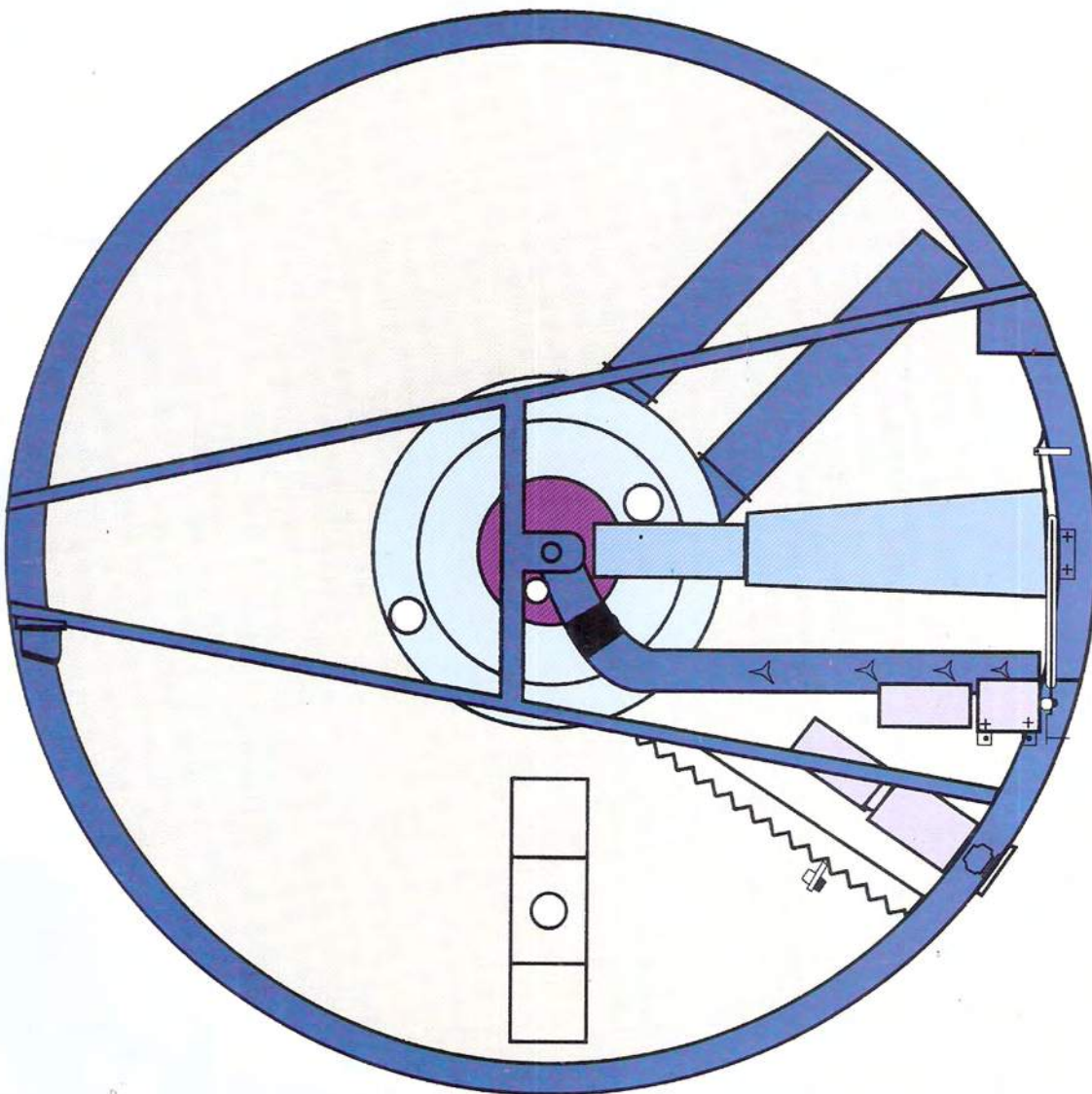


DAFTECH

F L O A T C E L L



**A COST EFFECTIVE DISSOLVED AIR FLOTATION CLARIFIER
BACKED BY MORE THAN TWO DECADES OF EXPERIENCE**

DAFTECH ENGINEERS PVT. LTD.

