Pan America Environmental, Inc.

262.716.0105 · www.panamenv.com
technical@panamenv.com

ENGINEERING SPECIFICATION

EC Series Emulsion Cracking System

Engineering Specification

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PRODUCT PAGE

https://www.panamenv.com/oil-water-separators/ec-emulsion-cracking-system/

Performance

The Pan America Environmental EC Series emulsion cracking/breaking systems are designed to remove free/dispersed and emulsified hydrocarbon products in wastewater streams through the use of chemical cracking technology. The emulsion is cracked via pH adjustment and/or emulsion cracking chemicals. Oil/water separation follows the cracking stage. Once oils are removed the pH is readjusted for final discharge. The systems are designed to produce an effluent with 10 mg/l of oil droplets 30 micron or larger.

SECTION 1.0 EMULSION CRACKING SYSTEM

1.01 Reaction Chamber

The reaction, emulsion-cracking chamber is provided with (1) 0-450 RPM, universal mount mixer with 316 stainless steel shaft and propeller. (2) Externally, shelf mounted electronic chemical metering pumps with matched diaphragms are provided for injection of acid/caustic and/or demulsifying chemicals. The automated pH adjustment process is controlled via an electronic pH controller with analog or digital display. (1) 50-gallon chemical mix tank with 1/3 HP mixer is included for preparation of chemical demulsifier for injection in combination with acid or caustic.

1.02 Oil/Water Separation

Following the emulsion cracking stage the free product is passed through the oil/water separation stage for free product removal.

1.03 Influent Chamber

Influent flow enters the clog proof influent diffuser pipe and is immediately distributed across the depth and width of the separator influent chamber. Any readily settleable solids drop to the bottom of the solids accumulating V-hopper located directly below the Flopak coalescing media.

1.04 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° cross-flute angle. The separation chamber will be design to prevent bypass or short-circuiting of the flow around, over or under the media.

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1.05 Oil Skimmer

The separator shall be provided with a fixed weir type oil skimmer with an integral oil reservoir.

1.06 Solids Accumulation Chamber

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.

1.07 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 modifying the standard integral chamber so a greater volume of water is available for pump suction directly from the tank.

1.08 Oil Reservoir (LARGER THAN STANDARD RESERVOIR, OPTIONAL, NOT PROVIDED WITH THIS QUOTE)

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 pump suction, high/low level switch accommodation and vent.

1.09 Separator Cover

The oil/water separator is to have a multi-piece 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 PVC gasket.

1.10 Fittings

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

1.11 pH Post Adjustment Chamber

The final chemical reaction chamber is designed for the readjustment of pH to discharge requirements. The post adjustment chamber is provided with (1) 1750 RPM, universal mount mixer with 316 stainless steel shaft and propeller. (1) Externally shelf mounted electronic chemical metering pump with Teflon diaphragm is provided for injection of acid/caustic. The automated pH adjustment process is controlled via an electronic pH controller with analog or digital display. Customer to provide chemical drum for pump supply.

1.12 Control Panel

The system is supplied with a NEMA 4-control panel installed on the EC tank or shipped loose. HOA and on/off switches are provided for mixer and pump control. The pH controllers are panel mounted. Motor run and power on lights are provided. 115/230V/1 or 3ph/60/50Hz power supply as project/site dictates. The system will be factory plumbed, wired and functionally tested prior to shipment.

Applications

- oil water separation petrochemical
- oil-in-water emulsion cracking system
- refinery wastewater emulsion treatment
- metalworking coolant emulsion breaking
- food processing oil water separator

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- produced water treatment emulsion breaker
- marine bilge water emulsion breaking
- automotive wash water oil emulsion removal
- steel mill emulsion breaking system
- pharmaceutical oil water separation
- how to break oil in water emulsions
- industrial oil water emulsion breaking equipment
- chemical emulsion breakers for wastewater
- high efficiency oil water separator for emulsions
- emulsion breaking technology for industrial wastewater
- coalescing plate oil water separator emulsion
- dissolved air flotation emulsion breaking
- centrifugal emulsion breaker system
- ultrasonic emulsion breaking industrial
- electrocoagulation oil water emulsion removal

SECTION 2.0 SUBMITTAL PACKAGE

2.01 Submittal Approval 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
- 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

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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 3.0 MATERIALS OF CONSTRUCTION

3.01 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.

3.02 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.

3.03 Coatings

Interior coating shall be coated with Ameron High Build Coal Tar Epoxy Amercoat 78HB (18-20 mils DFT). Exterior coating shall be coated with Ameron epoxy primer, Amerlock 2, (5-8 mils DFT). Final coat to be Ameron Amershield Aliphatic Polyurethane Enamel coat (5 mils DFT). Surface color to be Green RT-2203.

3.04 Piping

Internal piping shall be ASTM, A-53 steel.

