

Stormwater Management

GE@CEPTOR®
B y p a s s S e p a r a t o r



Product Brochure
September 25

INTRODUCTION

The protection of our watercourses from surface water contamination, such as hydrocarbons and silt, is an essential aspect of Turtle's proactive approach to stormwater management and Sustainable Drainage Systems (SUDS).

Surface water runoff carrying hydrocarbons (including petrol, diesel, and engine oil) can significantly impact our watercourses and the surrounding environment. By designing drainage systems in line with SUDS principles, we can effectively implement "source control" for surface water runoff. Hydrocarbon and oil separators are vital tools in this effort, as they treat surface water runoff prior to its discharge into watercourses or sewer systems.

Where Are Hydrocarbon/Oil Separators Beneficial?

It is important for any site with a potential risk of surface water contamination by hydrocarbons and oils to employ effective measures to safeguard the environment. Hydrocarbon and oil separators should be installed on sites where there is a possibility of accidental spillages or leaks from vehicles, machinery, or equipment.

In compliance with current UK legislation, it is imperative to take action to prevent pollution. Each site should carefully evaluate and implement the most suitable measures to ensure environmental protection.

There are generally two types of Hydrocarbon/Oil Separators:

1. Full Retention

2. Bypass

Recommended Applications for Bypass Separators:

- Car parks with 50 or more parking spaces or exceeding 800 m² in size
- Highways and roads



By taking these constructive steps, we can contribute to a cleaner, healthier environment and protect our vital water resources.

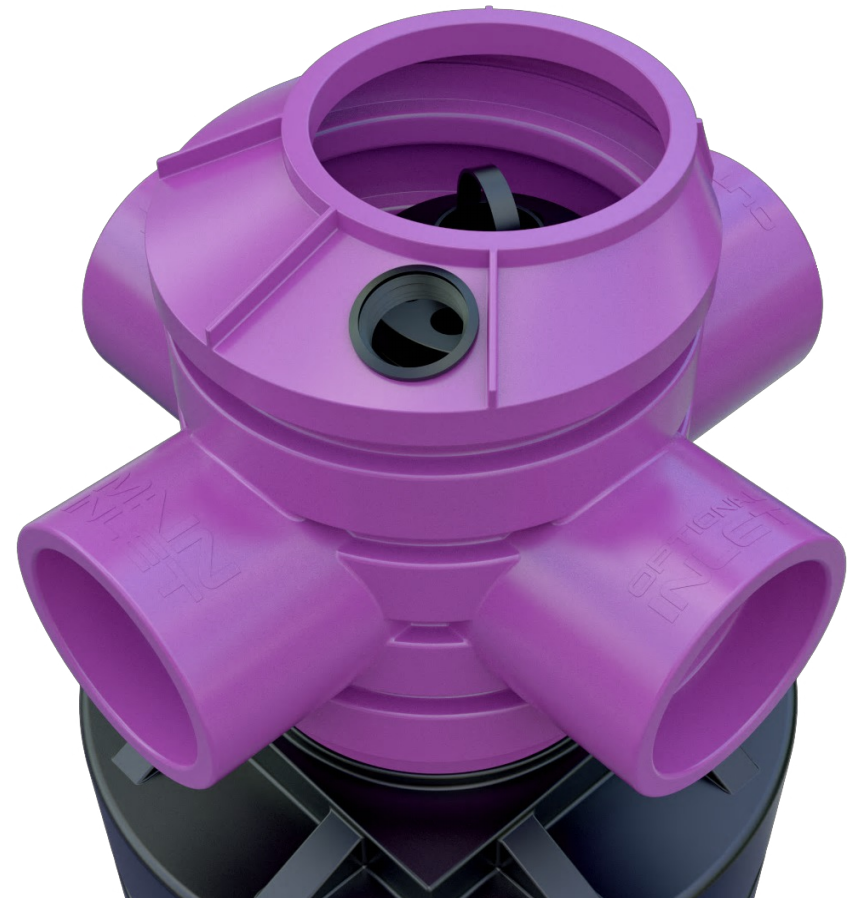
GEOCEPTOR®
B y p a s s S e p a r a t o r

Bypass separators are utilised when it is deemed acceptable to forgo full treatment for very high flow conditions, particularly in situations where the risk of a significant spillage coinciding with heavy rainfall is minimal.

The Geoeceptor's unique bypass design has been independently tested to meet EN858-1. These tests showed that the Geoeceptor design effectively removes hydrocarbons, silts, and solids from low-flow surface runoff, thereby preventing contamination of the surrounding environment.

There are four models available in this range, each designed to treat runoff from drainage areas of up to 22,220 m².

