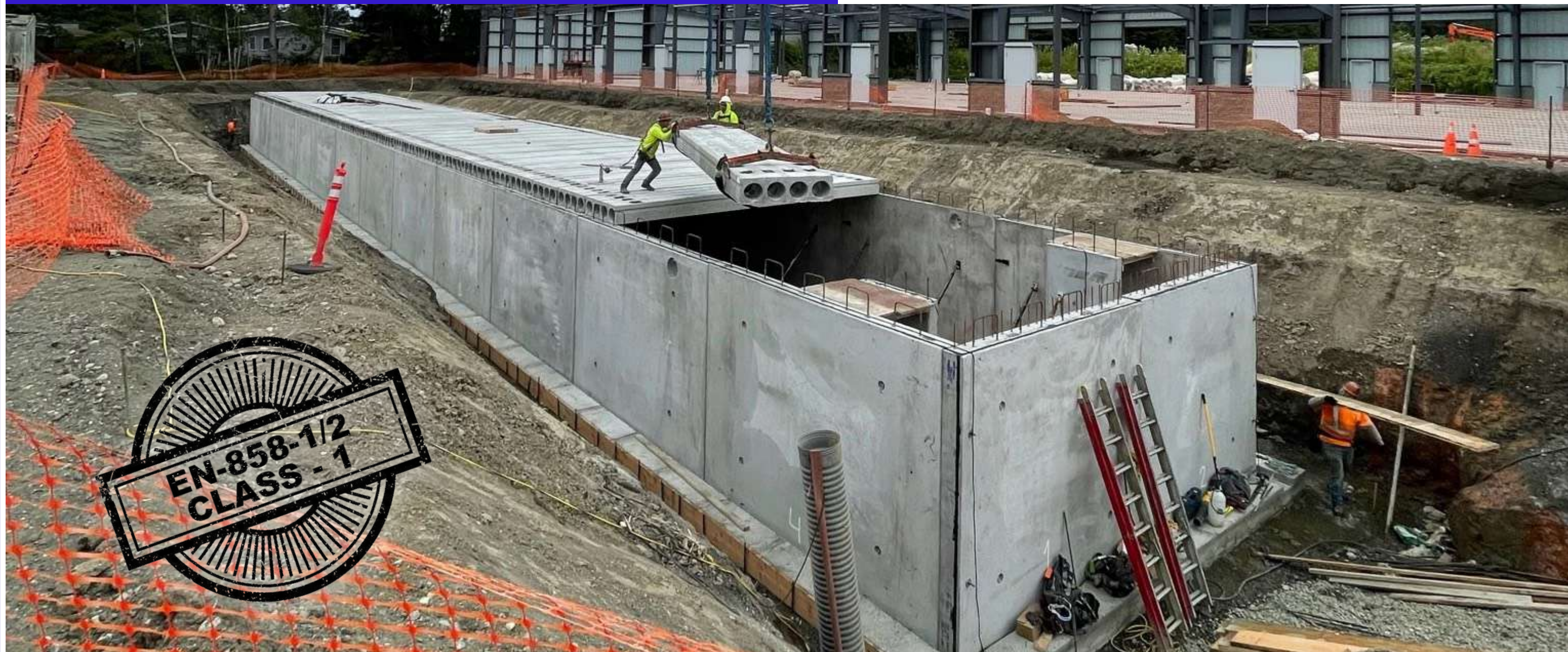


CIS-OWS+3

CONCRETE - CAST IN SITU
UNDERGROUND OIL/ WATER SEPARATORS



OUR EXPERIENCE

We offers customized Oil Separator Tank packages for the reduction of oil and gas in storm and drainage water. Our company maintains project management and quality assurance standards that are in compliance with the requirements of the leading oil and petrochemical companies across the globe.

We optimized process design and comprehensive project management can produce a cost-effective package.



CIS-OWS+3 Oil/ Water Separators with Coalescence:

CIS-OWS+3 The Bypass Oil Water Separators are engineered to collect sand, grit, grease and free oil (hydrocarbons and other petroleum products) from storm water runoff, spills and vehicle maintenance operations. They are equipped with internal bypass to direct peak flow without disturbing the collected grit/ dirt and oil inside the separator.

Function:

The Oil/ Water Separator is a stationary underground, stormwater treatment vessel, filled with water. Internal baffles and inclined parallel plates plus additional cartridge coalescers to accelerate the oil/ water separation process. Waste accumulates within the separator while effluent is discharged by gravity. The system is designed for access from above for observation, maintenance and cleaning.

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INTERCEPTORS

CIS-OWS+3 Oil/ Water Separators are used specifically for the removal of free floating oil, grease, and settleable oily coated solids from oil/ water discharges associated with many types of industrial facilities. Designed to remove oils with a specific gravity less than 0.95, high performance separators from 2,000 ppm oil/ grease discharge (**CIS-OWS+3**) down to 5 ppm.

