ALLTRAP
ENGINEERING cc

OIL SEPARATOR

OPERATION & SPECIFICATION

Manufacturers of grease and oil separators and rainwater harvesting

What is an oil separator?

An oil water separator (OWS) is a piece of equipment used to separate oil and water mixtures into their separate components. There are many different types of oil-water separator. Each has different oil separation capability and are used in different industries. Oil water separators are designed and selected after consideration of oil separation performance parameters and life cycle cost considerations. "Oil" can be taken to mean mineral, vegetable and animal oils, and the many different hydrocarbons.

When are they needed?

Any business that plans to discharge oily or sediment-laden wastewater to the sanitary sewer must install, use, and maintain an oil/ water separator.

Which businesses require oil separators?

- Automotive workshops
- Car dealerships
- Fuel stations
- Panel beaters
- Mechanical workshops
- Plant and equipment hire

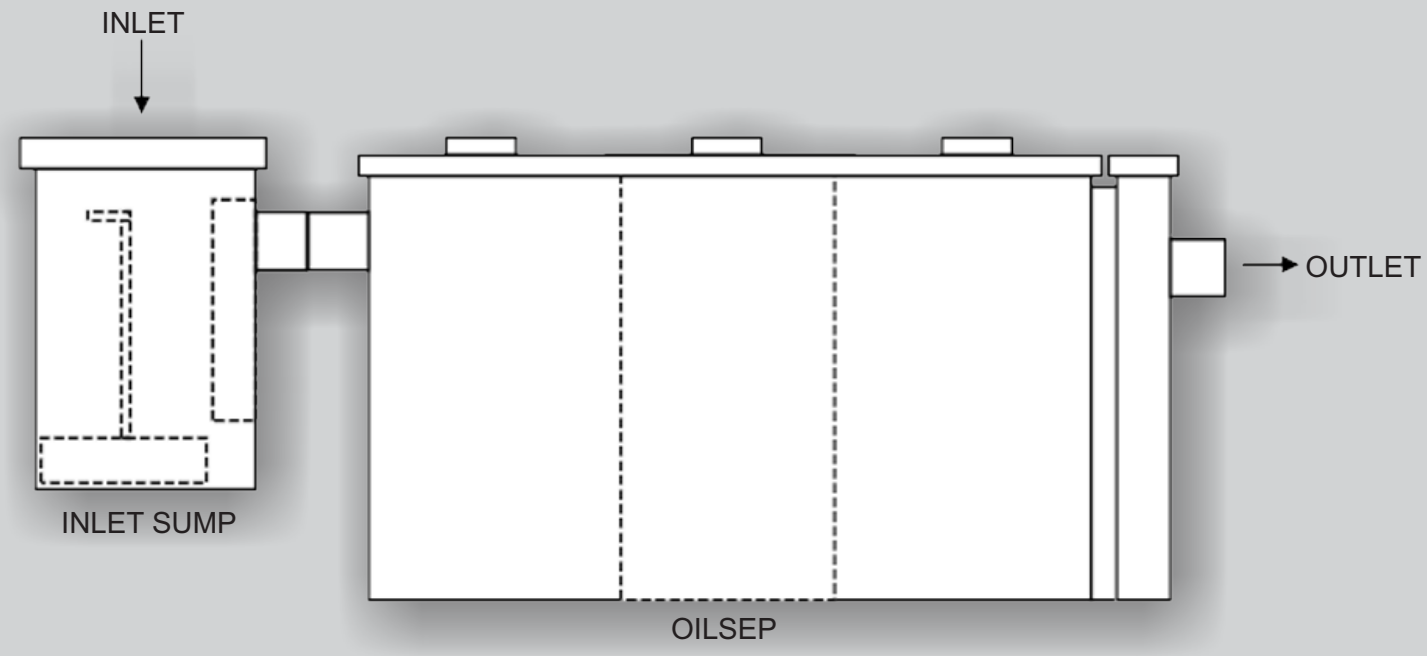
2 Stage Working Principle

First Stage - Inlet Sump

Inlet sump/sand trap 300/600 is the first stage of the oil separation process. Installed upstream (before) grit trap and oil separator. It is designed to collect and catch solids with a specific gravity of over 1. The inlet sump has a removable Basket and mentis grate cover with a 100mm ID outlet connection. To clean sump, remove basket with accumulated solids and discard accordingly.

