

## Dissolved Air Flotation

### Product Application

- Wastewater Treatment
- Desalination
- Process Water Production
- Drinking Water Intake
- Offshore Produced Water
- Onshore Produced Water
- Pulp and Paper Plant

### Process Description

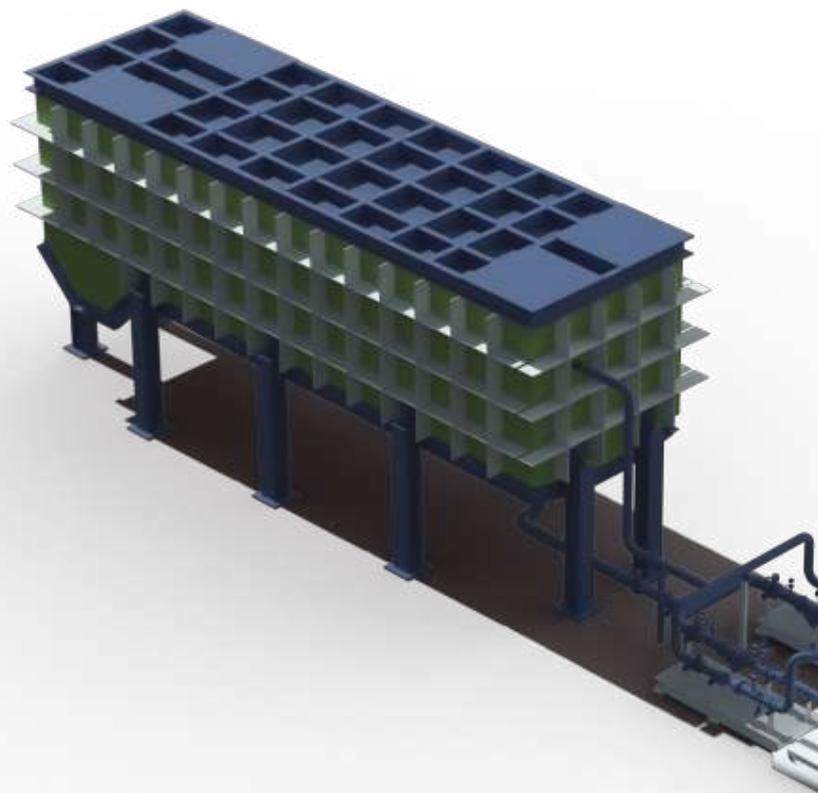
The Peerless Dissolved Air Flotation (DAF) typically uses a rectangular flotation tank where the flocculated water is mixed with small air bubbles. These air bubbles attach themselves to the flocs, thereby reducing the density of the impurities. The flocs then float rapidly to the free liquid surface in the flotation basin, together with the entrained air bubbles, to form a flotation froth-layer that is removed on a continuous basis by a surface flights-and-chains scraper.

The air bubbles are generated by dissolving air into a partial stream of the treated water. For this purpose part of the DAF unit effluent water (depending upon the application, the amount of re-circulated water typically varies between 10 and 30%) is pumped into a pressurisation vessel. As the water flows through this vessel, the air supplied by a compressor will be dissolved into the recycled water. From the pressurisation vessel, the water flows towards the inlet compartment of the flotation tank. Just prior to entering the raw water inlet pipe, the pressure is released to atmospheric conditions. At that moment the air, until then in solution in the water, will come out of solution and forms very fine air bubbles (in the range of 40-60 micron). These then attach themselves to the flocs, which rise to the water surface.

### Principle of Operation

In the Dissolved Air flotation (DAF) process, the fine air bubbles are generated by saturating a pressurised partial stream of treated water with air (or gas) and subsequently releasing this stream to atmospheric pressure.

This is contrary to the process known as Induced Air Flotation, whereby air is drawn straight from the environment above the atmospheric liquid level and is introduced into the raw water solely by mechanical means such as impellers, air jet nozzles or venturi devices. The induced air flotation process generates much larger air bubbles (in range of 100 to 400 microns) than the DAF process and more suitable for applications with non-emulsified oil.



However when, which is often the case, the oil is present in the water in the form of a very finely dispersed emulsion, it is the Dissolved Air Flotation Process, together with adequate chemical conditioning, that will provide the solution to the problem. During more than 40 years of experience in the treatment of oily water, Peerless has developed a tremendous knowledge in designing, engineering and supplying the right DAF unit for each individual treatment problem.

**Design And Configuration Options**

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

- Atmospheric Tank or Pressurized Vessel
- Integrated coalescing plate pack, for high inlet oil concentrations
- Stand-alone unit or fully-skidded unit
- Using microbubble-generating multi-phase
- Using pump, compressor, and saturation vessel configuration
- Using microbubble diffusing membranes

**Product Benefits:**

- High contaminant removal
- Cost effective alternative to conventional sedimentation clarification processes
- Capable of treating a wide range of suspended solids in water

