

VWS OIL & GAS

Veolia Water Solutions & Technologies (VWS), a subsidiary of Veolia Water, is a leading global water and wastewater technology company and provider of a full range of services including engineering, project management, design-build, and maintenance services.

VWS Oil & Gas is the global division of Veolia Water Solutions & Technologies dedicated to serving the oil and gas industry. VWS Oil & Gas supports developments onshore and offshore around the world.

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Cophase™ CFU Compact Flotation Unit

Compact Flotation

Traditional produced water treatment is usually comprised of hydrocyclones followed by degassing or flotation processes. Increasingly stringent environmental discharge requirements plus the constant pressure to reduce equipment footprint have led to the development of the Compact Flotation Unit (CFU). VWS has taken this process forward to the next level with the Cophase™ CFU.



DESIGN PHILOSOPHY

- › Remove the need for a pressurised gas supply
- › Improve oil removal efficiency
- › Minimise footprint and weight
- › Reduce maintenance
- › Extend operating life
- › Eliminate power requirements
- › On and offshore compatibility



How it works

The Cophase™ CFU operates by combining the well established principles of gas flotation, oil droplet coalescence and centrifugal separation into a single process step.

The efficiency of oil/water separation at low concentrations depends on maximising the contact between the oil droplets and gas bubbles. The smaller and more densely packed the gas bubbles, the greater surface area the oil droplets have available to adhere to and agglomerate.

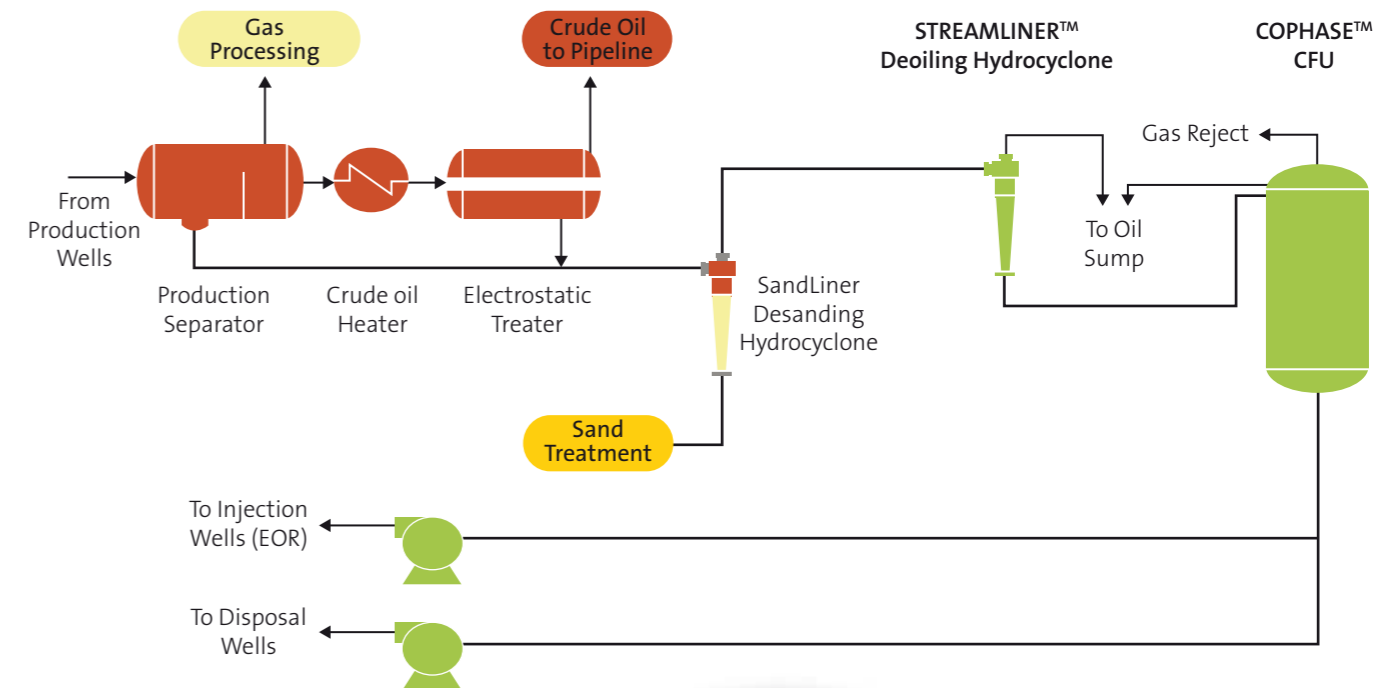
The Cophase™ CFU LoHead™ eductor design is unique in that 100% of the inlet flow is fed through the gas eductors, thus maximising bubble generation and contact between the oil droplets and gas bubbles. By enhancing the opportunity for contact between the oil droplets and the gas bubbles, greater oil removal efficiency for a given vessel volume is achieved.

The LoHead™ eductor design also generates a vortex within the separation volume. This vortex applies centripetal force upon the heavier water and solids, forcing them to the periphery of the vessel and therefore concentrating the oil and gas bubbles in the centre and so aiding agglomeration and coalescence.

An important feature of the Cophase™ CFU is that this vortex, combined with the internal geometry of the vessel has been designed using Computational Flow Dynamics (CFD) to suppress backmixing in the vessel. This means that the water passes through the separation volume in what is termed “rotating plug flow”, which leads to a higher oil removal efficiency than is achieved in the older designs of flotation units currently available.

TYPICAL PROCESS INSTALLATION DIAGRAM

Many process configurations are possible, the example below illustrates the Cophase™ CFU post hydrocyclones.



By combining a Cophase™ CFU with our STREAMLINER™ and SandLiner range of hydrocyclones, common problems associated with interfacing plant from different suppliers are eliminated



Cophase™ CFU Benefits

- › Highly tolerant of typical FPSO motion
- › Self regulating oil skimmer eliminates gas and reduces water in the reject stream
- › Skimmed flow minimised to <1% of total flow
- › One minute retention time reduces vessel size and weight
- › No motor or pump consuming power
- › Turndown performance is consistent
- › 100% of the inlet flow passes through the LoHead™ eductors ensuring excellent gas/liquid contact and superior separation performance
- › No rotating parts to maintain
- › Designed for high flow rate
- › No need for pressurised water or gas; in most cases no gas consumption at all