Specialists in wastewater treatment by flotation

DAFTECH is a company promoted by people with more than two decades of experience in Dissolved Air Flotation. DAFTECH designs and manufactures a complete line of dissolved air flotation clarifiers.

Each industry generates a characteristic wastewater and each has unique treatment problems. Considerable study and supporting information must be analyzed before deriving the best solution to any wastewater treatment problem. To identify and eliminate would-be difficulties, a comprehensive wastewater study is often warranted. This is an up-front cost that must be recognized in order to manage all potential scenarios and to minimize future costs.

Dissolved Air Flotation (DAF) or micro flotation process is an effective, economical method of wastewater treatment. A DAF clarification system comprises of three basic components : 1) process equipment, 2) chemical conditioning, 3) dissolved air process. Each component is crucial to the efficient operation of wastewater clarification.

PROCESS EQUIPMENT

The DAF clarifier is a solid/liquid separation device that removes suspended particles from water. To ensure that the clarifier receives wastewater with relatively consistent flow and chemical characteristics, it is essential that upstream treatment through screens and equalization tanks be assessed. Extremes in water temperature and pH can impact coagulant/flocculant performance and must be considered. Prescreening to remove large solids is recommended. An equalization tank preferably equipped with a mixing system is suggested. After the tank, an oil-water separator may be needed. Coagulation and flocculation tank may be required to ensure proper chemical conditioning of the influent. Optimum DAF performance and chemical cost savings can be achieved when the equipment is positioned and piped in properly.