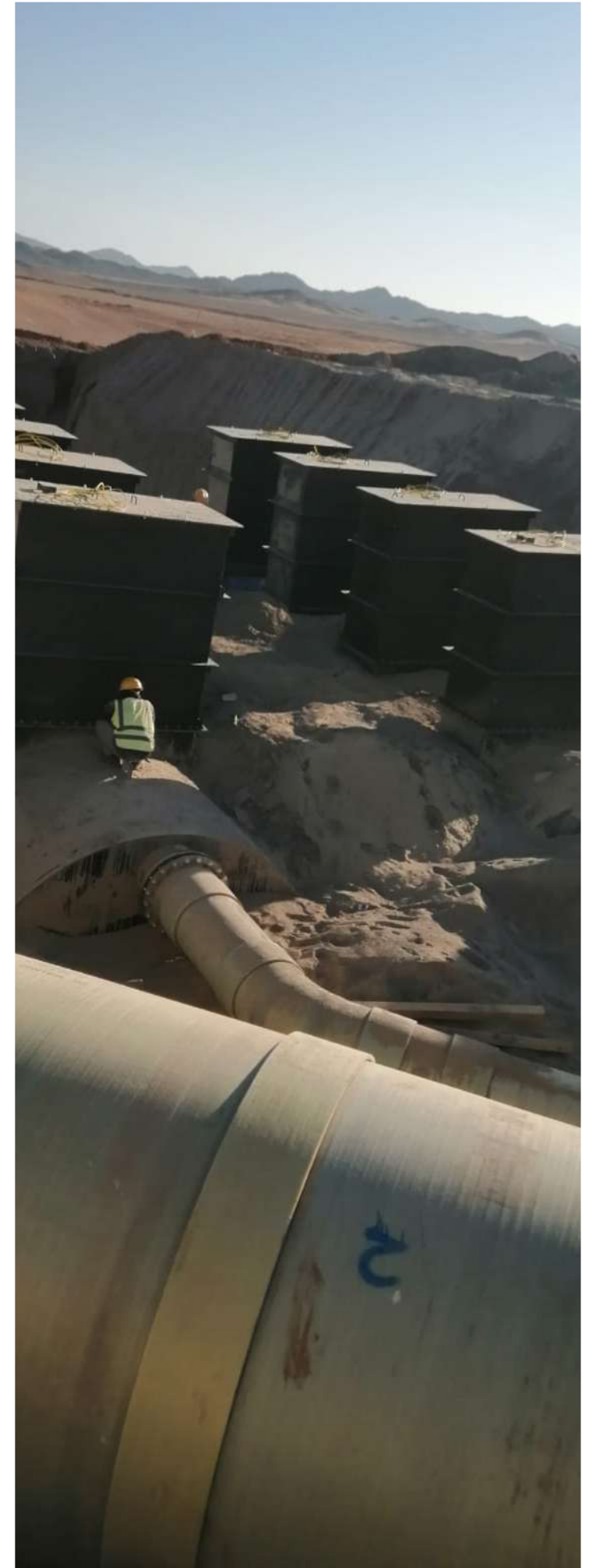
APPLICATION

Oil drippings and spills from parking lots, driveways, oil terminals, airplane aprons, runways, and other vehicular traffic surfaces are being washed into our water supplies by rainwater, creating serious environmental concerns.

