

MICROBUBBLE FLOTATION

with Planotex Jet System and Parallel Plates

Flotation is a highly effective and economical method for cleaning wastewater containing suspended matter of a low specific weight. It is based on a reduction of the density of the suspended particles, causing them to rise (float). This effect is reached by adsorption of gas bubbles as small as practical. Another major factor influencing operation is the efficiency of the separator (flotation tank) which is determined by its separation area surface and flowrate.

Flotation has been successfully applied to the treatment of process and wastewaters in many industries, including:

- **Food industry:**
Cattle, pig and poultry slaughter houses, meat and fish processing, food-canning, dairies, cheese making, edible oil and fat production, delicatessen and ready-to-eat dishes
- **Beverage industry:**
Apple juice fining, press houses.



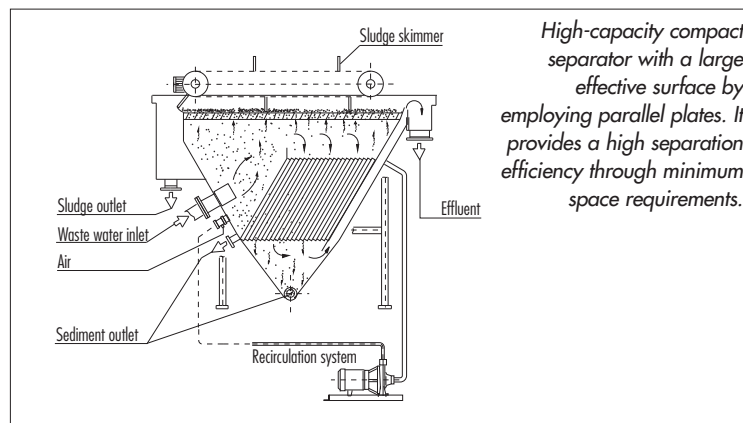
- **Municipal sewage treatment:**
Primary clarifiers, activated sludge separation and thickening.
- **Industrial wastewater treatment:**
Paper and board industry, petroleum industry, animal destructor plants, tank cleaning. Chemical industry. Textile industry.
- **Environmental technology:**
Rehabilitation of oil-polluted ground and surface waters, soil rehabilitation.
- **Recycling/Recovery of useful materials:**
Oils and fats in food industry, process water and fibre recovery in paper industry, ore dressing.
- **Water treatment:**
Drinking and industrial water.

Type PFP Planotex Flotation Plant

By employing parallel plates, the PFP Planotex Flotation Plant is provided with a larger effective surface and, consequently, reaches a higher separation efficiency at a smaller total volume. The wastewater to be treated is gravity-fed or pumped to the plant. At the inlet it is distributed across the width to achieve a uniform flow. During this process it is mixed with previously treated recirculating water to which microbubbles were added. Rapidly floating solids rise already at this stage. Following the water runs into the parallel-plate assembly in which also the slowly floating particles are separated. Due to the small diameter of the bubbles their floating rate is very low and therefore they are still available in this section to support the flotation process.

The resulting flotation layer is dewatered by gravity and a static mechanical facility and then moved into the integral sludge tank by means of a rake or scraper. A hopper bottom design ensures that settling matters can be

discharged through valves. Behind a scum board wall the clear water flows to the outlet. Part of that water is recycled through the Planotex Jet System for adding microbubbles to the inlet of the flotation plant.



The Parallel-Plate-Pack Separator

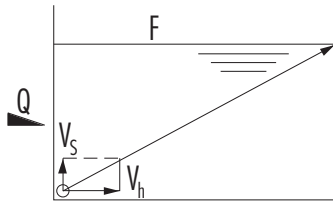


Fig. 1

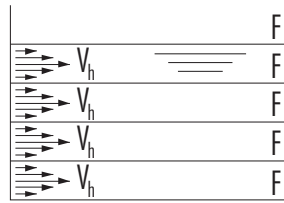


Fig. 2

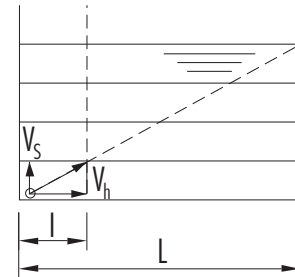
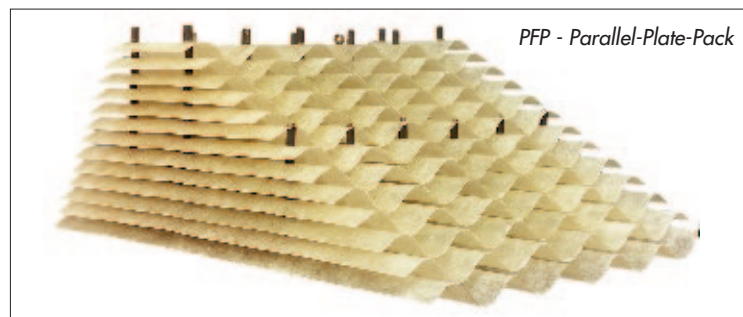


Fig. 3

The efficiency of a separator is determined by its surface F and flowrate Q (Fig. 1). Subdividing a basin into several planes would provide a much larger surface F . An appropriate flowrate generates a laminar flow between the plates, the flow rate at the plates being Q (Fig. 2). Due to these ideal conditions and the low height of rise the basin size may be reduced while retaining the separation efficiency (Fig. 3; l to L). Since this arrangement would not allow the floating particles to be removed, the plates of the

Planotex Flotation Plant were designed of a tilted plate pack. With this design solids separated between the plates may float up the plate walls in counterflow (refer to schematic of the PFP).

Planotex has employed corrugated plates enabling small particles separated in the small pitches to form larger flocs, entailing a higher buoyancy.



Advantages of the Type PFP Planotex Microbubble Flotation:

- All stainless steel.
- Compact design.
- Large separation area.
- Planotex Microbubble System.
- Hopper bottom design for sediment discharge.
- Integrated sludge compartment.
- High solid content of flotation sludge by dewatering unit.
- Optimum flow conditions for solid separation.

Our long-standing experience and the broad product range provide you with the optimum solution to your specific wastewater problem.