CHEMICAL CONDITIONING

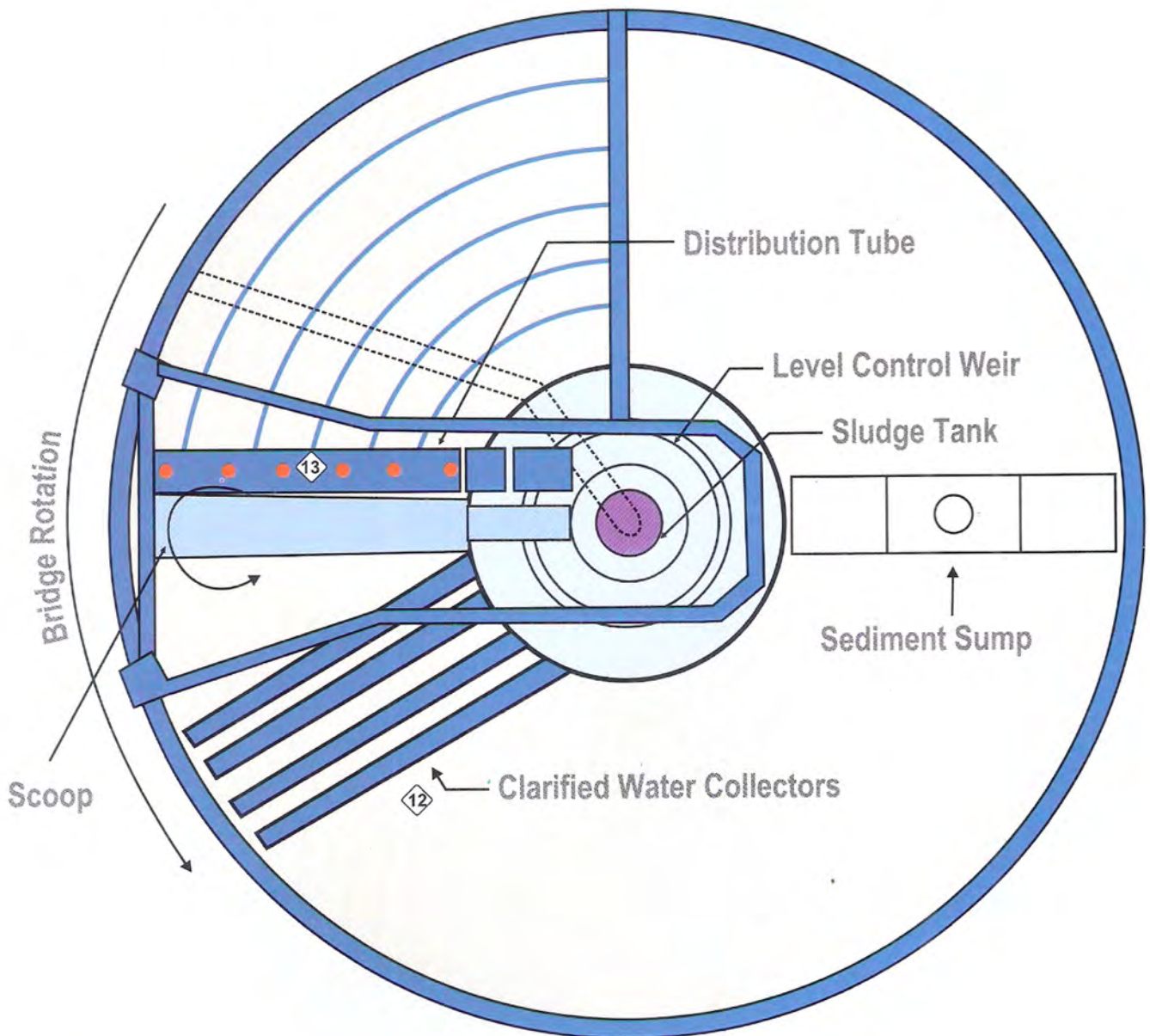
Chemical conditioning promotes separation of suspended, colloidal, and in some cases, dissolved solids from the wastewater. Jar bench tests are necessary to identify the coagulant/flocculant chemical programme that will most effectively condition the wastewater prior to DAF treatment. Several approaches are available for conditioning wastewater to enhance the removal of solids. These are dependent on the characteristics of the wastewater and the requirements for the treated effluent. Proper mixing time and a good understanding of how and where to locate the chemical injection points are essential to the performance and low operation costs of the DAF cell.

DISSOLVED AIR PROCESS

Following preliminary treatment and chemical conditioning the flocculated suspended solids enter the DAF clarifier. Turbulence must be minimized as dissolved air is being introduced with the flocculated influent into the tank. To attain the highest solids removal efficiency it is important to accurately control the process flow and air dissolving conditions. A key factor in maximizing the separation of finely divided suspended solids from water is the generation of microsized bubbles. This is accomplished with the aid of the DAFTECH Air Mixing Tube (AMT). In the AMT, a fraction of the clarified effluent from the DAF, referred to as recycle water, is pressurized and saturated with air at approximately 5.5 to 6.5 kg/cm². The recycle water is returned to the DAF clarifier where the pressure is released causing any air above the saturation point at the new lower pressure to escape out of solution as very fine bubbles. Bubbles attach to and change the buoyancy of the suspended solid particles causing them to float to the surface of the clarifier tank. The amount of air required is small, normally one to four percent of the water volume, and may vary depending upon the amount of solids in the liquid. The AMT produces consistently sized air bubbles that range from 30 to 60µm in diameter.

FLOATCELL

DISSOLVED AIR FLOTATION CLARIFIER



SIZE RANGE

Clarifiers are available to process raw water flows of $5 \text{ m}^3/\text{hr}$ to $2019 \text{ m}^3/\text{hr}$ utilizing a shallow circular tank approximately 65 cm deep. Tank diameter ranges from 1.2 mtrs. to 21.3 mtrs.

