



Halgan
Environmental

Downstream Defender® High Capacity Stormwater Treatment



Environmentally Sustainable Treatment Solutions

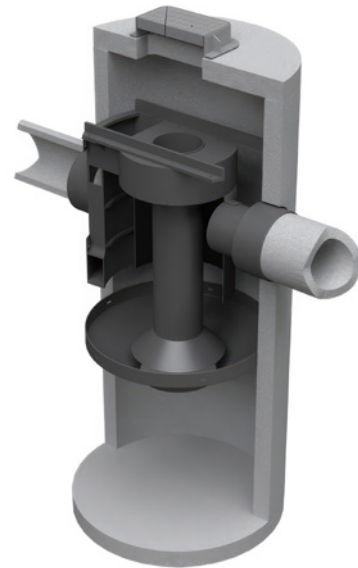


Downstream Defender®

Halgan Environmental provides innovative stormwater solutions through the latest technology to achieve sustainability goals. Halgan's latest range of products simplifies installation and treatment of stormwater, whilst satisfying Water Sensitive Urban Design (WSUD) principles.

Installed in Halgan polyethylene or high density polyethylene vessels the Downstream Defender® is an advanced hydrodynamic vortex separator, designed to create a low energy rotational flow to facilitate pollutant separation and capture. The Downstream Defender® provides efficient capture and retention of fine and coarse particles, hydrocarbons, oils and floatable debris from stormwater runoff.

The Downstream Defender® can accommodate a wide range of flows and other site-specific requirements due to its innovative



Applications

- ✓ New developments, retrofits, utility yards, streets and roadways, car parks, industrial and commercial facilities, wetlands protection
- ✓ Pretreatment for filters (Up-Flo Filter®), infiltration and storage
- ✓ Water Sensitivity Urban Design Projects (WSUD)

Advantages

- ✓ Pre-assembled to facilitate ease of installation
- ✓ Removes sediment, floatables, oil and grease without pollutant washouts
- ✓ Advanced hydrodynamic vortex separation generating a long flow path to ensure capture and retention of pollutants

Approvals

- ✓ Variety of sizes accommodating for site specific requirements
- ✓ MUSIC Modelling to provide appropriate removal efficiencies to meet council requirements
- ✓ Retrofit installations

