

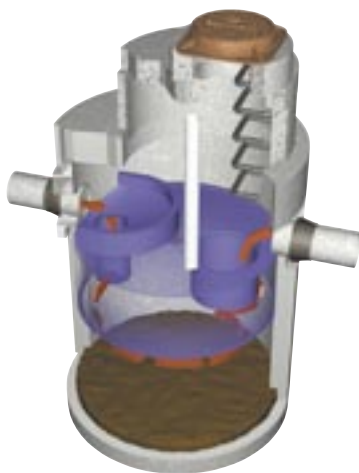
Product Range

In-Line Humeceptor™

The most commonly installed unit is the In-Line Humeceptor™. It is designed with single or multiple inlets and a single outlet, and is available in eight different unit sizes, ranging from 3,000 to 27,000 litre storage capacities. Each unit is constructed from precast concrete components and a patented fibreglass insert that separates the upper (by-pass) and lower (separation/holding) chambers. In areas where oil or hydrocarbon/petroleum spills accumulate in substantial volume between cleaning, the fibreglass insert provides dual wall containment to ensure trapped hydrocarbons are safely stored inside the treatment chamber.

Normal Operating Conditions

Under normal (frequent) operating conditions (more than 85% of all storm events), stormwater flows into the upper by-pass chamber and is diverted by a semi circular weir, down into the separation/holding chamber. Flow entering the lower chamber is carefully controlled by an orifice plate to prevent excessive operational velocities, and maximise capture and retention of hydrocarbons and suspended solids. This downward flow is directed, by right-angle outlets, tangentially around the circular walls of the chamber to maximise the flow path and detention time. Flow continues around the circumference of the unit, exits the lower chamber through the riser pipe and rejoins the piped drainage system. Fine and coarse suspended solids settle to the floor of the chamber, under very low velocity quiescent conditions, while the petroleum products rise and become trapped beneath the fibreglass insert.



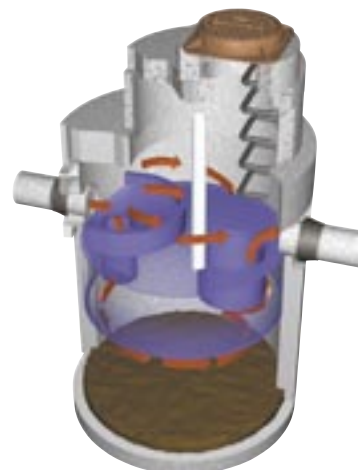
Normal flow conditions

By-Pass Operating Conditions

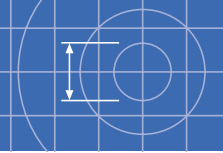
During infrequent high flow events (less than 15% of all storm events), peak stormwater flows will pass over the diverting weir and continue through the by-pass chamber into the downstream stormwater system. This by-pass activity creates pressure equalisation across the by-pass chamber, between the inlet and outlet, causing a slight throttling or reduction of the flow entering the lower treatment chamber which guarantees retention of fine material previously deposited. A portion of incoming suspended solids continues to be diverted by the weir into the lower chamber where it is stored, along with previously collected solids and hydrocarbons. Humeceptor™ is unique in the market place since it is the only product which places emphasis on carefully controlling flow rates and operational velocities during all hydrologic conditions, thus preventing scouring, resuspension and ultimate loss of suspended solids during high flows.

The In-Line Humeceptor™ has been proven in full scale laboratory and field validation tests to capture and retain over:

- 80% of total suspended solids, including the fine fraction classified as material having a particle size less than 60 µm, which has been shown to comprise the majority of the total mass load.
- 98% of free and floating oils, grease, hydrocarbons and petroleum products under both dry weather, emergency spill situations and during wet weather rainfall periods.
- Removal and retention of a range of contaminants sorbed or attached to the fine suspended solids, material including hydrocarbons, petroleum products and heavy metals.



High flow conditions



Inlet Humeceptor™

Taking the place of traditional inlet structures, the Inlet **Humeceptor™** is ideal for small drainage areas such as truck loading bays, small car parks, electrical transformer stations and fuel storage pads. Its unique design allows for runoff to enter the structure in several configurations:

- i) Grated inlet with a single outlet pipe at the head of the drainage system.
- ii) Grated inlet with inlet and outlet pipes to form a grated in-line device.
- iii) Small in-line configuration without the grated inlet.

