

OIL / WATER SEPARATORS WHICH IS THE BEST ONE FOR MY BUSINESS?

Streams of oily wastewater are frequent within Industry, however, that does not mean we should be complacent about them. Everybody has a duty of care to reduce the risks of oily wastewater escaping to the environment.

Engine degreasing, parts cleaning, floor cleaning and oil spills all generate oily wastewater which most not be allowed to flow into the street drains (stormwater) and must be treated to remove oil before going to sewer or holding tank for collection by an appropriate waste contractor.

In collision repairers yards and carwashing businesses, etc. the wash water generated from the washing of motor vehicles external panels can go direct to sewer via a settling pit to remove sand/grit (but see note below).

Note: This is an agreed practice on the understanding that no underbody or engine degreasing will occur in the washdown area. Should this be the case, or for that matter the vehicle prove to be excessively dirty and/or greasy e.g. commercial/industrial transport further treatment may be necessary - check with Environment, Heritage and the Arts (EHA) Division.

In some cases where a very small volume of oily waste water is generated, it may be worthwhile considering construction of a roofed wash bay over a concrete bunded area, (see Technical Sheet No 2 on Washdown Facilities), which has NO OUTLETS. It is critical that no rainwater or stormwater enter the collection pit and that even evaporation is maximised so that the dried oily sludge can be removed or removed as slurry by an appropriate waste contractor. The level of wastewater must be monitored closely as it must not overflow.

Some vehicle wash bay operators may consider reusing their cleaned waste water by further treatment (e.g. cartridge filters) in order to save water, but the costs of treatment must balance against the savings in water (recirculating car wash systems).

Note: Technology is frequently changing so contact the water treatment specialists below before selecting the type and cost of waste treatment system for your business.

For new operators who are setting up a wash area or existing operators who are updating an existing system, the following details are provided as a guide to possible options. Please consult a wastewater engineer/consultant or the Environment, Heritage and the Arts on telephone 8924 4139 if you are unsure on what to do. The Yellow Pages list a range of Water Treatment Engineers and equipment suppliers who can also help in advising on the range of suitable options (generally they will visit your site to assist).

Note: Inground separators or interceptor pits alone are no longer regarded as suitable as an oil removal pre-treatment device and existing operators who fail to properly maintain their existing pits may be forced to upgrade their system to minimise risk of polluting the environment.

COMPARISON OF KNOWN OIL SEPARATORS

1. API Pits, Triple Interceptors Traps and similar devices

These rely heavily on gravity and perhaps represent the original, simplest and lowest cost of separating certain amounts of oils/solids prior to discharge to the sewer.

The method of operation is that effluent/contaminated water enters the vessel (tank/compartments(s)) where it must sit undisturbed for a prolonged period of time, oil eventually floats to the top of the holding tank. The main **disadvantages** are:

- The settling tanks are designed to separate only relatively large oil droplets (100 microns or larger) over a long time period);
- The settling tanks, depending on the process flow of effluent, are often too large and too heavy to be practical in many industries;
- When treating a continuous stream, depending on tank design, the incoming flow disturbs the settled effluent and reduces the tank's efficiency; in many workshop/other waste separation applications the EHA Division consider that this system is insufficient to comply with the Department's waste discharge policy, as a stand alone system;
- Over time, the tanks have to be pumped out and checked regularly at a cost of collection, which can be significant.

Note: Interceptor pits are only appropriate at existing installations if they are maintained in a proper manner i.e. regularly checked, periodic emptying and disposal by an appropriate contractor, etc. All new sites and existing sites that are not operating correctly, (due to nature or volume of discharge, etc.) should install a parallel/ coalescing/or similar oil separator.

2. Parallel / Coalescing Plate Separators.

These separators arguably represent second-generation systems for the waste/effluent treatment of oil/solids contaminated water prior to discharge to sewer.

They consist of a chamber containing; a pack of narrowly separated paralleled plates stacked one above the other (usually fibreglass or stainless steel plates) usually with the plates inclined so as not to impede flow. The method of operation is that effluent/waste water flows smoothly between the plates with a minimum of turbulence/disturbance. Oil coalesces or 'sticks' on the surface of the plate above and travels to the opposite opening between the plates.

The coalesced oil then migrates to the bulk of oil at the top of the chamber.

By comparison with settling tanks, oil may have to rise many centimetres to coalesce whereas in a plate pack coalescence occurs between the plates which may be only a couple of centimetres. Some newer designed plate separators are even more compact

There are however, a couple of **disadvantages**:

- They are susceptible to blocking especially with viscous, thick or fatty oils. Cleaning therefore requires removal of the plate pack and washing with cleaner/degreaser - in the course of which the waste oil must be contained and removed by an appropriate waste oil or liquid waste contractor.
- Depending on their design, plate packs can separate oil droplets larger than 40 microns in size. However some manufacturers now claim their plate packs "under normal conditions and at the rated flows" are capable of removing all oil droplets of 20 microns or larger. (Check the manufacturer specifications.) These plate separators are generally considered appropriate by the EHA Division as a replacement for (or inclusion with) triple pit interceptors and similar below ground structures. If you have any doubts please check with the Branch prior to purchase.

Application: Engineering Workshops, Transport Depot Wash Bays, etc.

Known suppliers: Safewaste Industries Pty Ltd 0409 099610 or 89843155, Allbuilt Constructions Phone 89844100 (Sepa Separators), All-Pumps Phone 1800 810139 (Kikflo Separators) Phone: 02 6385555.

2A Vertical Gravity Separators.

These are cone shaped plate separators and appear to accept faster flow rates than traditional parallel plate separators of similar size. They claim to be much easier to maintain and only require disassembly every few years (depending on use) and are fairly compact.

Application: Vehicle Repair Workshops, CarWash bays, etc.

Known suppliers Fluid Power NT (ISS Clarke Vertical Gravity Separators) Phone Alice Springs 8952 6999 or Darwin 8947 2488, Australian Separation Technologies Group Phone 03 9560 1155, R I Industries Phone: 08 8445 7822.

3. Hydrocyclone Oil Separators.

These separators are compact, (depending on the application) and are designed as a vertical cylinder/cone with oily effluent/waste entering at the top via a positive pressure pump. "The flow is directed into a vortex without disrupting the reverse flowing core. As the flow is forced down the liner it takes up a helical form along the inner walls and (accelerates) creating the strong centrifugal forces that promote rapid separation (of oil from water). The denser water moves to the walls of the hydrocyclone and is removed at the downstream clean water outlet. Oil is drawn into the low pressure core and by applying back pressure to the treated water outlet it flows back up the hydrocyclone to be removed at the upstream outlet orifice."

The Vortoil separator system has separation capacities from 20 litres/minute to units capable of 42,000 litres/minute and claim oil separation of droplets down to 20 micron in size. The main advantages claimed are high performance, low maintenance (cleaning), and compactness.

Note: Check the total cost of the unit and holding tank etc. including also maintenance costs when comparing all up cost of plate separators. All washing and degreasing operations should only use quick break detergents. Kerosene, petrol, other petroleum based cleaners, normal household detergents and other non quick breaking detergents are not to be used as the emulsified waste waters from the use of such products cannot be satisfactorily treated by any of the above methods.

For more information, contact:

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