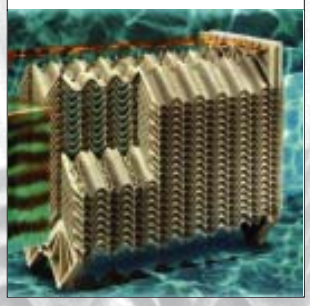
Oil Water Separator LLS-B

Facet International



- Operation
- Maintenance

Anchorage Tank & Welding Inc.

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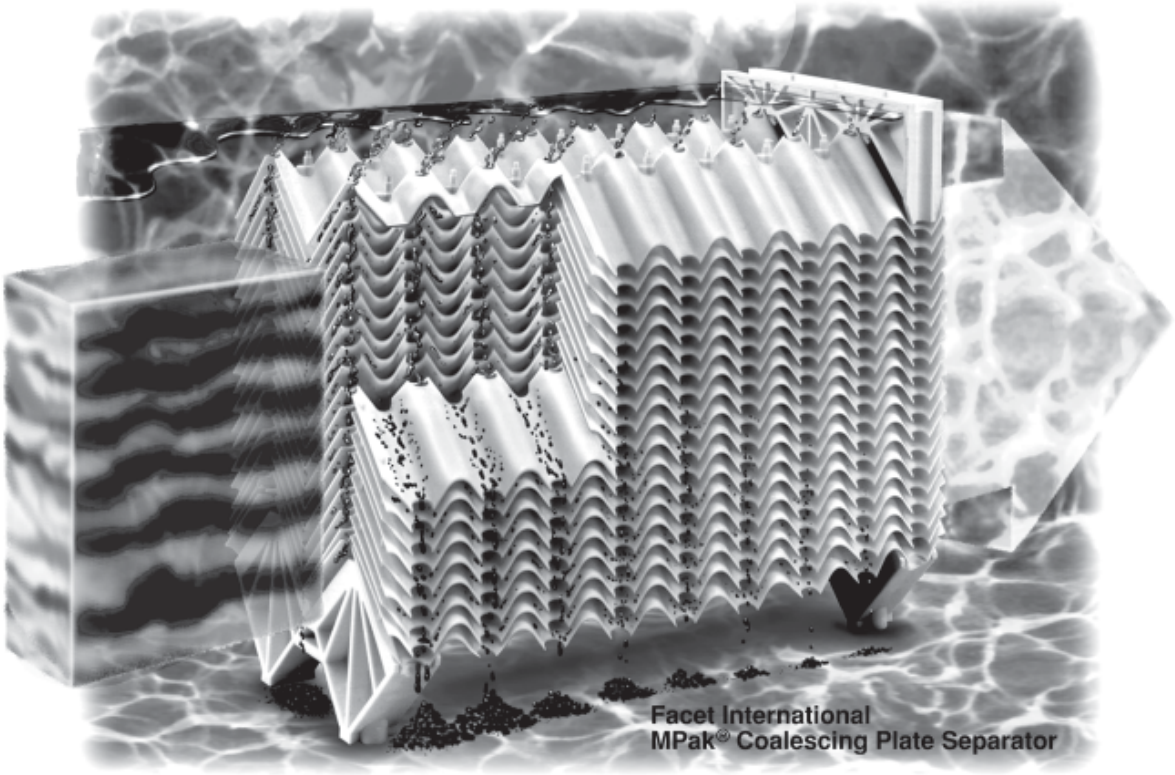
Introduction

Your Anchorage Tank & Welding, Inc. oil water separator is an enhanced gravity passive system for the removal of oil and solids from waste water. Oil droplets, being lighter (lower specific gravity) than water, tend to rise and separate from the waste water. In a similar manner, the higher specific gravity (heavier) solid particles fall to the bottom of the separator.

