The COMBOSEP™ separator from Siemens Water Solutions is typically comprised of a vertical and horizontal flotation system or a vertical/vertical vessel, mounted on a common skid complete with interconnect piping. The vertical unit (SPINSEP™ or CYCLOSEP™ system) can be packaged on a skid separate from the horizontal VEIRSEP™ unit. This sophisticated design precludes the need for a gravity separator or skimmer upstream of the flotation system.

Applications
- Offshore produced water treatment
- Refinery wastewater treatment
- Petrochemical plants
- Water treatment facilities

COMBOSEP™ System
The COMBOSEP™ system is designed to replace the traditional use of LP separators, skimmers and flotation polishing separate systems. It can replace an entire produced water treatment system with two vessels; a vertical skimmer and horizontal flotation unit. The COMBOSEP™ system has the ability to replace multiple treatment vessels due to flotation capabilities in both COMBOSEP™ vessels. This unit is offered in multiple configurations:
- SPINSEP-P™/VEIRSEP™ System
- CYCLOSEP-P™/VEIRSEP™ System
- SPINSEP-P™/SPINSEP™ System

The vertical SPINSEP™ or CYCLOSEP™ unit is the primary separator system of the COMBOSEP™ System. The CYCLOSEP™ system, if used in this application, would include a built-in cyclonic device used to separate the solids and oil from the produced water. After exiting the internal cyclone, the concentrated solids fall to the bottom while the water and oil particles rise.
Once the water and oil reach the top of the sand hopper, oils continue to rise while the water is channeled through the packing material and bubbles for further scrubbing. The remaining oil droplets travel to the surface where they come in contact with gas bubbles. The free phase oil is then skimmed over a weir into an oil compartment and removed.

Next, the water flows down, traveling through the pack section where small oil droplets are coalesced in size to facilitate gravity separation towards the surface. The processed water flows through a micro-fine bubble section, completing the process of removing oil droplets from the processed water.

If a SPINSEP™ system is selected for your application, the same flotation process would occur with the exception that this unit does not include the internal cyclone for solids removal.

VEIRSEP™ System
The final polishing vessel of the COMBOSEP™ system includes a VEIRSEP™ flotation system that removes the remaining oil to achieve discharge limits. The unit is comprised of six separation chambers, has no internal moving parts and can be equipped with either DGF or eductor technology to provide gas bubbles that attach and lift the oil to the surface where it is skimmed into the oil compartment.

Design Options
We offer several design configurations to suit your individual needs:

- ASME Code or Non-Code Vessel Construction
- DGF, Eductor or Sparge Tube Flotation Design
- Coalescing Pack constructed of Polypropylene or Stainless Steel (COMBOSEP-PLUS™ System)
- Client determines controls, valve configuration and safety controls

Note: The following dimensions are for reference only and are subject to change.

<table>
<thead>
<tr>
<th>Model No</th>
<th>Vessel Flow Rate</th>
<th>Vessel Weight</th>
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