RANGE OF SERVICE

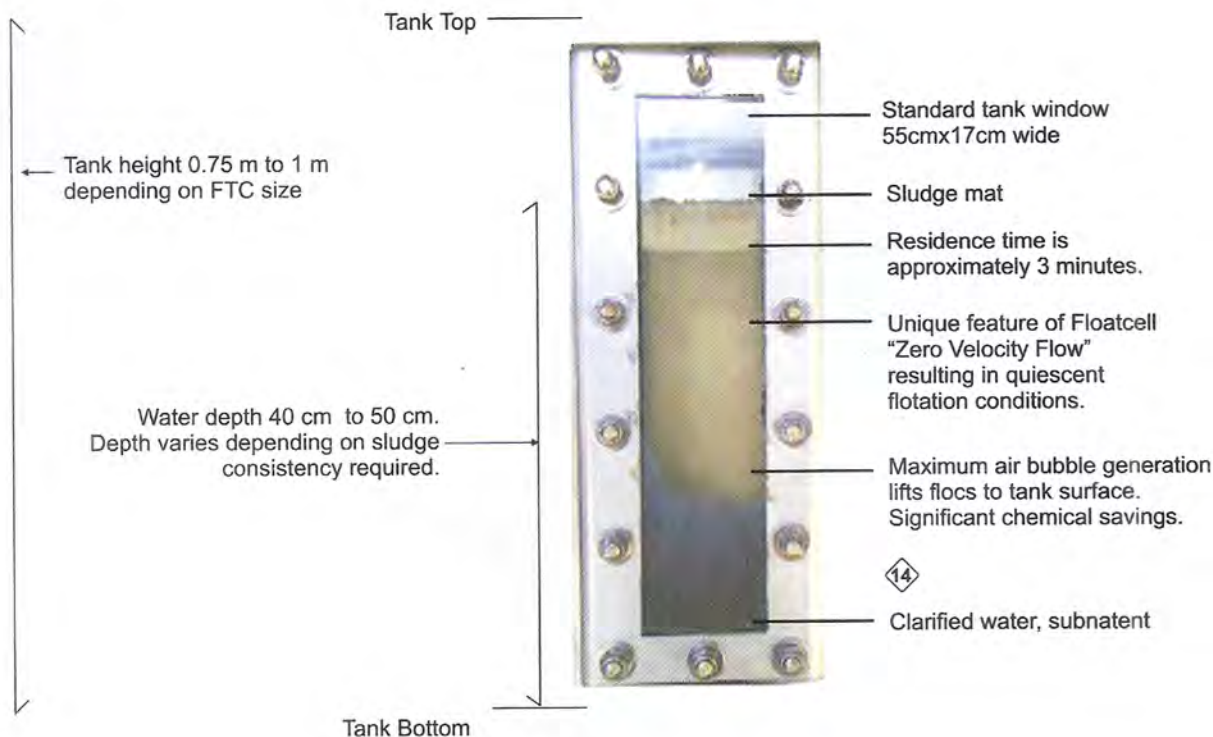
DAFTECH can conduct laboratory analysis of process waters, manufacture, and arrange for complete installation of a DAF system. Equipment supplied by DAFTECH is covered by a one-year warranty.

APPLICATIONS:

These clarifiers find application in pulp and paper mills, recycled fibre, deinking, food processing, dairy, textile industries, municipalities and others. Total suspended solids removal to below 50ppm of filterable solids and thickened sludge consistency of 2-4% is indicative of the efficient operation of these devices.

CONSTRUCTION

The standard Floatcell features an epoxy coated carbon steel round tank, tank bottom supports, side wall stiffeners, heavy duty tank rim, top bridge and catwalks. Units can be fabricated entirely of stainless steel on request. All clarifiers feature a standard sludge cone, clear water separation wall, air mixing tube (AMT), center rotary joint, sludge scoop and top bridge with attached assembly.