Every model features a robust HDPE body equipped with a patented vertical separation system, capable of handling rainfall intensities of up to 6.5 mm per hour.



PARTS LISTING



Optional: Invert Risers

Effective height 230mm



Class 1 filtration

Removable reticulated foam coalescing filter

Hydrocarbon storage

Capacities from 90 to 600 litres

Base Chamber

Manufactured from HDPE with profiled base for extra strength

Silt retention/storage

Capacities from 600 to 4000 litres

Filter Housing & Overflow chamber



*A15 loading cover



Optional : High level hydrocarbon alarm

To meet PPG3 section 5b and GPP3 section 4.5.2 , separators must be provided with an alarm/warning system that provides both visual and audible warning (if necessary to a remotely located supervisory point).

When the level of oil reaches 90 per cent of the oil storage volume (V) under static liquid level conditions. This automatic warning device indicates that the separator is in need of immediate emptying for it to continue to work effectively.

Oil alarm probe

Bypass ports/weirs

Primary chamber

Where hydrocarbon is skimmed off into the base chamber via skim pipe/pipes

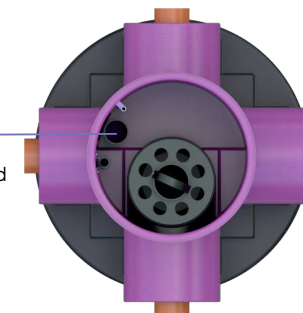
Vent

Prevents air locks in bottom

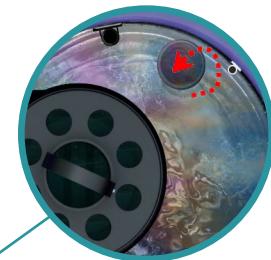
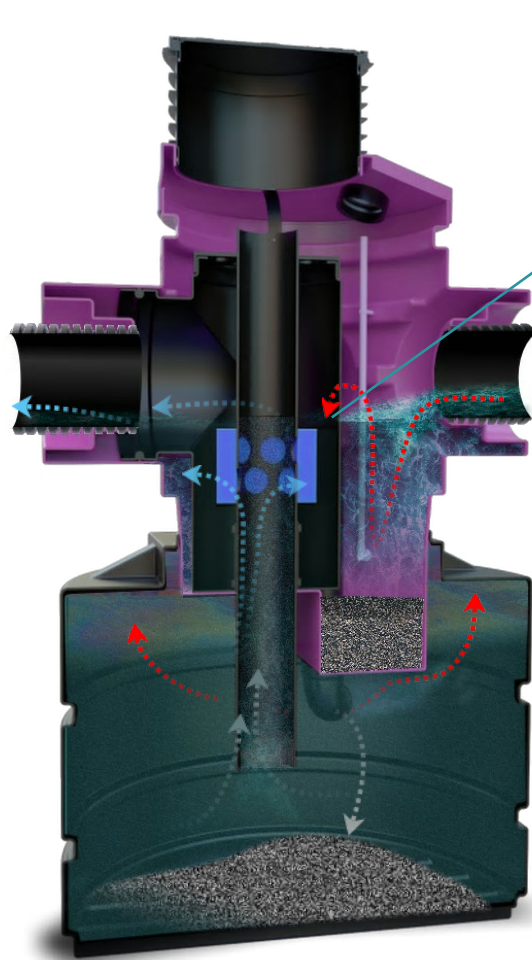
Skim pipe/pipes

Skim pipe diffuser

Filter pipe



HOW THEY WORK



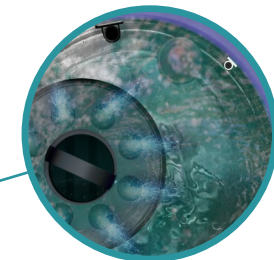
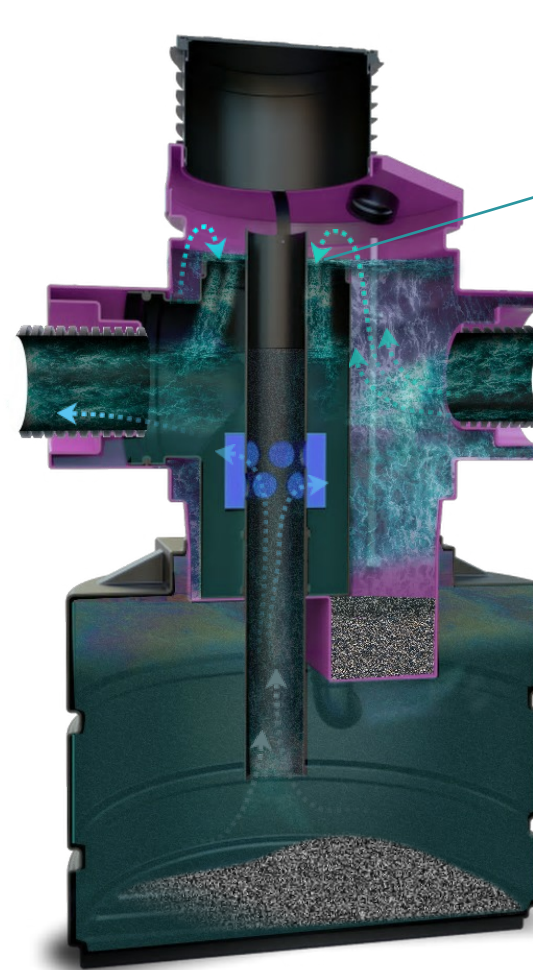
Stage 1: Initial runoff