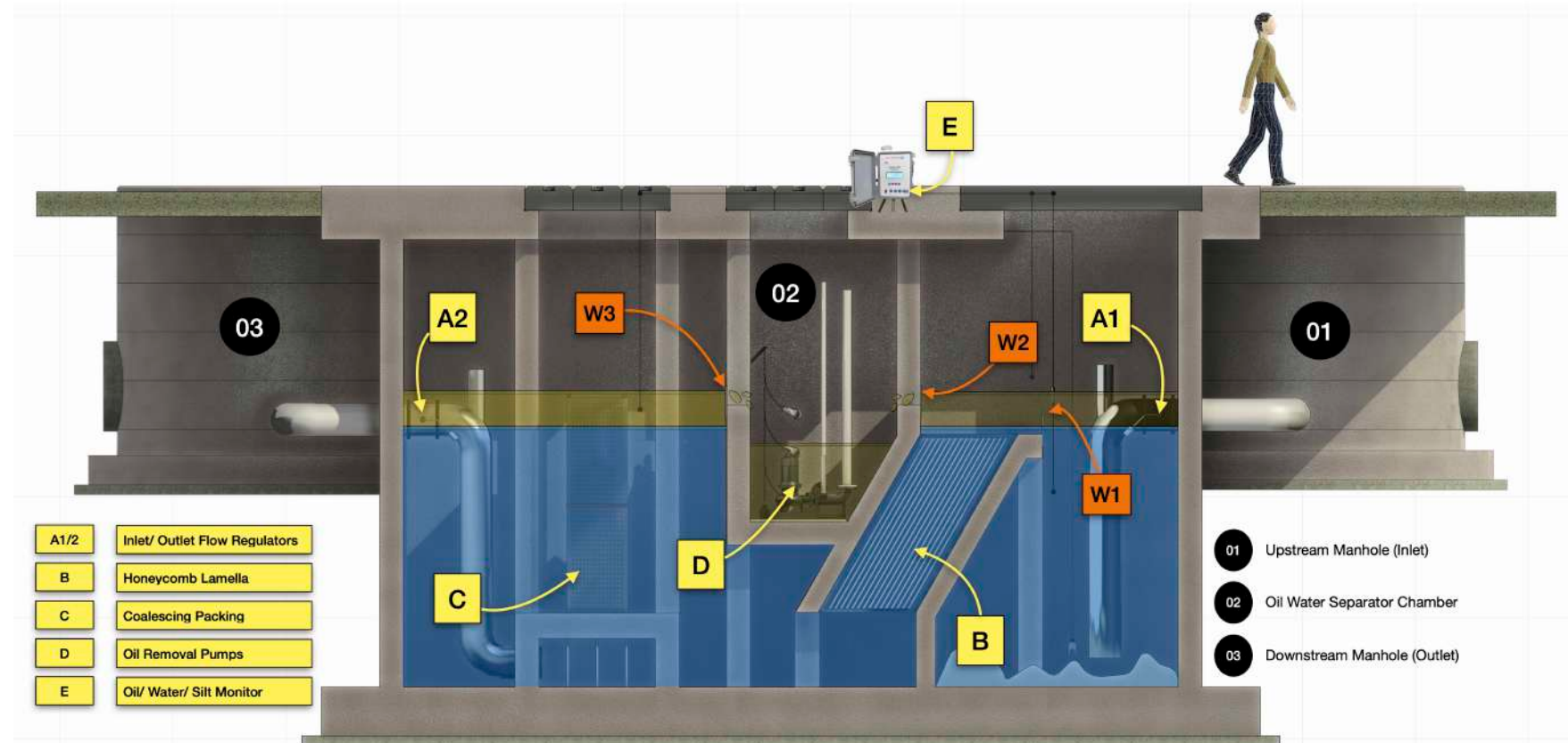
CIS-OWS+3 Oil/ Water Separators are designed to meet EPA and local Saudi Arabian guidelines for rainwater runoff control including the Royal Commission RC Standards.

ELECTRONICS

Oil/ Water Separator monitoring and control systems can be configured to satisfy a wide range of customer requirements. Control panels, sensors, probes and gauges are available for double-wall and single-wall oil/water separator systems as well as for single-tank or multiple-tank installations. We carry a full line of pump controls, inlet and outlet pumps, and waste oil pumps. We can package the right model with the proper electronics so when the tank arrives the only thing left to do is connect the piping.



CIS-OWS+3 SYSTEM PROCESS



PROCESS DESCRIPTION:

Dirty surface drain water enters the upstream manhole (01). The inlet flow regulator (A1) controls the inlet flow to the Concrete Oil/ Water Separator Chamber (2) so the flow does not exceed the design flow. In case of storm, the excess water will flow from Manhole (01) to Manhole (02) through the external DN800 concrete pipe. Regulated flow pass through the Oil Water Separator (OWS) inlet DN300 pipe.

Diffusion Baffle (B)

The velocity head diffusion baffle, located near the inlet of the separator, is designed to serve four basic functions:

1. To dissipate the velocity head, thereby improving the overall hydraulic characteristics of the separator.
2. To direct incoming flow downward and outward maximizing the use of the separator volume.
3. To reduce flow turbulence and to distribute the flow evenly over the separator's cross-sectional area.
4. To isolate inlet turbulence from the rest of the separator

Sludge and silt will settle at bottom by gravity.

Honeycomb Coalescing Packing

Water and Oil Slugs Mixtures will continue traveling up through the weir (W1). From (W1) the oil and water mixture will continue traveling downwards through the Honeycomb Lamella Tube Settler (B).

The oil then creeps up the plate surface, and breaks loose at the top in the form of large globules. Oil will continue accumulating at top and when oil level increase sufficiently, it will overflow through the oil weir (W2). Water will continue traveling down. Oil will collected in the Oil Chamber and when oil level is high enough, it will be discharged to outside location for disposal by Explosion Proof Oil Transfer Pumps (D).

Oil Filter Packing

Water with some traces of oil will continue traveling down where it will pass through the Coalescent Packing (C). The Coalescent Packing (C) contain oleophilic material that attracts oil droplets and repels water. The oil droplets agglomerate and increase in size and raises up to form an oil layer above. When oil layer increases enough in size, it will raise and overflow through oil weir (W3). Oil collected in the Oil Collection Chamber to be discharged by Oil Transfer Pump (D). Clean water will continue traveling downwards through the Coalescent Packing (C) and travel through the concrete chamber to the OWS DN300 Outlet Pipe and through the Outlet Flow Regulator (A2).

The outlet flow regulator (A2) will prevent back flow from Outlet Manhole (03) in case of storm water.

