

Dissolved Air Flotation:

A Reliable and Efficient Clarification Technology

H₂FLOW
DAF

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EQUIPMENT AND TECHNOLOGY

Applications

Clarification Technology

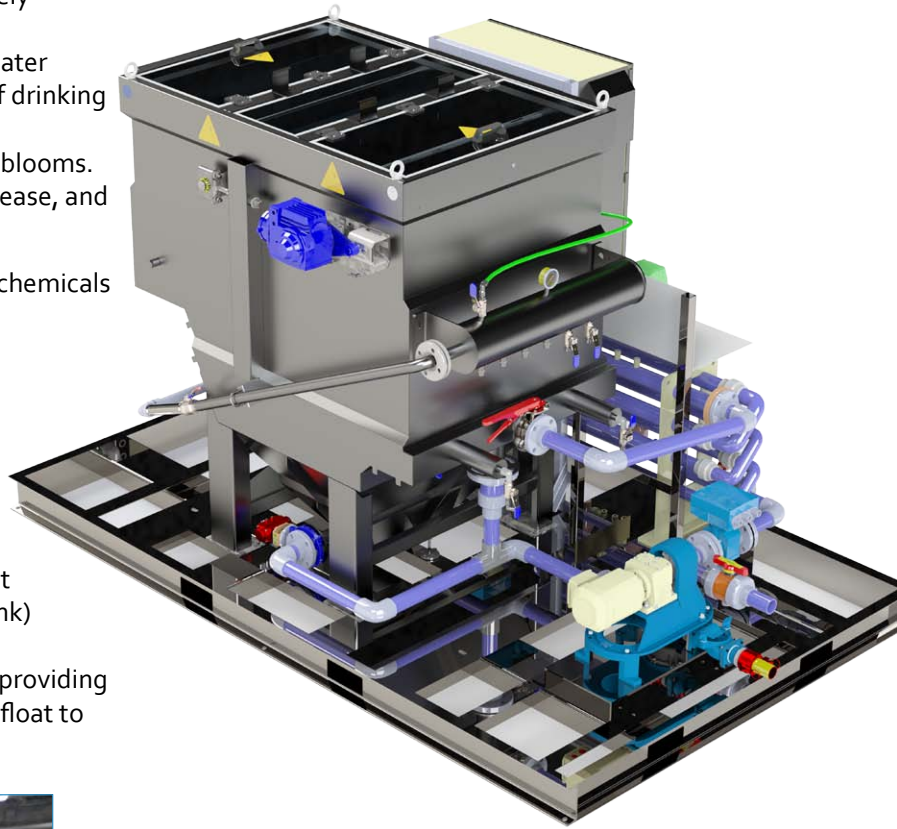
Dissolved Air Flotation (DAF) is a technology used extensively for wastewater treatment in food plants, oil & gas, mining, pulp & paper, many major industries and municipal wastewater plants. It also has a very good fit for its use in clarification of drinking water treatment, especially for difficult to flocculate, low temperature, coloured waters, and waters subject to algae blooms. DAF works extremely well for waters that have fats, oils, grease, and very fine particles.

DAF can be used by itself as a clarifier, but when used with chemicals such as a coagulant and a flocculent, it becomes a physical/chemical process. A properly functioning DAF will remove:

- 90-95% of Total Suspended Solids (TSS)
- 90-95% of Fats, Oils & Grease (FOG)
- 90-95% of insoluble Biochemical Oxygen Demand (BOD)

Let's first understand how a DAF actually works. A DAF unit would just be a gravity separator (essentially a sink/float tank) if it were not for the air being introduced.

In the DAF, micro sized air bubbles are added to the water, providing buoyancy to the impurities to be separated. The impurities float to the surface and form a sludge layer, ready for separation.

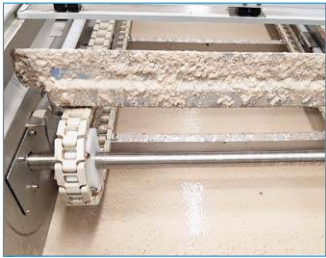


H2FLOW DAF UNIT INSTALLED AT AN INDUSTRIAL FACILITY

The type of chemicals and the dosing rates are an important factor in the design of the DAF treatment system, creating floc particles which the micro bubbles can easily attach to and float to the surface.