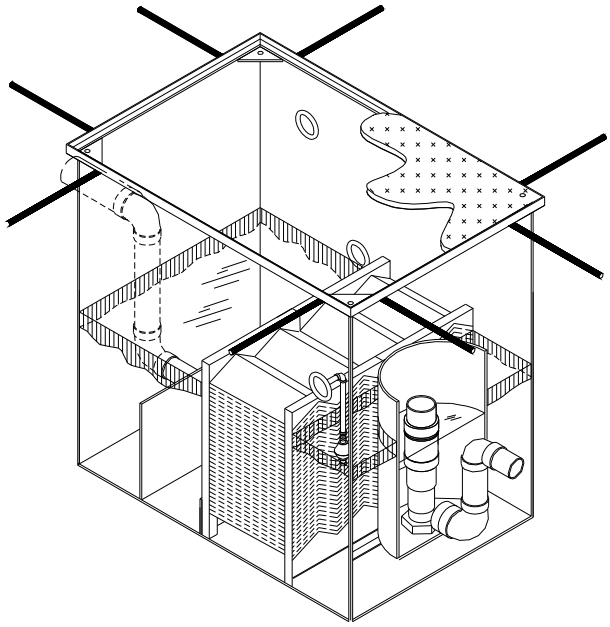
To enhance this separation, the Anchorage Tank & Welding, Inc. separator utilizes the Facet International MPak® system. The MPak® is an assembly of special patented coalescing plates (U.S. Patent No. 4,897,206) to remove droplets much more efficiently than simple gravity separators. Please note that this system is designed for the removal of free oil from water. It will not, however, remove dissolved hydrocarbons or break emulsifications.

The coalescing plates are made of calcium carbonate-fillet polypropylene, stacked and bound together with sturdy rods and supports into modular plate packs known as MPaks®. MPaks® are available in either 1/4" or 1/2" nominal plate spacing, although 1/2" spacing is preferred in underground separtators..

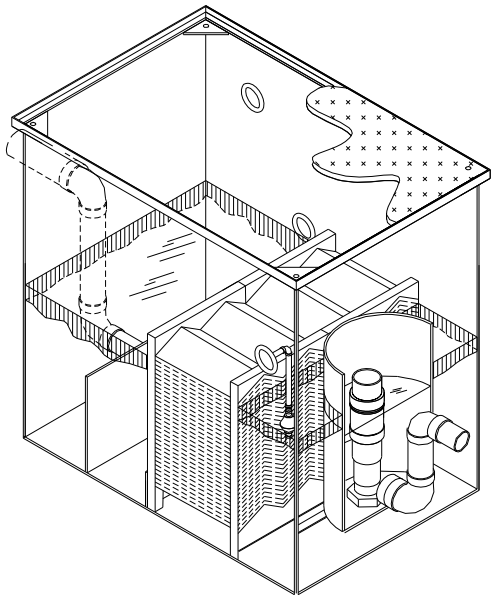


Facet International
MPak© Coalescing Plate Separator

Internal Configuration



Underground Model



Aboveground Model

The Anchorage Tank & Welding, Inc. LLS-B basic oil water separator is for either aboveground or underground installation on the floor slab of a building, in a single wall configuration.

A cross sectional flow schematic and basic shop drawings of *your* separator are included with this manual. These drawings reveal the internal configuration that includes an inlet pipe, pre-separation chamber, MPak® coalescing plates, exit pipe, and any additional optional features.

The oil/water mixture enters the separator down through an inlet pipe then turns up toward the top of the tank so that the incoming fluid momentum can be dissipated. Oil already separated in this upward moving liquid will rise directly to the top of the tank, and the remainder of the mixture will flow into the coalescing plates.

As the oil/water mixture passes horizontally through the plates, the oil droplets rise to meet the bottom of the plate above them, where they are collected. From this point the oil droplets merge to form larger droplets what will rise through the holes located at the peaks. The oil droplets will continue to rise to the top of the separator to form an oil layer which can be removed periodically from the separator by means of a vacuum truck. Frequency of oil removal from the separator will depend upon the amount of oil entering the unit.

Most of the solids drop to the bottom near the inlet pipe. Some additional solids enter the plate packs and are separated there. Solid particles that are captured by the plate packs fall to the bottom of the plate area through holes in the valleys of the plates. Space has been provided under the plate packs for these solids.

The processed water flows out of the coalescing plates and upward into the outlet chute. The pipe inside this chute has an adjustable coupling to set the liquid level in the separator. The water flows over this coupling and out the separator and into the plumbing (sanitary or storm drain) system.

Safety

a) Normal fire prevention measures and safety precautions must be exercised in areas where free hydrocarbon products exist.

b) Care shall be taken in keeping the area cleansed as oil/water mixtures can produce slick areas and hazardous footing for personnel.

System Installation

Flow into the separator should not exceed the recommended flow rate for your particular application. The maximum allowable flow rate may be found on the *Plate Pack Analysis* provided with this manual. The tank must be vented to the atmosphere. The flow through the separator is normally gravity flow.