The initial flush or run off of surface water from the storm is typically the most contaminated with hydrocarbons and silt.

During these early stages of a runoff event, the surface water flows into the primary chamber. Then any oils/hydrocarbons will be in suspension as these have a specific gravity less than water. They will rise to the surface, where they are then siphoned off, into the base chamber via the skim pipe.

Any silts in suspension will also be skimmed into the base chamber and over time, settled silt and solids that are not skimmed into the base chamber, will build up in the top chamber until they reach the skim pipe and will then also be siphoned down into the base chamber.

-➔ Hydrocarbon flow path
-➔ Silt in suspension
-➔ Separated water
-➔ Filtered water



Stage 2: Bypass overflow

As the runoff from the storm event increases to its maximum, the levels of incoming hydrocarbon and silt sharply decrease and the flow into the primary chamber starts to overwhelm the skim pipes maximum flow velocity and so the water level in the primary chamber starts to rise rapidly.

As the flow increases the level in the primary separation chamber will quickly reach the top level of the chamber and at this stage the flow will then bypass the main flow path via the overflow ports at the top of the unit (As shown above).

-➔ Bypass flow
-➔ Separated water
-➔ Filtered water



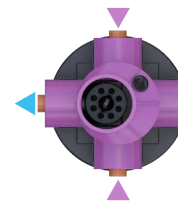
GE@CEPTOR®
B y p a s s S e p a r a t o r

PIPEWORK OPTIONS

*For optimum performance of each bypass separator the pipe diameter and configurations shown in diagrams above must be adhered too. Installing multiple inlet pipes above Ø150mm will effect the flow dynamics and the efficiency of the separator and the maximum number of inlet pipes must not be exceeded.