TYPICAL APPLICATIONS OF FLOATCELLS

Fibre Recovery in Pulp and Paper Mills	Ballast Water	Carbon Black Production
Solids Recovery	Fish Processing	Soap Industry
Municipalities	Meat Processing and Packing	Primary Clarification
Tanneries	General Food Manufacturing	Secondary Clarification
Sludge Thickening	Snack Food Production	Vegetable Oil Processing
Dairies	Rendering Plants	Laundries
Breweries	Canning Water	Water Recycling
Algae Removal	Bakeries	Car Wash Operations
Poultry Processing	Confectionery	Textile Effluent
Refineries	Potato Processing	Starch Removal
Pharmaceuticals	Slaughter Houses	Heavy Metals Removal
Membrane System Pre-treatment	Paint Shops	Jute Mill Effluents

PIPE FLOW SCHEMATIC

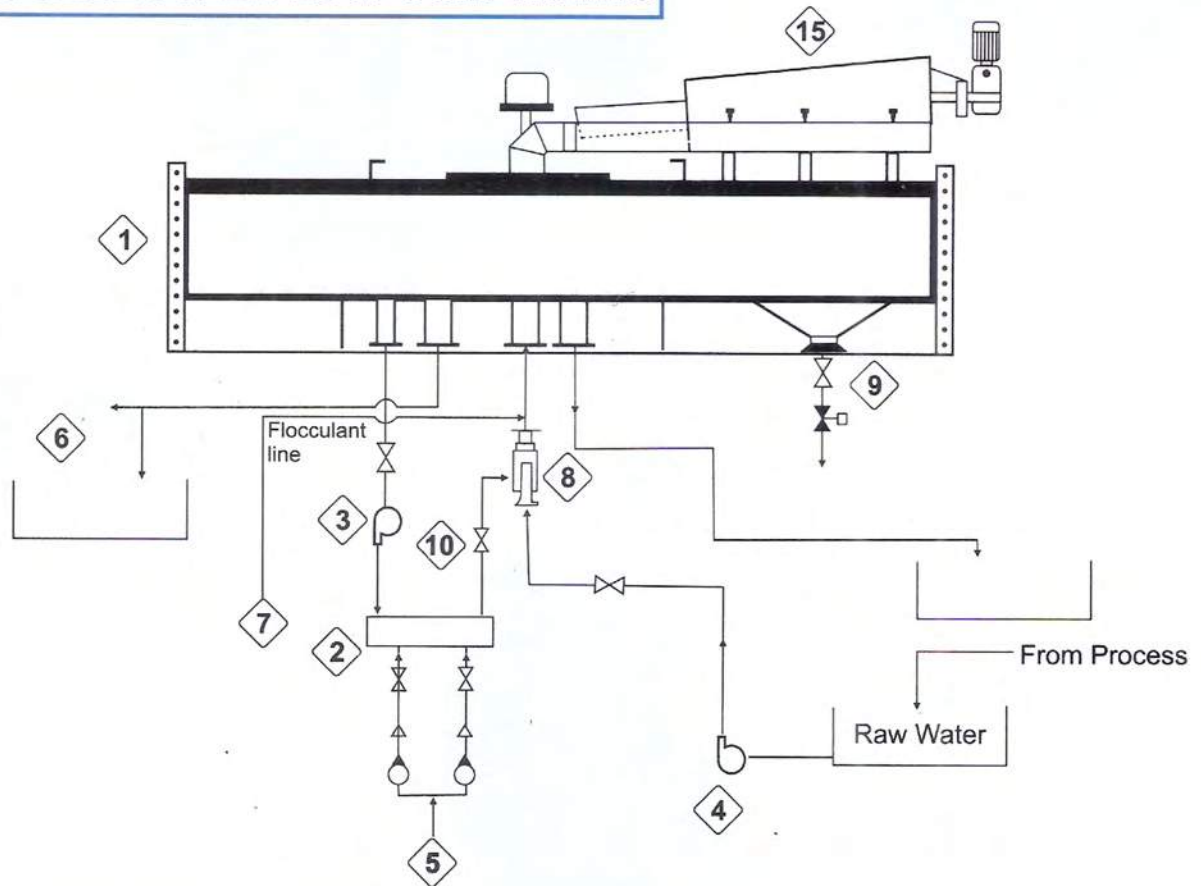
The Floatcell capitalizes on the zero velocity principle, optimizing the process in a circular steel tank. Raw influent, mixed with aerated recycle water, is introduced into the tank through a series of adjustable distribution nozzles that are positioned on a radial inlet manifold that moves with the rotating centre bridge or carriage. The rotational speed of the manifold is adjusted to equal the speed at which the influent flows from the distribution nozzles into the tank, i.e. any velocity the aerated influent mixture has upon entering the clarifier is negated by the rotation of the carriage in the opposite direction. By this means, the velocity of the water in tank is, in effect, zero. Under this static condition, the flocculated particles are carried to the surface by air bubbles and interference due to turbulence in the tank is negligible.

