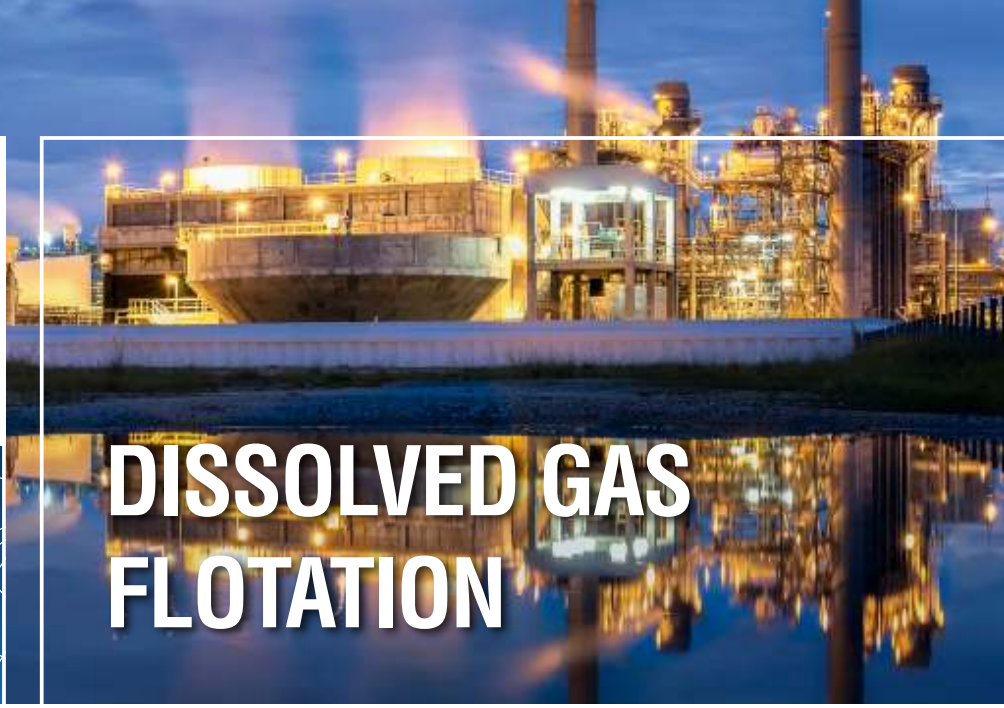
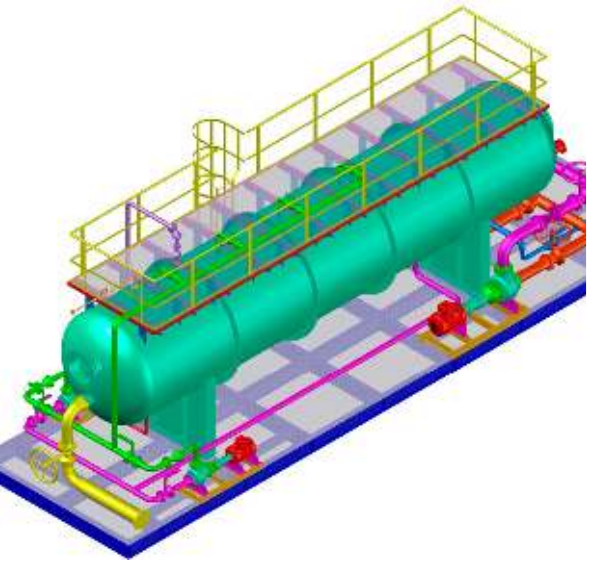
Peerless
A CECO Environmental Brand

skimovex



# DISSOLVED GAS FLOTATION



Typical General Arrangement for DGF-PQC model [pressurised vessel design with four flotation cells].

Typical General Arrangement for DGF-TFS model [covered atmospheric tank] in a single skid along with chemical pre-treatment unit and DGF pumps.

## PRODUCT APPLICATIONS

+ Produced water separation
+ Produced water injection
+ Refineries
+ Ship bilge and ballast water

## PROCESS DESCRIPTION

Peerless Dissolved Gas Flotation units utilise a recirculation pump system to introduce micro-bubbles, enhancing the separation surface area improving the oil and solid separation performance.

The Peerless DGF has a sophisticated pumping mechanism to generate micro-bubbles. These pumps utilize dual sided impellers to draw in vapour and precisely mix it with the liquid. The vapour/liquid mixture is sheared and compressed in the pump to enhance creation of micro-bubbles before this gas-enriched mixture is de-pressurized and discharged to the flotation chamber. The dense bubble formation lifts oils and solids to the liquid surface where they are ultimately skimmed off & discharged.

