WEMCO DEPURATOR

Highly effective, mechanically induced gas flotation units for the secondary removal of oil and solids from produced water

APPLICATIONS
- Oil production for onshore and offshore (fixed and floating) applications
- Refinery and petrochemical wastewater
- Metal casting and primary metal industry wastewater

ADVANTAGES
- Reliable experience of more than 40 years and more than 5,000 units operating worldwide in a wide variety of applications
- High mixing efficiency
- Wide operating flexibility
- Versatility with the ability to be configured with two to five cells
- Lower amounts of flotation chemicals required
- Suitability for onshore, offshore, and motion-sensitive applications
- Good retrofit capability

WEMCO® DEPURATOR® units use mechanically induced gas flotation (IGF) to remove oil and solids from produced water. After the produced water enters the depurator, motor-driven rotors induce a recirculating flow of air or blanket gas into the mixture. This disperses small bubbles throughout the tank volume, and oil droplets and solids are carried to the surface in a rising gas froth, where they are recovered by skimming. Though the original IGF design is still the standard for many applications, the new pressurized version — available in two- to five-cell designs — provides a distinct advantage for the oil and gas industry.

Operating principle and key features
All DEPURATOR units use the froth flotation process to remove oil and solids from produced water. The key component is the mechanical aeration assembly that uses motor-driven rotors to constantly disperse gas bubbles into the produced water. The oil, solids, or both adhere to the bubbles and then rise with them to the surface of the cell, forming a froth. Because the contaminated water and the floating froth are constantly being subjected to reintroduced gas, it is impossible for the floating materials to settle into the now-cleaner water below.

Depending upon the type of depurator, the froth is removed either by mechanical or hydraulic skimmers. The water then moves into the next cell, where the process is repeated. In the final stage, the now-cleaned water goes through a degassing discharge chamber and exits the unit.

The DEPURATOR unit hydraulic skimming process uses motor-driven rotors to continuously disperse gas bubbles into produced waters, which eliminates the settling of floating materials into the cleaner water.
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Performance
The overall removal efficiency of the motion application two-cell design is 94% with a 2.5-min residence time per cell. The four-cell unit has approximately a 95% removal efficiency with a 1-min residence time per cell. The dual-cell configuration is specifically suited for offshore applications, where deck motion influences the liquid surface in the cells. This unit will operate satisfactorily under both general motion and pitch-and-roll conditions.

Product range
- Individual units for flow rates of 270 to 28,160 m³/d [1,700 to 177,000 bbl/d]
- Operating pressure from atmospheric to 1.05-kg/cm² [15-psi] gauge pressure
- Separation efficiency up to 98% or more

Options and types
- IGF original tank design
- Cylindrical design
  - Dual-cell design for motion sensitive applications
  - Two- to five-cell designs for fixed applications

Aftermarket support
Schlumberger provides site support using a dedicated team of experienced service and project representatives. With strategically located hubs across the globe, this network provides turnkey expertise and support for customers for the duration of a project—from commissioning to operation. From replacement parts and spares, from field service to equipment repair, Schlumberger works to provide the highest-quality support to ensure our customers’ satisfaction.

The efficient four-cell DEPURATOR unit reduces chemical requirement compared with conventional designs, decreasing opex.

The DEPURATOR unit features a sled design that eases onshore transportation and installation in difficult-to-reach locations, lowering capex.

Flotation cells are used in series to achieve up to 95% removal efficiency.

Oversized tapered roller bearings
Bearing housing
Dual seals
One-piece oversized shaft
Heavy-gauge rotor

Dual-cell configurations are designed to suit offshore applications, where deck motion influences the cells' liquid surface.

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