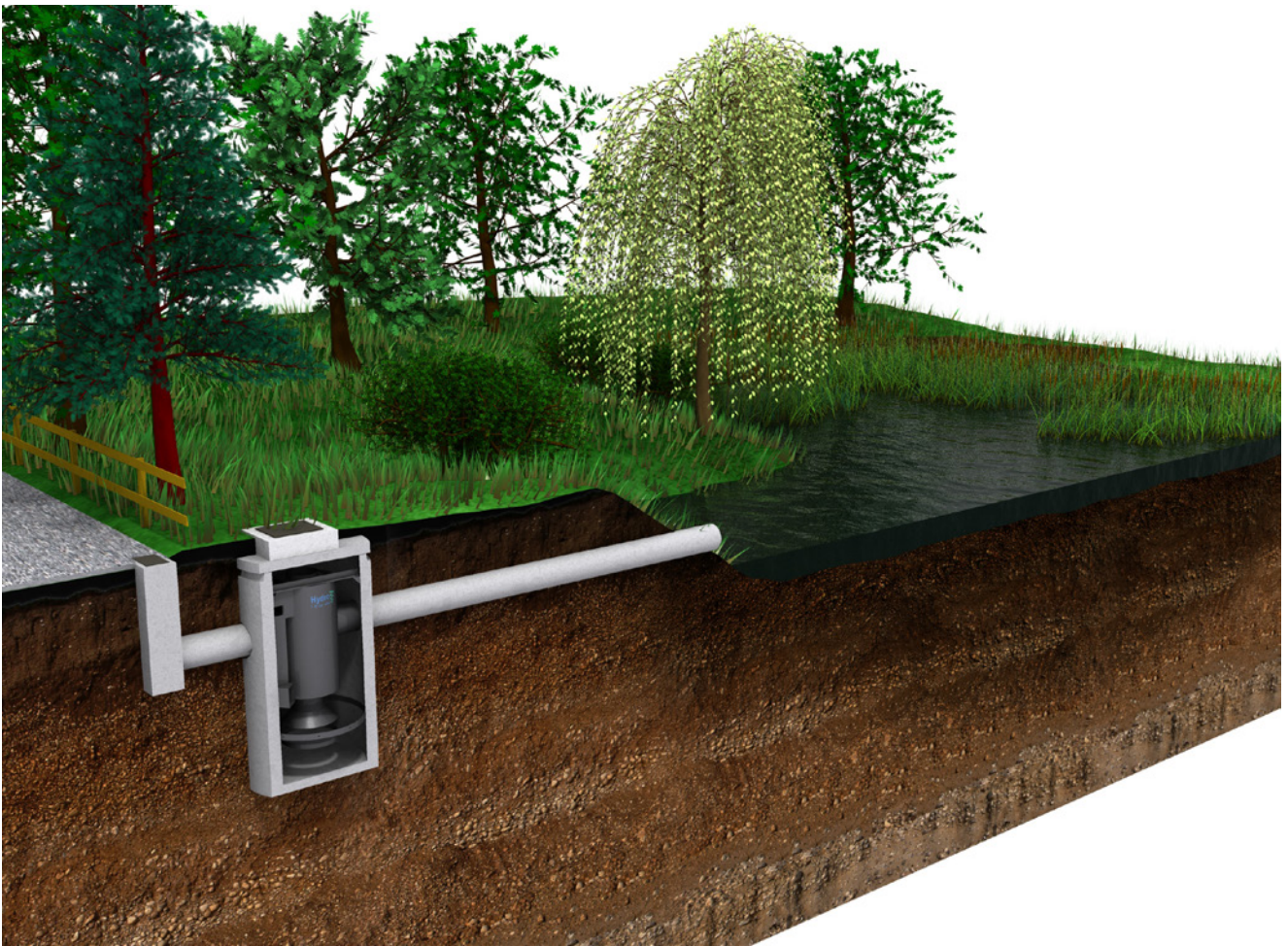


How it works

Stormwater runoff enters the chamber through the inlet pipe at a tangent to generate a rotational flow. As the flow spirals down around the dip plate cylinder, the low energy vortex separates the pollutants.

Sediments are directed inward along the benching skirt and captured in the sediment storage zone, while oils, litter and floatable debris rise to the surface and are trapped in the oil and floatables zone.

The treated stormwater is discharged from within the dip plate cylinder, maximizing the residence time to enable effective separation of pollutants.



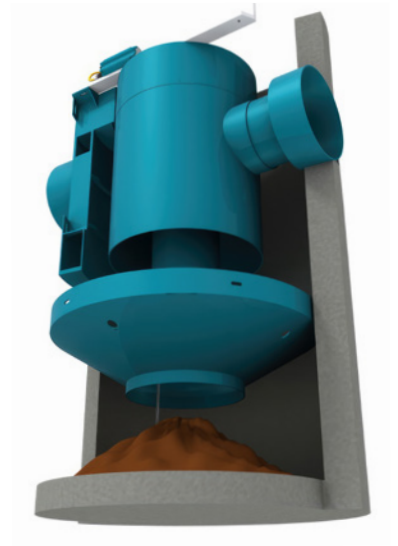


Design and sizing

Sizing for the Downstream Defender® is determined by design flow rates to meet a water quality treatable flow rate. Each device has a maximum treatable flow rate and a maximum peak flow rate.

Halgan supplies a variety of designs for the Downstream Defender®, catering for: variable depths to invert, required treatable flow rates, WSUD MUSIC Modelling requirements.

The Downstream Defender® is also frequently paired with the Up-Flo Filter® for best practice and results.



Model and size table

Model	Diameter (mm)	Maximum Treatable Flow Rate (L/s)	Peak Online Flow Rate (L/s)	Maximum Pipe Size (mm)	Sump Capacity (L)
HDD1200	Ø: 1200mm	38	120	600	1000
HDD1800	Ø: 1800mm	85	270	600	3000

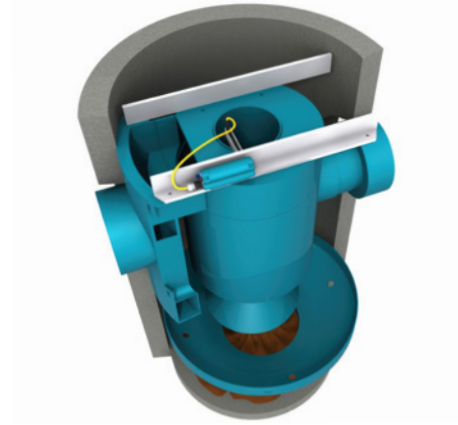


Operation and maintenance

The Downstream Defender® is designed to operate on vortex separation. It is a self-activating device, that has no moving components or require any external power and has been fabricated with durable and corrosion resistant material.

