Pan America Environmental, Inc.

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ENGINEERING SPECIFICATION

Clarisep Series Slant Plate Clarifier

Engineering Specification

GET A QUOTE	SPEAK TO AN ENGINEER
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PRODUCT PAGE

https://www.panamenv.com/clarifiers/clarisep/

SECTION 1.0 SLANT PLATE CLARIFIER SECTION EQUIPMENT

Performance

The Pan America Environmental Clarisep Series Slant Plate Clarifiers/oil water separator are designed to settle readily settleable suspended solids and oils/fuels.

1.01 Design

The SPC Slant Plate Clarifier will be designed and fabricated per the following specifications. The tank shall be a rectangular steel design with features as described.

1.02 Influent Chamber

The influent chamber provides a velocity decreasing surface area and influent diffuser that minimizes turbulence. A slotted exit is provided at the bottom of this chamber to allow unimpeded, uniform flow of water and solids into the sludge/clarification chamber. The slotting will prevent bridging of solids over the exit in the influent chamber.

1.03 Solids/Clarification Chamber

Once the flow exits the influent chamber the diversion plate located below the slotted exit of the chamber redirects it. The flow is diverted from its vertical, downward path to a horizontal path to the solids/clarifying chambers. This is performed to prevent settled solids from being re-entrained into the flow. The readily settleable solids drop out in this chamber while the finer solids continue in an upward flow through the SPC plates. PVC plates are bound together via a 304 stainless steel support structure that facilitates removal and installation of all plates simultaneously. The effective plate angle of inclination will be 55° with a standard plate spacing of 1". The plate material provides a slippery surface that assists in solids removal. The SPC-240 and smaller will be provided with an inverted pyramid type sludge chamber. The optional sludge auger system may be provided in the solids chamber to convey solids to the sludge outlet. A sludge auger system is provided as a standard feature for the SPC-330 and larger. The adjustable water weir in the effluent chamber will determine the clarification chamber water level.

1.04 Sludge Auger System (OPTIONAL FOR SPC20 – SPC-240)

The solids chamber is provided with a rotating, sludge auger. The auger consists of stainless steel shafts with an epoxy coated steel screw auger driven by a slow speed gear motor drive assembly with an

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adjustable packing gland and anti-torque bracket. Self-lubricating, submersible Teflon bearings are provided. The auger extends the full length of the solids chamber and conveys solids to the sludge outlet. The hopper bottom angle facilitates movement of sludge toward the auger. All wetted hardware shall be 304 stainless steel. Power required: 230V/3ph/60Hz. Motor controls are by others.

1.05 Lifting Lugs and Skid

The tank shall be provided with lifting lugs and forkliftable skid. The skid will provide bolt -holes for hold down to the installation surface.

1.06 Slant Plate Pack Chamber

A chamber is provided directly above the solids chamber for location of our SPC, Slant Plate Clarifier plate pack assembly. This chamber allows easy removal and installation of the plate pack. The stainless steel water overweir is located at the top of this chamber and provides an even water distribution across the width and length of the chamber. The water flows up from the bottom of the plate pack through all the plates for 100% flow exposure to the entire plate surface area. Lifting lugs are provided.

1.07 Effluent Chamber

The water flows up through the plate pack and uniformly crests over the fixed water weir and into the effluent chamber. A flanged outlet is provided. The effluent chamber will be provided spanning the entire width of the SPC tank.

- Fittings

All fittings shall be ANSI, B16.5, 150# Flat Faced flange. All fittings shall be FNPT couplings.

SECTION 2.0 MATERIALS OF CONSTRUCTION

2.01 Steel Construction

Tank shell, baffles and external structural members shall be constructed of ASTM A-36 carbon steel. Welded joints are double welded and dye penetrant tested.

2.02 Surface Preparation

Interior surfaces shall be prepared to an SSPC-SP10 near white metal blast. Exterior surfaces shall be prepared to an SSPC-SP6 commercial blast.

2.03 Coatings

Interior coating shall be a self-priming coal tar epoxy (18-20 mils dft). Exterior coating shall be an industrial polyurethane enamel coat (6 mils dft). Color is Green.

