

VORSEP™ Compact Flotation Unit

Our proprietary Vorsep™ compact flotation unit incorporates several unique methods for removing oil from produced and wastewater streams before they are discharged, reused, or reinjected.

The unit is compact and lightweight, ideally suited for offshore applications where footprint and weight are critical. The Vorsep™ system can reduce the residence time necessary for separation by 80 percent or more, relative to standard flotation systems. This separation efficiency results in reducing the inventoried water in the system by the same percentage as the residence time, resulting in a system optimized for footprint and weight without reducing effectiveness.

The Vorsep™ unit can be designed as a code or non-coded vessel.

Applications

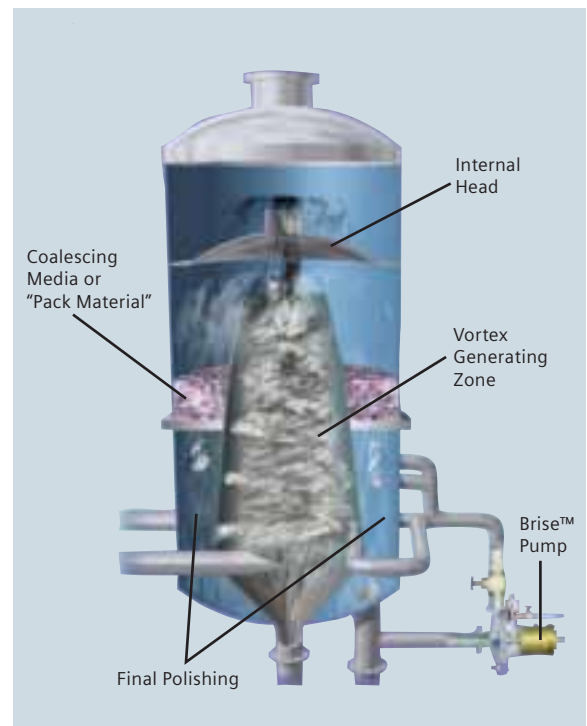
- Removal of oil in produced water from offshore and onshore production facilities
- Secondary oil/water separation of refinery or crude upgrader wastewater
- Removal of pulp from wastewater in the paper industry
- Treatment of oily wastewater

Flotation Process

As oily water feed enters the Vorsep™ compact flotation system, its flow is tangential to the walls of the internal vortex zone. The inlet flow is also combined with the first of two flotation zones. The gas-filled feed is accelerated by angled pipes to generate a vortex-induced separation of the incoming liquid. This motion created in the Vorsep™ system by the inlet angle results in accelerating the separation forces, improving removal efficiency.

As the oil droplets grow due to the voraxial motion, micro-bubbles attach, aid and accelerate flotation of the oil to the surface. The rising oil droplets coagulate at the surface and are skimmed from the water. Clean effluent flows from the Vorsep™ system ready for discharge, reuse, reinjection, or further treatment.

Conventional flotation technologies create gas bubbles by a number of different methods including eduction, sparge tubes, or the dissolution of gas under pressure.



Our unique dissolved gas flotation (DGF) technology uses a proprietary Brise™ pump system to create micro-fine gas bubbles. The system uses a dual-sided impeller that pulls both water and gas into the pump where it is mixed and fine bubbles are discharged at an accelerated rate. DGF technology allows for instantaneous adjustments in bubble size resulting in greater adaptability to changing water chemistry characteristics.

Also, as an added feature, the Vorsep™ system is designed to handle standard operating environments or environments that experience extreme movement, such as floating platforms (Spar, TLP, FPSO). Extreme movements in these applications result in potential turbulent environments within the vessel causing excess water to be removed with the oil if based on a

standard oil removal system. Our design incorporates the proven “head-in-head” arrangement that:

1. Reduces turbulence at the removal point from the vessel by reducing the surface area
2. Reduces the water carried with removed oil
3. Maximizes oil removal efficiency

Design Options

- Code or non-coded vessel construction
- Client determined controls, valve configuration and safety controls
- Head-in-head design for extreme movement applications
- System that can be packaged on a single skid or integrated into a larger oil removal system



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