STORMCEPTOR® EF IS PATENT-PENDING.

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OVERVIEW

The Stormceptor® EF is a continuation and evolution of the most globally recognized oil-grit separator (OGS) stormwater treatment technology - Stormceptor®. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil-grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at higher flow rates as compared to the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF’s patent-pending treatment and scour prevention technology and internal bypass ensures sediment is retained during all rainfall events.

Stormceptor EF offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe, multiple inlet pipes, and/or from the surface through an inlet grate. Stormceptor EF can also serve as a junction structure, accommodate a 90-degree inlet to outlet bend angle, and be modified to ensure performance in submerged conditions. With its scour prevention technology and internal bypass, Stormceptor EF can be installed online, eliminating the need for costly additional bypass structures.

OPERATION

• Stormwater enters the Stormceptor upper chamber through the inlet pipe(s) or a surface inlet grate. A specially designed insert reduces the influent velocity by creating a pond upstream of the insert’s weir. Sediment particles immediately begin to settle. Swirling flow sweeps water, sediment, and floatables across the sloped surface of the insert to the inlet opening of the drop pipe, where a strong vortex draws water, sediment, oil, and debris down the drop pipe cone.

• Influent exits the cone into the drop pipe duct. The duct has two large rectangular outlet openings as well as perforations in the backside and floor of the duct. Influent is diffused through these various opening in multiple directions and at low velocity into the lower chamber.

• Free oils and floatables rise up and are trapped beneath the insert, while sediment settles to the sump. Pollutants are retained for later removal during maintenance cleaning.

• Treated effluent enters the outlet riser, moves upward, and discharges to the top side of the insert downstream of the weir, where it flows out the outlet pipe.

• During intense storm events with very high influent flow rates, the pond height on the upstream side of the weir may exceed the height of the weir, and the excess flow passes over the top of the weir to the downstream side of the insert, and exits through the outlet pipe. This internal bypass feature allows for online installation, avoiding the cost of additional bypass structures. During bypass, the pond separates sediment from all incoming flows, while full treatment in the lower chamber continues at the maximum flow rate.

• Stormceptor EF’s patent-pending enhanced flow and scour prevention technology ensures pollutants are captured and retained, allowing excess flows to bypass during infrequent, high intensity storms.
• Insert – separates vessel into upper and lower chambers, and provides double-wall containment of hydrocarbons
• Weir – creates stormwater ponding and driving head on top side of insert
• Drop pipe – conveys stormwater and pollutants into the lower chamber
• Outlet riser – conveys treated stormwater from the lower chamber to the outlet pipe, and provides primary inspection and maintenance access into the lower chamber
• Outlet riser vane – prevents formation of a vortex in the outlet riser during high flow rate conditions
• Oil inspection pipe – primary access for measuring oil depth, and oil removal

IDENTIFICATION

Each Stormceptor EF/EFO unit is easily identifiable by the trade name Stormceptor® embossed on the access cover at grade as shown in Figure 3. The tradename Stormceptor® is also embossed on the top of the insert upstream of the weir as shown in Figure 3.

The unit serial number is identified on the top of the insert upstream of the weir as shown in Figure 4.
### TABLE 1. METRIC DIMENSIONS AND CAPACITIES

