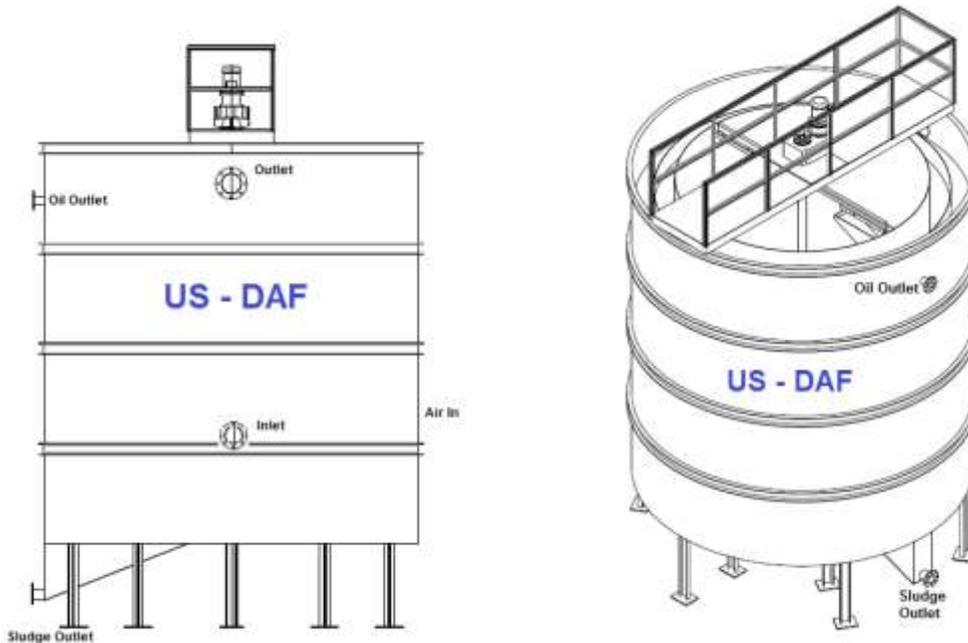


Description of the design and operation of US-DAF System

Dissolved air flotation (DAF) is a water/wastewater treatment process that clarifies water by the removal of suspended matter such as oil or solids.

The removal is achieved by dissolving air in the water or wastewater under pressure and then releasing the air at atmospheric pressure in a flotation tank or basin. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it may then be removed by a skimming device.



Dissolved air flotation is very widely used in treating the industrial wastewater effluents from oil refineries, petrochemical and chemical plants, natural gas processing plants, paper mills, general water treatment and similar industrial facilities. A very similar process known as induced gas flotation is also used for wastewater treatment. Froth flotation is commonly used in the processing of mineral ores.

In the oil industry, dissolved gas flotation (DGF) units generally do not use air as the flotation medium due to the explosion risk. Nitrogen gas is used instead to create the bubbles. All the system is the same but air used in tank can be nitrogen.

Process Description

The feed water to the DAF float tank is often (but not always) dosed with a coagulant (such as ferric chloride or aluminum sulfate) to flocculate the suspended matter.

A portion of the clarified effluent water leaving the DAF tank is pumped into a small pressure vessel (called the air drum) into which compressed air is also introduced. This results in saturating the pressurized effluent water with air. The air-saturated water stream is recycled to the front of the float tank and flows through a pressure reduction valve just as it enters the front of the float tank, which results in the air being released in the form of tiny bubbles. The bubbles adhere to the suspended matter, causing the suspended matter to float to the surface and form a froth layer which is then removed by a skimmer. The froth-free water exits the float tank as the clarified effluent from the DAF unit.

DAF systems can be categorized as circular (more efficient) and rectangular (more residence time). The former type requires just 3 minutes. The rectangular type requires 20 to 30 minutes. One of the biggest advantages of the circular type is its spiral scoop.

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