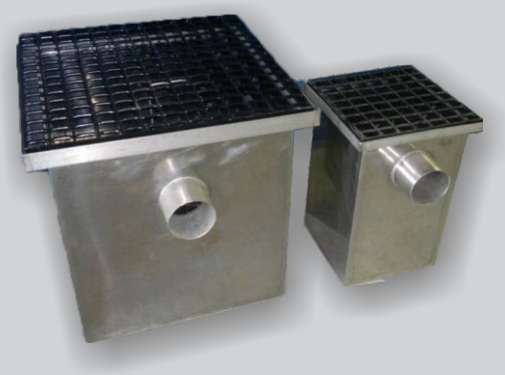
Second Stage - Oil Separator

The oil/water separator is designed to separate non-emulsified light liquids or low-water-soluble fluids with a specific gravity below 0.95 (gasoline, diesel, heating oils and other mineral oils) from effluent discharge. A two-step separation process, gravity separation and removal of small oil particles by coalescing media elements, produce high removal efficiencies. Also included is a shut off valve, this floats in water and sinks in oil. Therefore closing the system if oil content is too high.



3 Stage Working Principle

First Stage - Inlet Sump



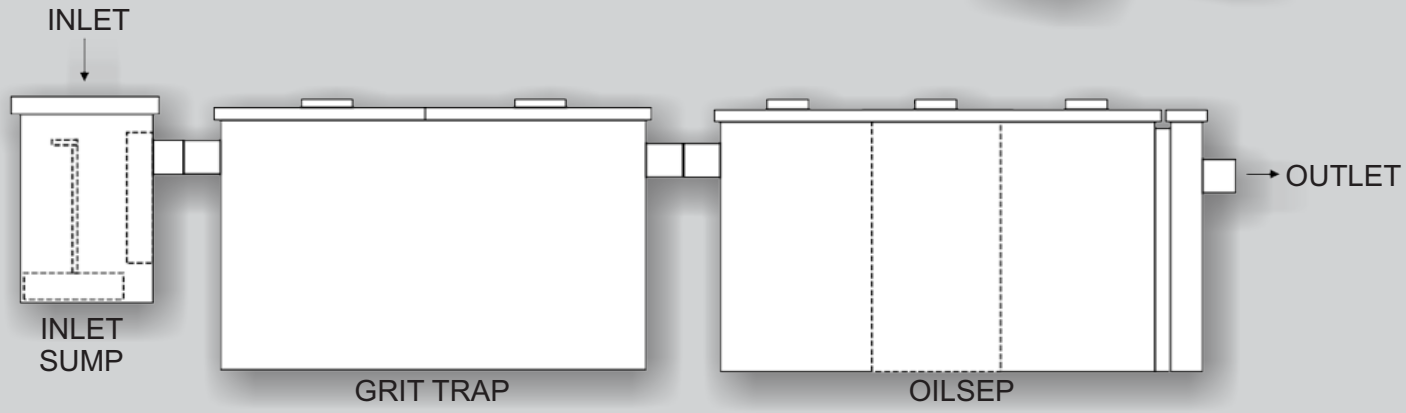
Inlet sump/sand trap 300/600 is the first stage of the oil separation process. Installed upstream (before) grit trap and oil separator. It is designed to collect and catch solids with a specific gravity of over 1. The inlet sump has a removable Basket and mentis grate cover with a 100mm ID outlet connection. To clean sump, remove basket with accumulated solids and discard accordingly.