<table>
<thead>
<tr>
<th>Stormceptor Model</th>
<th>Inside Diameter</th>
<th>Minimum Surface to Outlet Invert</th>
<th>Depth Below Outlet Pipe Invert</th>
<th>Wet Volume</th>
<th>Sediment Capacity¹</th>
<th>Hydrocarbon Storage Capacity²</th>
<th>Maximum Flow Rate into Lower Chamber³</th>
<th>Peak Conveyance Flow Rate⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF4 / EFO4</td>
<td>1.22 (m)</td>
<td>915 (mm)</td>
<td>1524 (mm)</td>
<td>1780 (L)</td>
<td>1.19 (m³)</td>
<td>265 (L)</td>
<td>22.1 / 10.4 (L/s)</td>
<td>425 (L/s)</td>
</tr>
<tr>
<td>EF6 / EFO6</td>
<td>1.83 (m)</td>
<td>915 (mm)</td>
<td>1930 (mm)</td>
<td>5070 (L)</td>
<td>3.47 (m³)</td>
<td>610 (L)</td>
<td>49.6 / 23.4 (L/s)</td>
<td>990 (L/s)</td>
</tr>
<tr>
<td>EF8 / EFO8</td>
<td>2.44 (m)</td>
<td>1219 (mm)</td>
<td>2591 (mm)</td>
<td>12090 (L)</td>
<td>8.78 (m³)</td>
<td>1070 (L)</td>
<td>88.3 / 41.6 (L/s)</td>
<td>1700 (L/s)</td>
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<tr>
<td>EF10 / EFO10</td>
<td>3.05 (m)</td>
<td>1219 (mm)</td>
<td>3251 (mm)</td>
<td>23700 (L)</td>
<td>17.79 (m³)</td>
<td>1670 (L)</td>
<td>138 / 65 (L/s)</td>
<td>2830 (L/s)</td>
</tr>
<tr>
<td>EF12 / EFO12</td>
<td>3.66 (m)</td>
<td>1524 (mm)</td>
<td>3886 (mm)</td>
<td>40800 (L)</td>
<td>31.22 (m³)</td>
<td>2475 (L)</td>
<td>198.7 / 93.7 (L/s)</td>
<td>2830 (L/s)</td>
</tr>
</tbody>
</table>

1. Sediment Capacity is measured from the floor to the bottom of the drop pipe cone. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

2. Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.

3. EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 1135 L/min/m² (27.9 gpm/ft²). EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 535 L/min/m² (13.1 gpm/ft²).

4. Peak Conveyance Flow Rate is limited by a maximum velocity of 1. m/s (5 fps).
INSPECTION AND MAINTENANCE

It is important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued protection of natural waterways.

Quick Reference

• Typical inspection and maintenance is performed from grade
• Remove manhole cover(s) or inlet grate to access insert and lower chamber
  NOTE: If an inlet grate is present, EF4/EFO4 requires the removal of a flow deflector beneath inlet grate
• Use Sludge Judge® or similar sediment probe to check sediment depth through the outlet riser
• Oil dipstick can be inserted through the oil inspection pipe
• Visually inspect the insert for debris, remove debris if present
• Visually inspect the drop pipe opening for blockage, remove blockage if present
• Visually inspect insert and weir for damage, schedule repair if needed
• Insert vacuum hose and jetting wand through the outlet riser and extract sediment and floatables
• Replace flow deflector (EF4/EFO4), inlet grate, and cover(s)

When is inspection needed?

• Post-construction inspection is required prior to putting the Stormceptor into service.
• Routine inspections are recommended during the first year of operation to accurately assess pollutant accumulation.
• Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
• Inspections should also be performed immediately after oil, fuel, or other chemical spills.

What equipment is typically required for inspection?

• Manhole access cover lifting tool
• Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
• Flashlight
• Camera
• Data log / Inspection Report
• Safety cones and caution tape
• Hard hat, safety shoes, safety glasses, and chemical-resistant gloves
When is maintenance cleaning needed?

- If the post-construction inspection indicates presence of construction sediment of a depth greater than a few inches, maintenance is recommended at that time. For optimum performance and normal operation the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, see Table 3.
- Maintain immediately after an oil, fuel, or other chemical spill.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>Sediment Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF4 / EFO4</td>
<td>8 in, 203 mm</td>
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<tr>
<td>EF6 / EFO6</td>
<td>12 in, 305 mm</td>
</tr>
<tr>
<td>EF8 / EFO8</td>
<td>24 in, 610 mm</td>
</tr>
<tr>
<td>EF10 / EFO10</td>
<td>24 in, 610 mm</td>
</tr>
<tr>
<td>EF12 / EFO12</td>
<td>24 in, 610 mm</td>
</tr>
</tbody>
</table>

* Based on a minimum distance of 40 inches (1,016 mm) from bottom of outlet riser to top of sediment bed

The frequency of inspection and maintenance may need to be adjusted based on site conditions to ensure the unit is operating and performing as intended. Maintenance costs will vary based on the size of the unit, site conditions, local requirements, disposal costs, and transportation distance.

