



DELTAFLLOAT features

- High efficiency flotation unit: up to 99% suspended solids removal
- Operation with dynamic (various) inlet flow rates
- High density of floated sludge (up to 8%) depending on the applications
- Sturdy self-supporting stainless steel construction
- Drive with pinion and gear rail
- 2 years warranty of mechanical components
- High reliability, extremely low maintenance
- High efficiency Air Saturation Reactor (A.S.R.)
- Energy recovery with Turbo Dissolving System

Industry; Oil Refineries; Tanneries; Industrial Laundries; Potable water plants; Municipal and Industrial sewage treatment plants.

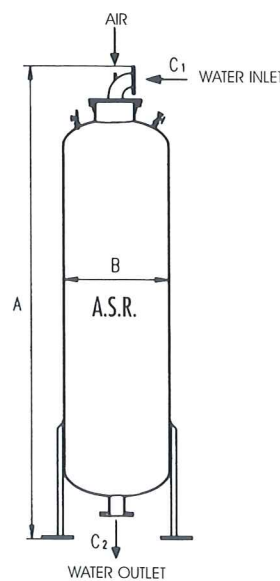
DELTAFLLOAT applications

- Paper and board machine: back water clarification, fibres recovery;
- Clarification of paper mill waters coming from fractioning and thickening filters; effluent clarification;
- Removal of stickies and dissolved contaminants;
- Sludge and foam thickening in deinking plants
- Biological plants water clarification and biological activated sludge thickening.

MOREOVER: Mining Industry; Chemical and Pharmaceutical Industry; Textile Industry; Food Processing and Canning Industry; Dairies; Abattoirs; Breweries; Wineries; Beverages

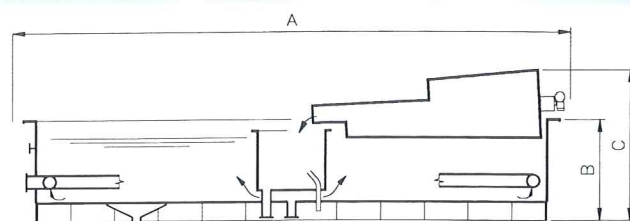
Production program and standard sizes

A.S.R. Air Saturation Reactors



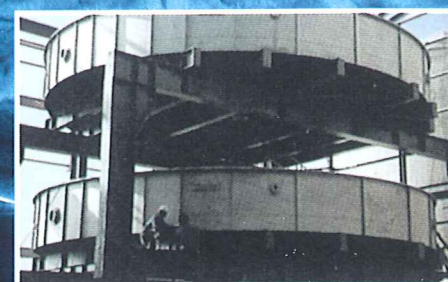
Model	A mm	B mm	C1-C2 mm	Max Capacity m ³ /h
0,08	1400	200	DN 40	10
0,25	2900	350	DN 50	30
0,5	3000	480	DN 80	60
0,75	3000	600	DN 100	90
1,5	3400	850	DN 125	180
3	3600	1200	DN 150	360
5	4400	1650	DN 250	600

Flotation units

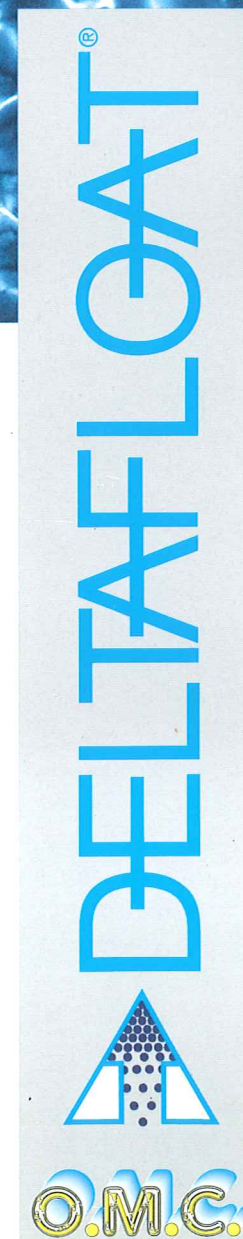


DELTAFLLOAT Model	A Overall diam. mm	B Height mm	C Overall height mm	Q max capacity m ³ /h
2,5	2300	1000	1520	20
5,5	3200	1000	1620	44
9	4100	1100	1660	72
13	4800	1100	1820	104
18	5530	1100	1930	144
25	6530	1100	2030	200
28	6900	1100	2080	224
36	7700	1100	2440	288
47	8920	1200	2630	376
56	9560	1200	2630	448
67	10550	1200	2630	536
71	10800	1200	2630	568
83	11700	1300	2700	664
100	12450	1300	2810	800
118	13600	1300	2850	944
141	14800	1400	3020	1128
163	15800	1400	3120	1304
184	16750	1400	3250	1472
212	18000	1400	3520	1696
241	19500	1400	3600	1928
289	20850	1500	3860	2312
320	21850	1500	3960	2560
360	23150	1500	4170	2880