Second Stage - Grit Trap

The grit trap removes solids from the influent, thus ensuring unimpeded functioning of the oil separator itself. The grit trap is the second stage of the separation process. The inlet apron guarantees an optimum usage of the retention time in the system. It works against the formation of so called "Eddy-currents" and thus enables maximum solids separation. The grit chamber also compensates for influent temperature fluctuations, influent oil concentration influxes and initializes the separation of light fluids. A perforated 90-degree outlet tube retains floating solids from entering the separation chamber.

Third Stage - Oil Separator

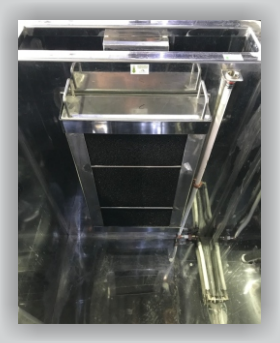
The oil/water separator is designed to separate non-emulsified light liquids or low-water-soluble fluids with a specific gravity below 0.95 (gasoline, diesel, heating oils and other mineral oils) from effluent discharge. A two-step separation process, gravity separation and removal of small oil particles by coalescing media elements, produce high removal efficiencies. Also included is a shut off valve, this floats in water and sinks in oil. Therefore closing the system if oil content is too high.



Description of Oil / Water Separator (oilsep)

1) Removable Filter

In the residual oil media, fine droplets, which are too small to be separated by gravity alone are accumulated into bigger drops that rise to the surface. This coalescing media is made of reticular (i.e.“net-like“) soft polyurethane foam. The media-cartridge is very easy to lift out and reinstall once it is cleaned/rinsed with a garden hose.



2) Oil removal Outlet

A crank hand pump can be used to remove the accumulated oils, from the oil recipient tank.
(20mm bsp thread)

3) Safety Float Valve

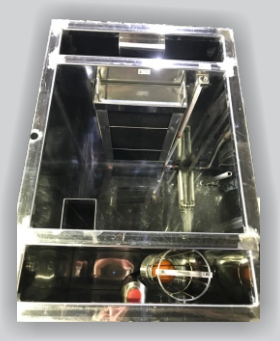
The calibrated float will lose buoyancy in oil as it accumulates, hence shutting down the outlet pipe of the separator. The valve will be completely shut when the maximum oil storage capacity is reached. Preventing any oil discharge into the municipal line.

4) Oil Recipient Tank

The oil skimming pipe constantly removes accumulated light fluids, from the water surface and stores them in the oil recipient tank. The collected oils which is free, of any water can be pumped through the oil removal outlet standpipe and disposed of.

5) Skimming Pipe

The skimming pipe automatically removes accumulated light fluids, from the water surface into the oil recipient tank.



Specification for light liquid separators

OilSep 1

Design Criteria:

SANS 50858-1:2002.
Separator systems for light liquids (e.g. oil and petrol)
Part 1: Principles of product design, performance and testing, marking and quality control.

SANS 50858-2:2003.
Separator systems for light liquids (e.g. oil and petrol)
Part 2: Selection of normal size, installation, operation and maintenance.

- Material: Grade 430 stainless steel
- Dimensions:930mm X 800mm X 1000mm
- Discharge: 1litre per second
- Water Capacity :450litres
- Oil Recipient Capacity:40litres
- Safety Closure Valve: Cage protected copper float, operated spill control device. Nitrile rubber valve seal.
- Maintenance Requirements: Monthly inspections.
- Light Liquid Discharge Limits: Below 10 ppm.

Materials and dimensions may change due to manufacturer development.

Manufacturer: Alltrap Engineering cc

Specification for light liquid separators

OilSep 3

Design Criteria:

SANS 50858-1:2002.
Separator systems for light liquids (e.g. oil and petrol)
Part 1: Principles of product design, performance and testing, marking and quality control.

SANS 50858-2:2003. Separator systems for light liquids (e.g. oil and petrol)
Part 2: Selection of normal size, installation, operation and maintenance.