This configuration eliminates the need for a separate dissolution vessel as found on many traditional dissolved air flotation systems. Further simplification is realised as complicated back pressure and level control setups are no longer required.

## PRINCIPLE OF OPERATION

In the Dissolved Gas flotation (DGF) process, the micro-size gas bubbles are generated by saturating a pressurized partial stream of treated water with gas and subsequently releasing this stream to atmospheric pressure.

This is contrary to the traditional process of Induced Gas Flotation, whereby gas is drawn straight from the blanketing gas cap and is introduced into the raw water solely by mechanical means such as impellers, jet nozzles or venturi devices.

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The Dissolved Gas Flotation process produces much finer bubbles than the traditional induced air flotation allowing for much higher separation efficiencies.

Oil is typically present in the form of a finely dispersed emulsion which creates a significant separation challenge. Employing a properly designed DGF system, along with chemical treatment, brings an effective systematic approach. Peerless applies more than 40 years of experience to its designs for treating oily water to make sure the proper DGF system is offered for each treatment challenge.

## DESIGN AND CONFIGURATION OPTIONS

Depending on the discharge requirements and pressure profile, Peerless can supply the dissolved gas flotation units with the following design options:

+ DGF-TFS model – atmospheric rectangular covered tank design equipped with non-metallic surface scraper suitable for vast range of effluent characteristics
+ DGF-PQC model – ASME pressure vessel with quadra-cell arrangement (four flotation cells) with side launder for the oily skim

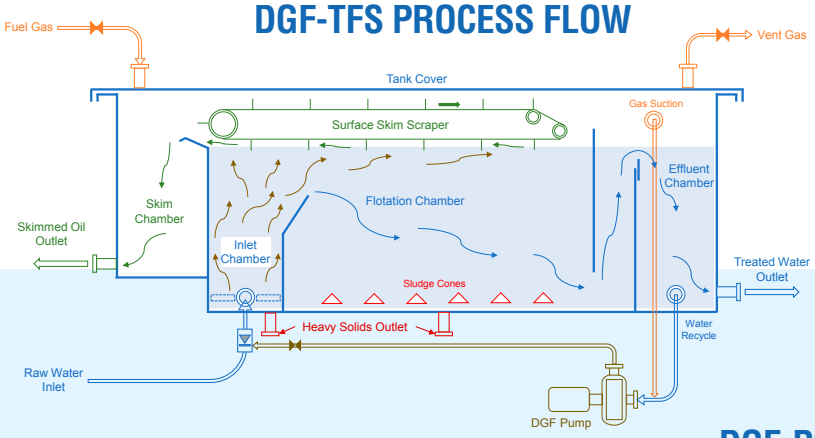
## PRODUCT BENEFITS

+ Enhanced separation over traditional flotation systems down to 10 ppm concentration of free oil in water
+ High contaminant removal efficiency due to smaller bubble size of denser bubble population
+ Easy maintenance and minimum operation cost with the removal of the conventional pressurized dissolution vesse
+ Small footprint with compact structure
+ Reduced fuel gas consumption
+ Reduced pre-treatment chemical consumption (i.e. coagulant and flocculant)

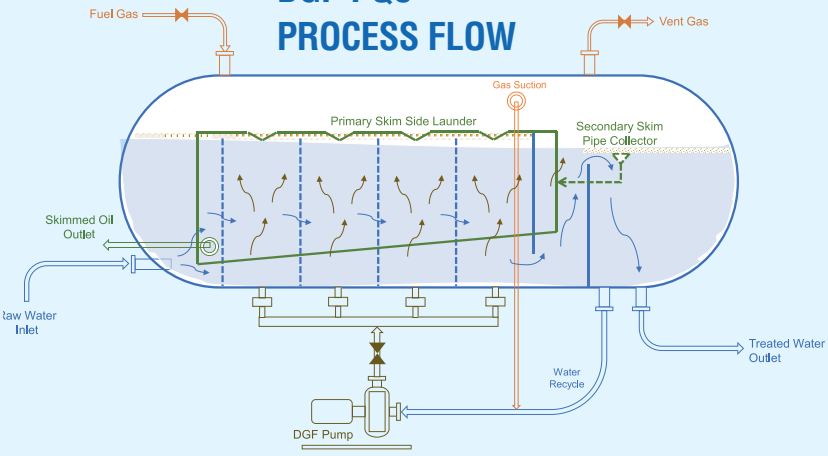
Skid assembly for DGF pumps with free-gas vent vessel for large DGF units

Peerless DGF-TFS

## DGF-TFS PROCESS FLOW




## DGF-PQC PROCESS FLOW




**Visit our website or contact one of our local technical sales staff to see the full range of Peerless oil and gas processing technologies and how they can can be combined to meet your complete processing needs.**

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