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Dissolved Air Flotation



DELTAFLLOAT® IS A PRODUCT BY O.M.C. AQUA ENGINEERING DIVISION



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Dissolved Air Flotation

Dissolved air flotation is a proven technology used for solid/liquid separation as well as sludge thickening.

How Dissolved Air Flotation works

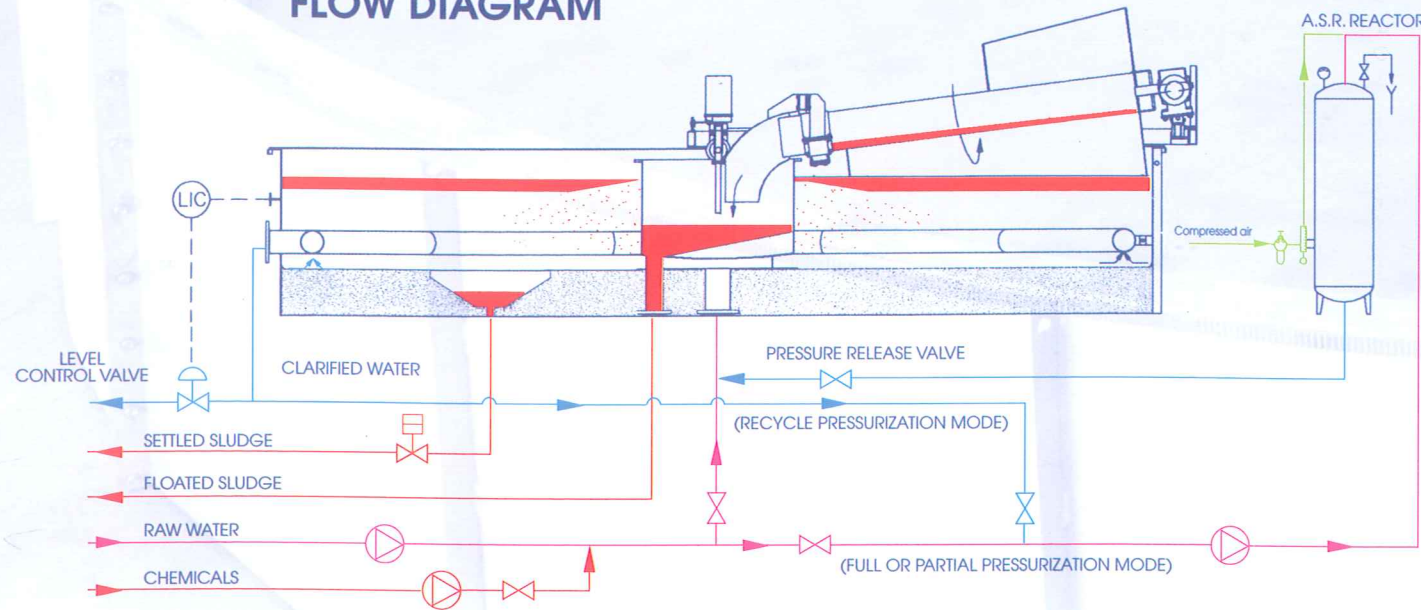
The specific weight of suspended particles in raw water is usually very close to that of the water itself. This is the reason why dissolved air floaters have been designed and manufactured. In the flotation process, to support and float up the solids (flocs, fines, fibres) which you intend to separate from the water, a lot of very fine air bubbles are necessary. Those air bubbles are generated by dissolving a fixed amount of air (or gas) in the water under a high pressure. Subsequently, when the high pressure is brought back to the atmospheric value, the big amount of air gets free in a form of micro-bubbles, thus mixing with the solids suspended in the raw water.