- Material: Grade 430 stainless steel
- Dimensions:1000mm X 800mm X 1000mm
- Discharge:3litres per second
- Water Capacity :800litres
- Oil Recipient Capacity:60litres
- Safety Closure Valve: Cage protected copper float, operated spill control device. Nitrile rubber valve seal.
- Maintenance Requirements: Monthly inspections.
- Light Liquid Discharge Limits: Below 10 ppm.

Materials and dimensions may change due to manufacturer development.

Manufacturer: Alltrap Engineering cc

Specification for light liquid separators

OilSep 5

Design Criteria:

SANS 50858-1:2002.
Separator systems for light liquids (e.g. oil and petrol)
Part 1: Principles of product design, performance and testing, marking and quality control.

SANS 50858-2:2003. Separator systems for light liquids (e.g. oil and petrol)
Part 2: Selection of normal size, installation, operation and maintenance.

- Material: Grade 430 stainless steel
- Dimensions:1200mm X 800mm X 1100mm
- Discharge:5litres per second
- Water Capacity :1000litres
- Oil Recipient Capacity:250litres
- Safety Closure Valve: Cage protected copper float, operated spill control device. Nitrile rubber valve seal.
- Maintenance Requirements: Monthly inspections.
- Light Liquid Discharge Limits: Below 10 ppm.

Materials and dimensions may change due to manufacturer development.

Manufacturer: Alltrap Engineering cc

Specification for light liquid separators

OilSep 7

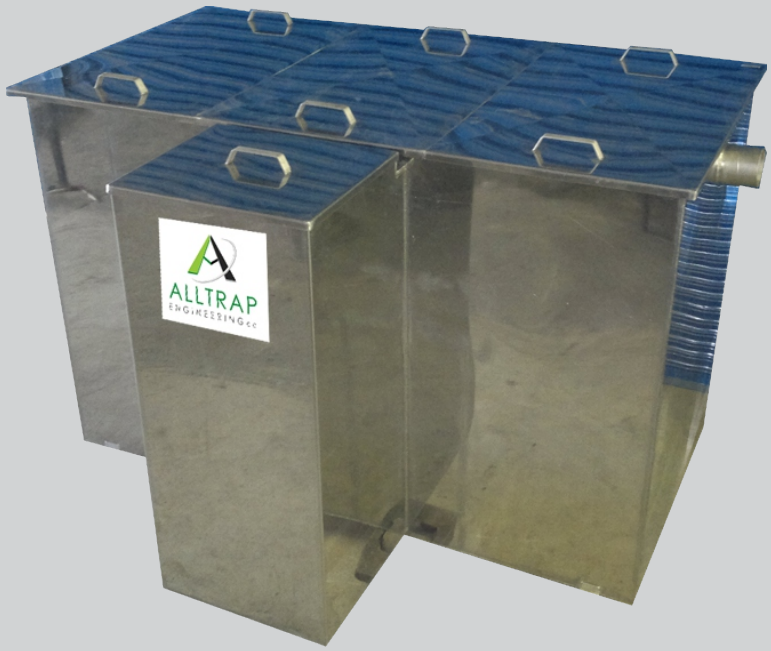
Design Criteria:

SANS 50858-1:2002.
Separator systems for light liquids (e.g. oil and petrol)
Part 1: Principles of product design, performance and testing, marking and quality control.

SANS 50858-2:2003. Separator systems for light liquids (e.g. oil and petrol)
Part 2: Selection of normal size, installation, operation and maintenance.

- Material: Grade 430 stainless steel
- Dimensions:1850mm X 1000mm X 1200mm
- Discharge:7 litres per second
- Water Capacity :2000litres
- Oil Recipient Capacity:275litres
- Safety Closure Valve: Cage protected copper float, operated spill control device. Nitrile rubber valve seal.
- Maintenance Requirements: Monthly inspections.
- Light Liquid Discharge Limits: Below 10 ppm.

Materials and dimensions may change due to manufacturer development.