Monitoring Systems

Separator systems are equipped with electronic monitoring with high oil level alarms, oil removal pumps, and control panel. For easy and efficient operation and maintenance, an oil level sensor will sound an alarm at high oil levels so waste oil can be removed from the separator..

Characteristics:

- Designed according to API Standard and EN 858-1/2
- Outlet parameters lower than 5 ppm (Class 1) - Can drain to Surface Water.
- Includes a dedicated Sand and Solids settling chambers.
- Includes Tank is design as Concrete Cast in Situ
- Oil and Hydrocarbon Dual Separation Chambers.
- Accumulation of oil and hydrocarbon on water surface.
- Coalescing Cartridges in Stainless Steel with large specific surface: 240 m²/m³. The cartridge includes Honeycomb Lamella Tubes in PP or Stainless Steel
- Polishing coalescing cartridge filter on final stage.
- Oil removal by upper manhole.
- Internal Bypass to direct Peak Flow during storm to outlet of tank without affecting accumulated dirt and oil.
- Level sensors for oil interface layer
- Flow Regulating Devices at Inlet/ Outlet to control flow and water level.

PARAMETER	PERFORMANCE CIS-OWS+3 MODEL
EN 858 1/2	✓
Class I (Oil < 5 ppm)	✓
Stokes' Law	✓
ASTM D-4201	✓
UL 1316	✓
API 421	✓
USCG 46CFR 162.050	✓
UL 2215 - Oil Separators	✓
Intermittent Flow	✓
Continuous Flow	✓

CIS-OWS+3 Bypass Oil/ Water Separators are unparalleled in performance, structural strength, product compatibility, and corrosion resistance. With hundreds of high-performance separators in commercial operation throughout the world, Our patented oil/ water separators have a proven record of reliability.

CIS-OWS+3 Bypass Oil/ Water Separators handle a wide range of oily discharges from paved surfaces at petroleum, industrial, military, commercial, and municipal facilities. Most common applications include facilities with vehicle fueling, repair/ maintenance areas and wash pads. **CIS-OWS+3** Oil/ Water Separators come in a variety of capacities and designs, available for cast-in-situ concrete chambers.

Our engineers have designed a functional means of primary separation that not only meets the international and national oil and grease discharge limitation requirements, but also surpasses them. And unlike other oil/ water separators, Our separators are easy to operate and maintain!

Each Oil/ Water separator is backed by our OWS professional design, engineering, fabrication, delivery and service. **CIS-OWS+3** separators come directly from our manufacturing facilities. This practice ensures complete quality control, from expert design to timely delivery by our experienced drivers. Construction and performance certification of the separator in strict accordance with Underwriters' Laboratories (UL-2215) and EN-858-1/2 Standards.



CIS-OWS+3 Oil/ Water Separators are competitively priced and are readily available from a network of knowledgeable regional factory representatives and distributors. In addition, we provide a wide array of support information, including an engineering manual with detailed information, specifications, and engineering drawings for selecting and specifying oil/ water separators and accessories. You can depend on us to provide you with environmentally safe and structurally sound oil water separator solutions well into the 21st century and beyond.