Air is introduced to the DAF unit via a recycle pump system. A fraction of the treated water from the clean water side leaving the unit is recirculated to the inlet of the DAF unit, and in this loop, air is introduced to create the micro size air bubbles in the 30-50 micron range.

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H2FLOW DAFs use multistage centrifugal pumps that are able to tolerate a certain amount of air to flow right through their impellers and chambers. Air is usually injected right at the pump, and the pump does most of the air / water mixing. Larger DAF units utilize single stage impeller pumps. The recirculation pump pressurises the water and saturates the water with a controlled amount of air. The saturated recirculation water is collected in a recirculation tank and distributed at points underneath the DAF.

The heavy solids which will not float, will sink to the bottom of the flotation unit and will be discharged with outlet valves. Larger DAF models are equipped with bottom augers.

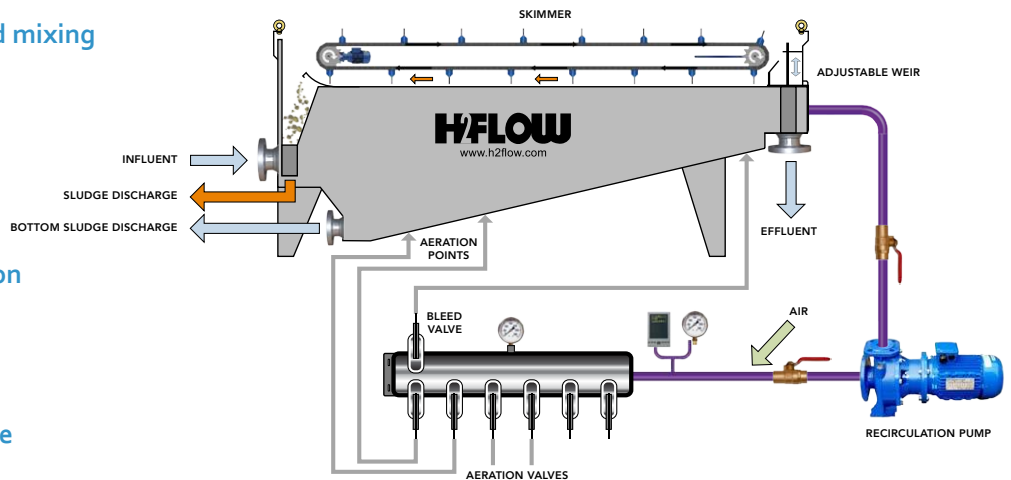
At the surface of the flotation unit, a sludge thickener is installed to dewater the sludge. The skimmer skims off the floating sludge into a sludge compartment. The speed of the skimmer system can be varied to influence the dry solids content of the sludge. The % of dry solids can also be influenced by the water level in the unit, via adjustable weirs.

The floating sludge removed by the skimmer unit is between 4-12 % dry solids.

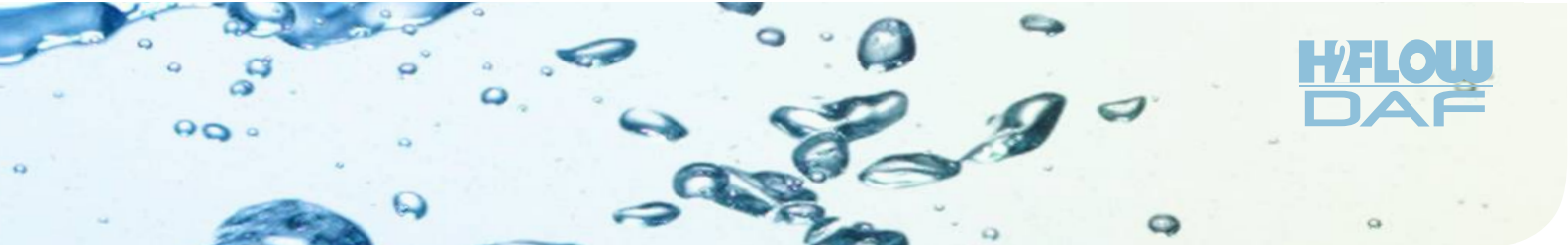
DAF treatment technology is easily piloted on site. Piloting is highly recommended for challenging applications to determine the treatability of the water. Results from pilot tests can be utilized to effectively design a full-scale system.

