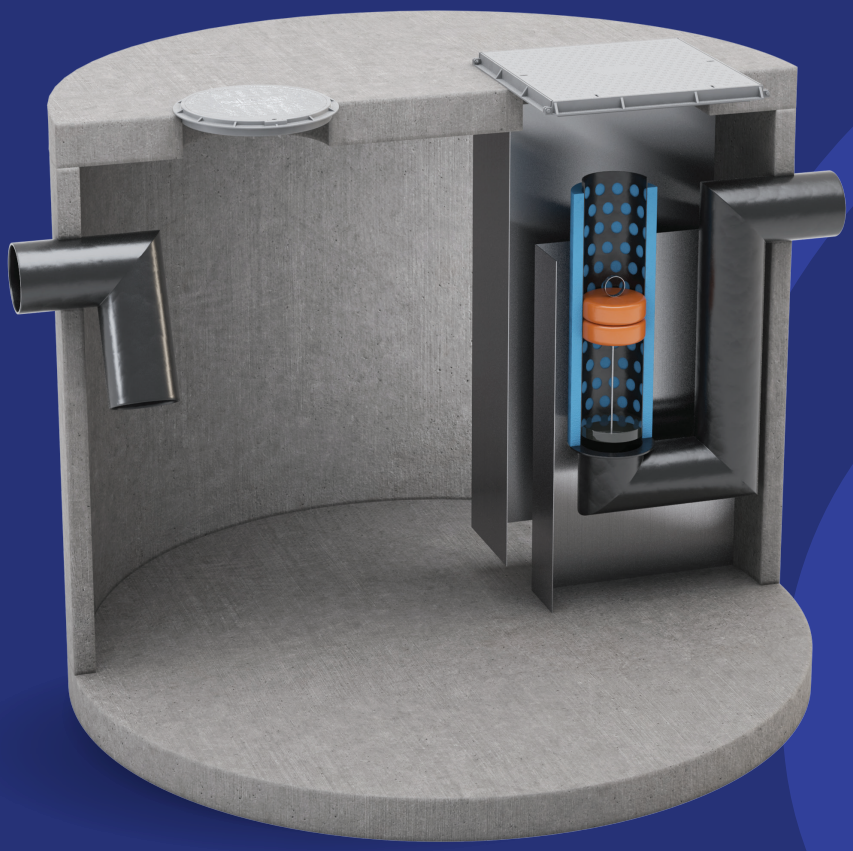
ESK™ Oil/Water Separator

Technical Design Guide



Stopping Pollution Entering Waterways

09/22

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Introduction

The ESK™ Oil/Water Separator (hereafter referred to as the ESK™) is a passive high efficiency coalescing separator that removes free oil from contaminated stormwater runoff and has a built-in shutoff valve to prevent any defined spill volumes from exiting the device and polluting the environment. The device is ideally suited for sites where specific effluent targets are specified, or for sites where removal of oil and grease is the greatest concern e.g. fuel stations, fuel distribution stations, car servicing workshops, etc. It is typically sized to remove oil droplets as small as 10 microns and achieve an effluent total petroleum hydrocarbon concentration of 5 mg/L or less.

Operational Overview

The ESK™ are often installed within petrol stations and other areas where the transfer of bulk fuel or lubricant occurs. The ESK™ is designed to capture and retain hydrocarbons and other fluids that are lighter than water. The flow from the refuelling and fuel transfer areas would be directed to a collection pit or grated trench which then conveys any stormwater and hydrocarbon spills to the ESK™ inlet pipe. The ESK™ inlet pipe is dipped such that incoming flows are quenched in the primary chamber – providing a safety barrier in the event of fire. Any hydrocarbons entrained in the stormwater flow are able to separate in the primary chamber and any sediments are also settled into the lower portion of the primary chamber.

Stormwater - free of larger hydrocarbon droplets - then travels from the primary chamber to the secondary chamber where it then must pass through the coalescing foam and into the outlet pipe structure. The coalescing foam enhances the coalescence of very fine hydrocarbons droplets into larger droplets that rise to the surface of the secondary chamber.

Features

The Separator consists of a tank equipped with inlet and outlet pipes, chamber baffles, a basket with coalescence insert and a closing float valve.

The coalescence insert is made of polyurethane foam.

The separator is normally equipped with a safety device: a float valve which prevents oil from escaping the separator when the volume inside the tank reaches the designed maximum value.

The float is calibrated for density equal to 0.85 g/cm^3.

The applied solution prevents leakage of oil into the stormwater system.

Optional oil sensor alarm is available.