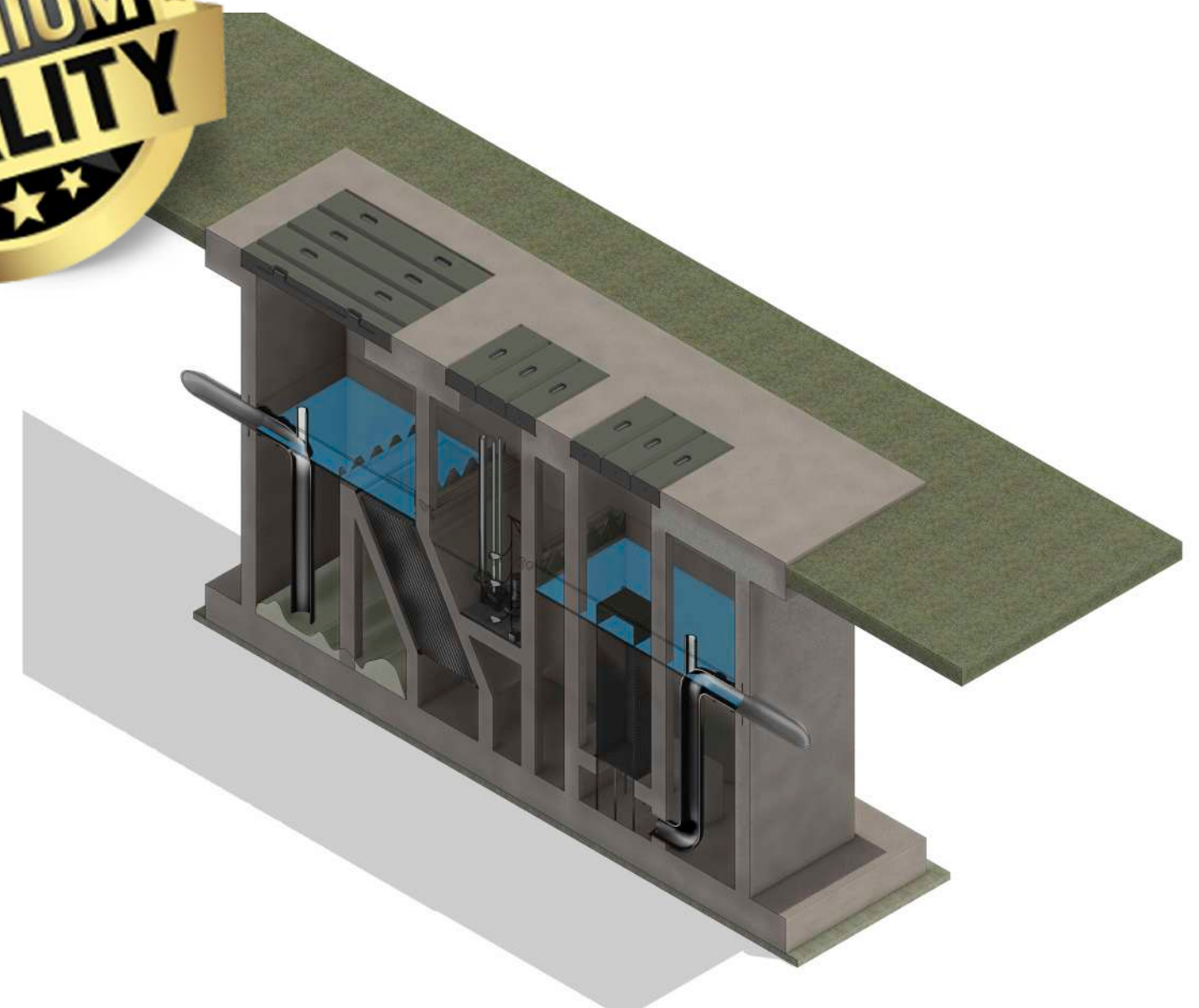
In addition, all protected **CIS-OWS+3** Oil/ Water Separators carry a 30-year limited warranty against corrosion and structural failure.

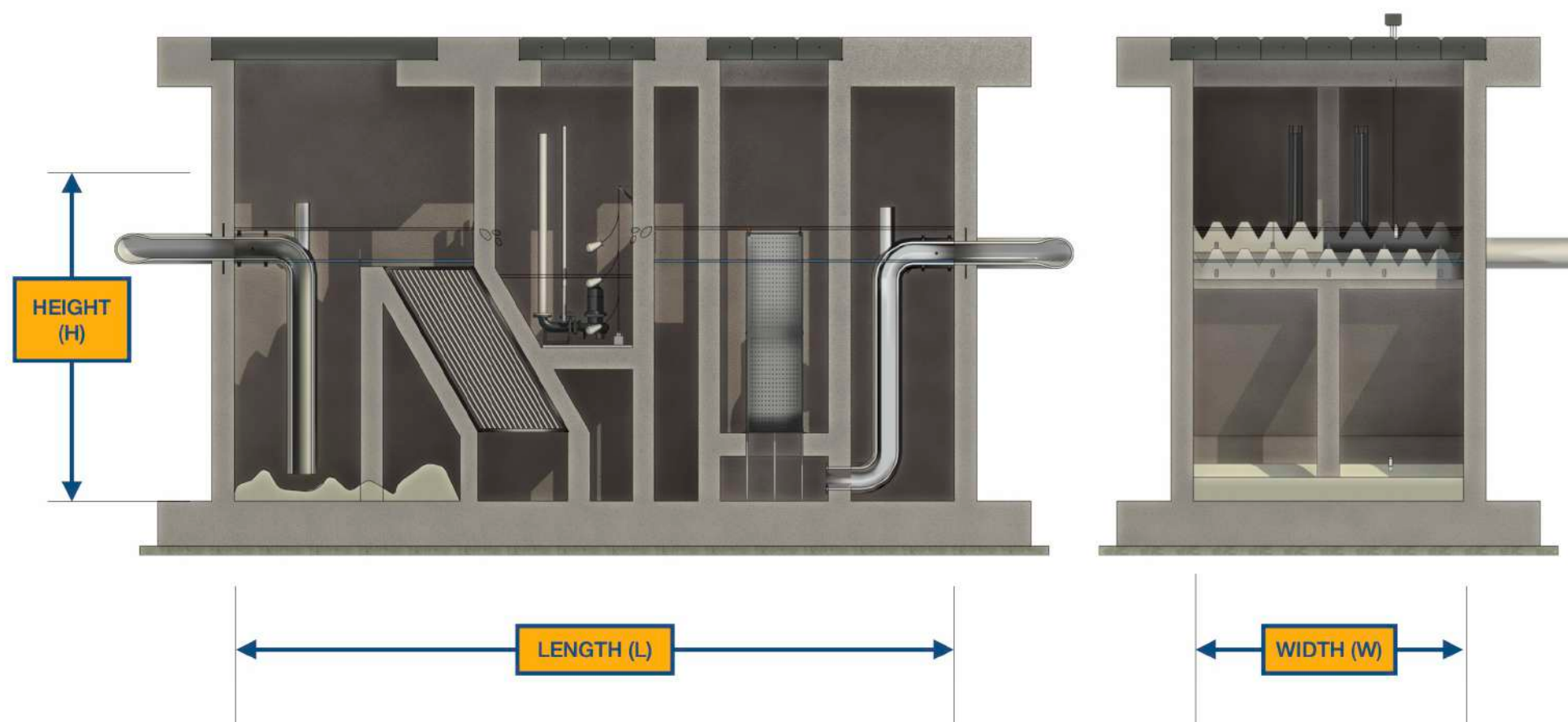
From the solid heavyweight construction to the patented design and operating simplicity, a **CIS-OWS+3** Oil/ Water Separator is a product of experience, backed by a company with 15+ years of private ownership and management.