Factors that contribute to the efficiency and economics of the Floatcell include:

- **Rapid Rising Velocity** — reduces the process time to three minutes or less compared to other clarifiers with water retention times of 15 to 30 minutes.
- **Water Depth** — Floatcell tank water is only 40 to 50 cms. deep. Because of this, the load factor is only 730 kgs/square meter and only half the floor space is necessary compared to a rectangular dissolved air flotation clarifier.

Due to the rapid velocity and the shallow water depth, the Floatcell clarifies the same volume of water in half or less of the floor space. Furthermore, Floatcell clarifies the same quantity of water in 3 minutes compared to 15 minutes required by many conventional dissolved air flotation clarifiers.

FLOATCELL PIPE FLOW SCHEMATIC



1. FTC (Floatcell) Epoxy coated mild steel— standard.
2. Air Mixing Tube — Saturates water with air under pressure to produce microbubbles during flotation.
3. Recycle Pump — Pressurizes portion of clarified water in air mixing tube and delivers aerated water to clarifier.
4. Raw Water Pump
5. Compressed Air — For aeration of recycle flow.
6. Clarified Water
7. Chemical Dosing Station
8. Dissolved Air Transmitter — An innovative mixer that mixes air-saturated recycle water with the influent. This transmitter mixes the influent and recycled water uniformly.
9. Sedimentation Sump — Sludge Valve — Settled Solids are collected. A timer controls the automatic sludge valve for purging.
10. Expansion Valve — Pressure release valve prior to mixing of aerated water with influent.
11. Top Carriage/Bridge — Supports all the tank internal parts. Driven by a variable speed gear box and drive wheel supported on the top tank rim, it rotates around the tank. *(Please see page 3)*
12. Clarified Water Collector — Removes clarified water from the tank bottom evenly and conveys it to the centre separation wall. *(Please see page 3)*
13. Distribution Nozzles — Discharge influent at a rate equal to the rate that water is being extracted by the clarified water collection pipes. *(Please see page 3)*
14. Tank Window — Clear plexiglass window is installed vertically in the tank wall for observation of water clarity, depth of sludge mat, etc. *(Please see page 4)*
15. Scoop — Slowly rotates and scoops off the floated sludge mat.

MODEL	FLOATCELL SIZES		MAX. CAPACITY EXCLUDING RECYCLE
		Dia in mm	
FTC 5		1219	5
FTC 9		1858	9
FTC 26		2400	26
FTC 45		3200	45
FTC 68		3900	68
FTC 90		4500	90
FTC 135		5500	135
FTC 164		6100	164
FTC 198		6700	198
FTC 229		7200	229
FTC 290		8100	290
FTC 358		9000	358
FTC 443		10000	443
FTC 534		11000	534
FTC 657		12200	657
FTC 792		13400	792
FTC 968		14800	968
FTC 1247		16800	1247
FTC 1584		19900	1584
FTC 2019		21300	2019

ADVANTAGES OF FLOATCELL CLARIFIERS

Low capital and operational costs	Continuous self-cleaning
Totally integrated	Minimal maintenance
Pre-engineered	Stable operation
Space savings and low foundation costs	High quality clarified water
Simple installation	Superior performance
High chemical efficiency	Easily relocatable

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