A complete DAF system should include:

- influent flow equalization tank and mixing
- screening to protect pumps
- feed pumps
- chemical feed (pH adjustment, coagulation, flocculation)
- polymer make down system
- mix tanks or in-line pipe flocculation
- sludge pumping
- sludge storage
- pneumatic control panel
- central PLC control panel to run the complete system
- additional treatment steps as needed (sludge dewatering, biological, etc.)
- compressed air supply



H2FLOW can provide a complete treatment system with all the above components, supplied by a single, experienced and reliable source. H2FLOW has been supplying DAF systems for over 20 years.



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APPLICATIONS

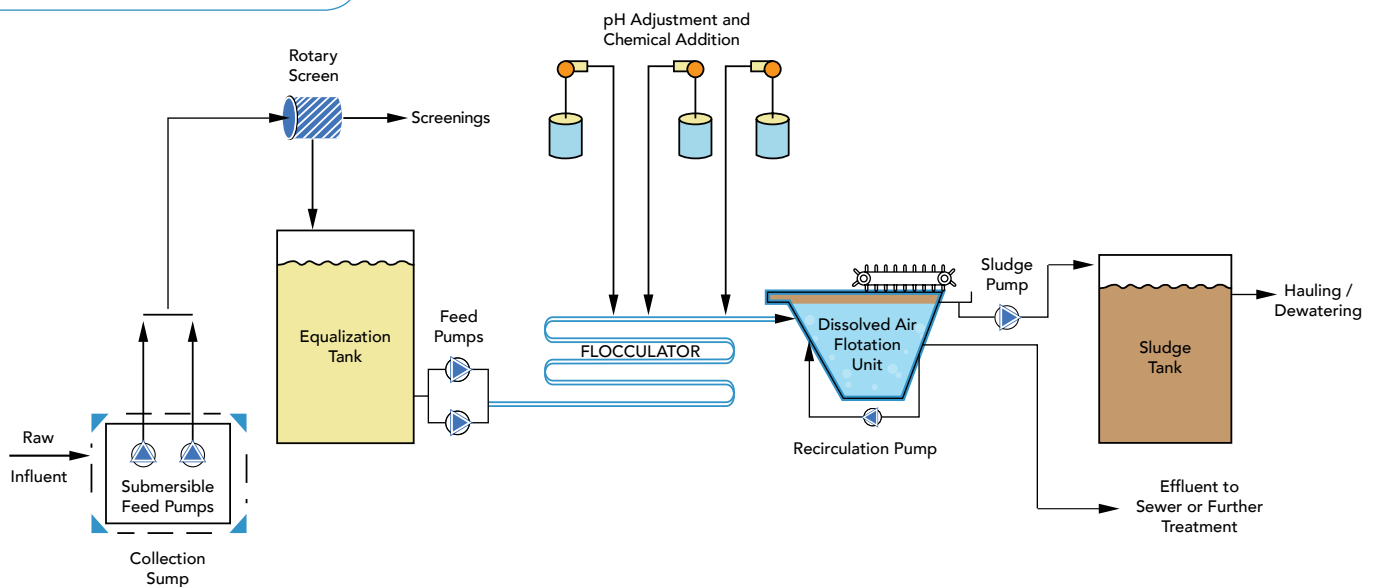
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ENCLOSED FOR ODOUR CONTROL



ROTARY SCREEN



TYPICAL DAF TREATMENT FLOW DIAGRAM, DESIGNED AND SUPPLIED BY H2FLOW



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