The separator tank should be level to within 1/16" per foot.

It is recommended that the water effluent pipe (in addition to the inlet pipe) be gravity flow. The outlet pipe must be arranged so as to be free flowing. If the outlet pipe is too small or has a high pressure drop, water will back up into the separator, causing problems. External piping should be supported separately with back fill, not supported from the separator.

To install the separator, follow these steps:

1) Since your system is an underground model, refer to the STI-P3® installation instructions included herein. *Note: To minimize maintenance intervals it is recommended that a grit trap be installed upstream of the separator.*

2) Connect the oil/water inlet piping to the separator inlet connection.

3) Connect vent plumbing.

4) Connect the water outlet piping to the water outlet connection.

5) Install wiring and control panel for level sensors and tank leak sensor. Detailed instruc tions are included in this manual.

6) Place grade ring manholes or optional cus tom manhole. The skirts of these manholes (or any other metallic objects) must not come in contact with the tank, as the Steel Tank Institute warranty will be void.

System Operation

Initial Start-Up

The following procedure shall be followed after the installation of the separator or after the separator has been drained or pumped out, and is ready to be restarted. This procedure assumes that the separator is delivered with plate packs installed. If the plates are to be field installed, follow the procedure provided in the Maintenance section below.

1) Ensure there are no obstructions in the inlet or water outlet pipes.

2) Remove covers to reveal tank interior.

3) Fill the tank with clean water (to avoid contaminating the separator outlet area with oil) until it flows through the outlet pipe.

4) After 15 minutes of run time, take a sample of the effluent for testing, if required.

5) The liquid level in the separator will drop an inch or two when the flow is reduced or shut off. This is due to normal back pressure in the unit.

6) Replace covers

It is recommended that the separator be closely monitored during the first several weeks of operation.

Normal Operation

During normal operation the separated oil will rise to the surface and displace the water. Eventually, the oil level will be thick enough that it will reach the designated level sensor which will send a signal to the control panel indicating that it is time to pump out the contained oil. A second level switch, located lower in the tank, will send another signal that means the separator has reached a very high level of oil holding capacity and *needs to be pumped out soon*. Ignoring this signal could result in oil being released from the tank.

Maintenance

Note: When hosing your facility floor and equipment, use only recommended degreasers such as AMEROID OWS Quick Separating Degreaser. Commercial soaps and detergents will cause unbreakable emulsifications in the separator, causing the separator to cease functioning.

1) After the initial 1000 hours of operation, the separator tank should be inspected and cleaned out if necessary as follows:

a) Remove covers.
b) Remove water from the tank. Plate

packs may be cleaned in place with the Magic Wand (See Section 5.5). However, if it is determined that the plate packs must be removed, then proceed.

c) Locate the pull-out cords on the coalescing plate pack(s), and with a fork-lift (or other equipment) lift straight up and out of the unit.

d) Hose down the tank interior and sweep or vacuum all sediment out of the inlet and coalescing chambers.

e) Examine tank interior for damage to internal coating. Contact Anchorage Tank & Welding, Inc. for touch-up paint.

f) Replace plate pack(s) in the reverse order of removal, item c.

g) To restart, follow the steps in Initial Start-Up.

Note: The quantity of sludge found in the tank should be used as a basis for determining the next interval before cleaning. If sludge is impinging on the plate pack(s), then the maintenance schedule should be shortened, otherwise, it can be lengthened.

2) Should it become necessary to clean the plate pack(s), lift the plate pack assembly as detailed in Maintenance 1),c), however, do not remove the assembly from the tank. Lift the assembly to a point where the plate pack(s) are accessible to clean.

The Facet MPak® plates are designed to be cleaned in place using a special cleaning wand (Facet part number 60517464) and city water pressure. The wand has a connection just like an ordinary garden hose and is equipped with a small conical strainer in the connection so that solids in the inlet water will not clog the cleaning holes. (See drawing number 6051764) The plate pack(s) can also be cleaned using a 1½" fire hose at 10-15 PSI or a standard garden hose at normal house pressure (30-35 PSI). In a similar manner, steam can also be used to flush the plate pack(s).

Re-installation of Plate Packs

Note:

DO NOT disassemble the plate pack assembly.