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required (adhere to all OSHA / CCOSH standards)
What conditions can compromise Stormceptor performance?

- Presence of construction sediment and debris in the unit prior to activation
- Excessive sediment depth beyond the recommended maintenance depth
- Oil spill in excess of the oil storage capacity
- Clogging or restriction of the drop pipe inlet opening with debris
- Downstream blockage that results in a backwater condition

MAINTENANCE PROCEDURES

- Maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is maintained from grade through a standard surface manhole access cover or inlet grate.
- In the case of submerged or tailwater conditions, extra measures are likely required, such as plugging the inlet and outlet pipes prior to conducting maintenance.
- Inspection and maintenance of upstream catch basins and other stormwater conveyance structures is also recommended to extend the time between future maintenance cycles.
- Sediment depth inspections are performed through the Outlet Riser and oil presence can be determined through the Oil Inspection Pipe (see Figures 6 and 7).
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.
- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.
• When maintenance is required, a standard vacuum truck is used to remove the pollutants from the lower chamber of the unit through the Outlet Riser (see Figure 7).

![Figure 7]

• The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference (see Figure 8).

![Figure 8]

**REMOVABLE FLOW DEFLECTOR**

• Grated inlets for the Stormceptor EF4/EFO4 model requires a removable flow deflector staged underneath a 24-inch x 24-inch (600 mm x 600 mm) square inlet grate to direct flow towards the inlet side of the insert, and avoid flow and pollutants from entering the outlet side of the insert from grade (See Figure 9). The EF6/EFO6 and larger models do not require the flow deflector.

![Figure 9]
HYDROCARBON SPILLS
Stormceptor is often installed on high pollutant load hotspot sites with vehicular traffic where hydrocarbon spill potential exists. Should a spill occur, or presence of oil be identified within a Stormceptor EF/EFO, the unit should be cleaned immediately by a licensed liquid waste hauler.

Disposal
Maintenance providers are to follow all federal, state/provincial, and local requirements for disposal of material.

Oil Sheens
When oil is present in stormwater runoff, a sheen may be noticeable at the Stormceptor outlet. An oil rainbow or sheen can be noticeable at very low oil concentrations (< 10 mg/L). Despite the appearance of a sheen, Stormceptor EF/EFO may still be functioning as intended.

Oil Level Alarm
To mitigate spill liability with 24/7 detection, an electronic Oil Level Alarm monitoring system can be employed to trigger a visual and audible alarm when a pre-set level of oil is captured within the lower chamber or when an oil spill occurs. The oil level alarm is available as an optional feature to include with Stormceptor EF/EFO as shown in Figure 10.

For additional details about the Oil Level Alarm, please visit www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

REPLACEMENT PARTS
Stormceptor has no moving parts. Therefore, inspection and maintenance activities are generally focused on pollutant removal. Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. However, if replacement parts are necessary, they may be purchased by contacting your local Stormceptor representative.
STORMCEPTOR INSPECTION AND MAINTENANCE LOG

Stormceptor Model No: ________________________________________________________

Serial Number: _____________________________________________________________

Installation Date: ___________________________________________________________

Location Description of Unit: _________________________________________________

Recommended Sediment Maintenance Depth: _________________________________

<table>
<thead>
<tr>
<th>DATE</th>
<th>SEDIMENT DEPTH</th>
<th>OIL DEPTH (inches or mm)</th>
<th>SERVICE REQUIRED (Y/N)</th>
<th>MAINTENANCE PERFORMED</th>
<th>MAINTENANCE PROVIDER</th>
<th>COMMENTS</th>
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Other Comments: ____________________________________________________________

CONTACT INFORMATION

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Stormceptor representative.

Imbrium Systems Inc.
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