Manufacturer: Alltrap Engineering cc

Stainless Steel Material

General Properties 430 Stainless Steel

AllTrap Steel Type 430 is one of the most widely used of the “non-hardenable” ferritic stainless steels. It combines good corrosion resistance and heat and oxidation resistance up to 1500°F (816°C) with good mechanical properties. Typical consumer product applications include automotive trim and molding, furnace combustion chambers, dishwashers, range hoods, gas burners on heating units, gutters and downspouts, steam iron bases and flatware. Industrial and commercial applications range from interior architectural applications to nitric acid plant equipment, oil refinery equipment, roofing and siding and restaurant equipment.

Available Form

AllTrap Steel produces Type 430 Stainless Steel in coils and cut lengths in thicknesses 0.010" to 0.145" (0.25 mm to 3.68 mm) and widths up to and including48" (1219 mm).

Composition %

Carbon	0.12 max.
Manganese	1.00 max.
Phosphorus	0.040 max.
Sulfur	0.030 max.
Silicon	1.00 max.
Chromium	16.0 - 18.0
Nickel	0.50 max.

Physical Properties

Density, 0.28 lbs/in3
7.74 g/cm3

Electrical Resistivity, microhm-in (microhm-cm) 70°F (21°C) – 23.68 (60)

Specific Heat, BTU/lb/°F (kJ/kg•K)
32 - 212°F (0 - 100°C) – 0.11 (0.46)

Thermal Conductivity, BTU/hr/ft2/ft/°F (W/m•K)

at 212°F (100°C) – 15.1 (26.1)
at 932°F (500°C) – 15.2 (26.3)

Coefficient of Thermal Expansion, in/in/°F (µm/m•K)

32 -212°F (0 -100°C)– 5.8 x 10-6 (10.4)
32-1000°F (0 -538°C)–6.3 x 10-6 (11.4)

Modulus of Elasticity, ksi (MPa)
29 x 103 (200 x 103)

Specifications

AllTrap Steel Type 430 Stainless Steel sheet and strip is covered by the following specifications:
AMS 5503
ASTM A 240

Mechanical Properties

Typical Mechanical Properties

		Elongation	
UTS ksi (MPa)	0.2% YS ksi (MPa)	% in 2* (50.8mm)	Hardness Rockwell
70 (483)	45 (310)	25	B85

Heat Treatments

Anneal: Heat to 1400 - 1525°F (760 - 829°C), air cool or water quench.

Corrosion and Oxidation Resistance

AllTrap Steel Type 430 has excellent corrosion resistance, including high resistance to nitric acid as well as to sulfur gases and many organic and food acids. This alloy does not provide the resistance to pitting by dilute reducing acids that is provided by the chromium-nickel stainless steels. Because of its relatively high chromium content, the material provides good resistance to oxidation. Its maximum scaling temperature is 1500°F (816°C) for continuous service.

Stainless Steel Material

General Properties 304 Stainless Steel

AllTrap Steel Type 304 is a variation of the basic 18-8 grade, Type 302, with a higher chromium and lower carbon content. Lower carbon minimizes chromium carbide precipitation due to welding and its susceptibility to intergranular corrosion. In many instances, it can be used in the ”as-welded“ condition, while Type 302 must be annealed in order to retain adequate corrosion resistance. Type 304L is an extra low-carbon variation of Type 304 with a 0.03% maximum carbon content that eliminates carbide precipitation due to welding. As a result, this alloy can be used in the ”as-welded“ condition, even in severe corrosive conditions. It often eliminates the necessity of annealing weldments except for applications specifying stress relief. It has slightly lower mechanical properties than Type 304.Typical uses include architectural mouldings and trim, kitchen equipment, welded components of chemical, textile, paper, pharmaceutical and chemical industry processing equipment..