The coalescing plates do not need to be cleaned until they are white. A thin coating of oil does not deteriorate the performance.

Caution should be taken that the cleaning process does not result in a pollution problem.

Replace plates in reverse order of removal, please note the following:

a) The plate pack(s) are designed to fit snuggly within its housing.

b) Install plate pack assemblies one at a time.

c) Be sure that the plate pack assembly is resting on its seat.

d) Check to see that no possibility of fluid by-passing can occur around the plates and sidewalls of the tank, as well as between plate pack assemblies, since this could deteriorate the efficiency of the separator.

e) Replace the retaining angles, if applicable.

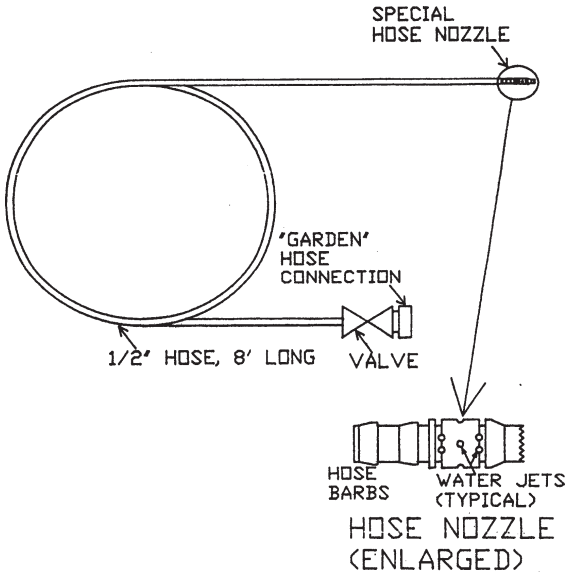
f) Restart the separator as outlined in section Initial Start-Up.

Cleaning the Plate Packs

Facet International MPak™ oil water separator plate packs are self-cleaning, but even self-cleaning packs can become clogged with solids under adverse conditions. For this reason, they are designed so that they can be cleaned in place to remove accumulations of solid particles.

Plate type separators that are provided in large modules must be lifted out of the separator by a crane when contaminated with dirt. This is inconvenient and expensive, and it is possible to damage the packs during removal or reinstallation.

Facet MPak™ plates are designed to be cleaned in place using a special cleaning wand (Facet part number 6051764) and city water pressure. The wand has a connection just like an ordinary garden hose and is equipped with a small conial strainer in the connection so that solids in the Facet MPak® plates may either be cleaned in place or removed and cleaned. To clean the packs, first stop the flow to the unit, remove the oil, and drain the water.



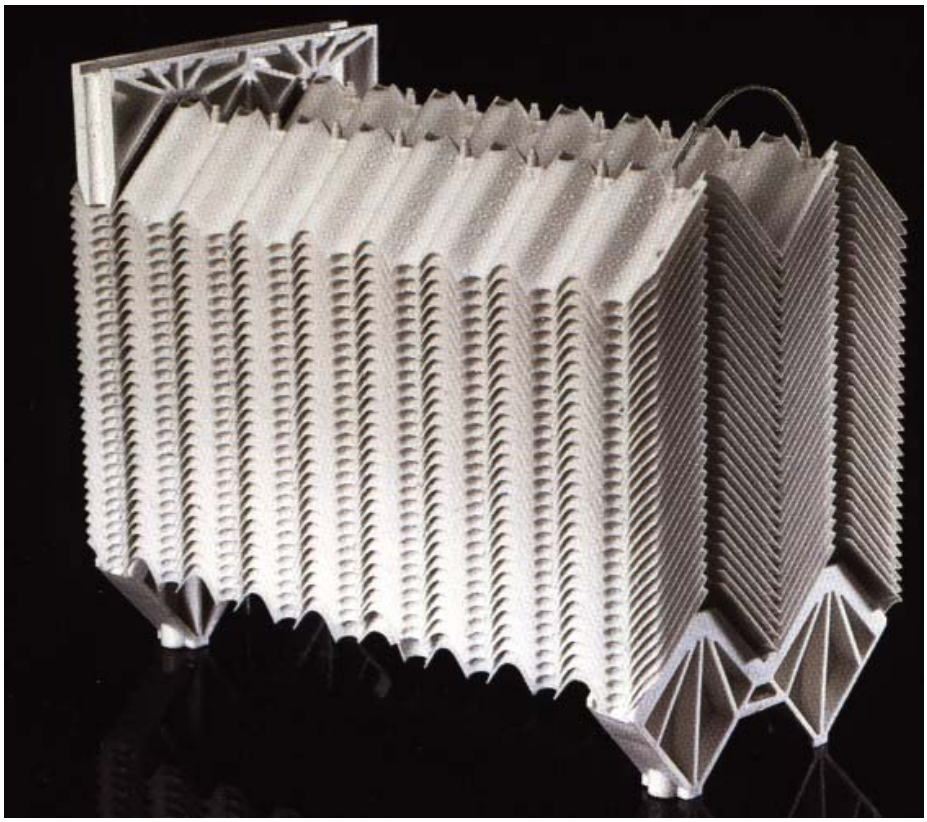
For cleaning in place, connect a pressure water hose (at least 60 psig) to the special cleaning wand. Provide a vacuum truck or other means of disposing the sludge and dirt in the tank. Turn on the water to provide a spray from the wand andinsert the tip of the wand slowly into each hole of the plate pack, starting at the upstream end. As the water flushes the dirt out of the plate packs, it should be removed by the vacuum hose or directed to an oily water sewer if one is available.