The Inlet **Humeceptor™** is manufactured with a 1200mm diameter precast concrete shaft. Like the conventional In-Line **Humeceptor™**, a sloped fibreglass insert separates the upper (by-pass) and lower (separation/holding) chambers. The insert extends into the treatment chamber providing dual wall containment of free oils, hydrocarbons and petroleum products.

Normal operating conditions

Under normal (frequent) operating conditions (more than 85% of all storm events), stormwater enters the upper by-pass chamber either via the grated inlet or from an upstream pipe (or both) and is diverted, through the drop pipe into the separation/holding chamber. Flow entering the lower chamber is carefully controlled through a combination of the head and the orifice opening to prevent excessive operational velocities and maximise capture and retention of hydrocarbons and suspended solids. This flow is directed, by a right angle drop pipe configuration tangentially around the circular walls of the chamber.



Normal flow conditions

Flow continues around the circumference of the unit, exits the lower chamber through the riser pipe and rejoins the piped drainage system. Fine and coarse suspended solids settle to the chamber floor, under very low velocity quiescent conditions, while the petroleum products rise and become trapped beneath the fibreglass insert.

By-pass operating conditions

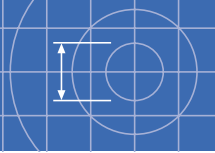
During infrequent high flow events (less than 15% of all storm events), peak stormwater flows will pass over the diverting weir into the downstream drainage system. This by-pass feature creates pressure equalisation across the by-pass chamber, causing a slight throttling or reduction of the flow entering the lower treatment chamber which guarantees retention of fine material previously deposited. A portion of incoming suspended solids will continue to be diverted into the lower chamber. **Humeceptor™** is unique in the market place since it is the only product which places emphasis on carefully controlling flow rates and operational velocities during all hydrologic conditions, thus preventing scouring, resuspension and ultimate loss of suspended solids during high flows.

The Inlet **Humeceptor™** is an excellent alternative to normal drainage practices, as it saves the cost of providing a traditional inlet structure upstream of a conventional treatment device in small drainage areas.



High flow conditions



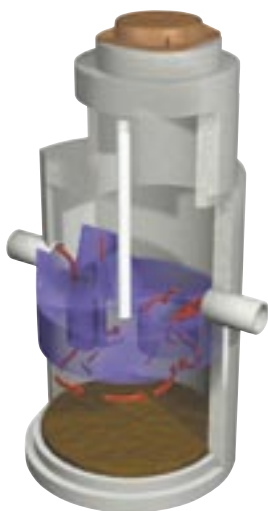


Submerged Humeceptor™

The Submerged **Humeceptor™** is designed to remove hydrocarbons and suspended solids from stormwater runoff in partially submerged pipes. The primary application for the Submerged **Humeceptor™** is where a relatively permanent tailwater from a downstream wetland, lake, pond, waterway or canal causes the piped drainage system to be partially submerged. The precast concrete sections are manufactured in easily assembled components and available in the same sizes as the In-Line **Humeceptor™** (3,000 to 27,000 litres storage capacity). A customised fibreglass insert (similar to the standard In-Line **Humeceptor™**) separates the upper (by-pass) and lower (separation/holding) chambers.

Normal operating conditions

The Submerged **Humeceptor™** operates much like the In-Line **Humeceptor™**. The submerged design includes a customised weir height (depending on the average water level in the downstream pipe and annual water level fluctuation) and two inlet drop pipes. The lower drop pipe is always submerged. This drop pipe transports suspended solids and bedload sediment into the separation chamber. The higher drop pipe is located at the average submergence elevation and transports lighter material (free oil/TPH) into the separation chamber by forcing the development of a vortex, which "sucks" floating hydrocarbons into the lower chamber. The Submerged **Humeceptor™** utilises the same flow control features of the standard In-Line units.