Maintenance for the Downstream Defender® is limited to periodic inspections, and pollutant removal (sediment and floatables).

Further details for operation and maintenance guidelines can be found in the Downstream Defender® Operation and Maintenance Manual.



Operation and maintenance summary

Activity	Frequency
Inspection	Regularly during the first year of installation. Every 6 months after the first year of installation.
Oil and Floatables Removal	Once per year with sediment removal. Immediately if there is a contaminated spill in the drainage area.
Sediment Removal	Once per year or as required. Following a contaminated spill in the drainage area.
Sediment Removal	Once per year or as required. Following a contaminated spill in the drainage area.

NOTE: For most clean outs, the entire volume of liquid is not required to be removed from the manhole. The first few centimeters of oils and floatables from the water surface may be removed to reduce the total volume of liquid removed during the clean out.





FAQs

Q: What maintenance is required?

A: Maintenance is simple and safe and can be carried out using a vactor truck, without any need to physically enter the space. Maintenance and inspections consists of clean outs removing sediments from the sump and floatables, oil, grease, litter and other debris from the capture zone.

Q: What are the removal efficiencies?

A: Precise removal efficiencies are dependent on particle size, specific gravity of the pollutant and multiple other variables. Please contact Halgan Sales Representative to discuss your specific removal requirements. Halgan also produces MUSIC Models to demonstrate the achieved removal efficiencies.

Q: Can multiple inlets be incorporated into the design?

A: Yes, in some instances it may. Please contact Halgan Sales Representative to discuss your specific requirements.

Q: Why is there no internal bypass?

A: The standard Downstream Defender® models are designed to be installed online to treat the entire flow, therefore an internal bypass is not required. However, if required, an offline design with an upstream bypass diversion can be considered. Please contact Halgan Sales Representative to discuss in further detail.

Q: Does the Downstream Defender® require a pump?

A: No pump is needed. The Downstream Defender® operates on simple hydraulics and after the first storm/first flush, the device will be filled to the invert of the outlet and operate without the necessity of a pump.

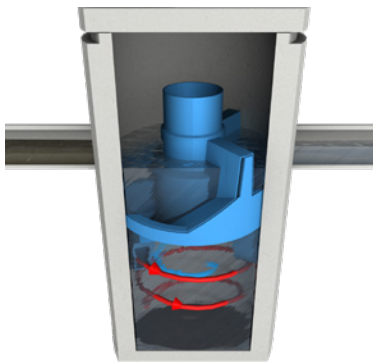


Other Products



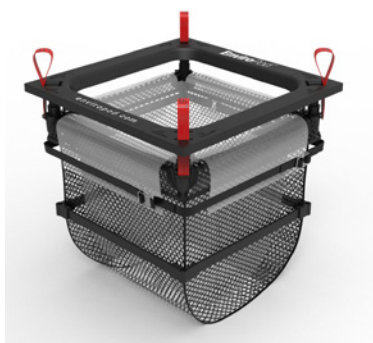
Up-Flo Filter

Installed in a lightweight Halgan polyethylene or high density polyethylene vessel the Up-Flo Filter® is a multistage stormwater treatment system that combines pre-treatment and media technology for effective pollutant removal for stormwater runoff. Suitable for all catchment types, the Up-Flo Filter® consists of configurable modules to meet stormwater treatment requirements.



First Defense

Installed in a lightweight Halgan polyethylene or high density polyethylene vessel the First Defense stormwater separator captures and retains sediments, litter and floatables. Through low-energy vortex separation, the First Defense eliminates the agitation of captured pollutants to ensure they are not washed out during subsequent storm events. The First Defense is available in various sizes and works with multiple inlets and pipe sizes.



Enviropod 200

The Enviropod is an easy to install and operate, pre-treatment device that removes gross pollutants, debris and other associated nutrients and pollutants. It comes in varying sizes and is most practical for retrofits, requiring no alterations to the drainage.





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