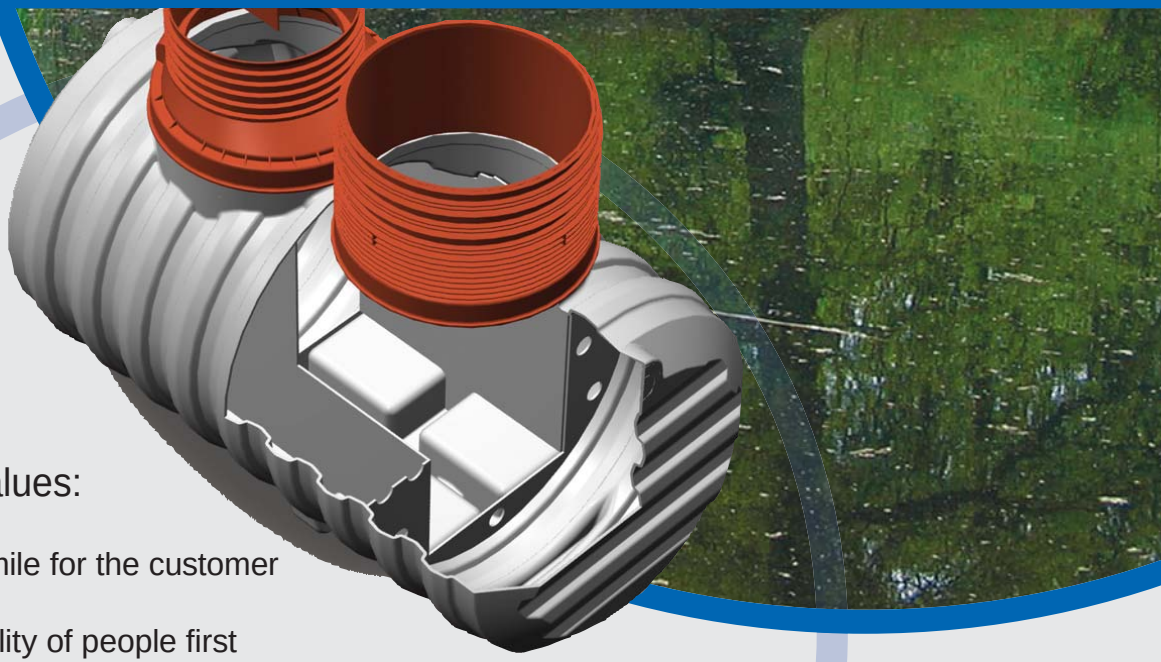
Application of Pipelife's eco systems

About Pipelife

Our business activities are focused on the development, manufacturing and distribution of plastic pipe systems. We provide solutions for the complete water cycle, energy and power distribution, for telecommunication networks and industrial applications. Pipelife's unique position of providing customers with excellent services and products is the result of constant improvement and innovation at the highest quality level. Outstanding competence, extraordinary team spirit, and visionary management are the key factors for being no.1 in terms of customer satisfaction.

Due to management purposes, Pipelife has allocated its whole worldwide presence into 5 different regions, that are all headed by a Chief Operating Officer, who is in charge of the daily business and the strategy of the respective region.

About Pipelife



Principles & Values:

- Go the last mile for the customer
- Invest in quality of people first
- Run lean and unbureaucratic
- Focus on innovation and speed
- Improve performance every single day
- Act honestly, with integrity and citizenship
- Work hard, oriented to results, yet have fun

Mission

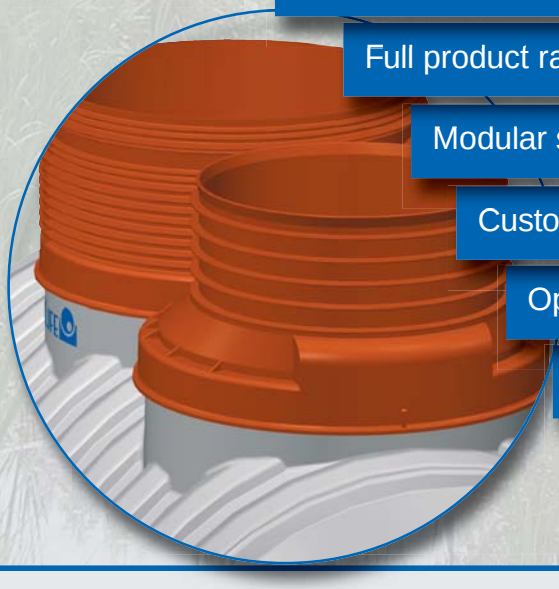
Improve quality of life by providing high value solutions for the protection and flow of water and energy

One of Pipelife's main goals is to help the environment as much as we can. We reach this goal by recycling and providing solutions for a cleaner world!

In more and more countries, it is not allowed to drain of untreated sewage and rain water. Pipelife's SBR system (Sequential Batch Reactor) removes sulphur, micro-organisms, phosphor and nitrogen from water. Our separators will help to clean water from oil and grease. Due to our wide range of eco products, we have the right sollution for every situation.

Advantages

- Easy cleaning by high-pressure injection washers
- Optional electronic control device
- Easy compacting of the sand
- Optional sampling shaft
- Service and support by choosing the right system
- Pipelife offers full solutions
- Low weight
- Optional shut of valve
- Large access holes for cleaning and oil removal
- Easy transportation, handling and installation
- Life expectation: 20 years of service
- Very good cleaning results
- Big storage volume
- Oil separating capacity better than EN858
- Full product range for different needs
- Modular system
- Customized solutions
- Optional electronic control device
- Usable for: Petrol stations, car wash stations and so on



PIPELIFE

Pipelife Oil Separator

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