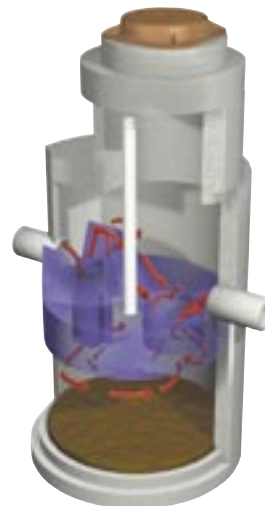


Normal flow conditions

The orifice plate combined with the pressure (head) between the upstream and downstream pipes carefully controls flow entering the lower chamber to prevent excessive operational velocities and maximise capture and retention of hydrocarbons and suspended solids. The Submerged **Humeceptor™** is effective for free oil and suspended solids removal under partially submerged conditions.

By-pass operating conditions

During infrequent high flow events, water is conveyed over the internal by-pass weir directly to the downstream drainage system. By-passing high flows prevents the generation of high velocities within the lower chamber thus guaranteeing the retention of previously deposited material.



High flow conditions



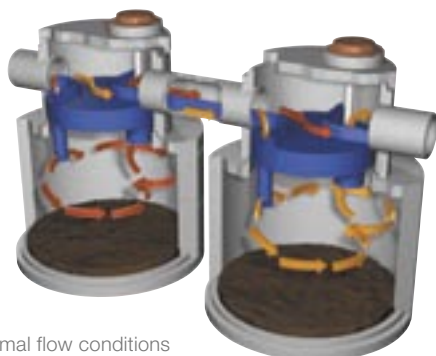
Series Humeceptor™

The Series Humeceptor™ is designed to treat runoff from larger drainage areas or on highly disturbed sites where export rates and the mass load of suspended solids is expected to be greater than conventional impervious catchments. Examples of highly disturbed or unstable sites include mining operations, work yards and industrial activities with material stockpiles and similar sites. The Series Humeceptor™ can more than double the treated drainage areas of the In-Line Humeceptor™ System and achieve very high total suspended solids retention. The series models are available in 40,000, 50,000 and 60,000 litre sizes.

The Series Humeceptor™ consists of two structures which whilst constructed and installed in series, actually operate in parallel. The first structure acts as a flow splitter, diverting half of the flow into the first treatment chamber, and allowing the second half of the flow to travel through the unit to the second treatment chamber. The Series Humeceptor™ units contain essentially the same patented fibreglass insert as the In-Line Humeceptor™ which provides the internal by-pass feature inherent in all Humeceptor™ designs, preventing scour and resuspension during high flows, which have hampered the performance of conventional separator systems.

Normal operating conditions

Under normal (frequent) operating conditions (more than 85% of all storm events), stormwater enters the upper by-pass chamber of the first structure. Half of the flow is diverted by a semi circular weir into the separation/holding chamber of the first structure. Like the standard In-Line Humeceptor™, flow entering the lower chamber is carefully controlled by an orifice plate to prevent excessive operational velocities and maximise capture and retention of hydrocarbons and suspended solids.



Normal flow conditions

This downward flow is directed, by right-angle outlets, tangentially around the circular walls of the chamber to maximise the flow path and detention time. Flow continues around the circumference of the unit, exits the lower chamber through the riser pipe and rejoins the upper chamber of the combined Series Humeceptor™ arrangement. Fine and coarse suspended solids settle to the floor of the chamber, under very low velocity quiescent conditions, while the petroleum products rise and become trapped beneath the fibreglass insert. The half of the flow which is not diverted in the lower chamber continues through the first structure to the second structure. This remaining flow is diverted into the lower chamber of the second structure, progresses through the second treatment chamber and rejoins the downstream pipe system. Suspended solids and floatables are retained as they are in the first chamber.

By-pass operating conditions

During infrequent high flow events, peak stormwater flows will pass over the diverting weirs in the first and second chamber and continue through the by-pass chamber into the downstream stormwater system. This by-pass activity creates pressure equalisation across both units, which causes a slight throttling or reduction of the flow entering the lower treatment chamber which guarantees retention of fine material previously deposited. A portion of incoming suspended solids continues to be diverted by the weirs in the first and second structure into the treatment chamber. Humeceptor™ is unique in the market place since it is the only product which places emphasis on carefully controlling flow rates and operational velocities during all hydrologic conditions, thus preventing scouring, resuspension and ultimate loss of suspended solids during high flows.



High flow conditions