RED HORN ENGINEERING PTE. LTD.

INDUSTRIAL WASTEWATER TREATMENT

Dissolved Air Flotation

Efficient solid-liquid separation for industrial wastewater treatment

DAF SYSTEM OVERVIEW



DAF separation process

Fine air bubbles lift contaminants to the surface for removal.

01 **Chemical conditioning**

Coagulants and flocculants can help suspended particles form larger flocs.

02 **Air dissolution**

Pressurised recycle water releases fine bubbles when pressure drops.

03 **Flotation**

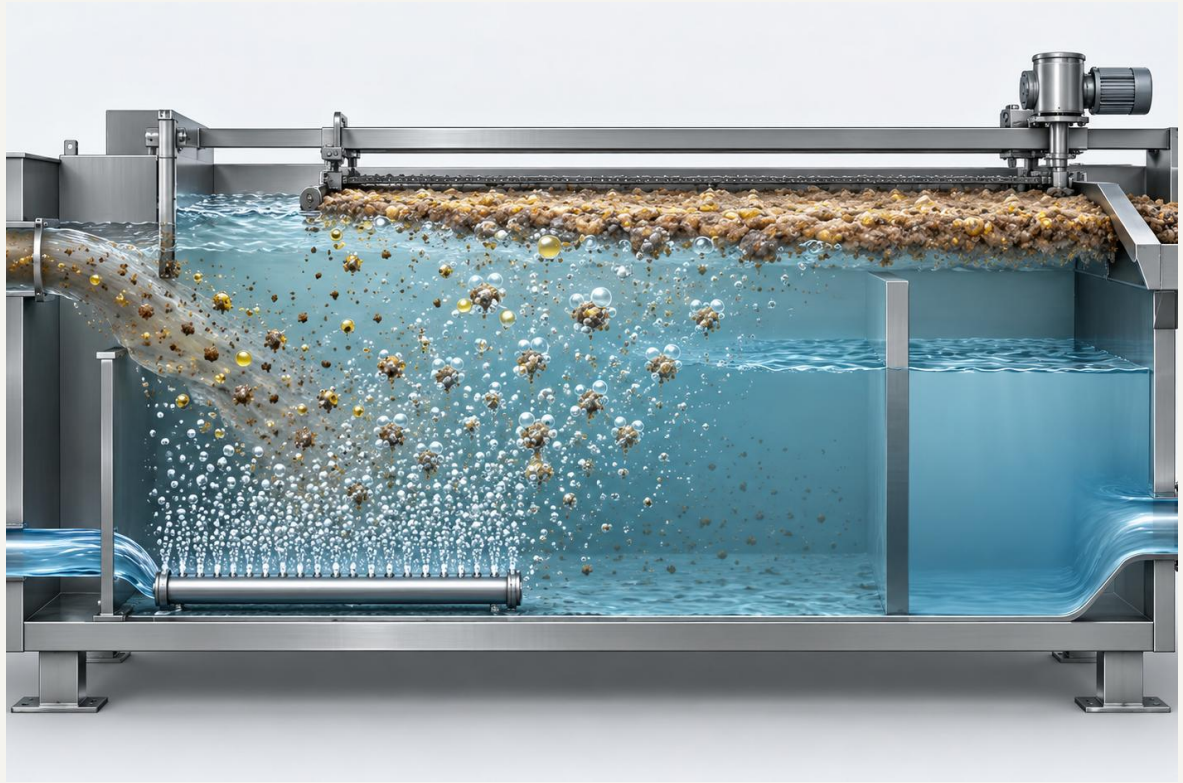
Bubbles attach to particles, oil droplets and flocs, carrying them upward.

04 **Surface skimming**

A mechanical skimmer removes the floating sludge layer.

05 **Treated water outlet**

Water continues to further treatment, reuse or disposal as required.



ILLUSTRATIVE DAF MECHANISM

What DAF can support

A flotation stage can target several contaminants while helping prepare water for downstream treatment.

01	**Suspended solids**	Promotes separation of suspended particles and chemically formed flocs.
02	**Oil and grease**	Suitable for wastewater with free or dispersed oil and grease that flotation can capture.
03	**Downstream loading**	Solids, oil and grease removal can reduce loading on filtration or membrane stages.
04	**Space and configuration**	System layout can be selected around flow, wastewater characteristics and available space.

Actual separation depends on wastewater properties, chemical conditioning and system design.

Chemical and control integration

DAF performance depends on matching treatment chemistry and equipment to the wastewater.

Chemical conditioning

Chemical choice and dosage depend on wastewater characteristics and should be optimised through appropriate testing.

Coagulants	Destabilise suspended particles and support aggregation.
Flocculants	Encourage smaller particles to form larger flocs.
pH adjustment	Establish conditions for the required treatment reactions.

Automation options

Manual	Operator-controlled treatment and equipment.
Automatic	Automated dosing and selected equipment functions.
Fully automatic	Integrated controls coordinate process and selected monitoring.

SYSTEMS MAY INCLUDE

Chemical dosing and controls, pumps, skimming, sludge removal, alarms, PLC control and remote monitoring for suitable installations.

Applications and design factors

DAF can suit industrial streams where flotation can separate the target contaminants.

POTENTIAL APPLICATIONS

Construction and infrastructure
Industrial process wastewater
Wastewater with suspended solids or fine particles
Wastewater containing oil and grease
Pretreatment for filtration or membranes
Industrial water recycling and reuse

KEY DESIGN INPUTS

Flow rate	Treatment capacity and operating range
Solids	Concentration and particle characteristics
Oil and grease	Presence and form of floatable contaminants
Water chemistry	pH and response to chemical conditioning
Treatment objective	Required effluent quality and next process stage

Final configuration depends on the wastewater stream and project requirements.

DAF in an integrated treatment train

A typical arrangement places flotation between chemical conditioning and downstream polishing.



Wastewater collection

Chemical dosing

Coagulation and flocculation

DAF separation

Filtration or membranes

Discharge or reuse

Not every application needs every stage. The treatment sequence depends on wastewater characteristics and treatment objectives.

DOWNSTREAM UF

When properly designed and operated, DAF may reduce suspended-solids and oil loading to support more stable membrane operation.