2.04 SPC Plate Pack

Plate packs will be constructed of stress relieved PVC. The plate support structure shall be constructed of 304 stainless steel and schedule 80 PVC.

2.05 Internal Piping

Internal piping shall be ASTM A-53 black pipe.

- Hardware

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All wetted hardware shall be ANSI, 304 stainless steel. All non-wetted hardware to be ANSI, zinc plated.

2.07 Manufacturer

The manufacturer of preference shall be: Pan America Environmental

2.08 Warranty

Pan America Environmental warrants its products to be free of defect in materials and workmanship for a period of one year from the date of shipment.

SECTION 3.0 OIL WATER SEPARATOR SECTION

Performance

The Pan America Environmental OS Series Oil/Water Separators are designed to produce an effluent concentration of 10 mg/l or less of oil droplets 30 micron and larger of non-emulsified, free and dispersed oils. By virtue of our Flopak coalescing media and tank design, readily settleable solids are also removed.

3.01 Design

The oil/water separator will be designed and fabricated per the following specifications. Rectangular tankage with features as described designed per API #421 Design & Operation of Oil/Water Separators Manual and stokes law. The design will incorporate flexible flow rating capability based on application parameters.

3.02 Influent Chamber

Influent flow enters the clog proof influent diffuser and is immediately spread out across the depth and width of the chamber. Any readily settleable solids drop to the bottom of the V-shaped solids accumulation chamber located directly under the Flopak coalescing media pack.

3.03 Oil/Water Separation Chamber

The separation chamber is to be packed with Flopak cross-fluted coalescing media. The media pack will be designed to create a quiescent zone, a laminar flow pattern to facilitate the impingement of oil on the media, and will provide numerous impact sites and changes of flow direction. The media shall have a 60-degree cross-flute angle.

3.04 Sludge Hopper

The separator shall have a V-shaped solids accumulation chamber located under the coalescing media. This chamber will provide temporary solids storage. The chamber walls are to be pitched at 45 degrees to assure simple and thorough solids removal. Dual outlet ports will be provided for sludge removal. Hopper design shall allow an optional sludge auger system to be accommodated at the factory.

3.05 Sludge Auger System

The solids hopper(s) to be provided with a rotating, screw type sludge auger. The auger consists of stainless steel shafts with coated steel screw auger driven by a slow speed gear motor drive assembly with TEFC motor. The auger extends the full length of the sludge hopper and conveys solids to the sludge

outlet. Controls: Local NEMA 4 control panel with manual on/off switch. Power required: 230/460V/3ph/60Hz.

3.06 Clean Water Effluent Chamber

The cleansed water will flow under the oil retention baffle, over the water weir and into the effluent chamber. This chamber is to have the capability to be expanded at the factory by expanding the standard integral chamber so a greater volume of water is available for pump suction directly from the OS tank.

3.07 Oil Reservoir

A fixed weir oil skimmer with an integral oil reservoir is to be provided for the temporary storage of separated oils. This chamber is located at the effluent end of the separator. The reservoir will have fittings for gravity drain and vent. This chamber is to have the capability to be expanded at the factory by modifying the standard integral chamber so a greater volume of oil can be stored and pumped directly from the OS tank to desired point of discharge.

3.08 Separator Cover

The separator is to have a multi-section cover that provides complete closure of the tank. The separator cover will be mounted to the tank via zinc plate hardware and vapor sealed with an industrial grade closed cell, compressible polyethylene gasket.

3.09 Skid & Lifting Lugs

The OS tank shall be provided with an integral, skid base with anchor bolt holes (hardware by others). Lifting lugs shall be provided.

3.10 Fittings

All fittings are to be FNPT coupling up to 3". Fittings larger to be 150# FF ANSI B16.5 flange.