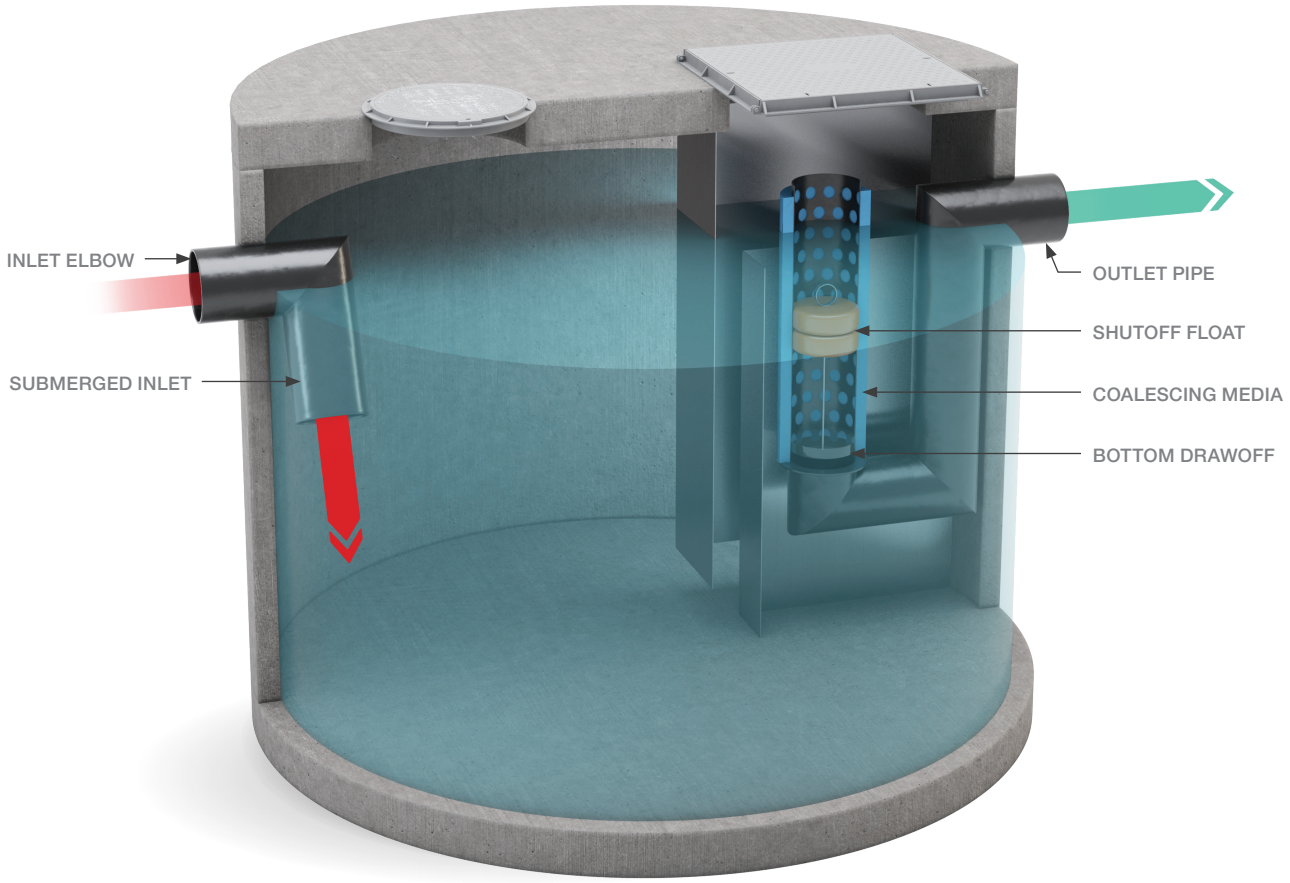

Figure 1: ESK™ Oil/Water Separator components

Configurations

The ESK™ is available in multiple tank configurations and also available in a single or multi chamber arrangement.

Because each application and each site can vary significantly the environmental compliance can also vary. It is often legislated that the treatment system should be sized to accommodate 100 or 110% of the largest storage vessel or transfer vessel. This allows for the case where a vessel has catastrophically failed and released its entire contents as a spill. A typical volume is 8000 L which represents one compartment of a standard road fuel tanker.

The flow rate of a catastrophic spill and also the flow rate of any associated rainfall onto any open areas draining to the ESK™ needs to be calculated and considered when selecting the appropriate ESK™ model.

In summary, the ESK™ should be sized to suit the maximum anticipated spill volume as well as the expected treatment flow rate from the collection area.

Model	Unit Diameter (m)	Flow Capacity (L/s)	Oil Storage Capacity to shut off (L)
ESK-20	1.5	20	650
ESK-40	1.5	40	850
ESK-100	2.25	100	2,500
ESK-20-B-2250	2.25	20	5,500
ESK-20-B-3250	3.25	20	13,000
ESK-40-B-2250	2.25	40	5,500
ESK-40-B-3250	3.25	40	13,000
ESK-100-B-2250	2.25	100	6,000
ESK-100-B-3250	3.25	100	13,000

Note: The oil storage capacity to shut off is a maximum for each model. The volume can be adjusted to suit the site specific requirements.

Performance

Full Scale Laboratory Test Results

The ESK™ meets the European and UK standard EN 858 for the capture and removal of hydrocarbons to 5ppm and 10 microns.

The EN standard is often referenced in local, state and national environmental protection documents.

If you are uncertain of your specific environmental compliance for your site or application please contact your Ocean Protect representative for assistance.

Maintenance

To ensure optimal performance, it is advisable that regular inspection and maintenance is performed. Typically, the ESK™ requires an inspection every 6 months with a minor service at 12 months. Additionally, as the coalescing media foam ages it may eventually become occluded with fine sediments and loss of structure such that the foam will require replacement (expected Foam media life is 2 to 3 years).

Service Type	Description of Typical Activities	Frequency
Inspection	Visual Inspection of the primary and secondary chambers Dipping of the accumulated oil level and sediment level Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Wash-down of coalescing foam, into primary chamber Removal of accumulated floating hydrocarbon (if required) Removal of accumulated sediment (if required) Check correct operation of sensor and alarm (if fitted)	Every 12 Months
Major Service	Replacement of coalescing foam	As required

For further information please refer to the *ESK™ Oil/Water Separator Operations and Maintenance Manual.*

Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

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