For cleaning outside the tank, remove plate packs and other internals. Flush with hose and cleaning wand to an oily water drain.

CAUTION: The spray wand produces a vigorous spray. Operators should wear waterproof clothing and goggles or face mask.

Troubleshooting

TROUBLE	POSSIBLE CAUSE	DIAGNOSTIC TECHNIQUE	CORRECTIVE ACTION
PROCESSED WATER HAS OIL IN IT	FLOW TOO GREAT FOR APPLICATION	CHECK FLOW	SLOW THE FLOW RATE
	LEAKAGE AROUND OIL DAM	REMOVE COVER AND INSPECT	SLOW THE FLOW RATE
	PLATES BLOCKED	REMOVE PLATES AND INSPECT	CLEAN AND REASSEMBLE
TANK IS OVERFLOWING	OUTPUT LINE RESTRICTED	CHECK FLOW	REMOVE RESTRICTION



ALTEX COATINGS
INDUSTRIAL & MARINE

Devoe Bar-Rust™ 235

Multi-Purpose Epoxy Coating

Data sheet

FEATURES

Advantages:

- Exceptional corrosion protection
- Surface tolerant with abrasive blasting not required in most applications
- Good adhesion to light rust
- Tolerates surface dampness at application
- Self priming for steel and masonry substrates
- Suitable for fresh and salt water immersion
- Excellent abrasion and chemical resistance
- Low temperature cure to minus 18°C
- Low VOC

Performance Data:

- Adhesion (ASTM 04541) – excellent
- Abrasion resistance (ASTM 04060) – excellent
- Humidity resistance (ASTM 02247) – excellent
- Salt spray resistance (ASTM 8117) – excellent
- Water immersion (ASTM 01308) – excellent
- Chemical resistance (ASTM 01308) – excellent

Approvals:

- AS 4020 – Potable water
- EPA for potable water
- Sydney Water Corp 95/00015

RECOMMENDED USES

Devoe Bar-Rust™ 235 is a high performance, multi-purpose, surface tolerant, two component; chemically cured epoxy semi-Gloss: coating.

Devoe Bar-Rust™ 235 is specifically formulated for use as a new construction or maintenance coating for steel or masonry surfaces in the following areas:

- Pulp and Paper Mills
- Power Generation
- Railway Rolling Stock
- Fertiliser and Chemical Industries
- Pipelines
- Tankage
- Dairy and Food Industries.
- Shipyards and Dockyards.
- Sewage Treatment Plants
- Coal industry
- Off-Shore Installations.
- Potable Water Tanks

Limitations of Use:

- Exterior exposure will cause early loss of sheen and chalking. This will not affect the protective properties of the coating.