3.11 Submittal Package

Upon receiving an order Pan America Environmental will engineer and produce a Submittal Approval Package, which allows you the customer to review and change or keep aspects of the system detailed in this quote. The submittal package provides the following at a minimum:

- General arrangement drawings, 2D, 3D, plan, end, sectional, detail and other views
- Hydraulic profile
- Electrical schematics
- Control panel physical layout
- Process/control narrative (where project size is applicable)
- Component datasheets
- Component cutsheets

Options

- P&ID
- Structural, seismic, wind load, lifting lug review, anchorage and/or other PE review calculations
- Design sizing PE calculations and/or calculations of any other types
- Testing review and implementation during fabrication and assembly, i.e. NDT, NDE, radiographic, x-ray, ultrasonic, magnetic particle exam, others

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- Piping testing per desired standards, i.e. ASME B31.1 power piping, ASME B31.3 process piping
- Rigging and lifting guide, drawings and/or procedures and methods
- WPS, ITP, PQR, PMI, others
- Document, QC report and/or other project document binder
- Mill certificates

Revisions & Meetings

The submittal package contains a limited amount of engineering and provides a maximum of Two (2) revisions of up to 10% maximum each. This quote does not include open ended, extensive or continuous revisions until approval is given. This submittal package does not include: Iterative R&D and review projects, design/redesign projects, pre-submittal before or after order placement to attain approval from the end user before order is placed, honored or executed by Buyer, engineers/consultants, contractors and/or other parties involved with this project. In addition, numerous and/or excessive meetings relative to the system design and complexity are not provided as PAE strives to have all valuable communications in writing so as to create a trackable/traceable project evolution.

Engineering Only

The quotation provides a limited amount of engineering and does not provide “Engineering Only”. The limited engineering is part of the system cost and is provided to give direction and final understanding as to what is being provided to you in the system design. The quoted and submitted system is a proprietary PAE product and PAE will not produce drawings for you to build, license, bid out or produce and/or market as your product for your or any other entities use.

SECTION 4.0 MATERIALS OF CONSTRUCTION

4.01 Steel Construction

Tank shell, baffles, cover and external structural members shall be constructed of A-36 carbon steel. Welded joints are continuous double welded and dye penetrant tested.

4.02 Surface Preparation

Interior surfaces shall be prepared to an SSPC-SP10 near white metal blast. Exterior surfaces shall be prepared to an SSPC-SP6 commercial blast.

4.03 Coatings

Interior coating shall be a self-priming, coal tar epoxy (14-16 mils DFT). Exterior coating shall be primer coat followed by industrial polyurethane enamel coat (6 mils DFT). Color is Green.

4.04 Piping

Internal piping shall be ASTM, A-53 black steel.

4.05 Coalescing Media

Flopak, cross-fluted, oleophilic, PVC coalescing media shall be provided as manufactured by Pan America Environmental. The media shall be packed in stainless steel frame(s) with lifting lugs.

4.06 Cover Gasketing

Closed cell, industrial grade polyethylene constructed vapor sealed cover gasketing shall be provided. No neoprene shall be permitted.

4.07 Manufacturer

The manufacturer of preference shall be Pan America Environmental, Inc.

4.08 Warranty

Pan America Environmental warrants its products to be free of defect in materials and workmanship for a period of one year from the date of shipment.

Applications

- oil water separator for vehicle wash water
- oil water separator for wash bay
- wastewater treatment oil water separator
- industrial wastewater oil separation
- fuel contaminated water treatment
- solids and oil separation system

Design Type

- steel oil water separator
- industrial oil water separator
- oil water separator with solids removal
- coalescing settling oil water separator
- api421 based oil water separator
- vehicle wash oil water separator
- refinery oil water separator
- petroleum derived products separator
- above grade coalescing separator
- oil fuel solids separator wastewater

Design Type

- clarisep
- clarisep oil water separator
- clarisep clarifier
- pan america environmental clarisep
- api 421 oil water separator
- above ground oil water separator
- coalescing oil water separator
- clarifier oil water separator

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SECTION 5.0 FREIGHT AND SHIPPING PREPARATION

5.01 Freight Cost

Any quoted freight cost is an actual or estimated cost. This cost is subject to change throughout the life of the quote and any resultant order.

5.02 Palletizing (DOMESTIC ORDER)

All equipment prices include palletization except where large tank or skidded systems are shipped via flat bed.

Specifying a Clarisep Series Slant Plate Clarifier for your project?

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