The buoyancy of the bubble-particle combination, causes the solids particles to rise to the surface of the tank, forming a floated sludge layer, which is continuously removed by a spiral skimmer. The clarified water flows into a ring-shaped holed pipe immersed in the flotation tank. As the air dissolved in the water is used for the generation of the micro-bubbles, this type of process is called Dissolved Air Flotation (D.A.F.).

The DELTAFLLOAT concept

A clear concept is necessary to design a successful dissolved air flotation system. The **DELTAFLLOAT** system was designed and developed with computer-aided research studies relevant the hydrodynamic behaviour of aerated streams; yet the **DELTAFLLOAT** key to success is simplicity.

FLOW DIAGRAM



DELTAFLLOAT - Process Modes

DELTAFLLOAT system is able to operate with one of the following pressurization modes, depending on the application:

Partial pressurization mode: a part of the raw water flow to the flotation unit is pressurized in the A.S.R. reactor.

Full pressurization mode: 100 % of the raw water flow to the flotation unit is pressurized in the A.S.R. reactor.

Recycle pressurization mode: a part of clarified water flow is pressurized in the A.S.R. reactor.

The ability to operate in partial, full or recycle flow mode - an unique advantage of the **DELTAFLLOAT** system - offers more flexibility and achieves better results.



Assembly of DELTAFLLOAT unit

The DELTAFLLOAT system

The DELTAFLLOAT plants are custom designed for each application thanks to the different sizes included in standard production program. The components of the system are pre-assembled and tested in the workshop to guarantee quick and safe assembly on site.

The flotation tank

The self-supporting **flotation tank** is circular, manufactured in stainless steel (types 300) and consists of several parts that join together quickly.

Upon request, it can be produced with a cell completely in concrete, if necessary with stainless steel coating, or concrete bottom with stainless steel sides.

The incoming stream of water to be treated, mixed to the previously pressurized water, distributes itself evenly from the centre toward the edges of the circular flotation chamber, following a pre-calculated dynamic that allows the optimal separation of the solids particles from the liquid in a very short processing time.

A **ring-shaped holed pipe**, immersed in the flotation tank, receives the clarified water and conveys it to an outlet main manifold.

A butterfly pneumatic control valve, mounted at the outlet of the manifold, keeps the pre-set water level in the cell according to the signal sent by the level transmitter through the electronic controller.

This control system allows to maintain the set level in the tank independently from variations of the inlet flow. The **rotating bridge**, mounted on the top of the cell, is driven by a unique pinion and rack system, which ensures uniform and reliable anti-slip operation also in case of outdoor installation of the plant.

On the rotating bridge is placed a **spiral skimmer**, driven by another motor and made-up with two differentiated scoops along its length; the design ensures an uniform discharge of the sludge.

The rotating speeds of the bridge and the skimmer are regulated by frequency inverters, placed in the **electric control panel**; that permits to control the sludge consistency, that, depending on the situation, can be varied from 2% to up to 8%.

Possible settled material is continuously removed by a special bottom scraper and conveyed at each rotation of the bridge to a built-in sump for timed discharge.



Bridge drive by gear pinion (without security protection)



A.S.R.: Air Saturation Reactor

The most important element to get a perfect flotation process is the Air Saturation Reactor, where, under pressure, the air is dissolved into the water. The unique and exclusive design of the A.S.R. dissolving system achieves an air saturation rate higher than 95 % of the theoretical value related to Henry's Law.



A.S.R. Air Saturation Reactor

The right ratio among Air/Water/Solids

In a flotation process it is fundamental that the amount of the dissolved air into the water to be treated is in a correct ratio with the concentration of the suspended solids to be removed.

Into the A.S.R., the flow of water to be pressurized enters from the top, at the same time with the air to be dissolved.

The air/water mixture is injected by a conical nozzle in a vertical mixing tube, which is built-in into A.S.R. unit.

The main aim is promoting the development of a huge quantity of air micro-bubbles thanks to a large exchanging area, which allows to get the highest air dissolution into water.

The pressurized water flows out from the bottom of the reactor; in this way, big air bubbles, that could damage the following phase of flotation, can not come out.



Test with A.S.R. pilot unit

The main features of the A.S.R. reactors are:

- **Pressure** tests according to the rules in force into the Countries of installation;
- **Highest** efficiency and lowest possible energy consumption;
- **Maintenance-free** stainless steel construction;
- **Operation** even with raw water, not only with recycled clarified water thanks to the total absence of internal devices that could get clogged;
- **High** air dissolution even if the water contains high solid contents.