Ultra Lamell Float

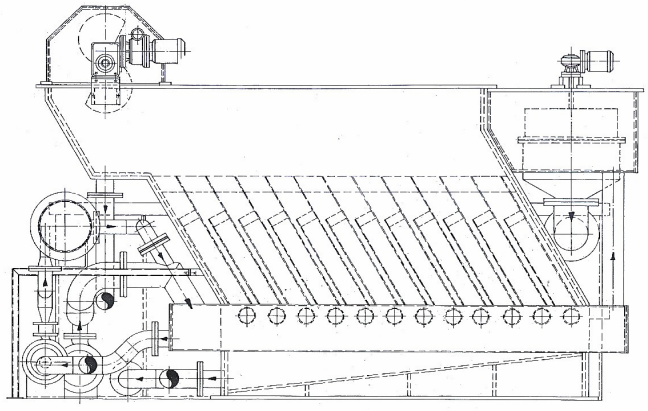
Working principle

The artificial introduction of fine air bubbles into a liquid to be purified, containing solid particles of a density below or close to those of water, entails the attachment of these fine bubbles to the particles themselves with a reduction in the density of the agglomerate and therefore resulting flotation.
In the case in point the already clarified liquid is first pressurised with air in excess, above the rate of saturation at atmospheric pressure and then, after mixing with the liquid to be treated, fed into the flotation basin where, following a reduction in pressure and depression of kinetic energy, the pollutant agglomerates rise rapidly and contemporarily the excess air dissolved is released.
In order to increase the size of the flakes and therefore the surface area of the particles per unit of weight, a coagulant is added to the water to be treated; this produces an acceleration in the ascension of the flakes and consequent greater speed of separation of the suspended solids. Such separation is specifically encouraged by means of a laminar system which covers almost the entire surface area of the flotation machine.

Performance

- Consistently improved efficiency in the separation of suspended solids compared to traditional flotation
- Possibility of treating waste waters with a higher concentration of pollutants and/or with a greater flow rate compared to traditional flotation and chemical-physical treatment
- Use of small amounts of auxiliary products (coagulants, polyelectrolytes etc.) compared to traditional flotation and chemical-physical treatment with a consequent reduction of the final sludge
- Reduced running costs compared to traditional chemical-physical systems
- Possible reutilisation of the treated water
- Limited space required for the system

ULF Overall view



ULF cross-section

System components

1. The system is composed of :

- Water pressurisation/saturation system**,** with dissolution of compressed air for the flotation of the flakes of suspended solids
- Flotation machine, for the separation of the suspended solid particles from the water and their removal
- Electric command panel for control of the ratio motors, n. 2 users 400 v-50 Hz-aux. circuits 24 v, with stop/go buttons, power used 0.75 kW

2. Flotation machine components:

- Rectangular TANK, to retain the water and for the flotation of the solid particles in suspension, with trap/drain for the sedimented material and flanged stub pipes for the intake and drainage of water, complete with self-supporting bracket;
- CENTRAL CISTERN, integral with the retention tank, to collect and drain the material removed from the rotating collector;
- STATIC MIXER, multiple-celled, for an even distribution of the flocculant in the water to be treated;
- Distribution and collection SECTOR, including the expansion/flocculation compartment, the anti-blockage flow divider and the channel for collecting the clarified water to be drained off;
- LEVEL CONTROLLER, with substantial overflow capacity and adjustable from the outside, to regulate the density of the flotated material to be removed and the discharge of the clarified water;
- ROTATING COLLECTOR with two or more elements, for the removal of the separated material, complete with protective guard and service hatch
- SPEED CHANGE DRIVE UNIT with worm reduction unit, mounted straight onto the shaft, to control the collector.

3. Pressurisation system components:

- MIXER BODY of variable size, complete with gauged nozzle for acceleration of the water and flanged stub pipes for the application and connection of porous baffles;
- MICRONISATION SEPTUM for the diffusion of the compressed air inside the mixer and its dissolution into the water;
- Gauged FRICTION NOZZLE, for the decompression of the water/air mixture, installed in the fuel pipe of the flotation machine;
- Service DEVICE, including air pressure reducer with filter, delivery/register/check/safety valves, direct read-off flow meters, device for controlling the pressure and breather pipe for the mixer.

Technical-functional data

Running capacity (max)	90 m^3/h
Water treatment capacity (max)	25 m^3/h
Recirculation for pressurisation at 5.5 bar	20 m^3/h
Internal recirculation	15 m^3/h
Contents to be removed (4000 ppm max)	100 kg/h
Surface charge per m^2	36 kg/h
Discharge flotated sludge at 4-5%	2.8 m^3/h
Discharge clarified water	22,2 m^3/h
Consumption compressed air at 6.5 bar	2,4 N m^3/h
Power used for pumps	8,8 kW

Pressurisation system

System configuration	N°1 saturatore
Diameter closure flange	450 mm
Saturation body length	1400 mm

General measurements	3000 x 4000 x 3000 mm

ULF detail sludge collection

ULF detail pressurisation system