Additional Features:

- Oil and Hydrocarbon Detection Alarm.
- Oil maximum level alarm.
- Maximum Solids level alarm to avoid clogging.
- Mechanical skimmer for separated oil removal.
- Oil Removal Pumps.





MODEL	Nominal Size (NSB) Flow (l/s)	Nominal Flow Rate (M3/hr)	Peak Flow Rate (M3/hr)	Oil Storage (Liters) NSBx15	Silt Storage (Liters) NSBx100	Length (mm)	Width (mm)	Height (mm) (Water)	Volume (m3)	Retention Time (Minutes)	Inlet/Outlet (DN)
CIS-OWS+3-025	25	90	900	375	2,500	3,000	2,200	2,800	18	12	200
CIS-OWS+3-050	50	180	1,800	750	5,000	5,000	2,500	2,800	35	12	250
CIS-OWS+3-080	80	288	2,880	1,200	8,000	7,000	3,000	2,800	59	12	315
CIS-OWS+3-100	100	360	3,600	1,500	10,000	8,000	3,000	3,000	72	12	400
CIS-OWS+3-200	200	720	7,200	3,000	20,000	14,000	3,400	3,000	143	12	500
CIS-OWS+3-300	300	1,080	10,800	4,500	30,000	20,000	3,600	3,000	216	12	650
CIS-OWS+3-400	400	1,440	14,400	6,000	40,000	22,000	4,200	3,000	277	12	800
CIS-OWS+3-500	500	1,800	18,000	7,500	50,000	26,000	4,600	3,000	359	12	900
CIS-OWS+3-600	600	2,160	21,600	9,000	60,000	28,000	5,000	3,000	420	12	1000
CIS-OWS+3-800	800	2,880	28,800	12,000	80,000	36,000	5,200	3,000	562	12	1000