Note: When used in potable water tanks use X-100 Thinner

SPECIFICATION DATA

Coating Type:	Advanced Technology Epoxy
Colour:	Off White Y35, Light Grey N35, Pipeline Grey N43
Packaging:	1 litre (Off White) 5 litre and 20 litre
Mix Ratio:	4:1 by volume
Gloss:	Low sheen
Flash Point:	38 °C Setaflash
Thinner:	½ Thinner
Pot Life:	5 hours at 25 °C
Induction Time:	15 minutes
Shelf Life:	Store under cool dry conditions

Density:	1.35 kg per litre
VOC:	292 g per litre
Temperature Resistance:	121 °C
Volume solids (mixed):	68 %

Theoretical Coverage Rate:

4.53 sq. metres per litre at 150 microns dry

Recommended Film Thickness Per Coat:

147-294 microns wet to obtain 100-200 microns dry

Application:	Spray, Brush or Roller
Dry Times (25°C /.150µm DFT / 50 % RH):	
Touch Dry:	4 hours
Hard Dry:	7 hours
Recoat – minimum:	Dependent on topcoat to be used. Refer recoat window chart or consult Resene Paints (Australia) Ltd.
Recoat – maximum:	

Note:
Manufactured/ supplied by Altex Coatings Limited under licence and trademark of Devoe Coatings USA

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Oil or grease should be removed in accordance with AS1627.1 solvent cleaning. Surface defects revealed by the preparation process, should be ground, filled, or treated in the appropriate manner. Clean to remove all grit dust and debris and ensure the surface is dry.

Steel Surfaces:
Abrasive blast to AS1627.4 Class 3 for immersion service and for non-immersion to AS1627.4 Class 2 ½ to achieve a uniform blast profile between 38 to 63 microns and be of a jagged nature as opposed to a peen pattern. A lesser degree of cleaning will reduce the service life of the coating. Apply primer coat to the cleaned surface to prevent re-rusting or contamination.

Galvanised Steel and Electrodepositing Zinc Surfaces:
All traces of dichromate passivation must be removed. Sweep abrasive blast with non metallic media or thoroughly sand with synthetic scouring pad to provide a uniform roughened finish.

GRP and Wooden Surfaces:
Thoroughly sand with non-sterate paper with 80-120 grit paper.

Concrete surfaces:
Concrete must cure for at least 28 days and not be greater than 10 pH. Acid etch with dilute hydrochloric acid solution (1 part concentrated acid to 10 parts water) to produce a uniformly roughened surface profile, followed by washing off with copious amounts of clean fresh water until the cleaning water is neutral to litmus paper. DO NOT allow etch solution to dry on the surface. Check for excessive moisture using the ASTM D-4263 "Plastic Sheet Method" test. Grinding or sweep blasted to remove all laitence may also be carried out.

Previously Painted Surfaces:
Clean with Devoe Devprep® 88. Remove all unsound coatings. Prepare all corroded and damaged paint areas in accordance with the preparation required for the applicable primer. Feather back edges to a sound clean existing coating. Matt all existing coating to provide a fine matt finish. Clean to remove all grit dust and debris and ensure the surface is dry.
Apply a test patch to confirm compatibility with existing coating system. If lifting occurs remove to bare substrate.

DIRECTIONS FOR USE

Mixing:
Devoe Devoe Bar-Rust™ 235 is a two component product supplied in 1 litre (Off White), 5 litre and 20 litre kits that contain the correct ratio of ingredients.
Power mix the base portion first to obtain a smooth homogeneous condition. After mixing the base portion, slowly add the converter whilst continuing to agitate at slow speed. After addition of the converter is complete, continue to mix slowly until homogeneous.

Higher temperatures will reduce the working life of the coating; lower temperatures will increase it.

Thinning:
Thinning maybe required to assist application. Any solvent addition should be made after the two components are thoroughly mixed. Excessive thinning can cause low film thickness and coating defects.

Clean-up:
Use ½ thinner

Curing:
For maximum chemical resistance, internals of vessels must be cured for a minimum of 7 days at 25°C; with continuous forced ventilation during application and curing of the coating before putting into service.
At lower temperatures, longer cure times are required.

Application:
Application by either conventional air spray or airless spray equipment is the preferred method. For touch-up and repair to small areas, Devoe Bar-Rust™ 235 can be applied by brush and roller.

Suggested spray equipment is:

Air Spray:	Binks - type 2001 gun, 66SS Fluid Nozzle, 63P8 Air Nozzle
	DeVilbiss - JGA Gun, D Fluid Nozzle 64 Air Nozzle
Airless Spray:	Binks - 88-36 pump, Airless 1 0.021-0.027" tip
	Graco - 45:1 pump, Contractor Gun, 0.021-0.027" RAC IV tip

Note: Other equipment equivalent to the above may be used.