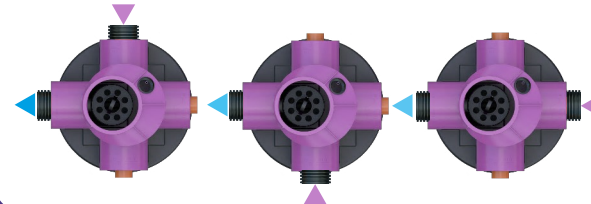
Ø160mm pipework



All 3 inlet connections can be utilised

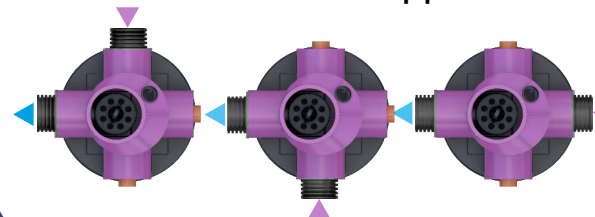
▶ Inlet
▶ Outlet

Ø225mm twinwall



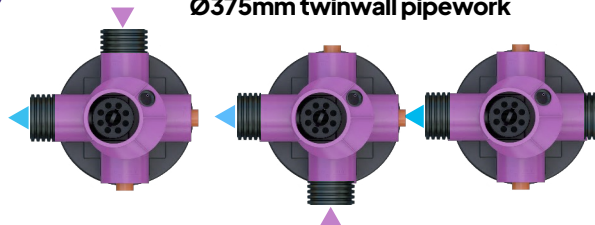
▶ Inlet
▶ Outlet

Ø300mm twinwall pipework



▶ Inlet
▶ Outlet

Ø375mm twinwall pipework



▶ Inlet
▶ Outlet

GE@CEPTOR®
B y p a s s S e p a r a t o r

EN 858
Tested

Class 1
filtration

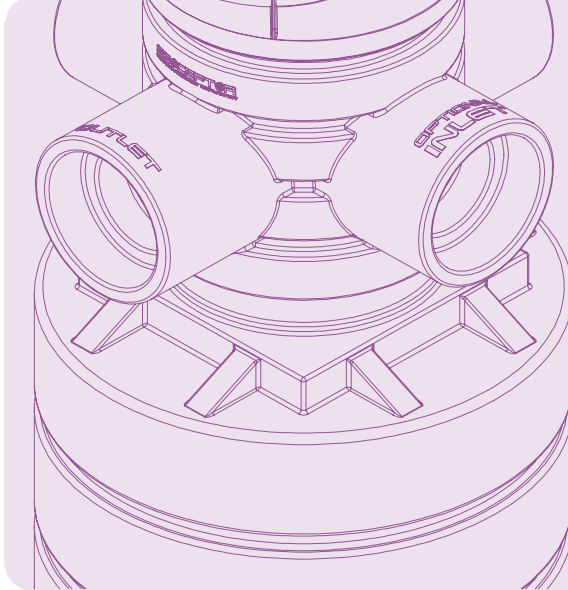
Integrated
silt storage

30+
YEAR
Design Life

PPG3
&
GPP3
Conformity



SPECIFICATION



How to choose the correct size separator

The Geoceptor bypass separator should be sized in accordance with the guidance in PPG3 and GGP3. The size of separator is calculated by applying a standard formula to the surface area that you are treating.

The **Nominal Size (NS)** is the flow rate in litres per second, which is treated by the unit to the specified standard. In the case of the Geoceptor the standard treatment is Class 1.

Bypass separators are referred to as NSB (Nominal Size Bypass).

The nominal size of a bypass separator for a catchment of area A (m²) is obtained using the following formula:

$$NSB = 0.0018 \times A$$

Example :

Assume you have a car park of 3000m². This area is A in the calculation.

Applying the given formula to the car park of A = 3000

$$NSB = 0.0018 \times 3000$$

Gives a result of 5.4

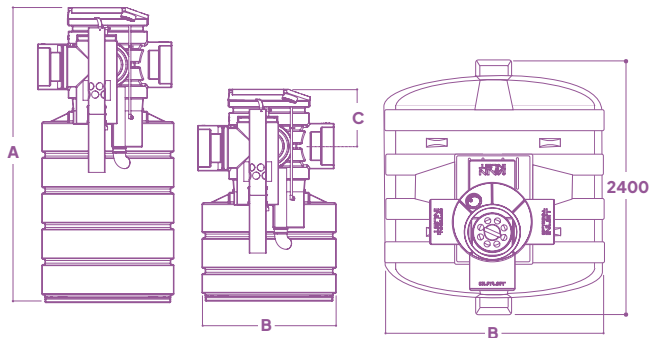
Therefore the bypass separator required for this application would be our **GNSB6**.

Geoceptor Bypass Separator Mitigation Indices For Class 1 Filtration

TSS (Total Suspended Solids)	Total Metals	Total Hydrocarbons
0.85	0.64	0.99*

*Hydrocarbon mitigation tested to 5 x 10⁻⁶

Mitigation indices are normalized metrics that quantify the relative effectiveness of a mitigation measure. They are derived from raw performance data and scaled (e.g., per million) to provide a dimensionless index, enabling consistent comparison across different scenarios or systems.

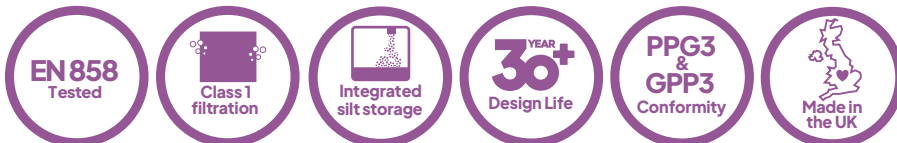


Model Ref.	Nominal Size	Treated flow (l/s)	Peak Flow (l/s)	Area Drained (m ²)	Hydrocarbon Retention (litres)	Silt Retention (litres)	A Height (mm)	B Ø Chamber (mm)	C Inlet centre (mm)	Pipework options (mm)	Weight (kg)
GNSB6	6	6	60	3333	90	645	1966	1260	585	160, 225 & 300	83
GNSB15	15	15	150	8333	225	1500	2711	1260	585	160, 225 & 300	102
GNSB20	20	20	200	11110	300	2000	2805	1560	585	160, 225 & 300	140
GNSB40	40	40	400	22220	600	4000	3000	2150	585	160, 225, 300 & 375	135



Please Note:

- Extension Risers are available separately to extend invert



GE@CEPTOR®
B y p a s s S e p a r a t o r

GE@CEPT@R
HIDROCARBON SILT SEPARATOR



email: sales@turtleenviro.co.uk | sales & technical support: tel. 0191 3036315 | www.turtleenviro.co.uk