PERFORMANCE ADVANTAGES

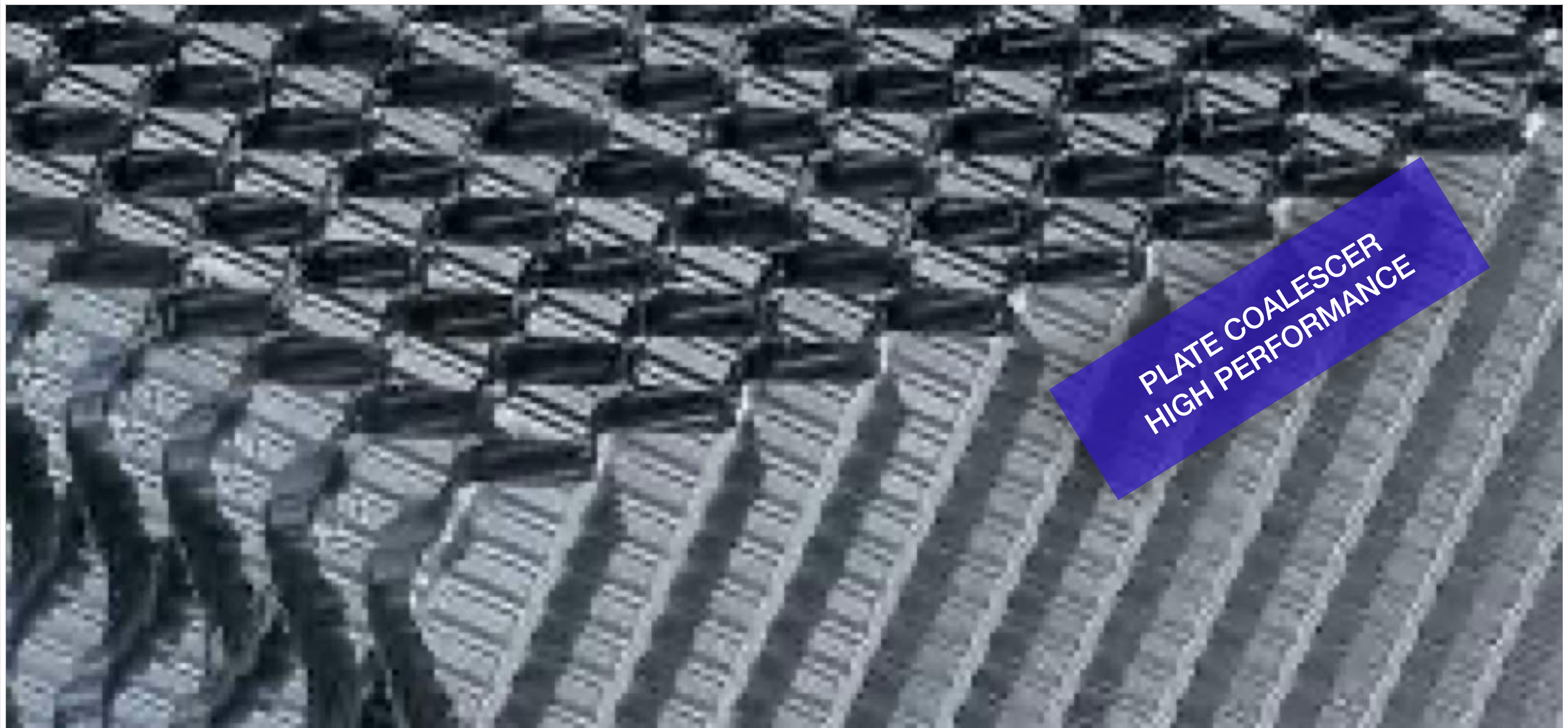
- Consistently removes large quantities of non-emulsified organic contaminants to non-detectable levels or levels meeting regulatory codes.
- Especially effective in removing oil and grease, total petroleum hydrocarbons, and dissolved hydrocarbons.
- Eliminates or reduces waste volume, mobility and toxicity.
- Uses no anthracite coal fillers
- Enhanced coalescer system is comprised of oleophilic plates to maximize separation and minimize maintenance.
- Removable plates simplifies routine cleaning.
- Removes free floating oils and settleable solids for oil/ water mixtures to achieve 5 ppm effluent quality
- Includes a 30-year internal/ external corrosion and structural warranty.

SEPARATOR DESIGN & SIZING

Since each site is unique, the most effective approach is to analyze each situation and design the system accordingly. Our engineering staff can help determine the best fit for your technical considerations and site specific needs:

- | | |
|--------------------|------------------------------------|
| • Inlet flow rates | • Inlet/ Outlet Concentration |
| • Effluent Quality | • Specific Gravity of Contaminants |

CIS-OWS+3 separators are sized primarily on flow rates. A complete list of flow rate plate pack options are available. Contact your our representative for more information.



HONEYCOMB LAMELLA HOLLOW TUBES COALESCER

This type of equipment uses gravity separation similar to the skim vessels, but in addition it promotes the coalescence of oil droplets. Bigger droplets flow faster to the phase interface. These devices resemble skim vessels retrofitted with the plate interceptors. Honeycomb Lamella Tubes and cross-flow devices are the most effective plate coalescer that are able to separate oil droplets down to sizes of 30-50 μm . The main difference between CPI and cross-flow devices is that the plate axes of the corrugations are parallel to the direction of flow in CPI and are perpendicular in the cross-flow devices

OIL COALESCER FILTER PACK

OCFP2 (DOUBLE PACK)

Oil Coalescer Filter Pack are common oil separation systems due to their simplicity, modularity, and economic cost. Oil Coalescer Cabinet Filter have no moving parts, the configuration of plates simply enhances the coalescence of small droplets making them larger which is reflected in a faster rise rate according to Stoke's Law.

GENERAL DESCRIPTION & PRINCIPLE OF WORK

Oil Coalescer Filter Pack is a device used to separate fluid mixtures into individual using the principle of coalescence. Coalescence is a process whereby fluid molecules agglomerate (come together) to form a larger whole. Coalescing filters can separate particulate components of mixtures at a comparable efficiencies. Any heavy solids present in the water being treated, or sludge, in theory should fall into the sludge compartment of the OWS unit. As oil droplets coalesce into to larger droplets, the buoyancy of the droplets increases. This is reflected in the known rise time for a given size of oil droplet. The more efficient the coalescence action of the media, the larger the oil droplets become. Oil Coalescer Filter Pack can be used to eliminate the need for chemicals in odor-control scrubbers, or improve oil removal efficiency in compact oil-water separators. The main function is to enhance the oil-water separation systems by capturing the small oil droplets of the oily water stream, enlarge their size, and help to float the oil to the top surface. Moreover, it can collect other suspended solids also that pass throw plates and enhance the water stream overall parameters.



