

OILY WATER SEPARATING TECHNOLOGIES



PROS AND CONS

There are many different types of oily water separator on the market. Each type has its own unique design factors that determine how well it will work.

HYDROCYCLONE SEPARATORS

Oily water is pumped tangentially into a cone-shaped separator tube. This creates a spinning vortex which generates a separation force around 1,000 times the force of gravity. Strong centrifugal forces fling the heavier water to the outside of the vortex while the lighter oil phase moves to the centre. The separated oil is then removed via one end and the treated water is discharged through the opposite end. Ultraspin engineers were the designers of the world's first commercially successful oil removal hydrocyclones.

Pros	Cons
<ul style="list-style-type: none">• Powerful vortex generates 1000x force of gravity• Can treat small oil droplets down to 10 micron• High oil separation efficiency• Low operating costs• Very low maintenance costs	<ul style="list-style-type: none">• Technology was developed by Ultraspin; still very few vendors with the technical capability. Choice of vendors is limited within Australia.



GRAVITY SETTLING TANKS



Given enough time, large oil droplets will float to the surface and separate out naturally. This is a simple, low-tech way to remove easily separable oil droplets, about 150 microns or more. Separators that use simple gravity to separate oil include API separators, triple interceptors, SPELs, above-ground tanks and collection pits.

Pros	Cons
<ul style="list-style-type: none">• Simple design• Simple operation	<ul style="list-style-type: none">• Unable to remove droplets below 150 microns• Emulsified oil will go untreated• Pit may overflow in rain event, leading to oil spill• Smelly, stagnant oil layer will build up on pit surface• Underground systems, such as SPELs, have complex installation and maintenance requirements



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💧 COALESCING PLATE PACKS

These separators use closely packed plates to enhance coalescence of oil droplets and improve upon gravity separation. They can typically remove droplets of 60 microns or more. Also known as, Tilted Plate Interceptors (TPI), Corrugated Plate Packs (CPP and CPS), Vertical Gravity Separators (VGS) and similar.

Pros	Cons
<ul style="list-style-type: none">• Simple design• Easy installation• Small footprint	<ul style="list-style-type: none">• Unable to remove droplets below 60 microns• Large variation in performance. Can range from 60-150 micron depending on vendor.• Ineffective in applications with high sediment load, as oil coalescence is hindered• Plates susceptible to clogging• Requires regular maintenance to clean plates



💧 MEDIA FILTERS

This technology uses special filters to remove oil while allowing water to pass through. Once the filter is 'full' of oil it must be replaced. Media filters are best suited to small, highly emulsified oil droplets. They are able to achieve very high separation performance.

Pros	Cons
<ul style="list-style-type: none">• Able to remove very small oil droplets - 1 micron• Can be cost-effective if used as a final polishing step on very clean water (<10mg/L)	<ul style="list-style-type: none">• If oil concentration is high, filters will require very frequent replacement• Cost of replacement filters very high



💧 CHEMICAL TREATMENT (DAF/IAF)

Dissolved Air Flotation (DAF) and Induced Gas Flotation (IGF) produce small bubbles to adhere to oil droplets and sediment. These bubbles make the particles more buoyant causing them to float to the surface. The process is enhanced by flocculants and other chemicals.

Pros	Cons
<ul style="list-style-type: none">• Able to achieve high level of separation• 10 micron oil droplets	<ul style="list-style-type: none">• Requires constant supervision to maintain good separation• High operating costs due to ongoing chemical purchasing• Many moving parts and heavy maintenance requirements



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