Safety within enclosed areas:
It is very important for the safety of the applicator and to ensure correct performance of the coatings, good ventilation is provided to all portions of the enclosed area.
It is equally important to bring into the enclosed area, dry fresh air to remove all solvent vapours. As solvent vapours are heavier than air, ventilation ducts should reach to the lowest portions of the enclosed area as well as into any structural pockets.
Ventilation should be maintained throughout the cure period.

PRECAUTIONS

For industrial use only.
See the Altex Coatings Limited General Safety Data Sheet, product label and Material Safety Data Sheet (MSDS) for health and safety information prior to use.

Devoe Bar-Rust™ 235 is flammable. Keep away from heat, sparks and open flame. Use with adequate ventilation.
May cause eye and skin irritation. Do not breathe vapour or spray. Wear suitable protective clothing such as gloves and eye and face protection.

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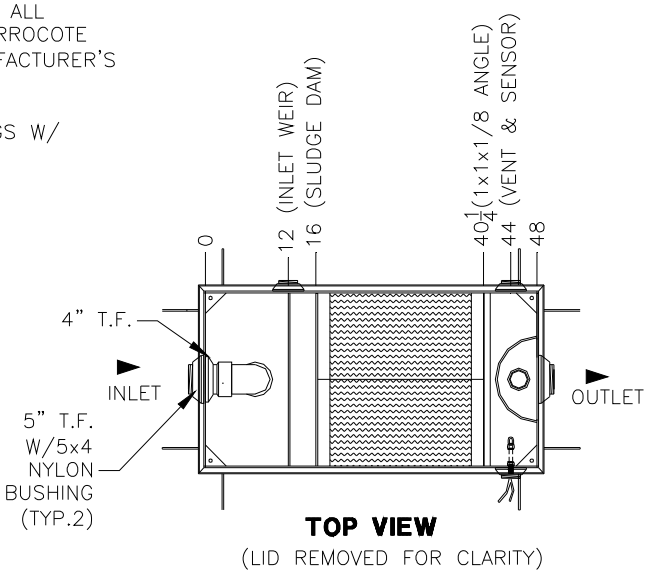
DISCLAIMER

LLS-B Oil Water Separator Manual

SANDBLAST & COAT ALL SURFACES WITH CORROCOTE CLASSIC PER MANUFACTURER'S SPECIFICATIONS

CLOSE ALL OPENINGS W/ THREADED PLUGS



TOP VIEW
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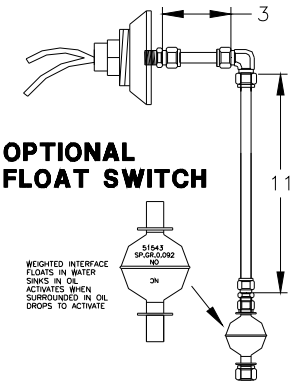
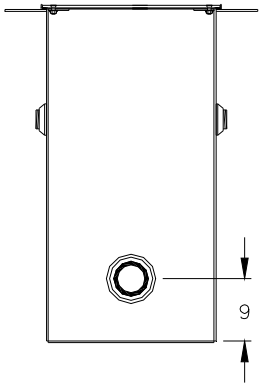
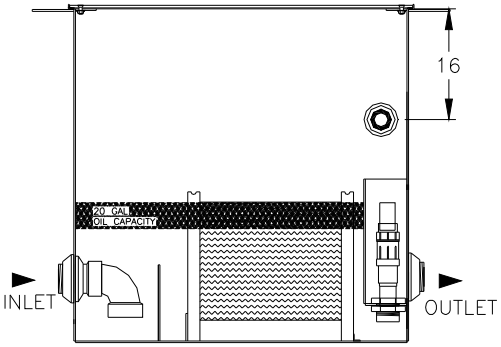
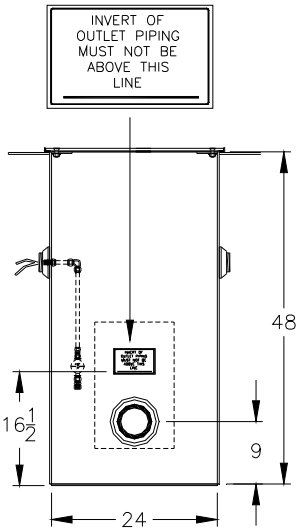




INLET VIEW



SIDE/SECTION VIEW



OUTLET VIEW