ACCESSORIES FOR OIL/ WATER SEPARATORS

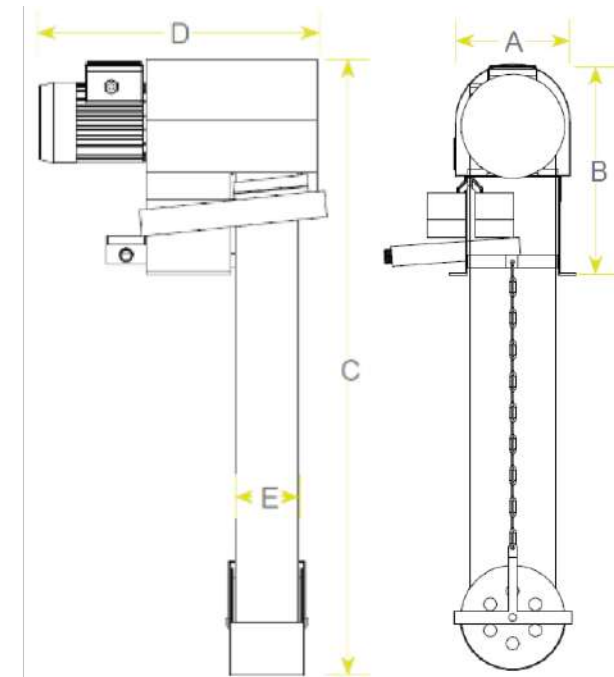
MECHANICAL SKIMMER

Function

Collection of mineral oil and hydrocarbon present in water or aqueous solutions.

Characteristics

- Equipment manufactured in AISI 304 stainless steel.
- Oil belt designed for extreme conditions.
- Steel safety chain to prevent the loss of the skimmer if the belt breaks.
- Anti-splash protection in AISI 304 stainless steel.
- Can be used as a pretreatment, before the filtration or combined with a coalescing system.
- Compact, robust and handy.
- Programmer and explosion protection in option.
- Skimmer with explosion-proof protection ATEX in option.



ACCESSORIES FOR OIL/ WATER SEPARATORS

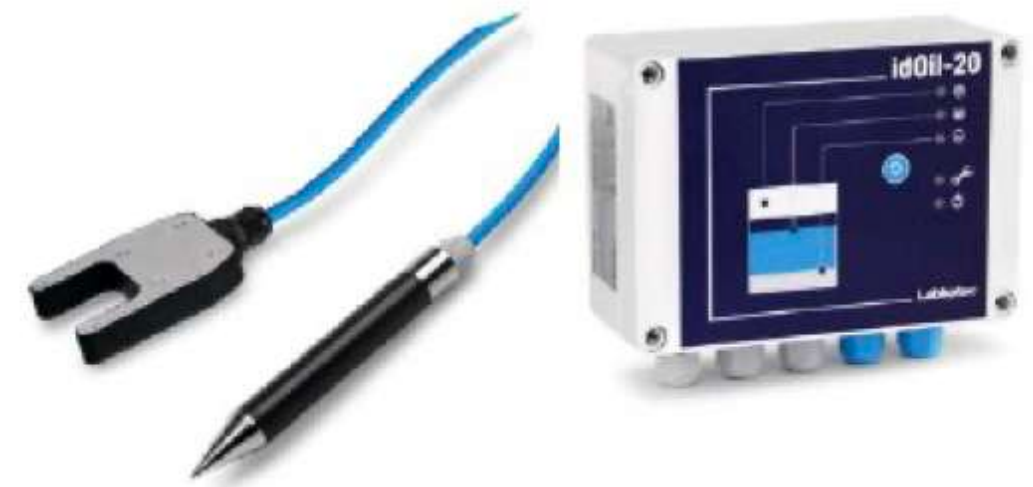
HYDROCARBON LEVEL DETECTION ALARM

- Equipment of level detection of hydrocarbon, oil and grease to install in grease and oil/ water separators with working temperatures (-20 to 50°C).



HYDROCARBON, SAND AND SOLIDS DETECTION ALARM

- Combined alarm system for oil, hydrocarbon, sand and solids.



HYDROCARBON, SAND AND SOLIDS DETECTION ALARM

- Detection of maximum level of oil and hydrocarbon on the water surface. To be installed in civil construction tanks or open top tanks.
- The probe is placed on three floats and detects an hydrocarbon layer up to 15 mm thick.



ACCESSORIES FOR OIL/ WATER SEPARATORS

OIL TRANSFER PUMPS

Function

Removal of collected oil in the oil chamber

Characteristics

- IECEx and ATEX  approved
- Three-phase heavy-duty explosion-proof slurry pump.
- High-chromium cast iron agitator that assists the smooth suction of the settled material.
- Impellers and suction plates are made of high-chromium cast iron
- Pump casing and motor frame made of ductile cast iron
- Anti-wicking Cable Entry
- Motor Protector
- Ground Check Diode
- Dual Inside Mechanical Seals
- Seal Pressure Relief Ports
- Oil Seal and Labyrinth Ring





SAMPLE PROJECT:

- PROJECT: AMAALA AIR PORT FIELD
- CAPACITY: 5000 GPM Normal Flow



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