3.05 Coalescing Media

Cross-fluted, oleophilic, PVC, Flopak coalescing media shall be provided as manufactured by Pan America Environmental. Media shall be encased in 304 stainless steel media frame with lifting lugs (provided with EC24 & larger)

3.06 Cover Gasket

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

3.07 Field Assistance

PAE can provide startup field assistance when desired or required.

3.08 Manufacturer

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

3.09 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.

3.10 Manuals

(2) Installation & Operation Manual (IOM) manuals will be provided. Extras are available at additional cost.

SECTION 4.0 FREIGHT AND SHIPPING PREPARATION

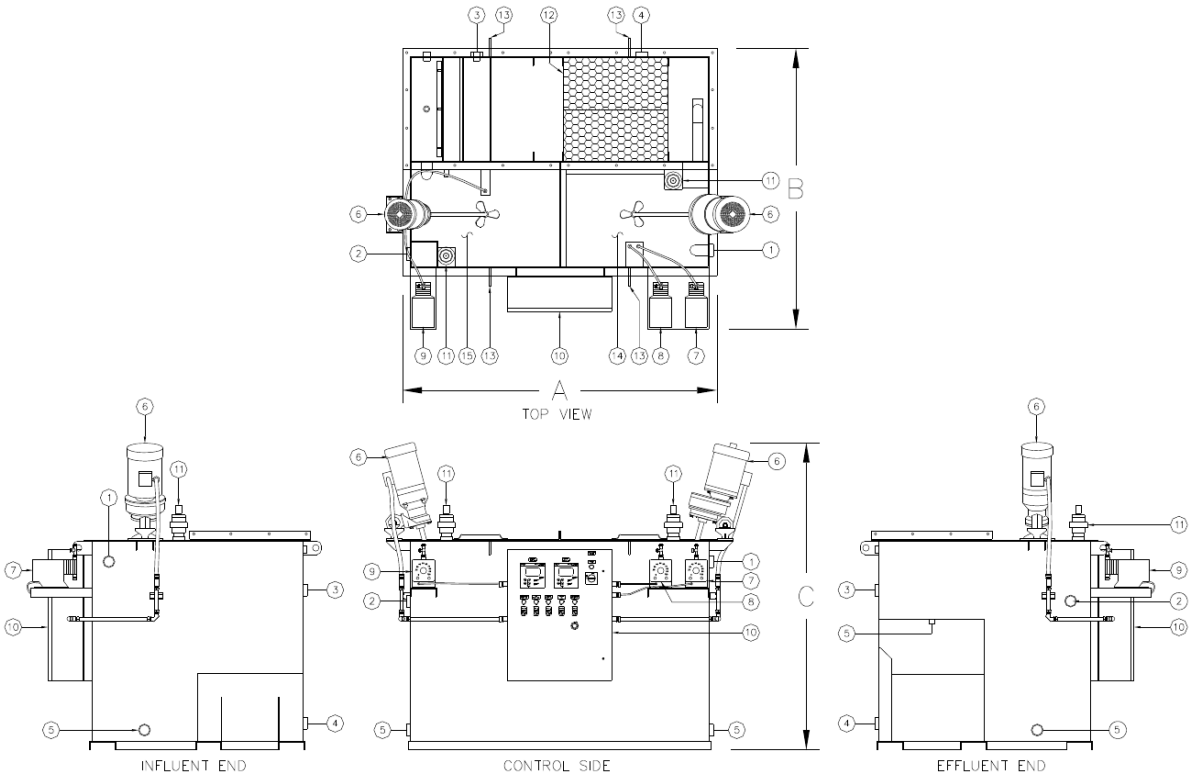
4.01 Freight Cost

The 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.

4.02 Palletizing

All equipment prices include palletization where equipment size requires a pallet.

EC System Drawing



Model	Dimensions			Weights (lbs)		Flow GPM
	A	B	C	Empty	Operating	
EC-4	5'-11"	3'-10"	4'-4"	1700	3965	8
EC-8	5'-11"	4'-6"	4'-4"	2425	7900	16
EC-12	6'-7"	4'-6"	6'-4"	2910	9050	25
EC-16	6'-7"	5'-6"	8'-4"	3454	11600	35
EC-24	7'-10"	6'-10"	8'-4"	4800	13000	50
EC-36	8'-4"	7'-10"	8'-4"	6250	15000	70
EC-48	11'-4"	8'-6"	9'-4"	8300	16500	100
EC-64	12'-6"	8'-6"	8'-6"	9750	20000	125
EC-80	13'-6"	9'-6"	8'-6"	10900	25000	150

Dimensions, weights and design subject to change, not for construction.

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Item List

1 Inlet, wastewater	8 Pump, chemical, acid
2 Outlet, treated water	9 Pump, chemical, NaOH
3 Outlet, oil	10 Control panel
4 Outlet, sludge	11 pH Probe
5 Drain	12 Flopak coalescing media
6 Mixer	13 Lifting lugs
7 Pump, chemical, demulsifier	14 Reaction chamber, emulsion break
15 Reaction chamber, pH adjustment	

Specifying an EC Series Emulsion Cracking System for your project?

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