Available Forms

AllTrap Steel produces Type 304 Stainless Steel in thicknesses from 0.01" to 0.25" (0.025 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

Specifications

AllTrap Steel produces Type 304 Stainless Steel in thicknesses from 0.01" to 0.25" (0.025 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

Type 304	Type 304L
AMS 5513	AMS 5511
ASTM A 240	ASTM A 240
ASTM A 666	ASTM A 666

Composition

	Type 304 %	Type 304L %
Carbon	0.08Max.	0.03Max.
Manganese	2.00 Max.	2.00 Max.
Phosphorus	0.045 Max.	0.045 Max.
Sulfur	0.030 Max.	0.030 Max.
Silicon	0.75 Max.	0.75 Max.
Chromium	18.00 - 20.00	18.0 - 20.0
Nickel	8.00 - 12.00	8.0 - 12.0
Nitrogen	0.10 Max.	0.10 Max.
Iron	Balance	Balance

Corrosion Resistance

These steels exhibit excellent resistance to a wide range of atmospheric, chemical, textile, petroleum and food industry exposures.

Oxidation Resistance

The maximum temperature to which Types 304 and 304L can be exposed continuously without appreciable scaling is about 1650°F (899°C). For intermittent exposure, the maximum exposure temperature is about 1500°F (816°C).

Mechanical Properties

Typical Room Temperature Mechanical Properties

	UTS ksi (MPa)	0.2%YS ksi (MPa)	Elongation % in 2” (50.8 mm)	Hardness Rockwell
Type 304L	85 (586)	35 (241)	55	B80
Type 304	90 (621)	42 (290)	55	B82

Stainless Steel Material

General Properties 316 Stainless Steel

AllTrapType 316 is an austenitic chromium-nickel stainless steel containing molybdenum. This addition increases general corrosion resistance, improves resistance to pitting from chloride ion solutions, and provides increased strength at elevated temperatures. Properties are similar to those of Type 304 except that this alloy is somewhat stronger at elevated temperatures. Corrosion resistance is improved, particularly against sulfuric, hydrochloric, acetic, formic and tartaric acids; acid sulfates and alkaline chlorides. Type 316L is an extra-low carbon version of Type 316 that minimizes harmful carbide precipitation due to welding. Typical uses include exhaust manifolds, furnace parts, heat exchangers, jet engine parts, pharmaceutical and photographic equipment, valve and pump trim, chemical equipment, digesters, tanks, evaporators, pulp, paper and textile processing equipment, parts exposed to marine atmospheres and tubing. Type 316L is used extensively for weldments where its immunity to carbide precipitation due to welding assures optimum corrosion resistance.

Available Forms

AllTrap Steel produces Types 316 and 316L Stainless Steels in thicknesses from 0.01" to 0.25" (0.25 to 6.35 mm) max. and widths up to 48" (1219 mm). For other thicknesses and widths, inquire.

Specifications

AllTrap Types 316 and 316L Stainless Steel sheet and strip are covered by the following specifications:

Type 316	Type 316L
AMS 5524	AMS 5507
ASTM A 240	ASTM A 240
ASTM A 666	ASTM A 666

Composition

	Type 316 %	Type 316L %
Carbon	0.08Max.	0.03Max.
Manganese	2.00 Max.	2.00 Max.
Phosphorus	0.045 Max.	0.045 Max.
Sulfur	0.030 Max.	0.030 Max.
Silicon	0.75 Max.	0.75 Max.
Chromium	18.00 - 20.00	18.0 - 20.0
Nickel	8.00 - 12.00	8.0 - 12.0
Molybdenum	2.00 - 3.00	2.00 - 3.00
Nitrogen	0.10 Max.	0.10 Max.
Iron	Balance	Balance

Corrosion Resistance

Types 316 and 316L Stainless Steels exhibit better corrosion resistance than Type 304. They provide excellent pitting resistance and good resistance to most chemicals involved in the paper, textile and photographic industries.

Mechanical Properties

Typical Room Temperature Mechanical Properties

	UTS ksi (MPa)	0.2%YS ksi (MPa)	Elongation % in 2" (50.8 mm)	Hardness Rockwell
Type 316	84 (579)	42 (290)	50	B79
Type 316L	81 (558)	42 (290)	50	B79

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