



DAF

DISSOLVED AIR FLOTATION



A process that provides high quality, efficient **clarification for suspended matter**

DAF

DISSOLVED AIR FLOTATION

Dissolved Air Flotation (DAF) is a clarification process used for the separation of solids, fats, oils, etc. DAF systems allow a wide range of suspended substances, or colloids, to be removed from water, and can also be used to thicken sludge.

Application

DAF systems can be applied as pre-treatment, to meet requirements that are not too stringent (such as discharge into public sewer) or upstream of biological plants.

DAFs are also used as systems for the separation of chemical, physical or biological sludge, since they occupy about 5 times less space than a static settler with the same flow rate.

Furthermore, they can be used to thicken already separated sludge (chemical, physical or biological), and generally allow for an increase in the concentration of a sludge from 1% to 8-10%.

DAF is a proven and effective physical/chemical technology commonly used for many industrial and municipal applications, including:

- Product recovery and reuse
- Pretreatment to meet sewer discharge limits
- Pretreatment to reduce loading on downstream biological systems
- Polishing of biological treatment effluent
- Silt and grease removal from industrial water

Key Features



Total Suspended Solids (TSS)
reduction of up to 97%



Chemical Oxygen Demand (COD)
removal of up to 85%



Low Operation and Maintenance (O&M) costs



Standard and customized units
to meet a variety of application and flow ranges



Designed for ease of installation and use



Materials suitable for high-salinity water



Process

There are two preparatory processes for flotation: coagulation and flocculation of substances such as suspended solids, oil, fats, proteins, etc.

Coagulation is accomplished by adding chemicals such as iron chloride or aluminum polychloride to the wastewater; this addition causes the destabilization of the colloids and their union in larger particles.

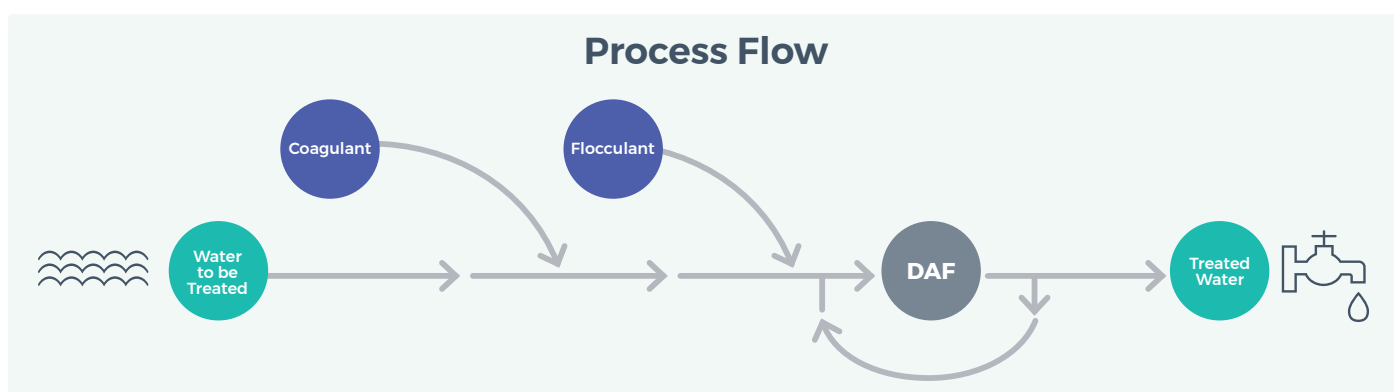
Flocculation is carried out by means of other chemical products (generally polyelectrolytes), and coagulates the particles into larger and more easily removable "flakes".

The actual flotation is a process used to separate solid particles from liquids. The separation is achieved by introducing a gas (usually air) dispersed in fine bubbles into the liquid. These bubbles adhere to the particles and drag them to the surface of the liquid itself.

Flotation is effective both for particles that have a density greater than that of water, and, more so, for particles that have a lower density.

Given that the solubility of the air in the water increases with increasing pressure, the following system is used to generate fine bubbles: a part of the waste is saturated with air at a pressure of 5 ÷ 6 bar. The air-saturated waste stream is then conveyed into the flotation tank, which is at atmospheric pressure. The pressure drop causes the previously solubilized air to be released in the whole mass of liquid in the form of minute bubbles, forming a floating bed of sludge.

A scraping assembly skims the sludge off the surface of the water and into a sump, from where it is pumped to the subsequent treatments, while the treated water is ready for discharge or for further purification processes.



Municipalities

- Water Treatment Plants
- Wastewater Treatment Plants
- Biological Treatment Plants
- Algae Removal
- Fat and Oil Removal Plants

Industrial

- Meat/Poultry/Fish Processing
- Dairy Industries
- Food Processing
- Petroleum/Oil Refineries
- Pulp and Paper

Solution Architecture

DAF unit: made of AISI 304 stainless steel and equipped with a flocculate accumulation basin.

Flocculate scraper: composed of 1 driveshaft, with two gears placed at its extremities; 1 secondary shaft, with two gears placed at its extremities; 2 transmission chains (which transmit the motion from the driveshaft to the secondary

shaft); and 4 scraper blades, made of rubber, fixed to the two chains.

Hypersaturation system: consisting of an air saturator and a subsequent centrifugal pump, or a multi-rotor centrifugal pump with injection of air directly into the latter body.

Models

Wastewater		
Models	Dimensions (WxL in m)	Capacity (m ³ /h)
DAF W07-80	2.2 X 4.8	0 - 30
DAF W07-150	2.2 X 4.8	30 - 130
DAF W10-80	3.2 X 4.8	0 - 30
DAF W10-150	3.2 X 4.8	30 - 130
DAF W13-80	3.2 X 5.7	0 - 30
DAF W13-150	3.2 X 5.7	30 - 130
DAF W17-80	4.2 X 5.7	0 - 30
DAF W17-150	4.2 X 5.7	30 - 130

Digestate Recycle		
Models	Dimensions (WxL in m)	Capacity (m ³ /h)
DAF R07-80	2.2 X 4.8	0 - 5
DAF R10-80	3.2 X 4.8	5 - 10
DAF R13-125	3.2 X 5.7	10 - 15
DAF R17-125	4.2 X 5.7	15 - 20