

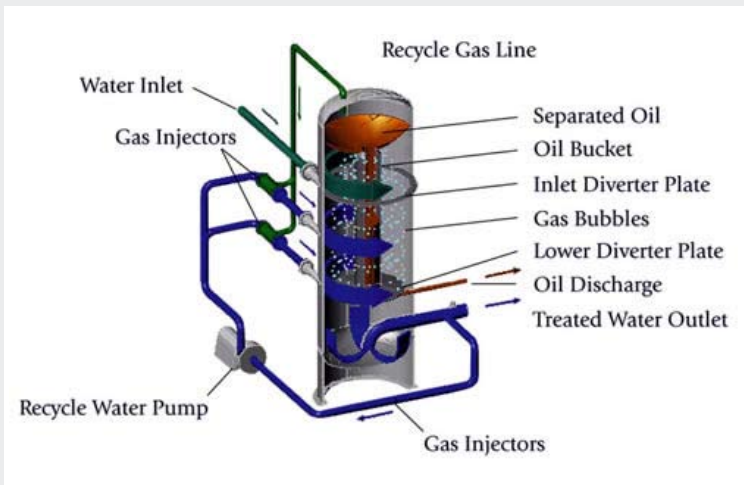


Patented Produced Water Treatment Technology: CrudeSep®

Produced Water Treatment System for High-Efficiency Removal of Oil, Gas, and Solids

CrudeSep® is a compact 4-phase separator designed to treat produced water, reducing oil content in the water to acceptable discharge levels over a wide range of flow rates and conditions. Oil in water reduction to 5 ppm (or below 10 ppm) is achievable with additional treatment.

CrudeSep is a produced water treatment vessel operating at near atmospheric pressure. Oil recovery and solids removal is achieved by induced gas flotation and a cyclonic motion system. Produced water enters the CrudeSep vessel through tangential nozzles which are geometrically



spaced to eliminate the effects of surge or slug flow. Influent fluid enters a treatment zone where continuous recycle maintains a minimal spin providing sufficient centrifugal force for immediate oil/water separation. Gas bubbles are injected with recycled water below the inlet water nozzles to maintain a continuous supply of 'floatation' gas.

Flotation effects and centrifugal forces will bring the oil droplets to the surface where they are subsequently skimmed to the oil bucket. CrudeSep can also be used upstream of CETCO's Hi-Flow and CrudeSorb technologies as a primary oil separation system.



Benefits

- Efficient oil removal
- Low chemical usage
- Better performance/discharge compliance
- Less deck space and weight
- Ease of operation
- Small vessels
- Solids tolerant
- No moving parts
- Infinite turndown

WATER TREATMENT



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EQUIPMENT SPECIFICATIONS

Model	Vessel Diameter (in)	Vessel Height (mm)	Design Capacity (bpd)	Design Capacity (m ³ /hr)
CrudeSep 18	18	1200	1,500	10
CrudeSep 24	24	1300	3,300	22
CrudeSep 30	30	1650	7,800	52
CrudeSep 36	36	1950	15,100	100
CrudeSep 40	48	2600	36,200	240
CrudeSep 50	60	3250	73,300	485
CrudeSep 60	72	3900	120,900	800



CrudeSep

Features

- Applied fluid dynamics
- Small footprint
- Short residence time
- Four phase separator
- Supplements existing process

System Performance

CrudeSep achieved up to 95% efficiency in oil in water reduction and regularly meets discharge criteria below 30 ppm without chemical usage.

Further reductions to 5 ppm have been achieved with additional treatment.

Technical Parameters

We have a small test unit capable of 2 x 1,500 BPD (2 x 10m³/hr) to handle the following process parameters:

Design Pressure: up to 16.5 barg (240 psi)

Design Temperature: 0° C-100° C

Pressure drop across unit: 0.5 barg

24" and 48" units are currently under manufacture.

Units can be manufactured for installation to client specifications.

(Pumps can be provided if required)

Utility Requirements

Clean instrument air at 7 barg (100 psig)

1 Phase-Max 10 amps to power HMI Panel (PLC) 1 x 90-240 VAC

3 Phase 1 x 415-440 VAC

